RL78 FAMILY

Selection Guide

2024.03

RL78 FAMILY LINEUP

RL78/G10 (10 to 16 pins)

R5F104AGASP —— Top: Product name
(16K/8K) —— Bottom: (RAM/Data flash (bytes))

Group	RL78/G10	
Pin count / ROM (bytes)	10-pin	16-pin
512K		
384K		
256K		
192K		
128K		
96K		
64K		
48K		
32K		
24K		
16K		
8K		
4K	R5F10Y17ASP*1 (512/—)	R5F10Y47ASP*1 (512/—)
2K	R5F10Y16ASP*1 (256/—)	R5F10Y46ASP*1 (256/—)
1K	R5F10Y14ASP*1 (128/—)	R5F10Y44ASP*1 (128/—)
Package	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm 	16-pin SSOP SP thickness: 1.725mm 4.4×5.0mm Pitch: 0.65mm 

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxxDxx, ambient operating temperature range: –40 to +85°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G11 (10 to 25 pins)

R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/G11				
ROM (bytes) \ Pin count	10-pin	16-pin	20-pin	24-pin	25-pin
512K					
384K					
256K					
192K					
128K					
96K					
64K					
48K					
32K					
24K					
16K	R5F1051AASP*1 (1.5K/2K)	R5F1054AASP*1 R5F1054AANA*1 (1.5K/2K)	R5F1056AASP*1 R5F1056AASM*1 (1.5K/2K)	R5F1057AANA*1 (1.5K/2K)	R5F1058AALA*1 (1.5K/2K)
8K					
4K					
2K					
1K					
Package	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm 	16-pin SSOP SP thickness: 1.725mm 4.4×5.0mm Pitch: 0.65mm  16-pin HWQFN NA thickness: 0.80mm 3×3mm Pitch: 0.50mm 	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm  20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm 	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm 	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm 

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G12 (20 to 30 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/G12							
ROM (bytes) \ Pin count	20-pin				24-pin		30-pin	
512K								
384K								
256K								
192K								
128K								
96K								
64K								
48K								
32K								
16K	R5F1036AASP (1.5K/—)	R5F1036AASM (1.5K/—)	R5F1026AASP*1 (1.5K/2K)	R5F1026AASM*1 (1.5K/2K)	R5F1037AANA (1.5K/—)	R5F1027AANA*1 (1.5K/2K)	R5F103AAASP (2K/—)	R5F102AAASP*1 (2K/2K)
12K	R5F10369ASP (1K/—)	R5F10369ASP (1K/—)	R5F10269ASP*1 (1K/2K)	R5F10269ASM*1 (1K/2K)	R5F10379ANA (1K/—)	R5F10279ANA*1 (1K/2K)	R5F103A9ASP (1K/—)	R5F102A9ASP*1 (1K/2K)
8K	R5F10368ASP (768/—)	R5F10368ASM (768/—)	R5F10268ASP*1 (768/2K)	R5F10268ASM*1 (768/2K)	R5F10378ANA (768/—)	R5F10278ANA*1 (768/2K)	R5F103A8ASP (768/—)	R5F102A8ASP*1 (768/2K)
4K	R5F10367ASP (512/—)	R5F10367ASM (512/—)	R5F10267ASP*1 (512/2K)	R5F10267ASM*1 (512/2K)	R5F10377ANA (512/—)	R5F10277ANA*1 (512/2K)	R5F103A7ASP (512/—)	R5F102A7ASP*1 (512/2K)
2K	R5F10366ASP (256/—)	R5F10366ASM (256/—)	R5F10266ASP*1 (256/2K)	R5F10266ASM*1 (256/2K)				
1K								
Package	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm  20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm 				24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm 		30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm 	

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

MEMO

RL78/G13 (20 to 48 pins)

R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G13				
ROM (bytes) \ Pin count	20-pin	24-pin	25-pin	30-pin	32-pin
512K					
384K					
256K					
192K					
128K				R5F100AGASP (12K/8K)*2 R5F101AGASP (12K/—)	R5F100BGANA (12K/8K)*2 R5F101BGANA (12K/—)
96K				R5F100AFASP (8K/8K)*2 R5F101AFASP (8K/—)	R5F100BFANA (8K/8K)*2 R5F101BFANA (8K/—)
64K	R5F1006EASP (4K/4K)*2 R5F1016EASP (4K/—) R5F1006EASM (4K/4K)*2 R5F1016EASM (4K/—)	R5F1007EANA (4K/4K)*2 R5F1017EANA (4K/—)	R5F1008EALA (4K/4K)*2 R5F1018EALA (4K/—)	R5F100AEASP (4K/4K)*2 R5F101AEASP (4K/—)	R5F100BEANA (4K/4K)*2 R5F101BEANA (4K/—)
48K	R5F1006DASP (3K/4K)*2 R5F1016DASP (3K/—) R5F1006DASM (3K/4K)*2 R5F1016DASM (3K/—)	R5F1007DANA (3K/4K)*2 R5F1017DANA (3K/—)	R5F1008DALA (3K/4K)*2 R5F1018DALA (3K/—)	R5F100ADASP (3K/4K)*2 R5F101ADASP (3K/—)	R5F100BDANA (3K/4K)*2 R5F101BDANA (3K/—)
32K	R5F1006CASP (2K/4K)*2 R5F1016CASP (2K/—) R5F1006CASM (2K/4K)*2 R5F1016CASM (2K/—)	R5F1007CANA (2K/4K)*2 R5F1017CANA (2K/—)	R5F1008CALA (2K/4K)*2 R5F1018CALA (2K/—)	R5F100ACASP (2K/4K)*2 R5F101ACASP (2K/—)	R5F100BCANA (2K/4K)*2 R5F101BCANA (2K/—)
16K	R5F1006AASP (2K/4K)*2 R5F1016AASP (2K/—) R5F1006AASM (2K/4K)*2 R5F1016AASM (2K/—)	R5F1007AANA (2K/4K)*2 R5F1017AANA (2K/—)	R5F1008AALA (2K/4K)*2 R5F1018AALA (2K/—)	R5F100AAASP (2K/4K)*2 R5F101AAASP (2K/—)	R5F100BAANA (2K/4K)*2 R5F101BAANA (2K/—)
12K					
8K					
4K					
2K					
1K					
Package	20-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm  20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm 	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm 	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm 	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm 	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm 

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxxDxx, ambient operating temperature range: –40 to +85°C)

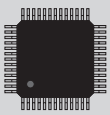
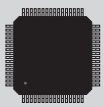
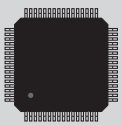
*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

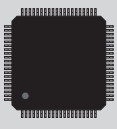
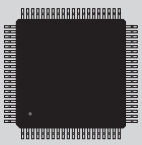
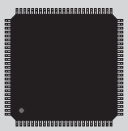
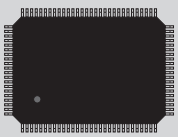
RL78/G13				
36-pin	40-pin	44-pin	48-pin	
		R5F100FLAFP (32K/8K)*1 R5F101FLAFP (32K/—)*1	R5F100GLAFB (32K/8K)*1 R5F101GLAFB (32K/—)*1	R5F100GLANA (32K/8K)*1 R5F101GLANA (32K/—)*1
		R5F100FKAFP (24K/8K)*1 R5F101FKAFP (24K/—)*1	R5F100GKAFB (24K/8K)*1 R5F101GKAFB (24K/—)*1	R5F100GKANA (24K/8K)*1 R5F101GKANA (24K/—)*1
		R5F100FJAFP (20K/8K)*2 R5F101FJAFP (20K/—)	R5F100GJAFB (20K/8K)*2 R5F101GJAFB (20K/—)	R5F100GJANA (20K/8K)*2 R5F101GJANA (20K/—)
	R5F100EHANA (16K/8K)*2 R5F101EHANA (16K/—)	R5F100FHAFP (16K/8K)*2 R5F101FHAFP (16K/—)	R5F100GHAFB (16K/8K)*2 R5F101GHAFB (16K/—)	R5F100GHANA (16K/8K)*2 R5F101GHANA (16K/—)
R5F100CGALA (12K/8K)*2 R5F101CGALA (12K/—)	R5F100EGANA (12K/8K)*2 R5F101EGANA (12K/—)	R5F100FGAFP (12K/8K)*2 R5F101FGAFP (12K/—)	R5F100GGAFB (12K/8K)*2 R5F101GGAFB (12K/—)	R5F100GGANA (12K/8K)*2 R5F101GGANA (12K/—)
R5F100CFALA (8K/8K)*2 R5F101CFALA (8K/—)	R5F100EFANA (8K/8K)*2 R5F101EFANA (8K/—)	R5F100FFAFP (8K/8K)*2 R5F101FFAFP (8K/—)	R5F100GFAFB (8K/8K)*2 R5F101GFAFB (8K/—)	R5F100GFANA (8K/8K)*2 R5F101GFANA (8K/—)
R5F100CEALA (4K/4K)*2 R5F101CEALA (4K/—)	R5F100EEANA (4K/4K)*2 R5F101EEANA (4K/—)	R5F100FEAFP (4K/4K)*2 R5F101FEAFP (4K/—)	R5F100GEAFB (4K/4K)*2 R5F101GEAFB (4K/—)	R5F100GEANA (4K/4K)*2 R5F101GEANA (4K/—)
R5F100CDALA (3K/4K)*2 R5F101CDALA (3K/—)	R5F100EDANA (3K/4K)*2 R5F101EDANA (3K/—)	R5F100FDAFP (3K/4K)*2 R5F101FDAFP (3K/—)	R5F100GDAFB (3K/4K)*2 R5F101GDAFB (3K/—)	R5F100GDANA (3K/4K)*2 R5F101GDANA (3K/—)
R5F100CCALA (2K/4K)*2 R5F101CCALA (2K/—)	R5F100ECANA (2K/4K)*2 R5F101ECANA (2K/—)	R5F100FCAFP (2K/4K)*2 R5F101FCAFP (2K/—)	R5F100GCAFB (2K/4K)*2 R5F101GCAFB (2K/—)	R5F100GCANA (2K/4K)*2 R5F101GCANA (2K/—)
R5F100CAALA (2K/4K)*2 R5F101CAALA (2K/—)	R5F100EAANA (2K/4K)*2 R5F101EAANA (2K/—)	R5F100FAAFP (2K/4K)*2 R5F101FAAFP (2K/—)	R5F100GAAFB (2K/4K)*2 R5F101GAAFB (2K/—)	R5F100GAANA (2K/4K)*2 R5F101GAANA (2K/—)
36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm	40-pin HWQFN NA thickness: 0.80mm 6×6mm Pitch: 0.50mm	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm

RL78/G13 (52 to 128 pins)

R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G13			
ROM (bytes) \ Pin count	52-pin	64-pin		
512K	R5F100JLAFA (32K/8K)*1 R5F101JLAFA (32K/—)*1	R5F100LLAFB (32K/8K)*1 R5F101LLAFB (32K/—)*1	R5F100LLAFA (32K/8K)*1 R5F101LLAFA (32K/—)*1	
384K	R5F100JKAFA (24K/8K)*1 R5F101JKAFA (24K/—)*1	R5F100LKAFB (24K/8K)*1 R5F101LKAFB (24K/—)*1	R5F100LKAFA (24K/8K)*1 R5F101LKAFA (24K/—)*1	
256K	R5F100JJAFA (20K/8K)*2 R5F101JJAFA (20K/—)	R5F100LJAFB (20K/8K)*2 R5F101LJAFB (20K/—)	R5F100LJAFA (20K/8K)*2 R5F101LJAFA (20K/—)	R5F100LJABG (20K/8K)*2 R5F101LJABG (20K/—)
192K	R5F100JHAFA (16K/8K)*2 R5F101JHAFA (16K/—)	R5F100LHAFB (16K/8K)*2 R5F101LHAFB (16K/—)	R5F100LHAFA (16K/8K)*2 R5F101LHAFA (16K/—)	R5F100LHABG (16K/8K)*2 R5F101LHABG (16K/—)
128K	R5F100JGAFA (12K/8K)*2 R5F101JGAFA (12K/—)	R5F100LGAFB (12K/8K)*2 R5F101LGAFB (12K/—)	R5F100LGAFA (12K/8K)*2 R5F101LGAFA (12K/—)	R5F100LGABG (12K/8K)*2 R5F101LGABG (12K/—)
96K	R5F100JFAFA (8K/8K)*2 R5F101JFAFA (8K/—)	R5F100LFAFB (8K/8K)*2 R5F101LFAFB (8K/—)	R5F100LFAFA (8K/8K)*2 R5F101LFAFA (8K/—)	R5F100LFABG (8K/8K)*2 R5F101LFABG (8K/—)
64K	R5F100JEAFA (4K/4K)*2 R5F101JEAFA (4K/—)	R5F100LEAFB (4K/4K)*2 R5F101LEAFB (4K/—)	R5F100LEAFA (4K/4K)*2 R5F101LEAFA (4K/—)	R5F100LEABG (4K/4K)*2 R5F101LEABG (4K/—)
48K	R5F100JDAFA (3K/4K)*2 R5F101JDAFA (3K/—)	R5F100LDAFB (3K/4K)*2 R5F101LDAFB (3K/—)	R5F100LDAFA (3K/4K)*2 R5F101LDAFA (3K/—)	R5F100LDABG (3K/4K)*2 R5F101LDABG (3K/—)
32K	R5F100JCAFA (2K/4K)*2 R5F101JCAFA (2K/—)	R5F100LCAFB (2K/4K)*2 R5F101LCAFB (2K/—)	R5F100LCAFA (2K/4K)*2 R5F101LCAFA (2K/—)	R5F100LCABG (2K/4K)*2 R5F101LCABG (2K/—)
16K				
12K				
8K				
4K				
2K				
1K				
Package	52-pin LQFP FA thickness: 1.70mm 10×10mm Pitch: 0.65mm 	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm 	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm 	64-pin VFBGA BG thickness: 0.99mm 4×4mm Pitch: 0.40mm 

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)
*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G13				
80-pin		100-pin		128-pin
R5F100MLAFB (32K/8K)*1 R5F101MLAFB (32K/—)*1	R5F100MLAFA (32K/8K)*1 R5F101MLAFA (32K/—)*1	R5F100PLAFB (32K/8K)*1 R5F101PLAFB (32K/—)*1	R5F100PLAFA (32K/8K)*1 R5F101PLAFA (32K/—)*1	R5F100SLAFB (32K/8K)*1 R5F101SLAFB (32K/—)*1
R5F100MKAFB (24K/8K)*1 R5F101MKAFB (24K/—)*1	R5F100MKAFA (24K/8K)*1 R5F101MKAFA (24K/—)*1	R5F100PKAFB (24K/8K)*1 R5F101PKAFB (24K/—)*1	R5F100PKAFA (24K/8K)*1 R5F101PKAFA (24K/—)*1	R5F100SKAFB (24K/8K)*1 R5F101SKAFB (24K/—)*1
R5F100MJAFB (20K/8K)*2 R5F101MJAFB (20K/—)	R5F100MJAFA (20K/8K)*2 R5F101MJAFA (20K/—)	R5F100PJAFB (20K/8K)*2 R5F101PJAFB (20K/—)	R5F100PJAFA (20K/8K)*2 R5F101PJAFA (20K/—)	R5F100SJAFB (20K/8K)*1 R5F101SJAFB (20K/—)*1
R5F100MHAFB (16K/8K)*2 R5F101MHAFB (16K/—)	R5F100MHAFA (16K/8K)*2 R5F101MHAFA (16K/—)	R5F100PHAFB (16K/8K)*2 R5F101PHAFB (16K/—)	R5F100PHAFA (16K/8K)*2 R5F101PHAFA (16K/—)	R5F100SHAFB (16K/8K)*1 R5F101SHAFB (16K/—)*1
R5F100MGAFB (12K/8K)*2 R5F101MGAFB (12K/—)	R5F100MGAFA (12K/8K)*2 R5F101MGAFA (12K/—)	R5F100PGAFB (12K/8K)*2 R5F101PGAFB (12K/—)	R5F100PGAFA (12K/8K)*2 R5F101PGAFA (12K/—)	
R5F100MFAFB (8K/8K)*2 R5F101MFAFB (8K/—)	R5F100MFAFA (8K/8K)*2 R5F101MFAFA (8K/—)	R5F100PFAFB (8K/8K)*2 R5F101PFAFB (8K/—)	R5F100PFAFA (8K/8K)*2 R5F101PFAFA (8K/—)	
80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	80-pin LQFP FA thickness: 1.70mm 14×14mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm	100-pin LQFP FA thickness: 1.60mm 14×20mm Pitch: 0.65mm	128-pin LFQFP FB thickness: 1.60mm 14×20mm Pitch: 0.50mm
				

RL78/G13A (44 to 100 pins)

R5F104AGASP (16K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G13A			
ROM (bytes) \ Pin count	44-pin	48-pin	64-pin	100-pin
768K				
512K	R5F140FLAFP (32K/8K) R5F140FLGFP (32K/8K)	R5F140GLAFB (32K/8K) R5F140GLGFB (32K/8K)	R5F140LLAFB (32K/8K) R5F140LLGFB (32K/8K)	R5F140PLAFB (32K/8K) R5F140PLGFB (32K/8K)
384K	R5F140FKAFP (24K/8K) R5F140FKGFP (24K/8K)	R5F140GKAFB (24K/8K) R5F140GKGFB (24K/8K)	R5F140LKAFB (24K/8K) R5F140LKGFB (24K/8K)	R5F140PKAFB (24K/8K) R5F140PKGFB (24K/8K)
256K				
192K				
128K				
96K				
64K				
48K				
32K				
16K				
12K				
8K				
4K				
2K				
1K				
Package	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm

MEMO

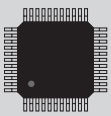
RL78/G14 (30 to 100 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/G14							
ROM (bytes) \ Pin count	30-pin	32-pin		36-pin	40-pin	44-pin	48-pin	
512K							R5F104GLAFB*1 (48K/8K)	R5F104GLANA*1 (48K/8K)
384K							R5F104GKAFB*1 (32K/8K)	R5F104GKANA*1 (32K/8K)
256K						R5F104FJAFP*1 (24K/8K)	R5F104GJAFB*1 (24K/8K)	R5F104GJANA*1 (24K/8K)
192K					R5F104EHANA*1 (20K/8K)	R5F104FHAFP*1 (20K/8K)	R5F104GHAFB*1 (20K/8K)	R5F104GHANA*1 (20K/8K)
128K	R5F104AGASP*1 (16K/8K)	R5F104BGANA*1 (16K/8K)	R5F104BGAFP*1 (16K/8K)	R5F104CGALA*1 (16K/8K)	R5F104EGANA*1 (16K/8K)	R5F104FGAFP*1 (16K/8K)	R5F104GGAFB*1 (16K/8K)	R5F104GGANA*1 (16K/8K)
96K	R5F104AFASP*1 (12K/8K)	R5F104BFANA*1 (12K/8K)	R5F104BFAFP*1 (12K/8K)	R5F104CFALA*1 (12K/8K)	R5F104EFANA*1 (12K/8K)	R5F104FFAFP*1 (12K/8K)	R5F104GFAFB*1 (12K/8K)	R5F104GFANA*1 (12K/8K)
64K	R5F104AEASP*1 (5.5K/4K)	R5F104BEANA*1 (5.5K/4K)	R5F104BEAFP*1 (5.5K/4K)	R5F104CEALA*1 (5.5K/4K)	R5F104EEANA*1 (5.5K/4K)	R5F104FEAFP*1 (5.5K/4K)	R5F104GEAFB*1 (5.5K/4K)	R5F104GEANA*1 (5.5K/4K)
48K	R5F104ADASP*1 (5.5K/4K)	R5F104BDANA*1 (5.5K/4K)	R5F104BDAFP*1 (5.5K/4K)	R5F104CDALA*1 (5.5K/4K)	R5F104EDANA*1 (5.5K/4K)	R5F104FDAFP*1 (5.5K/4K)	R5F104GDAFB*1 (5.5K/4K)	R5F104GDANA*1 (5.5K/4K)
32K	R5F104ACASP*1 (4K/4K)	R5F104BCANA*1 (4K/4K)	R5F104BCAFP*1 (4K/4K)	R5F104CCALA*1 (4K/4K)	R5F104ECANA*1 (4K/4K)	R5F104FCAFP*1 (4K/4K)	R5F104GCAFB*1 (4K/4K)	R5F104GCANA*1 (4K/4K)
16K	R5F104AAASP*1 (2.5K/4K)	R5F104BAANA*1 (2.5K/4K)	R5F104BAAFP*1 (2.5K/4K)	R5F104CAALA*1 (2.5K/4K)	R5F104EAANA*1 (2.5K/4K)	R5F104FAAFP*1 (2.5K/4K)	R5F104GAAFB*1 (2.5K/4K)	R5F104GAANA*1 (2.5K/4K)
12K								
8K								
4K								
2K								
1K								
Package	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm	40-pin HWQFN NA thickness: 0.80mm 6×6mm Pitch: 0.50mm	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.60mm*2 7×7mm Pitch: 0.50mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm





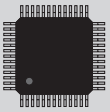
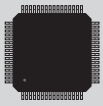
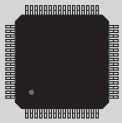
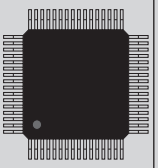
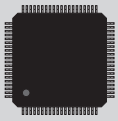
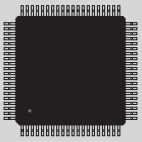
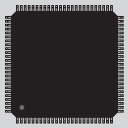
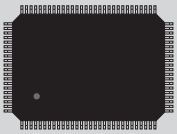



The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*2: Products with 384KB or 512KB of ROM are 1.70 mm thick.

RL78/G14								
52-pin	64-pin				80-pin		100-pin	
	R5F104LLAFB*1 (48K/8K)	R5F104LLAFA*1 (48K/8K)		R5F104LLALA*1 (48K/8K)	R5F104MLAFB*1 (48K/8K)	R5F104MLAFA*1 (48K/8K)	R5F104PLAFB*1 (48K/8K)	R5F104PLAFA*1 (48K/8K)
	R5F104LKAFB*1 (32K/8K)	R5F104LKAFA*1 (32K/8K)		R5F104LKALA*1 (32K/8K)	R5F104MKAFB*1 (32K/8K)	R5F104MKAFA*1 (32K/8K)	R5F104PKAFB*1 (32K/8K)	R5F104PKAFA*1 (32K/8K)
R5F104JJAFA*1 (24K/8K)	R5F104LJAFB*1 (24K/8K)	R5F104LJAFA*1 (24K/8K)	R5F104LJAFP*1 (24K/8K)	R5F104LJALA*1 (24K/8K)	R5F104MJAFB*1 (24K/8K)	R5F104MJAFA*1 (24K/8K)	R5F104PJAFB*1 (24K/8K)	R5F104PJAFA*1 (24K/8K)
R5F104JHAFA*1 (20K/8K)	R5F104LHAFB*1 (20K/8K)	R5F104LHAFA*1 (20K/8K)	R5F104LHAFP*1 (20K/8K)	R5F104LHALA*1 (20K/8K)	R5F104MHAFB*1 (20K/8K)	R5F104MHAFA*1 (20K/8K)	R5F104PHAFB*1 (20K/8K)	R5F104PHAFA*1 (20K/8K)
R5F104JGAFA*1 (16K/8K)	R5F104LGAFB*1 (16K/8K)	R5F104LGAFA*1 (16K/8K)	R5F104LGAFP*1 (16K/8K)	R5F104LGALA*1 (16K/8K)	R5F104MGAFB*1 (16K/8K)	R5F104MGAFA*1 (16K/8K)	R5F104PGAFB*1 (16K/8K)	R5F104PGAFA*1 (16K/8K)
R5F104JFAFA*1 (12K/8K)	R5F104LFAFB*1 (12K/8K)	R5F104LFAFA*1 (12K/8K)	R5F104LFAFP*1 (12K/8K)	R5F104LFALA*1 (12K/8K)	R5F104MFAFB*1 (12K/8K)	R5F104MFAFA*1 (12K/8K)	R5F104PFAFB*1 (12K/8K)	R5F104PFAFA*1 (12K/8K)
R5F104JEAFA*1 (5.5K/4K)	R5F104LEAFB*1 (5.5K/4K)	R5F104LEAFA*1 (5.5K/4K)	R5F104LEAFP*1 (5.5K/4K)	R5F104LEALA*1 (5.5K/4K)				
R5F104JDAFA*1 (5.5K/4K)	R5F104LDAFB*1 (5.5K/4K)	R5F104LDAFA*1 (5.5K/4K)	R5F104LDAFP*1 (5.5K/4K)	R5F104LDALA*1 (5.5K/4K)				
R5F104JCAFA*1 (4K/4K)	R5F104LCAFB*1 (4K/4K)	R5F104LCAFA*1 (4K/4K)	R5F104LCAFP*1 (4K/4K)	R5F104LCALA*1 (4K/4K)				
52-pin LQFP FA thickness: 1.70mm 10×10mm Pitch: 0.65mm	64-pin LFQFP FB thickness: 1.60mm*2 10×10mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm	64-pin LQFP FP thickness: 1.70mm 14×14mm Pitch: 0.80mm	64-pin WFLGA LA thickness: 0.76mm 5×5mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm*2 12×12mm Pitch: 0.50mm	80-pin LQFP FA thickness: 1.70mm 14×14mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.60mm*2 14×14mm Pitch: 0.50mm	100-pin LQFP FA thickness: 1.60mm 14×20mm Pitch: 0.65mm
								

RL78/G15 (8 to 20 pins)

R5F12007ANS (1K/1K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G15			
ROM (bytes) \ Pin count	8-pin	10-pin	16-pin	20-pin
768K				
512K				
384K				
256K				
192K				
128K				
96K				
64K				
48K				
32K				
16K				
12K				
8K	R5F12008ANS (1K/1K)*1	R5F12018ASP (1K/1K)*1	R5F12048ASP (1K/1K)*1 R5F12048ANA (1K/1K)*1	R5F12068ASP (1K/1K)*1
4K	R5F12007ANS (1K/1K)*1	R5F12017ASP (1K/1K)*1	R5F12047ASP (1K/1K)*1 R5F12047ANA (1K/1K)*1	R5F12067ASP (1K/1K)*1
2K				
1K				
Package	8-pin WDFN NS thickness: 0.80mm 3×3mm Pitch: 0.65mm 	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm 	16-pin SSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm  16-pin HWQFN NA thickness: 0.80mm 3×3mm Pitch: 0.50mm 	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm 

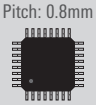
The above part numbers are consumer grade products. (ambient operating temperature range : –40~+85°C)

*1: Industrial grade products are also available. (part number:R5F120xxGxx, ambient operating temperature range: –40~+105°C, part number:R5F120xxMxx, ambient operating temperature range: –40~+125°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G16 (10 to 32pins)

R5F1211AASP (2K/1K): Product name (RAM((bytes) / Data flash (bytes))

Group	RL78/G16				
ROM (bytes) \ Pin count	10-pin	16-pin	20-pin	24-pin	32-pin
768K					
512K					
384K					
256K					
192K					
128K					
96K					
64K					
48K					
32K	R5F1211CASP (2K/1K)*1	R5F1214CASP (2K/1K)*1 R5F1214CANA (2K/1K)*1	R5F1216CASP (2K/1K)*1	R5F1217CANA (2K/1K)*1	R5F121BCANA (2K/1K)*1 R5F121BCAFP (2K/1K)*1
16K	R5F1211AASP (2K/1K)*1	"R5F1214AASP (2K/1K)*1 R5F1214AANA (2K/1K)*1	R5F1216AASP (2K/1K)*1	R5F1217AANA (2K/1K)*1	R5F121BAANA (2K/1K)*1 R5F121BAAFP (2K/1K)*1
12K					
8K					
4K					
2K					
1K					
Package	10-pin LSSOP SP thickness: 1.45mm 4.4×3.6mm Pitch: 0.65mm 	16-pin SSOP SP thickness: 1.725mm 4.4×5mm Pitch: 0.65mm  16-pin HWQFN NA thickness: 0.80mm 3×3mm Pitch: 0.5mm 	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm 	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.5mm 	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.5mm  32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.8mm 

The above part numbers are consumer grade products. (ambient operating temperature range : –40~+85°C)

*1: Industrial grade products are also available. (part number:R5F121xxGxx, ambient operating temperature range: –40~+105°C, part number:R5F121xxMxx, ambient operating temperature range: –40~+125°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G22 (16 to 48 pins)

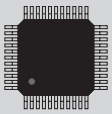
R7F102G4E2DNP (4K/2K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G22				
ROM (bytes) \ Pin count	16-pin	20-pin	24-pin	25-pin	30-pin
768K					
512K					
384K					
256K					
192K					
128K					
96K					
64K	R7F102G4E2DNP (4K/2K)*1	R7F102G6E2DSP (4K/2K)*1	R7F102G7E2DNP (4K/2K)*1	R7F102G8E2DLA (4K/2K)*1	R7F102GAE2DSP (4K/2K)*1
48K					
32K	R7F102G4C2DNP (4K/2K)*1	R7F102G6C2DSP (4K/2K)*1	R7F102G7C2DNP (4K/2K)*1	R7F102G8C2DLA (4K/2K)*1	R7F102GAC2DSP (4K/2K)*1
16K					
12K					
8K					
4K					
2K					
1K					
Package	16-pin HWQFN NP thickness: 0.80mm 3×3mm Pitch: 0.50mm	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NP thickness: 0.80mm 4×4mm Pitch: 0.50mm	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm	30-pin LSSOP SP thickness: 1.40mm 9.85mm (300mil) Pitch: 0.65mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40~+85°C)

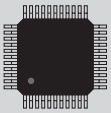
*1: Industrial grade products are also available. (part number: R7F102Gxx3Cxx, ambient operating temperature range: –40~+105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

RL78/G22				
32-pin	36-pin	40-pin	44-pin	48-pin
R7F102GBE2DNP (4K/2K)*1 R7F102GBE2DFP (4K/2K)*1	R7F102GCE2DLA (4K/2K)*1	R7F102GEE2DNP (4K/2K)*1	R7F102GFE2DFP (4K/2K)*1	R7F102GGE2DNP (4K/2K)*1 R7F102GGE2DFB (4K/2K)*1
R7F102GBC2DNP (4K/2K)*1 R7F102GBC2DFP (4K/2K)*1	R7F102GCC2DLA (4K/2K)*1	R7F102GEC2DNP (4K/2K)*1	R7F102GFC2DFP (4K/2K)*1	R7F102GGC2DNP (4K/2K)*1 R7F102GGC2DFB (4K/2K)*1
32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch: 0.50mm  32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm 	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm 	40-pin HWQFN NP thickness: 0.80mm 6×6mm Pitch: 0.50mm 	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm 	48-pin HWQFN NP thickness: 0.80mm 7×7mm Pitch: 0.50mm  48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.50mm 

RL78/G23 (30 to 128 pins)

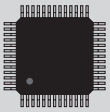
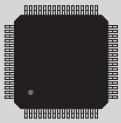
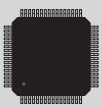
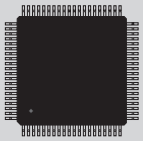
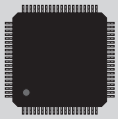
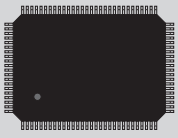
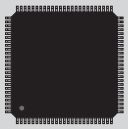
R7F100GAJ2DSP(24K/8K): Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G23				
ROM (bytes) \ Pin count	30-pin	32-pin	36-pin	40-pin	44-pin
768K					R7F100GFN2DFP(48K/8K)*1
512K					R7F100GFL2DFP(48K/8K)*1
384K					R7F100GFK2DFP(32K/8K)*1
256K	R7F100GAJ2DSP(24K/8K)*1	R7F100GBJ2DNP(24K/8K)*1 R7F100GBJ2DFP(24K/8K)*1	R7F100GCJ2DLA(24K/8K)*1	R7F100GEJ2DNP(24K/8K)*1	R7F100GFJ2DFP(24K/8K)*1
192K	R7F100GAH2DSP(20K/8K)*1	R7F100GBH2DNP(20K/8K)*1 R7F100GBH2DFP(20K/8K)*1	R7F100GCH2DLA(20K/8K)*1	R7F100GEH2DNP(20K/8K)*1	R7F100GFH2DFP(20K/8K)*1
128K	R7F100GAG2DSP(16K/8K)*1	R7F100GBG2DNP(16K/8K)*1 R7F100GBG2DFP(16K/8K)*1	R7F100GCG2DLA(16K/8K)*1	R7F100GEG2DNP(16K/8K)*1	R7F100GFG2DFP(16K/8K)*1
96K	R7F100GAF2DSP(12K/8K)*1	R7F100GBF2DNP(12K/8K)*1 R7F100GBF2DFP(12K/8K)*1	R7F100GCF2DSLA(12K/8K)*1	R7F100GEF2DNP(12K/8K)*1	R7F100GFF2DFP(12K/8K)*1
64K					
48K					
32K					
16K					
12K					
8K					
4K					
2K					
1K					
Package	30-pin LSSOP SM thickness: 1.30mm 9.85mm (300mil) Pitch: 0.65mm 	32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch: 0.50mm  32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm 	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm 	40-pin HWQFN NP thickness: 0.80mm 6×6mm Pitch: 0.50mm 	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm 

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R7F100Gxx3Cxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

RL78/G23					
48-pin	52-pin	64-pin	80-pin	100-pin	128-pin
R7F100GGN2DFB(48K/8K)*1 R7F100GGN2DNP(48K/8K)*1	R7F100GJN2DFA(48K/8K)*1	R7F100GLN2DFA(48K/8K)*1 R7F100GLN2DFB(48K/8K)*1 R7F100GLN2DLA(48K/8K)*1	R7F100GMN2DFA(48K/8K)*1 R7F100GMN2DFB(48K/8K)*1	R7F100GPN2DFA(48K/8K)*1 R7F100GPN2DFB(48K/8K)*1	R7F100GSN2DFB(48K/8K)*1
R7F100GGL2DFB(48K/8K)*1 R7F100GGL2DNP(48K/8K)*1	R7F100GJL2DFA(48K/8K)*1	R7F100GLL2DFA(48K/8K)*1 R7F100GLL2DFB(48K/8K)*1 R7F100GLL2DLA(48K/8K)*1	R7F100GML2DFA(48K/8K)*1 R7F100GML2DFB(48K/8K)*1	R7F100GPL2DFA(48K/8K)*1 R7F100GPL2DFB(48K/8K)*1	R7F100GSL2DFB(48K/8K)*1
R7F100GGK2DFB(32K/8K)*1 R7F100GGK2DNP(32K/8K)*1	R7F100GJK2DFA(32K/8K)*1	R7F100GLK2DFA(32K/8K)*1 R7F100GLK2DFB(32K/8K)*1 R7F100GLK2DLA(32K/8K)*1	R7F100GMK2DFA(32K/8K)*1 R7F100GMK2DFB(32K/8K)*1	R7F100GPK2DFA(32K/8K)*1 R7F100GPK2DFB(32K/8K)*1	R7F100GSK2DFB(32K/8K)*1
R7F100GGJ2DFB(24K/8K)*1 R7F100GGJ2DNP(24K/8K)*1	R7F100GJJ2DFA(24K/8K)*1	R7F100GLJ2DFA(24K/8K)*1 R7F100GLJ2DFB(24K/8K)*1 R7F100GLJ2DLA(24K/8K)*1	R7F100GMJ2DFA(24K/8K)*1 R7F100GMJ2DFB(24K/8K)*1	R7F100GPJ2DFA(24K/8K)*1 R7F100GPJ2DFB(24K/8K)*1	R7F100GSJ2DFB(24K/8K)*1
R7F100GGH2DFB(20K/8K)*1 R7F100GGH2DNP(20K/8K)*1	R7F100GJH2DFA(20K/8K)*1	R7F100GLH2DFA(20K/8K)*1 R7F100GLH2DFB(20K/8K)*1 R7F100GLH2DLA(20K/8K)*1	R7F100GMH2DFA(20K/8K)*1 R7F100GMH2DFB(20K/8K)*1	R7F100GPH2DFA(20K/8K)*1 R7F100GPH2DFB(20K/8K)*1	
R7F100GGG2DFB(16K/8K)*1 R7F100GGG2DNP(16K/8K)*1	R7F100GJG2DFA(16K/8K)*1	R7F100GLG2DFA(16K/8K)*1 R7F100GLG2DFB(16K/8K)*1 R7F100GLG2DLA(16K/8K)*1	R7F100GMG2DFA(16K/8K)*1 R7F100GMG2DNB(16K/8K)*1	R7F100GPG2DFA(16K/8K)*1 R7F100GPG2DNB(16K/8K)*1	
R7F100GGF2DFB(12K/8K)*1 R7F100GGF2DNP(12K/8K)*1	R7F100GJF2DFA(12K/8K)*1	R7F100GLF2DFA(12K/8K)*1 R7F100GLF2DFB(12K/8K)*1 R7F100GLF2DLA(12K/8K)*1			
48-pin LFQFP FB thickness: 0.70mm 7×7mm Pitch: 0.50mm  48-pin HWQFN NP thickness: 0.80mm 7×7mm Pitch: 0.50mm 	52-pin LQFP FA thickness: 1.70mm 10×10mm Pitch: 0.50mm 	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm  64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm  64-pin WFLGA LA thickness: 0.760mm 5×5mm Pitch: 0.50mm 	80-pin LQFP FA thickness: 1.70mm 14×14mm Pitch: 0.65mm  80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm 	100-pin LQFP FA thickness: 1.60mm 14×20mm Pitch: 0.65mm  100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm 	128-pin LFQFP FB thickness: 1.60mm 20×20mm Pitch: 0.50mm 

RL78/G24 (20 to 64pins)

R7F101G6E2DSP (12K/4K): Product name (RAM (bytes) / Data flash (bytes))

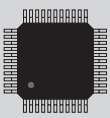
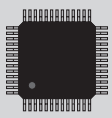
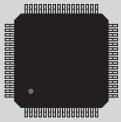
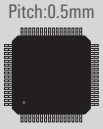
Group	RL78/G24				
Pin count / ROM (bytes)	20-pin	24-pin	25-pin	30-pin	32-pin
768K					
512K					
384K					
256K					
192K					
128K	R7F101G6G2DSP (12K/4K)*1	R7F101G7G2DNP (12K/4K)*1	R7F101G8G2DLA (12K/4K)*2	R7F101GAG2DSP (12K/4K)*1	R7F101GBG2DNP (12K/4K)*1 R7F101GBG2DFP (12K/4K)*2
96K					
64K	R7F101G6E2DSP (12K/4K)*1	R7F101G7E2DNP (12K/4K)*1	R7F101G8E2DLA (12K/4K)*2	R7F101GAE2DSP (12K/4K)*1	R7F101GBE2DNP (12K/4K)*1 R7F101GBE2DFP (12K/4K)*2
48K					
32K					
16K					
12K					
8K					
4K					
2K					
1K					
Package	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm 	24-pin HWQFN NP thickness: 0.80mm 4×4mm Pitch: 0.5mm 	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.5mm 	30-pin LSSOP SP thickness: 1.40mm 9.85mm(300mil) Pitch: 0.65mm 	32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch:0.5mm  32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.8mm 

The above part numbers are consumer grade products. (ambient operating temperature range : –40~+85°C)

*1: Industrial grade products are also available. (part number: R7F101Gxx3Cxx, ambient operating temperature range: –40~+105°C, part number: R7F101Gxx4Cxx, ambient operating temperature range: –40~+125°C)

*2: Industrial grade products are also available. (part number: R7F101Gxx3Cxx, ambient operating temperature range: –40~+105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

RL78/G24				
40-pin	44-pin	48-pin	52-pin	64-pin
R7F101GEG2DNP (12K/4K)*1	R7F101GFG2DFP (12K/4K)*2	R7F101GGG2DFB (12K/4K)*1 R7F101GGG2DNP (12K/4K)*2	R7F101GJG2DFA (12K/4K)*1	R7F101GLG2DFA (12K/4K)*2 R7F101GLG2DFB (12K/4K)*2
R7F101GEE2DNP (12K/4K)*1	R7F101GFE2DFP (12K/4K)*2	R7F101GGE2DFB (12K/4K)*1 R7F101GGE2DNP (12K/4K)*2	R7F101GJE2DFA (12K/4K)*1	R7F101GLE2DFA (12K/4K)*2 R7F101GLE2DFB (12K/4K)*2
40-pin HWQFN NP thickness: 0.80mm 6×6mm Pitch: 0.5mm 	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.8mm 	48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.5mm  48-pin HWQFN NP thickness: 0.80mm 7×7mm Pitch: 0.5mm 	52-pin LQFP FA thickness:1.70mm 10×10mm Pitch:0.65mm 	64-pin LQFP FA thickness:1.60mm 12×12mm Pitch:0.65mm  64-pin LFQFP FB thickness:1.70mm 10×10mm Pitch:0.5mm 

RL78/G1A (25 to 64 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/G1A					
ROM (bytes) \ Pin count	25-pin	32-pin	48-pin		64-pin	
512K						
384K						
256K						
192K						
128K						
96K						
64K	R5F10E8EALA*1 (4K/4K)	R5F10EBEANA*1 (4K/4K)	R5F10EGEAFB*1 (4K/4K)	R5F10EGEANA*1 (4K/4K)	R5F10ELEAFB*1 (4K/4K)	R5F10ELEABG*1 (4K/4K)
48K	R5F10E8DALA*1 (3K/4K)	R5F10EBDANA*1 (3K/4K)	R5F10EGDAFB*1 (3K/4K)	R5F10EGDANA*1 (3K/4K)	R5F10ELDAFB*1 (3K/4K)	R5F10ELDABG*1 (3K/4K)
32K	R5F10E8CALA*1 (2K/4K)	R5F10EBCANA*1 (2K/4K)	R5F10EGCAFB*1 (2K/4K)	R5F10EGCANA*1 (2K/4K)	R5F10ELCAFB*1 (2K/4K)	R5F10ELCABG*1 (2K/4K)
16K	R5F10E8AALA*1 (2K/4K)	R5F10EBAANA*1 (2K/4K)	R5F10EGAAFB*1 (2K/4K)	R5F10EGAANA*1 (2K/4K)		
12K						
8K						
4K						
2K						
1K						
Package	25-pin WFLGA LA thickness: 0.76mm 3×3mm Pitch: 0.50mm	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	64-pin VFBGA BG thickness: 0.99mm 4×4mm Pitch: 0.40mm

The above part numbers are consumer grade products. (ambient operating temperature range : −40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: −40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1C (32 to 48 pins)

R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/G1C							
ROM (bytes) \ Pin count	32-pin				48-pin			
512K								
384K								
256K								
192K								
128K								
96K								
64K								
48K								
32K	R5F10JBCANA*1 (5.5K/2K) Host/Function	R5F10JBCAFP*1 (5.5K/2K) Host/Function	R5F10KBCANA*1 (5.5K/2K) Function only	R5F10KBCAFP*1 (5.5K/2K) Function only	R5F10JGCANA*1 (5.5K/2K) Host/Function	R5F10JGCAFB*1 (5.5K/2K) Host/Function	R5F10KGCANA*1 (5.5K/2K) Function only	R5F10KGCAFB*1 (5.5K/2K) Function only
24K								
16K								
8K								
4K								
2K								
1K								
Package	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HWQFN NA thickness: 0.80mm 7×7mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1D (48 pins), RL78/G1D Module (42 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/G1D	RL78/G1D Module
ROM (bytes) \ Pin count	48-pin	42-pin
512K		
384K		
256K	R5F11AGJANB*1 (20K/8K)	RY7011A0000DZ00*1 (20K/8K)
192K	R5F11AGHANB*1 (16K/8K)	
128K	R5F11AGGANB*1 (12K/8K)	
96K		
64K		
48K		
32K		
16K		
12K		
8K		
4K		
2K		
1K		
Package	48-pin HWQFN NA thickness: 0.80mm 6×6mm Pitch: 0.40mm	42-pin LGA Thickness: 1.7mm 8.95×13.35mm Pitch: 0.85mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*1: Operating temperature range: –25 to +75°C

RL78/G1F (24 to 64 pins)

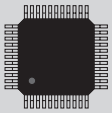
R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/G1F				
Pin count / ROM (bytes)	24-pin	32-pin	36-pin	48-pin	64-pin
512K					
384K					
256K					
192K					
128K					
96K					
64K	R5F11B7EANA*1 (5.5K/4K)	R5F11BBEAFP*1 R5F11BBEANA*1 (5.5K/4K)	R5F11BCEALA*1 (5.5K/4K)	R5F11BGEAFB*1 (5.5K/4K)	R5F11BLEAFB*1 (5.5K/4K)
48K					
32K	R5F11B7CANA*1 (5.5K/4K)	R5F11BBCAFP*1 R5F11BBCANA*1 (5.5K/4K)	R5F11BCCALA*1 (5.5K/4K)	R5F11BGCAFB*1 (5.5K/4K)	R5F11BLCAFB*1 (5.5K/4K)
16K					
12K					
8K					
4K					
2K					
1K					
Package	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm 32-pin HWQFN NA thickness: 0.80mm 5×5mm Pitch: 0.50mm	36-pin WFLGA LA thickness: 0.76mm 4×4mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1G (30 to 44 pins)

R5F104AGASP (16K/8K)
—— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/G1G		
ROM (bytes) \ Pin count	30-pin	32-pin	44-pin
512K			
384K			
256K			
192K			
128K			
96K			
64K			
48K			
32K			
16K	R5F11EAAASP (1.5K/—)	R5F11EBAAFP (1.5K/—)	R5F11EFAAFP (1.5K/—)
12K			
8K	R5F11EA8ASP (1.5K/—)	R5F11EB8AFP (1.5K/—)	R5F11EF8AFP (1.5K/—)
4K			
2K			
1K			
Package	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm 	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm 	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm 

RL78/G1H (64 pins)

R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/G1H
Pin count / ROM (bytes)	64-pin
512K	R5F11FLLANA*1 (48K/8K)
384K	R5F11FLKANA*1 (32K/8K)
256K	R5F11FLJANA*1 (24K/8K)
192K	
128K	
96K	
64K	
48K	
32K	
24K	
16K	
8K	
4K	
2K	
1K	
Package	64-pin HVQFN NA thickness: 1.00mm 9×9mm Pitch: 0.50mm

RL78/G1M (20 pins)

R5F104AGASP (16K/8K):
Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G1M
Pin count / ROM (bytes)	20-pin
768K	
512K	
384K	
256K	
192K	
128K	
96K	
64K	
48K	
32K	
16K	
12K	
8K	R5F11W68ASM (1K/—) R5F11W68DSM (1K/—)
4K	R5F11W67ASM (1K/—) R5F11W67DSM (1K/—)
2K	
1K	
Package	20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1N (20 pins)

R5F104AGASP (16K/8K):
Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G1N
Pin count / ROM (bytes)	20-pin
768K	
512K	
384K	
256K	
192K	
128K	
96K	
64K	
48K	
32K	
16K	
12K	
8K	R5F11Y68ASM (1K/—) R5F11Y68DSM (1K/—)
4K	R5F11Y67ASM (1K/—) R5F11Y67DSM (1K/—)
2K	
1K	
Package	20-pin TSSOP SM thickness: 1.20mm 4.4×6.5mm Pitch: 0.65mm 

RL78/G1P (24 to 32 pins)

R5F104AGASP (16K/8K):
Product name (RAM (bytes) / Data flash (bytes))

Group	RL78/G1P	
Pin count / ROM (bytes)	24-pin	32-pin
768K		
512K		
384K		
256K		
192K		
128K		
96K		
64K		
48K		
32K		
16K	R5F11Z7AANA (1.5K/2K) R5F11Z7ADNA (1.5K/2K)	R5F11ZBAAFP (1.5K/2K) R5F11ZBADFP (1.5K/2K)
12K		
8K		
4K		
2K		
1K		
Package	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm 	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm 

RL78/L12 (32 to 64 pins)

R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/L12						
ROM (bytes) \ Pin count	32-pin	44-pin	48-pin	52-pin	64-pin		
512K							
384K							
256K							
192K							
128K							
96K							
64K							
48K							
32K	R5F10RBCAFP*1 (1.5K/2K)	R5F10RFCAFP*1 (1.5K/2K)	R5F10RGCAFB*1 (1.5K/2K)	R5F10RJCAFA*1 (1.5K/2K)	R5F10RLCAFB*1 (1.5K/2K)	R5F10RLCAFA*1 (1.5K/2K)	R5F10RLCANB*1 (1.5K/2K)
24K							
16K	R5F10RBAAFP*1 (1K/2K)	R5F10RFAAFP*1 (1K/2K)	R5F10RGAAFB*1 (1K/2K)	R5F10RJAAFA*1 (1K/2K)	R5F10RLAAFB*1 (1K/2K)	R5F10RLAAFA*1 (1K/2K)	R5F10RLAANB*1 (1K/2K)
8K	R5F10RB8AFP*1 (1K/2K)	R5F10RF8AFP*1 (1K/2K)	R5F10RG8AFB*1 (1K/2K)	R5F10RJ8AFA*1 (1K/2K)			
4K							
2K							
1K							
Package	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	44-pin LQFP FP thickness: 1.60mm 10×10mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	52-pin LQFP FA thickness: 1.70mm 10×10mm Pitch: 0.65mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm	64-pin HWQFN NB thickness: 0.80mm 8×8mm Pitch: 0.40mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/L13 (64 to 80 pins)

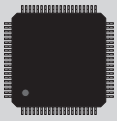
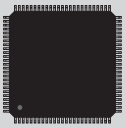
R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/L13			
Pin count / ROM (bytes)	64-pin		80-pin	
512K				
384K				
256K				
192K				
128K	R5F10WLGAFB*1 (8K/4K)	R5F10WLGAFA (8K/4K)	R5F10WMGAFB*1 (8K/4K)	R5F10WMGAFA (8K/4K)
96K	R5F10WLFAFB*1 (6K/4K)	R5F10WLFAFA (6K/4K)	R5F10WMFAFB*1 (6K/4K)	R5F10WMFAFA (6K/4K)
64K	R5F10WLEAFB*1 (4K/4K)	R5F10WLEAFA (4K/4K)	R5F10WMEAFB*1 (4K/4K)	R5F10WMEAFA (4K/4K)
48K	R5F10WLDAFB*1 (2K/4K)	R5F10WLDAFA (2K/4K)	R5F10WMDAFB*1 (2K/4K)	R5F10WMDAFA (2K/4K)
32K	R5F10WLCAFB*1 (1.5K/4K)	R5F10WLCAFA (1.5K/4K)	R5F10WMCAFB*1 (1.5K/4K)	R5F10WMCAFA (1.5K/4K)
24K				
16K	R5F10WLAAFB*1 (1K/4K)	R5F10WLAAFA (1K/4K)	R5F10WMAAFB*1 (1K/4K)	R5F10WMAAFA (1K/4K)
8K				
4K				
2K				
1K				
Package	64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm	64-pin LQFP FA thickness: 1.60mm 12×12mm Pitch: 0.65mm	80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	80-pin LQFP FA thickness: 1.70mm 14×14mm Pitch: 0.65mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/L1A (80 to 100 pins)

R5F104AGASP (16K/8K)
—— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/L1A	
Pin count / ROM (bytes)	80-pin	100-pin
512K		
384K		
256K		
192K		
128K		R5F11MPGAFB (8KB/5.5KB)
96K	R5F11MMFAFB (8KB/5.5KB)	R5F11MPFAFB (8KB/5.5KB)
64K	R5F11MMEAFB (8KB/5.5KB)	R5F11MPEAFB (8KB/5.5KB)
48K	R5F11MMDAFB (8KB/5.5KB)	
32K		
24K		
16K		
8K		
4K		
2K		
1K		
Package	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm 	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm 

RL78/L1C (80 to 100 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/L1C (USB)			RL78/L1C (no USB)		
Pin count / ROM (bytes)	80-pin	85-pin	100-pin	80-pin	85-pin	100-pin
512K						
384K						
256K	R5F110MJAFB*1 (16K/8K)	R5F110NJALA*1 (16K/8K)	R5F110PJAFB*1 (16K/8K)	R5F111MJAFB*1 (16K/8K)	R5F111NJALA*1 (16K/8K)	R5F111PJAFB*1 (16K/8K)
192K	R5F110MHAFB*1 (16K/8K)	R5F110NHALA*1 (16K/8K)	R5F110PHAFB*1 (16K/8K)	R5F111MHAFB*1 (16K/8K)	R5F111NHALA*1 (16K/8K)	R5F111PHAFB*1 (16K/8K)
128K	R5F110MGAFB*1 (12K/8K)	R5F110NGALA*1 (12K/8K)	R5F110PGAFB*1 (12K/8K)	R5F111MGAFB*1 (12K/8K)	R5F111NGALA*1 (12K/8K)	R5F111PGAFB*1 (12K/8K)
96K	R5F110MFAFB*1 (10K/8K)	R5F110NFALA*1 (10K/8K)	R5F110PFAFB*1 (10K/8K)	R5F111MFAFB*1 (10K/8K)	R5F111NFALA*1 (10K/8K)	R5F111PFAFB*1 (10K/8K)
64K	R5F110MEAFB*1 (8K/8K)	R5F110NEALA*1 (8K/8K)	R5F110PEAFB*1 (8K/8K)	R5F111MEAFB*1 (8K/8K)	R5F111NEALA*1 (8K/8K)	R5F111PEAFB*1 (8K/8K)
48K						
32K						
24K						
16K						
8K						
4K						
2K						
1K						
Package	80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	85-pin VFLGA LA thickness: 1.00mm 7×7mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	85-pin VFLGA LA thickness: 1.00mm 7×7mm Pitch: 0.65mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/H1D (48 to 80 pins)

R5F104AGASP (16K/8K)
—— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/H1D				
ROM (bytes) \ Pin count	48-pin	64-pin		80-pin	
512K					
384K					
256K					
192K					
128K	R5F11NGGAFB (5.5KB/4KB)	R5F11PLGABG (5.5KB/4KB)	R5F11NLGAFB (5.5KB/4KB)	R5F11NMGAFB (5.5KB/4KB)	R5F11RMGDFB (8KB/4KB)
96K	R5F11NGFAFB (5.5KB/4KB)	R5F11PLFABG (5.5KB/4KB)	R5F11NLFAFB (5.5KB/4KB)	R5F11NMFAFB (5.5KB/4KB)	
64K				R5F11NMEAFB (5.5KB/4KB)	
48K					
32K					
24K					
16K					
8K					
4K					
2K					
1K					
Package	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	64-pin TFBGA BG thickness: 1.10mm 4×4mm Pitch: 0.40mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	

RL78/I1A (20 to 38 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

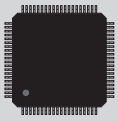
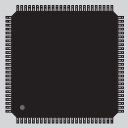
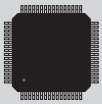
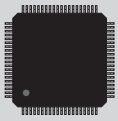
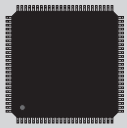
Group	RL78/I1A		
ROM (bytes) \ Pin count	20-pin	30-pin	38-pin
512K			
384K			
256K			
192K			
128K			
96K			
64K		R5F107AEGSP*1 R5F107AEMSP*2 (4K/4K)	R5F107DEGSP*1 R5F107DEMSP*2 (4K/4K)
48K			
32K	R5F1076CGSP*1 R5F1076CMSP*2 (2K/4K)	R5F107ACGSP*1 R5F107ACMSP*2 (2K/4K)	
16K			
12K			
8K			
4K			
2K			
1K			
Package	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	38-pin SSOP SP thickness: 2.00mm 7.62mm (300mil) Pitch: 0.65mm

*1: Operating temperature range: –40 to +105°C
*2: Operating temperature range: –40 to +125°C

RL78/I1B (80 to 100 pins), RL78/I1C (64 to 100 pins)

R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/I1B		RL78/I1C		
ROM (bytes) \ Pin count	80-pin	100-pin	64-pin	80-pin	100-pin
512K				R5F10NMLDFB (32K/2K)	R5F10NPLDFB (32K/2K)
384K					
256K				R5F10NMJDFB (16K/2K)	R5F10NPJDFB (16K/2K)
192K					
128K	R5F10MMGDFB (8K/—)	R5F10MPGDFB (8K/—)	R5F10NLGDFB R5F11TLGDFB (8K/2K)	R5F10NMGDFB (8K/2K)	R5F10NPGDFB (8K/2K)
96K					
64K	R5F10MMEDFB (6K/—)	R5F10MPEDFB (6K/—)	R5F10NLEDFB R5F11TLEDFB (8K/2K)	R5F10NMEDFB (6K/2K)	
48K					
32K					
24K					
16K					
8K					
4K					
2K					
1K					
Package	80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.70mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.70mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.70mm 14×14mm Pitch: 0.50mm

RL78/I1D (20 to 48 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/I1D					
ROM (bytes) \ Pin count	20-pin	24-pin	30-pin	32-pin		48-pin
512K						
384K						
256K						
192K						
128K						
96K						
64K						
48K						
32K			R5F117ACGSP (3K/2K)	R5F117BCGNA (3K/2K)	R5F117BCGFP (3K/2K)	R5F117GCGFB (3K/2K)
24K						
16K	R5F1176AGSP (2K/2K)	R5F1177AGNA (2K/2K)	R5F117AAGSP (2K/2K)	R5F117BAGNA (2K/2K)	R5F117BAGFP (2K/2K)	R5F117GAGFB (2K/2K)
8K	R5F11768GSP (0.7K/2K)	R5F11778GNA (0.7K/2K)	R5F117A8GSP (0.7K/2K)			
4K						
2K						
1K						
Package	20-pin LSSOP SP thickness: 1.45mm 4.4×6.5mm Pitch: 0.65mm	24-pin HWQFN NA thickness: 0.80mm 4×4mm Pitch: 0.50mm	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	32-pin LQFP FP thickness: 1.70mm 7×7mm Pitch: 0.80mm	48-pin LFQFP FB thickness: 1.70mm 7×7mm Pitch: 0.50mm

RL78/I1E (32 to 36 pins)

R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/I1E	
Pin count / ROM (bytes)	32-pin	36-pin
512K		
384K		
256K		
192K		
128K		
96K		
64K		
48K		
32K	R5F11CBCGNA*1 (8K/4K)	R5F11CCCGBG*1 (8K/4K)
24K		
16K		
8K		
4K		
2K		
1K		
Package	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	36-pin TFBGA BG thickness: 1.10mm 4×4mm Pitch: 0.5mm

The above part numbers are consumer grade products. (ambient operating temperature range : −40 to +85°C)
*1: Industrial grade products are also available. (part number: R5F1xxxMxx, ambient operating temperature range: −40 to +125°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/F23 (32 to 80pins)

R7F123FBG3ANP-C —— Top: Product name
(12K/8K) —— Bottom: (RAM/Data flash (bytes))

Group	RL78/F23			
Pin count / ROM (bytes)	32-pin	48-pin	64-pin	80-pin
768K				
512K				
384K				
256K				
192K				
128K	R7F123FBG3ANP-C (12K/8K)*1	R7F123FGG3AFB-C (12K/8K)*1	R7F123FLG3AFB-C (12K/8K)*1	R7F123FMG3AFB-C (12K/8K)*1
96K				
64K				
48K				
32K				
16K				
12K				
8K				
4K				
2K				
1K				
Package	32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.6mm/1.7mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.6mm/1.7mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.6mm/1.7mm 12×12mm Pitch: 0.50mm

Ambient operating temperature range of the above part numbers is –40 to +105°C.
*1: Products with –40 to +125°C ambient operating temperature range (part number: R7F1xxxxx4xxx-C) or –40 to +150°C ambient operating temperature range (part number: R7F1xxxxx5xxx-C) are also available.
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

RL78/F24 (32 to 100pins)

R7F124FBJ3ANP-C (24K/16K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/F24				
ROM (bytes) \ Pin count	32-pin	48-pin	64-pin	80-pin	100-pin
768K					
512K					
384K					
256K	R7F124FBJ3ANP-C (24K/16K)*1	R7F124FGJ3AFB-C (24K/16K)*1	R7F124FLJ3AFB-C (24K/16K)*1	R7F124FMJ3AFB-C (24K/16K)*1	R7F124FPJ3AFB-C (24K/16K)*1
192K					
128K					
96K					
64K					
48K					
32K					
16K					
12K					
8K					
4K					
2K					
1K					
Package	32-pin HWQFN NP thickness: 0.80mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness:1.6mm/1.7mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.6mm/1.7mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.6mm/1.7mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.6mm/1.7mm 14×14mm Pitch: 0.50mm

Ambient operating temperature range of the above part numbers is –40 to +105°C.
*1: Products with –40 to +125°C ambient operating temperature range (part number: R7F1xxxxx4xxx-C) or –40 to +150°C ambient operating temperature range (part number: R7F1xxxxx5xxx-C) are also available.
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

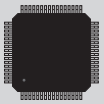
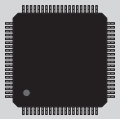
RL78/F13 (20 to 80 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/F13 (CAN & LIN)					
ROM (bytes) \ Pin count	30-pin	32-pin	48-pin		64-pin	80-pin
512K						
384K						
256K						
192K						
128K	R5F10BAGLSP*1 (8K/4K)	R5F10BBGLNA*1 (8K/4K)	R5F10BGGLFB*1 (8K/4K)	R5F10BGGLNA*1 (8K/4K)	R5F10BLGLFB*1 (8K/4K)	R5F10BMGLFB*1 (8K/4K)
96K	R5F10BAFLSP*1 (6K/4K)	R5F10BBFLNA*1 (6K/4K)	R5F10BGFLFB*1 (6K/4K)	R5F10BGFLNA*1 (6K/4K)	R5F10BLFLFB*1 (6K/4K)	R5F10BMFLFB*1 (6K/4K)
64K	R5F10BAELSP*1 (4K/4K)	R5F10BBELNA*1 (4K/4K)	R5F10BGELFB*1 (4K/4K)	R5F10BGELNA*1 (4K/4K)	R5F10BLELFB*1 (4K/4K)	R5F10BMELFB*1 (4K/4K)
48K	R5F10BADLSP*1 (3K/4K)	R5F10BBDLNA*1 (3K/4K)	R5F10BGDLFB*1 (3K/4K)	R5F10BGDLNA*1 (3K/4K)	R5F10BLDLFB*1 (3K/4K)	
32K	R5F10BACLSP*1 (2K/4K)	R5F10BBCLNA*1 (2K/4K)	R5F10BGCLFB*1 (2K/4K)	R5F10BGCLNA*1 (2K/4K)	R5F10BLCLFB*1 (2K/4K)	
24K						
16K						
8K						
4K						
2K						
1K						
Package	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm





Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) or –40 to +150°C ambient operating temperature range (part number: R5F1xxxxYxx) are also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

R5F104AGASP (16K/8K) — Top: Product name — Bottom: (RAM/Data flash (bytes))

Group	RL78/F13 (LIN)						
ROM (bytes) \ Pin count	20-pin	30-pin	32-pin	48-pin		64-pin	80-pin
512K							
384K							
256K							
192K							
128K				R5F10AGGLFB*1 (8K/4K)	R5F10AGGLNA*1 (8K/4K)	R5F10ALGLFB*1 (8K/4K)	R5F10AMGLFB*1 (8K/4K)
96K				R5F10AGFLFB*1 (6K/4K)	R5F10AGFLNA*1 (6K/4K)	R5F10ALFLFB*1 (6K/4K)	R5F10AMFLFB*1 (6K/4K)
64K	R5F10A6ELSP*1 (4K/4K)	R5F10AAELSP*1 (4K/4K)	R5F10ABELNA*1 (4K/4K)	R5F10AGELFB*1 (4K/4K)	R5F10AGELNA*1 (4K/4K)	R5F10ALELFB*1 (4K/4K)	R5F10AMELFB*1 (4K/4K)
48K	R5F10A6DLSP*1 (3K/4K)	R5F10AADLSP*1 (3K/4K)	R5F10ABDLNA*1 (3K/4K)	R5F10AGDLFB*1 (3K/4K)	R5F10AGDLNA*1 (3K/4K)	R5F10ALDLFB*1 (3K/4K)	
32K	R5F10A6CLSP*1 (2K/4K)	R5F10AACLSP*1 (2K/4K)	R5F10ABCLNA*1 (2K/4K)	R5F10AGCLFB*1 (2K/4K)	R5F10AGCLNA*1 (2K/4K)	R5F10ALCLFB*1 (2K/4K)	
24K							
16K	R5F10A6ALSP*1 (1K/4K)	R5F10AAALSP*1 (1K/4K)	R5F10ABALNA*1 (1K/4K)	R5F10AGALFB*1 (1K/4K)	R5F10AGALNA*1 (1K/4K)		
8K							
4K							
2K							
1K							
Package	20-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm

Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) or –40 to +150°C ambient operating temperature range (part number: R5F1xxxxYxx) are also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

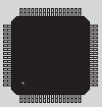
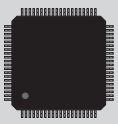
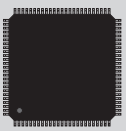
RL78/F14 (30 to 100 pins)

R5F104AGASP (16K/8K) —— Top: Product name
—— Bottom: (RAM/Data flash (bytes))

Group	RL78/F14						
ROM (bytes) \ Pin count	30-pin	32-pin	48-pin		64-pin	80-pin	100-pin
512K							
384K							
256K			R5F10PGJLFB*1 (20K/8K)	R5F10PGJLNA*1 (20K/8K)	R5F10PLJLFB*1 (20K/8K)	R5F10PMJLFB*1 (20K/8K)	R5F10PPJLFB*1 (20K/8K)
192K			R5F10PGHLFB*1 (16K/8K)	R5F10PGHLNA*1 (16K/8K)	R5F10PLHLFB*1 (16K/8K)	R5F10PMHLFB*1 (16K/8K)	R5F10PPHLFB*1 (16K/8K)
128K			R5F10PGGLFB*1 (10K/8K)	R5F10PGGLNA*1 (10K/8K)	R5F10PLGLFB*1 (10K/8K)	R5F10PMGLFB*1 (10K/8K)	R5F10PPGLFB*1 (10K/8K)
96K			R5F10PGFLFB*1 (8K/4K)	R5F10PGFLNA*1 (8K/4K)	R5F10PLFLFB*1 (8K/4K)	R5F10PMFLFB*1 (8K/4K)	R5F10PPFLFB*1 (8K/4K)
64K	R5F10PAELSP*1 (6K/4K)	R5F10PBELNA*1 (6K/4K)	R5F10PGELFB*1 (6K/4K)	R5F10PGELNA*1 (6K/4K)	R5F10PLELFB*1 (6K/4K)	R5F10PMELFB*1 (6K/4K)	R5F10PPELFB*1 (6K/4K)
48K	R5F10PADLSP*1 (4K/4K)	R5F10PBDLNA*1 (4K/4K)	R5F10PGDLFB*1 (4K/4K)	R5F10PGDLNA*1 (4K/4K)			
32K							
24K							
16K							
8K							
4K							
2K							
1K							
Package	30-pin LSSOP SP thickness: 1.40mm 7.62mm (300mil) Pitch: 0.65mm	32-pin HVQFN NA thickness: 0.90mm 5×5mm Pitch: 0.50mm	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm





Ambient operating temperature range of the above part numbers is –40 to +105°C.
*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) or –40 to +150°C ambient operating temperature range (part number: R5F1xxxxYxx) are also available.
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/F15 (48 to 144 pins)

R5F104AGASP (16K/8K) — Top: Product name; Bottom: (RAM/Data flash (bytes))

Group	RL78/F15					
ROM (bytes) \ Pin count	48-pin		64-pin	80-pin	100-pin	144-pin
512K	R5F113GLLFB*1 (32K/16K)	R5F113GLLNA*1 (32K/16K)	R5F113LLLFB*1 (32K/16K)	R5F113MLLFB*1 (32K/16K)	R5F113PLLFB*1 (32K/16K)	R5F113TLLFB*1 (32K/16K)
384K	R5F113GKLFB*1 (26K/16K)	R5F113GKLNA*1 (26K/16K)	R5F113LKLFB*1 (26K/16K)	R5F113MKLFB*1 (26K/16K)	R5F113PKLFB*1 (26K/16K)	R5F113TKLFB*1 (26K/16K)
256K					R5F113PJLFB*1 (20K/8K)	R5F113TJLFB*1 (20K/8K)
192K					R5F113PHLFB*1 (16K/8K)	R5F113THLFB*1 (16K/8K)
128K					R5F113PGLFB*1 (10K/8K)	R5F113TGLFB*1 (10K/8K)
96K						
64K						
48K						
32K						
24K						
16K						
8K						
4K						
2K						
1K						
Package	48-pin LFQFP FB thickness: 1.60mm 7×7mm Pitch: 0.50mm	48-pin HVQFN NA thickness: 0.90mm 7×7mm Pitch: 0.50mm	64-pin LFQFP FB thickness: 1.60mm 10×10mm Pitch: 0.50mm	80-pin LFQFP FB thickness: 1.60mm 12×12mm Pitch: 0.50mm	100-pin LFQFP FB thickness: 1.60mm 14×14mm Pitch: 0.50mm	144-pin LFQFP FB thickness: 1.60mm 20×20mm Pitch: 0.50mm

Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) is also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78 FAMILY SPECIFICATIONS

RL78/G10 (10 to 16 pins)

Group			RL78/G10					
Pin count			10-pin			16-pin		
Product name			R5F10Y14ASP*3	R5F10Y16ASP*3	R5F10Y17ASP*3	R5F10Y44ASP*3	R5F10Y46ASP*3	R5F10Y47ASP*3
CPU			RL78 CPU core					
Memory	Flash ROM [bytes]		1K	2K	4K	1K	2K	4K
	Data flash [bytes]		—					
	RAM [bytes]		128	256	512	128	256	512
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	20MHz					
		External resonator	—			20MHz		
Clock generator circuit	Crystal/ceramic oscillator [Hz]		—			1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 5MHz (V_{DD} = 2.0 to 5.5V)*1		
	High-speed on-chip oscillator [Hz]		1.25 to 20MHz (V_{DD} = 2.7 to 5.5V), 1.25 to 5MHz (V_{DD} = 2.0 to 5.5V)*1					
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 2.0 to 5.5V)*1					
	Subclock (32.768 kHz)		—					
I/O	I/O ports		8			14		
		N-channel open drain (6V tolerance)	—					
		N-channel open drain (V_{DD} tolerance)	2			4		
Timers	16-bit timer TAU [channels]		2, PWM output × 1			4, PWM output × 3		
	Real-time clock (RTC) [channels]		—					
	Watchdog timer (WDT) [channels]		1					
	Interval timer [channels]		—			12-bit × 1		
Serial interfaces	CSI×1, UART×1, simplified I²C×1		1			—		
	CSI×2, UART×1, simplified I²C×1		—			1		
	I²C×1		—			1		
DMA [channels]			—					
External interrupt pins [count]			8			10		
OCD	On-chip debugging		Yes					
Peripheral functions	8/10-bit A/D converter [channels]		4			7		
	Comparator [channels]		—			1		
	Multiplier/divider/ multiply-accumulator		Multiplier (8-bit × 8-bit)					
	Other functions		Selectable power-on reset (SPOR), clock/buzzer output × 1					
Safety functions			Internal reset at illegal instruction execution*2					
Other	Power supply voltage [V]		V_{DD} = 2.0 to 5.5V*1					
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)*3					
	Package (size [mm])		10-LSSOP (4.4×3.6mm)			16-SSOP (4.4×5.0mm)		

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Selectable power-on reset (SPOR) includes a detection voltage (VSPOR), which should be within the range of 2.25 to 5.5V.

*2: An internal reset is generated when the FFH instruction code is executed. No reset occurs when an illegal instruction is executed during emulation using OCD.

*3: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G11 (10 to 25 pins)

Group			RL78/G11				
Pin count			10-pin	16-pin	20-pin	24-pin	25-pin
Product name			R5F1051AASP *1	①R5F1054AASP *1 ②R5F1054AANA *1	①R5F1056AASP *1 ②R5F1056AASM *1	R5F1057AANA *1	R5F1058AALA *1
CPU			RL78 CPU core				
Memory	Flash ROM [bytes]		16KB				
	Data flash [bytes]		2KB				
	RAM [bytes]		1.5KB				
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz				
		External resonator	20MHz				
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz: V_{DD} = 2.7 to 5.5V, 1 to 16MHz: V_{DD} = 2.4 to 5.5V, 1 to 8MHz: V_{DD} = 1.8 to 5.5V, 1 to 4MHz: V_{DD} = 1.6 to 5.5V				
	High-speed on-chip oscillator [Hz]: 24MHz (max.)		1 to 24MHz (V_{DD} = 2.7 to 5.5V): HS mode, 1 to 16MHz (V_{DD} = 2.4 to 5.5V): HS mode, 1 to 8MHz (V_{DD} = 1.8 to 5.5V): LS mode, 1 to 4MHz (V_{DD} = 1.6 to 5.5V): LV mode, 1MHz (V_{DD} = 1.8 to 5.5V): LP mode				
	Medium-speed on-chip oscillator [Hz]: 4 MHz (max.)						
	Low-speed on-chip oscillator [Hz]		15kHz (TYP.): V_{DD} = 1.6 to 5.5V				
	Subclock (32.768 kHz)		—				
I/O	I/O ports		7	13	17	21	
	N-channel open drain (6V tolerance)		—				
	N-channel open drain (V_{DD} tolerance)		—	3	8	13	
Timers	16-bit timer TAU [channels]		2, PWM output × 1	4, PWM output × 3	4, PWM output × 4		
	Real-time clock (RTC) [channels]		—				
	Watchdog timer (WDT) [channels]		1				
	Timer KB [channels]		1, PWM output × 2				
	Interval timer [channels]		8-bit × 2 / 16-bit × 1, 12-bit × 1				
Serial interfaces	CSI×2, UART×1, simplified I^2C×2		—	—	1	2	
	CSI×2, UART×1, simplified I^2C×1		—	1	—	—	
	CSI×1, UART×1, simplified I^2C×1		—	—	1	—	
	CSI×1, UART×1		1	—	—	—	
	UART×1		—	1	—	—	
	I^2C×1		—	1	2		
DMA/DTC			DTC × 13 sources	DTC × 22 sources	DTC × 23 sources	DTC × 24 sources	
ELC [channels]			11 inputs	16 inputs	17 inputs	18 inputs	
External interrupt pins [count]			3	8	10	13	
OCD	On-chip debugging		Yes				
Peripheral functions	8/10-bit A/D converter [channels]		3	8	10	11	
	8-bit D/A converter [channels]		1 (CMP0 reference voltage)	2 (External output × 1, CMP0 reference voltage × 1)			
	Comparator [channels]		1	2			
	PGA [channels]		1				
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set), Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned), Divide: 32-bit ÷ 32-bit = 32-bit (unsigned), Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)				
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), internal reference voltage (V_{BGR}), data operation circuit (DOC), clock/buzzer output × 2, Interrupt flag output (INTFO)				
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function				
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V				
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)				
	Package (size [mm])		10-LSSOP (4.4×3.6mm)	16-SSOP (4.4×5.0mm) 16-HWQFN (3×3mm)	20-LSSOP (4.4×6.5mm) 20-TSSOP (4.4×6.5mm)	24-HWQFN (4×4mm)	25-WFLGA (3×3mm)

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G12 (20 to 30 pins)

Group			RL78/G12									
Pin count			20-pin									
Product name			①R5F10266ASP*1 ②R5F10266ASM*1	①R5F10267ASP*1 ②R5F10267ASM*1	①R5F10268ASP*1 ②R5F10268ASM*1	①R5F10269ASP*1 ②R5F10269ASM*1	①R5F1026AASP*1 ②R5F1026AASM*1	①R5F10366ASP ②R5F10366ASM	①R5F10367ASP ②R5F10367ASM	①R5F10368ASP ②R5F10368ASM	①R5F10369ASP ②R5F10369ASM	①R5F1036AASP ②R5F1036AASM
CPU			RL78 CPU core									
Memory	Flash ROM [bytes]		2K	4K	8K	12K	16K	2K	4K	8K	12K	16K
	Data flash [bytes]		2K					—				
	RAM [bytes]		256	512	768	1K	1.5K	256	512	768	1K	1.5K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz									
		External resonator	20MHz									
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V)									
	High-speed on-chip oscillator [Hz]		1 to 24MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V)									
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.8 to 5.5V)									
	Subclock (32.768 kHz)		—									
I/O	I/O ports		18									
		N-channel open drain (6V tolerance)	2									
		N-channel open drain (V_{DD} tolerance)	4									
Timers	16-bit timer TAU [channels]		4, PWM output × 3									
	Real-time clock (RTC) [channels]		—									
	Watchdog timer (WDT) [channels]		1									
	Interval timer [channels]		12-bit × 1									
Serial interfaces	CSI×1, UART×1		—					1				
	CSI×2, UART×1, simplified I^2C×2		1					—				
	CSI×1, UART×1, simplified I^2C×1		—									
	I^2C×1		1									
DMA [channels]			2					—				
External interrupt pins [count]			10									
OCD	On-chip debugging		Yes									
Peripheral functions	8/10-bit A/D converter [channels]		11									
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)									
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1									
Safety functions			RAM parity error detection function, illegal memory access detection function, frequency detection function, A/D converter test function									
			CRC calculation function (general-purpose), RAM guard function, SFR guard function					—				
Other	Power supply voltage [V]		V_{DD} = 1.8 to 5.5V									
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*1									
	Package (size [mm])		20-LSSOP (4.4×6.5mm), 20-TSSOP (4.4×6.5mm)									

* A dedicated library (approx. 8.1 KB) is required to use the data flash.

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*2: Figures in parentheses ( ) are when the PIOR function is used.

RL78/G12															
24-pin								30-pin							
R5F10277ANA*1	R5F10278ANA*1	R5F10279ANA*1	R5F1027AANA*1	R5F10377ANA	R5F10378ANA	R5F10379ANA	R5F1037AANA	R5F102A7ASP*1	R5F102A8ASP*1	R5F102A9ASP*1	R5F102AAASP*1	R5F103A7ASP	R5F103A8ASP	R5F103A9ASP	R5F103AAASP
RL78 CPU core															
4K	8K	12K	16K	4K	8K	12K	16K	4K	8K	12K	16K	4K	8K	12K	16K
2K				—				2K				—			
512	768	1K	1.5K	512	768	1K	1.5K	512	768	1K	2K	512	768	1K	2K
24MHz															
20MHz															
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V)															
1 to 24MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V)															
15kHz (V_{DD} = 1.8 to 5.5V)															
—															
22								26							
2															
5								9							
4, PWM output × 3								8, PWM output × 3 (7)*2							
—															
1															
12-bit × 1															
—				1				—				1			
1				—											
—								3				—			
1															
2				—				2				—			
14								6							
Yes															
11								8							
Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)															
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1								Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2							
RAM parity error detection function, illegal memory access detection function, frequency detection function, A/D converter test function															
CRC calculation function (general-purpose), RAM guard function, SFR guard function				—				CRC calculation function (general-purpose), RAM guard function, SFR guard function				—			
V_{DD} = 1.8 to 5.5V															
T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*1															
24-HWQFN (4×4mm)								30-LSSOP (7.62mm (300mil))							

RL78/G13 (20 to 32 pins)

Group			RL78/G13															
Pin count			20-pin								24-pin							
Product name			①R5F1006AASP*2 ②R5F1006AASM*2	①R5F1006CASP*2 ②R5F1006CASM*#2	①R5F1006DASP*2 ②R5F1006DASM*2	①R5F1006EASP*2 ②R5F1006EASM*2	①R5F1016AASP ②R5F1016AASM	①R5F1016CASP ②R5F1016CASM	①R5F1016DASP ②R5F1016DASM	①R5F1016EASP ②R5F1016EASM	R5F1007AANA*2	R5F1007CANA*2	R5F1007DANA*2	R5F1007EANA*2	R5F1017AANA	R5F1017CANA	R5F1017DANA	R5F1017EANA
CPU			RL78 CPU core															
Memory	Flash ROM [bytes]		16K	32K	48K	64K	16K	32K	48K	64K	16K	32K	48K	64K	16K	32K	48K	64K
	Data flash [bytes]		4K				—				4K				—			
	RAM [bytes]		2K	2K	3K	4K	2K	2K	3K	4K	2K	2K	3K	4K	2K	2K	3K	4K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz															
		External resonator	20MHz															
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)															
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)															
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)															
	Subclock (32.768 kHz)		—															
I/O	I/O ports		16								20							
		N-channel open drain (6V tolerance)	—								2							
		N-channel open drain (V_{DD} tolerance)	5								6							
Timers	16-bit timer TAU [channels]		8, PWM output × 2								8, PWM output × 3							
	Real-time clock (RTC) [channels]		1*1															
	Watchdog timer (WDT) [channels]		1															
	Interval timer [channels]		12-bit × 1															
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2															
	CSI×2, UART×1, simplified I^2C×2		—															
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—															
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		—															
	I^2C×1		—								1							
DMA [channels]			2															
External interrupt pins [count]			3								5							
OCD	On-chip debugging		Yes															
Peripheral functions	8/10-bit A/D converter [channels]		6															
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)															
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD)								Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1							
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function															
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V															
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*2															
	Package (size [mm])		20-LSSOP (7.62mm (300mil)) 20-TSSOP (4.4×6.5mm)								24-HWQFN (4×4mm)							

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries
The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Products with pin counts from 20 to 32 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.
*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.
*3: Figures in parentheses ( ) are when the PIOR function is used.

RL78/G13																															
25-pin								30-pin												32-pin											
R5F1008AALA*2	R5F1008CALA*2	R5F1008DALA*2	R5F1008EALA*2	R5F1018AALA	R5F1018CALA	R5F1018DALA	R5F1018EALA	R5F100AAASP*2	R5F100ACASP*2	R5F100ADASP*2	R5F100AEASP*2	R5F100AFASP*2	R5F100AGASP*2	R5F101AAASP	R5F101ACASP	R5F101ADASP	R5F101AEASP	R5F101AFASP	R5F101AGASP	R5F100BAANA*2	R5F100BCANA*2	R5F100BDANA*2	R5F100BEANA*2	R5F100BFANA*2	R5F100BGANA*2	R5F101BAANA	R5F101BCANA	R5F101BDANA	R5F101BEANA	R5F101BFANA	R5F101BGANA
RL78 CPU core																															
16K	32K	48K	64K	16K	32K	48K	64K	16K	32K	48K	64K	96K	128K	16K	32K	48K	64K	96K	128K	16K	32K	48K	64K	96K	128K	16K	32K	48K	64K	96K	128K
4K				—				4K				8K		—						4K				8K		—					
2K	2K	3K	4K	2K	2K	3K	4K	2K	2K	3K	4K	8K	12K	2K	2K	3K	4K	8K	12K	2K	2K	3K	4K	8K	12K	2K	2K	3K	4K	8K	12K
32MHz																															
20MHz																															
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																															
1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																															
15kHz (V_{DD} = 1.6 to 5.5V)																															
—																															
21								26												28											
2																				3											
6								9																							
8, PWM output × 3								8, PWM output × 3 (7)*3																							
1*1																															
1																															
12-bit × 1																															
2																															
—																															
—								1																							
—																															
1																															
2																															
5								6																							
Yes																															
6								8																							
Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																															
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1								Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																							
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function																															
V_{DD} = 1.6 to 5.5V																															
T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*2																															
25-WFLGA (3×3mm)								30-LSSOP (7.62mm (300mil))												32-HWQFN (5×5mm)											

RL78/G13 (36 to 44 pins)

Group			RL78/G13																		
Pin count			36-pin											40-pin							
Product name			R5F100CAALA*3	R5F100CCALA*3	R5F100CDALA*3	R5F100CEALA*3	R5F100CFALA*3	R5F100CGALA*3	R5F101CAALA	R5F101CCALA	R5F101CDALA	R5F101CEALA	R5F101CFALA	R5F101CGALA	R5F100EAANA*3	R5F100ECANA*3	R5F100EDANA*3	R5F100EEANA*3	R5F100EFANA*3	R5F100EGANA*3	R5F100EHANA*3
CPU			RL78 CPU core																		
Memory	Flash ROM [bytes]		16K	32K	48K	64K	96k	128k	16K	32K	48K	64K	96k	128k	16K	32K	48K	64K	96k	128k	192K
	Data flash [bytes]		4K				8K		—						4K				8K		
	RAM [bytes]		2K	2K	3K	4K	8K	12K	2K	2K	3K	4K	8K	12K	2K	2K	3K	4K	8K	12K	16K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz																		
		External resonator	20MHz																		
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																		
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																		
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)																		
	Subclock (32.768 kHz)		—												32.768kHz (V_{DD} = 1.6 to 5.5V)						
I/O	I/O ports		32												36						
		N-channel open drain (6V tolerance)	3																		
		N-channel open drain (V_{DD} tolerance)	10																		
Timers	16-bit timer TAU [channels]		8, PWM output × 3 (7)*4																		
	Real-time clock (RTC) [channels]		1*1												1						
	Watchdog timer (WDT) [channels]		1																		
	Interval timer [channels]		12-bit × 1																		
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2																		
	CSI×2, UART×1, simplified I^2C×2		—																		
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—																		
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		1																		
	I^2C×1		1																		
DMA [channels]			2																		
External interrupt pins [count]			6												10						
OCD	On-chip debugging		Yes																		
Peripheral functions	8/10-bit A/D converter [channels]		8												9						
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																		
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																		
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function																		
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V																		
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*3																		
	Package (size [mm])		36-WFLGA (4×4mm)												40-HWQFN (6×6mm)						

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Products with a pin count of 36 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.

*2: Industrial grade products are also available. (part number: R5F1xxxxDxx, ambient operating temperature range: –40 to +85°C)

*3: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*4: Figures in parentheses ( ) are when the PIOR function is used.

RL78/G13																											
40-pin							44-pin																				
R5F101EAANA	R5F101ECANA	R5F101EDANA	R5F101EEANA	R5F101EFANA	R5F101EGANA	R5F101EHANA	R5F100FAAFP*3	R5F100FCAFP*3	R5F100FDAFP*3	R5F100FEAFP*3	R5F100FFAFP*3	R5F100FGAFP*3	R5F100FHAFP*3	R5F100FJAFP*3	R5F100FKAFP*2	R5F100FLAFP*2	R5F101FAAFP	R5F101FCAFP	R5F101FDAF*2	R5F101FEAFP	R5F101FFAFP	R5F101FGAFP	R5F101FHAFP	R5F101FJAFP	R5F101FKAFP *2	R5F101FLAFP *2
RL78 CPU core																											
16K	32K	48K	64K	96k	128k	192K	16K	32K	48K	64K	96k	128k	192K	256K	384K	512K	16K	32K	48K	64K	96k	128k	192K	256K	384K	512K	
—							4K				8K						—										
2K	2K	3K	4K	8K	12K	16K	2K	2K	3K	4K	8K	12K	16K	20K	24K	32K	2K	2K	3K	4K	8K	12K	16K	20K	24K	32K	
32MHz																											
20MHz																											
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																											
1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																											
15kHz (V_{DD} = 1.6 to 5.5V)																											
32.768kHz (V_{DD} = 1.6 to 5.5V)																											
36							40																				
3							4																				
10																											
8, PWM output × 3 (7)*4							8, PWM output × 4 (7)*4																				
1																											
1																											
12-bit × 1																											
2																											
—																											
—																											
1																											
1																											
2																											
10																											
Yes																											
9							10																				
Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																											
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																											
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function																											
V_{DD} = 1.6 to 5.5V																											
T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)*2 T_A = –40 to +105°C (G: Industrial applications)*3																											
40-HWQFN (6×6mm)							44-LQFP (10×10mm)																				

RL78/G13 (48 to 52 pins)

Group			RL78/G13												
Pin count			48-pin												
Product name			①R5F100GAAFB*2 ②R5F100GAANA*2	①R5F100GCAFB*2 ②R5F100GCANA*2	①R5F100GDAFB*2 ②R5F100GDANA*2	①R5F100GEAFB*2 ②R5F100GEANA*2	①R5F100GFAFB*2 ②R5F100GFANA*2	①R5F100GGAFB*2 ②R5F100GGANA*2	①R5F100GHAFB*2 ②R5F100GHANA*2	①R5F100GJAFB*2 ②R5F100GJANA*2	①R5F100GKAFB*1 ②R5F100GKANA*1	①R5F100GLAFB*1 ②R5F100GLANA*1	①R5F101GAAFB ②R5F101GAANA	①R5F101GCAFB ②R5F101GCANA	①R5F101GDAFB ②R5F101GDANA
CPU			RL78 CPU core												
Memory	Flash ROM [bytes]		16K	32K	48K	64K	96K	128K	192K	256K	384K	512K	16K	32K	48K
	Data flash [bytes]		4K				8K						—		
	RAM [bytes]		2K	2K	3K	4K	8K	12K	16K	20K	24K	32K	2K	2K	3K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz												
		External resonator	20MHz												
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)												
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)												
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)												
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 5.5V)												
I/O	I/O ports		44												
		N-channel open drain (6V tolerance)	4												
		N-channel open drain (V_{DD} tolerance)	11												
Timers	16-bit timer TAU [channels]		8, PWM output × 4 (7)*3												
	Real-time clock (RTC) [channels]		1												
	Watchdog timer (WDT) [channels]		1												
	Interval timer [channels]		12-bit × 1												
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		1												
	CSI×2, UART×1, simplified I^2C×2		1												
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—												
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		1												
	I^2C×1		1												
DMA [channels]			2												
External interrupt pins [count]			13												
OCD	On-chip debugging		Yes												
Peripheral functions	8/10-bit A/D converter [channels]		10												
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)												
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2												
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function												
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V												
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)*1 T_A = –40 to +105°C (G: Industrial applications)*2												
	Package (size [mm])		①48-LFQFP (7×7mm) ②48-HWQFN (7×7mm)												

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)

*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*3. Figures in parentheses ( ) are when the PIOR function is used.

RL78/G13																									
48-pin							52-pin																		
①R5F101GEAFB ②R5F101GEANA	①R5F101GFAFB ②R5F101GFANA	①R5F101GGAFB ②R5F101GGANA	①R5F101GHAFB ②R5F101GHANA	①R5F101GJAFB ②R5F101GJANA	①R5F101GKAFB*1 ②R5F101GKANA*1	①R5F101GLAFB*1 ②R5F101GLANA*1	R5F100JCAFA*2	R5F100JDAFA*2	R5F100JEAFA*2	R5F100JFAFA*2	R5F100JGAFA*2	R5F100JHAFA*2	R5F100JJAFA*2	R5F100JKAFA*1	R5F100JLAFA*1	R5F101JCAFA	R5F101JDAFA	R5F101JEAFA	R5F101JFAFA	R5F101JGAFA	R5F101JHAFA	R5F101JJAFA	R5F101JKAFA	R5F101JLAFA
RL78 CPU core																									
64K	96K	128K	192K	256K	384K	512K	32K	48K	64K	96K	128K	192K	256K	384K	512K	32K	48K	64K	96K	128K	192K	256K	384K	512K
—							4K			8K						—								
4K	8K	12K	16K	20K	24K	32K	2K	3K	4K	8K	12K	16K	20K	24K	32K	2K	3K	4K	8K	12K	16K	20K	24K	32K
32MHz																									
20MHz																									
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																									
1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																									
15kHz (V_{DD} = 1.6 to 5.5V)																									
32.768kHz (V_{DD} = 1.6 to 5.5V)																									
44							48																		
4																									
11							13																		
8, PWM output × 4 (7)*3																									
1																									
1																									
12-bit × 1																									
1																									
1																									
—																									
1																									
1																									
2																									
13							15																		
Yes																									
10							12																		
Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																									
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																									
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function																									
V_{DD} = 1.6 to 5.5V																									
T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)*1 T_A = –40 to +105°C (G: Industrial applications)*2																									
①48-LFQFP (7×7mm) ②48-HWQFN (7×7mm)							52-LQFP (10×10mm)																		

RL78/G13 (64 pins)

Group			RL78/G13						
Pin count			64-pin						
Product name			①R5F100LCAFA*2 ②R5F100LCAFB*2 ③R5F100LCABG*2	①R5F100LDAFA*2 ②R5F100LDAFB*2 ③R5F100LDABG*2	①R5F100LEAFA*2 ②R5F100LEAFB*2 ③R5F100LEABG*2	①R5F100LFAFA*2 ②R5F100LFAFB*2 ③R5F100LFABG*2	①R5F100LGAFA*2 ②R5F100LGAFB*2 ③R5F100LGABG*2	①R5F100LHAFA*2 ②R5F100LHAFB*2 ③R5F100LHABG*2	①R5F100LJAFA*2 ②R5F100LJAFB*2 ③R5F100LJABG*2
CPU			RL78 CPU core						
Memory	Flash ROM [bytes]		32K	48K	64K	96K	128K	192K	256K
	Data flash [bytes]		4K			8K			
	RAM [bytes]		2K	3K	4K	8K	12K	16K	20K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz						
		External resonator	20MHz						
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)						
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)						
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)						
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 5.5V)						
I/O	I/O ports		58						
		N-channel open drain (6V tolerance)	4						
		N-channel open drain (V_{DD} tolerance)	15						
Timers	16-bit timer TAU [channels]		8, PWM output × 7						
	Real-time clock (RTC) [channels]		1						
	Watchdog timer (WDT) [channels]		1						
	Interval timer [channels]		12-bit × 1						
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		—						
	CSI×2, UART×1, simplified I^2C×2		2						
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—						
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		1						
	I^2C×1		1						
DMA [channels]			2						
External interrupt pins [count]			16 (18)*3						
OCD	On-chip debugging		Yes						
Peripheral functions	8/10-bit A/D converter [channels]		12						
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)						
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2						
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function						
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V						
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*2						
	Package (size [mm])		①64-LQFP (12×12mm) ②64-LFQFP (10×10mm) ③64-VFBGA (4×4mm)						

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxxDxx, ambient operating temperature range: –40 to +85°C)

*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*3. Figures in parentheses ( ) are when the PIOR function is used.

RL78/G13										
64-pin										
①R5F100LKAFA*1 ②R5F100LKAFB*1	①R5F100LLAFA*1 ②R5F100LLAFB*1	①R5F101LCAFA*2 ②R5F101LCAFB*2 ③R5F101LCABG	①R5F101LDAFA*2 ②R5F101LDAFB*2 ③R5F101LDABG	①R5F101LEAFA*2 ②R5F101LEAFB*2 ③R5F101LEABG	①R5F101LFAFA*2 ②R5F101LFAFB*2 ③R5F101LFABG	①R5F101LGAFA*2 ②R5F101LGAFB*2 ③R5F101LGABG	①R5F101LHAFA*2 ②R5F101LHAFB*2 ③R5F101LHABG	①R5F101LJAFA*2 ②R5F101LJAFB*2 ③R5F101LJABG	①R5F101LKAFA*1 ②R5F101LKAFB*1	①R5F101LLAFA*1 ②R5F100LLAFB*1
RL78 CPU core										
384K	512K	32K	48K	64K	96K	128K	192K	256K	384K	512K
8K		—								
24K	32K	2K	3K	4K	8K	12K	16K	20K	24K	32K
32MHz										
20MHz										
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)										
1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)										
15kHz (V_{DD} = 1.6 to 5.5V)										
32.768kHz (V_{DD} = 1.6 to 5.5V)										
58										
4										
15										
8, PWM output × 7										
1										
1										
12-bit × 1										
—										
2										
—										
1										
1										
2										
16 (18)*3										
Yes										
12										
Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)										
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2										
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function										
V_{DD} = 1.6 to 5.5V										
T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)*1 T_A = –40 to +105°C (G: Industrial applications)*2										
①64-LQFP (12×12mm) ②64-LFQFP (10×10mm) ③64-VFBGA (4×4mm)										

RL78/G13 (80 to 128 pins)

Group			RL78/G13											
Pin count			80-pin											
Product name			①R5F100MFAFB*2 ②R5F100MFAFA*2	①R5F100MGAFB*2 ②R5F100MGAFA*2	①R5F100MHAFB*2 ②R5F100MHAFA*2	①R5F100MJAFB*2 ②R5F100MJAFA*2	①R5F100MKAFB*1 ②R5F100MKAFA*1	①R5F100MLAFB*1 ②R5F100MLAFA*1	①R5F101MFAFB ②R5F101MFAFA	①R5F101MGAFB ②R5F101MGAFA	①R5F101MHAFB ②R5F101MHAFA	①R5F101MJAFB ②R5F101MJAFA	①R5F101MKAFB*1 ②R5F101MKAFA*1	①R5F101MLAFB*1 ②R5F101MLAFA*1
CPU			RL78 CPU core											
Memory	Flash ROM [bytes]		96K	128K	192K	256K	384K	512K	96K	128K	192K	256K	384K	512K
	Data flash [bytes]		8K						—					
	RAM [bytes]		8K	12K	16K	20K	24K	32K	8K	12K	16K	20K	24K	32K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz											
		External resonator	20MHz											
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)											
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)											
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)											
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 5.5V)											
I/O	I/O ports		74											
		N-channel open drain (6V tolerance)	4											
		N-channel open drain (V_{DD} tolerance)	21											
Timers	16-bit timer TAU [channels]		12, PWM output × 10											
	Real-time clock (RTC) [channels]		1											
	Watchdog timer (WDT) [channels]		1											
	Interval timer [channels]		12-bit × 1											
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		—											
	CSI×2, UART×1, simplified I^2C×2		3											
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—											
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		1											
	I^2C×1		2											
DMA [channels]			4											
External interrupt pins [count]			16 (18)*3											
OCD	On-chip debugging		Yes											
Peripheral functions	8/10-bit A/D converter [channels]		17											
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)											
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2											
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function											
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V											
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)*1 T_A = –40 to +105°C (G: Industrial applications)*2											
	Package (size [mm])		①80-LFQFP (12×12mm) ②80-LQFP (14×14mm)											

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)

*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*3. Figures in parentheses ( ) are when the PIOR function is used.

RL78/G13																			
100-pin													128-pin						
①R5F100PFAFB*2 ②R5F100PFAFA*2	①R5F100PGAFB*2 ②R5F100PGAFA*2	①R5F100PHAFB*2 ②R5F100PHAFA*2	①R5F100PJAFB*2 ②R5F100PJAFA*2	①R5F100PKAFB*1 ②R5F100PKAFA*1	①R5F100PLAFB*1 ②R5F100PLAFA*1	①R5F101PFAFB ②R5F101PFAFA	①R5F101PGAFB ②R5F101PGAFA	①R5F101PHAFB ②R5F101PHAFA	①R5F101PJAFB ②R5F101PJAFA	①R5F101PKAFB*1 ②R5F101PKAFA*1	①R5F101PLAFB*1 ②R5F101PLAFA*1	R5F100SHAFB*1	R5F100SJAFB*1	R5F100SKAFB*1	R5F100SLAFB*1	R5F101SHAFB*1	R5F101SJAFB*1	R5F101SKAFB*1	R5F101SLAFB*1
RL78 CPU core																			
96K	128K	192K	256K	384K	512K	96K	128K	192K	256K	384K	512K	192K	256K	384K	512K	192K	256K	384K	512K
8K						—						8K				—			
8K	12K	16K	20K	24K	32K	8K	12K	16K	20K	24K	32K	16K	20K	24K	32K	16K	20K	24K	32K
32MHz																			
20MHz																			
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																			
1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																			
15kHz (V_{DD} = 1.6 to 5.5V)																			
32.768kHz (V_{DD} = 1.6 to 5.5V)																			
92												120							
4																			
24												25							
12, PWM output × 10												16, PWM output × 14							
1																			
1																			
12-bit × 1																			
—																			
3																			
—																			
1																			
2																			
4																			
16 (20)*3																			
Yes																			
20												26							
Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																			
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																			
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function																			
V_{DD} = 1.6 to 5.5V																			
T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)*1 T_A = –40 to +105°C (G: Industrial applications)*2																			
①100-LFQFP (14×14mm) ②100-LQFP (14×20mm)												128-LFQFP (14×20mm)							

RL78/G13A (44 to 100 pins)

Group			RL78/G13A							
Pin count			44-pin		48-pin		64-pin		100-pin	
Product name			R5F140FKAFP R5F140FKGFP	R5F140FLAFP R5F140FLGFP	R5F140GKAFB R5F140GKGFB	R5F140GLAFB R5F140GLGFB	R5F140LKAFB R5F140LKGFB	R5F140LLAFB R5F140LLGFB	R5F140PKAFB R5F140PKGFB	R5F140PLAFB R5F140PLGFB
CPU			RL78 CPU core							
Memory	Flash ROM [bytes]		384K	512K	384K	512K	384K	512K	384K	512K
	Data flash [bytes]		8K							
	RAM [bytes]		24K	32K	24K	32K	24K	32K	24K	32K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz							
		External resonator	20MHz							
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)							
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)							
	Low-speed on-chip oscillator [Hz]		15kHz (TYP.) (V_{DD} = 1.6 to 5.5V)							
	Subclock		32.768kHz (V_{DD} = 1.6 to 5.5V)							
I/O	I/O ports		40		44		58		92	
		N-channel open drain (6V tolerance)	4							
		N-channel open drain (V_{DD} tolerance)	10		11		15		24	
Timers	16-bit timer TAU [channels]		8, PWM output × 7						12, PWM output × 10	
	Real-time clock (RTC) [channels]		1							
	Watchdog timer (WDT) [channels]		1							
	Interval timer [channels]		12-bit × 1							
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2		1		—			
	CSI×2, UART×1, simplified I^2C×2		—		1		2		3	
	CSI×2, UART (LIN bus support)×1, Simplified I^2C×2		1							
	I^2C bus		1							
DMA [channels]			2						4	
Interrupt sources	Internal		27						37	
	External		7		10		13			
OCD	On-chip debugging		Yes							
Peripheral functions	8/10-bit A/D converter [channels]		10				12		20	
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)							
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2							
Safety function			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Trap function							
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V (T_A = –40 to +85°C), V_{DD} = 2.4 to 5.5V (T_A = –40 to +105°C)							
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)							
	Package (size [mm])		44-LQFP (10×10mm)		48-LFQFP (7×7mm)		64-LFQFP (10×10mm)		100-LFQFP (14×14mm)	

MEMO

RL78/G14 (30 to 48 pins)

Group			RL78/G14																			
Pin count			30-pin						32-pin								36-pin					
Product name			R5F104AAASP*2	R5F104ACASP*2	R5F104ADASP*2	R5F104AEASP*2	R5F104AFASP*2	R5F104AGASP*2	①R5F104BAANA*2 ②R5F104BAAFP*2	①R5F104BCANA*2 ②R5F104BCAFP*2	①R5F104BDANA*2 ②R5F104BDAFP*2	①R5F104BEANA*2 ②R5F104BEAFP*2	①R5F104BFANA*2 ②R5F104BFAFP*2	①R5F104BGANA*2 ②R5F104BGAFP*2	R5F104CAALA*2	R5F104CCALA*2	R5F104CDALA*2	R5F104CEALA*2	R5F104CFALA*2	R5F104CGALA*2
CPU			RL78 CPU core																			
Memory	Flash ROM [bytes]		16K	32K	48K	64K	96K	128K	16K	32K	48K	64K	96K	128K	16K	32K	48K	64K	96K	128K		
	Data flash [bytes]		4K				8K		4K				8K		4K				8K			
	RAM [bytes]		2.5K	4K	5.5K		12K	16K	2.5K	4K	5.5K		12K	16K	2.5K	4K	5.5K		12K	16K		
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz																			
		External resonator	20MHz																			
		Timer RD clock	64MHz (V_{DD} = 2.7 to 5.5V)																			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																			
	High-speed on-chip oscillator [Hz]		1 to 64MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V) *Timer RD only, operation at 48 or 64MHz supported																			
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)																			
	Subclock (32.768 kHz)		—																			
I/O	I/O ports		26						28						32							
		N-channel open drain (6V tolerance)	2						3													
		N-channel open drain (V_{DD} tolerance)	10																			
Timers	16-bit timer TAU [channels]		4, PWM output × 3																			
	16-bit timer RJ [channels]		1																			
	16-bit timer RD [channels]		2, PWM output × 6																			
	16-bit timer RG [channels]		1, PWM output × 1																			
	Real-time clock (RTC) [channels]		1*1																			
	Watchdog timer (WDT) [channels]		1																			
	Interval timer [channels]		12-bit × 1																			
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2												1							
	CSI×2, UART×1, simplified I^2C×2		—												1							
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		1																			
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		—																			
	I^2C×1		1																			
DTC (sources)			28				30		28				30		28					30		
ELC (inputs/trigger outputs)			19/7				21/8		19/7				21/9		19/7					21/9		
External interrupt pins [count]			6																			
OCD	On-chip debugging		Yes																			
Peripheral functions	8/10-bit A/D converter [channels]		8																			
	8-bit D/A converter [channels]		—				1		—				2		—					2		
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																			
	Comparator		—				2		—				2		—					2		
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																			
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function																			
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V																			
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*2																			
	Package (size [mm])		30-LSSOP (7.62mm (300mil))						①32-HWQFN (5×5mm) ②32-LQFP (7×7mm)						36-WFLGA (4×4mm)							

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries
The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Products with pin counts from 30 to 36 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.
*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G14																										
40-pin							44-pin								48-pin											
R5F104EAANA*2	R5F104ECANA*2	R5F104EDANA*2	R5F104EEANA*2	R5F104EFANA*2	R5F104EGANA*2	R5F104EHANA*2	R5F104FAAFP*2	R5F104FCAFP*2	R5F104FDAFP*2	R5F104FEAFP*2	R5F104FFAFP*2	R5F104FGAFP*2	R5F104FHAFP*2	R5F104FJAFP*2	①R5F104GAAFB*2 ②R5F104GAANA*2	①R5F104GCAFB*2 ②R5F104GCANA*2	①R5F104GDAFB*2 ②R5F104GDANA*2	①R5F104GEAFB*2 ②R5F104GEANA*2	①R5F104GFAFB*2 ②R5F104GFANA*2	①R5F104GGAFB*2 ②R5F104GGANA*2	①R5F104GHAFB*2 ②R5F104GHANA*2	①R5F104GJAFB*2 ②R5F104GJANA*2	①R5F104GKAFB*2 ②R5F104GKANA*2	①R5F104GLAFB*2 ②R5F104GLANA*2
RL78 CPU core																										
16K	32K	48K	64K	96K	128K	192K	16K	32K	48K	64K	96K	128K	192K	256K	16K	32K	48K	64K	96K	128K	192K	256K	384K	512K		
4K				8K			4K				8K				4K				8K							
2.5K	4K	5.5K		12K	16K	20K	2.5K	4K	5.5K		12K	16K	20K	24K	2.5K	4K	5.5K		12K	16K	20K	24K	32K	48K		
32MHz																										
20MHz																										
64MHz (V_{DD} = 2.7 to 5.5V)																										
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																										
1 to 64MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V) *Timer RD only, operation at 48 or 64MHz supported																										
15kHz (V_{DD} = 1.6 to 5.5V)																										
32.768kHz (V_{DD} = 1.6 to 5.5V)																										
36							40								44											
3							4																			
11															12											
4, PWM output × 3																										
1																										
2, PWM output × 6																										
1, PWM output × 1																										
1*1																										
1																										
12-bit × 1																										
1																										
1																										
1															—											
—															1											
1																										
29		31		29		31			30			32														
20/7		22/9		20/7		22/9			20/7			22/9														
10									13																	
Yes																										
9							10																			
—		2		—		2			—			2														
Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																										
—		2		—		2			—			2														
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																										
Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function																										
V_{DD} = 1.6 to 5.5V																										
T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*2																										
40-HWQFN (6×6mm)							44-LQFP (10×10mm)								①48-LFQFP (7×7mm) ②48-HWQFN (7×7mm)											

RL78/G14 (52 to 100 pins)

Group			RL78/G14																	
Pin count			52-pin							64-pin										
Product name			R5F104JCAFA*1	R5F104JDAFA*1	R5F104JEAFA*1	R5F104JFAFA*1	R5F104JGAFA*1	R5F104JHAFA*1	R5F104JJAFA*1	①R5F104LCAFB*1 ②R5F104LCAFA*1 ③R5F104LCAFP*1 ④R5F104LCALA*1		①R5F104LDAFB*1 ②R5F104LDAFA*1 ③R5F104LDAFP*1 ④R5F104LDALA*1		①R5F104LEAFB*1 ②R5F104LEAFA*1 ③R5F104LEAFP*1 ④R5F104LEALA*1		①R5F104LFAFB*1 ②R5F104LFAFA*1 ③R5F104LFAFP*1 ④R5F104LFALA*1		①R5F104LGAFB*1 ②R5F104LGAFA*1 ③R5F104LGAFP*1 ④R5F104LGALA*1	
CPU			RL78 CPU core																	
Memory	Flash ROM [bytes]		32K	48K	64K	96K	128K	192K	256K	32K		48K		64K		96K		128K		
	Data flash [bytes]		4K			8K				4K						8K				
	RAM [bytes]		4K	5.5K		12K	16K	20K	24K	4K		5.5K				12K		16K		
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz																	
		External resonator	20MHz																	
		Timer RD clock	64MHz (V_{DD} = 2.7 to 5.5V)																	
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)																	
	High-speed on-chip oscillator [Hz]		1 to 64MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V) *Timer RD only, operation at 48 or 64MHz supported																	
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)																	
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 5.5V)																	
I/O	I/O ports		48							58										
		N-channel open drain (6V tolerance)	4																	
		N-channel open drain (V_{DD} tolerance)	14							16										
Timers	16-bit timer TAU [channels]		4, PWM output × 3																	
	16-bit timer RJ [channels]		1																	
	16-bit timer RD [channels]		2, PWM output × 6																	
	16-bit timer RG [channels]		1, PWM output × 1																	
	Real-time clock (RTC) [channels]		1																	
	Watchdog timer (WDT) [channels]		1																	
	Interval timer [channels]		12-bit × 1																	
Serial interfaces	CSI×1, UART×1, simplified I^2C × 1		1							—										
	CSI×2, UART×1, simplified I^2C×2		1							2										
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—																	
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		1																	
	I^2C×1		1																	
DTC (sources)			30			32				31						33				
ELC (inputs/trigger outputs)			20/7			22/9				20/7						22/9				
External interrupt pins [count]			15							15 (19)*2										
OCD	On-chip debugging		Yes																	
Peripheral functions	8/10-bit A/D converter [channels]		12																	
	8-bit D/A converter [channels]		—			2				—						2				
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																	
	Comparator		—			2				—						2				
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																	
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function																	
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V																	
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*1																	
	Package (size [mm])		52-LQFP (10×10mm)							①64-LFQFP (10×10mm) ②64-LQFP (12×12mm) ③64-LQFP (14×14mm) ④64-WFLGA (5×5mm)											

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*2. Figures in parentheses ( ) are when the PIOR function is used.

RL78/G14															
64-pin				80-pin						100-pin					
①R5F104LHAFB*1 ②R5F104LHAFA*1 ③R5F104LHAFP*1 ④R5F104LHALA*1	①R5F104LJAFB*1 ②R5F104LJAFA*1 ③R5F104LJAFP*1 ④R5F104LJALA*1	①R5F104LKAFB*1 ②R5F104LKAFA*1 ④R5F104LKALA*1	①R5F104LLAFB*1 ②R5F104LLAFA*1 ④R5F104LLALA*1	①R5F104MFAFB*1 ②R5F104MFAFA*1	①R5F104MGAFB*1 ②R5F104MGAFA*1	①R5F104MHAFB*1 ②R5F104MHAFA*1	①R5F104MJAFB*1 ②R5F104MJAFA*1	①R5F104MKAFB*1 ②R5F104MKAFA*1	①R5F104MLAFB*1 ②R5F104MLAFA*1	①R5F104PFAFB*1 ②R5F104PFAFA*1	①R5F104PGAFB*1 ②R5F104PGAFA*1	①R5F104PHAFB*1 ②R5F104PHAFA*1	①R5F104PJAFB*1 ②R5F104PJAFA*1	①R5F104PKAFB*1 ②R5F104PKAFA*1	①R5F104PLAFB*1 ②R5F104PLAFA*1
RL78 CPU core															
192K	256K	384K	512K	96K	128K	192K	256K	384K	512K	96K	128K	192K	256K	384K	512K
8K															
20K	24K	32K	48K	12K	16K	20K	24K	32K	48K	12K	16K	20K	24K	32K	48K
32MHz															
20MHz															
64MHz (V_{DD} = 2.7 to 5.5V)															
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)															
1 to 64MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V) *Timer RD only, operation at 48 or 64MHz supported															
15kHz (V_{DD} = 1.6 to 5.5V)															
32.768kHz (V_{DD} = 1.6 to 5.5V)															
58				74						92					
4															
16				25						28					
4, PWM output × 3				8, PWM output × 6											
1															
2, PWM output × 6															
1, PWM output × 1															
1															
1															
12-bit × 1															
—															
2				3											
—															
1															
1				2											
33				39											
22/9				26/9											
15 (19)*2				15 (19)*2						16 (20)*2					
Yes															
12				17						20					
2															
Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)															
2															
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2															
Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function															
V_{DD} = 1.6 to 5.5V															
T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*1															
①64-LFQFP (10×10mm) ②64-LQFP (12×12mm) ③64-LQFP (14×14mm) ④64-WFLGA (5×5mm)				①80-LFQFP (12×12mm) ②80-LQFP (14×14mm)						①100-LFQFP (14×14mm) ②100-LQFP (14×20mm)					

RL78/G15 (8 to 20 pins)

Group			RL78/G15									
Pin count			8-pin		10-pin		16-pin				20-pin	
Product name			R5F12007ANS R5F12007GNS R5F12007MNS	R5F12008ANS R5F12008GNS R5F12008MNS	R5F12017ASP R5F12017GSP R5F12017MSP	R5F12018ASP R5F12018GSP R5F12018MSP	R5F12047ASP R5F12047GSP R5F12047MSP	R5F12048ASP R5F12048GSP R5F12048MSP	R5F12047ANA R5F12047GNA R5F12047MNA	R5F12048ANA R5F12048GNA R5F12048MNA	R5F12067ASP R5F12067GSP R5F12067MSP	R5F12068ASP R5F12068GSP R5F12068MSP
CPU			RL78 CPU core									
Memory	Flash ROM [bytes]		4	8	4	8	4	8	4	8	4	8
	Data flash [bytes]		1									
	RAM [bytes]		1									
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	16MHz									
		External resonator	—				12MHz					
Clock generator circuit	Crystal/ceramic oscillator [Hz]		—				1 to 12MHz					
	High-speed on-chip oscillator [Hz]		1 MHz, 2 MHz, 4 MHz, 8 MHz, 16 MHz									
	Low-speed on-chip oscillator [Hz]		15 kHz (TYP.)									
I/O	I/O ports		6		8		14				18	
Timers	16-bit timer TAU [channels]		8									
	Watchdog timer (WDT) [channels]		1									
	Interval timer [channels]		1									
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		1				—					
	CSI×2, UART×1, simplified I^2C×2		—				1					
	I^2C bus		1									
Interrupt sources	Internal		8		10		16				19	
	External		6		8							
OCD	On-chip debugging		Yes									
Peripheral functions	8/10-bit A/D converter [channels]		6		8		14				18	
	Other functions		Power-on reset (POR), clock/buzzer output × 1									
Other	Power supply voltage [V]		V_{DD} = 2.4 to 5.5 V									
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications), T_A = –40 to +125°C (M: Industrial applications)									
	Package (size [mm])		8-pin WDFN (3×3mm)		10-pin LSSOP (4.4×3.6mm)		16-pin SSOP (4.4×6.5mm)		16-pin HWQFN (3×3mm)		20-pin LSSOP (4.4×6.5mm)	

MEMO

RL78/G16 (10 to 32pins)

Group			RL78/G16					
Pin count			10-pin		16-pin			
Product name			R5F1211AASP R5F1211AGSP R5F1211AMSP	R5F1211CASP R5F1211CGSP R5F1211CMSP	R5F1214AASP R5F1214AGSP R5F1214AMSP	R5F1214CASP R5F1214CGSP R5F1214CMSP	R5F1214AANA R5F1214AGNA R5F1214AMNA	R5F1214CANA R5F1214CGNA R5F1214CMNA
CPU			RL78 CPU core					
Memory	Flash ROM [bytes]		16	32	16	32	16	32
	Data flash [bytes]		1					
	RAM [bytes]		2					
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	16MHz					
		External resonator	—		12MHz			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		—		1 to 12MHz			
	High-speed on-chip oscillator [Hz]		1 MHz, 2 MHz, 4 MHz, 8 MHz, 16 MHz					
	Low-speed on-chip oscillator [Hz]		15 kHz (TYP.)					
I/O	I/O ports		8		14			
Timers	16-bit timer [channels]		8					
	Watchdog timer (WDT) [channels]		1					
	Interval timer [channels]		1					
Serial interfaces	CSI×1, UART×1, Simplified I^2C×1		1		—			
	CSI×2, UART×2, Simplified I^2C×2		—		1			
	CSI×3, UART×3, Simplified I^2C×3		—					
	I^2C bus		1					
Interrupt sources	Internal		23		26			
	External		8					
OCD	On-chip debugging		Yes					
Peripheral functions	8/10-bit A/D converter [channels]		4		7			
	Other functions		Power-on reset (POR), clock/buzzer output × 1					
Other	Power supply voltage [V]		V_{DD} = 2.4 to 5.5 V					
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications), T_A = –40 to +125°C (M: Industrial applications)					
	Package (size [mm])		10-pin LSSOP (4.4×3.6mm)		16-pin SSOP (4.4×5mm)		16-pin HWQFN (3×3mm)	

RL78/G16							
20-pin		24-pin		32-pin			
R5F1216AASP R5F1216AGSP R5F1216AMSP	R5F1216CASP R5F1216CGSP R5F1216CMSP	R5F1217AANA R5F1217AGNA R5F1217AMNA	R5F1217CANA R5F1217CGNA R5F1217CMNA	R5F121BAANA R5F121BAGNA R5F121BAMNA	R5F121BCANA R5F121BCGNA R5F121BCMNA	R5F121BAAFP R5F121BAGFP R5F121BAMFP	R5F121BCAFP R5F121BCGFP R5F121BCMFP
RL78 CPU core							
16	32	16	32	16	32	16	32
1							
2							
16MHz							
12MHz							
1 to 12MHz							
1 MHz, 2 MHz, 4 MHz, 8 MHz, 16 MHz							
15 kHz (TYP.)							
18		22		30			
8							
1							
1							
—							
—							
1							
1							
30							
8							
Yes							
11							
Power-on reset (POR), clock/buzzer output × 1							
V_{DD} = 2.4 to 5.5 V							
T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications), T_A = –40 to +125°C (M: Industrial applications)							
20-pin SSOP (4.4×5mm)		20-pin HWQFN (4×4mm)		32-pin HWQFN (5×5mm)		32-pin LQFP (7×7mm)	

RL78/G22 (16 to 48 pins)

Group			RL78/G22									
Pin count			16-pin		20-pin		24-pin		25-pin		30-pin	
Product name			R7F102G4C3CNP R7F102G4C2DNP	R7F102G4E3CNP R7F102G4E2DNP	R7F102G6C3CSP R7F102G6C2DSP	R7F102G6E3CSP R7F102G6E2DSP	R7F102G7C3CNP R7F102G7C2DNP	R7F102G7E3CNP R7F102G7E2DNP	R7F102G8C3CLA R7F102G8C2DLA	R7F102G8E3CLA R7F102G8E2DLA	R7F102GAC3CSP R7F102GAC2DSP	R7F102GAE3CSP R7F102GAE2DSP
CPU			RL78 CPU core									
Memory	Flash ROM [bytes]		32	64	32	64	32	64	32	64	32	64
	Data flash [bytes]		2									
	RAM [bytes]		4									
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz									
		External resonator	20MHz									
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20 MHz									
	High-speed on-chip oscillator [Hz]		1 MHz, 2 MHz, 3 MHz, 4 MHz, 6 MHz, 8 MHz, 12 MHz, 16 MHz, 24 MHz, 32 MHz									
	Middle-speed on-chip oscillator [Hz]		1 MHz, 2 MHz, 4 MHz									
	Low-speed on-chip oscillator [Hz]		32.768 kHz (TYP.)									
	Subclock		32.768 kHz (V_{DD} = 1.6 to 5.5 V)									
I/O	I/O ports		12		16		20		21		26	
		N-channel open drain (6V tolerance)	—				2					
Timers	16-bit timer TAU [channels]		8									
	Real-time clock (RTC) [channels]		1									
	Watchdog timer (WDT) [channels]		1									
	Interval timer [channels]		1									
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		1		2							
	CSI×2, UART×1, simplified I^2C×2		—									
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—								1	
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		—									
	Simplified I^2C×1		1		—							
	UARTA		—									
	I^2C bus		—								1	
Interrupt sources	Internal		23		25		26				29	
	External				3		5				6	
Key interrupt			—									
Data transfer controller (DTC)			21		23		25				28	
Event link controller (ELCL)			1									
SNOOZE mode sequencer (SMS)			1									
OCD	On-chip debugging		Yes									
Peripheral functions	8/10-bit A/D converter [channels]		3		6						8	
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2									
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Output level detection function									
Other	Power supply voltage [V]		V_{DD}=1.6 to 5.5 V									
	Operating ambient temperature [°C]		T_A = –40 to +85°C (2D: Consumer applications), T_A = –40 to +105°C (3C: Industrial applications)									
	Package (size [mm])		16-pin HWQFN (3×3mm)		20-pin LSSOP (4.4×6.5mm)		24-pin HWQFN (4×4mm)		25-pin WFLGA (3×3mm)		30-pin LSSOP (9.85mm (300mil))	

RL78/G22													
32-pin				36-pin		40-pin		44-pin		48-pin			
R7F102GBC3CNP R7F102GBC2DNP	R7F102GBE3CNP R7F102GBE2DNP	R7F102GBC3CFP R7F102GBC2DFP	R7F102GBE3CFP R7F102GBE2DFP	R7F102GCC3CLA R7F102GCC2DLA	R7F102GCE3CLA R7F102GCE2DLA	R7F102GEC3CNP R7F102GEC2DNP	R7F102GEE3CNP R7F102GEE2DNP	R7F102GFC3CFP R7F102GFC2DFP	R7F102GFE3CFP R7F102GFE2DFP	R7F102GGC3CFB R7F102GGC2DFB	R7F102GGE3CFB R7F102GGE2DFB	R7F102GGC3CNP R7F102GGC2DNP	R7F102GGE3CNP R7F102GGE2DNP
RL78 CPU core													
32	64	32	64	32	64	32	64	32	64	32	64	32	64
2													
4													
32MHz													
20MHz													
1 to 20 MHz													
1 MHz, 2 MHz, 3 MHz, 4 MHz, 6 MHz, 8 MHz, 12 MHz, 16 MHz, 24 MHz, 32 MHz													
1 MHz, 2 MHz, 4 MHz													
32.768 kHz (TYP.)													
32.768 kHz (V_{DD} = 1.6 to 5.5 V)													
28				32		36		40		44			
3								4					
8													
1													
1													
1													
2										1			
—										1			
1				—									
—				1									
—													
—				1									
1													
29				32									
6						7				10			
—						4				6			
28				30		31				32			
1													
1													
Yes													
8						9		10					
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2													
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Output level detection function													
V_{DD}=1.6 to 5.5 V													
T_A = –40 to +85°C (2D: Consumer applications), T_A = –40 to +105°C (3C: Industrial applications)													
32-pin HWQFN (5×5mm)		32-pin LQFP (7×7mm)		36-pin WFLGA (4×4mm)		40-pin HWQFN (6×6mm)		44-pin LQFP (10×10mm)		48-pin LFQFP (7×7mm)		48-pin HWQFN (7×7mm)	

RL78/G23 (30 to 52 pins)

Group			RL78/G23																			
Pin count			30-pin				32-pin								36-pin				40-pin			
Product name			R7F100GAF3CSP R7F100GAF2DSP	R7F100GAG3CSP R7F100GAG2DSP	R7F100GAH3CSP R7F100GAH2DSP	R7F100GAJ3CSP R7F100GAJ2DSP	R7F100GBF3CNP R7F100GBF2DNP	R7F100GBG3CNP R7F100GBG2DNP	R7F100GBH3CNP R7F100GBH2DNP	R7F100GBJ3CNP R7F100GBJ2DNP	R7F100GBF3CFP R7F100GBF2DFP	R7F100GBG3CFP R7F100GBG2DFP	R7F100GBH3CFP R7F100GBH2DFP	R7F100GBJ3CFP R7F100GBJ2DFP	R7F100GCF3CLA R7F100GCF2DLA	R7F100GCG3CLA R7F100GCG2DLA	R7F100GCH3CLA R7F100GCH2DLA	R7F100GCJ3CLA R7F100GCJ2DLA	R7F100GEF3CNP R7F100GEF2DNP	R7F100GEG3CNP R7F100GEG2DNP	R7F100GEH3CNP R7F100GEH2DNP	R7F100GEJ3CNP R7F100GEJ2DNP
CPU			RL78 CPU core																			
Memory	Flash ROM [bytes]		96K	128K	192K	256K	96K	128K	192K	256K	96K	128K	192K	256K	96K	128K	192K	256K	96K	128K	192K	256K
	Data flash [bytes]		8K																			
	RAM [bytes]		12K	16K	20K	24K	12K	16K	20K	24K	12K	16K	20K	24K	12K	16K	20K	24K	12K	16K	20K	24K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz																			
		External resonator	20MHz																			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz																			
	High-speed on-chip oscillator [Hz]		1MHz, 2MHz, 3MHz, 4MHz, 6MHz, 8MHz, 12MHz, 16MHz, 24MHz, 32MHz																			
	Middle-speed on-chip oscillator [Hz]		1MHz, 2MHz, 4MHz																			
	Low-speed on-chip oscillator [Hz]		32.768kHz (TYP.)																			
	Subclock		32.768kHz (V_{DD} = 2.4 to 5.5V)																32.768kHz (V_{DD} = 1.6 to 5.5V)			
I/O	I/O ports		20				28								32				36			
		N-channel open drain (6V tolerance)	2				3															
Timers	16-bit timer TAU [channels]		8																			
	Real-time clock (RTC) [channels]		1																			
	Watchdog timer (WDT) [channels]		1																			
	Interval timer [channels]		1 channel in 32-bit mode, 2 channels in 16-bit mode, 4 channels in 8-bit mode																			
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2																			
	CSI×2, UART×1, simplified I^2C×2		—																			
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		1												—							
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		—												1							
	UARTA		—												1							
	I^2C bus		1																			
Interrupt sources	Internal		31				32								35							
	External		6																7			
Key interrupt			—												1				4			
Logic and event link controller (ELCL)			1																			
SNOOZE mode sequencer (SMS)			1																			
OCD	On-chip debugging		Yes																			
Peripheral functions	8/10/12-bit A/D converter [channels]		8																9			
	D/A converter [channels]		2																			
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																			
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Trap function, Output level detection function																			
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V (2D: Consumer applications), V_{DD} = 1.8 to 5.5V (3C: Industrial applications)																			
	Operating ambient temperature [°C]		T_A = –40 to +85°C (2D: Consumer applications), T_A = –40 to +105°C (3C: Industrial applications)																			
	Package (size [mm])		30-LSSOP (9.85mm (300mil))				32-HWQFN (5×5mm)				32-LQFP (7×7mm)				36-WFLGA (4×4mm)				40-HWQFN (6×6mm)			

RL78/G23																																
44-pin							48-pin																	52-pin								
R7F100GFF3CFP R7F100GFF2DFP	R7F100GFG3CFP R7F100GFG2DFP	R7F100GFH3CFP R7F100GFH2DFP	R7F100GFJ3CFP R7F100GFJ2DFP	R7F100GFK3CFP R7F100GFK2DFP	R7F100GFL3CFP R7F100GFL2DFP	R7F100GFN3CFP R7F100GFN2DFP	R7F100GGF3CFB R7F100GGF2DFB	R7F100GGG3CFB R7F100GGG2DFB	R7F100GGH3CFB R7F100GGH2DFB	R7F100GGJ3CFB R7F100GGJ2DFB	R7F100GGK3CFB R7F100GGK2DFB	R7F100GGL3CFB R7F100GGL2DFB	R7F100GGN3CFB R7F100GGN2DFB	R7F100GGF3CNP R7F100GGF2DNP	R7F100GGG3CNP R7F100GGG2DNP	R7F100GGH3CNP R7F100GGH2DNP	R7F100GGJ3CNP R7F100GGJ2DNP	R7F100GGK3CNP R7F100GGK2DNP	R7F100GGL3CNP R7F100GGL2DNP	R7F100GGN3CNP R7F100GGN2DNP	R7F100GJF3CFA R7F100GJF2DFA	R7F100GJG3CFA R7F100GJG2DFA	R7F100GJH3CFA R7F100GJH2DFA	R7F100GJJ3CFA R7F100GJJ2DFA	R7F100GJK3CFA R7F100GJK2DFA	R7F100GJL3CFA R7F100GJL2DFA	R7F100GJN3CFA R7F100GJN2DFA
RL78 CPU core																																
96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K					
8K																																
12K	16K	20K	24K	32K	48K		12K	16K	20K	24K	32K	48K		12K	16K	20K	24K	32K	48K		12K	16K	20K	24K	32K	48K						
32MHz																																
20MHz																																
1 to 20MHz																																
1MHz, 2MHz, 3MHz, 4MHz, 6MHz, 8MHz, 12MHz, 16MHz, 24MHz, 32MHz																																
1MHz, 2MHz, 4MHz																																
32.768kHz (TYP.)																																
32.768kHz (V_{DD} = 1.6 to 5.5V)																																
40							44															48										
4																																
8																																
1																																
1																																
1 channel in 32-bit mode, 2 channels in 16-bit mode, 4 channels in 8-bit mode																																
2							1																									
—							1																									
—																																
1																																
2																																
2																																
39																																
7							10															12										
4							6															8										
1																																
1																																
Yes																																
10																						12										
2																																
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																																
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Trap function, Output level detection function																																
V_{DD} = 1.6 to 5.5V (2D: Consumer applications), V_{DD} = 1.8 to 5.5V (3C: Industrial applications)																																
T_A = –40 to +85°C (2D: Consumer applications), T_A = –40 to +105°C (3C: Industrial applications)																																
44-LQFP (10×10mm)							48-LFQFP (7×7mm)							48-HWQFN (7×7mm)								52-LQFP (10×10mm)										

RL78/G23 (64 to 128 pins)

Group			RL78/G23																							
Pin count			64-pin																							
Product name			R7F100GLF3CFA R7F100GLF2DFA	R7F100GLG3CFA R7F100GLG2DFA	R7F100GLH3CFA R7F100GLH2DFA	R7F100GLJ3CFA R7F100GLJ2DFA	R7F100GLK3CFA R7F100GLK2DFA	R7F100GLL3CFA R7F100GLL2DFA	R7F100GLN3CFA R7F100GLN2DFA	R7F100GLF3CFB R7F100GLF2DFB	R7F100GLG3CFB R7F100GLG2DFB	R7F100GLH3CFB R7F100GLH2DFB	R7F100GLJ3CFB R7F100GLJ2DFB	R7F100GLK3CFB R7F100GLK2DFB	R7F100GLL3CFB R7F100GLL2DFB	R7F100GLN3CFB R7F100GLN2DFB	R7F100GLF3CLA R7F100GLF2DLA	R7F100GLG3CLA R7F100GLG2DLA	R7F100GLH3CLA R7F100GLH2DLA	R7F100GLJ3CLA R7F100GLJ2DLA	R7F100GLK3CLA R7F100GLK2DLA	R7F100GLL3CLA R7F100GLL2DLA	R7F100GLN3CLA R7F100GLN2DLA
CPU			RL78 CPU core																							
Memory	Flash ROM [bytes]		96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K	96K	128K	192K	256K	384K	512K	768K			
	Data flash [bytes]		8K																							
	RAM [bytes]		12K	16K	20K	24K	32K	48K		12K	16K	20K	24K	32K	48K		12K	16K	20K	24K	32K	48K				
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz																							
		External resonator	20MHz																							
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz																							
	High-speed on-chip oscillator [Hz]		1MHz, 2MHz, 3MHz, 4MHz, 6MHz, 8MHz, 12MHz, 16MHz, 24MHz, 32MHz																							
	Middle-speed on-chip oscillator [Hz]		1MHz, 2MHz, 4MHz																							
	Low-speed on-chip oscillator [Hz]		32.768kHz (TYP.)																							
	Subclock		32.768kHz (V_{DD} = 1.6 to 5.5V)																							
I/O	I/O ports		58																							
		N-channel open drain (6V tolerance)	4																							
Timers	16-bit timer TAU [channels]		8																							
	Real-time clock (RTC) [channels]		1																							
	Watchdog timer (WDT) [channels]		1																							
	Interval timer [channels]		1 channel in 32-bit mode, 2 channels in 16-bit mode, 4 channels in 8-bit mode																							
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		—																							
	CSI×2, UART×1, simplified I^2C×2		2																							
	CSI×1, UART (LIN bus support)×1, Simplified I^2C×1		—																							
	CSI×2, UART (LIN bus support)×1, Simplified I^2C×2		1																							
	UARTA		2																							
	I^2C bus		2																							
Interrupt sources	Internal		39																							
	External		13																							
Key interrupt			8																							
Logic and event link controller (ELCL)			1																							
SNOOZE mode sequencer (SMS)			1																							
OCD	On-chip debugging		Yes																							
Peripheral functions	8/10/12-bit A/D converter [channels]		12																							
	D/A converter [channels]		2																							
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																							
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Trap function, Output level detection function																							
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V (2D: Consumer applications), V_{DD} = 1.8 to 5.5V (3C: Industrial applications)																							
	Operating ambient temperature [°C]		T_A = –40 to +85°C (2D: Consumer applications), T_A = –40 to +105°C (3C: Industrial applications)																							
	Package (size [mm])		64-LQFP (12×12mm)							64-LFQFP (10×10mm)							64-WFLGA (5×5mm)									

RL78/G23																																			
80-pin													100-pin												128-pin											
R7F100GMG3CFA R7F100GMG2DFA	R7F100GMH3CFA R7F100GMH2DFA	R7F100GMJ3CFA R7F100GMJ2DFA	R7F100GMK3CFA R7F100GMK2DFA	R7F100GML3CFA R7F100GML2DFA	R7F100GMN3CFA R7F100GMN2DFA	R7F100GMG3CFB R7F100GMG2DFB	R7F100GMH3CFB R7F100GMH2DFB	R7F100GMJ3CFB R7F100GMJ2DFB	R7F100GMK3CFB R7F100GMK2DFB	R7F100GML3CFB R7F100GML2DFB	R7F100GMN3CFB R7F100GMN2DFB	R7F100GPG3CFA R7F100GPG2DFA	R7F100GPH3CFA R7F100GPH2DFA	R7F100GPJ3CFA R7F100GPJ2DFA	R7F100GPK3CFA R7F100GPK2DFA	R7F100GPL3CFA R7F100GPL2DFA	R7F100GPN3CFA R7F100GPN2DFA	R7F100GPG3CFB R7F100GPG2DFB	R7F100GPH3CFB R7F100GPH2DFB	R7F100GPJ3CFB R7F100GPJ2DFB	R7F100GPK3CFB R7F100GPK2DFB	R7F100GPL3CFB R7F100GPL2DFB	R7F100GPN3CFB R7F100GPN2DFB	R7F100GSJ3CFB R7F100GSJ2DFB	R7F100GSK3CFB R7F100GSK2DFB	R7F100GSL3CFB R7F100GSL2DFB	R7F100GSN3CFB R7F100GSN2DFB
RL78 CPU core																																			
128K	192K	256K	384K	512K	768K	128K	192K	256K	384K	512K	768K	128K	192K	256K	384K	512K	768K	128K	192K	256K	384K	512K	768K	256K	384K	512K	768K								
8K																																			
16K	20K	24K	32K	48K		16K	20K	24K	32K	48K		16K	20K	24K	32K	48K		16K	20K	24K	32K	48K		24K	32K	48K									
32MHz																																			
20MHz																																			
1 to 20MHz																																			
1MHz, 2MHz, 3MHz, 4MHz, 6MHz, 8MHz, 12MHz, 16MHz, 24MHz, 32MHz																																			
1MHz, 2MHz, 4MHz																																			
32.768kHz (TYP.)																																			
32.768kHz (V_{DD} = 1.6 to 5.5V)																																			
74													92												120											
4																																			
12																									16											
1																																			
1																																			
1 channel in 32-bit mode, 2 channels in 16-bit mode, 4 channels in 8-bit mode																																			
—																																			
3																																			
—																																			
1																																			
2																																			
2																																			
44																									48											
13																																			
8																																			
1																																			
1																																			
Yes																																			
17													20												26											
2																																			
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2																																			
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Trap function, Output level detection function																																			
V_{DD} = 1.6 to 5.5V (2D: Consumer applications), V_{DD} = 1.8 to 5.5V (3C: Industrial applications)																																			
T_A = –40 to +85°C (2D: Consumer applications), T_A = –40 to +105°C (3C: Industrial applications)																																			
80-LQFP (14×14mm)						80-LFQFP (12×12mm)						100-LQFP (14×20mm)						100-LFQFP (14×14mm)						128-LFQFP (20×20mm)											

RL78/G24 (20 to 64pins)

Group			RL78/G24											
Pin count			20-pin		24-pin		25-pin		30-pin		32-pin			
Product name			R7F101G6E4CSP R7F101G6E3CSP R7F101G6E2DSP	R7F101G6G4CSP R7F101G6G3CSP R7F101G6G2DSP	R7F101G7E4CNP R7F101G7E3CNP R7F101G7E2DNP	R7F101G7G4CNP R7F101G7G3CNP R7F101G7G2DNP	R7F101G8E3CLA R7F101G8E2DLA	R7F101G8G3CLA R7F101G8G2DLA	R7F101GAE4CSP R7F101GAE3CSP R7F101GAE2DSP	R7F101GAG4CSP R7F101GAG3CSP R7F101GAG2DSP	R7F101GBE4CNP R7F101GBE3CNP R7F101GBE2DNP	R7F101GBG4CNP R7F101GBG3CNP R7F101GBG2DNP	R7F101GBE3CFP R7F101GBE2DFP	R7F101GBG3CFP R7F101GBG2DFP
CPU			RL78 CPU core											
Memory	Flash ROM [bytes]		64	128	64	128	64	128	64	128	64	128	64	128
	Data flash [bytes]		4											
	RAM [bytes]		12											
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	48 MHz											
		External resonator	20 MHz											
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20 MHz											
	High-speed on-chip oscillator [Hz]		1 MHz, 2 MHz, 3 MHz, 4 MHz, 6 MHz, 8 MHz, 12 MHz, 16 MHz, 24 MHz, 32 MHz, 48MHz, 64MHz											
	Middle-speed on-chip oscillator [Hz]		1 MHz, 2 MHz, 4 MHz											
	Low-speed on-chip oscillator [Hz]		32.768 kHz (TYP.)											
	Subclock		32.768 kHz (V_{DD} = 1.6 to 5.5 V)											
I/O	I/O ports		16		20		21		26		28		28	
		N-channel open drain (6V tolerance)	—						2					
Timers	16-bit timer (TAU,RJ,RD2,RX,RG2) [channels]		9											
	16-bit timer (KB3) [channels]		2		3									
	Real-time clock (RTC) [channels]		1											
	Watchdog timer (WDT) [channels]		1											
	Interval timer [channels]		1											
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2											
	CSI×2, UART×1, simplified I^2C×2		—											
	CSI×1, UART (LIN bus support)×1, Simplified I^2C×1		—						1		1			
	CSI×2, UART (LIN bus support)×1, Simplified I^2C×2		—											
	I^2C bus		—						1					
	I^2C (SM/PM) bus		—						1					
	DALI		—						1					
Interrupt sources	Internal		46		55									
	External		6		8				12					
Key interrupt			—											
Data transfer controller (DTC)			42		47				52					
Event link controller (ELC)			1											
Programmable gain amplifier (PGA)			1											
Comparator module			3		4									
OCD	On-chip debugging		Yes											
Peripheral functions	8/10/12-bit A/D converter [channels]		12		13		16							
	8/10-bit D/A converter [channels]		2 to 3											
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2											
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Output level detection function											
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5 V (2D: Consumer applications, 3C: Industrial applications), V_{DD} = 2.7 to 5.5 V (4C: Industrial applications)											
	Operating ambient temperature [°C]		T_A = −40 to +85°C (2D: Consumer applications), T_A = −40 to +105°C (3C: Industrial applications)), T_A = −40 to +125°C (4C: Industrial applications)											
	Package (size [mm])		20-pin LSSOP (4.4×6.5mm)		24-pin HWQFN (4×4mm)		25-pin WFLGA (3×3mm)		30-pin LSSOP (7.62mm(300mil))		32-pin HWQFN (5×5mm)		32-pin LQFP (7×7mm)	

RL78/G24													
40-pin		44-pin		48-pin				52-pin		64-pin			
R7F101GEE4CNP R7F101GEE3CNP R7F101GEE2DNP	R7F101GEG4CNP R7F101GEG3CNP R7F101GEG2DNP	R7F101GFE3CFP R7F101GFE2DFP	R7F101GFG3CFP R7F101GFG2DFP	R7F101GGE4CFB R7F101GGE3CFB R7F101GGE2DFB	R7F101GGG4CFB R7F101GGG3CFB R7F101GGG2DFB	R7F101GGE3CNP R7F101GGE2DNP	R7F101GGG3CNP R7F101GGG2DNP	R7F101GJE4CFA R7F101GJE3CFA R7F101GJE2DFA	R7F101GJG4CFA R7F101GJG3CFA R7F101GJG2DFA	R7F101GLE3CFA R7F101GLE2DFA	R7F101GLG3CFA R7F101GLG2DFA	R7F101GLE3CFB R7F101GLE2DFB	R7F101GLG3CFB R7F101GLG2DFB
RL78 CPU core													
64	128	64	128	64	128	64	128	64	128	64	128	64	128
4													
12													
48 MHz													
20MHz													
1 to 20 MHz													
1 MHz, 2 MHz, 3 MHz, 4 MHz, 6 MHz, 8 MHz, 12 MHz, 16 MHz, 24 MHz, 32 MHz, 48MHz, 64MHz													
1 MHz, 2 MHz, 4 MHz													
32.768 kHz (TYP.)													
32.768 kHz (V_{DD} = 1.6 to 5.5 V)													
36		40		44				48		58			
2													
9													
3													
1													
1													
1													
1											—		
1											2		
1				—									
—				1									
1													
1													
1													
55													
13				15									
4				6				8					
53													
1													
1													
4													
Yes													
19		21						23					
2 to 3													
Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2													
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Output level detection function													
V_{DD} = 1.6 to 5.5 V (2D: Consumer applications, 3C: Industrial applications), V_{DD} = 2.7 to 5.5 V (4C: Industrial applications)													
T_A = −40 to +85°C (2D: Consumer applications), T_A = −40 to +105°C (3C: Industrial applications)), T_A = −40 to +125°C (4C: Industrial applications)													
40-pin HWQFN (6×6mm)		44-pin LQFP (10×10mm)		48-pin LFQFP (7×7mm)		48-pin HWQFN (7×7mm)		52-pin LQFP (10×10mm)		64-pin LQFP (12×12mm)		64-pin LFQFP (10×10mm)	

RL78/G1A (25 to 64 pins)

Group			RL78/G1A																
Pin count			25-pin				32-pin				48-pin				64-pin				
Product name			R5F10EBAALA *2	R5F10EBCALA *2	R5F10EBDALA *2	R5F10EBEALA *2	R5F10EBAANA *2	R5F10EBCANA *2	R5F10EBDANA *2	R5F10EBEANA *2	①R5F10EGAAFB *2 ②R5F10EGAANA *2		①R5F10EGCAFB *2 ②R5F10EGCANA *2		①R5F10EGDAFB *2 ②R5F10EGDANA *2		①R5F10EGEAFB *2 ②R5F10EGEANA *2		①R5F10ELCAFB *2 ②R5F10ELCABG *2		①R5F10ELDAFB *2 ②R5F10ELDABG *2		①R5F10ELEAFB *2 ②R5F10ELEABG *2
CPU			RL78 CPU core																
Memory	Flash ROM [bytes]		16K	32K	48K	64K	16K	32K	48K	64K	16K		32K		48K		64K		32K		48K		64K
	Data flash [bytes]		4K																
	RAM [bytes]		2K		3K	4K	2K		3K	4K	2K				3K		4K		2K		3K		4K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz																
		External resonator	20MHz																
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)																
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)																
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 3.6V)																
	Subclock (32.768 kHz)		—								32.768kHz (V_{DD} = 1.6 to 3.6V)								
I/O	I/O ports		19				26				42						56		
	N-channel open drain (6V tolerance)		2				3				4								
	N-channel open drain (V_{DD} tolerance)		6				9				11						12		
Timers	16-bit timer TAU [channels]		8, PWM output × 1								8, PWM output × 3						8, PWM output × 6		
	Real-time clock (RTC) [channels]		1*1																
	Watchdog timer (WDT) [channels]		1																
	Interval timer [channels]		12-bit × 1																
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2								1						—		
	CSI×2, UART×1, simplified I^2C×2		—								1						2		
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		—				1				—								
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		—								1								
	I^2C×1		1																
DMA [channels]			2																
External interrupt pins [count]			5				6				13						18		
OCD	On-chip debugging		Yes																
Peripheral functions	8/12-bit A/D converter [channels]		13				18				24						28		
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD)																
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function																
Other	Power supply voltage [V]		V_{DD} = 1.6 to 3.6V																
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*2																
	Package (size [mm])		25-WFLGA (3×3mm)				32-HWQFN (5×5mm)				①48-LFQFP (7×7mm) ②48-HWQFN (7×7mm)						①64-LFQFP (10×10mm) ②64-VFBGA (4×4mm)		

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries
The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Products with pin counts from 25 or 32 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15 kHz) is available for use.
*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1C (32 to 48 pins)

Group			RL78/G1C			
Pin count			32-pin		48-pin	
Product name			①R5F10UBCANA*1 ②R5F10UBCAFP*1	①R5F10KBCANA*1 ②R5F10KBCAFP*1	①R5F10UGCANA*1 ②R5F10UGCAFB*1	①R5F10KGCANA*1 ②R5F10KGCAFB*1
CPU			RL78 CPU core			
Memory	Flash ROM [bytes]		32K			
	Data flash [bytes]		2K			
	RAM [bytes]		5.5K			
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz			
		External resonator	20MHz			
		USB clock	48MHz			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V)			
	High-speed on-chip oscillator [Hz]		1 to 48MHz (V_{DD} = 2.7 to 5.5V)			
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 2.4 to 5.5V)			
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 2.4 to 5.5V)			
I/O	Total I/O ports and dedicated USB pins		28*2	26*3	44*2	42*3
		I/O ports	22		38	
		N-channel open drain (6V tolerance)	3		4	
Timers	16-bit timer TAU [channels]		4			
	Real-time clock (RTC) [channels]		1			
	Watchdog timer (WDT) [channels]		1			
	Interval timer [channels]		12-bit × 1			
Serial interfaces	CSI×2, UART×1, simplified I^2C×2		1			
	I^2C×1		1			
USB	Host [channels]		2	—	2	—
	Function [channels]		1			
DMA [channels]			2			
External interrupts [channels]			8		10	
OCD	On-chip debugging		Yes			
Peripheral functions	8/10-bit A/D converter [channels]		8		9	
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)			
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2			
			—		RTC output (1Hz) × 1	
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function			
Other	Power supply voltage [V]		V_{DD} = 2.4 to 5.5V			
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*1			
	Package (size [mm])		①32-HWQFN (5×5mm) ②32-LFQFP (7×7mm)		①48-HWQFN (7×7mm) ②48-LFQFP (7×7mm)	

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*2: USB uses pins UVBUS, UVDD, UDP0, UDM0, UDP1, and UDM1.

*3: USB uses pins UVBUS, UVDD, UDP0, and UDM0.

RL78/G1D (48 pins)

Group			RL78/G1D		
Pin count			48-pin		
Product name			R5F11AGGANB *1	R5F11AGHANB *1	R5F11AGJANB *1
CPU			RL78 CPU core		
Memory	Flash ROM [bytes]		128K	192K	256K
	Data flash [bytes]		8K		
	RAM [bytes]		12K	16K	20K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz		
		External resonator	20MHz		
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)		
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)		
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 3.6V)		
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 3.6V)		
	Crystal resonator for RF [Hz]		32MHz		
	Low-speed on-chip oscillator for RF [Hz]		32.768kHz (with calibration)		
I/O	I/O ports		32		
		N-channel open drain (6V tolerance)	2		
		N-channel open drain (V_{DD} tolerance)	9		
Timers	16-bit timer TAU [channels]		8, PWM output × 7		
	Real-time clock (RTC) [channels]		1		
	Watchdog timer (WDT) [channels]		1		
	12-bit Interval timer [channels]		12-bit × 1		
8/10-bit resolution A/D converter [channels]			8		
Serial interfaces	CSI, simplified I^2C, UART		1		
	CSI, simplified I^2C		1		
	UART		1		
	I^2C bus		1		
DMA [channels]			4		
External interrupts [channels]			4 (When using RF, this includes connections between the MCU and the RF transceiver via pins externally connected on the board by the user.)		
OCD	On-chip debugging		Yes		
Peripheral functions	8/10-bit A/D converter [channels]		8		
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)		
	2.4 GHz RF transceiver		Bluetooth v4.2 specification (low energy) supported 2.4GHz ISM band, GFSK modulation, TDMA/TDD frequency hopping (on-chip AES encryption circuit), adapter function (during slave operation only)		
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1		
Safety functions			WDT, TRAP instruction, flash memory CRC calculation, RAM parity error detection, illegal memory access detection function, frequency detection function, RAM guard function, SFR guard function, A/D test		
Other	Power supply voltage [V]		1.6 to 3.6V (V_{DD} = 1.8 to 3.6V: using DC-DC converter)		
	Operating ambient temperature [°C]		T_A = –40 to +85°C		
	Package (size [mm])		48-HWQFN (6×6mm)		

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1D Module (42 pins)

Group			RL78/G1D Module
Pin count			42-pin
Product name			RY7011A0000DZ00
CPU			RL78 CPU core
Memory	Flash ROM [bytes]		256K
	Data flash [bytes]		8K
	RAM [bytes]		20K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz
		External resonator	20MHz
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4Hz (V_{DD} = 1.6 to 3.6V)
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4Hz (V_{DD} = 1.6 to 3.6V)
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 3.6V)
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 3.6V)
	Crystal resonator for RF [Hz]		32MHz
	Low-speed on-chip oscillator for RF [Hz]		32.768kHz (with calibration)
I/O	I/O ports		24
		N-channel open drain (6V tolerance)	2
		N-channel open drain (V_{DD} tolerance)	9
Timers	16-bit timer TAU [channels]		8, PWM output × 7
	Real-time clock (RTC) [channels]		1
	Watchdog timer (WDT) [channels]		1
	12-bit Interval timer [channels]		12-bit × 1
Serial interfaces	CSI, UART, simplified I^2C		1
	CSI, simplified I^2C		1
	UART		1
	I^2C		1
DMA [channels]			4
External interrupt pins [count]			3
OCD	On-chip debugging		Yes
Peripheral functions	8/10-bit A/D converter [channels]		8
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)
	2.4 GHz RF transceiver		Bluetooth v4.2 specification (low energy) supported 2.4GHz ISM band, GFSK modulation, TDMA/TDD frequency hopping (on-chip AES encryption circuit), adapter function (during slave operation only), transmission output: 0dBm, reception sensitivity: –90dBm
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 1
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function
Other	Power supply voltage [V]		V_{DD} = 1.6 to 3.6V (V_{DD} = 1.8 to 3.6V: using DC-DC converter)
	Receive/transmit peak current		Receive: 3.5mA, transmit: 4.3mA (voltage: 3.0V)
	Operating ambient temperature [°C]		T_A = –25 to +75°C
	Radio law compliance		Japan (MIC), Europe (CE), U.S.A. (FCC), Canada (IC)
	Product order number		RY7011A0000DZ00#001: 2500 pcs (1 reel), RY7011A0000DZ00#002: 100 pcs (1 reel)
	Package (size [mm])		42-LGA (8.95×13.35mm)
Default software	Supplied software		Software for checking operation of modem configuration for control by host microcontroller via UART
	Supplied profiles		Proximity profile, find me profile, heart rate profile, time profile, alert notification profile, running speed and cadence profile, health thermometer profile, blood pressure profile, glucose profile, phone alert status profile, general-purpose bidirectional communication, firmware update

*: A dedicated library is required to use the data flash.

RL78/G1F (24 to 64 pins)

Group			RL78/G1F									
Pin count			24-pin		32-pin		36-pin		48-pin		64-pin	
Product name			R5F11B7CANA*2	R5F11B7EANA*2	①R5F11BBCAFP*2 ②R5F11BBCANA*2	①R5F11BBEAFP*2 ②R5F11BBEANA*2	R5F11BCCALA*2	R5F11BCEALA*2	R5F11BGCAFB*2	R5F11BGEAFB*2	R5F11BLCAFB*2	R5F11BLEAFB*2
CPU			RL78 CPU core									
Memory	Flash ROM [bytes]		32K	64K	32K	64K	32K	64K	32K	64K	32K	64K
	Data flash [bytes]		4K									
	RAM [bytes]		5.5K									
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz									
		External resonator	20MHz									
		Clock for timer RD/RX	64MHz (V_{DD} = 2.7 to 5.5V)									
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4Hz (V_{DD} = 1.6 to 5.5V)									
	High-speed on-chip oscillator [Hz]		1 to 64MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4Hz (V_{DD} = 1.6 to 5.5V) *Timer RD, RX only, operation at 48 or 64MHz supported									
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)									
	Subclock (32.768 kHz)		—				32.768kHz (V_{DD} = 1.6 to 5.5V)					
I/O	I/O ports		20		28		31		44		58	
		N-channel open drain (6V tolerance)	—		—		2		4		4	
		N-channel open drain (V_{DD} tolerance)	10		12		10		12		16	
Timers	16-bit timer TAU [channels]		4, PWM output × 3									
	16-bit timer RJ [channels]		1									
	16-bit timer RD [channels]		2, PWM output × 6									
	16-bit timer RG [channels]		1, PWM output × 1									
	16-bit timer RX [channels]		1									
	Real-time clock (RTC) [channels]		1*1									
	Watchdog timer (WDT) [channels]		1									
	Interval timer [channels]		12-bit × 1									
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		2 (including 1 UART with IrDA support)						1		—	
	CSI×2, UART×1, simplified I^2C×2		—						1 (including 1 UART with IrDA support)		2 (including 1 UART with IrDA support)	
	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		1						—		—	
	CSI×2, UART (LIN bus support)×1, simplified I^2C×2		—						1			
	I^2C×1		1									
DTC (sources)			30		32		31		32		33	
ELC (inputs/trigger outputs)			21						22			
External interrupt pins [count]			9		11		10		16		20	
OCD	On-chip debugging		Yes									
Peripheral functions	8/10-bit A/D converter [channels]		8		13		15		17		17	
	8-bit D/A converter [channels]		1		2							
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit ÷ 32-bit = 32-bit (signed/unsigned)									
	Comparator		2 (with reference voltage generator function)									
	Programmable-gain amplifier		1									
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output (48-pin: 1 channel, 64-pin: 2 channels)									
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function									
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V				V_{DD} = 1.6 to 5.5V (EV_{DD} support)		V_{DD} = 1.6 to 5.5V		V_{DD} = 1.6 to 5.5V (EV_{DD} support)	
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*2									
	Package (size [mm])		24-HWQFN (4×4mm)		32-LQFP (7×7mm) 32-HWQFN (5×5mm)		36-WFLGA (4×4mm)		48-LFQFP (7×7mm)		64-LFQFP (10×10mm)	

* A dedicated library is required to use the data flash.
The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)
*1: Products with pin counts from 24 or 32 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.
*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1G (30 to 44 pins)

Group			RL78/G1G					
Pin count			30-pin		32-pin		44-pin	
Product name			R5F11EA8ASP	R5F11EAAASP	R5F11EB8AFP	R5F11EBAAFP	R5F11EF8AFP	R5F11EFAAFP
CPU			RL78 CPU core					
Memory	Flash ROM [bytes]		8K	16K	8K	16K	8K	16K
	Data flash [bytes]		—					
	RAM [bytes]		1.5K					
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz					
		External resonator	20MHz					
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V)					
	High-speed on-chip oscillator [Hz]		1 to 48MHz (V_{DD} = 2.7 to 5.5V) *Timer RD only, operation at 48MHz supported					
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 2.7 to 5.5V)					
	Subclock (32.768 kHz)		—					
I/O	I/O ports		26		28		40	
		N-channel open drain (6V tolerance)	—					
		N-channel open drain (V_{DD} tolerance)	7					
Timers	16-bit timer TAU [channels]		4, PWM output × 3					
	16-bit timer RJ [channels]		1					
	16-bit timer RD [channels]		2, PWM output × 6					
	Real-time clock (RTC) [channels]		—					
	Watchdog timer (WDT) [channels]		1					
	Interval timer [channels]		12-bit × 1					
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		1					
	UART×1		1					
ELC (inputs/trigger outputs)			18/6				19/6	
External interrupt pins [count]			6				10	
OCD	On-chip debugging		Yes					
Peripheral functions	8/10-bit A/D converter [channels]		8				12	
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)					
	Comparator [channels]		2 (with reference voltage generator function)					
	Programmable-gain amplifier		1					
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output					
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function					
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5V					
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications)					
	Package (size [mm])		30-LSSOP (7.62mm)		32-LQFP (7×7mm)		44-LQFP (10×10mm)	

RL78/G1H (64 pins)

Group		RL78/G1H		
Pin count		64-pin		
Product name		R5F11FLJANA *1	R5F11FLKANA *1	R5F11FLLANA *1
CPU		RL78 CPU core		
Memory	Flash ROM [bytes]	256KB	384KB	512KB
	Data flash [bytes]	8KB		
	RAM [bytes]	24KB	32KB	48KB
Main system clock	High-speed system clock	X1 (crystal/ceramic) oscillator, external main system clock input (EXCLK), HS (high-speed main) mode: 1 to 20MHz (V_{DD} = 2.7 to 3.6V), HS (high-speed main) mode: 1 to 16MHz (V_{DD} = 2.4 to 3.6V), LS (low-speed main) mode: 1 to 8MHz (V_{DD} = 1.8 to 3.6V)		
	High-speed on-chip oscillator clock	HS (high-speed main) mode: 1 to 32MHz (V_{DD} = 2.7 to 3.6V), HS (high-speed main) mode: 1 to 16MHz (V_{DD} = 2.4 to 3.6V), LS (low-speed main) mode: 1 to 8MHz (V_{DD} = 1.8 to 3.6V)		
Subclock (32.768 kHz)		XT1 (crystal) oscillator, external subsystem clock input (EXCLKS) 32.768kHz (TYP.)		
Low-speed on-chip oscillator [Hz]		15kHz (TYP.)		
RF reference clock		48MHz (TYP.)		
General-purpose register		8 bits × 32 registers (8 bits × 8 registers × 4 banks)		
Minimum instruction execution time		0.03125µs (High-speed on-chip oscillator clock: f_{IH} = 32MHz operation)		
		0.05µs (High-speed system clock: f_{MX} = 20MHz operation)		
		30.5µs (Subsystem clock: f_{SUB} = 32.768kHz operation)		
Instruction set		Data transfer (8/16bits), Adder and subtractor/logical operation (8/16bits), Multiplication (8bits × 8bits, 16bits × 16bits), Division (16bits ÷ 16bits, 32bits ÷ 32bits), Multiplication and Accumulation (16bits × 16bits + 32bits), Rotate, barrel shift, and bit manipulation (set, reset, test, and boolean operation), etc.		
I/O ports	Total	41		
	CMOS I/O	26		
	CMOS input	5		
	CMOS output	1		
	N-ch open-drain I/O (6V tolerance)	4		
	GPIO (RF unit)	5		
SubGHz RF transceiver	Operating frequency band	863MHz to 928MHz		
	Modulation scheme / Data rate (kbps)	2FSK/GFSK: 10/20/40/50/100/150/200/300 4FSK/GFSK: 200/400		
	Quiescent current (RF portion)	Vcc=3.3V, typ. RX: 6.3mA, RX wait: 5.8mA / TX: 20mA (+10dBm)		
	Receiving sensitivity	–114dBm (GFSK 10Kbps, BER<0.1%) –104dBm (GFSK 100Kbps, BER < 0.1%)		
	Support IEEE802.15.4e/g	Dual Sub-GHz Communication filtering, Transmission frame auto-generation function, *Preamble length: 4 – 1000 Bytes can be set, Auto ACK Reply / Reception function support		
Timers	16-bit timer [channels]	9		
	Watchdog timer (WDT) [channels]	1		
	Real-time clock (RTC) [channels]	1		
	12-bit interval timer	1		
	Timer output	1		
Serial interfaces		CSI/UART: 2 channels, CSI: 2 channels (1 channel of 2 channels is used for the internal communication between MCU and RF transceiver.)		
	I²C Bus	2		
DTC (sources)		21		
Vectored interrupt sources	Internal	26		
	External	7		
OCD	On-chip debugging	Yes		
Peripheral functions	10-bit resolution A/D converter	6		
	Multiplier/divider/multiply-accumulator	Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned), Divide: 32-bit ÷ 32-bit = 32-bit (unsigned), Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)		
	Reset	Reset by RESET# pin, Internal reset by watchdog timer, Internal reset by power-on-reset, Internal reset by voltage detector, Internal reset by illegal instruction execution, Internal reset by RAM parity error, Internal reset by illegal-memory access		
	Power-on-reset circuit	Power-on-reset: 1.51 (TYP.), Power-down-reset: 1.50 (TYP.)		
	Voltage detector	Rising edge: 1.88V to 3.13V (10 stages), Falling edge: 1.84V to 3.06V (10 stages)		
	Clock output/buzzer output	2		
		2.44kHz, 4.88kHz, 9.76kHz, 1.25MHz, 2.5MHz, 5MHz, 10MHz (Main system clock: f_{MAIN} = 20MHz operation), 256Hz, 512Hz, 1.024kHz, 2.048kHz, 4.096kHz, 8.192kHz, 16.384kHz, 32.768kHz (Subsystem clock: f_{SUB} = 32.768kHz operation)		
Other	Power supply voltage [V]	V_{DD} = 1.8 to 3.6V		
	Operating ambient temperature [°C]	T_A = –40 to +85°C (A: Consumer applications, D: Industrial applications)		
	Package (size [mm])	64-HVQFN (9×9mm)		

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Industrial grade products are also available. (part number: R5F1xxxDxx, ambient operating temperature range: –40 to +85°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/G1M (20 pins)

Group			RL78/G1M	
Pin count			20-pin	
Product name			R5F11W67ASM R5F11W67DSM	R5F11W68ASM R5F11W68DSM
CPU			RL78 CPU core	
Memory	Flash ROM [bytes]		4K	8K
	RAM [bytes]		0.5K	1K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	20MHz	
Clock generator circuit	High-speed on-chip oscillator [Hz]		1.25 to 20MHz (V_{DD} = 2.7 to 5.5V) 1.25 to 5MHz (V_{DD} = 2.0 to 5.5V*1)	
	Low-speed on-chip oscillator [Hz]		15kHz (TYP.)	
I/O	I/O ports		18	
		N-channel open drain (V_{DD} tolerance)	14	
Timers	16-bit timer TAU [channels]		4	
	Watchdog timer (WDT) [channels]		1	
	Interval timer [channels]		12-bit × 1	
Serial interfaces			CSI: 1 channel, UART: 1 channel	
Interrupt sources	Internal		12	
	External		7	
OCD	On-chip debugging		Yes	
Peripheral functions	8/10-bit A/D converter [channels]		8	
	Other functions		Power-on reset (POR), Clock/buzzer output × 1, Real time output × 8	
Safety function			Trap function	
Other	Power supply voltage [V]		V_{DD} = 2.0 to 5.5V*1	
	Operating ambient temperature [°C]		T_A = –40 to +85°C	
	Package (size [mm])		20-TSSOP (4×4mm)	

*1: Use this product within the voltage range from 2.25 to 5.5V because the detection voltage (VSPOR) of the selectable power-on-reset (SPOR) circuit should also be considered.

RL78/G1N (20 pins)

Group			RL78/G1N	
Pin count			20-pin	
Product name			R5F11Y67ASM R5F11Y67DSM	R5F11Y68ASM R5F11Y68DSM
CPU			RL78 CPU core	
Memory	Flash ROM [bytes]		4K	8K
	RAM [bytes]		0.5K	1K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	20MHz	
Clock generator circuit	High-speed on-chip oscillator [Hz]		1.25 to 20MHz (V_{DD} = 2.7 to 5.5V) 1.25 to 5MHz (V_{DD} = 2.0 to 5.5V*1)	
	Low-speed on-chip oscillator [Hz]		15kHz (TYP.)	
I/O	I/O ports		18	
		N-channel open drain (V_{DD} tolerance)	14	
		P-ch open-drain output (high current pin)	6	
Timers	16-bit timer TAU [channels]		4	
	Watchdog timer (WDT) [channels]		1	
	Interval timer [channels]		12-bit × 1	
Serial interfaces			CSI: 1 channel, UART: 1 channel	
Interrupt sources	Internal		12	
	External		7	
OCD	On-chip debugging		Yes	
Peripheral functions	8/10-bit A/D converter [channels]		8	
	Other functions		Power-on reset (POR), Clock/buzzer output × 1	
Safety function			Trap function	
Other	Power supply voltage [V]		V_{DD} = 2.0 to 5.5V*1	
	Operating ambient temperature [°C]		T_A = –40 to +85°C	
	Package (size [mm])		20-TSSOP (4×4mm)	

*1: Use this product within the voltage range from 2.25 to 5.5V because the detection voltage (VSPOR) of the selectable power-on-reset (SPOR) circuit should also be considered.

RL78/G1P (24 to 32 pins)

Group			RL78/G1P	
Pin count			24-pin	32-pin
Product name			R5F11Z7AANA R5F11Z7ADNA	R5F11ZBAAFP R5F11ZBADFP
CPU			RL78 CPU core	
Memory	Flash ROM [bytes]		16K	
	Data flash [bytes]		2K	
	RAM [bytes]		1.5K	
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz	
		External resonator	20MHz	
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 3.6V)	
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 3.6V)	
	Low-speed on-chip oscillator [Hz]		15kHz (TYP.) (V_{DD} = 2.7 to 3.6V)	
I/O	I/O ports		20	28
	N-channel open drain (6V tolerance)		2	2
Timers	16-bit timer TAU [channels]		4	
	Watchdog timer (WDT) [channels]		1	
Serial interfaces			CSI: 1 channel, UART: 1 channel 1 channel (2 slave addresses)	
DMA [channels]			2	
Interrupt sources	Internal		12	
	External		6	
OCD	On-chip debugging		Yes	
Peripheral functions	8/10-bit A/D converter [channels]		6	8
	10-bit D/A CONVERTER [ch]		2	
	EVENT LINK CONTROLLER (ELC)		Event input: 10, Event trigger output: 3	
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output × 2	
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory accessdetection function, frequency detection function, A/D converter test function, Trap function	
Other	Power supply voltage [V]		V_{DD} = 2.7 to 3.6V	
	Operating ambient temperature [°C]		T_A = –40 to +85°C	
	Package (size [mm])		24-HWQFN (4×4mm)	32-LQFP (7×7mm)

RL78/L12 (32 to 64 pins)

Group			RL78/L12												
Pin count			32-pin			44-pin			48-pin			52-pin			64-pin	
Product name			R5F10RB8AFP*4	R5F10RBAAFP*4	R5F10RBCAFP*4	R5F10RF8AFP*4	R5F10RFAAFP*4	R5F10RFCAFP*4	R5F10RG8AFB*4	R5F10RGAAFB*4	R5F10RGCAFB*4	R5F10RJ8AFA*4	R5F10RJAAFA*4	R5F10RJCAFA*4	①R5F10RLAAFB*4 ②R5F10RLAAFA*4 ③R5F10RLAANB*4	①R5F10RLCAFB*4 ②R5F10RLCAFA*4 ③R5F10RLCANB*4
CPU			RL78 CPU core													
Memory	Flash ROM [bytes]		8K	16K	32K	8K	16K	32K	8K	16K	32K	8K	16K	32K	16K	32K
	Data flash [bytes]		2K													
	RAM [bytes]*1		1K	1K	1.5K	1K	1K	1.5K	1K	1K	1.5K	1K	1K	1.5K	1K	1.5K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz													
		External resonator	20MHz													
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)													
	High-speed on-chip oscillator [Hz]		1 to 24MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)													
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)													
	Subclock (32.768 kHz)		—			32.768kHz (V_{DD} = 1.6 to 5.5V)										
I/O	Total I/O ports and LCD pins (SEG and COM)		28			40			44			48			58	
	I/O ports		20			29			33			37			47	
		N-channel open drain (EV_{DD} tolerance)	2													
LCD controller/Driver			Selectable among internal voltage boost, capacitor split, and external resistance division													
	Segment signal outputs		13			22 (18)*2			26 (22)*2			30 (26)*2			39 (35)*2	
	Common signal outputs		4			4 (8)*2										
Timers	16-bit timer TAU [channels]		4, PWM output × 3			5, PWM output × 4			6, PWM output × 5			8, PWM output × 7				
	Real-time clock (RTC) [channels]		1*3													
	Watchdog timer (WDT) [channels]		1													
	Interval timer [channels]		1													
Serial interfaces	CSI×2/UART (LIN bus support)×1		1													
	I^2C×1		1													
DMA [channels]			2													
External interrupts [channels]			4			6			7						9	
OCD	On-chip debugging		Yes													
Peripheral functions	8/10-bit A/D converter [channels]		4			7			9			10				
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)													
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output, Remote control carrier wave output × 1													
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function													
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V													
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*4													
	Package (size [mm])		32-LQFP (7×7mm)			44-LQFP (10×10mm)			48-LFQFP (7×7mm)			52-LQFP (10×10mm)			①64-LFQFP (10×10mm) ②64-LQFP (12×12mm) ③64-HWQFN (8×8mm)	①64-LFQFP (10×10mm) ②64-LQFP (12×12mm) ③64-HWQFN (8×8mm)

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: 630 bytes when using self-programming function and data flash function.

*2: Figure in parentheses ( ) is number of signal lines when using 8 COM.

*3: Products with a pin count of 32 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.

*4: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

MEMO

RL78/L13 (64 to 80 pins)

Group			RL78/L13				
Pin count			64-pin				
Product name			①R5F10WLAAFB *2 ②R5F10WLAAFA	①R5F10WLCAFB *2 ②R5F10WLCAFA	①R5F10WLDAFB *2 ②R5F10WLDAFA	①R5F10WLEAFB *2 ②R5F10WLEAFA	①R5F10WLFAFB *2 ②R5F10WLFAFA
CPU			RL78 CPU core				
Memory	Flash ROM [bytes]		16K	32K	48K	64K	96K
	Data flash [bytes]		4K				
	RAM [bytes]		1K	1.5K	2K	4K	6K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz				
		External resonator	20MHz				
		Timer KB20 clock	48MHz (V_{DD} = 2.7 to 5.5V)				
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)				
	High-speed on-chip oscillator [Hz]		1 to 24MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)				
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 5.5V)				
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 5.5V)				
I/O	Total I/O ports and LCD pins (SEG and COM)		57				
		I/O ports	49				
		N-channel open drain (6V tolerance)	2				
LCD controller	LCD drive voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division				
	Segment signal outputs		36 (32)*1				
	Common signal outputs		4 (8)*1				
Timers	16-bit timer TAU [channels]		8 , PWM output × 7				
	16-bit timer KB20 [channels]		1, PWM output × 2				
	Real-time clock2 (RTC2) [channels]		1 (0.96 ppm minimum resolution)				
	Watchdog timer (WDT) [channels]		1				
	Interval timer [channels]		12-bit × 1				
Serial interfaces	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		1				
	CSI×1, UART×1, simplified I2C×1		1				
	UART×1		1				
	I^2C×1		1				
DMA [channels]			4				
External interrupts [channels]			9				
OCD	On-chip debugging		Yes				
Peripheral functions	8/10-bit A/D converter [channels]		9				
	Comparator [channels]		2				
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)				
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2, remote control carrier wave output × 1				
Safety functions			Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function				
Other	Power supply voltage [V]		V_{DD} = 1.6 to 5.5V				
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*2				
	Package (size [mm])		①64-LFQFP (10×10mm) ②64-LQFP (12×12mm)				

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Figure in parentheses ( ) is number of signal lines when using 8 COM.

*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/L13						
64-pin	80-pin					
①R5F10WLGAFB *2 ②R5F10WLGAFA	①R5F10WMAAFB *2 ②R5F10WMAAFA	①R5F10WMCAFB *2 ②R5F10WMCAFA	①R5F10WMDAFB *2 ②R5F10WMDAFA	①R5F10WMEAFB *2 ②R5F10WMEAFA	①R5F10WMFAFB *2 ②R5F10WMFAFA	①R5F10WMGAFB *2 ②R5F10WMGAFA
RL78 CPU core						
128K	16K	32K	48K	64K	96K	128K
4K						
8K	1K	1.5K	2K	4K	6K	8K
24MHz						
20MHz						
48MHz (V_{DD} = 2.7 to 5.5V)						
1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)						
1 to 24MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 5.5V), 1 to 8MHz (V_{DD} = 1.8 to 5.5V), 1 to 4MHz (V_{DD} = 1.6 to 5.5V)						
15kHz (V_{DD} = 1.6 to 5.5V)						
32.768kHz (V_{DD} = 1.6 to 5.5V)						
57	73					
49	65					
2						
Selectable among internal voltage boost, capacitor split, and external resistance division						
36 (32)*1	51 (47)*1					
4 (8)*1						
8 , PWM output × 7						
1, PWM output × 2						
1 (0.96 ppm minimum resolution)						
1						
12-bit × 1						
1						
1						
1	2					
1						
4						
9						
Yes						
9	12					
2						
Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)						
Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2, remote control carrier wave output × 1						
Flash memory CRC calculation function (high-speed), CRCcalculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function						
V_{DD} = 1.6 to 5.5V						
T_A = –40 to +85°C (A: Consumer applications) T_A = –40 to +105°C (G: Industrial applications)*2						
①64-LFQFP (10×10mm) ②64-LQFP (12×12mm)	①80-LFQFP (12×12mm) ②80-LQFP (14×14mm)					

RL78/L1A (80 to 100 pins)

Group			RL78/L1A					
Pin count			80-pin			100-pin		
Product name			R5F11MMDAFB	R5F11MMEAFB	R5F11MMFAFB	R5F11MPEAFB	R5F11MPFAFB	R5F11MPGAFB
CPU			RL78 CPU core					
Memory	Flash ROM [bytes]		48K	64K	96K	64K	96K	128K
	Data flash [bytes]		8K					
	RAM [bytes]		5.5K					
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz					
		External resonator	20MHz					
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz: V_{DD} = 2.7 to 3.6V, 1 to 8MHz: V_{DD} = 1.8 to 2.7V					
	High-speed on-chip oscillator [Hz]		1 to 24MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V)					
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.8V to 3.6V)					
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.8 to 3.6V)					
I/O	Total I/O ports and LCD pins		59			79		
LCD controller	LCD drive voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division					
	Segment signal outputs		32 (28)*1			45 (41)*1		
	Common signal outputs		4 (8)*1					
Timers	16-bit timer TAU [channels]		8 (Timer output × 8, PWM output × 7)					
	8/16-bit interval timer [channels]		2 (8-bit)/1 (16-bit)					
	Real-time clock2 (RTC2) [channels]		1					
	Watchdog timer (WDT) [channels]		1					
	12-bit interval timer [channels]		1					
Serial interfaces	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		1					
	CSI×1, UART×1, simplified I^2C×1		3					
	I^2C×1		1					
DTC (sources)			30					
ELC (inputs/trigger outputs)			Event inputs: 22, event outputs: 8					
External interrupts [channels]			8					
OCD	On-chip debugging		Yes					
Peripheral functions	8/12-bit A/D converter[ch]		10			14		
	12-bit D/A converter [channels]		3					
	Op-amp [channels]		3 (of which, 2 channels have 2 I/O switches)			3 (of which, 2 channels have 4 I/O switches)		
	Reference voltage		2.5/2.048/1.8/1.5V					
	Comparator [channels]		1					
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)					
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2					
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function					
Other	Power supply voltage [V]		V_{DD} = 1.8 to 3.6V					
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications)					
	Package (size [mm])		80-LQFP (12×12mm)			100-LQFP (14×14mm)		

*1: Figure in parentheses ( ) is number of signal lines when using 8 COM.

MEMO

RL78/L1C (80 to 100 pins)

Group			RL78/L1C (USB)													
Pin count			80-pin					85-pin					100-pin				
Product name			R5F110MEAFB*2	R5F110MFAFB*2	R5F110MGAFB*2	R5F110MHAFB*2	R5F110MJAFB*2	R5F110NEALA*2	R5F110NFALA*2	R5F110NGALA*2	R5F110NHALA*2	R5F110NJALA*2	R5F110PEAFB*2	R5F110PFAFB*2	R5F110PGAFB*2	R5F110PHAFB*2	R5F110PJAFB*2
CPU			RL78 CPU core														
Memory	Flash ROM [bytes]		64K	96K	128K	192K	256K	64K	96K	128K	192K	256K	64K	96K	128K	192K	256K
	Data flash [bytes]		8K														
	RAM [bytes]		8K	10K	12K	16K	16K	8K	10K	12K	16K	16K	8K	10K	12K	16K	16K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz														
		External resonator	20MHz														
		Timer KB2 clock, USB clock	48MHz (V_{DD} = 2.7 to 3.6V)														
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)														
	High-speed on-chip oscillator [Hz]		1 to 48MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)														
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 3.6V)														
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 3.6V)														
I/O	Total I/O ports and LCD pins (SEG and COM)*3		71										89				
	I/O ports		59										77				
		N-channel open drain (6V tolerance)	2														
LCD controller	LCD drive voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division														
	Segment signal outputs		44 (40)*1										56 (52)*1				
	Common signal outputs		4 (8)*1														
Timers	16-bit timer TAU [channels]		8 (PWM output × 7)														
	16-bit timer KB20 [channels]		3 (PWM output × 6)														
	Real-time clock2 (RTC2) [channels]		1 (0.96 ppm accuracy correction)														
	Watchdog timer (WDT) [channels]		1														
	Interval timer [channels]		12-bit × 1														
Serial interfaces	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		1														
	CSI×1, UART×1, simplified I^2C×1		3														
	I^2C×1		1														
USB	Function [channels]		1														
DTC (sources)			32										33				
ELC (inputs/trigger outputs)			30										31				
External interrupts [channels]			9														
OCD	On-chip debugging		Yes														
Peripheral functions	8/12-bit A/D converter [channels]		9										13				
	8-bit D/A converter [channels]		2														
	Comparator [channels]		1										2				
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)														
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2, remote control carrier wave output × 1														
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function														
Other	Power supply voltage [V]		V_{DD} = 1.6 to 3.6V														
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*2														
	Package (size [mm])		80-LFQFP (12×12mm)					85-VFLGA (7×7mm)					100-LFQFP (14×14mm)				

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Figure in parentheses ( ) is number of signal lines when using 8 COM.

*2: Industrial grade products are also available. (part number: R5F1xxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

*3: LCD uses SEG pins and COM pins. USB uses UVBUS, UREGC, UDP, and UDM pins.

RL78/L1C (80 to 100 pins)

Group			RL78/L1C (no USB)														
Pin count			80-pin					85-pin					100-pin				
Product name			R5F111MEAFB*2	R5F111MFAFB*2	R5F111MGAFB*2	R5F111MHAFB*2	R5F111MJAFB*2	R5F111NEALA*2	R5F111NFALA*2	R5F111NGALA*2	R5F111NHALA*2	R5F111NJALA*2	R5F111PEAFB*2	R5F111PFAFB*2	R5F111PGAFB*2	R5F111PHAFB*2	R5F111PJAFB*2
CPU			RL78 CPU core														
Memory	Flash ROM [bytes]		64K	96K	128K	192K	256K	64K	96K	128K	192K	256K	64K	96K	128K	192K	256K
	Data flash [bytes]		8K														
	RAM [bytes]		8K	10K	12K	16K	16K	8K	10K	12K	16K	16K	8K	10K	12K	16K	16K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz														
		External resonator	20MHz														
		Timer KB2 clock, USB clock	48MHz (V_{DD} = 2.7 to 3.6V)														
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)														
	High-speed on-chip oscillator [Hz]		1 to 48MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V)														
	Low-speed on-chip oscillator [Hz]		15kHz (TYP.): V_{DD} = 1.6 to 3.6V														
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.6 to 3.6V)														
I/O	Total I/O ports and LCD pins (SEG and COM)*3		71										89				
		I/O ports	63										81				
		N-channel open drain (6V tolerance)	2														
LCD controller	LCD drive voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division														
	Segment signal outputs		44 (40)*1										56 (52)*1				
	Common signal outputs		4 (8)*1														
Timers	16-bit timer TAU [channels]		8 (PWM output × 7)														
	16-bit timer KB20 [channels]		3 (PWM output × 6)														
	Real-time clock2 (RTC2) [channels]		1 (0.96 ppm accuracy correction)														
	Watchdog timer (WDT) [channels]		1														
	Interval timer [channels]		12-bit × 1														
Serial interfaces	CSI×1, UART (LIN bus support)×1, simplified I^2C×1		1														
	CSI×1, UART×1, simplified I^2C×1		3														
	I^2C×1		1														
DTC (sources)			30										31				
ELC (inputs/trigger outputs)			30										31				
External interrupts [channels]			9														
OCD	On-chip debugging		Yes														
Peripheral functions	8/12-bit A/D converter [channels]		11										13				
	8-bit D/A converter [channels]		2														
	Comparator [channels]		1										2				
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)														
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2, remote control carrier wave output × 1														
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function														
Other	Power supply voltage [V]		V_{DD} = 1.6 to 3.6V														
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications), T_A = –40 to +105°C (G: Industrial applications)*2														
	Package (size [mm])		80-LFQFP (12×12mm)					85-VFLGA (7×7mm)					100-LFQFP (14×14mm)				

The above part numbers are consumer grade products. (ambient operating temperature range : –40 to +85°C)

*1: Figure in parentheses ( ) is number of signal lines when using 8 COM.

*2: Industrial grade products are also available. (part number: R5F1xxxxGxx, ambient operating temperature range: –40 to +105°C)

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/H1D (48 to 80 pins)

Group			RL78/H1D									
Pin count			48-pin		64-pin				80-pin			
Product name			R5F11NGGAFB	R5F11NGFAFB	R5F11PLGABG	R5F11PLFABG	R5F11NLGAFB	R5F11NLFAFB	R5F11NMGAFB	R5F11NMFAFB	R5F11NMEAFB	R5F11RMGDFB
CPU			RL78 CPU core									
Memory	Flash ROM [bytes]		128KB	96KB	128KB	96KB	128KB	96KB	128KB	96KB	64KB	128KB
	Data flash [bytes]		4KB									
	RAM [bytes]		5.5KB									8KB
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz									
		External resonator	20MHz									
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz: V_{DD} = 2.7 to 5.5V, 1 to 16MHz: V_{DD} = 2.4 to 2.7V									
	High-speed on-chip oscillator [Hz]		1 to 24MHz (V_{DD} = 2.7 to 5.5V), 1 to 16MHz (V_{DD} = 2.4 to 2.7V)									
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 2.4V to 5.5V)									
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 2.4 to 5.5V)									
I/O	Total I/O ports and LCD pins		29				36		53			63
LCD controller	LCD drive voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division									
	Segment signal outputs		—				27 (23)*1		36 (32)*1			
	Common signal outputs		—				4 (8) *1					
Timers	16-bit timer TAU [channels]		8 (Timer output: 8, PWM output: 7)									
	8/16-bit interval timer [channels]		2 (8-bit)/1 (16-bit)									6 (8-bit)/3 (16-bit)
	Real-time clock2 (RTC2) [channels]		1									
	Watchdog timer (WDT) [channels]		1									
	12-bit interval timer [channels]		1									
	16-bit timer RJ [channels]		—									2, Timer output: 2
	External signal sampler [channels]		—									1
	Sampling output timer detector (SMOTD) [channels]		—									Input: 6, Output: 3
Serial interfaces	CSI×1, UART (LIN bus support)×1, simplified I^2C×1											
	CSI×1, UART×1, simplified I^2C×1		2									
	I^2C×1		1									
	Serial interface UARTMG		—									1
DTC (sources)			24				25		26			35
ELC (inputs/trigger outputs)			Event input: 19 Event trigger output: 10				Event input: 18 Event trigger output: 10		Event input: 20 Event trigger output: 7			Event input: 26 Event trigger output: 5
External interrupts [channels]			7				6		8			
OCD	On-chip debugging		Yes									
Peripheral functions	24-bit ΔΣ A/D converter with programmable gain instrumentation amplifier 0 (PGA0)		Analog input: 2 channels (differential or single-ended), 3 channels (single-ended)				Analog input: 1 channel (differential or single-ended), 3 channels (single-ended)		Analog input: 1 channel (differential or single-ended)			—
	8/10-bit resolution A/D converter	External [channels]	3									
		Internal [channels]	2 [internal reference voltage (1.45V), temperature sensor output voltage (only selectable in HS (high-speed main) mode)]									
	D/A converter	12-bit [channels]	1 (with an output amplifier but no external output pin)						—			
		8-bit [channels]	1 (without an output amplifier and no external output pin)									—
	Programmable gain instrumentation amplifier 1 (PGA1) [channels]		1						—			
	Rail-to-rail op-amp [channels] (AMP0)		1									—
	General-purpose op-amp [channels] (AMP1, AMP2)		2						—			
	Multiplier/divider/multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set), Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned), Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)									
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1Hz) × 1									
			Clock/buzzer output × 2				Clock/buzzer output × 1		Clock/buzzer output × 2			
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function									
Other	Power supply voltage [V]		V_{DD} = 2.4 to 5.5V (10-bit SAR ADC: 2.4 to 5.5V, operating voltage of the analog front-end (AFE): 2.7 to 5.5V)									V_{DD} = 1.8 to 5.5V
	Operating ambient temperature [°C]		T_A = –40 to +85°C (A: Consumer applications)									T_A = –40 to +85°C (D: Industrial applications)
	Package (size [mm])		48-LQFP (7×7mm)		64-TFBGA (4×4mm)		64-LQFP (10×10mm)		80-LQFP (12×12mm)			

*1: The number in parentheses indicates the number of signal outputs when 8 coms are used.

RL78/I1A (20 to 38 pins)

Group			RL78/I1A			
Pin count			20-pin	30-pin		38-pin
Product name			①R5F1076CGSP ②R5F1076CMSP	①R5F107ACGSP ②R5F107ACMSP	①R5F107AEGSP ②R5F107AEMSP	①R5F107DEGSP ②R5F107DEMSP
CPU			RL78 CPU core			
Memory	Flash ROM [bytes]		32K		64K	
	Data flash [bytes]		4K			
	RAM [bytes]		2K		4K	
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz (T_A = –40 to +105°C), 16MHz (T_A = 105 to 125°C)			
		External resonator	20MHz			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V)			
	High-speed on-chip oscillator [Hz]		1 to 32MHz (V_{DD} = 2.7 to 5.5V), 1 to 8MHz (V_{DD} = 2.7 to 5.5V)			
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 2.7 to 5.5V)			
	Subclock (32.768 kHz)		—			32.768kHz (V_{DD} = 2.7 to 5.5V)
I/O	I/O ports		16	26		34
		N-channel open drain (6V tolerance)	—			
		N-channel open drain (V_{DD} tolerance)	6	10		11
Timers	16-bit timer TAU [channels]		8	8, PWM output × 1		8, PWM output × 3
	16-bit timer KB [channels]		2, PWM output × 4	3, PWM output × 6		3, PWM output × 6
	16-bit timer KC [channels]		1, PWM output × 3	1, PWM output × 6		1, PWM output × 6
	Real-time clock (RTC) [channels]		1*1			
	Watchdog timer (WDT) [channels]		1			
	Interval timer [channels]		12-bit × 1			
Serial interfaces	UART×1		—	1		
	CSI×1, UART (LIN bus and DMX512 support)×1		—			1
	UART (LIN bus and DMX512 support)×1*2		1			—
	UART (DALI communication support)×1*2		1			
	I²C×1		1			
DMA [channels]			2			
External interrupts [channels]			7	10		11
OCD	On-chip debugging		Yes			
Peripheral functions	8/10-bit A/D converter [channels]		6	11		
	Comparator [channels]		4	6		
	PGA [channels]		1			
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)			
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD)			
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function			
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5V			
	Operating ambient temperature [°C]		①T_A = –40 to +105°C (G: Industrial applications), ②T_A = –40 to +125°C (M: Industrial applications)			
	Package (size [mm])		20-LSSOP (4.4×6.5mm)	30-LSSOP (7.62mm (300mil))		38-SSOP (7.62mm (300mil))

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries

*1: Products with pin counts from 20 or 30 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.

*2: The same pin is used for both functions on 20-pin products, so only one function may be used at any given time.

RL78/I1B (80 to 100 pins)

Group			RL78/I1B			
Pin count			80-pin		100-pin	
Product name			R5F10MMEDFB	R5F10MMGDFB	R5F10MPEDFB	R5F10MPGDFB
CPU			RL78 CPU core			
Memory	Flash ROM [bytes]		64K	128K	64K	128K
	Data flash [bytes]		—			
	RAM [bytes]		6K	8K	6K	8K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz			
		External resonator	20MHz			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 5.5V), 1 to 8MHz (V_{DD} = 1.9 to 5.5V)			
	High-speed on-chip oscillator [Hz]		24/12/6/3MHz (V_{DD} = 2.7 to 5.5V), 12/6/3MHz (V_{DD} = 2.4 to 5.5V), 6/3MHz (V_{DD} = 1.9 to 5.5V)			
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.9 to 5.5V)			
	Subclock (32.768 kHz)		32.768kHz (V_{DD} = 1.9 to 5.5V)			
I/O	Total I/O ports and LCD pins (SEG and COM)		61		77	
		I/O ports	53		69	
		N-channel open drain (6V tolerance)	3			
Timers	16-bit timer TAU [channels]		8, PWM output × 7			
	Real-time clock (RTC) [channels]		1 (high-precision, 0.96 ppm minimum resolution)			
	Watchdog timer (WDT) [channels]		1			
	Interval timer [channels]		12-bit × 1, 8-bit × 4			
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		1			
	UART×1, simplified I^2C×1		1			
	UART×1, IrDA×1		1			
	I^2C×1		1			
LCD controller	LCD drive voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division			
	Segment signal outputs		34 (30)*1		42 (38)*1	
	Common signal outputs		4 (8)*1			
DTC (sources)			30			
External interrupts [channels]			10			
OCD	On-chip debugging		Yes			
Peripheral functions	8/10-bit A/D converter [channels]		4		6	
	24-bit ΔΣ A/D converter [channels]		3		4	
	Comparator [channels]		2			
	PGA		×1, ×2, ×4, ×8, ×16, (×32)			
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)			
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), battery backup function, RTC output (1 Hz) × 1			
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function			
Other	Power supply voltage [V]		V_{DD} = 1.9 to 5.5V			
	Operating ambient temperature [°C]		T_A = −40 to +85°C (D: Industrial applications)			
	Package (size [mm])		80-LFQFP (12×12mm)		100-LFQFP (14×14mm)	

*1: The number in parentheses indicates the number of signal outputs when 8 coms are used.

RL78/I1C (64 to 100 pins)

Group		RL78/I1C			
Pin count		64-pin	80-pin		100-pin
Product name		R5F10NLE/G	R5F10NME/G	R5F10NMJ	R5F10NPJ/G
Code flash [bytes]		64K to 128K	64K to 128K	256K	128K to 256K
Data flash [bytes]		2K			
RAM [bytes]		6K to 8K	6K to 8K	16K	8K to 16K
System clocks	External	High-speed clock 1 to 20MHz, Low-speed clock 32.768kHz			
	On-chip oscillator clock	High-speed 1.5 to 24MHz, Middle-speed 1 to 4MHz, Low-speed 15kHz			
	PLL clock	—		32MHz	
High-speed on-chip oscillator clock frequency correction function		Yes			
24-bit ΔΣ A/D converter	Input channels	4ch	3ch	3ch	4ch
	SNDR	to 80dB (gain × 1)			
	Sampling frequency	3.906kHz/1.953kHz			
	PGA	×1, ×2, ×4, ×8, ×16, (×32)			
	Internal reference voltage (temperature coefficient)	0.8V (10ppm/°C)			
	Zero-cross detection	HW Zero-cross detection			
8/10-bit A/D converter		4ch			6ch
32-bit multiply-and accumulate circuit		Yes			
LCD controller	Segment/common signal combinations	15/8, 19/4	30/8, 34/4	30/8, 34/4	38/8, 42/4
	Drive voltage generation method	Selectable among internal voltage boost, capacitor split, and external resistance division			
Timers		16-bit timer array unit: 8ch			
		12-bit Interval timer: 1ch			
		8-bit Interval timer: 4ch			
RTC with independent power supply		1ch			
Serial interfaces	CSI0, UART0, simplified I^2C0	1ch			
	CSI1, UART1, simplified I^2C1	1ch			
	UART2, IrDA	1ch			
	CSI3, UART3, simplified I^2C3	—			1ch
	MultiMaster I^2C	1ch			
DTC (sources)		36			38
ELC		22 event generation sources, 5 selectable event output destinations			
Battery backup functions	CPU	VDD/VBAT			
	24-bit ΔΣ A/D converter	VDD/VBAT			
	RTC	VRTC (independent power supply)			
Low-voltage detection circuit (LVD)		Internal VDD, VDD pin, VBAT pin, VRTC pin, external pin			
AES HW		Encryption mode: GCM/ECB/CBC, encryption key length: 128/192/256-bit			
Key interrupts		5pins	8pins		
Other peripheral functions		Watchdog timer, power-on reset (POR), safety function			
Power supply voltage [V]		1.7V to 5.5V			
Operating ambient temperature [°C]		–40°C to 85°C			
Package (size [mm])		64-LFQFP (10×10mm)	80-LFQFP (12×12mm)		100-LFQFP (14×14mm)

RL78/I1C (512KB) (80 to 100 pins)

Group			RL78/I1C (512KB)	
Pin count			80-pin	100-pin
Product name			R5F10NMLDFB	R5F10NPLDFB
CPU			RL78 CPU core	
Memory	Flash ROM [bytes]		512K (256KB × 2 banks)	
	Data flash [bytes]		2K	
	RAM [bytes]		32K*1	
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz	
		External resonator	20MHz	
Clock generator circuit	Crystal/ceramic oscillator [Hz]		High-speed clock 1 to 20MHz, Low-speed clock 32.768kHz	
	On-chip oscillator [Hz]		High-speed 1.5 to 24MHz, Middle-speed 1 to 4MHz, Low-speed 15kHz	
	PLL [Hz]		32MHz	
High-speed on-chip oscillator clock frequency correction function			Yes	
24-bit ΔΣ A/D converter	Input channels [ch]		3	4
	SNDR		to 80dB (gain × 1)	
	Sampling frequency		3.906kHz/1.953kHz	
	PGA		×1, ×2, ×4, ×8, ×16, (×32)	
	Internal reference voltage (temperature coefficient)		0.8V (10ppm/°C)	
	Zero-cross detection		HW Zero-cross detection	
12-bit A/D converter [ch]			4	6
32-bit multiply-and accumulate circuit			Yes	
LCD controller	Segment/common signal combinations		30/8, 34/4	38/8, 42/4
	Drive voltage generation method		Selectable among internal voltage boost, capacitor split, and external resistance division	
Timers			16-bit timer array unit: 8ch	
			12-bit Interval timer: 1ch	
			8-bit Interval timer: 8ch	
RTC with independent power supply [ch]			1	
Serial interfaces	CSI0/UART/simplified I^2C [ch]		2	3
	UART/IrDA [ch]		1	
	UART [ch]		—	1
	I^2C bus [ch]		1	
	UARTMG [ch]		2	
Data transfer controller (DTC) (sources)			46	50
Event link controller (ELC)	Event input		7	
	Event trigger input		30	
Battery backup functions	CPU		V_{DD}/VBAT	
	24-bit ΔΣ A/D converter		V_{DD}/VBAT	
	RTC		VRTC (independent power supply)	
Low-voltage detection circuit (LVD)			Internal V_{DD}, V_{DD} pin, VBAT pin, VRTC pin, external pin	
AES HW			Encryption mode: GCM/ECB/CBC, encryption key length: 128/192/256-bit	
Key interrupts			8pins	
Other peripheral functions			Watchdog timer, power-on reset (POR), safety function	
Power supply voltage [V]			1.6V to 5.5V	
Operating ambient temperature [°C]			–40°C to 85°C	
Package (size [mm])			80-LFQFP (12×12mm)	100-LFQFP (14×14mm)

*1: This is about 31 KB when the self-programming function is used.

MEMO

RL78/I1D (20 to 48 pins)

Group			RL78/I1D											
Pin count			20-pin		24-pin		30-pin			32-pin				48-pin	
Product name			R5F11768GSP	R5F11768AGSP	R5F11778GNA	R5F1177AGNA	R5F117A8GSP	R5F117AAGSP	R5F117ACGSP	R5F117BAGNA	R5F117BCGNA	R5F117BAGFP	R5F117BCGFP	R5F117GAGFB	R5F117GCGFB
CPU			RL78 CPU core												
Memory	Flash ROM [bytes]		8K	16K	8K	16K	8K	16K	32K	16K	32K	16K	32K	16K	32K
	Data flash [bytes]		2K												
	RAM [bytes]		0.7K	2K	0.7K	2K	0.7K	2K	3K	2K	3K	2K	3K	2K	3K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	24MHz												
		External resonator	20MHz												
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (V_{DD} = 2.7 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 2.7V), 1 to 4MHz (V_{DD} = 1.6 to 1.8V)												
	High-speed on-chip oscillator [Hz]		1 to 24MHz (V_{DD} = 2.7 to 3.6V), 1 to 16MHz (V_{DD} = 2.4 to 3.6V), 1 to 8MHz (V_{DD} = 1.8 to 3.6V), 1 to 4MHz (V_{DD} = 1.6 to 3.6V), 1MHz (V_{DD} = 1.8 to 3.6V)												
	Middle-speed on-chip oscillator [Hz]														
	Low-speed on-chip oscillator [Hz]		15kHz (V_{DD} = 1.6 to 3.6V)												
	Subclock (32.768 kHz)		—				32.768kHz (V_{DD} = 1.6 to 3.6V)								
I/O	I/O ports		14		18		24			26				42	
		N-channel open drain (6V tolerance)	—		—		—			—				4	
		N-channel open drain (V_{DD} tolerance)	—												
Timers	16-bit timer TAU [channels]		4												
	Real-time clock (RTC) [channels]		1*1												
	Watchdog timer (WDT) [channels]		1												
	Interval timer [channels]		8-bit × 4 (or 16-bit × 2), 12-bit × 1												
Serial interfaces	CSI×1, UART×1, simplified I^2C×1		1		—		1			—				—	
	CSI×2, UART×1, simplified I^2C×2		—		1		—			1				1	
DTC (sources)			16		20		19			20				23	
ELC (inputs/trigger outputs)			13/5		17/5		16/7			17/7				20/7	
External interrupt pins [count]			3		5									8	
OCD	On-chip debugging		Yes												
Peripheral functions	12-bit A/D converter [channels]		6				12							17	
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)												
	Op-amp [channels]		2				4								
	Comparator [channels]		2												
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), clock/buzzer output, data operation circuit (DOC)												
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function												
Other	Power supply voltage [V]		V_{DD} = 1.6 to 3.6												
	Operating ambient temperature [°C]		–40 to +105°C (G: Industrial applications)												
	Package (size [mm])		20-LSSOP (4.4×6.5mm)		24-HWQFN (4×4mm)		30-LSSOP (7.62mm (300mil))			32-HVQFN (5×5mm)		32-LQFP (7×7mm)		48-LFQFP (7×7mm)	

* A dedicated library is required to overwrite the data flash. Refer to [Development Environments] – [Flash Programming Tools] – [Self-Programming Library] on the Renesas website. https://www.renesas.com/flash_libraries

*1: Products with pin counts from 20 or 24 pins are not equipped with a subsystem clock, so only the fixed-cycle interrupt function using the low-speed on-chip oscillator clock (15kHz) is available for use.

RL78/I1E (32 to 36 pins)

Group			RL78/I1E			
Pin count			32-pin		36-pin	
Product name			R5F11CBCGNA	R5F11CBCMNA	R5F11CCCGBG	R5F11CCCMBG
CPU			RL78 CPU core			
Memory	Flash ROM [bytes]		32K			
	Data flash [bytes]		4K			
	RAM [bytes]		8K			
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz			
		External resonator	20MHz			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz (2.7 to 5.5V), 1 to 16MHz (2.4 to 2.7V)			
	High-speed on-chip oscillator [Hz]		1 to 32MHz (2.7 to 5.5V)	1 to 24MHz (2.7 to 5.5V)	1 to 32MHz (2.7 to 5.5V)	1 to 24MHz (2.7 to 5.5V)
			1 to 16MHz (2.4 to 2.7V)			
	Low-speed on-chip oscillator [Hz]		15kHz			
	Subclock (32.768 kHz)		—			
I/O	I/O ports		10		14	
		N-channel open drain (6V tolerance)	—			
		N-channel open drain (V_{DD} tolerance)	6			
Timers	16-bit timer TAU [channels]		6			
	16-bit timer RJ [channels]		1			
	16-bit timer RG [channels]		1			
	Real-time clock (RTC) [channels]		1			
	Watchdog timer (WDT) [channels]		1			
	Interval timer [channels]		15-bit × 1			
Serial interfaces	CSIx2, UART×1, simplified I^2C×2		1			
	UART×1		1			
DTC (sources)			23			
ELC (inputs/trigger outputs)			16/7			
External interrupt pins [count]			7		8	
OCD	On-chip debugging		Yes			
Peripheral functions	Instrumentation amplifier + 24-bit ΔΣ A/D converter [channels]		3		4	
	8/10-bit A/D converter [channels]		8		10	
	12-bit D/A converter [channels]		1			
	Configurable amplifier [channels]		3			
	Multiplier/divider/ multiply-accumulator		Library support for multiply/divide/multiply-accumulate operations (equipped with functional unit) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)			
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), temperature sensor, reference voltage generation circuit			
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), RAM parity error detection function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function			
Other	Power supply voltage [V]		Vcc = 2.4 to 5.5V			
	Operating ambient temperature [°C]		Ta = –40 to +105°C (G: Industrial applications)	Ta = –40 to +125°C (M: Industrial applications)	Ta = –40 to +105°C (G: Industrial applications)	Ta = –40 to +125°C (M: Industrial applications)
	Package (size [mm])		32-HVQFN (5×5mm)		36-TFBGA (4×4mm)	

RL78/F23 (32 to 80pins)

Group			RL78/F23			
Pin count			32-pin	48-pin	64-pin	80-pin
Product name			R7F123FBG3ANP-C*1	R7F123FGG3AFB-C*1	R7F123FLG3AFB-C*1	R7F123FMG3AFB-C*1
CPU			RL78 CPU core			
Memory	Flash ROM [bytes]		128			
	Data flash [bytes]		8			
	RAM [bytes]		12			
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	40 MHz			
		External resonator	20 MHz			
		Timer RD clock	80 MHz			
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz			
	High-speed on-chip oscillator [Hz]		MAX. 80MHz (±2%)			
	Low-speed on-chip oscillator [Hz]		15 kHz (TYP.)			
	Subclock		32.768 kHz (VDD = 2.7 to 5.5 V)			
	PLL		Multiplication factors: ×3, ×4, ×5, ×6, ×8, ×10			
I/O	I/O ports		25	38	52	68
		N-channel open drain (6V tolerance)	—			
		N-channel open drain (EV_{DD} tolerance)	—		30	45
Timers	16-bit timer (TAU) [channels]		12			
	16-bit timer (RJ) [channels]		1			
	16-bit timer (RDe) [channels]		2			
	Real-time clock (RTC) [channels]		1			
	Watchdog timer (WDT) [channels]		1			
Serial interfaces	CSI×4, UART×2, Simplified I^2C×4		—	1		
	CSI×3, UART×2, Simplified I^2C×3		1	—		
	UART×1, LIN (RLIN3)×1		1			
	CAN (RS-CANFD lite)×1		—			
	Multi-master I^2C×1		1			
Data transfer controller (DTC) (activation sources)			35	36		
Event link controller (ELC) (inputs/trigger outputs)			—			
Interrupt sources	External		8	12	14	15
OCD	On-chip debugging		Yes (Hot plugin, On-chip trace)			
Peripheral functions	8/10-bit A/D converter [channels]		8	13	16	
	8-bit D/A converter [channels]		—			
	Comparator [channels]		—			
	Clock/buzzer output		—	1		
	Multiplier/divider/ multiply-accumulator		Application Accelerator Unit (AAU, the dedicated arithmetic assist hardware to reduce the software load for FOC algorithm processing)			
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1Hz) × 1			
Safety functions	ASIL-B (ISO26262)		WWDT (window watchdog timer), Flash memory fast CRC operation function, General purpose CRC operation, Code flash memory 1-bit error correction function, Code flash memory 2-bit error detection function, RAM 1-bit error correction function, RAM 2-bit error detection function, Invalid memory access detection function, Frequency detection function, Clock monitoring function, CPU Stack pointer monitor function, A/D converter test function			
Security functions	Evita light (ISO/SAE21434)		AESEA (ECB/CBC mode and CMAC (AES-128, 192, 256)) Random number generator (TRNG)			
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5 V			
	Operating ambient temperature [°C]		T_A = –40 to +105°C (3: Automotive applications), T_A = –40 to +125°C (4: Automotive applications)*1, T_A = –40 to +150°C (5: Automotive applications)*1			
	Package (size [mm])		32-pin HWQFN (5x5mm)	48-pin LFQFP (7×7mm)	64-pin LFQFP (10×10mm)	80-pin LFQFP (12×12mm)

Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R7F1xxxxx4xxx-C) or –40 to +150°C ambient operating temperature range (part number: R7F1xxxxx5xxx-C) are also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

RL78/F24 (32 to 100pins)

Group			RL78/F24				
Pin count			32-pin	48-pin	64-pin	80-pin	100-pin
Product name			R7F124FBJ3ANP-C*1	R7F124FGJ3AFB-C*1	R7F124FLJ3AFB-C*1	R7F124FMJ3AFB-C*1	R7F124FPJ3AFB-C*1
CPU			RL78 CPU core				
Memory	Flash ROM [bytes]		256				
	Data flash [bytes]		16				
	RAM [bytes]		24				
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	40 MHz				
		External resonator	20 MHz				
		Timer RD clock	80 MHz				
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz				
	High-speed on-chip oscillator [Hz]		MAX. 80MHz (±2%)				
	Low-speed on-chip oscillator [Hz]		15 kHz (TYP.)				
	Subclock		32.768 kHz (V_{DD} = 2.7 to 5.5 V)				
	PLL		Multiplication factors: ×3, ×4, ×5, ×6, ×8, ×10				
I/O	I/O ports		25	38	52	68	86
		N-channel open drain (6V tolerance)	—				
		N-channel open drain (EV_{DD} tolerance)	—		30	45	57
Timers	16-bit timer (TAU) [channels]		16				
	16-bit timer (RJ) [channels]		1				
	16-bit timer (RDe) [channels]		2				
	Real-time clock (RTC) [channels]		1				
	Watchdog timer (WDT) [channels]		1				
Serial interfaces	CSI×4, UART×2, Simplified I^2C×4		—	1			
	CSI×3, UART×2, Simplified I^2C×3		1	—			
	UART×1, LIN (RLIN3)×1		2				
	CAN (RS-CANFD lite)×1		1				
	Multi-master I^2C×1		1				
Data transfer controller (DTC) (activation sources)			43	44			
Event link controller (ELC) (inputs/trigger outputs)			26/10				
Interrupt sources	External		10	14	15	16	
OCD	On-chip debugging		Yes (Hot plugin, On-chip trace)				
Peripheral functions	8/10-bit A/D converter [channels]		8	13	16		
	8-bit D/A converter [channels]		1				
	Comparator [channels]		1unit (4ch)				
	Clock/buzzer output		—	1			
	Multiplier/divider/ multiply-accumulator		Application Accelerator Unit (AAU, the dedicated arithmetic assist hardware to reduce the software load for FOC algorithm processing)				
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1Hz) × 1				
Safety functions	ASIL-B (ISO26262)		WWDT (window watchdog timer), Flash memory fast CRC operation function, General purpose CRC operation, Code flash memory 1-bit error correction function, Code flash memory 2-bit error detection function, RAM 1-bit error correction function, RAM 2-bit error detection function, Invalid memory access detection function, Frequency detection function, Clock monitoring function, CPU Stack pointer monitor function, A/D converter test function				
Security functions	Evita light (ISO/SAE21434)		AESEA (ECB/CBC mode and CMAC (AES-128, 192, 256)) Random number generator (TRNG)				
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5 V				
	Operating ambient temperature [°C]		T_A = –40 to +105°C (3: Automotive applications), T_A = –40 to +125°C (4: Automotive applications)*1, T_A = –40 to +150°C (5: Automotive applications)*1				
	Package (size [mm])		32-pin HWQFN (5x5mm)	48-pin LFQFP (7×7mm)	64-pin LFQFP (10×10mm)	80-pin LFQFP (12×12mm)	100-pin LFQFP (14×14mm)

Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R7F1xxxxx4xxx-C) or –40 to +150°C ambient operating temperature range (part number: R7F1xxxxx5xxx-C) are also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 111.

RL78/F13 (30 to 80 pins)

Group			RL78/F13 (CAN & LIN)																					
Pin count			30-pin					32-pin					48-pin					64-pin					80-pin		
Product name			R5F10BACLSP*1	R5F10BADLSP*1	R5F10BAELSP*1	R5F10BAFLSP*1	R5F10BAGLSP*1	R5F10BBCLNA*1	R5F10BBDLNA*1	R5F10BBELNA*1	R5F10BBFLNA*1	R5F10BBGLNA*1	①R5F10BGCLFB*1 ②R5F10BGCLNA*1	①R5F10BGDLFB*1 ②R5F10BGDLNA*1	①R5F10BGELFB*1 ②R5F10BGELNA*1	①R5F10BGFLFB*1 ②R5F10BGFLNA*1	①R5F10BGGLFB*1 ②R5F10BGGLNA*1	R5F10BLCLFB*1	R5F10BLDLFB*1	R5F10BLELFB*1	R5F10BLFLFB*1	R5F10BLGLFB*1	R5F10BMELFB*1	R5F10BMFLFB*1	R5F10BMGLFB*1
CPU			RL78 CPU core																					
Memory	Flash ROM [bytes]		32K	48K	64K	96K	128K	32K	48K	64K	96K	128K	32K	48K	64K	96K	128K	32K	48K	64K	96K	128K	64K	96K	128K
	Data flash [bytes]		4K					4K					4K					4K					4K		
	RAM [bytes]		2K	3K	4K	6K	8K	2K	3K	4K	6K	8K	2K	3K	4K	6K	8K	2K	3K	4K	6K	8K	4K	6K	8K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz (automotive applications, T_A = –40 to +105°C), 24MHz (automotive applications, T_A = –40 to +125°C, T_A = –40 to +150°C)																					
		External resonator	20MHz																					
		Timer RD clock	64MHz																					
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz																					
	High-speed on-chip oscillator [Hz]		64MHz (±2%): automotive applications/T_A = –40 to +105°C, 48MHz (±3%): automotive applications/T_A = –40 to +125°C, 48MHz (±5%): automotive applications/T_A = –40 to +150°C																					
	Low-speed on-chip oscillator [Hz]		15kHz																					
	Subclock (32.768 kHz)		—										32.768kHz											
	PLL		Multiplication factors: ×3, ×4, ×6, ×8																					
I/O	I/O ports		23					25					38					52					68		
	N-channel open drain (6V tolerance)		—																					
	N-channel open drain (EV_{DD} tolerance)		9					13					16											
Timers	16-bit timer TAU [channels]		16																					
	Timer RJ		1																					
	Timer RD		2																					
	Real-time clock (RTC) [channels]		1																					
	Watchdog timer (WDT) [channels]		1																					
Serial interfaces	CSI×2, UART×1, simplified I^2C×2		1										—											
	CSI×4, UART×2, simplified I^2C×4		—										1											
	UART×1, LIN (RLIN3)×1		1																					
	CAN (RS-CAN lite)×1		1																					
	Multi-master I^2C×1		—					1																
DTC (sources)			36										37											
External interrupts [channels]			9										13					14						
OCD	On-chip debugging		Yes (hot plugin, trace)																					
Peripheral functions	8/10-bit A/D converter [channels]		12					10					15					19					20		
	8-bit D/A converter [channels]		—																					
	Comparator [channels]		—																					
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																					
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1Hz) × 1																					
			—										Clock/buzzer output × 1											
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), SRAM ECC function, CPU stack pointer monitor function, clock monitor function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function																					
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5V																					
	Operating ambient temperature [°C]		T_A = –40 to +105°C (L: automotive applications), T_A = –40 to +125°C (K: automotive applications)*1, T_A = –40 to +150°C (Y: automotive applications)*1																					
	Package (size [mm])		30-LSSOP (6.1×9.85mm)					32-HVQFN (5×5mm)					①48-LFQFP (7×7mm) ②48-HVQFN (7×7mm)					64-LFQFP (10×10mm)					80-LFQFP (12×12mm)		

Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) or –40 to +150°C ambient operating temperature range (part number: R5F1xxxxYxx) are also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/F13 (20 to 80 pins)

Group			RL78/F13 (LIN)																											
Pin count			20-pin				30-pin				32-pin				48-pin						64-pin					80-pin				
Product name			R5F10A6ALSP*1	R5F10A6CLSP*1	R5F10A6DLSP*1	R5F10A6ELSP*1	R5F10AAALSP*1	R5F10AACLSP*1	R5F10AADLSP*1	R5F10AAELSP*1	R5F10ABALNA*1	R5F10ABCLNA*1	R5F10ABDLNA*1	R5F10ABELNA*1	①R5F10AGALFB*1 ②R5F10AGALNA*1	①R5F10AGCLFB*1 ②R5F10AGCLNA*1	①R5F10AGDLFB*1 ②R5F10AGDLNA*1	①R5F10AGELFB*1 ②R5F10AGELNA*1	①R5F10AGFLFB*1 ②R5F10AGFLNA*1	①R5F10AGGLFB*1 ②R5F10AGGLNA*1	R5F10ALCLFB*1	R5F10ALDLFB*1	R5F10ALELFB*1	R5F10ALFLFB*1	R5F10ALGLFB*1	R5F10AMELFB*1	R5F10AMFLFB*1	R5F10AMGLFB*1
CPU			RL78 CPU core																											
Memory	Flash ROM [bytes]		16K	32K	48K	64K	16K	32K	48K	64K	16K	32K	48K	64K	16K	32K	48K	64K	96K	128K	32K	48K	64K	96K	128K	64K	96K	128K		
	Data flash [bytes]		4K				4K				4K				4K						4K									
	RAM [bytes]		1K	2K	3K	4K	1K	2K	3K	4K	1K	2K	3K	4K	1K	2K	3K	4K	6K	8K	2K	3K	4K	6K	8K	4K	6K	8K		
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz (automotive applications, T_A = –40 to +105°C), 24MHz (automotive applications, T_A = –40 to +125°C, T_A = –40 to +150°C)																											
		External resonator	20MHz																											
		Timer RD clock	64MHz																											
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz																											
	High-speed on-chip oscillator [Hz]		64MHz (±2%): automotive applications/T_A = –40 to +105°C, 48MHz (±3%): automotive applications/T_A = –40 to +125°C, 48MHz (±5%): automotive applications/T_A = –40 to +150°C																											
	Low-speed on-chip oscillator [Hz]		15kHz																											
	Subclock (32.768 kHz)		—												32.768kHz															
	PLL		Multiplication factors: ×3, ×4, ×6, ×8																											
I/O	I/O ports		13				23				25				38						52					68				
	N-channel open drain (6V tolerance)		—																											
	N-channel open drain (EV_{DD} tolerance)		6								10				16/13						16/13					16				
Timers	16-bit timer TAU [channels]		8																12		8				12					
	Timer RJ		1																											
	Timer RD		2																											
	Real-time clock (RTC) [channels]		1																											
	Watchdog timer (WDT) [channels]		1																											
Serial interfaces	CSI×2, UART×1, simplified I^2C×2		1																—		1									
	CSI×4, UART×2, simplified I^2C×4		—																1											
	UART×1, LIN (RLIN3)×1		1																											
	CAN (RS-CAN lite)×1		—																											
	Multi-master I^2C×1		—																1		—				1					
DTC (sources)			28				29								30				36		30				36					
External interrupts [channels]			7				8								10				12		10				13					
OCD	On-chip debugging		Yes (hot plugin, trace)																											
Peripheral functions	8/10-bit A/D converter [channels]		4				10				8				12				15		12				19	20				
	8-bit D/A converter [channels]		—																											
	Comparator [channels]		—																											
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																											
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1Hz) × 1																											
			—												Clock/buzzer output × 1															
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), SRAM ECC function, CPU stack pointer monitor function, clock monitor function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function																											
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5V																											
	Operating ambient temperature [°C]		T_A = –40 to +105°C (L: automotive applications), T_A = –40 to +125°C (K: automotive applications)*1, T_A = –40 to +150°C (Y: automotive applications)*1																											
	Package (size [mm])		20-LSSOP (6.1×6.65mm)				30-LSSOP (6.1×9.85mm)				32-HVQFN (5×5mm)				①48-LFQFP (7×7mm) ②48-HVQFN (7×7mm)						64-LFQFP (10×10mm)					80-LFQFP (12×12mm)				

Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) or –40 to +150°C ambient operating temperature range (part number: R5F1xxxxYxx) are also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/F14 (30 to 100 pins)

Group			RL78/F14									
Pin count			30-pin		32-pin		48-pin					
Product name			R5F10PADLSP*1	R5F10PAELSP*1	R5F10PBDLNA*1	R5F10PBELNA*1	①R5F10PGDLFB *1 ②R5F10PGDLNA *1	①R5F10PGELFB *1 ②R5F10PGELNA *1	①R5F10PGFLFB *1 ②R5F10PGFLNA *1	①R5F10PGGLFB *1 ②R5F10PGGLNA *1	①R5F10PGHLFB *1 ②R5F10PGHLNA *1	①R5F10PGJLFB *1 ②R5F10PGJLNA *1
CPU			RL78 CPU core									
Memory	Flash ROM [bytes]		48K	64K	48K	64K	48K	64K	96K	128K	192K	256K
	Data flash [bytes]		4K		4K		4K			8K		
	RAM [bytes]		4K	6K	4K	6K	4K	6K	8K	10K	16K	20K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz (automotive applications, T_A = –40 to +105°C), 24MHz (automotive applications, T_A = –40 to +125°C), 24MHz (automotive applications, T_A = –40 to +150°C)									
		External resonator	20MHz									
		Timer RD clock	64MHz									
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz									
	High-speed on-chip oscillator [Hz]		64MHz (±2%): automotive applications/T_A = –40 to +105°C, 48MHz (±3%): automotive applications/T_A = –40 to +125°C, 48MHz (±5%): automotive applications/T_A = –40 to +150°C									
	Low-speed on-chip oscillator [Hz]		15kHz									
	Subclock (32.768 kHz)		—				32.768kHz					
	PLL		Multiplication factors: ×3, ×4, ×6, ×8									
I/O	I/O ports		23		25		38					
		N-channel open drain (6V tolerance)	—									
		N-channel open drain (EV_{DD} tolerance)	9		13		16					
Timers	16-bit timer TAU [channels]		12				16 or 12					
	16-bit timer RJ [channels]		1									
	16-bit timer RD [channels]		2									
	Real-time clock (RTC) [channels]		1									
	Watchdog timer (WDT) [channels]		1									
Serial interfaces	CSI×3, UART×2, simplified I^2C×3		1				—					
	CSI×4, UART×2, simplified I^2C×4		—				1					
	UART×1, LIN (RLIN3)×1		1				2 or 1					
	CAN (RS-CAN lite)×1		1									
	Multi-master I^2C×1		—		1							
DTC (sources)			37				44/38					
ELC (inputs/trigger outputs)			20/7				26 (20)/9 (7)					
External interrupts [channels]			9				14 or 13					
OCD	On-chip debugging		Yes (hot plugin, trace)									
Peripheral functions	8/10-bit A/D converter [channels]		10		8		13					
	8-bit D/A converter [channels]		1									
	Comparator [channels]		1									
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)									
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2									
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function(general-purpose), SRAM ECC function, CPU stack pointer monitor function, clock monitor function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function									
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5V									
	Operating ambient temperature [°C]		T_A = –40 to +105°C (L: automotive applications), T_A = –40 to +125°C (K: automotive applications)*1, T_A = –40 to +150°C (Y: automotive applications)*1									
	Package (size [mm])		30-LSSOP (6.1×9.85mm)		32-HVQFN (5×5mm)		①48-LFQFP (7×7mm) ②48-HVQFN (7×7mm)					

Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) or –40 to +150°C ambient operating temperature range (part number: R5F1xxxxYxx) are also available.

For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78/F14														
64-pin					80-pin					100-pin				
R5F10PLELFB*1	R5F10PLFLFB*1	R5F10PLGLFB*1	R5F10PLHLFB*1	R5F10PLJLFB*1	R5F10PMELFB*1	R5F10PMFLFB*1	R5F10PMGLFB*1	R5F10PMHLFB*1	R5F10PMJJLFB*1	R5F10PPELFB*1	R5F10PPFLFB*1	R5F10PPGLFB*1	R5F10PPHLFB*1	R5F10PPJLFB*1
RL78 CPU core														
64K	96K	128K	192K	256K	64K	96K	128K	192K	256K	64K	96K	128K	192K	256K
4K		8K			4K		8K			4K		8K		
6K	8K	10K	16K	20K	6K	8K	10K	16K	20K	6K	8K	10K	16K	20K
32MHz (automotive applications, T_A = –40 to +105°C), 24MHz (automotive applications, T_A = –40 to +125°C), 24MHz (automotive applications, T_A = –40 to +150°C)														
20MHz														
64MHz														
1 to 20MHz														
64MHz (±2%): automotive applications/T_A = –40 to +105°C, 48MHz (±3%): automotive applications/T_A = –40 to +125°C, 48MHz (±5%): automotive applications/T_A = –40 to +150°C														
15kHz														
32.768kHz														
Multiplication factors: ×3, ×4, ×6, ×8														
52					68					86				
—														
16														
16 or 12														
1														
2														
1														
1														
—														
1														
2 or 1										2				
1														
1														
44/38										44				
26 (20)/9 (7)										26/9				
15 or 14					16 or 14					16				
Yes (hot plugin, trace)														
17 or 16					18 or 16					24				
1														
1														
Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)														
Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1 Hz) × 1, clock/buzzer output × 2														
Flash memory CRC calculation function (high-speed), CRC calculation function(general-purpose), SRAM ECC function, CPU stack pointer monitor function, clock monitor function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function														
V_{DD} = 2.7 to 5.5V														
T_A = –40 to +105°C (L: automotive applications), T_A = –40 to +125°C (K: automotive applications)*1, T_A = –40 to +150°C (Y: automotive applications)*1														
64-LFQFP (10×10mm)					80-LFQFP (12×12mm)					100-LFQFP (14×14mm)				

RL78/F15 (48 to 144 pins)

Group			RL78/F15																	
Pin count			48-pin				64-pin		80-pin		100-pin					144-pin				
Product name			R5F113GKLFB*1	R5F113GLLFB*1	R5F113GKLNA*1	R5F113GLLNA*1	R5F113LKLFB*1	R5F113LLLFB*1	R5F113MKLFB*1	R5F113MLLFB*1	R5F113PGLFB*1	R5F113PHLFB*1	R5F113PJLFB*1	R5F113PKLFB*1	R5F113PLLFB*1	R5F113TGLFB*1	R5F113THLFB*1	R5F113TJLFB*1	R5F113TKLFB*1	R5F113TLLFB*1
CPU			RL78 CPU core																	
Memory	Flash ROM [bytes]		384K	512K	384K	512K	384K	512K	384K	512K	128K	192K	256K	384K	512K	128K	192K	256K	384K	512K
	Data flash [bytes]		16K								8K			16K		8K			16K	
	RAM [bytes]		26K	32K	26K	32K	26K	32K	26K	32K	10K	16K	20K	26K	32K	10K	16K	20K	26K	32K
Operating clocks	Maximum operating frequency [Hz]	On-chip oscillator clock	32MHz (automotive applications, T_A = –40 to +105°C), 24MHz (automotive applications, T_A = –40 to +125°C)																	
		External resonator	20MHz																	
		Timer RD clock	64MHz																	
Clock generator circuit	Crystal/ceramic oscillator [Hz]		1 to 20MHz																	
	High-speed on-chip oscillator [Hz]		64MHz (±2%): automotive applications/T_A = –40 to +105°C, 48MHz (±3%): automotive applications/T_A = –40 to +125°C																	
	Low-speed on-chip oscillator [Hz]		15kHz																	
	Subclock (32.768 kHz)		32.768kHz																	
	PLL		Multiplication factors: ×3, ×4, ×6, ×8																	
I/O	I/O ports		38				52		68		86					130				
	N-channel open drain (6V tolerance)		—																	
	N-channel open drain (EV_{DD} tolerance)		16																	
Timers	16-bit timer TAU [channels]		16													24				
	16-bit timer RJ [channels]		1																	
	16-bit timer RD [channels]		2																	
	Real-time clock (RTC) [channels]		1																	
	Watchdog timer (WDT) [channels]		1																	
Serial interfaces	CSI×6, UART×3, simplified I^2C×4		1																	
	CSI×3, UART×2, simplified I^2C×3		—								1									
	CSI×4, UART×2, simplified I^2C×4		1								—									
	UART×1, LIN (RLIN3)×1		2								3									
	CAN (RS-CAN lite)×1		2																	
	IEBus controller		1																	
	Multi-master I^2C×1		1																	
DTC (sources)			46								50					52				
ELC (inputs/trigger outputs)			26/9																	
External interrupts [channels]			15				18		19		20					22				
OCD	On-chip debugging		Yes (hot plugin, trace)																	
Peripheral functions	8/10-bit A/D converter [channels]		13				17		18		24									
	8-bit D/A converter [channels]		1																	
	Comparator [channels]		1																	
	Multiplier/divider/ multiply-accumulator		Multiply/divide/multiply-accumulate instructions supported (included in CPU instruction set) Multiply: 16-bit × 16-bit = 32-bit (signed/unsigned) Divide: 32-bit ÷ 32-bit = 32-bit (unsigned) Multiply-accumulate: 16-bit × 16-bit + 32-bit = 32-bit (signed/unsigned)																	
	Other functions		Power-on reset (POR), low-voltage detection circuit (LVD), RTC output (1Hz) × 1, clock/buzzer output × 2																	
Safety functions			Flash memory CRC calculation function (high-speed), CRC calculation function (general-purpose), SRAM ECC function, CPU stack pointer monitor function, clock monitor function, RAM guard function, SFR guard function, illegal memory access detection function, frequency detection function, A/D converter test function, I/O power output signal level detection function																	
Other	Power supply voltage [V]		V_{DD} = 2.7 to 5.5V																	
	Operating ambient temperature [°C]		T_A = –40 to +105°C (L: automotive applications), T_A = –40 to +125°C (K: automotive applications)*1																	
	Package (size [mm])		48-LFQFP (7×7mm)		48-HVQFN (7×7mm)		64-LFQFP (10×10mm)		80-LFQFP (12×12mm)		100-LFQFP (14×14mm)					144-LFQFP (20×20mm)				

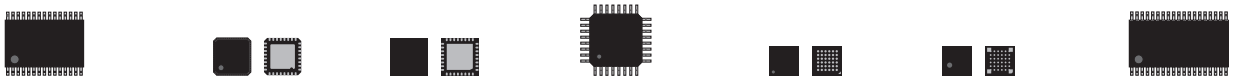
Ambient operating temperature range of the above part numbers is –40 to +105°C.

*1: Products with –40 to +125°C ambient operating temperature range (part number: R5F1xxxxKxx) is also available.

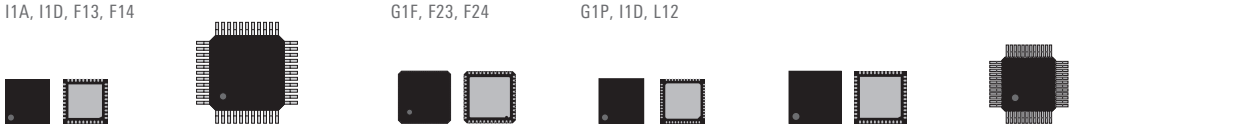
For detail about part number, please see "Explanation of Orderable Part Numbers" on page 110.

RL78 FAMILY PACKAGE LINEUP

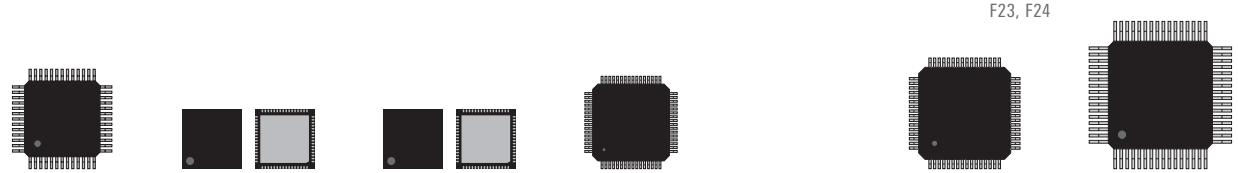
Pin-type:	8-WDFN	10-LSSOP	16-SSOP	16-HWQFN	20-LSSOP	20-LSSOP	20-TSSOP	24-HWQFN	25-WFLGA
Size:	3 x 3 mm	4.4 x 3.6 mm	4.4 x 5 mm	3 x 3 mm	4.4 x 6.5 mm	6.1 x 6.65 mm	4.4 x 6.5 mm	4 x 4 mm	3 x 3 mm
Pitch:	0.65 mm	0.65 mm	0.65 mm	0.50 mm	0.65 mm	0.65 mm	0.65 mm	0.50 mm	0.50 mm
Thickness:	0.80 mm	1.45 mm	1.725 mm	0.80 mm	1.45 mm	1.40 mm	1.20 mm	0.80 mm	0.76 mm
Group:	G15	G10, G11, G15, G16	G10, G11, G15, G16	G11, G15, G16, G22	G11, G12, G15, G16, G22, G24, I1A, I1D	G13, F13	G11, G12, G13, G1M, G1N	G11, G12, G13, G16, G22, G24, G1F, G1P, I1D	G11, G13, G22, G24, G1A



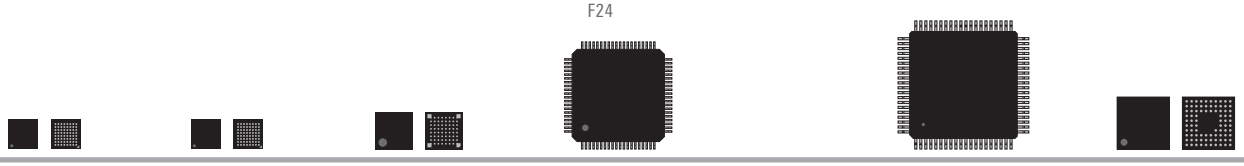
Pin-type:	30-LSSOP	32-HVQFN	32-HWQFN	32-LQFP	36-TFBGA	36-WFLGA	38-SSOP
Size:	6.1 x 9.85 mm	5 x 5 mm	5 x 5 mm	7 x 7 mm	4 x 4 mm	4 x 4 mm	6.1 x 12.3 mm
Pitch:	0.65 mm	0.50 mm	0.50 mm	0.80 mm	0.50mm	0.50mm	0.65mm
Thickness:	1.40 mm	0.90 mm	0.80 mm	1.70 mm	1.10mm	0.76mm	2.00mm
Group:	G12, G13, G14, G22, G23, G24, G1G, I1A, I1D, F13, F14	I1D, I1E, F13, F14	G13, G14, G16, G22, G23, G24, G1A, G1C, G1F, F23, F24	G14, G16, G22, G23, G24, G1C, G1F, G1G, G1P, I1D, L12	I1E	G13, G14, G22, G23, G1F	I1A



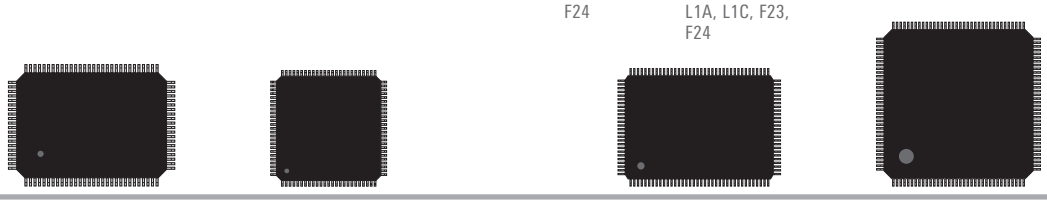
Pin-type:	40-HWQFN	44-LQFP	48-HVQFN	48-HWQFN	48-HWQFN	48-LFQFP	
Size:	6 x 6 mm	10 x 10 mm	7 x 7 mm	6 x 6 mm	7 x 7 mm	7 x 7 mm	
Pitch:	0.50mm	0.80mm	0.50mm	0.40mm	0.50mm	0.50mm	
Thickness:	0.80mm	1.60mm	0.90mm	0.80mm	0.80mm	1.60mm	1.70mm
Group:	G13, G14, G22, G23, G24	G13, G13A, G14, G22, G23, G24, G1G, L12	F13, F14, F15	G1D	G13, G14, G22, G23, G24, G1A, G1C	G13, G13A, G14, G1A, G1C, L12, F13, F14, F15, F23, F24	G14, G22, G23, G24, G1F, I1D, H1D, F23, F24



Pin-type:	52-LQFP	64-HVQFN	64-HWQFN	64-LFQFP		64-LQFP	64-LQFP
Size:	10 x 10 mm	9 x 9 mm	8 x 8 mm	10 x 10 mm		12 x 12 mm	14 x 14 mm
Pitch:	0.65mm	0.50mm	0.40mm	0.50mm		0.65mm	0.80mm
Thickness:	1.70mm	1.00mm	0.80mm	1.60mm	1.70mm	1.60mm	1.70mm
Group:	G13, G14, G23, G24, L12	G1H	L12	G13, G13A, G14, G1A, L12, F13, F14, F15, F23, F24	G14*1, G23, G24, G1F, H1D, I1C, L13, F23, F24	G13, G14, G23, G24, L12, L13	G14



Pin-type:	64-TFBGA	64-VFBGA	64-WFLGA	80-LFQFP		80-LQFP	85-VFLGA
Size:	4 x 4 mm	4 x 4 mm	5 x 5 mm	12 x 12 mm		14 x 14 mm	7 x 7 mm
Pitch:	0.40mm	0.40mm	0.50mm	0.50mm		0.65mm	0.65mm
Thickness:	1.10mm	0.99mm	0.76mm	1.60mm	1.70mm	1.70mm	1.00mm
Group:	H1D	G13, G1A	G14, G23	G13, G14, F13, F14, F15, F23, F24	G14*1, G23, H1D, I1B, I1C, L13, L1A, L1C, F23, F24	G13, G14, G23, L13	L1C



Pin-type:	100-LQFP	100-LFQFP		128-LFQFP	144-LFQFP
Size:	14 x 20 mm	14 x 14 mm		14 x 20 mm	20 x 20 mm
Pitch:	0.65mm	0.50mm		0.50mm	0.50mm
Thickness:	1.60mm	1.60mm	1.70mm	1.60mm	1.60mm
Group:	G13, G14, G23	G13, G13A, G14, F14, F15, F24	G14*1, G23, I1B, I1C, L1A, L1C, F24	G13, G23	F15

Note: *1. G14 (384, 512 KB)

EXPLANATION OF ORDERABLE PART NUMBERS
(For part numbers start with R5F)

R5 F 1 00 6 E C A SP #Vx

- **R5**: Renesas MCU
- **F**: ROM Type, F: Flash
- **1**: RL78 Family
- **00**: Product group
- **6**: Pin count
- **E**: ROM Size (KB)
- **C**: Bonding wire (Only part of RL78/F1x)*2
- **A**: Temperature & Quality Grade
- **SP**: Package, Pin Pitch
- **#Vx**: Packaging, Material (Pb-free)

Product group

00	G13	Data Flash
01		No Data Flash
02	G12	Data Flash
03		No Data Flash
04	G14	
05	G11	
07	I1A	
09	F12	
0A	F13	LIN
0B		LIN & CAN
0E	G1A	
0F	G1E	
0J	G1C	USB Host & Function
0K		USB Function
0M	I1B	
0N	I1C On-chip AES	
0P	F14	
0R	L12	
0W	L13	
0Y	G10	
10	L1C	LCD & USB Function
11		LCD
13	F15	
17	I1D	
1A	G1D	
1B	G1F	
1C	I1E	
1E	G1G	
1F	G1H	
1M	L1A	
1N	H1D	AFE, LFQFP package
1P		AFE, TFBGA package
1R		Meter, Timer
1T	I1C No On-chip AES	
1W	G1M	
1Y	G1N	
1Z	G1P	
20	G15	
21	G16	
40	G13A	

Pin count

0	8
1	10
4	16
6	20
7	24
8	25
A	30
B	32
C	36
D	38
E	40
F	44
G	48
J	52
L	64
M	80
P	100
S	128
T	144

ROM Size (KB)

4	1
6	2
7	4
8	8
9	12
A	16
B	24
C	32
D	48
E	64
F	96
G	128
H	192
J	256
K	384
L	512

Package, Pin Pitch

SP	SSOP 0.65 mm	LA	WFLGA 0.5 mm
	LSSOP 0.65 mm		VFLGA 0.65 mm
SM	TSSOP 0.65 mm	BG	VFBGA 0.4 mm
NA	HWQFN 0.5 mm		TFBGA 0.5 mm
	HVQFN 0.5 mm	FA	LQFP 0.65 mm
NB	HWQFN 0.65 mm	FB	LFQFP 0.5 mm
	HWQFN 0.4 mm	FP	LQFP 0.8 mm

Temperature & Quality Grade

A	-40°C to 85°C	Consumer
D	-40°C to 85°C	Industrial
G	-40°C to 105°C	Industrial
M	-40°C to 125°C	Industrial
J	-40°C to 85°C	Automotive
L	-40°C to 105°C	Automotive
K	-40°C to 125°C	Automotive
Y	-40°C to 150°C	Automotive

Bonding wire (Only part of RL78/F1x)*2

C	Cu (Copper)

Packaging, Material (Pb-free)

#G, #0	Full Carton (HWQFN,HVQFN,WFLGA)
#H, #1	Full Carton (SSOP,LSSOP,LQFP,LFQFP,TSSOP,WDFN)
#U, #2	Tray (HWQFN,HVQFN.VFBGA,VFLGA,WFLGA,FLGA,TFBGA)
#V, #3	Tray, Tube*1 (SSOP,LSSOP,LQFP,LFQFP,TSSOP,WDFN)
#W, #4	Embossed Tape (HWQFN,HVQFN,VFBGA,VFLGA,WFLGA,FLGA,TFBGA)
#X, #5	Embossed Tape (SSOP,LSSOP,LQFP,LFQFP,TSSOP,WDFN)

Notes: 1. For 20-pin RL78/G11, RL78/G12, RL78/G15, RL78/G16 RL78/I1A and RL78/I1D LSSOP products only the package specification is tube.
2. Please contact Renesas sales or agent for details.

EXPLANATION OF ORDERABLE PART NUMBERS
(For part numbers start with R7F)

R7 F 1 00G L J 3 C FB -C #AAx

- **R7**: Renesas MCU
- **F**: ROM Type, F: Flash
- **1**: RL78 Family

Product group

00G	G23	23F	F23
01G	G24	24F	F24
02G	G22		

Pin count

4	16
6	20
7	24
8	25
A	30
B	32
C	36
E	40
F	44
G	48
J	52
L	64
M	80
P	100
S	128

ROM Size (KB)

C	32
E	64
F	96
G	128
H	192
J	256
K	384
L	512
N	768

Temperature

2	-40°C to 85°C
3	-40°C to 105°C
4	-40°C to 125°C
5	-40°C to 150°C

Quality Grade

A	Automotive
C	Industrial
D	Consumer

Package, Pin Pitch

SP	LSSOP 0.65 mm
FP	LQFP 0.8 mm
FA	LQFP 0.65 mm
FB	LFQFP 0.5 mm
NP	HWQFN 0.5 mm
LA	WFLGA 0.5 mm
BG	VFBGA 0.4 mm

Bonding wire (Only part of RL78/F2x)

C	Cu (Copper)

Packaging, Material (Pb-free)

#UA #BA #AA	Tray (LFQFP, LQFP, LSSOP, HWQFN)
#UC #BC #AC	Tray (WFLGA)
#CA	Tube* (LSSOP) * Also known as “magazine” (shipping form is the same)
#HA	Embossed Tape (LFQFP, LQFP, LSSOP, HWQFN)
#HC	Embossed Tape (WFLGA)

Renesas Electronics Corporation TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating Renesas Electronics products, if required.
5. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
6. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.
   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.
   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.
   Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.
7. No semiconductor product is absolutely secure. Notwithstanding any security measures or features that may be implemented in Renesas Electronics hardware or software products, Renesas Electronics shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a Renesas Electronics product or a system that uses a Renesas Electronics product. RENESAS ELECTRONICS DOES NOT WARRANT OR GUARANTEE THAT RENESAS ELECTRONICS PRODUCTS, OR ANY SYSTEMS CREATED USING RENESAS ELECTRONICS PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION ("Vulnerability Issues"). RENESAS ELECTRONICS DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, RENESAS ELECTRONICS DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.
8. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
12. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
13. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
14. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.
(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev.5.0-1 2020.10)

■Contact Us
https://www.renesas.com/contact-us

Renesas Electronics Corporation

www.renesas.com

Document No. R01CL0028EJ0700