

PHOTOCOUPLERS

CATALOG



RENESAS PHOTOCOUPPLERS CONTRIBUTE TO THE REALIZATION OF INDUSTRIAL SYSTEMS THAT ARE SAFE, EFFICIENT, AND ENVIRONMENTALLY FRIENDLY.



CONTENTS

Gate Drive, IPM Drive	04
New Package	04
Isolation Amplifiers, Communication Applications	05
Application Examples	06
Product Lineup	08





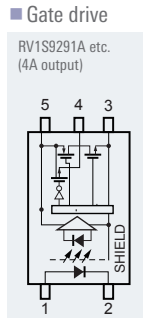
In manufacturing and industrial settings, photocouplers convey control signals while shielding persons and control systems from high voltages. Renesas photocouplers enable isolation of high voltages in solar and wind power generation systems, and in inverters that convert DC power to AC they enable accurate signal transfer and help improve power efficiency. The lineup includes products with integrated functionality for protecting the IGBTs used in inverter circuits. Also available are high-precision isolation amplifiers, for accurate voltage monitoring and motor control, and IC- or transistor-output products, which isolate microcontrollers and control devices while allowing high-speed signal transfer. Renesas photocoupler products deliver improved efficiency in manufacturing and industrial applications while contributing to safe and stable operation.

Gate Drive, IPM Drive

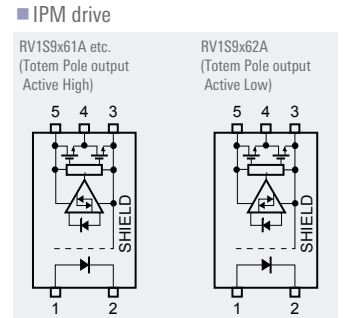
Gate Drive RV1S9x9xA, IPM Drive RV1S9x61A, RV1S9x62A

Reduced SiC, GaN, IGBT switching loss contributes to improved inverter efficiency, better real-time performance and downsizing.

- Contribution
Power Devices on-off operation at high dv/dt
- Features
 - lopeak
 - 4A (RV1S9x91A, RV1S9x92A)
 - 10A (RV1S9993A, RV1S9994A)
 - Small PDD 35ns MAX.
 - High CMTI $\pm 100\text{kV}/\mu\text{s}$ MIN.



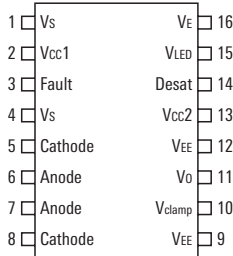
- Contribution
Can be connected to 15V IPM input
- Features
(RV1S9x61A, RV1S9x62A)
 - Small PDD 25ns MAX.
 - High CMTI $\pm 100\text{kV}/\mu\text{s}$ MIN.
 - High-temperature operation:
 $T_a = 125^\circ\text{C}$ max.



Gate Drive with Protection Functions

PS9402 Gate drive coupler with protection functions
Integrated peripheral functions for reduced board area
(Gate driver with protection functions)

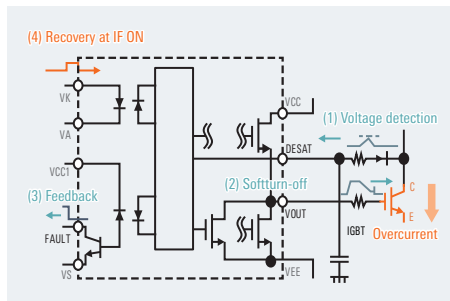
- Advantages
Lower design and board costs due to reduced need for external protection circuits and elimination of negative power supply
- Features
 - Two on-chip protection functions
 - Desat (desaturation detection)
 - Active Miller clamp



Desat

Protects the IGBT from damage from overcurrent.

- (1) Detects rise in the collector voltage due to overcurrent.
- (2) Softturn-off of Vout (Gate).
- (3) Fault feedback to the MCU.
- (4) Operation recovery when IF input turns on again.

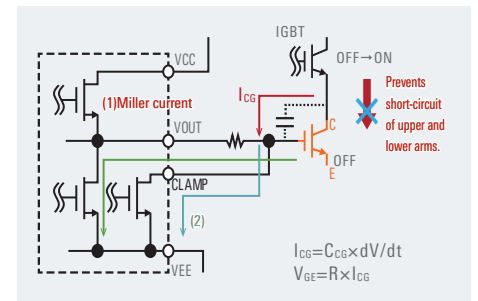


Active Miller clamp

Prevents short-circuit of upper and lower arms if turns on erroneously.

The displacement current (Miller current(1) *) when the upper arm turns on is drawn off by the clamp circuit(2), preventing erroneous on-switching.

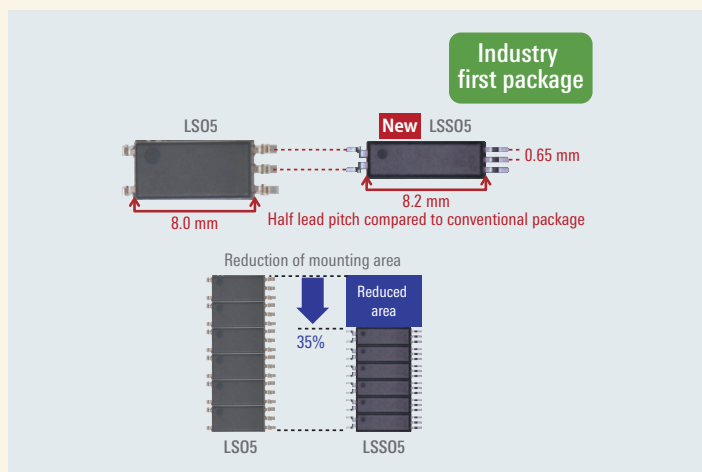
* Current (ICG) that flows to the Miller capacitance between the collector and gate of the IGBT



New Package

LSS05(5pin)/LSSOP(4pin)

- Downsizing while maintaining long creepage 8.2 mm (35% reduction in mounting area compared to LS05)
- Lineup: Gate drive, IPM drive, 15 Mbps, Transistor output



Isolation Amplifiers, Communication Applications

Δ - Σ Modulators, Isolation Amplifiers

RV1S9355A, RV1S9356A Δ - Σ Modulator/PS8352A Isolation Amplifier

Contributes to highly precise motor control with high precision and high input resistance.

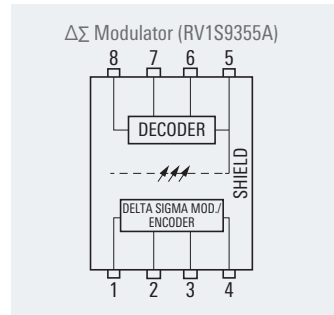
(Δ - Σ Modulator & Very High Precision Isolation Amplifier)

•Contribution

Direct connection to RZ/T and RX72M

•Features

- Output clock 20MHz TYP.
- High SNR 88dB TYP.
- Low offset temperature drift Small
1 μ V/°C MAX.

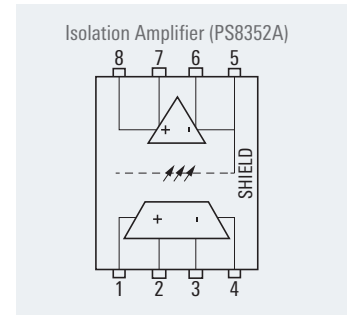


•Contribution

High-precision feedback

•Features

- High precision: Gain \pm 1% MAX.
- High input resistance: 450 k Ω



Transistor output coupler for ultra-low input current

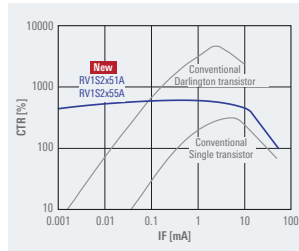
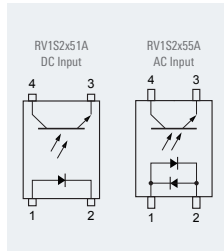
Input current $I_F=50 \mu$ A drive RV1S2x51A, RV1S2x55A

•Contribution

The high CTR in the low input current region enables low power consumption of the application and control of multiple photocouplers by an MCU.

•Features

- High CTR 300% or more
- High temperature compatible 115°C
- Creepage distance/Pin pitch
15/1.27mm (RV1S2451A)
8.2/1.3mm (RV1S225xA)
4/1.27mm (RV1S295xA)



4 channel transistor output coupler

World's smallest class

PS284x-4x

• Advantages

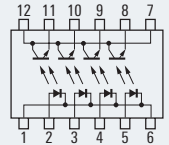
Compact I/O

• Features

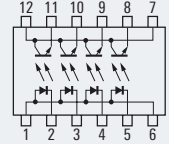
Low input

4-channel package

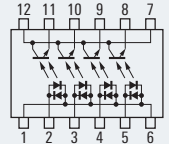
PS2841-4A



PS2841-4B



PS2845-4A



LSDIP

Advanced package for high-voltage systems

(Package with very long creepage of 15 mm)

• Features

- Long creepage of 15 mm
- High dielectric strength: 7.5 kV r.m.s.
- High surge resistance: 12 kV allowable transient voltage

• Advantages

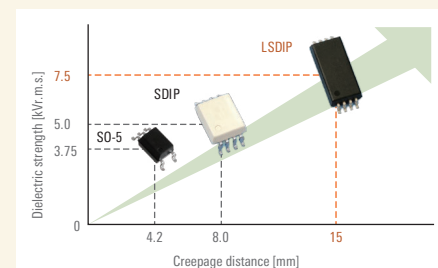
- Less board space is needed to ensure isolation.
- Enables smaller boards for large-capacity battery control.
- Simplifies high-voltage feedback.

• Lineup

- PS9905(2.5A), RV1S999xA(4A/10A) for Gate drive
- RV1S9960A for 15Mbps high-speed communication
- PS9924 for 10 Mbps high-speed communication
- PS8902 for 1 Mbps analog
- Transistor output coupler for ultra-low input current
RV1S2451A

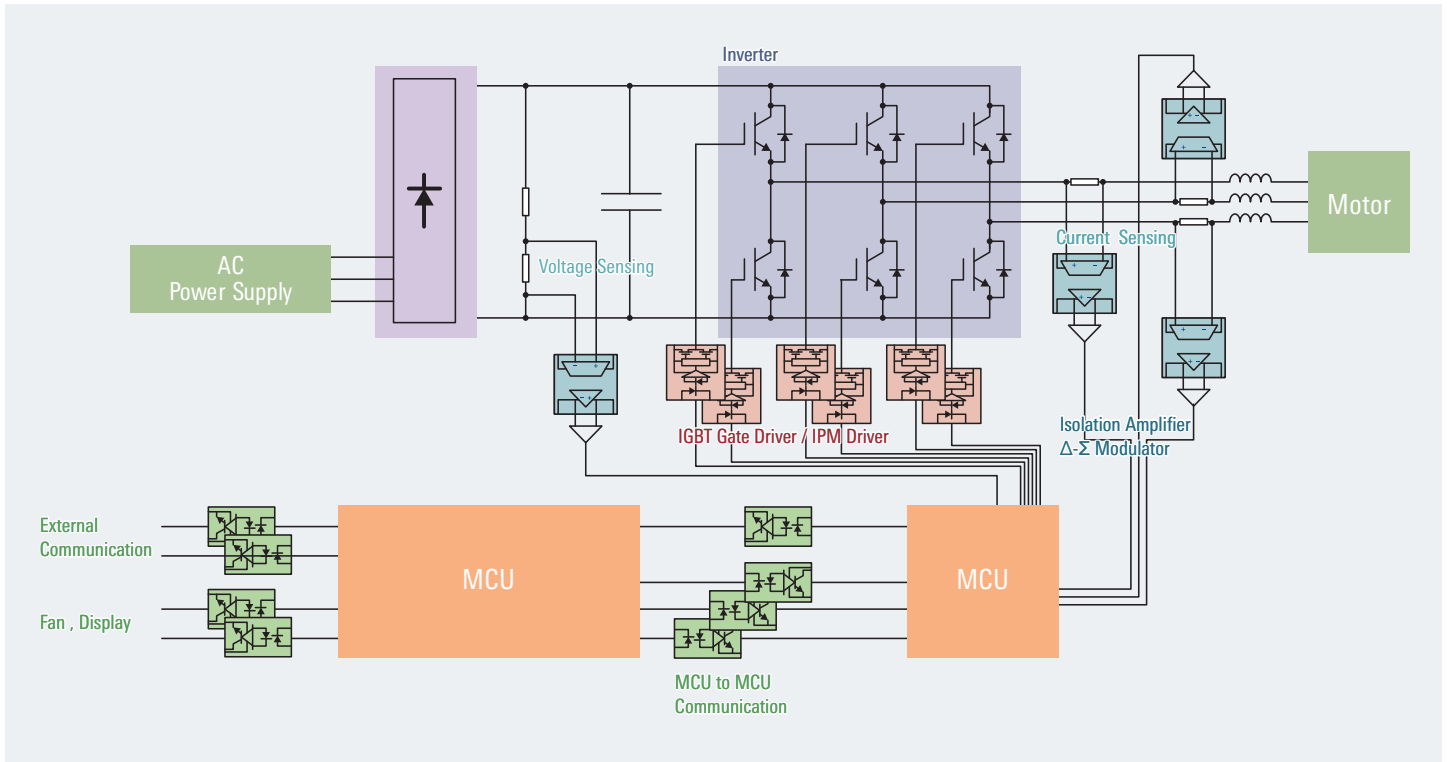
• Application

- 1500V Solar inverter
- 690V Industrial inverter
- 480V Medical equipment

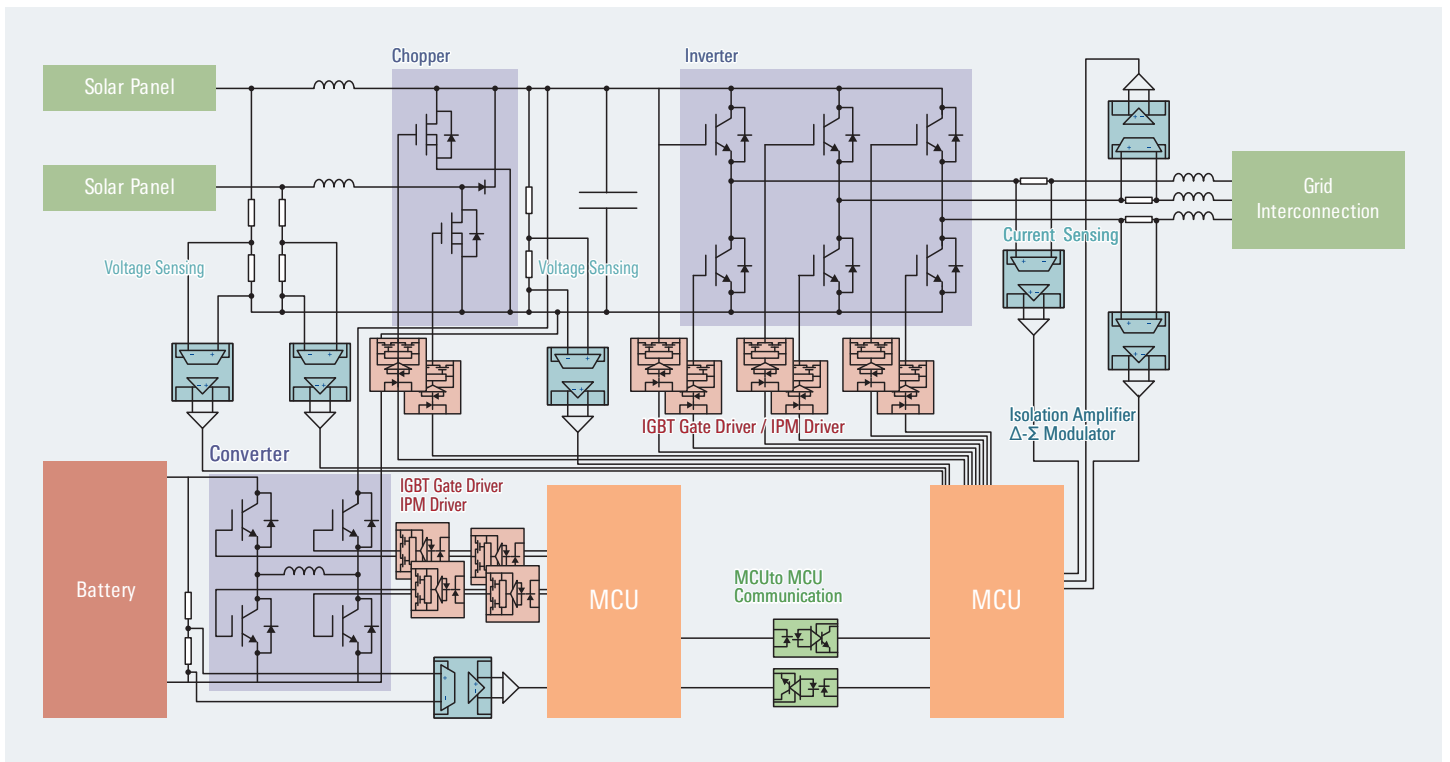


Application Examples

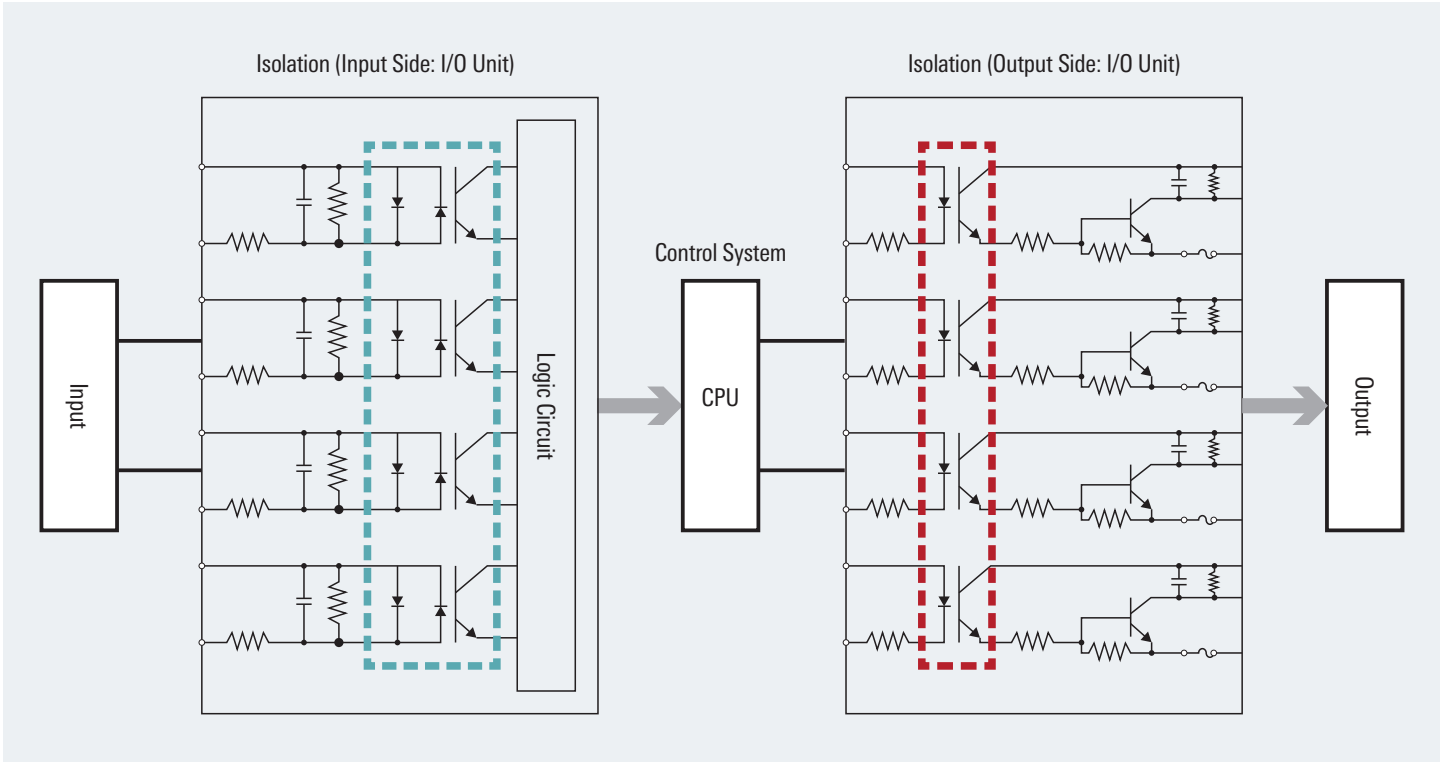
Motor Solution



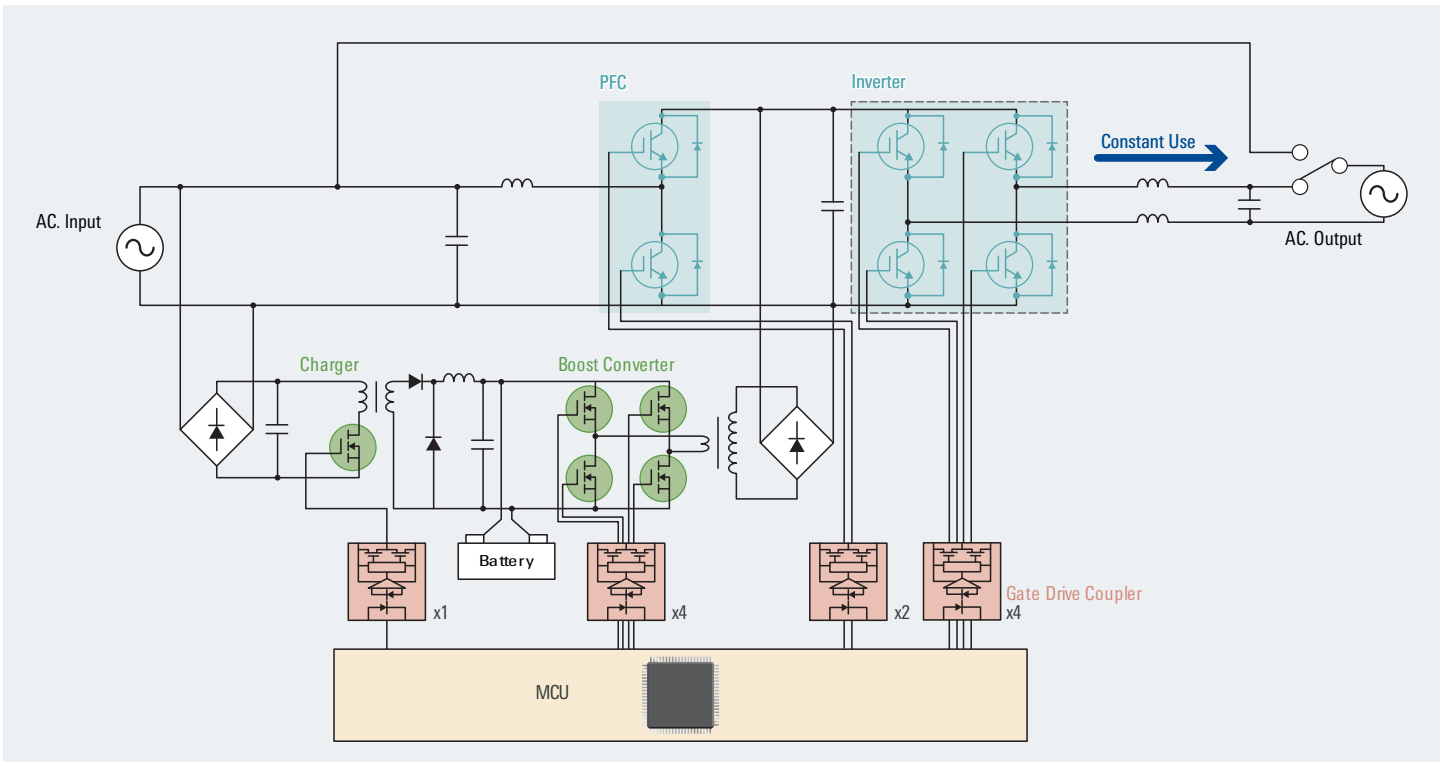
Power Control + Storage Battery



PLC



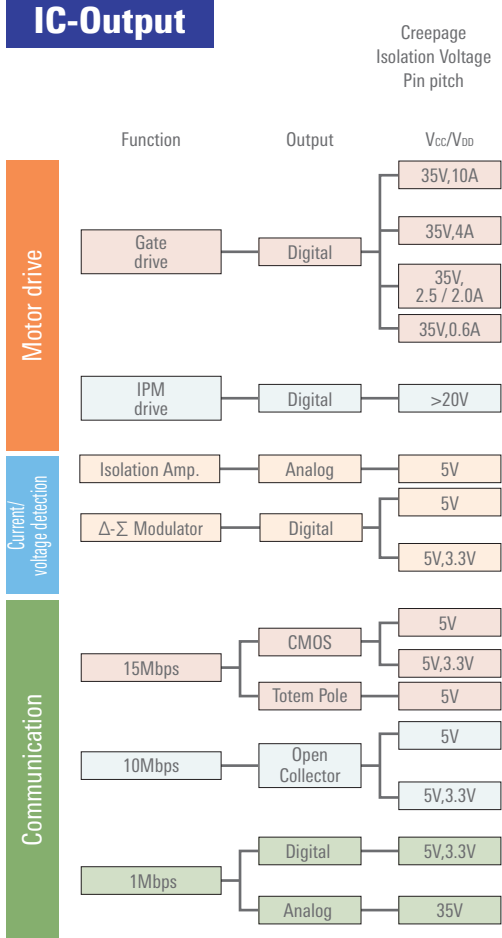
UPS



Product Lineup

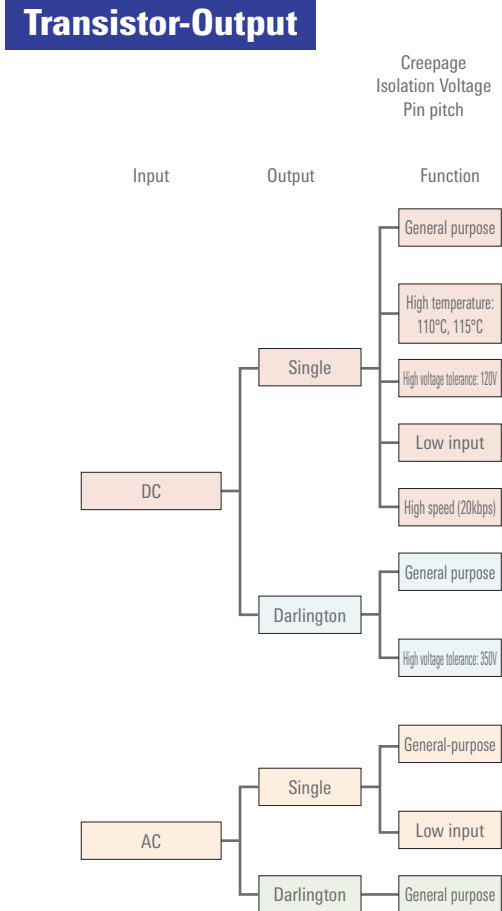
The extensive lineup extends from high-speed products for motor drive of communication applications to general-purpose transistor-output products.

IC-Output



DIP8 7/8 mm 5 kV 2.54 mm	SDIP6/8 7/8 mm 5 kV 1.27 mm	LSDIP8 15 mm 7.5 kV 1.27 mm	LS05 8 mm 5 kV 1.27 mm	S05 4.2 mm 3.75 kV 1.27 mm	LSS05 8.2 mm 5 kV 0.65 mm	S08 4 mm 2.5 kV 1.27 mm	S016 8 mm 5 kV 1.27 mm
		RV1S9993A RV1S9994A					
		RV1S9991A RV1S9992A	RV1S9091A RV1S9092A		RV1S9291A RV1S9292A		
PS9531	PS9331 PS9332	PS9905	PS9031		RV1S9231A		PS9402
PS9506	PS9307A				RV1S9207A		
PS9513	PS9313 PS9303 PS9309		PS9013 RV1S9062A PS9009 RV1S9061A	PS9113 RV1S9162A RV1S9161A	RV1S9213A RV1S9262A RV1S9209A RV1S9261A		
PS8551A PS9551A	PS8352A						
	RV1S9353A RV1S9355A RV1S9356A						
	PS9351			PS9151		PS9851-1 PS9851-2	
		RV1S9960A	RV1S9060A	RV1S9160A	RV1S9260A		
				PS9123			
PS9587	PS9317		PS9001	PS9117A		PS9817A-1 PS9817A-2	
	PS9324	PS9924		PS9124		PS9821-1 PS9821-2	
				PS9122		PS9822-1 PS9822-2	
PS8501 PS8502	PS8302	PS8902		PS8101		PS8802-1 PS8802-2	

Transistor-Output



DIP4 7/8 mm 5 kV 2.54 mm	LSOP 8 mm 5 kV 2.54 mm	SOP 5 mm 3.75 kV 2.54 mm	LSSOP 8.2 mm 5 kV 1.3 mm	LSDIP8 15 mm 7.5 kV 1.27 mm	SSOP 4/4.5/5 mm 1.5/2.5/3.75 kV 0.8/1.27 mm	Flat lead 4 mm 2.5 kV 1.27 mm
		PS2701A-1			PS2801C-1/4	
PS2561D-1 PS2561F-1	PS2381-1	PS2761B-1	RV1S2281A		PS2861B-1	
		PS2703-1				PS2913-1
		PS2711-1	RV1S2211A RV1S2251A	RV1S2451A	PS2811-1/4 PS2841-4A/4B	PS2911-1 RV1S2951A
PS2514-1						
PS2562-1		PS2702-1			PS2802-1/4	
PS2533-1 PS2535-1		PS2733-1			PS2833-1/4	PS2933-1
PS2565-1		PS2705A-1	RV1S2285A		PS2805C-1/4	
		PS2715-1	RV1S2255A		PS2815-1/4 PS2845-4A	PS2915-1 RV1S2955A
PS2506-1		PS2706-1				

Gate Drive

Function	Part No.	Output Peak Current [A]	Power Supply Voltage [V]	Package		Isolation Voltage [Vr.m.s.]	Ta max. [°C]	Electrical Characteristics					Protection Functions		
				Configuration	Creepage Distance [mm]			DC IFLH max. [mA]	SW			Protection			
									tpHL,LH max. [ns]	PWD max. [ns]	PDD [ns]	CMTI min. [kV/μs]	UVLO	Clamp	Desat
Gate Drive	PS9307A	0.6	10 to 30	SDIP6	L:7 L2:8	5000	125	5.0	150	50	-80 to 80	50	○	–	–
	RV1S9207A			LSSO5	8.2	5000	125	5.0	150	50	-80 to 80	50	○	–	–
	PS9506			DIP8	-/L3:7 L1/L2:8	5000	110	7.0	400	250	-300 to 300	25	–	–	–
	PS9031	2.5	15 to 30	LSO5	8	5000	125	4.0	175	75	-90 to 90	50	○	–	–
	RV1S9231A			LSSO5	8.2	5000	125	5.2	175	75	-90 to 90	50	○	–	–
	PS9331			SDIP6	L:7 L2:8	5000	125	4.0	175	75	-90 to 90	50	○	–	–
	PS9531			DIP8	-/L3:7 L1/L2:8	5000	125	4.0	175	75	-90 to 90	50	○	–	–
	PS9905			LSDIP8	15	7500	110	6.0	150	75	-100 to 100	25	○	–	–
	PS9332			SDIP8	L:7 L2:8	5000	125	4.0	200	75	-90 to 90	50	○	○	–
	PS9402			SO16	8	5000	110	5.0	200	100	-100 to 100	25	○	○	○
	RV1S9091A	4	10 to 30	LSO5	8	5000	125	6.0	95	35	-35 to 35	100	○	–	–
	RV1S9092A		13 to 30	LSO5	8	5000	125	6.0	95	35	-35 to 35	100	○	–	–
	RV1S9291A		10 to 30	LSSO5	8.2	5000	125	6.0	95	35	-35 to 35	100	○	–	–
	RV1S9292A		15 to 30	LSSO5	8.2	5000	125	6.0	95	35	-35 to 35	100	○	–	–
	RV1S9991A		10 to 30	LSDIP8	15	7500	125	8.0	95	35	-35 to 35	100	○	–	–
	RV1S9992A		15 to 30	LSDIP8	15	7500	125	8.0	95	35	-35 to 35	100	○	–	–
	RV1S9993A		10 to 30	LSDIP8	15	7500	125	8.0	95	35	-35 to 35	100	○	–	–
	RV1S9994A	15 to 30	LSDIP8	15	7500	125	8.0	95	35	-35 to 35	100	○	–	–	

IPM Drive

Function	Part No.	Output Type	Logic	Package		Recommended Operating Conditions	Absolute Maximum Ratings		Electrical Characteristics					
				Configuration	Creepage Distance [mm]		Power Supply Voltage [V]	Isolation Voltage [Vr.m.s.]	Ta max. [°C]	DC IFLH/LH max. [mA]	SW			CMTI min. [kV/μs]
											tpHL/LH max. [ns]	PWD max. [ns]	PDD max. [ns]	
IPM Drive	RV1S9161A	Totem Pole	Active High	S05	4.2	4.5 to 30	3750	125	3.0	60	20	25	100	
	PS9009			LSO5	8	4.5 to 20	5000	125	3.0	200	80	100	50	
	RV1S9061A					4.5 to 30	5000	125	4.5	60	20	25	100	
	RV1S9209A			LSSO5	8.2	4.5 to 20	5000	125	3.8	200	80	100	50	
	RV1S9261A					4.5 to 30	5000	125	4.0	60	20	25	100	
	PS9309			SDIP6	L:7 L2:8	4.5 to 20	5000	110	3.0	200	80	80	15	
	PS9303			SDIP6	L:7 L2:8	4.5 to 20	5000	100	5.0	500	350	–	15	
	RV1S9162A			S05	4.2	4.5 to 30	3750	125	3.0	60	20	25	100	
	RV1S9062A			LSO5	8	4.5 to 30	5000	125	4.1	60	20	25	100	
	RV1S9262A			LSSO5	8.2	4.5 to 30	5000	125	4.0	60	20	25	100	
	PS9513	Open Collector	Active Low	DIP8	-/L3:7 L1/L2:8	4.5 to 20	5000	100	5.0	500/750	650	650	15	
	PS9013			LSO5	8	4.5 to 25	5000	125	5.0	500/750	650	650	50	
	RV1S9213A			LSSO5	8.2	4.5 to 25	5000	125	5.0	500/750	650	650	50	
	PS9313			SDIP6	L:7 L2:8	4.5 to 20	5000	110	5.0	500/750	650	650	15	
	PS9113			S05	4.2	4.5 to 20	3750	100	5.0	500/750	650	650	15	

Isolation Amplifiers

Function	Part No.	Output	Package		Absolute Maximum Ratings		Electrical Characteristics							
			Configuration	Creepage Distance [mm]	Isolation Voltage [Vr.m.s.]	Ta max. [°C]	Input Voltage Linearity Range [mV]	Gain typ. [V/V]	Gain Error Max. [%]	NL typ. [%]	VDD2 [V]	CMTI min. [kV/μs]	fc typ. [kHz]	Output Type
Isolation amplifier	PS8551A	Analog	DIP8	8	5000	105	-200 to 200	8	1	0.014	5	10	100	Differential
	PS8352A		SDIP8	8	5000	110	-200 to 200	8	1	0.014	5	10	100	Differential

Δ-Σ Modulators

Function	Part No.	Output	Package		Absolute Maximum Ratings		Electrical Characteristics							
			Configuration	Creepage Distance [mm]	Isolation Voltage [Vr.m.s.]	Ta max. [°C]	Input Voltage Linearity Range [mV]	Gain Error Max. [%]	INL typ. [LSB]	VDD2 [V]	ENOB typ. [bits]	CMTI min. [kV/μs]	fCLK typ. [MHz]	
Δ-Σ Modulators	PS9551A	Digital	DIP8	8	5000	105	-200 to 200	1	3	5	12	15	10	
	RV1S9353A		SDIP8	8	5000	110	-200 to 200	0.5	3	3.3/5	13.8	15	10	
	RV1S9355A		SDIP8	8	5000	125	-250 to 250	0.5	3	3.3/5	14	50	20	
	RV1S9356A		SDIP8	8	5000	125	-250 to 250	0.5	3	3.3/5	14	50	20	

High-Speed Communication (Analog)

Function	Part No.	Speed [bps]	Output Type	Absolute Maximum Rated Power Supply Voltage [V]	Package		Isolation Voltage [Vr.m.s.]	Ta max. [°C]	Electrical Characteristics						
					Configuration	Creepage Distance [mm]			Detector				Coupled		
									IOH @Vcc30V max. [μA]	VOL max. [V]	ICCL typ. [μA]	ICCH max. [μA]	CTR@ IF 16mA Vcc 4.5V Vo 0.4V [%]	tpHL/LH max. [ns]	CMTI min. [kV/μs]
High-Speed Communication (Analog)	PS8101	1M	Open Collector	35	S05	4.2	3750	100	100	0.4	50	2	15 to 35	800/1200	15
	PS8802-1/-2				S08	4.0	2500	100	100	0.4	100/200	2/4	15 and Over	800/1200	15
	PS8302				SDIP6	L:7 L2:8	5000	110	100	0.4	150	1	15 and Over	800/800	15
	PS8501				DIP8	-L3:7 L1/L2:8	5000	100	100	0.4	150	1	15 and Over	800/800	-
	PS8502								100	0.4	150	1	15 and Over	800/800	15
	PS8902				LSDIP8	15	7500	110	100	0.4	50	2	15 to 35	800/1200	15

High-Speed Communication (Digital)

Function	Part No.	Speed [bps]	Output Type	Power Supply Voltage [V]	Package		Isolation Voltage [Vr.m.s.]	Ta max. [°C]	DC			AC				
					Configuration	Creepage Distance [mm]			VOL max. [V]	VOH min. [V]	ICCL/H max. [mA]	IFHL max. [mA]	tpHL/LH max. [ns]	PWD max. [ns]	tpsk max. [ns]	CMTI min. [kV/μs]
High-Speed Communication (Digital)	PS9122	1M	Open Collector	N 2.7~3.6, L 4.5~5.5	S05	4.2	3750	100	0.6	-	3.5/2.5	5.0	500/700	200	-	15
	PS9822-1/-2				S08	4.0	2500	100	0.6	-	3.5/2.5	5.0	500/700	200	-	-
	PS9124				S05	4.2	3750	110	0.6	-	10/7	3.0	100/100	35	40	10
	PS9324	10M	Open Collector	2.7~3.6 & 4.5~5.5	SDIP6	L:7 L2:8	5000	110	0.6	-	10/7	3.0	100/100	35	40	15
	PS9924				LSDIP8	15	7500	110	0.6	-	10/7	5.0	100/100	35	40	15
	PS9821-1/-2				S08	4.0	2500	85	0.6	-	10/7	5.0	100/100	35	40	15
	PS9587				DIP8	-L3:7 L1/L2:8	5000	85	0.6	-	11/8	5.0	100/100	50	60	15
	PS9317				SDIP6	L:7 L2:8	5000	85	0.6	-	10/7	5.0	75/75	35	40	15
	PS9001				LS05	8.0	5000	125	0.6	-	2/2	4.0	100/100	50	60	50
	PS9117A	S05	4.2	3750	85	0.6	-	10/7	5.0	100/100	35	40	15			
	PS9817A-1/-2	S08	4.0	2500	85	0.6	-	10/7	5.0	100/100	35	40	15			
	PS9123	15M	Totem Pole	4.5~5.5	S05	4.2	3750	100	0.6	2.4	10/7	5.0	60/60	30	-	15
	PS9151				S05	4.2	3750	100	0.1	4.0	5/5	5.0	60/60	30	40	15
	RV1S9160A		CMOS	4.5~5.5	S05	4.2	3750	125	0.1	VDD-0.1	2/2	2	60/60	20	25	50
	PS9851				S08	4.0	2500	100	0.1	4.0	5/5	6.0	60/60	30	40	10
	RV1S9060A				LS05	8	5000	125	0.1	VDD-0.1	2/2	2.2	60/60	20	25	50
RV1S9260A	LSS05				8.2	5000	125	0.1	VDD-0.1	2/2	2.6	60/60	20	25	50	
PS9351	SDIP6				L:7 L2:8	5000	100	0.1	4.0	5/5	5.0	60/60	30	40	15	
RV1S9960A	LSDIP8				15	7500	110	0.1	VDD-0.1	2/2	3.8	60/60	20	25	50	

Transistor-Output (DC Input) Single

Function	Part No.	Output Type	Package		Absolute Maximum Ratings				Electrical Characteristics				
			Configuration	Creepage Distance [mm]	VCEO max. [V]	IC max. [mA]	Isolation Voltage [Vr.m.s.]	Ta max. [°C]	DC		SW		
									CTR %	tr typ. [μs]	tf typ. [μs]	ton typ. [μs]	toff typ. [μs]
Transistor-Output (DC Input)	PS2561D-1	Single	DIP4	-L:7 L1/L2:8	80	50	5000	110	50 to 400	3	5	–	–
	PS2561F-1		DIP4	7	80	50	5000	110	300 to 600	5	7	–	–
	PS2514-1		DIP4	7	40	20	5000	100	50 to 200	–	–	15	15
	PS2381-1		LSOP4	8	80	50	5000	115	50 to 400	4	5	–	–
	RV1S2281A		LSSOP	8.2	80	30	5000	115	50 to 400	4	5	–	–
	PS2701A-1		SOP4	5	70	30	3750	100	50 to 300	5	7	8	10
	PS2761B-1		SOP4	5	70	50	3750	110	50 to 400	4	5	8	5
	PS2703-1		SOP4	5	120	30	3750	100	50 to 400	10	10	13	11
	PS2711-1		SOP4	5	40	40	3750	100	100 to 400	4	5	–	–
	PS2801C-1		SSOP4	4.5	80	30	2500	100	50 to 400	5	7	10	7
	PS2801C-4		SSOP16	4.5	80	30	2500	100	50 to 400	5	7	10	7
	PS2861B-1		SSOP4	5	70	50	3750	110	50 to 300	4	5	5	5
	PS2811-1		SSOP4	4.5	40	40	2500	100	100 to 400	4	5	7	5
	PS2811-4		SSOP16	4.5	40	40	2500	100	100 to 400	4	5	7	5
	RV1S2211A		LSSOP	8.2	40	40	5000	115	100 to 400	4	5	–	–
	RV1S2251A		LSSOP	8.2	40	80	5000	115	300 to 1000	5	6	–	–
	RV1S2451A		LSDIP8	15	40	80	7500	115	300 to 1000	5	6	–	–
	PS2841-4A		SSOP Common Leads	4	70	20	1500	100	100 to 400	–	–	20	110
	PS2841-4B		SSOP Common Leads	4	70	20	1500	100	100 to 400	–	–	20	110
	PS2911-1		Flat Leads	4	40	40	2500	100	100 to 400	5	10	40	120
PS2913-1	Flat Leads	4	120	30	2500	100	50 to 200	10	10	80	50		
RV1S2951A	Flat Leads	4	40	80	2500	115	300 to 800	5	6	–	–		

Transistor-Output (DC Input) Darlington

Function	Part No.	Output Type	Absolute Maximum Ratings		Package		Isolation Voltage [Vr.m.s.]	Ta max. [°C]	Electrical Characteristics						
			VCEO [V]	IC [mA/ch]	Configuration	Creepage Distance [mm]			DC			SW			
							CTR min. [%]	CTR max. [%]	VCE SAT [V]	tr typ. [μs]	tf typ. [μs]	ton typ. [μs]	toff typ. [μs]		
Transistor-Output (DC Input)	PS2802-1	Darlington	40	90	SSOP4	4.5	2500	100	200	–	1.0	200	200	–	–
	PS2802-4			100	SSOP16	4.5	2500	100	200	–	1.0	200	200	–	–
	PS2562-1			200	DIP4	7	5000	100	200	–	1.0	100	100	–	–
	PS2702-1			200	SOP4	5	3750	100	200	–	1.0	70	60	90	60
	PS2833-1		350	60	SSOP4	4.5	2500	100	400	4500	1.0	20	5	–	–
	PS2833-4			60	SSOP16	4.5	2500	100	400	4500	1.0	20	5	–	–
	PS2535-1			120	DIP4	7	5000	100	400	5500	1.0	18	5	–	–
	PS2533-1			150	DIP4	7	5000	100	1500	6500	1.0	100	100	–	–
PS2733-1	150	SOP4	5	2500	100	1500	–	1.0	100	100	–	–			

Transistor-Output (AC Input)

Function	Part No.	Output Type	Package		Absolute Maximum Ratings				Electrical Characteristics				
			Configuration	Creepage Distance [mm]	VCEO max. [V]	IC max. [mA]	Isolation Voltage [Vr.m.s.]	Ta max. [°C]	DC		SW		
									CTR %	tr typ. [μs]	tf typ. [μs]	ton typ. [μs]	toff typ. [μs]
Transistor-Output (AC Input)	PS2565-1	Single	DIP4	7	80	50	5000	100	80 to 400	3	5	–	–
	PS2705A-1		SOP4	5	70	30	3750	100	50 to 300	5	7	8	10
	PS2715-1		SOP4	5	40	40	3750	100	100 to 400	4	5	–	–
	PS2805C-1		SSOP4	4.5	80	30	2500	100	50 to 400	5	7	10	7
	PS2805C-4		SSOP16	4.5	80	30	2500	100	50 to 400	5	7	10	7
	PS2815-1		SSOP4	4.5	40	40	2500	100	100 to 400	4	5	7	5
	PS2815-4		SSOP16	4.5	40	40	2500	100	100 to 400	4	5	7	5
	RV1S2285A		LSSOP	8.2	80	30	5000	115	50 to 400	4	5	–	–
	RV1S2255A		LSSOP	8.2	40	80	5000	115	300 to 1000	5	6	–	–
	PS2845-4A		SSOP Common Leads	4	70	20	1500	100	100 to 400	–	–	20	110
	PS2915-1		Flat Leads	4	40	40	2500	100	100 to 400	5	10	40	120
	RV1S2955A		Flat Leads	4	40	80	2500	115	300 to 800	5	6	–	–
	PS2506-1		Darlington	DIP4	7	40	200	5000	100	200 min.	100	100	–
	PS2706-1	SOP4		5	40	200	3750	100	200 min.	200	200	–	–

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