

Renesas' industry-leading PCIe® timing portfolio provides the most complete solution for networking, storage, compute, accelerator, and industrial applications.

Our PCIe clock generators, zero-delay / fanout buffers, and fanout multiplexers support PCIe Gen 5/6 data rates and derivatives. These devices are all designed to work together to form a complete solution. Renesas' patented LP-HCSL outputs with integrated terminations eliminate up to 4 resistors per differential output, saving board space and reducing output power by up to 90% over standard HCSL outputs.

Our extensive selection of timing devices allows designers to implement the most complex PCI Express clock trees while maintaining timing margin, minimizing board space, and reducing power consumption, thus ensuring robust system operation.

Performance

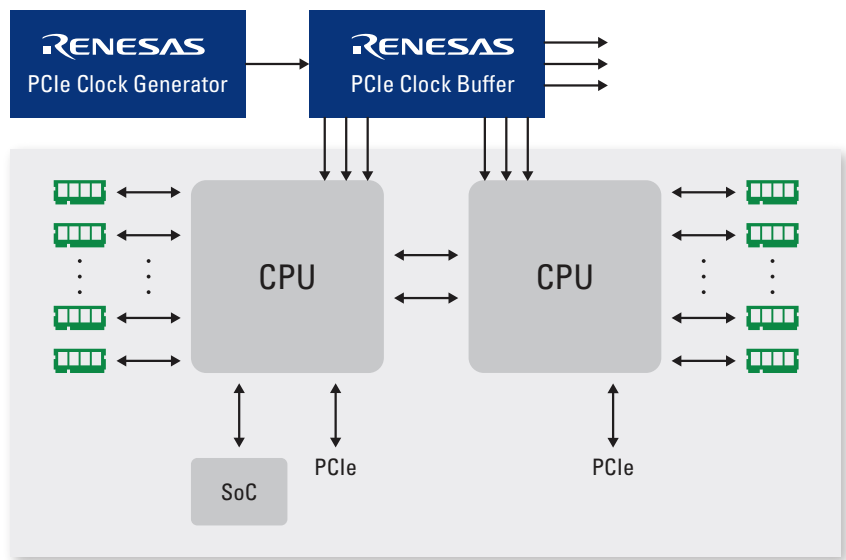
- PCIe Gen 6, 64GT/s
- PCIe Gen 5, 32GT/s

Integration

- Integrated terminations save up to 160 mm² board area
- Integrated crystal load capacitors on programmable devices
- Integrated devices crystal options available

Security

- Software write protection available



PCI Express Gen 5/6 Timing Solutions

9FG Clock (Frequency) Generators

- Eliminate up to 32 resistors
- Save up to 55 mm² of area[†]
- As small as 6.25 mm²
- 85Ω and 100Ω system support
- SSC generation

RC190/9ZX/9DB Zero-delay Fanout Buffers

- Eliminate up to 96 resistors
- Save up to 160 mm² of area[†]
- As small as 16 mm²
- 85Ω and 100Ω system support
- SSC compatible

RC192/9ZM/9DM Fanout Multiplexers

- Eliminate up to 64 resistors
- Save up to 110 mm² of area[†]
- As small as 9 mm²
- 85Ω and 100Ω system support
- SSC compatible

[†] Compared to traditional HCSL outputs

PCI EXPRESS TIMING SOLUTIONS

PCIe Gen6 Timing Solutions for CC, SRNS, SRIS Architectures

Function	Voltage	Part Number	PCIe Outputs	Zout (Ω)	Features	Package Type	Package Size (mm)
Fanout Buffer	3.3V	RC19004A	4	85	LOS, PDT, ACP, FSS, SBI, Write Protect	QFN-24	4 x 4
		RC19008A	8			QFN-40	5 x 5
		RC19013A	13			QFN-56	7 x 7
		RC19016A	16			QFN-64	9 x 9
		RC19020A	20		LOS, PDT, ACP, FSS, SBI, Write Protect, DB2000QL pinout	GQFN-80	6 x 6
		9QXL2001C	20		DB2000QL for PCIe Gen6	GQFN-80	6 x 6
		RC19020A072	20		LOS, PDT, ACP, FSS, SBI, Write Protect, DB2000Q pinout	QFN-72	10 x 10
		9QXL2000C	20		DB2000Q for PCIe Gen6	QFN-72	10 x 10
		RC19024A	24		LOS, PDT, ACP, FSS, SBI, Write Protect	QFN-100	8 x 8
		RC19004A100	4		100	LOS, PDT, ACP, FSS, SBI, Write Protect	QFN-24
	RC19008A100	8	QFN-40	5 x 5			
	RC19013A100	13	QFN-56	7 x 7			
	RC19016A100	16	QFN-64	9 x 9			
	Multiplexer	3.3V	RC19202A	2	85/100 selectable	2-inputs, LOS, PDT, ACP, FSS, SBI, Write Protect	QFN-20
RC19204A			4	QFN-28			4 x 4
RC19208A			8	QFN-48			6 x 6
RC19216A			16	GQFN-80			6 x 6
1.8V-3.3V		9DML4493	4	85/100 selectable	4-inputs, PDT	QFN-32	5 x 5
Generator	3.3V	9SQ440	20	85	CK440Q, PDT, SBI	QFN-100	8 x 8
	1.8V-3.3V	9FGV1002	4	85/100 programmable	Integrated crystal options available. See datasheet.	QFN-24	4 x 4
		9FGV1006	2			LGA-16	3 x 3

Features description:

LOS: Loss of Signal output indicates when input clock is lost.

PDT: Power Down Tolerant pins can be driven even if VDD is not applied to the device.

ACP: Automatic Clock Parking places the outputs in a low/low state if the input clock is lost.

FSS: Flexible Startup Sequencing allows power, control pins and/or input clocks to be applied in any order.

SBI: 4-wire Side Band Interface, similar to the 9SQ440, allows rapid hardware control of output enables.

Write Protect: Software write protection bits prevent unintended SMBus writes.

PCI EXPRESS TIMING SOLUTIONS

PCIe Gen5 Timing Solutions for CC, SRNS, SRIS Architectures

Function	Voltage	Part Number	PCIe Outputs	Zout (Ω)	Comments	Package Type	Package Size (mm)
Zero-Delay / Fan-out Buffer	3.3V	9ZXL0451	4	85		QFN-32	5 x 5
		9ZXL0631 9ZXL0651	6	33 85		QFN-40	5 x 5
		9ZXL0831 9ZXL0851	8	33 85	DB800ZL	QFN-48	6 x 6
		9ZXL1231 9ZXL1251	12	33 85	DB1200ZL	QFN-64	9 x 9
		9ZXL1530 9ZXL1550	15	33 85		QFN-64	9 x 9
		9ZXL1930 9ZXL1950	19	33 85	DB1900Z	QFN-72	10 x 10
	1.8V	9DBV0231 9DBV0241	2	33 100		QFN-24	4 x 4
		9DBV0431 9DBV0441	4	33 100		QFN-32	5 x 5
		9DBV0631 9DBV0641	6	33 100		QFN-40	5 x 5
		9DBV0831 9DBV0841	8	33 100		QFN-48	6 x 6
Fanout Buffer	1.8V	9DBV0531 9DBV0541	5	33 100		QFN-32	5 x 5
		9DBV0731 9DBV0741	7	33 100		QFN-40	5 x 5
		9DBV0931 9DBV0941	9	33 100		QFN-48	6 x 6
Multiplexer	3.3V	9DML0441 9DML0451	4	100 85	2 inputs	QFN-24	4 x 4
		9DML2855	8	85		QFN-48	6 x 6
		9ZML1245 9ZML1255	12	100 85		QFN-72	10 x 10
	1.8V	9DMV0131 9DMV0141	1	33 100	2 inputs	QFN-16	3 x 3
Generator	3.3V	9FGL0241 9FGL0251	2	100 85		QFN-24	4 x 4
		9FGL0441 9FGL0451	4	100 85		QFN-32	5 x 5
		9FGL0641 9FGL0651	6	100 85		QFN-40	5 x 5
		9FGL0841 9FGL0851	8	100 85		QFN-48	6 x 6



To request samples, download documentation or learn more visit: renesas.com/pcietiming



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