

## PRODUCT BRIEF

# PI7C9X2G404xxQ Family

## Automotive Gen2 PCIe® 3~4-Port/4-Lane ExtremeLo/SlimPacket Packet Switch

The PI7C9X2G404xxQ Family is an Automotive compliant PCI Express® 2.1 3~4-port/4-lane PCI Express Switch specifically designed to be AEC-Q100 qualified and the latest low-power and lead (Pb)-free requirements. The PI7C9X2G404xxQ Family is a high-performance, cost-effective solution that can be implemented in systems such as Automotive Safety and Security, Traffic Mapping, Infotainment and Telematics platforms.

The PI7C9X2G404xxQ Family provides one x1 or x2 upstream port and two or three x1 downstream ports. The PI7C9X2G404xxQ Family provides users the flexibility to expand or fan-out from a wide range of Bridges such as Automotive MCU, FPGA, video processing and other application specification ICs.

### Industry Specifications Compliance

- AEC-Q100, Grade 3
- PCISIG PCI Express 2.1 certificated
- PCI Express® Base Specification, Revision 2.1
- PCI Express CEM Specification, Revision 2.0
- PCI-to-PCI Bridge Architecture Spec., Rev 1.2
- Advanced Configuration Power Interface (ACPI) Specification

### Applications

- Automotive Telematics and Infotainment
- In-vehicle Wireless AP/Router
- V2V System
- ADAS
- Vehicle Navigation
- Safety and Security
- V2G System

### Product Features

#### Features

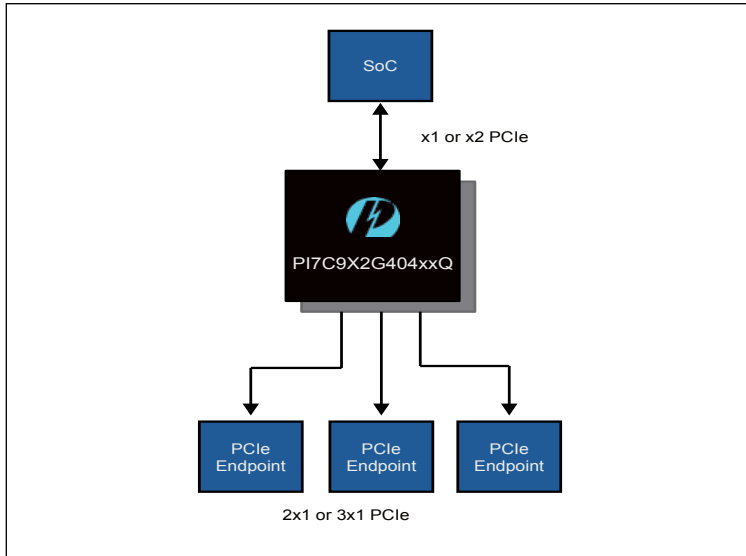
- Integrated 100MHz Clock buffer for each downstream port
- Reliability, Availability and Serviceability
  - Supports Data Poisoning and End-to-End CRC
  - Advanced Error Reporting and Logging
  - IEEE 1149.1 JTAG interface support
- Link Power Management
  - Supports L0, L0s, L1, L2, L2/L3Ready and L3 link power state
  - Active state power management for L0s and L1 state
- Device State Power Management
  - Supports D0, D3Hot and D3Cold
  - 3.3V Aux Power support in D3Cold power state
- Supports up to 512-byte maximum payload size
- Power Dissipation: 650 mW typical in L0 normal mode and 200 mW typical in L1 mode
- Automotive Temperature Range: -40° to 85°C
- MTBF: 50,927,360 hours
- Package:
  - 136-pin aQFN 10mmx10mm
  - 128-pin LQFP 14mm x 14mm
- Pb free and 100% Green

#### Enhanced Features

- Programmable Driver Current and De-Emphasis Level at each individual port
- 150ns typical latency for packet running through switch without blocking
- Supports “Cut-through”(Default) as well as “Store and Forward” mode for switching packets
- Advanced Power Savings
  - Empty downstream ports are set to idle
  - Clock to corresponding circuit is turned off when any port enters L1 or ASPM L1
- Supports Access Control Service (ACS) for peer-to-peer traffic
- Supports Address Translation (AT) packet for SR-IOV application
- Supports Latency Tolerance Reporting (LTR) to improve platform power management
- Supports Optimized Buffer Flush Fill (OBFF) to improve platform power management

## PRODUCT BRIEF

### Application Diagram



### PI7C9X2G404xxQ Family Features

Part Number	Ports	Lanes	AEC-Q100	Latency (ns)	Clock Buffer	Temp. (°C)	Package (mm)	Pkt pins	Pb free
PI7C9X2G304ELQ	3	4	Grade 3	<150	Yes	-40°+85°	10x10 aQFN	136	Yes
PI7C9X2G304SLQ	3	4	Grade 3	<150	Yes	-40°+85°	14x14 LQFP	128	Yes
PI7C9X2G404ELQ	4	4	Grade 3	<150	Yes	-40°+85°	10x10 aQFN	136	Yes
PI7C9X2G404SLQ	4	4	Grade 3	<150	Yes	-40°+85°	14x14 LQFP	128	Yes

### Ordering Information

Part Number	Package (mm)	AEC-Q100	Product Description	Evaluation kit Part Number	Product Description
PI7C9X2G304ELQZXAEX <sup>+</sup>	10 x 10mm aQFN	Grade 3	3ports, 4Lanes PCIe2.1 Packet Switch	PI7C9X2G304ELEVB-X1U	Evaluation kit for PI7C9X2G304ELQ
PI7C9X2G304SLBQFDEX <sup>+</sup>	14 x 14mm LQFP	Grade 3	3ports, 4Lanes PCIe2.1 Packet Switch	PI7C9X2G304SLBEVB-X1U	Evaluation kit for PI7C9X2G304SLBQ
PI7C9X2G404ELQZXAEX <sup>+</sup>	10 x 10mm aQFN	Grade 3	4ports, 4Lanes PCIe2.1 Packet Switch	PI7C9X2G404ELEVB	Evaluation kit for PI7C9X2G404ELQ
PI7C9X2G404SLBQFDEX <sup>+</sup>	14 x 14mm LQFP	Grade 3	4ports, 4Lanes PCIe2.1 Packet Switch	PI7C9X2G404SLBEVB	Evaluation kit for PI7C9X2G404SLBQ

<sup>+</sup>Notes:

1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See <http://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free. Thermal characteristics can be found on the company web site at [www.diodes.com/design/support/packaging/](http://www.diodes.com/design/support/packaging/)
3. E = Pb-free and Green
4. Adding an X suffix = Tape/Reel