PCIe-7822 Specifications

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PCIe-7822R Specifications

The following specifications are typical at 25 °C unless otherwise noted.

Digital I/O

Number of connectors	4
Number of channels per connector	32
Maximum frequency	80 MHz
Compatibility	LVTTL, LVCMOS
Logic family	Software-selectable
Default software setting	3.3 V

Table 1. Digital Input Logic Levels

Logic Family	Input Low Voltage (V_{IL})		Input High Voltage (V_{IH})	
	Minimum	Maximum	Minimum	Maximum
1.2 V	-0.3 V	0.40 V	0.84 V	1.5 V
1.5 V	-0.3 V	0.50 V	1.05 V	1.8 V
1.8 V	-0.3 V	0.60 V	1.25 V	2.1 V
2.5 V	-0.3 V	0.70 V	1.70 V	2.8 V
3.3 V	-0.3 V	0.80 V	2.00 V	3.6 V

Input leakage current	±15 µA maximum
Input impedance	50 kΩ typical, pull-down

Table 2. Digital Output Logic Levels

Logic Family	Current	Output Low Voltage (V_{OL}) Maximum	Output High Voltage (V_{OH}) Minimum
1.2 V	100 µA	0.20 V	1.00 V
1.5 V	100 µA	0.20 V	1.25 V
1.8 V	100 µA	0.20 V	1.54 V
2.5 V	100 µA	0.20 V	2.22 V
3.3 V	100 µA	0.20 V	3.00 V
	4 mA	0.40 V	2.40 V

Maximum DC output current per channel	
Source	4.0 mA
Sink	4.0 mA

Output impedance	50 Ω
Power-on state[1]	Programmable, by line
Protection[2]	±20 V, single line

Digital I/O voltage selection	Programmable, per connector, and defined at compilation (not run-time configurable)
Direction control of digital I/O channels	Per channel
Minimum I/O pulse width	6.25 ns
Minimum sampling period	5 ns

External Clock

Direction	Input into device
Maximum input leakage	±15 µA
Characteristic impedance	50 Ω
Power-on state	Tristated
Minimum input	Inherited from programmed digital voltage selection per connector
Maximum input	Inherited from programmed digital voltage selection per connector
Logic level	Inherited from programmed digital voltage selection per connector

Maximum input frequency	80 MHz

Reconfigurable FPGA

FPGA type	Kintex-7 325T
Number of flip-flops	407,600
Number of LUTs	203,800
Embedded Block RAM	16,020 kbits
Number of DSP48 slices	840
Timebase	40 MHz, 80 MHz, 120 MHz, 160 MHz, or 200 MHz
Default timebase	40 MHz
Timebase accuracy	±100 ppm, 250 pspeak-to-peak jitter
Data transfers	DMA, interrupts, programmed I/O

Onboard DRAM

Memory size	1 Bank; 512 MB

Maximum theoretical data rate	800 MB/s streaming

Synchronization Resources

Input/output source	RTSI<0..7>

Bus Interface

Form factor	x4 PCI Express, specification v1.0 compliant
Slot compatibility	x4, x8, and x16 PCI Express slots
Data transfers	DMA, interrupts, programmed I/O
Number of DMA channels	16

Power Requirements

Power requirements are dependent on the digital output loads and configuration of the LabVIEW FPGA VI used in your application.

+3.3 V	3 A
+12 V	2 A

Physical Characteristics

Note If you need to clean the device, wipe it with a dry, clean towel.

Dimensions	18.1 cm × 12.6 cm × 2.2 cm(7.1 in. × 5.0 in. × 0.9 in.)
Weight	171 g (6.03 oz)
I/O connectors	4 × 68-pin VHDCI

Safety Voltages

Connect only voltages that are below these limits.

Channel-to-earth	±12 V, Measurement Category I
Channel-to-channel	±24 V, Measurement Category I

Caution Do not connect the PCIe-7822R to signals or use for measurements within Measurement Categories II, III, or IV.

Attention Ne connectez pas le PCIe-7822R à des signaux et ne l'utilisez pas pour effectuer des mesures dans les catégories de mesure II, III ou IV.

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as ***MAINS*** voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage

measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Safety

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1

Note For UL and other safety certifications, refer to the product label or the Online Product Certification section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In

Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations and certifications, and additional information, refer to the Online Product Certification section.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

Environmental

Refer to the manual for the chassis you are using for more information about meeting these specifications.

Operating temperature (IEC 60068-2-1, IEC 60068-2-2)	0 °C to 40 °C
Storage temperature (IEC 60068-2-1, IEC 60068-2-2)	- 20 °C to 70 °C

Operating humidity (IEC 60068-2-56)	10% RH to 90% RH, noncondensing
Storage humidity (IEC 60068-2-56)	5% RH to 95% RH, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m

Indoor use only.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the ***Engineering a Healthy Planet*** web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

EU and UK Customers

- **Waste Electrical and Electronic Equipment (WEEE)**—At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国RoHS）

- **中国RoHS**— NI符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于NI中国RoHS合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/

environment/rohs_china.)

NI Services

Visit ni.com/support to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit ni.com/services to learn about NI service offerings such as calibration options, repair, and replacement.

Visit ni.com/register to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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