PXIe-2593 Specifications

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Contents

PXIe-2593 Specifications

This document lists specifications for the PXIe-2593. All specifications are subject to change without notice.

About These Specifications

Specifications characterize the warranted performance of the instrument under the stated operating conditions. Data in this document are ***Specifications*** unless otherwise noted.

Typical Specifications are specifications met by the majority of the instrument under the stated operating conditions and are tested at 23 °C ambient temperature. Typical specifications are not warranted.

All voltages are specified in DC, AC_{pk}, or a combination unless otherwise specified.

Caution The protection provided by the PXIe-2593 can be impaired if it is used in a manner not described in this document.

Input Characteristics

Maximum switching voltage	150 V, CAT I (channel-to-channel and channel-to-ground)

Caution This module is rated for Measurement Category I. It is intended to carry signal voltages no greater than 100 V_{rms}, 150 V_{pk}, or 150 VDC. This module can withstand up to 800 V impulse voltage. Do not use this module for connection to signals or for measurements within Categories II, III, or IV. Do not connect to MAINS supply circuits (for example, wall outlets) of 115 VAC or 230 VAC.

Caution When hazardous voltages (>42.4 V_{pk}/60 VDC) are present on any relay terminal, safety low-voltage (≤ 42.4 V_{pk}/60 VDC) cannot be connected to any other relay terminal.

Maximum switching current (per channel)	0.5 A
Maximum carry current (per channel)	1 A
Simultaneous channels at maximum current	Up to 2

Caution The switching power is limited by the maximum switching current and the maximum voltage and must not exceed 10 W.

Maximum switching power (per channel)	10 W

Note NI recommends against switching active RF signals. As a relay actuates, the channel is momentarily unterminated. Some RF sources can be damaged by reflections if their outputs are not properly terminated. Refer to your RF source documentation for more information.

Minimum switch load	10 µA, 10 mV
Maximum RF carry power (per channel)	10 W up to 500 MHz
DC path resistance	
Initial	<1.0 Ω

End-of-life	≥2.0 Ω

Path resistance is a combination of relay contact resistance and trace resistance. Contact resistance typically remains low for the life of a relay. At the end of relay life, the contact resistance rises rapidly above 1.0 Ω.

RF Performance Characteristics

Characteristic impedance (Z_0)	50 Ω nominal
Insertion Loss	
8 × 1	
DC to 200 MHz	<0.9 dB
200 MHz to 500 MHz	<1.6 dB
16 × 1	
DC to 200 MHz	<1.2 dB
200 MHz to 500 MHz	<1.9 dB
Typical bandwidth (3 dB)	
8 × 1	>900 MHz
16 × 1	>750 MHz
VSWR	

8 × 1	
DC to 200 MHz	<1.4
200 MHz to 500 MHz	<1.8
16 × 1	
DC to 200 MHz	<1.4
200 MHz to 500 MHz	<1.8

Channel-to-channel skew within each 8-channel bank is less than 100 ps. Only channels from standard topologies are listed in Table 1.

Table 1. Propagation Delay (ns)

COM	CH0-CH7	CH8-CH15
0	1.90 to 2.00	2.55 to 2.65
1	—	1.90 to 2.00

Typical rise time (10% to 90%)	
8 × 1	385 ps
16 × 1	460 ps

Refer to the following figures for typical insertion loss, typical VSWR, typical isolation, and typical bank-to-bank crosstalk, respectively.

Figure 1. Typical Insertion Loss

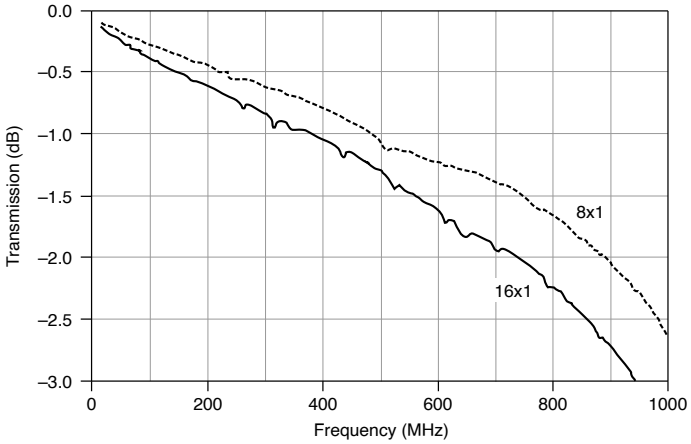


Figure 2. Typical VSWR

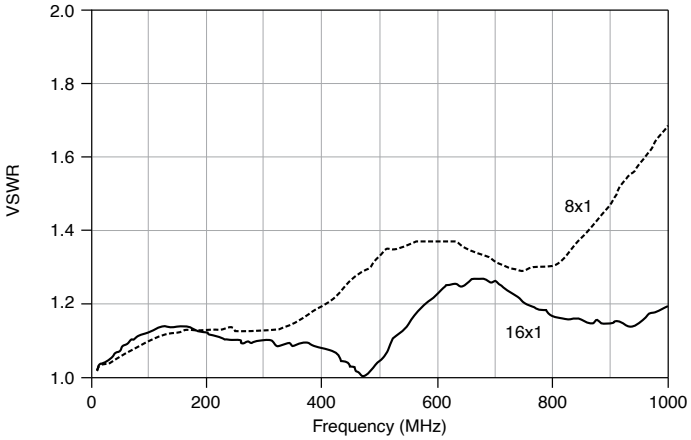


Figure 3. Typical Channel-to-Channel Isolation

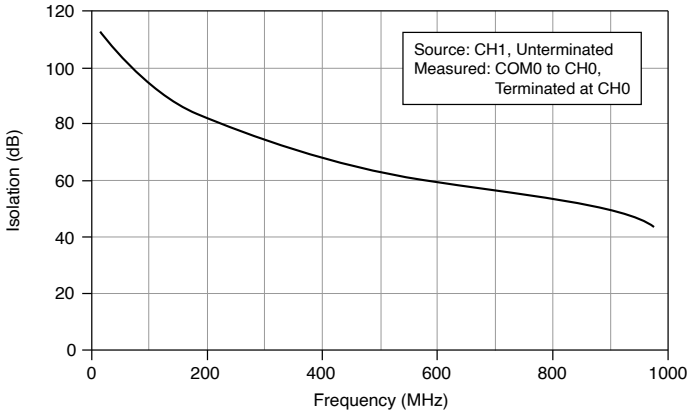
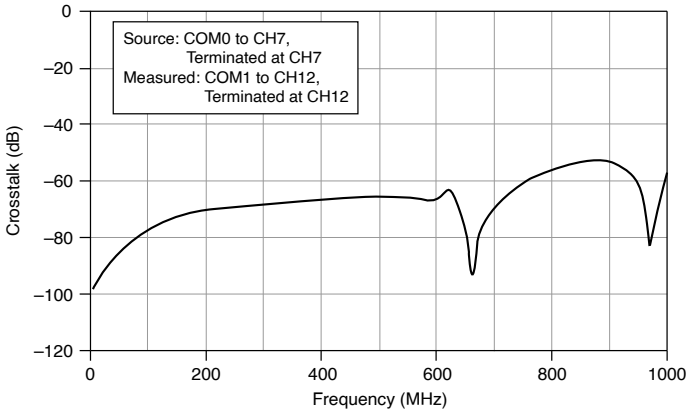


Figure 4. Typical Bank-to-Bank Crosstalk



Dynamic Characteristics

Relay operate time	
Typical	2.4 ms
Maximum	4.4 ms
Expected relay life	
Mechanical	5×10^7 cycles
Electrical (30 V, 0.3 A, DC resistive)	3×10^5 cycles

Trigger Characteristics

Input trigger	
Sources	PXI trigger lines <0...7>, Front panel
Minimum pulse width	150 ns

Front panel input voltage	
Minimum	-0.5 V
V_L Maximum	+0.7 V
V_H Minimum	+2.0 V
Nominal	+3.3 V
Maximum	+5.5 V
Output trigger	
Destinations	PXI trigger lines <0...7>, Front panel
Pulse width	Programmable (1 µs to 62 µs)
Front panel nominal voltage	3.3 V TTL, 8 mA

Physical Characteristics

Relay type	Electromechanical, latching
Relay contact material	Silver palladium and gold

I/O connectors	18 MCX jacks
Trigger connectors	2 SMB jacks
Power requirement	
PXI	3.5 W at 5 V, 1 W at 3.3 V
PXI Express	4.5 W at 12 V, 1 W at 3.3 V
Dimensions (L × W × H)	3U, one slot, PXI/cPCI module, PXI Express compatible 21.6 × 2.0 × 13.0 cm (8.5 × 0.8 × 5.1 in.)
Weight	330 g (12 oz)

Environment

Operating temperature	0 °C to 50 °C
Storage temperature	-20 °C to 70 °C
Relative humidity	5% to 85%, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m

Indoor use only.

Shock and Vibration

Operational Shock	30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC 60068-2-27. Test profile developed in accordance with MIL-PRF-28800F.)
Random Vibration	
Operating	5 Hz to 500 Hz, 0.3 g_{rms}
Nonoperating	5 Hz to 500 Hz, 2.4 g_{rms} (Tested in accordance with IEC 60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Compliance and Certifications

Safety Compliance Standards

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 safety certifications, refer to the product label or the Product Certifications and Declarations 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
- AS/NZS CISPR 11: Group 1, 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, certifications, and additional information, refer to the Product Certifications and Declarations section.

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 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`.)