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PXI-2542 Specifications

2024-04-12

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PXI-2542 Specifications

This document lists specifications for the PXI-2542. All specifications are subject to change without notice.

Topology	Quad 2 × 1 multiplexers

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- **Typical** specifications describe the performance met by a majority of models.
- **Nominal** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.
- **Measured** specifications describe the measured performance of a representative model.

Specifications are **Warranted** unless otherwise noted.

Conditions

Specifications are valid under the following conditions unless otherwise noted.

- Chassis is powered on
- Calibration adjustment cycle maintained
- 50 Ω termination connected to unused I/O front panel connectors
- All voltages are specified in DC, AC_{pk}, or a combination unless otherwise specified.

Cleaning Statement

Clean devices and terminal blocks by brushing off light dust with a soft, nonmetallic brush. Remove other contaminants with a soft, lint-free, dampened cloth. Do not use detergent or chemical solvents. The unit must be completely dry and free from contaminants before returning to service.

Input Characteristics

Minimum input frequency	10 MHz
Characteristic impedance (Z_0)	50 Ω nominal
Coupling	AC
Maximum safe DC input voltage	±8V

Maximum Safe Continuous RF Power

Chassis power ON	+30 dBm
Chassis power OFF	+20 dBm

RF Performance Characteristics

Values in parentheses are typical.

Insertion loss	
≤2.4 GHz	<3.7 dB (<2.5 dB)
≤6 GHz	<4.8 dB (<3.9 dB)

≤6.6 GHz	<6.1 dB (<5.0 dB)
Insertion loss thermal coefficient	α = 1,112 ppm/°C

Use the following equation to calculate the insertion loss at a given temperature:

$$IL_T = IL_{T0}(1 + \alpha(T - T_0))$$ $IL_T = IL_{T0}(1 + \alpha(T - T_0))$

where	IL is insertion loss in dB
	T is the temperature at which the property is being measured in °C
	T_0 is the reference temperature in °C
	α represents insertion loss temperature coefficient in ppm/°C

Table 1. Typical Flatness

Frequency	Flatness / 200 MHz	Flatness / 1GHz
10 MHz to 5 GHz	<0.15 dB	<0.50 dB
5 GHz to 6 GHz	<0.18 dB	<0.62 dB
6 GHz to 6.6 GHz	<0.63 dB	<1.25 dB

Voltage standing wave ratio (VSWR)	
10 MHz ≤ x≤2.4 GHz	<1.6 (<1.4)
2.4 GHz < x≤3.5 GHz	<1.7 (<1.4)
3.5 GHz < x ≤6 GHz	<1.6 (<1.2)
6 GHz < x≤6.6 GHz	<2.2 (<1.8)
CH-COM isolation	
≤2.4 GHz	>78 dB (>94 dB)
≤6 GHz	>60 dB (>86 dB)

≤6.6 GHz	>55 dB (>75 dB)
CH-CH isolation	
≤2.4 GHz	>79 dB (>94 dB)
≤6 GHz	>58 dB (>76 dB)
≤6.6 GHz	>54 dB (>70 dB)
Bank-to-bank crosstalk	
≤2.4 GHz	>75 dB (>94 dB)
≤6 GHz	>60 dB (>85 dB)
≤6.6 GHz	>55 dB (>83 dB)
Typical channel-to-channel skew	<3 ps
Typical propagation delay	680 ps
Input 1 dB compression	
Minimum	>28 dBm
Typical	>32 dBm

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

Figure 1. Typical Insertion Loss

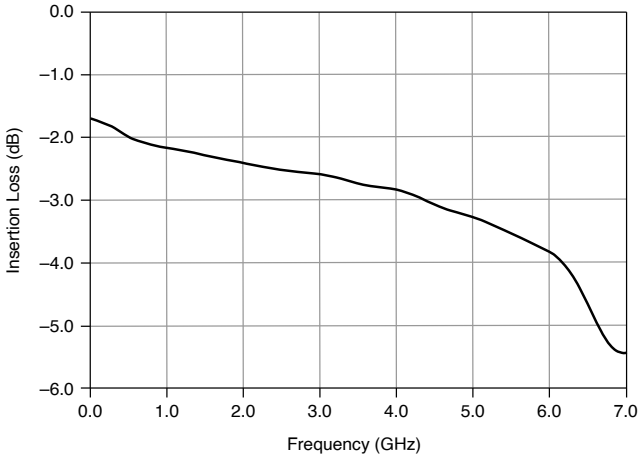


Figure 2. Typical VSWR

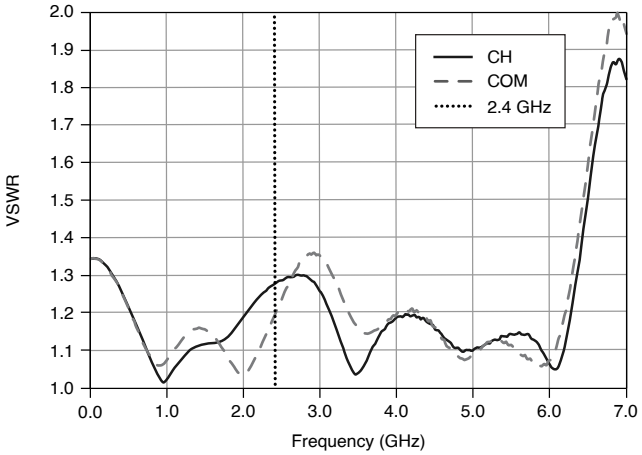


Figure 3. Typical Isolation

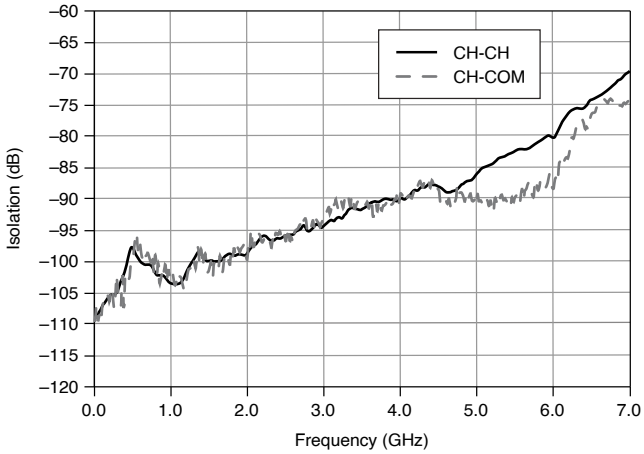
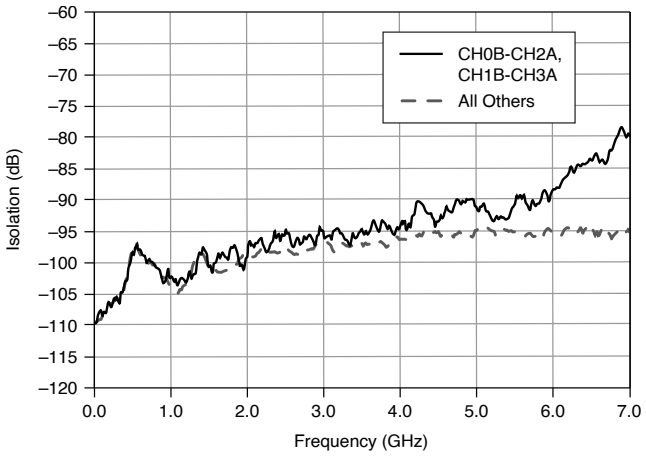


Figure 4. Typical Bank-to-Bank Isolation



Linearity

Second-order harmonic distortion (Input IP2 (IIP2))

Typical IP2 (input)	>+91 dBm

Note Measurements are performed with single CW tones, ranging from -26 dBm to +10 dBm at the RF input. This specification is based on both experimental and calculated data.

Third-order intermodulation distortion (Input IP3 (IIP3))

Typical IP3 (input)	>+61 dBm

Note Measurements performed with two 10 dBm input tones = 1 MHz apart. This specification is based on both experimental and calculated data.

Dynamic Characteristics

Maximum switch operate time	121 µs

Note Switch operate time is defined as the time from TRIG IN falling to 10% to when the output reaches 90% of final value.

Note Certain applications may require additional time for proper settling. Refer to the NI-Switch topic **Adding Additional Settling Time** for information about how to add settling time.

Related information:

- Adding Additional Settling Time

Trigger Characteristics

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

Note The PXI-2542 can recognize trigger pulse widths less than 150 ns if you disable digital filtering. Refer to the NI-Switch topic **Disabling Digital Filtering** for information about how to disable digital filtering.

Output trigger	
Destinations	PXI trigger lines <0...7>
Pulse width	Software-selectable: 1 µs to 62 µs

Related information:

- Disabling Digital Filtering

Physical Characteristics

Switch type	FET
Front panel I/O connectors	12 SMA jacks, female
Power requirement	
PXI	
5 V	0.1 W
3.3 V	0.7 W
PXI Express	
12 V	0.6 W
3.3 V	0.9 W
Dimensions (L × W × H)	3U, one slot, PXI/cPCI module, PXI Express compatible 21.6 cm × 2.0 cm × 13.0 cm (8.5 in. × 0.8 in. × 5.1 in.)
Weight	553 g (19.5 oz)

Environment

Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

Operating Environment

Ambient temperature range	0 °C to 55 °C
Relative humidity range	10% to 90%, noncondensing

Storage Environment

Ambient temperature range	-40 °C to 71 °C
Relative humidity range	5% to 95%, noncondensing

Shock and Vibration

Operating shock	30 g peak, half-sine, 11 ms pulse
Random vibration	
Operating	5 Hz to 500 Hz, 0.3 g RMS
Nonoperating	5 Hz to 500 Hz, 2.4 g RMS

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
- 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, 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.)

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