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Find the *National Instruments SCXI-1193* at our website: *Click HERE*

NI SCXI™-1193 Specifications

500 MHz Quad 8x1 50 Ω Multiplexer

This document lists specifications for the NI SCXI-1193 multiplexer module. All specifications are subject to change without notice. Visit `ni.com/manuals` for the most current specifications.

Configurations..... Quad 8x1 multiplexers
Dual 16x1 multiplexers
Single 32x1 multiplexer
Quad 4x1 terminated multiplexers
Dual 8x1 terminated multiplexers
Single 16x1 terminated multiplexer

RF Performance Characteristics

Characteristic impedance (Z_0)..... 50 Ω nominal

Insertion loss

- 8x1
  - DC to 200 MHz ..... <0.9 dB
  - 200 MHz to 500 MHz..... <1.6 dB
- 16x1
  - DC to 200 MHz ..... <1.2 dB
  - 200 MHz to 500 MHz..... <1.9 dB
- 32x1
  - DC to 200 MHz ..... <1.4 dB
  - 200 MHz to 500 MHz..... <2.4 dB

Typical bandwidth (3 dB)

- 8x1 ..... >900 MHz
- 16x1 ..... >750 MHz
- 32x1 ..... >600 MHz

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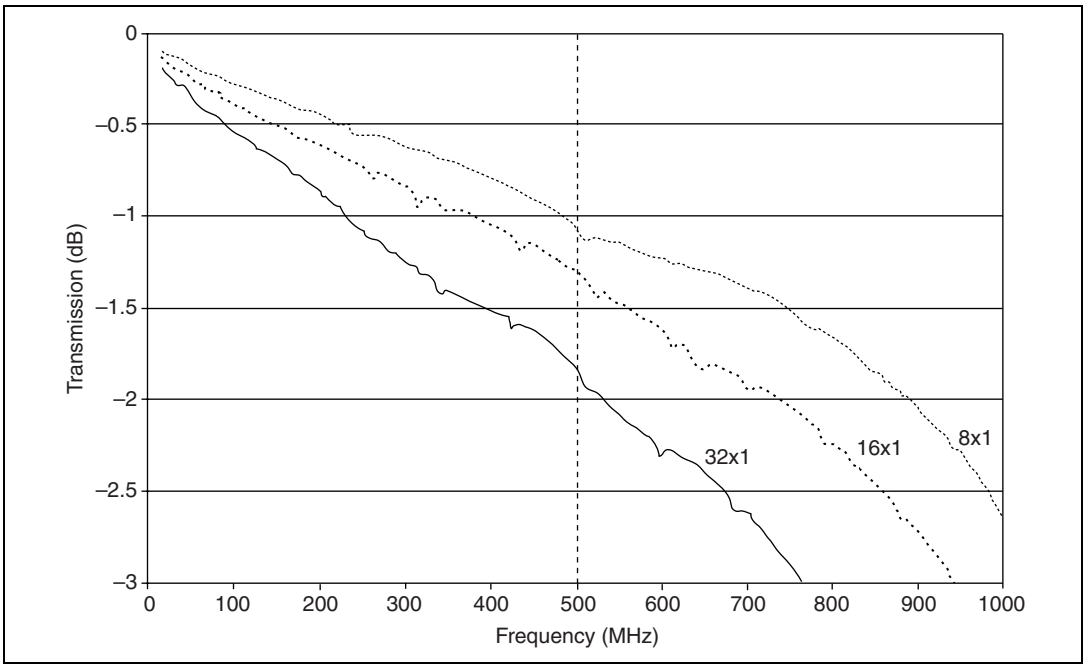


Figure 1. Typical Insertion Loss

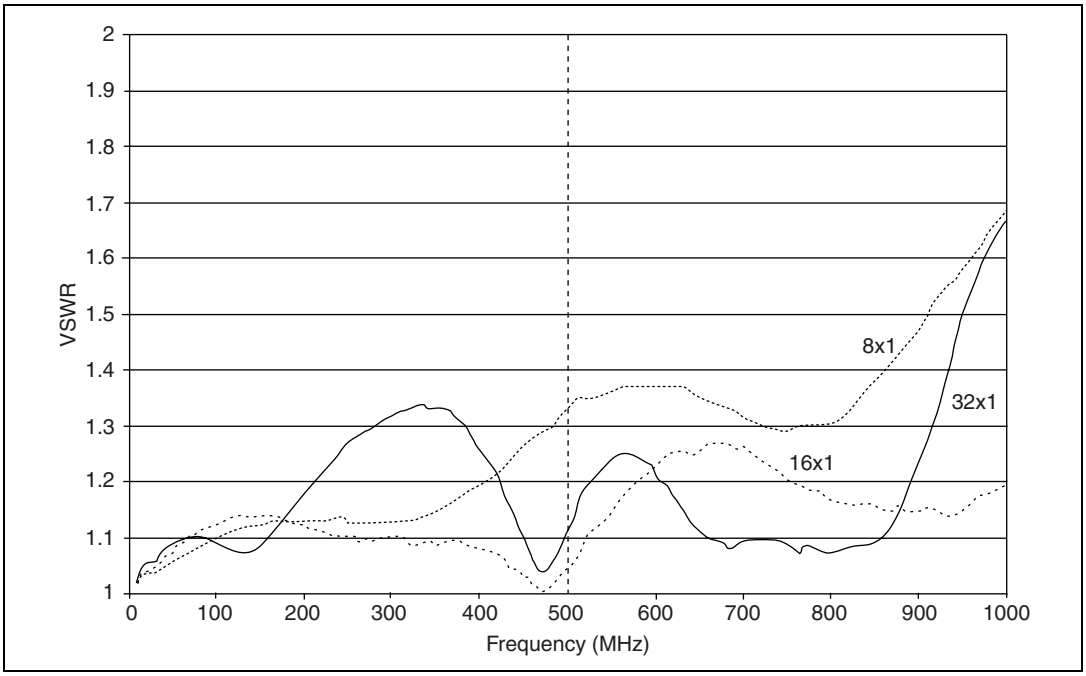


Figure 2. Typical VSWR

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VSWR

8x1

DC to 200 MHz ..... <1.4

200 MHz to 500 MHz..... <1.8

16x1

DC to 200 MHz ..... <1.4

200 MHz to 500 MHz..... <1.8

32x1

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	CH16–CH23	CH24–CH31
0	1.90 to 2.00	2.55 to 2.65	3.75 to 3.85	3.55 to 3.65
1	—	1.90 to 2.00	—	—
2	—	—	1.90 to 2.00	2.55 to 2.65
3	—	—	—	1.90 to 2.00

Typical rise time (10% to 90%)

8x1 ..... 385 ps

16x1 ..... 460 ps

32x1 ..... 550 ps

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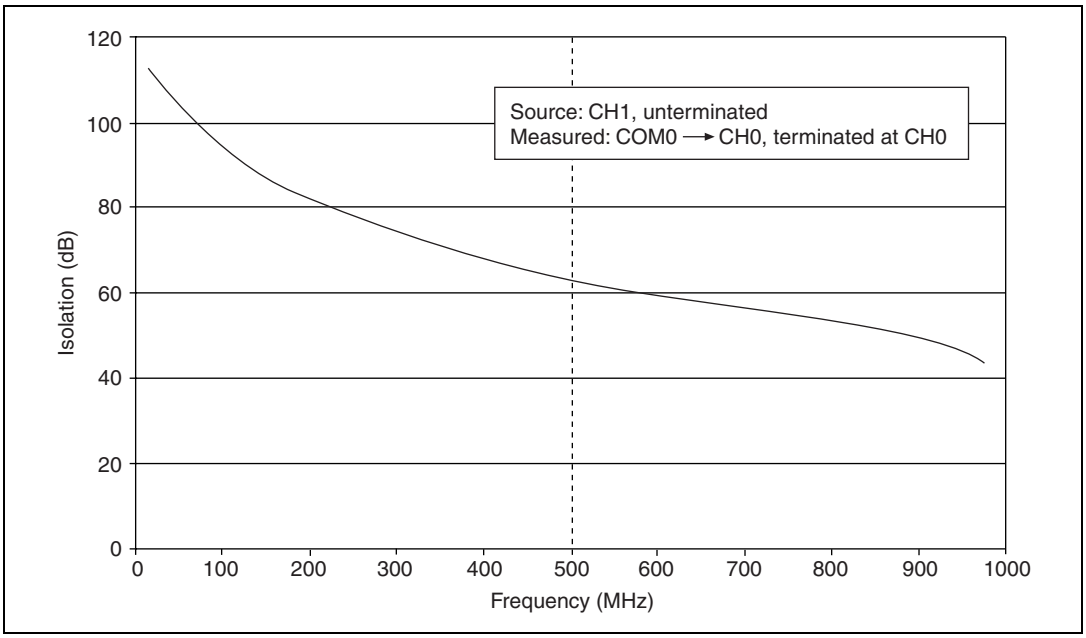


Figure 3. Typical Channel-to-Channel Isolation

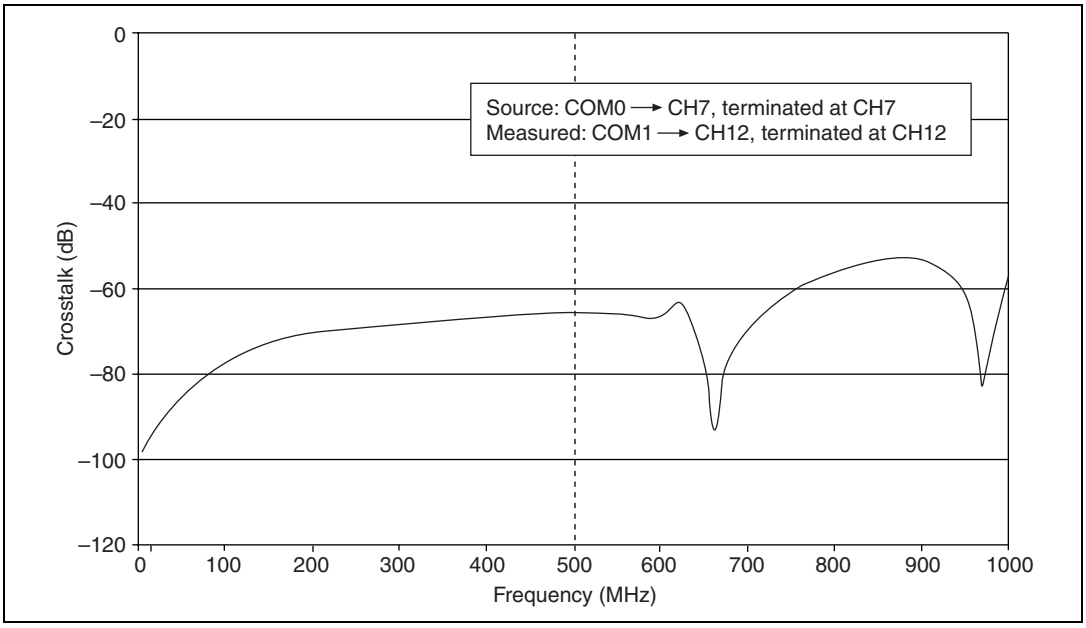


Figure 4. Typical Bank-to-Bank Crosstalk

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Input Characteristics

All input characteristics are DC, AC_{rms}, or a combination unless otherwise specified.

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

Caution This module is rated for Measurement Category I and intended to carry signal voltages no greater than 150 V. 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 or 230 VAC. Refer to the *NI Switches Getting Started Guide* for more information on measurement categories.

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 ..... 0.5 A
(per channel)

Maximum carry current ..... 1 A
(per channel)

Simultaneous channels
at maximum current ..... Up to 4

Maximum switching power ..... 10 W
(per channel)

Note National Instruments 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. Consult your RF source documentation for more information.

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.

Maximum RF carry power..... 10 W up to 500 MHz
(per channel)

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Module Load Derating

Insertion loss results in power dissipation and heat buildup within the module. Use the graphs in Figure 5 to determine the maximum power dissipated in each active channel.

Total RF power dissipation limit .....7 W
(valid over the entire ambient operating temperature range)

Example 1: Single 32x1 Multiplexer

1 channel carrying a 10 W signal at 500 MHz

From Figure 5C, the dissipated RF power for the signal is 4.2 W.

Example 2: Quad 8x1 Multiplexer

2 channels carrying 5 W signals at 100 MHz, and

2 channels carrying 10 W signals at 150 MHz

From Figure 5A, the dissipated RF power for each 5 W, 100 MHz signal is 0.75 W.

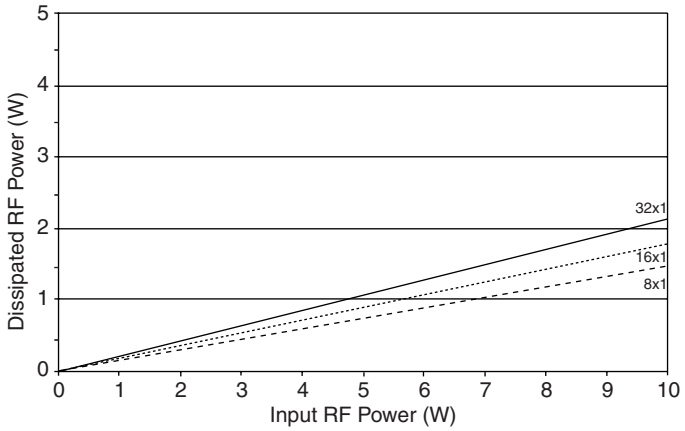
From Figure 5B, the dissipated RF power for each 10 W, 150 MHz signal is 1.9 W.

The total RF power dissipation for all four channels is:

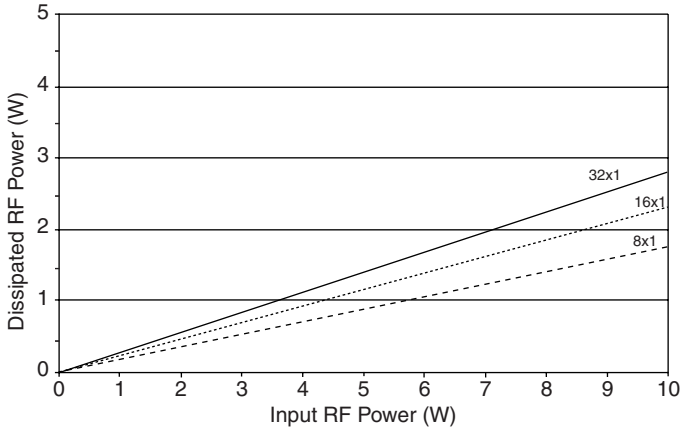
$$2 \times (0.75\ \text{W}) + 2 \times (1.9\ \text{W}) = 5.3\ \text{W}$$

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A. f ≤ 100 MHz



B. 100 MHz < f ≤ 200 MHz



C. 200 MHz < f ≤ 500 MHz

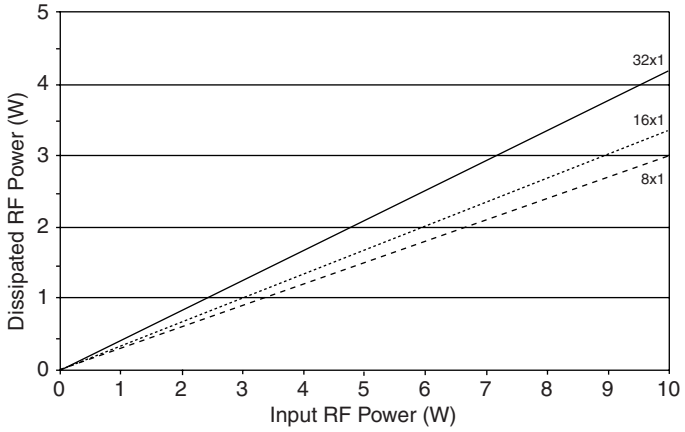


Figure 5. Maximum RF Power Dissipation per Channel

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Dynamic Characteristics

Maximum scan rate .....100 channels/s

Expected relay life

- Mechanical .....50,000,000 cycles
- Electrical.....300,000 cycles
  (30 V, 0.3 A, DC resistive)

Trigger Characteristics

Input trigger

- Sources .....SCXI trigger lines 0–7,
  Front panel,
  Rear connector
- 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 .....SCXI trigger lines 0–7,
  Front panel,
  Rear connector
- 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.....36 MCX jacks

Trigger connectors.....2 SMB jacks

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SCXI DC power requirement

+5 VDC ..... 50 mA

+18.5 VDC to +25 VDC ..... 170 mA

–18.5 VDC to –25 VDC ..... 170 mA

Dimensions (W × H × D) ..... 3.0 × 17.3 × 19.8 cm (1.2 × 6.8 × 7.8 in.)

Weight ..... 960 g (2 lb 2 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

Approved at altitudes up to 2,000 m.

Indoor use only.

Accessories

Visit `ni.com` for more information about the following accessories.

Table 2. RG-316 Cabling Available for the NI SCXI-1193

Connectors	Length	Part Number
MCX-MCX	0.3 m	188374-0R3
	1.0 m	188374-01
MCX-BNC	0.3 m	188375-0R3
	1.0 m	188375-01
MCX-SMB	0.3 m	188376-0R3
	1.0 m	188376-01
MCX-SMA	0.3 m	188377-0R3
	1.0 m	188377-01
50 Ω MCX terminator (1 GHz maximum)	—	778831-01

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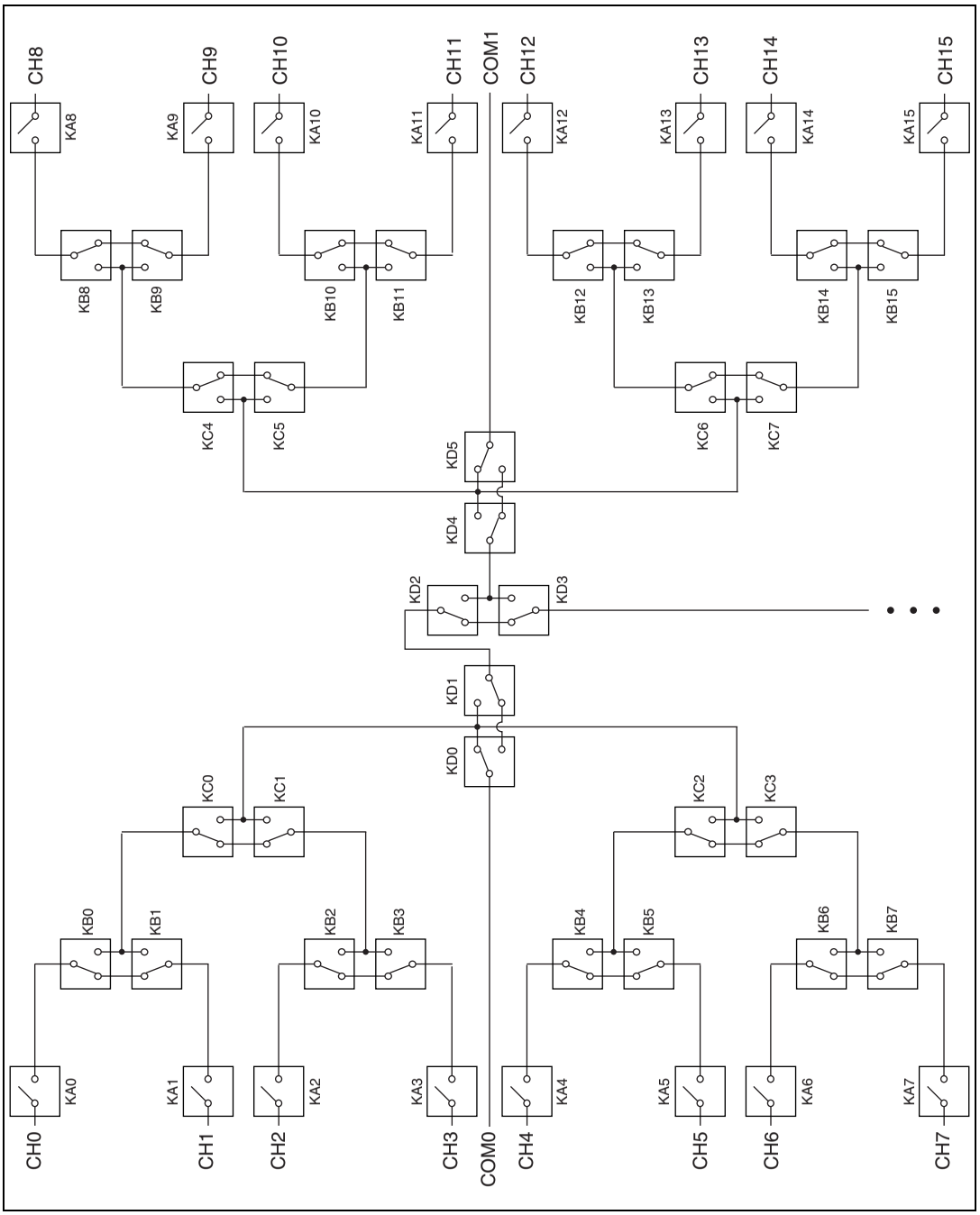


Figure 6. NI SCXI-1193 Power-On State

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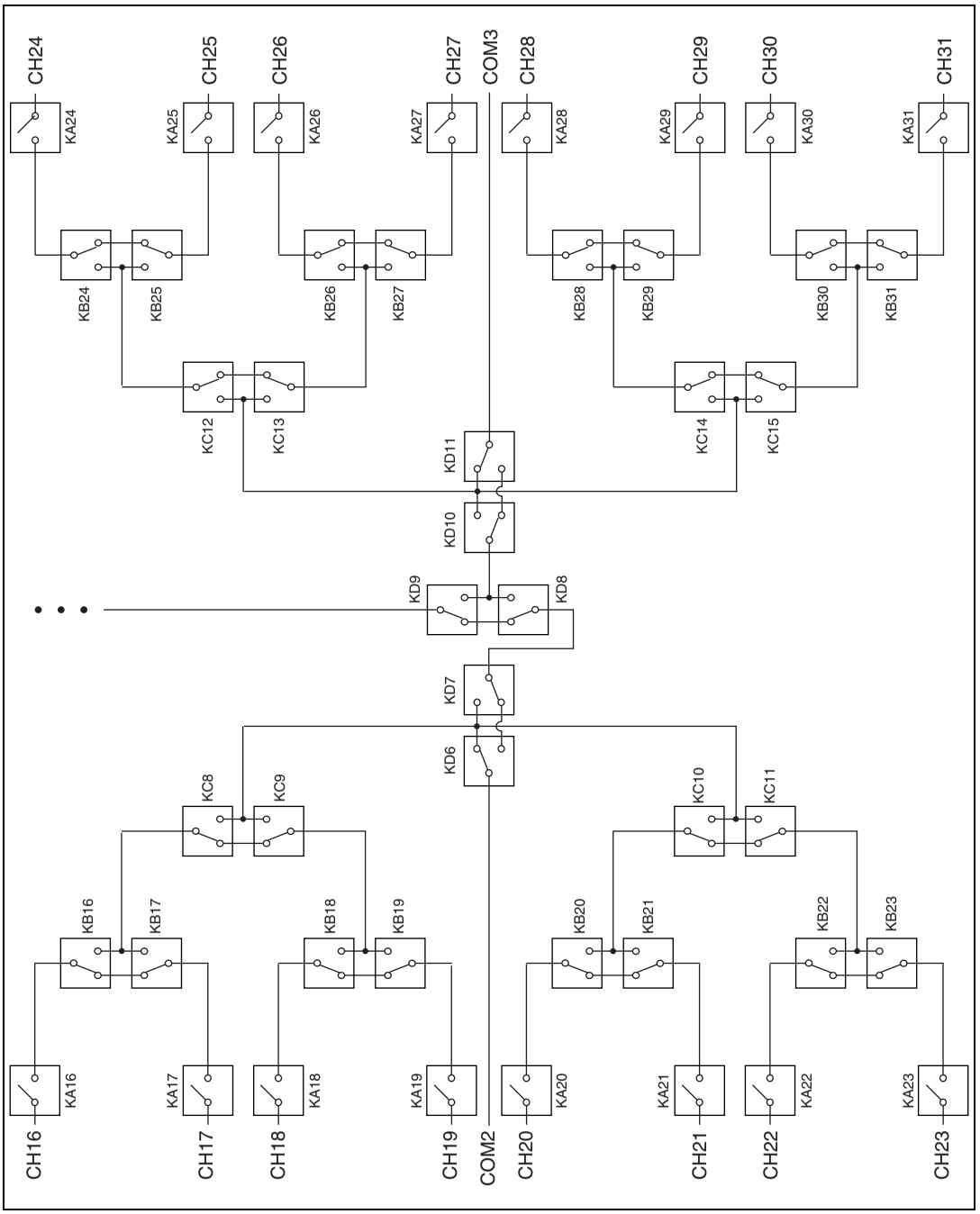


Figure 6. NI SCXI-1193 Power-On State (continued)

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Compliance and Certifications

Safety

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

- IEC 61010-1, EN 61010-1
- UL 3111-1, UL 61010B-1
- CAN/CSA C22.2 No. 1010.1

Note For UL and other safety certifications, refer to the product label or to `ni.com`.

Electromagnetic Compatibility

Emissions	EN 55011 Class A at 10 m FCC Part 15A above 1 GHz
Immunity	EN 61326:1997 + A2:2001, Table 1
EMC/EMI	CE, C-Tick, and FCC Part 15 (Class A) Compliant

Note For EMC compliance, you *must* operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

Low-Voltage Directive (safety)	73/23/EEC
Electromagnetic Compatibility Directive (EMC)	89/336/EEC

Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit `ni.com/hardref.nsf`, search by model number or product line, and click the appropriate link in the Certification column.

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