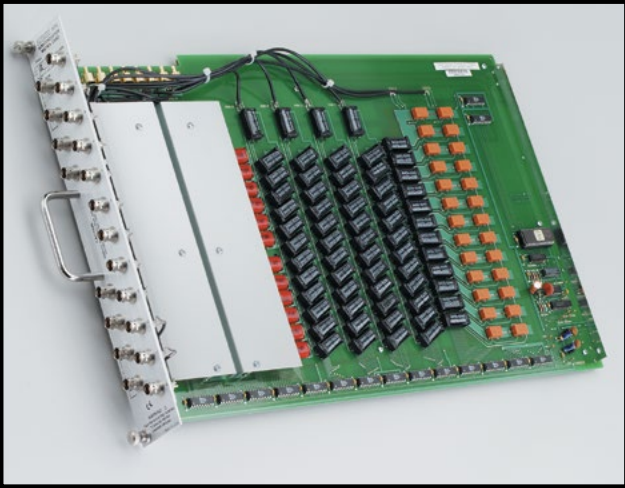


# 7072

# Semiconductor Matrix Card 8x12



- Two sub-picoamp current paths
- Two DC to 1MHz C-V paths
- Four high isolation signal paths
- 3-lug triaxial connection
- Compatible with Models 707A, 707B, 708A, and 708B

## Ordering Information

**7072 8x12 Semiconductor Matrix Card**

## Accessories Supplied

Instruction manual and four SMB expansion cables (CA-54-1)

The Model 7072 Semiconductor Matrix Card is designed specifically to handle low-level and high-impedance measurements encountered in semiconductor parametric tests on wafers and devices. This unique design provides two low-current circuits with specified 1pA maximum offset current for sensitive sub-picoamp measurement resolution and two C-V paths for measurement of Capacitance Voltage characteristics from DC to 1MHz. Four additional high-quality signal paths with <20pA offset current provide for general-purpose signal switching up to 100nA or 200V.

Connections are 3-lug triax with the outer shell connected to chassis for safety and noise shielding. The center conductor is fully surrounded by the inner conducting shield, so that fully guarded measurements can be made to achieve higher isolation and to improve measurement speed and accuracy.

Isolation relays on the low-current and C-V paths automatically disconnect unused circuits to achieve minimum interference and peak performance. The 707A or 708A mainframe allows each row (signal path) to be programmed for Break-Before-Make or Make-Before-Break operation.

For applications requiring connections

to a large number of devices or test points, the 7072 matrix can be expanded with additional cards. The low-current and C-V rows can be extended to other cards with coaxial jumpers. The other four high-quality signal paths connect directly to the 707A backplane for expansion.

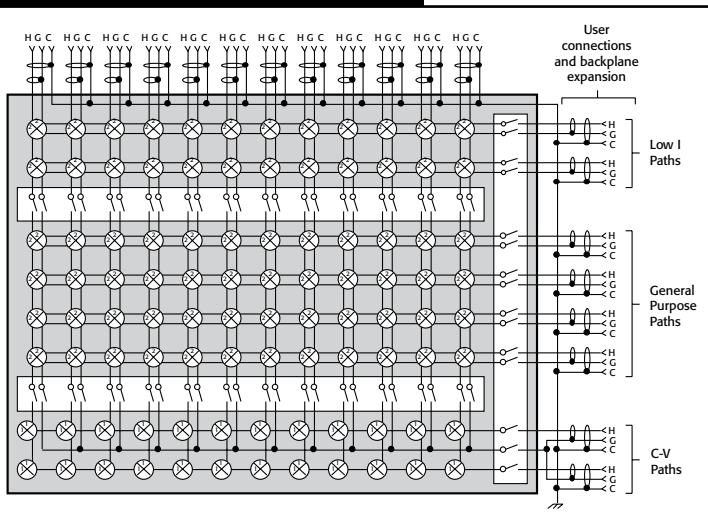
## ACCESSORIES AVAILABLE

237-TRX-T	3-Lug Triax Tee Adapter
7078-TRX-BNC	3-Lug Triax to BNC Adapter
7078-TRX-3	3-Lug Triax Cable, 0.9m (3 ft)
7078-TRX-10	3-Lug Triax Cable, 3m (10 ft)
7078-TRX-TBC	3-Lug Female Triax Bulkhead Connector with Cap

## SERVICES AVAILABLE

7072-3Y-EW	1-year factory warranty extended to 3 years from date of shipment
------------	---

	Low-Current (Rows A - B)	General-Purpose (Rows C - F)	C-V (Rows G - H)
<b>CROSSPOINT CONFIGURATION:</b>	2-pole Form A	2-pole Form A	1-pole Form A, Common Guard
<b>OFFSET CURRENT:</b>	<1 pA	<20 pA	<20 pA
<b>PATH ISOLATION: Resistance:</b>	>10 <sup>13</sup> Ω	>10 <sup>12</sup> Ω	>10 <sup>12</sup> Ω
<b>Capacitance (nominal):</b>	0.4 pF	1 pF	0.6 pF
<b>CROSSTALK</b>			
<b>1 MHz, 50Ω load (typical):</b>	<-50 dB	<-40 dB	<-50 dB
<b>3dB BANDWIDTH (typical), 50Ω Load:</b>	15 MHz	8 MHz	5 MHz



**MATRIX CONFIGURATION:** 8 rows by 12 columns.

**CONNECTOR TYPE:** 3-lug triaxial (Signal, Guard, Chassis).

**MAXIMUM SIGNAL LEVEL:** 200V, 1A carry/0.5A switched, 10VA peak (resistive load).

**COMMON MODE VOLTAGE:** 200V maximum between any 2 pins or chassis.

**CONTACT LIFE:**

**Cold Switching:** 10<sup>7</sup> closures.

**At Maximum Signal Level:** 10<sup>5</sup> closures.

**PATH RESISTANCE (per conductor):** <1Ω initial, <3.5Ω at end of contact life.

**CONTACT POTENTIAL:** <40μV per crosspoint (Signal to Guard).

**RELAY SETTling TIME:** <15ms.

**INSERTION LOSS (1MHz, 50Ω source, 50Ω load):** 0.1dB typical.

**EMC:** Conforms to European Union Directive 89/336/EEC.

**SAFETY:** Conforms to European Union Directive 73/23/EEC (meets EN61010-1/IEC 1010).

**ENVIRONMENT:**

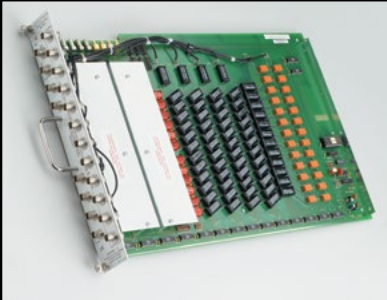
**OFFSET CURRENT and PATH ISOLATION Specifications:** 23°C, <60% R.H.

**Operating:** 0° to 50°C, up to 35°C at 70% R.H.

**Storage:** -25° to +65°C.

# 7072-HV

# High Voltage Semiconductor Matrix Card 8x12



- Two 1300V, sub-picoamp current paths
- Six 200V, 20pA paths
- For use with Model 2410 SourceMeter SMU Instrument, Series 2600B SourceMeter SMU Instruments, and the 4200-SCS Parameter Analyzer
- 3-lug triaxial connections
- Compatible with Models 707A, 707B, 708A, and 708B

## Ordering Information

**7072-HV 8x12 High Voltage Semiconductor Matrix Card**

The Model 7072-HV is designed to switch low-level, high-voltage, and high-impedance signals for semiconductor parametric tests on wafers and devices. This unique design provides two signal paths capable of switching 1300V with less than 1pA of offset current. The two C-V paths may be used for measurement of capacitance voltage characteristics from DC to 1MHz or for switching low currents with a common ground. Four additional high quality signal paths with less than 20pA offset current provide for signal switching to 200V.

Connections are 3-lug triax with the outer shell connected to chassis for safety and noise shielding. The center conductor is fully surrounded by the inner conducting shield to provide fully guarded measurements with higher isolation and improved measurement speed and accuracy.

### 7072-HV Applications

The Model 7072-HV is typically used with the Model 2410 SourceMeter SMU Instrument, Series 2600B SourceMeter SMU Instruments, and the 4200-SCS Parameter Analyzer to address a wide variety of semiconductor device and material characterization needs.

The high voltage signals encountered in breakdown measurements or oxide integrity testing can be easily switched with this matrix card. Signals connected to the High V, Low I paths are automatically isolated from the rest of the card.

For applications requiring connections to a large number of devices or test points, the 7072-HV matrix can be expanded with additional cards. The high voltage and C-V rows can be extended to other cards with coaxial jumpers. The other four high-quality signal paths connect directly to the 707A or 708A backplane for expansion.

### ACCESSORIES AVAILABLE

237-TRX-T	3-Lug Triax Tee Adapter
237-TRX-TBC	3-Lug High Voltage Female Triax Bulkhead Connector
7078-TRX-3	3-Lug Triax Cable, 0.9m (3 ft)
7078-TRX-10	3-Lug Triax Cable, 3m (10 ft)
7078-TRX-BNC	3-Lug Triax to BNC Adapter

### FOR USE AT 200V OR LESS

7078-TBC	3-Lug Female Triax Bulkhead Connector with Cap
----------	--

### SERVICES AVAILABLE

7072-HV-3Y-EW	1-year factory warranty extended to 3 years from date of shipment
---------------	---

**MATRIX CONFIGURATION:** 8 rows by 12 columns.

**CONNECTOR TYPE:** Three-lug triaxial (Signal, Guard, Chassis).

**CONTACT LIFE: Cold Switching:** 10<sup>7</sup> closures.

At Maximum Signal Level: 10<sup>5</sup> closures.

**PATH RESISTANCE (per conductor):** <1Ω initial, <3.5Ω at end of contact life.

**RELAY SETTLING TIME:** <15ms.

**INSERTION LOSS (1MHz, 50Ω source, 50Ω load):** 0.1dB typical.

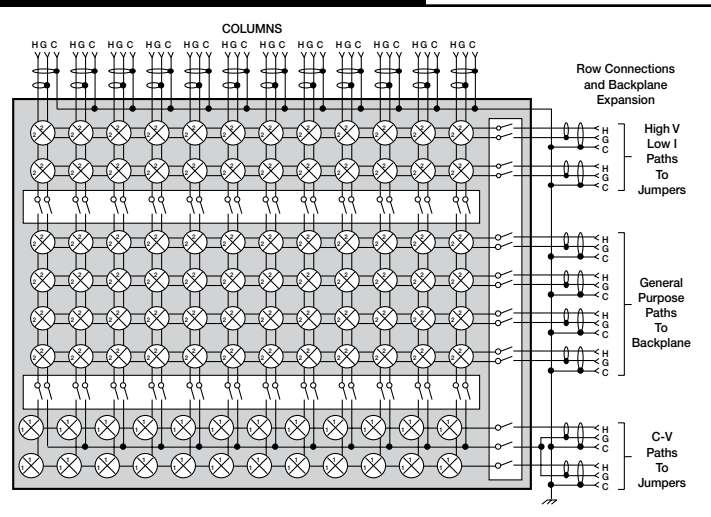
**EMC:** Conforms to European Union Directive 89/336/EEC.

**SAFETY:** Conforms to European Union Directive 73/23/EEC (meets EN61010-1/IEC 1010).

**ENVIRONMENT:**

**OFFSET CURRENT and PATH ISOLATION Specifications:** 23°C, <60% R.H.

**Operating:** 0° to 50°C, up to 35°C at 70% R.H. **Storage:** -25° to +65°C.



	Low Current (Rows A-B)	General Purpose (Rows C-F)	C-V (Rows G-H)
<b>CROSSPOINT CONFIGURATION</b>	2-pole Form A	2-pole Form A	1-pole Form A, Common Guard
<b>OFFSET CURRENT</b>	<1 pA	<20 pA	<20 pA
<b>PATH ISOLATION:</b>			
Resistance	>10 <sup>13</sup> Ω	>10 <sup>12</sup> Ω	>10 <sup>12</sup> Ω
Capacitance (nominal)	0.4 pF	1 pF	0.6 pF
<b>CROSSTALK:</b>			
1 MHz, 50Ω load (typical)	<-60 dB	<-40 dB	<-50 dB
<b>3dB BANDWIDTH (typical), 50Ω Load</b>	4 MHz	8 MHz	5 MHz
<b>MAXIMUM SIGNAL LEVEL</b>			
Maximum between any 2 pins or chassis:	1300 V	200 V	200 V
Maximum between signal & guard: 1A carry/0.5A switched, 10VA peak (resistive load)	200 V	200 V	200 V
<b>CONTACT POTENTIAL (Signal to Guard):</b>	<50 μV	<20 μV	<40 μV

# 7174A

# High Speed, Low Leakage Current Matrix 8×12



- **Fast time to measurement**
- **Low leakage (<100fA offset on all signal paths)**
- **2-pole switching, signal, and guard**
- **200V, 2A signal levels**
- **Designed for use with Keithley Model 4200-SCS, 2635B and 2636B System SourceMeter® SMU Instruments, and Agilent B1500**
- **Compatible with Models 707A, 707B, 708A, and 708B**

## Ordering Information

**7174A 8×12 High Speed, Low Current Matrix**

## Accessories Supplied

**Eight row interconnect cables for card to card matrix expansion**

The Model 7174A Low Current Matrix Card is designed for semiconductor research, development, and production applications requiring high quality, high performance switching of I-V and C-V signals. The Model 7174A is ideal for use with Keithley Models 2635B and 2636B System SourceMeter® SMU Instruments, Model 4200-SCS, and the Agilent B1500. The card's configuration is 8 rows × 12 columns, with signal and guard switched at each crosspoint. Offset current has been reduced dramatically to <100fA on all pathways. Significant reductions in the level of parasitic capacitances in the Model 7174A help speed the process of making low level measurements.

The Model 7174A provides an optimum solution to switching the lower level signals common to today's semiconductor characterization tests. The card's low leakage and minimal dielectric absorption ensure that key device measurements can be performed many times faster than with current switching technologies. Connections are 3-lug triax with the outer shell connected to chassis for safety and noise shielding. The center conductor is fully surrounded by the inner conducting shield allowing fully guarded measurements to be made with higher isolation and improved speed and accuracy.

For applications that require making connections to a large number of devices or test points, the Model 7174A matrix can be expanded with additional cards. On-card connectors are provided to connect the rows (column expansion) between other 7174A cards in adjacent slots of the Model 707B switching mainframe. Eight female-to-female cables are provided with each 7174A to simplify expansion. Up to six 7174A cards can be connected in a single 707A switching mainframe to form an 8×72 or 12×60 matrix.

### MATRIX CONFIGURATION: Single 8 rows×12 columns.

Expanding the columns can be done internally by connecting the rows of multiple 7174A cards together with coax jumpers.

### CROSSPOINT CONFIGURATION: 2-pole Form A (Signal Guard).

### CONNECTOR TYPE: 3-lug triax (Signal, Guard, Chassis).

### MAXIMUM SIGNAL LEVEL:

Pin-to-pin or Pin-to-Chassis: 200V, 2A carry current.

### CONTACT LIFE: Cold Switching: 10<sup>8</sup> closures.

### OFFSET CURRENT: 100fA max., 10fA typical (with 0V applied to inputs and outputs).

### ISOLATION: Path (Signal to Signal): >2×10<sup>14</sup>Ω, 1pF.

Common (Signal to Chassis): >10<sup>14</sup>Ω, <10pF.

### SETTLING TIME: <2.5s to 400fA (all pathways) after 10V applied (typical).

### CROSSTALK (1MHz, 50Ω Load): <-70dB.

### INSERTION LOSS (1MHz, 50Ω Load): <-0.2dB typical.

### 3dB BANDWIDTH:

(50Ω Load, 50Ω Source): 30MHz typical.  
(1MΩ Load, 50Ω Source): 40MHz typical.

### RELAY SETTling TIME: <1ms.

### EMC: Conforms to European Union Directive 89/336/EEC.

### SAFETY: Conforms to European Union Directive 73/23/EEC (meets EN61010-1/IEC 1010).

### ENVIRONMENT:

Offset Current and Path Isolation Specifications: 23°C, <60% R.H.

Operating: 0° to 50°C, up to 35°C at 70% R.H.

Storage: -25° to +65°C.

### MAXIMUM LEAKAGE:

Pin to Ground: 0.01pA/V. Pin to Pin: 0.005pA/V.

### INSULATION RESISTANCE: 6.7×10<sup>13</sup>Ω minimum.

### CAPACITANCE: (Guard Driven): Path to Ground: <10pF.

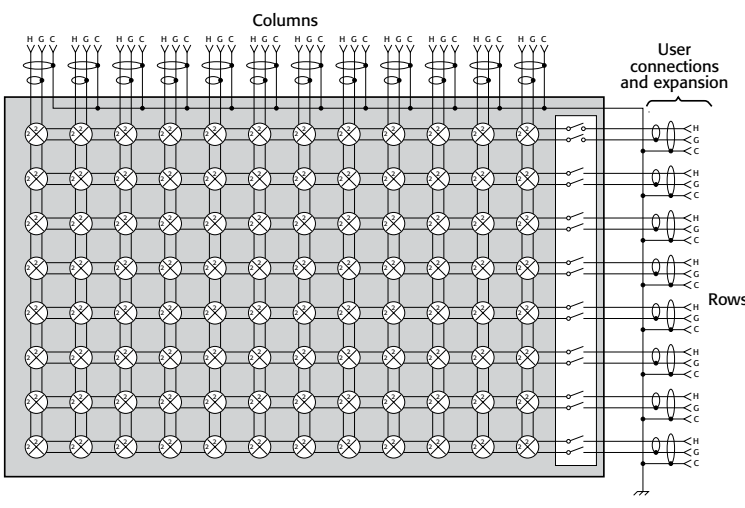
Path to Path: 1pF typical.

## ACCESSORIES AVAILABLE

237-TRX-T	3-Lug Triax Tee Adapter
7078-TRX-TBC	3-Lug Triax to BNC Adapter
7078-TRX-3	3-Lug Triax Cable, 0.9m (3 ft.)
7078-TRX-10	3-Lug Triax Cable, 3m (10 ft.)
7078-TBC	3-Lug Female Triax Bulkhead Connector with Cap

## SERVICES AVAILABLE

7174A-3Y-EW	1-year factory warranty extended to 3 years from date of shipment
-------------	---



# Wir haben die Lösungen für Ihre Mess- aufgaben.

**dataTec**

Mess- und Prüftechnik, Die Experten.

## Ihre Vorteile:

- > Diplom-Ingenieure, Elektronik- und Elektrotechniker
- > Langjährige Praxiserfahrung und hohe Kompetenz
- > Bundesweit über 20 praxiserfahrene und herstellerzertifizierte Vertriebsingenieure im Außendienst bei Ihnen vor Ort

## Experten für:

- > Oszilloskope
- > Spektrum- / Netzwerkanalysatoren
- > Netzgeräte / Stromversorgungen
- > Thermografie / Temperatur
- > Prüfgeräte VDE / Netzanalyse
- > u. v. m.



**Technische  
Beratung  
und Service.**