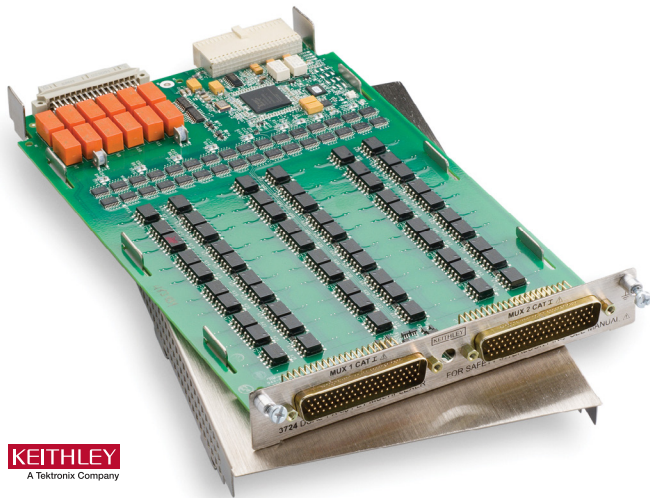


3724 Dual 1x30 FET Multiplexer Card

60 differential channels, automatic CJC with 3724-ST accessory

Datasheet



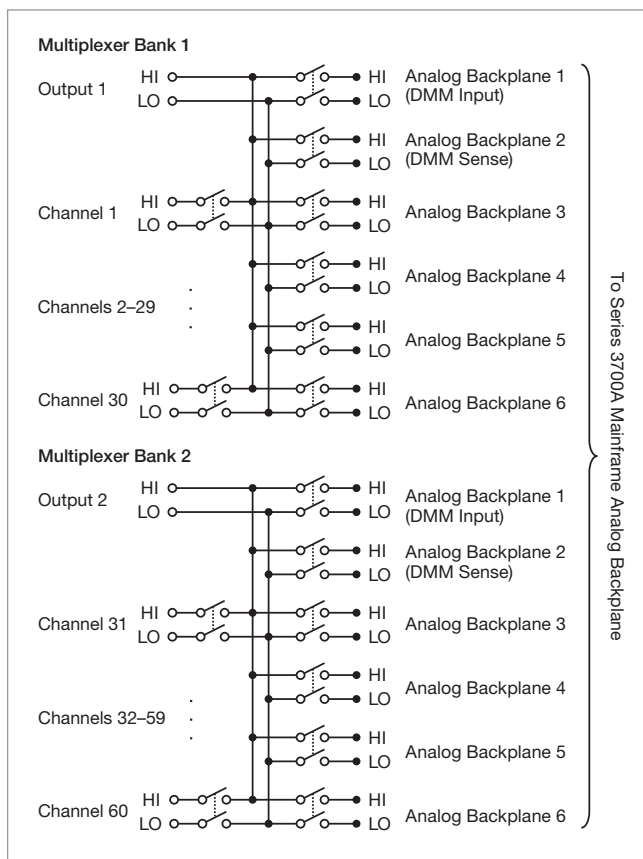
The 3724 provides two independent banks of solid-state relays arranged as 1x30 two-pole multiplexers that are ideal for high reliability, high speed multipoint measurement applications including temperature. The two banks can automatically be connected to the Series 3700A mainframe backplane and optional DMM through the analog backplane connection relays. This connection allows the mainframe to reconfigure the card to a single 1x60 two-pole multiplexer or to enable card-to-card expansion for even larger configurations.

Key Features

- 60 two-pole or 30 four-pole solid-state channels
- Scanning speeds greater than 1250 channels/second (switch only)
- Optically isolated, solid-state FET relays provide unlimited contact life
- 200 V, 0.1 A switch/carry signal capacity; 800mW
- Automatic CJC for temperature measurements when used with 3724-ST accessory
- Analog backplane connection relays provide easy bank and card interconnections
- Screw terminal connections provided with removable 3724-ST accessory
- Ideal for maintenance-free, long-life thermocouple temperature measurements
- Perfect for EV battery cell voltage monitoring

The solid-state FET relay technology supports fast switching times with scanning rates of greater than 1250 channels/second and provides unlimited contact life. In addition, the 3724 supports thermocouple temperature measurements when used with the 3724-ST (screw terminal) accessory providing automatic cold junction compensation (CJC).

The 3724 uses two 78-pin male D-sub connectors for signal connections. For screw terminal or automatic CJC, use the detachable 3724-ST accessory.



3724 Specifications

Multiplexer Configuration	Two independent 1×30, 2-pole multiplexers. Banks can be connected together via relay creating a single 1×60 multiplexer. Banks can be isolated from the backplane by relays. Card can be configured for 2- and 4-wire.
Contact Configuration	2-pole form A.
Connector type	Two 78-pin male D-shells.
3724-ST Screw Terminal Option	#22AWG typical wire size with 0.062 inch O.D. 124 conductors maximum. 16 AWG maximum wire size with 0.092 inch O.D. 36 conductor per card maximum.
Maximum Signal Level	200 V DC or 141 V RMS between any terminal, 0.1 A switched (0.1 A carry), 800 mW.
Common Mode Voltage	300V DC or RMS between any terminal and chassis.
Volt-Hertz Limit	10 ⁷ .
Contact Life	Solid State: > unlimited. EMR (Backplane): >1×10 ⁸ operations @ 5 V, 10 mA. 1×10 ⁵ operations @ max. signal level.

		Dual 1×30 ¹	Single 1×60 ^{1, 2}
Channel Resistance		<62 Ω (54 Ω @ 23°C)	<64 Ω (58 Ω @ 23°C)
Contact Potential (differential)		<±2 μV	<±2.5 μV
Offset Current		<10 nA (<±100 pA @ 23°C/60% R.H.)	<10 nA (<±100 pA @ 23°C/60% R.H.)
Isolation	Differential	10 ⁹ Ω, 500 pF	10 ⁹ Ω, 1100 pF
	Bank-Bank	10 ⁹ Ω, 100 pF	—
	CH-CH	10 ⁹ Ω, 125 pF	10 ⁹ Ω, 125 pF
	Common Mode	10 ⁹ Ω, 150 pF	10 ⁹ Ω, 700 pF
Crosstalk CH-CH	300 kHz	−40 dB	−40 dB
	1 MHz	−30 dB	−30 dB
Bandwidth		2 MHz	1 MHz

Notes

- Connections made using 3724-ST.
- 3706A mainframe with all DMM backplane relays disconnected. Maximum two card backplane relays closed.

3724 Card/3706A Multimeter Condensed Specifications

Temperature

Displayed in °C, °F, or K. Exclusive of probe errors.

Displayed in °C, °F, or K. Exclusive of probe errors.

Thermocouples (accuracy based on ITS-90)

Type	Range	Resolution	90 Day/1 Year, 23°C ± 5°
J	–150 to +760°C	0.001°C	1.0°C
K	–150 to +1372°C	0.001°C	1.0°C
N	–100 to +1300°C	0.001°C	1.0°C
T	–100 to +400°C	0.001°C	1.0°C
E	–150 to +1000°C	0.001°C	1.0°C
R	+400 to +1768°C	0.1°C	1.8°C
S	+400 to +1768°C	0.1°C	1.8°C
B	+1100 to +1820°C	0.1°C	1.8°C

DC Specifications

3724 Card/3706A Multimeter Uncertainty Specifications

Function	Range	Notes
Voltage	All	Add 4.5 μ V to PPM “of range”
Resistance	100 k Ω	Add 8 PPM to “of reading”
Resistance	1 M Ω	Add 80 PPM to “of reading”
Resistance	10 M Ω	Add 250 PPM to “of reading”
Resistance	100 M Ω	Add 5000 PPM to “of reading”
Resistance 2-wire	1 k Ω through 100 M Ω	Add 1.2 Ω (with REL) to PPM “of range” Add 64 Ω (without REL) to PPM “of range”
Resistance 4-wire and Dry Circuit	1 Ω , 10 Ω , and 100 Ω	Ranges Not Available (maximum lead resistance exceeded, see manual for measurement considerations)

Conditions 1 PLC or 5 PLC.

Accuracy $\pm$ (ppm of reading + ppm of range) (ppm = parts per million; e.g., 10 ppm = 0.001%).

General

ACTUATION TIME	<0.2 ms.	
Temperature Accuracy Using Automatic CJC with 3724-ST Accessory	1°C for J, K, T, and E type (see mainframe specification for details).	
Relay Type	Optically isolated FET.	
Relay Drive Scheme	Direct.	
Interlock	Backplane relays disabled when interlock connection removed.	
Relay Drive Current	4 mA.	
Operating Environment	Specified for 0°C to 50°C. Specified to 70% R.H. at 35°C.	
Storage Environment	–25°C to 65°C.	
Weight	1.13 kg (2.5 lbs.).	
Safety	Conforms to European Union Directive 73/23/EEC, EN61010-1.	
EMC	Conforms to European Union Directive 2004/108/EC, EN61326-1.	
Typical Scanning Speeds, Switch Only¹	Sequential scanning, single channel, immediate trigger advance >1250 ch/s.	
Typical Scanning Speeds, With Measurements Into Memory²		
	DCV (10 V range) or 2WΩ (1 kΩ range)	>1000 ch/s.
	Thermocouple	>1000 ch/s.
	3- or 4-Wire RTD	>450 ch/s.
	4-Wire Ω (1 kΩ range)	>450 ch/s.
	ACV (10 V, 400 Hz range)	>1000 ch/s.
Power Budget Information	Quiescent Power (mW)	1150.
	Channel Relay Power (mW) Each	20.
	Backplane Relay Power Consumption (mW) Each	100.

See Chapter 8 of the Series 3700A user's manual for more detailed information.

Notes

1. Scanning script local to mainframe, within same bank, break before make.

2. 3706A mainframe with autorange off, limits off, dmm.autodelay=0, dmm.autozero=0, 4½ digits (NPLC=.006), for ACV dmm.detectorbandwidth=300, for OHMs dmm.offsetcompensation=off, dmm.opendetector=off. Scanning script local to mainframe, sequential scan within same bank (2-pole) or card (4-pole), and break before make switching.

Ordering Information

3724	Dual 1×30 FET Multiplexer Card
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Available Accessories

3720-MTC-3	78-pin female-to-male D-sub Cable Assembly, 3 m (9.8 ft)
3724-ST	Screw Terminal Block (required for auto CJC thermocouple measurements)

Available Services

3724-3Y-EW-STD	1-year factory warranty extended to 3 years from date of shipment
3724-5Y-EW-STD	1-year factory warranty extended to 5 years from date of shipment
C/3724-3Y-DATA	3 (Z540-1 compliant) calibrations within 3 years of purchase*

*Not available in all countries

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Vietnam 12060128

* European toll-free number. If not accessible, call: +41 52 675 3777

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