PCIe/PXIe-6302

24 bits temperature input module for Thermocouple

Ⓤ Please download JYTEK <JYPEDIA>, you can quickly inquire the product prices, the key features and available accessories.

temperature measurement module which provides up to 32 channels, supports R/S/B/J/T/E/K/N/C/A type thermocouple, with input voltage range of -78.125 mV ~ +78.125 mV and sample rate up to 800 Samples/sec. The module utilizes a high-throughput PCI Express bus and multi-core optimized drivers and application software to provide high-performance capabilities.

Main Features

- 32 channels of thermocouple measurements
- 3 voltage ranges: ±78.125 mV / ±39.06 mV / ±19.53 mV
- J/K/T/E/N/B/R/S type thermocouple
- 8 cold-junction compensation channels by 2 TB-68CJ terminal box
- Onboard 128M sample FIFO buffer for analog input
- DMA for analog input
- 24 bits resolution
- Provide resistance or temperature measurements
- Digital and Software Trigger

Overview

JYTEK PCIe/PXIe-6302 is a high-resolution

Specifications

Input Characteristics

Basic

Number of channels	32 channels
ADC resolution	24 bits
Type of ADC	Δ-Σ
Sensor support	R/S/B/J/T/E/K/N/C/A thermocouple
Sampling mode:	Scanned
Sampling rate	800 Samples/s MAX (4 channels)
	100 Samples/s (all 32 channels)
Voltage measurement range	±78.125 mV/±39.06 mV /±19.53 mV
Temperature measurement range	Full J, K, T, E, N, B, R, S thermocouple range
Overvoltage protection	±30 V
Synchronous acquisition	NO
Storage depth	128M Samples
Differential input impedance:	15 MΩ
Typical DC linearity:	±2 ppm
Maximum DC linearity:	±15 ppm

Open Thermocouple Detection (OTD)

OTD selection:	Software
OTD detection:	Per channel
OTD enabled input current:	0.5 µA/2 µA/4 µA
OTD disabled input current:	1 nA(SE) 200 pA(DS)

Common Mode Voltage Range

Channel-COM	0-3 V
Channel-Channel	0-3 V
COM-Earth ground	±300 V

Input bandwidth (-3 dB)

Input bandwidth(level 0):	11.5 Hz
Input bandwidth(level 1):	36.8 Hz
Input bandwidth(level 2):	184 Hz
Input bandwidth(level 3):	220.8 Hz
Input bandwidth(level 4):	2.2 kHz
Input bandwidth(level 5):	4.4 kHz

Overvoltage Protection

any CJC Pin,TC Pin,COM	±24 V(3.6V Between I+ and I-)
RSVD-GND	±24 V
ESD protection	4 kV

PFI

Number of channels	4 channels PFI<0..3>
External digital trigger	Trigger voltage：5 V TTL Trigger edge：rising/falling
Direcrion	Input
6302's PFI is only used for external digital triggering	

Timing and Trigger

Sampling Rate

Maximum full-channel sampling rate (level 0)	0.275 S/s
Maximum full-channel sampling rate (level 1)	0.625 S/s
Maximum full-channel sampling rate (level 2)	3.125 S/s
Maximum full-channel sampling rate (level 3)	5 S/s
Maximum full-channel sampling rate (level 4)	50 S/s
Maximum full-channel sampling rate (level 5)	100 S/s

Digital Trigger

Trigger source	PXI_TRIG <0..7> PXI_STAR PFI<0..3>
Trigger Mode	Start Reference ReTrigger
Polarity	Software selectable

Physical and Environment

Bus

PXIe standard	x4 PXI Express peripheral module Specification V1.0 compliant
Slot supported	x1 and x4 PXI Express or PXI Express hybrid slots

Size

External physical size	3 U PXIe
Weight	190 g

Power

3.3V	2.0 A
12V	0.04 A

Operating Environment

Ambient temperature range	0 °C to 50 °C
Relative humidity range	20% to 80%, noncondensing

Storage Environment

| Ambient temperature range	-20 ˚C to 80 ˚C
Relative humidity range	10% to 90%, noncondensing

Performance Test

Voltage Accuracy

	Typical	Max
Offset error(25±5 °C)	0.55 µV	2.43 µV
Offset error(0-50 °C)	0.77 µV	3.01 µV
Gain error(25±5 °C)	0.01%	0.01%
Gain error(0-50 °C)	0.02%	0.04%

Typical Error(30mV Input)

Typical Error(65mV Input)

Performance Test
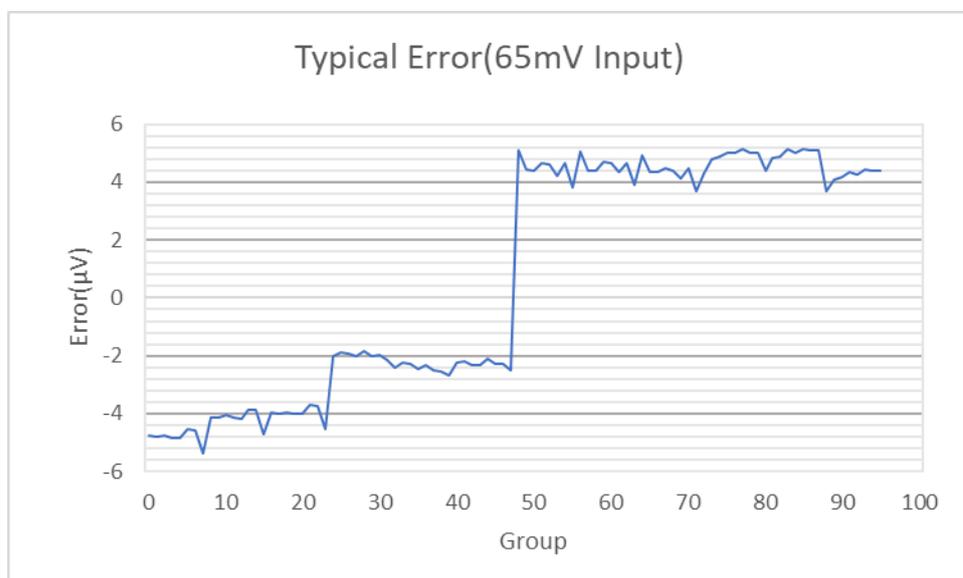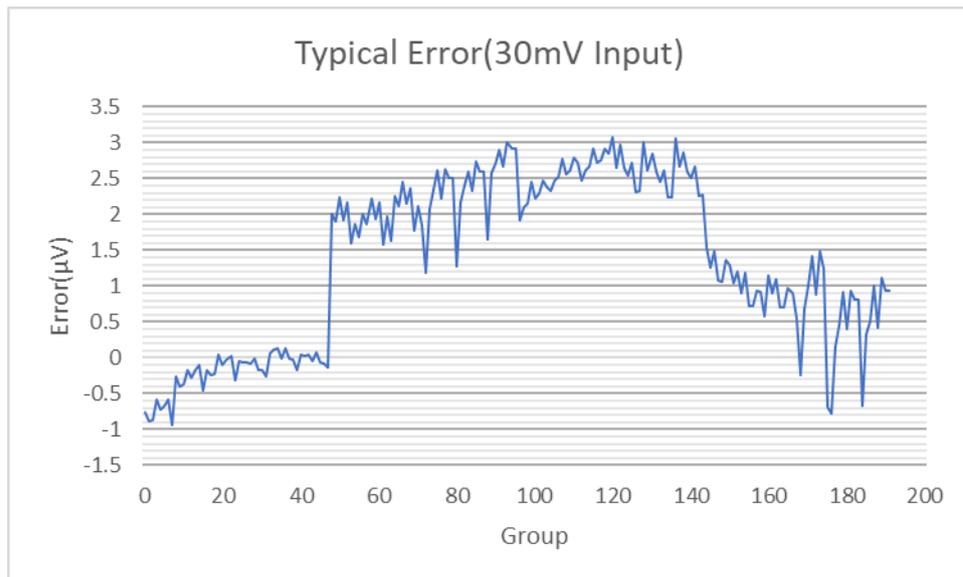
Input Noise

Sampling rate	Voltage measurement noise(RMS)
Level 0	0.215 µV
Level 1	0.241 µV
Level 2	0.295 µV
Level 3	0.492 µV
Level 4	0.775 µV
Level 5	6.230 µV

Typical Noise(Level 2)

Typical Noise(Level 3)

Typical Noise(Level 4)

Typical Noise(Level 5)
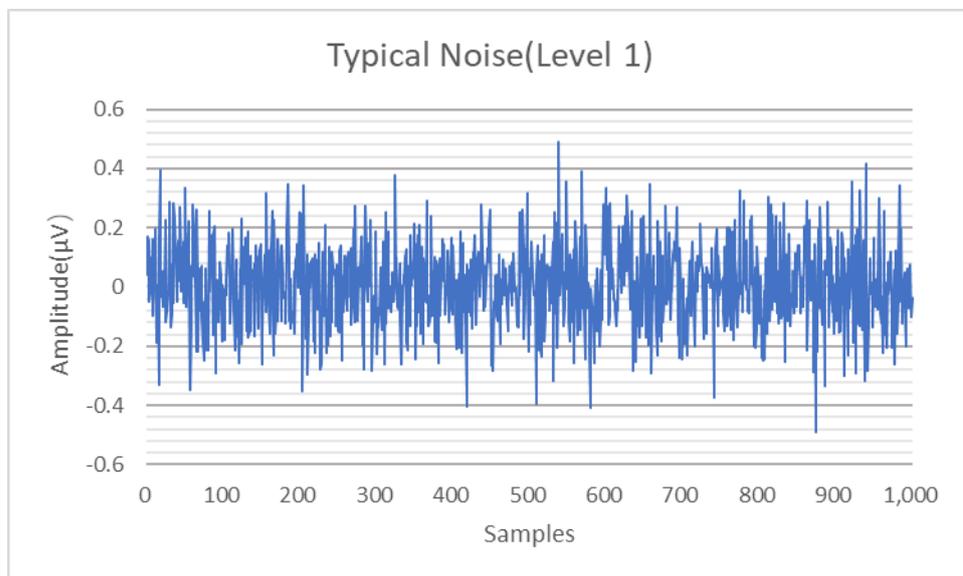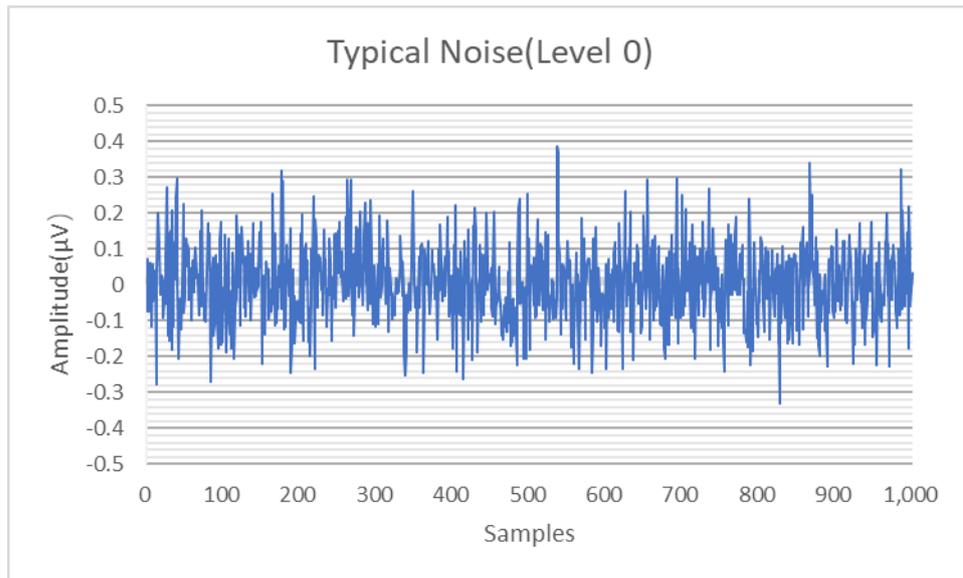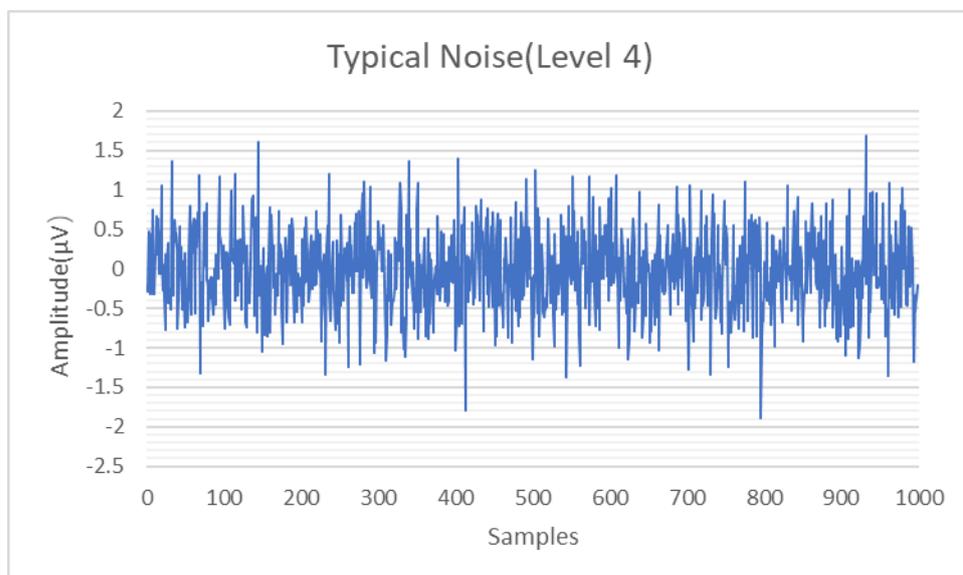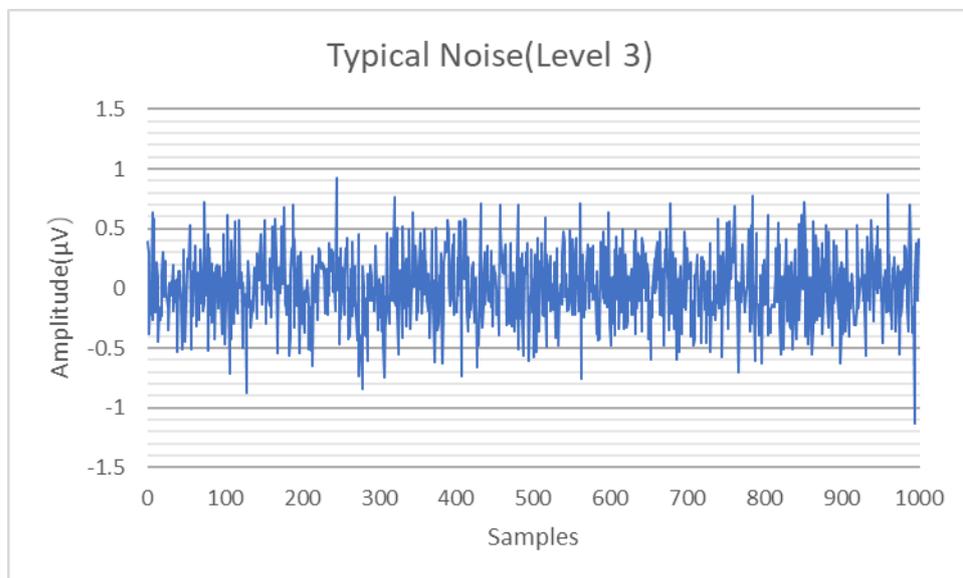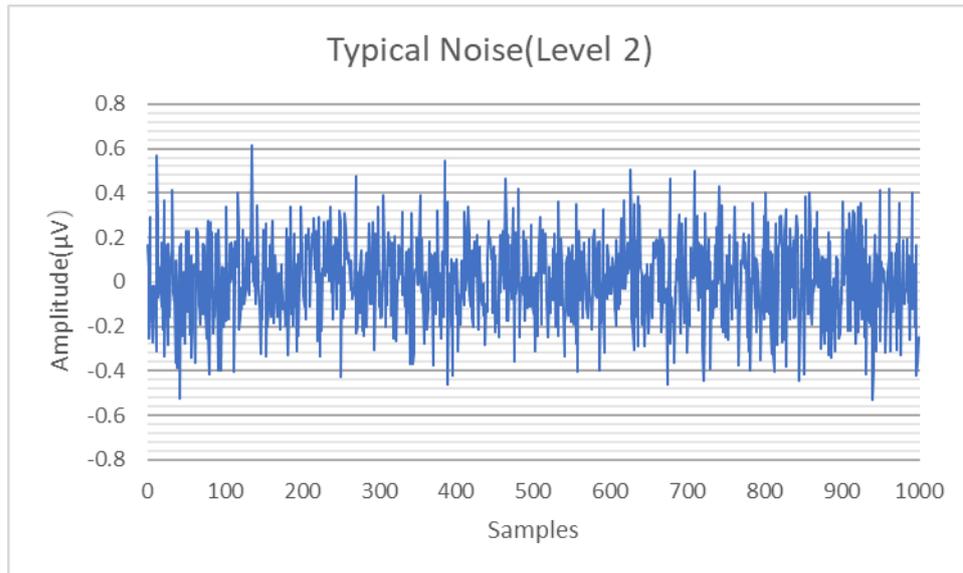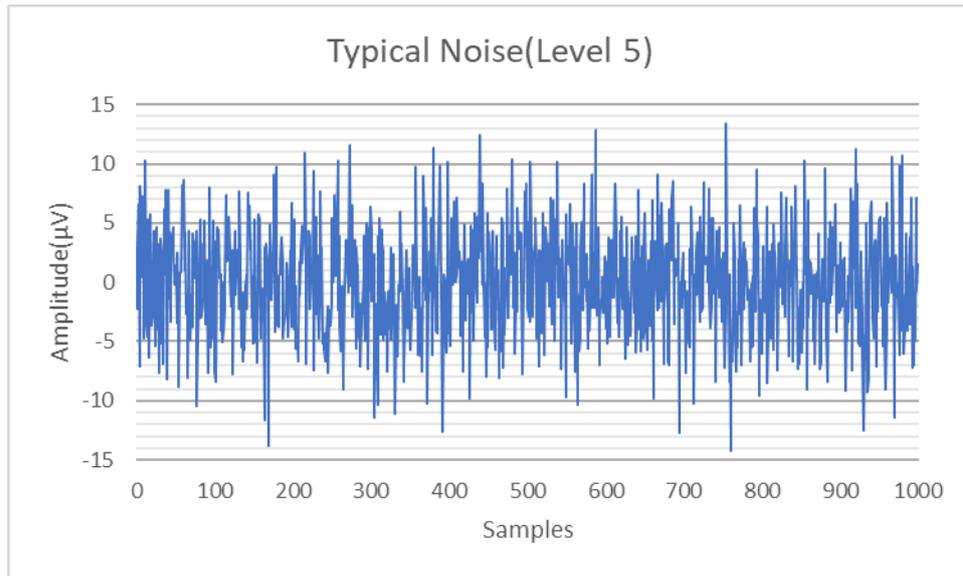
Input stability

Typical offset error drift	7.32 nV/℃
Maximum offset error drift	19.2 nV/℃
Typical gain error drift	5.91 ppm/℃
Maximum gain error drift	11.9 ppm/℃

Typical Drift (30mV Input)

Typical Drift (60mV Input)
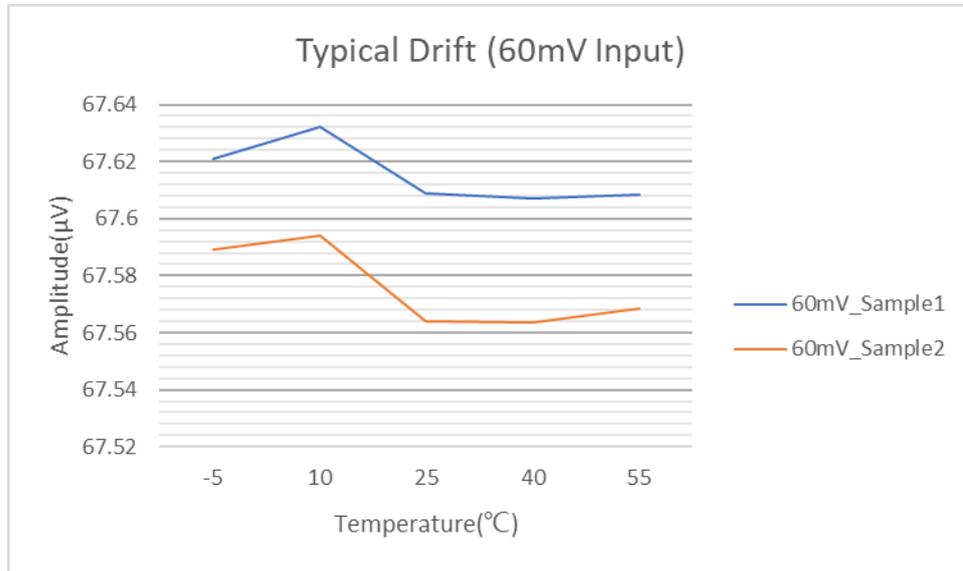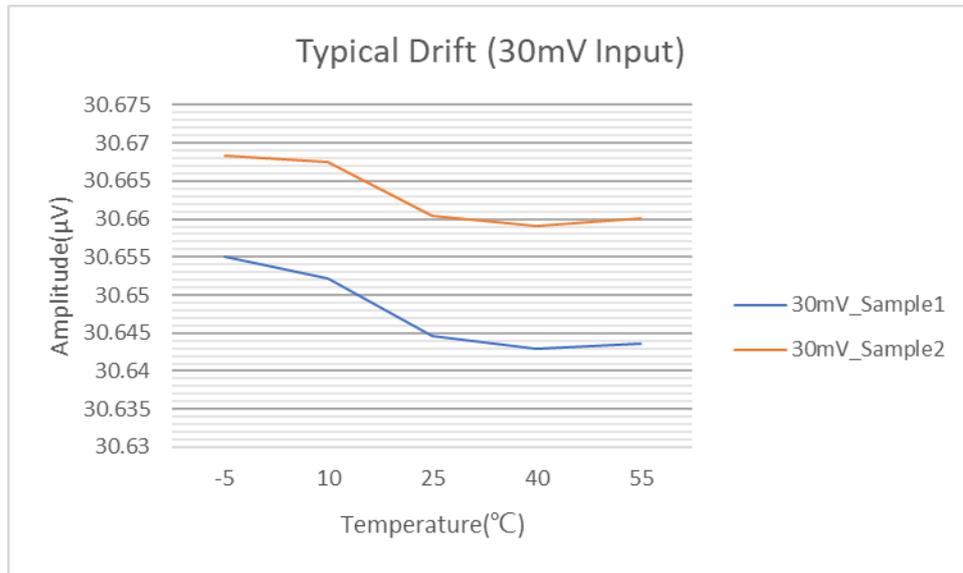
Temperature Accuracy

	Typical(°C)	Max(°C)
25 °C,J/N thermocouple(0 °C)	0.029349	0.089078
25 °C,J/N thermocouple(1100 °C)	0.07781	0.140331
0-50 °C,J/N thermocouple(0 °C)	-	0.196668
0-50 °C,J/N thermocouple(1100 °C)	-	0.306258
25 °C,K thermocouple(0 °C)	0.037448	0.113659
25 °C,K thermocouple(1400 °C)	0.099281	0.179055667
0-50 °C,K thermocouple(0 °C)	-	0.250937797
0-50 °C,K thermocouple(1400 °C)	-	0.39077
25 °C,T/E thermocouple(0 °C)	0.038223	0.116008
25 °C,T/E thermocouple(900 °C)	0.101333	0.182757
0-50 °C,T/E thermocouple(0 °C)	-	0.256125
0-50 °C,T/E thermocouple(900 °C)	-	0.398847485
25 °C,R/S thermocouple(0 °C)	0.279097126	0.847079525
25 °C,R/S thermocouple(1400 °C)	0.739925441	1.33447148
0-50 °C,R/S thermocouple(0 °C)	-	1.870196786
0-50 °C,R/S thermocouple(1400 °C)	-	2.912339186
25 °C,B thermocouple(300 °C)	0.49307159	1.496507161
25 °C,B thermocouple(1400 °C)	1.307201613	2.357566281
0-50 °C,B thermocouple(300 °C)	-	3.304014322
0-50 °C,B thermocouple(1400 °C)	-	5.145132561

Measurement sensitivity

ADC Level	J, K, T, E	N	B	R,S
Level 0	0.016 °C	0.012 °C	0.035 °C	0.024 °C
Level 5	0.48 °C	0.37 °C	1.027 °C	0.707 °C

Order Information

- PXIe-6302 (PN: JY2016302-01)
  32-ch 24-bit PXIe Temperature input card for thermocouple

- PCIe-6302 (PN: JY2116302-02)
  32-ch 24-bit PCIe Temperature input card for thermocouple

Accessories

- TB-68CJ (PN: JY2010068-01)
  68-Pin SCSI Shielded I/O Connector Block with cold junction sensor

- ACL-2026868-1 (PN: JY2026868-01)
  1M 68pin VHDCI68M-SCSI68M 100Ω all shielded cable

- ACL-2026868-2 (PN: JY2026868-02)
  2M 68pin VHDCI68M-SCSI68M 100Ω all shielded cable

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