TH2554 Series | Data Recorder

1 model available

RS232 | USB HOST | USB DEVICE | LAN | HANDLER / GPIB | SCPI

Dimensions / Weight

Rack dimensions（mm）:215（W）x132（H）x490（D）
Overall dimensions（mm）:235（W）x154（H）x530（D）
Net weight:approx. 7.8 kg
Channel:0.5kg each

Applications

- Industrial

Temperature testing for motors, transformers, magnetic cores, thermal rise evaluation, resistance sintering furnaces, new energy batteries, charging stations, automotive motors, LED lamps, and semiconductor chips.

- Agriculture

Temperature monitoring in vegetable greenhouses, fruit greenhouses, seed cold storage facilities, and similar environments.

- Chemical Industry

Temperature monitoring for reaction furnaces and production equipment.

- Animal Husbandry

Temperature monitoring in livestock sheds, pens, food storage facilities, and seafood warehouses.

- Medical & Pharmaceutical

Temperature monitoring in hospital wards, examination rooms, pharmaceutical storage rooms, sperm banks, and ambulances.

- Environmental

Temperature monitoring at outdoor observation sites and meteorological monitoring stations.

- Transportation

Temperature monitoring for traffic signs, expressways, refrigerated transportation, and automotive electronics.

Performance Features

- 7-inch color capacitive touchscreen with 800 × 480 resolution
- Linux operating system
- User-friendly HMI: capacitive touchscreen, menu-driven operation logic, multifunctional rotary knob, and quick channel selection/menu navigation/data entry via the front panel
- Modular design with a 5-slot mainframe
- Supports up to 160 channels per unit, offering extremely low cost per channel
- Independent channel configuration: assign individual functions, Mx+B calibration, sound prompts for sorting results
- Convenient data logging:
  - Reading rate up to 1,000 readings/second
  - Interval scanning function: stores up to 100,000 timestamped readings
  - Direct USB data storage
- 6 1/2-digit DMM module:
  - Supports DCV, DCI, ACV, ACI, 2WR, 4WR, period, frequency, and temperature
  - Temperature acquisition supports thermocouples, thermistors, and RTDs
  - DC voltage measurement accuracy of 0.0035%
  - Basic resistance measurement accuracy of 0.0100%
- Scanning speed:
  - Basic board: 90 channels/second
  - High-speed board: 300 channels/second
- Portable, durable chassis with non-slip feet
- Standard SCPI command set

Introduction

The TH2554 is a high-precision, high-stability, multi-channel scanning modular data acquisition system, featuring five module slots, a reading rate of up to 1,000 readings per second, a basic DC voltage accuracy of 0.0035%, and a basic resistance accuracy of 0.0100%, along with a range of other outstanding performance capabilities.

Whether in product performance testing during the R&D phase or automated testing in the production process, the TH2554 Series Data Acquisition/Switch System combines precise measurement capabilities with flexible signal switching to meet applications involving multiple test points and diverse signal types, delivering comprehensive and versatile test and measurement solutions.

Quick Selection

Main frame	Model	Name	Number of Slots	
	TH2554	Data recorder	5	
Modules	Model	Name	Basic Specifications	Remark
	TH2554-DMM	High-Precision Measurement Module	6½-digit measurement accuracy, supporting DCV, DCI, ACV, ACI, 2WR, 4WR, period, freq., and temp.	Mandatory
	TH2554-01	20-Channel Basic Scanning Module	90 CH/s; differential type, 20 CH 2-wire / 10 CH 4-wire multiplexer relays, configurable into 2 independent multiplexer groups; 2 independent current channels; auto CJC; 300 V / 1 A	Optional
	TH2554-02	40-Channel Basic Scanning Module	90 CH/s; differential type, 40 CH 2-wire / 20 CH 4-wire multiplexer relays, configurable into 2 independent multiplexer groups; 2 independent current channels; auto CJC; 300 V / 1 A	Optional
	TH2554-03	20-Channel High-Speed Scanning Module	300 CH/s; differential type, 20 CH 2-wire / 10 CH 4-wire solid-state multiplexer relays, configurable into 2 independent multiplexer groups; auto CJC; 60 V / 0.1 A	Optional

Features

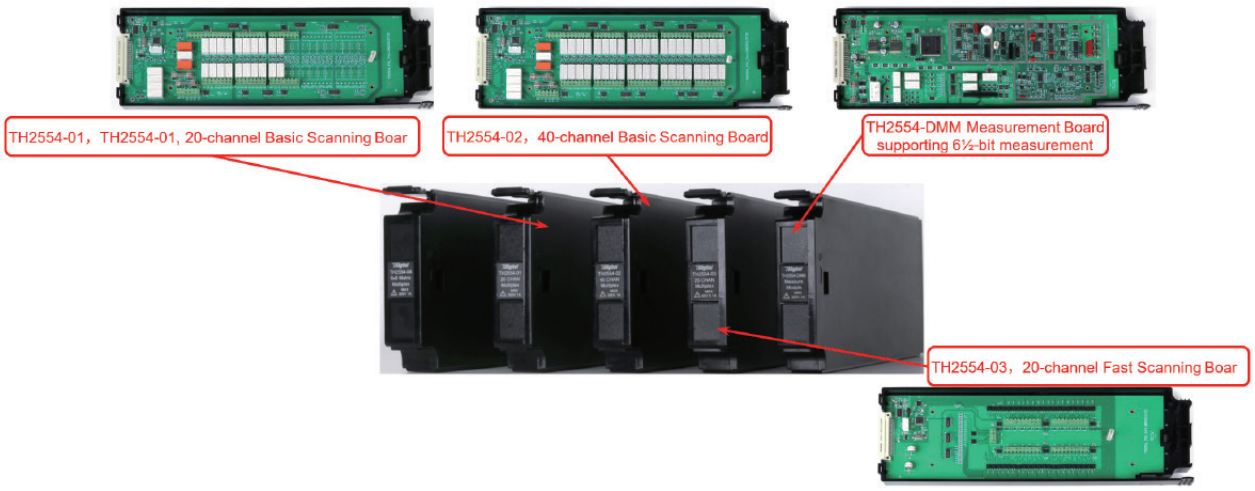
A.Modular design with a 5-slot mainframe

The TH2554 data acquisition system adopts a modular design, supporting up to 5 slots, with a maximum of 160 scanning channels, or up to 200 channels without a measurement module installed. The 5 slots allow any combination of modules, with automatic module recognition by the system.

The TH2554 is equipped with common interfaces such as RS232, USB HOST, USB DEVICE, and HANDLER, and supports the standard SCPI command set, making it suitable for automated integration.

B.Basic Boards

The TH2554 data acquisition system supports five types of boards, with automatic recognition upon insertion.

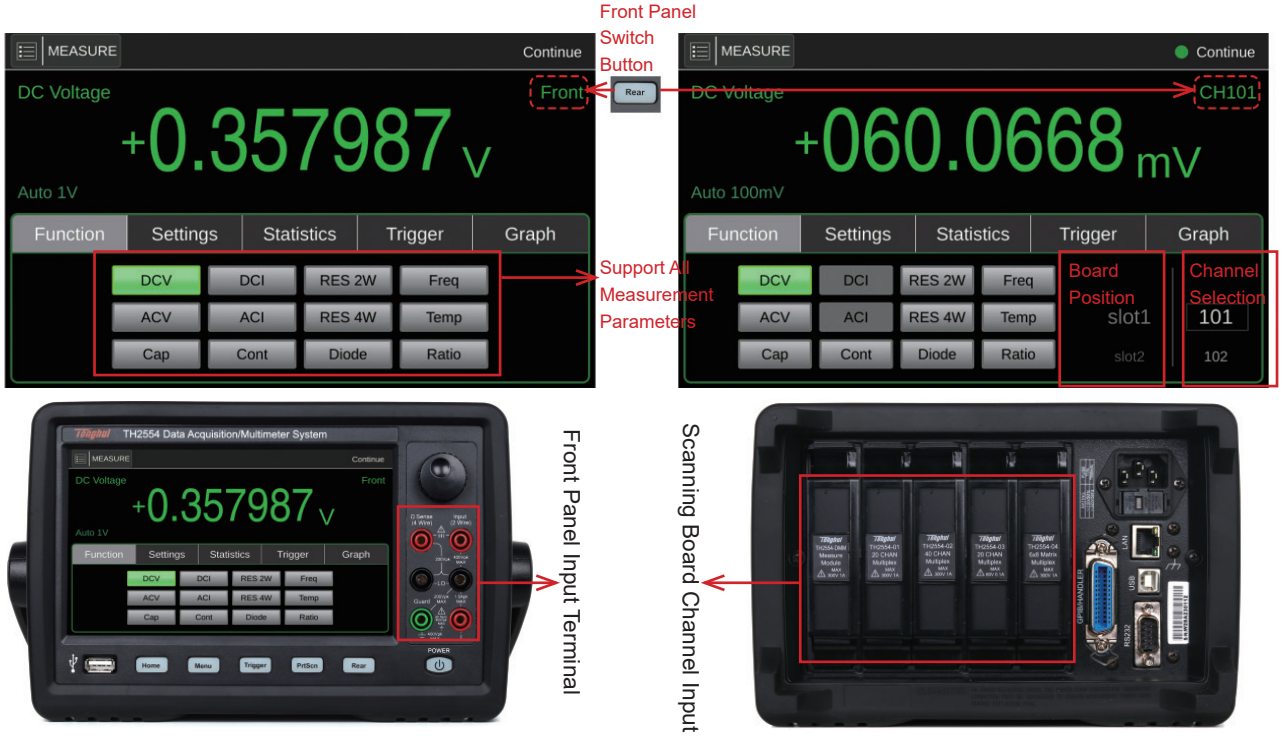


C.7-inch capacitive touchscreen, Linux-based platform, and menu-driven operation logic for enhanced ease of use, with both Chinese and English interfaces.

The TH2554 features a 7-inch capacitive touchscreen, a Linux-based operating system, drop-down menus, and a digital rotary encoder, making it highly suitable for quick instrument setup and measurement display.

D.Multiple Measurement Modes

1. Single-Channel Measurement: Supports both front-panel input terminals and scanning board channels. The instrument allows quick switching between the front-panel input terminals and any channel on the scanning boards via front-panel keys.

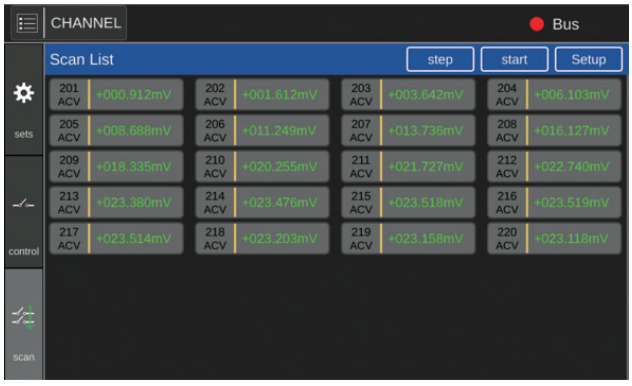


2. Multi-Channel Scanning Measurement

Through the drop-down menu, users can directly access the scanning setup, enabling configuration of scanning measurement parameters, channel control, as well as scanning control and display.

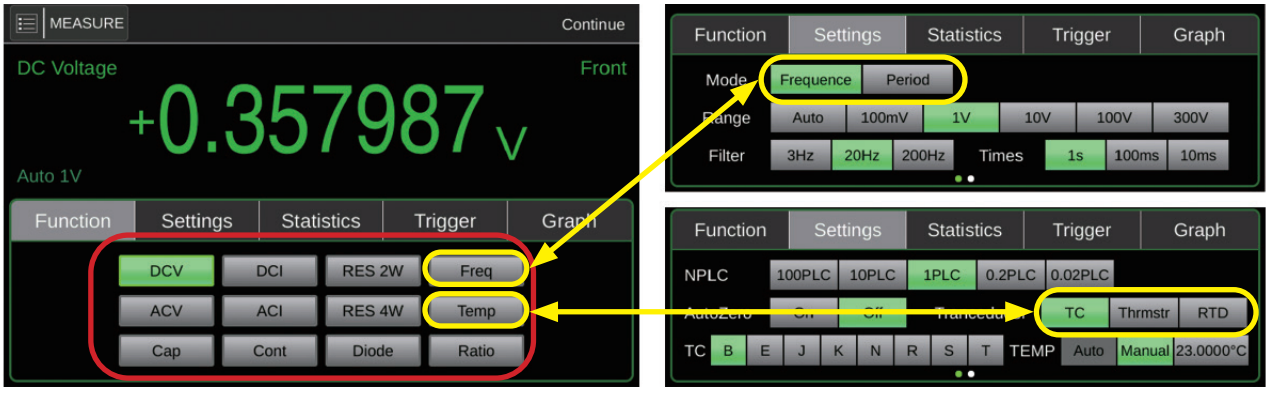
Supports all measurement parameters

Switch between the display of multi-channel scanning results directly on the scanning interface for a more intuitive experience.



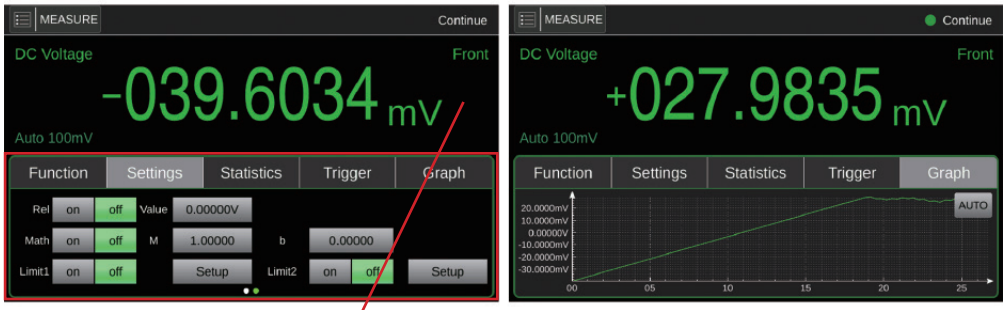
E.Powerful Measurement Capabilities: Measures and converts over a dozen types of input signals

Supported signal types: temperature from thermocouples, thermistors, and RTD sensors; AC voltage; DC voltage; AC current; DC current; 2-wire/4-wire resistance; frequency and period; capacitance; and ratio.

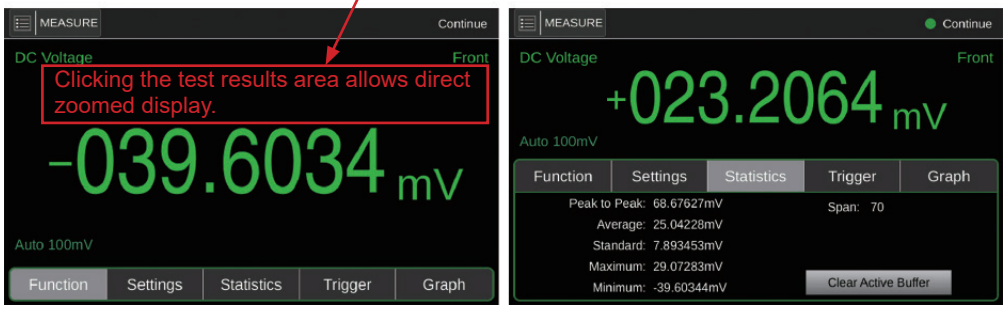


F.100,000 test data points in buffer with flexible data processing options

The instrument can store up to 100,000 test data points in its buffer. The buffered data supports timeline graph display and statistical analysis, while measurement results support null value operations and Y = mX + b function calculations. The processed results are displayed on the screen and can be enlarged for viewing.



Buffered data can be directly plotted as a timeline (line chart).

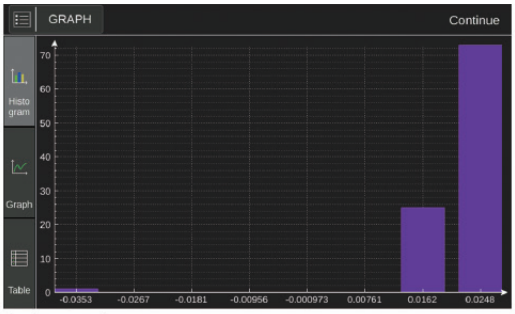


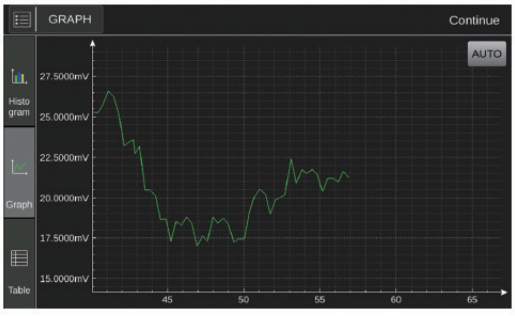
Test results stored in the buffer can be automatically analyzed statistically.

G.Powerful Charting Capabilities, Supporting Three Display Modes for Buffered Data

Through the drop-down menu, the instrument can directly switch to the chart display interface, supporting three display modes for buffered data: histogram, line chart, and data table. Display results can show either a single channel’ s test results or the results of all scanned channels.

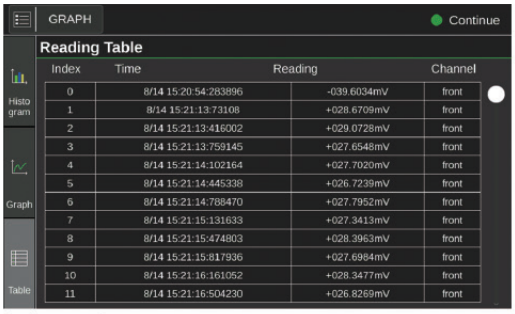
Scanning Board Channel Input

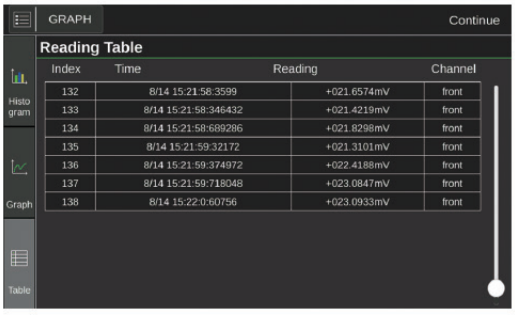




Line Chart: X for Time, Y for Result

Data Table: Display in Direct Table Format, Single Measurement

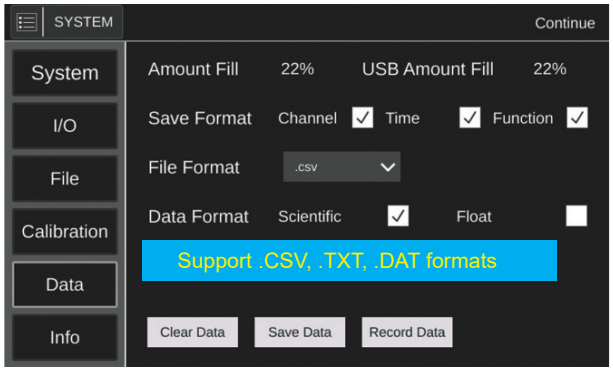




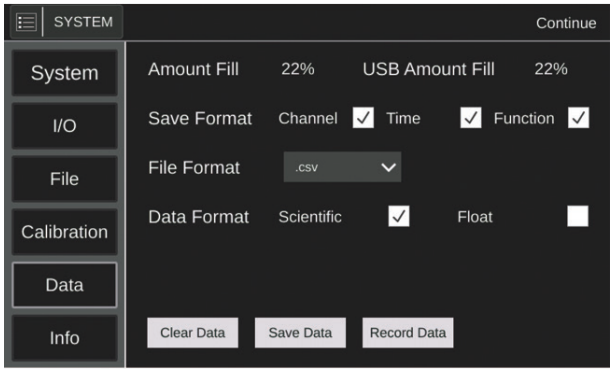
Data Table: Display in Direct Table Format, Multi - channel Scanning

H.Data and File Processing

Test data processing supports storage in three formats, with the corresponding record file generated automatically upon starting data logging.

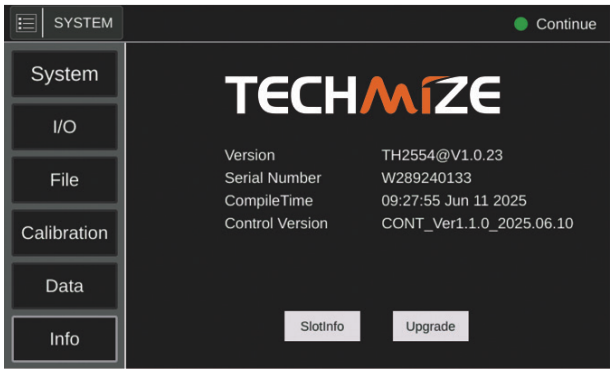


Flexible file handling, supporting data exchange via USB flash drive.



I.Intelligent Firmware Upgrade

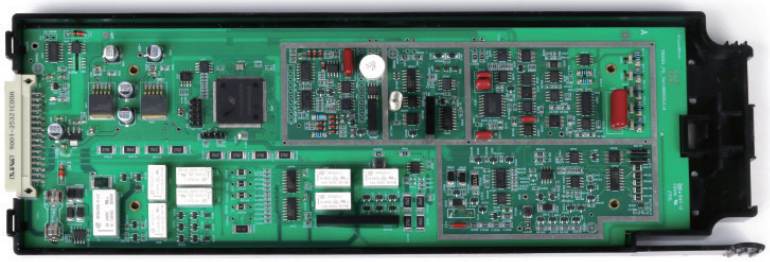
The instrument supports firmware upgrades via USB flash drive or network connection, allowing customized functions or program enhancements to be updated without the need to return the unit to the factory.



Supported Boards

A.TH2554-DMM: 6½-Digit DMM Board

1.Appearance



2.Basic Specifications

Supports DMM functions with 6½-digit measurement resolution, allowing hot-swapping in any slot.

Measurement Parameter	Range	Maximum Accuracy %
DCV	0.1μV-300.000V	0.0035
DCI	0.1nA-3A	0.050
DCR	10μΩ-100.0000MΩ	0.0100
ACV	0.1μV-300.000V	0.060
ACI	1nA-3A	0.1
Frequency	3Hz-300kHz	0.010
Diode	5V range/1mA test current	0.010
Continuity (Conductance)	1kΩ range/1mA test current	0.010
Temperature	PT100（DIN/IEC751）probe	Probe Accuracy+0.05°C
	5kΩ thermistor	Probe Accuracy+0.10°C
Capacitance	0.0001nF-10.000mF	0.5

3.Technical Specifications

Model	TH2554-DMM						
Meas. Resolution	6½- digit						
Meas. Function	Parameter			Accuracy			
DCV	Range			24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	100.0000mV			0.0030 + 0.0030	0.0040 + 0.0035	0.0050 + 0.0035	0.0065 + 0.0035	0.0005 + 0.0005
	1.000000V			0.0020 + 0.0006	0.0030 + 0.0007	0.0040 + 0.0007	0.0055 + 0.0007	0.0005 + 0.0001
	10.00000V			0.0015 + 0.0004	0.0020 + 0.0005	0.0035 + 0.0005	0.0050 + 0.0005	0.0005 + 0.0001
	100.0000V			0.0020 + 0.0006	0.0035 + 0.0006	0.0045 + 0.0006	0.0060 + 0.0006	0.0005 + 0.0001
	300.000V			0.0020 + 0.0006	0.0035+ 0.0010	0.0045+ 0.0010	0.0060 + 0.0010	0.0005 + 0.0001
ACV	Freq./ Range			24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	3-5 Hz			1.00 + 0.02	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03	0.100 + 0.003
	5-10 Hz			0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.35 + 0.03	0.035 + 0.003
	10 Hz-20 kHz			0.04 + 0.02	0.05 + 0.03	0.06 + 0.03	0.07 + 0.03	0.005 + 0.003
	20-50 kHz			0.10 + 0.04	0.11 + 0.05	0.12 + 0.05	0.13 + 0.05	0.011 + 0.005
	50-100 kHz			0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
	100-300 kHz			4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020
DCI	Range	Int. R / V Drop		24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	10μA	<0.11V		0.020 + 0.030	0.040 + 0.040	0.050 + 0.040	0.060 + 0.040	0.0020+ 0.0050
	100μA	<0.11V		0.010 + 0.020	0.040 + 0.025	0.050 + 0.025	0.060 + 0.025	0.0020+ 0.0030
	1mA	<0.11V		0.010 + 0.006	0.030 + 0.006	0.050 + 0.006	0.060 + 0.006	0.0020+ 0.0005
	10mA	< 0.5 V		0.010 + 0.020	0.030 + 0.020	0.050 + 0.020	0.060 + 0.020	0.0020+ 0.0020
	100mA	< 0.5 V		0.010 + 0.004	0.030 + 0.005	0.050 + 0.005	0.060 + 0.005	0.0020+ 0.0005
	1A	< 0.7 V		0.050 + 0.006	0.080 + 0.010	0.100 + 0.010	0.120 + 0.006	0.0050+ 0.0010
	3A	< 2.0 V		0.180 + 0.020	0.200 + 0.020	0.200 + 0.020	0.230 + 0.020	0.0050+ 0.0020
ACI	Range	V Drop	Frequency	24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	100μA	<0.011V	3Hz- 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
	1mA	< 0.11V						
	10mA	<0.05V	5kHz - 10kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.030 + 0.006
	100mA	<0.5V						
	1A	<0.7V	3Hz- 5kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
			5kHz - 10kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.030 + 0.006
	3A	<2.0V	3Hz- 5kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.015 + 0.006
			5kHz - 10kHz	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.030 + 0.006
DCR	Range		Test Current	24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	10Ω		10mA	0.0050 + 0.0030	0.008 + 0.004	0.010 + 0.004	0.012 + 0.004	0.0006 + 0.0005
	100 Ω		1mA	0.0030 + 0.0020	0.008 + 0.003	0.010 + 0.003	0.012 + 0.003	0.0006 + 0.0003
	1kΩ		1mA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.012 + 0.001	0.0006 + 0.0001
	10kΩ		100μA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.012 + 0.001	0.0006 + 0.0001
	100kΩ		10μA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.012 + 0.001	0.0006 + 0.0001
	1MΩ		5μA	0.002 + 0.001	0.008 + 0.001	0.010 + 0.001	0.012 + 0.001	0.0030 + 0.0030
	10MΩ		500nA	0.015 + 0.001	0.020 + 0.001	0.040 + 0.001	0.060 + 0.001	0.0030 + 0.0030
	100MΩ		500nA//10M	0. 300 + 0.010	0.800 + 0.010	0.800 + 0.010	0.800 + 0.010	0.0030 + 0.0030
Freq.	Freq./Range			24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	3Hz - 10Hz			0.100	0.100	0.100	0.100	0.0002
	10Hz - 100Hz			0.030	0.030	0.030	0.035	0.0002
	100Hz - 1kHz			0.003	0.008	0.010	0.015	0.0002
	1kHz - 300kHz			0.002	0.006	0.010	0.015	0.0002
	Square Wave			0.001	0.006	0.010	0.015	0.0002
Diode	Function		Test Current	24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	5V		1mA	0.002 + 0.030	0.008 + 0.030	0.010 + 0.030	0.012 + 0.030	0.0010 + 0.0020
Continuity (Conductance)	Function		Test Current	24hrs TCAL ± 1°C	90days TCAL ± 5°C	1year TCAL ± 5°C	2year TCAL ± 5°C	Temp. Coefficient/°C
	1kΩ		1mA	0.002 + 0.030	0.008 + 0.030	0.010 + 0.030	0.012 + 0.030	0.0010 + 0.0020
Temp.	Probe Type	PT100 （DIN/ IEC 751）		+ 0.05°C				
		5kΩ Thermistor		+ 0.10°C				

	Range	Test Current	1year TCAL ± 5°C	Temp. Coefficient
Capacitance	1.0000nF	10μA	1.0 + 0.5	0.02
	10.000nF	10μA	0.5 + 0.1	0.02
	100.00nF	10μA	0.5 + 0.1	0.02
	1.0000μF	100μA	0.5 + 0.1	0.02
	10.000μF	100μA	0.5 + 0.1	0.02
	100.00μF	1mA	0.5 + 0.1	0.02
	1.0000mF	10mA	0.5 + 0.1	0.02
	10.000mF	10mA	1.0 + 0.5	0.02

B.TH2554-01: 20-Channel Differential Multiplexer Module

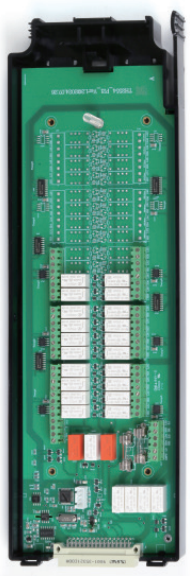
1. Features

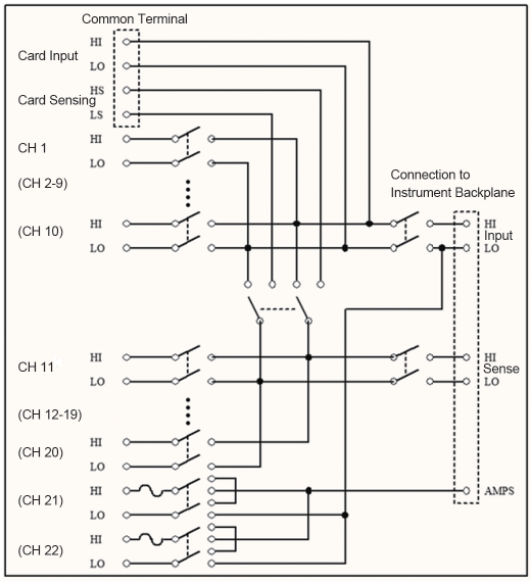
- 20 CH (2-wire) / 10 CH (4-wire) inputs, with 2 independent current input channels
- Max scan speed: 90 CH/s
- Max voltage measurement: 300 V; max current measurement: 1 A; max input power: 60 W or 125 VA
- Thermocouple temperature measurement with CJC (Cold Junction Compensation)
- 3 A current channel
- Test ports with common terminals, supporting 1-to-many configuration
- All DMM module functions accessible through the module

2. Technical Specifications

Function			Parameter
Specification			
Test Method		CH 1-10,21-30	Mux scanning; connects any of 20 × 2-wire or 10 × 4-wire signals to the DMM
		CH 41,42	Mux scanning; connects either of 2 × 2-wire current signals to the DMM
Input	Max Signal Level	CH 1-10,11-20	300 V_{DC} or 300 Vrms, 1 A switching, 60 W, 125 VA (max)
		CH 41-42	60 V_{DC} or 30 Vrms, 3 A switching, 60 W, 125 VA (max)
	Contact Life (typ.)		$>10^5$ ops at max signal level
			$>10^8$ ops with no load
Contact R			at end of contact life <1W
Contact Potential			Per contact<±500nV（typ.）,1mV（max）
			Per contact pair<±500nV（typ.）,1mV（max）
Offset Current			<100pA
Connector Type			Screw terminal, #20 AWG wire size
Isolation between any two terminals			$>10^{10}\Omega$,<100pF
Isolation between any terminal and chassis			$>10^9\Omega$,<200pF
Crosstalk (10 MHz, 50 Ω load)			<-40dB
Insertion Loss (50 Ω source, 50 Ω load)			<0.1dB below 1MHz
			<3dB below 2MHz
Common-Mode Voltage			between any terminal and chassis: 300V
General Characteristics			
20 Channels			20 DPST relay input channels, all configurable for 4-wire
2 Channels			2 current-only input channels
Relay Type			Latching electromechanical relay
Environment		Operating	0° to 50 °C, ≤80% RH at 35 °C
		Storage	-25° TO 65℃

3. Appearance & Schematic





C.TH2554-02: 40-Channel Differential Multiplexer Module

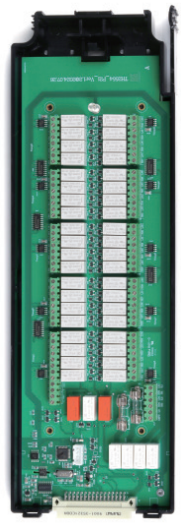
1. Features

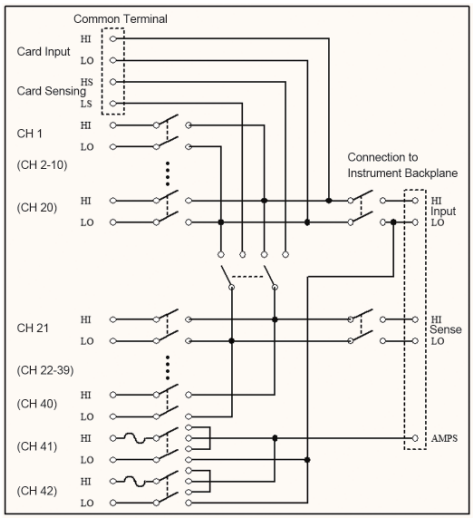
- 40 CH (2-wire) / 20 CH (4-wire) inputs, with 2 independent current input channels
- Max scan speed: 90 CH/s
- Max voltage measurement: 300 V; max current measurement: 1 A; max input power: 60 W or 125 VA
- Thermocouple temperature measurement with CJC (Cold Junction Compensation)
- 3 A current channe
- Test ports with common terminals, supporting 1-to-many configuration
- All DMM module functions accessible through the module

2. Technical Specifications

Function			Parameter
Specification			
Test Method		CH 1-20,21-40	Mux scanning; connects any of 40 × 2-wire or 20 × 4-wire signals to the DMM
		CH 41-42	Mux scanning; connects either of 2 × 2-wire current signals to the DMM
Input	Max Signal Level	CH 1-20,21-40	300 V_{DC} or 300 Vrms, 1 A switching, 60 W, 125 VA (max)
		CH 41-42	60 V_{DC} or 30 Vrms, 3 A switching, 60 W, 125 VA (max)
	Contact Life (typ.)		$>10^5$ ops at max signal level
			$>10^8$ ops with no load
Contact R			at end of contact life <1W
Contact Potential			Per contact<±500nV（typ.）,1mV（max.）
			Per contact pair<±500nV（typ.）,1mV（max.）
Offset Current			<100pA
Connector Type			Screw terminal, #20 AWG wire size
Isolation between any two terminals			$>10^{10}\Omega$,<100pF
Isolation between any terminal and chassis			$>10^9\Omega$,<200pF
Crosstalk (10 MHz, 50 Ω load)			<-40dB
Insertion Loss (50 Ω source, 50 Ω load)			<0.1dB below 1MHz
			<3dB below 2MHz
Common-Mode Voltage			between any terminal and chassis: 300V
General Characteristics			
40 Channels			40 DPST relay input channels, all configurable for 4-wire
2 Channels			2 current-only input channels
Relay Type			Latching electromechanical relay
Environment		Operating	0° to 50 °C, ≤80% RH at 35 °C
		Storage	-25° to 65 °C

3. Appearance & Schematic





D.TH2554- 03: 20-Channel Differential High-Speed Multiplexer Module

The TH2554-03 plug-in module provides 20-channel 2-wire or 10-channel 4-wire multiplexer switching, configurable into two independent multiplexer groups. It features built-in Cold Junction
Compensation (CJC), enabling thermocouple temperature measurement without additional accessories.

1. Features

- 20-CH solid-state differential multiplexer module, 10 CH for 4-wire resistance
- Max scan speed: 300 CH/s
- Max voltage measurement: 60 V; no current measurement
- Thermocouple temperature measurement with CJC (Cold Junction Compensation)
- Test ports with common terminals, supporting 1-to-many configuration
- All DMM module functions accessible through the module

2. Technical Specifications

Function		Parameter
Specification		
Max Input Signal		Any CH to any CH (1–20): 60 VDC or 42 V (max)
Contact Life		$>10^{10}$ops at cold switching or min input signal (design guaranteed)
		$>10^{5}$ ops at max signal level
Relay Drive Current		6 mA continuous per CH, 25 mA during initial pulse
Contact R		<10 W per CH or <5 W per conductor
Contact Potential		<3mV（per contact pair）
Leakage Current		<3 nA per CH at °23 C
		+0.13 nA/°C per CH above °23 C
Connector Type		3.5 mm removable screw terminal, #22 AWG wire size
Isolation between any two terminals		$>10^{10}$Ω@23℃,>8×109W@50℃,<100pF
Isolation between any terminal and chassis		$>10^{10}$Ω,<100pF
Crosstalk (CH–CH, 500 kHz, 50 Ω load)		<-40dB
Insertion Loss (50 Ω source, 50 Ω load)		<1dB below 500kHz
General Characteristics		
20 Channels		20 DPST relay input channels, all configurable for 4-wire
Relay Type		Latching electromechanical relay
Environment	Operating	0° to 50 °C, ≤80% RH at 35 °C
	Storage	-25° to 65℃

3. Appearance & Schematic