

Micro Signal Type Tester

II. TH193X Series Low Noise Precision Power Supply



Features

- 7-inch capacitive touch screen with 800 x 480 resolution
- Linux operating system, Chinese and English interface
- Four-quadrant precision power output
- Single/dual channel output and measurement
- Up to $\pm 210\text{V}$ DC voltage, $\pm 3\text{A}$ DC current/ $\pm 10.5\text{A}$ pulse
- $10\text{fA}/0.1\mu\text{V}$ minimum output resolution (6 1/2 bits)
- $1\text{pA}/10\mu\text{V}$ minimum measurement resolution (4 1/2 bits)
- Supports voltage, current, resistance, and power measurements
- Four basic modes of voltage source, current source, voltmeter, and ammeter
- Minimum sampling interval $1\mu\text{s}$
- Supports DC, pulse, scanning and list outputs
- Pulse output with a minimum pulse width of $50\mu\text{s}$
- 1mHz - 10kHz arbitrary waveform generation and list scan function (minimum $1\mu\text{s}$ interval)
- Flexible programmable output resistance function
- Math operation function, sliding average filter function, deviation deduction function
- 14-speed sorting function with Grading and Sorting modes



RS232	LAN	HANDER	USB HOST	USB DEVICE
standard	standard	standard	standard	standard

TH193X Series

Shelf volume (mm): 235x132x490
 Outline volume (mm): 250x154x530
 Net weight: about 8.5kg (single channel) / 10kg (dual channel)

Applications

- Analog-to-digital converters and digital-to-analog converters
- High-precision analog ICs and circuits
- RF integrated circuits and circuits
- Medical Applications
- Cable/Harness Evaluation
- Voltage Controlled Oscillator (VCO)
- Sensor devices and transducers
- Solar cells and interface circuits
- Electrochemical applications
- Research & Education
- Crystal Oscillators
- Current source for small voltage measurements
- Battery Management Simulator
- Advanced Materials Evaluation

Specifications

Product Model		TH1931		TH1932		
Display						
Monitor		7-inch capacitive touch color LCD monitor with 800 x 480 resolution				
Key Indicator						
Channels		1		2		
Max Output	Voltage	$\pm 210\text{V}$				
	Current	DC	$\pm 3.03\text{A}$			
		Pulse	$\pm 10.5\text{A}$			
Power Supply	Max Bits	Bits	6 1/2			
	Min. Resolution	Voltage	0.1 μV			
		Current	0.01pA			
Measurement	Max Bits	Bits	4 1/2			
	Min. Resolution	Voltage	10 μV			
		Current	1pA			
Voltage Range		0.2V-200V				
Min. Interval Time		1 μs				
Voltage Output						
Range	Programming Resolution	Accuracy \pm (% of reading + bias)	DC output voltage or pulse peak/base voltage	Max. Current ¹		Pulse Width ²
				DC Output	Pulse Output	

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0.2V	100nV	$\pm(0.015\%+225\mu V)$	$0\leq V \leq 0.21V$	$\pm 3.03A$	$\pm 3.03A$	$50\mu s\leq t\leq t_{max}$
					$\pm 10.5A$	$50\mu s\leq t\leq 1ms$
2V	1 μV	$\pm(0.015\%+225\mu V)$	$0\leq V \leq 2.1V$		$\pm 3.03A$	$50\mu s\leq t\leq t_{max}$
				$\pm 10.5A$	$50\mu s\leq t\leq 1ms$	
20V	10 μV	$\pm(0.015\%+5mV)$	$0\leq V \leq 6V$	$\pm 1.515A$	$\pm 3.03A$	$50\mu s\leq t\leq t_{max}$
			$0\leq V \leq 21V$		$\pm 10.5A$	$50\mu s\leq t\leq 1ms$
200V	100 μV	$\pm(0.015\%+50mV)$	$0\leq V \leq 6V$	$\pm 3.03A$	$\pm 3.03A$	$50\mu s\leq t\leq t_{max}$
			$0\leq V \leq 21V$	$\pm 1.515A$	$\pm 1.515A$	$50\mu s\leq t\leq t_{max}$
			$0\leq V \leq 180V$	—	$\pm 1.05A$	$50\mu s\leq t\leq 10ms$
			$0\leq V \leq 200V$	—	$\pm 1.515A$	$50\mu s\leq t\leq 2.5ms$
			$0\leq V \leq 210V$	$\pm 105mA$	$\pm 105mA$	$50\mu s\leq t\leq t_{max}$

Note:

superscript¹: Refer to the Limits table section when using channels 1 and 2 for DC outputs or pulsed outputs ($50\mu s \leq t \leq t_{max}$ (= 99.9999ks)).

superscript²: For pulses with $50\mu s \leq t \leq t_{max}$, the maximum duty cycle is 99.9999%.

For pulses with $50\mu s \leq t \leq 1ms$, $50\mu s \leq t \leq 2.5ms$ or $50\mu s \leq t \leq 10ms$, the maximum duty cycle is 2.5%.

Current Output

Range	Setting Resolution	Accuracy \pm (% of reading + bias)	DC output current or pulse peak/base current ^{1,2}	Max. Voltage		Pulse Width ³	
				DC Output	Pulse Output		
10nA	10fA	$\pm(0.10\%+50pA)$	$0\leq I \leq 10.5nA$	$\pm 210V$	$\pm 210V$	$50\mu s\leq t\leq t_{max}$	
100nA	100fA	$\pm(0.06\%+100pA)$	$0\leq I \leq 105nA$				
1 μA	1pA	$\pm(0.025\%+500pA)$	$0\leq I \leq 1.05\mu A$				
10 μA	10pA	$\pm(0.025\%+1.5nA)$	$0\leq I \leq 10.5\mu A$				
100 μA	100pA	$\pm(0.02\%+25nA)$	$0\leq I \leq 105\mu A$				
1mA	1nA	$\pm(0.02\%+200nA)$	$0\leq I \leq 1.05mA$				
10mA	10nA	$\pm(0.02\%+2.5\mu A)$	$0\leq I \leq 10.5mA$				
100mA	100nA	$\pm(0.02\%+20\mu A)$	$0\leq I \leq 105mA$				
1A	1 μA	$\pm(0.03\%+1.5mA)$	$0\leq I \leq 105mA$	$\pm 21V$	$\pm 21V$	$50\mu s\leq t\leq 2.5ms$	
			$105mA\leq I \leq 1.05A$	—	$\pm 200V$		$50\mu s\leq t\leq 10ms$
			$0\leq I \leq 1.05A$	—	$\pm 180V$		$50\mu s\leq t\leq 10ms$
1.5A	1 μA	$\pm(0.05\%+3.5mA)$	$0\leq I \leq 105mA$	$\pm 210V$	$\pm 210V$	$50\mu s\leq t\leq t_{max}$	
			$105mA\leq I \leq 1.515A$	$\pm 21V$	$\pm 21V$		
			$0\leq I \leq 1.515A$	—	$\pm 200V$		$50\mu s\leq t\leq 2.5ms$
			$0\leq I \leq 1.05A$	—	$\pm 180V$		$50\mu s\leq t\leq 10ms$
3A	10 μA	$\pm(0.4\%+7mA)$	$0\leq I \leq 105mA$	$\pm 210V$	$\pm 210V$	$50\mu s\leq t\leq t_{max}$	
			$105mA\leq I \leq 1.515A$	$\pm 21V$	$\pm 21V$		
			$1.515A\leq I \leq 3.03A$	$\pm 6V$	$\pm 6V$		
10A ⁴	10 μA	$\pm(0.4\%+25mA)$ ⁵	$0\leq I \leq 10.5A$	—	$\pm 6V$	$50\mu s\leq t\leq 1ms$	
			$0\leq I \leq 1.515A$	—	$\pm 200V$	$50\mu s\leq t\leq 2.5ms$	
			$0\leq I \leq 1.05A$	—	$\pm 180V$	$50\mu s\leq t\leq 10ms$	

***Note:**

superscript¹: Refer to the Limits table section when using channels 1 and 2 for DC outputs or pulsed outputs ($50\mu s \leq t \leq t_{max}$ (= 99.9999ks)).

superscript²: The maximum base current is 500mA for pulses with $50\mu s \leq t \leq 1ms$, and the maximum base current is 50mA for pulses with $50\mu s \leq t \leq 2.5ms$ or $50\mu s \leq t \leq 10ms$.

superscript³: The maximum duty cycle is 99.9999% for pulses with $50\mu s \leq t \leq t_{max}$ and the maximum duty cycle is 2.5% for pulses with $50\mu s \leq t \leq 1ms$, $50\mu s \leq t \leq 2.5ms$ or $50\mu s \leq t \leq 10ms$.

superscript⁴: 10A range for pulse mode only, not for DC mode.

superscript⁵: Measurement speed is 0.01 PLC.

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Voltage Measurement			
Range	Voltage Measurement	Resolution	Accuracy
0.2V	$0 \leq V \leq 0.212V$	10 μ V	$\pm(0.015\% + 225\mu V)$
2V	$0 \leq V \leq 2.12V$	100 μ V	$\pm(0.02\% + 350\mu V)$
20V	$0 \leq V \leq 21.2V$	1mV	$\pm(0.015\% + 5mV)$
200V	$0 \leq V \leq 212V$	10mV	$\pm(0.015\% + 50mV)$
Current Measurement			
Range	Current Measurement	Resolution	Accuracy
10nA	$0 \leq I \leq 10.6nA$	1pA	$\pm(0.10\% + 50pA)$
100nA	$0 \leq I \leq 106nA$	10pA	$\pm(0.06\% + 100pA)$
1 μ A	$0 \leq I \leq 1.06\mu A$	100pA	$\pm(0.025\% + 500pA)$
10 μ A	$0 \leq I \leq 10.6\mu A$	1nA	$\pm(0.025\% + 1.5nA)$
100 μ A	$0 \leq I \leq 106\mu A$	10nA	$\pm(0.02\% + 25nA)$
1mA	$0 \leq I \leq 1.06mA$	100nA	$\pm(0.02\% + 200nA)$
10mA	$0 \leq I \leq 10.6mA$	1 μ A	$\pm(0.02\% + 2.5\mu A)$
100mA	$0 \leq I \leq 106mA$	10 μ A	$\pm(0.02\% + 20\mu A)$
1A	$0 \leq I \leq 1.06A$	100 μ A	$\pm(0.03\% + 1.5mA)$
1.5A	$0 \leq I \leq 1.53A$		$\pm(0.05\% + 3.5mA)$
3A	$0 \leq I \leq 3.06A$	1mA	$\pm(0.4\% + 7mA)$
10A ¹	$0 \leq I \leq 10.6A$		$\pm(0.4\% + 25mA)$
<p>※Note: ^{superscript1} For pulse mode, not for DC mode.</p>			
Pulse source (pulse width is the time from 10% rising edge to 90% falling edge, base level: pulse low level, peak level: pulse high level)			
Minimum programmable pulse width		50 μ s	
Pulse width programming resolution		1 μ s	
Interface		RS232C、MSB HOST、MSB DEVICE、LAN、HANDLER	
Environment & Temperature			
Environment		Suitable for indoor equipment	
Temperature of operating condition		0°C - 55°C	
Humidity of operating condition		30% - 80% RH (non-condensing)	
Elevation of operating condition		0 - 2000米 (6561ft)	
Temperature of storage condition		30°C - +70°C	
Humidity of storage condition		10% - 90% RH (non-condensing)	
Elevation of storage condition		0 - 4600米 (15092ft)	
Warm-up time after power on		≥60minutes	
General Indicator			
Power supply		90 V to 264V, 47 Hz to 63Hz, maximum	
Power consumption		< 250VA	
Rack mount		215mmx132mmx490mm	
Dimension		235mmx154mmx530mm	
Weight		Approx. 8.5kg (single)/10kg (dual)	
Safety		Class I Safety	
EMC standards		IEC61326-1/EN61326-1	
AS/NZS		CISPR 11	
Insulation resistance		Under the reference working conditions, the insulation resistance between the power terminals and the shell is not less than 50M Ω ; Under humid and hot transportation conditions, the insulation resistance between the power terminals and the shell is not less than 2M Ω .	
Dielectric strength		Under the reference working conditions, the power terminals and the shell can withstand the rated voltage of 1.5kV, frequency of 50Hz AC voltage for 1 minute, without breakdown and flying arc phenomenon.	
Leakage current		≤3.5mA	
Safety certification		CE、cCSA μ s、C-Tick	

Standard Accessories

Three-core power cord	
TH26050B	Test cable at both ends
TH1931-003	Low Noise Filter
TH26017	USB interface cable
TH26050S	Four-terminal test cable