TELEDYNE TEST TOOLS
Everywhereyoulook™

Product Line Card 2023

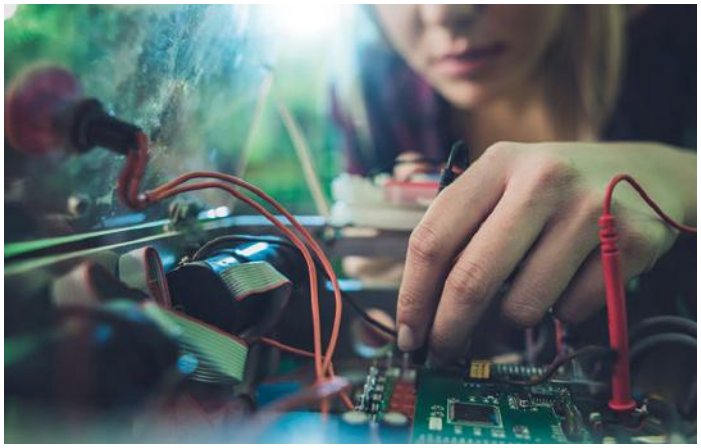
ABOUT TELEDYNE TEST TOOLS

TELEDYNE TEST TOOLS
Everywhereyoulook™

Company Profile

Teledyne LeCroy is a leading provider of oscilloscopes, protocol analyzers and related test and measurement solutions that enable companies across a wide range of industries to design and test electronic devices of all types. Since our founding in 1964, we have focused on creating products that improve productivity by helping engineers resolve design issues faster and more effectively. Oscilloscopes are tools used by designers and engineers to measure and analyze complex electronic signals in order to develop high-performance systems and to validate electronic designs in order to improve time to market.

The Teledyne Test Tools brand extends the Teledyne LeCroy product portfolio with a comprehensive range of test equipment solutions. This new range of products delivers a broad range of quality test solutions that enable engineers to rapidly validate product and design and reduce time-to-market. Designers, engineers and educators rely on Teledyne Test Tools solutions to meet their most challenging needs for testing, education and electronics validation.



Location and Facilities

Headquartered in Chestnut Ridge, New York, Teledyne Test Tools and Teledyne LeCroy has sales, service and development subsidiaries in the US and throughout Europe and Asia. Teledyne Test Tools and Teledyne LeCroy products are employed across a wide variety of industries, including semiconductor, computer, consumer electronics, education, military/aerospace, automotive/industrial, and telecommunications.

Arbitrary Waveform Generators

6

T3AFG Series
30 MHz – 500 MHz, 16-bit, up to 20 Mpts memory

High Definition Multi Channel Arbitrary Waveform Generator

7

T3AWG2152
2 Ch, 150 MHz, 16 bit, 128 Mpts/Ch, 6 Vpp Output, AFG/AWG, Wave Sequencing

T3AWG2152-D
2 Ch, 150 MHz, 16 bit, 128 Mpts/Ch, 8 Dig Ch, 6 Vpp Output, AFG/AWG, Wave Sequencing

T3AWG3x52
2 Ch, 250 MHz/350 MHz, 16 bit, 1 Gpts/Ch, 8 Dig Ch, 12 Vpp Output, AFG/AWG, Wave Sequencing

T3AWG3x54
4 Ch, 250 MHz/350 MHz, 16 bit, 1 Gpts/Ch, 16 Dig Ch, 12 Vpp Output, AFG/AWG, Wave Sequencing

T3AWG3x58
8 Ch, 250 MHz/350 MHz, 16 bit, 1 Gpts/Ch, 32 Dig Ch, 12 Vpp Output, AFG/AWG, Wave Sequencing

Digital Multimeters

12

T3DMM4-5
DC: 1000 Volts, AC: 750 Volts, Current: 10A, 4.5 Digit DMM

T3DMM6-5
DC: 1000 Volts, AC: 750 Volts, Current: 10A, 6.5 Digit DMM with optional Scanner

Oscilloscopes

14

T3DSO1000 / T3DSO1000A
100 MHz – 350 MHz, 2/4 Ch, 1 GS/s, up to 28 Mpts, 7" Display, MSO Option

T3DSO2000A
100 MHz – 500 MHz, 2/4 Ch, 2 GS/s, up to 200 Mpts, 8" Display, MSO Option

T3DSO3000
200 MHz – 1 GHz, 4 Ch, up to 5 GS/s, up to 250 Mpts, 10.1" Display, MSO Option

Programmable DC Power Supply

20

T3PS11230 / T3PS12415 / T3PS13206 / T3PS16006 / T3PS23203(P) / T3PS3000 / T3PS33203(P) / T3PS36006 / T3PS43203(P) / T3PS30063P / T3PS60033P / T3PS16081P / T3PS30051P / T3PS20051P / T3PS36031P / T3PS100011P / T3PS30721P / T3PS80271P / T3PS160141P / T3PS250041P / T3PS800011P / T3PS062001P / T3PS40381P / T3PS60251P
Bench Power Supplies

Rogowski Probes

48

T3RC0300-UM / T3RC0600-HF / T3RC3000-HF / T3RC3000-LF / T3RC6000-LF / T3RC0060-LF / T3RC0120-UM
300 Amps – 6000 Amps

DC/AC Current Probes

50

T3CP Current Probes

Time Domain Reflectometers

58

T3SP15D

- True Differential TDR up to 15 GHz
- Small Form Factor and Battery Powered for Mobile Use
- Pre-Compliance for Emerging Serial Data Standards – USB, BroadR-Reach, HDBaseT.

TDR Probes

59

T3SP-DPROBE
TDR Differential Probe, 18 GHz, variable pitch

T3SP-DPROBE-F
TDR Differential Probe, 5 GHz, fixed pitch

T3SP-SEPROBE-F
TDR Single-ended Probe, 5 GHz, fixed pitch

T3SP-SEP
TDR Single-ended Probe, 10 GHz, variable pitch

T3AFG

Function / Arbitrary Waveform Generators

Debug with Confidence

30 MHz – 500 MHz

Tools for Improved Debugging

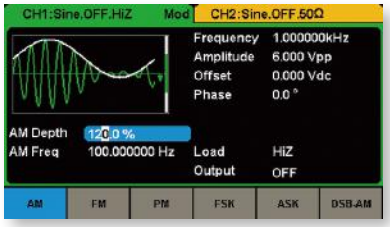
• **Deep Memory** – models with up to 20 Mpts/Ch or 8 Mpts/Ch depending on model.	✓ Generate complex arbitrary waveforms.
• **Wide Range of Modulation Types** – AM, DSB-AM, FM, PM, FSK, ASK, PWM, Sweep, Burst, and PSK on 2 Ch models.	✓ Quickly set up modulated waveforms.
• **High Resolution** – 16 bit or 14 bit vertical resolution depending on the model.	✓ Generate waveforms with low noise and spurious signal content.
• **Bandwidth Models up to 500 MHz**	✓ Wide choice of bandwidths.
• **Built In Arbitrary Waveforms**	✓ Load and replay built in Arbitrary Waveforms.
• **User Defined Waveforms**	✓ Store and recall user defined waveforms.
• **3 Years Warranty as standard**	✓ Peace of mind.

Key Specifications

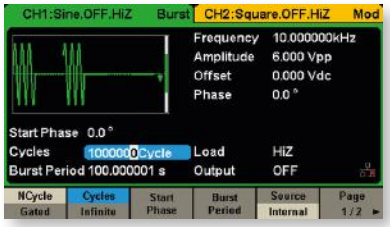
Bandwidth	30 MHz, 40 MHz, 60 MHz, 80 MHz, 120 MHz, 200 MHz, 350 MHz, 500 MHz
Channels	2 Channel Models
Memory	8 Mpts/Ch, 20 Mpts/Ch
Sample Rate	up to 2.4 GS/s
Display	T3AFG30 – T3AFG500: 4.3"
Connectivity	USB Host, USB Device, LAN

T3AFG

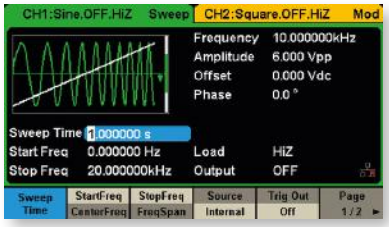
Function / Arbitrary Waveform Generators



The T3AFG range of Function / Arbitrary Waveform Generators support a wide range of modulation types.



Burst mode supports 'N Cycle' and 'Gated' modes with the Burst source being configured as 'Internal', 'External' or 'Manual'.



Sweep mode supports 'Linear' and 'Log' sweep, with 'Up' and 'Down' direction, and Sweep source being configured as 'Internal', 'External' or 'Manual'.

Ordering Information

Model	Bandwidth	Channel	Vertical Resolution	Memory per Ch	Sample Rate per Ch
T3AFG30	30 MHz	2	14 Bits	16 kpts	150 MS/s
T3AFG40	40 MHz	2	16 Bits	8 Mpts	1.2 GS/s
T3AFG60	60 MHz	2	14 Bits	16 kpts	150 MS/s
T3AFG80	80 MHz	2	16 Bits	8 Mpts	1.2 GS/s
T3AFG120	120 MHz	2	16 Bits	8 Mpts	1.2 GS/s
T3AFG200	200 MHz	2	16 Bits	20 Mpts	2.4 GS/s (Interpolated)
T3AFG350	350 MHz	2	16 Bits	20 Mpts	2.4 GS/s (Interpolated)
T3AFG500	500 MHz	2	16 Bits	20 Mpts	2.4 GS/s (Interpolated)

Function	T3AFG30*, T3AFG40, T3AFG60*, T3AFG80, T3AFG120	T3AFG200, T3AFG350, T3AFG500
Built-in Waveforms	5 Standard, 196 Arbitrary	7 Standard, 196 Arbitrary
Input / Output	2 Waveform Outputs, Counter Input, Aux In/Out, 10 MHz Clock In/Out	2 Waveform Outputs, Counter Input, Aux In/Out, 10 MHz Clock In/Out
Modulation Functions	AM, DSB-AM, FM, PM, FSK, ASK, PSK, PWM. Sweep, Burst, Harmonic	AM, DSB-AM, FM, PM, FSK, ASK, PSK, PWM. Sweep, Burst, Harmonic
Maximum Amplitude Output (Sine Wave)	< 20 MHz: 10 Vpp at 50 Ohms, 20 Vpp at HiZ > 20 MHz: 5 Vpp at 50 Ohms, 10 Vpp at HiZ *T3AFG30 and T3AFG60: < 10 MHz: 10 Vpp at 50 Ohms, 20 Vpp at HiZ > 10 MHz: 5 Vpp at 50 Ohms, 10 Vpp at HiZ	From 10 Vpp at 50 Ohms, 20 Vpp at HiZ (<40 MHz), to 640 mVpp at 50 Ohms, 1.28 Vpp at HiZ at 500 MHz. See data sheet for full specifications on each model

Excellent Performance

- Bandwidths from 30 MHz to 500 MHz
- 2 Channel Models
- Up to 20 Mpts/Channel memory

Great Connectivity

- USB host port for mass storage
- USB device port (USBTMC)
- LAN port on 2 channel models

Smart Capabilities

- Sweep output carrier can be Sine, Square, Triangle and Arbitrary waveforms
- Burst output under internal or external signal control
- Waveforms types include DC
- Frequency Resolution 1 µHz
- DSB-AM: Double Sideband AM modulation Function
- Harmonic Function on 2 channel models
- T3AFG200/T3AFG350/T3AFG500 support PRBS output as standard
- Optional IQ signal generation on T3AFG200/ T3AFG350/T3AFG500 models

T3AWG2K-series

Affordable 16-bit Dual Channel Arbitrary Waveform Generator

High-performance Affordable Waveform Generation

● 16-bit vertical resolution	✔ Exceptional detailed waveform generation with high-performance fidelity
● Output voltage and spectral purity	✔ 6 V_{pp} at full frequency range and excellent Harmonic Distortion
● Mixed signal generation	✔ Combine two analog channels with 8 synchronized digital channels, ideal for debugging and validating digital design
● Waveform Memory 128 Mpts@Ch	✔ Deep memory for downloading and generating complex pseudo-random both analog and digital waveforms
● Advanced Arbitrary Waveform Generator	✔ 128 Mpts arbitrary waveform depth on each channel ✔ Up to 16.384 waveform sequencing entries and single point granularity with conditional/unconditional jump, loop, event also remotely programmable. ✔ Simple and intuitive waveform editor utility for complex analog and digital waveform creation
● Advanced Function Generator	✔ Built-in waveforms include sine, square, pulse, double pulse, ramp, noise, sin(x)/x, gaussian, Lorentz, exponential rise, exponential decay and others
● Specialized for key applications	✔ Transmitter Distortion Test for Automotive Ethernet 100Base-T1 and 1000-Base-T1 ✔ Power and semiconductor dynamic behavior test enabled by the flexible double pulse test capability

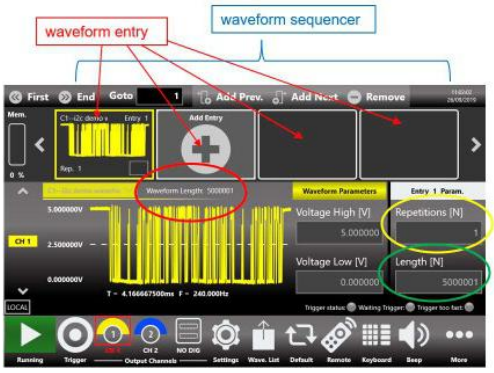
Standard warranty is one year.

Key Specifications

Model	T3AWG2152	T3AWG2152-D
Frequency Range (sinewave waveform)	1 µH to 150 MHz	
Vertical Resolution	16 Bits	
Number of Analog Channels	2	2
Number of Digital Channels	n.a.	8
Output Voltage Range (50 Ω into 50 Ω)	6 V_{pp} @150 MHz	
Waveform Memory	128 Mpts/Ch.	
Sample Rate (not interpolated)	600 MS/s (1,2 GS/s mit 2x Interpolation)	
Output Source Impedance	Low Impedance (0 Ω) and 50 Ω	
Load Impedance @scaling output amplitude	1 Ω to 1 MΩ	
Output Voltage Load Protection	High Voltage and Low Voltage Limits setting	

T3AWG2K-series

Affordable 16-bit Dual Channel Arbitrary Waveform Generator



Arbitrary Waveform Generator – AWG Operating Mode

Generate complex and long signals with multiple waveforms in the sequencer. AWG operating mode uses variable and synchronized sample rate 'True-Arb' technology for applications requiring extremely high signal fidelity. The platform's deep memory enables the capability to store numerous long waveforms.

- 16-bit vertical resolution
- Up to 16,384 waveform entries in the sequencer with loop, conditional/unconditional jump and specified triggered events
- Up to 4G or infinite waveform repeat count
- 128 Mpts arbitrary waveform memory on each channel (standard)
- Waveform granularity is 1 for waveform length >384
- Output impedance 50 Ω and 0 Ω selectable
- Variable load impedance selectable

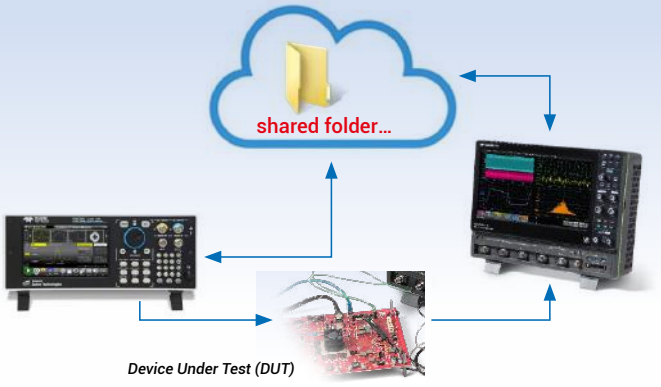
Arbitrary Function Generator – AFG Operating Mode

Generate a large variety of functions including the traditional ones and more. Change parameters and apply modulations on-the-fly for the output signal. AFG operating mode uses an improved Direct Digital Synthesis (DSS) technology. The Double Pulse function is a standard feature, simplifying the testing of dynamic behavior of power devices.

- 150 MHz sine waveform
- 16-bit vertical resolution
- Built-in waveforms include sine, square, pulse, double pulse, ramp, noise, DC, sin(x)/x, gaussian, lorentz, exponential rise, exponential decade, haversine and others
- Run modes includes continuous, modulation, sweep and burst
- Modulation modes include AM, FM, PM, PSK, FSK and PWM
- Output impedance 50 Ω and 0 Ω selectable
- Variable load impedance selectable

Emulation of real-world signals

Quickly generate and replicate real-world waveforms captured with an oscilloscope.



Ordering information

T3AWG2K Series Platforms	Product Code
Function/Arbitrary Waveform Generator, 2 Ch, 150 MHz, 128 Mpts/Ch, 6 V_{pp} output, Wave Sequencing	T3AWG2152
Function/Arbitrary Waveform Generator, 2 Ch, 8 Ch Digital, 150 MHz, 128 Mpts/Ch, 6 V_{pp} output, Wave Sequencing	T3AWG2152-D
T3AWG2K Series Accessories	**Product Code**
Mini-SAS HD to 16x SMA cable (8 LVDS output) only for T3AWG2152-D (Accessories to be order separately for the T3AWG2152-D, not included)	T3AWG3-8DIG-SMA

Standard warranty is one year.

T3AWG3K-series

High Definition 2, 4 and 8 Channel Arbitrary Waveform Generator

Accurate and Versatile Waveforms Generation

• 16 Bit Vertical Resolution	✓ Exceptional signal fidelity for developing quality products with a reduced design cycle.
• up to 24 V_{pp} Output Voltage and ±12 V HW Baseline Offset for a total output voltage window ±24 V or 48 V (50 Ohm into High Impedance)	✓ Unmatched wide output voltage window enables generating challenging in amplitude large-signal waveforms.
• Waveform memory up to 1 Gpoint @Ch	✓ Unmatched deep memory depth allows to store and reproduce complex pseudo-random waveforms for long play time testing.
• Mixed Signal Generation	✓ Combining the 2, 4 or 8 analog channels with 8, 16 or 32 synchronized Digital Channels for debugging and validating digital design.
• Multifunctional solution instrument (AFG/AWG/DPG)	✓ Arbitrary Function Generator, Arbitrary Waveform Generation and Digital Pattern Generation functionalities combined into one instrument.

Standard warranty is one year (3 year optional)

Key Specifications

Model	T3AWG3252	T3AWG3352	T3AWG3254	T3AWG3258	T3AWG3354	T3AWG3358
# Analog Channels	2		4		8	
# Digital Pattern Channels	0–8		0–16		0–16–32	
Frequency Range (Sinewave, AFG mode)	1 µH to 250 MHz	1 µH to 350 MHz	1 µH to 250 MHz	1 µH to 350 MHz	1 µH to 250 MHz	1 µH to 350 MHz
Sample Rate (AWG mode, not interpolated)	1.0 GS/s	1.2 GS/s	1.0 GS/s	1.2 GS/s	1.0 GS/s	1.2 GS/s
Vertical Resolution	16 Bits					
Memory	Up to 1 Gpoint/Ch					
Output Voltage V_{pp} (peak to peak)	12 V_{pp} (50 Ohm into 50 Ohm), 24 V_{pp} (50 Ohm into High-Impedance)					

T3AWG3K-series

High Definition 2, 4 and 8 Channel Arbitrary Waveform Generator

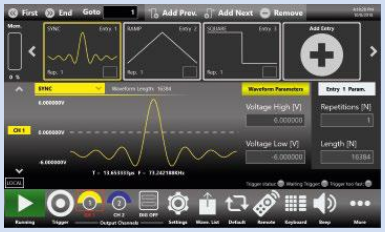
AFG Operational Mode

- Improved Direct Digital Synthesis (DDS) based technology
- Fixed sampling clock

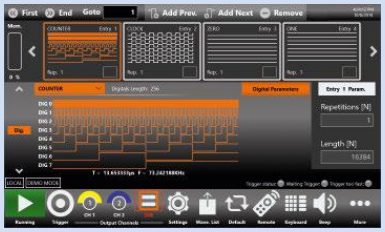
Arbitrary Function Generation (AFG functionality)

AWG Operational Mode

- Variable Clock True-Arbitrary Technology
- Variable Sampling Clock
- Mixed Signal Generation: 2 Analog Channels and 8 Digital Channels



Arbitrary Waveform Generation (AWG functionality)



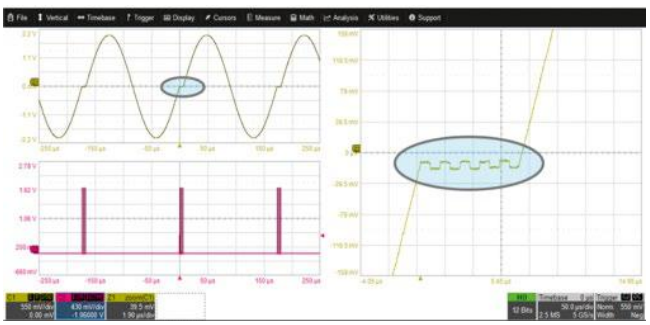
Digital Pattern Generation (DPG functionality)

Ordering information (complete info available on T3AWG datasheet)

T3AWG3252 and T3AWG3352 Product Description (2 Channels)	Product Code
Arbitrary Waveform Generator, 2 Ch, 250 MHz, 16 bit, 128 Mpts/Ch, 6 V_{pp}, AFG/AWG	T3AWG3252
Arbitrary Waveform Generator, 2 Ch, 350 MHz, 16 bit, 128 Mpts/Ch, 6 V_{pp}, AFG/AWG	T3AWG3352
256 Mpts/Ch Memory option for 2 Ch mainframe	T3AWG3-M
512 Mpts/Ch Memory option for 2 Ch mainframe	T3AWG3-X
1024 Mpts/Ch Memory option for 2 Ch mainframe	T3AWG3-XL
High Voltage (12 V_{pp} on 50 Ohm) for 2 Ch mainframe	T3AWG3-HV
Digital 8 Ch. Output (require 1 x Mini-SAS cable)	T3AWG-8 DIG
T3AWG3254 and T3AWG3354 Product Description (4 Channels)	**Product Code**
Arbitrary Waveform Generator, 4 Ch, 250 MHz, 16 bit, 128 Mpts/Ch, 6 V_{pp}, AFG/AWG	T3AWG3254
Arbitrary Waveform Generator, 4 Ch, 350 MHz, 16 bit, 128 Mpts/Ch, 6 V_{pp}, AFG/AWG	T3AWG3354
1024 Mpts/Ch Memory Option for 4 Ch mainframe	T3AWG3-XL-4CH
High Voltage (12 V_{pp} on 50 Ohm) for 4 Ch mainframe	T3AWG3-HV-4CH
Digital 16 Ch. Output (require 2 x Mini-SAS cables)	T3AWG3-16DIG-4CH
T3AWG3258 and T3AWG3358 Product Description (8 Channels)	**Product Code**
Arbitrary Waveform Generator, 8 Ch, 250 MHz, 16 bit, 128 Mpts/Ch, 6 V_{pp}, AFG/AWG	T3AWG3258
Arbitrary Waveform Generator, 8 Ch, 350 MHz, 16 bit, 128 Mpts/Ch, 6 V_{pp}, AFG/AWG	T3AWG3358
1024 Mpts/Ch Memory Option for 8 Ch mainframe	T3AWG3-XL-8CH
High Voltage (12 V_{pp} on 50 Ohm) for 8 Ch mainframe	T3AWG3-HV-8CH
Digital 16 Ch. Output (require 2 x Mini-SAS cables)	T3AWG3-16DIG-8CH
Digital 32 Ch. Output (require 4 x Mini-SAS cables)	T3AWG3-32DIG-8CH
Accessories	**Product Code**
Cable Mini SAS HD 1m for 8 DIG (require T3AWG3-8DIG)	T3AWG3-8DIG-MSCAB
LVDS to LVTTL adapter (require T3AWG3-8DIG and T3AWG3-8DIG-MSCAB)	T3AWG3-8DIG-TTL
Mini-SAS HD to x16 SMA cable (require T3AWG3-8DIG)	T3AWG3-8DIG-SMA

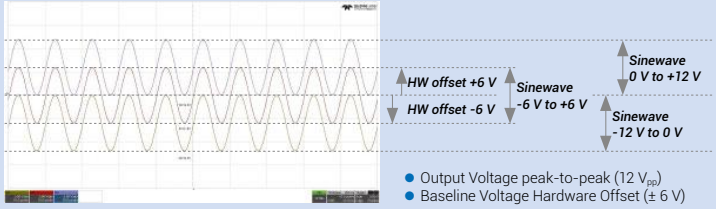
A multifunctional generator with an innovative architecture

Exceptional Signal Fidelity with 16-bit Vertical Resolution



4V_{pp} Sine Wave and 5 x 10 mV_{pp} Square Wave Sequencing

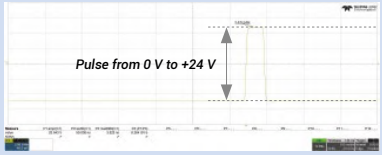
Output Voltage Window: ± 12 V (50 Ω into 50 Ω)



- Output Voltage peak-to-peak (12 V_{pp})
- Baseline Voltage Hardware Offset (± 6 V)

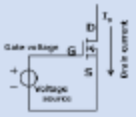
12 V_{pp} waveform can be shifed of ±6 V from -12 V to 0 V to 0 V to +12 V

Output Voltage Window: ± 24 V (50 Ω into High Impedance)



- Output Voltage peak-to-peak (24 V_{pp})
- Baseline Voltage Hardware Offset (± 12 V)

Pulse from 0 V to 24 V



MOSFET gate voltage-driven

T3DMM4-5 / T3DMM6-5

Digital Multimeters

Debug with Confidence

DC: 1000 Volts
AC: 750 Volts
Current: 10 A

Tools for Improved Debugging

• **Wide range of measurements** – DC/AC voltage and Current, Resistance, Capacitance, Frequency, Period, Temperature, and more.	✓ More application coverage from a single Digital multimeter.
• **True-RMS measurements** – All AC Voltage and Current ranges give True-RMS readings.	✓ Excellent accuracy regardless of the waveform shape.
• **Low level measurement, high sensitivity ranges** – Voltage ranges as low as 200 mV full scale, DC Current 200 µA, AC Current 200 µA full scale.	✓ High sensitivity ranges give greater accuracy of small signal measurements.
• **Advanced measurement features** – Min, Max, Average, Standard Deviation dBm/dB, Pass/fail, Histogram, Trend, Relative measurements.	✓ Advanced features for today's measurement needs.
• **Built-in cold terminal thermocouple compensation.**	✓ Accurate Temperature measurements.
• **4.3 inch (10.92 cm) color TFT-LCD 480 x 272 display.**	✓ Clear and flexible display aids ease of use.
• **3 Years Warranty as standard.**	✓ Peace of mind.

Key Specifications

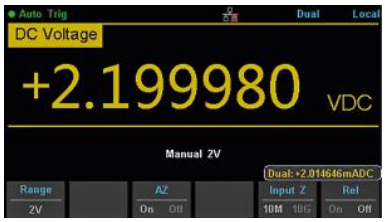
DC Voltage	200 mV to 1000 V
DC Current	200 µA to 10 A
True RMS AC Voltage	200 mV to 750 V
True RMS AC Current	200 µA to 10 A
2/4 Wire Resistance	200 Ohms to 100 MOhms
Connectivity	USB Device, LAN

T3DMM4-5 / T3DMM6-5

Digital Multimeters

The T3DMM range gives a choice of 4.5 or 6.5 digit display

The T3DMM4-5 display.



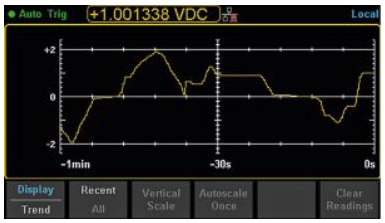
The T3DMM6-5 display.

Function	T3DMM4-5	T3DMM6-5
DC Voltage	600 mV – 1000 V	200 mV – 1000 V
DC Current	600 µA – 10 A	200 µA – 10 A
True RMS AC Voltage	600 mV – 750 V	200 mV – 750 V
True RMS AC Current	60 mA – 10 A	200 µA – 10 A
2/4 Wire Resistance	600 Ohms – 100 M Ohms	200 Ohms – 100 M Ohms
Max Readings/Sec	150	10,000
Digits Displayed	4.5	6.5

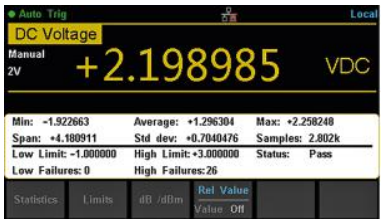
Smart Capabilities as Standard

- In addition to DCV, DCI, ACV, ACI, 2/4 Wire Ohms the T3DMM range can also measure Capacitance, Frequency, Period,Temperature, Diode Test and Continuity.
- True RMS ACV and ACI measurements improve AC measurement accuracy.
- Temperature support for TC and RTD sensors with built-in cold terminal compensation.
- Remote control via USB or LAN connection.

The T3DMM range offers versatile functionality

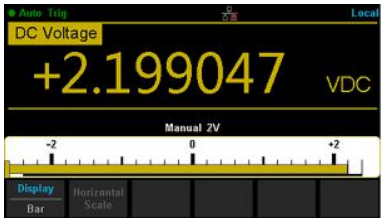


Trend Chart mode shows how the data changes over time in a value verses time strip chart display.



Statistics mode quantifies the data being captured whilst the Pass/Fail mode can can quickly test, and instantly indicate if there is a problem.

Histogram display mode shows how the data is distributed across a range of user defined Bin values.



Bar Meter display mode adds a horizontal bar meter below the numerical display giving an analog indication of the measured value.

Hold mode provides a stable reading on screen even when the test leads are disconnected, enabling users to view the measured history data.

The dB and dBm functions allow relative measurements to either a stored relative value or 1 milliwatt depending on which function is chosen.

T3DSO1000 / T3DSO1000A

Oscilloscopes

Debug with Confidence

100 MHz – 350 MHz

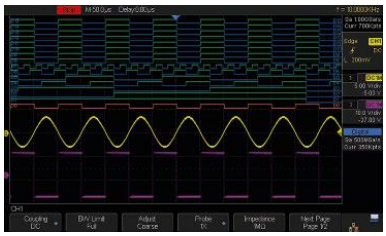
Tools for Improved Debugging

• **Long Capture** – 14 Mpts/Ch and 28 Mpts interleaved.	✓ Capture more time and show more waveform detail.
• **Math and Measure** – 7 basic math functions plus FFT and 38 automatic measurement parameters.	✓ Extract results from waveforms and measurements.
• **Connectivity** – USB for mass storage, printing and PC control, plus LAN for fast data transfer.	✓ Save data for external analysis and screen images for reports.
• **Serial Bus Trigger and Decode** – I²C, SPI, UART, RS232, CAN, LIN.	✓ Debug serial buses directly in your Oscilloscope.
• **Waveform Sequence Recorder** – record and play back up to 80,000 waveforms.	✓ Replay the changing waveform history.
• **Optional MSO** – 16 Digital Channels (not available on the T3DSO1102).	✓ Add mixed signal debugging to your Oscilloscope.
• **3 Years Warranty** as standard	✓ Peace of mind.

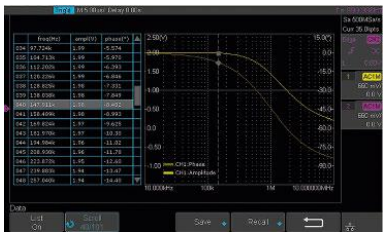
Key Specifications

Bandwidth	100 MHz, 200 MHz, 350 MHz
Channels	2 or 4
Memory	up to 14 Mpts/Ch (28 Mpts interleaved)
Sample Rate	up to 1 GS/s / 2 GS/s interleaved
Display	7" Bright TFT LCD (800 x 480)
Connectivity	USB Host, USB Device, LAN

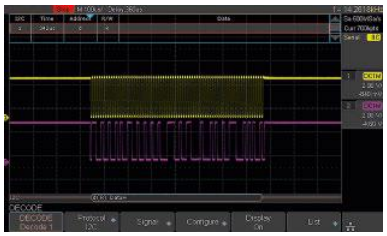
T3DSO1000 / T3DSO1000A
Oscilloscopes



Optional MSO – 16 Digital Channels enables users to debug mixed signal applications (not available on the T3DSO1102).



Bode Plot – The T3DSO1000 can control the USB AWG module, to scan an object's amplitude and phase frequency response, and display the data as a Bode Plot (not available on the T3DSO1102).



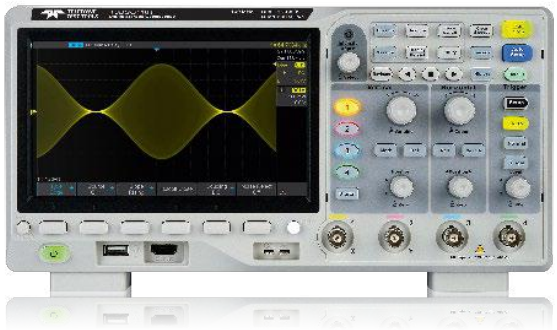
Protocol Trigger and Decode – The T3DSO1000 displays the waveform decoding and events list. Bus protocol information can be quickly and intuitively triggered and displayed.

Ordering Information

Model	Bandwidth	Channel	Memory (per Ch/interleaved)	Sample Rate (per Ch/interleaved)
T3DSO1102	100 MHz	2	7 Mpts / 14 Mpts	500 MS/s / 1 GS/s
T3DSO1104	100 MHz	4	7 Mpts / 14 Mpts	500 MS/s / 1 GS/s
T3DSO1202A	200 MHz	2	14 Mpts / 28 Mpts	1 GS/s / 2 GS/s
T3DSO1204	200 MHz	4	7 Mpts / 14 Mpts	500 MS/s / 1 GS/s
T3DSO1302A	350 MHz	2	14 Mpts / 28 Mpts	1 GS/s / 2 GS/s

Standard Configuration	Options
• One passive probe per channel • Getting Started Manual • USB Cable • Calibration and Performance Verification Certificate • Multi-language User Interface • Power Cord	**Optional Accessories (not available on the T3DSO1102)** • 16 Channel MSO: Sample Rate 1 Gsa/s, Memory Depth 14 Mpts / Ch • 1 channel AWG Waveform Generator, frequency up to 25 MHz. • Optional Wifi

Full list of Optional Accessories can be found in the Data Sheet



Excellent Performance

- 100, 200 and 350 MHz bandwidths
- 2 GS/s maximum sample rate
- Up to 14 Mpts/Ch memory, 28 Mpts interleaved
- Optional MSO: Sample Rate 1 Gsa/s, Memory Depth 14 Mpts/Ch

Great Connectivity

- USB host port for mass storage
- USB device port for printing and PC control
- LAN port on all T3DSO1000 oscilloscopes

Smart Capabilities

- Averaging, Peak Detect and Equivalent Time
- Advanced Triggering
- Measurement Statistics
- Built-in Help
- Multi-Language User Interface

T3DSO2000A

Oscilloscopes

Debug with Confidence

100 MHz – 500 MHz

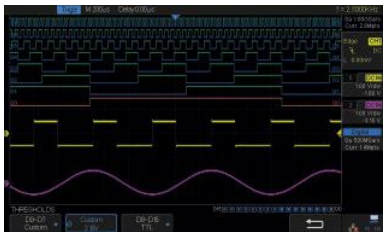
Tools for Improved Debugging

• **Long Capture** – 100 Mpts/Ch and 200 Mpts interleaved.	✓ Capture more time and show more waveform detail.
• **Math and Measure** – 9 basic math functions plus FFT and 50+ automatic measurement parameters.	✓ Extract results from waveforms and measurements.
• **Low Noise Architecture** – Supports channel sensitivity as low as 500 µV / Div.	✓ Clearly view small waveforms in detail.
• **Bandwidth Models to 500 MHz** – Choice of 100 MHz, 200 MHz, 350 MHz or 500 MHz models.	✓ Choose the bandwidth you need with 2 or 4 channels.
• **Waveform Sequence Recorder** – record and play back up to 90,000 waveforms.	✓ Replay the changing waveform history.
• **Includes Bode Plot, Power Analysis and common Serial Bus Decoders as standard.**	✓ Wide application coverage as standard.
• **Connectivity** – USB for mass storage, printing and PC control, plus LAN for fast data transfer.	✓ Save data for external analysis and screen images for reports.
• **3 Years Warranty as standard.**	✓ Peace on mind.

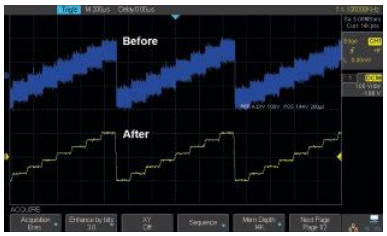
Key Specifications

Bandwidth	100 MHz, 200 MHz, 350 MHz, 500 MHz
Channels	2 or 4, 50 Ohm / 1 MOhm Input Impendence
Memory	up to 100 Mpts/Ch (200 Mpts interleaved)
Sample Rate	up to 2 GS/s
Display	10.1" Bright TFT LCD (1024 x 600)
Connectivity	USB Host, USB Device, LAN

T3DSO2000A
Oscilloscopes



Optional MSO – 16 Digital Channels with colour coded display enables users to more intuitively debug mixed signal applications.



Enhanced Resolution (Eres) mode can improve the SNR without needing a repetitive waveform. Extra resolution bits can be added 0.5 bits at a time up to +3 bits.

Includes Serial Bus Trigger and Decode – I²C, SPI, UART, CAN, LIN. Optional Serial Bus Trigger and Decode – CAN FD, I²S, MIL-1553B, FlexRay

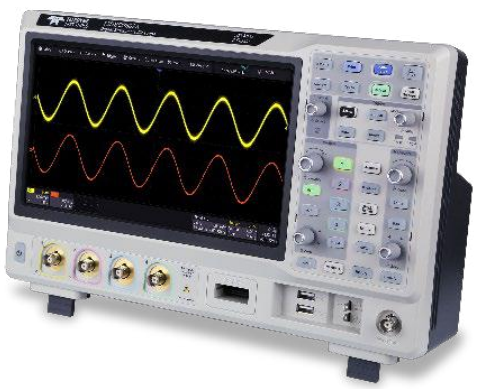
Ordering Information

Model	Bandwidth	Channel	Memory (per Ch/interleaved)	Sample Rate (per Ch/interleaved)
T3DSO2104A	100 MHz	4	100 Mpts / 200 Mpts	1 GS/s / 2 GS/s
T3DSO2204A	200 MHz	4	100 Mpts / 200 Mpts	1 GS/s / 2 GS/s
T3DSO2354A	350 MHz	4	100 Mpts / 200 Mpts	1 GS/s / 2 GS/s
T3DSO2502A	350 MHz	4	100 Mpts / 200 Mpts	1 GS/s / 2 GS/s
	500 MHz	2	200 Mpts	2 GS/s

Standard Configuration	Available Options – See Data Sheet for full details	
• One passive probe per channel • Getting Started Manual • USB Cable • Certificate of Calibration • Multi-language User Interface • Power Cord	• Optional Built-in 16 Channel MSO	T3DSO2000A-MSO & T3DSO2000-LS
	• CAN FD trigger and decode	T3DSO2000A-CANFD
	• FlexRay trigger and decode	T3DSO2000A-FLEXRAY
	• MIL-STD-1553B trigger and decode	T3DSO2000A-MIL-1553
	• I²S trigger and decode	T3DSO2000A-I2S

Excellent Performance

- 100, 200, 350 and 500 MHz bandwidths
- 2 GS/s maximum sample rate
- Up to 100 Mpts/Ch memory, 200 Mpts interleaved



Great Connectivity

- USB host port for mass storage, USB device port for printing and PC control
- LAN port on all T3DSO2000A oscilloscopes

Smart Capabilities

- Averaging, Peak Detect, 10 bit and Enhanced Resolution modes
- Bode Plot and Power Analysis included as standard
- Advanced Triggering including Zone triggering
- Measurement Statistics
- Protocol Trigger and Decode (standard and optional)
- Built-in Function/Arbitrary Waveform Generator
- Optional Built-in 16 Channel MSO

T3DSO3000

Oscilloscopes

Debug with Confidence

200 MHz – 1 GHz

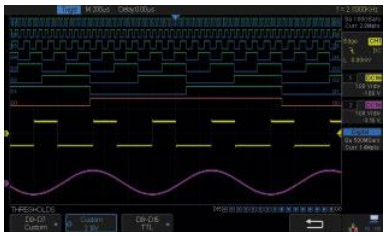
Tools for Improved Debugging

• **Long Capture** – 125 Mpts/Ch and 250 Mpts interleaved.	✓ Capture more time and show more waveform detail.
• **Math and Measure** – 9 basic math functions plus FFT and 50+ automatic measurement parameters.	✓ Extract results from waveforms and measurements.
• **Low Noise Architecture** – Supports channel sensitivity as low as 500 µV / Div.	✓ Clearly view small waveforms in detail.
• **Bandwidth Models to 1 GHz** – Choice of 200 MHz, 350 MHz, 500 MHz or 1 GHz models.	✓ Choose the bandwidth you need with 2 or 4 channels.
• **Waveform Sequence Recorder** – record and play back up to 100,000 waveforms.	✓ Replay the changing waveform history.
• **Includes Bode Plot, Power Analysis and common Serial Bus Decoders as standard.**	✓ Wide application coverage as standard.
• **Connectivity** – USB for mass storage, printing and PC control, plus LAN for fast data transfer.	✓ Save data for external analysis and screen images for reports.
• **3 Years Warranty as standard.**	✓ Peace on mind.

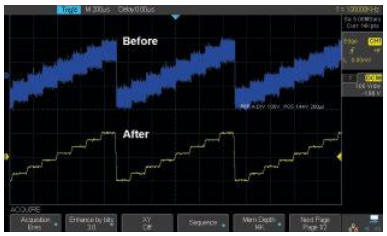
Key Specifications

Bandwidth	200 MHz, 350 MHz, 500 MHz and 1 GHz
Channels	4, 50 Ohm / 1 MOhm Input Impendence
Memory	up to 125 Mpts/Ch (250 Mpts interleaved)
Sample Rate	up to 5 GS/s
Display	10.1" Bright TFT LCD (1024 x 600) touch screen
Connectivity	USB Host, USB Device, LAN

T3DSO3000
Oscilloscopes



MSO – 16 Digital Channels with colour coded display enables users to more intuitively debug mixed signal applications.



Enhanced Resolution (Eres) mode can improve the SNR without needing a repetitive waveform. Extra resolution bits can be added 0.5 bits at a time up to +3 bits.

Includes Serial Bus Trigger and Decode for: I²C, SPI, UART, CAN, LIN, CAN FD, I²S, MIL-1553B, FlexRay, SENT & Manchester decode only.

Ordering Information

Model	Bandwidth	Channel	Memory (per Ch/interleaved)	Sample Rate (per Ch/interleaved)
T3DSO3204	200 MHz	4	125 Mpts / 250 Mpts	2.5 GS/s / 5 GS/s
T3DSO3354	350 MHz	4	125 Mpts / 250 Mpts	2.5 GS/s / 5 GS/s
T3DSO3504	500 MHz	4	125 Mpts / 250 Mpts	2.5 GS/s / 5 GS/s
T3DSO31004	1 GHz	4	125 Mpts / 250 Mpts	2.5 GS/s / 5 GS/s

Standard Configuration	Available Options – See Data Sheet for full details	
• One passive probe per channel • Getting Started Manual • USB Cable • Certificate of Calibration • Multi-language User Interface • Power Cord	• 16 Channel MSO Probe	T3DSO2000-LS
	• 25 MHz Function/Arbitrary Waveform Module	T3DSO1000-FGMOD-A
	• 500 MHz Passive Probe, 10:1, 10 MOhm	PP020-1

Excellent Performance

- 200, 350, 500 and 1 GHz bandwidths
- 5 GS/s maximum sample rate
- Up to 125 Mpts/Ch memory, 250 Mpts interleaved

Great Connectivity

- USB host port for mass storage, USB device port for printing and PC control
- LAN port on all T3DSO3000 models

Smart Capabilities

- Averaging, Peak Detect, 10 bit and Enhanced Resolution modes
- Bode Plot and Power Analysis included as standard
- Advanced Triggering including Zone triggering
- Measurement Statistics
- Protocol Trigger and Decode included as standard
- Function/Arbitrary Waveform Generator
- 16 Channel MSO

Power Supplies
Single and Dual Output

Broad Product Range

Current: Up to 30 Amps
Voltage: Up to 60 Volts
Power: Up to 360 Watts

Tools for Improved Debugging

• 6 Models to choose from.	✓ More choices for better application coverage.
• Single and Dual output models.	✓ Triple and Quad output models available in our Triple and Quad output model brochure.
• Programmable and non-programmable models available.	✓ Selection of bench or programmable/ATE instruments.
• Sense terminals on all single output models.	✓ Ensure the full voltage gets to your DUT. Sense compensates for wiring loss.
• Twin output models support independent, series and parallel output modes.	✓ Twin output models support the maximum output configuration flexibility.

Warranty: 3 Years return to Teledyne LeCroy.

Models and Characteristics

	Voltage Range	Current Range	Maximum Power	
T3PS11230	0 – 12 V	0 – 30 A	360 W	
T3PS12415	0 – 24 V	0 – 15 A	360 W	
T3PS13206	0 – 32 V	0 – 6 A	192 W	
T3PS16006	0 – 60 V	0 – 6 A	360 W	
T3PS23203	0 – 32 V / 0 – 32 V	0 – 3 A / 0 – 3 A	192 W	
T3PS23203P	0 – 32 V / 0 – 32 V	0 – 3 A / 0 – 3 A	192 W	Programmable

Power Supplies
Single and Dual Output

Models and Specifications

Model	T3PS11230	T3PS12415	T3PS13206	T3PS16006	T3PS23203	T3PS23203P
Number of Channels	1	1	1	1	2	2
Voltage Range	0–12 V	0–24 V	0–32 V	0–60 V	0–32 V / 0–32 V	0–32 V / 0–32 V
Current Range	0–30 A	0–15 A	0–6 A	0–6 A	0–3 A / 0–3 A	0–3 A / 0–3 A
Maximum Power	360 W	360 W	192 W	360 W	192 W	192 W
Constant Voltage						
Line Regulation	≤ 5 mV	≤ 5 mV	≤ 0.01 % + 3 mV	≤ 5 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
Load Regulation	≤ 5 mV	≤ 5 mV	≤ 0.02 % + 5 mV	≤ 5 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
Ripple & Noise	≤ 5 mV rms (20 Hz – 20 MHz)	≤ 5 mV rms (20 Hz – 20 MHz)	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 5 mV rms (20 Hz – 20 MHz)	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 350 µV rms (5 Hz – 1 MHz)
Recovery Time (50 % Load Change, minimum load 0.5 A)	≤ 500 µs	≤ 500 µs	≤ 100 µs	≤ 500 µs	≤ 100 µs	≤ 50 µs
Constant Current						
Line Regulation	≤ 3 mA	≤ 3 mA	≤ 0.02 % + 3 mA	≤ 3 mA	≤ 0.02 % + 3 mA	≤ 0.02 % + 3 mA
Load Regulation	≤ 3 mA	≤ 3 mA	≤ 0.02 % + 3 mA	≤ 3 mA	≤ 0.02 % + 3 mA	≤ 0.02 % + 3 mA
Ripple & Noise	≤ 30 mA rms	≤ 10 mA rms	≤ 3 mA rms	≤ 3 mA rms	≤ 3 mA rms	≤ 2 mA rms
Other						
Tracking Operation	No	No	No	No	Yes	Yes
Remote Sense Terminals	Yes	Yes	Yes	Yes	No	No
Programmable	No	No	No	No	No	Yes
Technology	Switching	Switching	Linear	Switching	Linear	Linear
Form Factor	A	A	B	A	B	C

Form Factor

Form Factor style A

Form Factor style A offers a dual measurement display, high efficiency and high power density due to it's efficient switching design architecture.

Form Factor style B ***Form Factor style C***

Form Factor style B and C offer independent voltage and current readouts for both channels, high resolution read out, low noise, high reliability and compact size, along with 'Tracking Operation' on the dual channel models.

Power Supplies
Triple and Quad Output

Broad Product Range
Current: Up to 12 Amps
Voltage: Up to 120 Volts
Power: Up to 385 Watts

Tools for Improved Debugging

• 8 Models to choose from.	✓ More choices for better application coverage.
• Triple and Quad output models.	✓ Single and Dual output models available in our Single and Dual output model brochure.
• Programmable and non-programmable models available.	✓ Selection of bench or programmable/ATE instruments.
• All power supplies support Constant Voltage and Constant Current modes (C.V. and C.C. modes).	✓ Multiple independent modes per output supports a wider range of applications.
• All models support independent, series and parallel output modes.	✓ Support for the maximum output configuration flexibility.

Warranty: 3 Years return to Teledyne LeCroy.

Models and Characteristics

	Voltage Range	Current Range	Maximum Power	
T3PS3000	0 – 32 V / 0 – 32 V / 2.5 V, 3.3 V, 5 V	0 – 3.2 A / 0 – 3.2 A / 0 – 3.2 A	220 W	Programmable
T3PS33203	0 – 32 V / 0 – 32 V / 5 V	0 – 3 A / 0 – 3 A / 0 – 5 A	207 W	
T3PS33203P	0 – 32 V / 0 – 32 V / 1.8 V, 2.5 V, 3.3 V, 5 V	0 – 3 A / 0 – 3 A / 0 – 5 A	207 W	Programmable
T3PS36006[1]	0 – 60 V / 0 – 60 V / 0.1 – 5 V	0 – 6 A / 0 – 6 A / 0 – 3 A	375 W	
T3PS43203	0 – 32 V / 0 – 32 V / 0 – 15 V / 0 – 5 V	0 – 3 A / 0 – 3 A / 0 – 1 A / 0 – 1 A	212 W	
T3PS43203P	0 – 32 V / 0 – 32 V / 0 – 15 V / 0 – 5 V	0 – 3 A / 0 – 3 A / 0 – 1 A / 0 – 1 A	212 W	Programmable
T3PS30063P	0 – 30 V / 0 – 30 V / 1.8 V, 2.5 V, 3.3 V, 5 V	0 – 6 A / 0 – 6 A / 0 – 5 A	385 W	Programmable
T3PS60033P	0 – 60 V / 0 – 60 V / 1.8 V, 2.5 V, 3.3 V, 5 V	0 – 3 A / 0 – 3 A / 0 – 5 A	385 W	Programmable

1 See page 2 for additional specifications.

Power Supplies
Triple and Quad Output

Models and Specifications

Model		T3PS3000	T3PS33203	T3PS33203P	T3PS36006
Number of Channels		3	3	3	3
Voltage Range	Ch1/Ch2	0 – 32 V	0 – 32 V	0 – 32 V	0 – 30 V / 0 – 60 V
	Ch3	2.5 V, 3.3 V, 5 V ± 8 %	5 V ± 5 % (fixed)	1.8 V, 2.5 V, 3.3 V, 5 V ± 5 %	0.1 – 5 V
	Ch4	–	–	–	–
Current Range	Ch1/Ch2	0 – 3.2 A	0 – 3 A	0 – 3 A	0 – 6 A / 0 – 3 A
	Ch3	0 – 3.2 A	0 – 5 A	0 – 5 A	0 – 3 A
	Ch4	–	–	–	–
Maximum Power		220 W	207 W	207 W	375 W
Constant Voltage					
Line Regulation	Ch1/Ch2	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
	Ch3	≤ 0.01 % + 3 mV	≤ 3 mV	≤ 3 mV	≤ 0.01 % + 3 mV
	Ch4	–	–	–	–
Load Regulation	Ch1/Ch2	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 5 mV
	Ch3	≤ 0.01 % + 3 mV	≤ 5 mV	≤ 5 mV	≤ 0.01 % + 5 mV
	Ch4	–	–	–	–
Ripple & Noise	Ch1/Ch2	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 350 µV rms (5 Hz – 1 MHz)	≤ 5 mV rms (5 Hz – 1 MHz)
	Ch3	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 2 mV rms (5 Hz – 1 MHz)	≤ 5 mV rms (5 Hz – 1 MHz)
	Ch4	–	–	–	–
Recovery Time (50 % Load Change, minimum load 0.5 A)		≤ 50 µs	≤ 100 µs	≤ 50 µs	≤ 100 µs
Constant Current					
Line Regulation		≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA
Load Regulation		≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA
Ripple & Noise		≤ 3 mA rms	≤ 3 mA rms	≤ 2 mA rms	≤ 3 mA rms
Other					
Series Tracking		0 – 64 V, 0 – 3.2 A	0 – 64 V, 0 – 3 A	0 – 64 V, 0 – 3 A	0 – 120 V, 0 – 3 A
Parallel Tracking		0 – 32 V, 0 – 6.4 A	0 – 32 V, 0 – 6 A	0 – 32 V, 0 – 6 A	0 – 30 V, 0 – 12 A
Programmable		Yes	No	Yes	No

Model		T3PS30063P	T3PS60033P	T3PS43203	T3PS43203P
Number of Channels		3	3	4	4
Voltage Range	Ch1/Ch2	0 – 30 V	0 – 60 V	0 – 32 V	0 – 32 V
	Ch3	1.8 V, 2.5 V, 3.3 V, 5 V ± 5 %	1.8 V, 2.5 V, 3.3 V, 5 V ± 5 %	0 – 15 V	0 – 15 V
	Ch4	–	–	0 – 5 V	0 – 5 V
Current Range	Ch1/Ch2	0 – 6 A	0 – 3 A	0 – 3 A	0 – 3 A
	Ch3	0 – 5 A	0 – 5 A	0 – 1 A	0 – 1 A
	Ch4	–	–	0 – 1 A	0 – 1 A
Maximum Power		385 W	385 W	212 W	212 W
Constant Voltage					
Line Regulation	Ch1/Ch2	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
	Ch3	≤ 3 mV	≤ 3 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
	Ch4	–	–	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
Load Regulation	Ch1/Ch2	≤ 0.01 % + 5 mV	≤ 0.01 % + 5 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
	Ch3	≤ 5 mV	≤ 5 mV	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
	Ch4	–	–	≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV
Ripple & Noise	Ch1/Ch2	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 1 mV rms (5 Hz–1 MHz)	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 350 µV rms (5 Hz – 1 MHz)
	Ch3	≤ 2 mV rms	≤ 2 mV rms	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 1 mV rms (5 Hz – 1 MHz)
	Ch4	–	–	≤ 1 mV rms (5 Hz – 1 MHz)	≤ 1 mV rms (5 Hz – 1 MHz)
Recovery Time (50 % Load Change, minimum load 0.5 A)		≤ 100 µs	≤ 100 µs	≤ 100 µs	≤ 50 µs
Constant Current					
Line Regulation		≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA
Load Regulation		≤ 0.01 % + 3 mV	≤ 0.01 % + 3 mV	≤ 0.2 % + 3 mA	≤ 0.2 % + 3 mA
Ripple & Noise		≤ 2 mV	≤ 2 mV	≤ 3 mA rms	≤ 2 mA rms
Other					
Series Tracking		0 – 60 V, 0 – 6 A	0 – 120 V, 0 – 3 A	0 – 64 V, 0 – 3 A	0 – 64 V, 0 – 3 A
Parallel Tracking		0 – 30 V, 0 – 12 A	0 – 60 V, 0 – 6 A	0 – 32 V, 0 – 6 A	0 – 32 V, 0 – 6 A
Programmable		Yes	Yes	No	Yes

T3PS16081P/T3PS30051P

Programmable Power Supplies

Debug with Confidence

30 Volts, 8 Amps, 150 Watts

Tools for Improved Debugging

• Single high performance, high precision programmable output.	✓ Ideal for a wider range of bench power supply application coverage.
• Compact, modern, easy to use, reliable, low noise linear design ≤ 350 µVrms.	✓ Ideal for electronic components/ systems, battery, IoT, digital, analog and audio applications.
• High resolution 2.8 inch TFT LCD Display with 240 x 320 pixels.	✓ Large, clear display aids setup and ease of use.
• Two output modes: standard 2-wire or 4-wire using remote sense capability.	✓ Delivers accurate, precision voltage directly to the DUT.
• Provides power up to 128/150 Watts.	✓ Ideal for low to medium power applications.
• Rear panel USB Device and LAN interface connectors.	✓ Support for the maximum control flexibility.
• 3 years warranty as standard.	✓ Reliable product gives piece of mind.

Models and Characteristics

T3PS16081P	0 V – 16 V	0 – 8 A	128 Watts	Programmable
T3PS30051P	0 V – 30 V	0 – 5 A	150 Watts	Programmable

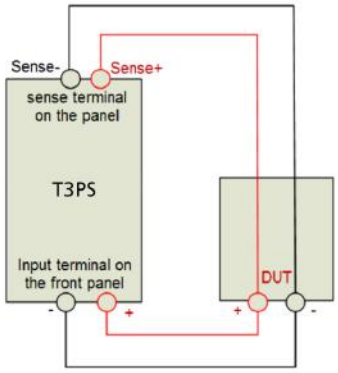
T3PS16081P/T3PS30051P

Programmable Power Supplies

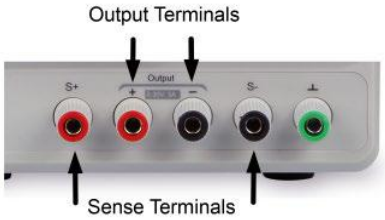
Models and Specifications

Model	T3PS16081P	T3PS30051P
Number of Channels	1	1
Voltage Range	0 – 16 V	0 – 30 V
Current Range	0 – 8 A	0 – 5 A
Maximum Power	128 W	150 W
Constant Voltage		
Load Regulation	≤ 0.01 % + 2 mV	
Ripple & Noise	≤ 350 µVrms / 3 mVpp (20 Hz – 20 MHz)	
Recovery Time (50 % load change, minimum load 0.5 A)	< 50 us	
Constant Current		
Line Regulation	≤ 0.2 % + 3 mA	
Load Regulation	≤ 0.2 % + 3 mA	
Ripple & Noise	≤ 2 mArms	
Other		
Remote Sense Terminals	Yes	
Programmable	Yes via USB and LAN	
Technology	Linear	
Display	2.8 inch color TFT LCD, 240 x 320 pixels	
Dimensions	154.6 mm (W) x 144.5 mm (H) x 280 mm (D)	
Weight	5.5 kg	
Warranty	3 Years	

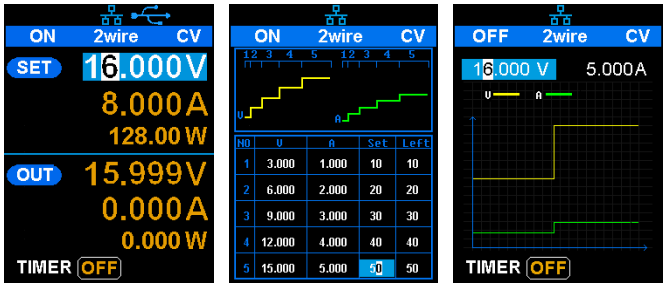
4-Wire Sense Capability



4-Wire Sense compensates for losses in cabling between the DUT and terminals of the T3PS30051P/T3PS16081P power supply.



Using remote sense is an effective way to improve power delivery accuracy at the DUTs terminals, effectively removing the additional error due to the voltage drop in the connection wiring.



Multiple display formats for ease of use.

Excellent Performance

- 5 digit voltage, 4 digit current display with minimum resolution of 1 mV / 1 mA.
- Low ripple and noise of ≤ 350 µVrms / 3 mVpp, < 2 mArms.
- Fast < 50 µs transient response time.
- Use standard 2-Wire mode, or 4-Wire Sense capability to compensate for wiring losses.

Great Connectivity

- LAN and USB device port (USBTMC) for instrument control.
- LabView driver and SCPI programming support.

Smart Capabilities

- Intelligent temperature controlled fan reduces noise.
- Clear graphical interface with waveform display function.
- Save/recall 5 internal groups of parameters.
- Multiple display formats supporting numerical and graphical modes.

Power Supplies

Programmable High-Precision DC Power Supplies

Measure with Confidence

Current:
Up to 5 Amps

Voltage:
Up to 100 Volts

Power:
Up to 108 Watts

Tools for Improved Debugging

● 0.03 % Voltage setting and measurement accuracy.	✔ Apply the desired voltage to the load accurately.
● Low Ripple Noise ≤ 1.2 mVrms and transient recovery time ≤ 100 µs.	✔ Improved power supply specifications meets your low noise power needs.
● Adjustable Slew Rates for the level transition of both Current and Voltage.	✔ Adjustable slew rates allows flexible output setting in various testing conditions.
● Ch1 and Ch2 support Constant Voltage and Constant Current Operation.	✔ Flexible voltage and current output configurations for a broader application coverage.
● Fully programmable via LAN, USB, RS-232 and RS-485 interface.	✔ Full remote control extends the usability from the bench to automated systems.
● 3 years warranty as standard.	✔ Reliable product gives peace of mind.

Models and Characteristics

Models	Voltage	Current	Power	Voltage Setting Accuracy	Current Setting Accuracy
T3PS20051P	20 V	5 A	100 W	0.03 %*	0.05 %*
T3PS36031P	36 V	3 A	108 W		
T3PS100011P	100 V	1 A	100 W		

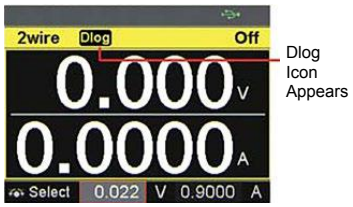
* Refer the specifications section below for detailed specifications.

Power Supplies

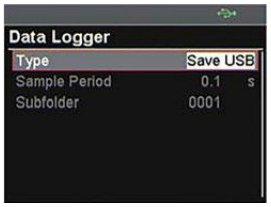
Programmable High-Precision DC Power Supplies

Model		T3PS20051P	T3PS36031P	T3PS100011P
DC Output Mode				
Output Voltage		20.000 V	36.000 V	100.00 V
Output Current		5.0000 A	3.0000 A	1.0000 A
Output Power		100 W	108 W	100 W
Constant Voltage Operation				
Line Regulation		± (0.01 % of setting + 1 mV)	± (0.01 % of setting + 3 mV)	± (0.01 % of setting + 7 mV)
Load Regulation		± (0.01 % of setting + 3 mV)	± (0.01 % of setting + 4 mV)	± (0.01 % of setting + 7 mV)
Transient Response		< 50 µs		< 100 µs
Ripple Noise(Vrms/ Vpp)		0.5 mVrms / < 8 mVpp	0.8 mVrms / < 10 mVpp	1.2 mVrms / < 15 mVpp
Rise Time	Rated load	≤ 50 ms	≤ 50 ms	≤ 100 ms
	No load	≤ 50 ms	≤ 50 ms	≤ 100 ms
Fall Time	Rated load	≤ 20 ms	≤ 20 ms	≤ 50 ms
	No load	≤ 150 ms	≤ 150 ms	≤ 250 ms
Setting Range (105 %)		0 V to 21.0 V	0 V to 37.8 V	0 V to 105.0 V
Setting Resolution		1 mV	1 mV	2 mV
Setting Accuracy (23 °C ± 15 °C)		± (0.03 % of setting + 5 mV)	± (0.03 % of setting + 8 mV)	± (0.0 3% of setting + 20 mV)
Remote Sensing Compensation Voltage (single line)		1 V	1 V	3 V
Temperature Coefficient (Typ.)		100 ppm / °C		
Constant Current Operation				
Line Regulation		± (0.02 % of setting + 250 µA)	± (0.02 % of setting + 150 µA)	± (0.02 % of setting + 50 µA)
Load Regulation		± (0.02 % of setting + 250 µA)	± (0.02 % of setting + 150 µA)	± (0.02 % of setting + 50 µA)
Ripple Noise (Arms)		2 mA	1 mA	1 mA
Setting Range (105 %)		0 A to 5.25 A	0 A to 3.15 A	0 A to 1.050 A
Setting Resolution		0.1 mA		
Setting Accuracy (23 °C ± 5 °C)		± (0.05 % of setting + 3.0 mA)	± (0.05 % of setting + 1.5 mA)	± (0.05 % of setting + 1.0 mA)
Temperature Coefficient (Typ.)		200 ppm / °C		
Other				
Interface Capabilities	LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask		
	USB	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC		
	RS-232/RS-485	Complies with the EIA-RS-232/RS-485 specifications (excluding the connector)		
Dimensions (mm)		107 (W) × 124 (H) × 313 (D) (not including protrusions)		
Weight		Approx. 5.5 kg		

A. DATA LOGGER



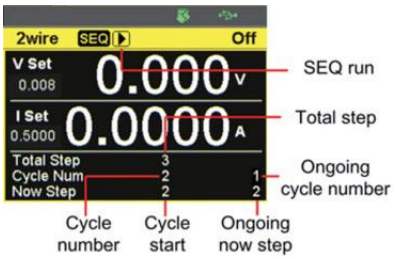
Data Logger Function



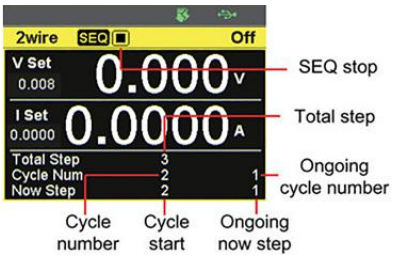
Save Data Log Into USB Disk

The T3PS series can record the measured voltage, current and temperature data to a USB flash drive or can be remotely controlled to read the data. Data sampling interval is 0.1 ~ 999.9 seconds.

B. SEQUENCE TEST



SEQ Run in Cycle Mode



SEQ Stop in Cycle Mode

The Sequence Test function allows the user to program the T3PS series to execute a sequential power output. The supply will automatically execute the power output sequence to the DUT. The T3PS series can store 10 sets of edited Test Scripts in the internal memory and can also be connected to a USB flash drive to store Test Scripts.

Power Supplies

Single Output Multi-Range Power Supplies

Broad Product Range

Current:
Up to 72 Amps

Voltage:
Up to 800 Volts

Power:
Up to 720 Watts

Tools for Improved Debugging

• Multi-range operation extends the Voltage and Current limit up to 3 times compared to conventional supply.	✓ Single unit covers wide Voltage and Current Ranges.
• Adjustable Slew Rates for the level transition of both Current and Voltage.	✓ Adjustable slew rates allows flexible output setting in various testing conditions.
• Ch1 and Ch2 support Constant Voltage and Constant Current Operation.	✓ Flexible voltage and current output configurations for a broader application coverage.
• Fully programmable via LAN and USB interface.	✓ Full remote control extends the usability from the bench to automated systems.
• 3 years warranty as standard.	✓ Reliable product gives peace of mind.

Models and Characteristics

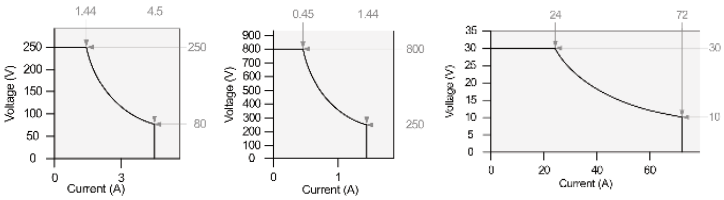
Models	Voltage	Current	Power
T3PS30721P	0 – 30 V	0 – 72 A	720 W
T3PS80271P	0 – 80 V	0 – 27 A	720 W
T3PS160141P	0 – 160 V	0 – 14.4 A	720 W
T3PS250041P	0 – 250 V	0 – 4.5 A	360 W
T3PS800011P	0 – 800 V	0 – 1.44 A	360 W

Power Supplies

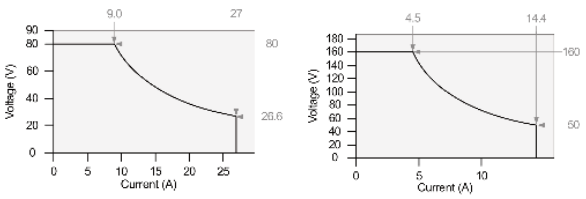
Single Output Multi-Range Power Supplies

	T3PS30721P	T3PS80271P	T3PS160141P	T3PS250041P	T3PS800011P
Output Rating					
Voltage	0 – 30 V	0 – 80 V	0 –160 V	0 – 250 V	0 – 800 V
Current	0 – 72 A	0 – 27 A	0 –14.4 A	0 – 4.5 A	0 – 1.44 A
Power	720 W	720 W	720 W	360 W	360 W
Regulation (CV)					
Load	20 mV	45 mV	85 mV	130 mV	405 mV
Line	18 mV	43 mV	83 mV	128 mV	403 mV
Regulation (CC)					
Load	77 mA	32 mA	19.4 mA	9.5 mA	6.44 mA
Line	77 mA	32 mA	19.4 mA	9.5 mA	6.44 mA
Ripple & Noise (Noise Bandwidth 20 MHz; Ripple Bandwidth = 1 MHz)					
CVp-p	80 mV	80 mV	80 mV	80 mV	150 mV
CV rms	11 mV	11 mV	15 mV	15 mV	30 mV
CC rms	144 mA	54 mA	30 mA	10 mA	5 mA
Programming Accuracy					
Voltage	0.1 % + 10 mV	0.1 % + 10 mV	0.1 % + 100 mV	0.1 % + 200 mV	0.1 % + 400 mV
Current	0.1 % + 60 mA	0.1 % + 30 mA	0.1 % + 15 mA	0.1 % + 5 mA	0.1 % + 2 mA
Measurement Accuracy					
Voltage	0.1 % + 10 mV	0.1 % + 10 mV	0.1 % + 100 mV	0.1 % + 200 mV	0.1 % + 400 mV
Current	0.1 % + 60 mA	0.1 % + 30 mA	0.1 % + 15 mA	0.1 % + 5 mA	0.1 % + 2 mA
Response Time					
Rise Time	50 ms	50 ms	100 ms	100 ms	150 ms
Fall Time (Full Load)	50 ms	50 ms	100 ms	150 ms	300 ms
Fall Time (No Load)	500 ms	500 ms	1000 ms	1200 ms	2000 ms
Load Transient Recover Time (Load change from 50–100 %)	1 ms	1 ms	2 ms	2 ms	2 ms
Other					
Analog Control	Yes				
Interface	USB/LAN				
Fan	With thermal sensing control single				
Power Source	85 VAC ~ 265 VAC, 47 ~ 63 Hz, single phase				
Dimensions & Weight	142 (W) x 124 (H) x 350 (D) mm; Approx 5.3 kg	142 (W) x 124 (H) x 350 (D) mm; Approx 5.3 kg	142 (W) x 124 (H) x 350 (D) mm; Approx 5.3 kg	71 (W) x 124 (H) x 350 (D) mm; Approx 3 kg	71 (W) x 124 (H) x 350 (D) mm; Approx 3 kg

A. MULTI-RANGE OPERATION

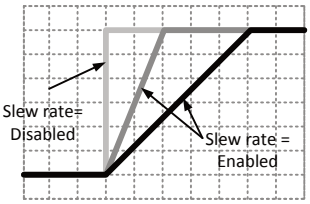


Operating areas of 360 W Models: T3PS250041P, T3PS800011P, T3PS30721P



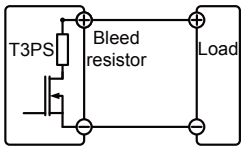
Operating areas of 720 W Models: T3PS80271P, T3PS160141P

B. ADJUSTABLE SLEW RATE



TheT3PS has selectable slew rates for CC and CV mode. This gives the T3PS power supply the ability to limit the current/voltage draw of the power supply.

C. BLEEDER CONTROL



The T3PS DC power supplies employ a bleed resistor in parallel with the output terminals. Bleed resistors are designed to dissipate the power from the power supply filter capacitors when power is turned off and the load is disconnected.

T3PS40381P / T3PS60251P / T3PS062001P

Programmable Switching DC Power Supply

Power With Confidence

Voltage: Up to 60 Volts
Current: Up to 200 Amps
Power: Up to 1520 Watts

Tools for Improved Debugging

• Dual Measurement display.	✓ Clear Visibility of your power settings.
• Switched mode high efficiency power supply design.	✓ Excellent accuracy regardless of the waveform shape.
• Constant Voltage and Constant Current operation.	✓ Wider application coverage for a more complete solution.
• Remote sensing to compensate for voltage drop in load leads.	✓ Ensure that full voltage gets to your DUT. Sense compensates for wiring losses.
• Supports various interfaces like USB, LAN, RS-232, RS-485.	✓ Support for maximum control flexibility.
• 1U Height and 19" Rack Mount Size.	✓ Provides more flexible system integration.
• 3 Years Warranty as standard.	✓ Peace of mind.

Key Specifications

Model	Voltage Rating	Current Rating	Power
T3PS062001P	6 V	200 A	1200 W
T3PS40381P	40 V	38 A	1520 W
T3PS60251P	60 V	25 A	1500 W

T3PS40381P / T3PS60251P / T3PS062001P

Programmable Switching DC Power Supply

Model		T3PS062001P	T3PS40381P	T3PS60251P
Ripple and Noise				
CVp-p (10 – 20 MHz) p-p		60 mV	60 mV	60 mV
CVrms (5 Hz – 1 MHz) r.m.s		8 mV	8 mV	8 mV
CCrms (5 Hz – 1 MHz) r.m.s		400 mA	95 mA	75 mA
Load Regulation				
Voltage		2.6 mV	6 mV	8 mV
Current		45 mA	12.6 mA	10 mA
Line Regulation				
Voltage		2.6 mV	6 mV	8 mV
Current		22 mA	5.8 mA	4.5 mA
Transient Response Time				
Transient Response Time		1.5 ms	1 ms	1 ms
Output Response Time				
RiseTime	Rated load	80 ms	80 ms	80 ms
	No Load	80 ms	80 ms	80 ms
Fall Time	Rated load	10 ms	80 ms	80 ms
	No Load	500 ms	1100 ms	1100 ms
Temperature Coefficience				
Voltage & Current		100 ppm/°C after a 30 minute warm-up		
Remote Sense Compensation Voltage (Single Wire)				
Voltage		1 V	2 V	3 V

Features

- CC or CV Priority Mode
- Adjustable Voltage/Current Rise and Fall Time
- Three sets of Preset Functions
- Bleeder Control Function
- Internal Resistance Function
- Panel Lock Function
- Protection: OVP, OCP, OHP, UVL, AC Fail, FAN Fail
- Standard: USB, LAN, RS-232, RS-485, Analog Control

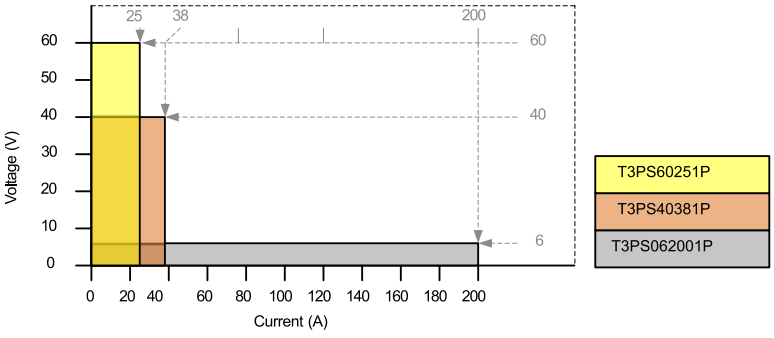
Applications

- The primary input of DC/DC converter
- Servomotor Manufacturing Equipment
- Aging test equipment for Capacitor
- Aging test equipment for Diodes
- Power supply for communications Equipment
- Automotive 12/48 V Systems
- Military and Aviation

T3PS Series Operating Area

The T3PS power supplies are regulated DC power supplies with a high voltage and current output. These operate in CC or CV mode within a wide operating range limited only by the voltage or current output.

The operating area of each power supply is determined by the rated output power as well as the voltage and current rating.



T3EL150302P / T3EL150303P

Programmable Electronic Loads

Debug with Confidence

150 Volts, 30 Amps, 300 Watts

Tools for Improved Debugging

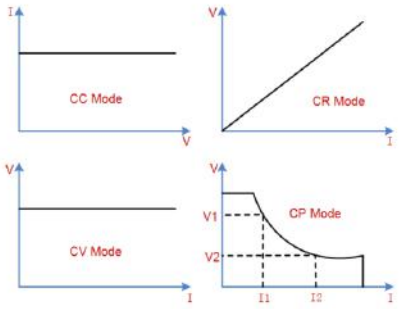
• 2 Models to choose from. Each model has a Low and High mode.	✓ Dual modes add more flexibility for better application coverage.
• 4 Operating modes: CC, CV, CR, CP	✓ Ideal for electronic components, battery, portable charger/adaptor and power products.
• Static, Dynamic and Sequence mode support.	✓ Generate a single static load right through to complex dynamic sequences for thorough product testing.
• Built in Application Functions: Short Circuit Test, Battery Test Mode, CR-LED Mode, OCP and OPP Test.	✓ Quickly set up common tests.
• Provides a load of up to 300 Watts.	✓ Ideal for low to medium power applications.
• Programmable and analog external control.	✓ Support for the maximum control flexibility.
• 3 years warranty as standard.	✓ Reliable product gives piece of mind.

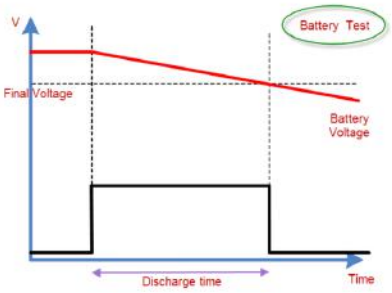
Models and Characteristics

T3EL150302P	High Range	0 V – 150 V	0 – 30 A	200 Watts
	Low Range	0 V – 150 V	0 – 5 A	200 Watts
T3EL150303P	High Range	0 V – 150 V	0 – 30 A	300 Watts
	Low Range	0 V – 150 V	0 – 5 A	300 Watts

T3EL150302P / T3EL150303P

Programmable Electronic Loads



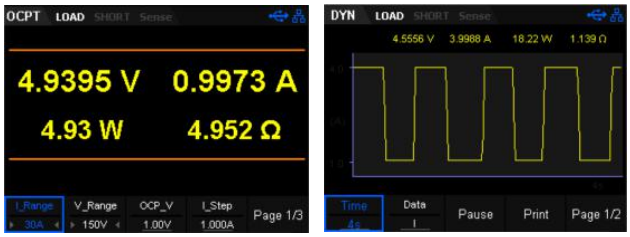


The T3EL15030xP range of Electronic Loads support CC, CV, CP and CR modes. In CC mode the electronic load will sink a constant current regardless of the voltage. In CV mode the electronic load will maintain a set voltage on its input terminals. In CR mode the electronic load will behave as a fixed resistance load. In CP mode the electronic load will dissipate a constant power value from the DUT.

The T3EL15030xP Battery Discharge Function can provide insight into battery performance by analyzing the discharge characteristics of the DUT. The T3EL15030xP features three stop conditions for the discharge test: Voltage, capacity or time. Throughout the test process the battery voltage, discharge current, discharge time and discharged capability is displayed clearly on the LCD panel.

In CC/CV/CR/CW mode, 4-Wire Sense compensates for losses in cabling between the DUT and terminals of the T3EL15030xP electronic load. Using remote sense is an effective way to improve measurement accuracy at the DUTs terminals, effectively removing the additional error due to the voltage drop in the connection wiring.

Function	T3EL150302P	T3EL150303P
Built-in Test Functions	Overcurrent Protection Testing, Over Power Protection Testing, Battery Test Function, LED Test Function	
Sequence Mode	List Test Mode: Up to 100 single mode Steps per list, in up to 8 lists Auto Test Mode: Up to 50 mixed mode Steps per file in up to 8 files	
Static/Dynamic Modes	Constant Current, Constant Voltage, Constant Resistance, Constant Power	
Maximum Input High Range Low Range	0 V – 150 V, 0 A – 30 A 0 V – 150 V, 0 A – 5 A	0 V – 150 V, 0 A – 30 A 0 V – 150 V, 0 A – 5 A
Maximum Input Power	200 Watts	300 Watts
Display Size	3.5" TFT-LCD Display	3.5" TFT-LCD Display



Multiple display formats for ease of use.

Excellent Performance

- Four operating modes CV, CC, CR and CP.
- Dynamic sequence/list mode of up to 100 steps.
- 4-Wire Sense capability compensates for wiring losses.

Great Connectivity

- USB host port for mass storage.
- RS232, LAN, USB device port (USBTMC) for instrument control.
- BNC output connectors to monitor current and voltage.

Smart Capabilities

- 4 built in applications modes supporting short circuit, battery test, CR-LED and factory test modes.
- Static and Dynamic load capability.
- Program function supports 50 groups of steps.
- OCP, OVP, OPP, OTP and LRV protection.
- Multiple display formats supporting numerical and graphical modes.
- Smart fan control to minimize noise.

T3SA3100 / T3SA3200

2.1 GHz and 3.2 GHz Spectrum Analyzers

Broad Measurement Range

Frequency Range Up to 3.2 GHz

Tools for Improved Debugging

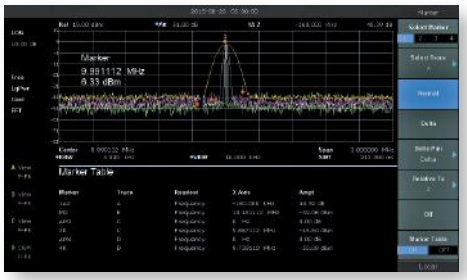
• Frequency Range from 9 kHz to 3.2 GHz.	✓ More application coverage from a single Spectrum Analyzer.
• -161 dBm/Hz Displayed Average Noise Level (Typ.)	✓ View and measure very small signals.
• -98 dBc/ Hz @10 kHz Offset Phase Noise (1 GHz, Typ.)	✓ Improved specification gives more accurate measurement results.
• Total Amplitude Accuracy < 0.7 dB.	✓ Make more accurate measurements over a wide frequency range.
• 1 Hz Minimum Resolution Bandwidth.	✓ Easily see and measure closely spaces frequencies.
• Built-in switchable pre-amplifier.	✓ Integrated pre-amplifier allows higher sensitivity measurements.
• 10.1 inch (25.65 cm) color WVGA 1024 x 600 display.	✓ Clear and flexible display aids ease of use.
• USB Device, USB Host and LAN support.	✓ Remote control your measurements.
• 3 Years Warranty as standard.	✓ Peace of mind.

Key Specifications

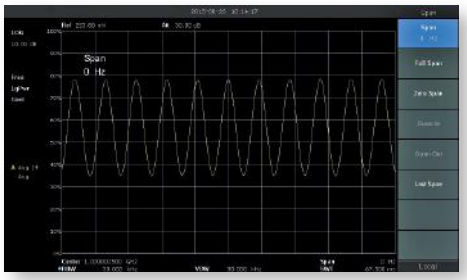
Model	T3SA3200	T3SA3100
Frequency Range	9 kHz ~ 3.2 GHz	9 kHz ~ 2.1 GHz
Resolution Bandwidth	1 Hz ~ 1 MHz, in 1-3-10 sequence	1 Hz ~ 1 MHz, in 1-3-10 sequence
Displayed Average Noise Level	-161 dBm/Hz, Normalize to 1 Hz (typ.)	-161 dBm/Hz, Normalize to 1 Hz (typ.)
Phase Noise	< -98 dBc/Hz@1 GHz, 10 kHz offset	< -98 dBc/Hz@1 GHz, 10 kHz offset
Amplitude Precision	< 0.7 dB	< 0.7 dB

T3SA3100 / T3SA3200

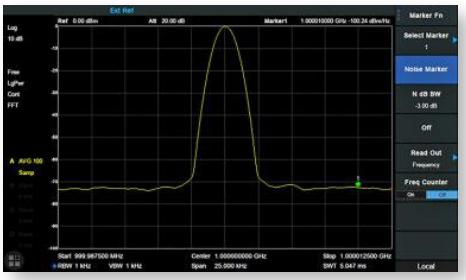
2.1 GHz and 3.2 GHz Spectrum Analyzers



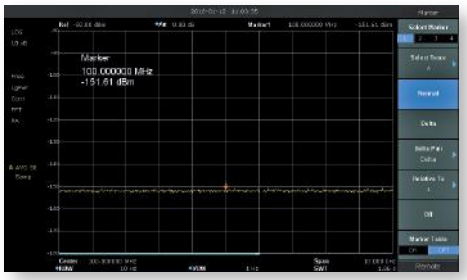
Supports four independent traces and cursors



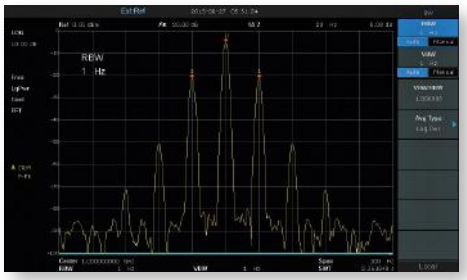
Zero span and demodulation capabilities



Phase Noise -98 dBc/Hz @ 1 GHz, offset 10 kHz



-151 dBm Displayed Average Noise Level (RBW = 10 Hz)



1 Hz Minimum Resolution Bandwidth (RBW) allowing closely spaced frequencies to be measured

Smart Capabilities as Standard

- High performance specification as standard (see T3SA3000 data sheet for detailed specifications).
- Built-in preamplifier as standard. Enhances your measurement capability and sensitivity when measuring small signals.
- "Preset" and "Auto Tune" for quick set up.
- All-Digital IF Technology.
- Large, bright 10.1 inch (25.65 cm) color WVGA 1024 x 600 display.
- Built-in front panel accessible help system.
- File management (support for U-disc and local storage)
- Lightweight, small footprint, easy to transport.

Typical Applications

- Research and Development applications.
- Radio Frequency (RF) and Wireless applications.
- Use with a Near Field Probe in applications identifing sources of radiated emmissions.
- Calibration Laboratory.
- Automatic Production Test.
- General Bench-top use.

Available Rear Connections

- Connections available for USB, USBTMC, LAN, 10 MHz Refence In, 10 MHz Reference Out, Trigger In.
- A Kensington security lock point.

T3VNA

Vector Network Analyzer

Debug with Confidence

Frequency Range 9 kHz to 3.2 GHz

Tools for Improved Debugging

• Vector Network Analyzer, Spectrum Analyzer and Distance To Fault modes.	✓ More application coverage from a single instrument.
• -161 dBm/Hz Displayed Average Noise Level (Typ.)	✓ View and measure very small signals.
• -98 dBc/Hz @ 10 kHz Offset Phase Noise (1 GHz, Typ.)	✓ Improved specification gives more accurate measurement results.
• Built-in Advanced Measurement capability (CHP, ACPR, OBW, CNR, TOI, etc)	✓ Wide range of capability and application support as standard.
• Built-in switchable pre-amplifier.	✓ Integrated pre-amplifier allows higher sensitivity measurements.
• 10.1 inch (25.65 cm) color WVGA 1024 x 600 display.	✓ Large, clear and flexible display aids ease of use.
• 3 years warranty as standard.	✓ Reliable product gives piece of mind.

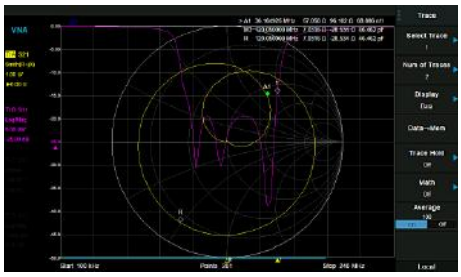
Key Specifications

Model	T3VNA3200
Vector Network Analyzer Frequency Range	100 kHz to 3.2 GHz
Spectrum Analyzer Frequency Range	9 kHz to 3.2 GHz
Resolution Bandwidth	1 Hz to 1 MHz
Displayed Average Noise Level	-161 dBm/Hz
Phase Noise	< -98 dBc/Hz
Total Amplitude Accuracy	< 0.7 dB

T3VNA

Vector Network Analyzer

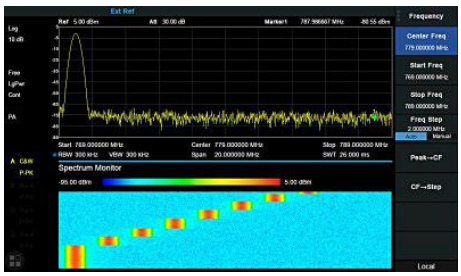
Vector Network Analyzer Mode with multi-format overlay display



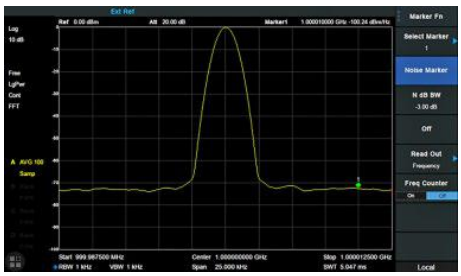
Distance to Fault Mode based on time domain analysis

Adjacent Channel Power Ratio (ACPR) in advanced measurement mode

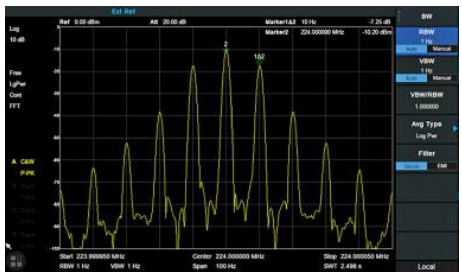
2D Time – Spectrogram in Spectrum Analyzer advanced measurement mode



Phase noise -98 dBc/Hz @1 GHz, offset 10 kHz



Minimum 1 Hz Resolution Bandwidth



Excellent Performance

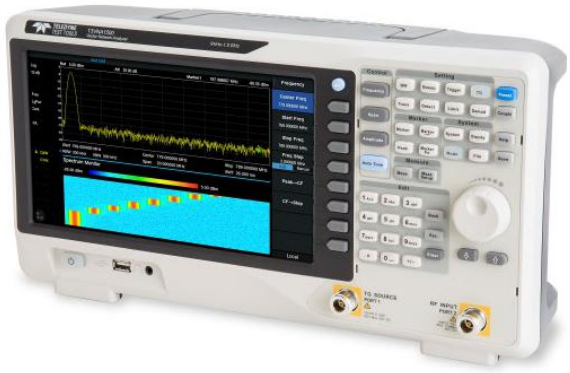
- "Default Setup", "Preset" and "Auto Tune" for quick user set up.
- Built-in Advanced Measurement capability (CHP, ACPR, OBW, CNR, TOI, etc) as standard.
- Supports full Vector Network Analyzer, Spectrum Analyzer and Distance To Fault modes.
- 1 Hz Minimum Resolution Bandwidth (RBW).
- All-Digital IF Technology.

Great Connectivity

- USB Device, USB Host and LAN support.
- File management (support for U-disc and local storage).
- External trigger input.

Smart Capabilities

- Distance to fault measurement uses VNA time domain analysis capability.
- Built in Preamplifier and Tracking Generator as standard.
- Clear display for easy operation.



T3LCR1002, T3LCR1100, T3LCR1300

Precision LCR Meters

Measure With Confidence

10 Hz – 300 KHz

Tools for Improved Debugging

• 3.5" Large TFT LCD Display.	✓ Clear visibility of your power settings.
• Continuous adjustable test frequency range.	✓ Flexibility in choosing measuring frequency for various components.
• Basic Accuracy of 0.05 %.	✓ Measurements will be faster as well as accurate.
• OPEN/SHORT fixture compensation function with full frequency and spot frequency zero options.	✓ Helps in faster measurements.
• Provides PASS/FAIL test function.	✓ Helps in faster validation process.
• Standard Interface: RS-232C, Handler, USB and USB Storage.	✓ Support for the maximum control flexibility.
• 3 years warranty as standard.	✓ Peace of mind.

Key Specifications

Model	Test Frequency	Measurement Resolution	Measuring Speed
T3LCR1002	10 Hz – 2 KHz	6 digits	Fast: 25 ms
T3LCR1100	10 Hz – 100 KHz	6 digits	Med: 100 ms
T3LCR1300	10 Hz – 300 KHz	6 digits	Slow: 33 ms

T3LCR1002, T3LCR1100, T3LCR1300

Precision LCR Meters

Various Information Display Modes

MEAS Display
Parameter Setting and Four Measurement Parameters

ENLARGE Display
Enlarge Measurement Results and Include PASS/FAIL Result

Features

- Available measurement functions: R, X, |Z|, G, B, |Y|, L, C, D, Q, θd, θr, DCR, Δ%
- Internal D.C. Bias Voltage (±2.5 V) for simulating A.C and D.C to measure capacitance variation.
- Auto Level Control (ALC) Function for components which require a rated test voltage such as Multilayer Ceramic Capacitors (MLCC).
- List Measurement feature to perform automated sweep measurements by listing up to 10 frequency or amplitude points.
- 4 Wire Kelvin clip is available as standard accessory. Replacement lead set can be ordered as an optional accessory using the code: T3TL4k-075.

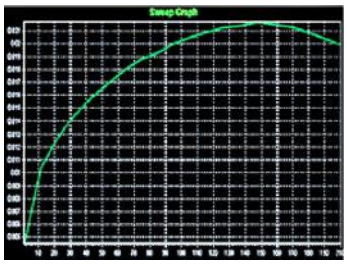
Continuous Frequency and Convenient Zero Function

Continuous and Adjustable Frequency
Freely Input Frequency Within Provided Frequency Range

Selectable Fixture Zeroing Methods
Full Frequency Range Zero or Spot Frequency Zero

List Measurement Function

Listed Tests
Variation Criteria Based on Frequency or Voltage/Current



Characteristic Curve
Provides More Accurate Characteristic Variation Trend

Additional Measurement Functions

Automatic Level Control
Ideal for Measuring Components With Specific Voltage Requirements

Internal Bias (± 2.5 V Adjustable)
Ideal for Capacitive Components' Characteristic Tests

T3DAQ1-16

Data Acquisition System

Broad Measurement Range

DC: up to 1000 Volts
AC: up to 750 Volts
Current: up to 10 A

Tools for Improved Debugging

• **16 Multi-purpose Data Acquisition Channels** built on a 6½ digit digital multimeter platform.	✓ More flexible measurements without losing accuracy.
• **Wide range of measurements** – DC/AC Voltage and Current, Resistance, Capacitance, Frequency, Period.	✓ More application coverage from a single system.
• **True-RMS measurements** – All AC Voltage and Current ranges give True-RMS readings.	✓ Excellent accuracy regardless of the waveform shape.
• **Built-in cold terminal thermocouple compensation.**	✓ Accurate Temperature measurements.
• **USB Device, USB Host and LAN support.**	✓ Remote control your measurements.
• **3 Years Warranty as standard.**	✓ Reliable product gives peace of mind.

Key Specifications

Specification	Scanner	Front Panel Connector
Number of Channels	12 Multi-Purpose and 4 Current Channels	1 Multi-Purpose channel
DC/AC Voltage Range	200 mV to 200 V	200 mV to 1000 V
DC/AC Current Range	2 A fixed	200 µA to 10 A
2/4 Wire Resistance Range	200 Ω to 100 MΩ	

T3DAQ1-16
Data Acquisition System

Features

- 4.3" TFT-LCD Display
- Dual display, Chinese and English Menu
- Built-in front panel accessible help system
- File management (support for U-disc and local storage)
- Real 6-5 digit (2,200,000 count) readings resolution
- 1 GB flash memory for mass storage configuration files and data files

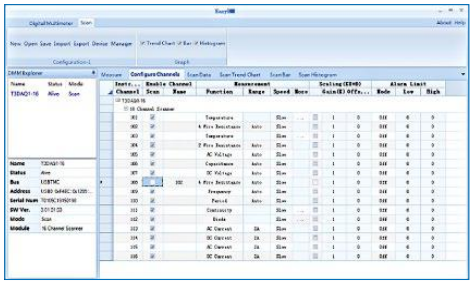
Smart Capabilities as Standard

- In addition to DCV, DCI, ACV, ACI, 2/4 Wire Ohms the T3DAQ range can also measure Capacitance, Frequency, Period, Temperature, Diode Test and Continuity.
- True RMS ACV and ACI measurements improve AC measurement accuracy.
- Temperature support for TC and RTD sensors with built-in cold terminal compensation.
- Remote control via USB or LAN connection.

EasyDMM Software

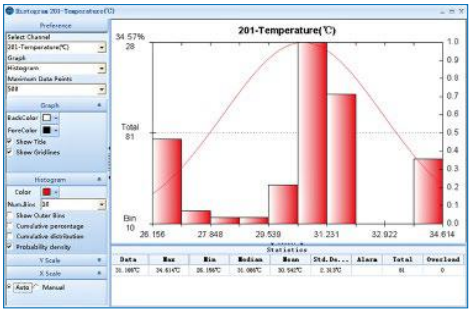
The T3DAQ can be remotely operated by the EasyDMM software. The software provides user friendly graphical interface to operate the DAQ.

Channel Configuration



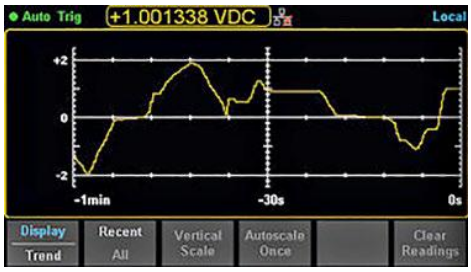
Configure Channels menu in the Scan mode can be used to enable channels as well as to configure various settings such as measurement function, range, speed of measurement. Channels can also be monitored within the defined limits by using Alarm Limit feature.

Histogram

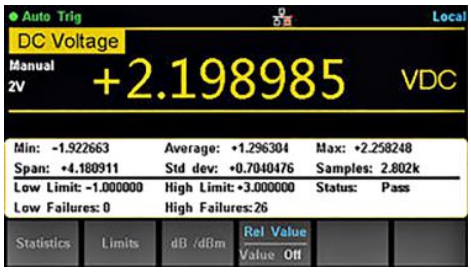


To view the scanned data visually, the software has Trend Chart, Histogram and Bar graph. All the graphs also has user customizable options such as colour, axis scales, type of curve etc.

Built-in 6½ multimeter for quick measurements

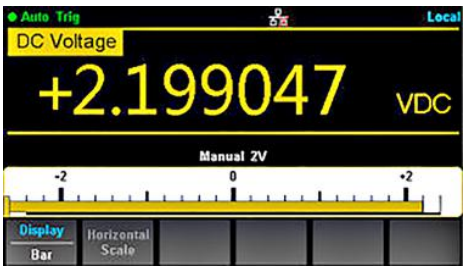


Trend Chart mode shows how the data changes over time in a value verses time strip chart display.



Statistics mode quantifies the data being captured while the Pass/Fail mode can quickly test, and instantly indicate if there is a problem.

Histogram display mode shows how the data is distributed across a range of user defined Bin values.



Bar Meter display mode adds a horizontal bar meter below the numerical display giving an analog indication of the measured value.

T3MIL50 & T3MIL50X

D.C. Milli-Ohm Meters

Tools for Improved Debugging

• 3.5" Large TFT LCD Display.	✓ Clear visibility of your measurement results.
• Fast measurement rate of 60 readings per second with an accuracy of up to 0.05 %.	✓ Faster measurements without losing accuracy.
• Various drive modes: T3MIL50X: DC+/DC-, Pulsed, PWM, Zero, Standby T3MIL50: DC+, Standby	✓ Suitable for various measuring applications.
• Built-in temperature compensation measurement function.	✓ Accurate Temperature measurements.
• Standard interfaces: USB, RS-232C, HANDLER/SCAN/EXT I/O	✓ Remote control your measurements.
• 3 Years Warranty as standard.	✓ Reliable product gives peace of mind.

Key Specifications

Specification	T3MIL50/T3MIL50X
Resistance Measurement Range	5 mΩ to 5 MΩ
Sampling Rate	Fast: 60 readings/s Slow: 10 readings/s
Display	50,000 counts
Interface	USB, RS-232C, HANDLER/SCAN/EXT I/O

T3MIL50 & T3MIL50X

D.C. Milli-Ohm Meters

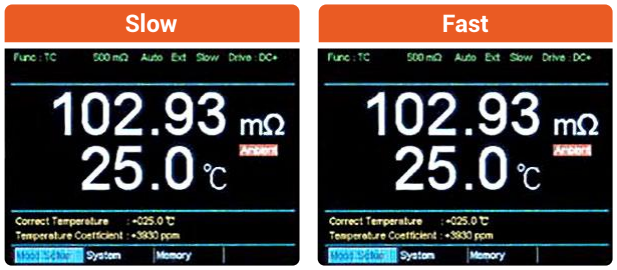
Features

- 50,000 Counts Display
- 3.5" (320 x 240) TFT LCD Display
- Accuracy of up to 0.05 %
- Alarm setting for function-specific PASS/FAIL test results
- 1 Amp Test Current, 0.1 μΩ Resolution
- Fast measurement of 60 readings per second
- Four wire resistance measurement
- Temperature Compensation measurement function
- Delayed measurement
- 20 sets of panel setting memory
- Dry circuit testing (T3MIL50X only)
- Drive Modes:
  T3MIL50X: DC+/DC-, Pulsed, PWM, Zero, Standby
  T3MIL50: DC+, Standby
  Interface: USB Device, RS-232C, Handler/Scan/EXT I/O

Application Fields

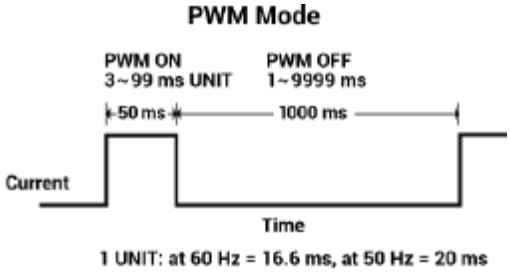
- Production testing of contact resistance of switches, relays, connectors, cables, and other low Resistance Devices
- Production testing of various inductive components (coil, choke, and transformer winding etc.)
- Testing of low value resistors, fuses, and heating elements
- Winding resistance of motors, transformers, solenoids, and ballasts
- Conductivity evaluation in product design
- Incoming inspection and quality assurance testing

Faster Measurement without Sacrificing Resolution



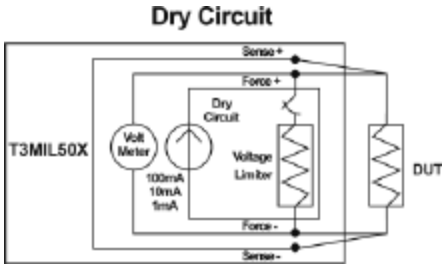
T3MIL series offers Fast (60 readings per second) and Slow (10 readings per second) measurement speeds. The measurement speed does not affect the measurement accuracy. The number of digits displayed remains the same irrespective of the measurement speed. The user can measure in Fast mode without losing accuracy.

Various Drive Modes (T3MIL50X only)



T3MIL50X provides various current output drive modes to satisfy diversified and accurate low resistance measurement applications. The pulsed current output mode is suitable for interacting conductors of different materials to reduce the influence of thermal EMF on the measurement. Thermal EMF is caused by electric potential difference generated from different conductors acting on different temperatures while conducting low resistance measurements. The DC+ and DC output modes are best for the measurement requirements of inductive components.

Dry Circuit Test (T3MIL50X only)



Dry circuit testing is used to detect contaminates and oxides on mating contact surfaces. Typically, a dry circuit test is performed in conjunction with environmental stress tests intended to create contamination or metal oxides on connector contact surfaces. Based upon MIL-STD-1344 method 3002-1 low signal level contact resistance,tests must be applied under the maximum open circuit voltage of 20 mV (or lower), and short circuit current of 100 mA (or lower) to avoid over voltage for the both ends of components. The over voltage will damage the oxide coating and the thin layer of contact surface, as a result, losing the validity of the measurement. T3MIL50X provides three levels (500 mΩ: 100 mA / 5 Ω: 10 mA / 50 Ω: 1 mA) to limit open circuit voltage at 20mV to execute Dry circuit tests.

T3PM1006

Digital Power Meter

Tools for Improved Debugging

• 4" Large TFT LCD Display.	✓ Clear visibility of your measurement results.
• Two numerical display modes along with a waveform display of various parameters.	✓ Choose the best display mode for your measurement requirements.
• Front and Rear Input Terminal.	✓ Flexibility in choosing measuring terminals.
• Standard interfaces: USB, LAN, RS-232C.	✓ Remote control of your measurements.
• 3 Years Warranty as standard.	✓ Reliable product gives peace of mind.

Key Specifications

Specification	T3PM1006
Input Type	Voltage: Floating input through resistive voltage divider Current: Floating input through shunt
Measurement Range	Voltage: 15 V, 30 V, 60 V, 150 V, 300 V, 600 V Current: 5 mA, 10 mA, 20 mA, 50 mA, 100 mA, 200 mA, 0.5 A, 1 A, 2 A, 5 A, 10 A, 20 A
Input Bandwidth	DC, 45 Hz to 6 kHz

T3PM1006

Digital Power Meter

Features

- 4" TFT LCD
- DC to 6 kHz Voltage/Current Test Frequency Bandwidth
- Two numerical display modes
- General Mode: Displays 2 main test items + 6 secondary test items
- Simple Mode: Displays the test values of 4 main test items
- Meets the Requirement for IEC 62301 Power Measurement
- Voltage/Current Test Frequency Bandwidth: DC – 6 kHz
- Watt Resolution: 1 mW
- Current Resolution: 0.1 μA
- Current/Voltage Measurements Reach CF = 3 for Distorted Wave and CF = 6 for Half Range
- W-h Power vs Time/A-h Current vs Time Integration Function
- Total Harmonic Distortion Measurement
- Standard Interfaces: RS-232C, USB Device/Host, LAN

DUAL DISPLAY MODES

Standard Mode (Setting & 8 Measurements)

Simple Mode (4 Measurements)

T3PM1006 provides two display modes for various measuring situations. Standard mode displays 8 measurement parameters (2 major measurements + 6 secondary measurements) and related measurement setting parameters which is ideal for applications in R&D, design, and engineering verification. Simple mode displays four measurement parameters which can be useful in production environments.

VARIOUS MEASUREMENT PARAMETERS

MEASUREMENT ITEMS	Symbols
Voltage	Vrms, V+pk, V-pk, Vdc+
Current	Irms, I+pk, I-pk, Idc+
Power	P, P+pk, P-pk, VA, VAR
Power Factor	PF
Crest Factor	CFV, CFI
Phase Angle	DEG
Frequency	VHz, IHz
Total Harmonic Distortion	THDV, THDI
INTEGRATION	WP, WP+, WP-, q, q+, q-

Note: "+"V dc/Idc is selectableonly when measurement mode DCis selected

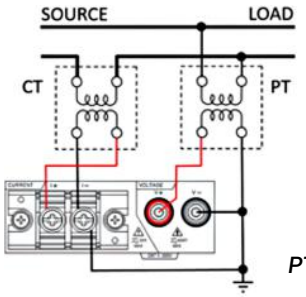
T3PM1006 provides various measurement functions such as voltage, current, frequency, active power, apparent power, reactive power, power factor, crest factor, and total harmonic distortion measurement.

T3PM1006 is also equipped to measure time integral of power or current for the DUT. Users can set a time window to perform instantaneous power integration at specified intervals and then divide value by total time period to obtain the average power of the DUT.

OPTIMAL MEASUREMENT CAPABILITIES

LowCurrent Range & High Resolution

T3PM1006 offers measurement frequency bandwidth of DC-6kHz, minimum current level of 5 mA (resolution: 0.1 μA), power measurement resolution of 1 μW (1 μW for minimum current and voltage levels; 1 mW for maximum current and voltage levels). These parameters meet the test requirement according to IEC 62301/EN 50564 standard and hence can be used to measure standby power consumption of low power devices.



PT/CT Connection

T3PM1006 offers PT/CT rate functions for large voltage/current measurement applications. High voltage measurements can be done using VT rate setting along with an external voltage Potential Transformer. Current measurements above 20 A can be done by connecting Current Transformer (current output type) directly to current input terminal on the rear panel and setting the appropriate CT ratio state in the Ratio configuration menu.

T3PM1100

Digital Power Meter

Tools for Improved Debugging

• 5" Large TFT LCD Display.	✓ Clear visibility of your measurement results.
• Two numerical display modes along with a waveform display of various parameters.	✓ Choose the best display mode for your measurement requirements.
• Automatic Level-changing feature for integration function.	✓ Achieve faster measurement results without worrying about power level changes.
• External Current Sensor Input Terminal.	✓ Extends the current measurement capability for various application requirements.
• Standard interfaces: USB, LAN, RS-232C.	✓ Remote control of your measurements.
• 3 Years Warranty as standard.	✓ Reliable product gives peace of mind.

Key Specifications

Specification	T3PM1100
Input Type	Voltage: Floating input through resistive voltage divider Current: Floating input through shunt
Measurement Range	Voltage: 15 V, 30 V, 60 V, 150 V, 300 V, 600 V Current: Direct input: 5 mA, 10 mA, 20 mA, 50 mA, 100 mA, 200 mA, 0.5 A, 1 A, 2 A, 5 A, 10 A, 20 A Sensor input EXT 1: 2.5 V, 5 V, 10 V EXT 2: 50 mV, 100 mV, 200 mV, 500 mV, 1 V, 2 V
Input Bandwidth	DC, 0.1 Hz to 100 kHz

T3PM1100
Digital Power Meter

Features

- 5" TFT LCD
- DC, 0.1 Hz to 100 kHz Voltage/ Current test bandwidth
- Two numerical display modes
- General Mode: Displays 2 main test items + 8 secondary test items
- Simple Mode: Displays the test values of 4 main test items
- Waveform Display: V (Voltage), I (Current), P (Power)
- The Current/Voltage can be measured to a deformed wave with CF of 3, and the half-range CF can reach 6 or 6 A
- Meets the IEC 61000-4-7 harmonics measurement requirements (50/60 Hz)
- 50th order of harmonic measurement and analysis (value and bar graph)
- Integration function supports automatic level-changing
- External current sensor input terminals (EXT1/EXT2)
- Standard Interfaces: RS-232C, USB Device/Host, LAN

RICH MEASUREMENT PARAMETERS

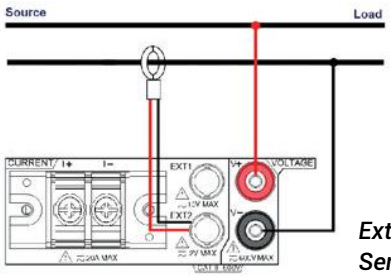
Measurement Items	Symbols
Voltage	Vrms, V+pk, V-pk, Vac*, Vdc*, Vmn*
Current	Irms, I+pk, I-pk, Iac*, Idc*
Power	P, P+pk, P-pk, VA, VAR
Power Factor	PF
Crest Factor	CFV, CFI
Phase Angle	DEG
Frequency	VHz, IHz
Total Harmonic Distortion	THDV, THDI
Maximum Current Ratio	MCR
Integration	WP, WP+, WP-, q, q+, q-, Vac, Iac

Note: "*" Only applicable to specific measurement modes

T3PM1100 provides various measurement functions such as voltage, current, frequency, effective power, apparent power, reactive power, power factor, crest factor, total harmonic distortion, and maximum current ratio. T3PM1100 is also equipped to measure time integral of power or current for the DUT.

AUXILIARY MEASUREMENT FUNCTIONS

Ratio Configuration



External Current Sensor Input

The T3PM1100 has a rich set of auxiliary measurement functions. High voltage measurements can be done using VT rate setting along with an external voltage Potential Transformer.

To measure currents above 20 A a Current Transformer (CT) can be used and the type of CT determines the instrument settings. When a voltage output type CT is used, measurement can be conducted through the external current sensor input terminals EXT1/EXT2. When a current output type CT is used, the CT can be directly connected to current input terminal on the rear panel and setting the appropriate CT ratio state in the Ratio configuration menu.

VARIOUS DISPLAY MODES

Numerical (General) Mode

Numerical (Simple) Mode

Waveform Mode

The results of parameter measurement are displayed in numerical as well as graphical formats. Numerical format offers general and simple mode to display various parameters. The graphical format can display waveforms of voltage, current and power. The horizontal scale can be adjusted from 25 µs/div to 1 s/div (depends on data update rate). Three magnification levels for waveform are also provided for users to select.

T3RC Rogowski Probe

Rogowski Current Transducers

Debug with Confidence

60 Amps – 6000 Amps

Tools for Improved Debugging

• 7 Models to choose from.	✓ More choice for better application coverage.
• Models with Frequency coverage from < 0.1 Hz to 30 MHz.	✓ Excellent accuracy regardless of the waveform frequency and shape.
• Models with maximum current measurements from 60 A to 6000 A.	✓ Coverage for a wide range of applications.
• 4 different coil sizes.	✓ Probe everything from the leg of a TO220 device to a high power bus bar.
• Near zero insertion impedance.	✓ Minimum effect on the circuit under test.
• Simple to use with flexible probe coils.	✓ Easy to insert into difficult to reach parts of the circuit.
• Use with batteries or plug in power adaptor (supplied).	✓ Use plug in power adaptor when on the bench or batteries when out in the field.

Key Characteristics

T3RC0060-LF	60 Amps	Bandwidth: 11 Hz to 5 MHz
T3RC0120-UM	120 Amps	Bandwidth: 34 Hz to 30 MHz
T3RC0300-UM	300 Amps	Bandwidth: < 10 Hz to 30 MHz
T3RC0600-HF	600 Amps	Bandwidth: 12 Hz to 30 MHz
T3RC3000-HF	3000 Amps	Bandwidth: 3 Hz to 23 MHz
T3RC3000-LF	3000 Amps	Bandwidth: < 0.2 Hz to 6.5 MHz
T3RC6000-LF	6000 Amps	Bandwidth: < 0.1 Hz to 6.5 MHz

T3RC Rogowski Probe

Rogowski Current Transducers

4 different coil sizes, 80 mm, 100 mm, 200 mm or 300 mm coil circumferences. See the Data Sheet for more details.

The Attenuation Ratio value can be used in your Oscilloscope's channel settings to correctly scale the channel vertical (Y axis) range.

The Teledyne Test Tools Rogowski Current Transducers come in a protective case and include a set of batteries and a wall power adaptor.

The inclusion of both battery power and wall plug operation means that the Teledyne Test Tools Rogowski Current Probes are as happy working out in the field as they are working on the bench.

Electrical Specifications

Model	Sensitivity	Peak Current	Max Noise	Droop (%/ms)	LF (–3 dB) Bandwidth	HF (–3 dB) Bandwidth	Peak di/dt	Attenuation Ratio
T3RC0060-LF	100 mV/A	60 A	2.6 mV rms	11	11 Hz	5 MHz	0.4 kA/us	10
T3RC0120-UM	50 mV/A	120 A	2.5 mV rms	35	34 Hz	30 MHz	8 kA/us	20
T3RC0300-UM	20 mV/A	300 A	2.5 mV rms	9	9.2 Hz	30 MHz	20 kA/us	50
T3RC0600-HF	10 mV/A	600 A	1.7 mV rms	11	12 Hz	30 MHz	40 kA/us	100
T3RC3000-HF	2 mV/A	3000 A	1.4 mV rms	2.8	3 Hz	23 MHz	80 kA/us	500
T3RC3000-LF	2 mV/A	3000 A	2.5 mV rms	0.1	0.11 Hz	6.5 MHz	11 kA/us	500
T3RC6000-LF	1 mV/A	6000 A	2.5 mV rms	0.05	0.055 Hz	6.5 MHz	11 kA/us	1000

Application Fields

- Component level design and development such as semiconductor switching waveforms in MOSFET or IGBT, also capacitor and inductor devices.
- Power converter design and development for wind farms and other renewable energy.
- System level development such as motor drives in hybrid and fully electric transportation systems (automotive, rail, sea, etc).
- Research and Development.
- Long term system monitoring and maintenance.

Excellent Performance

- 7 different probes covering a wide range of applications.
- Maximum current measurement coverage up to 6000 Amps.
- Peak coil insulation voltage up to 10 kV depending on probe model (See the Data Sheet for more details).
- Power via the supplied wall power adaptor or use with batteries.
- Low loading of the circuit under test.
- Wide coil operating temperature from – 40 C to +125 C on UM and HF probes. – 20 C to +100 C for LF probes.
- Compatible with the majority of Oscilloscopes with a BNC input connector and a 1 MΩ input impedance.

T3CP Current Probes

DC/AC Current Probes

Debug with Confidence

30 Amps – 500 Amps

Tools for Improved Debugging

• 5 Models to choose from.	✓ More choice for better application coverage.
• Models with Frequency coverage up to 100 MHz.	✓ Excellent accuracy regardless of the waveform frequency and shape.
• Models with maximum current measurements from 30A to 500A.	✓ Coverage for a wide range of applications.
• 2 different clamp sizes, 5 mm and 20 mm.	✓ Probe cables up to 20 mm diameter.
• Built-in degaussing and automatic zero setting.	✓ Built-in functions to maintain user measurement accuracy.
• Simple connection to any oscilloscope with a BNC 1 MOhm input.	✓ Easy to use with wide oscilloscope support.
• Includes universal wall socket power supply.	✓ No need for batteries, use with the supplied plug in power adaptor.

Key Characteristics

T3CP30-50	30 Amps	Bandwidth: DC to 50 MHz
T3CP30-100	30 Amps	Bandwidth: DC to 100 MHz
T3CP50-50	50 Amps	Bandwidth: DC to 50 MHz
T3CP150-12	150 Amps	Bandwidth: DC to 12 MHz
T3CP500-5	500 Amps	Bandwidth: DC to 5 MHz

T3CP Current Probes

DC/AC Current Probes

Application Fields

- Component level design and development such as semiconductor switching waveforms in MOSFET or IGBT devices.
- Consumer electronics and household appliances.
- Switching and linear power design.
- DC measurement applications.
- System level development such as motor drives in hybrid and fully electric transportation systems (automotive, rail, sea, etc).
- Power converter design and development for wind farms and other renewable energy.
- Domestic and industrial photo-voltaic (PV) system design.

Excellent Performance

- 5 different probes covering a wide range of applications.
- Maximum current measurement coverage up to 500 Amps.
- Frequency coverage down to DC.
- Power via the supplied universal wall power adaptor.
- Built-in degaussing and auto-zero for improved accuracy.
- Compatible with the majority of Oscilloscopes with a BNC input connector and a 1 MOhm input impedance.
- Each probe has a high and low sensitivity range (dual range probes).
- Over-current warning via a buzzer and LED indicators with a thermal overload safety cutout.

Electrical Specifications

Model	Bandwidth	Rise Time	Maximum Continuous Current Rating	Ranges	Minimum Measurable Current
T3CP30-50	DC to 50 MHz	≤ 7 ns	30 A rms	5 A / 30 A	1 mA / 10 mA
T3CP30-100	DC to 100 MHz	≤ 3.5 ns	30 A rms	5 A / 30 A	1 mA / 10 mA
T3CP50-50	DC to 50 MHz	≤ 7 ns	50 A rms	7.5 A / 50 A	1 mA / 10 mA
T3CP150-12	DC to 12 MHz	≤ 29 ns	150 A rms	30 A / 150 A	10 mA / 100 mA
T3CP500-5	DC to 5 MHz	≤ 70 ns	500 A rms	75 A / 500 A	10 mA / 100 mA

2 different jaw sizes, 5 mm (T3CP30-50, T3CP30-100, T3CP50-50), and 20 mm (T3CP150-12, T3CP500-5).

The Attenuation Ratio value can be used in your Oscilloscope's channel settings to correctly scale the channel vertical (Y axis) range.

The Teledyne Test Tools T3CP Current Probes come in a protective case and include a universal wall power adaptor.

Power is applied from the universal wall plug adaptor to the control module.

A 1 m BNC cable is supplied with the current probe for connection to the oscilloscope.

The Teledyne Test Tools T3CP Current Probe control module give the user control of degaussing, autozero and setting the range.

The control module has a BNC connector at one end, for connection to the oscilloscope, whilst the current probe measurement head is permanently fixed to the other end.

T3CP100-2 Current Probe

DC/AC Current Probe

Debug with Confidence

DC/AC 100 Amps, 2 MHz

Tools for Improved Debugging

• 12 mm probe jaw size.	✓ Large measurement jaw size gives wide application coverage.
• Simultaneous DC and AC measurement coverage.	✓ Measure from DC to 2 MHz all in one product.
• Connects to any oscilloscope with a 1 MΩ input impedance and BNC connector.	✓ Compatible with a wide range of oscilloscopes, not just Teledyne LeCroy or Teledyne Test Tools.
• Over-current protection with audio indicator.	✓ Buzzer informs the user of measurement current overload conditions helping to protect the current probe from potential damage.
• Built-in degaussing and zero setting.	✓ Functions to maintain user measurement accuracy.
• Dual range 10 A or 100 A capability.	✓ A high and low range setting giving the user broader measurement sensitivity coverage.
• Use multiple probes to cover multiphase applications.	✓ Wide single and multiphase application coverage.

Key Specifications

Current Measurements	Dual selectable ranges of 10 A or 100 A Peak
Frequency	DC to 2 MHz
Measurement Jaw Size	12 mm
Rise Time	≤ 175 ns
Connectivity	BNC cable to Oscilloscope 1 MΩ input
Power	Wall socket power adapter or 9 V Battery
Warranty	1 Year

T3CP100-2 Current Probe

DC/AC Current Probe

Teledyne Test Tools new T3CP100-2 current probe is a DC to 2 Mhz bandwidth active AC/DC coupled probe, featuring 2 ranges of (100 A Peak, 70 A rms)/(10 A Peak, 7 A rms), fast and accurate waveform capture, risetime of ≤ 175 ns and low test circuit loading. This probe can be used with any oscilloscope having a 1 MΩ BNC input.

The Teledyne Test Tools T3CP100-2 Current Probes come in a protective case and include a universal wall power adaptor.

Key Features

- Accurate and easy current measurements.
- Wide 2 MHz bandwidth.
- Maximum AC Peak to Peak current of 200 A.
- Dual range (10 A Peak,7 A rms)/(100 A Peak,70 A rms).
- Maximum conductor voltage of ± 600 V.
- Measurement jaw size 12 mm.
- Auto Zero button and indicator.
- Use with any scope with a 1 MΩ input and BNC connector.
- Powered by 9 V battery or wall plug power supply (included).

Applications

- Power design and power component measurements.
- Consumer electronics and household appliances.
- Domestic and industrial photo-voltaic (PV)system design and maintenance.
- Automotive and vehicle electronics.
- Industrial and military electronics.
- Service technicians.
- Research and development.
- Universities, general electronics and education.

BNC Output Connector

Connect to any instrument with 1 MΩ input impedance.

External DC Power Socket

High/Low Range Selector

Auto Zero Button with Indicator

Degauss and auto zero the probe by pressing the button. The auto zero indicator will alight during the process.

Control Unit

The control unit houses the probe control as well as having a 9 V battery compartment. A standard 9 V alkaline battery can be installed within the battery compartment if the probe is used without the external power supply.

Probe Head

The current probe measurement head uses a spring loaded lever to open and close the jaw. The jaw can clamp around cables up to 12 mm in diameter.

T3LVD Low Voltage Probe

Low Voltage Differential Probe

Debug with Confidence

20 Volts, 200 MHz

Tools for Improved Debugging

± 20 V Differential signal input (DC + Peak AC).	Large measurement voltage range gives wide application coverage.
± 60 V maximum common mode voltage input.	Wide common mode rejection for accurate measurements.
Wide DC to 200 MHz bandwidth.	Wide bandwidth enhances measurement capability and application coverage.
Combined single ended and differential measurement capability.	Make measurements on single ended and differential circuits without the need to change probes.
Use with any scope with a 50 Ω or 1 MΩ input and BNC connector.	Compatible with all your Oscilloscopes.
High Common Mode Rejection Ratio of > 50 dB at 10 MHz, > 80 dB at 50 Hz / 60 Hz	Good CMRR figures for accurate measurements.
Includes wall socket 5 V / 1 A power supply.	All accessories included to enable immediate use.

Key Specifications

Maximum Differential Voltage	± 20 V (DC + Peak AC)
Maximum Common Mode Voltage	± 60 V
Bandwidth (-3dB)	DC to 200 MHz
Rise Time	≤ 1.75 ns
Differential Mode Input Impedance	1 MΩ, < 3.5 pF
Connectivity	BNC cable to Oscilloscope 50 Ω or 1 MΩ input
Warranty	1 Year

T3LVD Low Voltage Probe

Low Voltage Differential Probe

Teledyne Test Tools new T3LVD20-200 low voltage differential probe is a wide bandwidth active differential voltage probe, featuring 200 MHz bandwidth, ± 20 V (DC + Peak AC), fast and accurate waveform capture, measurement accuracy of 2 % and low test circuit loading. This probe can be used with any oscilloscope having a 50 Ω or 1 MΩ BNC input.

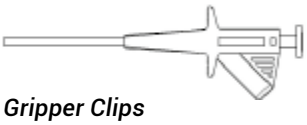
The Teledyne Test Tools T3LVD Probes come in a protective case and include a universal wall power adaptor.

Key Features

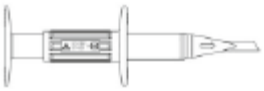
- Accurate and easy voltage measurements.
- Wide 200 MHz bandwidth.
- Differential signal input of ± 20 V (DC + Peak AC).
- High differential input impedance of 1 MΩ / < 3.5 pF.
- Maximum common mode voltage of ± 60 V.
- Combined single ended and differential measurements.
- Use with any scope with a 50 Ω or 1 MΩ input and BNC connector.
- Over-Voltage protection with dual indicators.

Standard Accessoires

Alligator Clips



Gripper Clips



Test Hook

50 Ω Feedthrough Termination

BNC Output Cable

USB Cable

BNC Output Connector

Connect to any instrument with 50 Ω input impedance. A 50 Ω feedthrough terminator is supplied for use with instruments that only have 1 MΩ input impedance.

Overload alarm indicator

Power supply connection point

The external power supply is connected via a standard USB type B port which can be powered from the supplied external USB wall plug adaptor or from an oscilloscope USB port.

Offset adjustment

The probe head has an offset adjustment button to allow the user to remove any common mode offset up to ± 60 V.

T3HVD High Voltage Probe

High Voltage Differential Probe

Debug with Confidence

7000 Volts, 200 MHz

Tools for Improved Debugging

● ± 7000 V Differential signal input (DC + Peak AC).	✔ Large measurement voltage range gives wide application coverage.
● Input impedance up to 40 MΩ / ≤ 2.5 pF depending on model.	✔ Low DUT loading for accurate measurements.
● Wide DC to 200 MHz bandwidth.	✔ Wide bandwidth enhances measurement capability and application coverage.
● Combined single ended and differential measurement capability.	✔ Make measurements on single ended and differential circuits without the need to change probes.
● Use with any scope with a 1 MΩ input and BNC connector.	✔ Compatible with all your Oscilloscopes.
● High Common Mode Rejection Ratio of > 50 dB at 1 MHz, > 80 dB at DC.	✔ Good CMRR figures for accurate measurements.
● Includes wall socket 5 V / 1 A power supply.	✔ All accessories included to enable immediate use.

Key Specifications

Maximum Differential Voltage	± 7000 V (DC + Peak AC)
3 Models Available	T3HVD1500-70, T3HVD1500-200, T3HVD7000-100
Bandwidth (-3 dB)	Up to 200 MHz
Rise Time	Up to < 1.75 ns
Differential Mode Input Impedance	Up to 40 MΩ / < 2.5 pF
Connectivity	BNC cable to Oscilloscope 1 MΩ input
Warranty	1 Year

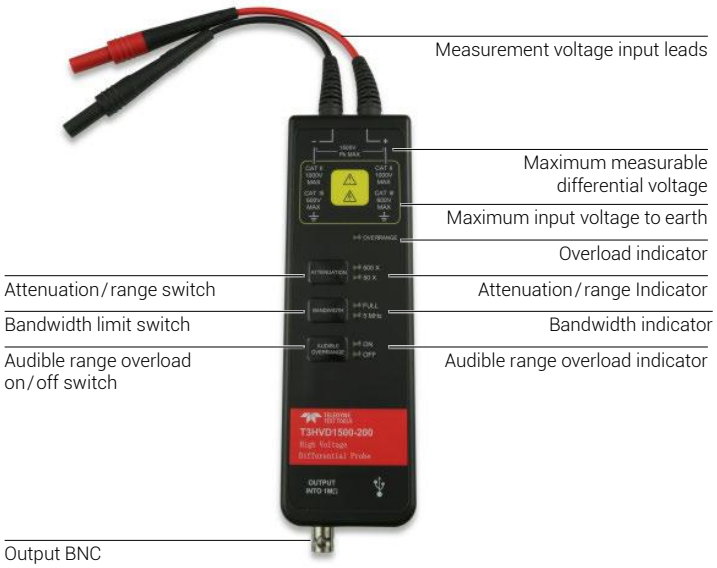
T3HVD High Voltage Probe

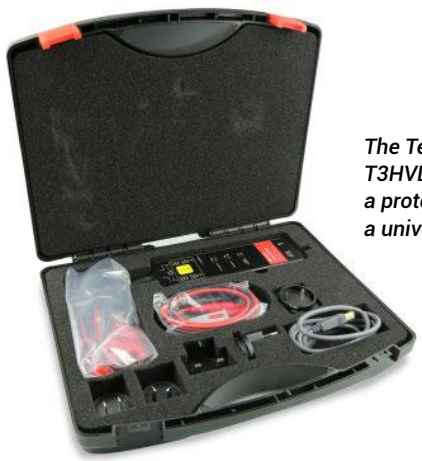
High Voltage Differential Probe

Key Features

- Accurate and easy voltage measurements.
- Wide 200 MHz bandwidth.
- Differential signal input of up to ± 7000 V (DC + Peak AC) depending on model.
- High differential input impedance of up to 40 MΩ / < 2.5 pF depending on model.
- Maximum common mode voltage of ± 7000 V.
- Combined single ended and differential measurement capability.
- Use with any scope with a 1 MΩ input and BNC connector.
- Over-Voltage alarm with dual indicators.
- Switchable bandwidth limit to reduce noise.

Specification		T3HVD1500-70 & T3HVD1500-200		T3HVD7000-100	
Bandwidth (-3 dB)		T3HVD1500-70	70 MHz	100 MHz	
		T3HVD1500-200	200 MHz		
Rise Time		T3HVD1500-70	≤ 5 ns	≤ 3.5 ns	
		T3HVD1500-200	≤ 1.75 ns		
Accuracy		± 2 %		± 2 %	
Attenuation / Range Selection		50 x / 500 x		100 x / 1000 x	
Maximum Differential Voltage (DC + Peak AC)		50 x	± 150 V	100 x	± 700 V
		500 x	± 1500 V	1000 x	± 7000 V
Common Mode Voltage (DC + Peak AC)		± 1500 V		± 7000 V	
Maximum Input Voltage To Earth (V rms)		CAT II 1000 V / CAT III 600 V		CAT I 2300 V / CAT III 1000 V	
Input Impedance	Single Ended To Ground	5 MΩ, < 4 pF		20 MΩ, 5 pF	
	Between Inputs	10 MΩ, < 2 pF		40 MΩ, 2.5 pF	
CMRR	DC	> 80 dB		> 80 dB	
	100 kHz	> 60 dB		> 60 dB	
	1 MHz	> 50 dB		> 50 dB	
Noise (Vrms)		50 x	< 50 mV	100 x	< 200 mV
		500 x	< 300 mV	1000 x	< 1.2 V





The Teledyne Test Tools T3HVD Probes come in a protective case and include a universal wall power adaptor.

High Resolution Calibrated True Differential TDR
Time Domain Reflectometers

Signal Intergrity Analyzer
Accurate Impedance Profile Measurements

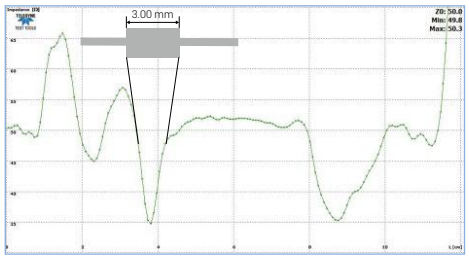
Affordable Tools for Precision Debugging

• **True Differential TDR and Single-ended TDR** – Best for cables, differential design and twisted pair.	✓ Accurate Impedance measurements, no ground connection required for differential.
• **30 ps typ. Rise Time** – Less than 3 mm impedance measurement spatial resolution.	✓ Precisely locate and detect impedance mismaches for signal integrity.
• **Instant Cable and Connector Testing** – Verify the quality of your cables and connectors.	✓ Detect even on your premium cables any imperfection that might be the root cause of measurement artifacts.
• **Small Form Factor and Battery Powered** – Measure and analyze in the lab, factory floor or in the field.	✓ Measure and analyze everywhere you go without an AC requirement.
• **S-parameter: Differential S_{11} and Full 2-port Single-ended Measurements** – Analyze transmission lines, cable, connectors and adaptors in the frequency domain.	✓ Precisely and rapidly identify any frequency related signal integrity impairments.
• **Up to 50,000 points long memory** – Long TDR response capture with high resolution.	✓ Characterize up to 40 m long cables with more detailed measurement data.
• **Pre-Compliance for Emerging Serial Data Standards** – USB, BroadR-Reach and Automotive Ethernet.	✓ Debug serial data standards easily.

Key Specifications

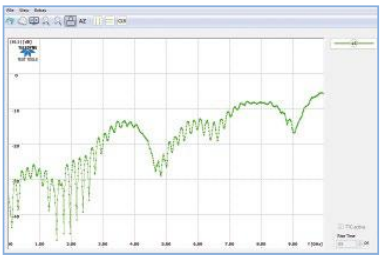
Model	T3SP15D
Impedance Profile	Yes, True Differential TDR and Single-ended TDR
Rise Time	35 ps
Spatial Resolution (FR4)	≤ 3 mm
S_{11}, Reflection	Yes, Differential (S_{dd11}) and Single-ended (S_{11})
Frequency	15 GHz
Full 2-port Single-ended	Yes (S_{11}, S_{21}, S_{12}, S_{22})
Impedance Profile Memory Trace	up to 50.000 points
Battery Operated (B-Models)	Yes
Dimensions	220 x 210 x 82.5 mm

High Resolution Calibrated True Differential TDR
Time Domain Reflectometers



OSL calibration in time domain avoid aberrations effects in impedance plots and let the user identify impedance anomalies with less than 3 mm resolution.

Based on the true differential design, there is no need for a physical ground connection if differential lanes are measured.



The T3SP15D series offer full calibrated S-parameters measurements from DC up to 15 GHz.

Ordering information

Product Description	Product Code
Differential TDR, 35 ps Rise Time, ESD protection, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Differential S_{11} and Single-ended S_{11}, S_{21}, S_{12}, S_{22}	T3SP15D-BUNDLE
Differential TDR, 35 ps Rise Time, ESD protection, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Internal Battery, Differential S_{11} and Single-ended S_{11}, S_{21}, S_{12}, S_{22}	T3SP15D-B-BUNDLE
Phase Matched 3.5 mm cables (50 ± 1 Ohm, <1 ps skew)	T3SP-CABLE-3.5MM
Differential TDR-Probe (high precision, 18 GHz, 0.5 – 5.0 mm variable pitch)	T3SP-DPROBE
Differential TDR-Probe (economic, 5 GHz, 2.5 or 5 mm fixed pitch)	T3SP-DPROBE-F
Single-ended TDR-Probe (fixed pitch 2.54 mm)	T3SP-SEPROBE-F
Single-ended TDR-Probe (high precision, 10 GHz, variable pitch)	T3SP-SEP
OSLT Calibration Kit 3.5MM with torque wrench, female	T3SP-CALKIT-3.5MM
Storage and Travel Case (aluminum suitcase for TDRs and accessories)	T3SP-CASE
Demo and Verification Board	T3SP-BOARD

Standard warranty is one year (for warranty extension please contact Teledyne LeCroy Service)

T3SP15D offers great value being affordable, small, simple to use, portable and lightweight with unique specifications for differential lines and high accuracy in detecting and locating with high spatial resolution any signal integrity issue.

Ultra-portable and Battery operated

T3SP15D are designed to be used wherever measurements have to be performed. The battery pack option allows up to 3 hours of operation.

Fully calibrated

Using three calibration standards (open, short, load) in the time domain instead of using a simple normalization which is common in TDR-instruments offers the highest accuracy both in the impedance profile measurements as well as in the S-11 Return Loss frequency response.

ESD protected

The T3SP-Series is protected against electrostatic discharge (ESD) isolating the high-frequency front-end when connecting and during the set-up.

TDR-Probes: Differential and Single-ended

The variable and fixed pitch TDR-Probe provides an ideal solution for TDR circuit board impedance characterization.

Glossary of Terms

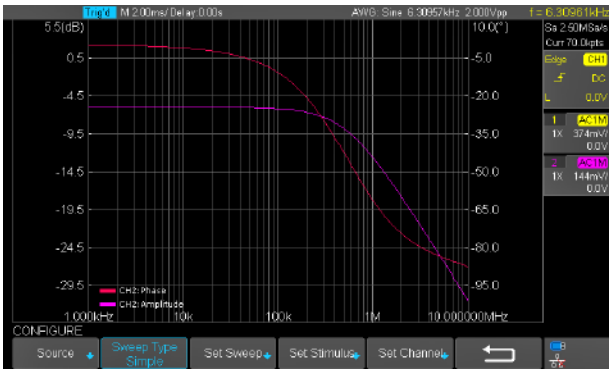
4 Wire Resistance (Digital Multi-Meter):

A DMM would use 4 Wire Resistance measurements to increase the accuracy of low resistance measurements by negating the effects of the measurement cables. Also see Sense Terminals.

Bode Plot (Oscilloscope):

A Bode Plot is two graphs, one of frequency verses magnitude (amplitude) and the other of frequency verses phase. The graph X axis is usually a log frequency scale, the graph Y axes magnitude scale is usually in dB and the graph Y axis phase scale is usually in degrees.

Bode Plots are typically used for passive components such as filters and in active system design such as control/ feedback systems in amplifiers and power supplies.



Bode Plot Example Graphs

CC, Constant Current (Power Supply, Electronic Load):

The power supply tries to supply the user set current level to the load. The power supply varies it's output voltage to keep the current at it's specificed level.

Cold Terminal Thermocouple Compensation (Digital Multi-Meter):

This means that the DMM has a built in cold terminal reference that is used by the thermocouple to give the correct temperature reading. The output voltage from the thermocouple is compensated by using the DMMs' built in cold terminal reference.

CP, Constant Power (Electronic Load):

The electronic load will dynamically adjust the current it draws to keep the DUT power drain constant.

CR, Constant Resistance (Electronic Load):

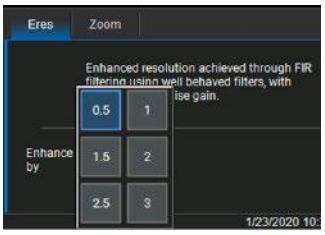
The Electronic Load can be configured to offer a constant resistance load to a DUT, typically a power supply or battery.

CV, Constant Voltage (Power Supply, Electronic Load):

The power supply tries to supply the user set voltage level to the load. The power supply supplies varying output current to keep the voltage at it's specificed level as the load changes.

Eres (Oscilloscope):

Enhanced Resolution Mode. Vertical resolution can be increased whilst noise is reduced by using Enhanced Resolution Mode. The Eres settings allow a user to select between 0.5 and 3 additional bits of vertical resolution.



Line Regulation (Power Supply):

Line regulation is the ability of the power supply to maintain its user set output voltage during changes in the input line voltage. Line Regulation is expressed as percent of change in the output voltage relative to the change in the input line voltage.

Load Regulation (Power Supply):

Load regulation is the ability of the power supply to maintain its user set output voltage or current during changes in the load.

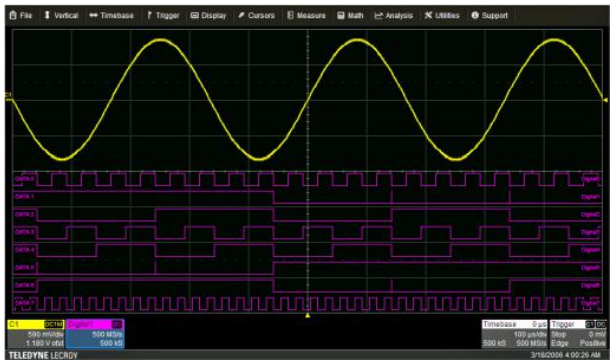
Glossary of Terms

Mpts (Oscilloscope):

Mega-points. The acquisition memory depth specified in millions of acquired sample points.

MSO (Oscilloscope):

Mixed Signal Oscilloscope. Mixed signal usually refers to a mix of analogue and digital waveforms typically found in a micro-controller. An MSO is an Oscilloscope that has both analogue channels (typically 2 or 4) and digital channels (typically 16 digital inputs). The analogue inputs have an 8 or 12 bit A/D converter whereas the digital channels have a 1 bit A/D converter.



Example MSO Display Showing 1 analogue Channel and 8 Digital Channels.

Parallel Output Mode (Power Supply):

Typically the two primary outputs of the power supply can be connected in parallel with one another by selecting this mode, usually by a front panel push button. The two primary outputs act as a single output giving twice the output current.

Peak Detect (Oscilloscope):

This is an acquisition mode that captures the maximum and minimum signal values of each acquisition sample and thereby displaying the maximum positive and negitive peaks.

Phase Noise (Spectrum Analyser):

In simple terms Phase Noise is the frequency domain equivalent to time domain jitter. An RF Engineer would talk about Phase Noise whereas a digital Engineer would refer to jitter.

Protocol Triggering (Oscilloscope):

The ability of the Oscilloscope to trigger on specific events within the serial bus protocol thereby displaying a stable and consistant protocol event.

Example of I²C Protocol Triggering.

Resolution Bandwidth (Spectrum Analyser):

Resolution bandwidth (RBW) is defined as the frequency span of the filter that is applied to the input signal of a spectrum analyser. Smaller RBWs provide finer frequency resolution and the ability to differentiate signals that have frequencies that are closer together. When differentiating signals that are close together in the frequency spectrum the signal separation is only clear when the RBW is less than the frequency difference between the signals. Unfortunately smaller RBWs result in longer sweep times.

Sense Terminals (Digital Multi-Meter, Power Supply, Electronic Load):

Sense terminals allow the instrument to extend the accuracy of it's functionality from the instrument front panel to the end of the wires connecting the instrument to the DUT. A Digital Multi-Meter would use this to increase the accuracy of low resistance measurements. A Power Supply and Electronic Load would both use this to remove cabling losses between the instrument and the DUT.

T3EL Electronic Load Output and Sense Terminals

Glossary of Terms

Series Output Mode (Power Supply):

Typically the two primary outputs of the power supply can be connected in series by selecting this mode, usually by a front panel push button. The two primary outputs act as a single output giving twice the output voltage.

Tracking Generator (Spectrum Analyser):

A tracking generator is a sine-wave signal generator that is synchronised with the center frequency of the bandpass filter in a spectrum analyser. The spectrum analyser and tracking generator sweep the user set frequency range in unison. The signal from the tracking generator allows the spectrum analyser to measure the losses in passive components such as filters and backplanes. The tracking generator is typically not a stand alone instrument, but part of another instrument such as a spectrum analyser.

True RMS (Digital Multi-Meter):

True RMS measurements are made on AC voltage or AC current waveforms. A True RMS DMM can accurately measure both sine waves and more complex non-sinusoidal waveforms. An averaging DMM accuracy can vary by up to −40 % to +10 % depending on waveform shape, whereas the True RMS T3DMMs do not have this inaccuracy.

Video Bandwidth (Spectrum Analyser):

The Video Bandwidth (VBW) does not change the measurement results. The VBW filter is applied after the data has been collected, but before the screen displays the trace. When the VBW is large, noise makes small signal observation difficult. If the VBW is reduced the small signals become visible.

RBW verses VBW: Adjusting the RBW can provide lower noise floor and fine frequency resolution, but the sweep time will increase dramatically. For noisy signals lower the VBW to smooth the trace and make signal identification easier, but this will still increase sweep time but not to the same extent. For general purpose use set the RBW and VBW to the same value.

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Distributed by:

Teledyne LeCroy (US Headquarters)

700 Chestnut Ridge Road
Chestnut Ridge, NY. USA 10977-6499

Phone: 800-553-2769 or 845-425-2000
Fax Sales: 845-578-5985
Phone Support: 1-800-553-2769
Email Sales: contact.corp@teledynelecroy.com
Email Support: support@teledynelecroy.com
Web Site: http://teledynelecroy.com/

Teledyne LeCroy (European Headquarters)

Teledyne GmbH
Im Breitspiel 11c
D-69126 Heidelberg, Germany

Phone: +49 6221 82700
Fax: +49 6221 834655
Phone Service: +49 6221 8270 85
Phone Support: +49 6221 8270 28
Email Sales: contact.gmbh@teledynelecroy.com
Email Service: service.gmbh@teledynelecroy.com
Email Support: tlc.t3.appsupport.eu@teledyne.com
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