Digital Storage Oscilloscopes

TBS1000B Series Datasheet

The TBS1000B Digital Storage Oscilloscope Series provides you with affordable performance in a compact design. Packed with standard features - including USB connectivity, 34 automated measurements, limit testing, data logging, frequency counter, TrendPlot™ and a context-sensitive help menu - the TBS1000B Series oscilloscopes helps you get more done, in less time.

Key performance specifications

- 200MHz, 150 MHz, 100 MHz, 70 MHz and 50 MHz bandwidth models
- 2-channel models
- Up to 2 GS/s sample rate on all channels
- 2.5k point record length on all channels
- Advanced triggers including pulse and line-selectable video triggers

Key features

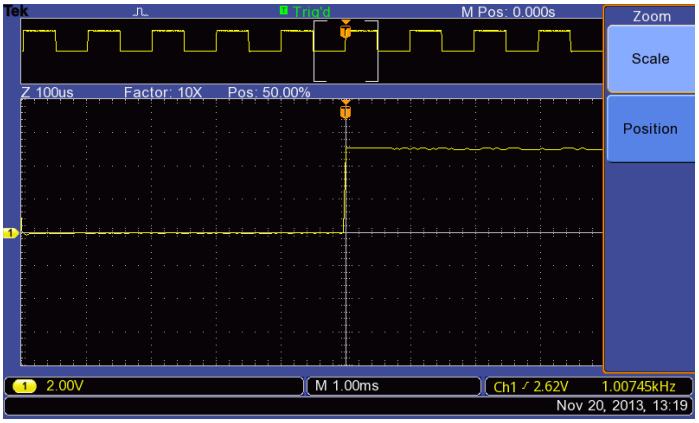
- 7 inch WVGA (800X480) Active TFT Color Display
- 34 automated measurements
- Dual window FFT, simultaneously monitors both the time and frequency domains
- Built-in waveform limit and TrendPlot™ testing
- Dual channel frequency counter
- Zoom Function
- Automated, extended data logging feature
- Autoset and auto-ranging functions
- Built-in context-sensitive help
- Multiple-language user interface
- Small footprint and lightweight - Only 4.9 in. (124 mm) deep and 4.4 lb. (2 kg)

Connectivity

- USB 2.0 host port on the front panel for quick and easy data storage
- USB 2.0 device port on rear panel for easy connection to a PC

Seeing signal details

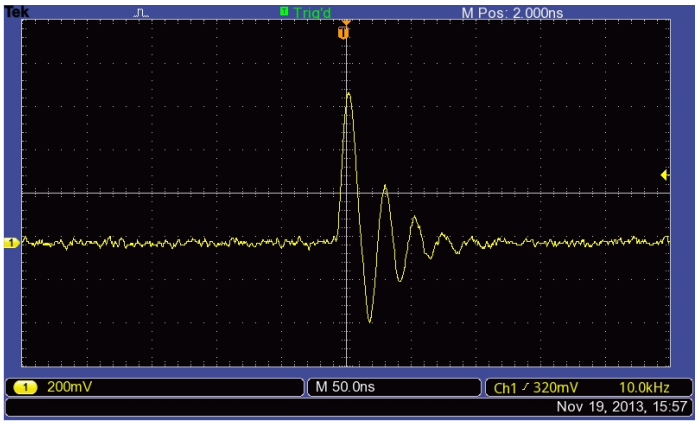
To properly analyze signals you need to make sure that you can see them in enough detail. The TBS1000B comes standard with a 7-inch high resolution TFT display for a clear view of all of your signals and critical on screen information. The instrument is further enhanced by a user interface inspired by the award winning Tektronix MSO/DPO series of instruments. The interface is easy to use, provides quick access to all of the oscilloscope functions and includes a high resolution "Pan & Zoom" feature enabling you to see even more signal details of up to 10 times normal resolution.



The zoom function shows details in an event of up to 10X the normal view.

Digital precision for accurate measurements

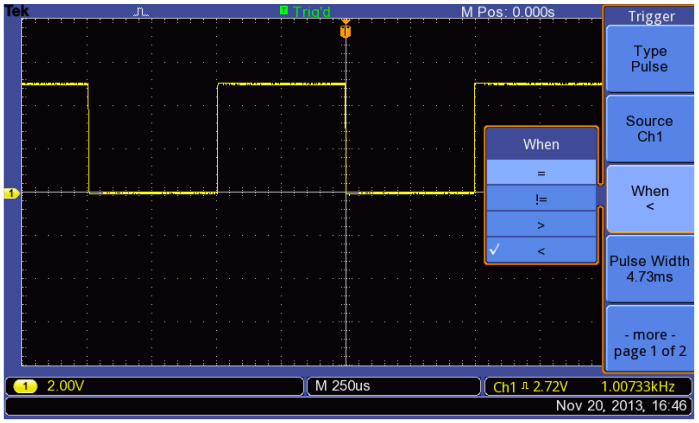
With up to 200 MHz bandwidth, 2 GS/s maximum sample rate and 3% vertical measurement accuracy the TBS1000B allows you to see the details of your signals. With the Tektronix proprietary sampling technology there are no compromises, you will get the stated real-time sampling rate on all channels, all the time with at least of 10X oversampling. The sampling performance is not reduced when changing horizontal settings or when using multiple channels, enabling you to see the true characteristics of your signals.



See all the details other oscilloscopes might miss with Tektronix proprietary digital real-time sampling.

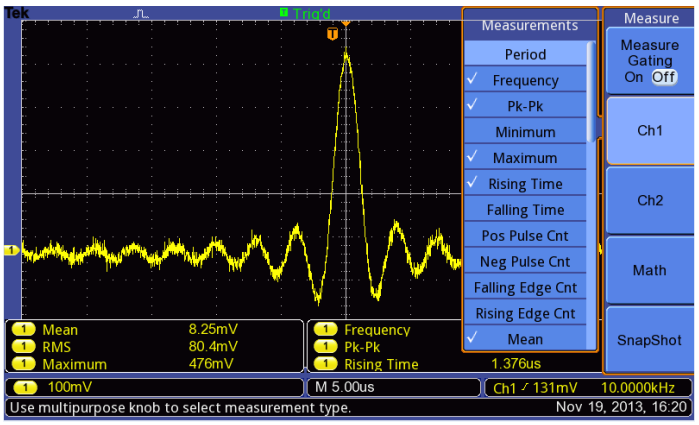
Critical tools for troubleshooting your device

The TBS1000B oscilloscope comes standard with a variety of advanced triggers used to debug today's complex circuitry. Flexible options for utilizing rising or falling edges, pulse widths and video trigger set-ups enable users to quickly isolate their signals of interest.



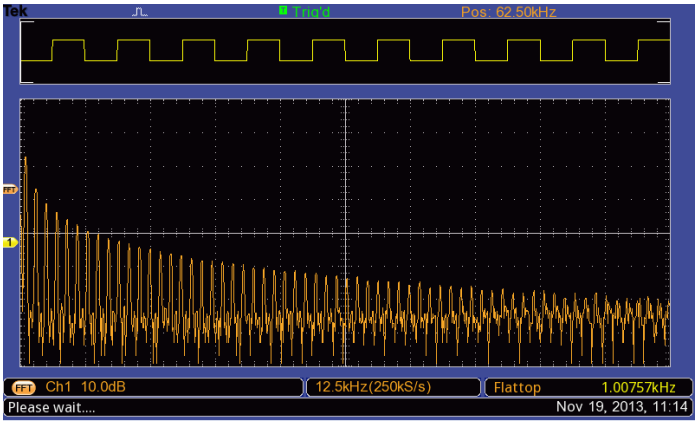
The pulse trigger function can easily capture critical events.

Once signals are captured, the TBS1000B offers advanced math and measurement capabilities making it easy to evaluate signal quality . Users can add, subtract and multiply waveforms or use any one of 34 automated measurements to quickly and reliably calculate important signal characteristics such as frequency, rise time or overshoot.



Quickly analyze signals with the standard 34 automated measurements.

A dedicated front panel button provides quick access to the FFT function that is capable of showing both frequency and time domain waveforms simultaneously, which provides a convenient way to see the relationship between signals and the FFT results.



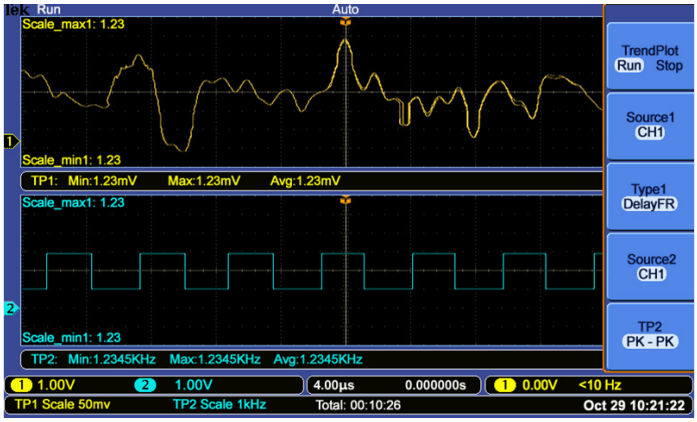
Quickly perform an FFT with a dedicated front panel button.

For accurate frequency measurements the TBS1000B also comes with built-in dual channel frequency counters. Independent control of each counter's trigger level provides an easy way to monitor two different signal frequencies simultaneously.

Dual channel - 6 digit frequency counters come standard with all TBS1000 models.

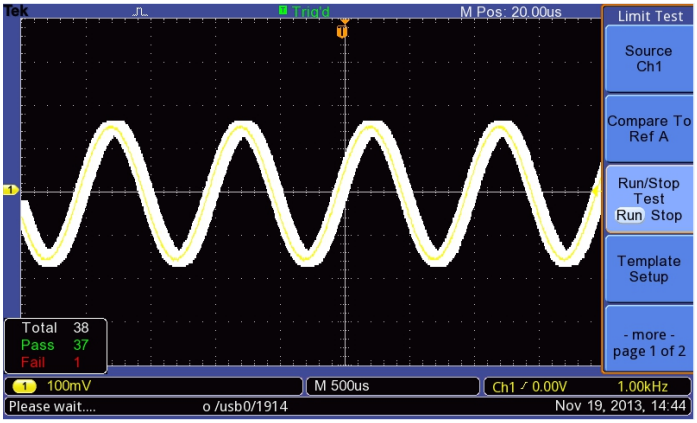
Extensive monitoring and analysis tools

Intermittent faults can be hard to evaluate, simply because they do not repeat often making them difficult to capture. The TrendPlot™ function helps find those faults by plotting measurement values over long periods of time. Select the measurement to capture on either or both channels and then set-up the oscilloscope to continuously monitor those measurements, plot the data on the display and simultaneously save the information to a USB thumb drive. Depending on the oscilloscope setting, you'll be able to capture data for minutes, hours or even days; the only limitation is the size of the thumb drive.



To find intermittent faults the TrendPlot ™ function can monitor measurements for long periods of time.

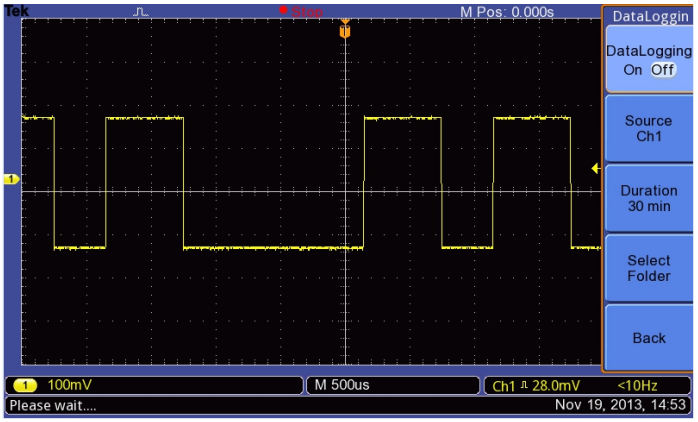
Often, only Pass/Fail data is needed to determine if a signal is good. This can be accomplished easily with the TBS1000B Limit Test feature. The oscilloscope can be set-up to automatically monitor a source signals and output Pass or Fail results by evaluating whether the acquired waveform falls within predefined boundaries. The TBS1000B Limit Test feature allows users to create templates based on one or two independent reference waveforms, providing more flexibility when creating masks for complex signals. If a failure is detected, a series of specific actions can be triggered which include; stopping waveform acquisition, halting Limit Test functions, saving a screen image of the failed waveform, or any combination of the above.



The Limit Test feature provides a quick Pass/Fail comparison between any triggered input signal and a user- defined template.

Flexible data transfer

The USB host port on the front panel enables you to save your instrument settings, screenshots, and waveform data onto a USB memory device. This port also supports the built-in Data Logging feature which enables you to set up the oscilloscope to save user- specified triggered waveforms to a USB device for up to 24 hours. You can also select the "Infinite" option for continuous waveform monitoring. In the infinite mode you can save your triggered waveforms to an external USB memory device without a duration limitation until the memory device is full. The oscilloscope will then guide you to insert another USB memory device to continue saving waveforms.



Data logging enables automatic saving of triggered waveforms.

Designed to make your work easy

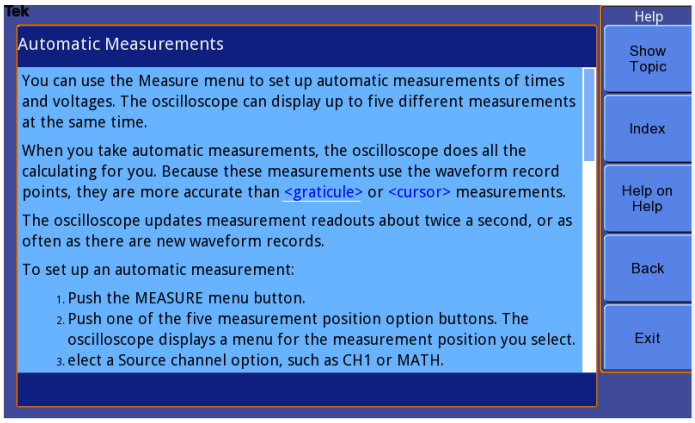
The TBS1000B series oscilloscopes are designed with the ease of use and familiar operation you have come to expect from Tektronix.

Intuitive operation

The intuitive user interface with dedicated per-channel vertical controls, auto-setup, and auto-ranging makes these instruments easy to use, reducing learning time and increasing efficiency.

Help when you need it, where you need it

The built-in Help menu provides you with important information about your oscilloscope's features and functions. Help is provided in the same languages as the user interface.



The context-sensitive help system provides important information specific to the task you are working on.

Performance you can count on

In addition to industry-leading service and support, every TBS1000B series oscilloscope comes backed with a 5-year warranty as standard.

Specifications

All specifications apply to all models unless noted otherwise.

Model overview

	TBS1052B	TBS1072B	TBS1102B	TBS1152B	TBS1202B
Bandwidth [1]	50 MHz	70 MHz	100 MHz	150 MHz	200 MHz
Channels	2	2	2	2	2
Sample rate on each channel	1.0 GS/s	1.0 GS/s	2 .0 GS/s	2 .0 GS/s	2 .0 GS/s
Record length	2.5k points at all-time bases				

Vertical system – Analog channels

Vertical resolution	8 bits
Input sensitivity range	2 mV to 5 V/div on all models with calibrated fine adjustment
DC gain accuracy	±3%, from 10 mV/div to 5 V/div
Maximum input voltage	300 V_{RMS} CAT II; derated at 20 dB/decade above 100 kHz to 13 V_{p-p} AC at 3 MHz and above
Offset range	2 mV to 200 mV/div: ±1.8 V >200 mV to 5 V/div: ±45 V
Bandwidth limit	20 MHz
Input coupling	AC, DC, GND
Input impedance	1 MΩ in parallel with 20 pF
Vertical zoom	Vertically expand or compress a live or stopped waveform

Horizontal system — Analog channels

Time base range	2.5 ns to 50 s/div
Time base accuracy	50 ppm
Horizontal zoom	Horizontally expand or compress a live or stopped waveform

1 Bandwidth is 20 MHz at 2 mV/div

Input/Output ports

USB interface	USB host port on front panel supports USB flash drives USB device port on back of instrument supports connection to PC and all PictBridge®-compatible printers
GPIB interface	Optional

Data storage

Nonvolatile storage

Reference waveform display	2.5K point reference waveforms
Waveform storage without USB flash drive	2.5K point
Maximum USB flash drive size	64 GB
Waveform storage with USB flash drive	96 or more reference waveforms per 8 MB
Setups without USB flash drive	10 front-panel setups
Setups with USB flash drive	4000 or more front-panel setups per 8 MB
Screen images with USB flash drive	128 or more screen images per 8 MB (the number of images depends on file format selected)
Save All with USB flash drive	12 or more Save All operations per 8 MB A single Save All operation creates 3 to 9 files (setup, image, plus one file for each displayed waveform)

Acquisition system

Acquisition modes

Peak Detect	High-frequency and random glitch capture. Captures glitches as narrow as 12 ns (typical) at all time base settings from 5 µs/div to 50 s/div
Sample	Sample data only
Average	Waveform averaged, selectable: 4, 16, 64, 128
Single Sequence	Use the Single Sequence button to capture a single triggered acquisition sequence
Roll	At acquisition time base settings of >100 ms/div

Trigger system

External trigger input	Included on all models
Trigger modes	Auto, Normal, Single Sequence

Trigger types

Edge (Rising/Falling)	Conventional level-driven trigger. Positive or negative slope on any channel. Coupling selections: AC, DC, Noise Reject, HF Reject, LF Reject
Video	Trigger on all lines or individual lines, odd/even or all fields from composite video, or broadcast standards (NTSC, PAL, SECAM)
Pulse Width (or Glitch)	Trigger on a pulse width less than, greater than, equal to, or not equal to, a selectable time limit ranging from 33 ns to 10 s

Trigger source	Two channel models: CH1, CH2, Ext, Ext/5, AC Line
Trigger view	Displays trigger signal while Trigger View button is depressed.
Trigger signal frequency readout	Provides a frequency readout of the trigger source.

Waveform measurements

Cursors	
Types	Amplitude, Time
Measurements	ΔT, 1/ΔT, ΔV
Automatic measurements	Period, Frequency, Pos Width, Neg Width, Rise Time, Fall Time, Maximum , Minimum , Peak-Peak, Mean, RMS, Cycle RMS, Cursor RMS, Phase, Pos Pulse Cnt, Neg Pulse Cnt, Rise Edge Cn, Fall Edge Cn, Pos Duty, Neg Duty, Amplitude, Cycle Mean, Cursor Mean, Burst Width, Pos Overshoot, Neg Overshoot, Area, Cycle Area, High, Low, Delay RR, Delay RF, Delay FR, Delay FF

Waveform math

Arithmetic	Add, Subtract, Multiply
Math functions	FFT
FFT	Windows: Hanning, Flat Top, Rectangular 2048 sample points
Sources	Two channel models: CH1 - CH2, CH2 - CH1, CH1 + CH2, CH1 × CH2

Autoset

Autoset menu	Single-button, automatic setup of all channels for vertical, horizontal, and trigger systems, with undo Autoset
Square wave	Single Cycle, Multicycle, Rising or Falling Edge
Sine wave	Single Cycle, Multicycle, FFT Spectrum
Video (NTSC, PAL, SECAM)	Field: All, Odd, or Even Line: All or Selectable Line Number

Autorange

Automatically adjust vertical and/or horizontal oscilloscope settings when probe is moved from point to point, or when the signal exhibits large changes.

Frequency counter

Resolution	6 digits
Accuracy (typical)	+ 51 parts per million including all frequency reference errors and +1 count errors
Frequency range	AC coupled, 10 Hz minimum to rated bandwidth
Frequency counter signal source	Pulse width or edge selected trigger source Frequency counter measures selected trigger source at all times in pulse width and edge mode, including when the oscilloscope acquisition is halted due to changes in run status, or acquisition of a single shot event has completed. The frequency counter does not measure pulses that do not qualify as legitimate trigger events. Pulse Width mode: Counts pulses of enough magnitude inside the 250 ms measurement window that qualify as triggerable events (e.g. all narrow pulses in a PWM pulse train if set to "<" mode and the limit is set to a relatively small number). Edge Trigger mode: Counts all pulses of enough magnitude.
Channels	2 channel

Display system

Interpolation	Sin (x)/x
Waveform styles	Dots, vectors
Persistence	Off, 1 s, 2 s, 5 s, infinite
Format	YT and XY

Physical characteristics

Dimensions

	mm	in.
Height	158.0	6.22
Width	326.3	12.85
Depth	124.2	4.89

Shipping dimensions

	mm	in.
Height	266.7	10.5
Width	476.2	18.75
Depth	228.6	9.0

Weight

	kg	lb.
Instrument only	2.0	4.3
...with accessories	2.2	4.9

RM2000B rackmount

	mm	in
Width	482.6	19.0
Height	177.8	7.0
Depth	108.0	4.25

Environmental

Temperature

Operating	0 to +50 ºC
Nonoperating	–40 to +71 ºC

Humidity

Operating and nonoperating	Up to 85% RH at or below +40 ºC
	Up to 45% RH up to +50 ºC

Altitude

Operating and nonoperating	Up to 3,000 m (9,843 ft.)

Regulatory

Electromagnetic compatibility	Meets Directive 2004/108/EC, EN 61326-2-1 Class A; Australian EMC Framework
Safety	UL61010-1:2004, CSA22.2 No. 61010-1:2004, EN61010-1:2001, IEC61010-1:2001

Ordering information

Models

TBS1052B	50 MHz, 2 Ch, 1 GS/s, TFT DSO
TBS1072B	70 MHz, 2 Ch, 1 GS/s, TFT DSO
TBS1102B	100 MHz, 2 Ch, 2 GS/s, TFT DSO
TBS1152B	150 MHz, 2 Ch, 2 GS/s, TFT DSO
TBS1202B	200 MHz, 2 Ch, 2 GS/s, TFT DSO

Language options

Opt. L1	French overlay
Opt. L2	Italian overlay
Opt. L3	German overlay
Opt. L4	Spanish overlay
Opt. L5	Japanese overlay
Opt. L6	Portuguese overlay
Opt. L7	Simplified Chinese overlay
Opt. L8	Traditional Chinese overlay
Opt. L9	Korean overlay
Opt. L10	Russian overlay

Power plug options

Opt. A0	North America power plug (115 V, 60 Hz)
Opt. A1	Universal Euro power plug (220 V, 50 Hz)
Opt. A2	United Kingdom power plug (240 V, 50 Hz)
Opt. A3	Australia power plug (240 V, 50 Hz)
Opt. A5	Switzerland power plug (220 V, 50 Hz)
Opt. A6	Japan power plug (100 V, 110/120 V, 60 Hz)
Opt. A10	China power plug (50 Hz)
Opt. A11	India power plug (50 Hz)
Opt. A12	Brazil power plug (60 Hz)
Opt. A99	No power cord

Service options

Opt. D1	Calibration Data Report

Probes and accessories are not covered by the oscilloscope warranty and Service Offerings. Refer to the datasheet of each probe and accessory model for its unique warranty and calibration terms.

Probe option

TBS1XX2B P2220 Replaces standard probes with P2220 probes (200 MHz passive voltage probes with 1x/ 10x attenuation)

Standard accessories

Accessory	Description
Passive probes, one per channel	TPP0051: 50MHz passive probe for: TBS1052B
	TPP0101: 100 MHz passive probe for: TBS1072B, TBS1102B
	TPP0201: 200 MHz passive probe for: TBS1152B, TBS1202B
Power cord	(Please specify plug option)
NIM/NIST	Traceable certificate of calibration
Printed documentation	Installation and safety manual
	(English, Japanese, and Simplified Chinese)
CD with customer documentation	Customer documentation including detailed user manuals (English, French, German, Italian, Japanese, Korean, Portuguese, Russian, Simplified Chinese, Spanish, Traditional Chinese)
5-year warranty	Covers labor and parts for defects in materials and workmanship for 5 years, excluding probes and accessories (probes and accessories are not covered by the oscilloscope warranty and service offerings. refer to the data sheet of each probe and accessory model for its unique warranty and calibration terms)

Recommended accessories

Accessory	Description
TEK-USB-488	GPIB-to-USB converter
AC2100	Soft carrying case for instrument
HCTEK4321	Hard plastic carrying case for instrument (requires AC2100)
RM2000B	Rackmount kit
077-0444-xx	Programmer manual – English only
077-0772-xx	Service manual – English only
174-4401-xx	USB host to device cable, 3 ft. long

Recommended probes

Probe	Description
TPP0051	10X passive probe, 50 MHz bandwidth
TPP0101	10X passive probe, 100 MHz bandwidth
TPP0201	10X passive probe, 200 MHz bandwidth
P2220	1X/10X passive probe, 200 MHz bandwidth
P6101B	1X passive probe (15 MHz, 300 V RMS CAT II rating)
P6015A	1000X high-voltage passive probe (75 MHz)
P5100A	100X high-voltage passive probe (500 MHz)
P5200A	50 MHz, 50X/500X high-voltage differential probe
P6021A	15 A, 60 MHz AC current probe
P6022	6 A, 120 MHz AC current probe
A621	2000 A, 5 to 50 kHz AC current probe
A622	100 A, 100 kHz AC/DC current probe/BNC
TCP303/TCPA300	150 A, 15 MHz AC/DC current probe/amplifier
TCP305A/TCPA300	50 A, 50 MHz AC/DC current probe/amplifier

Probe	Description
TCP312A/TCPA300	30 A, 100 MHz AC/DC current probe/amplifier
TCP404XL/TCPA400	500 A, 2 MHz AC/DC current probe/amplifier

CE

Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

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Tektronix®

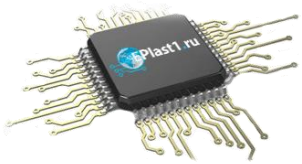
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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