



Power-Electronics Measurement System

Measurement Capability:

AC/DC Current

- 50 MHz Bandwidth
- 50 Amp Peak Pulse
- 10 mA/div Sensitivity

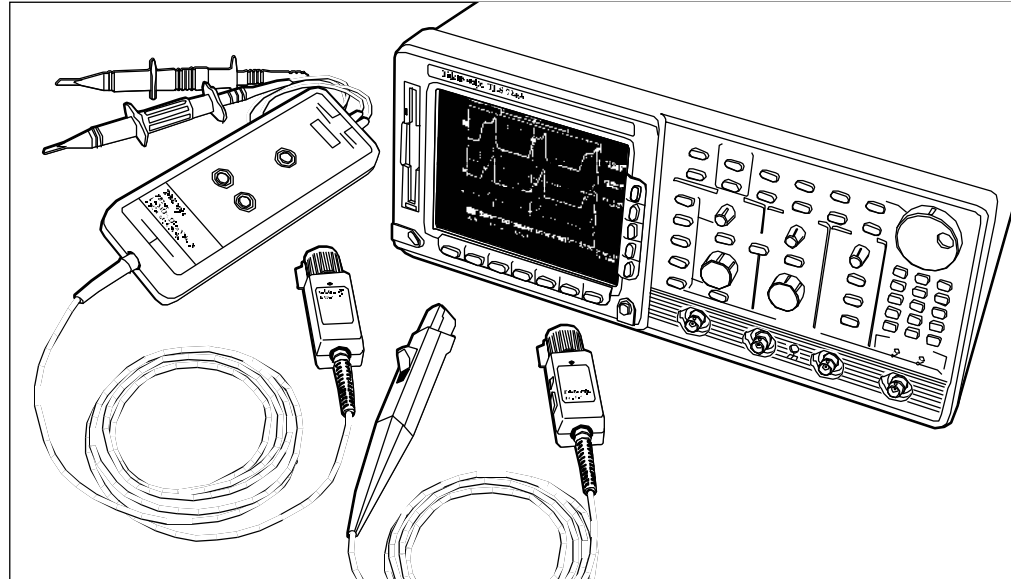
Differential Voltage

- 100 MHz Bandwidth
- 1300 V Differential
- 50 mV/div Sensitivity

Instantaneous Power

- 50 MHz Bandwidth
- 5.0 mW/div to 50 kW/div

Energy Computation



The Power Electronics Measurement System provides a breakthrough in measurement capability for designers who make many types of power, current, and floating voltage measurements.

The system consists of a TDS 744A oscilloscope*, P5205 high-voltage differential probe, and the TCP202 current probe.

The probes are powered by the scope via the TEKPROBE™ interface and the readout on the screen is in Volts, Amps, or W (watts) with correct magnitude.

TYPICAL APPLICATIONS

- True and Apparent Line Power
- Switching Transistor Instantaneous Power
- Instantaneous Impedance of a Switching Device
- Power Converter Start-up Modes/Fault Conditions
- Converter Output Impedance
- Switching Ripple and Line Ripple
- Inductor Saturation
- Battery Power Consumption

TCP202 SPECIFICATIONS

Bandwidth

DC to 50 MHz

Peak Pulse

50 Amp

Max DC + Peak AC

15 Amp

Amp*Sec Product

500×10^{-6} Amp * Sec

Rise Time

7.0 ns

Accuracy

1% with calibrator,
3% without calibrator

Maximum Barewire V

300 V (cat I)

Maximum Conductor Size

0.15 in (3.8 mm)

Propagation Delay

17 ns

P5205 SPECIFICATIONS

Bandwidth

100 MHz

Differential

1300V

Common Mode

±1000V

Attenuation

50X/500X

CMRR

80 dB @ 60 Hz
50 dB @ 100 kHz

Input C

7 pF

Input R

4 M

Rise Time

3.5 ns

Propagation Delay

17 ns



Power Electronics Measurement System

For further information,
contact Tektronix:

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TDS 744A* SPECIFICATIONS

Bandwidth
500 MHz

Sample Rate
1 GS/s (2 ch.)

Deskew
±25 ns (per channel)

InstaVu™ Acquisition Mode

25 Automatic Measurements

Input C/R
10 pF/1 M

Scale Factor Units

Color Monitor
(Tektronix patented pi-cell technology)

*Although the TDS 744A (S/N B040100 & up) (4 channel, Color Display) is the preferred oscilloscope for power electronics measurements, the following oscilloscopes may be substituted:

TDS 520B – 2-channel, Mono-chrome Display

TDS 540B – 4-channel, Mono-chrome Display

TDS 724A – 2-channel, Color Display (S/N B050100 & up)

TDS 784A – 4-channel, Color Display (S/N B040100 & up)

The TDS 744A digital oscilloscope provides the advanced signal acquisition, analysis and display functions required for making power electronics measurements.

The P5205 high-voltage differential probe allows users to make safe, floating measurements with the oscilloscope grounded. With its 1300 volt tip-to-tip capability, it enables

differential measurements on most power systems.

The TCP202 is a DC-coupled current probe capable of measuring DC currents up to 15 amps and peak pulse currents up to 50 amps. With its DC to 50 MHz bandwidth, it can be used with the P5205 to provide instantaneous power measurements of circuits up to 50 MHz.

The total system has the capability of measuring the area under the curve of the current and voltage waveforms. The probes have propagation delays that are matched to ±2 nsec. In addition, the scope has deskew capability for more precise measurements. Power calculations developed from these waveforms are displayed directly in W (watts).

ORDERING INFORMATION

TDS 744A
Digital Oscilloscope

Option 20
TCP202
DC-coupled Current Probe
(with calibrator)

Option 21
TCP202
DC-coupled Current Probe
(with calibrator)

P5205
High Voltage Differential Probe

Other options: see TDS 744A data sheet

Extra Probes and Calibrators may be ordered separately:

TCP202
DC-coupled Current Probe

015-0672-50
Calibrator

P5205
High Voltage Differential Probe