PowerMeasure Systems

POWER CONVERSION TEST SOLUTIONS

Unmatched Performance
Complete Capabilities

LeCroy

LeCroy Systems Solve Power Measurement Challenges

THE CHALLENGES:

- Measuring voltages connected to line potential
- Measuring small signals riding on large signals
- Measuring wide bandwidth current — DC to MHz
- Testing wide dynamic ranges of time — < 100 ns to seconds
- Performing additional computations to get meaningful results from voltage and current waveforms

THE SOLUTION:
LeCroy PowerMeasure Systems

Unmatched performance with a complete set of measurement tools

The LeCroy PowerMeasure Systems are the most complete high-performance design tools available for the power conversion engineer. Each system includes an easy-to-use, high-performance digital storage oscilloscope, high-performance current probe and differential voltage amplifier, and a powerful analysis software package.

Engineers will quickly find this system indispensable. The ease of use, versatility, and accuracy will improve power design productivity.

Only LeCroy offers these capabilities:

- Complete range of power device measurements, in circuit!
- Full range of voltage and current probes, direct connect, fully integrated
- Control loop analysis
- High-performance differential amplifier with matching differential passive probes

The systems will do virtually everything you need with just the push of a few buttons

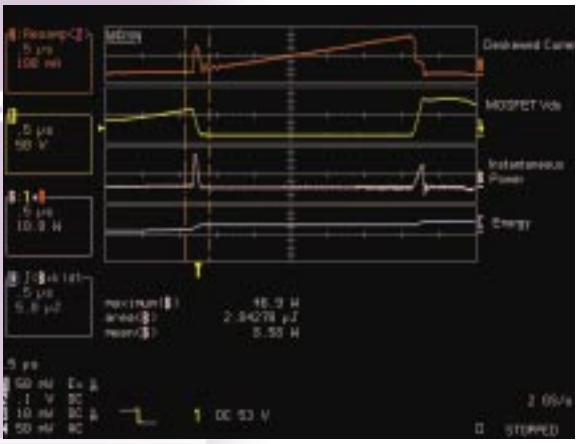
In addition to important voltage and current measurement capabilities, such as high-side gate drive and in-rush current, the PowerMeasure Systems provide extensive analysis capability. This allows direct measurement and display of in-circuit switching device characteristics such as conduction loss, dynamic channel resistance, and safe operating area (SOA). Line power analysis displays direct measurements of real and apparent power, power factor, and line-current harmonic content in both frequency domain and tabular display formats. Modulation analysis provides a time domain display of demodulated PWM and FM control circuit operation.

Choice of standard or custom PowerMeasure Systems

Measurement needs vary depending on the products in design — whether it's DC-DC converters, off line switching power supplies, motor drives, or other power conversion devices. To address these different needs and maintain the pricing advantage of a complete PowerMeasure System, LeCroy offers both standard and customized configurations. Choose the probes suitable for the voltage and current ranges of your devices. Select from a range of oscilloscope bandwidths, sample rates, and record lengths.

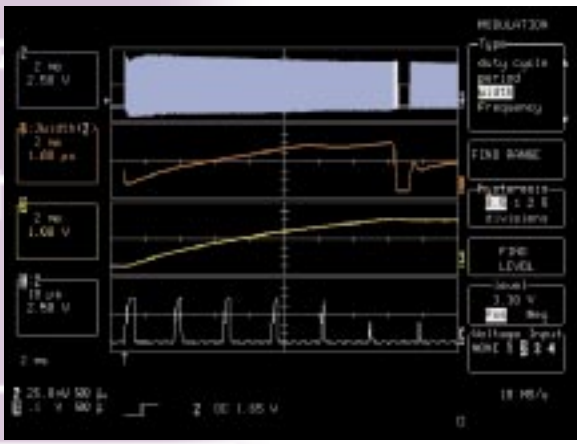
PowerMeasure Analysis — Redefined

The LeCroy PowerMeasure System sets a new standard, providing an unequaled level of performance and completeness. It no longer makes economic sense to use questionable measurement practices when the highest level of measurement utility is available and affordable.



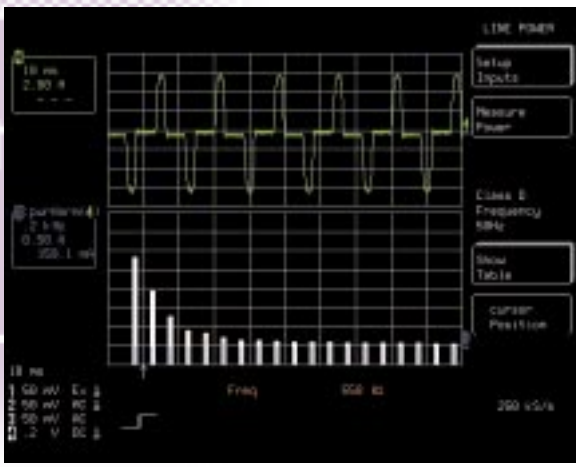
Power Device Analysis

- Device saturation voltage
- Transition power losses: Turn-on; Turn-off
- Conduction power loss
- Dynamic on-resistance
- High-side gate drive
- Safe Operating Area: Single to multiple switch cycles



Modulation Analysis

- Step response to line and load changes
- View soft start performance
- Time domain display of pulse width or frequency-modulated control loops



Line Power Analysis

- Measure input power
  - Real power
  - Apparent power
  - Power factor
- View line current harmonics
  - Frequency domain display
  - Tabular display
- Pre-compliance testing to EN 61000-3-2

The PowerMeasure System

These components make up the PowerMeasure System — the most complete solution available for making power measurements

The Waverunner™ digital oscilloscope captures complete records of each detail in every cycle of important circuit transitions, such as load change, turn-on, and turn-off. SMART Trigger® makes it easy to capture waveforms during complex power transitions. The oscilloscope performs mathematical analysis of live or stored waveforms and performs waveform math and math-on-math for detailed live analysis of the circuit and its components.

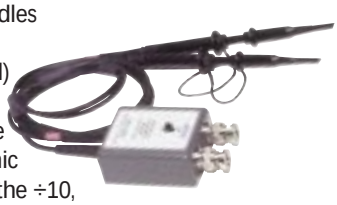
The PowerMeasure Analysis (PMA1) software's dedicated menus and shortcuts let you quickly and easily set up the scope to acquire, view, and analyze power signals. A "Setup Helper" is built in to support users step-by-step, ensuring correct and accurate measurements. The dedicated manual that comes with PMA1 details the best way to optimize the oscilloscope and probe setups for voltage, current, power, and energy measurements.

The DA1855A is a stand-alone, high-performance 100 MHz differential amplifier that acts as a fully integrated signal-conditioning preamplifier. It provides unequalled common mode rejection ratio (CMRR) and overdrive recovery performance. Amplifier gain can be set to 1 or 10. A built-in input attenuator can be separately set to attenuate signals by a factor of 10, extending the system scale factors between 200 µV/div and 100 V/div; and common mode dynamic range is limited only by the voltage rating of the probes.

Equipped with the ProBus® interface, the DA1855A becomes an integral part of the oscilloscope. The amplifier can be fully controlled from the oscilloscope's front panel or through remote commands (GPIB, RS-232-C, or 10Base-T Ethernet).

The AP015 current probe measures the current flowing through a conductor. The probe is based on a combination of Hall effect and transformer technology that allows measurements to be made on DC, AC, and impulse currents. Its rugged design uses a split-core transformer that allows the probe head to be clamped around a conductor that remains in circuit.

The DXC100A is a high-performance, passive, matched differential probe pair designed for use with the DA1855A amplifier. The DXC100A handles up to a ±500 V (1000 V differential) voltage rating. Users can optimize the probe's dynamic range by utilizing the ÷10, ÷100 switchable attenuator.



The DCS015 – Deskew Calibration Source provides time-coincident voltage and current signals that are used as references for deskewing current and voltage measuring systems.

Probe compatibility

Maybe you already own a LeCroy DSO, or you've already invested in another vendor's probes. No problem! The PowerMeasure System software works on LeCroy digital oscilloscopes; and other manufacturers' current and voltage probe settings are integrated into the setup menus. Waveforms are displayed showing the proper units (watts, joules, VA, etc.), even with other manufacturer's non-ProBus accessories. Not only do you protect your investment, you get superior performance and analysis capabilities.

Power Device Analysis Capabilities

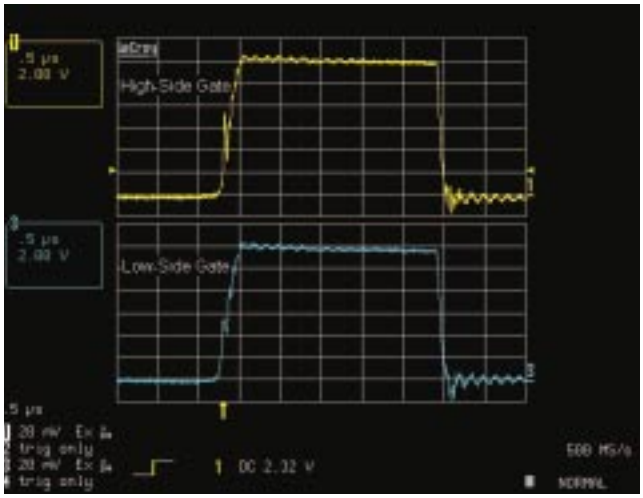
LeCroy's PowerMeasure System can analyze power devices' performance while they are operating in circuit. Tests previously restricted to a test fixture and requiring specially designed clipping circuits, can now be routinely made while they operate in their designed environment. The LeCroy PowerMeasure Systems provide a combination of capabilities never before available from a single system.

The following examples illustrate many of the measurement capabilities provided by the PowerMeasure Systems. These measurements require many features available only from LeCroy, such as:

- *Differential amplifier with fast overdrive recovery and high CMRR*
- *Oscilloscope inputs and math channels automatically set with appropriate units (watts, joules, VA, etc.)*
- *Time aligned current and voltage waveforms*
- *Oscilloscope waveform math utilized for waveform calculations, such as power, energy, dv/dt, FFT's. etc.*

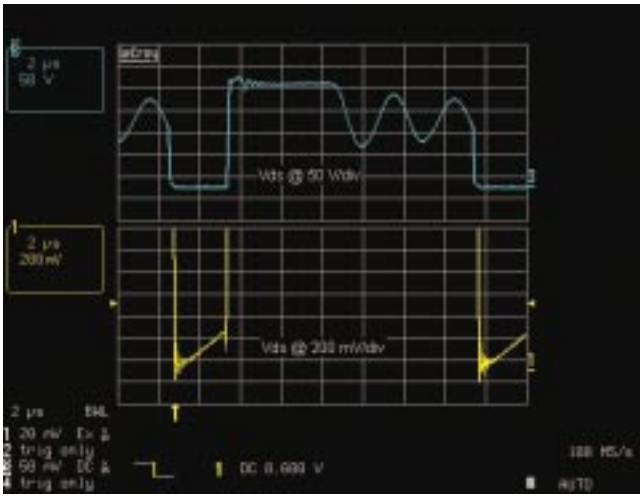
High-Side Gate Drive

Accurately viewing gate or base drive voltage waveforms on the upper device in a half-or full-bridge drive section is extremely difficult. The relatively small voltage signal riding on top of large positive to negative bus voltage transition challenges the capabilities of lower performance "power" differential amplifiers. The DA1855A, along with the matched DXC100A probes, provides the high **Common Mode Rejection Ratio (CMRR)** needed to make this difficult measurement. *The display shows upper and lower gate drive signals of a forward converter, captured simultaneously, with DA1855A-PR2.*



Saturation Voltage

Measuring the saturation voltage of a switching device operating in-circuit poses several challenges. Because the device is often operating from line-connected circuitry, the typical method of "floating the scope" is inherently dangerous to the user, the instrument, and the device under test. The dynamic range of the transition — hundreds of volts when off — to a small fraction of a volt when on — overloads the input amplifier of a standard oscilloscope. This makes accurate measurements impossible. The DA1855A's exclusive **fast overdrive recovery (< 100 ns)** allows the amplifier to fully recover from severe overdrive conditions within a few tens of nanoseconds — in time to accurately measure the device's turn on transition. *Note the high sensitivity of the voltage scale factor on the lower trace.*

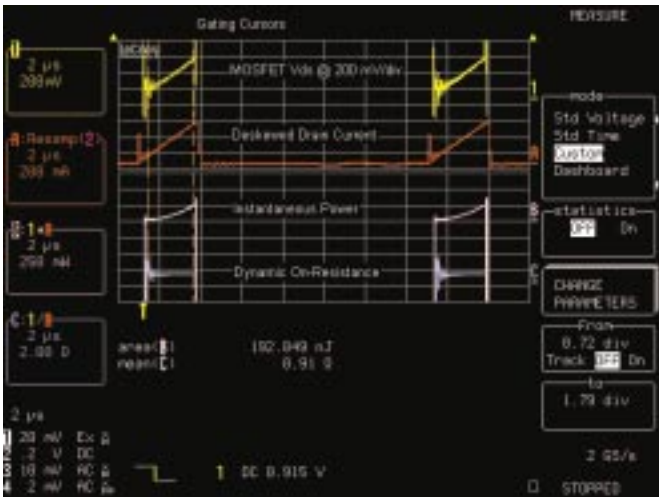


Power Device Analysis Capabilities (continued)

Switching Loss Measurements

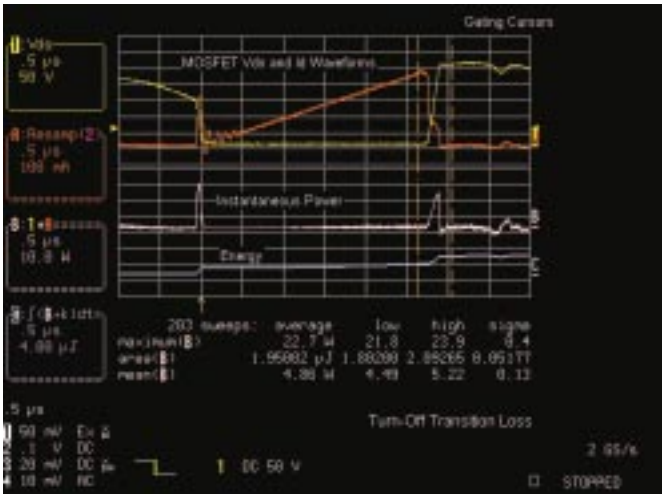
Conduction Loss and Dynamic On-Resistance

The DA1855A's fast overdrive recovery enables thf the power loss during the conduction portion of the switching cycle is now possible. In addition, the oscilloscope's waveform math, parameter table, and gating cursors provide the calculation of the dynamic on-resistance for this switching device.



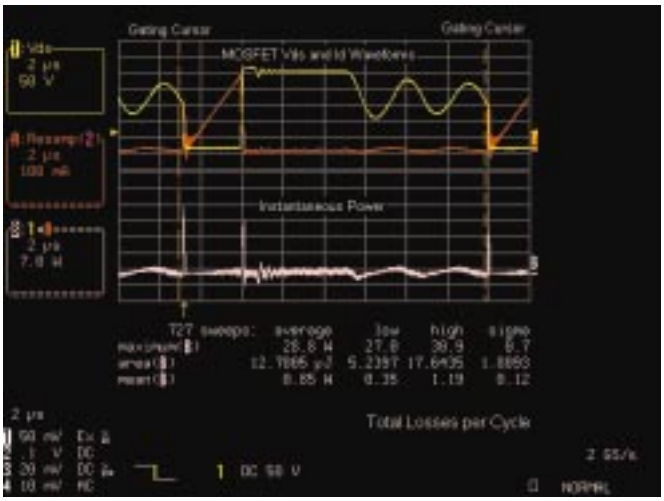
Instantaneous Power Loss – Turn-Off Loss

Oscilloscope waveform math is utilized to generate the deskewed current waveform. By applying the "product" and "integrate" math functions, the instantaneous power waveform (in watts) and energy waveforms (in Joules) are calculated and displayed. The parameter table, with gating cursors, can be used to provide the power loss during the power device's turn-off transition.



Total Losses per Switching Cycle

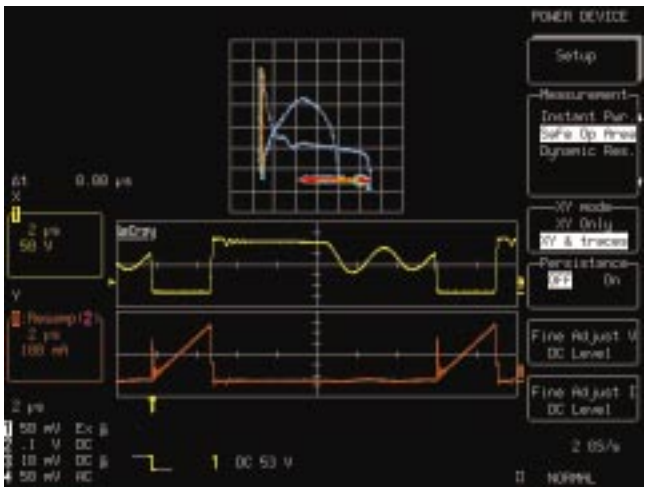
A slower timebase setting allows the measurement of the power loss during one complete switching cycle. The use of gated cursors and the parameter table allows analysis of the portion of the waveform selected by the user, in this case displaying the power loss of one full cycle.



Power Device Analysis Capabilities (continued)

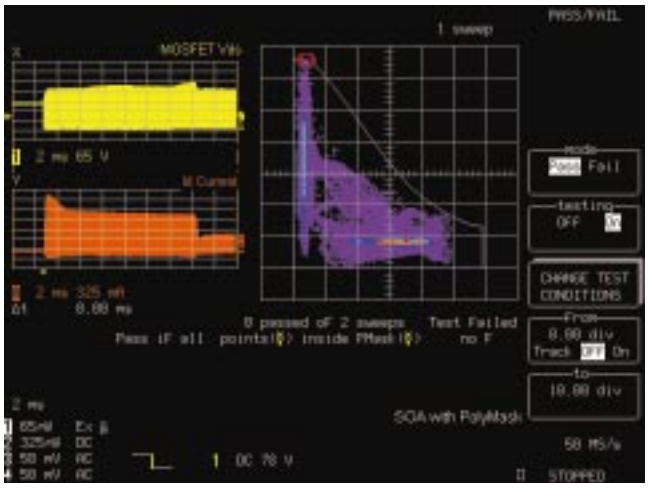
Safe Operating Area

LeCroy's PowerMeasure System displays the device's V-I characteristics in an X-Y format to verify compliance to the manufacturer's Safe Operating Area (SOA) specification. By applying measurement cursors, the exclusive combination of the X-Y plot and Y-T graphs allows the user to quickly locate the points in the waveform where SOA violations occurred.



Wide Time Window – SOA

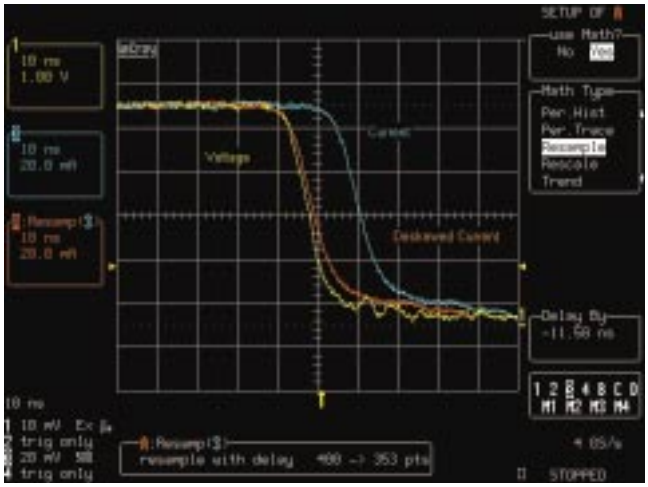
Finding SOA violations that occur for only a few cycles after an event, such as short circuit or startup, can be problematic. These violations often go undetected, as the results only degrade the device rather than causing catastrophic failure. Using the long record length in the Waverunner oscilloscope, time windows of 20 ms or more can be captured with sufficient resolution to allow detailed examination of a single switching cycle. In addition, SOA violations are easily identified by using pass/fail testing with the oscilloscope's Polymask option.



Deskew

The "Resample" function allows time skew compensation for different signal propagation times through the voltage and current signal conditioners. The DCS015 deskew calibration source provides a convenient reference of time-coincident voltage and current pulses to simplify deskew offset adjustment.

The DCS015's time-coincident voltage and current waveform edges can be used to match delay differences up to ±2 µs with 10 ps resolution. This is sufficient for current and voltage probes with greatly differing time delays.

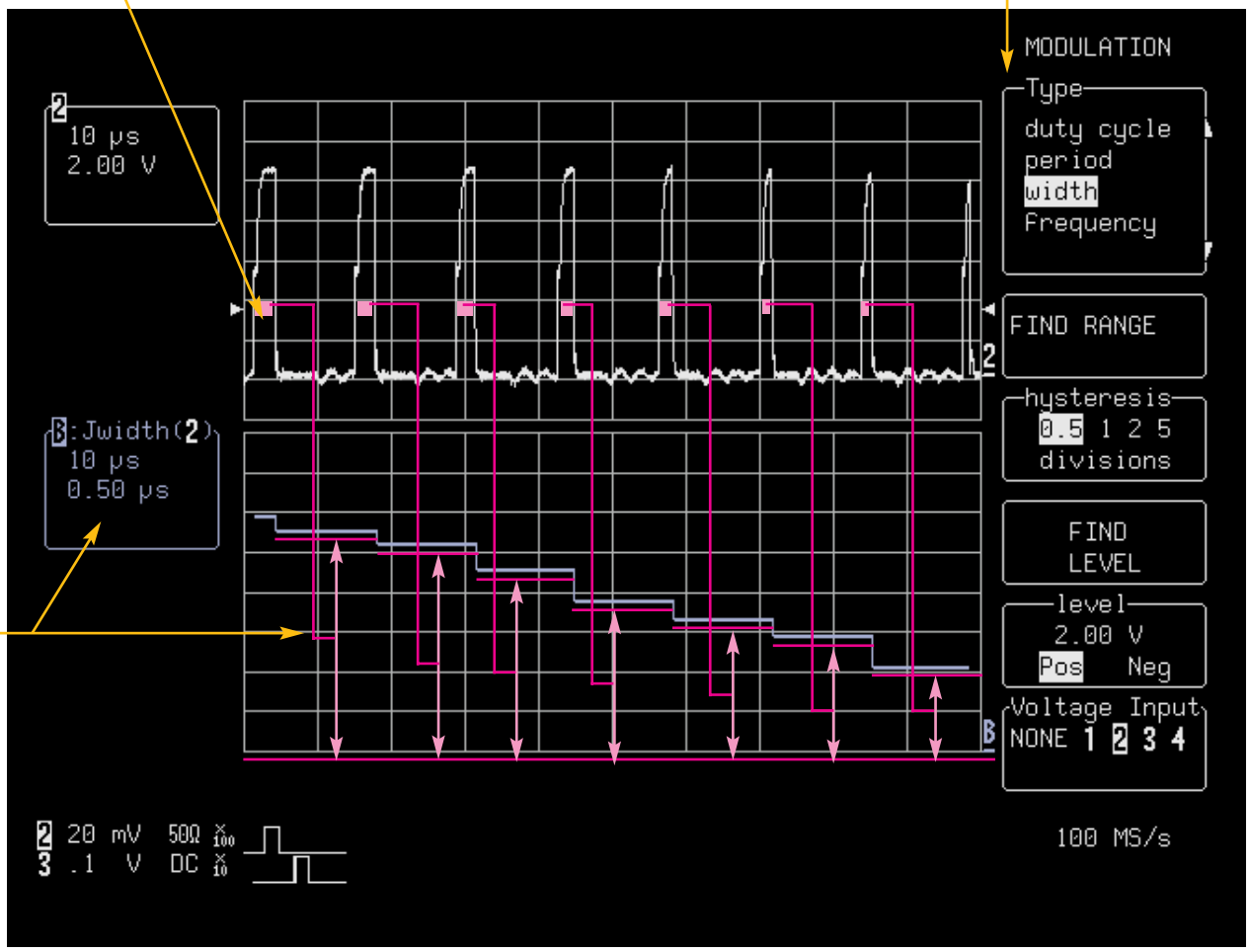


Modulation Analysis Capabilities

The Modulation Analysis functions produce a time domain display, which represents the modulated parameter in a time-versus-time graphical plot. The parameters of Pulse Width, Frequency, Period or Duty Cycle can be displayed. This provides a convenient method of viewing the time domain response of the entire control loop – including any time constants added by the pulse width modulator.

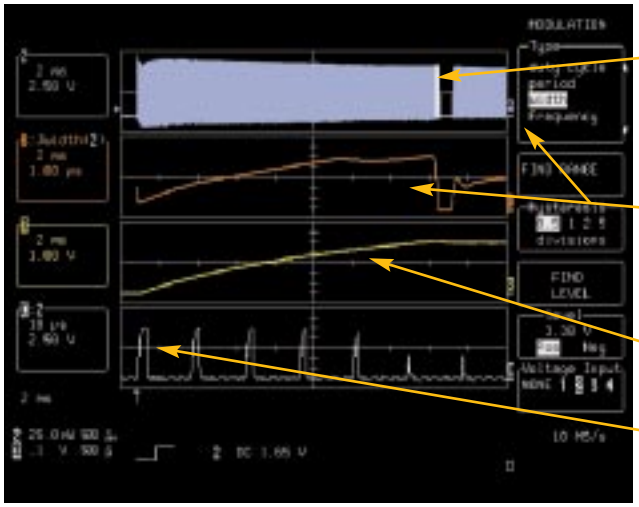
The width of every pulse in a rapidly changing Pulse Width Modulated (PWM) power supply's control circuit is measured.

Modulation Analysis is provided for duty cycle, period, width, and frequency modulation.



The time value of each pulse width is displayed on the vertical axis.

Modulation Analysis Capabilities (continued)



START-UP

In this example, the Waverunner DSO acquires a 20 ms record of every gate drive pulse from the time a power supply is turned on until it reaches steady state.

Modulation Analysis displays the pulse width value of every cycle on the vertical axis as it occurs. The soft start circuit's performance is readily observed.

The 5 volt supply is monitored as it increases from 0 volts to a regulated +5 volt level.

The zoom feature allows each gate drive pulse to be individually examined.

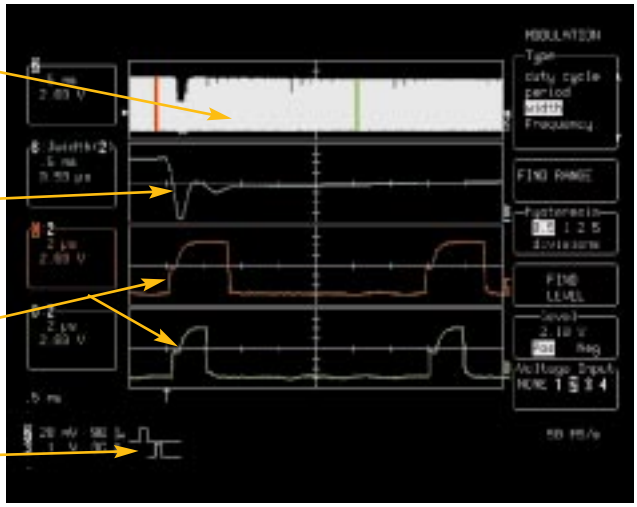
STEP RESPONSE

The Waverunner DSO examines the change in gate drive pulse widths as a power supply's load steps from full to minimum.

Modulation Analysis displays the pulse width value of every cycle on the vertical axis as it occurs. The circuit's response to a step change can be observed.

The two zoom traces allow individual gate drive pulses to be observed before and after a large load change.

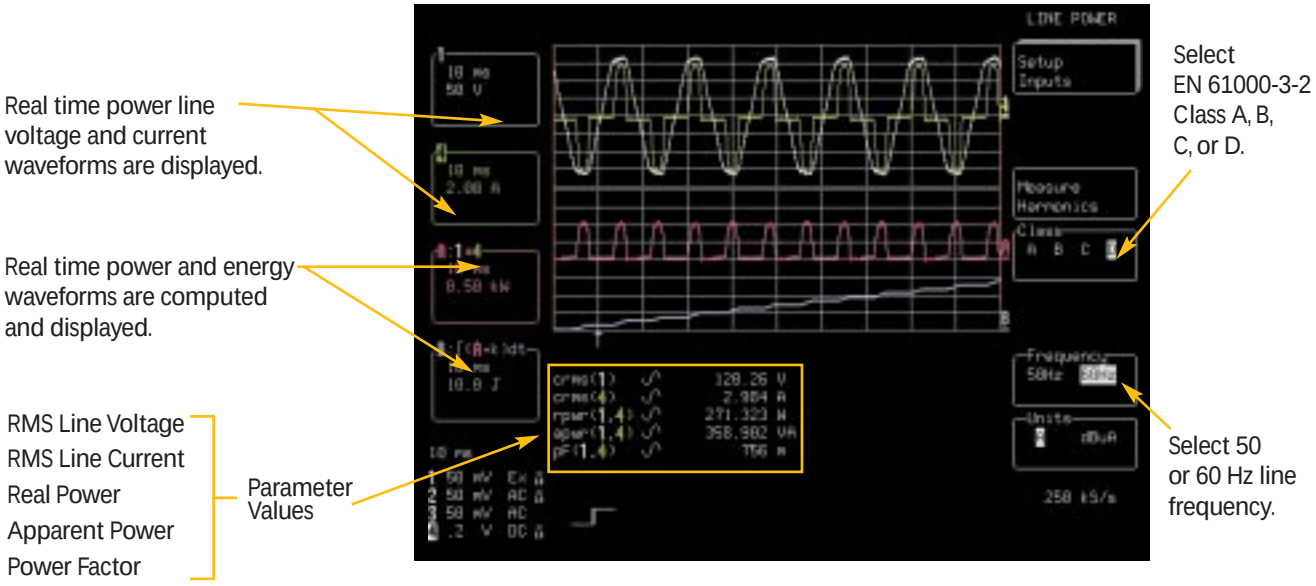
SMART Trigger allows the gate drive signal acquisition to start on the first gate drive pulse that occurs after the load changes from maximum to minimum.

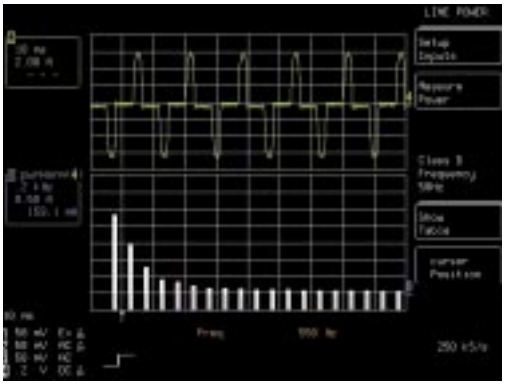


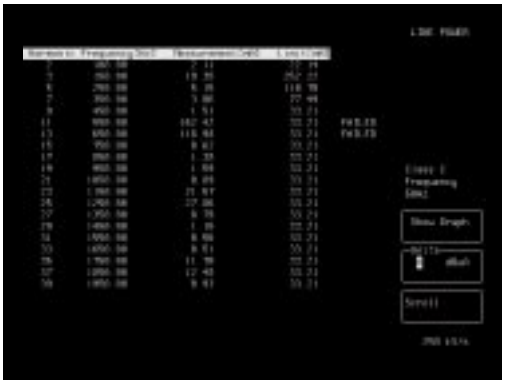
Line Power Analysis Capabilities

The LeCroy PowerMeasure System provides design engineers with an easy-to-use method of measuring the line power harmonics of their circuits. EN 61000-3-2 precompliance testing avoids expensive and time-consuming trips to a third-party qualification laboratory.

Line Power Analysis easily measures a power conversion device's incoming line voltage, RMS current consumption (in watts and VA), and Power Factor. Line current harmonic measurements are made and compared to standard templates for EN 61000-3-2 Class A, B, C, or D equipment. Results can be displayed in either graphical frequency domain or tabular formats.







Line current harmonics can be viewed in either graphical or tabular format. The proper template for the selected class and line frequency is calculated and displayed as each current waveform is acquired. Each harmonic's value is displayed on the graph. A cursor is provided to select individual harmonics. Out-of-limit harmonics are shown extending beyond the template. In tabular format, the value of each harmonic is displayed along with its frequency and magnitude limit. Harmonics exceeding their limits are shown as "FAILED" in the table.

PowerMeasure System Components

LeCroy PowerMeasure Systems are the most complete high performance design test tools available for the power conversion engineer. By combining the industry's best differential amplifier and probe, integrated current probe, analysis software, deskew calibration source, and a full-featured digital oscilloscope LeCroy provides the best approach to power supply testing.

Use the following test system components to increase your confidence in the operation and reliability of your power supply, under all operating conditions.

1. Waverunner Oscilloscopes
2. PMA1 PowerMeasure Analysis Software
3. DA1855A Differential Amplifier
4. DXC100A Differential Passive Probe
5. AP015 Current Probe
6. DCS015 Deskew Calibration Source

1 Waverunner Oscilloscopes

The PowerMeasure System uses the Waverunner series of oscilloscopes as its foundation. Its built-in wizard menus walk you through the measurements and setup of your PowerMeasure System. The Waverunner oscilloscope is easy to learn and easy to operate. Its large 8.4" color display lets you see not only the current and voltage signals, but also the resulting power, energy, SOA, and many other measurements.

Waverunner scopes provide the best view of your signal with up to four zooms of your circuit signal. Each oscilloscope channel uses the LeCroy ProBus interface for intelligent probe connection. Just plug in the current probe and amplifier, and the scope knows how to calibrate and set correct sensitivities and values, and manage all functions. Units are displayed on the screen, so you can read out the amps or watts of your measurement. The PowerMeasure System is integrated to give you easily obtained and accurate results on your power measurement applications.

PowerMeasure System	Waverunner Oscilloscope	Bandwidth	Channels	Maximum Sample Rate	Acquisition Memory
PS374/M/L	LT374*	500 MHz	Four	2-4 GS/s	250 k/1M/4 Mpts
PS354/M/ML	LT354	500 MHz	Four	1 GS/s	250 k/1M/2 Mpts
PS264/M	LT264	350 MHz	Four	1 GS/s	100 k/1Mpts

* LT374 doubles the memory and sampling rate when using one or two channels.

PowerMeasure System Components (continued)

❷ PMA1 PowerMeasure Analysis Software

The PowerMeasure Analysis software provides unique tools for power conversion engineers using switching techniques. This software adds dedicated menus and shortcuts allowing the user to set up the oscilloscope quickly and easily to view and analyze signals from switched mode power converters such as power supplies, motor drives, or electronic lamp ballasts. A "Setup Helper" is built in to support users step-by-step, ensuring correct and accurate measurements.

A detailed manual gives expert advice on how to optimize the oscilloscope and probe setup for voltage, current, power, and energy measurement. Full remote control is possible over GPIB, RS-232-C, or 10Base-T Ethernet interfaces.

PowerMeasure Analysis software is also available as an upgrade for WavePro, Waverunner, LC series, and 9300 series LeCroy oscilloscopes.

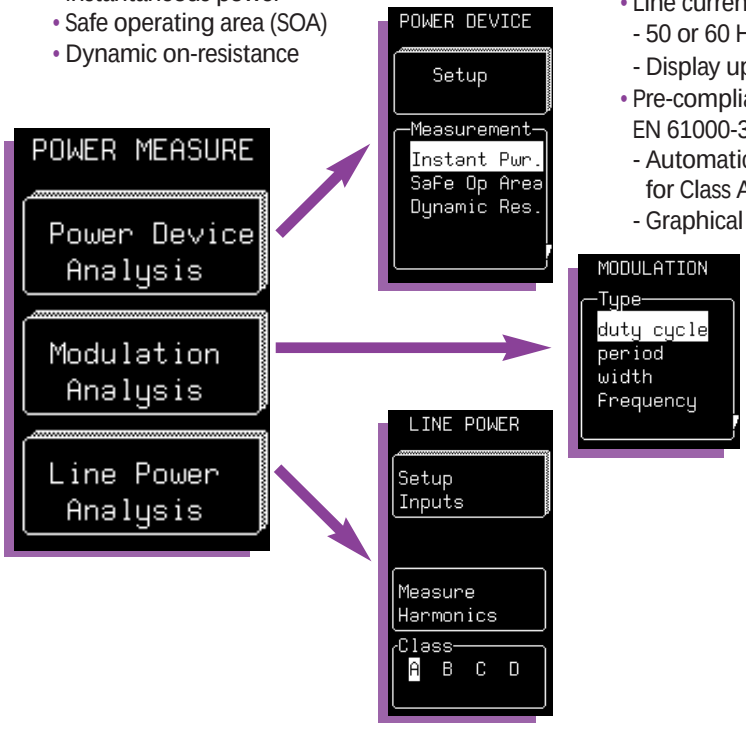
General Specifications

- Analysis on up to 4 million points (depends on oscilloscope model)
- Deskew range is ±2 µs with a resolution of 10 ps
- Scale factor from x100 to ÷10,000 provided for non-ProBus voltage and current probes
- Fine voltage and current DC offset adjustment
- Proper units displayed for non-ProBus voltage and current probes

PowerMeasure Analysis software consists of three measurement areas:

Power Device Analysis

- Instantaneous power
- Safe operating area (SOA)
- Dynamic on-resistance



Modulation Analysis

- Signal width, duty cycle, period, or frequency modulation
- Full control of hysteresis (0.5, 1, 2, 5 div) and level
- Analysis for an unlimited number of events or cycles

Line Power Analysis

- Line power measurements
  - Line voltage (RMS)
  - Input current (RMS)
  - Real and apparent power
  - Power factor
- Line current harmonic measurements
  - 50 or 60 Hz line frequency
  - Display up to 40th harmonic
- Pre-compliance testing to EN 61000-3-2 standard
  - Automatic pass/fail testing to templates for Class A, B, C, or D equipment
  - Graphical or tabular display formats

PowerMeasure System Components (continued)

❸ DA1855A Differential Amplifier

The DA1855A differential amplifier, when combined with the DXC series differential probes, acquires virtually any signal in a power conversion circuit without the signal degradation normally associated with such measurements. The common mode voltage range (CMVR) is limited only by the voltage rating of the probes. The amplifier's fast overdrive recovery and high CMRR allow you to make such difficult measurements as device saturation voltage and high-side gate drive — while the device is operating in-circuit.

PROBUS COMPATIBLE

STATE-OF-THE-ART OVERDRIVE RECOVERY:
Settles within 100 ns to 100 mV from 400 V overdrive

VERY LOW NOISE: 5 nV/√Hz, 1 to 100 MHz

AMPLIFIER GAIN: X1 or X10

GAIN ACCURACY: ±1%

BANDWIDTH: DC to 100 MHz

OUTPUT IMPEDANCE: 50 Ω

INPUT ATTENUATION: ÷1 or ÷10

MAX DIFFERENTIAL INPUT:

$$\frac{0.4 \text{ Volts}}{\text{Gain Setting}} \times \text{Combined internal and probe's attenuation factor}$$

COMMON MODE REJECTION RATIO: 100,000 to 1

MAX COMMON MODE INPUT:
(÷1 ATTENUATOR): ±15.5 V

(÷10 ATTENUATOR): ±155 V

(÷10 ATTENUATOR and ÷10 probe):
up to ±1.55 kV (limited by probe rating)

±500 V with DXC100A

±2500 V with DXC5100

INPUT RESISTANCE: 1 MΩ or 100 MΩ

INPUT CAPACITANCE: 20 pF

BANDWIDTH LIMIT FILTERS: 20 MHz, 1 MHz, and 100 kHz (three-pole Bessel)

OFFSET MODE: Differential and comparison

Voltage Range of the Amplifier/Probe Combination	DA1855A & DXC200	DA1855A & DXC100A	DA1855A & DXC5100 w/ DA101
Common Mode Each probe tip to earth ground	±155 V	±500 V	±2500 V
Differential Mode Probe tip to probe tip	±4 V	±400 V	±4000 V

PowerMeasure System Components (continued)

❹ DXC100A Differential Passive Probe

BANDWIDTH: DC to 100 MHz with DA1855A

MAX INPUT VOLTAGE: 500 V (1000 V differential)

INPUT RESISTANCE: 1 MΩ

INPUT CAPACITANCE: 10.5 pF

ATTENUATION: Selectable ÷10 or ÷100

CABLE LENGTH: 1.2 m

❺ AP015 Current Probe

BANDWIDTH: DC to 50 MHz

MAX CONTINUOUS CURRENT: ±30 A, DC or RMS

MAX PEAK PULSE CURRENT: ±50 A with pulse width < 10 s

OFFSET RANGE: ±100 A maximum (depends on oscilloscope used)

OUTPUT SENSITIVITY: 10 mA/div to 20 A/div

COUPLING: AC, DC, GND

DC ACCURACY (AT 25° C): ±1% of reading to 15 A, ±2% of reading to 30 A

RISETIME: < 7 ns

INSERTION IMPEDANCE: < 0.06 Ω at 5 MHz

CABLE LENGTH: 2 m

MAX. CONDUCTOR DIAMETER: 5 mm

❻ DCS015 Deskew Calibration Source

TIME CORRELATION: ±1 ns

VOLTAGE OUTPUT: ~0 to 5 V

CURRENT OUTPUT: ~ –100 to 0 mA

REPETITION RATE: ~8 kHz

DESKEW TIME RANGE: ±2 µs

RISETIME: ~8 ns

PowerMeasure System – Optional Components

Measurement needs vary depending on the product in design. You may want choices in both voltage and current measurement ranges as well as oscilloscope bandwidths, record lengths, and sample rates. LeCroy offers a custom PowerMeasure System approach that helps you configure your own setup while maintaining the same price advantage offered in our standard systems. Select at least one item in each column from the chart listed below, and configure your own custom PowerMeasure System.

Optional components available with a custom PowerMeasure System:

Oscilloscopes	Differential Amplifiers	Differential Probes	Current Probes	Power Software	Deskew Sources
Waverunner* WavePro	DA1855A* DA1855A-PR2 DA1822A DA1822A-PR2	DXC100A* DXC200 DXC5100 w/ DA101	AP015* CP015 CP150	PMA1*	DCS015*

* Included in PSXXX Systems.

Differential Amplifiers

The DA1855-PR2 (shown) and the DA1822A-PR2 are two channel versions of the DA1855A and the DA1822A differential amplifiers. Each channel amplifier operates independently from the other channel, but shares a common power cord and power switch. The package depth is extended to allow the oscilloscopes to sit on top of the amplifiers, making optimum use of bench space. Also available in rackmount configuration, 2U height.

DA1822A Differential Amplifier

AMPLIFIER GAIN: X1, X10, X100, X1000

BANDWIDTH: DC to 10 MHz

MAX. DIFFERENTIAL INPUT:

$$\frac{\text{4 Volts}}{\text{Setting}} \times \text{combined internal and gain probe attenuation factor}$$

BW LIMITING FILTERS:
Upper: 100, 300, 1k, 3k, 10k, 30, 100k, 300k, 1M, 3 MHz
Lower: DC, 0.1, 1, 10, 100, 1k Hz

The DA1822A differential amplifier provides higher gain and differential voltage range than the DA1855A at lower bandwidth. It does not offer fast overtime recovery which is needed for switching-device saturation voltage measurements. The higher gain and additional bandwidth limit filtering options are ideal for measuring very low voltages, such as high current shunt resistors and characterizing power structure losses.

PowerMeasure System – Optional Components (continued)

Passive Differential Probes

DXC5100 ÷100 2.5 kV differential probe pair
DA101 ÷10 external passive attenuator

MAX. INPUT VOLTAGE: ±2500 VCAT II tip to ground

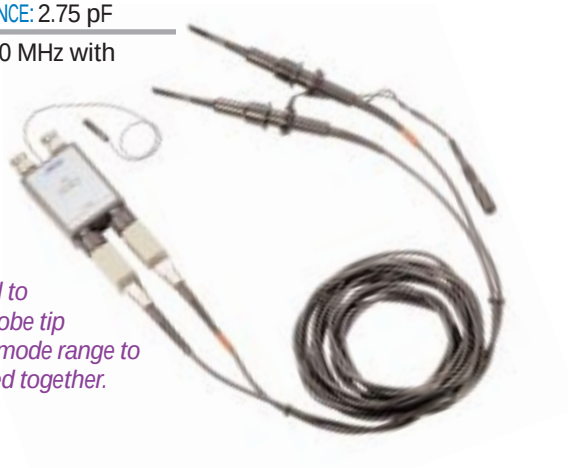
MAX INPUT VOLTAGE (SYSTEM):
±400 V tip to tip, DXC5100 only
±4000 V tip to tip, DXC5100 with DA101

INPUT RESISTANCE: 10 MΩ

INPUT CAPACITANCE: 2.75 pF

BANDWIDTH: 100 MHz with DA1855A

CABLE LENGTH: 3.1 m



The DXC5100 extends the voltage measurement capability of the DA1855A. With the DXC5100, the common mode range is extended to ±2500 V tip to ground, and the differential mode range is ±400 V probe tip to probe tip. Adding the DA101 attenuator extends the differential mode range to ±4000 V probe tip to probe tip, and is recommended to be purchased together.

DXC200 ÷1 differential probe pair

MAX. INPUT VOLTAGE: ±500 V tip to ground

INPUT RESISTANCE:
1 MΩ or 100 MΩ (with DA18xxA)

INPUT CAPACITANCE: 50 pF (with DA18xxA)

BANDWIDTH: 100 MHz with DA1855A

CABLE LENGTH: 0.7 m

The DXC200 is a non-attenuating passive probe pair intended for applications that require maximum system gain with minimal capacitive loading. When used with the DA1822A or DA1855A, the DXC200 is ideal for differential voltage measurements across high-current shunt resistors, characterizing bus bar losses, etc.

Current Probes

CP015 Current Probe

MAX CONTINUOUS CURRENT: 15 A DC or RMS

MAX PEAK PULSE CURRENT: ±50 A (< 10 ms)

BANDWIDTH: 50 MHz

MINIMUM SENSITIVITY: 20 mA/div,
10 mA/div on some oscilloscope models

CABLE LENGTH: 2 m

MAX CONDUCTOR DIAMETER: 5 mm

The CP015 offers a smaller probe head size with lower maximum current capability than the AP015. It is ideal for current measurement applications in tight areas.

CP150 Current Probe

MAX CONTINUOUS CURRENT: 150 A DC or RMS

MAX PEAK PULSE CURRENT: ±500 A (< 30 ms)

BANDWIDTH: 10 MHz

CABLE LENGTH: 2 m

MAX. CONDUCTOR DIAMETER: 20 mm

The CP150 provides higher current measuring capability with the convenience of direct oscilloscope connection.

Ordering Information

Ordering Information

PowerMeasure Systems		Product Code
LT374 Four channel 500 MHz DSO; 2-4 GS/s sampling rate with 250 kpts mem/ch*, DA1855A, DXC100A, AP015, DCS015 and PMA1 Software.		PS374
LT354 Four channel 500 MHz DSO; 1 GS/s sampling rate with 250 kpts mem/ch**, DA1855A, DXC100A, AP015, DCS015 and PMA1 Software		PS354
LT264 Four channel 350 MHz DSO, 1 GS/s sampling rate with 100 kpts mem/ch***, DA1855A, DXC100A, AP015, DCS015 and PMA1 Software		PS264
*Option M: 1 Mpt/ch; Option L: 4 Mpt/ch		
**Option M: 1 Mpt/ch; Option ML: 2 Mpt/ch		
***Option M: 1 Mpt/ch		
System Components for Custom Configurations		
SOFTWARE:		
PowerMeasure Analysis		PMA1†
DIFFERENTIAL AMPLIFIERS: ††		
1 ch. 100 MHz Differential Amplifier with Fast Overdrive Recovery and 100 kHz, 1 MHz, and 20 MHz BW filters		DA1855A†
2 ch.100 MHz Differential Amplifier with Fast Overdrive Recovery and 100 kHz, 1 MHz, and 20 MHz BW filters		DA1855A-PR2
1 ch. 10 MHz Differential Amplifier with X1,X10, X100, and X1000 Gain and selectable LP and HP BW filters		DA1822A
2 ch. 10 MHz Differential Amplifier with X1,X10, X100, and X1000 Gain and selectable LP and HP BW filters		DA1822A-PR2
DIFFERENTIAL PASSIVE PROBES:		
÷100 or ÷10 Selectable, 250 MHz Passive Differential Probe Pair		DXC100A†
÷1 Passive Differential Probe Pair		DXC200
÷100 2.5 kV Passive High Voltage Probe Pair	Requires DA101 for full performance	DXC5100
÷10 1 MΩ Passive Attenuator	Recommended with DXC5100	DA101
CURRENT PROBES:		
30 Amp, 50 MHz Current Probe	AC/DC, 30 Amp Rms, 50 Amp Peak Pulse	AP015†
15 Amp, 50 MHz Current Probe	AC/DC, 30 Amp Rms, 50 Amp Peak Pulse	CP015
150 Amp, 10 MHz Current Probe	AC/DC, 150 Amp Rms, 500 Amp Peak Pulse	CP150
ACCESSORIES:		
Deskew Calibration Source		DCS015†
Other Power Accessories		
HIGH-VOLTAGE DIFFERENTIAL PROBES:		
1,400 V 100 MHz Differential Probe	÷100 / ÷1000, ProBus Powered, with Scale Factor Readout	ADP305
1,400 V 20 MHz Differential Probe	÷100 / ÷1000, ProBus Powered, with Scale Factor Readout	ADP300
15 MHz Differential Probe	700 V, ÷10 / ÷100, Battery Powered, w/o Scale Factor Readout	AP031
HIGH-VOLTAGE PASSIVE PROBES:		
÷10/÷100, 200/300 MHz, 5 MΩ/50 MΩ High Voltage Probe	600 V/1.2 kV Max. Voltage DC + Peak AC	PPE1.2KV
÷100, 400 MHz, 50 MΩ High Voltage Probe	5 kV Max. Voltage DC + Peak AC	PPE5KV
÷1000, 100 MHz, 50 MΩ High Voltage Probe	20 kV (40 kV Peak) Max. Voltage DC + Peak AC	PPE20KV

† Included in PowerMeasure Systems

†† Rackmounts are available, 2U height. Add – RM extension when ordering. Example: DA1855A-PR2-RM.

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