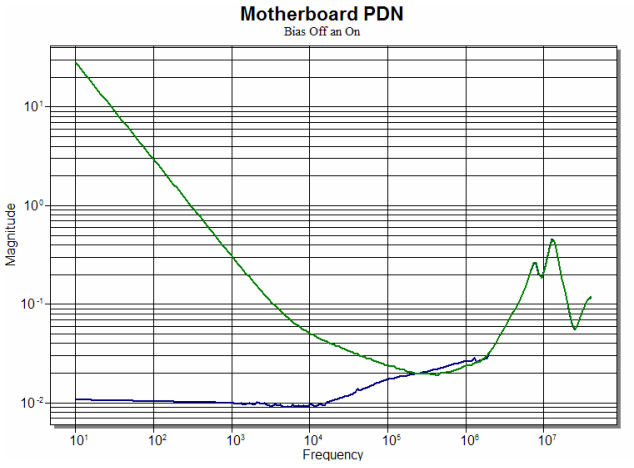
P4800
Power Delivery Network Analyzer

Ultimetrix

The Ultimetrix P4800 Power Delivery Network Analyzer was developed to allow you to verify the performance of your high-speed IC package or PCB power delivery systems. Higher switching speeds, larger switching currents, and reduced voltage noise margins have made power delivery increasingly challenging. Without a measurement solution designed to accurately measure tens of micro-ohms of impedance from nearly DC to well into the GHz region, you cannot be sure whether your design is going to achieve the level of performance you require.



Get to the Root of Switching Noise

The performance demands placed on power delivery networks in IC packages and on PCB's are steadily increasing as direct results of a number of stubbornly persistent trends such as:

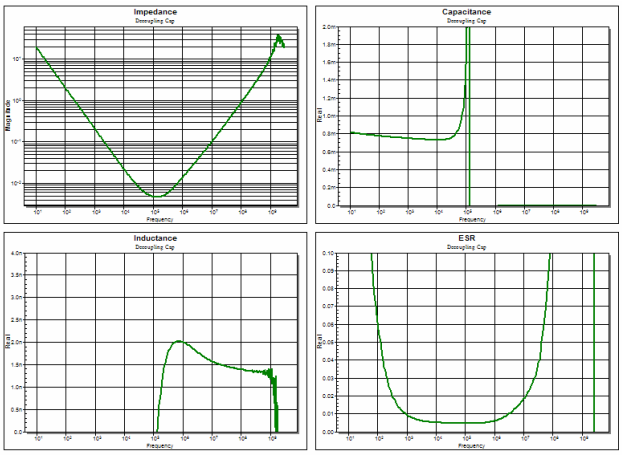
- Faster switching speeds
- Higher currents
- Lower supply voltages, and
- Reduced voltage margins

Meeting these demands requires improved performance from the power delivery network in terms of:

- Lower impedance, and
- Wider bandwidth

A critical piece of the power delivery design cycle was missing before the Ultimetrix P4800, namely, an instrument designed for measuring the characteristics of ultra-low impedance power delivery networks. Without real measured data, understanding how your device performs can be a guessing game.

The P4800 can be used for assessing whether the voltage to a device will stay within its noise margin when it switches, and also whether the switching of one device will adversely affect the voltage supplied to another device.



Productivity Enhancing Features

The P4800 makes accurate swept frequency measurements starting at 10Hz and extending to GHz frequencies with optional 3rd party add-on instruments.

Exceptional measurement dynamic range allows devices with impedances below 25 micro-ohms to be measured. This is equivalent to determining, for example, when 5mV of noise will occur as a result of 200A being switched.

The frequency range and measurement range of the P4800 make it ideal for evaluating:

- IC packages
- PCB's
- De-coupling capacitors
- VRM's

Using the P4800 allows you to systematically determine such factors as:

- Effectiveness of de-coupling strategy,
- Detrimental effects of excess inductance of planes, vias, or feed lines,
- Presence of excess noise caused by another device,
- And more

Flexible data formatting and export options aid in understanding the true behavior of these types of devices, and in developing equivalent circuit models for use in system-level

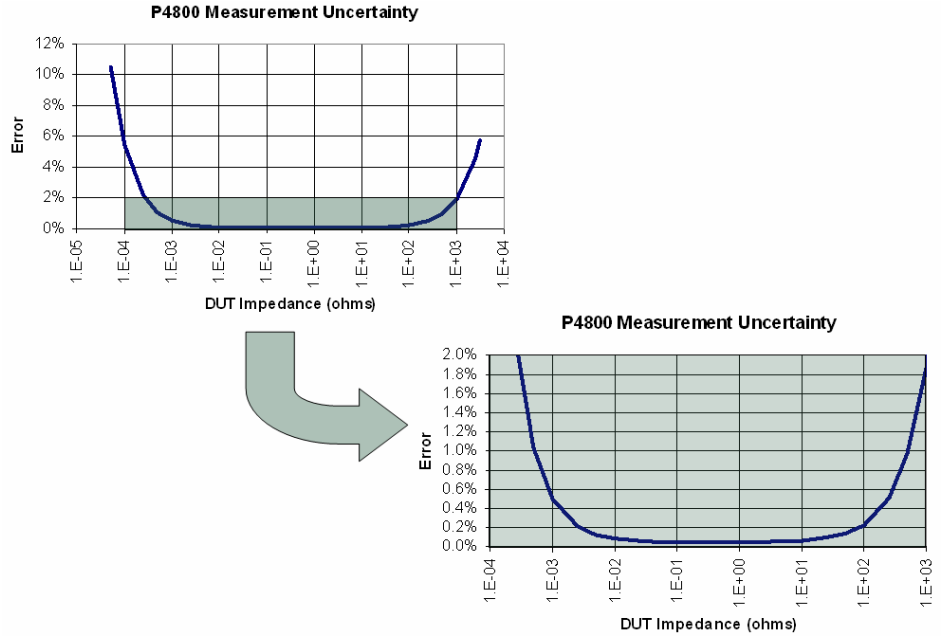
Flexible Configuration

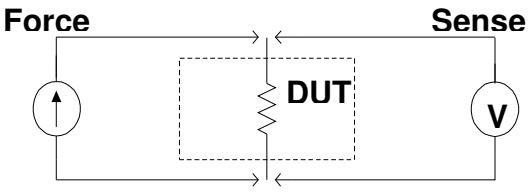
The P4800 system consists of hardware that interfaces to your DUT and to the USB port of your PC, and software which handles all of the hardware control, error correction, and user interface features.

With Ultimetrix hardware and software alone, the P4800 is capable of measuring the impedance of devices from 10Hz to 40MHz. By adding additional 3rd party instruments, the frequency range can be seamlessly extended into microwave frequencies.

The operation and features of the P4800 are identical regardless of the configuration you select. Therefore, as your needs change and you find it necessary to extend the performance of your system, you will already know how to use the features on which you have come to trust and rely.

Connection to the 3rd party hardware is done directly to the P4800, so no additional PC interfaces are required to take advantage of the extended frequency capability. Additional calibration options are available through the software for the higher frequencies, though, so as to achieve the most accurate results possible across the entire band of operation.





The 4-Point Impedance Measurement Technique

The measurement of very low resistance values at DC becomes difficult using a standard ohm meter and a 2-point measurement technique. The limit occurs when the contact resistance becomes significant compared to the resistance of the DUT.

However, very low value DC resistance measurements can be reliably and accurately made using a 4-point technique where one pair of contacts is used to inject a signal into the DUT, and a second pair of contacts is used to sense the resulting signal across the DUT.

This same proven principle is applied in the P4800 by using a signal source swept over frequency in place of the DC current source, and a high dynamic range tuned receiver in place of the DC volt meter. The result is a system that can measure tens of micro-ohms of impedance well into the GHz frequency range.

PC Requirements

Minimum 512 MB of memory
Minimum 20 MB available storage space
USB 1.1 or 2.0
Microsoft Windows 2000/XP

Optional Add-On Instruments

Agilent 8753ES (3GHz and 6GHz)
Agilent N5230A (6GHz, 13.5GHz, and 20GHz)
Agilent E8362B (20GHz)

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