

電池耗電流與電源完整性測試

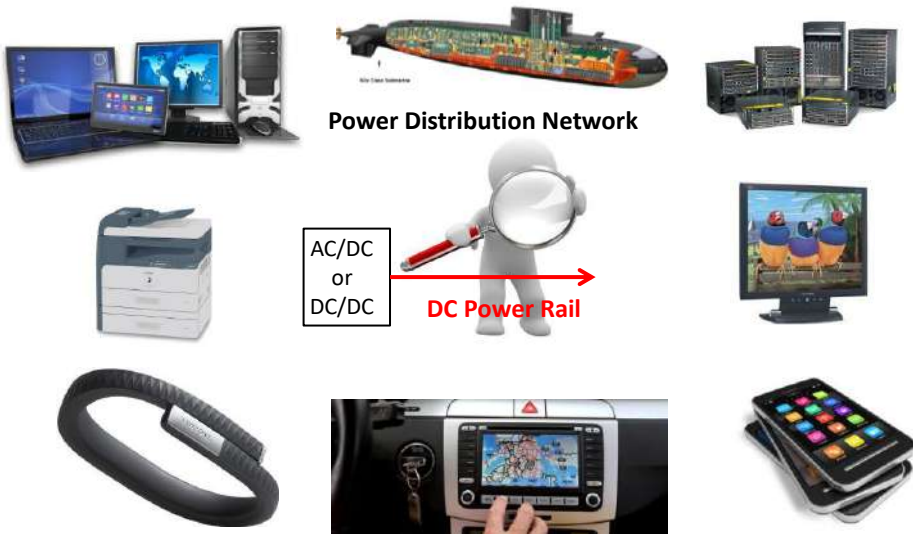
主講人: 曾國鈞
品勛科技股份有限公司
(Keysight正式授權經銷商)



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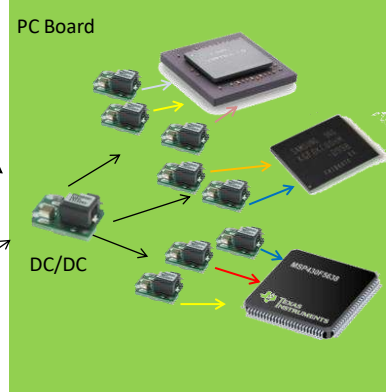
Power Supply is Everywhere



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Power Distribution Network



Power Integrity: Study the effectiveness of delivering DC power from DC-DC converter to the gates of the IC

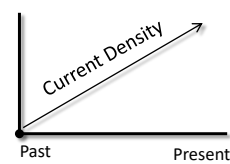
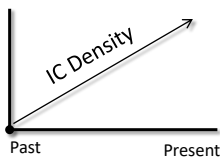
SSD: 12+
Tablet: 24+
Network switch: ~56
Next gen mobile: ~200



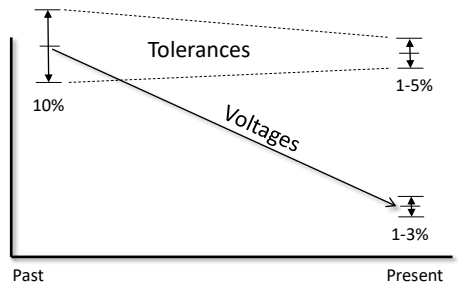
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The Case For Power Integrity



Goal: improve power consumption with each generation

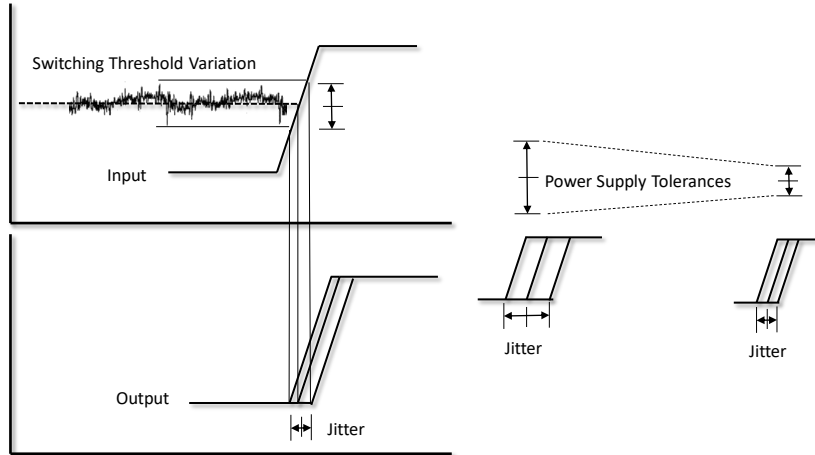


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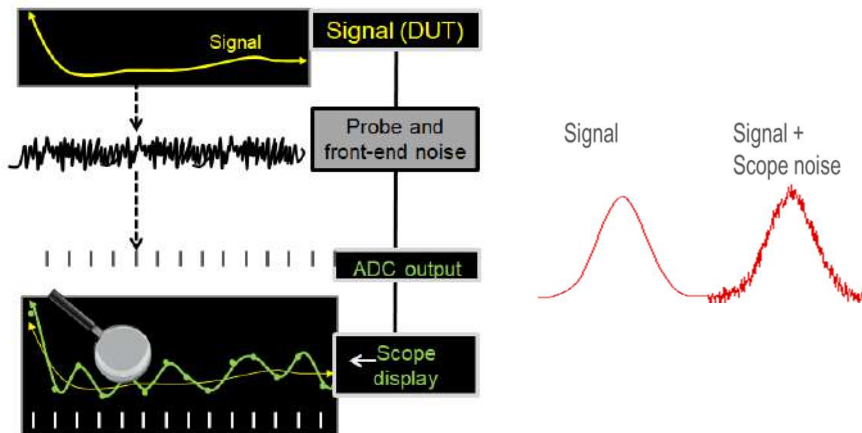
The Case For Power Integrity

» Power supply noise causes clock/data jitter



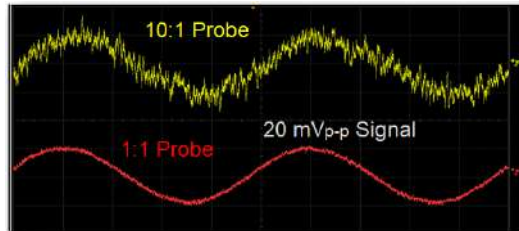
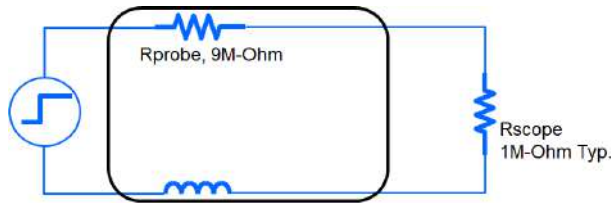
Ripple Noise Measure Challenge -- One

» Oscilloscope Noise Floor



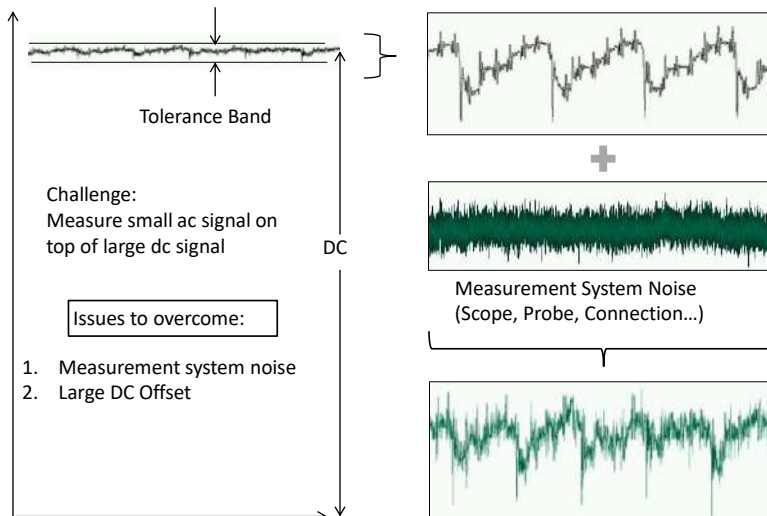
Ripple Noise Measure Challenge -- Two

» x10 Passive Probe is Attenuating Signals and Good Antenna



Ripple Noise Measure Challenge -- Three

» Need to Handle Offset Voltage



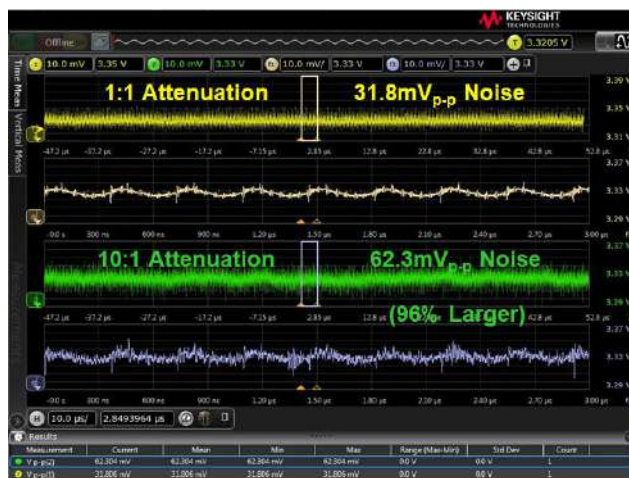
Low Noise

» Scope Input Termination—Lowest Noise Path

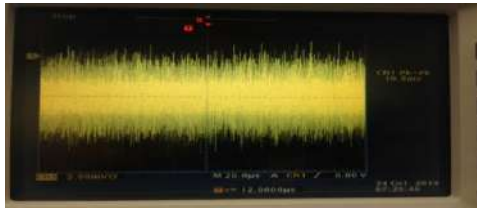
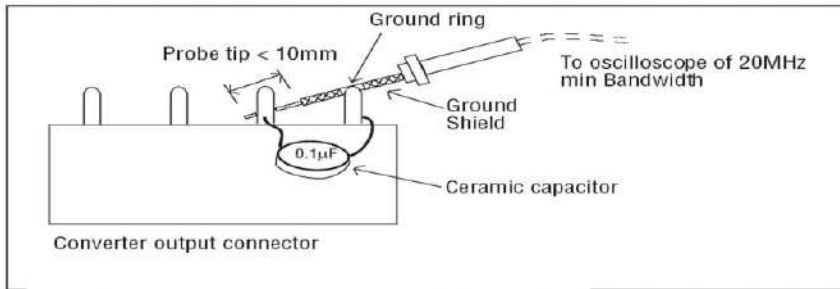


Low Noise

» Attenuation Ratio Effects Noise

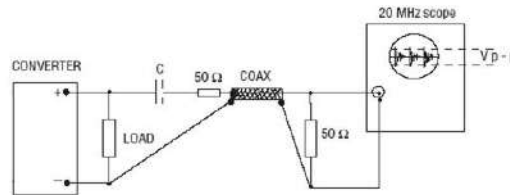


Typical Ripple Noise Measure Setup # 1



- X10 Passive Probe
 - Robust, cheap
 - Signal is attenuated by 10
 - The 10M-Ohm Impedance is sensitive for coupling noise

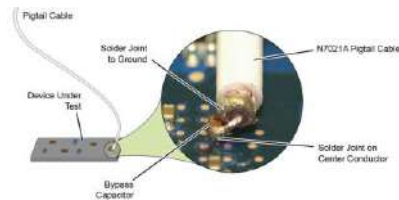
Typical Ripple Noise Measure Setup #2



- Coaxial Cable with DC-Blocker
 - Easy to use
 - Filtering low frequency contents
 - Loading effect

N7020A Power Rail Probe

1. Low noise
 - 1:1 for great signal-to-noise ratio
 - 50Ω termination for superior noise immunity
2. Support for popular rail voltages
 - +/- 24V offset range
3. Low Loading
 - 50kΩ at DC minimizes loading of power rail
4. High Bandwidth
 - 2GHz for capturing high speed/frequency noise and transients that can cause clock/data jitter



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Meet the Infiniium EXR-Series

Specifications

Analog channels	4 or 8
Bandwidth	500 MHz → 2.5 GHz
Sample rate	16 GSa/s
Memory	100 Mpts/ch → 400 Mpts/ch
Resolution	10 bits, 16 with high-res
Logic channels	16 (dedicated connector)
Integrated tools	7-in-1 : Digital Oscilloscope Digital Voltmeter Logic Analyzer (MSO) Counter Protocol Analyzer Function Generator Frequency Response Analyzer



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Power Up/Down Sequencing / PMIC Test – Standard

- Mask testing on every channel
- “One page report” with timing measurements and failures on screen
- Analyze control signals with protocol trigger/decoding

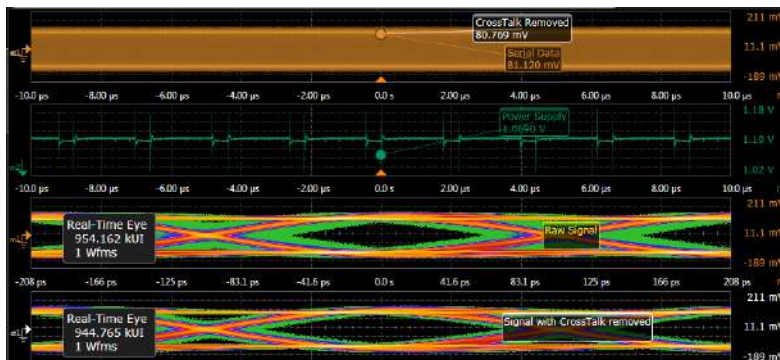


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Power Distribution – D9010POWA

- Measure DC power rail quality with N7020A probe solution
- Perform “what if” analysis by simulating a cleaner power rail and seeing the net benefits to signal integrity



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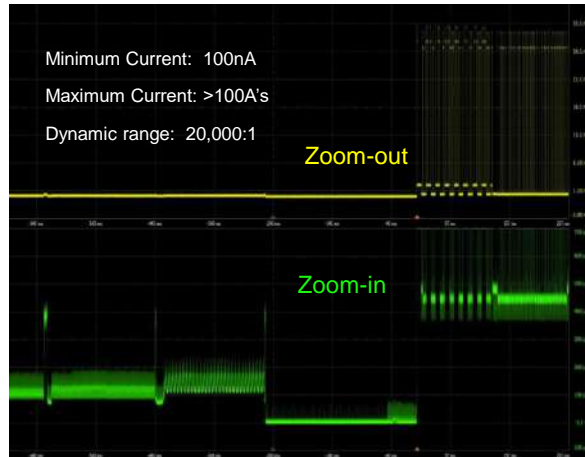


Power Consumption – N2820A/N2821A

Industry's only shunt resistor current probe:
N2820A-Series Current Probes

- ✓ High Sensitivity
- ✓ High Dynamic Range
- ✓ R_{SENSE} : 1mΩ to 1MΩ

Capture and analyze low level current flow in the device under test to characterize sub-circuits or measure current consumption of wireless battery-powered devices or integrated circuits



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How to Solve Power Rail Challenges

» Measure dynamic current and voltage with confidence

Precision Scope

- Wide bandwidth
- Fast sampling rate



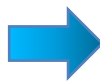
DMM

- High sensitivity
- Low noise

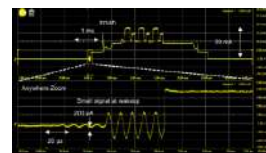


Data Logger

- Long measurement



CX3300A Series



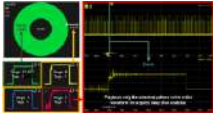
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CX3300A Series Device Current Waveform Analyzer

» Powerful measurement and analysis solution



	Scope Mode	Data Logger Mode
ADC	14-bit /16-bit	
Bandwidth	200 MHz	
Maximum Sampling rate	1GSa/s (14-bit) 75MSa/s (16-bit)	10MSa/s (14-bit) 7.5MSa/s (16-bit)
Maximum Measurement duration	Memory size / sampling rate	100 hours 



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Thanks for your attention!!



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