

Power integrity measurements with R&S®RTM3000 and R&S®RTA4000 oscilloscopes

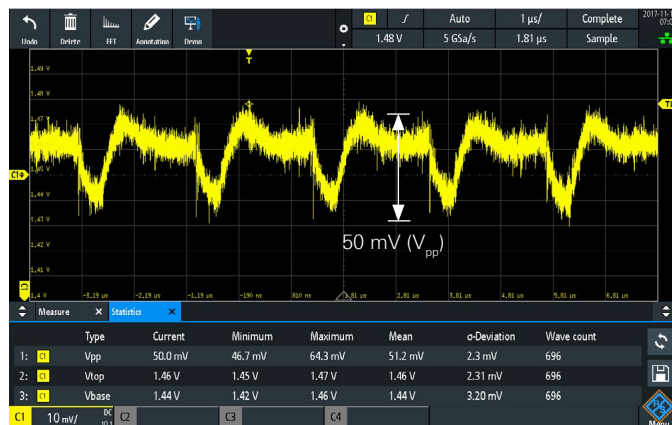


R&S®RTA4004 oscilloscope.

Make more accurate power rail measurements.

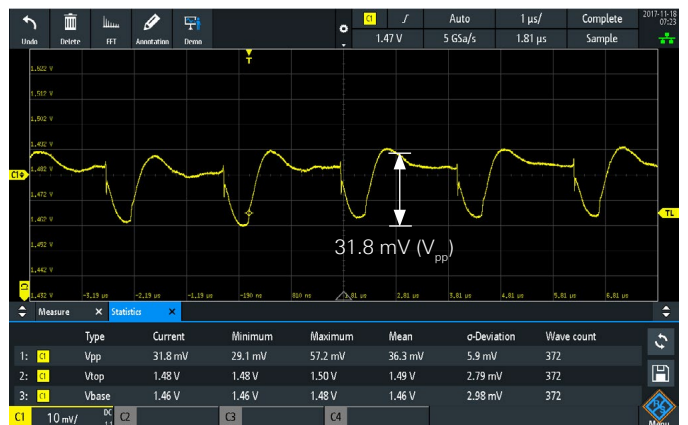
Your task

Measuring noise and ripple on power rails with small voltages and increasingly tighter tolerances is a challenge for oscilloscopes. Using a standard 500 MHz passive probe with a 10:1 attenuation results in additional measurement noise, causing overstated peak-to-peak voltage measurements and masking signal details as shown below.



Measurement of a 1.5 V power rail using an R&S®RT-ZP10 10:1, 500 MHz passive probe (50 mV (V_{pp}), noise masks signal details).

Passive probes with 1:1 attenuation have less noise, but are bandwidth limited to around 35 MHz. They miss higher frequency content that may be riding on the power rail and may understate peak-to-peak-voltages.



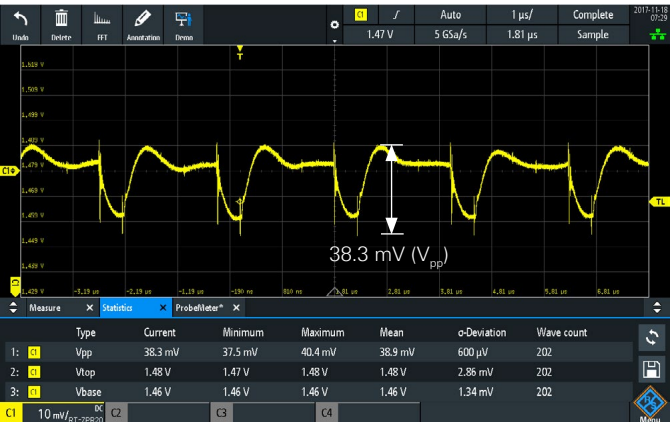
Measurement of a 1.5 V power rail using an R&S®RT-ZP1x 1:1 passive, 38 MHz probe (31.8 mV (V_{pp})). Bandwidth limiting eliminates the ability to see higher frequency transients.

Our solution

Combining a low-noise oscilloscope with a power rail probe, developed uniquely for measuring power rails, provides a measurement system that delivers measurements that are more accurate. The R&S®RT-ZPR20 active probe with a 1:1 attenuation ratio has very little noise and enough bandwidth to not attenuate critical signal content.

When combined with an R&S®RTA4000 or R&S®RTM3000 oscilloscope, the R&S®RT-ZPR20 power rail probe provides the following benefits:

- The probe's 1:1 attenuation provides minimal noise for a system noise of less than 500 µV (at 1 GHz bandwidth and 10 mV/div)
- With ±60 V of built-in offset, users can center and zoom in a wide variety of DC rail voltage standards without worrying about how much built-in offset the scope has. The offset eliminates the need to use AC coupling or DC blocking capacitors, which impede the ability to see true DC values and drift



Measurement of a 1.5 V power rail using an R&S®RT-ZPR20 1:1 active power rail probe (–38.3 mV (V_{pp})). The captured waveform includes higher frequency transients riding on the rail.

- High-frequency transients and coupled signals are isolated. The probe's rated bandwidth is 2 GHz. When used with an R&S®RTA4000 or R&S®RTM3000, overall bandwidth is set by the oscilloscope bandwidth
- 50 kΩ DC input impedance minimizes loading, so DC values remain accurate
- An integrated 16-bit probe meter provides a simultaneous five-digit readout of each power rail's DC value

A power integrity package consisting of an R&S®RTA4004 200 MHz 4-channel oscilloscope, one power rail probe, and a spectrum analysis and spectrogram option can be ordered as a bundle at a reduced price. Bandwidth upgrades and additional probes or options can be added separately.



R&S®RT-ZPR20 power rail probe.

Ordering information			
Consisting of	Type	Power integrity measurement package	Order No.
Oscilloscope, 200 MHz, 4 channels	R&S®RTA4004	R&S®RTA4K-PI	1335.7917P02
Power Rail Probe	R&S®RT-ZPR20		
Spectrum Analysis and Spectrogram	R&S®RTA-K18		

