Keysight Technologies
N2804A and N2805A
High Voltage Differential Probes

Data Sheet

KEYSIGHT TECHNOLOGIES

The N2804A and N2805A differential probes provide superior general-purpose differential signal measurements that are required for high-speed power measurements such as measuring characteristics of switching power devices, DC-DC converters or class D amplifiers, vehicle bus measurements, and high-speed digital system designs. Both probes are powered by the oscilloscope's AutoProbe interface.

Both probes allow conventional earth-grounded Keysight oscilloscopes to be used for safe floating signal measurements. Because of outstanding common mode rejection ratio of the probes across the full frequency ranges, probes allow measurement of small differential signal in the presence of much larger common mode signals typically found in power measurements.

The N2804A 300-MHz differential probe offers 100:1 attenuation ratio, allowing it to be used adequately for high voltage signal measurements. The differential probe has a differential input resistance of 4 MΩ and low input capacitance of 4 pF to minimize circuit loading. The probe comes with a pair of extension leads (30 cm long) with a damping resistor built in to damp out the in-band resonance and provide flat frequency response even while using the extension leads and probe tip accessories.

The N2805A is a 200-MHz differential probe designed to provide superior differential signal measurements with long cable length (5 m), making it ideal in an environment where extended cable length is required. This probe comes with an extensive set of probe tip accessories for use with small and large components in tight spaces.

Figure 1. N2804A 300-MHz differential probe with standard accessories.

Figure 2. N2805A 200-MHz differential probe with standard accessories.

Product number	N2804A	N2805A
Bandwidth [1] (–3 dB)	300 MHz (without extension leads)	200 MHz
	120 MHz (with extension leads)	
Rise time (calculated, 0.35/Tr, 10 to 90%)	1.167 ns	1.75 ns
Attenuation	100:1	50:1
DC gain accuracy [1] (% of reading)	± 1%	± 1%
Input R//C (each side to ground)	2 MΩ//3 pF	2 MΩ//8 pF
Input R//C (between inputs)	4 MΩ//1.5 pF	4 MΩ//4 pF
Max differential operating voltage	± 300 V (DC+ peak AC) and ± 200 Vrms	± 100 V (DC+ peak AC) and ± 100 Vrms
Max common mode operating voltage	± 300 V (DC+ peak AC) and ± 200 Vrms CATII	± 200 V (DC+ peak AC) and ± 200 Vrms CAT II
	± 1000 V (DC+ peak AC) and ± 1000 Vrms (Main Isolated)	± 500 V (DC+ peak AC) and ± 500 Vrms (Main Isolated)
Max non-destructive voltage (each side to ground)	± 300 V (DC+ peak AC) and ± 200 Vrms CATII	± 300 V (DC+ peak AC) and ± 200 Vrms CATII
	± 1000 V (DC+ peak AC) and ± 1000 Vrm (Main Isolated)	± 500 V (DC+ peak AC) and ± 500 Vrms (Main Isolated)
Probe noise (referred to probe input)	90 mVrms	30 mVrms
Output termination	50 Ω AutoProbe interface	50 Ω AutoProbe interface
Output offset (typical)	< ± 2 mV (adjustable)	< ± 2 mV (adjustable)
Adjustable offset range	–80 mV to + 80 mV or larger	–80 mV to + 80 mV or larger
CMRR (typical)	–80 dB at 60 Hz, –50 dB at 10 MHz	–80 dB at 60 Hz, –50 dB at 10 MHz
Temperature – operating	–10 to 40 °C	–10 to 40 °C
Temperature – non-operating	–30 to 71 °C	–30 to 71 °C
Humidity – operating	25 to 85% RH	25 to 85% RH
Humidity – non-operating	25 to 85% RH	25 to 85% RH
Altitude – operating	3,000 m	3,000 m
Altitude – non-operating	15,300 m	15,300 m
Length of BNC cable	1.2 m	5 m
Probe input lead	Φ2 mm, 12 cm without extension leads	Φ4 mm, 16.5 cm
	39 cm with extension leads	
Dimension	111 mm x 22 mm x 14 mm	111 mm x 22 mm x 14 mm
Standard accessories	2 each alligator clips	2 each alligator clip
	2 each pincer clips	2 each hook clips
	2 each extension leads (30 cm)	2 each pincer clips
	1 trimmer tool (for offset adjustment)	2 each browser tips
	8 color-coded rings	1 trimmer tool (for offset adjustment)
		8 color-coded rings
Safety specifications	IEC61010-031	IEC61010-031

1. Warranted specifications.

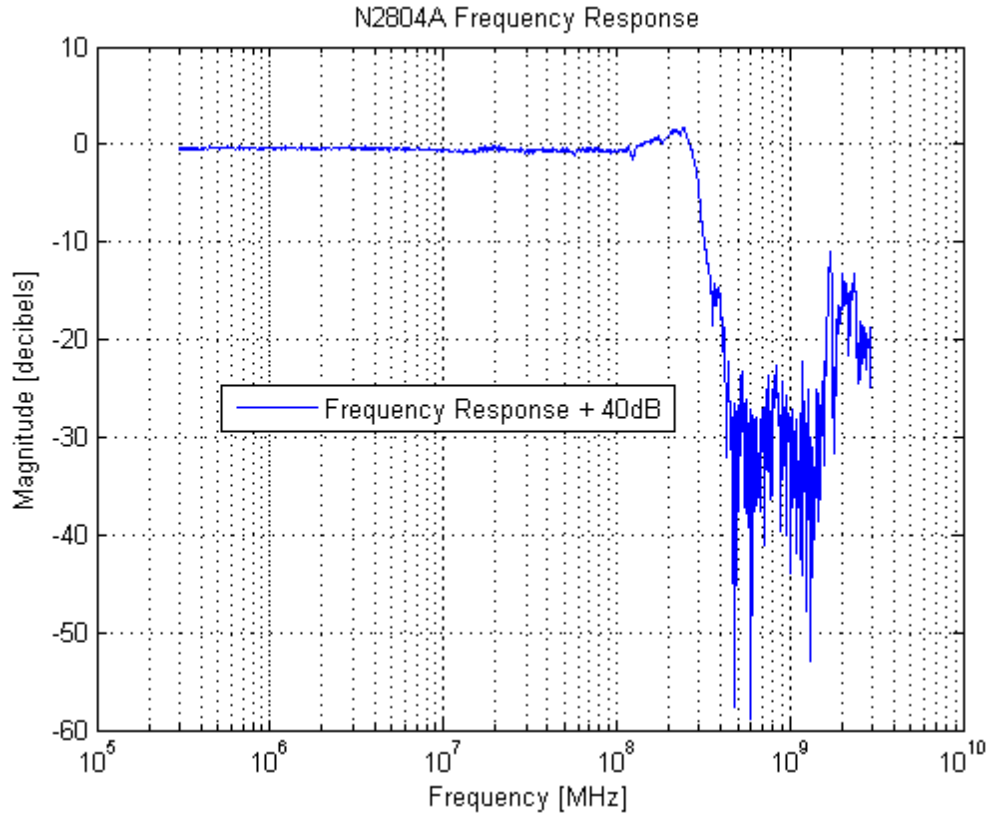

Figure 3. N2804A frequency response.

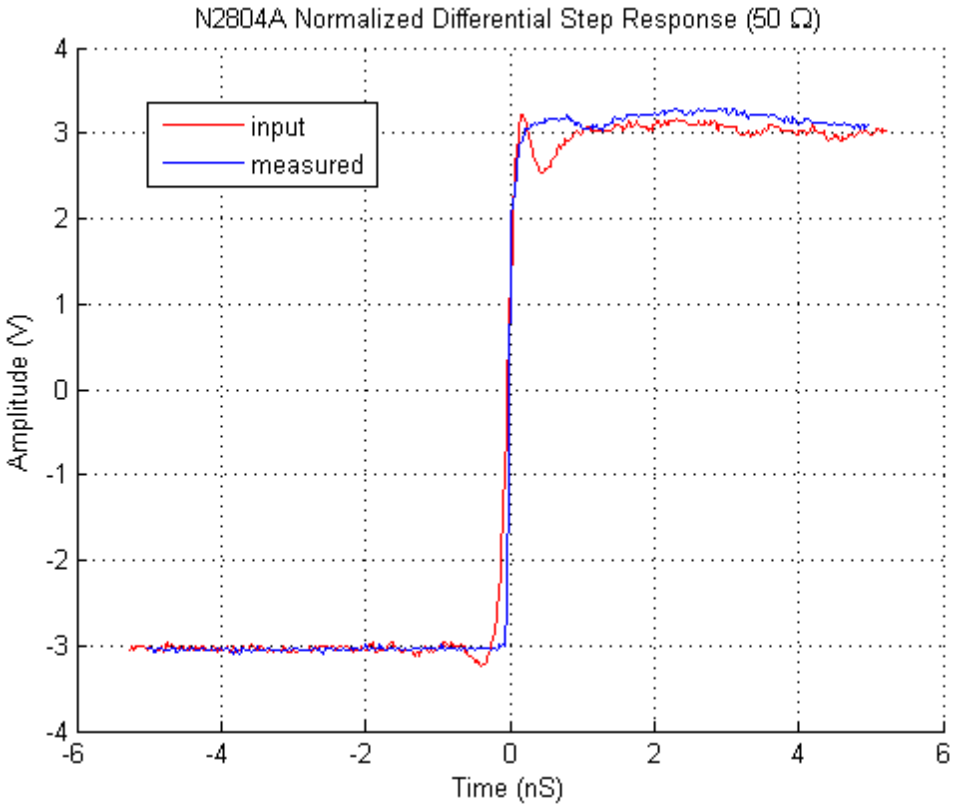

Figure 4. N2804A step response (normalized).

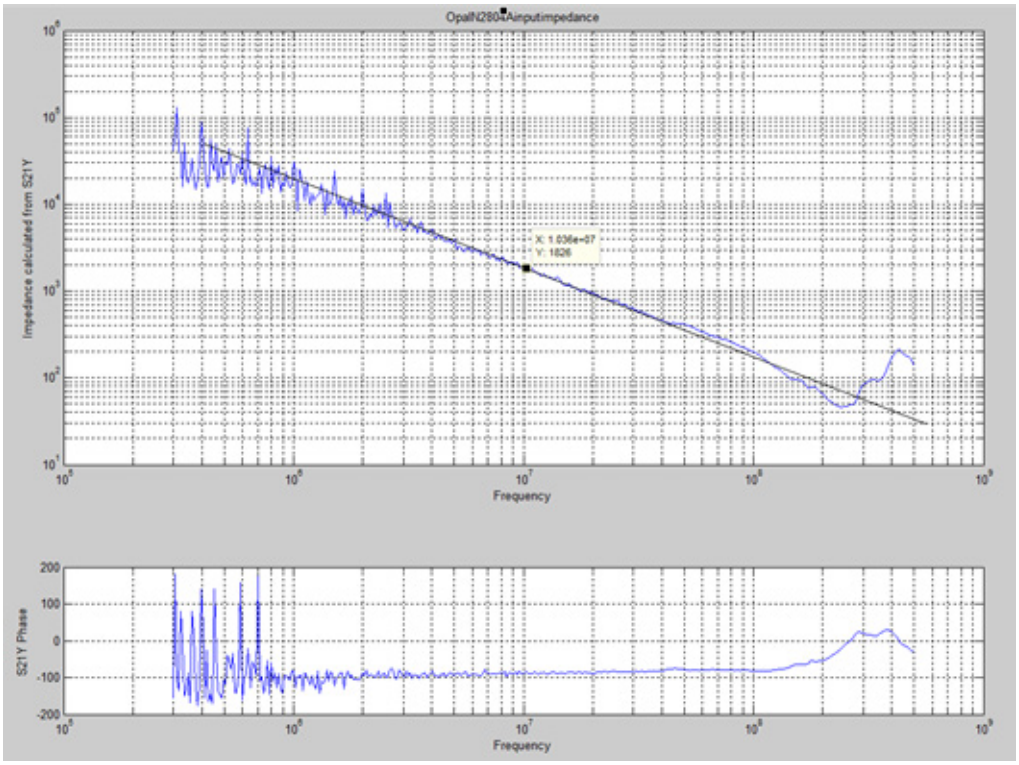

Figure 5. N2804A input impedance over frequency (between two inputs).

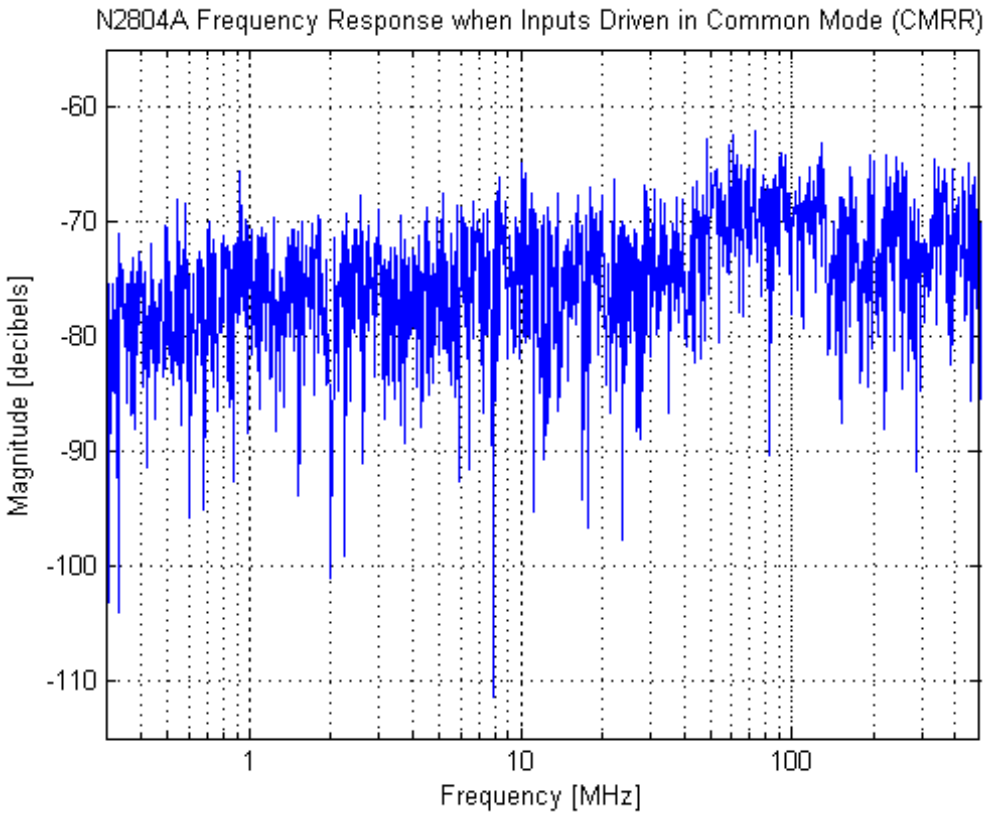

Figure 6. N2894A common mode rejection ratio,

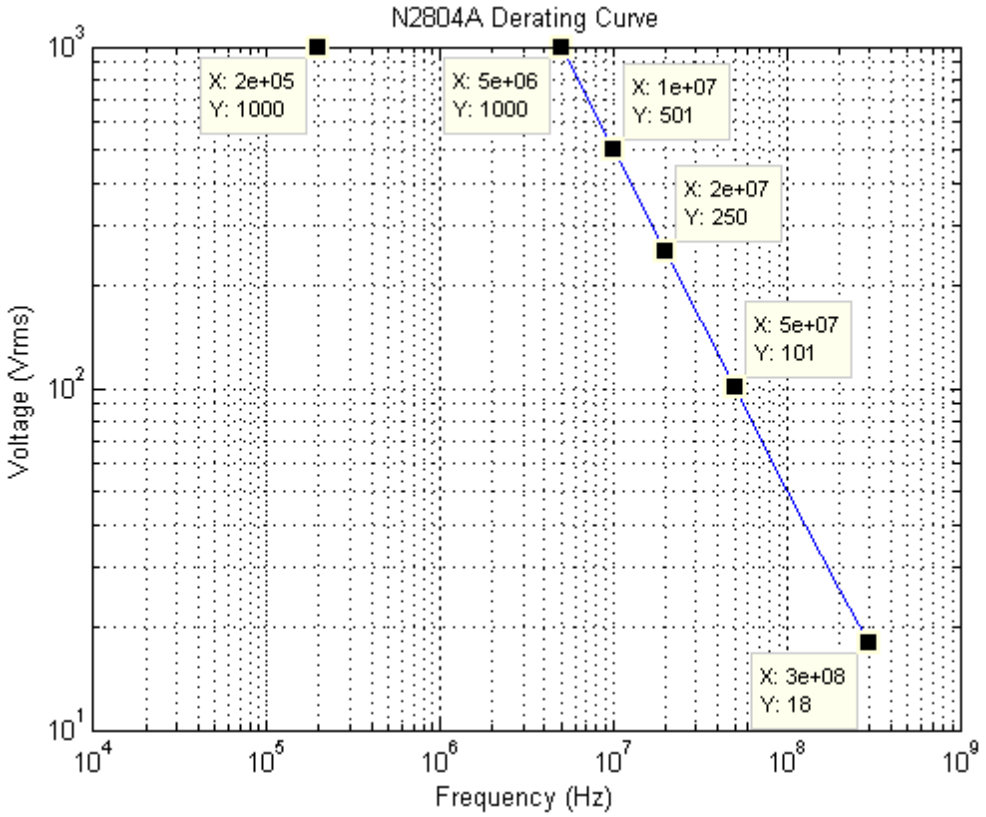

Figure 7. N2804A derating characteristics over frequency.

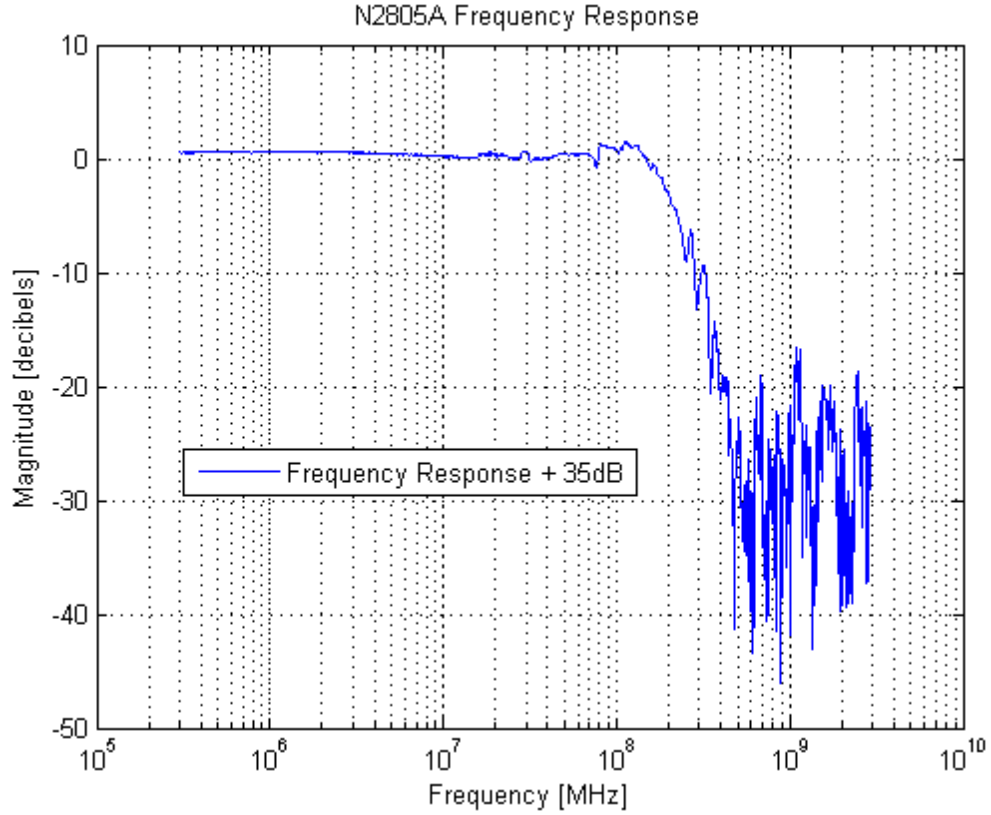

Figure 8. N2805A frequency response.

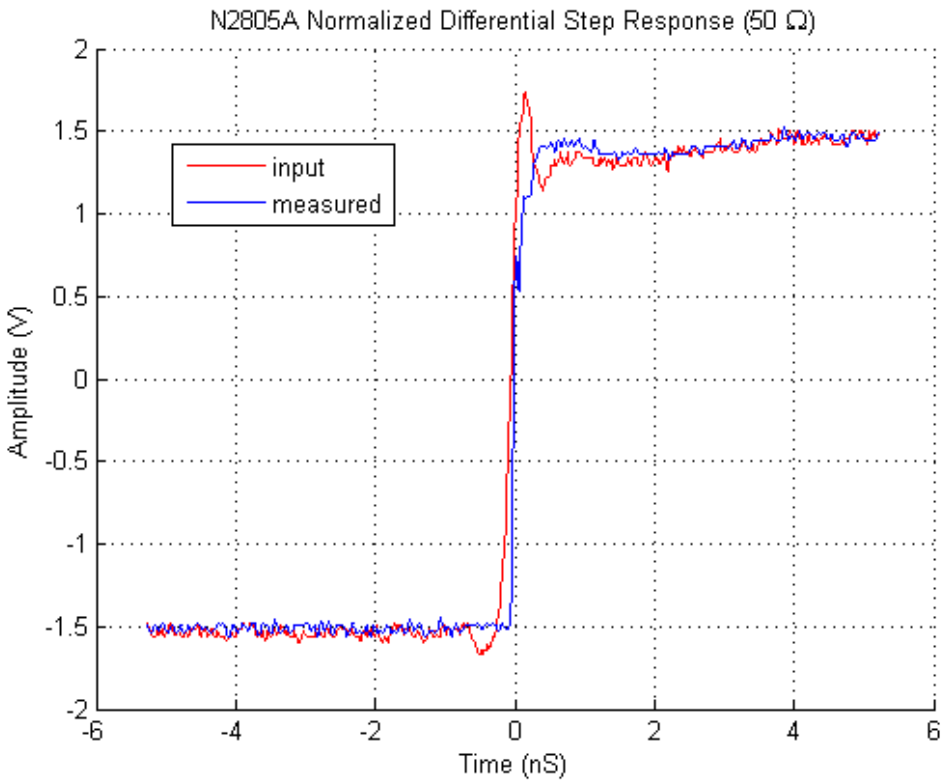

Figure 9. N2805A step response (normalized).

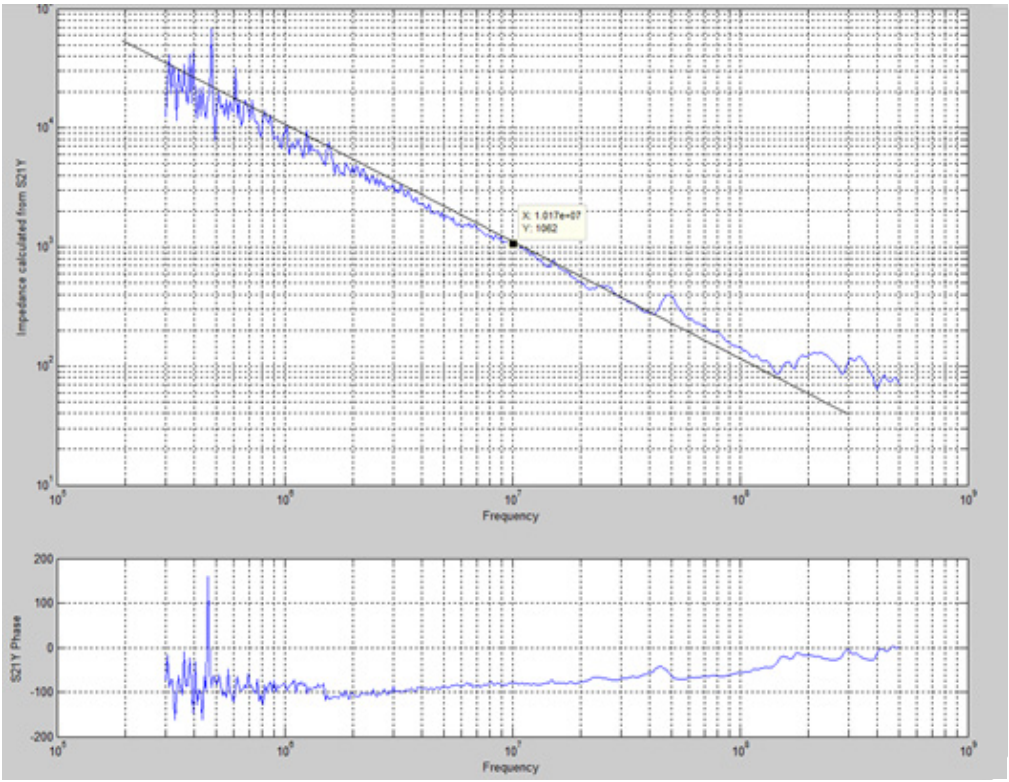

Figure 10. N2805A input impedance over frequency (between two inputs).

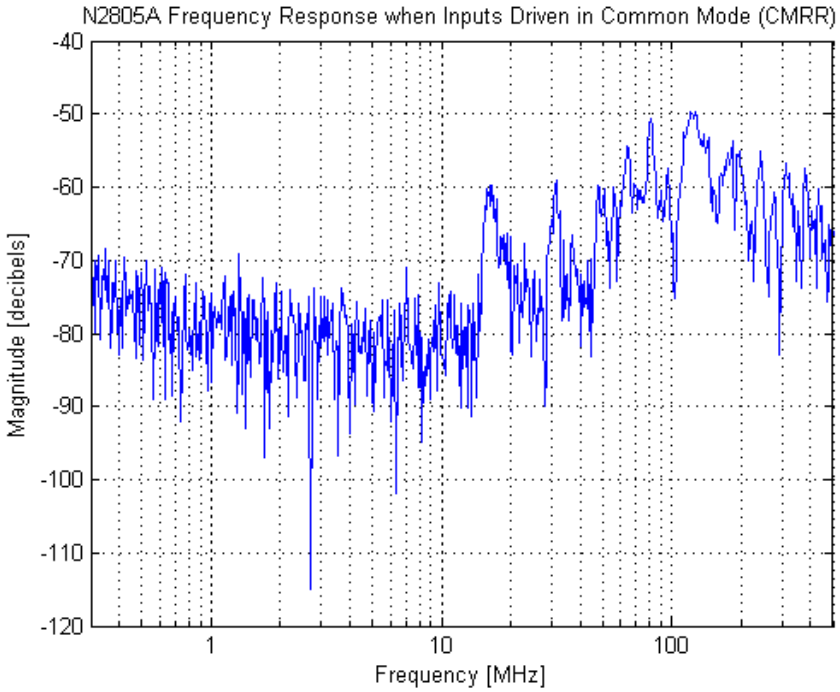

Figure 11. N2805A common mode rejection ratio.

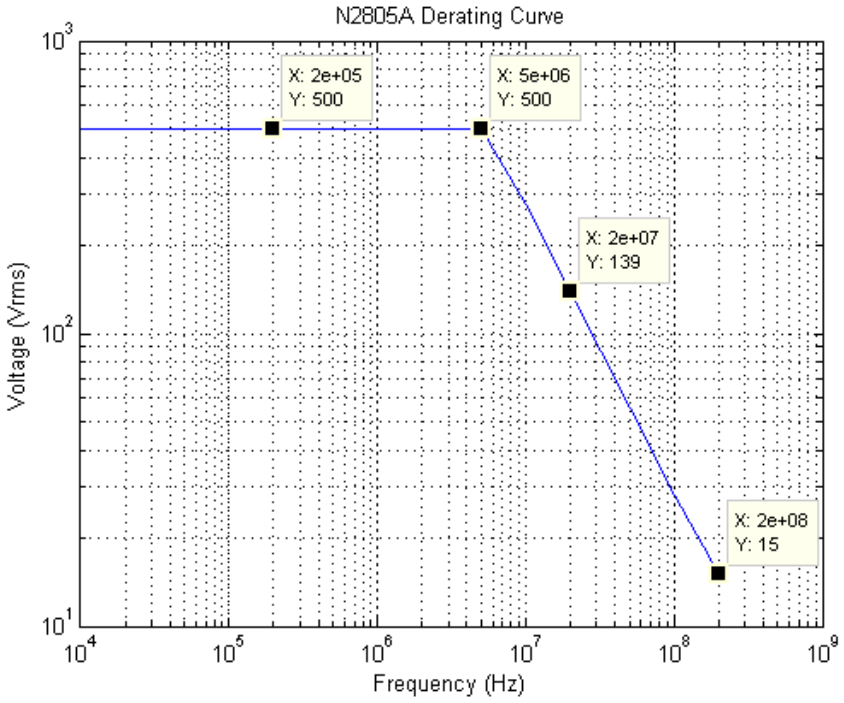

Figure 12. N2805A derating characteristics over frequency.

Ordering Information

Product number	Description
N2804A	300 MHz high voltage differential probe
N2805A	200 MHz high voltage differential probe with extended cable length
N2816A	Probe tip accessory kit for N2804A including 2 each alligator clips, 2 each pincer clips, and 1 extension leads (30 cm)
N2817A	Probe tip accessory kit for N2805A including 2 each alligator clips, 2 each hook clips, 2 each pincer clips, and 2 each browser tips
N7014A	Banana-to-socketed adapters (1 pair) for N2805A for connecting to 0.025” square pins (headers)

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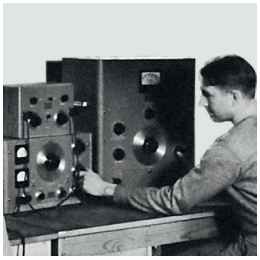

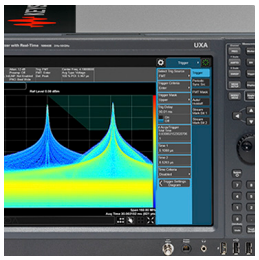

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