

Power Supply Functional Test System

Engineering Characterization/ Design Verification Test 5700

APPLICATION

The PowerScope Design Verification Test (DVT) measurement suite provides an integrated hardware and software solution for rapidly gathering and reporting extensive power supply characterization data. Built around a high-speed waveform digitizer combined with powerful software tools, PowerScope allows the user to analyze the power supply's characteristics interactively and/or create DVT test sequences from a comprehensive library of characterization tests. Test results are now available in hours rather than weeks and months. The end result are greatly improved power supply development and qualification times, both previously a bottleneck to rapid time-to-market business goals.

WAVEFORM ANALYSIS

The key instrument in the PowerScope measurement suite is a high-speed waveform digitizer optimized for power supply characterization measurements. The digitizer operates by simultaneously capturing up to 3 analog waveforms along with as many as 16 digital signals. Then, once all the waveforms of interest are viewed on a single screen, the user can quickly specify a virtually unlimited number of measurements, including those from waveform-to-waveform and waveform-to-signal. The built-in measurement library includes Voltage, Timing, Frequency, Spectrum, Harmonics, Mean, Median, Over/Undershoot, Peak-to-Peak, Peak-min/max, Phase, and RMS. Between 15 and 25 of such measurements per waveform capture comprise a typical test step in a 30-to 40-step power supply characterization test.

HIGH SAMPLE RATE AND DEEP MEMORY

The waveform digitizer's solution to capturing a fast, non-repetitive signal with a relatively long separation



from its triggering event is two fold. First, the 200MSample/Sec A/D provides the necessary resolution for the type of fast transients found in power supplies. Second, is the deep memory of up to 32MSample/ channel, which allows both a high time resolution and long capture period.

AUTOMATIC SWEEP TESTS

Sweep tests involving recording of any parameter across the full range of input and/or output conditions are straight-forward to create, execute and graph. This is accomplished through a standard PowerScope test routine that allows this type of test to be accomplished in minutes.

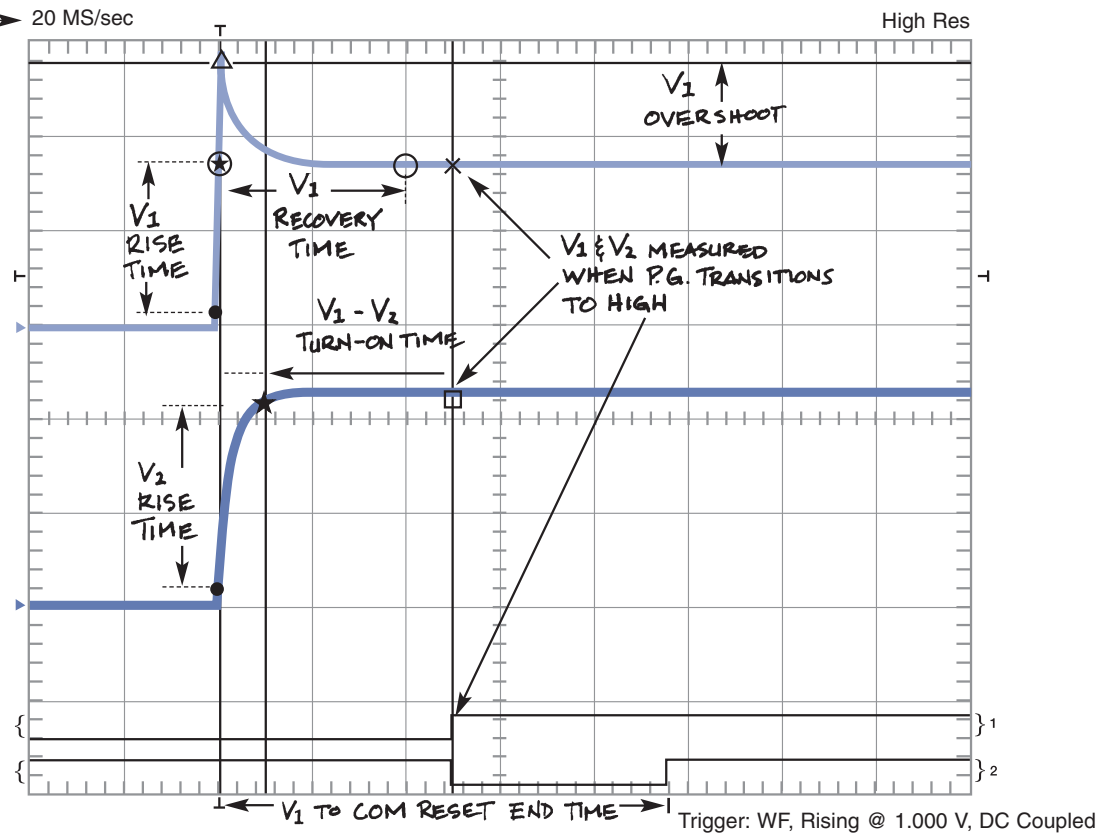
ISOLATED AND DIFFERENTIAL MEASUREMENTS

The PowerScope waveform digitizer improvements over non-isolated, single-ended DSOs are many. The most significant are isolated and differential measurements. This has two distinct benefits: more accurate measurements through the elimination of ground noise and the elimination of a UUT short circuit should measurement grounds be inadvertently connected.

POWERSCOPE WAVEFORM CAPTURE

Step	Label	Minimum	Actual	Maximum	Result
1	Turn-On Tests				
	V1 Overshoot	0.000 V	2.280 V	2.750 V	Pass
	V1 Recovery Time	10.000 mS	39.308 mS	50.000 mS	Pass
	V1 Rise Time	0.000 S	807.650 uS	2.000 mS	Pass
	V2 Rise Time	0.000 S	9.069 mS	12.000 mS	Pass
	V1 to V2 Turn-On Time	0.000 S	9.238 mS	12.000 mS	Pass
	V1 to P.G. HIGH Time	0.000 S	49.258 mS	50.000 mS	Pass
	V1 to COM RESET End Time	75.000 mS	95.159 mS	150.000 mS	Pass
	V1 @ P.G. HIGH	3.210 V	3.378 V	3.390 V	Pass
	V2 @ P.G. HIGH	1.075 V	1.099 V	1.175 V	Pass

8-32 MB/ch
FACILITATES THE
CAPTURE OF
FAST EVENTS
AT A LARGER
TIME BASE



20.000 mS/div

Wf1, Chn 011, 2 V/div.

Wf2, Chn 010, 600 mV/div.

UNLIMITED CURSORS
AND MARKERS
IDENTIFY THE
EXACT POINT
WHERE THE
MEASUREMENT
WAS TAKEN

V1 Overshoot: Max = Δ WF1: Chn 011 @ 40.957 mS, 5.539 V

V1 Recovery Time: Start = \circ WF1: Chn 011 @ 40.643 mS, 3.400 V: Stop = \circ WF1: Chn 011 @ 79.951 mS, 3.378 V

V1 Rise Time: Start = \bullet WF1: Chn 011 @ 39.835 mS, 185.597 mV: Stop = \bullet WF1: Chn 011 @ 40.643 mS, 3.400 V

V2 Rise Time: Start = \bullet WF2: Chn 010 @ 40.812 mS, 1109.169 mV: Stop = \bullet WF2: Chn 010 @ 49.881 mS, 1.073 V

V1 to V2 Turn-On Time: Start = \star WF1: Chn 011 @ 40.843 mS, 3.400 V: Stop = WF2: Chn 010 @ 49.881 mS, 1.073 V

V1 @ PG HIGH: Event = X Digital @ 89.881 mS, 3.378 V

V1 @ PG HIGH: Event = \square Digital @ 89.881 mS, 1.099 V

Wf1 = V1; Wf2 = V2; DIG#1 = P.G.; DIG#2 = COM RESET

