

Model 4500E
Step Generator

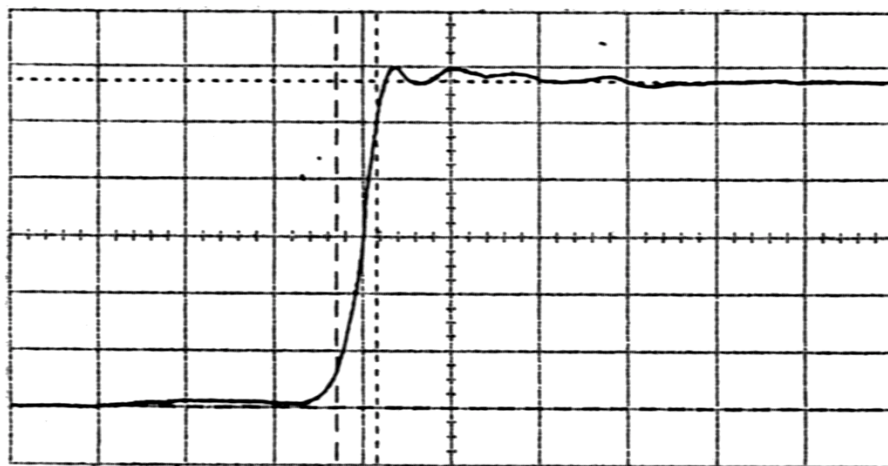
- 100 ps Risetime
- 35 V Amplitude
- 1.5 ps Jitter



The Model 4500E Step Generator is a fast risetime, 100 ps, high amplitude, 35 V step generator. The amplitude can be adjusted from 35 V to 3.5 mV in 1 dB steps with microwave quality step attenuators. Special attention was given in the design to provide extremely stable pulses. The timing jitter is only 1.5 ps rms.

With the addition of optional accessories, other pulse waveforms may also be obtained. A negative polarity pulse can be obtained by using a Model 5100 Inverting Transformer. DC offset can be accomplished with a Model 5550B Bias Tee.

There are many applications for the 4500E. They include semiconductor switching time measurements, laser diode research, and measuring the step responses of traveling wave oscilloscopes, coaxial cable and other wideband components.



6 V/div and 200 ps/div
35V, 85 ps rise, Step Pulse

Waveform measured by an HP-54121A, 17.5 rise, digital sampling scope

Output Pulse Parameters [1]	
Amplitude into 50 Ω	35 V, 30 V min.
Attenuation	0 to 81 dB in 1 dB steps, 50 Ω
Polarity	Positive
Baseline	0 V
Risetime (leading edge)	100 ps, 125 ps max.
Step Duration [2]	20 ns
Precursor	3%
Overshoot	2%, 5% max.
Topline Perturbations	$\pm 2\%$
Falltime (trailing edge)	1 ns

Trigger Output and Timing	
Amplitude	10 V into 50 Ω
Waveform	Exponential
Risetime	1 ns
Duration	9 ns
Delay	21 ns trig in/out, 0 to 110 ns trig out/step, adjustable in 10 ns steps.
Delay Jitter	1.5 ps rms, (3 ps rms max.)
Repetition Rate	100 kHz to 1 Hz in 5 ranges with 0.1 to 1.0 vernier.
Ext. Trigger Input Level	>1.5 V, (+) slope

General Specifications	
Controls	Power, Rep. Rate/Ext. Trig., Rep. Rate Vernier, Single Pulse, Delay, Attenuation
Connectors	35 V pulse out: SMA, Charge line In/out: SMA, Trig. In/out: BNC
Power Required	100, 115 or 230 V AC, 50/60 Hz, 22 VA (50 Hz), 17 VA (60 Hz)
Operating Environment	Indoors, 0 C to 50 C, < 80%rh
Safety Certifications	Conforms to EN-061010-1 (CE mark) UL-1244 and IEC-348. Safety class I. For lab use only by qualified personnel
EMI Certifications	Conforms to EU Directive 89/336/EEC EN55011 and EN55082-1, CE mark
Calibration	Test report with waveforms is furnished. NPL/NIST-traceable.
Warranty	One year. See Terms and Conditions of Sale for details.
Accessories Included	6" cable, power cord, front handles and rack mount brackets, instruction manual, and video
Dimensions	3.5" x 17" x 13" (8.9 x 43.2 x 33 cm)
Weight	15 lbs (6.8 kg), 20 lbs (9.1 kg) shipping

Notes

[1] These are typical performance parameters as measured using an HP-54121A, 17.5 ps digital sampling oscilloscope and (2) PSPL 5510-20 dB attenuators. These parameters are only guaranteed when max./min. limits are given.

[2] The duration is set by an internal, 20 ns, 50 Ω coaxial cable charge line. A rear panel SMA connection is provided to allow other length, external charge lines to be used (3 ns/ft.). With no charge line, a narrow pulse of < 1 ns is obtained. For durations in excess of 20 ns, the topline of the pulse will sag, the falltime will be slower and some spurious pulses will occur on the topline. Do not exceed a duty cycle of 1% max., nor a max. duration of 250 ns.