



AVG-1 Output (10 kHz, 50 V/div, 2 ns/div)

- PW as low as 1 ns, amplitudes to 920 Volts
- PRF to 50 kHz
- Rise times as low as 0.5 ns
- Stand-alone lab instruments, or miniature modules
- IEEE-488.2 GPIB and RS-232 control (-B units)

The AVG series of high voltage impulse generators includes units providing pulse widths (measured at the 20% rise time point) in the range of 1 to 10 ns, amplitudes from 120V to 1 kV, and pulse repetition rates to 50 kHz. All models require a 50 Ohm load.

The AVG-1 family generates < 4 ns impulses at repetition rates up to 30 kHz. For repetition rates below 10 kHz, the maximum amplitude is 240V. The maximum amplitude at 10-30 kHz falls to 180V.

The AVG-2 family provides 120 Volt, < 2 ns output. The AVG-2A family offers the same amplitude, but offers a narrower < 1 ns output.

The AVG-3 family provides up to 500 Volts with a half-power pulse width of < 5 ns. Model AVG-3A-C is similar but features a pulse width at the 20% rise point of < 4 ns and a rise time of less than 1 ns.

The AVG-3B family provides 420 Volt, < 2.7 ns outputs.

For much higher power applications, see the AVG-4A and AVG-4B families, which respectively provide peak outputs of 600 and 800 Volts and 20% rise time point pulse width of < 5 ns and < 6 ns. The AVG-4C family provides a peak output of 920 V with a pulse width of < 8 ns.

The pulse repetition frequency of is variable from 100 Hz to 50 kHz (to 20 kHz for Model AVG-3-C and to 10 kHz for Models AVG-4A-C, AVG-4B-C and AVG-4C-C) using the internal clock oscillator. A delay control and a sync output are provided for sampling scope triggering purposes. The units can also be triggered externally by a TTL-level pulse.

Either output polarity or an optional dual output polarity can be provided. Polarity inversion in dual polarity units is accomplished by means of a rear-panel two-position switch. A DC offset or bias insertion option is available with most units. Units with this option include a circuit similar to Model AVX-T at the output. The required DC offset or bias is applied directly to rear-panel solder terminals. All models are available with a monitor option and with optional analog electronic control (0 to +10V) of the output amplitude.

Instruments with the “-B” suffix include a complete computer control interface (see page 8 for details). This provides GPIB and RS-232 computer-control, as well as front panel keypad and adjust knob control of the output pulse parameters. A large back-lit LCD displays the output amplitude, polarity, frequency, pulse width, and delay. To allow easy integration into automated test systems, the programming command set is based on the SCPI standard, and LabView drivers are available for download at the Avtech web site ([www.avtechpulse.com](http://www.avtechpulse.com)).

The -C versions provide output pulse parameters similar to those of the -B models, but do not include the GPIB or RS-232 interfaces (i.e. no computer control or LCD display). The output parameters are controlled by front-panel switches and one-turn controls. Models with the -B or -C suffixes require 100 – 240 V, 50 – 60 Hz prime power.

Some AVG models are available in DC powered (+15V) miniature module form. These modules require a TTL input trigger signal.



AVG-1 Module



AVG-3B-C-PN



## SPECIFICATIONS

## AVG SERIES

Model:	AVG-1-C <sup>1</sup> AVG-1-B <sup>2</sup> AVG-1	AVG-2-C <sup>1</sup> AVG-2-B <sup>2</sup> AVG-2	AVG-2A-C <sup>1</sup> AVG-2A-B <sup>2</sup> AVG-2A	AVG-3-C <sup>1</sup> AVG-3-B <sup>2</sup> AVG-3	AVG-3A-C <sup>1</sup> AVG-3A-B <sup>2</sup> AVG-3A	AVG-3B-C <sup>1</sup> AVG-3B-B <sup>2</sup> AVG-3B	AVG-4A-C <sup>1</sup> AVG-4A-B <sup>2</sup> AVG-4A	AVG-4B-C <sup>1</sup> AVG-4B-B <sup>2</sup>	AVG-4C-C <sup>1</sup>
Amplitude <sup>3,4,10</sup> : (50 Ω load <sup>9</sup> )	40-240 V <sup>8</sup>	15-120 V		75-500 V	70-420 V		90-600 V <sup>11</sup>	120-800 V <sup>11</sup>	150-920 V <sup>11</sup>
Pulse width: (at 20% rise time)	≤ 4 ns	≤ 2 ns	≤ 1 ns	≤ 5 ns (at half-power)	≤ 4 ns	≤ 2.7 ns	≤ 5 ns	≤ 6 ns	≤ 8 ns
Rise time: (20%-80%)	≤ 2 ns	≤ 1 ns	≤ 0.4 ns	≤ 2 ns	≤ 1 ns	≤ 0.9 ns	≤ 1.5 ns	≤ 2 ns	≤ 2.5 ns
Fall time: (80%-20%)	≤ 2 ns	≤ 1 ns	≤ 0.4 ns	≤ 10 ns	≤ 2.5 ns	≤ 0.9 ns	≤ 3 ns	≤ 3.5 ns	≤ 4 ns
PRF:	0 to 30 kHz	0 to 50 kHz		0 to 20 kHz			0 to 10 kHz		
Polarity <sup>5</sup> :	Positive or negative or both (specify)								
GPIB and RS-232 control <sup>2</sup> :	Standard on -B units. Not available on -C units or modules.								
LabView Drivers:	-B units only: check <a href="http://www.avtechpulse.com/labview">http://www.avtechpulse.com/labview</a> for availability and downloads								
Propagation delay:	≤ 50 ns (Ext trig in to pulse out)								
Jitter:	± 100 ps (Ext trig in to pulse out)								
DC offset:	-OS option <sup>6</sup> : Apply required DC offset (± 50 Volts, 250 mA DC max) to rear-panel solder terminals								
Trigger required:	Modules, and -C & -B external trigger mode: +5 Volts, 50 to 500 ns (TTL)								
Sync delay:	Sync out to pulse out, -C and -B units only: Variable 0 to 200 ns								
Sync out:	+ 3 Volts, 200 ns, will drive 50 Ohm loads (-B and -C units only)								
Gate input:	Active high or low, switchable. Suppresses triggering when active. (-B units only)								
Monitor output:	Optional <sup>7</sup> : Provides a 20 dB attenuated coincident replica of main output								
Connectors:	-C & -B units: Out: SMA <sup>9</sup> , Trig, Sync, Gate (-B only): BNC Modules: In, Out: SMA, Power: Solder terminal								
Dimensions: (H x W x D)	-C & -B units: 100 mm x 430 mm x 375 mm (3.9" x 17" x 14.8"). Modules: 43 mm x 76 mm x 152 mm (1.7" x 3.0" x 6.0").								
Power:	-C & -B units: 100 – 240 Volts, 50 – 60 Hz Modules: +15 Volts, 200 mA								
Chassis material:	Cast aluminum frame & handles, blue vinyl on aluminum cover plates								
Mounting:	Any								
Temp. range:	+5°C to +40°C								

- 1) -C suffix indicates stand-alone lab instrument with internal clock and line powering. No suffix indicates miniature module requiring DC power and external trigger.
- 2) -B suffix indicates IEEE-488.2 GPIB and RS-232 control of amplitude, pulse width, PRF and delay (see <http://www.avtechpulse.com/gpib>).
- 3) For operation at amplitudes of less than 20% of full-scale, best results will be obtained by setting the amplitude near full-scale and using external attenuators on the output.
- 4) For electronic control (0 to + 10 V) of amplitude, suffix the model number with -EA. Electronic control units also include standard front-panel one-turn controls. The -EA option will cause the maximum available output amplitude to be reduced by 10%, due to the loss that the additional circuitry introduces.
- 5) Indicate desired polarity by suffixing model number with -P or -N (i.e.

- positive or negative) or -PN for the dual polarity option. (-PN available only on -B and -C units). AVX-1 transformer may be used to invert polarity.
- 6) For DC offset option suffix model number with -OS.
- 7) For monitor option add suffix -M.
- 8) Falls to 180V for PRF above 10 kHz.
- 9) A 50 Ohm load is required. Other loads may damage the instrument. Consult Avtech ([info@avtechpulse.com](mailto:info@avtechpulse.com)) if you need to drive other load impedances.
- 10) Maximum amplitudes are for positive outputs only. The maximum negative amplitude for -N and -PN units will be approximately 10% lower, due to the use of an internal inverting transformer.
- 11) The maximum available output amplitude will decrease by 10% for pulse repetition frequencies above 5 kHz.