AVTECH

GPIB IEEE-488

AVI SERIES
40, 50 AND 100 VOLT
PULSE GENERATORS
WITH RISE TIMES TO 200 ps

40 VOLTS / DIV
2 NS / DIV

AVI-V   AVI-MP

AVI-V-C

- 200 ps rise times, amplitudes to 100V
- IEEE-488.2 GPIB Control (-B units)

- PW variable from 1.0 to 100 ns
- Stand-alone lab instruments or miniature modules

The AVI series provides high amplitude (as high as 100 Volts) flat-topped pulses with rise times as low as 200 ps and fall times of 2 ns.

The AVI-V family has rise times of 350 ps, pulse widths of 2 to 100 ns, variable amplitudes to 50V, and repetition frequencies up to 20 kHz. The AVI-V-HV1-TR family is similar, but have non-adjustable amplitudes of 50V, with faster 250 ps rise times.

The 40V AVI-V-2L family offers operation at pulse repetition frequencies as high as 100 kHz, with 500 ps rise times. The pulse width is adjustable from 1 to 10 ns, using front-panel controls.

The higher-voltage AVI-V-HV2 family provides rise times of 500 ps, pulse widths variable from 4 to 100 ns, variable amplitudes of up to 100V, and pulse repetition frequencies of up to 5 kHz. The AVI-V-HV3 family is similar, but offers faster 250 ps rise time operation.

The AVI-MP module offers high performance in an ultra-compact size. The AVI-MP has a fixed amplitude of 40V, with 350 ps rise time. The pulse width may be varied from 2 to 100 ns by varying the length of an external delay line. Maximum PRF is 1 MHz when operating at minimum pulse width, and 20 kHz at maximum pulse width. Specifically, PW (in ns) × PRF (in kHz) ≤ 2000.

Models with -C or -B suffixes include an internal oscillator, whose PRF is variable up to 100 kHz (40V models), 20 kHz (50V models), or 5 kHz (100V models) using the front-panel controls. (The minimum PRF is 4 decades below the maximum PRF). A delay control and a sync output are provided for oscilloscope triggering. All models can also be triggered externally with a TTL-level pulse, at any PRF between 0 Hz and the maximum rated value.

Either output polarity can be provided. A dual-polarity option is available on most models. Polarity inversion in dual polarity -C units is accomplished by means of an inverting transformer module which mates to the pulse generator output port. Polarity inversion in computer-controllable -B units is accomplished internally, without need for external transformers. A DC offset or bias insertion option is available. 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. Some models are available with a monitor option that provides an attenuated (20 dB or X10) coincident replica of the main output pulse. Additional options include electronic control (0 to +10V) of output amplitude and pulse width.

Instruments with the -B suffix include a complete computer control interface (see http://www.avtechpulse.com/gpib) 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 (http://www.avtechpulse.com/labview). 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. Please note that the output amplitude is not adjustable on the AVI-MP model, or models with the -TR suffix. -C and -B models require 100-240V, 50-60 Hz prime power.

Some models are also available in a DC-powered (+15V) miniature module form. These modules require a TTL input trigger signal and the output PRF equals the input trigger PRF.

Model: -C format: -B format (with GPIB): Module format:	AVI-V-C[1] AVI-V-B[2] AVI-V	AVI-V-HV1-TR-C[1] AVI-V-HV1-TR-B[2] AVI-V-HV1-TR	AVI-V-HV2-B[2]	AVI-V-HV3-C[1]	AVI-V-2L-B[2] AVI-V-2L	AVI-MP
Amplitude (50Ω load required)[3,4]:	0-50 V, variable	50 V, fixed	0-100 V, variable		0-40 V, variable	≥ 40 V, fixed
Rise time (20%-80%):	≤ 350 ps	≤ 250ps	≤ 500 ps	≤ 250 ps	≤ 500 ps	≤ 350 ps
Fall time (80%-20%):	≤ 3 ns		≤ 4 ns		≤ 750 ps	≤ 2 ns
Pulse width (FWHM)[4]:	2 to 100 ns		4 to 100 ns		1 to 10 ns	2 to 100 ns
Maximum pulse repetition frequency (PRF):	20 kHz		5 kHz		100 kHz	1 MHz (2ns PW)[9] 20 kHz (100ns PW)[9]
Propagation delay:						≤ 70 ns
Polarity[5]:	Positive or negative or both (specify[5])					Pos or Neg (-P or -N)
GPIB and RS-232 control[2]:	Standard on -B units. Not available on -C units or modules.					
LabView Drivers:	-B units only: check http://www.avtechpulse.com/labview for availability and downloads					
Telnet / Ethernet control:	Optional[8]. See http://www.avtechpulse.com/options/tnt for details.					
Jitter:	-C and Modules: ±15 ps, -B units: ± 35 ps ± 0.015% of sync delay					
DC offset or bias insertion[6]:	Optional. Apply DC offset in the range of ±50V (250 mA max) to back panel solder terminal. See note 7.					
Trigger required:	Modules, and -C & -B ext trig mode: +5 Volts, 50 to 500 ns (TTL)					
Sync delay:	(-C and -B only) Sync out to pulse out: Variable 0 to 500 ns					
Sync output:	(-C and -B only) +2 Volts, 200 ns, will drive 50 Ohm loads					
Monitor output option[7]:	Provides a 20 dB attenuated coincident replica of main output					
Connectors: -C, -B: Modules:	Out: SMA, Trig: BNC, Sync: BNC, Monitor: SMA Out: SMA, In: SMA, Power: Solder terminal					
Power required:	-C, -B: 100-240 Volts, 50-60 Hz, Modules: +15 Volts, 200 mA					+15 Volts, 200 mA
Dimensions: -C: -B: Modules:	100 x 215 x 375 mm (3.9 x 8.5 x 14.8") 100 x 430 x 375 mm (3.9 x 17 x 14.8") 43 x 66 x 107 mm (1.7 x 2.6 x 4.2")		102 x 152 x 203 mm (4 x 6 x 8")			Modules: 58 x 36 x 28 mm (2.3" x 1.4" x 1.1")
Temperature 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. (See http://www.avtechpulse.com/formats for details of the basic instrument formats).
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 +10V) of amplitude or pulse width, suffix the model number with -EA or -EW. Electronic control units also include standard front-panel controls. -EA is available on AVI-V-C, AVI-V-B, AVI-V, and AVI-V-2L-B models only. -EW is available on AVI-V-C and AVI-V models only. AVI-V modules with -EA or -EW may be slightly

larger than the dimensions given above.
5) Indicate desired polarity by suffixing model number with -P or -N (i.e. positive or negative). For dual-polarity -C units, add the suffix -P-PN or -N-PN, where the suffix preceding -PN indicates the polarity at the mainframe output port. The other polarity is generated by adding an external inverting transformer. For dual-polarity -B units, add the suffix -PN. Both polarities are generated internally.
6) For DC offset option suffix model number with -OS. Avtech Model AVX-T bias tee can also be used to obtain DC offset (http://www.avtechpulse.com/bias/avx-t).
7) For monitor option add suffix -M. (Not available on modules.)
8) Add the suffix -TNT to the model number to specify the Telnet / Ethernet control option.
9) More generally, PW (in ns) × PRF (in kHz) ≤ 2000