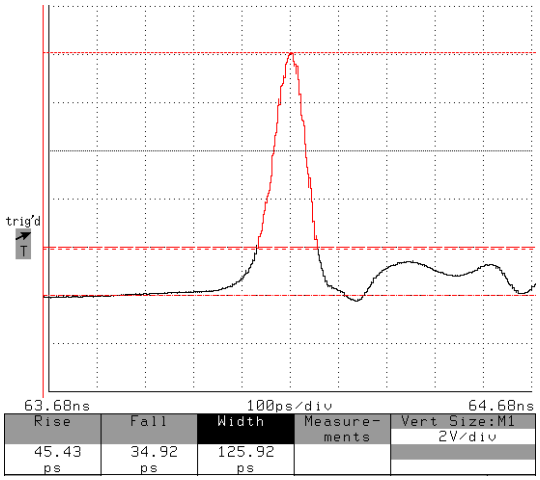
# AVH SERIES

130 ps to 2 ns
10 to 100 VOLTS, 1 MHz
IMPULSE GENERATORS




AVH-S-1-B-P Output, 100 kHz, 2V/div, 100 ps/div.

- Pulse widths as low as 130 ps
- Amplitudes to 100 Volts
- PRF to 1 MHz
- Low jitter
- Dual-channel option available
- Double-pulse option available
- Stand-alone lab instruments, or miniature modules

The AVH series of low jitter, high output amplitude impulse generators provides pulse widths (measured at the 20% rise time point) in the range of 130 ps to 2 ns, amplitudes as high as 100 Volts, with pulse repetition frequencies to 1 MHz.

Models in the AVH-S-1 series generate 0 to 10 Volt impulses, with 130 ps pulse widths (measured at the 20% rise time point – the FWHM pulse width is smaller). The AVH-S series provides 500 ps widths and 0 to 15V amplitudes. The AVH-SA series provides 200 ps widths and amplitudes to 20 Volts.

The AVH-SB series provides 350 ps widths and amplitudes to 30 Volts. The AVH series offers wider (1 ns) operation at 30V.

The high-voltage AVH-HV1 series provides 1 ns widths (optionally 0.8 ns) and amplitudes to 100 Volts.

Models AVH-MPT, AVH-M1, and AVH-M2 are all miniature low-cost modules with non-adjustable amplitude, suitable for OEM applications. (The amplitude is adjustable on all other models). Model AVH-MPT provides 30 Volt, 1 ns impulses, and requires a +15V DC power supply. Models AVH-M1 and AVH-M2 generate 30 V / 1 ns and 60 V / 2 ns, respectively, and require a +135V DC power supply.

Certain models are optionally available with two outputs, each with independent amplitude controls. The two channels share a common trigger source, and have a variable delay separation of 0 to ±50 ns. (Other delay ranges can be provided upon request.) To specify two positive outputs, add the suffix -2CHPP to the model number. To specify two negative outputs, add the suffix -2CHNN. To specify one positive and one negative output, add the suffix -2CHPN.

Options are available which permit the generation of double-pulse (doublet) waveforms. The -DPP option provides a burst of two positive output pulses on a common output with a variable time separation of 0 to ± 5 ns. (Other delay ranges can be provided upon request.) Two independent amplitude controls are provided. Units with the -DPP option have a maximum output amplitude of 70% of the standard maximum amplitude (except when the relative time delay is set to zero, in which case the addition of the two coincident pulses allows the 140% of the standard amplitude to be obtained). The -DPN option is similar, except that one pulse in the doublet is positive, and one is negative. These double-pulse options are not available on units with the dual-channel options.

The dual-channel and double-pulse options are only available on -C units.

On all -B and -C models, a delay control and a sync output are provided for sampling scope triggering purposes. The units can also be triggered externally using a TTL-level pulse. Either output polarity can be provided, as well as a dual-polarity option. A DC offset or bias insertion option is available with most units. Units with this option include a circuit similar to Model AVX-T (see http://www.avtechpulse.com/bias/avx-t) at the output. The required DC offset or bias is applied directly to rear-panel solder terminals. All -B and -C models require 100-240 V, 50-60 Hz prime power.

Instruments with the -B suffix include a complete computer control interface (see http://www.avtechpulse.com/gpib). 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 backlit LCD displays the output amplitude, frequency, delay, and polarity. To allow easy integration into automated test systems, the programming command set is based on the SCPI standard, and some LabView drivers are available.

-C models 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.

All AVH units are also available in a DC-powered miniature module form. The modules require a TTL input trigger signal.

In some cases, the specifications can be adapted to satisfy a particular requirement. Contact the factory for your special requirement. See the AVG series for higher amplitudes and the AVMH series for higher repetition rates, at the online selection guide: http://www.avtechpulse.com/impulse.


AVH-HV1-B

GPIB IEEE-488

# SPECIFICATIONS

# AVH SERIES

| Model: | AVH-S-1-C[1]<br>AVH-S-1-B[2]<br>AVH-S-1 | AVH-S-C[1]<br>AVH-S-B[2]<br>AVH-S | AVH-SA-C[1]<br><br>AVH-SA | AVH-SB-C[1]<br>AVH-SB-B[2]<br>AVH-SB | AVH-C[1]<br>AVH-B[2]<br>AVH | AVH-HV1-C[1]<br>AVH-HV1-B[2]<br>AVH-HV1 | AVH-MPT | AVH-M1 | AVH-M2 |
|---|---|---|---|---|---|---|---|---|---|
| Amplitude[3,9]: (50Ω load) | 2 to 10 V | 3 to 15 V | 4 to 20 V | 6 to 30 V | 6 to 30 V | 10 to 100 V | ≥ 30 V | ≥ 30 V | ≥ 60 V |
| Pulse width, measured at 20% rise time[11]: | ≤ 130 ps | ≤ 500 ps | ≤ 200 ps | ≤ 350 ps | ≤ 1.0 ns | ≤ 1.0 ns std.<br>(0.8 ns opt.[4]) | ≤ 1.0 ns | ≤ 1.0 ns | ≤ 2.0 ns |
| PRF: | 0 to 1 MHz | | | | | 0 to 100 kHz | 0 to 1 MHz | | |
| Polarity[5]: | Positive, negative, or dual-polarity (specify) | | | | | | Positive or negative (specify) | | |
| Propagation delay:<br>(Ext trig in to pulse out) | -C and -B units: ≤ 200 ns<br>Modules: ≤ 75 ns | | | | | | | ≤ 2 ns | |
| Required load impedance: | 50 Ohms[10] | | | | | | | | |
| Jitter: | ± 15 ps (Ext trig in to pulse out) | | | | | | | | |
| Two channel option: | Optional[8]. Available on -B & -C models. | | | | | | Not available. | | |
| Double pulse option: | Optional[9]. Available on -B & -C models. | | | | | | Not available. | | |
| DC offset option[6]: | Apply required DC offset to back-panel solder terminals (± 50 Volts, 250 mA max) | | | | | | Not available. Use the model AVX-T. | | |
| Trigger modes: -B units: | Internal trigger, external trigger (TTL level pulse, > 10 ns, 1 kΩ input impedance),<br>front-panel "Single Pulse" pushbutton, or single pulse trigger via computer command. | | | | | | | | |
| -C units: | Internal trigger, or external trigger (TTL level pulse, > 50 ns, 1 kΩ input impedance). | | | | | | | | |
| Modules: | External trigger (TTL level pulse, > 50 ns, 1 kΩ input impedance). | | | | | | | | |
| Variable delay: -B units: | 0 to 1.0 seconds, for all trigger modes (including external trigger). | | | | | | | | |
| (Sync to main out) -C units: | 0 to 200 ns, for internal trigger mode only. No variable delay in external trigger mode. | | | | | | | | |
| Modules: | No variable delay. | | | | | | | | |
| Sync output (-B & -C only): | > +3 Volts, > 50 ns, will drive 50 Ohm loads | | | | | | | | |
| Gate input: | -B units only: Synchronous or asynchronous, active high or low, switchable. Suppresses triggering when active. | | | | | | | | |
| Connectors: | -B and -C units: Out: SMA, Trig/Sync, Gate (-B only): BNC<br>Modules: In, Out: SMA, Power: Solder terminals | | | | | | | | |
| GPIB, RS-232 control[2]: | Standard on -B units. Not available on -C units or modules. | | | | | | Not available. | | |
| Ethernet port, for remote control using VXI-11.3, ssh, telnet, & web: | Optional on -B units[7]. Recommended as a modern alternative to GPIB / RS-232.<br>See http://www.avtechpulse.com/options/vxi for details. | | | | | | Not available. | | |
| Power requirements: | -C units: 100 - 240 Volts, 50 - 60 Hz<br>Modules: + 15 Volts, 200 mA | | | | | | +15 Volts,<br>200 mA | + 135 Volts,<br>5 mA | |
| Dimensions:<br>(H x W x D) | -B & -C units: 100 mm x 430 mm x 375 mm (3.9" x 17" x 14.8")<br>Modules: 43 mm x 66 mm x 107 mm (1.7" x 2.6" x 4.2") | | | | | | 28x36x58 mm<br>(1.1x1.4x2.3") | 23 x 28 x 38 mm<br>(0.9" x 1.1" x 1.5") | |
| Optional rack-mount kit: | Available on -B and -C units. Add the suffix "-R5" to the model number to<br>include 19" rack mount kit. The width of all -R5 units is 430 mm / 17". | | | | | | Not available. | | |
| Operating temperature: | +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 the basic instrument formats).
2) -B suffix indicates IEEE-488.2 GPIB and RS-232 control of amplitude, PRF, delay and polarity. (See http://www.avtechpulse.com/gpib).
3) For operation of variable-amplitude units 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 800 ps pulse width option, add suffix -T1.
5) Indicate desired polarity by suffixing model number with -P or -N (i.e. positive or negative) or -PN for dual polarity option. Polarity reversal achieved by means of a two-position switch that controls the polarity of the signal output port on -C units and via keypad control on -B units. -PN option not available on modules.
6) For DC offset option suffix the model number with -OS. Avtech Model AVX-T bias tee can also be used to obtain DC offset.
7) Add the suffix -VXI to the model number to specify the Ethernet port..
8) For the two channel option, add the suffix -2CHPP for two positive outputs, the suffix -2CHNN for two negative outputs, or the suffix -2CHPN for the one positive output and one negative output.
9) For the double pulse option add the suffix -DPP for a unipolar output, and add the suffix -DPN for a bipolar output. Note that the maximum amplitude is reduced to 70% for DP option units.
10) A 50 Ohm load is required. Other loads may damage the instrument. Consult Avtech (info@avtechpulse.com) if you need to drive other load impedances.
11) The FWHM pulse width, measured at 50% rise, will be lower.


AVH-S-1-C


AVH-SB-P,
DC-Powered Module