



AV-107D-B: +2A, +5A, +10A, +20A into a 0.965Ω load.

- Peak outputs of 2 to 20 Amperes
- Compliance voltage range of 0 to 60 V
- PW from 20 ns to 200 us
- 10, 20 & 30 ns rise times
- PRF to 20 kHz
- Rugged 100 cm output cables
- IEEE-488.2 GPIB and RS-232 interfaces
- Ethernet port for VXI-11.3 support

The AV-107 series of pulsed constant current generators is designed for pulsing diodes and other high-speed, high-current loads. This series offers an unusually wide compliance voltage range of 0 to 60V.

Model AV-107B-B provides amplitudes of up to 2 A, with pulse widths from 20 to 200 ns, and 10 ns rise times, at frequencies to 20 kHz.

Model AV-107C-B provides up to 10 A and a pulse width range of 100 ns to 1 us (optionally 20 us), with 20 ns rise times, at frequencies of up to 5 kHz.

Model AV-107D-B operates to 500 Hz, with PW variable from 0.1 to 5 us, amplitudes variable up to 20 A, and 30 ns rise and fall times.

For applications requiring much wider pulse widths (of up to 200 us) the 2.5 Amp Model AV-107E-B is available.

The compliance voltage range for all models is 0 to 60 V.

All AV-107 models have a rear-panel output connector to which a unique 100 cm long high-current transmission line may be attached. This line has a characteristic impedance ( $Z_0$ ) approximately equal to 1Ω (for the 107C and 107D) or 10.8Ω (for the 107B and 107E). This allows the load to be placed away from the instrument without degrading the pulse shape significantly. A medium-power test load is provided with these models for the convenience of initial testing purposes.

The AV-107 models are pulsed constant current sources. The output current is largely independent of the load voltage. The instrument will function properly into short circuits and diode loads. For optimal waveform shape, however, it may be beneficial to add a small resistance to the load (~ 1Ω for the 107C and 107D, or ~ 10Ω for the 107B and 107E), to better match the load impedance to the cable characteristic impedance.

All models 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 <http://www.avtechpulse.com/labview>.

A standard rear-panel Ethernet connector allows the instrument to be remotely controlled using the VXI-11.3, ssh, telnet, and web protocols. In particular, the VXI-11.3 features allows software like LabView to control an instrument using standard VISA communications drivers and network cabling, instead of using older-style GPIB cabling and GPIB controller cards. See <http://www.avtechpulse.com/options/vxi>.

Either output polarity can be provided, as well as a dual polarity option. Dual-polarity units include two output connectors (one for each polarity). Only one is active at a time. All models incorporate an Output On/Off function, as well as power-on protection circuitry, to protect attached loads. A delay control and a sync output are provided for scope triggering purposes. The units can also be triggered externally using a TTL-level pulse. All models include a monitor output, whose output voltage is proportional to the current on the main output.

A DC offset option is available. Units with this option include a "diode-OR gate" function to combine the pulse and the user-supplied DC bias (two high-current diodes are connected to allow the larger of the pulse or the DC offset to pass to the output). The DC bias polarity must be the same as the pulse polarity. The required DC bias (generated by a user-supplied power supply) is applied directly to rear-panel solder terminals.

Please note that the combination of high currents and fast rise times makes the AV-107 series intolerant of even very small parasitic inductances. For tests involving probing stations or long cable runs, it may be more advisable to use a high-voltage 50 Ohm pulser (with 50 Ohms added in series with the device under test), such as the AV-1011, AVR-3, AVR-4, AVR-5B, AVR-7B, and AVR-8A families. In many cases, this approach will provide better waveforms, particularly if the load impedance is reasonably well defined (or << 50Ω). Avtech's knowledgeable applications engineers can suggest an appropriate approach for your application. Email us [info@avtechpulse.com](mailto:info@avtechpulse.com) for more information!



AV-107C-B, shown with the supplied accessories (AV-CLZ1-100 cable and AV-CTL1-ENC test load).

See <http://www.avtechpulse.com/transmission/av-clz1> for more information about the AV-CLZ1-100 cable.  
See <http://www.avtechpulse.com/accessories/av-ctl1> for more information about the AV-CTL1-ENC test load.



## SPECIFICATIONS

## AV-107 SERIES

Model <sup>1</sup> :	AV-107B-B	AV-107E-B	AV-107C-B	AV-107D-B
Maximum amplitude <sup>2</sup> :	2 Amps	2.5 Amps	10 Amps	20 Amps
Pulse width (FWHM):	20 to 200 ns	0.2 to 200 us	100 to 1000 ns (0.1-20 us optional <sup>4</sup> )	0.05 to 5 us
Maximum duty cycle:	0.4%	5%	0.5%	0.25%
Output during pulse:	Pulsed constant current, with $\leq \pm 5\%$ change in current for a load voltage change of 0 Volts to maximum rated load voltage			
Output between pulses:	Pulled to ground through a resistance of $\leq 50 \Omega$			
Load voltage range:	0 to 60 Volts			
Rise, fall time (20%-80%) <sup>7</sup> :	$\leq 10$ ns	$\leq 30$ ns	$\leq 20$ ns	$\leq 30$ ns
PRF:	0 to 20 kHz	0 to 1 kHz	0 to 5 kHz	0 to 500 Hz
Polarity <sup>3</sup> :	Positive or negative or both (specify)			
DC Offset Option <sup>6</sup> :	N/A	1A maximum	2A maximum	2A maximum
GPIB & RS-232 control <sup>1</sup> :	Yes (standard on -B units).			
LabView drivers:	Check <a href="http://www.avtechpulse.com/labview">http://www.avtechpulse.com/labview</a> for availability and downloads			
Ethernet port, for remote control using VXI-11.3, ssh, telnet, & web (IPv4):	Included. Recommended as a modern alternative to GPIB / RS-232. See <a href="http://www.avtechpulse.com/options/vxi">http://www.avtechpulse.com/options/vxi</a> for details.			
Settings resolution:	The resolution of the timing parameters (pulse width, delay, period) varies, but is always better than 0.15% of ( set value  + 20 ns). The amplitude resolution is $< 0.1\%$ of the maximum amplitude.			
Settings accuracy:	Typically $\pm 3\%$ (plus $\pm 1.5\%$ of maximum amplitude, or $\pm 3$ ns) after 10 minute warmup, subject to a minimum timing uncertainty of $1.5 \times$ (Rated rise time + Rated fall time). For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope <sup>8</sup> .			
Propagation delay:	$\leq 100$ ns (Ext trig in to pulse out)			
Jitter:	$\pm 100$ ps $\pm 0.03\%$ of sync delay (Ext trig in to pulse out)			
Trigger modes:	Internal trigger, external trigger (TTL level pulse, $> 10$ ns, 1 k $\Omega$ input impedance), front-panel "Single Pulse" pushbutton, or single pulse trigger via computer command.			
Variable delay:	Sync to main out: 0 to 1.0 seconds, for all trigger modes (including external trigger).			
Sync output:	$> +3$ Volts, $> 50$ ns, will drive 50 Ohm loads			
Gate input:	Synchronous or asynchronous, active high or low, switchable. Suppresses triggering when active.			
Monitor output:	Provides an attenuated coincident replica of main output			
Supplied output transmission line:	Detachable high-current transmission line cable assembly. See <a href="http://www.avtechpulse.com/transmission">http://www.avtechpulse.com/transmission</a> for details.			
Part number: Z <sub>0</sub> , length:	AV-CLZ11-100 10.8 $\Omega$ , 100 cm	AV-CLZ1-100 1 $\Omega$ , 100 cm		
Output connection:	End of cable: DB-9 male. Pins 1-5 = signal, pins 6-9 = ground.		End of cable: DB-37 male. Pins 1-19 = signal, pins 20-37 = ground.	
Supplied test load <sup>5</sup> :	AV-CTL11-ENC		AV-CTL1-ENC	
Other connectors:	Trig, Sync, Gate, Monitor: BNC			
Dimensions: (H x W x D)	100 x 430 x 375 mm (3.9" x 17" x 14.8")			
Power required:	100-240 V, 50-60 Hz			
Temperature range:	$+5^{\circ}\text{C}$ to $+40^{\circ}\text{C}$			

- 1) -B suffix indicates IEEE-488.2 GPIB and RS-232 control of amplitude, pulse width, PRF and delay. (See <http://www.avtechpulse.com/gpib>).
- 2) The minimum useful amplitude is 3% of the maximum amplitude.
- 3) Indicate desired polarity by suffixing the model number with -P or -N (i.e. positive or negative) or -PN for dual output polarity.
- 4) Add the suffix -PW1 to the model number to specify the extended pulse width range.
- 5) The supplied test load is for low-duty-cycle basic operational tests only. The power rating of the load is 5 Watts. It may not be capable of supporting the instrument's full maximum average output power. See <http://www.avtechpulse.com/accessories/> for details about the AV-CTL series of test loads.
- 6) Add the -OS suffix to the model number to specify the DC offset option. The DC offset must be generated by a user-supplied power supply. The offset is combined with the

- pulse output using a diode-OR gate, which permits the larger of the two signals (pulse versus offset) to flow to the main output. Contact Avtech if you require higher DC current ratings or other offset configurations.
- 7) When measured across the supplied test load. The rise and fall times may increase when operating into higher impedances that produce larger voltage swings.
- 8) These instruments are provided with a basic calibration checklist, showing a selection of measured output parameters. These measurements are performed with equipment that is calibrated on a regular basis by a third-party ISO/IEC 17025:2005 accredited calibration laboratory. However, Avtech itself does not claim any accreditation. For applications requiring traceable performance, use a calibrated measurement system rather than relying on the accuracy of the pulse generator settings.

Need assistance? Call our knowledgeable Application Engineers  
at 888-670-8729 (US and Canada) or +1-613-686-6675 (International).