



- 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

The AV-107 series of pulsed constant current generators is designed for pulsing microwave & laser diodes and other loads requiring a very high source impedance and fast rise times. The AV-107 series features an output current change (or regulation) of less than  $\pm 5\%$  for a load voltage change from 0 to 60V.

Model AV-107B-B provides a peak output amplitude that is variable in two ranges from 0 to 200 mA and 0 to 2 A, with a pulse width from 20 to 200 ns and a 10 ns rise time, at frequencies to 20 kHz.

Model AV-107C-B provides an output variable from 0 to 10 Amperes and a pulse width variable from 100 to 1000 ns with rise times of 20 ns, at frequencies to 5 kHz. The maximum pulse width can optionally be extended to 20 us.

Model AV-107D-B operates to 500 Hz, with PW variable from 0.1 to 5 us, amplitudes variable 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 (model AV-CLZ1-100). This line has a characteristic impedance ( $Z_0$ ) approximately equal to 1 $\Omega$ . (See <http://www.avtechpulse.com/transmission/av-clz1> for details.) This allows the load to be placed away from the instrument without degrading the pulse shape significantly. A medium-power test load (5 Watts) 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 ( $\sim 1\Omega$ ), 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 backlit 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>.

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 are available with a monitor output option which provides an attenuated coincident replica of the main output current pulse.

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  $\ll 50\Omega$ ). 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-107C-B	AV-107D-B	AV-107E-B
Amplitude <sup>2,3</sup> :	0 to 2 Amps	0 to 10 Amps	0 to 20 Amps	0 to 2.5 Amps
Pulse width (PW):	20 to 200 ns	100 to 1000 ns (0.1-20 us optional <sup>8</sup> )	0.05 to 5 us	0.2 to 200 us
Maximum duty cycle:	0.4%	0.5%	0.25%	5%
Output regulation:	≤ ±5% change in current for a load voltage change from 0 Volts to maximum rated load voltage			
Load voltage range:	0 to 60 Volts			
Rise, fall time (20%-80%):	≤ 10 ns	≤ 20 ns	≤ 30 ns	≤ 30 ns
PRF:	0 to 20 kHz	0 to 5 kHz	0 to 500 Hz	0 to 1 kHz
Polarity <sup>4</sup> :	Positive or negative or both (specify)			
DC Offset Option <sup>10</sup> :	N/A	2A maximum	2A maximum	1A 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			
Internet control: (Telnet & Web)	Optional <sup>7</sup> . See <a href="http://www.avtechpulse.com/options/tnt">http://www.avtechpulse.com/options/tnt</a> for details.			
Controls:	Keypad and adjust knob, and GPIB / RS-232 control			
Propagation delay:	≤ 100 ns (Ext trig in to pulse out)			
Jitter:	± 100 ps ± 0.03% of sync delay (Ext trig in to pulse out)			
Trigger required:	Ext trig mode: +5 Volts, 50 to 500 ns (TTL)			
Sync delay:	0 to ± 1 second			
Sync output:	+3 Volts, 200 ns, will drive 50 Ohm loads			
Gate input:	Synchronous or asynchronous, active high or low, switchable. Suppresses triggering when active.			
Monitor output option <sup>5</sup> :	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: length, Z <sub>0</sub> :	AV-CLZ1-100 (see <a href="http://www.avtechpulse.com/transmission/av-clz1">http://www.avtechpulse.com/transmission/av-clz1</a> ) 1 Ω, 100 cm			
Output connection:	End of cable: DB-37 male. Pins 1-19 = signal, pins 20-37 = ground.			
Supplied test load <sup>6</sup> :	AV-CTL1-ENC. See <a href="http://www.avtechpulse.com/accessories/av-ctl1">http://www.avtechpulse.com/accessories/av-ctl1</a> for details.			
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°C to +40°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) For analog electronic control of amplitude, suffix model number with -EA. Electronic control units also include standard front-panel controls.
- 3) The minimum useful amplitude is 3% of the maximum amplitude.
- 4) Indicate desired polarity by suffixing the model number with -P or -N (i.e. positive or negative) or -PN for dual output polarity.
- 5) For monitor option add suffix -M.
- 6) Load must be connected via low inductance leads (LENZ'S LAW predicts a 10 Volt spike for a 10 Ampere change of current in 10 ns to a 10 nanohenry load).
- 7) Add the suffix -TNT to the model number to specify the Internet control (Telnet and

- Web) option.
- 8) Add the suffix -PW1 to the model number to specify the extended pulse width range.
- 9) 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.
- 10) 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.

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