AVTECH

GPIB
IEEE-488

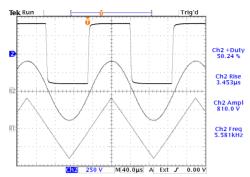# AV-151 SERIES

MEDIUM POWER, HIGH VOLTAGE
LINEAR AMPLIFIERS
AND FUNCTION GENERATORS

Typical AV-151J-B waveforms, into 10 kΩ

- ◆ Voltage-output and current-output models
- ◆ Voltage amplitudes up to ±500 Volts
- ◆ Current amplitudes up to ±2 Amps
- ◆ Sine, square, or triangle, with DC offset
- ◆ Pulse mode
- ◆ Amplifier mode, for arbitrary input waveforms
- ◆ IEEE-488.2 GPIB control
- ◆ VXI-11.3 / ssh / telnet / web optional

The AV-151 series is a family of high-voltage (or, for the AV-151F, high-current) function generators and variable-gain amplifiers. All models include both an internal oscillator that can generate sine, triangle, and square waves, and a variable-gain amplifier mode, which permits generation of more complex high-voltage waveforms.

The ultra-high-voltage AV-151A-B operates at frequencies up to 3 kHz with peak amplitudes as high as ±500 Volts (i.e. 1 kV peak-to-peak) to loads of 100 kilohms and higher.

The AV-151J-B operates at slightly lower amplitudes (to ±400V), but operates at higher frequencies (to 50 kHz), and can drive lower-impedance loads (down to 10 kilohms).

The AV-151B-B operates to 100 kHz and provides amplitudes to ±200 Volts. The AV-151G-B family is similar, but offers a higher bandwidth of 350 kHz.

The AV-151C-B provides a peak output of ±100 Volts into high impedance loads (> 10 kΩ) at frequencies of up to 200 kHz. For higher speed applications, the AV-151H family operates to 1 MHz and at amplitudes to ±50 Volts (into >10 kΩ).

The AV-151D-B can drive 50 Ohms loads, at frequencies to 1 MHz, and amplitudes to ±30 Volts. For high output current / low load impedance applications, Avtech offers the AV-151E family, which provides a peak output of ±25 Volts to loads as low as 20 Ohms, at frequencies up to 20 kHz.

The AV-151F-B and AV-151K-B, unlike the above models, offer current-mode outputs. That is, the output amplitude is set in terms of current, rather than voltage. The output current is largely independent of the load voltage, as long as the load voltage is within the specified compliance range.

The AV-151F-B provides up to ±2 Amps with a compliance voltage range of ±5 Volts, at frequencies of up to 20 kHz. The AV-151-K-B provides up to ±100 mA, for voltages of up to ±100V, at frequencies of up to 10 kHz.

The sine, square, and triangle waveforms are bipolar. That is, they oscillate between a positive voltage and a negative voltage. All models also include a pulse mode of operation. The pulse mode allows the generation of a rectangular pulse waveform that swings from zero Volts to a positive voltage.

The pulse width is adjustable up to 0.5 seconds. The maximum pulse duty cycle is 80%.

A burst mode option is available. This allows the generation of a burst of 1-500 cycles of sine, square, triangle, or pulse waveforms. This burst may be triggered by pressing a front-panel pushbutton, or by computer command.

All models may also be operated as variable-gain linear amplifiers by selecting the "EXT" mode and applying the low-level input (±2V) to the TRIG connector. If this input is driven by an external arbitrary waveform generator, complex high-voltage output waveforms can be generated.

All models include a variable DC offset feature, which allows the waveforms to be shifted by an adjustable DC value.

These instruments include a 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 parameters. A large backlit LCD displays the output amplitude and frequency. To allow easy integration into automated test systems, the programming command set is based on the SCPI standard.

The -VXI option (see http://www.avtechpulse.com/options/vxi/) adds a rear-panel Ethernet connector, allowing an 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.

For higher power applications also consider the AV-153 series of function generators (http://www.avtechpulse.com/function).

The AV-110 and AV-112 families of amplifiers (described at http://www.avtechpulse.com/high-voltage/) may also be of interest for applications that do not require the internal sine / triangle / square wave oscillator feature.

All models are protected from temporary overload conditions (such as low load impedance) by an automatic control feature that limits the output power.

Many models can be adapted for special applications. Call or email us today (info@avtechpulse.com) with your requirement!

AV-151G-B

GPIB
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Model[1]:	AV-151A-B	AV-151J-B	AV-151B-B	AV-151G-B	AV-151C-B	AV-151H-B	AV-151D-B	AV-151E-B	AV-151F-B	AV-151K-B
Maximum amplitude[2] & maximum peak output[3]:	± 500 V	± 400 V	± 200 V	± 200 V	± 100 V	± 50 V	± 30 V	± 25 V	± 2.0 Amps	± 100 mA
Load resistance:	≥ 100 kΩ	≥ 10 kΩ	≥ 50 kΩ	≥ 50 kΩ	≥ 10 kΩ	≥ 10 kΩ	≥ 50 Ω	≥ 20 Ω	N/A	
Compliance voltage range[4]:	N/A								± 5 Volts	± 100 V
Amplitude is set in terms of:	Voltage								Current	
Min. Frequency:	1 Hz									
Max. frequency (int mode), -3dB bandwidth (ext mode)	3 kHz	50 kHz	100 kHz	350 kHz	200 kHz	1 MHz	1 MHz	20 kHz	20 kHz	10 kHz
Waveforms:	Sine, square, triangle, pulse. (The pulse mode is positive only.)									
Pulse width (FWHM)[5]:	100 us - 0.5s	10 us - 0.1s	5 us - 0.5s	5 us - 0.5s	2 us - 0.5s	1 us – 0.5s	0.2 us - 0.5s	5 us - 0.5s	20 us - 0.5s	50 us - 0.5s
Maximum DC offset:	± 50V[6]	± 50V[6]	± 50V[6]	± 50V[6]	± 25V[6]	± 25V[6]	± 10V	± 10V	± 0.5 A	±100 mA
Square wave rise time (20%-80%)[7]:	35 us	3.5 us	1.5 us	1.5 us	0.8 us	0.3 us	0.08 us	1.5 us	10 us	20 us
Ext trig mode:	Input for maximum output: ± 2 Volts. (1 kΩ input impedance)									
Burst mode:	Optional[7]. This allows the generation of a burst of 1-500 cycles of sine, square, triangle, or pulse waveforms. This burst may be triggered by pressing a front-panel pushbutton, or by computer command.									
GPIB / RS-232 control[1]:	Standard on -B units.									
Ethernet port, for remote control using VXI-11.3, ssh, telnet, & web:	Optional[8]. Recommended as a modern alternative to GPIB / RS-232. See http://www.avtechpulse.com/options/vxi for details.									
LabView drivers:	Available for download at http://www.avtechpulse.com/labview.									
Settings resolution:	The resolution of the timing parameters varies, but is always better than 0.15% of the set value. The amplitude and offset resolution is typically 0.02% of the maximum amplitude.									
Settings accuracy:	Typically ± 3% after 10 minute warmup. For high-accuracy applications requiring traceable calibration, verify the output parameters with a calibrated oscilloscope.									
Connectors:	BNC									
Power requirement:	100 - 240 Volts, 50 - 60 Hz									
Operating temperature:	+5°C to +40°C									
Dimensions:	100 x 430 x 375 mm (3.9" x 17" x 14.8")									

1) The -B suffix indicates IEEE-488.2 GPIB and RS-232 control of amplitude and frequency. See http://www.avtechpulse.com/gpib/ for details.
2) The minimum useful amplitude is 5% of the maximum amplitude.
3) Peak output = amplitude + offset. The amplitude and offset can not be set to maximum at the same time, or the peak output rating will be exceeded.
4) The output current will be largely independent of the load voltage, but the load voltage must stay within this range for proper operation.
5) Subject to a maximum duty cycle limit of 80%.

6) The maximum offset may be increased to equal the "maximum peak output" rating by adding the suffix "-XOS" to the model number.
7) Valid into a resistive load installed directly on the output connector. Long lengths of cabling may degrade rise times. Non-zero rise times will noticeably distort the sine and triangle waveforms when operating near the maximum rated frequency.
8) Add the suffix -VXI to the model number to specify the Ethernet port.
9) Add the suffix -PANB to the model number to specify the burst mode option.