AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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INSTRUCTIONS

MODEL AVP-AV-HV3
0 to 40V, 0.4 to 2 ns
PULSE GENERATOR
WITH 150 ps RISE TIME

SERIAL NUMBER: _____

WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been dissembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

TECHNICAL SUPPORT

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TABLE OF CONTENTS

Manual Reference: Z:\officefiles\instructword\avp\AVP-AV-HV3,edition4.odt.
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INTRODUCTION

The AVP-AV-HV3 is a high performance DC-powered module capable of generating up to 40V into 50Ω loads at repetition rates up to 1 MHz. The rise time is less than 150 ps, and the fall time is less than 300 ps. The pulse width is variable from 0.4 to 2 ns.

Instruments with the "-P" model suffix can generate 0 to +40V, whereas instruments with the "-N" model suffix can generate 0 to -40V.

The AVP-AV-HV3-C must be triggered by an external TTL pulse (> 50 ns) applied to the “IN” connector.

The output is designed to drive 50Ω loads. (A 50Ω load is required for proper operation.) The output is AC-coupled.

This instrument is intended for use in research and development laboratories.

AVAILABLE OPTIONS

The AVP-AV-HV3-C is available with several options:

-EA Option: the output amplitude can be controlled by an externally generated 0 to +10V analog control voltage.

-ECL Option: the input trigger levels are ECL, rather than TTL.

-EW Option: the output pulse width can be controlled by an externally generated 0 to +10V analog control voltage.

-M Option: a monitor output is provided.

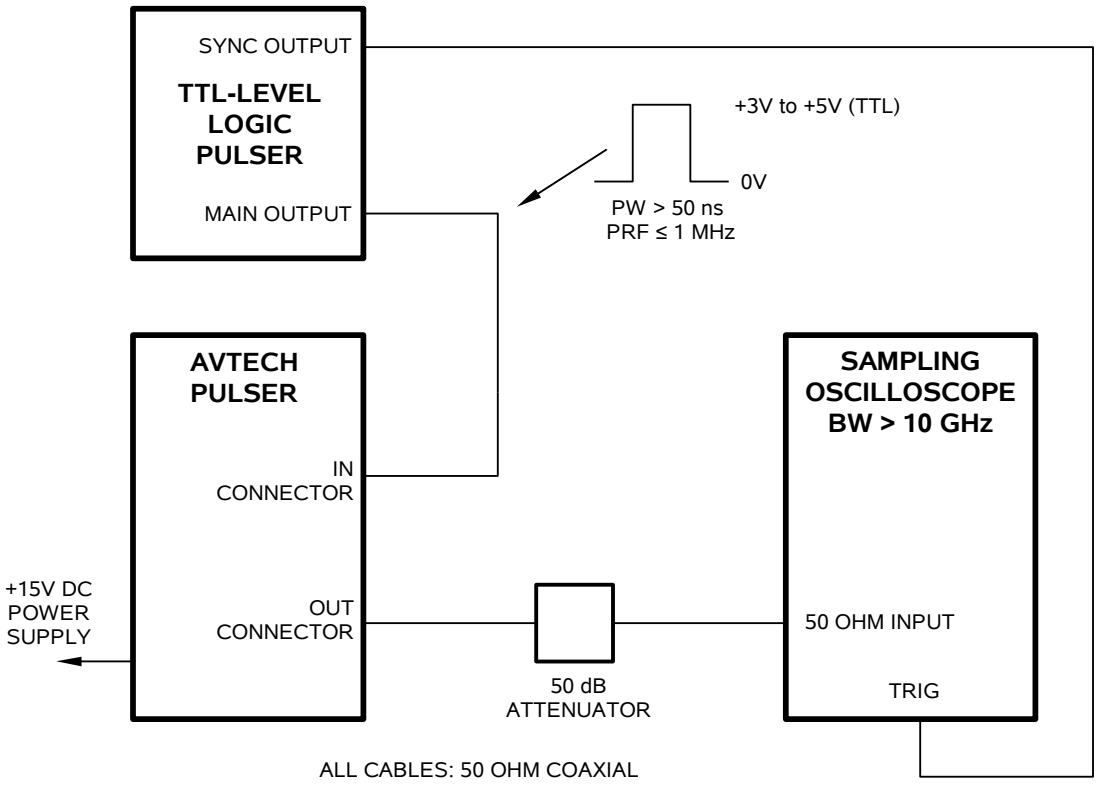
-OS Option: an externally generated DC offset can be added to the output.

SPECIFICATIONS

Model:	AVP-AV-HV3
Amplitude[1,2]: (50 Ohm load)	0 to 40 Volts
Pulse width[1]: (FWHM)	0.4 - 2.0 ns
PRF:	0 Hz to 1 MHz
Rise time (20%-80%):	≤ 150 ps
Fall time (80%-20%):	≤ 300 ps
Polarity:	Specify -P or -N
Propagation delay:	≤ 70 ns
Jitter, Ext trig in to pulse out:	±15 ps
DC offset or bias insertion:	Option available. Apply required DC offset or bias in the range of ± 50 Volts (250 mA max) to back panel solder terminal. See note 3.
Trigger required:	+5 Volt, 50 ns to 500 ns (TTL). ECL trigger option available. See note 5.
Monitor output option[4]:	Provides a 20 dB (x10) attenuated coincident replica of main output
Connectors: OUT, MONITOR[4]: TRIG: DC POWER:	SMA SMA solder terminals
Power requirement:	+15 Volt, 200 mA
Dimensions (H x W x D):	43 mm x 66 mm x 107 mm (1.7" x 2.6" x 4.2")
Chassis material:	Cast aluminum, blue enamel
Mounting, Temperature range:	Any, +5°C to +40°C

1) For analog electronic control (0 to +10V) of amplitude or pulse width suffix model number with -EA or -EW. Electronic control units also include standard front-panel controls.
2) 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.
3) For externally applied DC offset option suffix model number with -OS. The Avtech AVX-T bias tee can also be used to obtain DC offset..
4) For monitor option add suffix -M.
5) For ECL trigger option, add suffix -ECL.

BASIC TEST ARRANGEMENT



CONTROLS – FRONT AND TOP

The location of the IN and OUT connectors, the optional “M” connector, and the amplitude and pulse width controls are shown in the photo below.

The “AMP” and “PW” controls may be adjusted using a screwdriver.

Units with the -EA option will have a solder terminal to control the amplitude, rather than a screwdriver-adjustable trimpot. The amplitude is then controlled by a 0 to +10V DC voltage applied to the solder terminal.

Units with the -EW option will have a solder terminal to control the pulse width, rather than a screwdriver-adjustable trimpot. The pulse width is then controlled by a 0 to +10V DC voltage applied to the solder terminal.

The -EA and -EW solder terminals are shown in the photo below:

AVP-AV-HV3 units also have a “TR” trimpot accessible from the top cover, The “TR” control is a ten-turn trimpot which varies the output rise time and pulse top flatness. For PRF below 200 kHz (approximately), this control is normally set fully counter-clockwise. For higher PRF the control may need to be set fully clockwise for best performance. The AVP-AV-HV3 is shipped with this control the fully counter-clockwise position.

CONTROLS - REAR

The location of the power terminals are shown in the photo below.

The +15V input terminal is protected with a 1N4746A Zener diode, which will fail as a short if an excessive positive voltage (> 18V), or a negative voltage, is applied to the terminal.

GENERAL OPERATING NOTES

1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 10 GHz.

2) The use of 50 dB attenuator on the output will insure a peak enput signal to the sampling scope of less than one volt.

3) In general, the source pulse generator trigger delay control should be set in the 0.1 to 1.0 us range, for proper positioning of the output pulse on the sampling oscilloscope display.

4) WARNING: The module may fail if triggered at a PRF greater than 1 MHz.

5) The output pulse width is controlled by means of the one turn potentiometer (PW). The pot should initially be set maximum clockwise and the pulse width adjusted using an oscilloscope.

6) The output pulse amplitude is controlled by means of the one turn potentiometer (AMP). The pulse width may change by several nanoseconds as the output amplitude is reduced from maximum to minimum. Therefore it is convenient to first set the desired amplitude and then set the desired pulse width. Rotation of the PW pot causes the position of the falling edge of the pulse to change.

7) Some properties of the output pulse may change as a function of the amplitude pot setting. For some demanding applications, it may be desirable to use a combination of external attenuators and the amplitude pot to achieve the desired output amplitude.

8) To DC offset the output pulse connect a DC power supply set to required DC offset value to the terminals marked “OS”. The maximum attainable DC offset voltage is +50 volts. (Option).

9) The monitor output port (M) provides a coincident attenuated (÷10) replica of the main output to a 50 ohm load. (Option).

10) AVP-AV-HV3 units have a “TR” trimpot accessible from the top cover, The “TR” control is a ten-turn trimpot which varies the output rise time and pulse top flatness. For PRF below 200 kHz (approximately), this control is normally set fully counter-clockwise. For higher PRF the control may need to be set fully clockwise for best performance. The AVP-AV-HV3 is shipped with this control the fully counter-clockwise position.

PERFORMANCE CHECK SHEET