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SINCE 1975

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INSTRUCTIONS

MODEL AVM-1-NIM-ED-EW-EA-M-P

0 TO 5 VOLTS, 25 MHz

HIGH SPEED PULSE GENERATOR

WITH 100 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: /fileserver1/officefiles/instructword/avm/older manuals/AVM-1-NIM-ED-EW-EA-M-P,edition1.sxw.
Last modified February 29, 2024.

INTRODUCTION

The AVM-1-NIM-ED-EW-EA-M-P is a high performance module capable of generating up to +5V into 50Ω loads at repetition rates up to 25 MHz. The output pulse width is variable from 0.2 to 6 ns. The rise time is less than 100 ps, and the fall time is less than 135 ps.

This DC-powered module requires an external NIM-level trigger pulse (logic low = 0V, logic high = -0.8V).

The amplitude, delay, and pulse width are controlled by 0 to +10V DC control voltages applied to solder terminals on the module.

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.

ORIGINAL QUOTATION

Feb. 13, 2004
To: Klaus Attenkofer
Argonne Natl. Labs
630-252-0383
klaus.attenkofer@anl.gov

Following your recent inquiry, I am pleased to quote as follows:

Quote number: 11930.01

Model number: AVM-1-NIM-ED-EW-EA-M-P

Description: Ultra High Speed Pulse Generator

Polarity: positive

-NIM option: The module triggers from NIM logic levels (rather than TTL levels), on the 0 to -0.8V transition. The input impedance is 50 Ohms.

Datasheet & pricing: http://www.avtechpulse.com/speed/avm-1

Price: $4436 US each, FOB destination.

Estimated delivery: 3 weeks after receipt of order.

Quote number: 11930.02

Model number: AVM-1-NIM-ED-EW-EA-M-N

Description: Ultra High Speed Pulse Generator

Polarity: negative

-NIM option: The module triggers from NIM logic levels (rather than TTL levels), on the 0 to -0.8V transition. The input impedance is 50 Ohms.

Datasheet & pricing: http://www.avtechpulse.com/speed/avm-1

Price: $4436 US each, FOB destination.

Estimated delivery: 3 weeks after receipt of order.

Regards,
Dr. Michael J. Chudobiak
VP, New Product Development

--- Avtech Electrosystems Ltd. ---------- since 1975 ---

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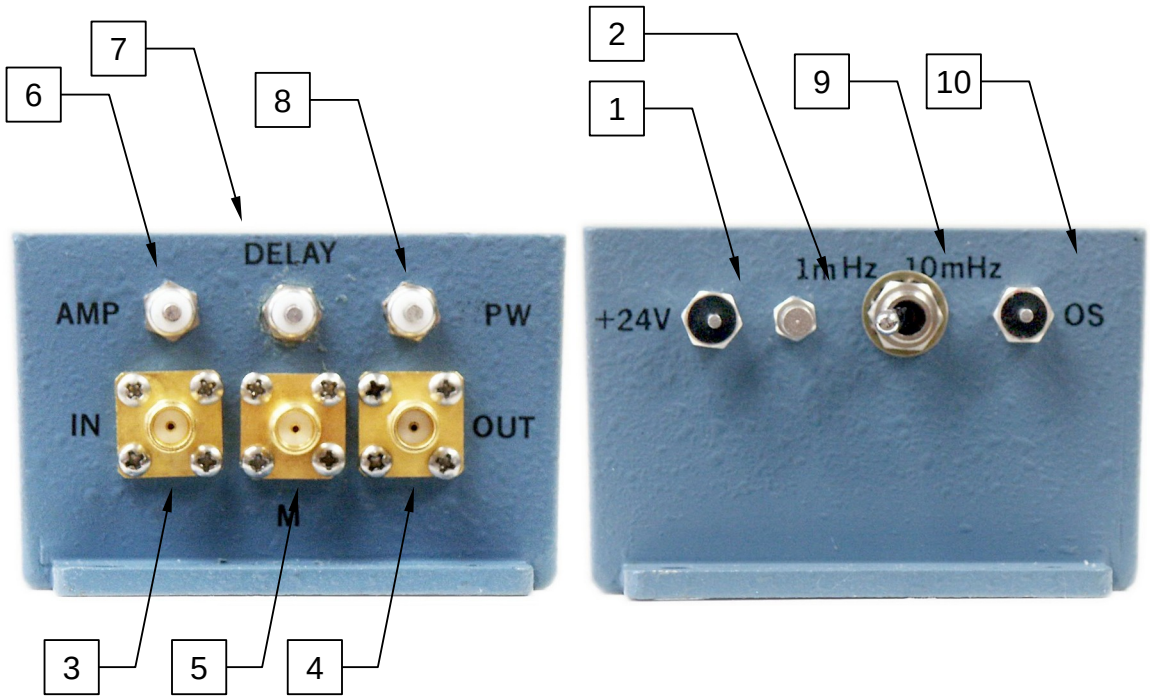
Nanosecond Waveform Generators
for general purpose, R&D and OEM applications

Pulse Generators - Laser Diode Drivers - Pulse Amplifiers
Impulse Generators - Current Pulsers - Delay Generators - Splitters
Function Generators - Monocycle Generators - Frequency Dividers + more!

SPECIFICATIONS

Model:	AVM-1-NIM-ED-EW-EA-M-P
Amplitude:	Variable to 5 Volts (50 Ohm load)
Pulse width:	Variable 0.2 to 6 ns
PRF:	0 to 25 MHz
Rise time:	≤ 100 ps
Fall time:	≤ 135 ps (typically 100 ps)
Polarity:	Positive
Propagation delay:	≤ 30 ns (Ext trig in to pulse out)
Variable propagation delay:	0 to 5 ns
Jitter:	± 15 ps (Ext trig in to pulse out)
DC offset or bias insertion:	Apply required DC offset to solder terminals (± 50 Volts, 250 mA max)
Trigger required:	Triggers from NIM logic levels, on the 0 to -0.8V transition. The input impedance is 50 Ohms.
Monitor output:	Provides a 20 dB attenuated coincident replica of main output
Connectors:	In, Out, Monitor: SMA
Power:	+24V DC
Dimensions:	43 mm x 66 mm x 107 mm (1.7” x 2.6” x 4.2”)

CONTROLS



1. POWER Input. Apply +24V prime power to this solder terminal.

2. Ground. Connect this solder terminal to your power supply ground.

3. NIM Input. The module triggers from NIM logic levels (rather than TTL levels) applied to this SMA connector, on the 0 to -0.8V transition. The input impedance is 50 Ohms.

4. OUT Connector. This is the main output. (This output *requires* a 50Ω load to function properly).

5. M Connector. This SMA connector output provides a 20 dB attenuated coincident replica of main output, for monitoring purposes.

6. AMP Control. To control the amplitude of the output, apply 0 to +10V to this solder terminal (R_{IN} ≥ 10 kΩ). Zero input corresponds to minimum output amplitude, and +10V corresponds to maximum output amplitude.

7. DELAY Control. To control the delay of the output, apply 0 to +10V to this solder terminal (R_{IN} ≥ 10 kΩ). Zero input corresponds to minimum output delay, and +10V corresponds to maximum output delay.

8. PW Control. To control the pulse width of the output, apply 0 to +10V to this solder terminal (R_{IN} ≥ 10 kΩ). Zero input corresponds to minimum output pulse width, and

+10V corresponds to maximum output pulse width.

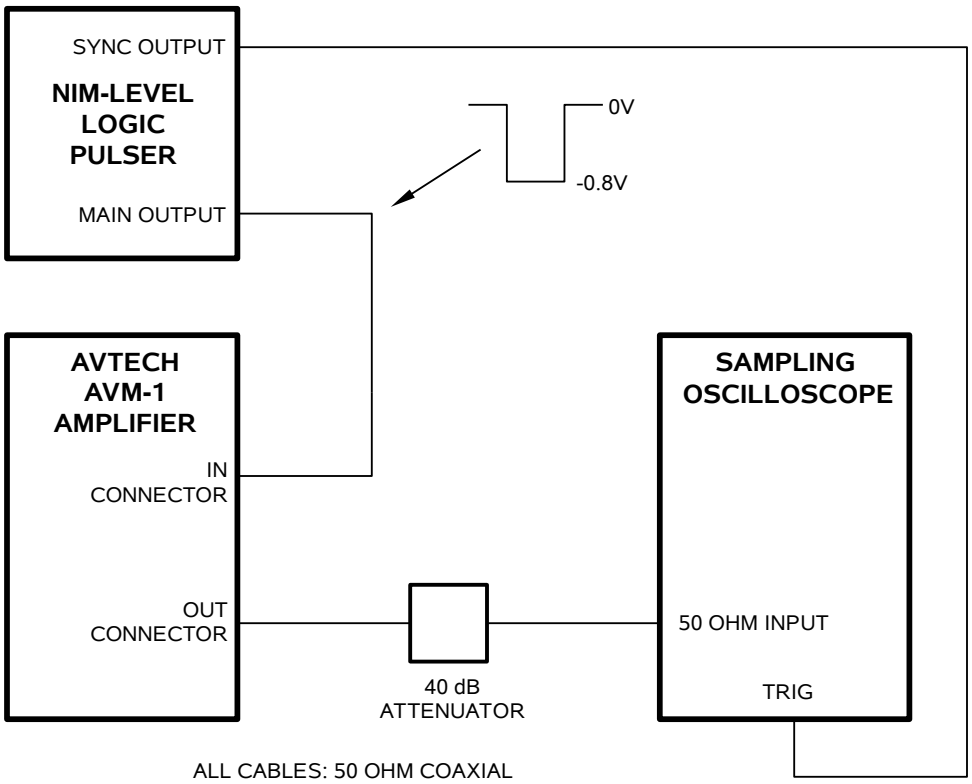
9. 1 MHz / 10 MHz Switch. This switch should normally be in the 1 MHz position. For operation at PRF in the 10 to 25 MHz range, a smoother pulse top may be obtained by setting the switch in the 10 MHz position.

10. OS Input. A DC offset in the range of ±50V (250 mA max) may be applied to this solder terminal. The DC offset will appear on the output. When this feature is not used, the OS input should be connected to ground (using the GND solder terminal). This is especially important when driving loads containing a diode.

GENERAL INFORMATION

BASIC TEST ARRANGEMENT

The AVM-1-NIM-ED-EW-EA-M-P should be tested with a sampling oscilloscope with a bandwidth of at least 10 GHz to properly observe the high-speed waveform. A typical test arrangement is shown below:



The attenuator is required to prevent damage to the sampling oscilloscope.

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 a 40 dB attenuator at the sampling scope vertical input channel will ensure a peak input signal to the sampling scope of less than 1 Volt.

3) To DC offset the output pulse connect a DC power supply set to required DC offset value to the back panel terminals marked OS. The maximum attainable DC offset voltage is 50 Volts / 250 mA.

4) The module triggers from NIM logic levels (rather than TTL levels), on the 0 to -0.8V transition. The input impedance is 50 Ohms. The input pulse width should be more than 15 ns, and less than one-half of the period.

5) WARNING: Model AVM-C may fail if triggered at a PRF greater than 25 MHz.

AMPLITUDE INTERACTION

Some properties of the output pulse may change as a function of the amplitude 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.

MINIMIZING WAVEFORM DISTORTIONS

USE 50 OHM TRANSMISSION LINES AND LOADS

Connect the load to the pulse generator with 50Ω transmission lines (e.g. RG-58 or RG-174 cable).

This instrument requires a 50Ω load for proper operation. It will not properly drive a high-impedance load. The output stage will be damaged if it is operated into an open circuit (or any other high impedance). Failures due to improper output loading are not covered by the warranty.

USE LOW-INDUCTANCE LOADS

Lenz's Law predicts that for an inductive voltage spike will be generated when the current through an inductance changes. Specifically, $V_{SPIKE} = L \times dI_{LOAD}/dt$, where L is the inductance, I_{LOAD} is the load current change, and t is time. For this reason, it is important to keep any parasitic in the load low. This means keeping wiring short, and using low inductance components. In particular, wire-wound resistors should be avoided.

PREVENTING DAMAGE

The AVM-1-NIM-ED-EW-EA-M-P may fail if triggered at a PRF greater than 25 MHz.

This unit is designed to operate into a load impedance of 50 Ohms and the output stage will be damaged if it is operated into an open circuit (or any other high impedance). Failures due to improper output loading are not covered by the warranty.

The lifetime of the switching elements in the pulse generator module is proportional to the running time of the instrument. For this reason the prime power to the instrument should be turned off when the instrument is not in use.

HEATSINK IF PRF > 10 MHz

If the AVM-1-NIM-ED-EW-EA-M-P is triggered at rates above 10 MHz, the base of module should be attached to a heatsink (e.g., secured to a metal plate) to lower the operating temperature of the unit.

PERFORMANCE CHECK SHEET