

# AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

□ P.O. BOX 265  
OGDENSBURG, NY  
U.S.A. 13669-0265  
TEL: (315) 472-5270  
FAX: (613) 226-2802

TEL: 1-800-265-6681  
FAX: 1-800-561-1970

e-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)  
<http://www.avtechpulse.com/>

☒ BOX 5120, LCD MERIVALE  
OTTAWA, ONTARIO  
CANADA K2C 3H4  
TEL: (613) 226-5772  
FAX: (613) 226-2802

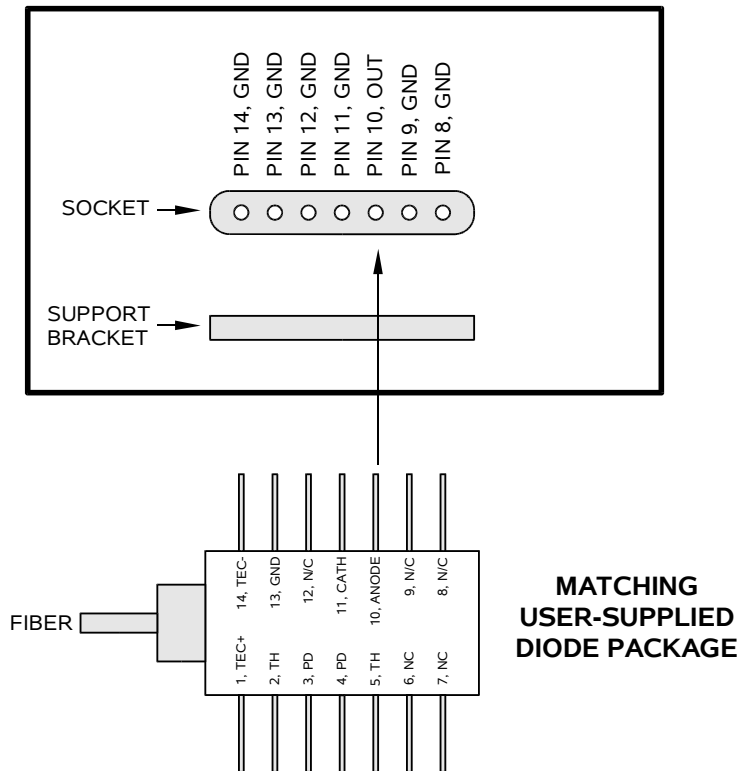
## INSTRUCTIONS

MODEL AVX-S1-HC-P1-COB

PLUG-IN SOCKET OUTPUT MODULE

SERIAL NUMBER: 11208

### AVX-S1-HC-P1-COB SOCKET VIEW



### 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 disassembled, 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

Phone: 613-226-5772 or 1-800-265-6681

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E-mail: [info@avtechpulse.com](mailto:info@avtechpulse.com)

World Wide Web: <http://www.avtechpulse.com>

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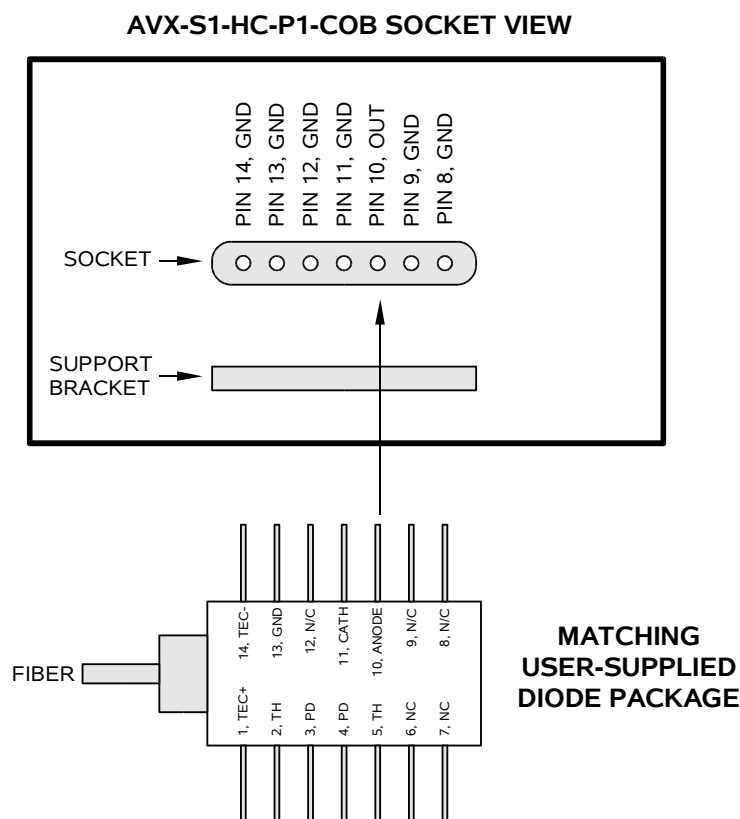
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Manual Reference: Z:\officefiles\instructword\avx-s\AVX-S1-HC-P1-COB,sn11208.sxw.  
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## INTRODUCTION

The AVX-S series of bias insertion units is designed to combine a pulse signal with a DC bias, and supply the resulting signal to a laser diode, which is inserted into a high quality socket included on the mount. The bias insertion module includes the necessary networks to match the laser diode to the pulse source, as well as networks for applying DC bias to the diode.

The AVX-S1-HC-P1-COB is specifically designed to accommodate butterfly-packaged laser diodes with the pinout illustrated below:



The diode series resistance must be 6 Ohms for proper operation.

ORIGINAL QUOTATION

Date: Wed, 06 Apr 2005 13:26:46 -0400  
 From: Avtech Sales  
 To: XXXXX  
 Subject: Re: RFQ

XXXXX,

Please send us a revised purchase order, using the new model number (AVX-S1-HC-P1-COB). There is no difference in the price, but we need to use the new model number to avoid confusion about the specifications if you re-order in the future. I am pleased to re-quote as follows, with the new model number and the updated series resistance specification:

Quote number: 12531

Model number: AVX-S1-HC-P1-COB

Description: Laser Diode Bias Insertion Unit with Socket.

-COB option: The socket will accept pins 8-14 of the butterfly package described in the attachment to your email. The pulse will be applied to the diode anode (pin 10). Pins 8-9 and 11-14 will be grounded. The diode series resistance must be 6 Ohms for proper operation.

Other: as per the standard AVX-S1-HC-P1, described at <http://www.avtechpulse.com/laser-bias/avx-s1>

Price: \$XXXXX US each, FOB destination.

Quote valid for: 60 days

Estimated delivery: 30 days after receipt of order.

Please call or email me if I can be of further assistance.

Thank you for your interest in our products!

Regards,  
 Dr. Michael J. Chudobiak  
 Chief Engineer

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

PO Box 265	ph: 1-800-265-6681 or 613-226-5772	Box 5120,
Ogdensburg,	fax: 1-800-561-1970 or 613-226-2802	LCD Merivale
New York	email: <a href="mailto:info@avtechpulse.com">info@avtechpulse.com</a>	Ottawa, Ontario
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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!

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## SPECIFICATIONS

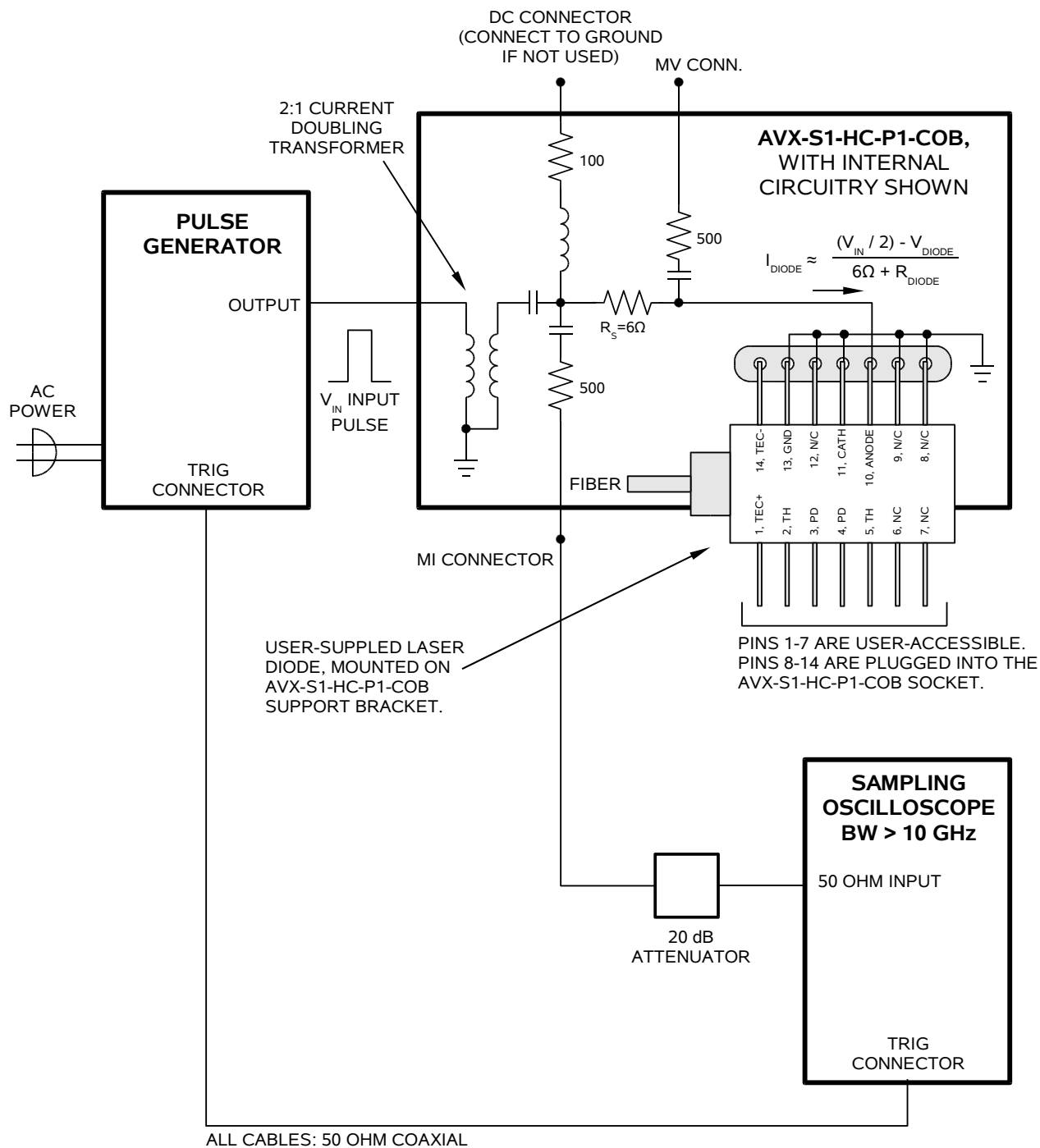
Model:	AVX-S1-HC
Peak diode current:	2 A
Max. input amplitude:	50 Volts
Pulse width (ns):	0.4 - 200
Rise time (ns):	0.2
Pulse PRF range:	DC-100 MHz
Max. bias current:	100 mA
Max. bias voltage:	50 Volts
Input impedance:	50 Ohms
N (transformer ratio <sup>1</sup> ):	2
R <sub>S</sub> :	6 Ohms
IN connector:	SMA
Monitor connector:	SMA
Bias connector:	Solder pin
Dimensions:	H x W x D: 41 mm x 66 mm x 76 mm (1.6" x 2.6" x 3.0")
Material:	Cast aluminum, blue enamel
Mounting:	Any

1) The transformer reduces the input voltage by a factor of N (approx) and increases the current by a factor of N (approx). The load resistance ( $R_S + R_{DIODE}$ ) must equal  $50\Omega / N^2$  (approx).

## GENERAL INFORMATION

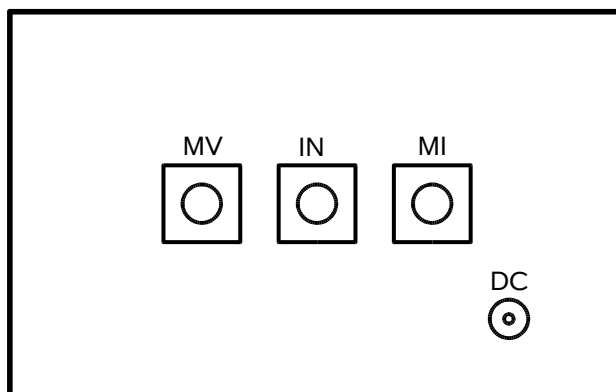
### BASIC TEST ARRANGEMENT

To fully test the AVX-S1-HC-P1-COB, and for normal operation, the output module should be connected as shown below:



The diode load is inserted into the socket on the output module, as shown above.

An oscilloscope may be used to monitor the MI and MV outputs, the locations of which are shown in the figure above. A forward DC bias may be applied to the laser diode by connecting a DC potential of 0 to +10 Volts to the DC solder terminal. The application of a small forward bias often yields a more ideal diode current waveform (as observed on the MI port). The DC port must be shorted to ground if a bias is not applied.



**AVX-S1-HC-P1-COB OUTPUT MODULE, CONNECTOR VIEW**

### INSTALLING THE DIODE

To install the diode in the output module socket, align the diode so that pins 8-14 are facing the socket, and the mounting flange of the diode is underneath the main body of the diode. Gently and slowly insert the diode into the socket. Insert it far enough that the mounting holes on the diode align with the mounting holes on the support bracket. Secure the diode to the support bracket using four 2-56 screws.

It may be necessary to first loosen the two 4-40 screws that attach the support bracket to the main body of the AVX-S1-HC-P1-COB, to provide optimal alignment of the bracket. Re-tighten the screws after optimal alignment has been obtained.

It is recommended that pins 8-14 be trimmed from their normal length to a shorter length of 7 mm. This will make it easier to insert and remove the diode.

### AMPLITUDE CONTROL

When using the output module, the pulse current through the diode load is given by:

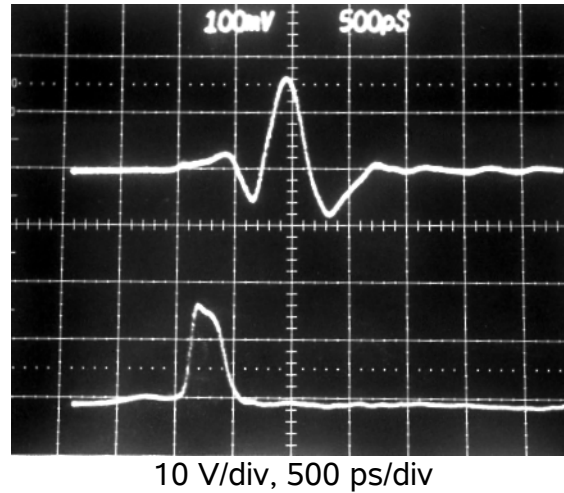
$$I_{\text{DIODE}} \approx ((V_{\text{IN}} / 2) - V_{\text{DIODE}}) / (6\Omega + R_{\text{DIODE}})$$

where  $V_{\text{IN}}$  is the amplitude of the input pulse,  $V_{\text{DIODE}}$  is the forward voltage drop across the diode (typically 2 or 3V), and  $R_{\text{DIODE}}$  is the series resistance of the diode. For proper operation,  $R_{\text{DIODE}}$  should be equal to 6 Ohms.



## TYPICAL RESULTS

For test purposes, the load consisted of a 5.1 Ohm resistor in series with a 1N459A diode. The photo below shows the waveform observed on the output, as well as the input signal.



Top: Output of the "MI" connector, into 50 Ohms.

Bottom: +15V input signal (measured into a 50 Ohm load), generated by an AVM-2 pulse generator.

These results indicate that it is possible to use the AVM-2 to generate sub-nanosecond current pulses through a diode.

The fidelity of the "MI" output is questionable at low pulse widths, due to parasitic inductance effects, and the only true measure of the output is to observe the optical output waveform.