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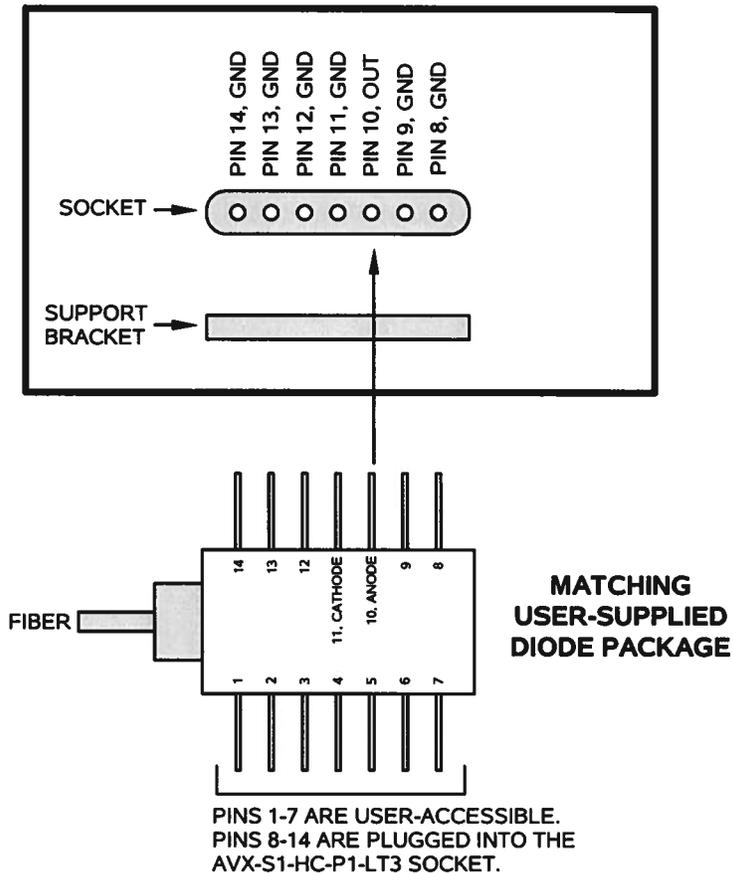
INSTRUCTIONS

MODEL AVX-S1-HC-P1-LT3

PLUG-IN SOCKET OUTPUT MODULE

SERIAL NUMBER: _____

AVX-S1-HC-P1-LT3 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.

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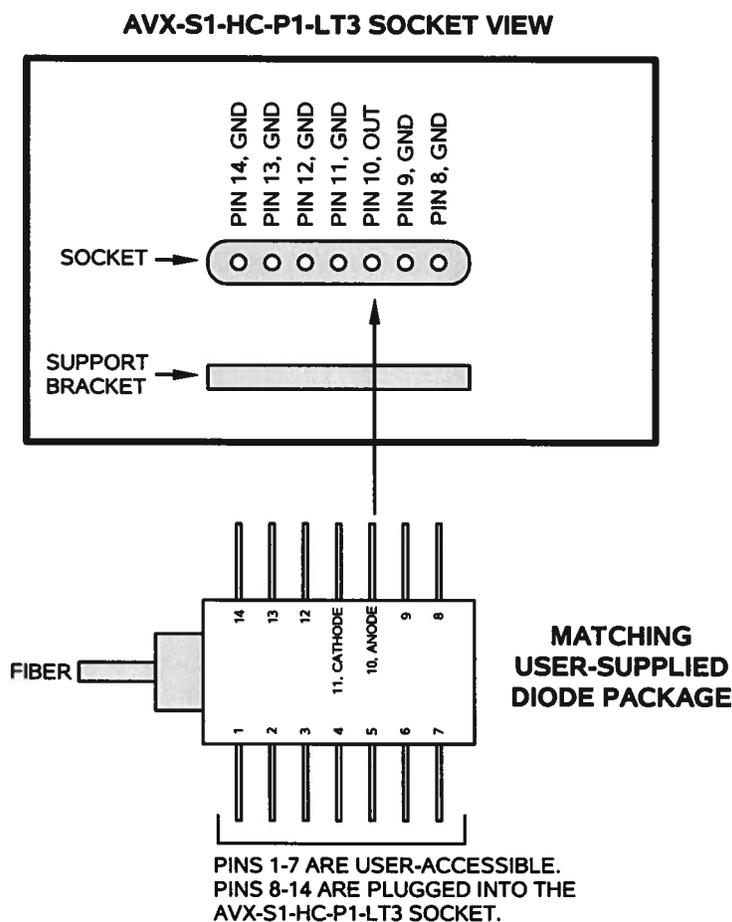
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Manual Reference: T:\instructword\avx-s\AVX-S1-HC-P1-LT3,ed1.odt.
Last modified January 19, 2006.
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INTRODUCTION

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-LT3 is specifically designed to accommodate butterfly-packaged laser diodes with the pinout illustrated below:



Examples of diodes with appropriate pinouts are the Lumics LU1064M200, the Qphotonics QFBGLD-1064-150, and the Bookham LC96A1060-20A.

The diode series resistance should be $< 1.2 \Omega$ for proper operation.

The AVX-S1-HC-P1-LT3 is specially designed and customized to be used with the Avtech AVO-2L-B-P-M-LT3 pulse generator.

ORIGINAL QUOTATION

Date: Mon, 24 Oct 2005 13:56:38 -0400
From: Avtech Sales
Subject: Re: pulsed laser diode drivers

XXXXX,

We can boost the PRF to 40 kHz. I have re-quoted below.

Also, I have re-quoted on the AVX-S1 output module, because the original quote referred to an internal series resistance (7.5 Ohms) that is probably too low for your diodes. (I originally mis-read the I-V curve that you supplied for the Qphotonics diode).

I am pleased to re-quote as follows:

Quote number: 12979.01

Model number: AVO-2L-B-P-M-LT3

Description: Customized Laser Diode Driver (Pulsed Voltage) with IEEE-488.2 GPIB and RS-232 Computer Control Ports

Amplitude: 0 to +5A, into a 12.5* Ohm load

Pulse width (FWHM): 1 to 10 ns

PRF: 1 Hz to 40 kHz

Other: as per the standard AVO-2L-B-P, described at <http://www.avtechpulse.com/laser/avo-2l>

Price: \$XXXXX US each, FOB destination.

Optional: An Internet control (Telnet and Web) option is available for an additional \$598. Add the suffix "-TNT" to the model number to specify this option. Additional details about this option are available at <http://www.avtechpulse.com/options/tnt>.

Quote valid for: 60 days

Estimated delivery: 60 days after receipt of order (excluding export permit* delays).

*Export Permit: These instruments are very high performance pulse generators, which are considered to be "Nuclear-Related Dual-Use Goods" under government regulations. As such, an "End Use Statement" must be completed when ordering. The necessary form is attached (in PDF format). We will use the information in the completed form to apply for an export license from the Canadian government, which will take 1 to 6 weeks to obtain. We cannot ship your order without the license. Please return the completed form to us by fax.

Quote number: 12979.02

Model number: AVX-S1-HC-P1-LT3

Description: Laser Diode Bias Insertion Unit with Socket, designed for use with the AVO-2L-B-P-LT3.

-LT3 option: An output module is provided with a socket that will accept pins 8-14 of the user-supplied butterfly-packaged laser diode. A positive pulse will be applied to the diode anode (pin 10). Pins 8-9 and 11-14 will be grounded. Pins 1-7 will remain unconnected and accessible to the user. A series resistance of approximately 11.3* Ohms will be present in the module. For optimal matching with the AVO-2L-B-P-LT3, the laser diode should have a parasitic resistance (dV/dI) of approximately 1.2 Ohms, so that the total resistance is 12.5 Ohms. It is important that you confirm that this is appropriate for your diodes.

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

Price: \$XXXXX US each, FOB destination.

Quote valid for: 60 days

Estimated delivery: 60 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 ---

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* Later changed to 10 Ohms, to improve performance.

SPECIFICATIONS

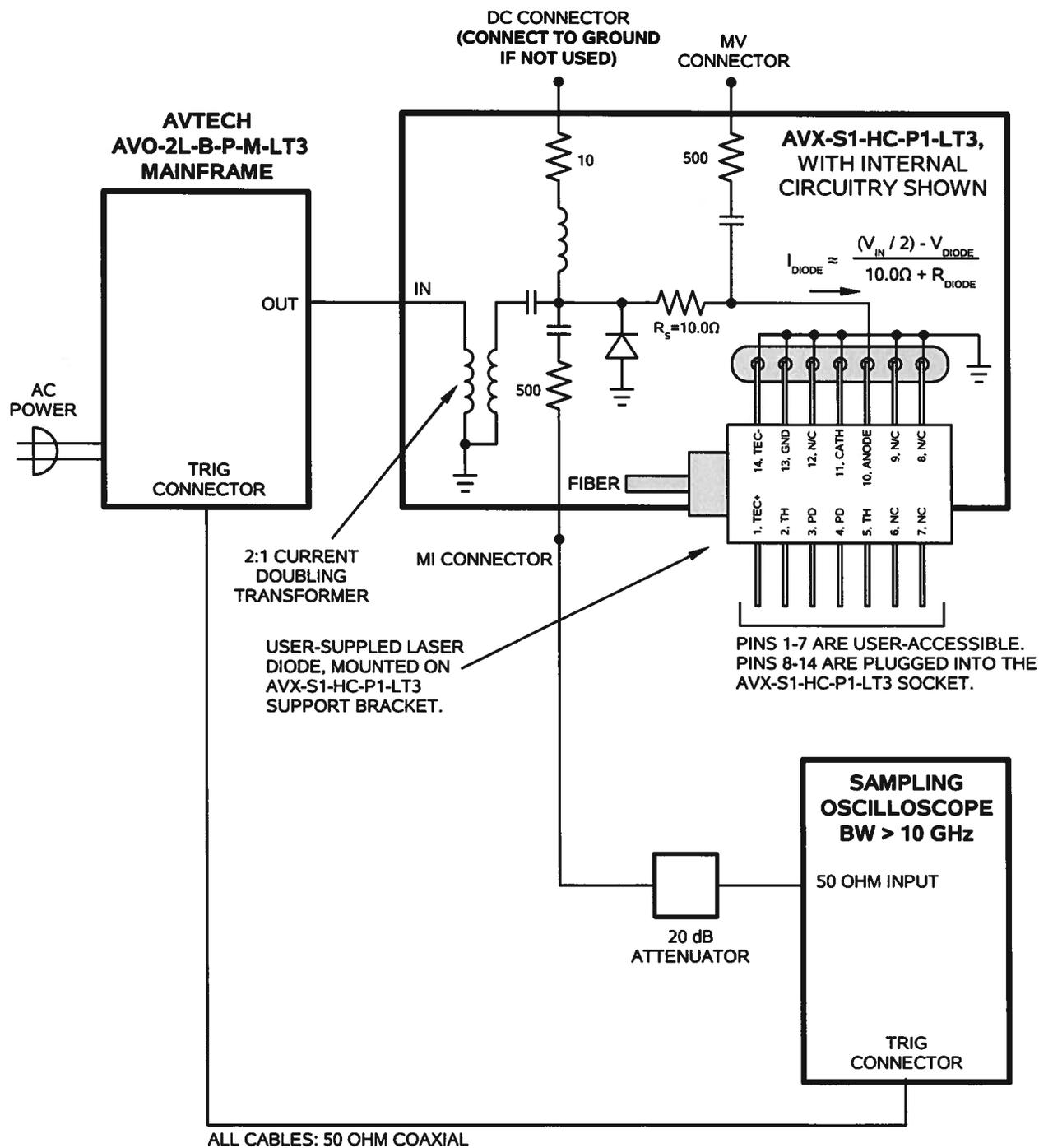
Model:	AVX-S1-HC-P1-LT3
Peak diode current:	5 A
Max. input amplitude:	125 Volts
Pulse width (ns):	1 – 10 ns
Rise time (ns):	0.2
Max. bias current:	100 mA
Max. bias voltage:	50 Volts
Input impedance:	50 Ohms
N (transformer ratio ¹):	2
R _s :	10.0 Ohms
IN connector:	SMA
Monitor connector:	SMA
Bias connector:	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 $25\Omega / N^2$ (approx).

GENERAL INFORMATION

BASIC TEST ARRANGEMENT

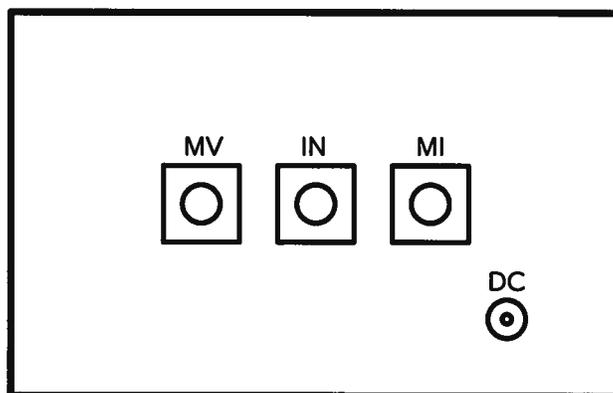
To fully test the AVX-S1-HC-P1-LT3, and for normal operation, the output module should be connected as shown below:



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/or MV outputs, the locations of which are shown in the figure below. The 50 Ohm input impedance of the attached oscilloscope and the 500 Ohm internal resistance will form an 11:1 voltage divider. Note, however, that the MV and MI outputs suffer from unavoidable distortions due to parasitic effects. For accurate time-domain measurements, the laser diode output should be measured optically.

A forward DC bias may be applied to the laser diode by connecting a DC voltage 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). This current should not exceed 100 mA. **The DC port must be shorted to ground if a bias is not applied. A ground tab is provided on the DC port for this purpose.**



AVX-S1-HC-P1-LT3 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-LT3, to provide optimal alignment of the bracket. Retighten 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:

$$I_{\text{DIODE}} \approx ((V_{\text{IN}} / 2) - V_{\text{DIODE}}) / (10.0 \Omega + R_{\text{DIODE}})$$

where V_{IN} is the amplitude of the input pulse, V_{DIODE} is the forward voltage drop across the diode (typically 2 or 3V), and R_{DIODE} is the series resistance of the diode. For proper operation, R_{DIODE} should be $< 1.2 \Omega$.

Jan 19/06