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SINCE 1975

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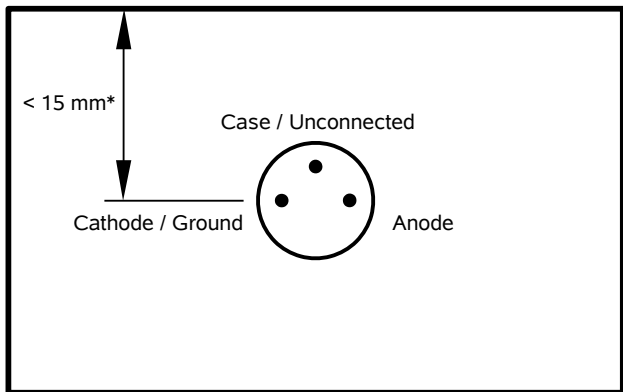
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INSTRUCTIONS

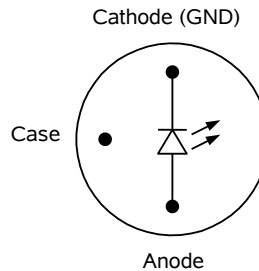
MODEL AVX-S1-P2-S105

PLUG-IN SOCKET OUTPUT MODULE

SERIAL NUMBER: _____



SOCKET VIEW (NOT TO SCALE)



**MATCHING USER-SUPPLIED
DIODE PACKAGE
(BOTTOM VIEW).
5.6 mm PACKAGE.**

SUITABLE FOR SHARP GH0421A2GE

* TO ACCOMMODATE THIS REDUCED DIMENSION,
NO "MV" MONITOR OUTPUT IS PROVIDED. AN "MI"
MONITOR OUTPUT IS STILL PROVIDED.

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

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Manual Reference: /fileserver1/officefiles/instructword/avx-s/AVX-S1-P2-S105,ed1.odt.

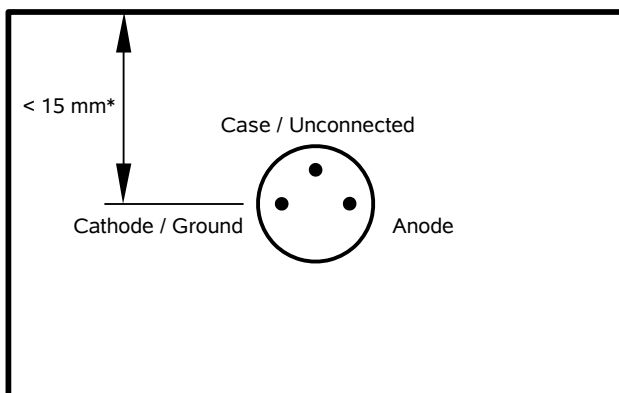
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INTRODUCTION

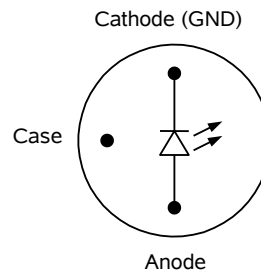
The AVX-S series of bias insertion units is designed to combine a pulse signal with a DC bias, and supply the resulting signal to a laser diode, which is inserted into a high quality socket included on the mount. The bias insertion module includes the necessary networks to match the laser diode to the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

The AVX-S1-P2-S105 is specifically designed for use with the Avtech AVO-9E-B-P-P2-S104-AKQ1 laser diode driver and the Sharp GH0421A2GE laser diode. It is electrically identical to the AVX-S1-P2-S104 originally supplied with the AVO-9E-B-P-P2-S104-AKQ1, but the pin socket locations have been repositioned.



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SUITABLE FOR SHARP GH0421A2GE

SPECIFICATIONS

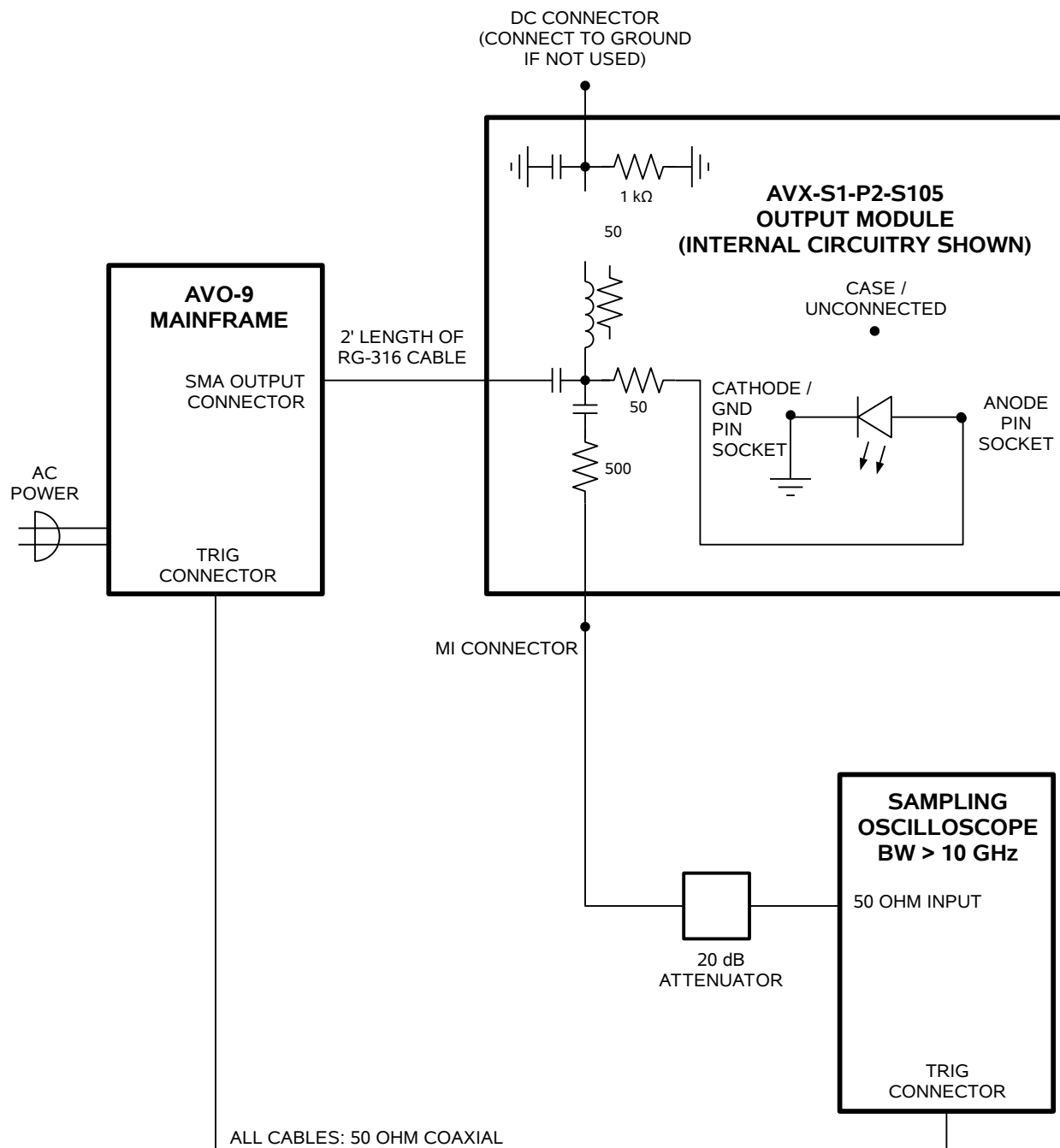
Model:	AVX-S1
Peak diode current:	400 mA
Max. input amplitude:	20 Volts
Pulse width:	0.4 ¹ - 200 ns
Rise time:	0.2 ns ¹
Pulse PRF range:	DC - 25 MHz
Max. bias current:	100 mA
Max. bias voltage:	50 Volts
Input impedance:	50 Ohms
N (transformer ratio ^{2,3}):	+1
R _S + R _{DIODE} :	50 Ohms
IN connector:	SMA female (one)
Other connectors:	MI: SMA (female), DC bias: solder terminal
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

- 1) Lower pulse widths (to 0.2 ns) and faster rise times (0.1 ns) may be possible for laser diode packages with very low parasitic inductance. The -P0 and -P2 packages generally have very low inductance. The -P1, -P3, and -TO3 packages normally have somewhat higher parasitic inductance.
- 2) 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 50Ω / N² (approx).
- 3) A polarity inverting option is available. Add the suffix -INV to the model number to specify this option. "N" is a negative number when this option is installed.
- 4) Generic option. A drawing showing the diode package size and electrical pinout must be provided by the end-user, and the model number and price may change.
- 5) -P1B (specific pinout option). No further drawings are required. The socket will accept pins 8-14 of a standard butterfly package with 0.5 mm wide pins. A pulse will be applied to the diode anode (pin 10). Pins 8-9 and 11-13 will be grounded. Pin 14 will be made accessible through a solder terminal. Four mounting holes on a 8.9 x 26 mm grid will be provided. The diode parasitic resistance (dV/dI at lasing) must be < 1 Ohm. A low-bandwidth slide-on socket can also be provided for pins 1-7 of the diode, with the thermal control pins brought out to a standard DB-9 connector (-T1B option).
- 6) -P1C (specific pinout option). No further drawings are required. The socket will accept pins 8-14 of a standard butterfly package with 0.5 mm wide pins. A negative pulse will be applied to the diode cathode (pin 12). Pins 8-11 and 13-14 will be grounded. Four mounting holes on a 8.9 x 26 mm grid will be provided. The laser input impedance (dV/dI at lasing) must be 25 Ohms (+/- 5 Ohms). Not available on AVX-S3 models, or models with the -HC suffix. A low-bandwidth slide-on socket can also be provided for pins 1-7 of the diode, with the thermal control pins brought out to a standard DB-9 connector (-T1C option).

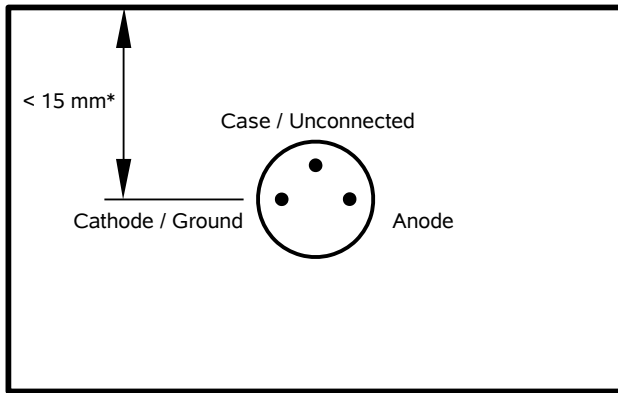
GENERAL INFORMATION

BASIC TEST ARRANGEMENT

To fully test the AVX-S1-P2-S105, and for normal operation, the output module should be connected as shown below:

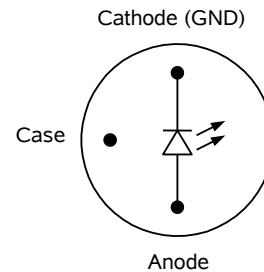


The diode load is inserted into the socket on the output module. The mechanical layout of the socket is shown below:



SOCKET VIEW (NOT TO SCALE)

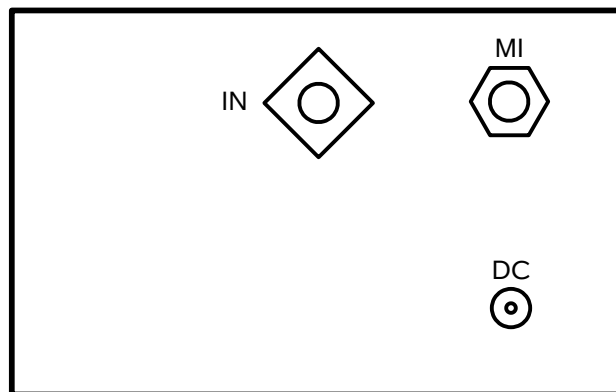
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NOTE: Trim the diode leads to **no longer than 1.0 cm in length**. If the leads are longer than that, they may cause an internal short circuit in the output module, which may cause damage to the diode and the output module.



CONNECTOR VIEW (NOT TO SCALE)

An oscilloscope may be used to monitor the MI output, the location of which is shown in the figure above. A forward DC bias may be applied to the laser diode by connecting a DC potential of 0 to +5 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). Note that the DC port must be shorted to ground if a bias is not applied.

AMPLITUDE CONTROL

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

$$I_{\text{DIODE}} = (V_{\text{SET}} - V_{\text{DIODE}}) / (50\Omega + R_{\text{DIODE}})$$

where V_{SET} is the amplitude setting on the mainframe (typically between 0 and +23V), V_{DIODE} is the forward voltage drop across the diode (typically 2-3V), and R_{DIODE} is the resistor internal to the laser diode (normally ≈ 0 Ohms). The 50Ω resistance is built into the AVX-S1-P2-S105 output module.