



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
<http://www.avtechpulse.com>

□ P.O. BOX 5120 STN. F
OTTAWA, ONTARIO
CANADA K2C 3H4
TEL: (613) 226-5772
FAX: (613) 226-2802

INSTRUCTIONS

MODEL AVX-S1-MV-MD-UTB BIAS INSERTION UNIT

S.N.: 10589

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

Fax: 613-226-2802 or 1-800-561-1970

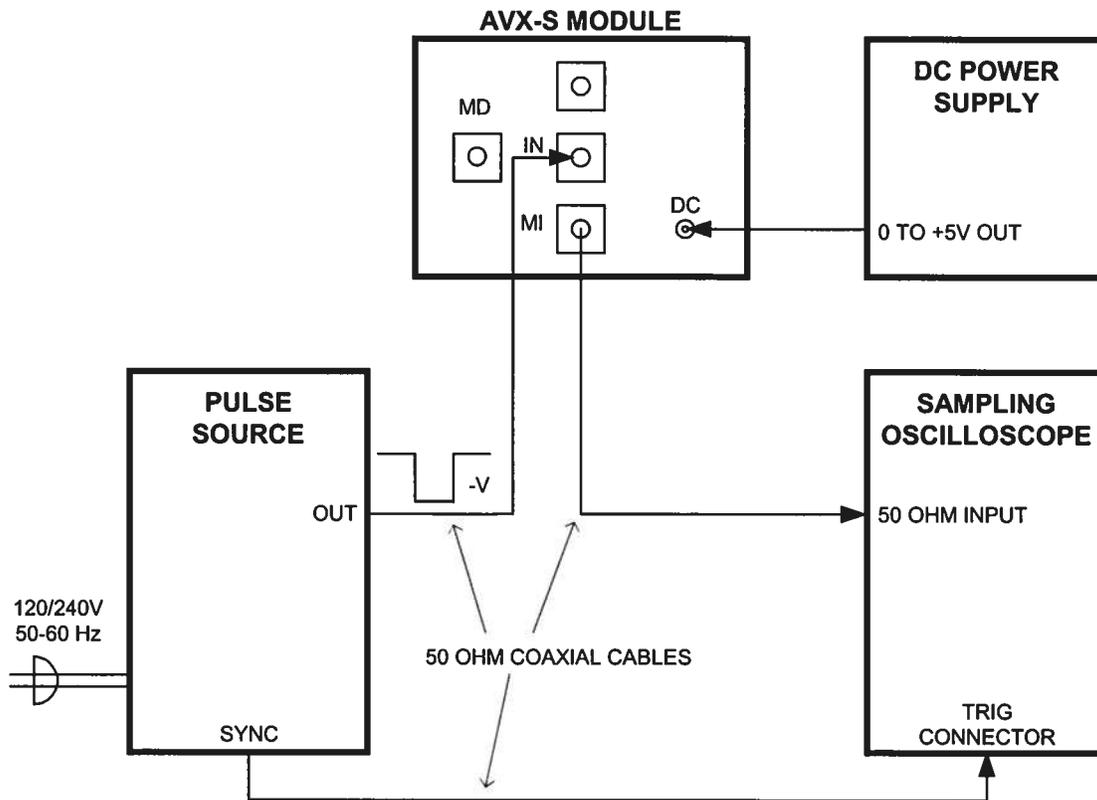
E-mail: info@avtechpulse.com

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

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Manual Reference: T:\instructword\avx-s\AVX-S1-MV-MD-UTB, sn 10589.doc, created May 2, 2003

FIG. 1: PULSE GENERATOR TEST ARRANGEMENT

GENERAL OPERATING INSTRUCTIONS

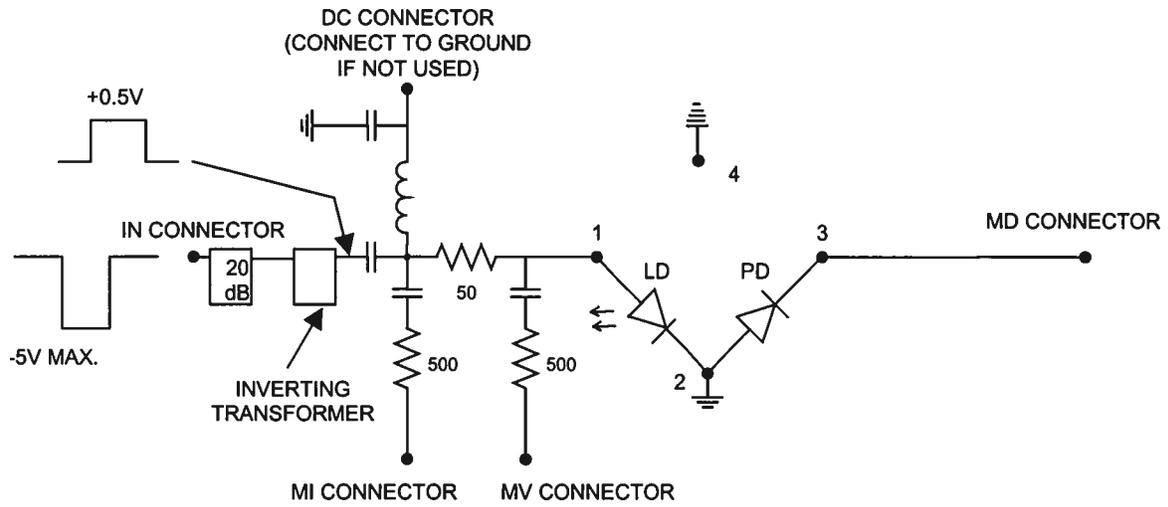
- 1) A general description of the AVX-S1 module is given in the enclosed data sheet.
- 2) The AVX-S1 module should be connected to your pulse source via a 50-Ohm cable (supplied).
- 3) The laser diode plugs directly into the socket on the side of the AVX-S1 module. Take care to gently insert (and remove) the diode and insure that the diode leads do not exceed 0.7 cm in length.
- 4) 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. Note that the DC solder terminal must be shorted to ground if the DC bias is not used.
- 5) The diode pulse current may be monitored by connecting the MI and MV output ports to the sampling scope. The output amplitude (V_{MI} and V_{MV} , Volts) and diode current (I_D , Amp) are related as follows:

$$I_D = 0.2 (V_{MI} - V_{MV})$$

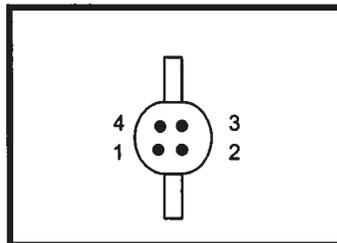
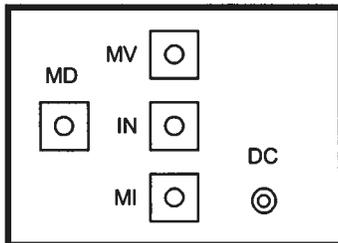
The laser diode voltage is given by the following:

$$V_D = 10 V_{MV}$$

AVX-S1-MD FUNCTIONAL EQUIVALENT CIRCUIT



AVX-S1-MD FUNCTIONAL EQUIVALENT CIRCUIT (S/N 10589)



PACKAGE (S/N 10589)

Dr. Michael J. Chudobiak

From: Dr. Michael J. Chudobiak
Sent: Monday, February 10, 2003 2:58 PM
To: 'Gauri Vibhakar Karve'
Cc: Avtech Sales
Subject: RE: Output module for TO-46 VCSEL



TO46-VCSEL
datasheet.pdf

To: Gauri Karve
Microelectronics Research Center
University of Texas
10100 Burnet Rd, Bldg 160, M/C R9950
Austin, TX 78758

ph. 512-232-4690
fax 512-471-5625
karve@ece.utexas.edu

Gauri,

I am pleased to quote as follows:

Quote number: 11400

Model number: AVX-S1-MV-MD-UTB

Description: Laser Diode Bias Insertion Unit (With Socket), for use with the Avtech AVO-9C-C-P-P1-UTA (S/N 10228).

Diode socket: mates with the VX-RO11-4AP1-PL diode described in the attached datasheet, assuming that the pinout diagram in the lower left portion of the page is the view from the bottom (leaded) end of the diode.

Attenuation: A 20 dB attenuator will be included within the AVX-S1-UTB, to reduce the peak current from 100 mA to 10 mA. This is due to the fact the that VX-RO11-4AP1-PL has a rated operating current of 5.5 mA. If this is not what you had in mind, please let me know and we can re-quote.

Polarity: The signal will be applied to the laser anode. The laser cathode and photodiode anode will be grounded. (A transformer will be included within the AVX-S1-UTB, to reverse the negative output polarity of the AVO-9C-C-P-P1-UTA).

Photodiode output: A direct connection to the photodiode cathode will be provided, through an SMA connector.

Other: as per the standard AVX-S1, see <http://www.avtechpulse.com/laser-bias/avx-s1/> for details.

Price: \$998 US, FOB destination (includes 5% academic discount).

Delivery: 60 days after receipt of order.



Laser Technologies

850nm VCSEL in TOSA Package (Preliminary)

1. Feature:

- a. Oxide VCSEL optimized for optical fiber communication
- b. TO-46 and LC-type packages with angle cap window and monitoring photodiode
- c. Data rate 2.5Gbps

2. Part Number: VX-RO11-4AP1-PL

3. Optical and Electrical Characteristics

Parameter	Symbol	Min.	TYP.	Max.	Unit	Test Condition
Peak Wavelength	λ_p	830	845	860	nm	$I_f = 8\text{mA@RT}$
Spectral Width (RMS)	$\Delta\lambda$			0.85	nm	$I_f = 8\text{mA@RT}$
Operating current @ 2.5 Gbps	I_{op}		5.5		mA	Adjustable
Beam Divergence (Full width at $1/e^2$)	θ		25	30	Deg	$I_f = 8\text{mA@RT}$
Forward Voltage	V_f	1.7	1.9	2.2	V	$I_f = 8\text{mA@RT}$
Threshold Current	I_{th}		1.8	2.6	mA	
Slope Efficiency	SE	0.03	0.11	0.15	W/A	$I_f = 8\text{mA@RT}$
Optical output power	P_{out}		0.68		mW	$I_f = 8\text{mA@RT}$
Dynamic Resistance	dV/dI	25	40	65	Ω	$I_f = 8\text{mA@RT}$
Rise / Fall Time	t_r / t_f		50	100	ps	20%-80%
Jitter p-p	t_j		35		ps	
λ_p Temperature Coefficient	$\delta\lambda_p / \delta T$		0.06		nm/ $^{\circ}\text{C}$	$T_A = 0\sim 70^{\circ}\text{C}$, $I_f = 8\text{mA}$
Relative Intensity Noise	RIN		-122	-117	dB/Hz	$I_f = 8\text{mA@RT}$
Thermal resistance	R_{th}		1		$^{\circ}\text{C}/\text{mW}$	$T_A = 25^{\circ}\text{C}$
I_{th} - Temperature variation	ΔI_{th}	-1.5		2.5	mA	$T_A = 0\sim 70^{\circ}\text{C}$
V_f Temp. Coeffi.	$\Delta V_f / \Delta T$	-3	-2.5	-1.0	mV/ $^{\circ}\text{C}$	$T_A = 0\sim 70^{\circ}\text{C}$
SE Temp. Coeffi.	$\Delta(\text{SE}) / \Delta T$			-6	%/ $^{\circ}\text{C}$	$T_A = 0\sim 70^{\circ}\text{C}$

4. Maximum Ratings

Parameter	Min.	Max.	Unit	Condition
Storage Temperature	-40	100	$^{\circ}\text{C}$	
Operating Temperature	0	85	$^{\circ}\text{C}$	
Continuous Forward Current		8	mA	
Continuous Reverse Voltage		5	V	@10 μA

5. Monitoring PIN Specs ($T_A = 25^{\circ}\text{C}$ unless noted)

Parameter	Symbol	Min.	TYP.	Max.	Unit	Test Condition
Monitor Current	I_m	100	450	700	μA	$I_f = 8\text{mA@RT}$
Dark current	I_r		0.2	20	nA	$V_r = 3\text{V}$
Breakdown voltage	V_{br}		50		V	$I_r = 10\mu\text{A}$
Junction capacitance	C_p			100	pF	@ $V_r = 0\text{V}$, 1 MHz

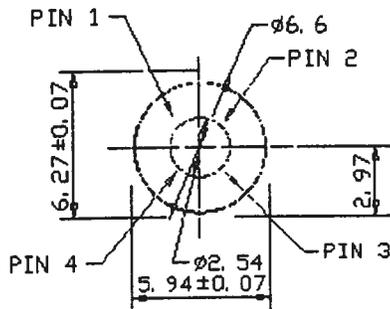
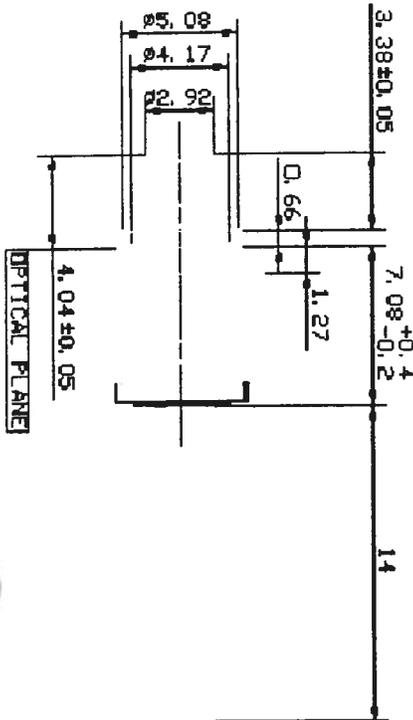
Note. These specifications are subject to change without notice.

Tel: 323-278-0820

Fax: 323-278-0096

Website: www.axt.com/vcsel

Email: vcsel@axt.com



- 1. VCSEL Anode
- 2. VCSEL Cathode/Photodiode Anode
- 3. Photodiode Cathode
- 4. N/A

May 2, 2003