



Sx3-Lx11x MSA 2 x 5 Small Form Factor Optical Transceiver

3.3 Volt, 1320nm LED, Multimode, up to 1.0Km, OC-12 / STM-4

FEATURES

- Complies with 2x5 SFF Multi Source Agreement
- Overall metal shield with spring clip chassis grounds
- Options for 0.55" or 0.60" centerline mounting
- Wave solder and aqueous wash compatible
- Multisourced 2 x 5 transceiver footprint
- PCI Mezzanine Card height compliant
- IEC 825 / CDRH Class 1 compliant
- Duplex LC multimode receptacle
- Single +3.3 V power supply

APPLICATIONS

The Sx3-Lx11x multimode glass optical fiber transceivers provide low profile, cost effective solutions for OC-12 / STM-4 (up to 700 Megabaud, up to 1.0 Km) multimode glass optical fiber data links.

These transceivers are fully compliant with the ITU-T, IEEE, and ANSI standards but they can be used for any other data communications purpose within their operating parameters.

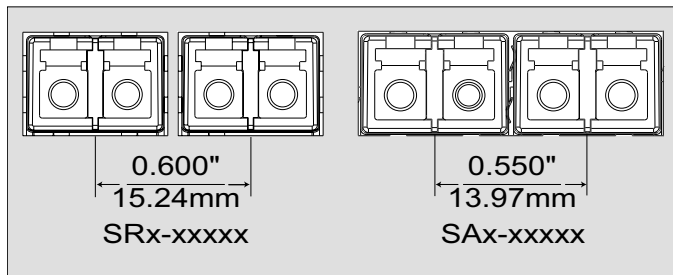
DESCRIPTION

The Sx3-Lx11x fiber optic transceivers consist of transmitter and receiver functions combined in a multisourced 2x5 SFF transceiver module. The optical transmitter is a high output 1320nm LED. The transmitter input lines are driven with LVPECL signals applied to the Transmit (TD+ and TD-) pins. The optical transmitter can be disabled by applying an LVTTTL signal to the Transmit Disable (TDIS) pin.

The optical receiver consists of PIN + preamplifier assembly and a limiting post-amplifier integrated circuit. Outputs from the receiver consist of LVPECL data signals on the Receive (RD+ and RD-) pins and a single ended LVPECL or LVTTTL signal detect function on the Signal Detect (SD) pin.

The 0.550" centerline mounting option incorporates a spring clip optimized for multiport applications where the adjacent transceivers must simultaneously ground to each other while preserving their true positions. The 0.600" centerline mounting option incorporates a different spring clip that is optimized for single port panel openings where no adjacent transceiver will be disturbed by its higher spring forces.

MSA CENTERLINE MOUNTING OPTIONS



SEE PAGE 11 FOR ORDERING INFORMATION

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ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	T_s	-55		+100	° C
Lead Soldering Temperature	T_{SOLD}			+260	° C
Lead Soldering Time	t_{SOLD}			10	Seconds
Supply Voltage	V_{CC}	-0.5		+6.0	V
Data Input Voltage	V_i	-0.5		V_{CC}	V
Differential Input Voltage (p-p)	V_D			2.0	V
Output Current	I_o			50	mA

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature Limit Part Number xxx-xxxx Part Number xxx-xxxxH	T_A	0 -40		+70 +85	° C
Supply Voltage	V_{CC}	+3.135		+3.465	V
TX Differential Input Voltage (p-p)	V_D	0.350	0.800	1.250	V
Transmit Disable Voltage	V_{TD}	$V_{CC} - 1.3$		V_{CC}	V
Transmit Enable Voltage	V_{TEN}	V_{EE}		$V_{EE} + 0.8$	V
RX Data Output Load	R_L		50		Ohms

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TRANSMITTERS

VCCTX = 3.15V to 3.45V, T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		100		700	MBaud
Optical Output Power ¹	P_O	-19		-14	dBm
Optical Output Wavelength	λ_{OUT}	1280	1320	1340	nm
Optical Rise Time	t_R	0.7		1.25	ns
Optical Fall Time	t_F	0.9		1.25	ns
Extinction Ratio	ER	10.0			dB
Supply Current	I_{CC}		120	160	mA

1. BER = 10^{-10} @ 622.08 Mbps, PRBS 2²³-1, NRZ, Compliant with Telcordia GR-253 and ITU recommendations G.957 and G.958

RECEIVERS

VCCR_X = 3.15V to 3.45V, T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		100		700	MBaud
Optical Sensitivity ¹	P_I	-28		-8	dBm
Optical Wavelength	λ_{IN}	1261		1380	nm
Supply Current	I_{CC}		70	120	mA
Signal Detect Assert Time	t_{SDAS}		<10	100	μ S
Signal Detect Deassert Time	t_{SDDA}		<10	350	μ S
Signal Detect Threshold Decreasing Light	LSTD	-45.0		-32.5	dBm
Increasing Light	LSTI	-45.0		-32.0	dBm
Signal Detect Hysteresis	HYS	0.5	2.25	3.5	dB
RX Data Output - Low	$V_{OL} - V_{CC}$	-1.810		-1.475	V
RX Data Output - High	$V_{OH} - V_{CC}$	-1.165		-0.880	V

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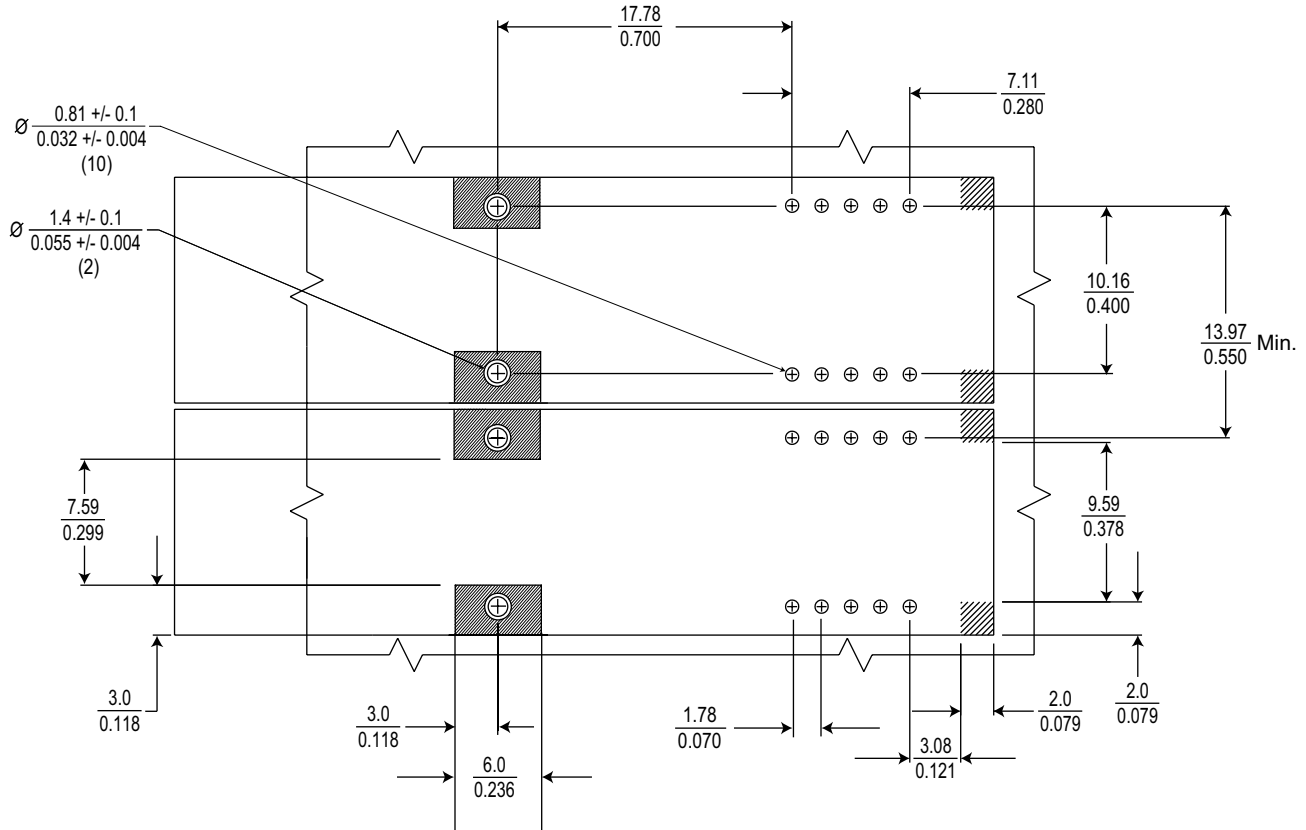
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MSA 2x5 SFF TRANSCEIVER PRINTED CIRCUIT BOARD LAYOUT

Top View Shown

Dimensions Are Shown As: $\frac{\text{mm}}{\text{inches}}$



CROSS-HATCHED AREAS SHOULD HAVE NO SIGNAL TRACES ON THE TOP LAYER

Sx3-Lx11x Small Form Factor Optical Transceiver

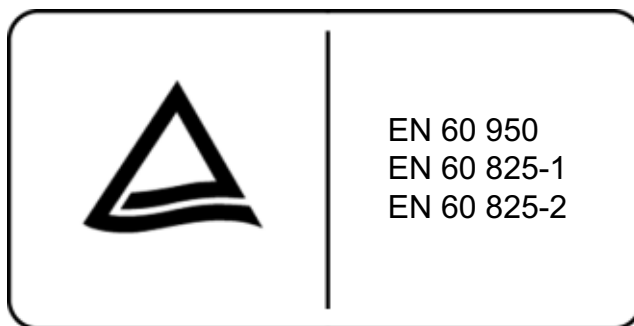
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REGULATORY COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883-3015.7	ESD	Class II	2200V
IEC-801-2	ESD	Human Body Model	25KV
IEC-801-3	EMI	Immunity	10V/M
FCC	EMI	Class B	>20dB
EN 55022 (CISPR 22A)	EMI	Class B	10V/M
IEC-825 issue 1993-11	Eye Safety	Class 1	TUV Certificate Number R 2171007
FDA CDRH 21-CFR 1040	Eye Safety	Class 1	CDRH Accession Number 9930009



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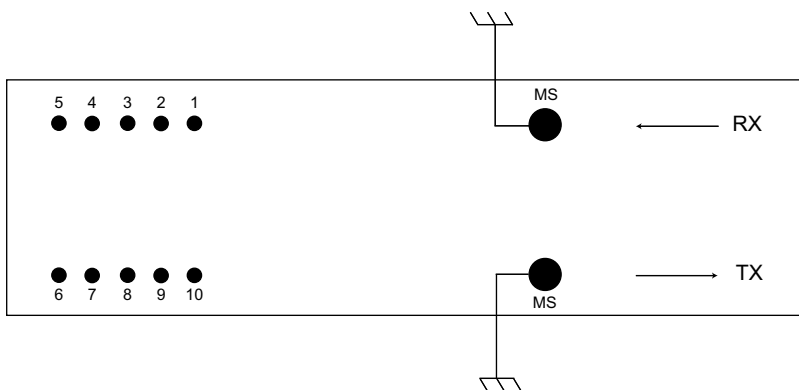


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2 x 5 MSA SMALL FORM FACTOR TRANSCEIVER PIN NUMBER ASSIGNMENTS TOP VIEW SHOWN



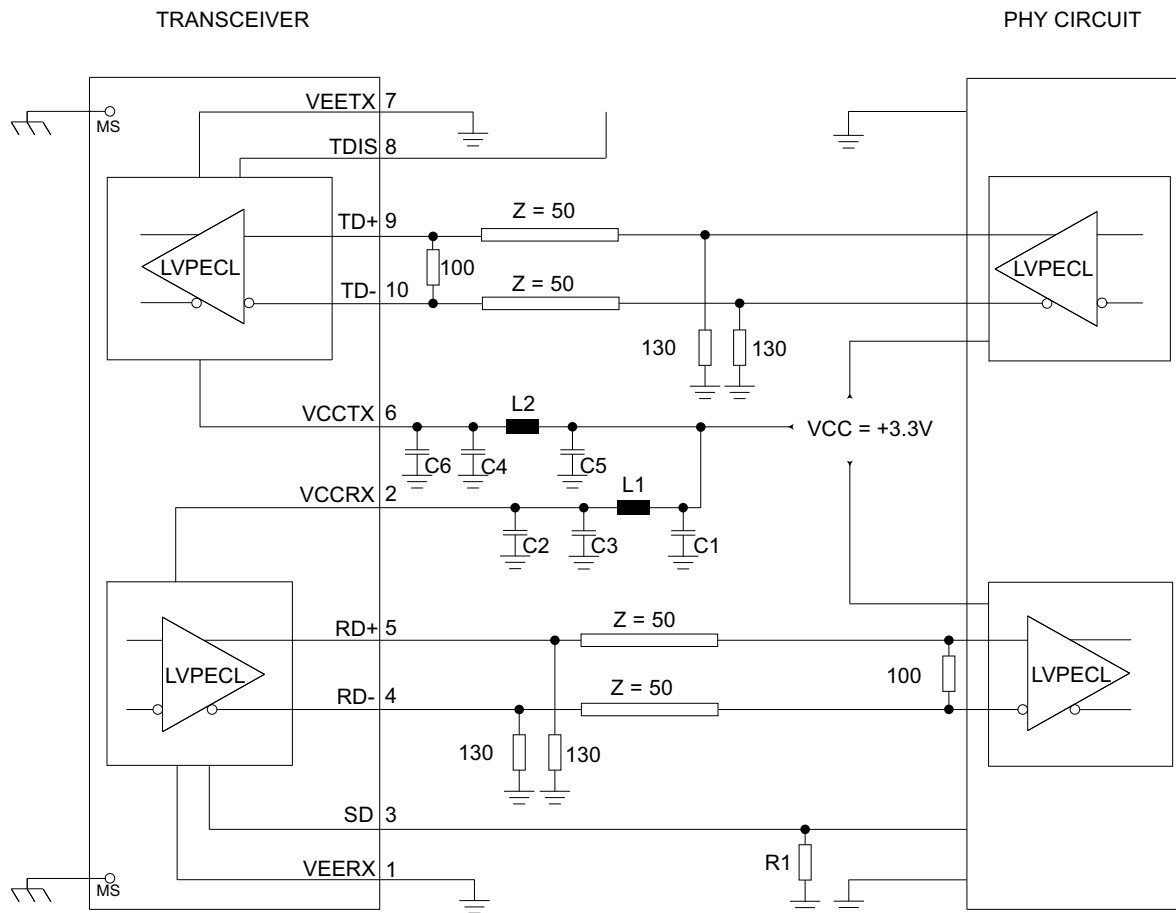
PIN FUNCTIONS

Pin Number	Symbol	Description	Logic Family
MS	MS	Mounting Studs <i>Connect to Chassis Ground</i>	N/A
1	VEERX	Receiver Signal Ground	N/A
2	VCCR _X	Receiver Power Supply	N/A
3	SD	Signal Detect <i>Satisfactory Optical Input: Logic "1" Output</i> <i>Fault Condition: Logic "0" Output</i>	Sxx-xPxxx LVPECL Sxx-xTxxx LVTTTL
4	RD-	Receiver DATA Out	LVPECL
5	RD+	Receiver DATA Out	LVPECL
6	VCCTX	Transmitter Power Supply	N/A
7	VEETX	Transmitter Signal Ground	N/A
8	TDIS	Transmitter Disable	LVTTTL
9	TD+	Transmitter DATA In	LVPECL
10	TD-	Transmitter DATA In	LVPECL

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TRANSCEIVER APPLICATION SCHEMATIC For Interface To +3.3V LVPECL Circuits

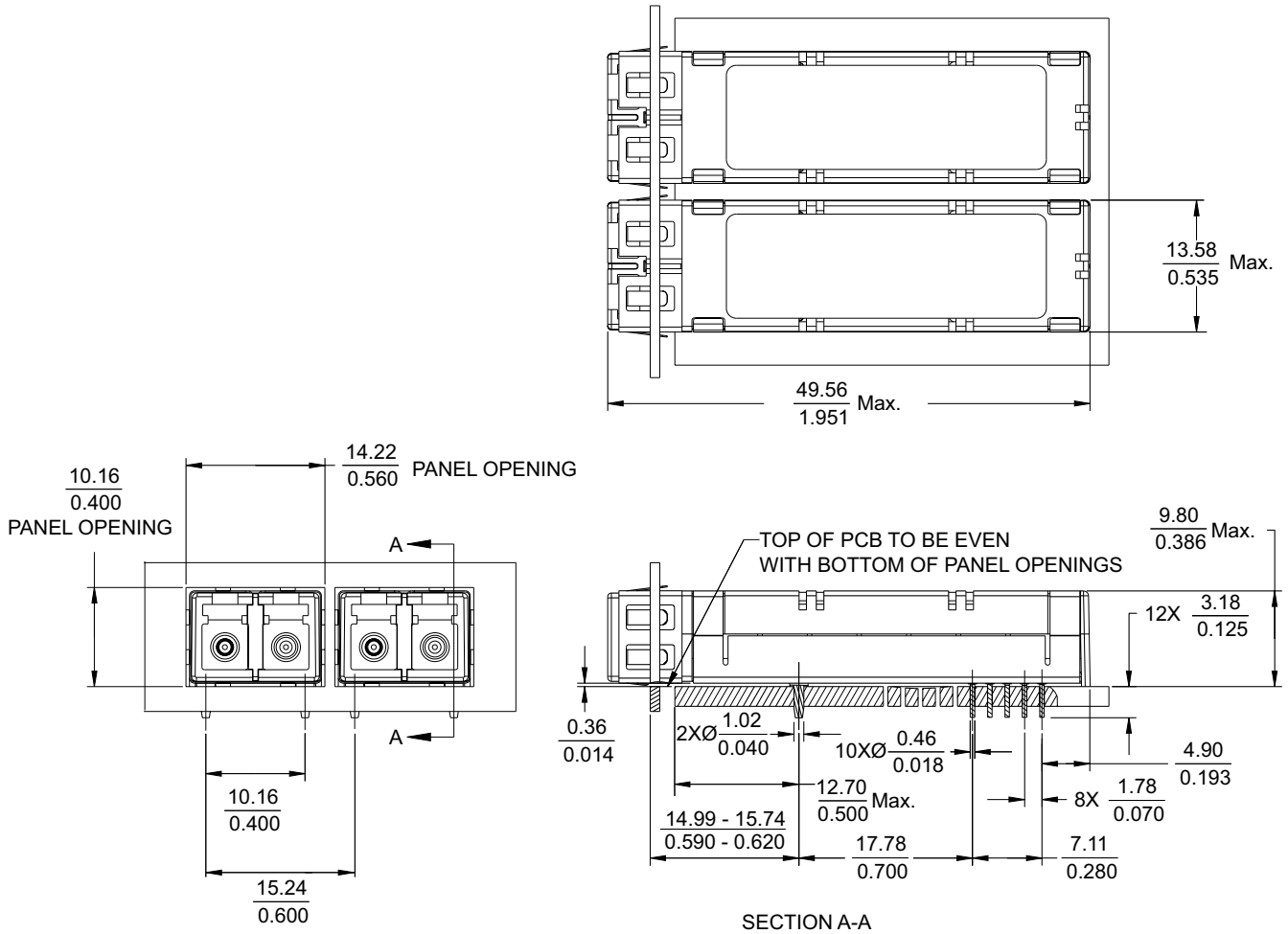


R1 = 150 for Sxx-xP1xx / Remove for Sxx-xT1xx
 L1, L2 = 1.0 μ H to 4.7 μ H*
 C1, C2, C6 = 10.0nF
 C3, C4, C5 = 4.7 μ F to 10.0 μ F
 * Or ferrite bead alternative

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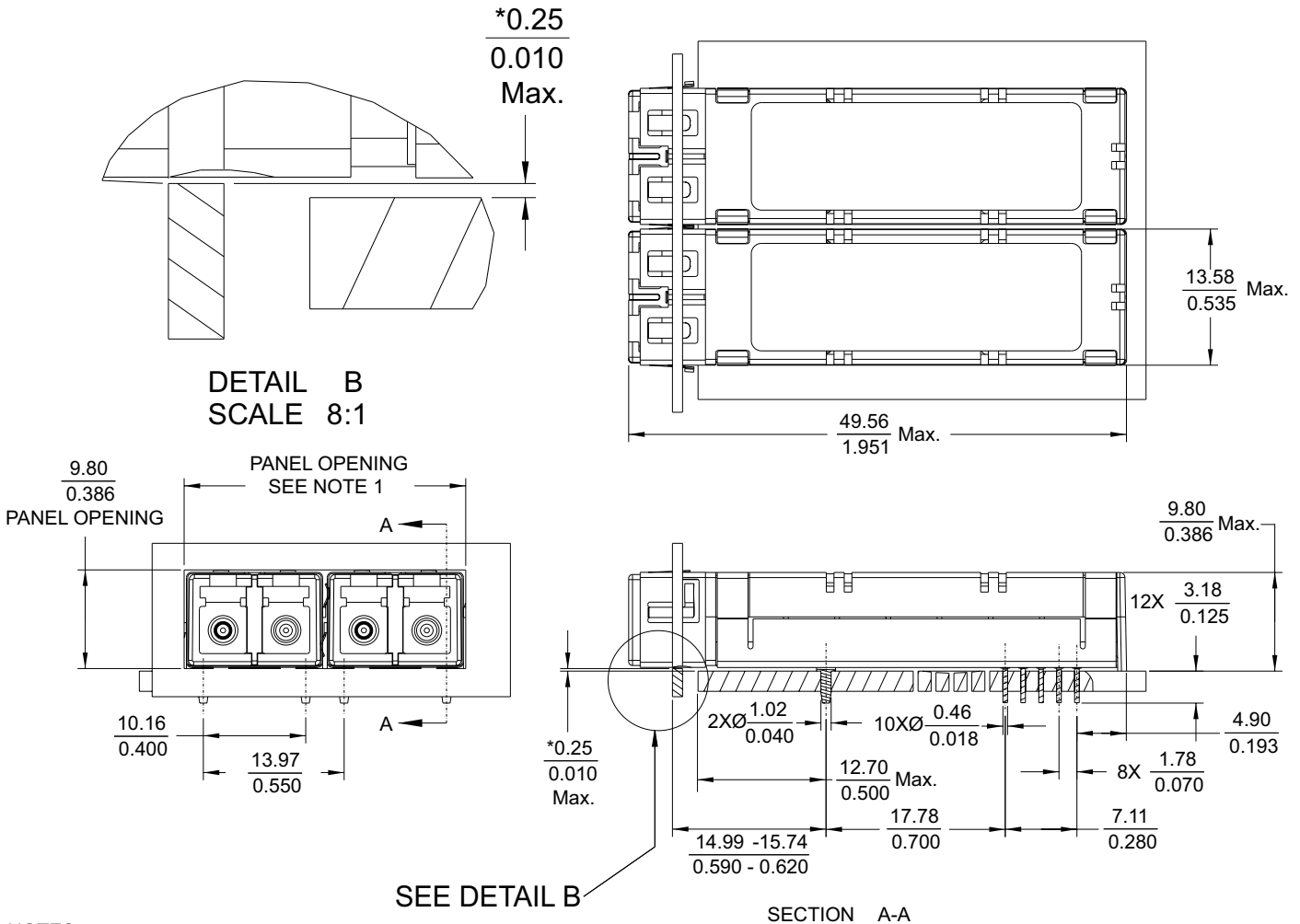
MSA 2 x 5 OUTLINE DIMENSIONS
For SRx-xxxxx 0.600" Center to Center Mounting
Dimensions Are Shown As: $\frac{\text{mm}}{\text{inches}}$



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MSA 2 x 5 OUTLINE DIMENSIONS For SAx-xxxxx 0.550" Center to Center Mounting Dimensions Are Shown As: $\frac{\text{mm}}{\text{inches}}$



- NOTES:
1. PANEL OPENING SIZE = .550" x N WHERE N = NUMBER OF TRANSCEIVERS.
2. *DIMENSION FROM TOP OF PCB TO BOTTOM OF OPENING.

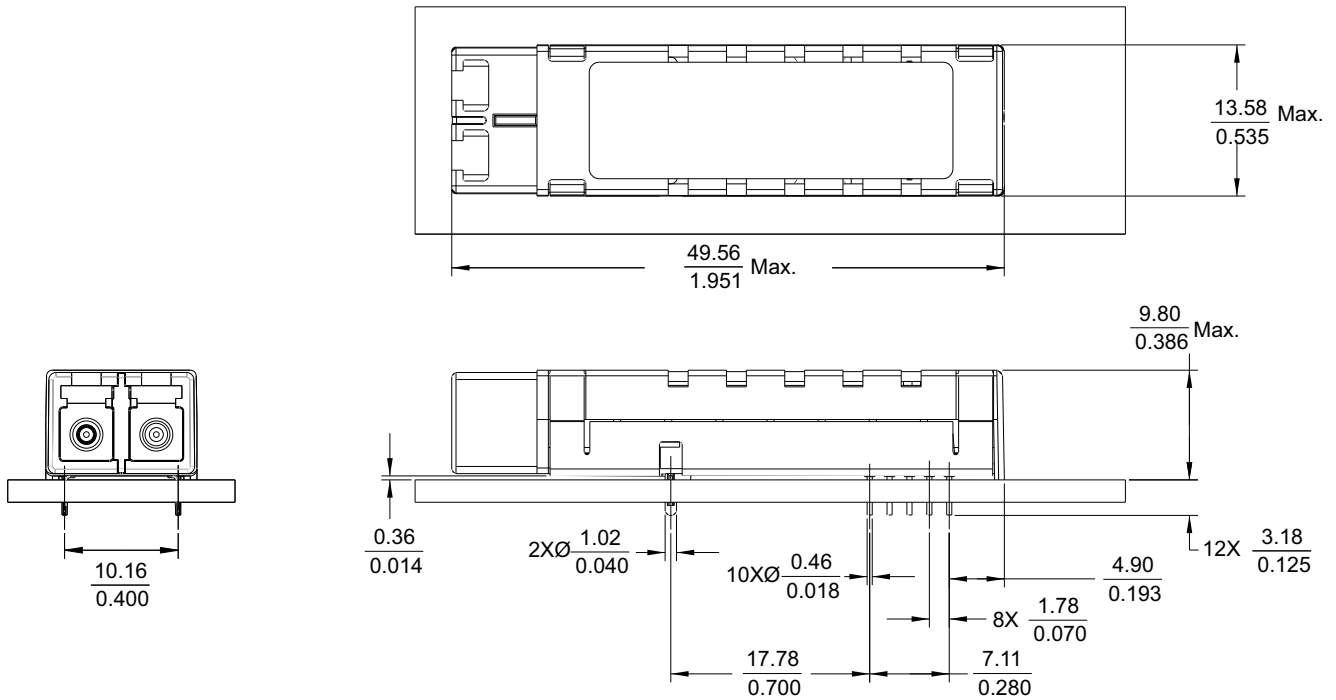
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MSA 2 x 5 OUTLINE DIMENSIONS

For SNx-xxxxx (No Grounding Clip)

Dimensions Are Shown As: $\frac{\text{mm}}{\text{inches}}$



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ORDERING INFORMATION

Application / Specification	Minimum Centerline Spacing	Temp. Range °C	Signal Detect	Part Number
OC-12 / STM-4 / ANSI T1.646	0.550" / 13.97mm	0 to +70	LVPECL	SA3-LP11
	0.550" / 13.97mm	-40 to +85	LVPECL	SA3-LP11H
	0.550" / 13.97mm	0 to +70	LVTTL	SA3-LT11
	0.550" / 15.24mm	-40 to +85	LVTTL	SA3-LT11H
	0.600" / 15.24mm	0 to +70	LVPECL	SR3-LP11
	0.600" / 15.24mm	-40 to +85	LVPECL	SR3-LP11H
	0.600" / 15.24mm	0 to +70	LVTTL	SR3-LT11
	0.600" / 15.24mm	-40 to +85	LVTTL	SR3-LT11H
	No Panel Grounding Clip	0 to +70	LVPECL	SN3-LP11
	No Panel Grounding Clip	-40 to +85	LVPECL	SN3-LP11H
	No Panel Grounding Clip	0 to +70	LVTTL	SN3-LT11
	No Panel Grounding Clip	-40 to +85	LVTTL	SN3-LT11H

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