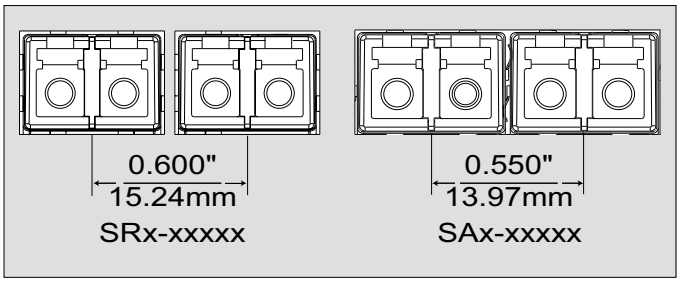
Sx3-Lx12x Series Sonet / SDH Compliant MSA 2 x 5 Small Form Factor Optical Transceiver

3.3 Volt, 1310nm Laser, Single Mode, OC-12 / STM-4 Intermediate Reach

FEATURES

- Compliant with Telcordia GR - 253 and ITU-T G.957
- Compliant with 2x5 SFF Multi Source Agreement
- Options for 0.55” or 0.60” centerline mounting
- Optimized for single mode glass optical fiber
- LVPECL or LVTTL signal detect options
- Front panel chassis grounding springs
- PCI Mezzanine Card height compliant
- Solder and aqueous wash compatible
- Duplex LC single mode receptacle
- IEC 825 / CDRH Class 1 compliant
- Sonet / SDH Intermediate Reach
- Single +3.3 V power supply

MSA CENTERLINE MOUNTING OPTIONS



SEE PAGE 11 FOR ORDERING INFORMATION

APPLICATIONS

The Sx3-Lx12x single mode glass optical fiber transceivers provide low profile, cost effective solutions for OC-12 / STM-4 (up to 700 Megabaud, up to 15 Km) single mode glass optical fiber data links.

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

DESCRIPTION

The Sx3-Lx12x fiber optic transceivers consist of transmitter and receiver functions combined in a multisourced 2x5 SFF transceiver module. The optical transmitter is a 1310nm Fabry-Perot laser. 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 LVTTL 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 LVTTL 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.

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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

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		10		700	MBaud
Optical Output Power[1]	P_O	-15		-8	dBm
Optical Output Wavelength	λ_{OUT}	1280	1310	1340	nm
Spectral Width	λ_{RMS}		2	5	nm
Extinction Ratio	ER	8.2			dB
Supply Current	I_{CC}		120	160	mA
Optical Rise Time	t_R			2	ns
Optical Fall Time	t_F			2	ns

1. BER = 10^{-10} @ 622.08 Mbps, PRBS 2^{23-1}, NRZ, Compliant with Telcordia GR-253 and ITU recommendations G.957 and G.958.

RECEIVERS

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		10		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	µS
Signal Detect Deassert Time	t_{SDDA}		<10	350	µS
Signal Detect Threshold Decreasing Light Increasing Light	 LSTD LSTI	 -45.0 -45.0		 -32.5 -32.0	 dBm 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

1. BER = 10^{-10} @ 622.08 Mbps, PRBS 2^{23-1}, NRZ, Compliant with Telcordia GR-253 and ITU recommendations G.957 and G.958.

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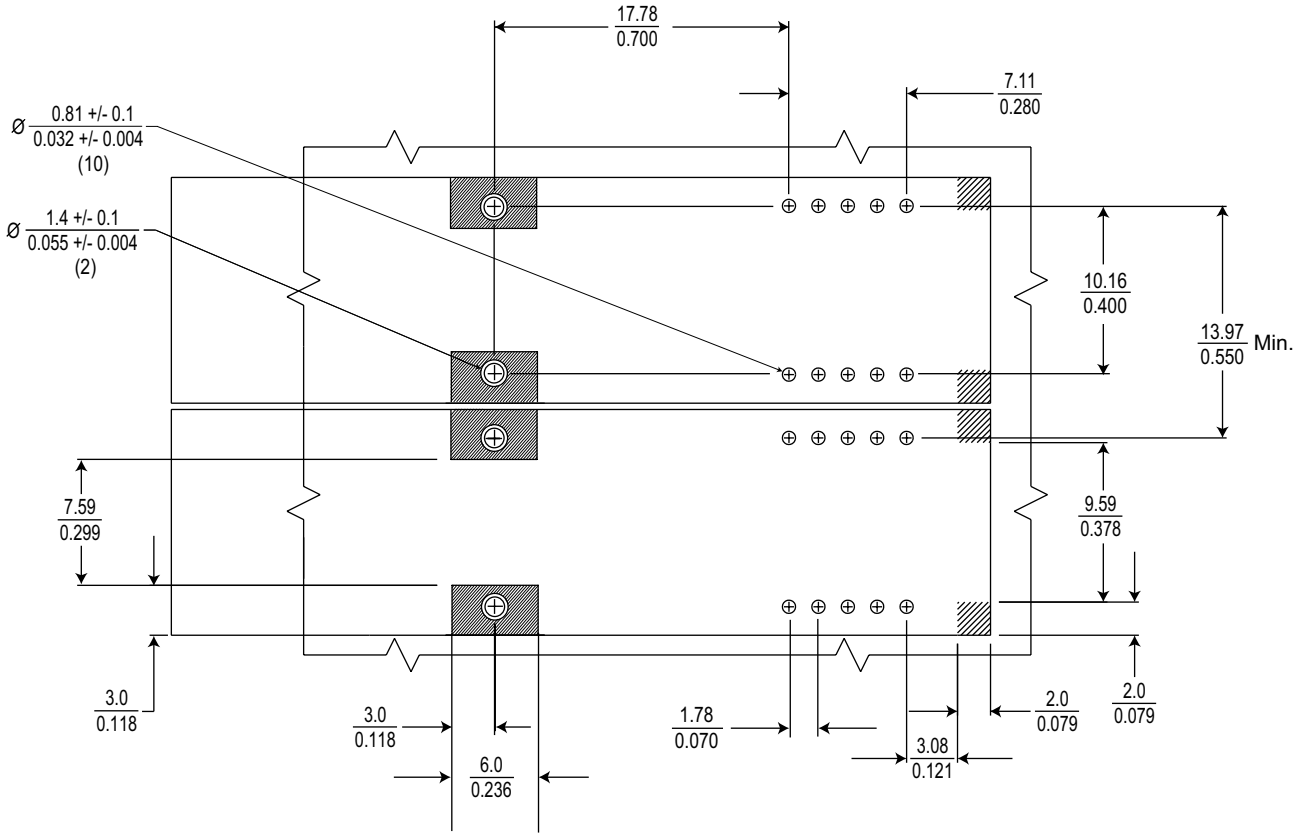
MSA 2x5 SFF TRANSCEIVER PRINTED CIRCUIT BOARD LAYOUT

Top View Shown

Dimensions Are Shown As: mm / inches



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

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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

c ® US

File Number: E209124

EN 60 950
EN 60 825-1
EN 60 825-2

File Number: R 2071007

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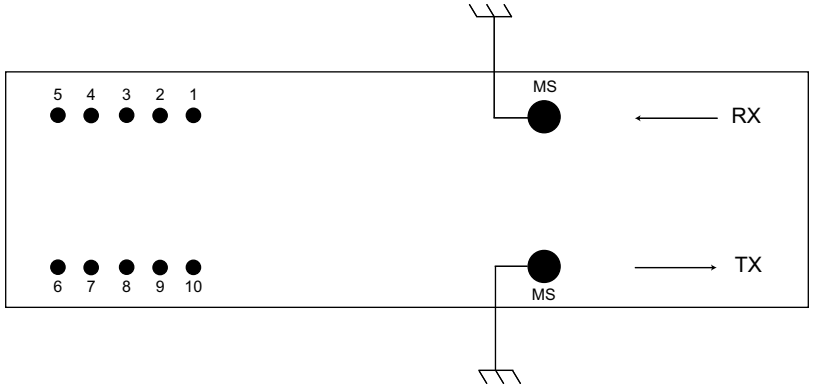
2 x 5 MSA SMALL FORM FACTOR TRANSCEIVER
PIN NUMBER ASSIGNMENTS
TOP VIEW SHOWN



PIN FUNCTIONS

Pin Number	Symbol	Description	Logic Family
MS	MS	Mounting Studs *Connect to Chassis Ground*	N/A
1	VEEREX	Receiver Signal Ground	N/A
2	VCCRX	Receiver Power Supply	N/A
3	SD	Signal Detect *Satisfactory Optical Input: Logic "1" Output* *Fault Condition: Logic "0" Output*	Sxx-xPxxx LVPECL Sxx-xTxxx LVTTL
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	LVTTL
9	TD+	Transmitter DATA In	LVPECL
10	TD-	Transmitter DATA In	LVPECL

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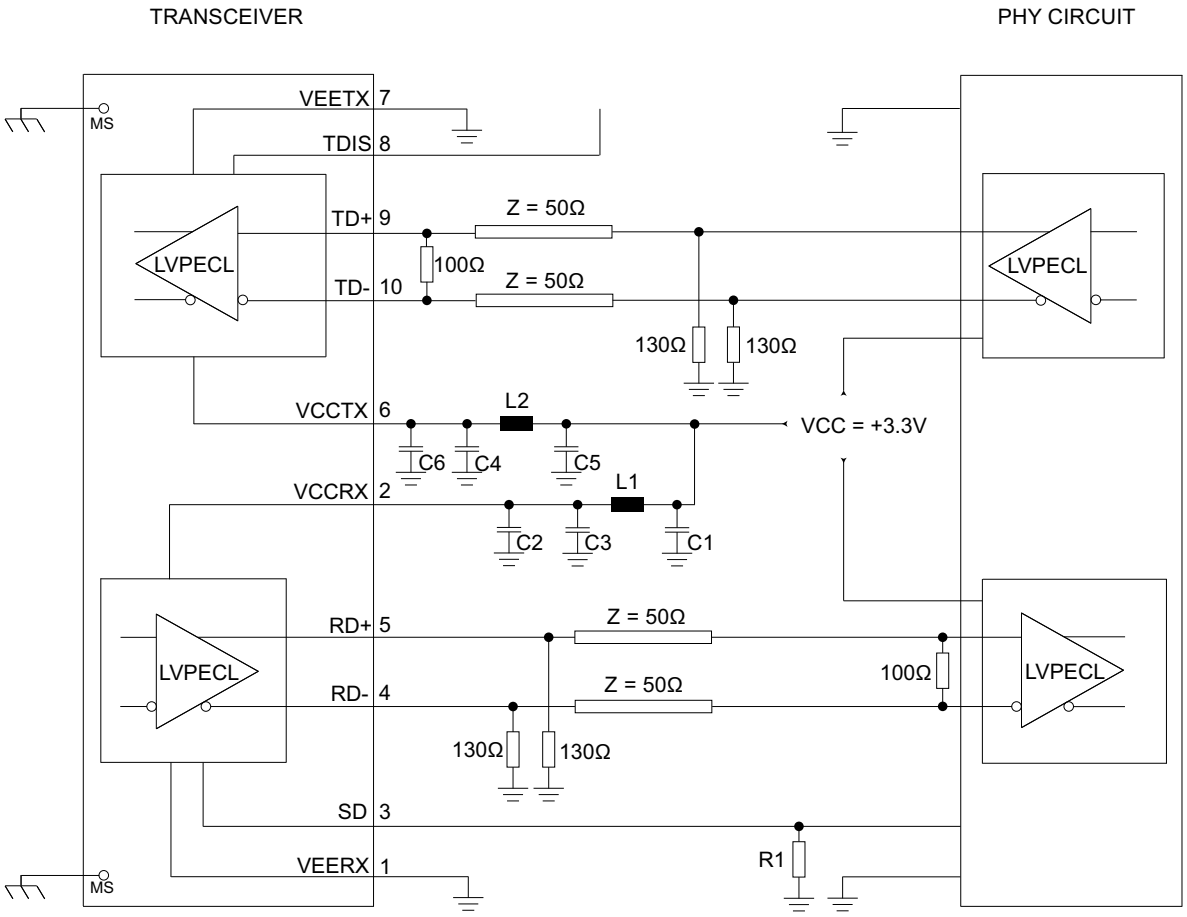
TRANSCEIVER APPLICATION SCHEMATIC

For Interface To +3.3V LVPECL Circuits



R1 = 150Ω for Sxx-LP1xx / Remove for Sxx-LT1xx
L1, L2 = 1.0µH to 4.7µH*
C1, C2, C6 = 10.0nF
C3, C4, C5 = 4.7µF to 10.0µF
* Or ferrite bead alternative

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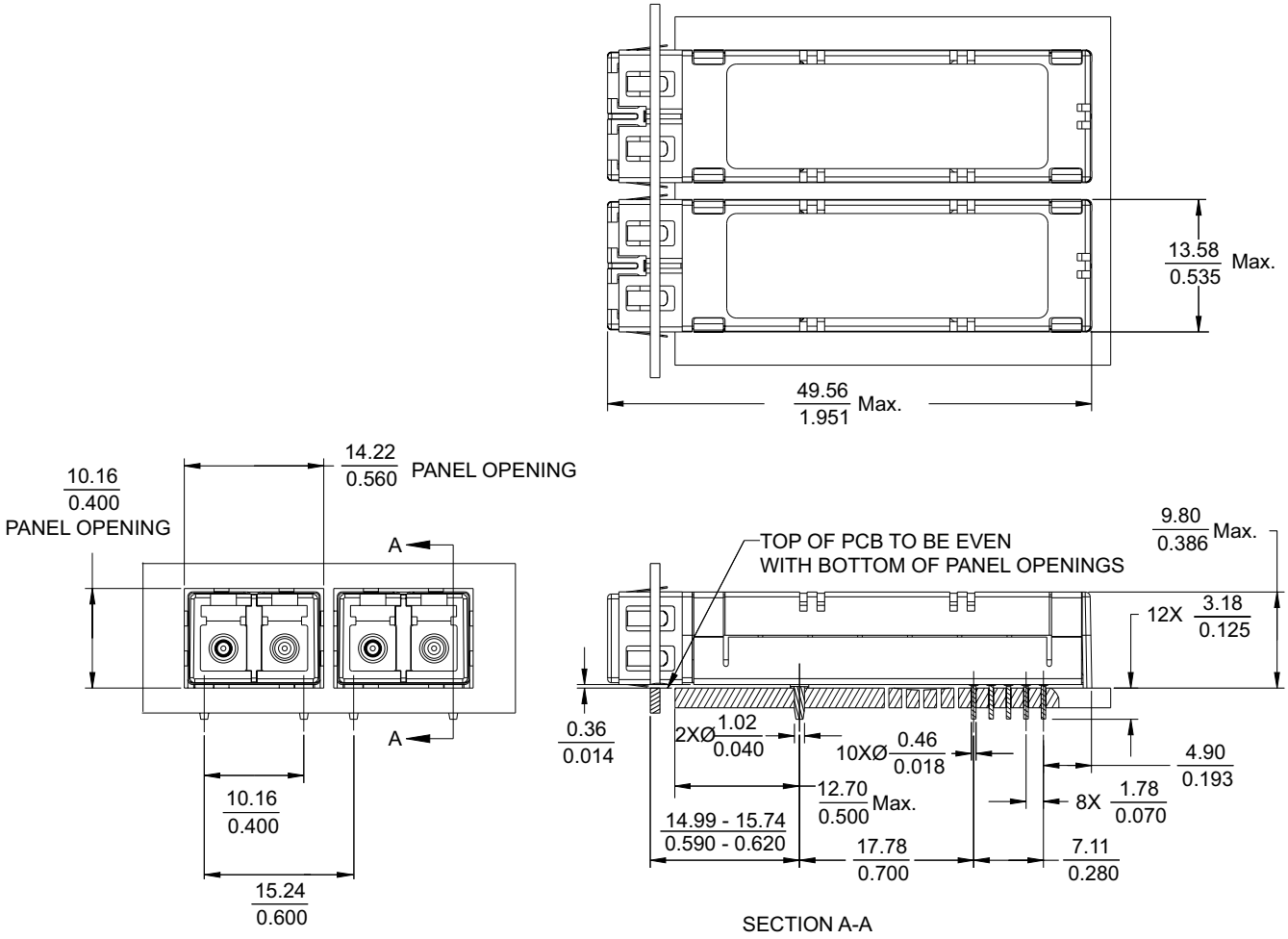
MSA 2 x 5 OUTLINE DIMENSIONS
For SRx-xxxxx 0.600" Center to Center Mounting
Dimensions Are Shown As: mm / inches



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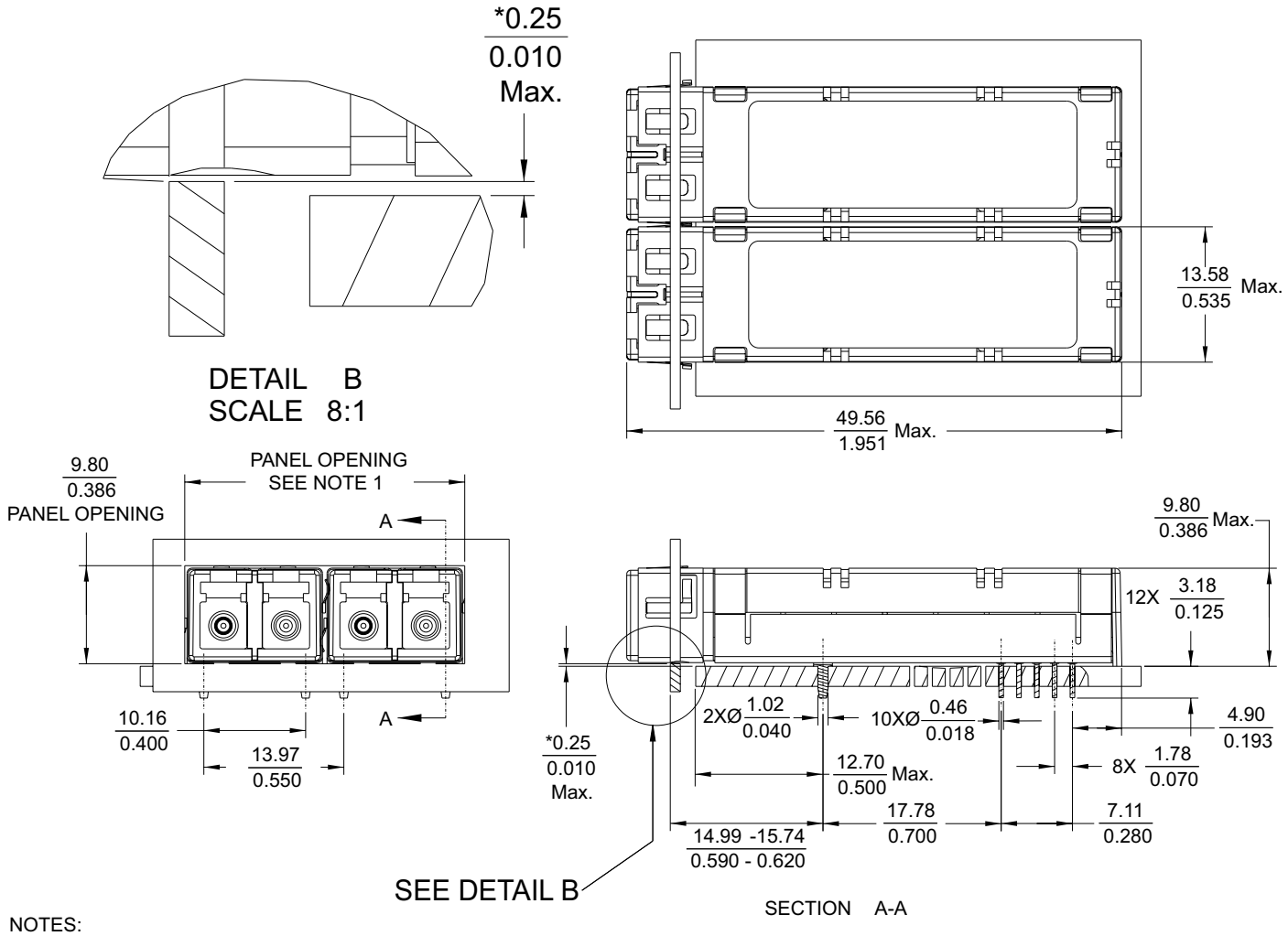
MSA 2 x 5 OUTLINE DIMENSIONS
For SAx-xxxxx 0.550" Center to Center Mounting
Dimensions Are Shown As: mm / inches



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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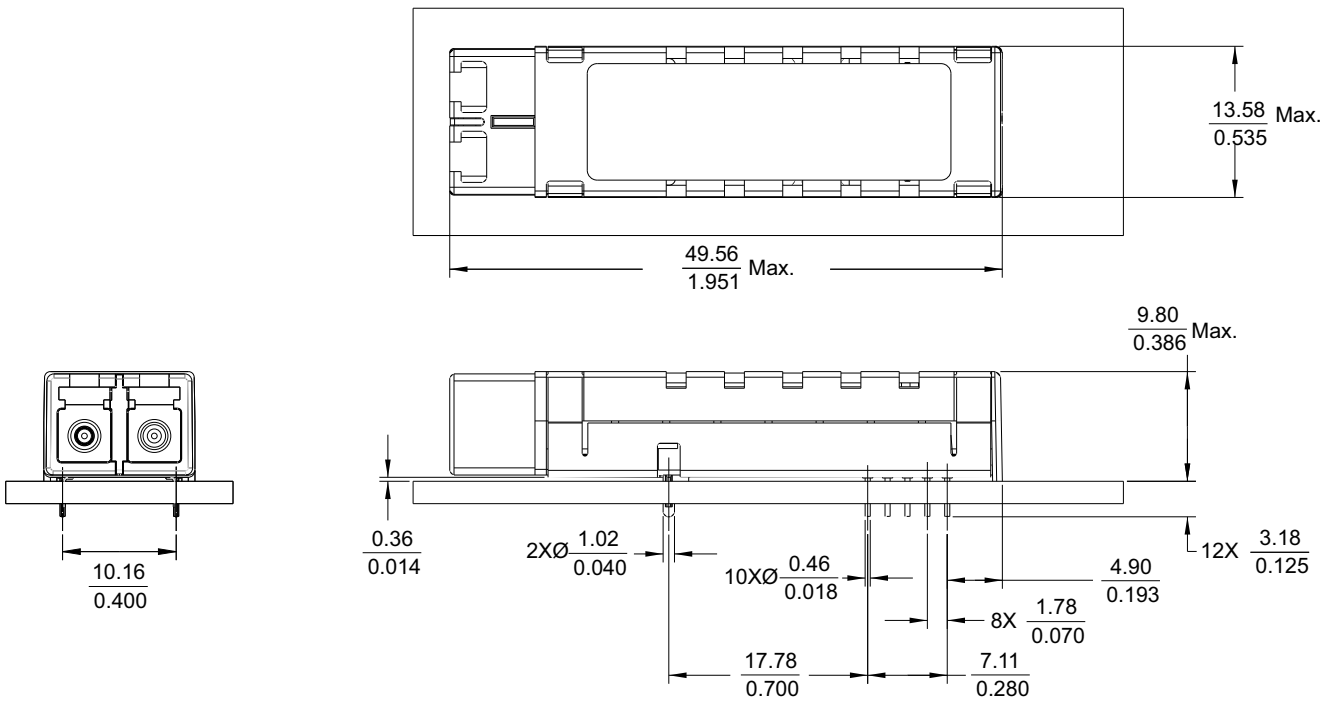
MSA 2 x 5 OUTLINE DIMENSIONS
For SNx-xxxxx (No Grounding Clip)
Dimensions Are Shown As: mm / inches



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ORDERING INFORMATION

Application	Specification	Minimum Centerline Spacing	Temp. Range °C	Signal Detect	Part Number
OC-12 / STM-4	ITU-T G.957, I-4, S-4.1	0.550" / 13.97mm	0 to +70	LVPECL	SA3-LP12
		0.550" / 13.97mm	-40 to +85	LVPECL	SA3-LP12H
		0.550" / 13.97mm	0 to +70	LVTTL	SA3-LT12
		0.550" / 13.97mm	-40 to +85	LVTTL	SA3-LT12H
		0.600" / 15.24mm	0 to +70	LVPECL	SR3-LP12
		0.600" / 15.24mm	-40 to +85	LVPECL	SR3-LP12H
		0.600" / 15.24mm	0 to +70	LVTTL	SR3-LT12
		0.600" / 15.24mm	-40 to +85	LVTTL	SR3-LT12H
		No Grounding Clip	0 to +70	LVPECL	SN3-LP12
		No Grounding Clip	-40 to +85	LVPECL	SN3-LP12H
		No Grounding Clip	0 to +70	LVTTL	SN3-LT12
		No Grounding Clip	-40 to +85	LVTTL	SN3-LT12H

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