



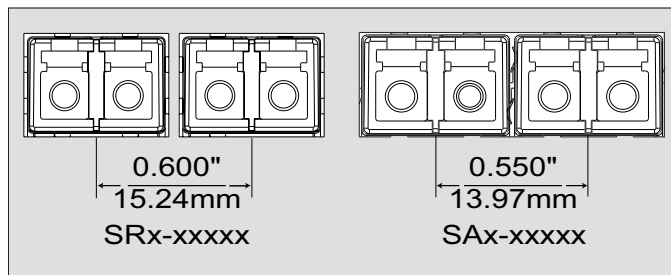
Sx2-Lx12x Series Sonet / SDH Compliant MSA 2 x 5 Small Form Factor Optical Transceivers

3.3 Volt, 1310nm Laser, Single Mode,
Intermediate Reach, up to 200 MBaud

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 LVTTTL 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 Sx2-Lx12x single mode glass optical fiber transceivers provide low profile, cost effective solutions for Fast Ethernet, STM-1, OC-3 or ESCON (up to 200 Megabaud, up to 15 Km) single mode glass optical fiber data links.

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

DESCRIPTION

The Sx2-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 LVTTTL signal to the Transmit Disable (TDIS) pin.

The optical receiver consists of a 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 0.55" centerline mounting option utilizes 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 opening 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

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		10		200	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. $BER = 10^{-10}$ @ 155.52 Mbps, PRBS 2²³⁻¹, NRZ, Compliant with Telcordia GR-253 and ITU recommendation G.957 and G.958.

RECEIVERS

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		10		200	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

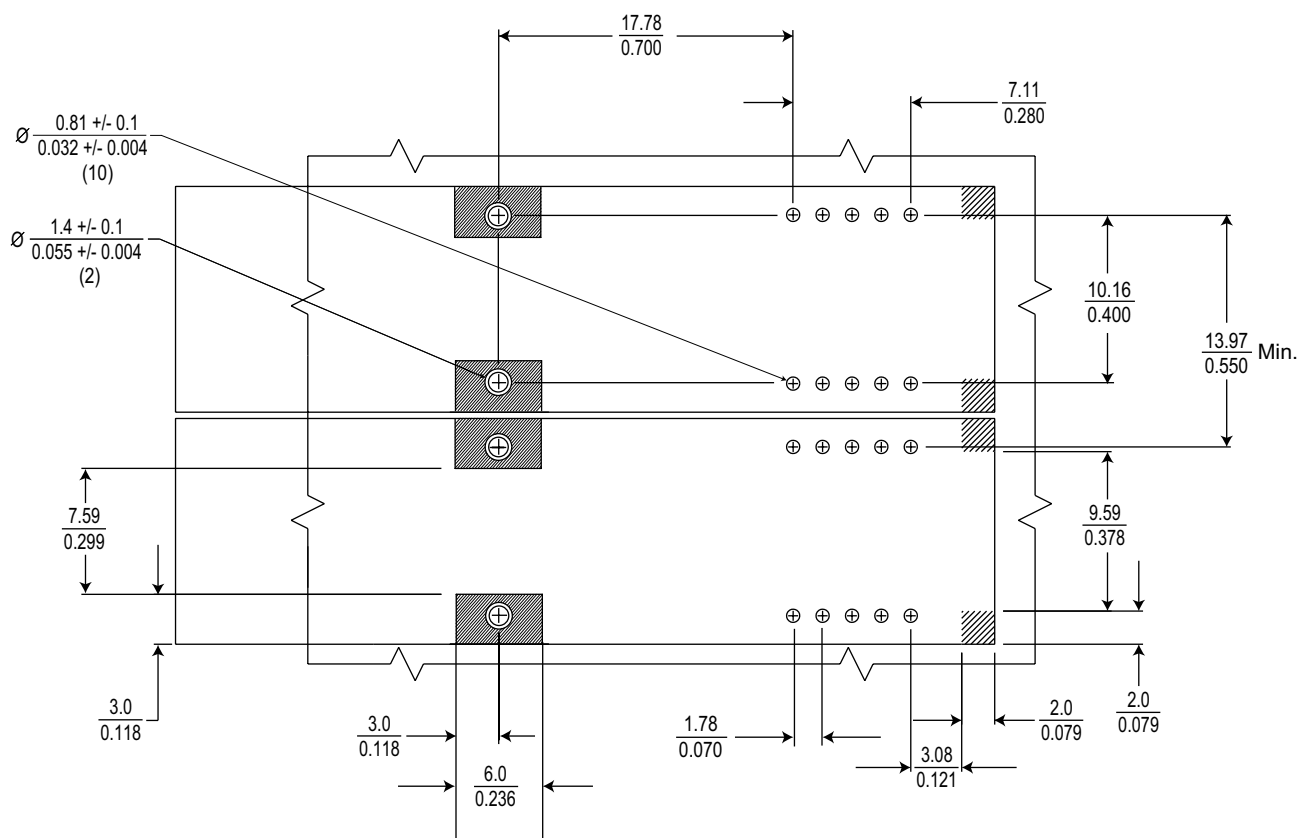
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MSA 2x5 SFF TRANSCEIVER PRINTED CIRCUIT BOARD LAYOUT

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



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

Sx2-Lx12x Series Sonet / SDH Compliant MSA 2 x 5 Small Form Factor Optical Transceivers

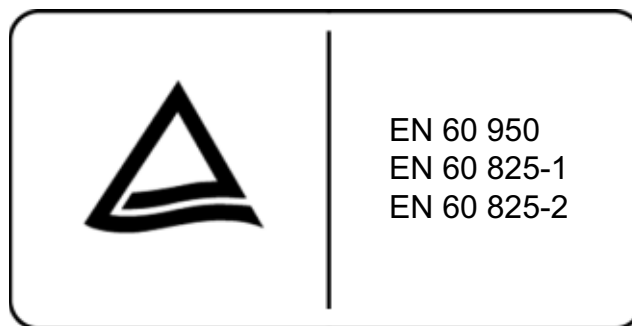
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REGULATORY COMPLIANCE

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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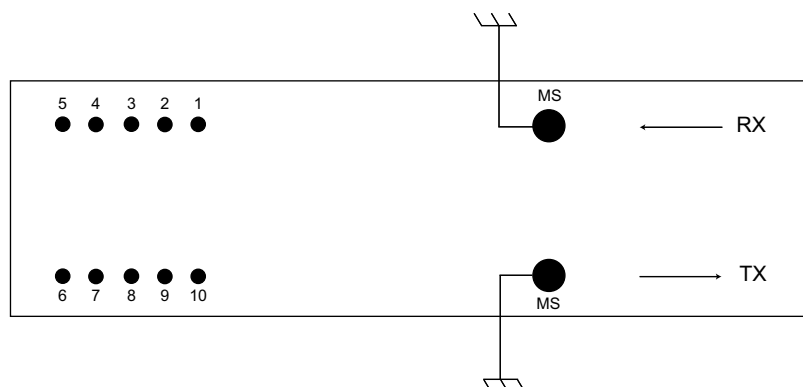


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2 x 5 MSA SMALL FORM FACTOR TRANSCEIVER PIN NUMBER ASSIGNMENTS TOP VIEW SHOWN



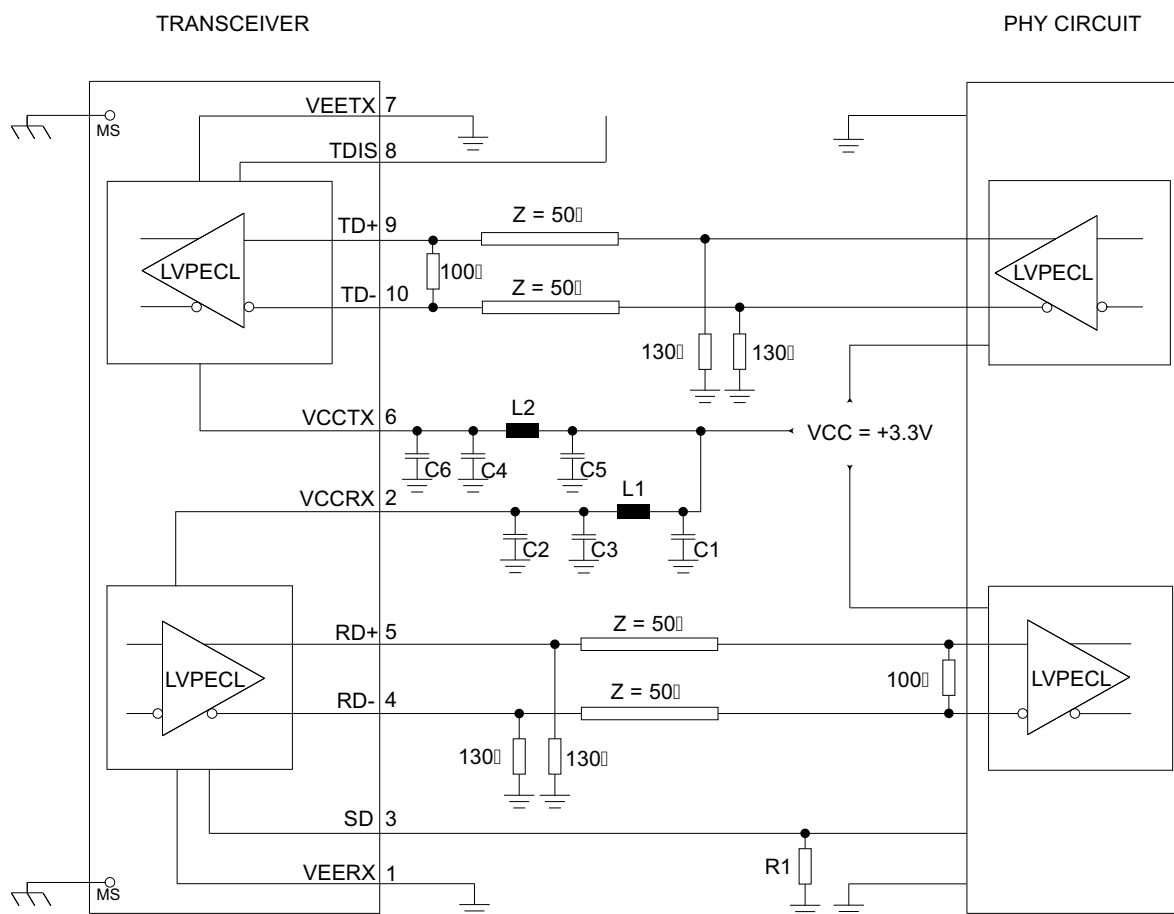
PIN FUNCTIONS

Pin Number	Symbol	Description	Logic Family
MS	MS	Mounting Studs <i>Connect to Chassis Ground</i>	N/A
1	VEEREX	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	VCCT _X	Transmitter Power Supply	N/A
7	VEET _X	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 = 150Ω for Sxx-LP1xx / Remove for Sxx-LT1xx
 L1, L2 = 1.0Ω H to 4.7Ω H*
 C1, C2, C6 = 10.0nF
 C3, C4, C5 = 4.7Ω F to 10.0Ω F
 * Or ferrite bead alternative

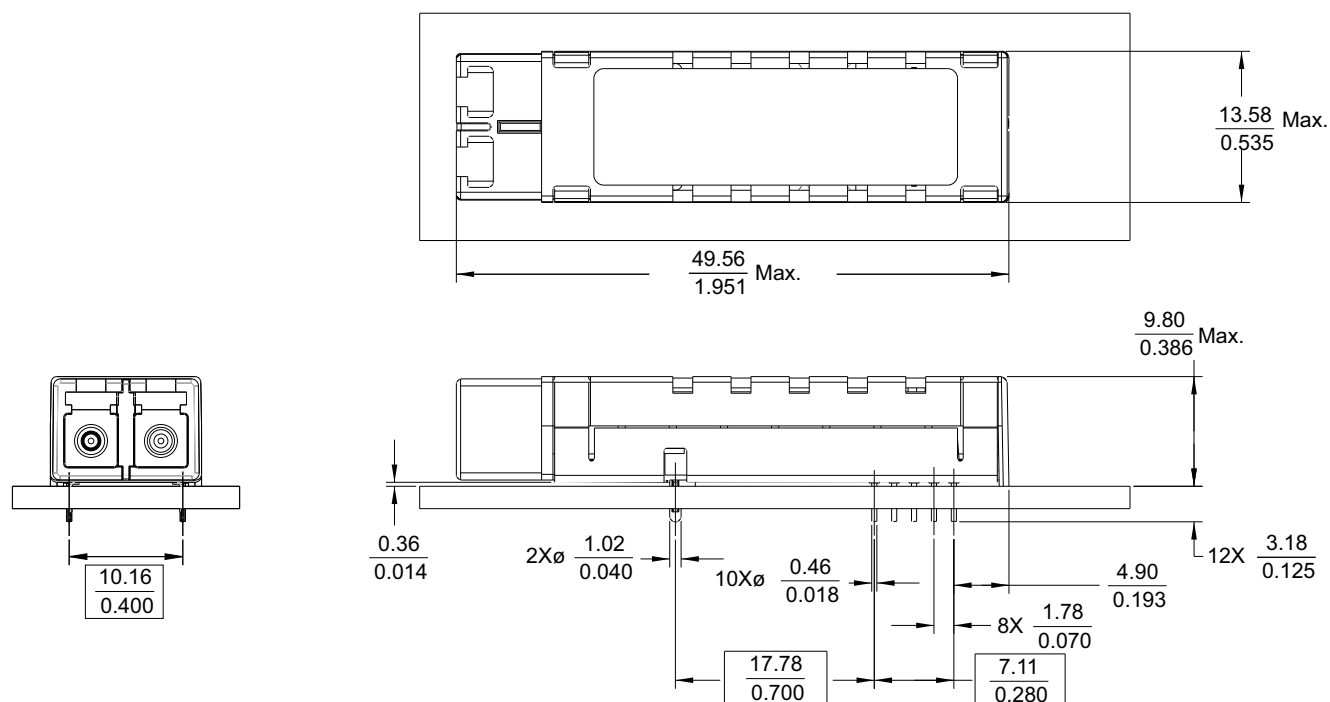
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MSA 2 x 5 OUTLINE DIMENSIONS

For SNx-xxxxx Non Panel Mount Applications (No Grounding Clip)

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



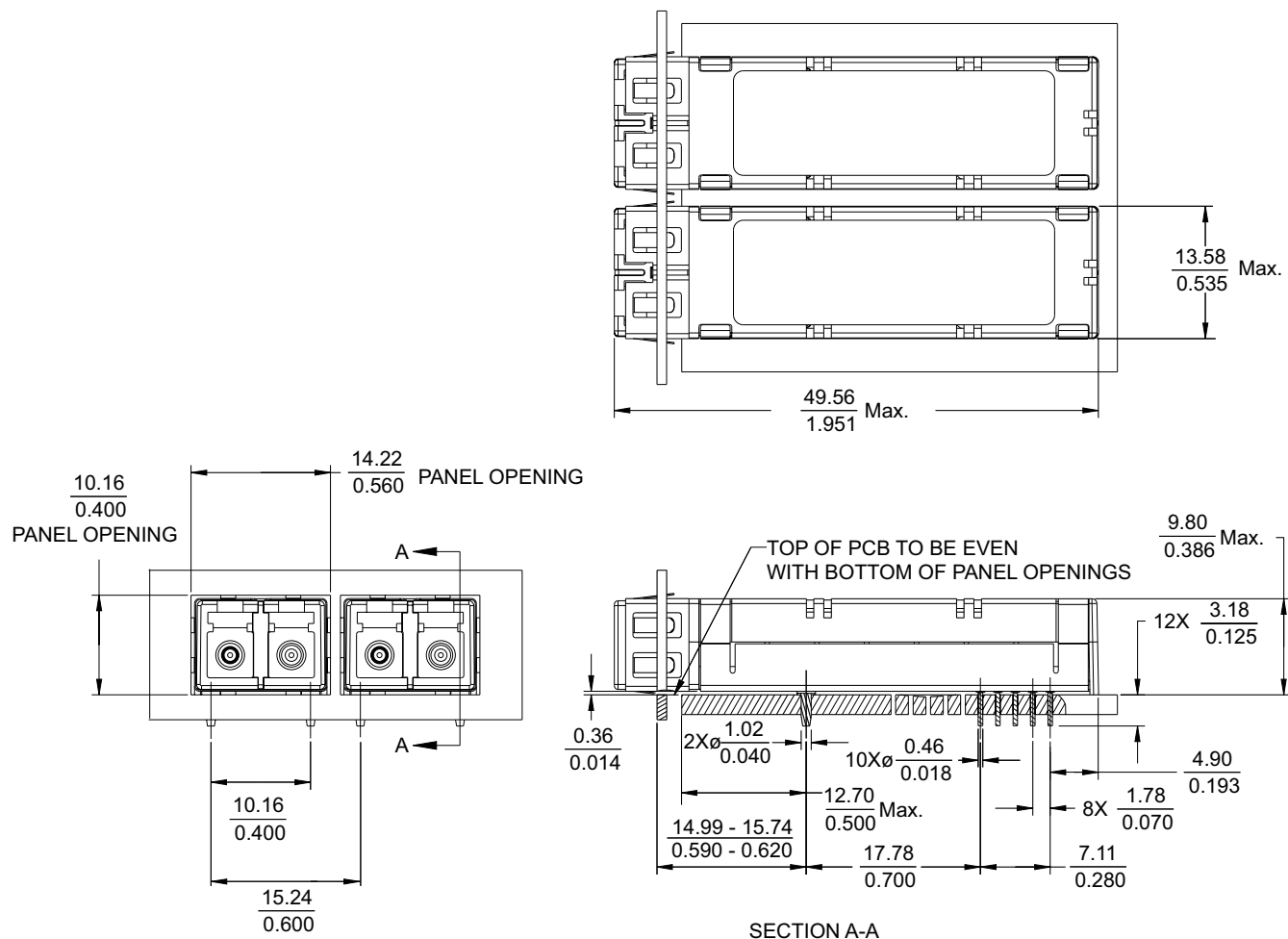
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MSA 2 x 5 OUTLINE DIMENSIONS

For SRx-xxxxx 0.600" Center to Center Mounting

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



3.3 Volt, 1310nm Laser, Single Mode, Intermediate Reach, up to 200 MBaud

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



SECTION A-A

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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ORDERING INFORMATION

Application / Specification	Minimum Centerline Spacing	Temp. Range °C	Signal Detect	Part Number
Fast Ethernet / 100Base-FX ESCON / ANSI X3.29 OC-3 / STM-1 / ITU-T G957, I-1, S-1.1	0.550" / 13.97mm	0 to +70	LVPECL	SA2-LP12
	0.550" / 13.97mm	-40 to +85	LVPECL	SA2-LP12H
	0.550" / 13.97mm	0 to +70	LVTTL	SA2-LT12
	0.550" / 15.24mm	-40 to +85	LVTTL	SA2-LT12H
	0.600" / 15.24mm	0 to +70	LVPECL	SR2-LP12
	0.600" / 15.24mm	-40 to +85	LVPECL	SR2-LP12H
	0.600" / 15.24mm	0 to +70	LVTTL	SR2-LT12
	0.600" / 15.24mm	-40 to +85	LVTTL	SR2-LT12H
	No Spring Clip	0 to +70	LVPECL	SN2-LP12
	No Spring Clip	-40 to +85	LVPECL	SN2-LP12H
	No Spring Clip	0 to +70	LVTTL	SN2-LT12
	No Spring Clip	-40 to +85	LVTTL	SN2-LT12H

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