



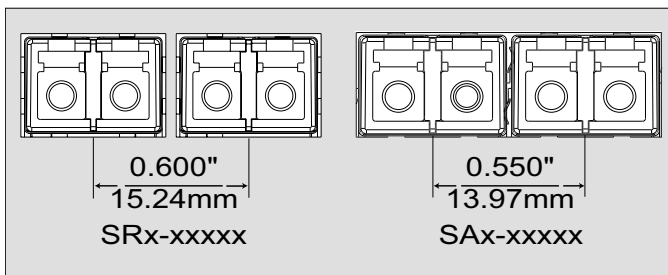
Sx2-Lx11x MSA 2 x 5 Small Form Factor Optical Transceiver

for Fast Ethernet, OC-3 and Escon Applications
3.3V, 1310nm LED, Multimode,
Up to 2.0Km, up to 210 MBaud

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

MSA CENTERLINE MOUNTING OPTIONS



SEE PAGE 11 FOR ORDERING INFORMATION

APPLICATIONS

The Sx2-Lx11x multimode glass optical fiber transceivers provide low profile, cost effective solutions for Fast Ethernet, OC-3 or ESCON (up to 210 Megabaud, up to 2.0 Km) multimode glass optical fiber data links.

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

DESCRIPTION

The Sx2-Lx11x fiber optic transceivers consist of transmitter and receiver functions combined in a multisourced 2x5 SFF transceiver module. The optical transmitter is a 1310nm high output LED. The transmitter input lines are driven with LVPECL signals applied to the Transmit (TD+ and TD-) pins.

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.

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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 Data Input Voltage - Low	$V_{IL} - V_{CC}$	-1.810		-1.475	V
TX Data Input Voltage - High	$V_{IH} - V_{CC}$	-1.165		-0.880	V
TX Differential Input Voltage (p-p)	V_D	+0.350	+0.800	+1.250	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		210	MBaud
Optical Output Power ¹	P_O	-19		-14	dBm
Optical Output Wavelength	λ_{OUT}	1270	1320	1380	nm
Supply Current	I_{CC}		120	160	mA
Optical Rise Time (10% - 90%)	t_R	0.6	1.5	3.0	nS
Optical Fall Time (10% - 90%)	t_F	0.6	2.0	3.0	nS
Duty Cycle Distortion	t_{DCD}		<0.1	0.6	nS
Data Dependent Jitter	t_{DDJ}		<0.1	0.7	nS
Extinction Ratio	ER	10.0			dB

1. BER = 10^{-10} @ 155.52 Mbps, PRBS 2²³-1, NRZ, Compliant with Telcordia GR-253 and ITU-T recommendations G.957 and G.958

RECEIVERS

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

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Baud Rate		100		210	MBaud
Optical Sensitivity ¹	P_I	-32		-8	dBm
Optical Wavelength	λ_{IN}	1270		1380	nm
Supply Current	I_{CC}		70	120	mA
Input Duty Cycle Distortion	t_{DCD}			1.0	nS
Input Data Dependent Jitter	t_{DDJ}			0.76	nS
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
Signal Detect Assert Time	t_{AAS}		<10	100	μ S
Signal Detect Deassert Time	t_{DEASS}		<10	350	μ S
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} @ 155.52 Mbps, PRBS 2²³-1, NRZ, Compliant with Telcordia GR-253 and ITU-T recommendations G.957 and G.958

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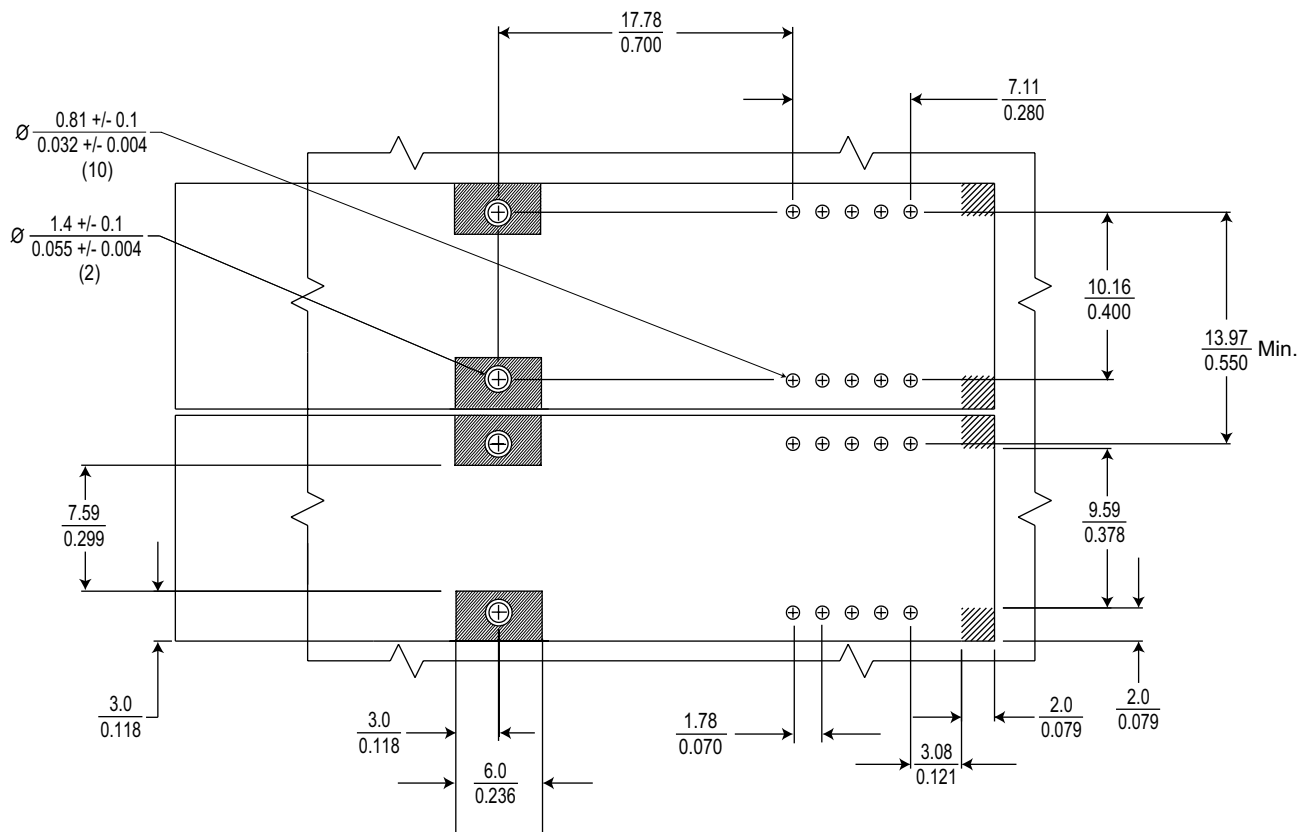
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MSA 2x5 SFF TRANSCEIVER PRINTED CIRCUIT BOARD LAYOUT

Top View Shown

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



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

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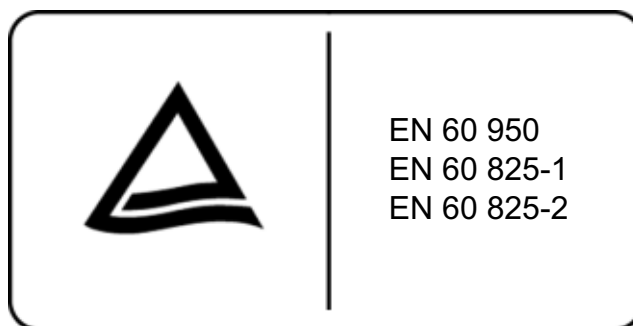
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REGULATORY COMPLIANCE

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



File Number: E209124



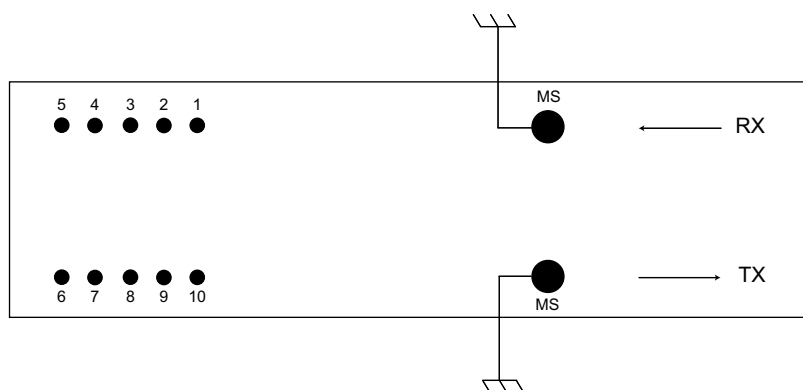
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2 x 5 MSA SMALL FORM FACTOR TRANSCEIVER PIN NUMBER ASSIGNMENTS TOP VIEW SHOWN



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-xPx1x LVPECL Sxx-xTx1x 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	N/C	N/C	N/A
9	TD ⁺	Transmitter DATA In	LVPECL
10	TD ⁻	Transmitter DATA In	LVPECL

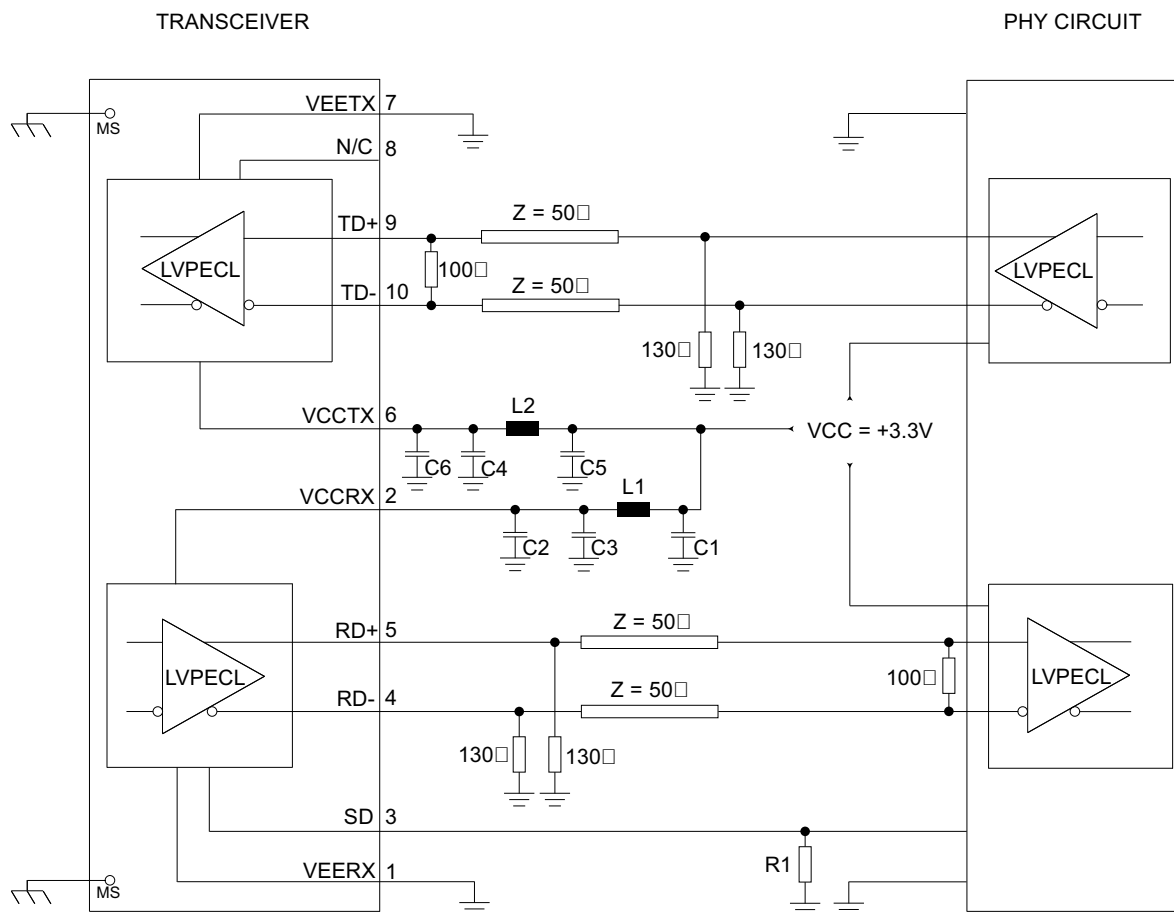
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TRANSCEIVER APPLICATION SCHEMATIC

For Interface To +3.3V LVPECL Circuits



R1 = 150 Ω for Sxx-LP11x / Remove for Sxx-LT11x

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

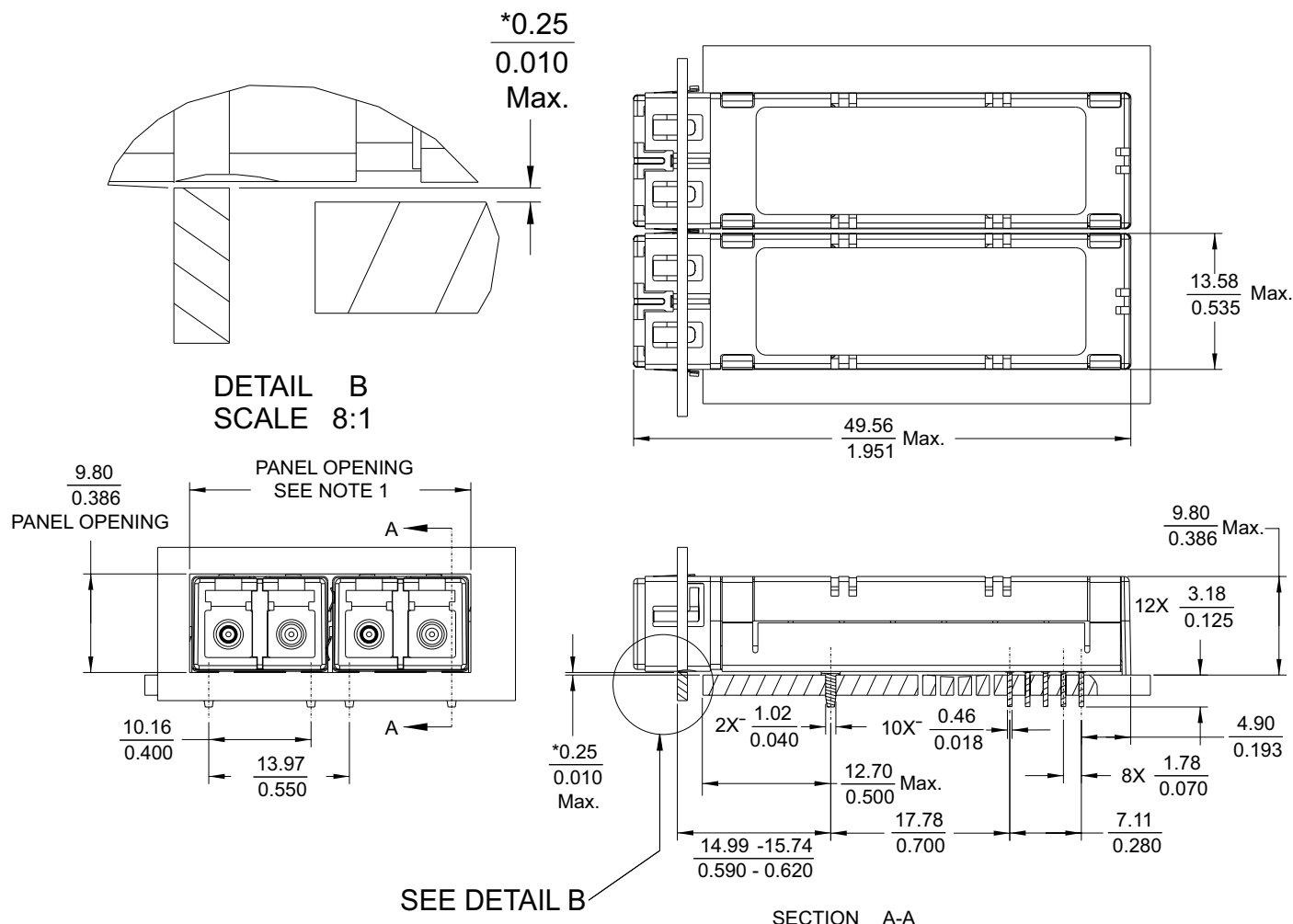


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MSA 2 x 5 OUTLINE DIMENSIONS For Sx-xxxxx 0.550" Center to Center Mounting Dimensions Are Shown As: $\frac{\text{mm}}{\text{inches}}$



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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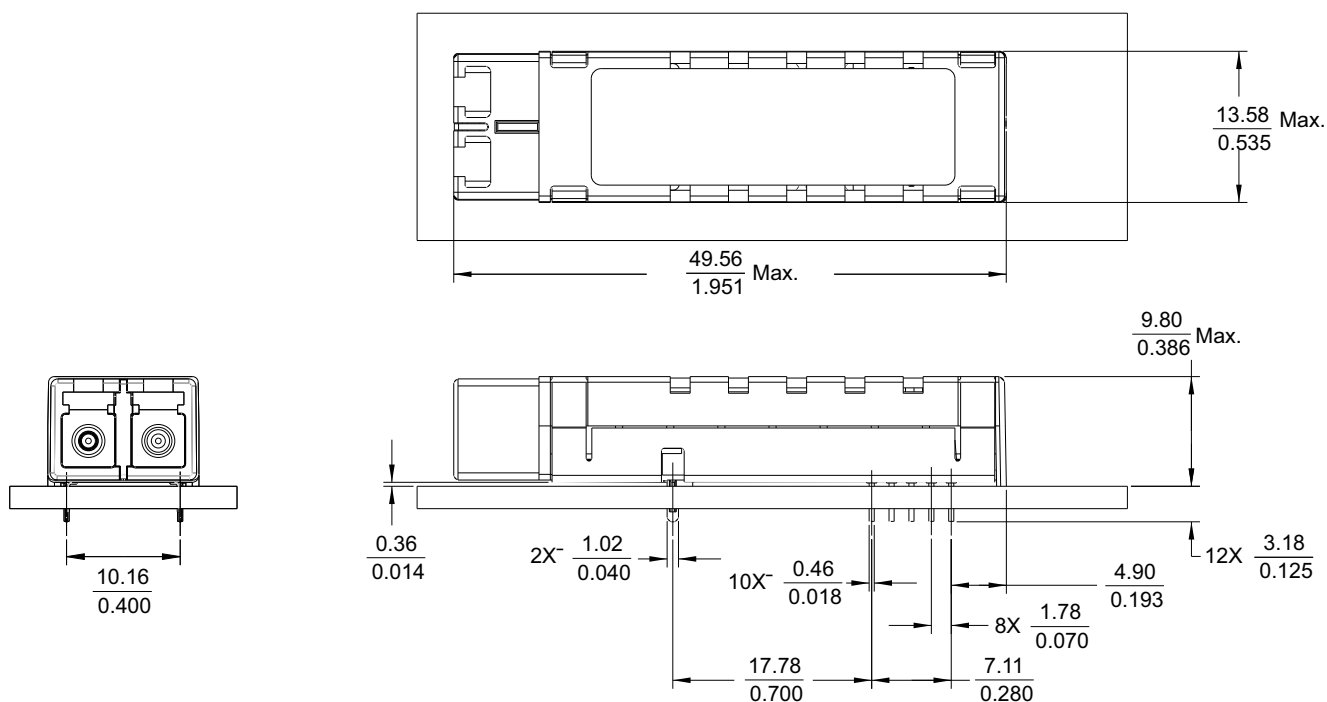
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MSA 2 x 5 OUTLINE DIMENSIONS

For SNx-xxxxx (No Grounding Clip)

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ORDERING INFORMATION

Application / Specification	Minimum Centerline Spacing	Temp. Range °C	Signal Detect	Part Number
Fast Ethernet / 100Base-FX Escon / ANSI X3.296 OC-3 / ANSI T1.646	0.550" / 13.97mm	0 to +70	LVPECL	SA2-LP11
	0.550" / 13.97mm	-40 to +85	LVPECL	SA2-LP11H
	0.550" / 13.97mm	0 to +70	LVTTL	SA2-LT11
	0.550" / 13.97mm	-40 to +85	LVTTL	SA2-LT11H
	0.600" / 15.24mm	0 to +70	LVPECL	SR2-LP11
	0.600" / 15.24mm	-40 to +85	LVPECL	SR2-LP11H
	0.600" / 15.24mm	0 to +70	LVTTL	SR2-LT11
	0.600" / 15.24mm	-40 to +85	LVTTL	SR2-LT11H
	No Panel Grounding Clip	0 to +70	LVPECL	SN2-LP11
	No Panel Grounding Clip	-40 to +85	LVPECL	SN2-LP11H
	No Panel Grounding Clip	0 to +70	LVTTL	SN2-LT11
	No Panel Grounding Clip	-40 to +85	LVTTL	SN2-LT11H

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