

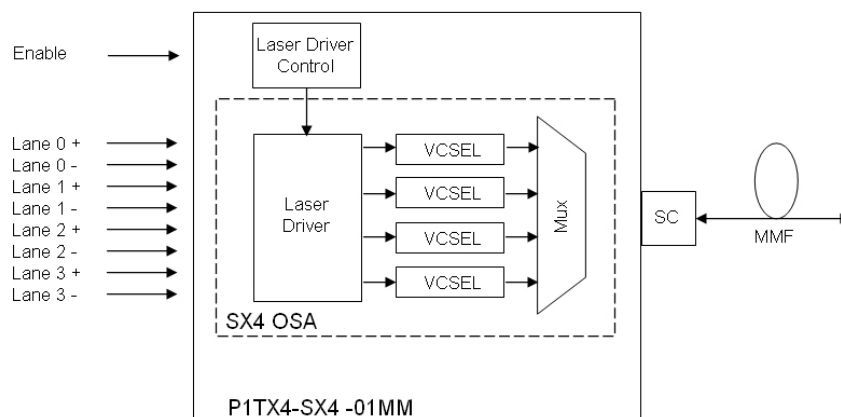
1.0 Description

The P1TX4C-SX4x-01MM (TX-SX4 Module) is an optical subassembly (OSA) that transmits four video- or data-channels over one multimode fiber. Each channel is capable of transmitting up to 1.65Gbps (model = V) or 3.5Gbps (model = D). With a microcontroller preprogrammed for optimal optical transmission on board, TX-SX4 module is a fully integrated electrical to optical transmitter versatile enough to be designed in to a variety of systems.



2.0 Features

- Multiple signals over one multimode fiber
- Integrated microcontroller for laser driver control
- ~ 0.5W power consumption
- Metal enclosure with SC optical interface



This device is **EXTREMELY SENSITIVE** to Electrostatic Discharge (ESD). At a minimum, all handling must be performed in accordance with an ANSI-compliant ESD Control Program (ANSI/ESD S20.20-2007) to mitigate possible ESD-induced damage. Reliability and life of the device will be adversely affected if these precautions are not met.



This device is a Class 3R Laser device (per IEC 60825-1:2007) and can cause damage to eye sight if used improperly. Refer to ANSI Z136 for proper handling and usage of Class 3R devices.



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3.0 Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Units
Storage Temperature ¹	Tst	-40		85	°C
3.3V Supply Voltage	VCC1	-0.3		3.6	V
Operating Surface Temperature ²	Ta	0		65	°C
Operating Humidity ³	RH			80	%
Durability – SC Connector			200		cycles
Durability – Plug-down Connector			50		cycles

4.0 Optical Characteristics

Parameter (per Channel)	Symbol	Min	Typ	Max	Units
Average Optical Power, per Lane ⁴	Pout	-3.0	0.0		dBm
Optical Modulation Amplitude		-6.25			dBm
Center Wavelength – Lane 0			778		nm
Center Wavelength – Lane 1			800		nm
Center Wavelength – Lane 2			825		nm
Center Wavelength – Lane 3			850		nm
Optical Rise/Fall Time ⁵ P1TX4C-SX4V-01 P1TX4C-SX4D-01			200 100		ps

¹ Stresses listed may be applied without causing damage. Functionality at or above the values listed is not implied. Exposure to these values for extended periods may affect reliability.

² See outline drawing for measurement point.

³ Non condensing, 80% RH.

⁴ I= 5mA, T=25°C. Measured at the end of a 2m section of 62.5μ fiber.

⁵ Rise and fall times measured from 20 - 80%

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5.0 Electrical Specifications

Parameter	Symbol	Min	Typ	Max	Units
Data Rate per Wavelength ⁶ P1TX4C-SX4V-01 P1TX4C-SX4D-01				1.65 3.50	Gb/s
Total Jitter (RMS) per lane ⁷	T _{J1}		10		ps
Input Differential Impedance			100		ohm
Input Differential Voltage		320		2000	mVp-p
Single-ended Input Voltage		160		1000	mVp-p
Common mode input voltage (AC-coupled input)		0.85	2.6	VCC	V
Operating Supply Voltage	Vcc-Vee	3.15	3.30	3.45	V
Operating Supply Current	Icc		140		mA

6.0 Fiber Transmission Distance⁸

Data Rate	Skew Limit	OM1	OM2	OM3	Units
1.65 Gbps	None	200	400	1000	m
	2.42ns	200	400	400	m
3.50 Gbps	None	100	200	500	m
	2.42ns	100	200	400	m
	1.78ns	100	200	294	m

⁶ Requires DC-balanced data pattern and a max run length of 80 bits. Measured with input signals conforming to HDMI rev 1.3a, section 4.2.4, figure 4-18.

⁷ Based on a jitter-free source. For optimal performance, clocks should be transmitted on Lane 0

⁸ Max distance considers the worst-case conditions. Actual distance may be up to 4x specified distance.

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7.0 Pin Numbers and Descriptions

The TX-SX4 plugs into a 30 pin connector. For information on the specifications of the connector, contact Hirose (DF12(4.0)-30DP-0.5V(86)).

Pin #	Signal	Name	Description
1	GND	Ground	Ground
2	NC	No connect	No Connect ⁹
3	+ IN0	Ch 0 + Data Input	Positive differential input for 778nm channel
4	NC	No connect	No Connect ⁹
5	- IN0	Ch 0 - Data Input	Negative differential input for 778nm channel
6	NC	No connect	No Connect ⁹
7	+ IN1	Ch 1 + Data Input	Positive differential input for 800nm channel
8	NC	No connect	No Connect ⁹
9	- IN1	Ch 1 - Data Input	Negative differential input for 800nm channel
10	NC	No connect	No Connect ⁹
11	+ IN2	Ch 2 + Data Input	Positive differential input for 825nm channel
12	NC	No connect	No Connect ⁹
13	- IN2	Ch 2 - Data Input	Negative differential input for 825nm channel
14	NC	No connect	No Connect ⁹
15	+ IN3	Ch 3 + Data Input	Positive differential input for 850nm channel
16	NC	No connect	No Connect ⁹
17	- IN3	Ch 3 - Data Input	Negative differential input for 850nm channel
18	EN	Enable	3.3V=normal operation, 0V turns off lasers
19	GND	Ground	Ground
20	NC	No connect	No Connect ⁹
21	NC	No connect	No Connect ⁹
22	NC	No connect	No Connect ⁹
23	NC	No connect	No Connect ⁹
24	NC	No connect	No Connect ⁹
25	NC	No connect	No Connect ⁹
26	NC	No connect	No Connect ⁹
27	NC	No connect	No Connect ⁹
28	VCC	Voltage Input	+3.3 volt input
29	GND	Ground	Ground
30	VCC	Voltage Input	+3.3 volt input

8.0 Laser Safety

The P1TX4C-SX4x-01 meets Class-3 requirements.

⁹ NC = No Connect. Do not connect anything to this PIN.

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9.0 Environmental Standards

Omron Network Products designs and manufactures its products to minimize the negative impact on our environment. As such, the P1TX4C-SX4-01MM conforms to a variety of environmental and safety standards

Standard	Compliant	Certificate Available
RoHS	Yes	Yes

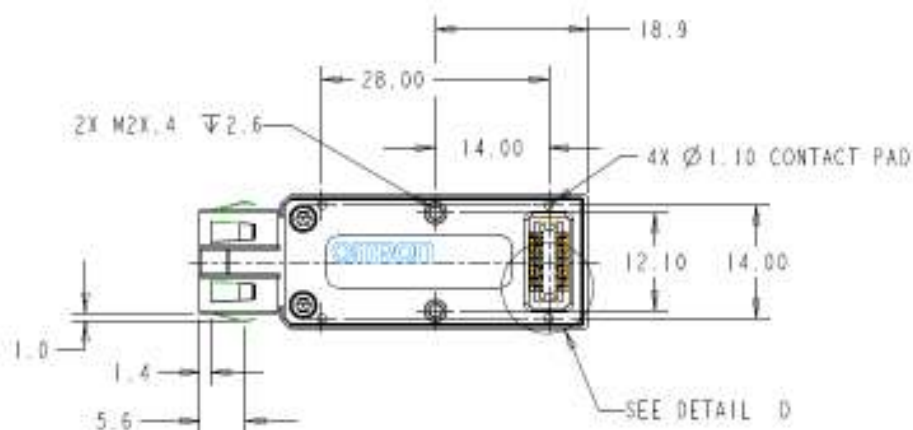
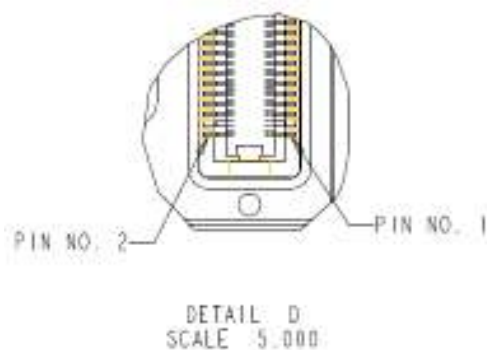
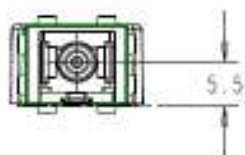
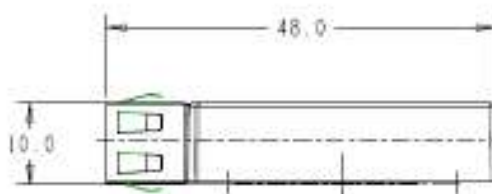
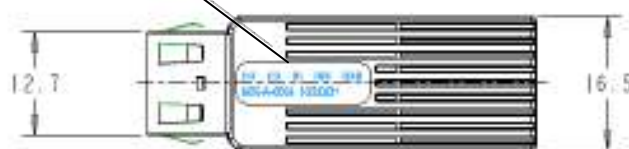
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10.0 Dimensions

The SX4 TOSA is designed to work with a standard SC ferrule only. Insertion of any other type may result in damage.

Dimensions (mm) and orientation are for reference only.

Temperature measurement point



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