


P1RX6B-SX51-02A

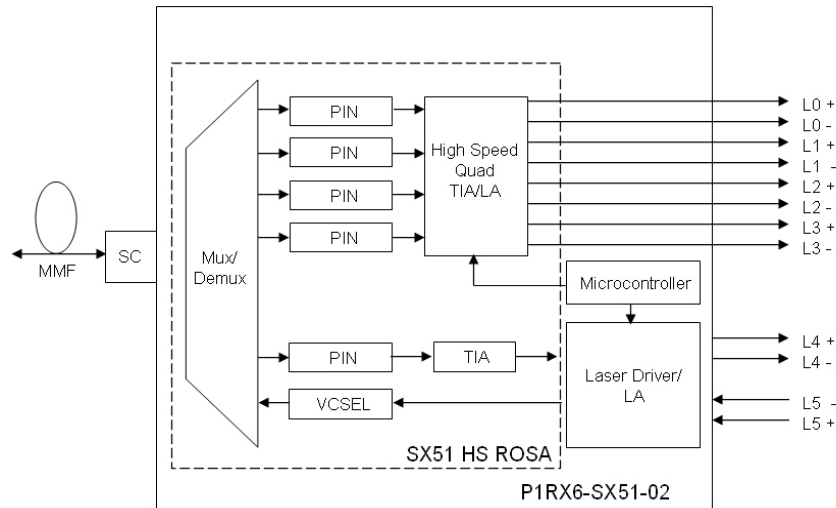
Product Specification Sheet

ORIGINATOR:	C. ENG	DATE:	3/9/2012
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CONFIDENTIAL INFORMATION

1.0 Features

- 5 receive lanes and 1 transmit lane over a single multimode fiber
- Low power consumption (1.1W)
- Mechanical enclosure serves as heat sink while allowing for FCC part 15 Class A compliance
- No manipulating or compressing the data
- Small footprint
- High-speed CML outputs



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 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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2.0 Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Units
Storage Temperature ¹	Tst				°C
Supply Voltage ^{2,3}	Vcc				V
Operating Surface Temperature ⁴	Ta				°C
Operating Humidity ⁵	RH				%
Input Voltage ⁶	V _{IN}				V

3.0 Optical Characteristics – High-speed Lanes

Parameter (per lane)	Symbol	Min	Typ	Max	Units
Wavelength – Lane 0			778		nm
Wavelength – Lane 1			800		nm
Wavelength – Lane 2			825		nm
Wavelength – Lane 3			850		nm
Data Rate ⁷	SX51V SX51D				Gb/s
Peak Optical Input Power	Pin				dBm
Peak Optical Modulation Power	Pin				dBm
OMA Sensitivity ⁸			-16.00		dBm
Input Data Pattern			DC-balanced		

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 Supply voltage must be present before input signal may be applied

³ Module must be powered down (OFF) before installation/removal.

⁴ See outline drawing for measurement point. Omron strongly recommends mounting with a heat sink.

⁵ Non condensing. Do not operate device if wet.

⁶ Supply voltage must be present before input signal may be applied. Driving the device in a power OFF state may result in permanent damage to the input pins.

⁷ Requires DC-balanced data pattern.

⁸ Optical Modulation Amplitude. Based on an unstressed input signal.

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4.0 Electrical Specifications – High-speed Lanes

Parameter	Symbol	Min	Typ	Max	Units
Low Frequency Cutoff	F _{CUTOFF}		175		kHz
Total Jitter (RMS), per lane ⁹	T _{J1}		10		ps
Differential Output Voltage ¹⁰	V _{OD}		500		mVp-p
Loss of Signal Assert Sensitivity	LOS _{SEN-ON}		-14.50		dBm
Loss of Signal De-Assert Sensitivity	LOS _{SEN-OFF}		-13.00		dBm
Loss of Signal Output Low ¹¹	V _{LOS}				V
Loss of Signal Output High	V _{LOS}				V
Operating Supply Voltage	V _{CC-Vee}		3.30		V
Operating Supply Current	I _{CC}				mA

5.0 Optical Characteristics – Bi-Directional Lanes

Receive Parameter	Symbol	Min	Typ	Max	Units
Wavelength - Lane 4			911		nm
Data Rate					Mb/s
Peak Optical Input Power	P _{in}				dBm
Peak Optical Modulation Power	P _{in}				dBm
OMA Sensitivity ¹²			-15.00		dBm
Input Data Pattern		DC-balanced			


Transmit Parameter	Symbol	Min	Typ	Max	Units
Average Optical Power - Lane 5	P _{avg}		-1.5		dBm
Optical Modulation Amplitude			0.0		dBm
Wavelength - Lane 5			980		nm
Optical Rise/Fall Time			2000		Ps

⁹ Based on a jitter-free source

¹⁰ Differential back-terminated CML outputs

¹¹ This output is asserted low when a loss of signal is detected on all lanes

¹² Optical Modulation Amplitude. Based on an unstressed input signal.

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6.0 Electrical Specifications – Bi-Directional Lanes

Receive Parameter	Symbol	Min	Typ	Max	Units
Low Frequency Cutoff	F _{CUTOFF}		35		kHz
Total Jitter (RMS) ¹³	T _{J1}		25		ps
Differential Output Voltage ¹⁴	V _{OD}		835		mVp-p
Loss of Signal Assert Sensitivity	LOS _{SEN-ON}		-15.5		dBm
Loss of Signal De-Assert Sensitivity	LOS _{SEN-OFF}		-13.5		dBm
Loss of Signal Output Low	V _{LOS}				V
Loss of Signal Output High ¹⁵	V _{LOS}				V

Transmit Parameter	Symbol	Min	Typ	Max	Units
Data Rate per Lane				155	Mb/s
Input Differential Impedance			100		ohm
Differential Input Voltage – Lane 5 ^{2,16}					mVp-p
Input Data Pattern		DC-balanced			

7.0 Laser Safety

The P1RX6-SX51-02 meets Class-3R requirements.¹⁷ Please use proper eye protection and handling practices per ANSI Z136.1.


¹³ Based on a jitter-free source

¹⁴ Differential back-terminated CML outputs

¹⁵ This output is asserted low when a loss of signal is detected on all lanes

¹⁶ Differential CML compatible inputs

¹⁷ Lane 4 data input with 50% duty cycle

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8.0 Pin Numbers and Descriptions¹⁸


The RX Data Module contains a 30 pin connector (DF12-30DS-0.5V(86)). For information on the specifications of the mating connector (DF12(4.0)-30DP-0.5V(86)), contact Hirose.

Pin #	Signal	Name	Description
1	GND	Ground	
2	LOS _{HI}	High Speed LOS	Loss of Signal – High Speed Channels
3	+ TD0	Ch 0 + Data Output	Positive differential output for 778nm lane
4	LOS _{BI}	Ch 4 LOS	Loss of Signal – Bi-Directional Channel
5	- TD0	Ch 0 - Data Output	Negative differential output for 778nm lane
6	Reset	Reset	Microcontroller Reset ¹⁹
7	+ TD1	Ch 1 + Data Output	Positive differential output for 800nm lane
8	UART	UART_TX	Reserved for future use
9	- TD1	Ch 1 - Data Output	Negative differential output for 800nm lane
10	UART	UART_RX	Reserved for future use
11	+ TD2	Ch 2 + Data Output	Positive differential output for 825nm lane
12	NC	No connect	Reserved for future use
13	- TD2	Ch 2 - Data Output	Negative differential output for 825nm lane
14	NC	No connect	Reserved for future use
15	+ TD3	Ch 3 + Data Output	Positive differential output for 850nm lane
16	EN _{BI}	Enable	Enable ²⁰ – Bi-directional laser
17	- TD3	Ch 3 - Data Output	Negative differential output for 850nm lane
18	NC	No connect	Reserved for future use
19	GND	Ground	
20	NC	No connect	Reserved for future use
21	- IN5	Ch 5 - Data Input	Negative differential input for 980nm lane
22	NC	No connect	Reserved for future use
23	+ IN5	Ch 5 - Data Input	Positive differential input for 980nm lane
24	NC	No connect	Reserved for future use
25	+ TD4	Ch 4 - Data Output	Positive differential output for 911nm lane
26	NC	No connect	Reserved for future use
27	- TD4	Ch 4 - Data Output	Negative differential output for 911nm lane
28	VCC ²	Voltage Input	+3.3 volt input
29	GND	Ground	
30	VCC ²	Voltage Input	+3.3 volt input

¹⁸ Verify pin assignments and polarity before powering on device

¹⁹ Reset must be pulled high for normal operation


²⁰ Enable to be pulled up to VCC for normal operation

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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 P1RX6B-SX51-02 conforms to a variety of environmental and safety standards

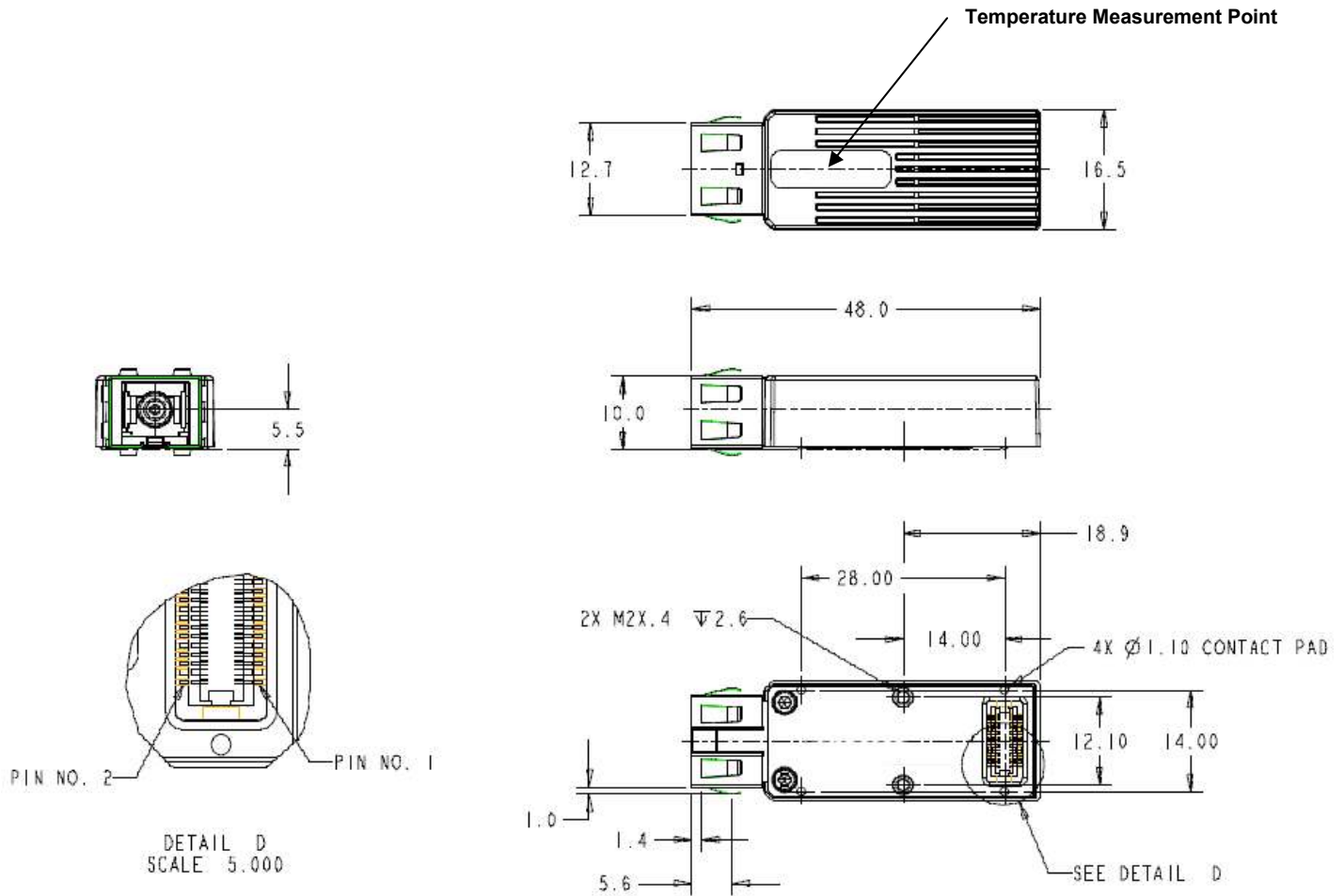
Standard	Compliant	Certificate Available
RoHS	Yes	Yes
REACH	Yes	Yes
FCC Part 15 Class A	Yes	No

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10.0 Dimensions

The SX51-02 data module is designed to work with a standard SC ferrule only. Insertion of any other type may result in damage.

Dimensions and orientation are for reference only. Customers can request final, detailed dimensions, or a CAD drawing, through your Omron sales representative.



Dimensions are in mm

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