


# P1RX6B-SX51-02A

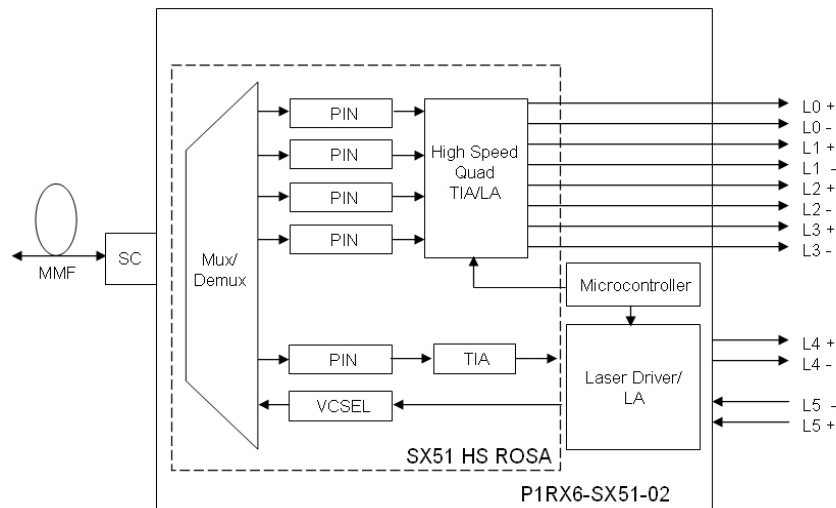
## Product Specification Sheet

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## 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 <sup>1</sup>	Tst				°C
Supply Voltage <sup>2 3</sup>	Vcc				V
Operating Surface Temperature <sup>4</sup>	Ta				°C
Operating Humidity <sup>5</sup>	RH				%
Input Voltage <sup>6</sup>	V <sub>IN</sub>				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 <sup>7</sup> SX51V SX51D					Gb/s
Peak Optical Input Power	Pin				dBm
Peak Optical Modulation Power	Pin				dBm
OMA Sensitivity <sup>8</sup>			-16.00		dBm
Input Data Pattern		DC-balanced			

<sup>1</sup> 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.

<sup>2</sup> Supply voltage must be present before input signal may be applied

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


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

<sup>5</sup> Non condensing. Do not operate device if wet.

<sup>6</sup> 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.

<sup>7</sup> Requires DC-balanced data pattern.

<sup>8</sup> 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 <sup>9</sup>	$T_{J1}$		10		ps
Differential Output Voltage <sup>10</sup>	$V_{OD}$		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 <sup>11</sup>	$V_{LOS}$				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 <sup>12</sup>			-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

<sup>9</sup> Based on a jitter-free source

<sup>10</sup> Differential back-terminated CML outputs

<sup>11</sup> This output is asserted low when a loss of signal is detected on all lanes

<sup>12</sup> 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 <sub>CUTOFF</sub>		35		kHz
Total Jitter (RMS) <sup>13</sup>	T <sub>J1</sub>		25		ps
Differential Output Voltage <sup>14</sup>	V <sub>OD</sub>		835		mVp-p
Loss of Signal Assert Sensitivity	LOS <sub>SEN-ON</sub>		-15.5		dBm
Loss of Signal De-Assert Sensitivity	LOS <sub>SEN-OFF</sub>		-13.5		dBm
Loss of Signal Output Low	V <sub>LOS</sub>				V
Loss of Signal Output High <sup>15</sup>	V <sub>LOS</sub>				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 <sup>2,16</sup>					mVp-p
Input Data Pattern		DC-balanced			

## 7.0 Laser Safety

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


<sup>13</sup> Based on a jitter-free source

<sup>14</sup> Differential back-terminated CML outputs

<sup>15</sup> This output is asserted low when a loss of signal is detected on all lanes

<sup>16</sup> Differential CML compatible inputs

<sup>17</sup> Lane 4 data input with 50% duty cycle

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## 8.0 Pin Numbers and Descriptions<sup>18</sup>


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 <sub>HI</sub>	High Speed LOS	Loss of Signal – High Speed Channels
3	+ TD0	Ch 0 + Data Output	Positive differential output for 778nm lane
4	LOS <sub>BI</sub>	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 <sup>19</sup>
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 <sub>BI</sub>	Enable	Enable <sup>20</sup> – 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 <sup>2</sup>	Voltage Input	+3.3 volt input
29	GND	Ground	
30	VCC <sup>2</sup>	Voltage Input	+3.3 volt input

<sup>18</sup> Verify pin assignments and polarity before powering on device

<sup>19</sup> Reset must be pulled high for normal operation

<sup>20</sup> 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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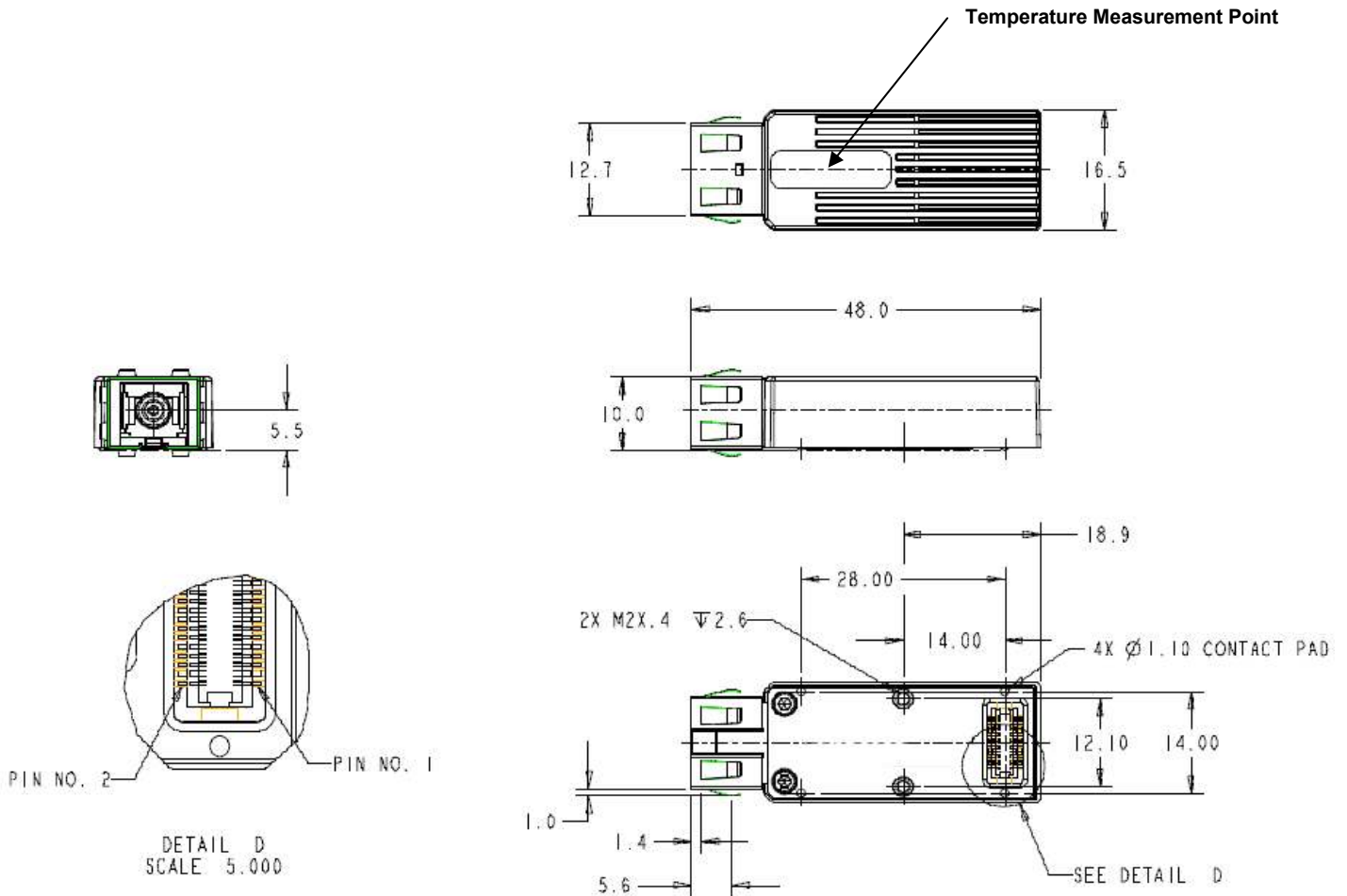
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## 10.0 Dimensions

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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