P1RX6B-SX51-02
Product Specification Sheet

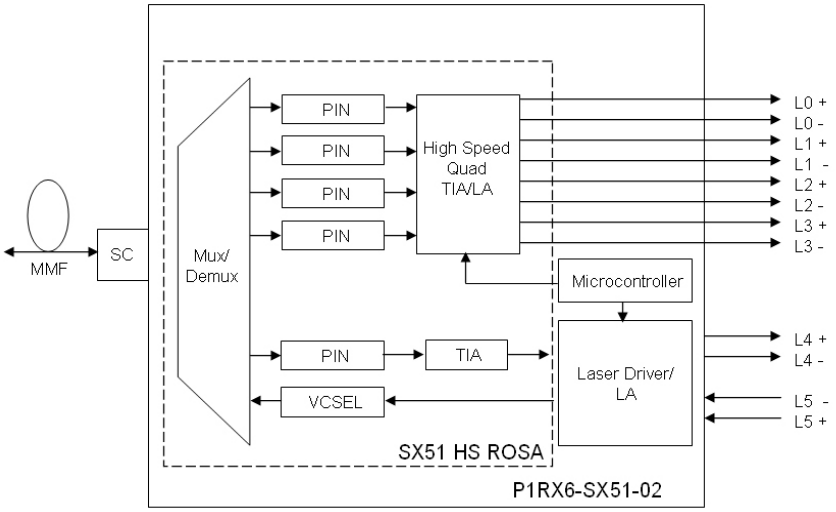
ORIGINATOR:	C. ENG	DATE:	9/19/2012
P1RX6B-SX51-02 Module Product Spec Sheet		DOCUMENT NO. DOC002261	REV B
		SHEET 1 OF 8	

1.0 Description

The P1RX6B-SX51x-02 (RX Data Module) is an optical communication module that receives over 14Gbps of data. The RX Data Module receives five data channels PLUS transmits one side-band channel, all on a single multimode fiber. With integrated drivers and amplifiers, the RX Data Module eliminates the need for in-house optical design expertise.

2.0 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.

3.0 Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Units
Storage Temperature[1]	Tst	-40		85	°C
Supply Voltage[2] [3]	Vcc	-0.3		3.6	V
Operating Surface Temperature[4]	Ta	0		65	°C
Operating Humidity[5]	RH			80	%
Input Voltage[6]	V_{IN}	-0.5		Vcc + 0.5	V

4.0 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				1.65 3.40	Gb/s
Peak Optical Input Power	Pin			3.0	dBm
Peak Optical Modulation Power	Pin			2.5	dBm
OMA Sensitivity[8]		-14.25	-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.

5.0 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}			0.7	V
Loss of Signal Output High	V_{LOS}	2			V
Operating Supply Voltage	Vcc-Vee	3.15	3.30	3.45	V
Operating Supply Current	Icc			330	mA

6.0 Optical Characteristics – Bi-Directional Lanes

Receive Parameter	Symbol	Min	Typ	Max	Units
Wavelength - Lane 4			911		nm
Data Rate -02A -02B -02C				 155 622 1250	 Mb/s
Peak Optical Input Power	Pin			3.0	dBm
Peak Optical Modulation Power	Pin			2.5	dBm
OMA Sensitivity[12]		-13.25	-15.00		dBm
Input Data Pattern		DC-balanced			

Transmit Parameter	Symbol	Min	Typ	Max	Units
Average Optical Power - Lane 5	Pavg		-1.5		dBm
Optical Modulation Amplitude		-6.25	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.

7.0 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}			0.7	V
Loss of Signal Output High[15]	V_{LOS}	2.0			V

Transmit Parameter	Symbol	Min	Typ	Max	Units
Data Rate per Lane -02A -02B -02C				 155 622 1250	 Mb/s
Input Differential Impedance			100		ohm
Differential Input Voltage – Lane 5[2,16]		320		2000	mVp-p
Input Data Pattern		DC-balanced			

8.0 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

9.0 Pin Numbers and Descriptions[18]

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

10.0 Environmental Standards

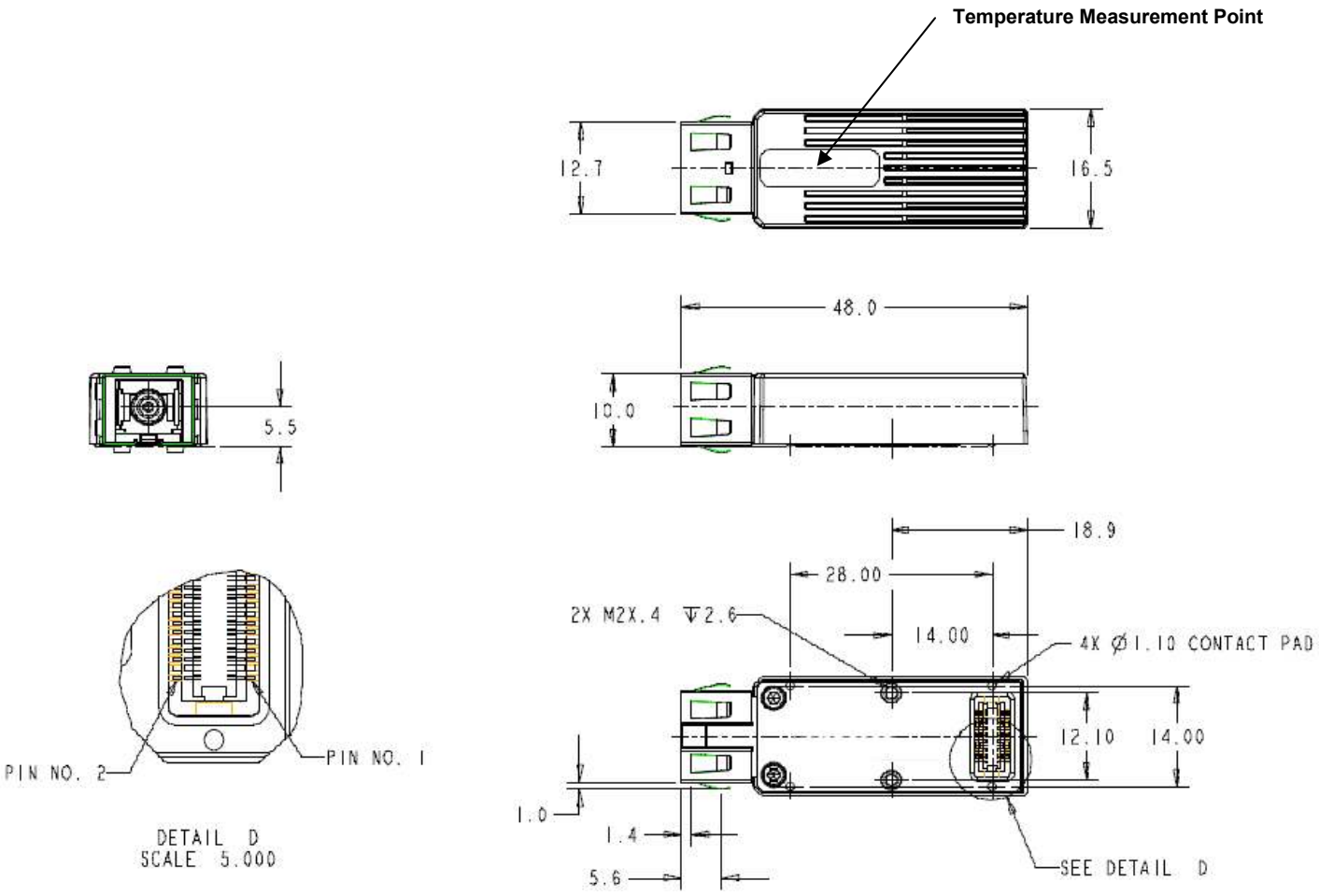
Omron Network Products designs and manufactures its products to minimize the negative impact on our environment. As such, the P1RX6B-SX51-02 conforms to a variety of environmental and safety standards

Standard	Compliant	Certificate Available
RoHS	Yes	Yes

11.0 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