

P1RX6B-SX51-02E

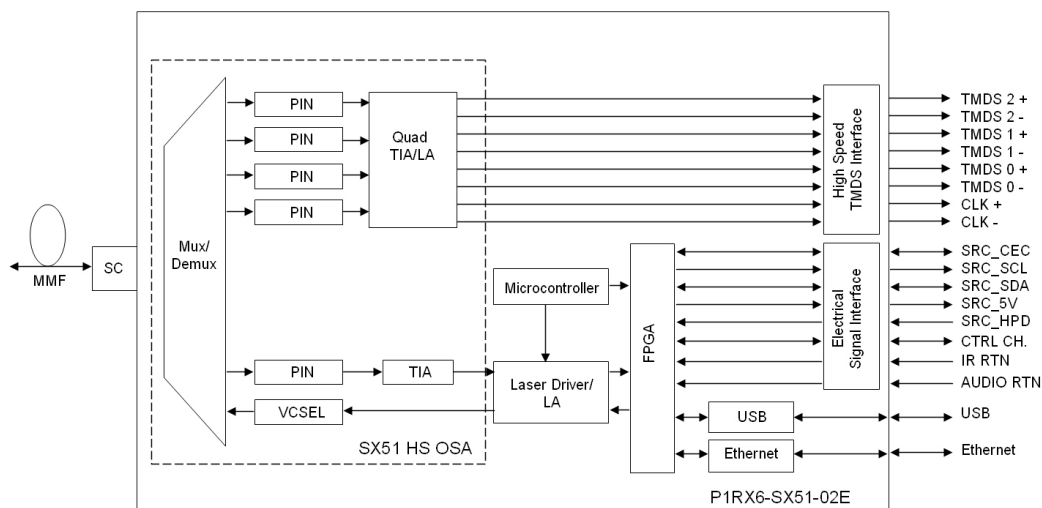
Product Specification Sheet

ORIGINATOR:		C. Eng	DATE:	10/30/2012
Omron Network Products	P1RX6B-SX51-02E Product Specification Sheet		DOCUMENT NO. DOC002330	REV A
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1.0 Features

- 5 receive lanes and 1 transmit lane over 1 multimode fiber
- Compatible with HDMI™ compliant sources and sinks
- Scalable to HDMI™ 1080P 16-bit color
- CML outputs
- Supports HDCP/EDID/CEC/ARC consumer electronics functionality
- Supports 10/100 Ethernet networking functionality
- Supports USB 1.1 peripheral interconnect functionality
- Supports Infrared pass-through from the sink to the source
- Automatic laser disable upon fiber disconnect



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.

HDMI, the HDMI Logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.



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2.0 Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Units
Storage Temperature ^{1, 3}	Tst				°C
3.3V Supply Voltage	VCC1		3.3		V
1.8V Supply Voltage	VCC2		1.8		V
Input Pin Voltage					V
Operating Surface Temperature ²	Ta				°C
Operating Humidity ³	RH				%
Durability – SC Connector			200		cycles
Durability – Plug-down Connector			50		cycles

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 ⁴ P1RX6-SX51V-02E P1RX6-SX51D-02E				1.65 3.40	Gb/s
Peak Optical Input Power	Pin			3.0	dBm
OMA Sensitivity ⁵			-16.00		dBm

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 Requires DC-balanced data pattern. Measured with input signals conforming to HDMI™ rev 1.3a, section 4.2.5, figure 4-20.

⁵ 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 ⁶	T_{J1}		10		ps
Differential Output Voltage ⁷	V_{OD}		500		mVp-p
Operating 3.3V Supply Voltage	VCC1		3.30		V
Operating 3.3V Supply Current	ICC1		334		mA
Operating 1.8V Supply Voltage	VCC2		1.8		V
Operating 1.8V Supply Current	ICC2		172		mA

5.0 Optical Characteristics – Low-speed Lanes

Photodiode Parameter	Symbol	Min	Typ	Max	Units
Wavelength - Lane 4			911		nm
Data Rate			400		Mb/s
Maximum Optical Input Power	Pin				dBm

Laser Parameter	Symbol	Min	Typ	Max	Units
Wavelength - Lane 5			980		nm
Data Rate			400		Mb/s
Average Optical Power ⁸	Pavg		-1.5		dBm

⁶ Based on a jitter-free source

⁷ Differential back-terminated CML outputs

⁸ I= 5mA ;, T=25C.

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6.0 Electrical Specifications – Low speed

6.1 Infrared Pass-through Electrical Parameters⁹

IR Pin Parameters	Symbol	Min	Typ	Max	Units
Modulation Frequency	DR _{IR}		50		khz
Minimum Input Transition Time			7.5		us
Input Voltage Low	V _{IL}	-0.3	Avg	0.8	V
Input Voltage High	V _{IH}	2		VCC1 + 0.3	V

6.2 Audio Return Channel (ARC) Electrical Parameters¹⁰

ARC Pin Parameters	Symbol	Min	Typ	Max	Units
Data Rate	DR _{ARC}			20	Mbps
Bit Cell	UI	50			ns
Jitter			0.2		UI
Input Voltage Low	V _{IL}	-0.3		0.8	V
Input Voltage High	V _{IH}	2		VCC1 + 0.3	V

6.3 HDMI, USB, Ethernet Electrical Parameters

HDMI, USB and Ethernet are compatible with published standards

⁹ Infrared pass-through direction is input from the RX-02E module to an output from the TX-02E module

¹⁰ The Audio Return Channel will pass a bit for bit copy of a data stream adhering to IEC 60958-1 Edition 3.0

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7.0 Status Signal Functional Table¹¹

The serial LED output from the P1RX6B-SX51-02E is designed to drive the SDI input of the AP3156 from Diodes Incorporated. A programmable logic device or ASIC may be used to monitor serial LED output and derive LED Status without utilizing the AP3156.

The following numbers referenced below will map directly into the D1-D6 outputs of the AP3156.

LED Position	Function	Description
D6	Off	Power Off or FPGA not initialized
	Flash	FPGA initialized but fiber link not detected
	On	FPGA initialized and fiber link up
D5	Off	No video
	Flash	Not Implemented (This LED doesn't flash)
	On	Video detected
D4	Off	HDMI 5v not detected
	Flash	HDMI 5v detected and no Hot Plug
	On	HDMI 5v and Hot Plug detected
D3	Off	Ethernet not connected
	Flash	Ethernet connected and Auto-Negotiation Failed
	On	Ethernet good link
D2	Off	Audio Return Channel inactive
	Flash	Not Implemented (This LED doesn't flash)
	On	Audio Return Channel data detected
D1	Off	USB Host not connected
	Flash	USB Host connected and no USB function
	On	USB Host and function connected

¹¹ Status signal table represents typical output. Variances in status signals may occur between different manufacturers and/or models of sources and sinks. Reference the -02E Information Package for diode wiring circuit.

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8.0 Laser Safety

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

9.0 Compatible Standards

The P1RX6-SX51-02E has been evaluated to interoperate with devices adhering to the following standards:

HDMI Specification Version 1.3a¹²
HDMI Compliance Test Specification Version 1.3c
High-Bandwidth Digital Content Protection (HDCP) Version 1.3¹²
High-Bandwidth Digital Content Protection Spec Compliance Test Specification Revision 1.1
Ethernet Specification, IEEE 802.3-2005, 10BASE-T/100BASE-T
Universal Serial Bus Specification Rev 1.1
IEC 60958-1 Edition 3.0

10.0 Patents

This product contains the following patents in additions to patents pending:
6201908, 6396978, 6456757, 6558046, 6572278, 6652161.

¹² Modules are not warranted for interoperability with all HDMI sources and sinks

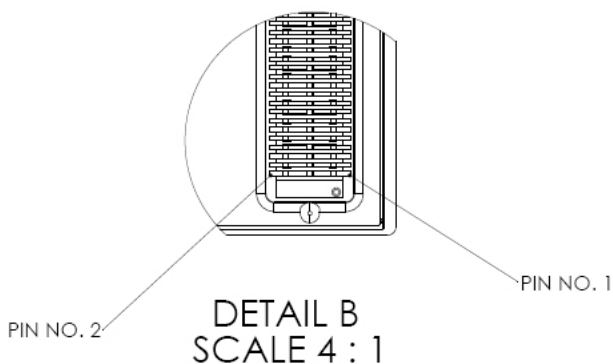
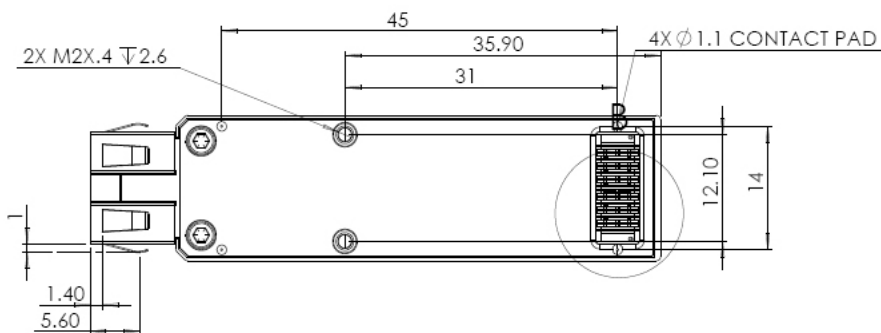
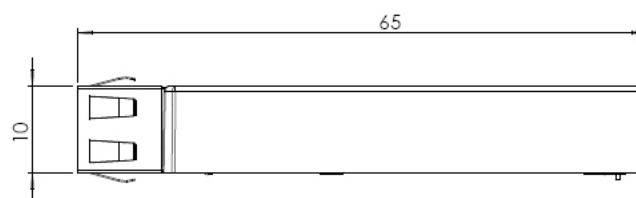
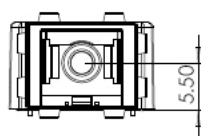
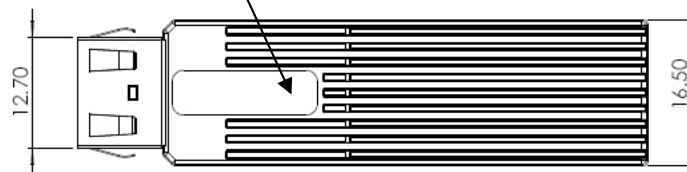
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Dimensions

The RX51-02E Module is designed to work with a standard SC ferrule only. Insertion of any other type may result in damage. For dust cap information, contact L-Com (DSTCP-SC).

Dimensions and orientation are for reference only.

****Temperature measurement point**



All dimensions are in mm.

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