



### Features

- Compliant with XENPAK MSA
- Up to 10GBd bi-directional data links
- Compliant with IEEE802.3ae 10GBASE-ER Application
- XAUI Electrical Interface: 4 Lanes@3.125Gbit/s
- Hot Z-Pluggable
- SC Duplex Optical Receptacle
- MDIO, DOM(Digital Optics Monitoring) Support
- Temperature stabilized EML transmitter
- PIN Photo-detector
- RoHS Compliant

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Note
Storage Temperature	$T_S$	-40	85	°C	
Supply Voltage	$V_5$	0	6	V	+5V
Supply Voltage	$V_3$	0	4	V	+3.3V
Supply Voltage	$V_{APS}$	0	1.5	V	APS
Optical Receiver Input	$P_{MAX}$		1.5	dBm	Average

### Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Units	Note
Case Operating Temperature	$T_C$	0	70	°C	
Supply Voltage	$V_{CC5}$	4.75	5.25	V	+5V
Supply Voltage	$V_{CC3}$	3.14	3.47	V	+3.3V
Supply Voltage	$V_{CCAPS}$	1.152	1.248	V	APS
Supply Current	$I_{CC5}$		350	mA	
Supply Current	$I_{CC3}$		300	mA	
Supply Current	$I_{CCAPS}$		1000	mA	
Power Consumption	$P$		4	W	

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Version: 15V.A

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### Transmitter Electro-optical Characteristics

Vcc5 = 4.75 V to 5.25 V, Vcc3 = 3.14 V to 3.47 V, V<sub>CCAPS</sub>=1.152V to 1.248V ; T<sub>C</sub> = 0 °C to 70 °C

Parameter	Symbol	Min.	Typ.	Max.	Units	Note
Operating Data Rate			10.3125		Gbps	
Bit Error Rate	BER			10 <sup>-12</sup>		
Output Optical Power	P <sub>out</sub>	-1		2	dBm	Average
Launch power of OFF Transmit Power	P <sub>OUT_OFF</sub>			-30	dBm	Average
Center Wavelength	λ <sub>C</sub>	1530		1570	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	8.2			dB	
Spectral Width (-20dB)	Δλ			0.6	nm	
Optical Return Loss Tolerance	ORL <sub>T</sub>			12	dB	
Relative Intensity Noise	RIN	---	---	-128	dB/Hz	
Transmitter Dispersion Penalty	TDP			2	dB	
Transmitter eye mask			Compliant with IEEE802.3ae			

**Receiver Electro-optical Characteristics**

**Vcc5 = 4.75 V to 5.25 V, Vcc3 = 3.14 V to 3.47 V, V<sub>CCAPS</sub>=1.152V to 1.248V ; T<sub>C</sub> = 0 °C to 70 °C**

<i>Parameter</i>	<i>Symbol</i>	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	<i>Units</i>	<i>Note</i>
Operating Center Wavelength	$\lambda_C$	1260	---	1600	nm	
Optical Input Power	$P_{IN}$	-16	---	0.5	dBm	Average, Informative
Receiver Sensitivity in OMA	$P_{IN\_OMA}$	---	---	-14.1	dBm	INformative
Stressed Receiver Sensitivity	$P_{IN\_S}$	---	---	-11.3	dBm mW	
Receiver Reflectance	$TR_{RX}$			-27	dB	
Loss of Signal Assert Level	$P_{LOS\_A}$	-25			dBm	
Loss of Signal DeAssert Level	$P_{LOS\_D}$			-17	dBm	
Loss of Signal Hysteresis	$P_{LOS\_H}$	1			dBm	
Receiver electrical 3dB upper cutoff frequency	FR			12.3	GHz	

**Pin Assignment**

70	GND
69	GND
68	RESERVED
67	RESERVED
66	GND
65	TX LANE3-
64	TX LANE3+
63	GND
62	TX LANE2-
61	TX LANE2+
60	GND
59	TX LANE1-
58	TX LANE1+
57	GND
56	TX LANE0-
55	TX LANE0+
54	GND
53	GND
52	GND
51	RX LANE3-
50	RX LANE3+
49	GND
48	RX LANE2-
47	RX LANE2+
46	GND
45	RX LANE1-
44	RX LANE1+
43	GND
42	RX LANE0-
41	RX LANE0+
40	GND
39	RESERVED
38	RESERVED
37	GND
36	GND



1	GND
2	GND
3	GND
4	5.0V
5	3.3V
6	3.3V
7	APS
8	APS
9	LAS1
10	RESET
11	VEND SPECIFIC
12	TX ON/OFF
13	RESERVED
14	MOD DETECT
15	VEND SPECIFIC
16	VEND SPECIFIC
17	MDIO
18	MDC
19	PRTAD4
20	PRTAD3
21	PRTAD2
22	PRTAD1
23	PRTAD0
24	VEND SPECIFIC
25	APS SET
26	RESERVED
27	APS SENSE
28	APS
29	APS
30	3.3V
31	3.3V
32	5.0V
33	GND
34	GND
35	GND

**Top of Transceiver PCB**

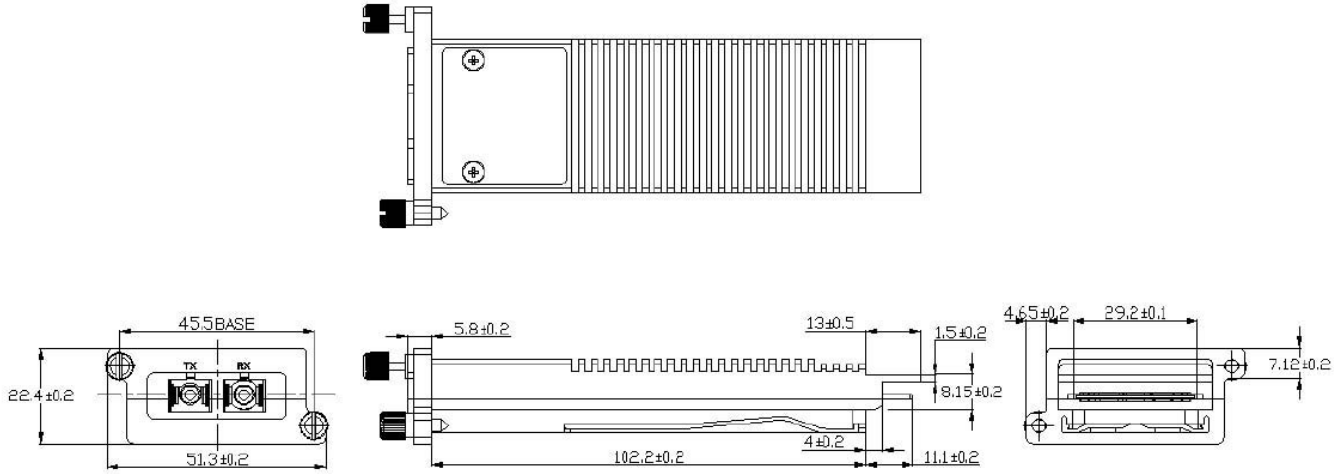
**Bottom of Transceiver PCB**  
As viewed through top

**Pin Description**

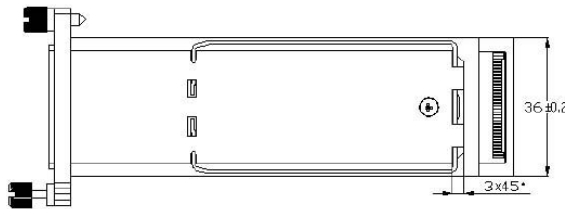
<i>PIN</i>	<i>Logic</i>	<i>Symbol</i>	<i>I/O</i>	<i>Description</i>
1	Supply	GND	I	Electrical ground
2	Supply	GND	I	Electrical ground
3	Supply	GND	I	Electrical ground
4	Supply	5.0V	I	Power
5	Supply	3.3V	I	Power
6	Supply	3.3V	I	Power
7	Supply	APS	I	Adaptive Power Supply
8	Supply	APS	I	Adaptive Power Supply
9	Open drain	LASI	O	Link Alarm Status Interrupt. 10-22k ohm pull up on host
10	1.2V CMOS	RESET	I	TX OFF when MDIO RESET
11		VEND SPECIFIC		Vendor Specific Pin. Leave unconnected
12	1.2V CMOS	TX ON/OFF	I	Transmitter ON/OFF
13		RESERVED		Reserved
14		MOD DETECT	O	Pulled low inside module through 1k ohm
15		VEND SPECIFIC		Vendor Specific Pin. Leave unconnected
16		VEND SPECIFIC		Vendor Specific Pin. Leave unconnected
17	Open Drain	MDIO	I/O	Management Data IO
18	1.2V CMOS	MDC	I	Management Data Clock
19	1.2V CMOS	PRTAD4	I	Port Address bit 4 (Low=0)
20	1.2V CMOS	PRTAD3	I	Port Address bit 3 (Low=0)
21	1.2V CMOS	PRTAD2	I	Port Address bit 2 (Low=0)
22	1.2V CMOS	PRTAD1	I	Port Address bit 1 (Low=0)
23	1.2V CMOS	PRTAD0	I	Port Address bit 0 (Low=0)
24		VEND SPECIFIC		Vendor Specific Pin. Leave unconnected
25		APS SET	O	Feedback output for APS
26		RESERVED		Reserved for Avalanche Photodiode use
27	Analog	APS SENSE	O	APS Sense connection
28	Supply	APS	I	Adaptive Power Supply
29	Supply	APS	I	Adaptive Power Supply
30	Supply	3.3V	I	Power
31	Supply	3.3V	I	Power
32	Supply	5.0V		Power
33	Supply	GND	I	Electrical Ground
34	Supply	GND	I	Electrical Ground
35	Supply	GND	I	Electrical Ground

<i>PIN</i>	<i>Logic</i>	<i>Symbol</i>	<i>I/O</i>	<i>Description</i>
36	Supply	GND	I	Electrical Ground
37	Supply	GND	I	Electrical Ground
38		RESERVED		Reserved
39		RESERVED		Reserved
40	Supply	GND	I	Electrical Ground
41	AC	RX LANE 0+	O	Module XAUI Output Lane 0+
42	AC	RX LANE 0-	O	Module XAUI Output Lane 0-
43	Supply	GND	I	Electrical Ground
44	AC	RX LANE 1+	O	Module XAUI Output Lane 1+
45	AC	RX LANE 1-	O	Module XAUI Output Lane 1-
46	Supply	GND	I	Electrical Ground
47	AC	RX LANE 2+	O	Module XAUI Output Lane 2+
48	AC	RX LANE 2-	O	Module XAUI Output Lane 2-
49	Supply	GND	I	Electrical Ground
50	AC	RX LANE 3+	O	Module XAUI Output Lane 3+
51	AC	RX LANE 3-	O	Module XAUI Output Lane 3-
52	Supply	GND	I	Electrical Ground
53	Supply	GND	I	Electrical Ground
54	Supply	GND	I	Electrical Ground
55	AC	TX LANE 0+	O	Module XAUI Input Lane 0+
56	AC	TX LANE 0-	O	Module XAUI Input Lane 0-
57	Supply	GND	I	Electrical Ground
58	AC	TX LANE 1+	O	Module XAUI Input Lane 1+
59	AC	TX LANE 1-	O	Module XAUI Input Lane 1-
60	Supply	GND	I	Electrical Ground
61	AC	TX LANE 2+	O	Module XAUI Input Lane 2+
62	AC	TX LANE 2-	O	Module XAUI Input Lane 2-
63	Supply	GND	I	Electrical Ground
64	AC	TX LANE 3+	O	Module XAUI Input Lane 3+
65	AC	TX LANE 3-	O	Module XAUI Input Lane 3-
66	Supply	GND	I	Electrical Ground
67		RESERVED		Reserved
68		RESERVED		Reserved
69	Supply	GND	I	Electrical Ground
70	Supply	GND	I	Electrical Ground

**Dimensions**



Unit: millimeter



**ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED**

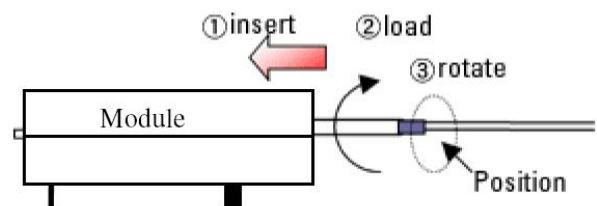
**Optical Receptacle Cleaning Recommendations :**

All fiber stubs inside the receptacle portions were cleaned before shipment. In the event of contamination of the optical ports, the recommended cleaning process is the use of forced nitrogen. If contamination is thought to have remained, the optical ports can be cleaned using a NTT international Cletop® stick type and HFE7100 cleaning fluid. Before the mating of patch-cord, the fiber end should be cleaned up by using Cletop® cleaning cassette.

**Cleaning of patch-cord**



**Cleaning of fiber stub**



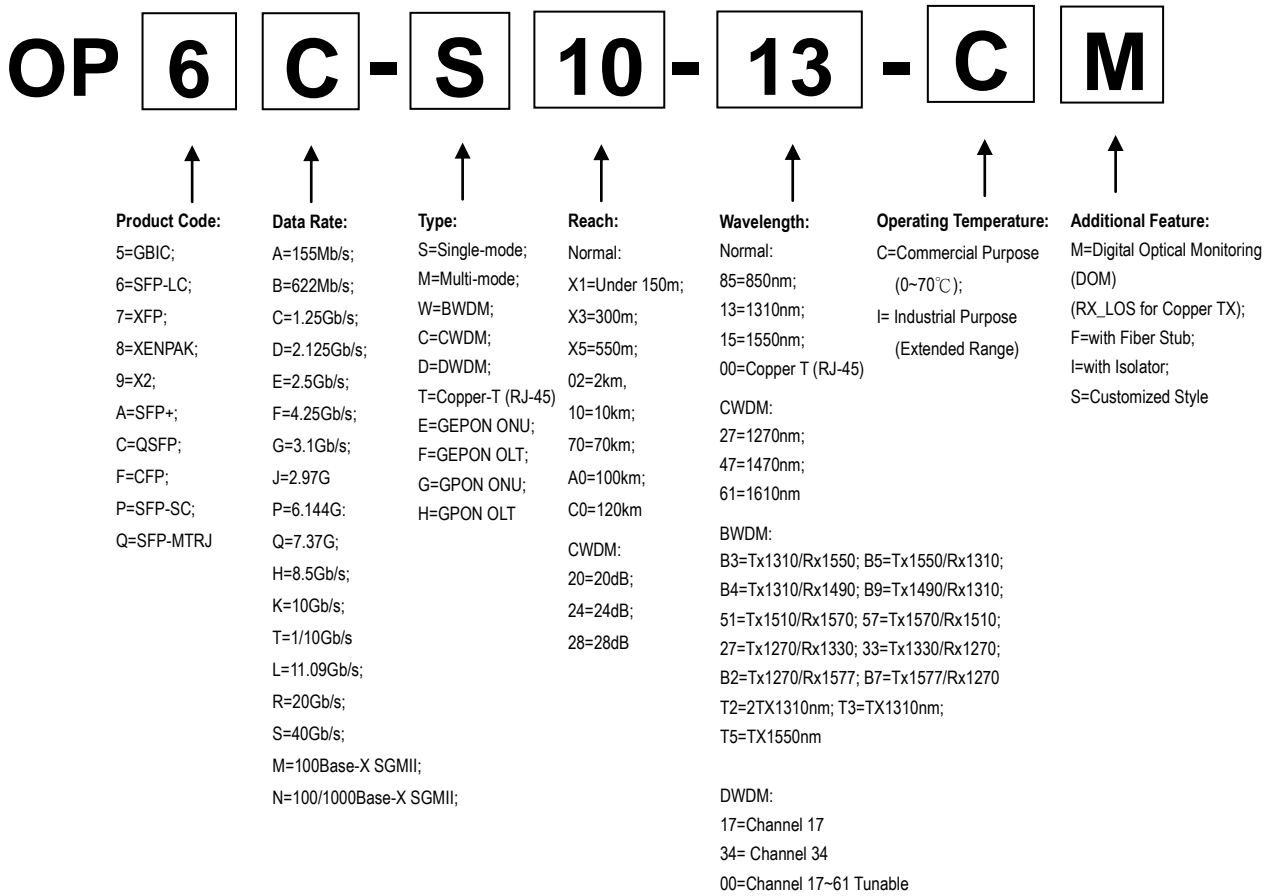
1. Insert  
Ensure that stick is held straight when inserting into sleeve.
2. Load  
Apply sufficient pressure (approx 600-700g) to ensure ferrule a little depressed in sleeve.
3. Rotate  
Rotate stick clockwise 4-5 times, while ensuring direct contact with ferrule end-face is maintained.

*Notice: Number of possible wipes:  
Maintenance (repair) ~1 use / piece  
Equipment construction: 4 uses / piece (max.)*

Note: The pictures were extracted from NTT-ME website. And the Cletop® is a trademark registered by NTT-ME



**Ordering Information**



Model Number	Part Number	Reach	Input/Output	Signal Detect	Voltage	Temperature
XENPAK-ER	OP8K-S40-15-C	40km	AC/AC	TTL	3.3V/5V	0°C to 70 °C

**Note: All information contained in this document is subject to change without notice.**