

# SFP-1G-CWDM-160

## 1000Base SFP CWDM EZX 1470-1610nm SMF 160km Transceiver

### Product Features

- Up to 1.25Gb/s data links
- CWDM DFB laser transmitter and APD photo-detector.
- Up to 160km on 9/125um SMF
- Hot-pluggable SFP footprint
- Duplex LC/UPC type pluggable optical interface.
- Low power dissipation
- RoHS-10 compliant and lead-free
- Support Digital Monitoring interface.
- Single +3.3V power supply
- Compliant with SFF-8472
- Metal enclosure, for lower EMI
- Meet ESD requirements, resist 8KV direct contact voltage.
- Available operating temperature ranges:
  - Commercial: 0°C to 70°C
  - Industrial: -40°C to 85°C



### Product Applications

- 1000BASE-EZX Ethernet
- OTN / FC
- Other optical links

### I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	TS	-40		+85	°C
Power Supply Voltage	Vcc	-0.5		3.6	V
Relative Humidity	RH	5		95	%
Damage Threshold	THd	0			dBm

## II. Operating / Environment Specifications

Parameter		Symbol	Min.	Typ.	Max.	Units
Case Operating Temperature	Commercial	TC	0		+70	°C
	Industrial		-40		+85	°C
Supply Voltage		VCC	3.135		3.465	V
Data Rate			1.25			Gb/s
Control Input Voltage High			2		Vcc	V
Control Input Voltage Low			0		0.8	V
Link Distance (SMF)		D			160	km

## III. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_c$	1470		1610	nm	
Spectrum Bandwidth (RMS)	$\sigma$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Power	Pavg	1		6	dBm	
Extinction Ratio	ER	9			dB	
Transmitter OFF Output Power	Poff			-45	dBm	
Output Eye Mask	Compliant with 802.3z(class 1 laser safety)					1
<b>Receiver</b>						
Center Wavelength	$\lambda_c$	1470		1610	nm	
Sensitivity (Average Power)	Pol			-33	dBm	2
Input Saturation Power (overload)	Sen	-10			dBm	
RX_LOS Assert	LOS A	-41			dBm	3
RX_LOS De-assert	LOS D			-34	dBm	3
RX_LOS Hysteresis	LOS H	0.5			dB	

### Notes:

1. Transmitter eye mask definition.
2. Measured with Light source 1470~1610nm, ER=9dB; BER≤1E-12 @PRBS=2<sup>7</sup>-1 NRZ
3. When LOS de-asserted, the RX data+/- output is High-level (fixed).

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1000BASE, SFP CWDM, EZX, SMF TRANSCEIVER  
1470-1610nm, 160km REACH, DUPLEX LC CONNECTOR

### IV. Electrical Characteristics



















Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Consumption	P			0.95	W	commercial
				1.00		Industrial
Supply Current	Icc			280	mA	commercial
				300		Industrial
<b>Transmitter</b>						
Single-ended Input Voltage Tolerance	V <sub>cc</sub>	-0.3		4.0	V	
Differential Input Voltage Swing	V <sub>in,pp</sub>	200		2400	mVpp	
Differential Input Impedance	Z <sub>in</sub>	90	100	110	Ohm	
Transmit Disable Assert Time				5	us	
Transmit Disable Voltage	V <sub>dis</sub>	V <sub>cc</sub> -1.3		V <sub>cc</sub>	V	
Transmit Enable Voltage	V <sub>en</sub>	V <sub>ee</sub> -0.3		0.8	V	
<b>Receiver</b>						
Differential Output Voltage Swing	V <sub>out,pp</sub>	500		900	mVpp	
Differential Output Impedance	Z <sub>out</sub>	90	100	110	Ohm	
Data output rise/fall time	T <sub>r</sub> /T <sub>f</sub>		100		ps	20% - 80%
LOS Assert Voltage	V <sub>losH</sub>	V <sub>cc</sub> -1.3		V <sub>cc</sub>	V	
LOS De-Assert Voltage	V <sub>losL</sub>	V <sub>ee</sub> -0.3		0.8	V	

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### V. Ordering Details

Part Number	Data Rate	Applications	Case Temp.	xWDM $\lambda$ Channel
SFP-CXX-160-GD	1.25Gbps	10GHz / peak ch:17-61 / 160km	0 ~ +70°C	XX
SFP-CXX-160-GDI			-40 ~ +85°C	

CWDM ITU Grid (18-Channel)							
Wavelength (nm)	CXX	Typical Bail Color		Wavelength (nm)	CXX	Typical Bail Color	
1270	C27	Light Purple		1450	C45	Yellow/Orange	
1290	C29	Sky Blue		<b>1470</b>	<b>C47</b>	Gray	
1310	C31	Yellow/Green		<b>1490</b>	<b>C49</b>	Violet	
1330	C33	Yellow/Ochre		<b>1510</b>	<b>C51</b>	Blue	
1350	C35	Pink		<b>1530</b>	<b>C53</b>	Green	
1370	C37	Beige		<b>1550</b>	<b>C55</b>	Yellow	
1390	C39	White		<b>1570</b>	<b>C57</b>	Orange	
1410	C41	Silver		<b>1590</b>	<b>C59</b>	Red	
1430	C43	Black		<b>1610</b>	<b>C61</b>	Brown	

Notes: ITU-T G.694.2 defines 18 wavelengths for CWDM transport ranging from 1270 to 1610 nm, spaced at 20 nm apart.

#### Warranty

All transceivers feature a limited lifetime warranty.

#### Disclaimer

External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.