

10Gbps SFP+ DWDM Optical Transceiver, 40km

Features

- ◆ Compliant with SFF-8431, SFF-8432 and IEEE802.3ae
- ◆ 10GBASE-ER, and 2G/4G/ 8G/10G Fiber Channel applications.
- ◆ Suitable for use in 100GHz channel spacing DWDM systems
- ◆ Cooled EML transmitter and PIN receiver
- ◆ link length up to 40km
- ◆ Low Power Dissipation 1.5W Maximum
- ◆ -5°C to 70°C Operating Case Temperature
- ◆ Single 3.3V power supply
- ◆ Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
- ◆ RoHS6 compliant



Applications

- ◆ 10GBASE-ER (with/without FEC)
- ◆ 10G Fiber Channel

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	3.8	V
Storage Temperature	Tst	-40	85	°C
Relative Humidity	Rh	0	85	%

Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	3.13	3.3	3.46	V
Supply current[1]	Icc	-	360	450	mA
Operating Case temperature	Tca	-5	-	70	°C
Module Power Dissipation	Pm	-	1.2	1.5	W

Transmitter Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength-Start of Life [1]	c	c-25	c	c+25	pm
Center Wavelength-End of life [1]	c	c-100	c	c+100	pm
Spectral Width (-20dB)	$\Delta\lambda_{20}$	-	-	0.3	nm
Average Optical Power	Po	-1	-	+3	dBm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Optical Transmit Power (disabled)	PTX_DISABL	-	-	-30	dBm
Extinction Ratio	ER	8.2	-	-	dB
Relative Intensity Noise	RIN	-	-	-128	dB/Hz
Optical Return Loss Tolerance	Orl	-	-	21	dB

Receiver Specifications – Optical

Parameter	Symbol	Min	Typical	Max	Unit
Input Operating Wavelength	λ	1260	-	1600	nm
Average receive power	Pavg	-15.8	-	-1.0	dBm
Receiver sensitivity in 9.95G~11.1Gbps(OMA)	Rsen1	-	-	-14.1	dBm
Stressed receiver sensitivity in 9.95G~11.1Gbps(OMA)	Rsen2	-	-	-11.3	dBm
Dispersion penalty(800ps/nm) PRBS 2 ³¹ -1 @9.95~11.1Gbps	DP	-	-	2	dB
Reflectance	Rrx	-	-	-26	dB
LOS Asserted	Lsa	-28	-	-	dBm
LOS De-Asserted	Lda	-	-	-19	dBm
LOS Hysteresis	Lh	0.5	-	-	dB

Notes:

[1] Measured with conformance test signal for BER = 10⁻¹². The stressed sensitivity values in the table are for system level BER measurements which include the effects of CDR circuits. It is recommended that at least 0.4 dB additional margin be allocated if component level measurements are made without the effects of CDR circuits.

Transmitter Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate	Mra	-	10.3	11.1	Gbps
Input differential impedance	Rim	-	100	-	Ω
Differential data Input	VtxDIFF	120	-	850	mV
Transmit Disable Voltage	VD	2.0	-	Vcc3+0.3	V
Transmit Enable Voltage	Ven	0	-	+0.8	V
Transmit Disable Assert Time	Vn	-	-	100	us

Receiver Specifications – Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Data Rate	Mra	-	10.3	11.1	Gbps
Differential Output Swing	Vout P-P	350	-	850	mV
Rise/Fall Time	Tr / Tf	24	-	-	ps
Loss of Signal –Asserted	VOH	2	-	Vcc3+0.3-	V
Loss of Signal –Negated	VOL	0	-	+0.4	V

Digital Diagnostic Functions

Parameter	Symbol	Min.	Max	Unit	Notes
Accuracy					
Transceiver Temperature	DMI_Temp	-3	+3	degC	Over operating temp
TX Output optical power	DMI_TX	-3	+3	dB	
RX Input optical power	DMI_RX	-3	+3	dB	-3dBm to -12dBm range
Transceiver Supply voltage	DMI_VCC	-0.08	+0.08	V	Full operating range
Bias current monitor	DMI_Ibias	-10%	10%	mA	
Dynamic Range Accuracy					
Transceiver Temperature	DMI_Temp	-5	70	degC	
TX Output optical power	DMI_TX	-1	+2	dBm	
RX Input optical power	DMI_RX	-18	0	dBm	
Transceiver Supply voltage	DMI_VCC	3.0	3.6	V	
Bias current monitor	DMI_Ibias	0	100	mA	

Ordering information

MSA Standard

Part Number	Product Description
SFP+ER-DWyy-CE	10Gbps, DWDM SFP+ 40km, -5°C ~ +70°C yy= ITU Channel 20~60

Cross-Platform/OEM Compatible

Part Number	Product Description
SFP+ER-DWyy-CExx	10Gbps, DWDM SFP+ 40km, -5°C ~ +70°C yy= ITU Channel 20~60

xx=TP, Cisco, Juniper & Ciena compatible

xx=AL, Alcatel compatible