155 Mbps CWDM SFP Transceiver

SFP-O3D-XLR-*xx*

Features

- 100 - 155 Mbps data rate
- 42.5 dB minimum link budget
- 1470 nm to 1610 nm CWDM DFB laser
- 120 km reach
- APD receiver
- SFP MSA compliance (SFF-8074i)
- Digital Diagnostic (SFF-8472)
- GR-253/STM G.957 compliance
- Single 3.3 volts power supply
- RoHS compliance
- Class 1 laser product

General Operating

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V_{cc}	3.135	3.3	3.465	V
Total Current	I_{cc}	-	-	300	mA
Power Supply Noise Rejection[a]	PSR	100	-	-	mV_{p-p}
Operating Case Temperature	T_{op}	-5	-	70	°C
Storage Temperature	T_{st}	-40	-	85	°C
Data Rate OC-3/STM-1	DR	-	155.52	-	Mbps

a) 20 Hz to 155 MHz

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P_{op}	1	-	5	dBm
Average Launch Power (Tx: Off)	P_{off}	-	-	-30	dBm
Extinction Ratio	ER	10	-	-	dB
Eye Mask	-	SONET/SDH Compliant			
Optical Jitter Generation	J_{gen}	-	-	0.002	UI
Optical Rise Time[b]	t_r	-	-	1000	ps
Optical Fall Time[b]	t_f	-	-	1000	ps
Mean Wavelength	λ	1xx1 - 6.5	1xx1	1xx1 + 6.5	nm
Spectral Width (20 dB)	$\Delta\lambda$	-	-	1	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Dispersion Penalty (120 km)	DP	-	0.5	2	dB
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Reflection Tolerance	rp	-24	-	-	dB

b) 20% - 80% values

Transmitter Specifications (Electical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Input Differential Impedence	R_{in}	80	100	120	Ω
PECL Single-Ended Data Input Swing	$V_{in,p-p}$	250	-	1200	mV
TxFault_Fault	V_{fault}	2	-	V_{cc}	V
TxFault_Normal	V_{normal}	V_{ee}	-	V_{ee} + 0.5	V
TxDisable_Disable	Vd	2	-	V_{cc}	V
TxDisable_Enable	V_{en}	V_{ee}	-	V_{ee} + 0.8	V

Receiver Specifications (Optical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Receive Power Low[c]	$R_{sens,low}$	-	-	-42	dBm
Receive Power High[c]	$R_{sens,high}$	-10	-	-	dBm
Damage Threshold for Receiver	$P_{in,damage}$	4	-	-	dBm
Wavelength[d]	λ	1260	-	1620	nm
LOS Assert	LOSA	-52	-	-	dBm
LOS De-assert	LOSD	-	-	-42	dBm
LOS Hysteresis	HYS	0.5	-	-	dB

c) at 10^{-10} BER, PRBS 2^{23}-1
d) Operational over 1200 nm to 1625 nm range

Receiver Specifications (Electrical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
PECL Single Ended Data Output Swing	$V_{out,p-p}$	185	-	800	mV
Data Output Rise Time	t_r	-	-	1000	ps
Data Output Fall Time	t_f	-	-	1000	ps

Timing and Electrical					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Tx Disable Negate Time	t_on	-	-	5	ms
Tx Disable Assert Time	t_off	-	-	10	µs
Time To Initialize, Including Reset of Tx Fault	t_init	-	-	300	ms
Tx Fault Assert Time	t_fault	-	-	100	µs
Tx Disable To Reset	t_reset	10	-	-	µs
LOS Assert Time	t_loss_on	-	-	100	µs
LOS De-assert Time	t_loss_off	-	-	100	µs
Serial ID Clock Rate	f_serial_clock	-	-	100	KHz
RX_LOS Voltage (High)	-	2	-	-	V
RX_LOS Voltage (Low)	-	-	-	0.8	V
LOS Output Voltage-Fault	V_{LOS} fault	2	-	V_{cc}	V
LOS Output Voltage-Normal	V_{LOS}normal	V_{ee}	-	V_{ee} + 0.5	V
MOD_DEF (0:2)-High	V_h	2	-	V_{cc}	V
MOD_DEF (0:2)-Low	V_l	V_{ee}	-	V_{ee} + 0.5	V

Ordering Information

Model	Description	Data Rate (Mbps)	Wavelength (nm)	Bail Latch Color	Distance Range (km)
SFP-O3D-XLR-*xx**	SFP FE/OC3 CWDM Transceiver	100 - 155	1260/1620	See Wavelength/ Bail Latch Color table below.	60 - 120

* See Wavelength Guide below for "***xx***" values

λc Wavelength Guide

xx	λc	Unit	*xx*	λc	Unit	*xx*	λc	Unit	*xx*	λc	Unit
47	1471	nm	**49**	1491	nm	**51**	1511	nm	**53**	1531	nm
55	1551	nm	**57**	1471	nm	**59**	1591	nm	**61**	1611	nm

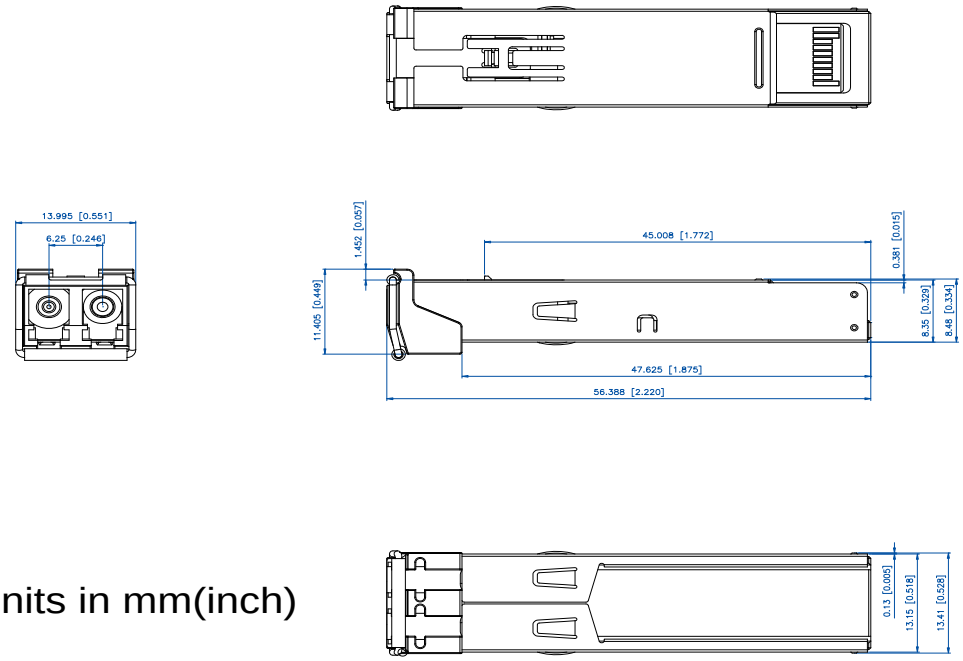
Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Formula
Temperature	-5 to 70	± 3	° C	Internal	Tc(C)=Tad(16 bit signed twos complement)/256
Voltage	0 to V_{cc}	0.1	V	Internal	V(Volts)=Vad(16 bit unsigned integer)*0.1
Bias Current	0 to 120	5	mA	External	I(mA)=Islope*Iad(16 bit unsigned integer)+Ioffset
TX Power	0 to +5	±3	dBm	External	TX_PWR(μW)=TX_PWRslope*TX_PWRad(16 bit unsigned integer +TX_PWRoffset
RX Power	-42 to -10	±3	dBm	External	RX_PWR(μW)=A0+A1*x+A2*x^2+A3*x^3+A4*x^4

Pin	Function	Notes
1	$V_{ee}T$	TX GND
2	TX_FAULT	Open Collector
3	TX_DISABLE	Internally Pulled High
4	MOD_DEF2	Serial Data Input
5	MOD_DEF1	Serial Clock Input
6	MOD_DEF0	Internally Grounded
7	NC	Not Connected
8	LOS	Open Collector
9	$V_{ee}R$	RX Ground
10	$V_{ee}R$	RX Ground
11	$V_{ee}R$	RX Ground
12	RXD-	RX Data Negative
13	RXD+	RX Data Positive
14	$V_{ee}R$	RX GND
15	V_{ccR}	RX Power
16	V_{ccT}	TX Power
17	$V_{ee}T$	TX GND
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	$V_{ee}T$	TX GND

Wavelength	Bail Latch Color
1470	Grey
1490	Purple
1510	Blue
1530	Green
1550	Yellow
1570	Orange
1590	Red
1610	Brown

Outline Drawing



Units in mm(inch)

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic descharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indeirect radiation.

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