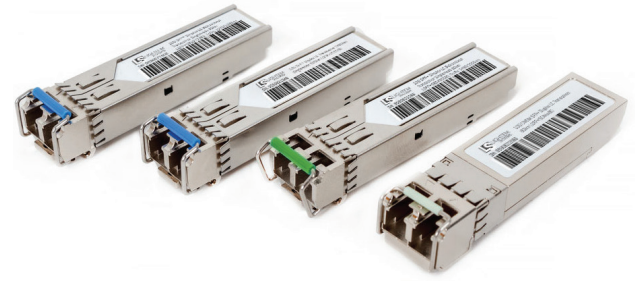


Lightem 1.25G CWDM SFP Transceiver 120km LCWS125SXXD120

FEATURES

- Up to 1.25Gb/s data links
- Duplex LC connector
- Hot-pluggable SFP footprint
- DFB laser transmitter in 8 possible CWDM wavelengths
- RoHS compliant and Lead Free
- Up to 120km on 9/125um SMF
- Metal enclosure for lower EMI
- Single +3.3V power supply
- Low power dissipation <1.0 W (0~70°C), <1.5W (-40~85°C)
- Commercial and industrial operating temperature optional
- SFP MSA SFF-8074i Compliant



APPLICATIONS

- Gigabit Ethernet
- 1x Fibre Channel

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Maximum Supply Voltage	VCC	-0.5	-	+4	V	
Storage Temperature	TS	-40	-	85	°C	
Operating Humidity	RH	5	-	85	%	

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	Vcc	3.13	+3.3	3.47	V
Power Supply Current	Icc			300(Commercial)	mA
	Icc			450(Industrial)	mA
Case Operating Temperature	Tc	0		+70(Commercial)	°C
	Tl	-40		+85(Industrial)	°C
Data Rate(Gigabit Ethernet)			1.25		Gbps
Data Rate(Fibre Channel)			1.063		Gbps
9/125um G.652 SMF	Lmax			120	km

TELECOM/DATACOM SYSTEM

ELECTRICAL CHARACTERISTICS (TOP = -5 TO 700C, VCC = 3.13 TO 3.5 VOLTS)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Transmitter						
Input differential impedance	RIN		100		Ω	1
Single ended data input swing	Vin, pp	250		1200	mV	
TX Disable High		Vcc-1.3		Vcc	V	
TX Disable Low		Vee		Vee+0.8	V	
TX Fault High		Vcc-0.5		Vcc	V	
TX Fault Low		Vee		Vee+0.5	V	
Initialization Time	T_start			60	s	2
Receiver						
Single ended data out swing	Vout, pp	300	400	800	mV	3
Data output rise time	tr			175	ps	4
Data output fall time	tf			175	ps	4
LOS Fault		Vcc-0.5		Vcc	V	
LOS Low		Vee		Vee+0.5	V	

Notes:

1. AC coupled
- For industrial application, room temperature and high temperature Initialization time < 300ms, for low temperature, in order to meet the CWDM wavelength requirements of +/- 6.5nm range, need to heat TOSA in advance, the low-temperature start-up time < 60s.
2. Into 100 ohm differential termination
3. 20-80%

OPTICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Ref
Transmitter						
Output Optical Power	PO	0	-	+5	dBm	1
Optical Wavelength	λ	-6.5		+6.5	nm	2
RMS Spectral Width	σ	-	-	1	nm	
Slide Mode Suppression Ratio	SMSR	30	-	-	dB	
Optical Rise/Fall Time	tr / tf	-	-	260	ps	3
Total Jitter	TJ	-	-	0.35	UI	
Optical Extinction Ratio	ER	9	-	-	dB	
Receiver						
Rx Sensitivity @ 1.25Gb/s	SENS	-	-	-32	dBm	4,5
Receiver Overload	-	-9	-	-	dBm	
Optical Center Wavelength	λ_c	1270	-	1600	nm	
LOS De-Assert	LOSD	-	-	-33	dBm	
LOS Assert	LOSA	-45	-	-	dBm	
LOS Hysteresis	-	0.5	-	5	dB	

Notes:

1. Class 1 laser safety
2. The transmitter center wavelength
 $\lambda^* = 1471, 1491, 1511, 1531, 1511, 1571, 1591, 1611$
3. Unfiltered, 20-80%. Complies with Gigabit Ethernet eye masks when filtered
4. Measured with conformance signals defined in FC PI-2 Rev. 10.0 specification
5. Measured with PRBS 27 -1 at 10-12 BER

TELECOM/DATACOM SYSTEM

DIGITAL DIAGNOSTIC MONITORING INTERFACE

Parameter	Range	Accuracy	Calibration
Temperature	0~+70°C (C)	±3°C	Internal
	-40~+85°C (I)		
Voltage	2.97 to 3.63V	±3%	Internal
Bias Current	0~100mA	±10%	Internal
TX Power	0 ~ +5dBm	±3dB	Internal
RX Power	-32 ~ -9dBm (APD)	±3dB	Internal

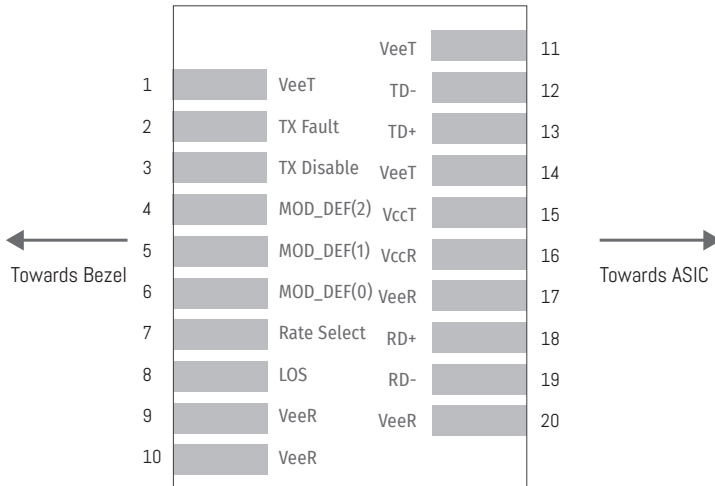
PIN DESCRIPTION

Pin	Symbol	Name /Description	NOTE
1	VeeT	Transmitter Ground (Common with Receiver Ground)	1
2	TX Fault	Transmitter Fault.	
3	TX Disable	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	VeeR	Receiver Ground (Common with Transmitter Ground)	1
10	VeeR	Receiver Ground (Common with Transmitter Ground)	1
11	VeeR	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VeeR	Receiver Ground (Common with Transmitter Ground)	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VeeT	Transmitter Ground (Common with Receiver Ground)	1

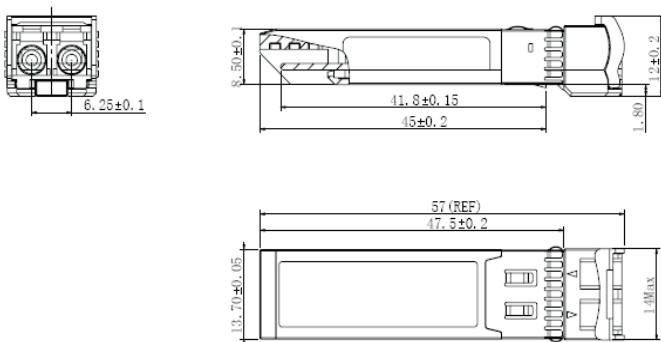
- Notes:
1. Circuit ground is internally isolated from chassis ground.
 2. Laser output disabled on TX Disable >2.0V or open, enabled on TX Disable <0.8V.
 3. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF (0) pulls line low to indicate module is plugged in.
 4. LOS is open collector output. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal

TELECOM/DATACOM SYSTEM

PIN OUT OF CONNECTOR BLACK ON HOST BOARD



MECHANICAL DIMENSIONS



Units in mm

ORDERING INFORMATION

PN	LCWS125SxxD120-x		Lightem 1.25G CWDM SFP Duplex LC 1xx0nm 120km
xx -	wavelength		
	47- 1471nm	49- 1491nm	
	51- 1511nm	53- 1531nm	
	55- 1551nm	57- 1571nm	
	59- 1591nm	61- 1611nm	
x-	l: optional industrial grade		
	eg LCWS125S47D120l		Lightem 1.25G CWDM SFP Duplex LC 1470nm 120km Industrial grade