

Lightem 100M~2.5G 100GHz DWDM SFP 120KM Transceiver LDWDS250Sxx32D

FEATURES

- Up to 2.5Gb/s data links
- DWDM DFB laser transmitter
- APD photo-detector
- 100GHz ITU Grid, C band
- Up to 120KM on 9/125µm SMF
- Hot-pluggable SFP footprint
- LC/UPC type pluggable optical interface
- Low power dissipation (<1.8W)
- Metal enclosure, for lower EMI
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Compliant with SFF-8472
- Standard Operating Range: 0°C to 70°C Operating temperature
- Optional Industrial grade: -40°C to 85°C Operating temperature



APPLICATIONS

- C band DWDM networks
- Sonet/SDH networks
- Router/Server Interface
- Metro/Access Networks
- Gigabit Ethernet
- Fiber Channel
- Other Optical Link

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	TC	-40	-	+85	°C	
Supply Voltage	VCCT, R	-0.5	-	4	V	
Relative Humidity	RH	5	-	+85	%	

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0		70	°C	commercial grade
		-40		85	°C	Industrial grade
Ambient Humidity	HA	5	3.3	95	%	Non-condensing
Power Supply Voltage	VCC	3.13	-	3.47	V	
Power Supply Current	ICC			500	mA	
Power Supply Noise Rejection			1.25	100	mVp-p	100Hz to 1MHz
Data Rate				2.5	Gbps	TX Rate/RX Rate
Transmission Distance				120	KM	9/125um SMF

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ELECTRICAL CHARACTERISTICS

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		Vcc		Vcc+0.8	V	
TX Fault High		Vcc-0.5		Vcc	V	
TX Fault Low		Vee		Vcc+0.5	V	
Receiver						
Single ended data out swing	Vout, pp	300	400	800	mV	2
Data output rise time	tr			175	ps	3
Data output fall time	tf			175	ps	3
LOS Fault		Vcc-0.5		Vcc	V	
LOS Low		Vcc		Vcc+0.5	V	

Notes:

1. AC coupled
2. Into 100 ohm differential termination
3. 20-80%

OPTICAL CHARACTERISTICS

Tx/Rx: 1310/1490nm	Symbol	Min	Typ	Max	Unit	Ref
Transmitter						
Output Optical Power	PO	0	-	+4	dBm	1
Optical Wavelength	λ		As per ITU-T 694.1		nm	
Special Width (-20dB)	$\Delta\lambda$	-	-	1	nm	
Slide Mode Suppression Ratio	SMSR	30	-	-	dB	
Total Jitter	TJ	-	-	0.35	UI	
Optical Extinction Ratio	ER	9	-	-	dB	
Central Wavelength	λ_c EOL	Z-100	Z	Z+100	pm	
Receiver						
Rx Sensitivity @ 2.488Gb/s	SENS		-	-30	dBm	2,3
Receiver Overload	-	-9	-	-	dBm	
Optical Center Wavelength	λ_c	1270	-	1600	nm	
LOS De-Assert	LOSD		-	-32	dBm	
LOS Assert	LOSA	-45	-		dBm	
LOS Hysteresis		0.5		5	dB	

Notes:

1. Class 1 laser safety
2. Measured with conformance signals defined in FC PI-2 Rev. 10.0 specification
3. Measured with PRBS 2⁷-1 at 10⁻¹² BER

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DIGITAL DIAGNOSTIC MONITORING INTERFACE

Parameter	Range	Accuracy	Calibration
Temperature	0~+70°C (C)	±3°C	Internal
	-40~+85°C (I)		
Voltage	2.97~3.63V	±3%	Internal
Bias Current	0~100mA	±10%	Internal
TX Power	0 ~ +4dBm	±3dB	Internal
RX Power	-30 ~ -9dBm	±3dB	Internal

PIN DESCRIPTION

Pin	Symbol	Name /Description	NOTE
1	VEER	Transmitter Ground (Common with Receiver Ground)	1
2	T FAULT	Transmitter Fault.	2
3	T DIS	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	No connection required	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	VCCR	Transmitter Power Supply	
17	VEER	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	VEER	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3VA high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. Low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on TDIS >2.0V or open, enabled on TDIS<0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

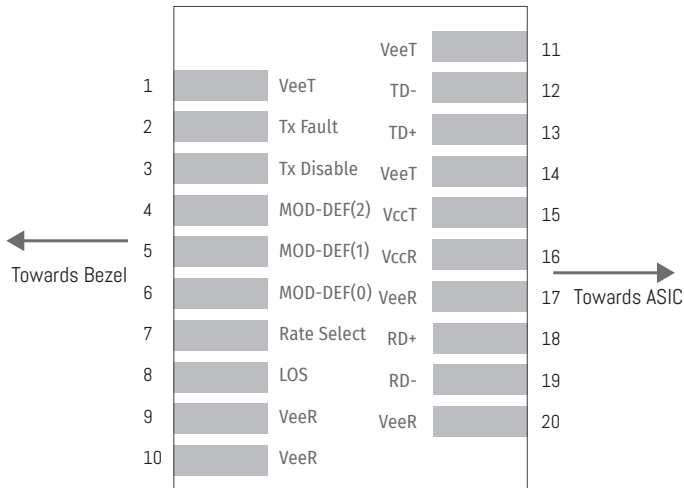
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100GHZ ITU GRID WAVELENGTH INFORMATION

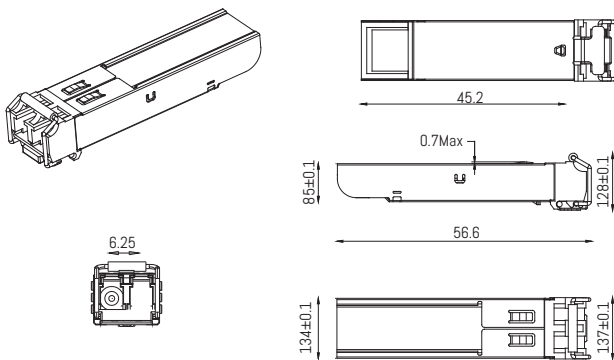
ITU Channel	Frequency	Center Wavelength (nm)
61	196.1	1528.77
60	196.0	1529.55
59	195.9	1530.33
58	195.8	1531.12
57	195.7	1531.90
56	195.6	1532.68
55	195.5	1533.47
54	195.4	1534.25
53	195.3	1535.04
52	195.2	1535.82
51	195.1	1536.61
50	195.0	1537.40
49	194.9	1538.19
48	194.8	1538.98
47	194.7	1539.77
46	194.6	1540.56
45	194.5	1541.35
44	194.4	1542.14
43	194.3	1542.94
42	194.2	1543.73
41	194.1	1544.53
40	194.0	1545.32
39	193.9	1546.92
38	193.8	1547.72
37	193.7	1548.51
36	193.6	1549.32
35	193.5	1550.12
34	193.4	1550.92
33	193.3	1551.72
32	193.2	1552.52
31	193.1	1553.33
30	193.0	1554.13
29	192.9	1554.94
28	192.8	1555.75
27	192.7	1556.55
26	192.6	1557.36
25	192.5	1558.17
24	192.4	1558.17
23	192.3	1558.98
22	192.2	1559.79
21	192.1	1560.61
20	192.0	1561.42
19	191.9	1562.23
18	191.8	1563.05
17	191.7	1563.86

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PIN OUT OF CONNECTOR BLACK ON HOST BOARD



MECHANICAL DIMENSIONS



Units in mm

ORDERING INFORMATION

PN	
LDWDS250Sxx32D-y	Lightem 100M~2.5G 100GHz DWDM SFP 120KM
xx -	wavelength
	from Ch17 - Ch17 1563.86nm to Ch61 1528.77nm
y-	l: optional industrial grade
eg LCWS125S47D120I	Lightem 100M~2.5G 100GHz DWDM SFP 120KM