



Applications

- ❑ 5G Applications
- ❑ XAUI/OBSAI/CPRI (3.125G)
- ❑ Fiber Channel 3xFC (3.1875G)
- ❑ SONET OC48 / SDH STM16 (2.488Gbps)
- ❑ Gigabit Ethernet / 1X/2X Fiber Channel

Features

- ❑ SFP Type LC Transmitter
- ❑ 100GHz ITU Grid, C-Band
- ❑ DWDM DFB Laser
- ❑ Transmitter only
- ❑ 3.3V single power supply
- ❑ Compliant with SFP MSA
- ❑ Hot pluggable
- ❑ Serial ID information support
- ❑ Digital diagnostic SFF-8472 compliant
- ❑ Compliant with RoHS
- ❑ Compliant with TUV
- ❑ One LC port blocked



SFP LC 5G SMF DWDM Transmitter

A51LZDxxSDOA0759

Ordering Information

Form Factor	Date Rate	Media	Wavelength (nm)	Frequency (THz)	TX Power (dBm)	Voltage (V)	Coupling	Signal Detect	DDM (Y/N)	Temperature (°C)	Part Number
SFP-LC	5G	SMF	1563.86	191.7	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD17SDOA0759
SFP-LC	5G	SMF	1563.05	191.8	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD18SDOA0759
SFP-LC	5G	SMF	1562.23	191.9	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD19SDOA0759
SFP-LC	5G	SMF	1561.42	192.0	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD20SDOA0759
SFP-LC	5G	SMF	1560.61	192.1	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD21SDOA0759
SFP-LC	5G	SMF	1559.79	192.2	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD22SDOA0759
SFP-LC	5G	SMF	1558.98	192.3	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD23SDOA0759
SFP-LC	5G	SMF	1558.17	192.4	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD24SDOA0759
SFP-LC	5G	SMF	1557.36	192.5	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD25SDOA0759
SFP-LC	5G	SMF	1556.55	192.6	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD26SDOA0759
SFP-LC	5G	SMF	1555.75	192.7	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD27SDOA0759
SFP-LC	5G	SMF	1554.94	192.8	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD28SDOA0759
SFP-LC	5G	SMF	1554.13	192.9	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD29SDOA0759
SFP-LC	5G	SMF	1553.33	193.0	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD30SDOA0759
SFP-LC	5G	SMF	1552.52	193.1	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD31SDOA0759
SFP-LC	5G	SMF	1551.72	193.2	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD32SDOA0759
SFP-LC	5G	SMF	1550.92	193.3	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD33SDOA0759
SFP-LC	5G	SMF	1550.12	193.4	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD34SDOA0759
SFP-LC	5G	SMF	1549.32	193.5	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD35SDOA0759
SFP-LC	5G	SMF	1548.51	193.6	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD36SDOA0759
SFP-LC	5G	SMF	1547.72	193.7	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD37SDOA0759
SFP-LC	5G	SMF	1546.92	193.8	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD38SDOA0759
SFP-LC	5G	SMF	1546.12	193.9	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD39SDOA0759
SFP-LC	5G	SMF	1545.32	194.0	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD40SDOA0759
SFP-LC	5G	SMF	1544.53	194.1	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD41SDOA0759
SFP-LC	5G	SMF	1543.73	194.2	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD42SDOA0759
SFP-LC	5G	SMF	1542.94	194.3	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD43SDOA0759
SFP-LC	5G	SMF	1542.14	194.4	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD44SDOA0759
SFP-LC	5G	SMF	1541.35	194.5	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD45SDOA0759
SFP-LC	5G	SMF	1540.56	194.6	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD46SDOA0759
SFP-LC	5G	SMF	1539.77	194.7	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD47SDOA0759
SFP-LC	5G	SMF	1538.98	194.8	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD48SDOA0759
SFP-LC	5G	SMF	1538.19	194.9	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD49SDOA0759
SFP-LC	5G	SMF	1537.40	195.0	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD50SDOA0759
SFP-LC	5G	SMF	1536.61	195.1	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD51SDOA0759
SFP-LC	5G	SMF	1535.82	195.2	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD52SDOA0759
SFP-LC	5G	SMF	1535.04	195.3	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD53SDOA0759
SFP-LC	5G	SMF	1534.25	195.4	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD54SDOA0759
SFP-LC	5G	SMF	1533.47	195.5	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD55SDOA0759
SFP-LC	5G	SMF	1532.68	195.6	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD56SDOA0759
SFP-LC	5G	SMF	1531.90	195.7	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD57SDOA0759
SFP-LC	5G	SMF	1531.12	195.8	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD58SDOA0759
SFP-LC	5G	SMF	1530.33	195.9	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD59SDOA0759
SFP-LC	5G	SMF	1529.55	196.0	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD60SDOA0759
SFP-LC	5G	SMF	1528.77	196.1	3 -7	3.3	AC/AC	TTL	Y	-20 ~ +93	A51LZD61SDOA0759



SFP LC 5G SMF DWDM Transmitter

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Absolute Maximum Ratings

Parameter	Symbol	Conditions	Min	Max	Unit
Storage Temperature	T _S	--	-40	+95	°C
Storage Relative Humidity	RH	--	5	95	%
Supply Voltage	V _{CC}	--	-0.5	3.8	V

Recommended Operating Conditions

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating Temperature (Case)	T _C	--	-20	--	93	°C
Supply Voltage	V _{CC}	--	3.13	3.3	3.47	V
Supply Current	I _{TX}	--	--	--	450	mA
Inrush Current	I _{CC}	--	--	--	I _{CC} +30	mA
Data Rate	DR	--	--	5	--	Gbps

Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmitter						
Differential Input Impedance	R _{DI}	--	--	100	--	Ohm
Differential Input Voltage	V _{DI}	AC-Coupled, peak to peak	0.10	--	1.20	V
Tx Disable Input-High	V _{DISH}	--	2.0	--	V _{CC}	V
Tx Disable Input-Low	V _{DISL}	--	V _{ee}	--	V _{ee} +0.8	V
Tx Fault Output-High	V _{FOH}	--	2.0	--	V _{CC}	V
Tx Fault Output-Low	V _{FOL}	--	V _{ee}	--	V _{ee} +0.5	V

Optical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmitter						
Optical Center Wavelength @End of Life	λ _C	X = specified ITU center wavelength	X-100	X	X+100	pm
Optical Center Wavelength @BOL Offset	λ _C	Y = specified BOL center wavelength	Y-25	Y	Y+25	pm
Center Wavelength Spacing		Corresponds to approximately 0.8nm	--	100	--	GHz
Spectral Width	Δλ	(-20dB)	--	0.2	0.3	Nm
Transmitter Output Power	P _O	Coupling into a 9/125um SMF	3	--	+7	dBm
Transmitter Extinction Ratio	E _R	Coupling into a 9/125um SMF	4.5	5	--	dB
Side Mode Suppression Ratio	SMSR	--	30	--	--	dB
Transmitter Jitter (Peak to Peak)					125	mUI
Relative Intensity Noise	RIN	--	--	--	-120	dB/Hz
Dispersion Penalty	DP	1700ps/nm SMF-28 (85Km) Notes 1.	--	1	2	dB

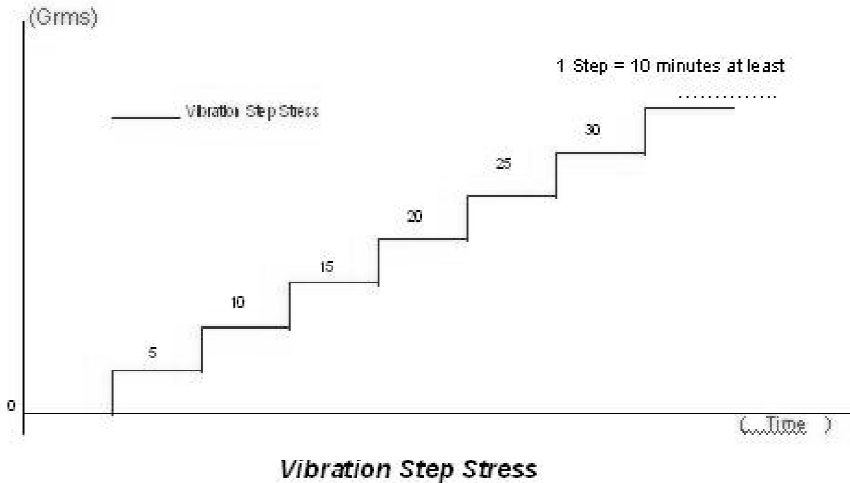
1. Measured with 5G PRBS2²³ -1 NRZ at 10⁻¹² BER

SFP LC 5G SMF DWDM Transmitter

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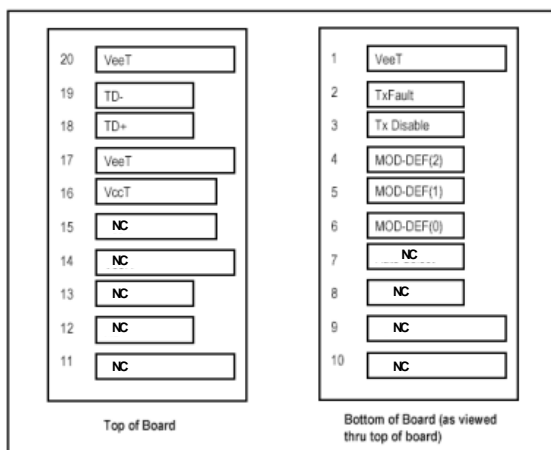
HALT Vibration requirement

25°C



1. Test conducted with samples exercising at maximum data rates.
2. Set start vibration Grms value at 5 G.
3. Each step vibration increased : 5 G.
4. Each step dwell time : 10 minute.
5. Increased Grms value step by step until operation degradation observed to get the operational limit which should be **at least 30G**

Pin Description



SFP Transceiver Electric Pad Layout

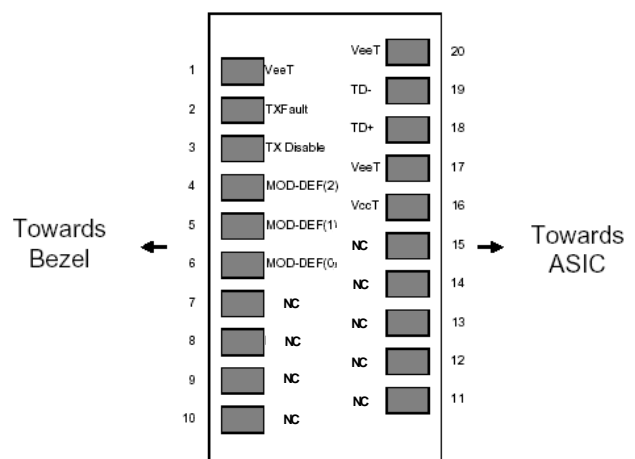


Diagram of Host Board Connector Block Pin Numbers and Names



Pin Function Definitions

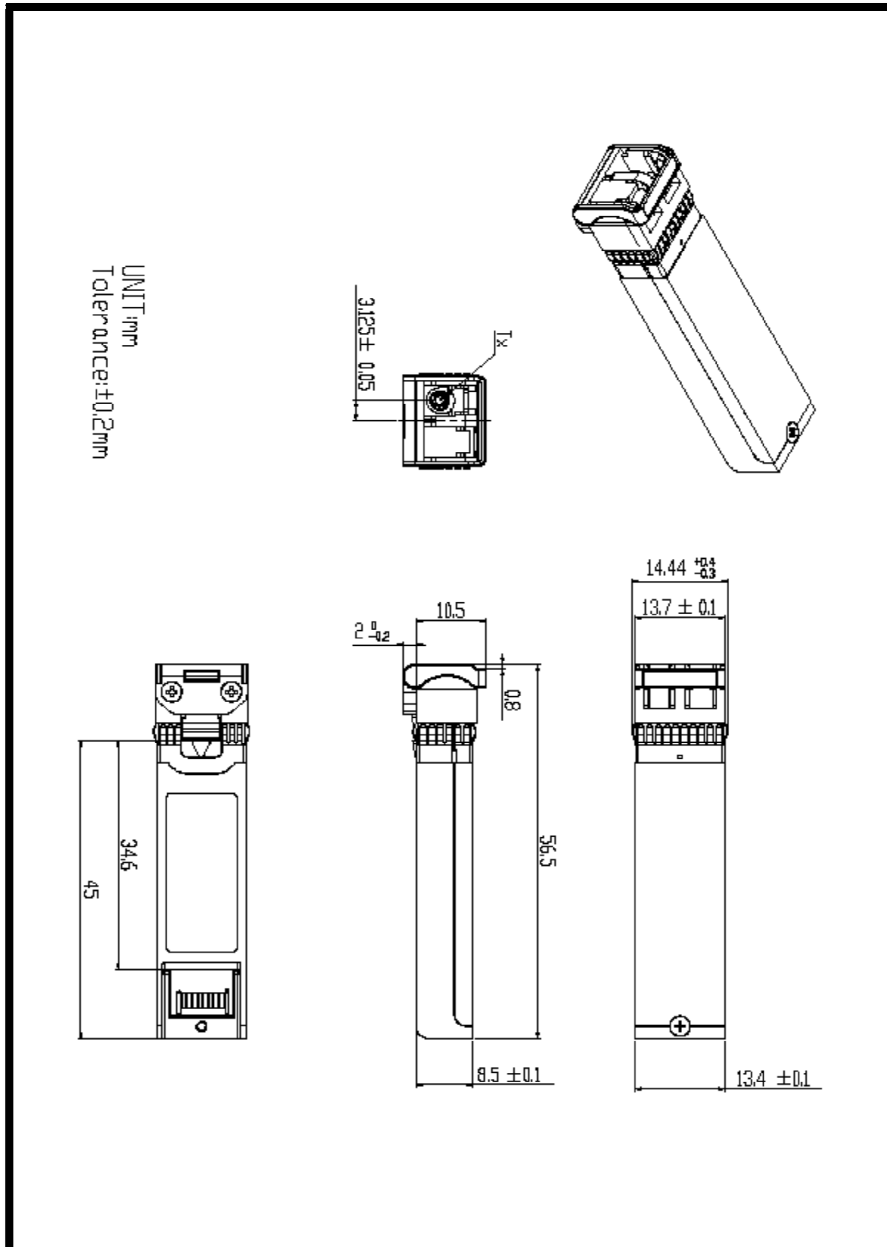
Pin No.	Pin Name	Function	Plug Seq.	Note
1	V _{ee} T	Transmitter Ground	1	4
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2
4	MOD_DEF 2	Module Definition 2	3	3
5	MOD_DEF 1	Module Definition 1	3	3
6	MOD_DEF 0	Module Definition 0	3	3
7	NC	NC		
8	LOS	Loss of Signal	3	7
9	NC	NC		
10	NC	NC		
11	NC	NC		
12	NC	NC		
13	NC	NC		
14	NC	NC		
15	NC	NC		
16	V _{cc} T	Transmitter Power	2	5
17	V _{ee} T	Transmitter Ground	1	4
18	TD +	Transmitter Data In	3	6
19	TD -	Inv. Transmitter Data In	3	6
20	V _{ee} T	Transmitter Ground	1	5

**SFP LC 5G SMF DWDM Transmitter****A5ILZDxxSDOA0759****Notes:**

Plug Seq.: Pin engagement sequence during hot plugging.

1. TX Fault is an open collector/drain output, which should be pulled up with a 4.7K – 10K Ω resistor on the host board. Pull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
2. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7 – 10 K Ω resistor. Its states are:
 - Low (0 – 0.8V): Transmitter on
 - (>0.8, < 2.0V): Undefined
 - High (2.0 – 3.465V): Transmitter Disabled
 - Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K - 10K Ω resistor on the host board. The pull-up voltage shall be VccT
 - Mod-Def 0 is grounded by the module to indicate that the module is present
 - Mod-Def 1 is the clock line of two wire serial interface for serial ID
 - Mod-Def 2 is the data line of two wire serial interface for serial ID
4. VeeT may be internally connected within the SFP module.
5. VccT are the Analog and transmitter power supplies. They are defined as 3.3V \pm 5% at the SFP connector pin. Maximum supply current is 450 mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value. VccT may be internally connected within the SFP transceiver module.
6. TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs will accept differential swings of 500 mV - 2400 mV (250 mV - 1200 mV single-ended), though it is recommended that values between 500 and 1200 mV differential (250 mV- 600 mV single-ended) be used for best EMI performance.
7. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K -10K Ω resistor on the host board. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V. LOS will remain high for the SFP TX without receiver.

Mechanical Design Diagram (mm)





Regulatory Compliance

Item	Standard
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B
Electrostatic Discharge to the Electrical Pins (ESD)	MIL-STD-883E Method 3015.7
Electrostatic Discharge to the Receptacle (ESD)	IEC 61000-4-2
RoHS	2011/65/EU
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11
Component Recognition	UL and TUV

Laser Safety Information

All versions of this laser are Class 1 laser products per IEC¹/EN² 60825-1. Users should observe safety precautions such as those recommended by ANSI³ Z136.1, ANSI Z36.2 and IEC 60825-1.

This product conforms to FDA (CDRH) 21 CFR 1040.10 and 1040.11 except for deviations of laser safety class designation pursuant to [Laser Notice No.50'](#) .

Product labeling:

Class 1 Laser Product
Compliance with 21 CFR
1040.10 and 1040.11

If labeling is not affixed to the module due to size constraints; then rather, labeling is placed on the outside of the shipping box.

This product is not shipped with a power supply.

Caution: use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Certifications

UL	60950-1 (E243407)
TUV	EN60950-1, EN 60825-1, EN 60825-2

Documentation is available upon request.

(1) IEC is a registered trademark of the International Electrotechnical Commission

(2) Within Europe the IEC standard has been adopted as a European Normative standard known as EN 60825, and each European country will have its own version of this standard, for example, the British Standards version known as BS EN 60825. There can be small differences between the different countries versions of EN 60825, and these are in part caused by the process of translating the standard into the native language of that country.

(3) ANSI is a registered trademark of the American National Standards Institute

Note : All information contained in this document is subject to change without notice.