SFP LC 5G SMF CWDM Transmitter

A5ILZCxxSDOA0756

Features

- Hot Pluggable SFP Digital Transmitter
- CWDM DFB Cooled Laser
- Link budgets 28dB
- Compliant with SFP MSA
- 3.3V single power supply
- Compliant with FC-PI-2
- Serial ID information support
- Digital diagnostic SFF-8472 compliant
- Compliant with RoHS
- Compliant with TUV

Applications

- 5G Applications
- Fiber Channel 4xFC
- Fiber Channel 2xFC (2.125Gbps)
- Fiber Channel 1xFC (1.0625Gbps)
- Gigabit Ethernet (1.25Gbps)

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Ordering Information

Form Factor	Media	Date Rate	Wavelength (nm)	TX Power (dBm)	Voltage (V)	Coupling	Signal Detect	DDM (Y/N)	Temperature(℃)	AOI Part Number
SFP	SMF	5G	1270	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC27SDOA0756
SFP	SMF	5G	1290	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC29SDOA0756
SFP	SMF	5G	1310	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC31SDOA0756
SFP	SMF	5G	1330	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC33SDOA0756
SFP	SMF	5G	1350	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC35SDOA0756
SFP	SMF	5G	1370	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC37SDOA0756
SFP	SMF	5G	1390	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC39SDOA0756
SFP	SMF	5G	1410	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC41SDOA0756
SFP	SMF	5G	1430	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC43SDOA0756
SFP	SMF	5G	1450	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC45SDOA0756
SFP	SMF	5G	1470	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC47SDOA0756
SFP	SMF	5G	1490	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC49SDOA0756
SFP	SMF	5G	1510	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC51SDOA0756
SFP	SMF	5G	1530	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC53SDOA0756
SFP	SMF	5G	1550	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC55SDOA0756
SFP	SMF	5G	1570	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC57SDOA0756
SFP	SMF	5G	1590	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC59SDOA0756
SFP	SMF	5G	1610	3 ~ 7	3.3	AC/AC	TTL	Y	-20 ~ 93	A5ILZC61SDOA0756

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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	4.0	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
Data Rate	DR	--	--	5.0	--	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	--	1.2	V
Tx Disable Input-High	V_{DISH}		2.0	--	V_{CC}+0.3	V
Tx Disable Input-Low	V_{DISL}		0	--	0.8	V
Tx Fault Output-High	V_{FOH}		2.0	--	V_{CC}+0.3	V
Tx Fault Output-Low	V_{FOL}		0	--	0.8	V

Optical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmitter						
Optical Center Wavelength	λc	--	λc -5.5	λc	λc +7.5	nm
Spectral Width	Δλ	(-20dB)	--	--	1	nm
Optical Output Power	P_o	Note 1	3	--	7	dBm
Side Mode Suppression Ratio	SMSR	--	30	--	--	dB
Optical Extinction Ratio	ER	--	4.5	5	--	dB
Dispersion Penalty	DP	1600ps/nm (80Km) Note 2	--	1	2	dB
Eye Mask	--	Compliant with FC-PI-2				

Coupling into a 9/125um single-mode fiber.

1. Measured with 5G TX PRBS 2^{23} –1 NRZ at 10^{-12} BER

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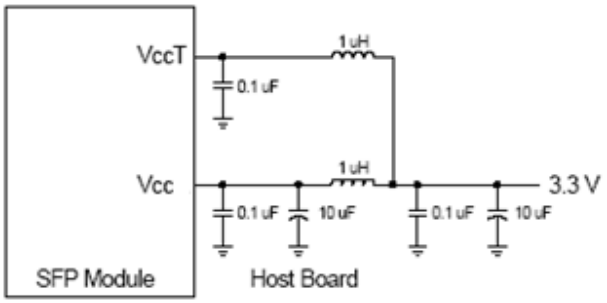
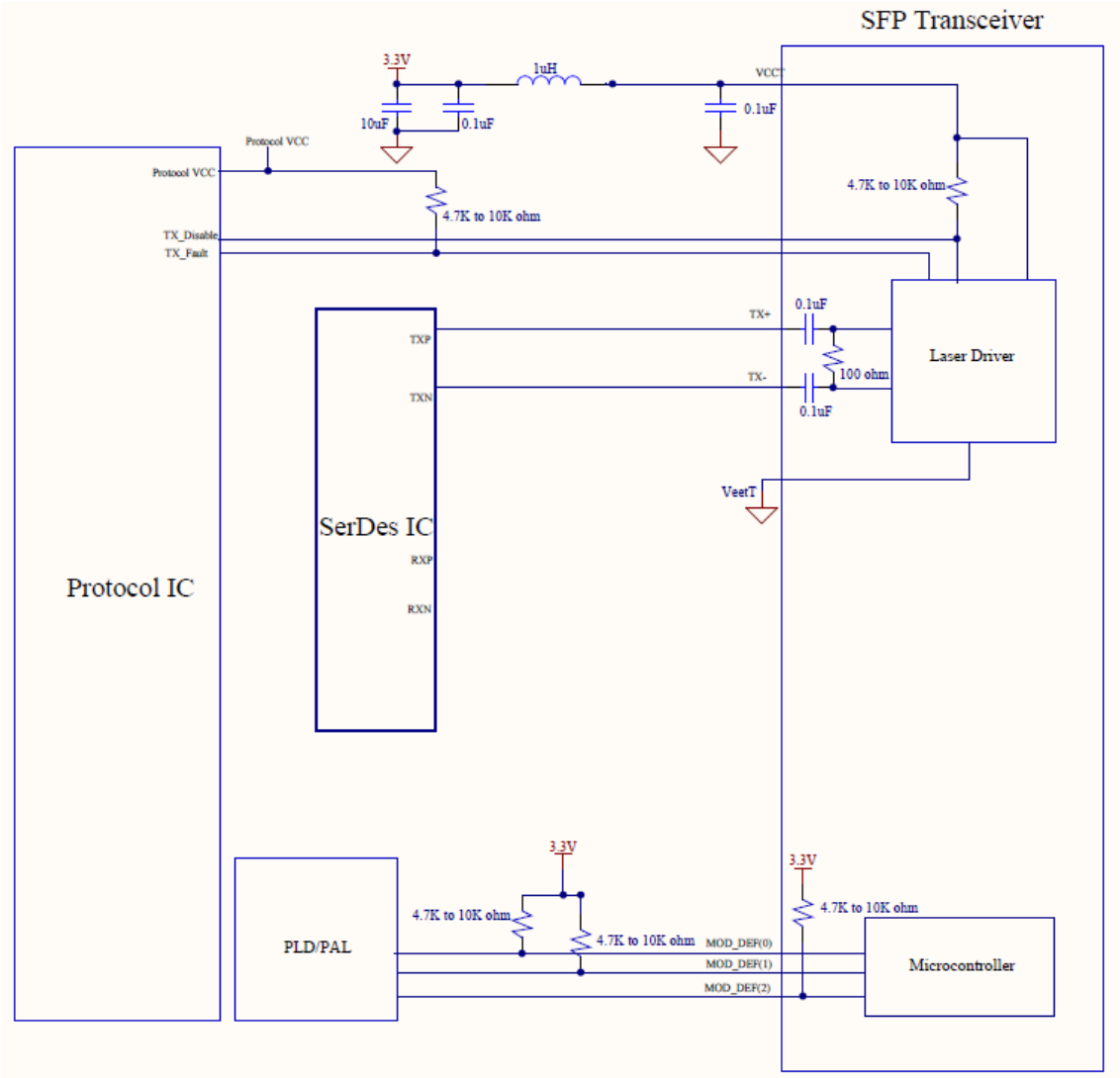
Recommended Host Board Power Supply Circuit



Recommended Interface Circuit



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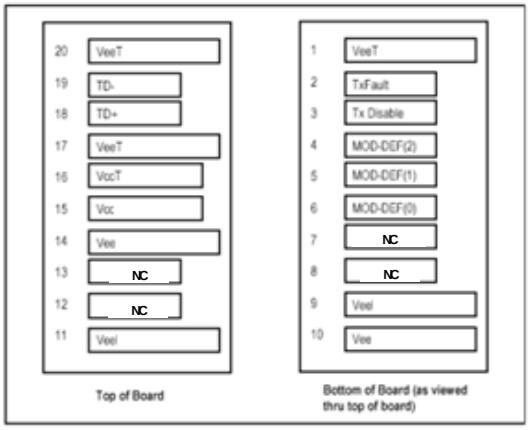
Pin Description



SFP Transmitter Electric Pad Layout

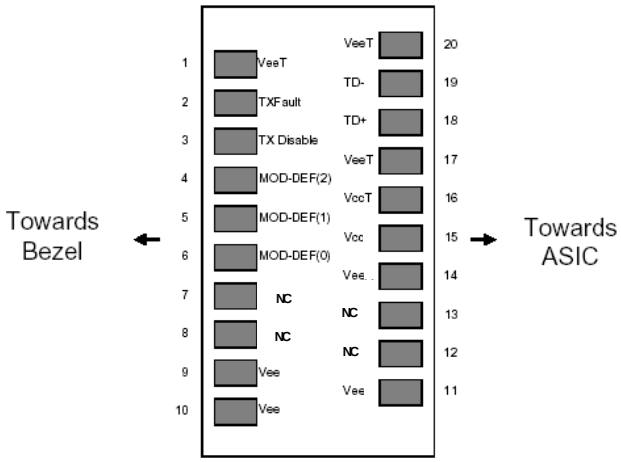


Diagram of Host Board Connector Block Pin Numbers and Names

Pin Function Definitions

Pin No.	Pin Name	Function	Plug Seq.	Note
1	VeeT	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	N/A	No connection		
8	N/A	No connection		
9	Vee	Ground	1	4
10	Vee	Ground	1	4
11	Vee	Ground	1	4
12	N/A	No connection		
13	N/A	No connection		
14	Vee	Ground	1	4
15	Vcc	MCU Power	2	5
16	VccT	Transmitter Power	2	5
17	VeeT	Transmitter Ground	1	4
18	TD +	Transmitter Data In	3	6
19	TD -	Inv. Transmitter Data In	3	6
20	VeeT	Transmitter Ground	1	4

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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 – 10KΩ 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 KΩ resistor. Its states are:
   Low (below 0.8V): Transmitter on
   (>0.8, < 2.0V): Undefined
   High (above 2.0v): 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 - 10KΩ resistor on the host board. The pull-up voltage shall be VccT or Vcc
   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 and Vee may be internally connected within the SFP module.

5. VccT and Vcc are the transmitter and MCU power supplies. They are defined as 3.3V ±5% at the SFP connector pin. Maximum supply current is 350 mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1Ω 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 and Vcc may be internally connected within the SFP transceiver module.

6. TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω 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.

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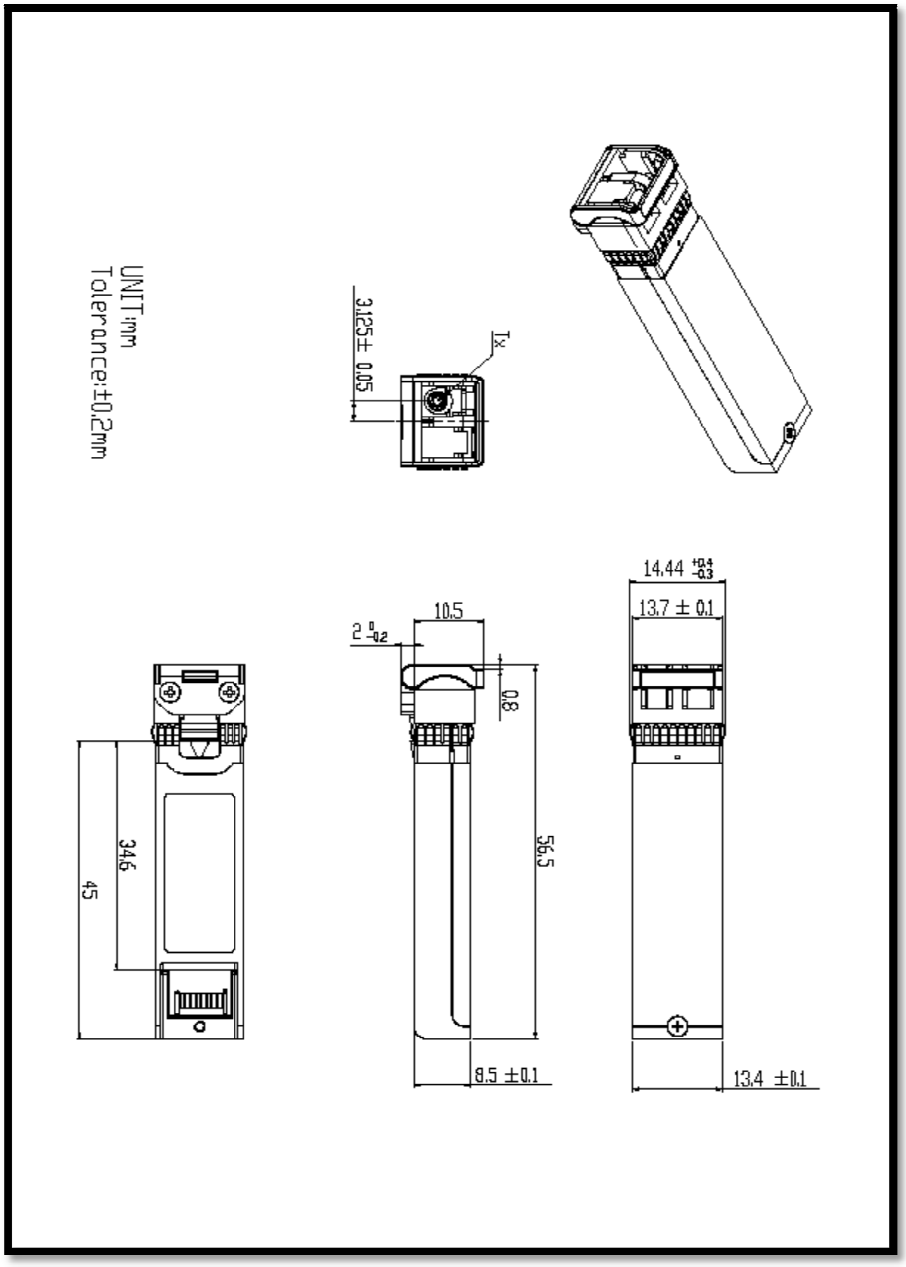
Mechanical Design Diagram



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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 IEC[1]/EN[2] 60825-1. Users should observe safety precautions such as those recommended by ANSI[3] 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

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