

PRODUCT SPECIFICATION

Part No.:	AC-SFBL-45G1-120/AC-SFBL-54G1-120	
Description:	1.25G SFP Transceiver,BIDI TX1490nm/RX1550nm 120km 1.25G SFP Transceiver,BIDI TX1550nm/RX1490nm 120km	
Release Date	Rev.	Revision Change Description
2015/06/07	A0	New Release
2020/12/28	A1	Template Update

Features

- ✧ Up to 1.25Gbps bi-directional data links
- ✧ 1490nm DFB laser and APD photo detector for AC-SFBL-45G1-120
- ✧ 1550nm DFB laser and APD photo detector for AC-SFBL-54G1-120
- ✧ Up to 120km for SMF transmission
- ✧ Compliant with SFP MSA and SFF-8472 with single LC receptacle
- ✧ Digital Diagnostic Monitoring: Internal Calibration or External Calibration
- ✧ Hot-pluggable SFP footprint
- ✧ Metal enclosure, for lower EMI
- ✧ Compatible with RoHS
- ✧ +3.3V single power supply
- ✧ Operating case temperature:
 - ✧ Standard : 0 to +70°C
 - ✧ Industrial : -40 to +85°C

Application

- ✧ Gigabit Ethernet
- ✧ Switched Backplane Applications
- ✧ Switch to Switch interface
- ✧ Switched backplane applications
- ✧ Router/Server interface
- ✧ Other optical transmission systems

Standard

- ✧ Gigabit Ethernet
- ✧ Compliant with SFF-8472
- ✧ Switched Backplane Applications
- ✧ Router/Server Interface

Specification

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	4	V
Storage Temperature	Ts	-40	+85	°C
Signal Input Voltage		-0.3	Vcc+0.3	
Operating Humidity	-	5	95	%
Receiver Damage Threshold		7		dBm

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Tc	0	+70	°C
	Industrial		-40	+85	°C
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	Icc			300	mA
Power Supply Noise Rejection				100	mVp-p
Transmission Distance				120	KM
Data Rate			1.25		Gbps
Coupled Fiber	Single mode fiber				9/125um SMF

Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Total Supply Current	Icc			A	mA	1
TX Disable	Disable	2.0		Vcc+0.3	V	
	Enable	0		0.8	V	
TX Fault	Fault	2.0		Vcc+0.3	V	
	Normal	0		0.8	V	
Receiver						
LOS Output Voltage-	High	2.0		Vcc+0.3	V	
	Low	0		0.8	V	
Total Supply Current	Icc			B	mA	1

Note:

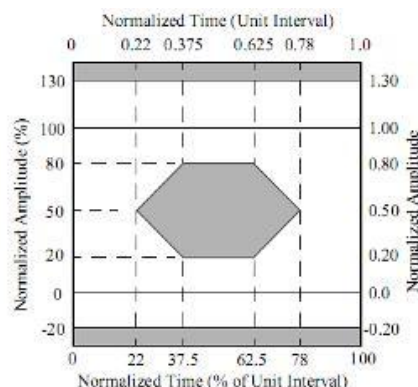
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1. A (TX) + B (RX) = 300mA (Not include termination circuit) .

Optical transmitter Characteristics							
Parameter		Symbol	Min	Typical	Max	Unit	Notes
Launched Power (avg.)		P _{out}	0		5	dBm	
Center Wavelength		λ _c	1470	1490	1510	nm	AC-SFBL-45G1-120
			1530	1550	1570	nm	AC-SFBL-54G1-120
Side Mode Suppression Ratio		SMSR	30			dB	
Extinction Ratio		ER	9			dB	
Spectrum Bandwidth(-20dB)		σ			1	nm	
Jitter P-P		t _J			0.1	UI	1
Relative Intensity Noise		RIN	90	100	110	ohm	
Optical Tx Output disable		P _{dis}			-45	dBm	
Output Eye Diagram		Complies with IEEE802.3z eye masks when filtered					
Optical receiver Characteristics							
Parameter		Symbol	Min	Typical	Max	Unit	Notes
Receiver Sensitivity		S			-31	dBm	2
Wavelength Range		λ _c	1530	1550	1570	nm	AC-SFBL-45G1-120
			1470	1490	1510	nm	AC-SFBL-54G1-120
Optical Power Input Overload		P _{in-max}	-10			dBm	
LOS	Optical De-assert	P _d			-32	dBm	3
	Optical Assert	P _a	-40				
LOS hysteresis			0.5	2	6	dB	

Notes:

1. Measure at 2⁷-1 NRZ PRBS pattern.
2. Measured with Light source 1550nm(1490nm), ER=9dB; BER =<10⁻¹² @PRBS=2⁷-1 NRZ.
3. When LOS de-asserted, the RX data+/- output is signal output.

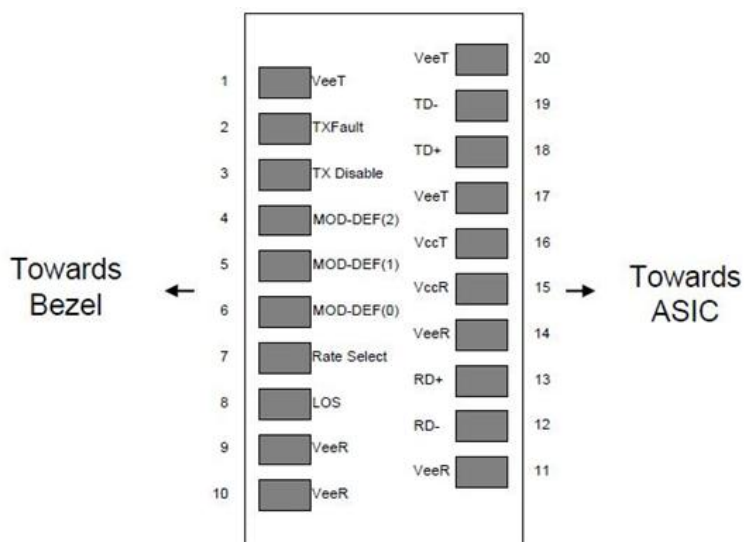


Pin Descriptions

Pin	Signal Name	Description	Notes
1	V _{EET}	Transmitter Ground	Note 1
2	TX FAULT	Transmitter Fault Indication	
3	TX DISABLE	Transmitter Disable	Note 2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID	Note 3
5	MOD_DEF(1)	Module Definition 1. Data line for Serial ID	Note 3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module	Note 3
7	Rate Select	Not Connected	Note 4
8	LOS	Loss of Signal	Note 5
9	V _{EER}	Receiver ground	Note 1
10	V _{EER}	Receiver ground	Note 1
11	V _{EER}	Receiver ground	Note 1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V _{EER}	Receiver ground	Note 1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	Transmitter Ground	Note 1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V _{EET}	Transmitter Ground	Note 1

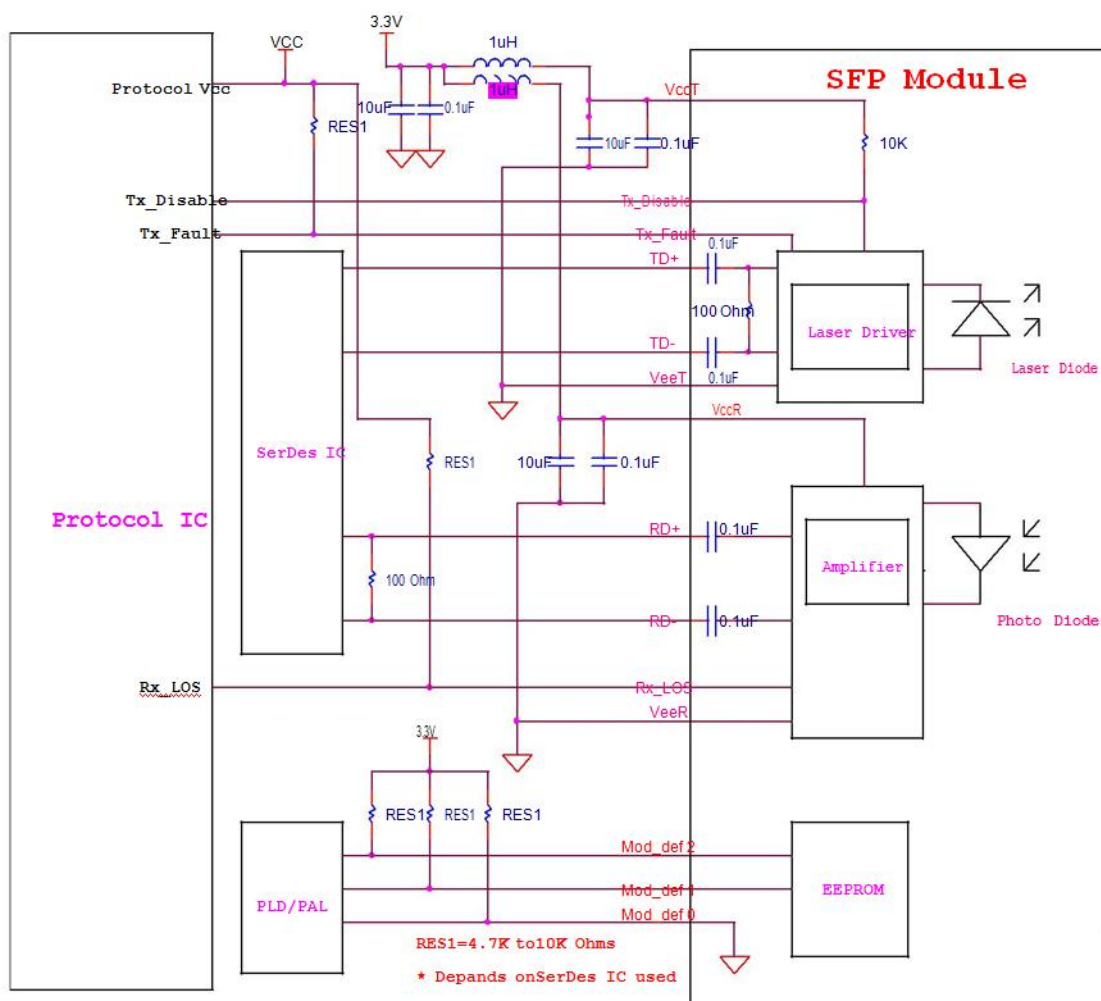
Notes:

- 1) Circuit ground is internally isolated from chassis ground.
- 2) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <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) This is an optional input used to control the receiver bandwidth for compatibility with multiple data rates (most likely Fiber Channel 1x and 2x Rates). If implemented, the input will be internally pulled down with > 30kΩ resistor. The input states are:
 - Low (0 – 0.8V): Reduced Bandwidth
 - (>0.8V, < 2.0V): Undefined
 - High (2.0 – 3.465V): Full Bandwidth
- 5) LOS is open collector output. Should be pulled up with 4.7k - 10kohms on host board to a voltage
 - a) between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.



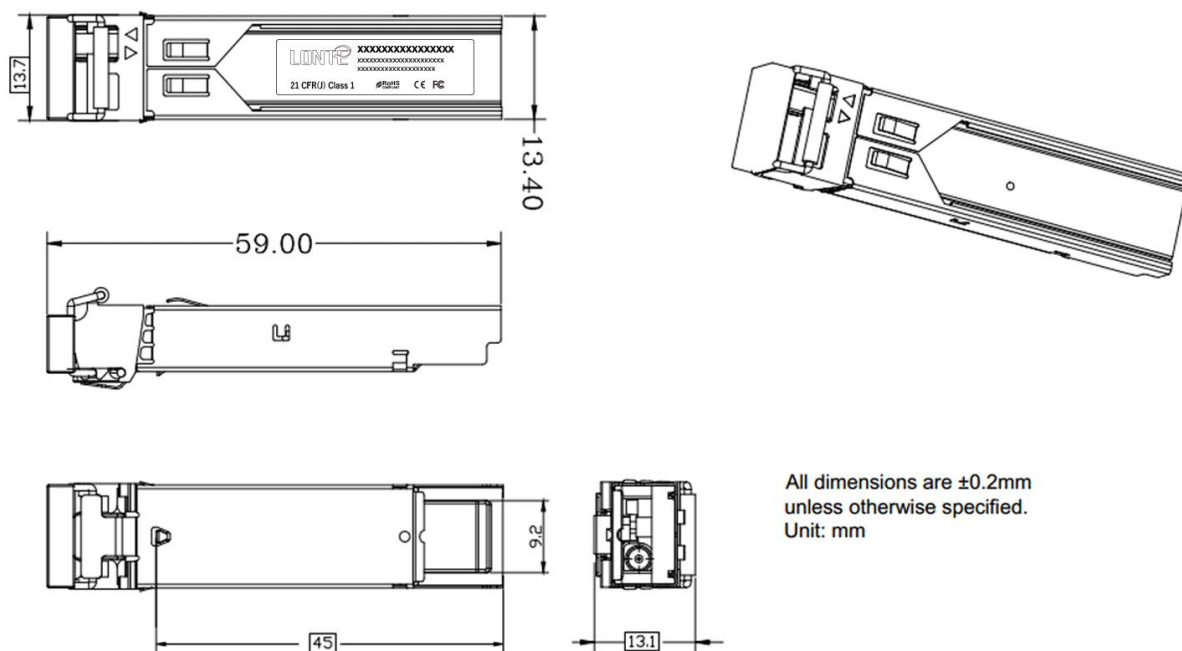
Pin-out of Connector Block on Host Board

Recommend Circuit Schematic



Package Outline

Dimensions are in millimeters. All dimensions are $\pm 0.2\text{mm}$ unless otherwise specified. (Unit: mm)



Regulatory Compliance

Feature	Test	Method
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>1000V for SFI pins, >2000V for other pins.)
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	Class 2(>4.0kV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B FCC Class B CENELEC EN55022 VCCI Class 1	Comply with standard
Immunity	IEC61000-4-3	Comply with standard
Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1,2	Compatible with Class I laser Product
EMC	EN61000-3	Comply with standard

Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX	Sen (dBm)	Temp (℃)	Reach (km)	DDM
AC-SFBL-45G1-120	SFP	1.25	1490	0~5	PIN	<-31	0~70	120	Y
AC-SFBL-54G1-120	SFP	1.25	1550	0~5	PIN	<-31	0~70	120	Y
AC-SFBL-45G1-120F	SFP	1.25	1490	0~5	PIN	<-31	-40~85	120	Y
AC-SFBL-54G1-120F	SFP	1.25	1550	0~5	PIN	<-31	-40~85	120	Y