

PRODUCT SPECIFICATION

Part No.:	AC-SFBS-35G1-03/AC-SFBS-53G1-03	
Description:	1.25G SFP Transceiver, BIDI TX1310nm/RX1550nm 3km 1.25G SFP Transceiver, BIDI TX1550nm/RX1310nm 3km	
Release Date	Rev.	Revision Change Description
2015/06/07	A0	New Release
2020/12/28	A1	Template Update
2023/08/15	A2	1310nm Tx/Rx update from 1290-1310-1330 to 1260-1310-1360 1550nm Tx/Rx update from 1510-1550-1590 to 1530-1550-1570

Features

- ✧ Up to 1.25Gbps bi-directional data links
- ✧ 1310nm & 1550nm FP laser and PIN photo detector for 3km transmission
- ✧ Compliant with SFP MSA and SFF-8472 with single SC receptacle
- ✧ Digital Diagnostic Monitoring: Internal Calibration or External Calibration
- ✧ 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

- ✧ Fiber Channel
- ✧ 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	4	V
Damage Threshold	THd		5	dBm
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	95	%

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			280	mA	
Control Input Voltage High		2		Vcc	V	
Control Input Voltage Low		0		0.8	V	
Data Rate			1.25		Gbps	
Fiber Length 9/125µm core SMF		-	3	-	km	

Optical and Electrical Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λ_c	1260	1310	1360	nm	AC-SFBS-35G1-03
		1530	1550	1570	nm	AC-SFBS-53G1-03
Spectral Width (RMS)	$\Delta\lambda$			3.5	nm	
Average Output Power	Pout	-11		-3	dBm	1
Extinction Ratio	ER	9			dB	
Optical Rise/Fall Time (20%~80%)	tr/tf			100	ps	
Transmit Disable Assert Time			5		us	
Data Input Swing Differential	V _{IN}	200		2400	mV	2
Input Differential Impedance	Z _{IN}	90	100	110	Ω	
TX Disable	Disable	Vdis	Vcc-1.3	Vcc	V	
	Enable	Ven	Vee-0.3	0.8	V	

TX Fault	Fault		2.0		Vcc	V	
	Normal		0		0.8	V	
Receiver							
Centre Wavelength	λ_c		1530	1550	1570	nm	AC- SFBS-35G1-03
			1260	1310	1360	nm	AC-SFBS-53G1-03
Receiver Sensitivity					-20	dBm	3
Receiver Overload			-3			dBm	3
LOS De-Assert	LOS _D				-21	dBm	
LOS Assert	LOS _A		-36			dBm	
LOS Hysteresis			1		4	dB	
Data Output Swing Differential	V _{out}		500		900	mV	4
LOS	High		Vcc-1.3		Vcc	V	
	Low		Vee-0.3		0.8	V	

Notes:

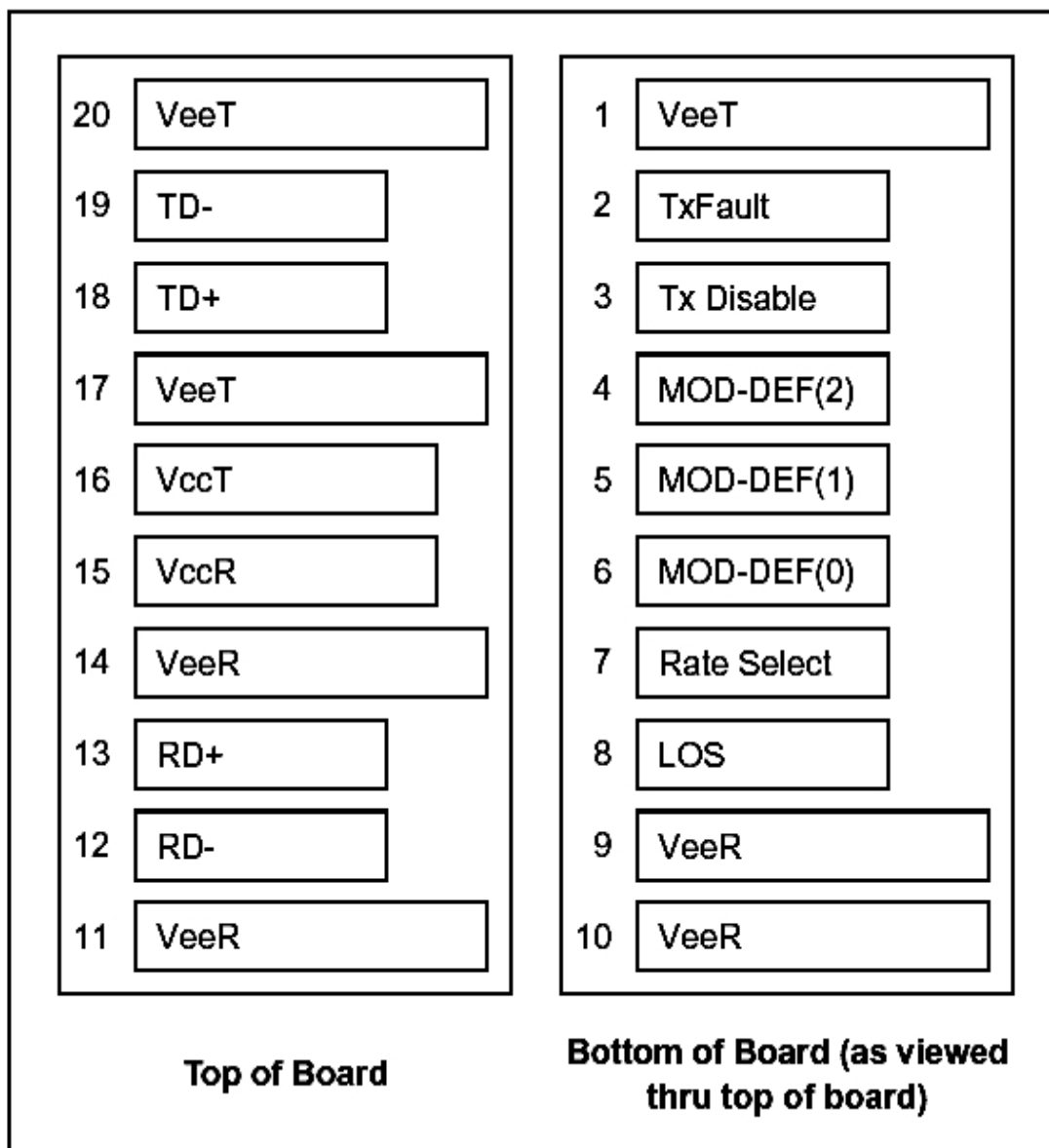
1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2⁷-1 test pattern @1250Mbps, BER $\leq 1 \times 10^{-12}$.
4. Internally AC-coupled.

Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal / External
	-40 to +85			
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	0 to 100	mA	±10%	Internal / External
TX Power	-11 to -3	dBm	±3dB	Internal / External
RX Power	-4 to -20	dBm	±3dB	Internal / External

Pin Definitions

Pin Diagram



Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	V _{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note 3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note 3

6	MOD_DEF(0)	TTL Low	3	Note 3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note 4
9	V _{EER}	Receiver ground	1	
10	V _{EER}	Receiver ground	1	
11	V _{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 5
13	RD+	Received Data Out	3	Note 5
14	V _{EER}	Receiver ground	1	
15	V _{CCR}	Receiver Power Supply	2	
16	V _{CCT}	Transmitter Power Supply	2	
17	V _{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 6
19	TD-	Inv. Transmit Data In	3	Note 6
20	V _{EET}	Transmitter Ground	1	

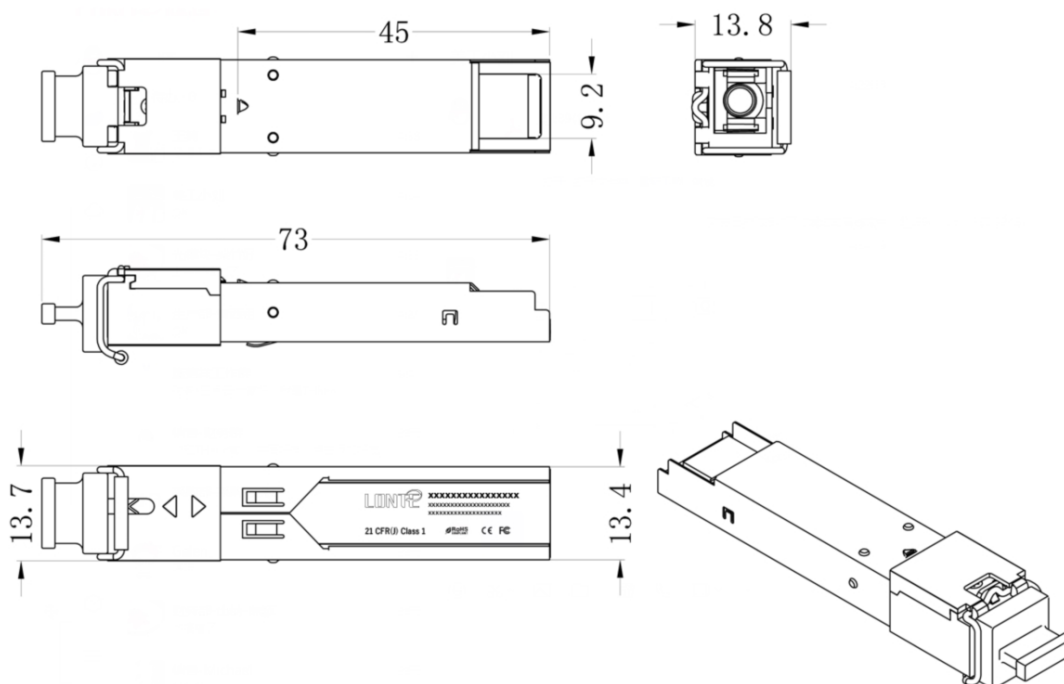
Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

- 1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and V_{cc}+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 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 4.7k~10kΩ resistor. Its states are:
 - Low (0 to 0.8V): Transmitter on
 - (>0.8V, < 2.0V): Undefined
 - High (2.0 to 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~10kΩ resistor on the host board. The pull-up voltage shall be V_{ccT} or V_{ccR}.
 - 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) LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and V_{cc}+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.
- 5) RD-/+ : These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
- 6) TD-/+ : These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

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

Ordering information

Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX	Sen (dBm)	Temp (°C)	Reach (km)	DDM
AC-SFBS-35G1-03	SFP	1.25	1310	-11~-3	PIN	<-20	0~70	3	Y
AC-SFBS-53G1-03	SFP	1.25	1550	-11~-3	PIN	<-20	0~70	3	Y
AC-SFBS-35G1-03F	SFP	1.25	1310	-11~-3	PIN	<-20	-40~85	3	Y
AC-SFBS-53G1-03F	SFP	1.25	1550	-11~-3	PIN	<-20	-40~85	3	Y