LP-OSFP2G01XX SFP Optical Transceiver module, 2.67Gbps Optical Transmitter 850 nm, Dual Rate, 300 m.

LPOSFP2G01XX _PFD_ENB01W

Features

- Up to 2.67Gb/s bi-directional data links.
- 850nm VCSEL laser.
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle.
- Digital Diagnostic Monitoring: Internal Calibration or External Calibration.
- 300m transmission with 50/125μm MMF.
- Compatible with RoHS.
- +3.3V single power supply.
- Operating case temperature:
  Standard: 0 to +70°C
  Extended: -25 to +85°C

Applications

- SDH STM-16 and SONET OC-48 system.
- 2X Fiber Channel.
- Switch to Switch interface.
- Switched backplane applications.
- Router/Server interface.
- Other optical transmission systems.

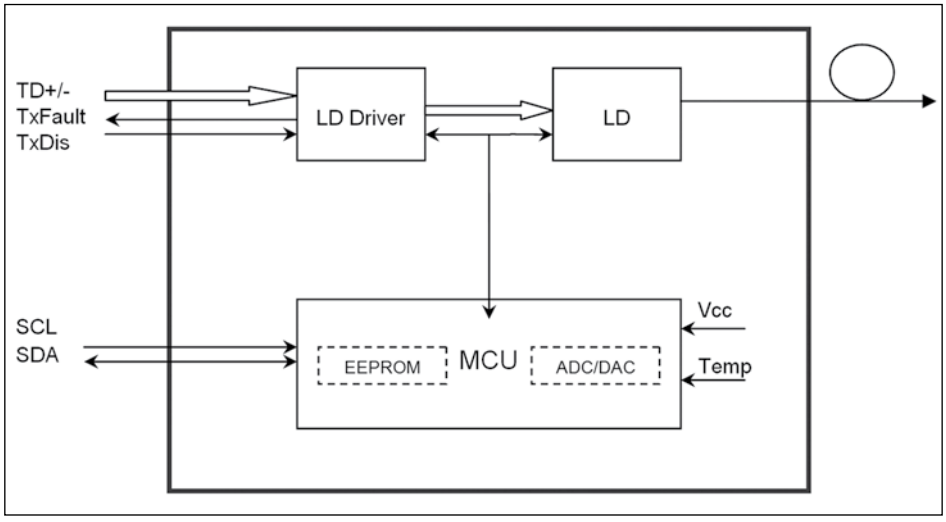
LP-OSFP2G01XX
SFP Optical Transceiver module, 2.67Gbps Optical Transmitter 850 nm, Dual Rate, 300 m.

The SFP transmitter is a high performance, cost effective module supporting dual data-rate of 2.67Gbps and 300 m transmission distance with MMF.

The transmitter consists of two sections: a VCSEL laser transmitter and MCU control unit. All modules satisfy class I laser safety requirements.

The transmitter is compatible with the SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

A Module Block Diagram



B Specifications

Absolute Maximum Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	4.5	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Table 2 - Recommended Operating Conditions

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Tc	0		+70	°C
	Extended		-20		+85	°C
Power Supply Voltage		Vcc	3.13	3.3	3.47	V
Power Supply Current		Icc			300	mA
Data Rate				2.67		Gbps

Optical and Electrical Characteristics

Table 3 - Optical and Electrical Characteristics

Parameter		Symbol	Min	Typical	Max	Unit	Notes
Transmitter							
Centre Wavelength		λc	830	850	860	nm	
Spectral Width (RMS)		σ			0.85	nm	
Average Output Power		Pout	-10		-3	dBm	1
Extinction Ratio		ER	9			dB	
Optical Rise/Fall Time (20%~80%)		tr/tf			0.16	ns	
Data Input Swing Differential		V_{IN}	400		1800	mV	2
Impedancia de entrada diferencial		Z_{IN}	90	100	110	Ω	
TX Disable	Disable		2.0		Vcc	V	
	Enable		0		0.8	V	
TX Fault	Fault		2.0		Vcc	V	
	Normal		0		0.8	V	

Notes:
1. The optical power is launched into MMF.
2. PECL input, internally AC-coupled and terminated.

Timing and Electrical

Table 4 - Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate Time	t_on			1	ms
Tx Disable Assert Time	t_off			10	µs
Time To Initialize, including Reset of Tx Fault	t_init			300	ms
Tx Fault Assert Time	t_fault			100	µs
Tx Disable To Reset	t_reset	10			µs
LOS Assert Time	t_loss_on			100	µs
LOS De-assert Time	t_loss_off			100	µs
Serial ID Clock Rate	f_serial_clock			400	KHz
MOD_DEF (0:2)-High	V_H	2		Vcc	V
MOD_DEF (0:2)-Low	V_L			0.8	V

Diagnostics

Table 5 – Diagnostics Specification

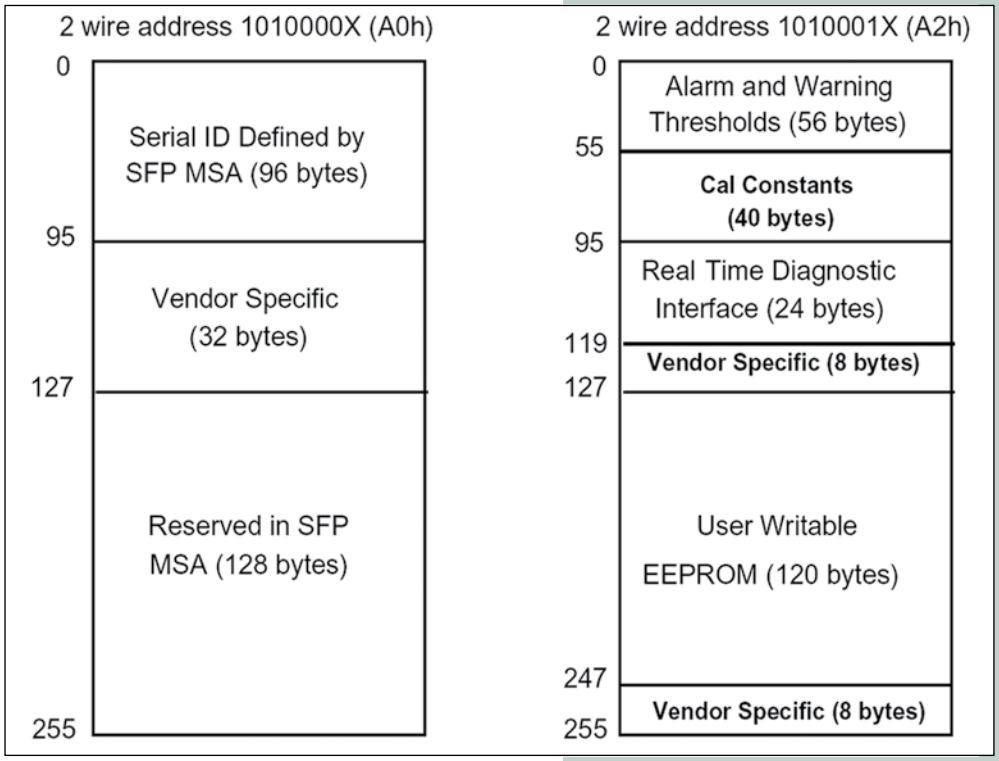
Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70 -20 to +85	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	0 to 100	mA	±10%	Internal / External
TX Power	-10 to -3	dBm	±3dB	Internal / External

C Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

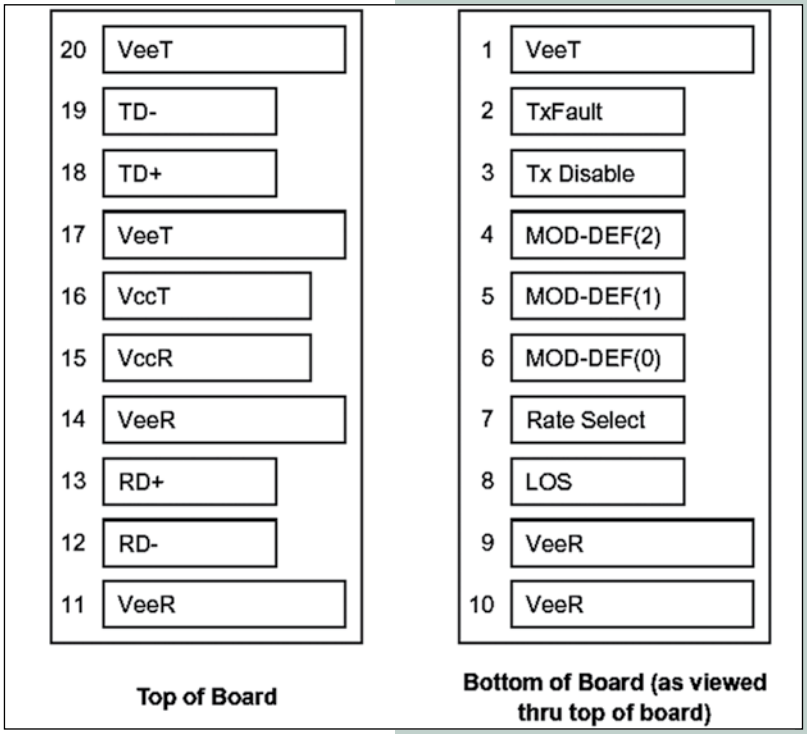
The diagnostic information with internal calibration or external calibration are all implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following.



D Pin Definitions

Pin Diagram.

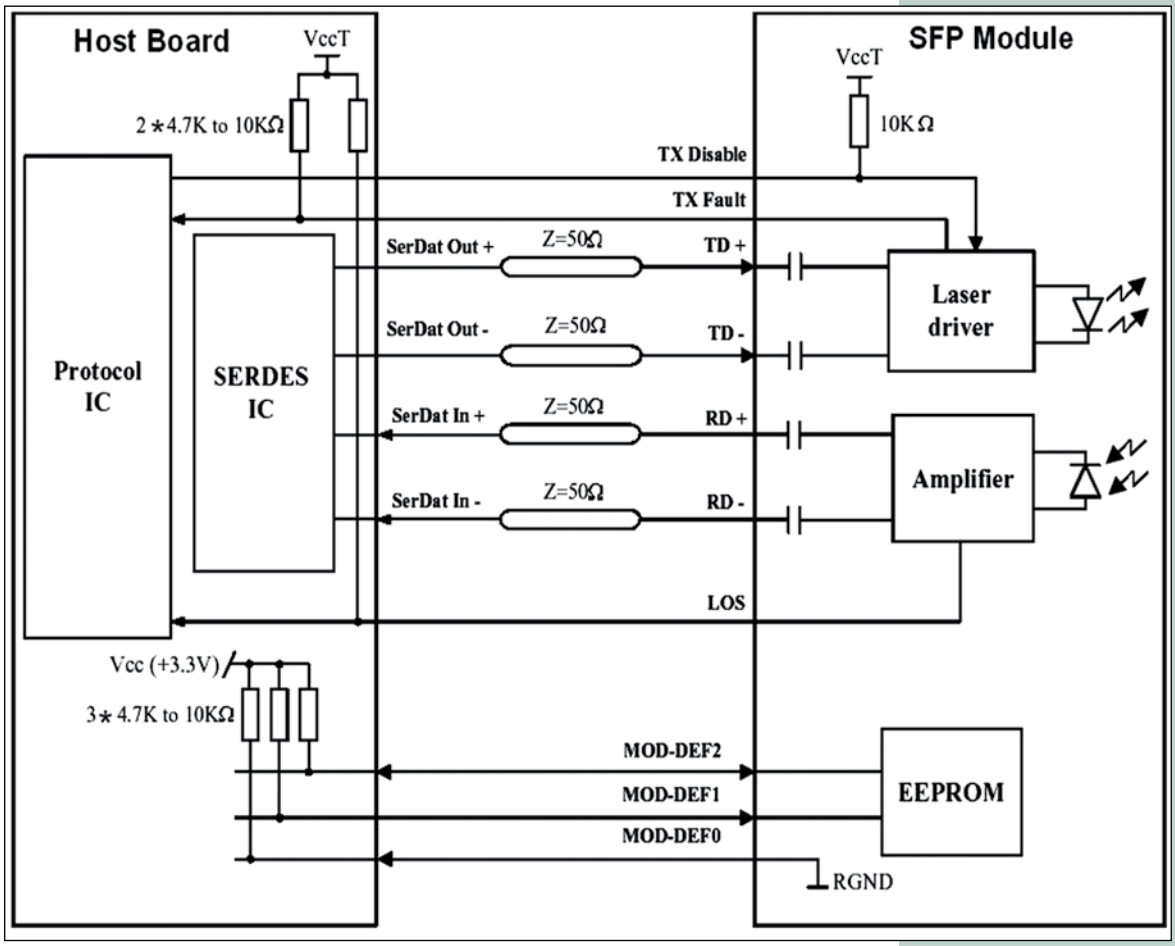


E Pin Descriptions

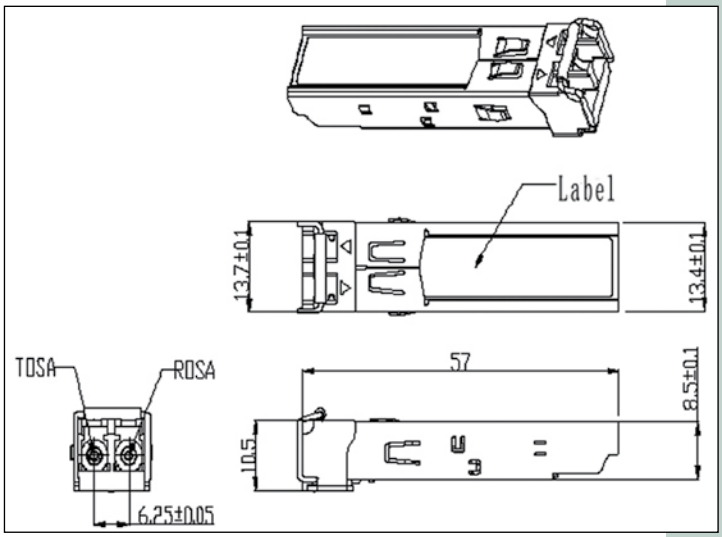
Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note 3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note 3
6	MOD_DEF(0)	TTL Low	3	Note 3
7	Rate Select	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 Vcc+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 VccT or VccR. **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 Vcc+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.

F Recommended Interface Circuit



G Mechanical Dimensions



H Regulatory Compliance

The SFP transceiver is designed to be Class I Laser safety compliant and is certified per the following standards.

Feature	Agency	Standard	Certificate / Comments
Laser Safety	FDA	CDRH 21 CFR 1040 and Laser Notice No. 50	1120295-000
Product Safety	BST	EN 60825-1 : 2007 EN 60825-2 : 2004 EN 60950-1 : 2006	BT0905142001
Environmental protection	SGS	RoHS Directive 2002/95/EC	GZ0902007478/CHEM
EMC	CCIC	EN 55022 : 2006+A1 : 2007 EN 55024 : 1998+A1 : 2001+A2 : 2003	CTE09020023

I Options

Part Number	Options
LP-OSFP2G01	850nm, 2.67Gbps, 300m, 0ºC ~ +70ºC
LP-OSFP2G01D	850nm, 2.67Gbps, 300m, 0ºC ~ +70ºC, With Digital Diagnostic Monitoring
LP-OSFP2G01E	850nm, 2.67Gbps, 300m, -20ºC ~ +85ºC
LP-OSFP2G01DE	850nm, 2.67Gbps, 300m, -20ºC ~ +85ºC, With Digital Diagnostic Monitoring

J References

1	Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 2000.
2	Telcordia GR-253-CORE and ITU-T G.957 Specifications.

K How to Order

LP-OSFP2G01	SFP Optical Transceiver module, 2.67Gbps Optical Transmitter 850 nm, Dual Rate, 300m, 0 to 70ºC.
LP-OSFP2G01D	SFP Optical Transceiver module, 2.67Gbps Optical Transmitter 850 nm, Dual Rate, 300m with DDM, 0 to 70ºC.
LP-OSFP2G01E	SFP Optical Transceiver module, 2.67Gbps Optical Transmitter 850 nm, Dual Rate, 300m, Extended temperature -25 to +85ºC.
LP-OSFP2G01DE	SFP Optical Transceiver module, 2.67Gbps Optical Transmitter 850 nm, Dual Rate, 300m, Extended temperature -25 to +85ºC, with DDM