ESP85X6-03D

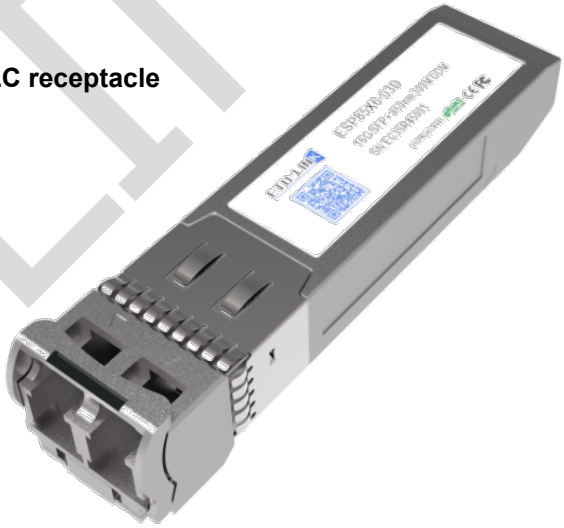
16G Fiber Channel SFP+ Transceiver, Multi Mode, 300m Reach

PRODUCT FEATURES

- **Supports up to 14.025Gbps bit rate**
- **Hot-pluggable SFP+ footprint**
- **850nm VCSEL laser and PIN photodiode,**

Up to 300m for OM3-MMF transmission

- **Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle**
- **Compatible with RoHS**
- **Single +3.3V power supply**
- **Real Time Digital Diagnostic Monitoring**
- **Operating case temperature:**
- **Standard: 0 to +70°C**



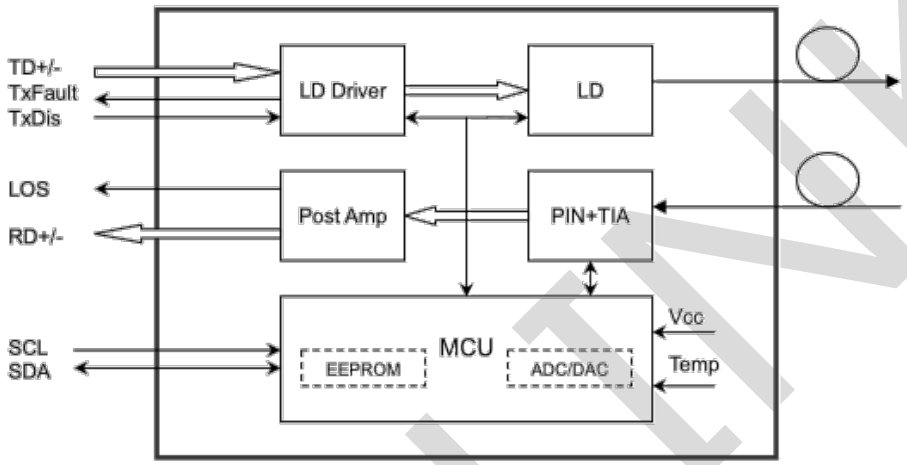
APPLICATIONS

- **4.25/8.5/14.025G Fiber Channel**

DESCRIPTIONS

The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.

Module Block Diagram



Ordering Information

Part No.	Data Rate(optical)	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI	Latch Color
ESP85X6-03D	14.025Gbps	VCSEL	MMF	300m	LC	0~70℃	Yes	Black

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

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	0		+70	°C

Power Supply Voltage	Vcc	3.135	3.30	3.465	V
Power Supply Current	Icc			300	mA
Data Rate			14.025		Gbps

Electrical Characteristics

High-Speed Signal: Compliant to CEI-25G-VSR

Low-Speed Signal: Compliant to SFF-8419

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)							
Differential Input Resistance		R_R_{din}	90	100	110	Ω	
Input Differential Voltage		R_V_{diff}	-	-	900	mVpp	
Tx_Disable	Normal Operation	V_{IL}	-0.3	-	0.8	V	
	Laser Disable	V_{IH}	2.0	-	V_{CC}+0.3	V	
Receiver (Module Output)							
Differential Resistance		T_R_d	90	100	110	Ohm	
Output Differential Voltage		T_V_{diff}	-	-	900	mVpp	
Differential Termination Resistance Mismatch		T_R_{dm}	-	-	10	%	
Rx los	Normal Operation	V_{OL}	-0.3	-	0.4	V	
	Loss Signal	V_{OH}	2		VCCHOST	V	

Optical and Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λc	840	850	860	nm	
Spectral Width（RMS）	Δλ			0.59	nm	
Average Output Power	P_{out}	-7.8			dBm	1
Extinction Ratio	ER	3.5			dB	
Receiver						
Centre Wavelength	λc	840	850	860	nm	
Receiver Sensitivity				-10.5	dBm	2
Receiver Overload		0			dBm	2
LOS De-Assert	LOS_D			-12	dBm	
LOS Assert	LOS_A	-22			dBm	
LOS Hysteresis		0.5		4	dB	

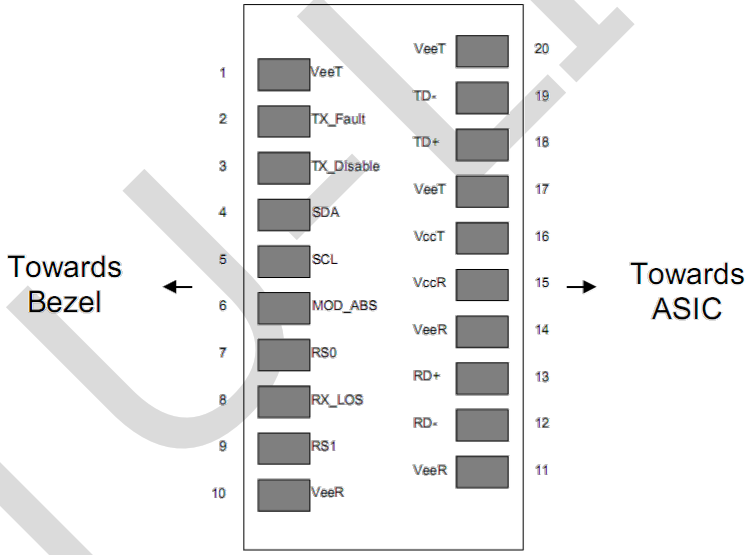
Notes:

1. The optical power is launched into MMF.
2. Measured with a PRBS 2^{31}-1 test pattern @14.025Mbps, BER ≤1×10^{-12}.

Digital Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal
Voltage	3.0 to 3.6	V	±3%	Internal
Bias Current	0 to 15	mA	±10%	Internal
TX Power	-7.8 to 0	dBm	±3dB	Internal
RX Power	-16 to 1	dBm	±3dB	Internal

.Pin Diagram



Pin Definitions

Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note1
3	TXDISABLE	Transmitter Disable	3	Note2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	

8	LOS	Loss of Signal	3	Note 3
9	RS1	Not Connected	3	
10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
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 5
19	TD-	Inv. Transmit Data In	3	Note 5
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.

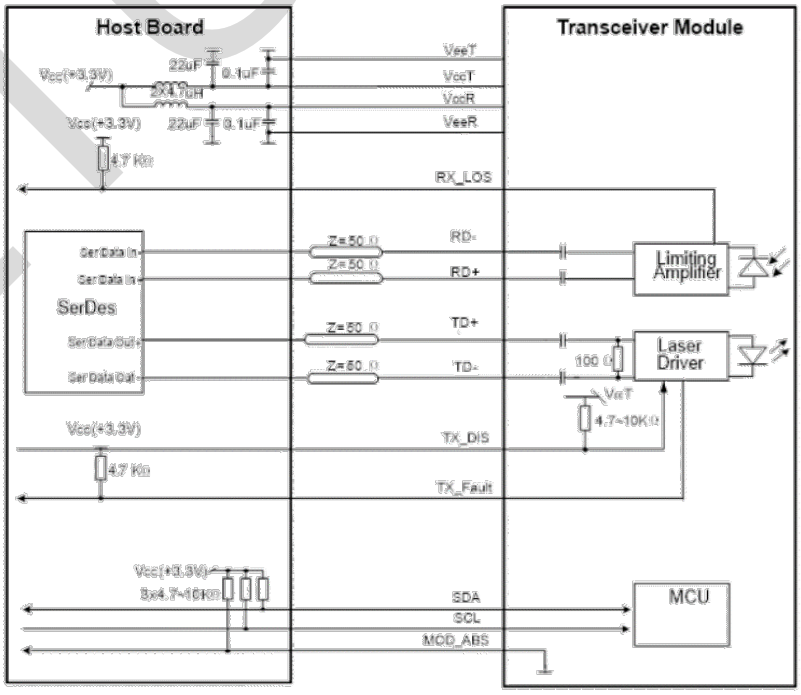
2) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

3) LOS is open collector output, should be pulled up with a 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

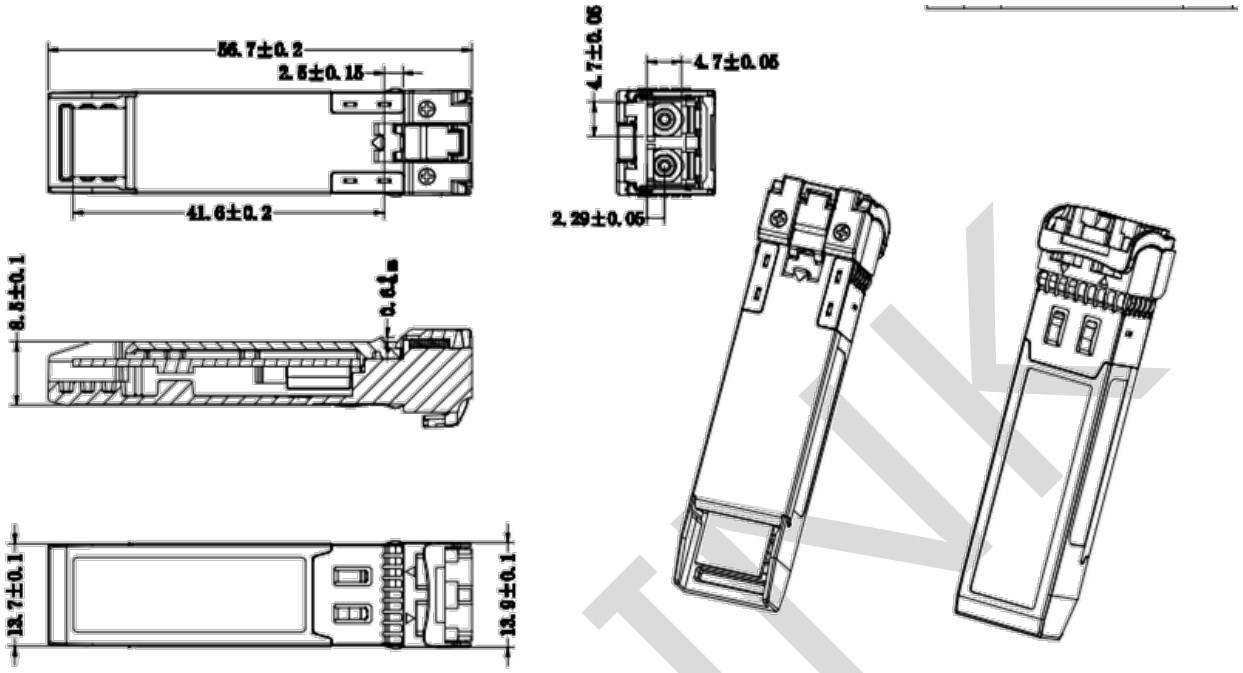
4) RD-/+: These are the differential receiver outputs. They are internally AC-coupled, differential lines which should be terminated with 100Ω (differential) at the user SERDES.

5) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Interface Circuit



Mechanical Diagram



Revision History

Version No.	Date	Description
1.0	February 8, 2019	Preliminary datasheet
2.0	Aug 21.2024	Format change

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