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25G SFP28 850nm 100m DOM Transceiver

407-BBWK-LL

Application

- 25GBASE-SR Ethernet

Standards

- SFF-8472
- SFF-8024
- SFF-8431
- SFF-8432

Features

- Supports 25.78Gb/s Bit Rate
- Hot-pluggable SFP+ Footprint
- 850nm VCSEL Laser and PIN Photo-detector
- Internal CDR on Transmitter and Receiver Channel
- RoHS-10 Compliant

- Link Lengths at 25.78G 100m Over OM4 MMF
- LC Duplex Connector
- Low Power Consumption < 1W
- 0℃ to 70℃ Operating Temperature Range

- Single +3.3V±5% Power Supply
- Programmable TX Input Equalizer
- Programmable RX Pre-emphasis
- Digital Monitoring SFF-8472 Compliant

Description

The 25G SR short-wavelength transceiver is designed for use in 25.78Gb/s data rate over multimode fiber. The transceiver is compliant with SFF-8431, and the mechanical SFP+ plug is compatible with SFF-8432. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	Vcc	-0.3	+4.0	V
Storage Temperature	Ts	-40	+85	℃
Operating Humidity	RH	0	+85	%

II. General Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Bit Rate	BR		25.78		Gbps
Bit Error Ratio	BER			$5*10^{E-5}$	
Max. Supported Link Length	L_{MAX}			100	m

III. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature	Tc	0		+70	℃
Power Supply Voltage	Vcc	3.14	3.3	3.46	V
Bit Rate	BR		25.78		Gbps
Max. Supported Link Length	L_{MAX}			100	m

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	V_{CC}	3.14	3.3	3.46	V	
Supply Current	Icc			230	mA	
Transmitter						
Input Differential Impedance	R_{IN}	80	100	120	Ω	1
Single Ended Data Input Swing	V_{IN}	90		500	mVp-p	
Transmit Disable Voltage	V_{DIS}	2		V_{CCHOST}	V	
Transmit Enable Voltage	V_{EN}	V_{EE}		$V_{EE}+0.8$	V	
Transmit Fault Assert Voltage	V_{FA}	2		V_{CCHOST}	V	
Transmit Fault De-Assert Voltage	V_{FDA}	V_{EE}		$V_{EE}+0.8$	V	
Receiver						
Single Ended Data Output Swing	V_{OD}	200		500	mVp-p	
LOS Fault	V_{LOSFT}	2		V_{CCHOST}	V	
LOS Normal	V_{LOSNR}	V_{EE}		$V_{EE}+0.8$	V	

Notes:

1. Differential between TD+ / TD−.

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V. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Nominal Wavelength	λ	840		860	nm	
Spectral Width	$\Delta\lambda$			0.6	nm	
Optical Modulation Amplitude	POMA	-6.4		3	dBm	
Optical Output Power	Pav	-8.4		2.4	dBm	
Extinction Ratio	ER	2			dB	
Transmitter and Dispersion Penalty	TDP			5	dB	
Average Launch Power of OFF Transmitter	P_{OFF}			-30	dBm	
Receiver						
Center Wavelength	λ	840		860	nm	
Average Receiver Power	P_{AVG}	-10.3		2.4	dBm	1
Stressed Receiver Sensitivity (OMA)	R_{SENSE}			-5.2	dBm	2
Receiver Reflectance	R_{REFL}			-12	dB	
Assert LOS	LOS_A	-30			dBm	
De-Assert LOS	LOS_D			-13	dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Sensitivity for 25.78G PRBS 231-1 and BER better than or equal to $5*10^{E-5}$.

2. The stressed sensitivity values in the table are for system level BER measurements which include the effects of CDR circuit.

VI. Pin Assignment

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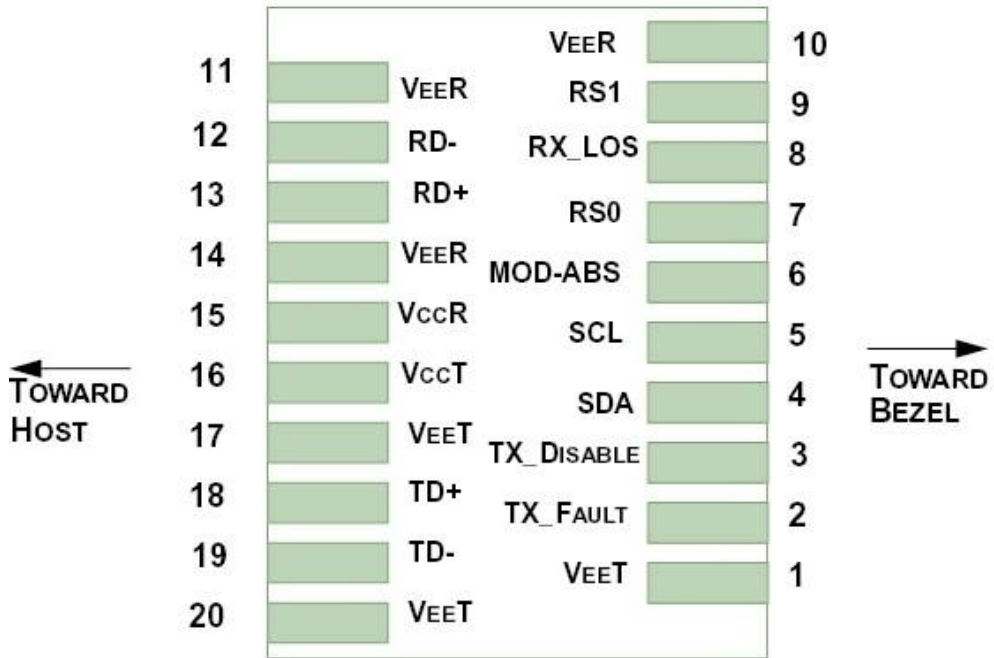
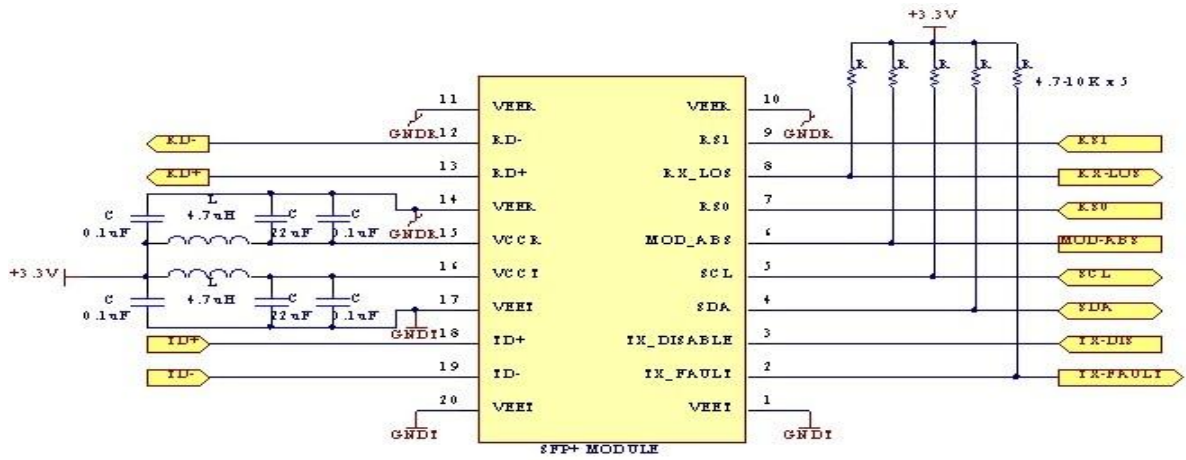| Pin Number	Symbol	Name	Description
1,17,20	VeeT	Transmitter Signal Ground	These pins should be connected to signal ground on the host board.
2	TX Fault	Transmitter Fault Out (OC)	Logic "1" Output = Transmitter Fault Logic "0" Output = Normal Operation This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor.
3	TX Disable	Transmitter Disable In (LVTTL)	Logic "1" Input (or no connection) = Laser off Logic "0" Input = Laser on This pin is internally pulled up to VccT with a 10 kΩ resistor.
4	SDA		
5	SCL	Module Definition Identifiers	Serial ID with SFF 8472 Diagnostics Module Definition pins should be pulled up to Host Vcc with 10 kΩ resistors.
6	MOD-ABS		
7	RS0	Receiver Rate Select (LVTTL) Transmitter Rate Select (LVTTL)	NA
9	RS1		NA
8	LOS	Loss of Signal Out (OC)	This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor.
10,11,14	VeeR	Receiver Signal Ground	These pins should be connected to signal ground on the host board.
12	RD-	Receiver Negative DATA Out (CML)	Light on = Logic "0" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.
13	RD+	Receiver Positive DATA Out(CML)	Light on = Logic "1" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.
15	VccR	Receiver Power Supply	This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter
16	VccT	Transmitter Power Supply	This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3.Recommended power supply filter
18	TD+	Transmitter Positive DATA In(CML)	Logic "1" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100Ω resistor.
19	TD-	Transmitter Negative DATA In(CML)	Logic "0" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100Ω resistor.

VII. Optical Module Block Diagram
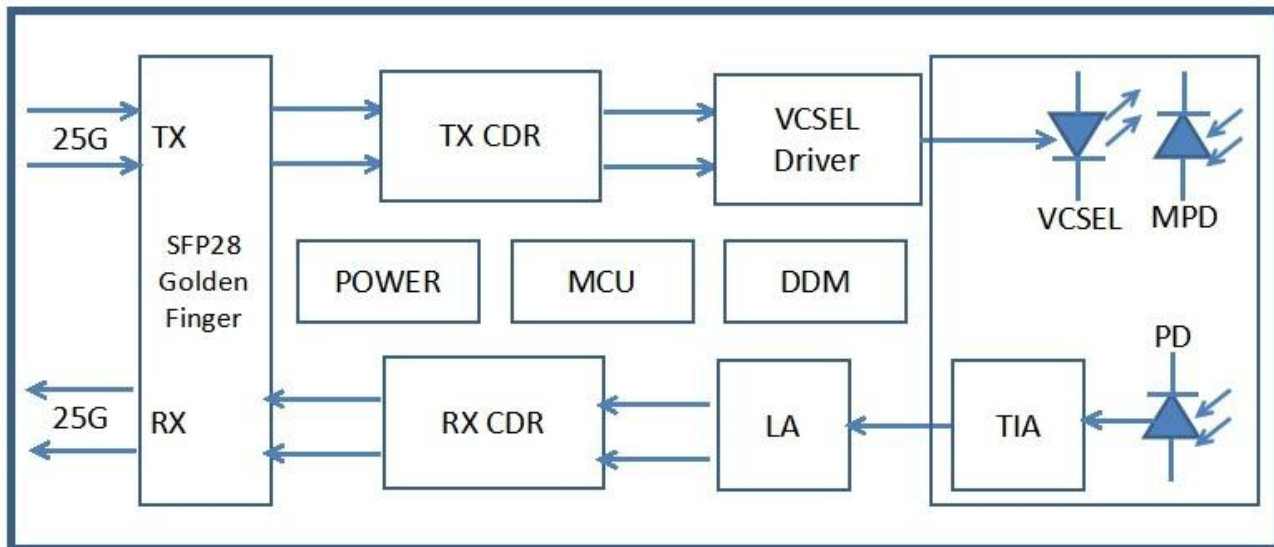
VIII. Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1 (> 1500 Volts)
Electrostatic Discharge (ESD) Immunity	Variation of IEC 61000-4-2	LV 4(Air discharge :15KV;Contact discharge:8 KV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B EN55022 Class B FCC Class B	Compliant with standards
Immunity	IEC61000-4-3 Class 2 EN55024	Typically show no measurable effect from a 3V/m fieldswept from 80 to 1000MHz applied to the transceiver without a chassis enclosure

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IX. Typical Application Circuit

X. Diagram Mechanial Drawing