

TITLE 25G SFP28 50GHz DWDM 15km Transceivers	DOC No. RFD-20250402001-001	
	REVISION : 02	AUTHORIZED BY : Hawk Rong
	DATE : 2025.07.18	CLASSIFICATION : Optical Transceiver

1. PRODUCT FEATURES

- Operating data rate up to 25.78Gbps
- Up to 15km (APD) transmission directly
- DWDM EML Laser and APD receiver
- LC duplex connector
- Hot pluggable 20pin connector
- Low power consumption
- Industrial <2.3W
- Single +3.3V±5% power supply
- Compliant with SFF-8472
- Fully RoHS Compliant
- Case operating temperature
- Industrial: -40°C to +85°C

2. PRODUCT APPLICATIONS

- 25G Ethernet
- CPRI Option 10

3. PRODUCT DESCRIPTION

The Transceiver is intended for 15km (APD) reach service from 24.33Gb/s to 25.78Gb/s DWDM D18~D61 single mode high-speed communications equipment where low-cost, extraordinary performance and reliability are essential. It consumes low power, operates base on 3.3V DC power supply and is offered in the industrial temperature range. They are compliant with SFP28 MSA SFF-8472, SFF-8431, SFF-8432 & SFF-8402 standards.

The low jitter and low bit error rate optical assembly features a D18~D61 EML laser transmitter and APD receiver. It utilizes internal clock and data recovery (CDR) units on transmitter and the receiver chains for low jitter compliance. The differential AC coupled Tx and Rx data interfaces are CML compatible. The device is Class I laser safety compliant.

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3.1 PRODUCT NAME AND SERIES NUMBER(S)

25G SFP28 15km DWDM Transceivers

Part Number	Bit Rate	Laser(nm)	Distance	Fiber Type	DDMI	Connector	Tem.
P58**0CRIZ15xx	25.78G	DWDM EML	15KM	SMF	YES	LC	I

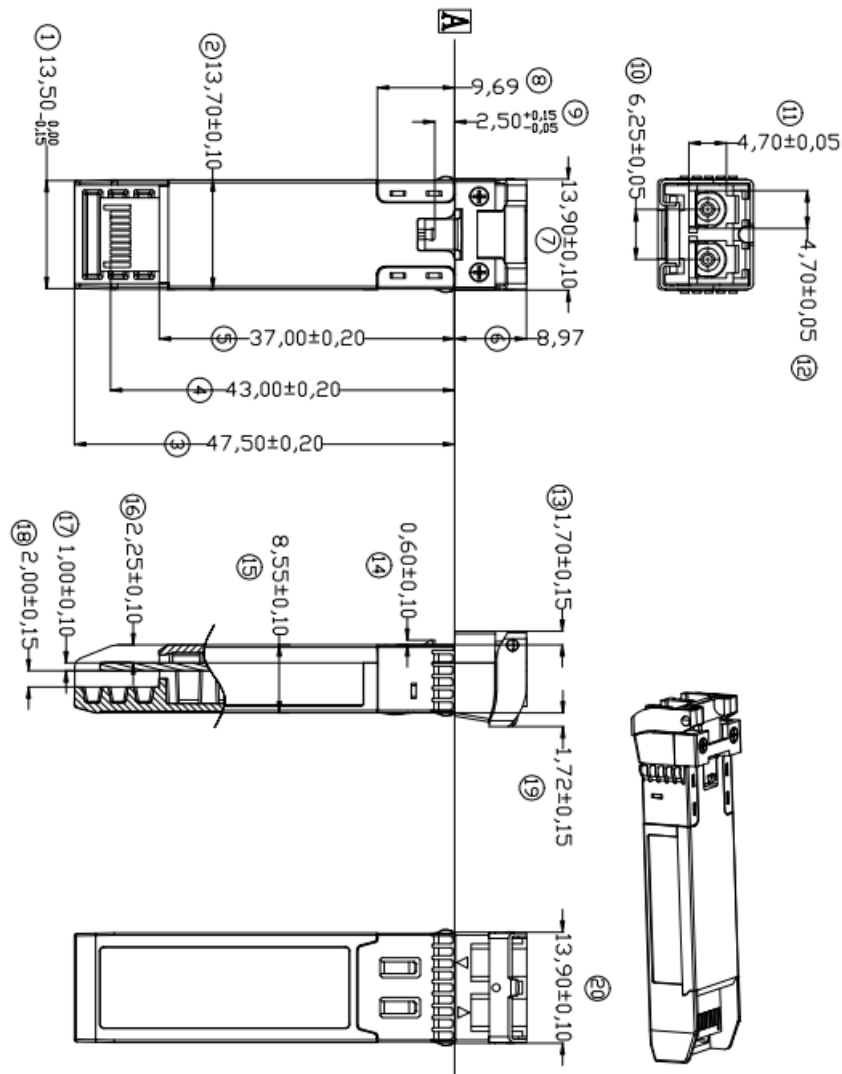
Note-1: ** Indicates the customer code.

Note-2: xx is the channel number ex P58**0CRIZ1518 is Channel C18 wavelength 1563.05nm

Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C17 (1563.86nm)	C18 (1563.05nm)	C19 (1562.23nm)	C20 (1561.41nm)	C21 (1560.61nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C22 (1559.79nm)	C23 (1558.98nm)	C24 (1558.17nm)	C25 (1557.36nm)	C26 (1556.55nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C27 (1555.75nm)	C28 (1554.94nm)	C29 (1554.13nm)	C30 (1553.33nm)	C31 (1552.52nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C32 (1551.72nm)	C33 (1550.92nm)	C34 (1550.12nm)	C35 (1549.32nm)	C36 (1548.51nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C37 (1547.72nm)	C38 (1546.92nm)	C39 (1546.12nm)	C40 (1545.32nm)	C41 (1544.53nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C42 (1543.73nm)	C43 (1542.94nm)	C44 (1542.14nm)	C45 (1541.35nm)	C46 (1540.56nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C47 (1539.77nm)	C48 (1538.98nm)	C49 (1538.19nm)	C50 (1537.40nm)	C51 (1536.61nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C52 (1535.82nm)	C53 (1535.04nm)	C54 (1534.25nm)	C55 (1533.47nm)	C56 (1532.68nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C57 (1531.90nm)	C58 (1531.12nm)	C59 (1530.33nm)	C60 (1529.55nm)	C61 (1528.77nm)

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3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



Unit is millimeter. All dimensions are $\pm 0.1\text{mm}$ unless otherwise specified

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4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- Compatible with SFP28 MSA

5. Absolute Maximum Ratings & Recommended Operating Conditions

5.1. Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	Ts	°C	-40	85
Relative Humidity	RH	%	0	95
Maximum Supply Voltage	Vcc	V	-0.5	4.0

5.2. Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Power Supply Voltage	Vcc	V	3.14	3.3	3.46
Bit Rate	BR	Gb/s		25.78	
Bit Error Ratio	BER				5*10 ⁻⁵

6. Electric Ports Definition

Parameter	Symbol	Unit	Min	Typ	Max	Note
Supply Voltage	V _{CC}	V	3.14	3.3	3.46	
Power consumption	P	mW			2300	I-temp
Transmitter						
Input Differential Impedance	R _{IN}	Ω		100		
Single-ended Data Input Swing	V _{IN}	mVp-p	90		450	
Transmit Disable Voltage	V _{DIS}	V	2		V _{CCHOST}	
Transmit Enable Voltage	V _{EN}	V	V _{EE}		V _{EE} +0.8	

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Transmit Fault Assert Voltage	V _{FA}	V	2		V _{CCHOST}	
Transmit Fault De-Assert Voltage	V _{FDA}	V	V _{EE}		V _{EE} +0.4	
Receiver						
Single-ended Data Output Swing	V _{OD}	mVp-p	200		450	
LOS Fault	V _{LOSFT}	V	2		V _{CCHOST}	
LOS Normal	V _{LOSNR}	V	V _{EE}		V _{EE} +0.4	

7. Optical Characteristics (Tc=-40 °C to 85 °C and Vcc= 3.14to 3.46V)

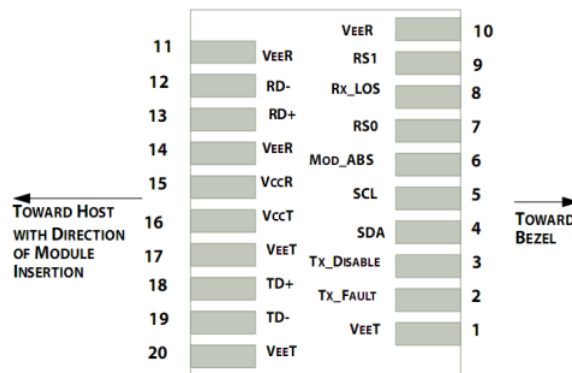
Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Nominal Wavelength	λC	nm	1528.77~1563.05			
Center Wavelength Spacing		GHz	50			
Wavelength Tolerance		nm	-0.04		0.04	
Average Output Power	P _{av}	dBm	0		5	
Spectral Width (-20dB)	σ	nm			1	
Extinction Ratio	ER	dB	6			
Side Mode Suppression Ratio	SMSR	dB	30			
Transmitter and Dispersion Penalty	TDP	dB			4	
Average Launch Power of OFF Transmitter	POFF	dBm			-30	
Relative Intensity Noise	RIN	dB/Hz			-128	
Receiver (APD/TIA)						
Center Wavelength	λC	nm	1260		1620	
Receiver Sensitivity(OMA)	RSENSE	dBm			-19	1
Receiver Overload (OMA)	P _{max}	dBm	-7			
Optical Return Loss		dB			-26	
LOS Assert	LOSA	dBm	-35			
LOS De-Assert LOS	LOSD	dBm			-24	
LOS Hysteresis		dB	0.5			

Note1: Measured at 25.78125Gb/s, ER>=6dBm, PRBS 2³¹-1 and BER better than or equal to 5E-5;

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8. Applications Note:

Pin Definitions



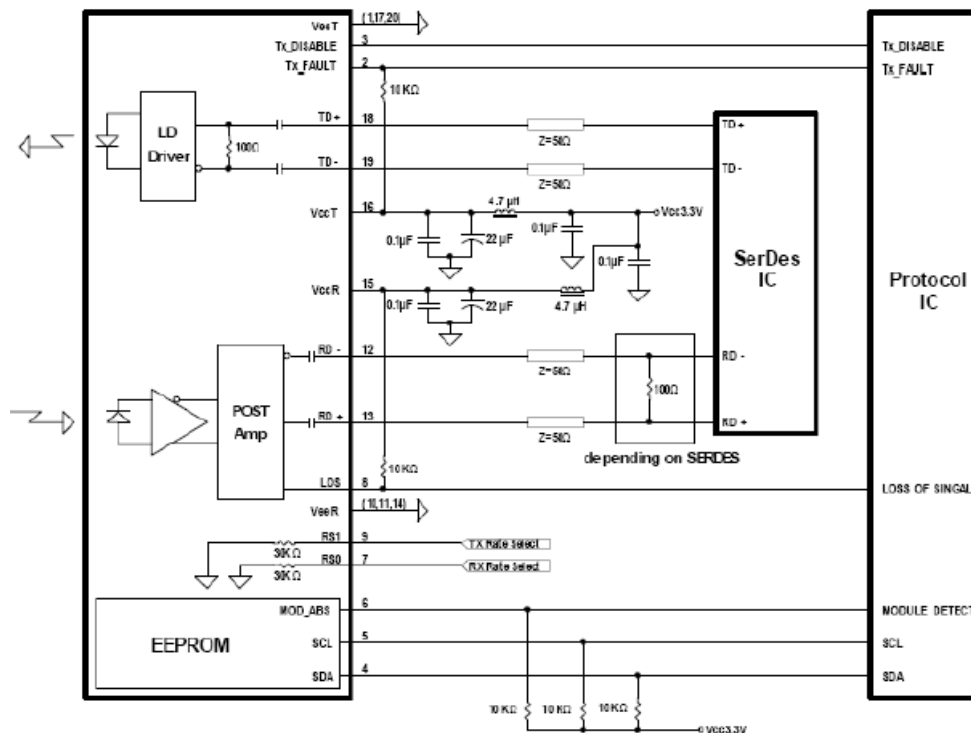
Pin Function Definitions for SFP28

Pin Number	Symbol	Name	Description
1,17,20	VeeT	Transmitter Signal Ground	Connected to signal ground on the host board.
2	TX Fault	Transmitter Fault Out (OC)	Module transmitter fault output.
3	TX Disable	Transmitter Disable In (LVTTL)	Module transmitter disable control.
4	SDA	Module Definition Identifiers	Serial ID with SFF 8472 Diagnostics
5	SCL		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)	Rate select 0(Rx):Low=CDR Bypass ; High=CDR Select
9	RS1		Rate select 1(Tx):Low=CDR Bypass ; High=CDR Select
8	LOS	Loss of Signal Out (OC)	Receiver loss of signal.
10,11,14	VeeR	Receiver Signal Ground	Connected to signal ground on the host board.
12	RD-	Receiver Negative DATA Out (CML)	Receiver inverted data output, internally AC coupled and terminated

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13	RD+	Receiver Positive DATA Out (CML)	Receiver non-inverted data output, internally AC coupled and terminated.
15	VccR	Receiver Power Supply	Receiver Power 3.3V Supply.
16	VccT	Transmitter Power Supply	Transmitter Power 3.3V Supply.
18	TD+	Transmitter Positive DATA In (CML)	Transmitter non-inverted data input, internally AC coupled and terminated.
19	TD-	Transmitter Negative DATA In (CML)	Transmitter inverted data Input, internally AC coupled and terminated.

Recommended Interface Circuit



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Digital Diagnostics Functions

As defined by the SFF-8472, Our SFP28 transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range. The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 0x00h to the maximum address of the memory. For more detailed information, including memory map definitions, please refer the SFF-8472 documentation.

Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

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9. Modification History

Rev.	Comments	Date	Originator	Approval
01	Initial	2025.04.01	Hawk Rong	Mike Sun
02	Modify 7. Average Output Power	2025.07.16	Hawk Rong	Mike Sun