TITLE **25G SFP28 CWDM 10km Transceiver**	**DOC No.**	**DTRX-200605**
	REVISION：03	**AUTHORIZED BY：Mike Sun**
	DATE：2021.05.27	**CLASSIFICATION：Optical Transceiver**

1. SCOPE

25G SFP28 CWDM transceiver, according to 25Gigabit Small Form Factor Pluggable "SFP28" Multi-Sourcing Agreement (MSA) SFF-8431 Rev. 4.1 and SFF-8472 Rev.12.1, are designed for use up to 25.78Gb/s and 24.33Gbps data rate and up to 12km link length. They are compatible with SFF-8432. 25G SFP28 CWDM transceiver offer Commercial and Industry operating temperature options.

2. PRODUCT FEATURES

- Up to 24.33Gb/s for CPRI
- Up to 25.78Gb/s for Bi-Directional Data Links
- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8432 and SFF-8472
- Build-In Dual CDR With Shut Off Control
- SFP28 MSA package with duplex LC connector
- Uncooled1271/1291/1311/1331/1351/1371nm DFB Laser and PIN ROSA
- Up to 10km On 9/125um SMF
- Single +3.3V Power Consumption
- 1.5W maximum power consumption
- Operating Temperature Options: 0℃~ +70℃； -20℃ ~ +85℃
- RoHS Compliant

3. PRODUCT DESCRIPTION

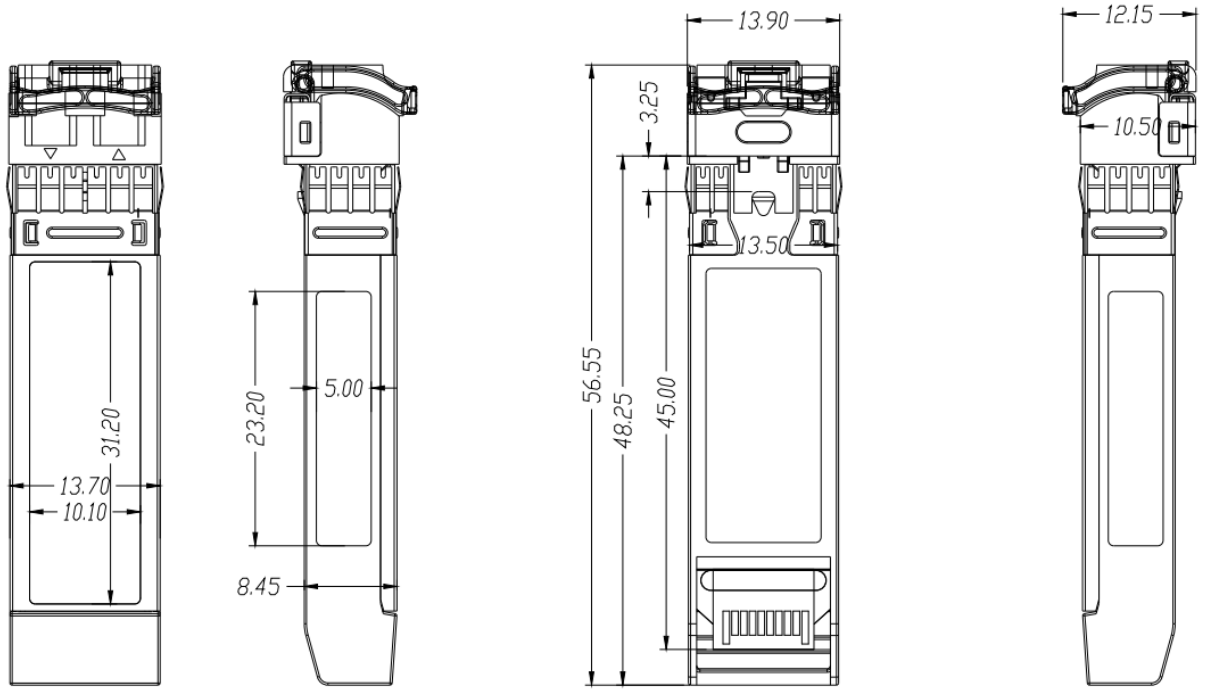
3.1 PRODUCT NAME AND SERIES NUMBER(S)

25G SFP28 CWDM Transceiver

Product Name	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
25G SFP28 CWDM 10km	25G	1271/1291/1311 133/11351/1371	10Km	SMF	0~6	-12	LC	C/E

TITLE **25G SFP28 CWDM 10km Transceiver**	**DOC No.**	**DTRX-200605**
	REVISION： **03**	**AUTHORIZED BY：** **Mike Sun**
	DATE： **2021.05.27**	**CLASSIFICATION：** **Optical Transceiver**

3.2 DIMENSIONS,MATERIALS,PLATINGS AND MARKING



Unit is millimeter. All dimensions are ±0.1mm unless otherwise specified.

4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- High Speed Storage Area Networks
- 25G High Speed Interconnection
- 24.33G CPRI/25.78Gb/s eCPRI

TITLE 25G SFP28 CWDM 10km Transceiver	DOC No. DTRX-200605	
	REVISION：03	AUTHORIZED BY：Mike Sun
	DATE：2021.05.27	CLASSIFICATION：Optical Transceiver

5. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	℃
Supply Voltage	VCC3	-0.5	4.0	V
Relative Humidity(Non-condensing)	RH	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0	25	70	℃
Operating Case Temperature	TI	-20	25	85	℃
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
Data Rate	-	-	25.78	-	Gbps

Transmitter Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Module Supply Current	Icc	-	-	450	mA	-
Power Dissipation	PD	-	-	1500	mW	-
Transmitter			-	-		-
Input Differential Impedance	ZIN	-	100		Ω	-
Differential Data Input Swing	VIN, P-P	180	-	800	mVP-P	-
TX_FAULT Transmitter Fault	VOH	2.0	-	VCCHOST	V	-
Normal Operation	VOL	0	-	0.8	V	-
TX_DISABLE Transmitter Disable	VIH	2.0	-	VCCHOST	V	-
Transmitter Enable	VIL	0		0.8	V	-

TITLE **25G SFP28 CWDM 10km Transceiver**	**DOC No.**	**DTRX-200605**
	REVISION：03	**AUTHORIZED BY：Mike Sun**
	DATE：2021.05.27	**CLASSIFICATION：Optical Transceiver**

Receiver						
Output Differential Impedance	ZO		100		Ω	-
Differential Data Output Swing	VOUT, P-P	300	-	850	mVP-P	1
Data Output Rise Time, Fall Time	tr, tf	15	-	-	ps	-
RX_LOS Loss of signal (LOS)	VOH	2.0	-	VCCHOST	V	-
Normal Operation	VOL	0	-	0.8	V	-

Transmitter Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Launch Optical Power	Po	0	-	6	dBm	1
Optical Modulation Amplitude	OMA	-1	-		dBm	
Extinction Ratio	ER	3	-	-	dB	
Center Wavelength Range	λc	1264.5	1271	1277.5	nm	2
Center Wavelength Range	λc	1284.5	1291	1297.5	nm	
Center Wavelength Range	λc	1304.5	1311	1317.5	nm	
Center Wavelength Range	λc	1324.5	1331	1337.5	nm	
Center Wavelength Range	λc	1344.5	1351	1357.5	nm	
Center Wavelength Range	λc	1364.5	1371	1377.5	nm	
Transmitter and Dispersion Penalty	TDP	-	-	2.7	dB	
Launch power in OMA minus TDP(min)		-5	-		dB	
SMSR		30	-		dB	
Spectral Width	Δλ	-	-	1	nm	
$RIN_{20}OMA$				-130	dB/Hz	
Optical Return Loss Tolerance	ORLT	-	-	20	dB	
Pout @TX-Disable Asserted	Poff	-	-	-20	dBm	

TITLE **25G SFP28 CWDM 10km Transceiver**	**DOC No.**	**DTRX-200605**
	REVISION：03	**AUTHORIZED BY：Mike Sun**
	DATE：2021.05.27	**CLASSIFICATION：Optical Transceiver**

Transmitter eye mask definition{X1,X2,X3,Y1,Y2,Y3} Hit ratio 5e-05 hits per sample	{0.31,0.4,0.45,0.34,0.38,0.4}

Notes:
1. Average optical power shall be measured using the methods specified in TIA/EIA-455-95.

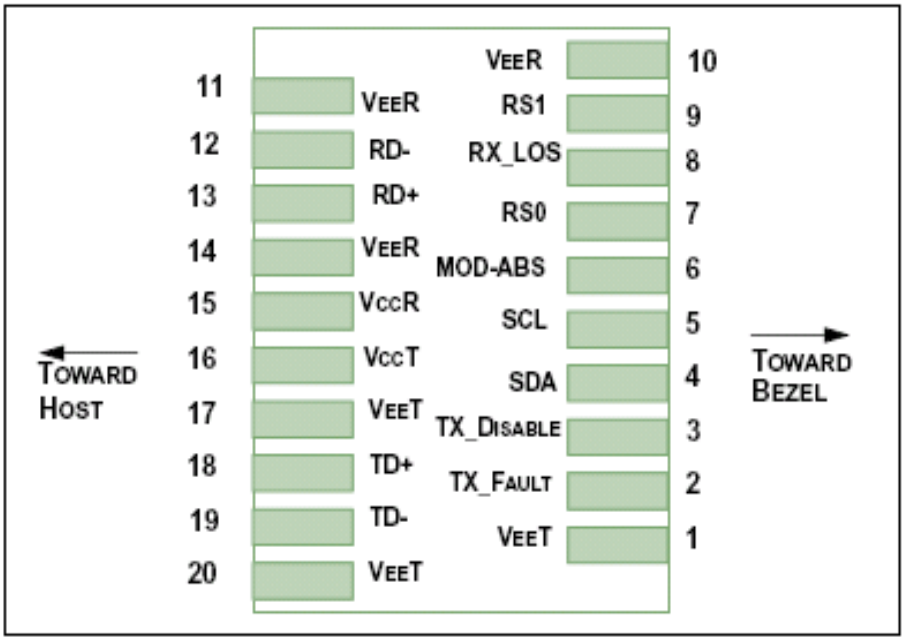
Receiver Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength Range	λc	1264.5	1271	1277.5	nm	L
Center Wavelength Range	λc	1284.5	1291	1297.5	nm	M
Center Wavelength Range	λc	1304.5	1311	1317.5	nm	N
Center Wavelength Range	λc	1324.5	1331	1337.5	nm	O
Center Wavelength Range	λc	1344.5	1351	1357.5	nm	P
Center Wavelength Range	λc	1364.5	1371	1377.5	nm	Q
Receiver OMA Sensitivity	Rx SENS	-	-	-13	dBm	1
Receiver Overload (Pavg)		2	-	-	dBm	1
Receiver reflectance			-	-26	dB	-
LOS De-Assert	LOSD	-	-	-13	dBm	-
LOS Assert	LOSA	-30	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

Notes:
[1] Measured with Light source 1310nm, ER=3.5dB; BER =<5E-05 @PRBS=2^31-1 NRZ

TITLE 25G SFP28 CWDM 10km Transceiver	DOC No. DTRX-200605	
	REVISION：03	AUTHORIZED BY：Mike Sun
	DATE：2021.05.27	CLASSIFICATION：Optical Transceiver

6. Applications Note :



Pin Definitions

Pin Assignment

Pin	Symbol	Name/Description	Note
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	NA	6
8	RX_LOS	Receiver Loss of Signal (LVTTL-O)	2

TITLE **25G SFP28 CWDM 10km Transceiver**	**DOC No.**	**DTRX-200605**
	REVISION： **03**	**AUTHORIZED BY：** **Mike Sun**
	DATE： **2021.05.27**	**CLASSIFICATION：** **Optical Transceiver**

9	RS1	NA	6
10	VeeRX	Receiver Ground	1
11	SCL	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O)	
13	RD+	Received Data out (CML-O)	
14	VeeR	Receiver Ground	
15	VccR	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3 V	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Data In (CML-I)	
19	TD-	Inverse Transmitter Data In (CML-I)	
20	VeeT	Transmitter Ground	1

Notes:

1. *The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.*
2. *This pin is an open collector/drain output pin and shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5 V.*
3. *This pin is an open collector/drain input pin and shall be pulled up with 4.7k-10kohms to VccT in the module.*
4. *See sff-8431 4.2 2-wire Electrical Specifications .*
5. *This pin shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board.*
6. *If implementing SFF-8079 pin 7 and 9 are used for AS0 and AS1 respectively.*

TITLE **25G SFP28 CWDM 10km Transceiver**	**DOC No.**	**DTRX-200605**
	REVISION： **03**	**AUTHORIZED BY：** **Mike Sun**
	DATE： **2021.05.27**	**CLASSIFICATION：** **Optical Transceiver**

Block Diagram of Transceiver

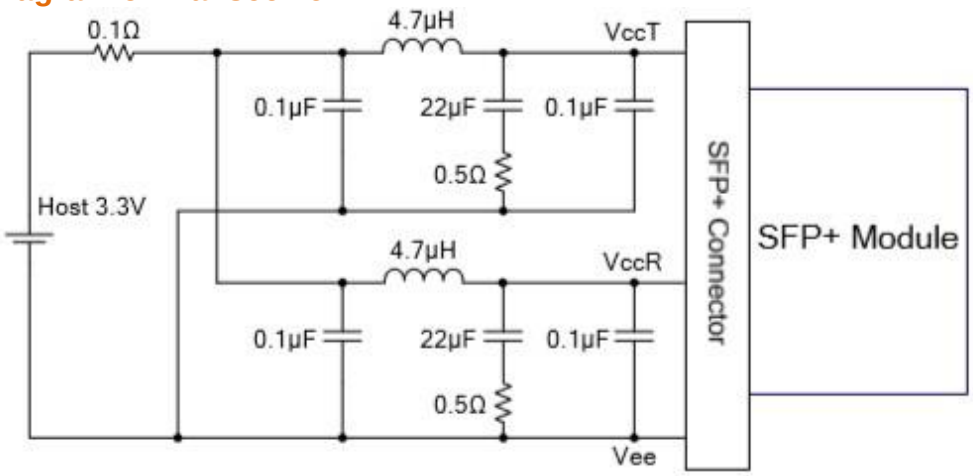


Figure2

Recommended Interface Circuit

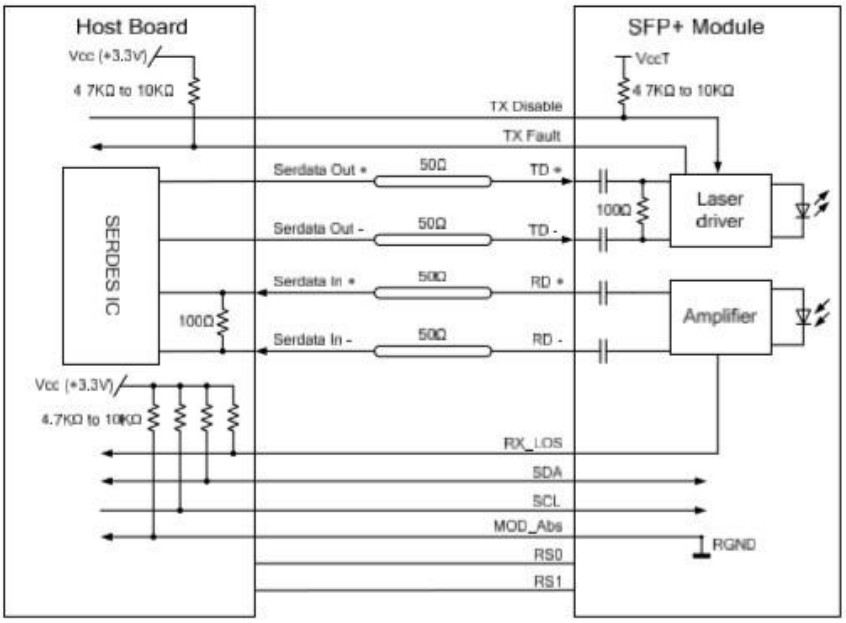
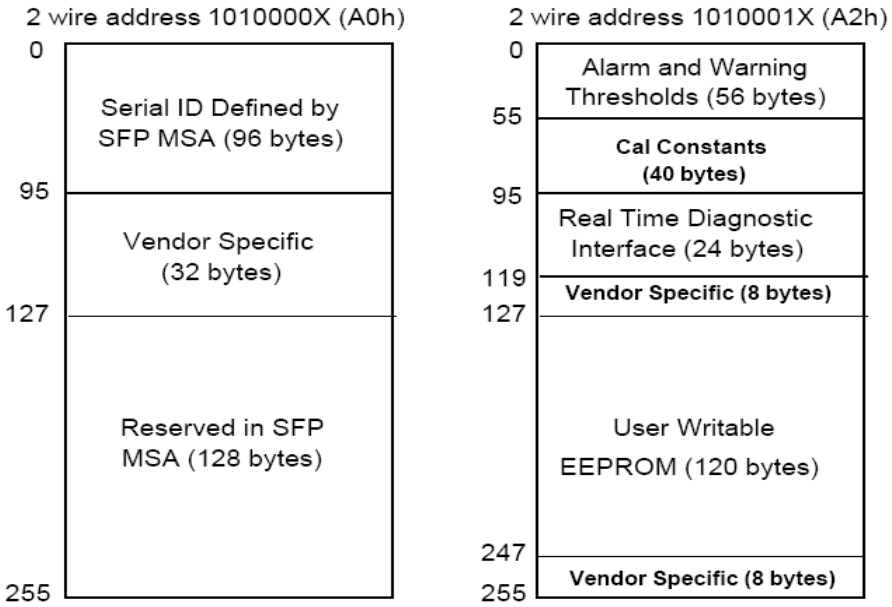


Figure3

TITLE **25G SFP28 CWDM 10km Transceiver**	DOC No. DTRX-200605	
	REVISION： 02	AUTHORIZED BY： Mike Sun
	DATE： 2020.06.12	CLASSIFICATION： Optical Transceiver

Digital Diagnostic Memory Map



TITLE **25G SFP28 CWDM 10km Transceiver**	DOC No. DTRX-200605	
	REVISION：02	AUTHORIZED BY：Mike Sun
	DATE：2020.06.12	CLASSIFICATION：Optical Transceiver

Part Number

Part Number	Wavelength	Temperature
P58000CECZ2027	1271	0℃~+70℃
P58000CECZ2029	1291	0℃~+70℃
P58000CECZ2031	1311	0℃~+70℃
P58000CECZ2033	1331	0℃~+70℃
P58000CECZ2035	1351	0℃~+70℃
P58000CECZ2037	1371	0℃~+70℃
P58000CEEZ2027	1271	-20℃ ~+85℃
P58000CEEZ2029	1291	-20℃ ~+85℃
P58000CEEZ2031	1311	-20℃ ~+85℃
P58000CEEZ2033	1331	-20℃ ~+85℃
P58000CEEZ2035	1351	-20℃ ~+85℃
P58000CEEZ2037	1371	-20℃ ~+85℃

8. Modification History

Rev.	Comments	Date	Originator	Approval
01	Preliminary Draft	2020.06.10	Mike Sun	Ray Yang
02	Add Wavelength	2020.06.12	Mike Sun	Ray Yang
03	Modify Wavelength and **Distance**	2021.05.27	Mike Sun	Ray Yang