25GBASE-LR SFP28 20KM Optical Transceiver with DDM	IP-FFLK20B31

PRODUCT FEATURES

- Support up to 25.78Gb/s bit rates
- Compliant with SFP28 MSA and SFF-8431
- Hot-pluggable SFP28 footprint
- Up to 20 km on 9/125um SMF G.652
- RoHS2.0 compliant
- Class 1 laser product complies with EN 60825-1
- Operating temperature range: 0℃ to 70℃

  -40℃ to 85℃

APPLICATIONS

- 25GBASE-LR
- eCPRI

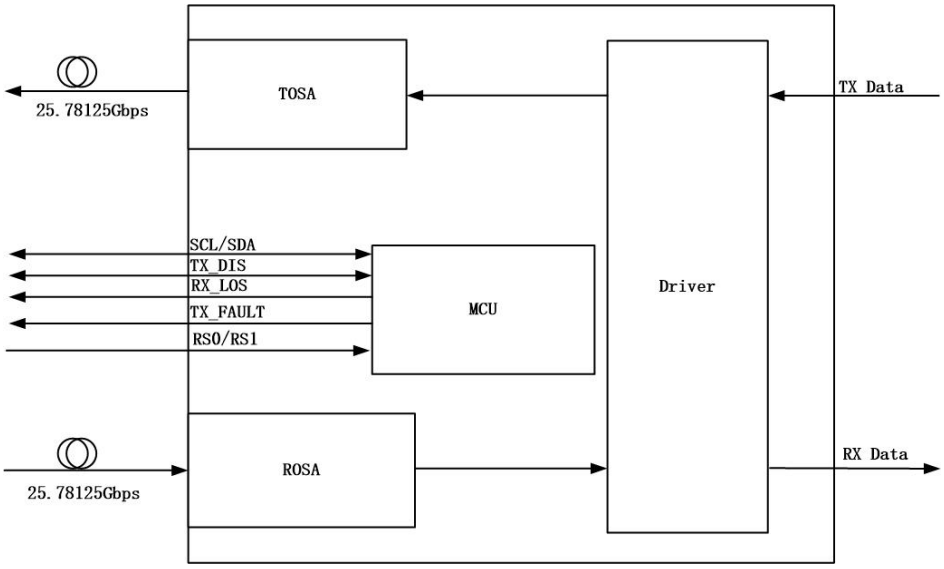
Ordering information

Part Number	Data Rate (Gb/s)	Media	Wavelength(nm)	Operating distance(km)	Temperature(℃)
IP-FFLK20B31C	25.78125	SMF	1310	20	0 ~ 70
IP-FFLK20B31I	25.78125	SMF	1310	20	-40 ~ 85

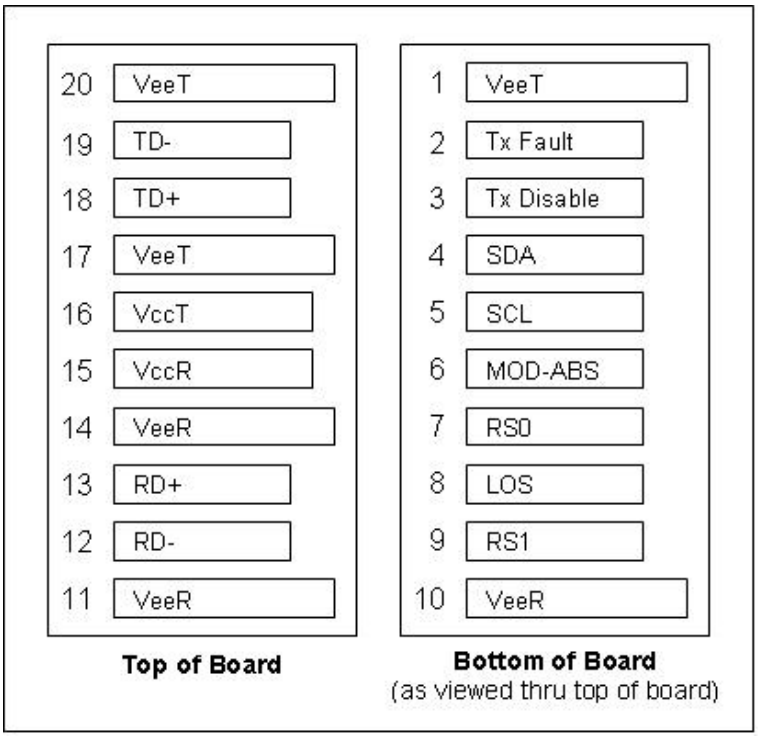
PRODUCT DESCRIPTION

The transceiver is intended for 20km reach service from 24.33Gb/s to 25.78Gb/s single mode high-speed communications equipment where low-cost, extraordinary performance and reliability are essential. 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.

1. Block Diagram



2. Pin Diagram



3. Pin Descriptions

Pin	Signal Name	Description	Notes
1	VEET	Transmitter Ground	
2	TX FAULT	Transmitter Fault Indication	1
3	TX DISABLE	Transmitter Disable	
4	SDA	SDA Serial Data Signal	
5	SCL	SCL Serial Clock Signal	
6	MOD_ABS	Module Absent. Grounded within the module	
7	RS0	Rx Rate Select	2
8	LOS	Loss of Signal	1
9	RS1	Not Connected	2
10	VEER	Receiver ground	
11	VEER	Receiver ground	
12	RD-	Inv. Received Data Out	3
13	RD+	Received Data Out	3
14	VEER	Receiver ground	
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground	
18	TD+	Transmit Data In	4
19	TD-	Inv. Transmit Data In	4
20	VEET	Transmitter Ground	

Notes:

1. Shall be pulled up with 4.7k-10k ohms to a voltage between 3.1V and 3.5V on the host board.
2. The pins are pulled low to VEET with a >30k resistor in the module.
3. The 100Ohms differential Rx Data output is internally AC coupled and terminated.
4. The 100Ohms differential Tx Data input is internally AC coupled and terminated.

4. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note
Storage Temperature	TS	-40	95	℃	
Operating Case Temperature	TOP	0	70	℃	C-Temp
		-40	85	℃	I-Temp
Power Supply Voltage	VCC	-0.3	3.6	V	
Relative Humidity (non-condensation)	RH	5	85	%	

5. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Note
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Power Consumption				1.2	W	C-temp
				1.5	W	I-temp
Power Supply Current @ 3.3V	Icc			360	mA	C-temp

				450	mA	I-temp

6. Electrical and Optical Characteristics

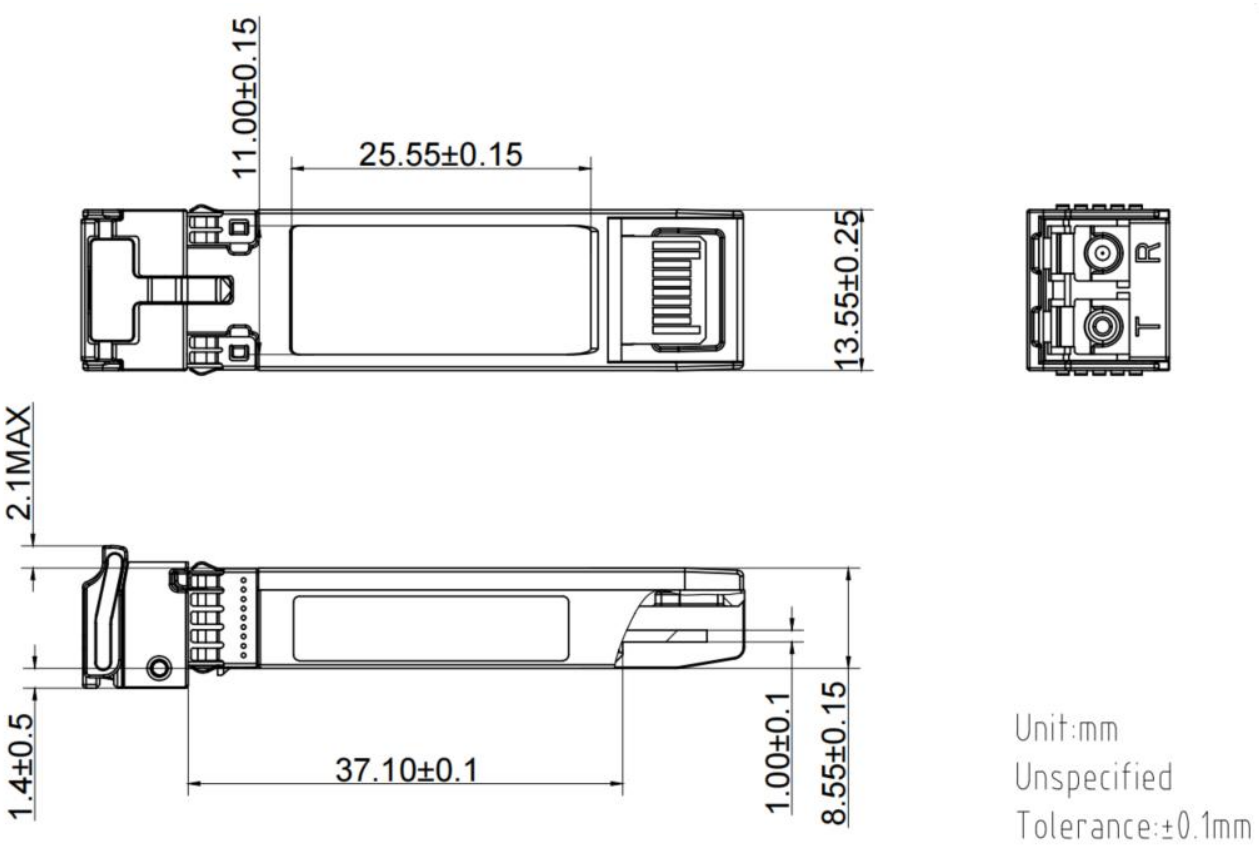
Parameter	Symbol	Min	Typical	Max	Unit	Note
Transmitter						
Support data rate			25.78		Gb/s	
Peak Wavelength	λp	1290	1310	1330	nm	
Spectral Width (-20dB)				1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Output Power	Po	-4		6	dBm	
Extinction Ratio	ER	3			dB	
Output Power with Transmitter Disabled	Poff			-30	dBm	
Transmitter Enable Voltage	VEN	-0.3		0.8	V	
Transmitter Disable Voltage	VD	2.0		Vcc+0.3	V	
Differential Data Input Swing	VINpp	200		800	mV	
Receiver						
Support data rate			25.78		Gb/s	
Operate Wavelength		1260		1360	nm	
Receiver sensitivity	Sen			-12	dBm	1
Receive Power Overload		2			dBm	
LOS Asserted	T_loss_on	-30			dBm	
LOS De-Asserted	T_loss_off			-14	dBm	
LOS Hysteresis	T_loss_Hs	0.5		5	dB	
Differential Data Output Swing	VOUTPP	200		800	mV	
LOS Low Voltage	VLout	Vee		Vee+0.4	V	
LOS High Voltage	VHout	2.4		Vcc	V	

Note:
1. Measured at 25.78125Gb/s, ER>3.5dBm, PRBS 2^{31}-1 and BER better than or equal to 5E-5;

7. Digital Diagnostic Monitor Accuracy

Parameter	Symbol	Spec	Units	Conditions / Notes
Temperature		+/-3℃	℃	
Voltage		+/-3%	V	
IBias		+/-10%	mA	
Rx power		+/-3	dBm	
Tx power		+/-3	dBm	

8. Mechanical Specifications(mm)



9. Contact Information

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10. Revision History

Version No.	Date	Description
1.0	May.23, 2021	Preliminary datasheet
1.1	Apr.15, 2024	Updata the product description, the pin descriptions, the specifications of power consumption , and the electrical and optical characteristics
1.2	Jun.30, 2024	Update contact information.