PRODUCT FEATURES

- LC BiDi optical interface
- Up to 20km transmission distance
- 24.33Gb/s to 25.78Gb/s data links
- Single 3.3V Power supply
- Low DC power consumption
- Hot-Pluggable SFP28 footprint
- High performance 1270/1330nm DML laser
- High sensitivity PIN/TIA optical receiver
- Single Mode operation
- BER < 5X10 -5
- Built-in CDR
- Case Operating temperature ranges:Industrial : -40 to 85ºC

  Commercial：0 to 70℃
- RoHS2.0 compliance

APPLICATIONS

- 25G BASE Ethernet
- CPRI 25G

Standards

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

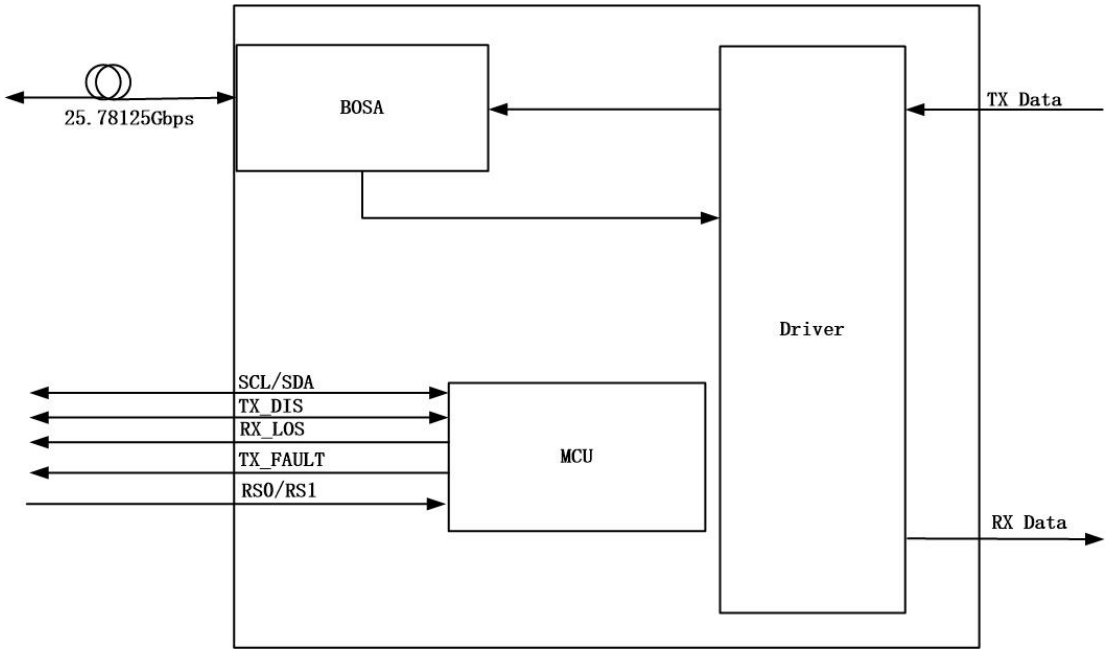
Ordering information

Part Number	Data Rate (Gb/s)	Media	Wavelength(nm)	Operating distance(km)	Temperature(℃)
IP-FFLK20B23C	25.78125	SMF	1270/1330	20	0~70
IP-FFLK20B32C	25.78125	SMF	1330/1270	20	0~70
IP-FFLK20B23I	25.78125	SMF	1270/1330	20	-40~85
IP-FFLK20B32I	25.78125	SMF	1330/1270	20	-40~85

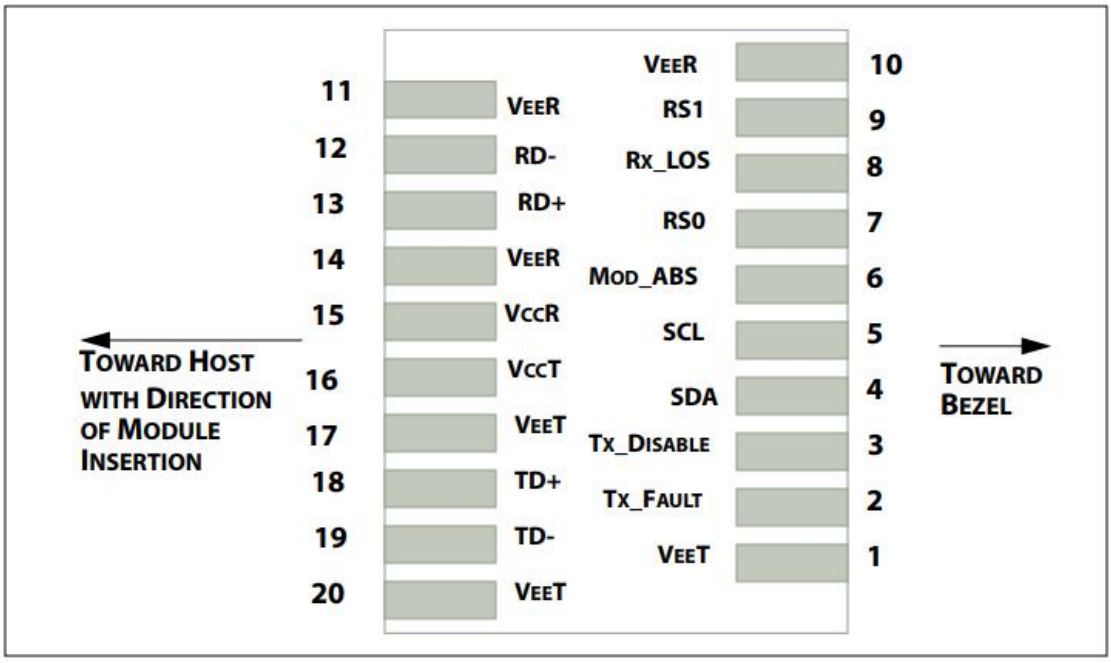
PRODUCT DESCRIPTION

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 Assignment



3. Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	V_{EET}	Transmitter Ground	
2	TF_{AULT}	Transmitter Fault Indication	1
3	T_{DIS}	Transmitter Disable-Module disables on high or open	
4	SDA	2-wire Serial Interface Data Line (MOD-DEF2)	
5	SCL	2-wire Serial Interface Clock (MOD-DEF1)	
6	MOD_ABS	Module Absent, connected to VEET	
7	RS0	Rx Rate Select	2
8	Rx_LOS	Loss of Signal indication. Logic 0 indicates normal operation.	1
9	RS1	Tx Rate Select	2
10	V_{EER}	Receiver Ground	
11	V_{EER}	Receiver Ground	
12	RD-	Receiver Inverted DATA out	3
13	RD+	Receiver Non-inverted DATA out	3
14	V_{EER}	Receiver Ground	
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground	
18	TD+	Transmitter Non-Inverted DATA in	4
19	TD-	Transmitter Inverted DATA in	4
20	V_{EET}	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	Units
Storage Temperature	Tstg	-40	+85	ºC
Case Operating Temperature (Industrial)	TO	-40	85	ºC
Case Operating Temperature (Commercial)	TO	0	70	ºC
Relative Humidity - Storage	RHS	0	95	%
Relative Humidity - Operating	RHO	0	85	%
DC Supply Voltage	VCC	0	3.6	V

5. Recommended Operating Environment

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 Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Differential Data input Swing	V_{IN}	200		800	mV	
Tx Differential Input Impendence	Z_{IN}		100		Ω	
Transmitter Disable Voltage	V_D	2.0		Vcc+0.3	V	
Transmitter Enable Voltage	V_{EN}	0		0.8	V	
Receiver						
Differential Data Output Swing	V_{OUT}	200		800	mV	
Rx Differential Output Impendence	Z_{OUT}		100		Ω	
LOS Assert Voltage	V_{LOSA}	2.4		Vcc	V	
LOS De-assert Voltage	V_{LOSD}	Vee		Vee+0.4	V	

7. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Transmitter Laser Type		1270/1330nm DML				
Average Output Power	Pout	-4		6	dBm	
Extinction ratio	ER	3			dB	
Wavelength	λ	1260	1270	1280	nm	
		1320	1330	1340		
Spectral Line RMS Width @ -20dB	Δλ			1	nm	
Side Mode Suppression Mode	SMSR	30			dB	
Average Output Power (Laser Off)	POFF			-30	dBm	
Receiver						
Receiver Type		PIN/TIA				
Wavelength	λ	1320	1330	1340	nm	
		1260	1270	1280		
Received Sensitivity (OMA)	P_{IN}(OMA)			-12	dBm	1
Optical Power Overload	P_{IN}(SAT)	2			dBm	
Rx_LOS of Signal Assert	LOSA	-30			dBm	
Rx_LOS of Signal De-assert	LOSD			-14	dBm	
Rx_LOS of Signal Hysteresis	LOSH	0.5		5	dB	

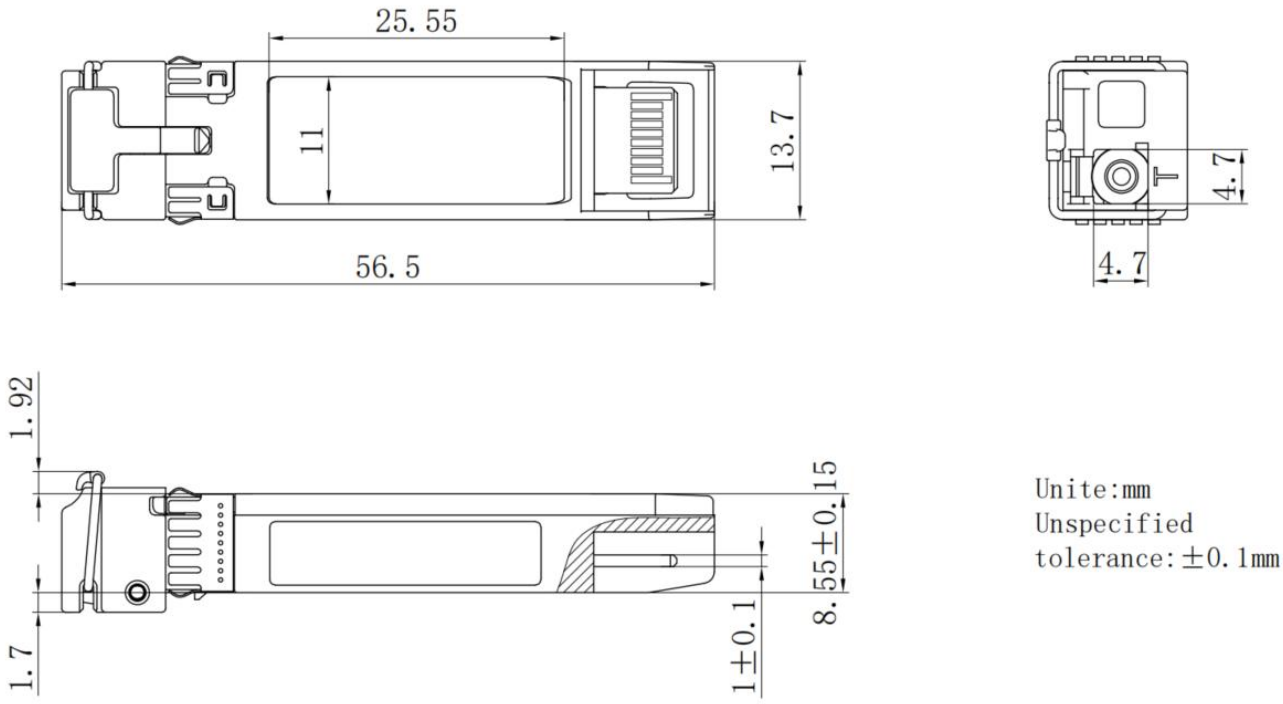
Note:

1.Measured at 25.78Gb/s with PRBS 2^{31-1} NRZ test pattern for BER < $5x10^{-5}$.

8. Digital Diagnostic Monitor Characteristics

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

9. Mechanical Dimensions



10. Regulatory Compliance

Feature	Reference	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	LV4(Air discharge :15KV;Contact discharge:8 KV) Performance criterion:B
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 field swept from 80 to 1000MHz applied to the transceiver without a chassis enclosure.

11. Contact Information

Wuhan Inphilight Technology Company Limited
NO.4 Building,Bonded Optoelectronics Industrial Park,Wuhan East Lake Comprehensive Bonded Area,NO.777-30 Optics Valley 3rd Road,East Lake Hi-Technology Development Zone,Wuhan, Hubei, China
Email: sales@inphilight.com

12. Revision History

Version No.	Date	Description
1.0	Mar. 15, 2020	Preliminary datasheet
1.1	Jan. 23, 2024	Update the power consumption, optical characteristics and digital diagnostic monitor characteristics.
1.2	Jun.30, 2024	Update contact information.