



# Product Specification

## 10Gbps BiDi SFP+ Transceiver

**PLSFPP10GBD27XXD**

**PLSFPP10GBD33XXD**

V20140812

### Product Features

- | Up to 10Gbps data links
- | 2km to 60km with 9/125μm SMF \*1
- | WDM 1270/1330nm DFB laser
- | **Simplex LC Connector**
- | Hot-pluggable SFP+ footprint
- | Single 3.3V power supply
- | Operating temperature: -5°C to 70°C
- | RoHS
- | Digital Diagnostic Monitor (DDM)

### Applications

- √ 10GBase Ethernet
- √ 10G FC

\*1 Notice

PART NUMBER	DISTANCE	LASER
PLSFPP10GBD2704D	2KM	DFB/PIN
PLSFPP10GBD3304D	2KM	DFB/PIN
PLSFPP10GBD2710D	10KM	DFB/PIN
PLSFPP10GBD3310D	10KM	DFB/PIN
PLSFPP10GBD2720D	20KM	DFB/PIN
PLSFPP10GBD3320D	20KM	DFB/PIN



PLSFPP10GBD2740D	40KM	DFB/PIN
PLSFPP10GBD3340D	40KM	DFB/PIN
PLSFPP10GBD2760D	60KM	DFB/APD
PLSFPP10GBD3360D	60KM	DFB/APD

## 1. Product Description

The PLSFPP10GBD27XXD/ PLSFPP10GBD33XXD is a 10Gbps enhanced small form factor pluggable SFP+ transceiver compatible with 10GBASE Ethernet and 10G Fiber Channel. It is suitable for single-mode fiber (SMF) communications in 10Gbps Ethernet and 10G Fiber Channel by single fiber.

PART NUMBER	CLASP COLOR
PLSFPP10GBD27XXD	BLUE
PLSFPP10GBD33XXD	GREEN

## 2. Regulatory Compliance

TINOUT transceivers are Class 1 Laser Products comply with FDA regulations. Meet Class 1 eye safety requirements of EN 60825 and the electrical safety requirements of EN 60950.

## 3. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	Vcc	-0.5	4	V
Storage Temperature	Ts	-40	85	°C
Operating Case Temperature	Tc	-5	70	°C

## 4. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	Tc	-5		70	°C
Power Supply Voltage	Vcc	3.15	3.3	3.45	V



Power Supply Current	I <sub>cc</sub>			300	mA
Data Rate			10		GBps
Max Link Length on 9/125μm SMF	L <sub>max</sub>	Ref. *1 Notice			

## 5. Optical Characteristics

Parameter		Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>						
PLSFPP10GBD27XXD Centre Wavelength		$\lambda_c$	1260	1270	1280	nm
PLSFPP10GBD33XXD Centre Wavelength		$\lambda_c$	1320	1330	1340	nm
Spectral Width (RMS)		$\sigma$			3	nm
Average Output Power	PLSFPP10GBD2704D PLSFPP10GBD3304D PLSFPP10GBD2710D PLSFPP10GBD3310D	P <sub>out</sub>	-4		5	dBm
	PLSFPP10GBD2720D PLSFPP10GBD3320D	P <sub>out</sub>	-4		5	dBm
	PLSFPP10GBD2740D PLSFPP10GBD3340D	P <sub>out</sub>	-1		5	dBm
	PLSFPP10GBD2760D PLSFPP10GBD3360D	P <sub>out</sub>	1		5	dBm
Extinction Ratio		ER	3.5			dB
Average Launch Power of Off Transmitter		P <sub>off</sub>			-30	dBm
<b>Receiver</b>						
PLSFPP10GBD27XXD Centre Wavelength		$\lambda_c$	1320	1330	1340	nm
PLSFPP10GBD33XXD Centre Wavelength		$\lambda_c$	1260	1270	1280	nm
Receiver Sensitivity	PLSFPP10GBD2704D PLSFPP10GBD3304D	P <sub>IN</sub>			-8	dBm
	PLSFPP10GBD2710D PLSFPP10GBD3310D	P <sub>IN</sub>			-14	dBm
	PLSFPP10GBD2720D PLSFPP10GBD3320D	P <sub>IN</sub>			-14	dBm
	PLSFPP10GBD2740D PLSFPP10GBD3340D	P <sub>IN</sub>			-15	dBm
	PLSFPP10GBD2760D	P <sub>IN</sub>			-20	dBm



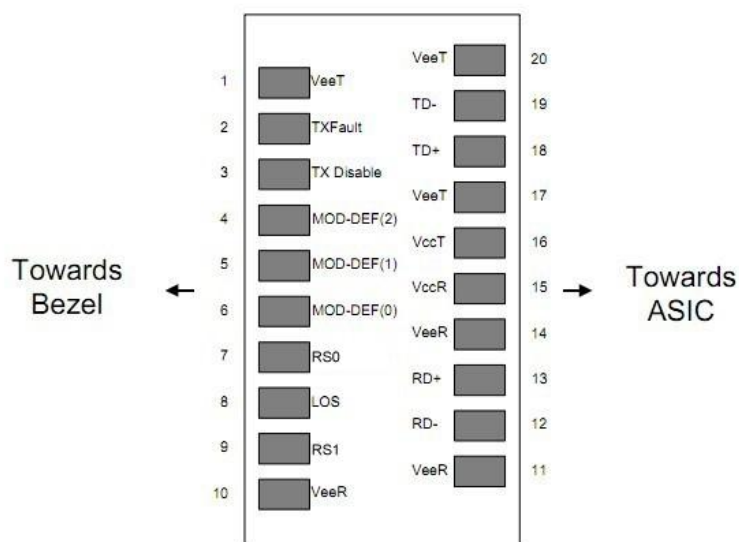
	PLSFPP10GBD3360D				
Receiver Overload	PLSFPP10GBD2704D	Pmax	5		dBm
	PLSFPP10GBD3304D				
	PLSFPP10GBD2710D				
	PLSFPP10GBD3310D				
	PLSFPP10GBD2720D				
	PLSFPP10GBD3320D				
	PLSFPP10GBD2740D	Pmax	-7		dBm
	PLSFPP10GBD3340D				
	PLSFPP10GBD2760D				
	PLSFPP10GBD3360D				
LOS De-Assert	LOS <sub>D</sub>			-27	dBm
LOS Assert	LOS <sub>A</sub>	-30			dBm
LOS Hysteresis		0.5		4.5	dB

## 6. Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>					
Input Differential Impedance	Z <sub>in</sub>	90	100	110	Ω
Data Input Swing Differential	V <sub>in</sub>	250		1200	mV
Tx-Dis Disable	V <sub>d</sub>	2.0		V <sub>cc</sub>	V
Tx-Dis Enable	V <sub>en</sub>	0		0.8	V
<b>Receiver</b>					
Data Output Swing Differential	V <sub>out</sub>	250		800	mV
Rx-Los Fault	V <sub>lf</sub>	2.0		V <sub>ccHOST</sub>	V
Rx-Los Normal	V <sub>ln</sub>	0		0+0.8	V
Output rise and fall time	Tr, Tf	30			ps



## 7. Pin Descriptions



**Diagram of Host Board Connector Block Pin Numbers and Names**

Pin	Symbol	Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	7.1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	7.2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	7.3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	7.3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	7.3
7	RS0	Rate Select0, optionally controls SFP+ module receiver. When high input signaling rate > 4.25 GBd and when low input signaling rate < 4.25 GBd	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	7.4
9	RS1	Rate Select1, optionally controls SFP+ module receiver. When high input signaling rate > 4.25 GBd and when low input signaling rate < 4.25 GBd	
10	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
11	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	7.1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	



19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	7.1

Notes:

7.1 Circuit ground is internally isolated from chassis ground.

7.2 Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

7.3 Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD\_DEF(0) pulls line low to indicate module is plugged in.

7.4 LOS is open collector output. Should be pulled up with 4.7k -10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

## 8. EEPROM & DDM THRESHOLD

### 8.1 EEPROM

**2 wire address 1010000X (A0h)**

0~95	Serial ID Defined by SFP MSA (96 bytes)
96~127	Vendor Specific (32 bytes)
128~255	Reserved (128 bytes)

#### EEPROM Serial ID Memory Contents



Add.	Size (Bytes)	Name of Field	Hex	Description
<b>BASE ID FIELDS</b>				
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	SFP function is defined by serial ID only
2	1	Connector	07	LC
3-10	8	Transceiver	20 00 00 00 00 00 00 00	Transmitter Code
11	1	Encoding	06	64B/66B
12	1	BR, Nominal	67	10.3Gbps
13	1	Reserved	00	
14	1	Length (9um) km	XX	XXkm
15	1	Length (9um) km	XX	
16	1	OM2 Length (50um) m	00	
17	1	OM1 Length (62.5um) m	00	
18	1	Length (Copper)	00	
19	1	OM3 Length (50um) m	00	
20-35	16	Vendor Name	43 2D 4C 49 47 48 54 20 20 20 20 20 20 20 20 20	TINOUT * CUSTOM available
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	* CUSTOM available
40-55	16	Vendor PN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	* CUSTOM available
56-59	4	Vendor Rev	30 31 20 20	01
60-61	2	Wavelength	04 F6/ 05 32	1270nm/ 1330nm
62	1	Reserved	00	
63	1	CC_BASE	xx	Check Code for Base ID Field
<b>EXTENDED ID FIELDS</b>				
64-65	2	Options	00 1A	Loss/ TX_Fault/ TX_Disable
66	1	BR, Max	00	
67	1	BR, Min	00	
68-83	16	Vendor SN	43 4C xx xx xx xx xx xx xx xx xx 20 20 20 20 20	SN of Transceiver (ASCII). Exp. "CLXXXXXXXXXX"
84-91	8	Date Code	xx xx xx xx xx xx 20 20	YY/MM/DD Exp. 120727
92	1	Diagnostic Monitoring	68	
93	1	Enhanced Options	F0	
94	1	SFF_8472 Compliance	03	
95	1	CC_EXT	checksum	Checksum for Extended ID
<b>VENDOR SPECIFIC ID FIELDS</b>				



96-127	32	Vendor Specific	20 20 20.....	Depends on Customer Info
128-255	128	Reserved	FF FF FF.....	Depends on Customer Info

## 8.1 DDM THRESHOLD

### PLSFPP10GBD2704D/PLSFPP10GBD3304D

	Low Alarm	Low Warn	High Warn	High Alarm
Temperature	-13°C	-8°C	85°C	88°C
Voltage	2.9V	3V	3.6V	3.7V
Tx Bias	15mA	20mA	80mA	85mA
Tx Power	-6dBm	-5dBm	5dBm	6dBm
Rx Power	-10dBm	-8dBm	5dBm	6dBm

### PLSFPP10GBD2710D/PLSFPP10GBD3310D

### PLSFPP10GBD2720D/PLSFPP10GBD3320D

	Low Alarm	Low Warn	High Warn	High Alarm
Temperature	-13°C	-8°C	85°C	88°C
Voltage	2.9V	3V	3.6V	3.7V
Tx Bias	15mA	20mA	80mA	85mA
Tx Power	-8dBm	-7dBm	5dBm	6dBm
Rx Power	-18dBm	-15dBm	5dBm	6dBm

### PLSFPP10GBD2740D/PLSFPP10GBD3340D

	Low Alarm	Low Warn	High Warn	High Alarm
Temperature	-13°C	-8°C	85°C	88°C
Voltage	2.9V	3V	3.6V	3.7V
Tx Bias	15mA	20mA	80mA	85mA
Tx Power	-5dBm	-3dBm	5dBm	6dBm
Rx Power	-18dBm	-16dBm	5dBm	6dBm

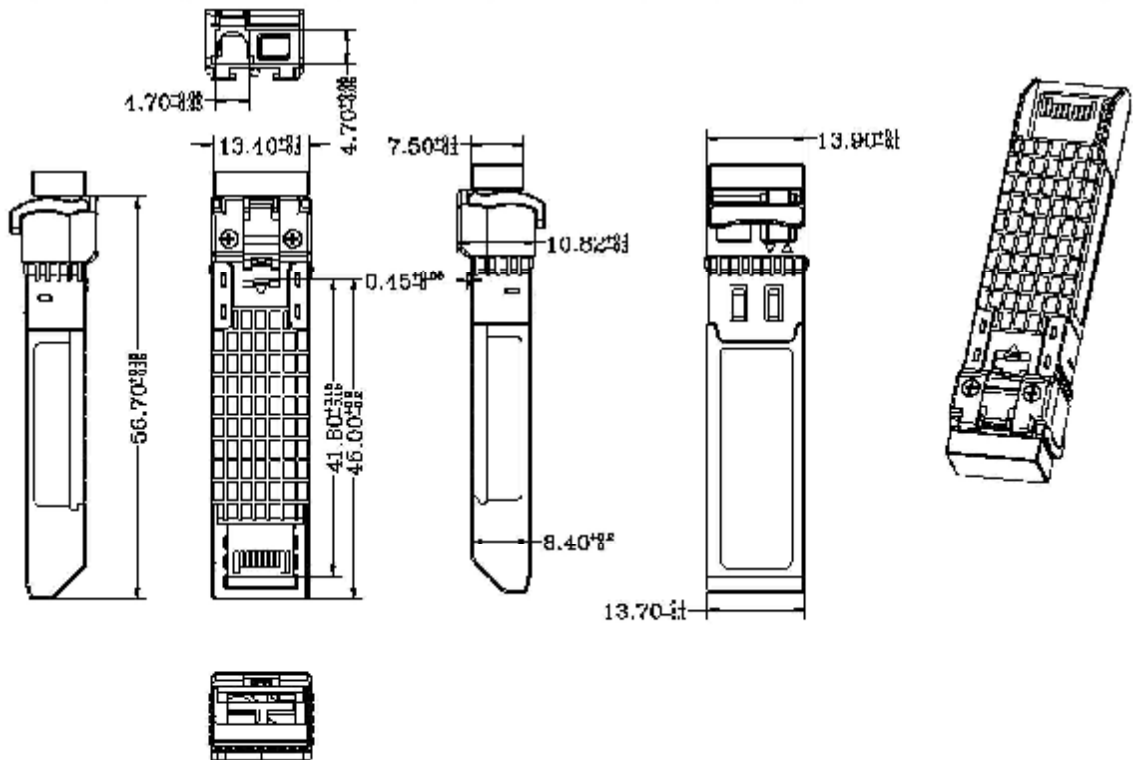
### PLSFPP10GBD2760D/PLSFPP10GBD3360D

	Low Alarm	Low Warn	High Warn	High Alarm
Temperature	-13°C	-8°C	85°C	88°C
Voltage	2.9V	3V	3.6V	3.7V
Tx Bias	15mA	20mA	80mA	85mA
Tx Power	-1dBm	0dBm	5dBm	6dBm
Rx Power	-20dBm	-18dBm	-7dBm	-6dBm





## 9. Mechanical Specifications



## 10. LABEL

TINOUT offers label OEM design and print.  
Label barcode supports code128 and 2D barcode  
SIZE: 30mm\*10mm





## Ordering Information

Part No.	Data Rate	DDM	Wave	Fiber Type	Dist.	Temp.	Optical Interface
PLSFPP10GBD2704D	10Gbps	yes	1270nm	SMF	2km	-5~70℃	BiDi LC
PLSFPP10GBD3304D	10Gbps	yes	1330nm	SMF	2km	-5~70℃	BiDi LC
PLSFPP10GBD2710D	10Gbps	yes	1270nm	SMF	10km	-5~70℃	BiDi LC
PLSFPP10GBD3310D	10Gbps	yes	1330nm	SMF	10km	-5~70℃	BiDi LC
PLSFPP10GBD2720D	10Gbps	yes	1270nm	SMF	20km	-5~70℃	BiDi LC
PLSFPP10GBD3320D	10Gbps	yes	1330nm	SMF	20km	-5~70℃	BiDi LC
PLSFPP10GBD2740D	10Gbps	yes	1270nm	SMF	40km	-5~70℃	BiDi LC
PLSFPP10GBD3340D	10Gbps	yes	1330nm	SMF	40km	-5~70℃	BiDi LC
PLSFPP10GBD2760D	10Gbps	yes	1270nm	SMF	60km	-5~70℃	BiDi LC
PLSFPP10GBD3360D	10Gbps	yes	1330nm	SMF	60km	-5~70℃	BiDi LC

## VERSION UPDATE:

VERSION NO.	DATE	UPDATED INFORMATION
V20131010	20131010	1. NEW PUBLISHED

## NOTICE:

TINOUT reserves the right to make changes to this product in this specification without notice, in order to improve product performance.

## CONTACT:

TINOUT TECHNOLOGY LIMITED

E-mail: [CROFT@TINOUT.com](mailto:CROFT@TINOUT.com) <http://www.TINOUT.com>

[WWW.TINOUT.COM](http://WWW.TINOUT.COM)