DATA SHEET

10.3Gbps XFP BIDI Transceiver, Single Mode,60km Reach TX1270nm / RX1330nm (TX1330nm / RX1270nm)

UTX10E6Bxx Transceiver Overview

UTX10E6BXX are hot pluggable 3.3V Small-Form-Factor transceiver modules. They are designed expressly for high-speed communication applications that require rates up to 11.3Gb/s, they are designed to be compliant with XFP MSA. The module data link up to 60km in 9/125um single mode fibe

Product Features

- Supports 9.95Gbps to 11.3Gbps bit rates
- Hot-pluggable XFP footprint
- XFI Loopback Mode
- 1270nm DFB laser and PIN receiver for UTX10E6B23
- 1330nm DFB laser and PIN receiver for UTX10E6B32
- Up to 60km for SMF transmission
- Compliant with SFP+ MSA and SFF-8472 with single LC receptacless

Compatible with RoHS

- Single +3.3V power supply
- Power dissipation<2.0W
- 2-wire interface with integrated Digital Diagnostic monitoring
- EEPROM with Serial ID Functionality
- Operating case temperature:
- Standard: -5 to +70°C
- Industrial: -40 to +85°C

Applications

- 10GBASE-LR/LW 10G Ethernet
- 10G Fiber Channel
- SONET OC-192 SR-1 SDH STM I-64.1

Ordering Information

Part Number	Description
UTX10E6B23	TX1270/RX1330, 10Gbps, LC, 60km, 0° C~+70° C, with DDM
UTX10E6B 32	TX1330/RX1270, 10Gbps, LC, 60km, 0° C~+70° C, with DDM
UTX10E6B23I	TX1270/RX1330, 10Gbps, LC, 60km, -40° C~+85° C, with DDM
UTX10E6B 32I	TX1330/RX1270, 10Gbps, LC, 60km, -40° C~+85° C, with DDM

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General Specifications

Parameter		Symbol	Min	Typ	Max	Unit	Remarks
Data Rate		DR	9.95	10.3	11.3	Gbps	
Bit Error Rate		BER			10^{-12}		
Operating Temperature	Standard	T_{OP}	-5		70	℃	
	Industrial		-40		+85	℃	
Storage Temperature		T_{STO}	– 40		85	℃	
Supply Current		I_S			600	mA	
Input Voltage		V_{CC}	3.14	3.3	3.46	V	
Maximum Voltage		V_{MAX}	– 0.5		4	V	

Optical Characteristics – Transmitter

V_{CC}=3.14V to 3.46V, T_C=-5℃ to 70℃

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Output Optical Power	P_{TX}	0		5	dBm	1
Side-Mode Suppression Ratio	SMSR	30	-		dB	
Optical Center Wavelength	λ_C	1260	1270	1280	nm	UTX10E6B23
		1320	1330	1340	nm	UTX10E6B32
Extinction Ratio	ER	3.5			dB	
Optical Rise/Fall Time (20% - 80%)	T_{RF_IN}			20	ps	
Relative Intensity Noise	RIN			– 130	dB/Hz	
Output Eye	Compliant with IEEE802.3 standard					

Optical Characteristics – Receiver

V_{CC}=3.14V to 3.46V, T_C=-5℃ to 70℃

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Receiver Sensitivity	S			-15	dBm	
Optical Center Wavelength	λ_C	1320	1330	1340	nm	UTX10E6B23
		1260	1270	1280	nm	UTX10E6B32
Receiver Sensitivity	R_{X_SEN}			-20	dBm	
Optical Power Input Overload	$P_{in\text{-}max}$	+0.5			dbm	
Receiver Reflectance	R			-14	dB	
LOS Assert	P_{LOS_A}	-38			dBm	

LOS De-Assert	P_{LOS_D}		-21	dBm	
LOS Hysteresis		0.5	4	dB	

Electrical Characteristics – Transmitter

V_{CC}=3.14V to 3.46V, T_C=-5℃ to 70℃

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Input differential impedance	R_{IN}		100		Ω	
Transmit differential output Voltage		120		820	mV	
Transmit disable voltage	V_D	V_{CC}–0.5		V_{CC}	V	
Transmit enable voltage	V_{EN}	V_{EE}		V_{EE}+0.8	V	
Transmit disable assert time				10	us	

Electrical Characteristics – Receiver

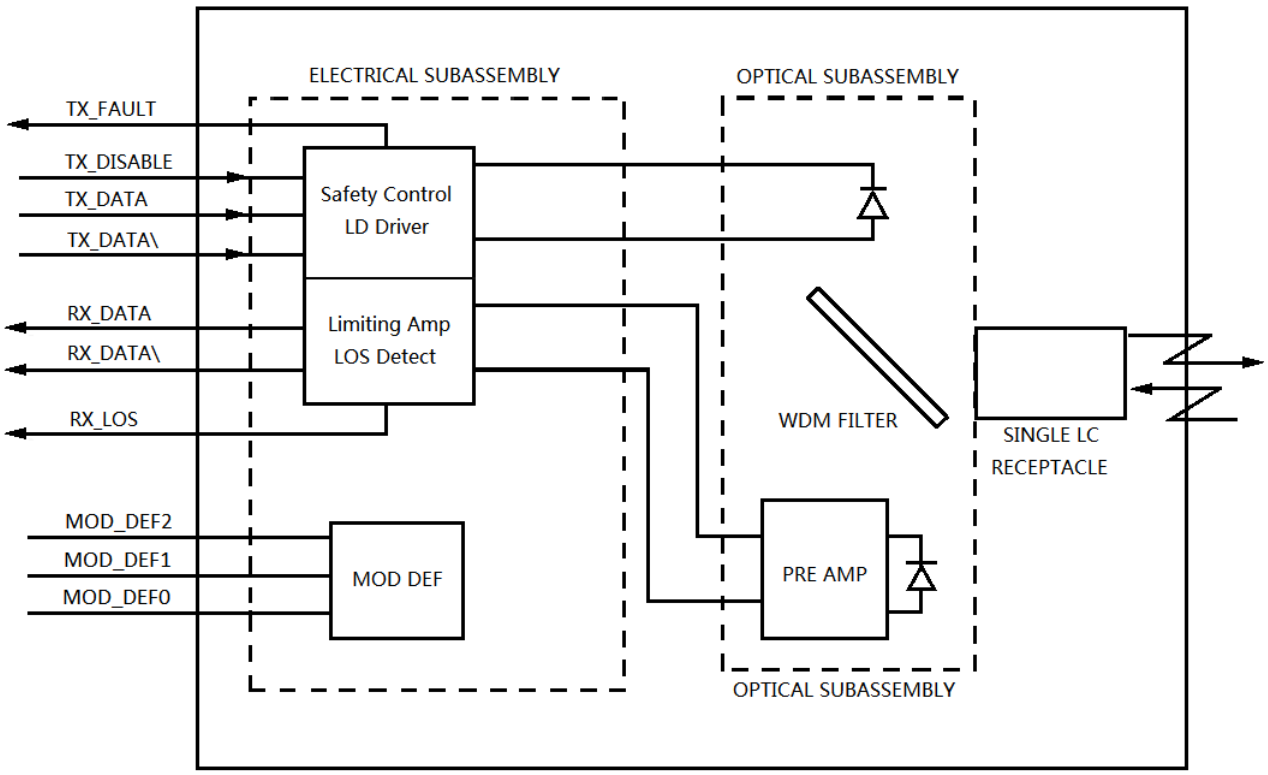
V_{CC}=3.14V to 3.46V, T_C=-5℃ to 70℃

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Differential data out put swing	V_{OUT_PP}	340	400	850	mV	
Data output rise/fall time (20%-80%)	T_R			20	ps	
LOS Fault	V_{LOS_Fault}	V_{CC} – 0.5		V_{CC_HOST}	V	
LOS Normal	V_{LOS_Normal}	V_{EE}		V_{EE} +0.5	V	

Notes:

1) The supply current is XFP module's working current.
2) For the measurements, the device was driven with10Gbps data pattern with 2^{31}-1 PRBS payload.
3) Optical transition time is the time interval required for the rising or falling edge of an optical pulse to transition between the 20% and 80% amplitudes relative to the logical 1 and 0 levels
4) Measured with a PRBS 2^{31}-1 test pattern, @10Gbps, ER=3.5dB, BER<10^{-12}
5) The LOS Hysteresis minimizes 'chatter' on the output line. In principle, Hysteresis alone does not guarantee chatter-free operation.

Block Diagram of Transceiver



Transmitter Section

The FP driver accepts differential input data and provide bias and modulation currents for driving a laser. An automatic power-control (APC) feedback loop is incorporated to maintain a constant average optical power.

TX_DISABLE

The TX_DISABLE signal is high (TTL logic "1") to turn off the laser output. The laser will turn on within 1ms when TX_DISABLE is low (TTL logic "0").

TX_FAULT

When the TX_FAULT signal is high, output indicates a laser fault of some kind. Low indicates normal operation.

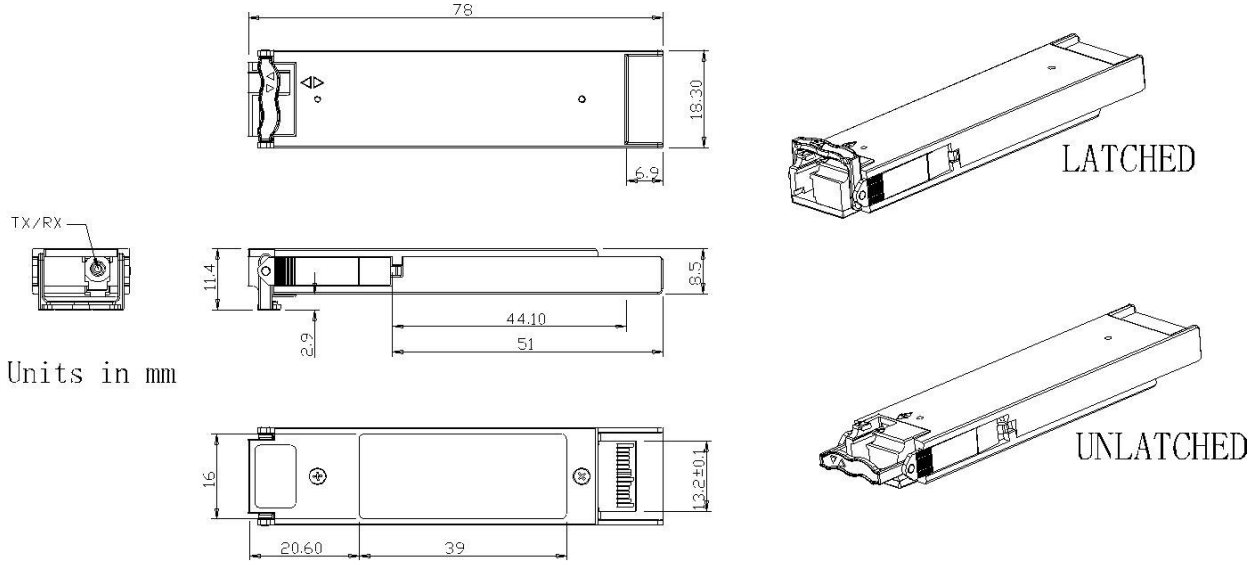
Receiver Section

The receiver utilizes a PIN detector integrated with a trans-impedance preamplifier in an OSA. This OSA is connected to a Limiting Amplifier which providing post-amplification quantization, and optical signal detection. The limiting Amplifier is AC-coupled to the transimpedance amplifier, with internal 100Ω differential termination.

Receive Loss (RX_LOS)

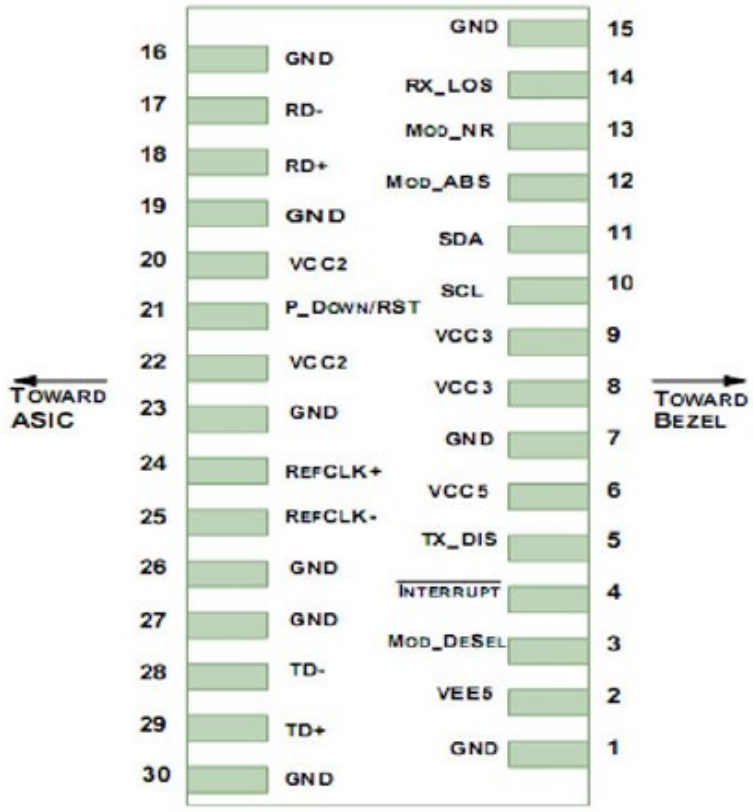
The RX_LOS is high (logic "1") when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in TTL level.

Dimensions



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

Electrical Pad Layout



Pin	Signal Name	Description	Plug Seq.	Notes
1	GND	Module Ground		1
2	VEE5	Optional –5.2 Power Supply – Not required		
3	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	LVTTL-I	
4	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	LVTTL-O	2
5	TX_DIS	Transmitter Disable; Transmitter laser source turned off	LVTTL-I	
6	VCC5	+5 Power Supply		
7	GND	Module Ground		1
8	VCC3	+3.3V Power Supply		
9	VCC3	+3.3V Power Supply		
10	SCL	Serial 2-wire interface clock	LVTTL-I	2
11	SDA	Serial 2-wire interface data line	LVTTL-I/O	2
12	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	LVTTL-I	2
13	Mod_NR	Module Not Ready; defines it as a logical OR between RX_LOS and Loss of Lock in TX/RX.	LVTTL-I	2
14	RX_LOS	Receiver Loss of Signal indicator	LVTTL-I	2
15	GND	Module Ground		1
16	GND	Module Ground		1
17	RD-	Receiver inverted data output	CML-O	
18	RD+	Receiver non-inverted data output	CML-O	
19	GND	Module Ground		1
20	VCC2	+1.8V Power Supply – Not required		
21	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset Reset; The falling edge initiates a complete reset of the module	LVTTL-I	
22	VCC2	including the 2-wire serial interface, equivalent to a power cycle. +1.8V Power Supply – Not required		
23	GND	Module Ground		1
24	RefCLK+	Reference Clock non-inverted input, AC	PECL-I	3

		coupled on the host board – Not required		
25	RefCLK-	Reference Clock inverted input, AC coupled on the host board – Not required	PECL-I	3
26	GND	Module Ground		1
27	GND	Module Ground		1
28	TD-	Transmitter inverted data input	CML-I	
29	TD+	Transmitter non-inverted data input	CML-I	
30	GND	Module Ground		1

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1) Module circuit ground is isolated from module chassis ground within the module.

2) Open collector; should be pulled up with 4.7k – 10kohms on host board to a voltage between 3.15V and 3.6V.

3) A Reference Clock input is not required by the MT-XFBL-23/32G10-60. If present, it will be ignored.

References

1. IEEE standard 802.3. IEEE Standard Department, 2005.

2. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 2000.