UTS10E4Bxx

10.3Gbps SFP+ BIDI Transceiver, Single Mode, 40km Reach

TX1270nm / RX1330nm (TX1330nm / RX1270nm)

Features

- Supports up to 11.3Gbps bit rates
- Hot-pluggable SFP+ footprint
- 1270nm DFB laser and PIN receiver for UTS10E4B23
- 1330nm DFB laser and PIN receiver for UTS10E4B32
- Up to 40km for SMF transmission
- Compliant with SFP+ MSA and SFF-8472 with single LC receptacle
- Compatible with RoHS
- Single +3.3V power supply
- Power dissipation<1.0W
- 2-wire interface with integrated Digital Diagnostic monitoring
- EEPROM with Serial ID Functionality
- Operating case temperature:
  Standard: 0 to +70°C
  Industrial: -40 to +85°C

Application

- 10GBASE-BX & 10GBASE-ER/EW
- 10G SONET/SDH, OTU2/2e

STANDARD

- Compliant with SFF-8472
- Compliant to SFF-8431

Description

UTS10E4B32/23 are hot pluggable 3.3V Small-Form-Factor transceiver module. They are designed expressly for high-speed communication applications that require rates up to 11.3Gb/s, they are designed to be compliant with SFF-8472 SFP+ MSA. The module data link up to 40km in 9/125um single mode fiber.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	0	4	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	95	%
Signal Input Voltage		Vcc-0.3	Vcc+0.3	V

Recommended Operating Conditions

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Tc	0		+70	°C
	Industrial		-40		+85	°C
Power Supply Voltage		Vcc	3.135	3.30	3.465	V
Power Supply Current		Icc			300	mA
Data Rate				10.3	11.3	Gbps
Fiber Length 9/125μm core SMF			-	40	-	km

Optical and Electrical Characteristics

Parameter		Symbol	Min	Typical	Max	Unit	Notes
Transmitter							
Centre Wavelength		λc	1260	1270	1280	nm	UTS10E4B23
			1320	1330	1340	nm	UTS10E4B32
Spectral Width（-20dB）		Δλ			1	nm	
Side-Mode Suppression Ratio		SMSR	30	-		dB	
Average Output Power		P_{out}	0		5	dBm	1
Extinction Ratio		ER	3.5			dB	
Data Input Swing Differential		V_{IN}	180		700	mV	2
Input Differential Impedance		Z_{IN}	85	100	115	Ω	
TX Disable	Disable		2.4		Vcc	V	
	Enable		-0.3		0.8	V	
TX Fault	Fault		2.0		Vcc	V	
	Normal		-0.3		0.8	V	

Receiver						
Centre Wavelength	λc	1320	1330	1340	nm	UTS10E4B23
		1260	1270	1280	nm	UTS10E4B32
Receiver Sensitivity				-15	dBm	3
Receiver Overload		0.5			dBm	3
LOS De-Assert	LOS_D			-17	dBm	
LOS Assert	LOS_A	-30			dBm	
LOS Hysteresis		0.5		5	dB	
Data Output Swing Differential	V_{out}	300		850	mV	4
LOS	Fault	Vcc-1.3		VccHost	V	
	Norm	Vee		Vee +0.8	V	

Notes:

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a $PRBS2^{31}$-1 test pattern @10312Mbps, BER ≤1×10^{-12}.
4. Internally AC-coupled.

Digital Diagnostic Memory Map

UTS10E4B32/23 transceivers support the 2-wire serial communication protocol as defined in the SFP+MSA.

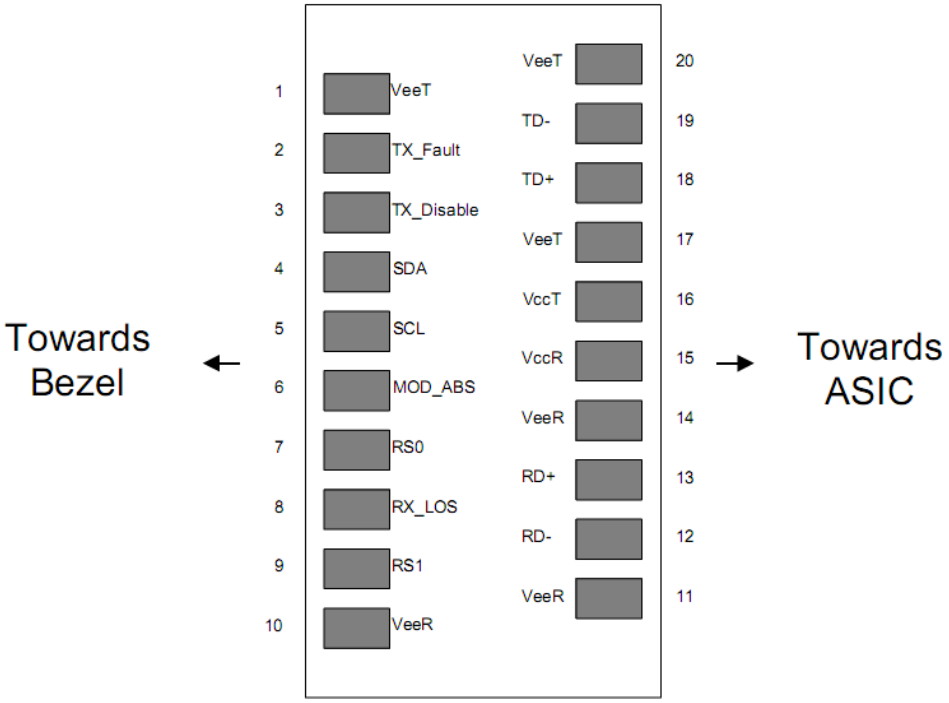
The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information. Additionally, SFP+ transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

The SFP+ MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h).The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer. The host uses SDA in

conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

Pin Descriptions



Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Note 3
9	RS1	Not Connected	3	
10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	V_{EER}	Receiver ground	1	
15	V_{CCR}	Receiver Power Supply	2	

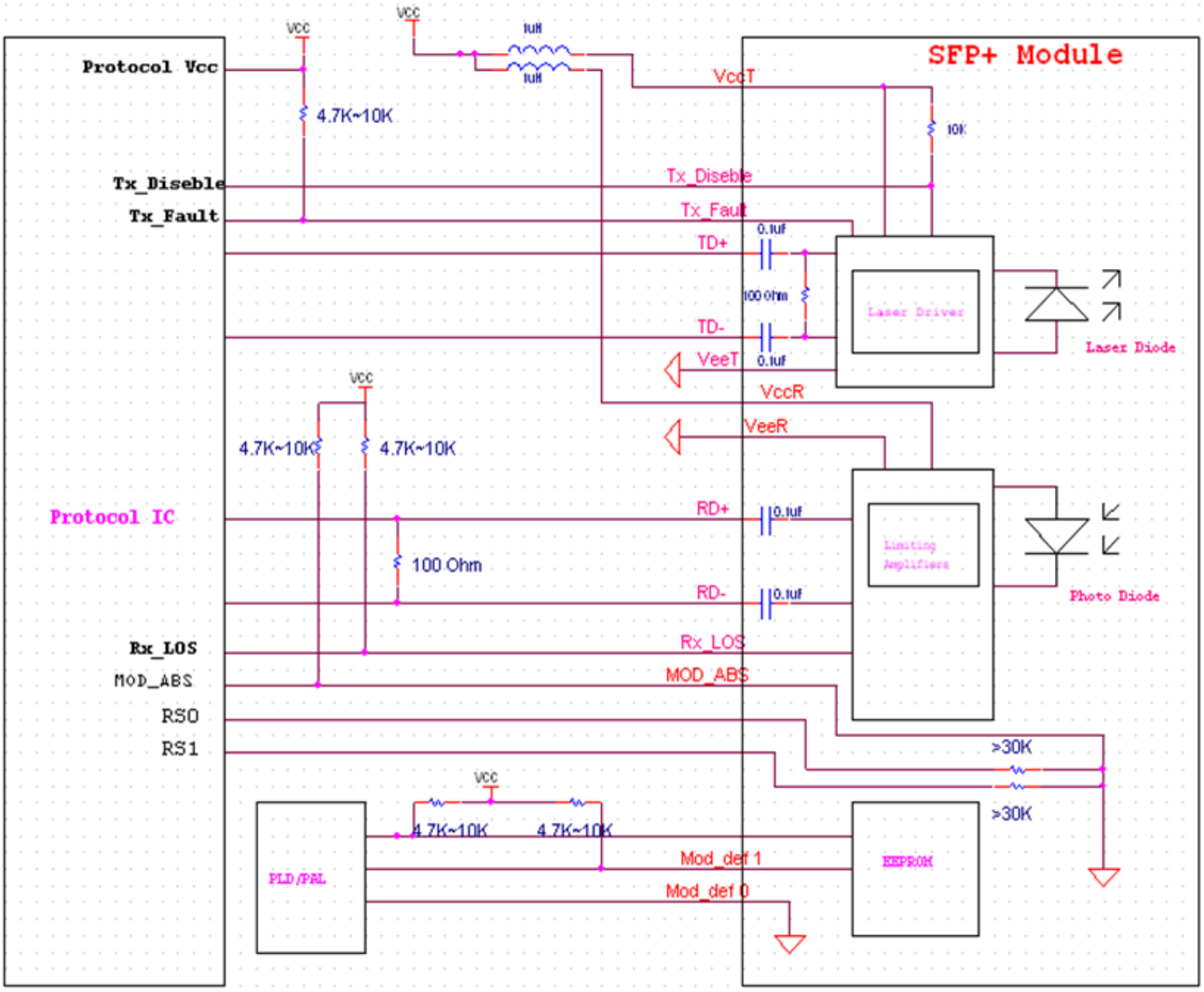
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5
19	TD-	Inv. Transmit Data In	3	Note 5
20	V_{EET}	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

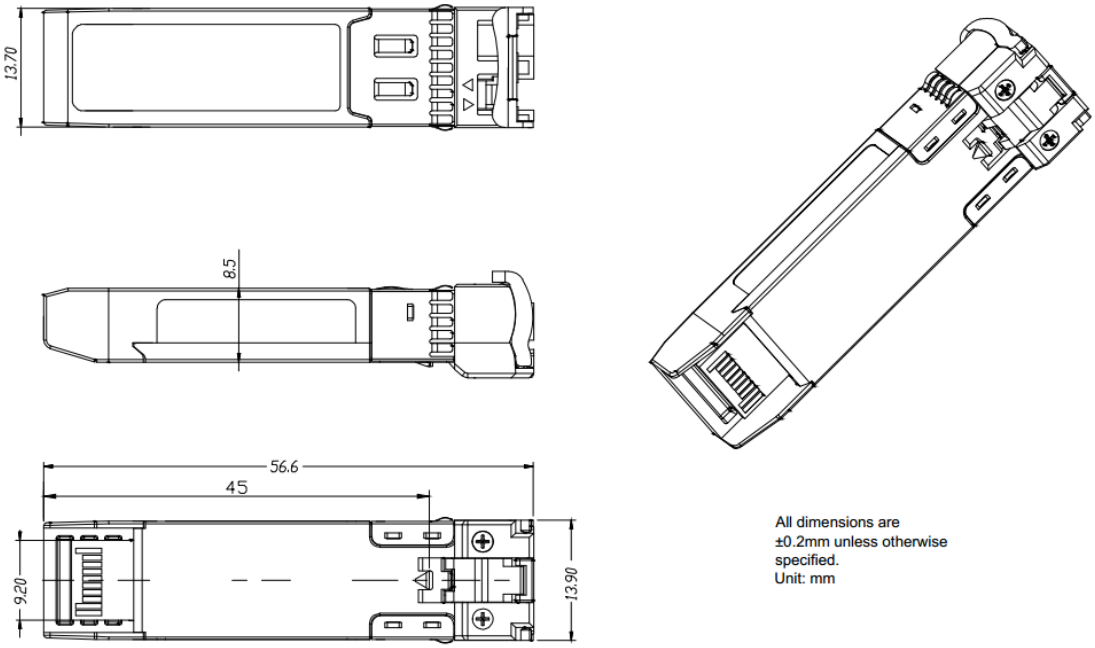
1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
2) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3) LOS is open collector output Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
4) RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
5) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Interface Circuit



Package Outline

Dimensions are in millimeters. All dimensions are ±0.2mm unless otherwise specified. (Unit: mm)



Ordering information

Model No.	Product Description
UTS10E4B23	TX1270/RX1330, 10Gbps, LC, 40km, 0°C~+70°C, with DDM
UTS10E4B32	TX1330/RX1270, 10Gbps, LC, 40km, 0°C~+70°C, with DDM
UTS10E4B23I	TX1270/RX1330, 10Gbps, LC, 40km, -40°C~+85°C, with DDM
UTS10E4B32I	TX1330/RX1270, 10Gbps, LC, 40km, -40°C~+85°C, with DDM