**DATA SHEET**
**UNIVISO – UTS10Z8Bxx**

## 10.3Gbps SFP+ BIDI Transceiver, Single Mode,80km Reach TX1490nm / RX1550nm (TX1550nm / RX1490nm)

UTS10Z8Bxx are hot-pluggable 3.3V Small-Form-Factor transceiver modules. They are designed expressly for high-speed communication applications that require rates up to 11.1Gb/s, they are designed to be compliant with SFF-8472 SFP+ MSA. The module data link up to 80km in 9/125um single mode fiber.

### Product Features

- Supports 11.1Gb/s bit rates
- Hot-pluggable SFP+ footprint
- Up to 80km for SMF transmission
- 1490nm EML laser and APD receiver for UTS10Z8B45
  1550nm EML laser and APD receiver for UTS10Z8B54
- Compliant with SFP+ MSA with single LC receptacle
- Compatible with RoHS
- Single +3.3V power supply
- Power dissipation<1.8W
- 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-BX 10.3125Gb/s Ethernet

### Ordering Information

| Part. No | Specifications (Per Channel) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pack | Rate (Gbps) | Tx (nm) | Po (dBm) | RX | Sen (dBm) | Temp (°C) | Reach (km) | DDM |
| UTS10Z8B45 | SFP+ | 10.3 | 1490 | 0~4 | APD | <-23 | 0~70 | 80 | Y |
| UTS10Z8B54 | SFP+ | 10.3 | 1550 | -1~3 | APD | <-23 | 0~70 | 80 | Y |
| UTS10Z8B45I | SFP+ | 10.3 | 1490 | 0~4 | APD | <-23 | -40~85 | 80 | Y |
| UTS10Z8B54I | SFP+ | 10.3 | 1550 | -1~3 | APD | <-23 | -40~85 | 80 | Y |

**For More Information:**
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## General Specifications

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Data Rate per Lane | DR | 9.95 | 10.3 | 11.1 | Gbps | |
| Operating Temperature | $T_{OP}$ | 0 | | 70 | ℃ | |
| Storage Temperature | $T_{STO}$ | – 40 | | 85 | ℃ | |
| Power Supply Current | ICC | | | 550 | mA | |
| Input Voltage | $V_{CC}$ | 3.14 | 3.3 | 3.46 | V | |
| Maximum Voltage | $V_{MAX}$ | – 0.3 | | 4 | V | |

## Optical Characteristics – Transmitter

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

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Average Launch Power each lane | Pavg | 0 | | 4 | dBm | UTS10Z8B45 |
| | | -1 | | 3 | dBm | UTS10Z8B54 |
| Transmitter and Dispersion Penalty each lane | TDP | | | 4.3 | dB | |
| Wavelength Assignment | λ0 | 1480 | | 1500 | nm | UTS10Z8B45 |
| | | 1540 | | 1560 | nm | UTS10Z8B54 |
| Spectral Width(-20dB) | Δλ | | | 0.3 | nm | |
| Extinction Ratio | ER | 7.5 | | | dB | |
| Optical Return Loss Tolerance | ORL | | | 12 | dBm | |
| Output Eye Diagram | Compliant with IEEE802.3bm eye mask | | | | | |

## Optical Characteristics – Receiver

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

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Rx Sensitivity per lane | S | | | -23 | dBm | 1 |
| Receiver Wavelength | $\lambda_0$ | 1540 | | 1560 | nm | UTS10Z8B45 |
| | | 1480 | | 1500 | nm | UTS10Z8B54 |
| Optical Power Input Overload | $P_{in-max}$ | 2.4 | | | dBm | |
| Receiver Reflectance | | | | -12 | dB | |
| LOS Assert | $P_{LOS\_A}$ | – 38 | | | dBm | |
| LOS De-Assert | $P_{LOS\_D}$ | | | – 25 | dBm | |
| LOS Hysteresis | | 0 | | 5 | dB | |

**Notes:**

1. Measured with a PRBS $2^{31}$-1 test pattern, @10.312Gb/s, BER<$10^{-12}$.

## Electrical Characteristics

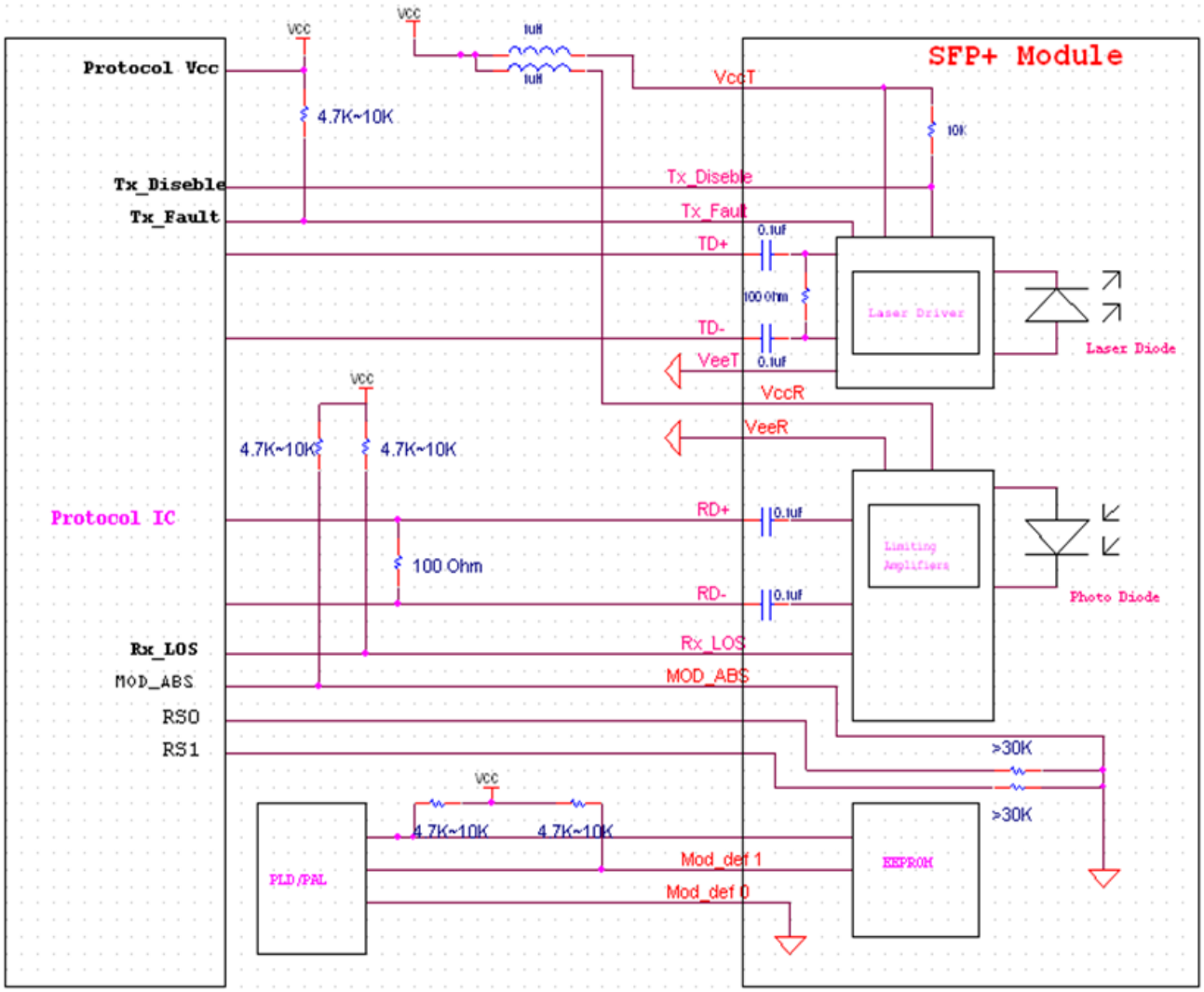
**$V_{CC}$=3.14V to 3.46V, $T_C$=-5℃ to 70℃**

| Parameter | Symbol | Min | Typ | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Supply Voltage | Vcc | 3.14 | 3.3 | 3.46 | mV | |
| Supply Current | Icc | | | 550 | mA | |
| Input differential impedance | Rin | | 100 | | Ω | 1 |
| Differential data input swing | Vin,pp | 180 | | 1200 | mV | |
| Single ended input voltage tolerance | VinT | -0.3 | | 4.0 | V | |
| Differential data output swing | Vout,pp | 300 | | 850 | mV | 2 |
| Single ended output voltage | | -0.3 | | 4.0 | V | |

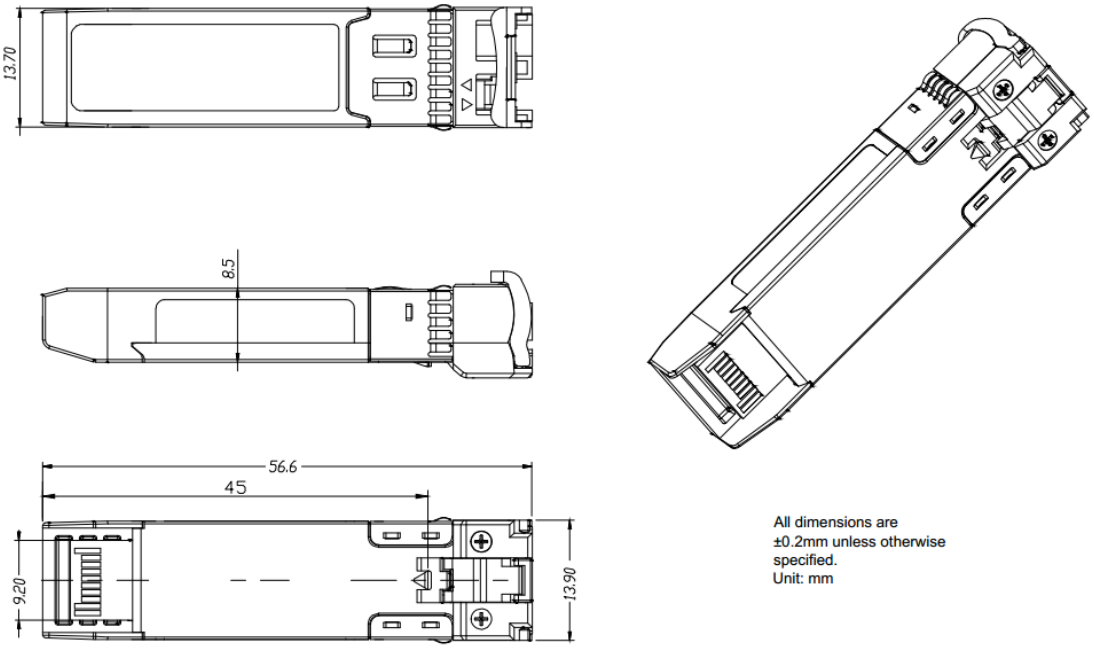
**Notes:**

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Into 100Ω ohms differential termination

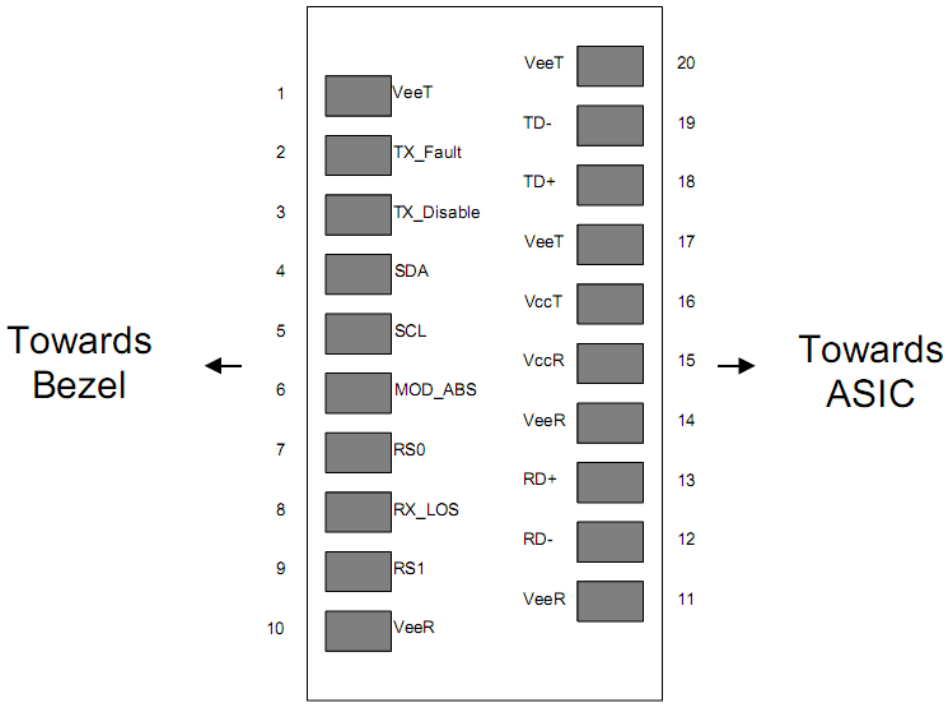
## Block Diagram



## Dimensions




## Electrical Pad Layout




| Pin | Signal Name | Description | Notes |
|---|---|---|---|
| 1 | $V_{EET}$ | Transmitter Ground | 1 |

| | | | |
|---|---|---|---|
| 2 | TX FAULT | Transmitter Fault Indication | 2 |
| 3 | TX DISABLE | Transmitter Disable | 3 |
| 4 | SDA | 2-wire Serial Interface Data Line | 4 |
| 5 | SCL | 2-wire Serial Interface Clock Line | 4 |
| 6 | MOD_ABS | Module Absent. Grounded within the module | 4 |
| 7 | RS0 | Rate Select 0 | 5 |
| 8 | LOS | Loss of Signal | 6 |
| 9 | RS1 | Not Connected | 1 |
| 10 | $V_{EER}$ | Receiver ground | 1 |
| 11 | $V_{EER}$ | Receiver ground | 1 |
| 12 | RD- | Inv. Received Data Out | |
| 13 | RD+ | Received Data Out | |
| 14 | $V_{EER}$ | Receiver ground | 1 |
| 15 | $V_{CCR}$ | Receiver Power Supply | |
| 16 | $V_{CCT}$ | Transmitter Power Supply | |
| 17 | $V_{EET}$ | Transmitter Ground | 1 |
| 18 | TD+ | Transmit Data In | |
| 19 | TD- | Inv. Transmit Data In | |
| 20 | $V_{EET}$ | Transmitter Ground | 1 |

**Notes:**

Plug Seq.: Pin engagement sequence during hot plugging.

1) Circuit ground is internally isolated from chassis ground.
2) TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
4) Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5) Internally pulled down per SFF-8431 Rev 4.1.
6) LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

## References

1. IEEE standard 802.3. IEEE Standard Department, 2005.
2. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 2000.