

## DATA SHEET

### UTS01Z8C-XX

#### 1.25G SFP (Small Form Pluggable) CWDM 80km DUAL Transceiver

#### UTS01Z8C-XX Overview

UTS01Z8C-XX SFP-DUAL optical transceivers are designed to comply with IEEE 802.3ah OC 24 standard. The UTS01Z8C-XX SFP-DUAL optical transceivers provide a quick and reliable interface for Gigabit Ethernet applications.

#### Product Features

- Up to 1.25Gbps Data Links
- DFB laser transmitter and PIN receiver
- Metal enclosure, for lower EMI
- Single +3.3V power supply
- Hot-pluggable
- Duplex LC/UPC type pluggable optical interface
- Operating temperature range:  
Commercial: -5°C~+70°C
- RoHS Compliant
- 2-wire interface with integrated Digital Diagnostic monitoring
- Up to 80km transmission distance over Single Mode Fiber(SMF)
- Low power dissipation

#### Applications

- Switch to Switch Interface
- Gigabit Ethernet
- Switched Backplane Applications
- Router/Server Interface
- Other Optical Links

#### Ordering Information

| Part Number | Description   |
|-------------|---|
| UTS01Z8C-XX | Gigabit Ethernet, SFP-DUAL, Dual LC Connector, CWDM, 80km |

#### For More Information:

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## Product selection

| Wavelength | xx | Clasp Color Code | Wavelength | xx | Clasp Color Code |
|------------|----|------------------|------------|----|------------------|
| 1270 nm    | 27 | Gray             | 1370 nm    | 37 | Green            |
| 1290 nm    | 29 | Gray             | 1390 nm    | 39 | Yellow           |
| 1310 nm    | 31 | Gray             | 1410 nm    | 41 | Orange           |
| 1330 nm    | 33 | Purple           | 1430 nm    | 43 | Red              |
| 1350 nm    | 35 | Blue             | 1450 nm    | 45 | Brown            |
| 1470 nm    | 47 | Gray             | 1550 nm    | 55 | Yellow           |
| 1490 nm    | 49 | Purple           | 1570 nm    | 57 | Orange           |
| 1510 nm    | 51 | Blue             | 1590 nm    | 59 | Red              |
| 1530 nm    | 53 | Green            | 1610 nm    | 61 | Brown            |

## General Specifications

| Parameter                               | Symbol           | Min  | Typ   | Max  | Unit      |
|---|------------------|------|-------|------|-----------|
| Operating Case Temperature (Commercial) | T <sub>c</sub>   | -5   |       | 70   | °C        |
| Power Supply Voltage                    | V <sub>cc3</sub> | 3.13 | 3.3   | 3.47 | V         |
| Supply Current                          | I <sub>cc3</sub> |      |       | 300  | mA        |
| Power Supply Noise Rejection            |                  |      |       | 100  | 100 mVp-p |
| Data Rate                               |                  |      | 3.125 |      | Gbps      |
| Fiber Length 9/125µm core SMF           |                  | -    | 80    | -    | km        |
| Operating Case Temperature (Commercial) | T <sub>c</sub>   | -5   |       | 70   | °C        |

## Optical Characteristics – Transmitter

V<sub>CC</sub>=3.13V to 3.47V, T<sub>C</sub>=-5°C to 70°C

| Parameter                         | Symbol           | Min  | Typ | Max   | Unit | Remarks |
|-----------------------------------|------------------|--|-----|-------|------|---------|
| Launched Power (avg.)             | P <sub>out</sub> | 0  |     | 5     | dBm  | 1       |
| Operating Wavelength Range        | λ <sub>c</sub>   | λ-6.5  |     | λ+6.5 | nm   | 2       |
| Spectral Width(-20dB)             | Δλ               |  |     | 1     | nm   |         |
| Side Mode Suppression Ratio       | SMSR             | 30   |     |       | dB   |         |
| Extinction Ratio                  | ER               | 9  |     |       | dB   |         |
| Transmitter OFF Output Power      | P <sub>off</sub> |  |     | -45   | dBm  |         |
| Differential Line Input Impedance | R <sub>IN</sub>  | 90   | 100 | 110   | Ohm  |         |
| Output Eye Diagram                |                  | Compliant with ITU-T G.959 eye mask and IEEE802.3ae eye mask |     |       |      |         |

### Notes:

- Class 1 Product.
- "λ" is: 1270,1290,1310,1330,1350,1370,1390,1410,1430,1450,1470,1490,1510,1530,1550,1570,1590,1610.

**Optical Characteristics – Receiver**
**V<sub>CC</sub>=3.13V to 3.47V, T<sub>C</sub>=-5°C to 70°C**

| Parameter                    | Symbol              | Min  | Typ | Max  | Unit | Remarks |
|------------------------------|---------------------|------|-----|------|------|---------|
| Receiver Sensitivity         | S                   |      |     | -26  | dBm  | 1       |
| Wavelength Range             | $\lambda_c$         | 1270 |     | 1610 | nm   |         |
| Optical Power Input Overload | P <sub>in-max</sub> | -3   |     |      | dBm  |         |
| Receiver Damage Threshold    |                     |      |     | 5    | dBm  |         |
| LOS Assert                   | Pd                  |      |     | -27  | dBm  |         |
| LOS De-Assert                | Pa                  | -38  |     |      | dBm  |         |
| LOS Hysteresis               |                     | 0.5  | 2   | 6    | dB   |         |

**Notes:**

1. Receiver Reflectance Measured with a PRBS 2<sup>7</sup>-1 test pattern, @1250Mbps, ER=9dB, BER<10<sup>-12</sup>.

**Electrical Characteristics – Transmitter**
**V<sub>CC</sub>=3.13V to 3.47V, T<sub>C</sub>=-5°C to 70°C**

| Parameter                              | Symbol             | Min                  | Typ | Max             | Unit     | Remarks |
|--|--------------------|----------------------|-----|-----------------|----------|---------|
| Transmitter differential input voltage | V <sub>in,pp</sub> | 200                  |     | 2400            | mVpp     |         |
| Input differential impedance           | R <sub>in</sub>    |                      | 100 |                 | $\Omega$ | 1       |
| Transmit disable voltage               | V <sub>IH</sub>    | V <sub>CC</sub> -1.3 |     | V <sub>CC</sub> | V        |         |
| Transmit enable voltage                | V <sub>IL</sub>    | V <sub>EE</sub> -0.3 |     | 0.8             | V        |         |
| Transmit Disable Assert Time           |                    |                      |     | 5               | us       |         |
| Single-ended Input Voltage Tolerance   | V <sub>CC</sub>    | -0.3                 |     | 4.0             | V        |         |
| Transmit Total Supply Current          | I <sub>CC</sub>    |                      |     | A               | mA       |         |
| Power Consumption                      | P                  |                      |     | 1.0             | W        |         |

**Notes**

1. Connected directly to TX data input pins. AC coupled thereafter.

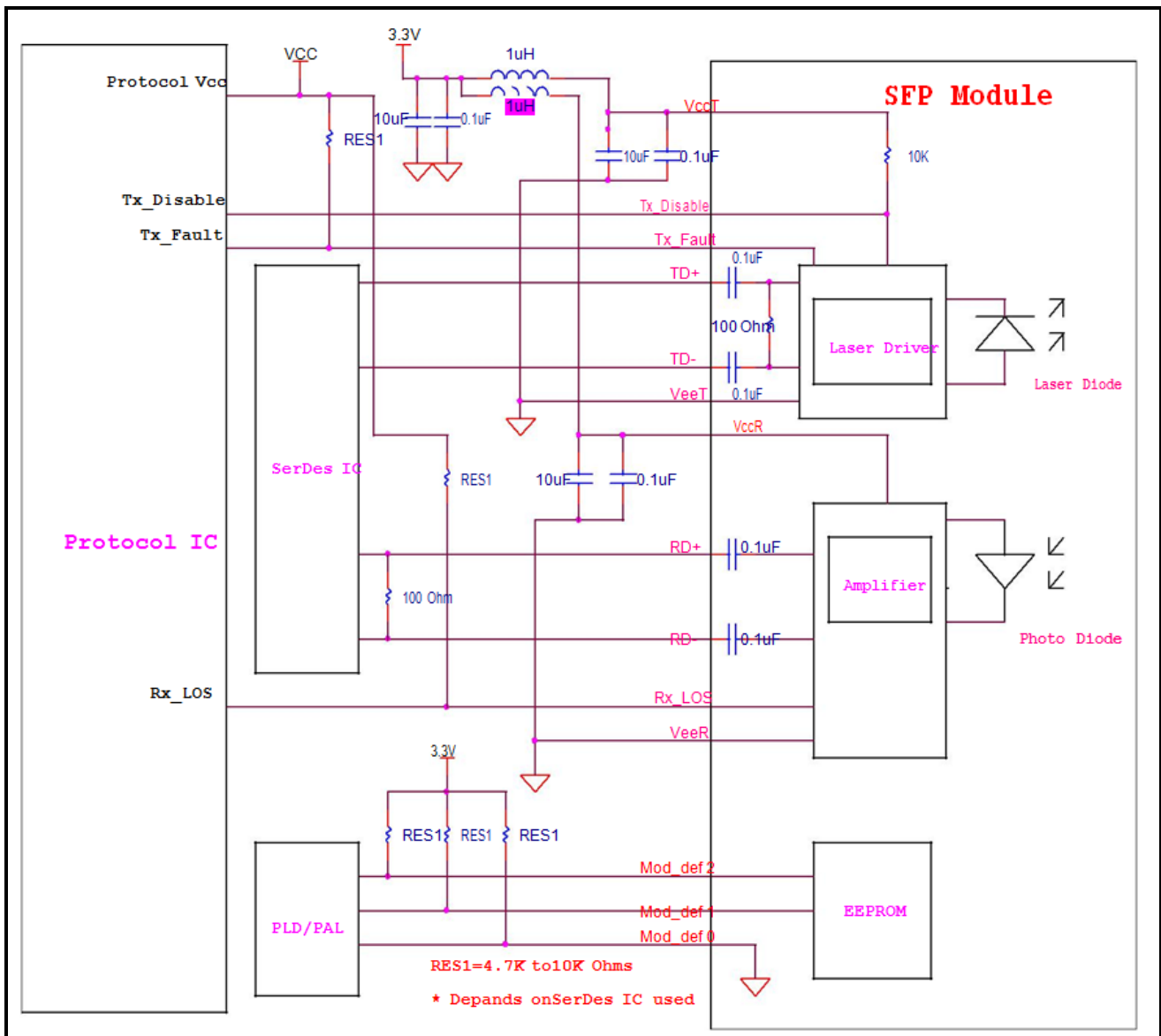
**Electrical Characteristics – Receiver**
**V<sub>CC</sub>=3.13V to 3.47V, T<sub>C</sub>=-5°C to 70°C**

| Parameter                            | Symbol                         | Min                  | Typ | Max             | Unit | Remarks    |
|--------------------------------------|--------------------------------|----------------------|-----|-----------------|------|------------|
| Receiver differential output Voltage | V <sub>in,pp</sub>             | 500                  |     | 900             | mVpp |            |
| LOS Fault                            | V <sub>LOS-H</sub>             | V <sub>CC</sub> -1.3 |     | V <sub>CC</sub> | V    | 1          |
| LOS Normal                           | V <sub>LOS-L</sub>             | V <sub>EE</sub> -0.3 |     | 0.8             | V    | 1          |
| Data output rise/fall time           | T <sub>r</sub> /T <sub>f</sub> |                      | 100 |                 | ps   | 20% to 80% |

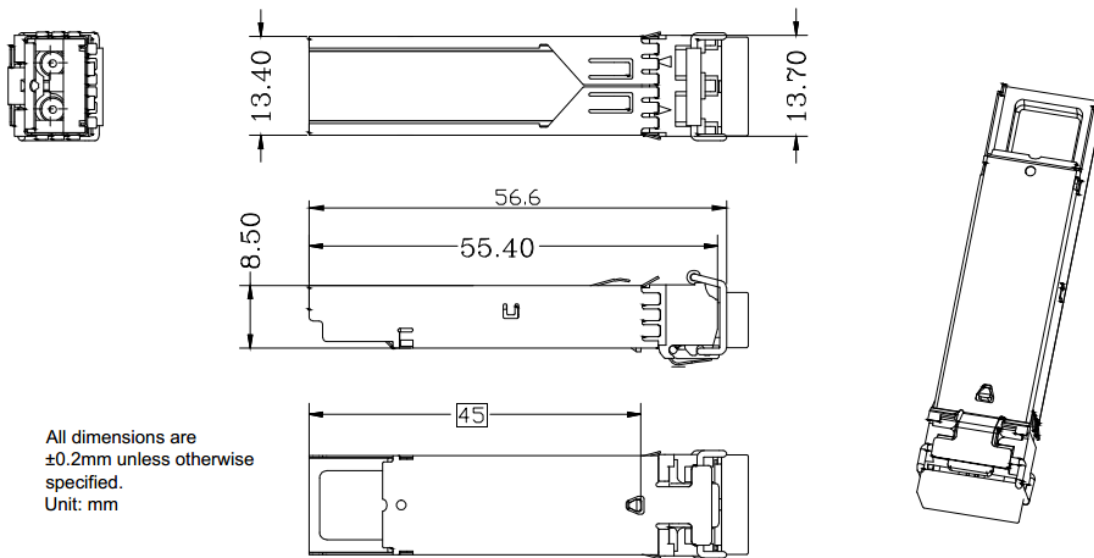
|                               |     |    |       |    |
|-------------------------------|-----|----|-------|----|
| Data output fall time         | Tf  | 28 |       | ps |
| Receiver Total Supply Current | Icc |    | 300-A | mA |

**Notes**

1. Loss Of Signal is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

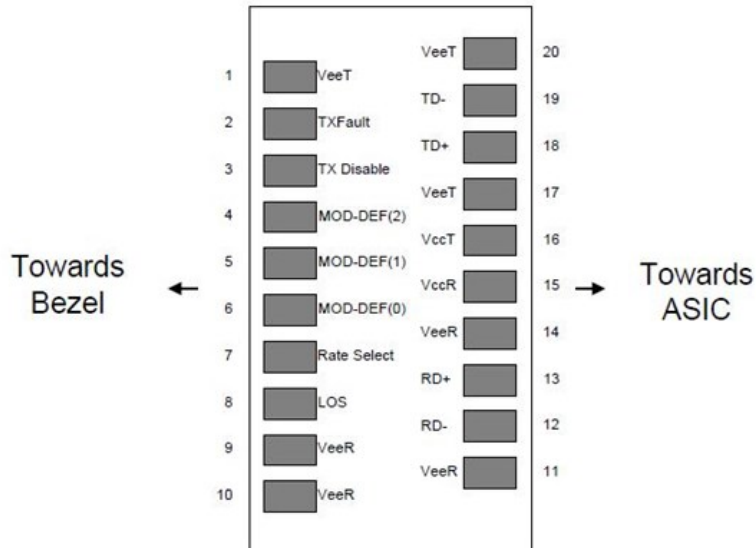
**Block Diagram of Transceiver**


### Dimensions



**ALL DIMENSIONS ARE  $\pm 0.2\text{mm}$  UNLESS OTHERWISE SPECIFIED**  
**UNIT: mm**

### Electrical Pad Layout



### Pin Assignment

| PIN # | Symbol     | Description   | Remarks |
|-------|------------|---|---------|
| 1     | VeeT       | Transmitter Ground (Common with Receiver Ground)                    | 1       |
| 2     | TX_Fault   | Transmitter Fault, Low: normal; High: abnormal                      | 2       |
| 3     | TX_Disable | Transmitter Disable<br>High: Transmitter off<br>Low: Transmitter on | 3       |
| 4     | MOD_DEF(2) | Module Definition 2. Data line for Serial ID.                       | 3       |

|    |             |  |   |
|----|-------------|--|---|
| 5  | MOD_DEF(1)  | Module Definition 1. Clock line for Serial ID.                 | 3 |
| 6  | MOD_DEF(0)  | Module Definition 0. Grounded within the module.               | 3 |
| 7  | Rate Select | No connection required   | 4 |
| 8  | LOS         | Loss of Signal indication. Logic 0 indicates normal operation. | 5 |
| 9  | VEER        | Receiver Ground(Common with Transmitter Ground)                | 1 |
| 10 | VEER        | Receiver Ground(Common with Transmitter Ground)                | 1 |
| 11 | VEER        | Receiver Ground(Common with Transmitter Ground)                | 1 |
| 12 | RD-         | Receiver Inverted DATA out. AC Coupled. CML-O                  |   |
| 13 | RD+         | Receiver Non-inverted DATA out. AC Coupled. CML-O              |   |
| 14 | VeeR        | Receiver Ground  | 1 |
| 15 | VccR        | Receiver Power Supply  |   |
| 16 | VccT        | Transmitter Power Supply                                       |   |
| 17 | VeeT        | Transmitter Ground   | 1 |
| 18 | TD+         | Transmitter Non-Inverted DATA in. AC Coupled. CML-I            |   |
| 19 | TD-         | Transmitter Inverted DATA in. AC Coupled. CML-I                |   |
| 20 | VeeT        | Transmitter Ground (Common with Receiver Ground)               | 1 |

**Notes:**

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. This is an optional input used to control the receiver bandwidth for compatibility with multiple data rates (most likely Fiber Channel 1x and 2x Rates). If implemented, the input will be internally pulled down with > 30kΩ resistor. The input states are:
  - Low (0 – 0.8V): Reduced Bandwidth
  - (>0.8, < 2.0V): Undefined
  - High (2.0 – 3.465V): Full Bandwidth
5. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a typical 3.3V voltage. 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.