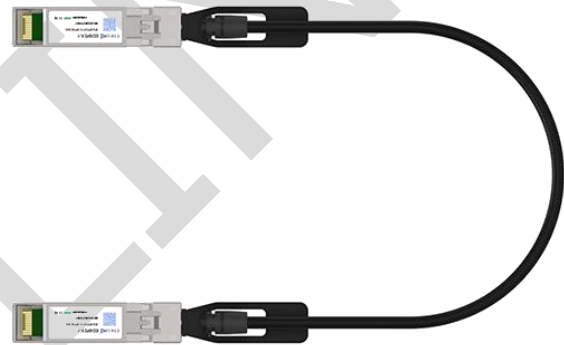# EDSP2X-x

## 25G SFP28 Direct Attach Cable (DAC)

## PRODUCT FEATURES

- ➢ **Up to 25.78125 Gbps data rate**

- ➢ **Up to 5 meter transmission**

- ➢ **Hot-pluggable SFP 20PIN footprint**

- ➢ **Improved Pluggable Form Factor(IPF)**

- ➢ **compliant for enhanced EMI/EMC performance**

- ➢ **Compatible to SFP28 MSA**

- ➢ **Compatible to SFF-8402 and SFF-8432**

- ➢ **Temperature Range: 0~ 70 °C**

- ➢ **RoHS Compatible**

## APPLICATIONS

- ➢ **Cost-effective copper solution**

- ➢ **Lowest total system power solution**

- ➢ **Lowest total system EMI solution**

- ➢ **Optimized design for Signal Integrity**

- ➢ **High density connections between networking equipment**

- ➢ **25G Ethernet**

# DESCRIPTIONS

ETU-LINK's SFP28 Direct Attach Cables are compliant with SFF-8432 and SFF-8402 specifications. Various choices of wire gauge are available from 30 to 26 AWG with various choices of cable length (up to 5m). The SFP28 passive cable assemblies are high performance, cost effective I/O solutions for 25G Ethernet. SFP28 copper cables allow hardware manufactures to achieve high port density, configurability and utilization at a very low cost and reduced power budget.

# Ordering Information

| Part No. | Description |
|---|---|
| EDSP2X-x-30 | 25G SFP28 Direct Attach Cable (DAC) 1~3M 30AWG |
| EDSP2X-x-26 | 25G SFP28 Direct Attach Cable (DAC) 3~5M 26AWG |

Notes:

1.  where "x" denotes cable length in meters. Examples are as follows:

2.  x = 1 for 1m,

# High Speed Characteristics

Notes:

| Parameter | Symbol | Min | Typical | Max | Unit | Note |
|---|---|---|---|---|---|---|
| Differential Impedance | TDR | 90 | 100 | 110 | Ὠ | |
| Insertion loss | SDD21 | -22.48 | | | dB | At 12.8906 GHz |
| Differential Return Loss | SDD11 | | | See 1 | dB | At 0.05 to 4.1 GHz |
| | SDD22 | | | See 2 | dB | At 4.1 to 19 GHz |
| Common-mode to common-mode output return loss | SCC11 SCC22 | | | -2 | dB | At 0.2 to 19 GHz |
| Differential to common-mode return loss | SCD11 SCD22 | | | See 3 | dB | At 0.01 to 12.89 GHz |
| | | | | See 4 | | At 12.89 to 19 GHz |
| Differential to common Mode Conversion Loss | SCD21-IL | | | -10 | dB | At 0.01 to 12.89 GHz |
| | | | | See 5 | | At 12.89 to 15.7 GHz |
| | | | | -6.3 | | At 15.7 to 19 GHz |

1. Reflection Coefficient given by equation $SDD11(dB) < -16.5 + 2 \times SQRT(f)$, with f in GHz

2. Reflection Coefficient given by equation $SDD11(dB) < -10.66 + 14 \times log10(f/5.5)$, with f in GHz

3. Reflection Coefficient given by equation SCD11(dB) < -22 + (20/25.78)*f, with f in GHz

4. Reflection Coefficient given by equation SCD11(dB) < -15 + (6/25.78)*f, with f in GHz

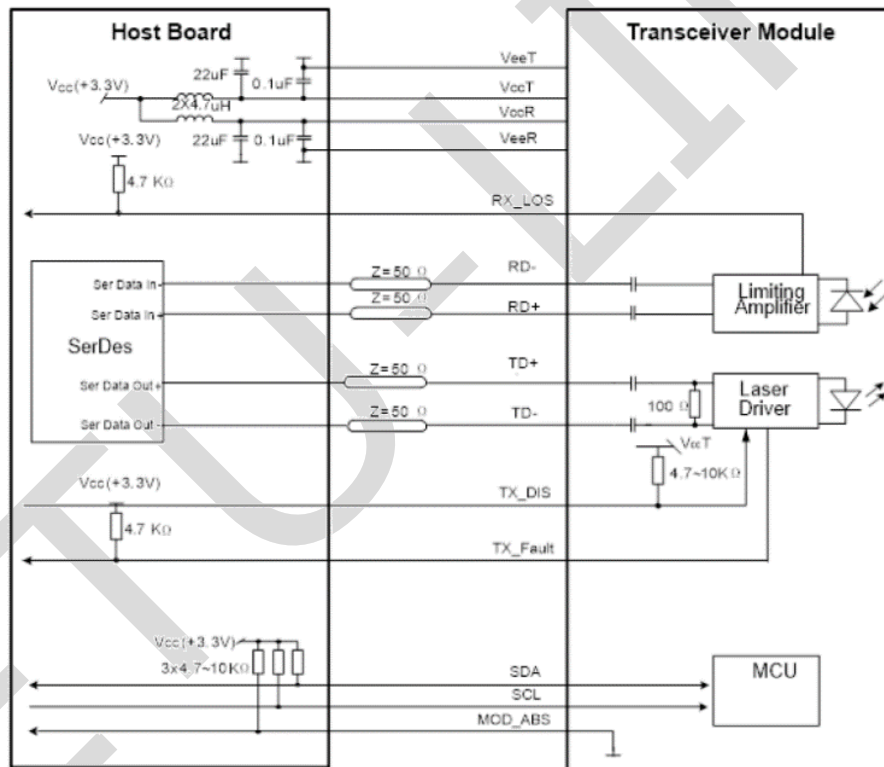5. Reflection Coefficient given by equation SCD21(dB) < -27 + (29/22)*f, with f in GHz

# Pin Diagram
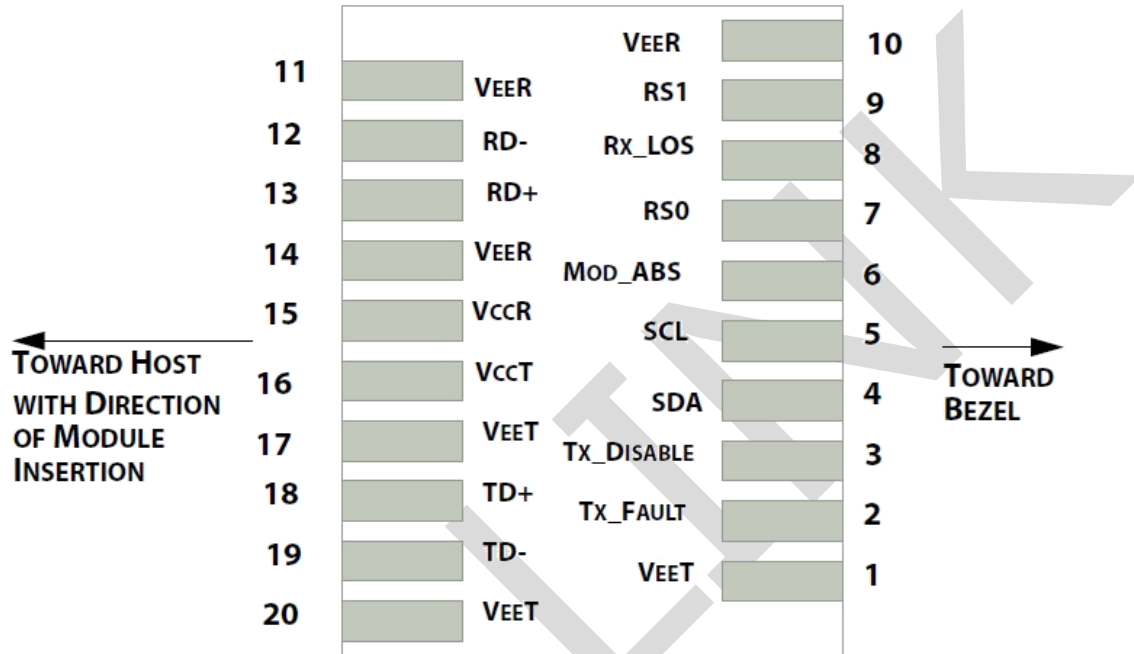


| PIN # | Name | Function | Notes |
|---|---|---|---|
| 1 | VeeT | Module transmitter ground | 1 |
| 2 | Tx Fault | Module transmitter fault | 2 |
| 3 | Tx Disable | Transmitter Disable; Turns off transmitter laser output | 3 |
| 4 | SDL | 2 wire serial interface data input/output (SDA) | 4 |
| 5 | SCL | 2 wire serial interface clock input (SCL) | 4 |
| 6 | MOD-ABS | Module Absent, connect to VeeR or VeeT in the module | 4 |
| 7 | RS0 | Rate select0, optionally control SFP+ receiver. When high, input data rate >4.5Gb/ s; when low, input data rate <=4.5Gb/s | 5 |
| 8 | LOS | Receiver Loss of Signal Indication | 6 |
| 9 | RS1 | Rate select0, optionally control SFP+ transmitter. When high, input data rate >4.5Gb/s; when low, input data rate <=4.5Gb/s | 1 |
| 10 | VeeR | Module receiver ground | 1 |
| 11 | VeeR | Module receiver ground | 1 |
| 12 | RD- | Receiver inverted data output | |
| 13 | RD+ | Receiver non-inverted data output | |
| 14 | VeeR | Module receiver ground | 1 |
| 15 | VccR | Module receiver 3.3V supply | |
| 16 | VccT | Module transmitter 3.3V supply | |

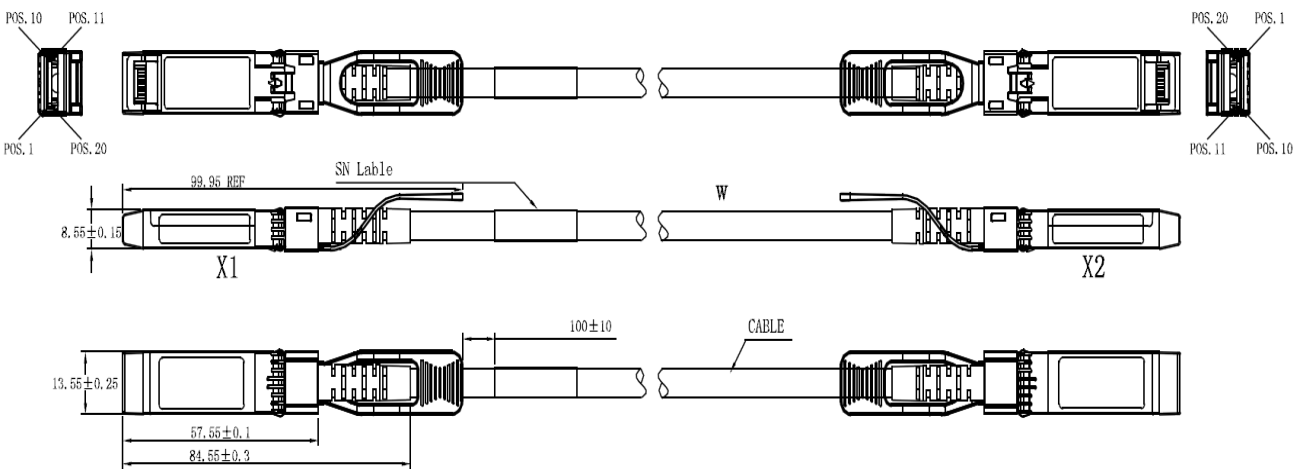| 17 | VeeT | Module transmitter ground | 1 |
|----|------|---------------------------|---|
| 18 | TD+ | Transmitter inverted data output | |
| 19 | TD- | Transmitter non-inverted data output | |
| 20 | VeeT | Module transmitter ground | 1 |

Notes:

1. Circuit ground is internally isolated from chassis ground
2. Tx FAULT 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 Tx DIS >2.0V or open, enabled on Tx DIS <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.

# Recommended Interface Circuit

## Mechanical Diagram

POS.10 POS.11

POS.1 POS.20

POS.20 POS.1

POS.11 POS.10

99.95 REF

SN Lable

8.55±0.15

X1

W

X2

13.55±0.25

100±10

CABLE

57.55±0.1

84.55±0.3

## Revision History

| Version No. | Date | Description |
|---|---|---|
| 1.0 | February 16, 2018 | Preliminary datasheet |
| 2.0 | Aug 12,2024 | Format change |

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