

**Alpha Bridge  
AB-25G-40T  
Datasheet**



### Product Features

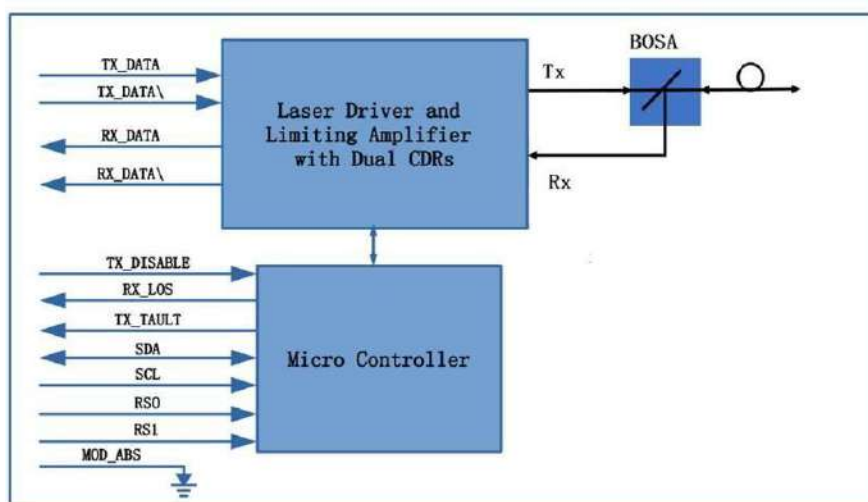
- Up to 25.78Gbps Data Links
- Up to 40km transmission on SMF
- 1270nm/1310nm DFB Laser and APD receiver
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable SFP28 footprint
- Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle
- Single 3.3V power supply
- Power dissipation < 1.5 W
- Operating case temperature: 0 to +70°C

### Applications

- 25GBASE-ER
- eCPRI and CPRI

### Standard

- Compliant with SFF-8472 & 8431
- RoHS Compliant.



Transceiver functional diagram

### Absolute Maximum Ratings

| Parameter            | Symbol | Min     | Max     | Unit |
|----------------------|--------|---------|---------|------|
| Storage Temperature  | Ts     | -40     | 85      | °C   |
| Relative Humidity    | RH     | 5       | 95      | %    |
| Power Supply Voltage | VCC    | -0.3    | 4       | V    |
| Signal Input Voltage | VSI    | Vcc-0.3 | Vcc+0.3 | V    |
| Rx Damage Threshold  | PRdmg  | -3      |         | dBm  |

### Recommended Operating Conditions

| Parameter                  | Symbol            | Min  | Typical | Max  | Unit |
|----------------------------|-------------------|------|---------|------|------|
| Case Operating Temperature | Tcase             | 0    |         | 70   | °C   |
| Power Supply Voltage       | VCC               | 3.14 | 3.3     | 3.47 | V    |
| Power Supply Current       | ICC               |      |         | 420  | mA   |
| Data Rate                  | BR                |      | 25.78   |      | Gbps |
| Transmission Distance      | TD                |      |         | 40   | km   |
| Coupled fiber              | Single mode fiber |      |         |      |      |

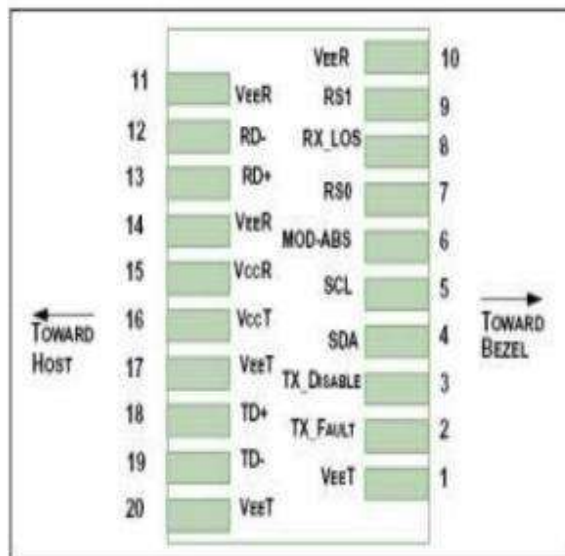
### Optical and Electrical Characteristics

| Parameter                         |         | Symbol                        | Min  | Typical | Max     | Unit     | Notes |
|-----------------------------------|---------|-------------------------------|------|---------|---------|----------|-------|
| Transmitter                       |         |                               |      |         |         |          |       |
| Centre Wavelength                 |         | $\lambda_c$                   | 1260 | 1270    | 1280    | nm       |       |
| Spectral Width (-20dB)            |         | $\Delta\lambda$               |      |         | 1       | nm       |       |
| Average Output Power              |         | Pout                          | 0    |         | 6       | dBm      |       |
| Average Launched Power(Laser Off) |         | Poff                          |      |         | -30     | dBm      |       |
| Extinction Ratio                  |         | ER                            | 3.5  |         |         | dB       | 1     |
| Input differential impedance      |         | Rin                           |      | 100     |         | $\Omega$ | 2     |
| Single ended data input swing     |         | Vin,pp                        | 180  |         | 700     | mV       |       |
| TX Disable                        | Disable |                               | 2    |         | Vcc+0.3 | V        |       |
|                                   | Enable  |                               | 0    |         | 0.8     | V        |       |
| TX Fault                          | Fault   |                               | 2    |         | Vcc+0.3 | V        |       |
|                                   | Normal  |                               | 0    |         | 0.8     | V        |       |
| Output Eye Mask                   |         | {0.31,0.4,0.45,0.34,0.38,0.4} |      |         |         |          |       |
| Receiver                          |         |                               |      |         |         |          |       |
| Centre Wavelength                 |         | $\lambda_c$                   | 1300 | 1310    | 1320    | nm       |       |
| Receiver Sensitivity              |         |                               |      |         | -17.5   | dBm      | 3     |
| Input Saturation Power (Overload) |         |                               | -6   |         |         | dBm      |       |
| Los Of Signal Assert              |         | PA                            | -35  |         |         | dBm      |       |
| Los Of Signal De-assert           |         | PD                            |      |         | -19     | dBm      |       |
| LOS -Hysteresis                   |         | PHys                          | 0.5  | 2       | 6       | dB       |       |
| Differential data output swing    |         | Vout,pp                       | 300  |         | 850     | mV       | 4     |
| LOS                               | High    |                               | 2    |         | Vcc+0.3 | V        |       |
|                                   | Low     |                               |      |         | 0.8     | V        |       |

#### Notes:

1. Measured with a PRBS 2<sup>31</sup>-1 test pattern, @25.78Gb/s.
2. Connected directly to TX data input pins. AC coupled thereafter.
3. ER=3.5dB; BER =<5X10<sup>-5</sup> @PRBS=2<sup>31</sup>-1 NRZ.
4. Into 100 ohms differential termination.

### Pin Descriptions

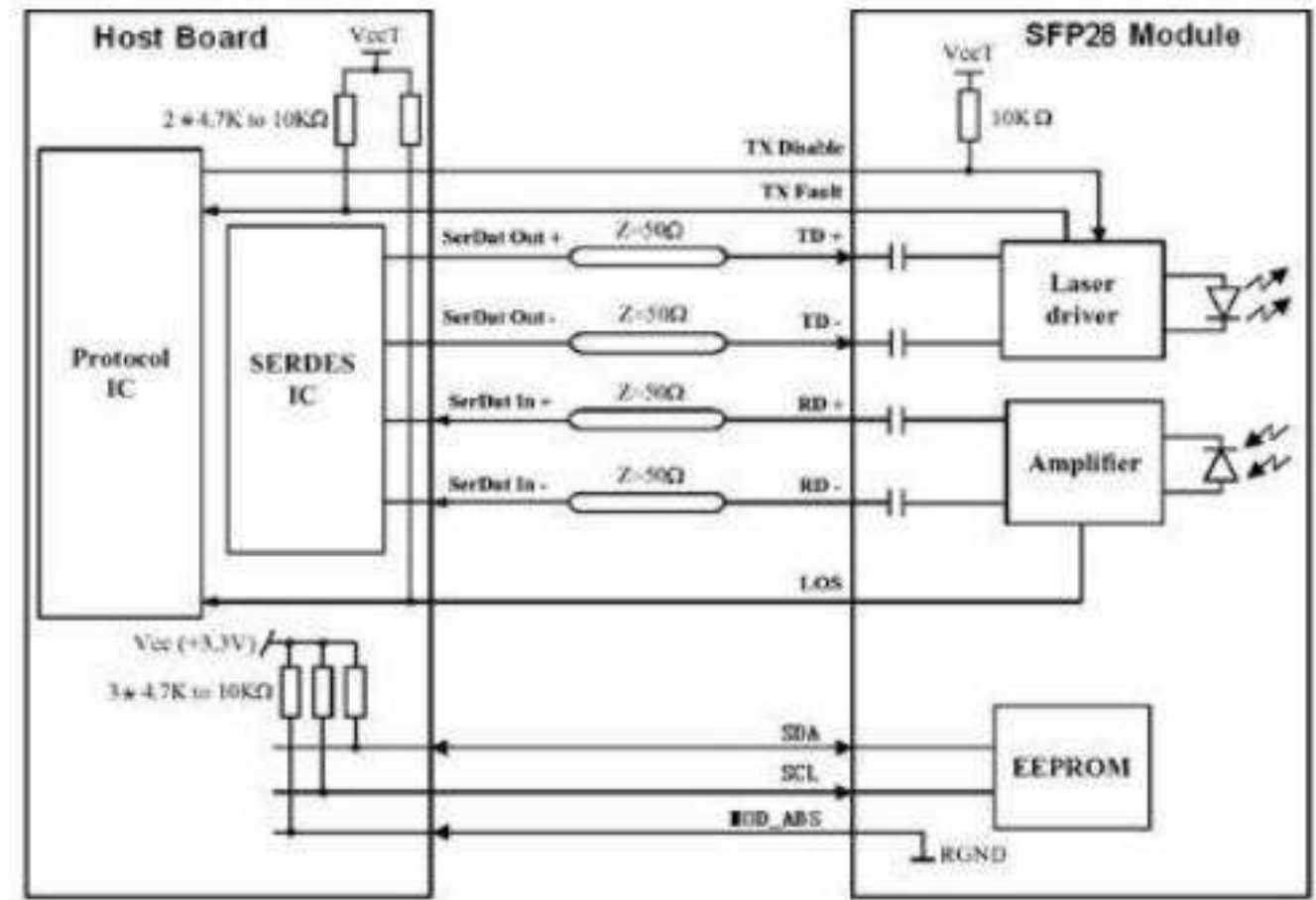


| Pin | Symbol  | Name/Description                                               | Notes |
|-----|---------|----------------------------------------------------------------|-------|
| 1   | VEET    | Transmitter Ground (Common with Receiver Ground)               | 1     |
| 2   | TFAULT  | Transmitter Fault.                                             | 2     |
| 3   | TDIS    | Transmitter Disable. Laser output disabled on high or open.    | 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, internal pull down                              | 5     |
| 8   | LOS     | Loss of Signal indication. Logic 0 indicates normal operation. | 6     |
| 9   | RS1     | Rate Select 1, internal pull down                              | 5     |
| 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                          |       |
| 13  | RD+     | Receiver Non-inverted DATA out.AC Coupled                      |       |
| 14  | VEER    | Receiver Ground (Common with Transmitter Ground)               | 1     |
| 15  | VCCR    | Receiver Power Supply                                          |       |
| 16  | VCCT    | Transmitter Power Supply                                       |       |
| 17  | VEET    | Transmitter Ground (Common with Receiver Ground)               | 1     |
| 18  | TD+     | Transmitter Non-Inverted DATA in. AC Coupled.                  |       |
| 19  | TD-     | Transmitter Inverted DATA in. AC Coupled.                      |       |
| 20  | VEET    | Transmitter Ground (Common with Receiver Ground)               | 1     |

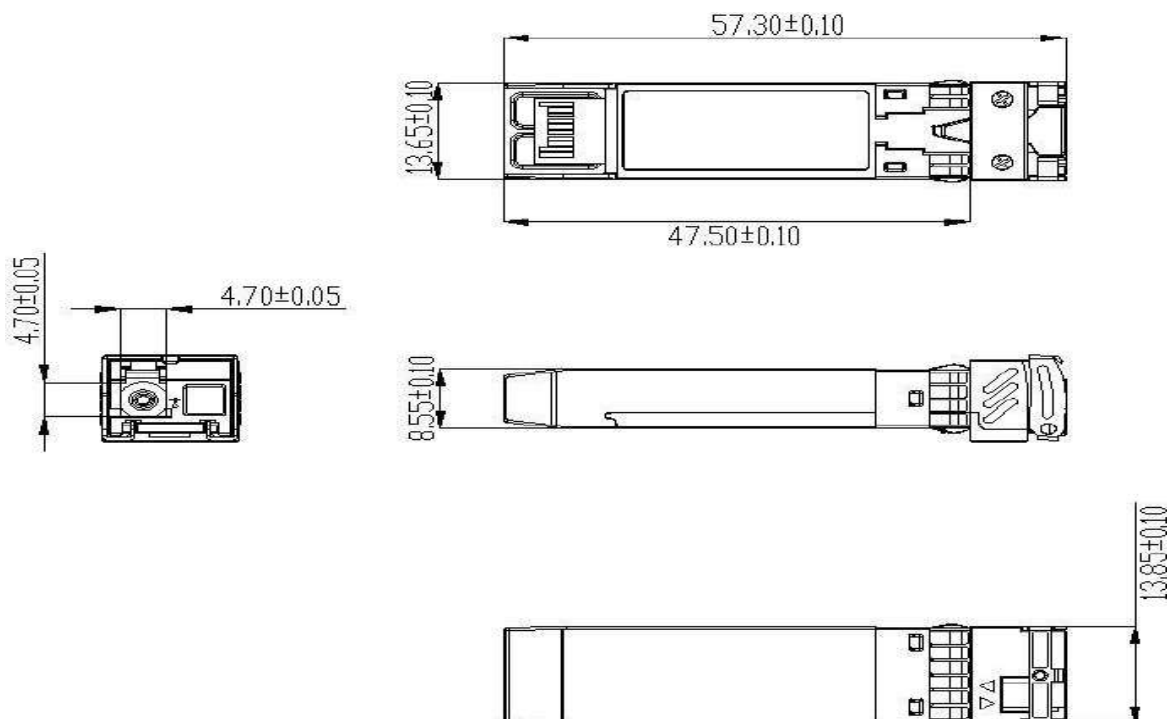
**Notes:**

1. Circuit ground is internally isolated from chassis ground.
2. 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 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. Rate select can also be set through the 2-wire bus in accordance with SFF-8472. Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.
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 Dimensions**



**Ordering information**

| Part Number | Description                                           |
|-------------|-------------------------------------------------------|
| AB-25G-40T  | 1270T/1310R, 25.78Gbps, LC, 40km, 0°C~+70°C, with DDM |

**Note:** All information contained in this document is subject to change without notice.

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