

## LG-SC341G-20IB1

GPON-ONU-SFP-B+ Transceiver, Single Mode, 20km Reach  
1.25Gbps 1310nm TX / 2.5Gbps 1490nm RX, SC

### Product Features

- Compliant to ITU-T G.984.2 GPON ONU Specifications
- SFP MSA, digital diagnostics SFF-8472 Compliant
- Simplex SC/APC Connector, Integrated Diplexer Transceiver
- Voice/Data FTTx ONT/ONU Applications
- 1244 Mbps Tx, 2488 Mbps Rx Asymmetric Data Rate
- Burst Mode Transmission
- TX Burst Mode Detection, TX\_SD
- 28 dB link budget; Class B+, 20 km reach
- Compliant to IEC-60825 Class 1 laser diode
- RoHS compliant
- Internal Calibration
- Operating case temperature:  
Standard: 0 to +70°C  
Industrial: -40 to +85°C

### Applications

- GPON Access network

### Description

This transceiver provides an asymmetric 1.244Gbps upstream and 2.488Gbps downstream, reaching a link up to 20km over SMF via SC connector. It is fully compliant with SFP MSA, ITU-T G.984.2, IEC-60825 and is ideal for asymmetric passive optical network (GPON) system.



## Recommended Operating Conditions

| Parameter                      | Symbol | Min  | Typical | Max    | Unit | Notes      |
|--------------------------------|--------|------|---------|--------|------|------------|
| Operating Case Temperature     | Tc     | 0    |         | 70     | °C   | Standard   |
|                                |        | -40  |         | 85     |      | Industrial |
| Storage Temperature            | Ts     | -40  |         | 85     | °C   |            |
| Operating Relative Humidity    | Ho     | 5    |         | 85     | %    |            |
| Storage Relative Humidity      | Hs     | 5    |         | 90     | %    |            |
| Operating Voltage              | VCC    | 3.14 | 3.30    | 3.46   | V    |            |
| Total TX and RX Supply Current | ICC    | -    | -       | 350    | dB   |            |
| Power Dissipation              | PD     | -    | -       | 1      | W    |            |
| Bit Rate(Tx)                   | BR     | -    | 1244.16 | -      | Mbps |            |
| Bit Rate(Rx)                   | BR     | -    | 2488.32 | -      | Mbps |            |
| Transmission Distance          | TD     | -    | -       | 20,000 | m    |            |

## Optical Characteristics

| Parameter                                     | Min                          | Typical | Max  | Unit | Notes |
|-----------------------------------------------|------------------------------|---------|------|------|-------|
| Transmitter                                   |                              |         |      |      |       |
| TX Central Wavelength                         | 1290                         | 1310    | 1330 | nm   |       |
| Average Output Power                          | 0.5                          | 5       | -    | dBm  |       |
| Average Output Power (Laser Off)              | -                            | -45     | -    | dBm  |       |
| Side Mode Suppression Ratio                   | 30                           | -       | -    | dB   |       |
| Spectral Width (-20dB)                        |                              |         | 1    | nm   |       |
| Extinction Ratio                              | 10                           | -       | -    | dB   |       |
| Optical Rise and Fall Time                    |                              |         | 260  | ps   |       |
| Tx reflectance                                |                              |         | -6   | dB   |       |
| ORL of ODN at Oru and Ord                     | 32                           |         |      | dB   |       |
| Tolerance to Transmitter Incident Light Power | -15                          |         |      | dB   |       |
| Transmitter Eye Mask                          | Compliant With ITU-T G.984.2 |         |      |      |       |
| Receiver                                      |                              |         |      |      |       |
| Receive Wavelength                            | 1480                         | 1490    | 1500 | nm   |       |
| Sensitivity                                   |                              |         | -27  | dBm  | 1     |
| Saturation                                    | -8                           |         |      | dBm  | 1     |

| BER                                          | 1 x10 <sup>-10</sup> |   |     |     |   |
|----------------------------------------------|----------------------|---|-----|-----|---|
| Damage Threshold                             |                      |   | 0   | dBm |   |
| Loss of Signal Assert                        | -45                  | - | -   | dBm |   |
| Loss of Signal Deassert                      |                      |   | -28 | dBm |   |
| LOS Hysteresis                               | 0.5                  |   | 6   | dB  |   |
| Rx Reflectance                               |                      |   | -20 | dB  |   |
| Tolerance to the Reflected Optical Power     |                      |   | 10  | dB  |   |
| 1310nm Tx to1490nm Rx Crosstalk              | -                    | - | -45 | dB  |   |
| 1490nm Rx to1555nm Isolation                 | 30                   |   |     |     |   |
| G.984.5 Wavelength Blocking Filter Isolation | 7                    | - | -   | dB  | 2 |
|                                              | 7                    | - | -   | dB  | 3 |
|                                              | 22                   | - | -   | dB  | 4 |
|                                              | 22                   | - | -   | dB  | 5 |

**Notes:**

1. Measured with a PRBS 2<sup>23</sup>- 1 test pattern @2.488Gbps, ER=8.2, BER 1X10<sup>-4</sup>, pre-FEC
2. 1490 Rx isolation for 1441 nm to 1450 nm
3. 1490 Rx isolation for 1530 nm to 1539 nm
4. 1490 Rx isolation for 1400 nm to 1441 nm
5. 1490 Rx isolation for 1539 nm to 1625 nm

## Electrical Characteristics

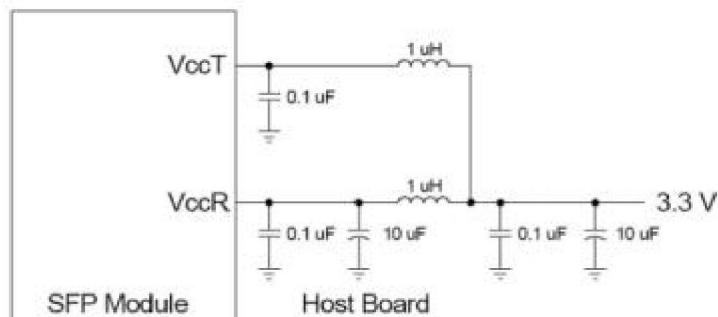
| Parameter                       | Min | Typical | Max   | Unit              | Notes |
|---------------------------------|-----|---------|-------|-------------------|-------|
| <b>Transmitter</b>              |     |         |       |                   |       |
| Differential Data Input Voltage | 300 |         | 1800  | mV <sub>P-P</sub> | 1     |
| Input Differential Impedance    | 90  | 100     | 110   | Ω                 | 2     |
| Tx Burst EnableTime             |     |         | 12.86 | ns                | 3     |
| Tx Burst DisableTime            |     |         | 12.86 | ns                | 3     |
| <b>Receiver</b>                 |     |         |       |                   |       |
| Differential Data Input Voltage | 300 |         | 1200  | mV                | 4     |
| Los Output High Voltage         | 2.4 |         |       | V                 | 5     |
| Los Output Low Voltage          | 0   |         | 0.4   | V                 | 6     |
| Data Output Rise and Fall Time  |     | 160     |       | ps                |       |

**Notes:**

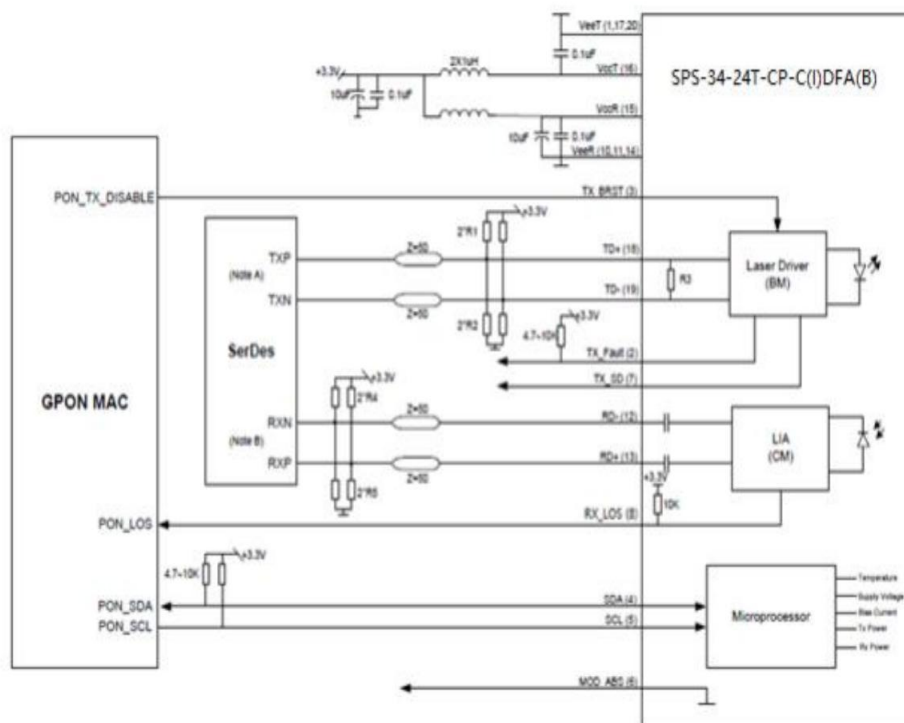
1. TXD+/- DC-coupled.
2. TXD+/-

3. 16 bits data @1244Mbps
4. CML output, AC coupled (0.1 F)
5. LVTTTL with internal 10k pull up resistor. Asserts HIGH when input data amplitude is below threshold.
6. LVTTTL. De-asserts LOW when input data amplitude is above threshold.

## Recommended Host Board Power Supply Circuit



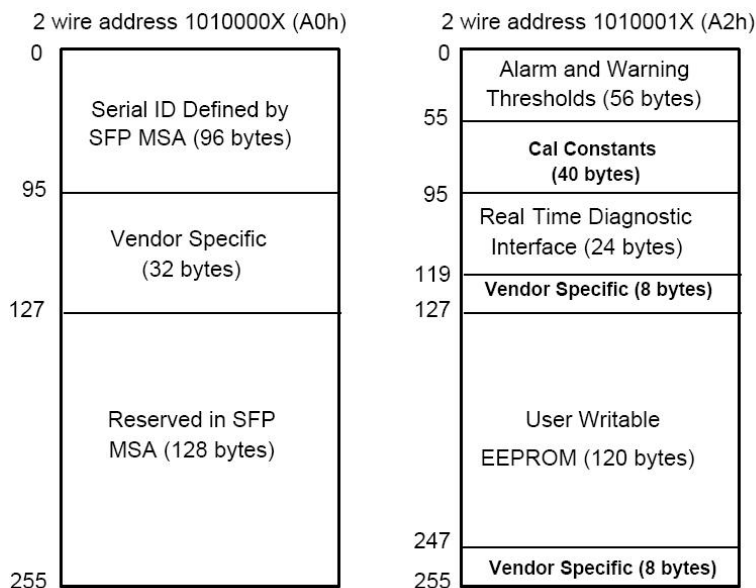
## Recommended Interface Circuit



## Pin definition

| Pin.No | Symbol            | Description                                 |
|--------|-------------------|---------------------------------------------|
| 1      | V <sub>EE</sub> T | Transmitter Ground                          |
| 2      | TX Fault          | Transmitter Fault Indication                |
| 3      | TX Disable        | Transmitter Disable                         |
| 4      | MOD-DEF2          | Module Definition 2                         |
| 5      | MOD-DEF1          | Module Definition 1                         |
| 6      | MOD-DEF0          | Module Definition 0                         |
| 7      | Reset             | Receiver Reset                              |
| 8      | SD                | Signal Detect                               |
| 9      | RSSI Trigger      | RSSI Trigger for Transceiver A/D Conversion |
| 10     | V <sub>EE</sub> R | Receiver Ground                             |
| 11     | V <sub>EE</sub> R | Receiver Ground                             |
| 12     | RD-               | Inv. Receiver Data Out                      |
| 13     | RD+               | Receiver Data Out                           |
| 14     | V <sub>EE</sub> R | Received Ground                             |
| 15     | V <sub>CC</sub> R | Receiver Power                              |
| 16     | V <sub>CC</sub> T | Transmitter Power                           |
| 17     | V <sub>EE</sub> T | Transmitter Ground                          |
| 18     | TD+               | Transmit Data In                            |
| 19     | TD-               | Inv. Transmit Data In                       |
| 20     | V <sub>EE</sub> T | Transmitter Ground                          |

## EEPROM Memory Map



## EEPROM Serial ID Memory Contents

The optical transceiver contains an EEPROM. It provides access to sophisticated identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information. When the serial protocol is activated, the host generates the serial clock signal (SCL, Mod Def 1). The positive edge clocks data into those segments of the EEPROM that are not writing protected within the SFP transceiver. 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.

The Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Calibration and alarm/warning threshold data is written during device manufacture. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented. The diagnostic data are raw A/D values and must be converted to real world units using calibration constants stored in EEPROM locations 56 – 95 at wire serial bus address A2h.

## Package Outline

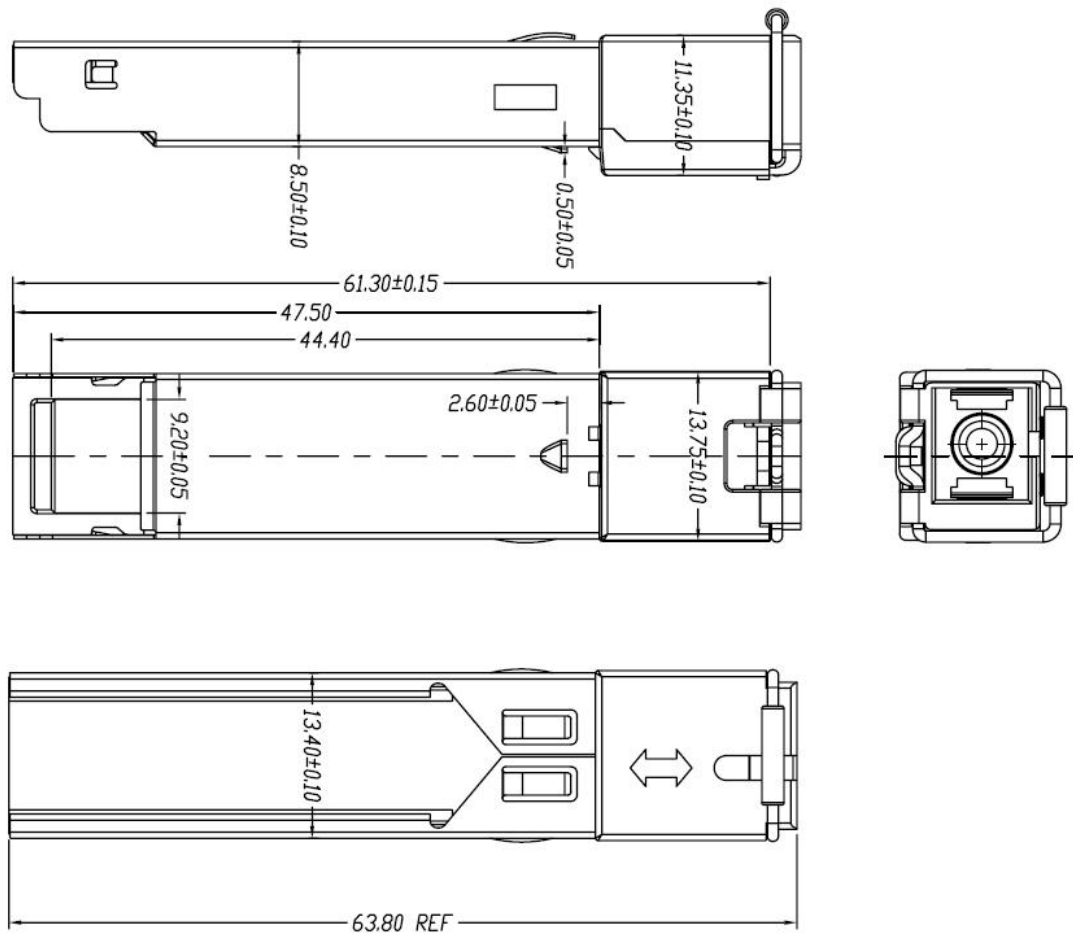


Figure 1. Package Outline

## Ordering information

| Part Number     | Product Description                                               |
|-----------------|-------------------------------------------------------------------|
| LG-SC341G-20IC1 | GPON ONU, SC, 1.25G 1310T/2.5G 1490R, 20km, -40°C~+85°C, Class C+ |
| LG-SC341G-20IB1 | GPON ONU, SC, 1.25G 1310T/2.5G 1490R, 20km, -40°C~+85°C, Class B+ |