

# Product Specification

212.5 LR4 QSFP56 1310nm 10km  
Optical Transceiver

P/N: 200G-Q56-LR4



## Features

- Hot Pluggable QSFP56 form factor
- Operating data rate 212.5Gbps
- Single +3.3V power supply
- Duplex LC connector
- Max power dissipation <8W
- PIN receivers
- Built-in digital diagnostic function
- Commercial temperature range 0°C to 70°C

## Compliance

- QSFP56 MSA
- Compliant with QSFP Electrical MSA SFF-8636
- Compliant with QSFP Mechanical MSA SFF-8665
- IEEE 802.3bm
- RoHS

## Applications

- Switches with QSFP56 ports
- Router with QSFP56 Ports
- Server or Network Adapter Card
- Optical Transmission System
- Other devices with QSFP56 Ports

## Description

The 200G-Q56-LR4 is a QSFP56 optical transceiver designed for 200G Ethernet long-reach applications in data centers and metro networks. It employs 4×50G PAM4 modulation technology, delivering an aggregate data rate of 212.5Gbps over single-mode fiber. Operating at 1310nm wavelength with dual LC connectors, this module achieves transmission distances up to 10km while maintaining compliance with IEEE 802.3bs and QSFP56 MSA standards. Its low-power architecture (<8W) supports hot-pluggable deployment in high-density network environments.

As an evolution of 100G QSFP28 solutions, this module optimizes spectral efficiency through advanced PAM4 encoding, reducing fiber infrastructure costs for 200G network upgrades. Ideal for spine-leaf connections and inter-data-center links, it ensures backward compatibility with existing DWDM systems and offers robust performance in temperature-controlled environments. The design prioritizes link reliability with built-in digital diagnostics (DDM) for real-time monitoring.

## Product performance Specifications

### 1、Basic Product Characteristics

| Parameter                      | Symbol               | Min   | Typ.  | Max    | Unit |
|--------------------------------|----------------------|-------|-------|--------|------|
| Storage Temperature            | T <sub>s</sub>       | -40   | -     | +85    | °C   |
| Supply Voltage                 | V <sub>CC</sub>      | 0     | -     | 3.6    | V    |
| Relative Humidity              | RH                   | 5     | -     | 85     | %    |
| Operating Case Temperature     | T <sub>c</sub>       | 0     | 25    | 70     | °C   |
| Power Supply Voltage           | V <sub>CC</sub>      | 3.135 | 3.3   | 3.465  | V    |
| Supply Current                 | I <sub>cc-8</sub>    | -     | -     | 2308.8 | mA   |
| Power Dissipation              | PD                   | -     | -     | 8      | W    |
| Data Rate                      | DR                   | -     | 212.5 | -      | Gbps |
| Supply Voltage Noise Tolerance | PSNR                 | -     | -     | 66     | mV   |
| Instantaneous peak current     | I <sub>cc_ip_8</sub> |       |       | 3200   | mA   |
| DC common mode voltage         |                      | -350  | -     | 2850   | mV   |

## 2、Product Optical and Electrical Characteristics

| Parameter                                                 | Symbol | Min             | Typ.    | Max     | Unit   |
|-----------------------------------------------------------|--------|-----------------|---------|---------|--------|
| AC Common-mode output voltage (RMS)                       |        |                 |         | 17.5    | mV     |
| Differential peak-to-peak output voltage                  |        |                 |         | 900     | mV     |
| Near-end ESMW (Eye symmetry mask width)                   |        | 0.265           |         |         | UI     |
| Near-end Eye height, differential                         |        | 70              |         |         | mV     |
| Far-end ESMW (Eye symmetry mask width)                    |        | 0.2             |         |         | UI     |
| Far-end Eye height, differential                          |        | 30              |         |         | mV     |
| Far-end pre-cursor ISI ratio                              |        | -4.5            |         | 2.5     | %      |
| Differential output return loss                           |        | Equation(83E-2) |         |         | dB     |
| Common to differential mode conversion return loss        |        | Equation(83E-3) |         |         | dB     |
| Differential termination mismatch                         |        |                 |         | 10      | %      |
| Transition time (20% to 80%)                              |        | 9.5             |         |         | Ps     |
| Signaling rate per lane (range)                           |        | -100ppm         | 26.5625 | +100ppm | GBd    |
| Differential pk-pk input voltage tolerance                |        | 900             |         |         | mV     |
| Differential input return loss                            |        | Equation(83E-5) |         |         | dB     |
| Differential to common mode input return loss             |        | Equation(83E-6) |         |         | dB     |
| Differential termination mismatch                         |        |                 |         | 10      | %      |
| ESMW (Eye symmetry mask width)                            |        | 0.22            |         |         | UI     |
| Applied pk-pk sinusoidal jitter                           |        | Table120E-6     |         |         | MHz,UI |
| Eye height                                                |        | 32              |         |         | mV     |
| Single-ended input voltage tolerance range                |        | -0.4            |         | 3.3     | V      |
| Transmitter                                               |        |                 |         |         |        |
| Center Wavelength                                         | Lane0  | 1294.53         |         | 1296.59 |        |
|                                                           | Lane1  | 1299.02         |         | 1301.09 |        |
|                                                           | Lane2  | 1303.54         |         | 1305.63 |        |
|                                                           | Lane3  | 1308.09         |         | 1310.19 |        |
| Total average launch power                                |        |                 |         | 11.3    | nm     |
| Average launch power, each lane <sub>1</sub>              |        | -3.4            |         | 5.3     | dBm    |
| Optical Modulation Amplitude [OMA],each lane <sub>2</sub> | OMA    | -0.4            |         | 5.1     | dBm    |
| Launch power in OMA minus TDEC                            |        | -1.8-1.7        |         |         | dBm    |
| Transmitter and dispersion eye closure [TDEC],each lane   | TDEC   |                 |         | 3.2     | dB     |
| TDECQ -10log10(Ceq) (max)                                 |        |                 |         | 3.2     | dB     |

|                                                               |                                      |                       |          |      |       |
|---------------------------------------------------------------|--------------------------------------|-----------------------|----------|------|-------|
| RIN15.6OMA                                                    |                                      |                       |          | -132 | dB/Hz |
| Optical Power for TX DISABLE                                  |                                      |                       |          | -30  | dBm   |
| Extinction Ratio                                              | ER                                   | 3.5                   |          |      | dB    |
| Optical Return Loss Tolerance                                 |                                      |                       |          | 15.6 | dB    |
| Signaling rate,each lane                                      |                                      |                       | 25.78125 |      | Gbps  |
| Optical eye mask                                              | Compliant with IEEE std 802.3bm-2015 |                       |          |      |       |
| Receiver                                                      |                                      |                       |          |      |       |
| Transmitter reflectance                                       |                                      |                       |          | -26  | dB    |
| Average receive power, each lane                              |                                      | −9.7                  |          | 5.1  | dBm   |
| Receive power (OMAAouter), each lane                          |                                      |                       |          | 5.1  | dBm   |
| Difference in receive power between any two lanes (OMAAouter) |                                      |                       |          | 4.2  | dB    |
| Receiver reflectance                                          |                                      |                       |          | -26  | dB    |
| Receiver sensitivity (OMAAouter), each lanec                  |                                      | RS=max(-7.2,SECQ-8.6) |          |      |       |
| Stressed receiver sensitivity(OMAAouter), each lane           |                                      | -5.4                  |          |      | dBm   |
| Conditions of stressed receiver sensitivity test              |                                      |                       |          |      |       |
| Stressed eye closure for PAM4 (SECQ), lane under test         | SECQ                                 | 3.2                   |          |      | dB    |
| SECQ – 10log10(Ceq), lane under test                          |                                      |                       |          | 3.2  | dB    |
| OMAAouter of each aggressor lane                              |                                      | -1.2                  |          |      | dBm   |

**Note1:** Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance

**Note2:** Even if the TDECQ < 1.4 dB for an extinction ratio of ≥ 4.5 dB or TDECQ < 1.3 dB for an extinction ratio of < 4.5 dB, the OMAouter (min) must exceed this value

## Recommended Host Board Power Supply Circuit

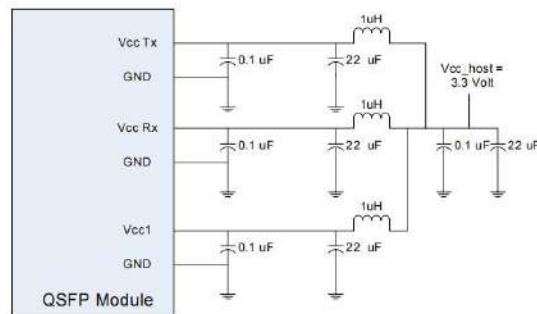


Figure 1: Recommended Host Board Power Supply Circuit

## Recommended Interface Circuit

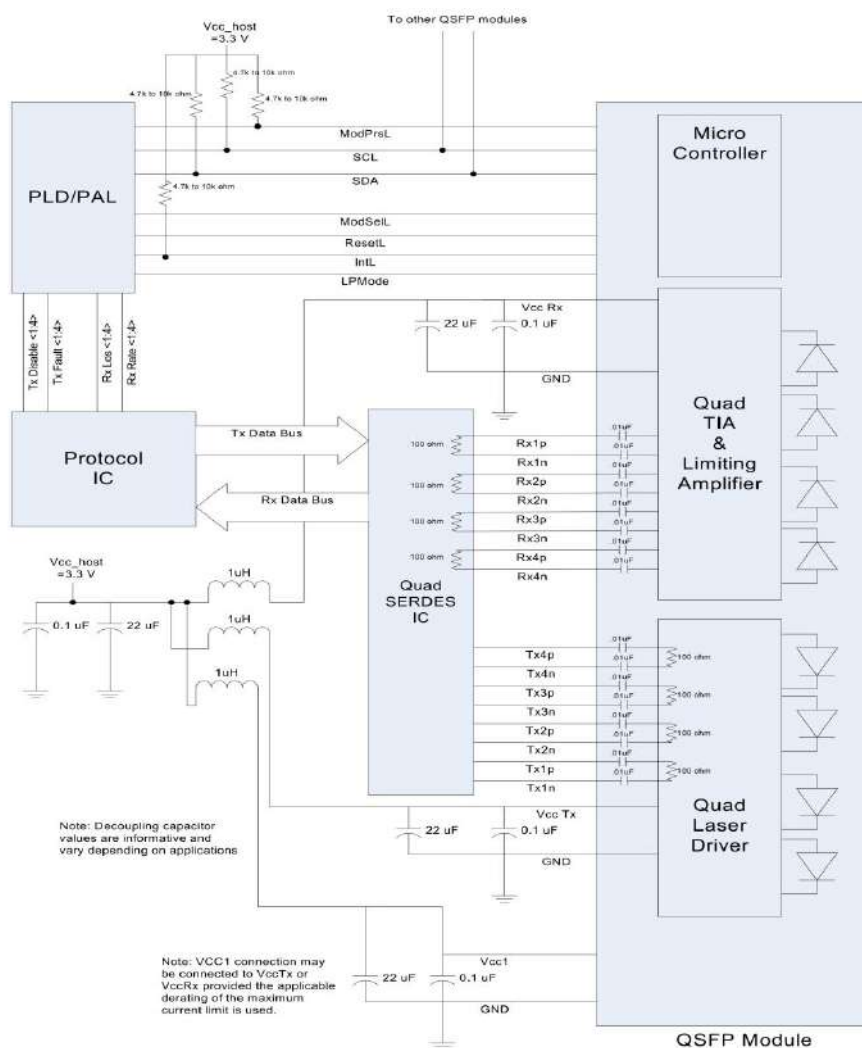


Figure 2: Recommended Interface Circuit

## Optical Interface

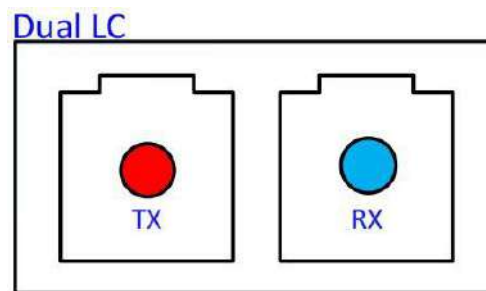


Figure3:Optical Lane Sequence

## Pin-out Definition

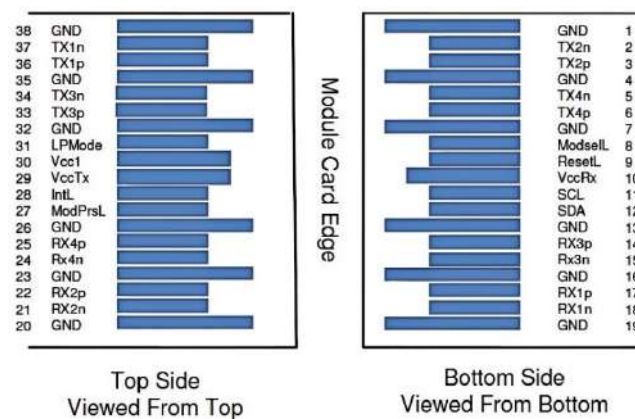


Figure4:Pin view

## Pin Function Definitions

| Pin | Logic       | Symbol  | Description                         | Note |
|-----|-------------|---------|-------------------------------------|------|
| 1   |             | GND     | Ground                              | 1    |
| 2   | CML-I       | Tx2n    | Transmitter Inverted Data Input     | 3    |
| 3   | CML-I       | Tx2p    | Transmitter Non-Inverted Data Input | 3    |
| 4   |             | GND     | Ground                              | 1    |
| 5   | CML-I       | Tx4n    | Transmitter Inverted Data Input     | 3    |
| 6   | CML-I       | Tx4p    | Transmitter Non-Inverted Data Input | 3    |
| 7   |             | GND     | Ground                              | 1    |
| 8   | LVTTL-I     | ModSelL | Module Select                       | 4    |
| 9   | LVTTL-I     | ReSelL  | Module Select                       | 4    |
| 10  |             | Vcc Rx  | +3.3V Power Supply Receiver         | 2    |
| 11  | LVC MOS-I/O | SCL     | 2-wire serial interface clock       | 4    |
| 12  | LVC MOS-I/O | SDA     | 2-wire serial interface data        | 4    |
| 13  |             | GND     | Ground                              | 1    |

|    |         |         |                                          |   |
|----|---------|---------|------------------------------------------|---|
| 14 | CML-O   | Rx3p    | Receiver Non-Inverted Data Output        | 3 |
| 15 | CML-O   | Rx3n    | Receiver Inverted Data Output            | 3 |
| 16 |         | GND     | Ground                                   | 1 |
| 17 | CML-O   | Rx1p    | Receiver Non-Inverted Data Output        | 3 |
| 18 | CML-O   | Rx1n    | Receiver Inverted Data Output            | 3 |
| 19 |         | GND     | Ground                                   | 1 |
| 20 |         | GND     | Ground                                   | 1 |
| 21 | CML-O   | Rx2n    | Receiver Inverted Data Output            | 3 |
| 22 | CML-O   | Rx2p    | Receiver Non-Inverted Data Output        | 3 |
| 23 |         | GND     | Ground                                   | 1 |
| 24 | CML-O   | Rx4n    | Receiver Inverted Data Output            | 3 |
| 25 | CML-O   | Rx4p    | Receiver Non-Inverted Data Output Ground | 3 |
| 26 |         | GND     | Ground                                   | 1 |
| 27 | LVTTL-O | ModPrsL | Module Present                           | 4 |
| 28 | LVTTL-O | IntL    | Interrupt                                | 4 |
| 29 |         | Vcc Tx  | +3.3V Power supply transmitter           | 2 |
| 30 |         | Vcc1    | +3.3V Power supply                       | 2 |
| 31 | LVTTL-I | LPMode  | Low Power Mode                           | 4 |
| 32 |         | GND     | Ground                                   | 1 |
| 33 | CML-I   | Tx3p    | Transmitter Non-Inverted Data Input      | 3 |
| 34 | CML-I   | Tx3n    | Transmitter Inverted Data Input          | 3 |
| 35 |         | GND     | Ground                                   | 1 |
| 36 | CML-I   | Tx1p    | Transmitter Non-Inverted Data Input      | 3 |
| 37 | CML-I   | Tx1n    | Transmitter Inverted Data Input          | 3 |
| 38 |         | GND     | Ground                                   | 1 |

**Note1:** GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

**Note2:** Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in Table. Recommended host board power supply filtering is shown in Host board power supply circuit. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP module in any combination. The connector pins are each rated for a maximum current of 500 mA.

**Note3:** High-speed signal interfaces require differential pairs (e.g. TX1+/TX1-) with tightly matched impedances (typically 100Ω).

**Note4:** The management and control signals are based on LVTTL level logic and are used for functions such as module selection and reset.

## Monitoring Specification

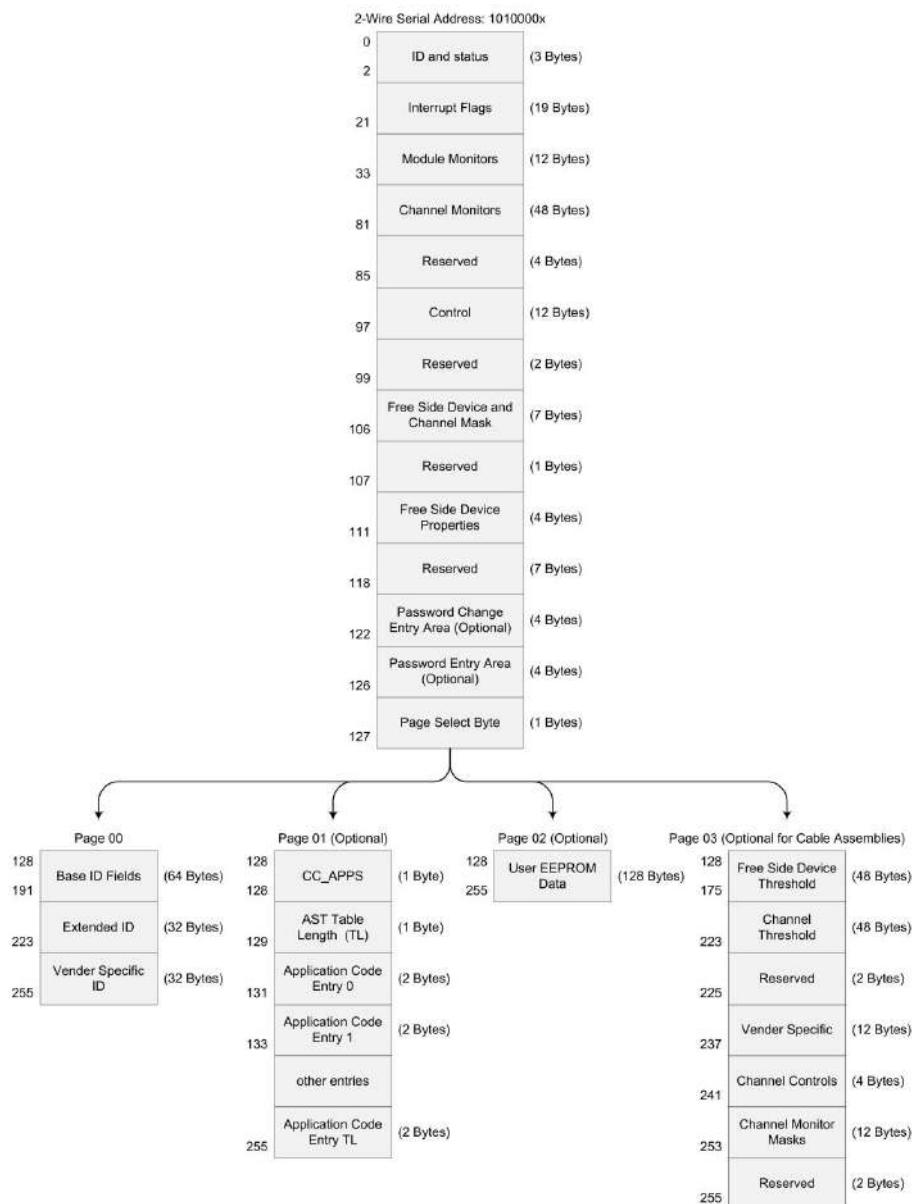


Figure5:Memory map

## Memory map Table

| Byte           | Unit | Name       | Description                                                                                        |
|----------------|------|------------|----------------------------------------------------------------------------------------------------|
| Lower Page 00h |      |            |                                                                                                    |
| 0              | 1    | Identifier | Type of transceiver,Page 00h Byte 0 and Page 00h Byte 128 shall contain the same parameter values. |
| 1              | 1    | Status     | Revision Compliance                                                                                |
| 2              | 1    | Status     | Status indicators                                                                                  |



|         |    |                                    |                                                                                                        |
|---------|----|------------------------------------|--------------------------------------------------------------------------------------------------------|
| 3-21    | 19 | Interrupt Flags                    | Consist of interrupt flags for LOS, Tx Fault, warnings and alarms. The non-asserted state shall be 0b. |
| 22      | 1  | Temperature MSB                    | Internally measured temperature (MSB)                                                                  |
| 23      | 1  | Temperature LSB                    | Internally measured temperature (LSB)                                                                  |
| 24-25   | 2  | Reserved                           | Reserved                                                                                               |
| 26      | 1  | Supply Voltage MSB                 | Internally measured supply voltage (MSB)                                                               |
| 27      | 1  | Supply Voltage LSB                 | Internally measured supply voltage (LSB)                                                               |
| 28-29   | 2  | Reserved                           | Reserved                                                                                               |
| 30-33   | 4  | Vendor Specific                    | Vendor Specific                                                                                        |
| 34      | 1  | Rx1 Power MSB                      | Internally measured Rx1 input power                                                                    |
| 35      | 1  | Rx1 Power LSB                      |                                                                                                        |
| 36      | 1  | Rx2 Power MSB                      | Internally measured Rx2 input power                                                                    |
| 37      | 1  | Rx2 Power LSB                      |                                                                                                        |
| 38      | 1  | Rx3 Power MSB                      | Internally measured Rx3 input power                                                                    |
| 39      | 1  | Rx3 Power LSB                      |                                                                                                        |
| 40      | 1  | Rx4 Power MSB                      | Internally measured Rx4 input power                                                                    |
| 41      | 1  | Rx4 Power LSB                      |                                                                                                        |
| 42      | 1  | Tx1 Bias MSB                       | Internally measured Tx1 bias                                                                           |
| 43      | 1  | Tx1 Bias LSB                       |                                                                                                        |
| 44      | 1  | Tx2 Bias MSB                       | Internally measured Tx2 bias                                                                           |
| 45      | 1  | Tx2 Bias LSB                       |                                                                                                        |
| 46      | 1  | Tx3 Bias MSB                       | Internally measured Tx3 bias                                                                           |
| 47      | 1  | Tx3 Bias LSB                       |                                                                                                        |
| 48      | 1  | Tx4 Bias MSB                       | Internally measured Tx4 bias                                                                           |
| 49      | 1  | Tx4 Bias LSB                       |                                                                                                        |
| 50      | 1  | Tx1 Power MSB                      | Internally measured Tx1 Power                                                                          |
| 51      | 1  | Tx1 Power LSB                      |                                                                                                        |
| 52      | 1  | Tx2 Power MSB                      | Internally measured Tx2 Power                                                                          |
| 53      | 1  | Tx2 Power LSB                      |                                                                                                        |
| 54      | 1  | Tx3 Power MSB                      | Internally measured Tx3 Power                                                                          |
| 55      | 1  | Tx3 Power LSB                      |                                                                                                        |
| 56      | 1  | Tx4 Power MSB                      | Internally measured Tx4 Power                                                                          |
| 57      | 1  | Tx4 Power LSB                      |                                                                                                        |
| 58-65   | 8  | Reserved                           | Reserved channel monitor set 4                                                                         |
| 66-73   | 8  | Reserved                           | Reserved channel monitor set 5                                                                         |
| 74-81   | 8  | Vendor Specific                    | Vendor Specific                                                                                        |
| 82-85   | 4  | Reserved                           | Reserved                                                                                               |
| 86-99   | 14 | Control                            | Control                                                                                                |
| 100-106 | 7  | Free Side Device and Channel Masks | Free Side Device and Channel Masks                                                                     |
| 107-110 | 4  | Free Side Device Properties        | Free Side Device Properties                                                                            |

|                |    |                                                      |                                                                                                                                                                                                                         |
|----------------|----|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 111-112        | 2  | Assigned for use by PCI Express                      | Used for:                                                                                                                                                                                                               |
|                |    |                                                      | - The PCI Express External Cable Specification                                                                                                                                                                          |
|                |    |                                                      | - The PCI Express OCuLink Specification                                                                                                                                                                                 |
| 113-117        | 4  | Free Side Device Properties                          | Free Side Device Properties                                                                                                                                                                                             |
| 118            | 1  | Reserved                                             | Reserved                                                                                                                                                                                                                |
| 119-122        | 4  | Password Change Entry Area                           | Password Change Entry Area                                                                                                                                                                                              |
| 123-126        | 4  | Password Entry Area                                  | Password Entry Area                                                                                                                                                                                                     |
| 127            | 1  | Page Select Byte                                     | Page Select Byte                                                                                                                                                                                                        |
| Upper Page 00h |    |                                                      |                                                                                                                                                                                                                         |
| 128            | 1  | Identifier                                           | Identifier Type of free side device.(See SFF-8024 Transceiver Management)                                                                                                                                               |
| 129            | 1  | Ext. Identifier                                      | Extended Identifier of free side device. Includes power classes, CLEI codes, CDR capability.                                                                                                                            |
| 130            | 1  | Connector Type                                       | Code for media connector type. (See SFF-8024 Transceiver Management)                                                                                                                                                    |
| 131-138        | 8  | Specification Compliance                             | Code for electronic or optical compatibility.                                                                                                                                                                           |
| 139            | 1  | Encoding                                             | Code for serial encoding algorithm. (See SFF-8024 Transceiver Management)                                                                                                                                               |
| 140            | 1  | Signaling rate, nominal                              | Nominal signaling rate, units of 100 MBd. For rate > 25.4 GBd, set this to FFh and use Byte 222.                                                                                                                        |
| 141            | 1  | Extended Rate Select Compliance                      | Tags for extended rate select compliance.                                                                                                                                                                               |
| 142            | 1  | Length (SMF)                                         | Link length supported at the signaling rate in byte 140 or page 00h byte 222, for SMF fiber in km *. A value of 1 shall be used for reaches from 0 to 1 km.                                                             |
| 143            | 1  | Length (OM3 50 um)                                   | Link length supported at the signaling rate in byte 140 or page 00h byte 222, for EBW 50/125 um fiber (OM3), units of 2 m *                                                                                             |
| 144            | 1  | Length (OM2 50 um)                                   | Link length supported at the signaling rate in byte 140 or page 00h byte 222, for 50/125 um fiber (OM2), units of 1 m *                                                                                                 |
| 145            | 1  | Length (OM1 62.5 um) or Copper                       | Link length supported at the signaling rate in byte 140 or page 00h byte 222, for 62.5/125 um fiber (OM1), units of 1 m *, or copper cable attenuation in dB at 25.78 GHz.                                              |
|                |    | Cable Attenuation                                    |                                                                                                                                                                                                                         |
| 146            | 1  | Length (passive copper or active cable or OM4 50 um) | Length of passive or active cable assembly (units of 1 m) or link length supported at the signaling rate in byte 140 or page 00h byte 222, for OM4 50/125 um fiber (units of 2 m) as indicated by Byte 147. See 6.3.12. |
| 147            | 1  | Device technology                                    | Device technology                                                                                                                                                                                                       |
| 148-163        | 16 | Vendor name                                          | Free side device vendor name (ASCII)                                                                                                                                                                                    |
| 164            | 1  | Extended Module                                      | Extended Module codes for InfiniBand.                                                                                                                                                                                   |
| 165-167        | 3  | Vendor OUI                                           | Free side device vendor IEEE company ID.                                                                                                                                                                                |
| 168-183        | 16 | Vendor PN                                            | Part number provided by free side device vendor(ASCII)                                                                                                                                                                  |
| 184-185        | 2  | Vendor rev                                           | Revision level for part number provided by the vendor(ASCII)                                                                                                                                                            |

|         |    |                                                  |                                                                                                                                                                                       |
|---------|----|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 186-187 | 2  | Wavelength or Copper Cable Attenuation           | Nominal laser wavelength (wavelength=value/20 in nm) or copper cable attenuation in dB at 2.5 GHz (Byte 186) and 5.0 GHz (Byte 187)                                                   |
| 188-189 | 2  | Wavelength tolerance or Copper Cable Attenuation | The range of laser wavelength (+/- value) from nominal wavelength. (wavelength Tol. =value/200 in nm) or copper cable attenuation in dB at 7.0 GHz (Byte 188) and 12.9 GHz (Byte 189) |
| 190     | 1  | Max case temp                                    | Maximum case temperature                                                                                                                                                              |
| 191     | 1  | CC_BASE                                          | Check code for base ID fields (Bytes 128-190)                                                                                                                                         |
| 192     | 1  | Link codes                                       | Extended Specification Compliance Codes (See SFF-8024)                                                                                                                                |
| 193-195 | 3  | Options                                          | Optional features implemented.                                                                                                                                                        |
| 196-211 | 16 | Vendor SN                                        | Serial number provided by vendor.(ASCII)                                                                                                                                              |
| 212-219 | 8  | Date Code                                        | Vendor's manufacturing date code.                                                                                                                                                     |
| 220     | 1  | Diagnostic Monitoring Type                       | Indicates which type of diagnostic monitoring is implemented (if any) in the free side device. Bit 1,0 Reserved.                                                                      |
| 221     | 1  | Enhanced Options                                 | Indicates which optional enhanced features are implemented in the free side device.                                                                                                   |
| 222     | 1  | CC_EXT                                           | Check code for the Extended ID Fields (Bytes 192-222)                                                                                                                                 |
| 224-255 | 32 | Vendor Specific                                  | Vendor Specific EEPROM                                                                                                                                                                |

#### Page 02h (Optional)

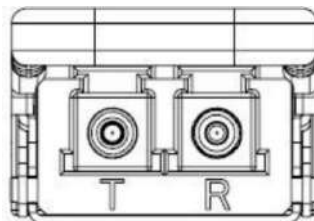
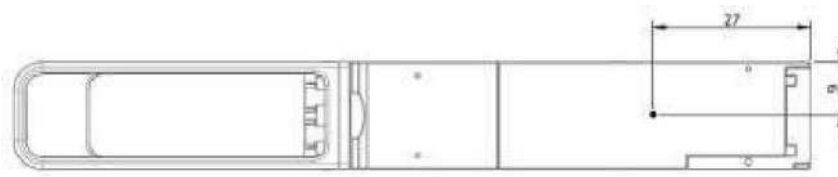
|         |     |                  |  |
|---------|-----|------------------|--|
| 128-255 | 128 | User EEPROM Data |  |
|---------|-----|------------------|--|

#### Page 03h (Optional)

|         |    |                       |                           |
|---------|----|-----------------------|---------------------------|
| 128-129 | 2  | Temp High Alarm       | MSB at lower byte address |
| 130-131 | 2  | Temp Low Alarm        | MSB at lower byte address |
| 132-133 | 2  | Temp High Warning     | MSB at lower byte address |
| 134-135 | 2  | Temp Low Warning      | MSB at lower byte address |
| 136-143 | 8  | Reserved              | Reserved                  |
| 144-145 | 2  | Vcc High Alarm        | MSB at lower byte address |
| 146-147 | 2  | Vcc Low Alarm         | MSB at lower byte address |
| 148-149 | 2  | Vcc High Warning      | MSB at lower byte address |
| 150-151 | 2  | Vcc Low Warning       | MSB at lower byte address |
| 152-159 | 8  | Reserved              | Reserved                  |
| 160-175 | 16 | Vendor Specific       | Vendor Specific           |
| 176-177 | 2  | Rx Power High Alarm   | MSB at lower byte address |
| 178-179 | 2  | Rx Power Low Alarm    | MSB at lower byte address |
| 180-181 | 2  | Rx Power High Warning | MSB at lower byte address |
| 182-183 | 2  | Rx Power Low Warning  | MSB at lower byte address |
| 184-185 | 2  | Tx Bias High Alarm    | MSB at lower byte address |
| 186-187 | 2  | Tx Bias Low Alarm     | MSB at lower byte address |
| 188-189 | 2  | Tx Bias High Warning  | MSB at lower byte address |
| 190-191 | 2  | Tx Bias Low Warning   | MSB at lower byte address |
| 192-193 | 2  | Tx Power High Alarm   | MSB at lower byte address |
| 194-195 | 2  | Tx Power Low Alarm    | MSB at lower byte address |
| 196-197 | 2  | Tx Power High Warning | MSB at lower byte address |

|         |    |                                        |                                                 |
|---------|----|----------------------------------------|-------------------------------------------------|
| 198-199 | 2  | Tx Power Low Warning                   | MSB at lower byte address                       |
| 200-207 | 8  | Reserved                               | Reserved thresholds for channel parameter set 4 |
| 208-215 | 8  | Reserved                               | Reserved thresholds for channel parameter set 5 |
| 216-223 | 8  | Vendor Specific                        | Vendor Specific                                 |
| 224     | 1  | Tx EQ & Rx Emphasis Magnitude ID       | Tx EQ & Rx Emphasis Magnitude ID                |
| 225     | 1  | Rx output amplitude support indicators | Rx output amplitude support indicators          |
| 226-229 | 4  | Control options advertising            | Control options advertising                     |
| 230-241 | 12 | Optional Channel Controls              | Optional Channel Controls                       |
| 242-247 | 6  | Channel Monitor Masks                  | Channel Monitor Masks                           |
| 248-249 | 2  | Reserved                               | Reserved channel monitor masks set 4            |
| 250-251 | 2  | Reserved                               | Reserved channel monitor masks set 5            |
| 252-255 | 4  | Reserved                               | Reserved                                        |

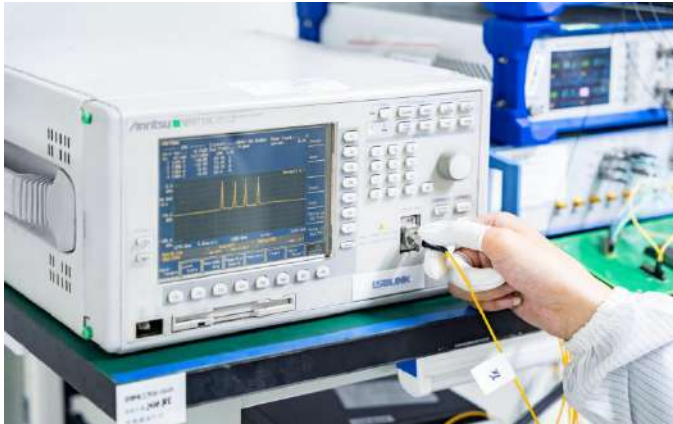
## Mechanical Dimension



## Test Center

### 1、Performance Testing

Every fiber optic transceiver is thoroughly tested by the LSOLINK Assurance Program, which is equipped with the world's most advanced analytical equipment to ensure that our transceivers meet the industry's international public protocol standards while still functioning flawlessly in your facility.



#### Optical Spectrum Inspection

Using the industry's leading optical spectrum analyser to check in real time that the parameters of the optical transceiver's laser comply with industry standards.

- **Peak:** Peak wavelength and peak level
- **2nd Peak:** Side-mode wavelength and level
- **Mean Wl:** Center wavelength
- **Total Power:** Total power of spectrum
- **SMSR:** Side-Mode Suppression Ratio



#### Optical Signal Quality Inspection

Using highly efficient sampling oscilloscopes and BERT testers, equipped with an automated test platform to accurately test the signal quality of the transceiver, test records are kept for up to 5 years to ensure the traceability of each transceiver.

- **Eye Mask Margin(NRZ)**
- **TDECQ(PAM4):**transmitter dispersion eye closure
- **OMA:** Optical modulation amplitude
- **BER:** Bit error rate
- **ER:** Extinction Ratio



#### Flow Pressure Test

Using multi-protocol network traffic analyser with various brands of switches to test the transceiver's ability to transmit at full speed.

- **Bandwidth:** Actual transceiver bandwidth on the port
- **Packet Loss**
- **Packet Errors:**CRC Errors/PCS Errors/Symbol Errors
- **LinkDown Counts**
- **latency**

Above is part of our test bed network equipment. For more information, Please click [download](#) for optical transceiver performance test report.



## 2、Quality Control

We adopt advanced quality management solutions. Each transceiver is self-inspected, including: 20x microscope inspection, 200x microscope inspection, and QC process inspection.



**visual inspection**



**Microscopic inspection: 20X**



**Microscopic inspection: 200X**



**Reliability Verification**



**Optical endface inspection**



**OQC Inspection**

## Order Information

| Part Number  | Description                                                                   |
|--------------|-------------------------------------------------------------------------------|
| 200G-Q56-SR4 | 200GBASE-SR4 QSFP56 200G 850nm 100m DOM MTP/MPO-12 UPC MMF Transceiver Module |
| 200G-Q56-FR4 | 200GBASE-FR4 QSFP56 200G 1310nm 2km DOM LC SMF Transceiver Module             |
| 200G-Q56-LR4 | 200GBASE-LR4 QSFP56 1310nm 10km DOM Duplex LC SMF Optical Transceiver Module  |

## Further Information

 | Lighting the Path to Global Links

 **Web** | [www.lsolink.com](http://www.lsolink.com)

 **Email** | For [Sales@lsolink.com](mailto:Sales@lsolink.com)

## Disclaimer

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