

## QFP-MM85FG-S1DC

40Gbps QSFP+ Transceiver, Multi Mode, 100m Reach

### Product Features

- 4 channels full-duplex transceiver modules
- 10.3125Gb/s data rate per channel
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Single MPO connector receptacle
- Hot Pluggable QSFP+ form factor
- Maximum link length of 100m on OM3 Multimode Fiber (MMF) and 150m on OM4 MMF
- Compatible with RoHS
- Single +3.3V power supply
- Real Time Digital Diagnostic Monitoring
- Operating case temperature: 0 to +70°C



### Applications

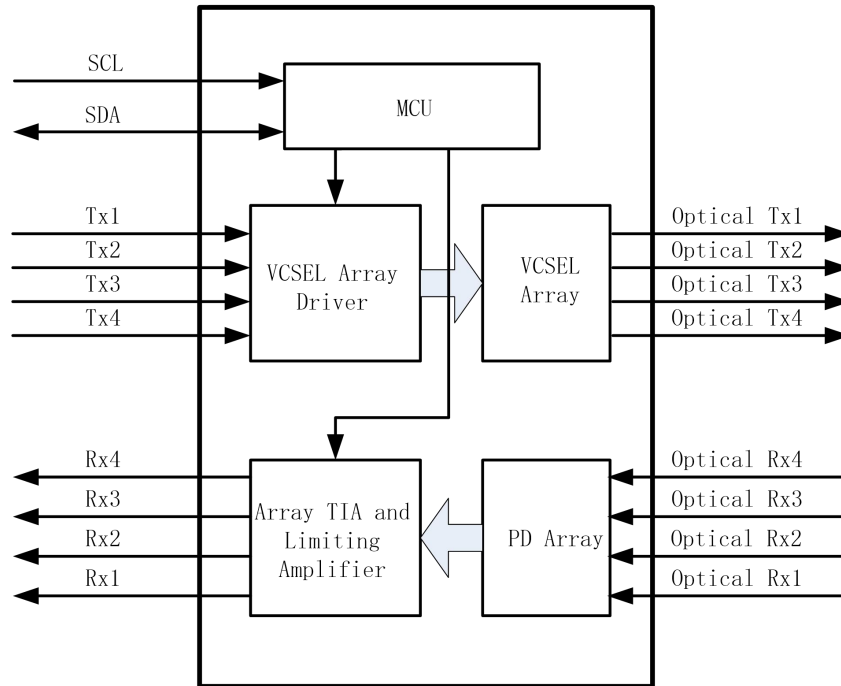
- 40GBASE-SR4 Ethernet
- Switch, router and HBAs
- Infiniband transmission at 4 channels SDR, DDR and QDR
- High-performance Backplane Applications
- Proprietary Protocol Applications

### Description

The QSFP+ SR4 transceivers are high performance, cost effective modules supporting data rate of 40Gbps and 100m transmission distance with MMF.

The transceiver consists of three sections: 4 channels 850nm VCSEL array, 4 channels PIN photo detector array and MCU control unit. All modules satisfy class I laser safety requirements.

The transceivers are compatible with 40GBASE-SR4 of IEEE802.3ba standard and SFF-8436 specification.



Transceiver functional diagram

## Absolute Maximum Ratings

| Parameter           | Symbol | Min  | Max | Unit |
|---------------------|--------|------|-----|------|
| Supply Voltage      | Vcc    | -0.5 | 4.5 | V    |
| Storage Temperature | Ts     | -20  | +85 | °C   |
| Operating Humidity  | -      | 5    | 85  | %    |

## Recommended Operating Conditions

| Parameter                  | Symbol | Min   | Typical | Max   | Unit |
|----------------------------|--------|-------|---------|-------|------|
| Operating Case Temperature | Tc     | 0     |         | +70   | °C   |
| Power Supply Voltage       | Vcc    | 3.135 | 3.30    | 3.465 | V    |
| Power Dissipation          | Pm     |       |         | 1.5   | W    |
| Data Rate                  |        |       | 10.3125 |       | Gbps |

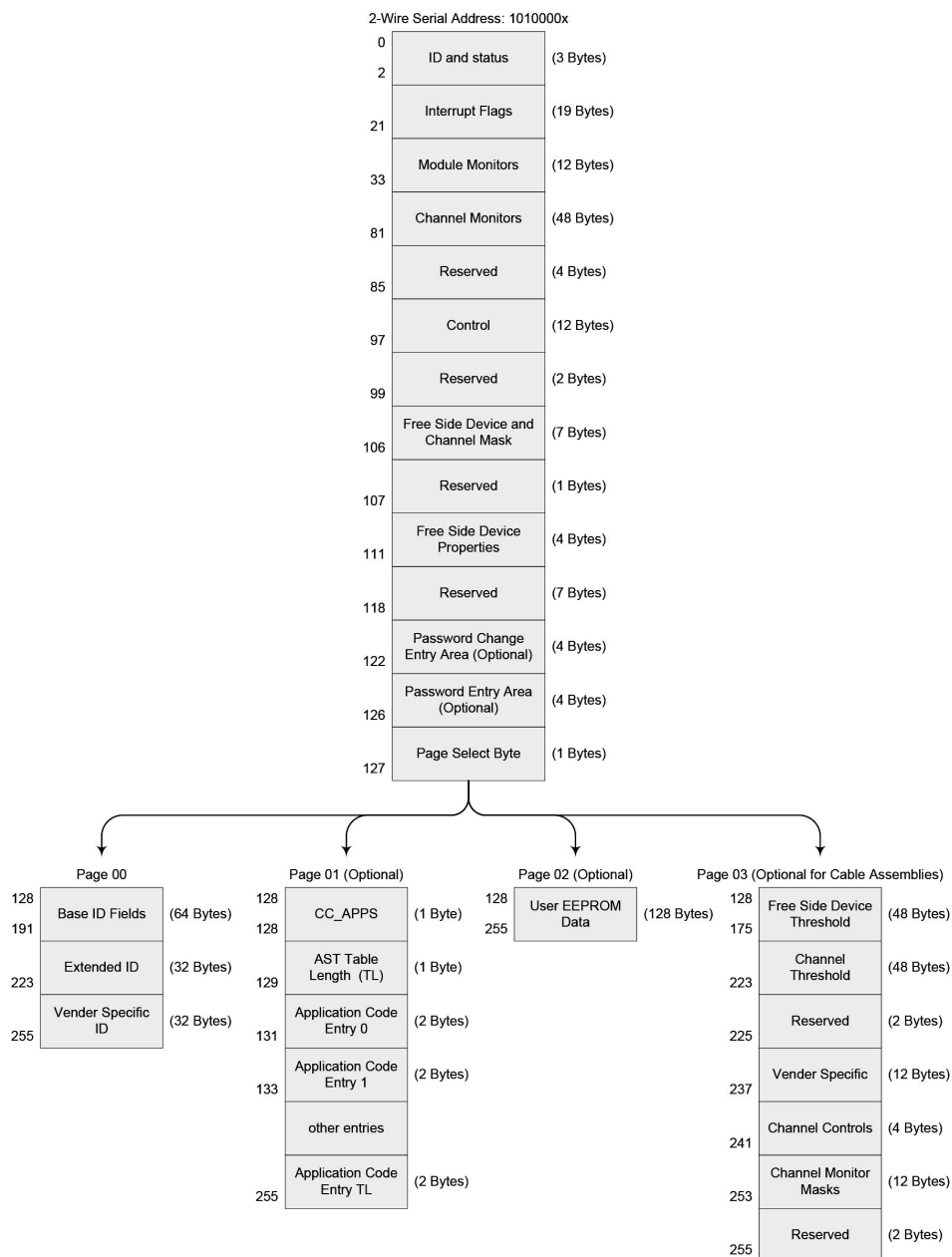
## Optical and Electrical Characteristics

| Parameter  | Symbol          | Min  | Typical | Max  | Unit     | Notes |
|--|-----------------|------|---------|------|----------|-------|
| <b>Transmitter</b>                                 |                 |      |         |      |          |       |
| Centre Wavelength                                  | $\lambda_c$     | 840  | 850     | 860  | nm       |       |
| RMS spectral width                                 | $\Delta\lambda$ | -    | -       | 0.65 | nm       |       |
| Average launch power, each lane                    | $P_{out}$       | -7.6 |         | 2.4  | dBm      |       |
| Extinction Ratio                                   | ER              | 3.0  |         |      | dB       |       |
| Average launch power of OFF transmitter, each lane | $P_{off}$       |      |         | -30  | dBm      |       |
| Data Input Swing Differential                      | $V_{IN}$        | 90   |         | 1600 | mV       |       |
| Input Differential Impedance                       | $Z_{IN}$        | 80   | 100     | 120  | $\Omega$ |       |
| <b>Receiver</b>                                    |                 |      |         |      |          |       |
| Centre Wavelength                                  | $\lambda_c$     | 840  |         | 860  | nm       |       |
| Damage threshold                                   | THd             | 3.4  |         |      | dBm      |       |
| Average power at receiver input, each lane         |                 | -9.5 |         | 2.4  | dBm      |       |
| LOS De-Assert                                      | $LOS_D$         |      |         | -12  | dBm      |       |
| LOS Assert   | $LOS_A$         | -30  |         |      | dBm      |       |
| LOS Hysteresis                                     |                 | 0.5  |         |      | dB       |       |

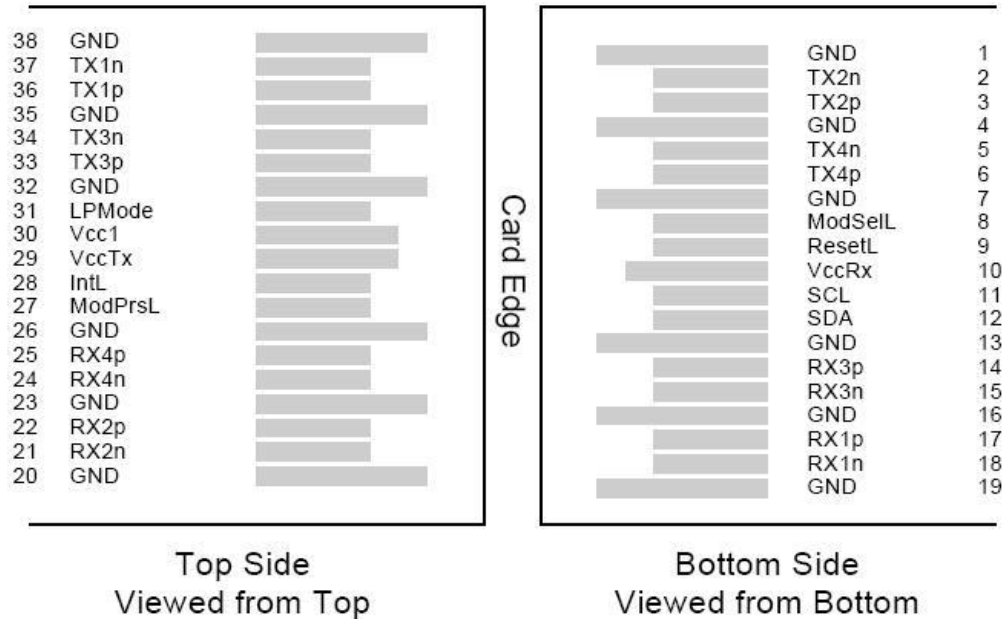
## Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The digital diagnostic memory map specific data field defines as following.



## Pin Descriptions



| PIN | Logic       | Symbol  | Name/Description                    | Note |
|-----|-------------|---------|-------------------------------------|------|
| 1   |             | GND     | Ground                              | 1    |
| 2   | CML-I       | Tx2n    | Transmitter Inverted Data Input     |      |
| 3   | CML-I       | Tx2p    | Transmitter Non-Inverted Data Input |      |
| 4   |             | GND     | Ground                              | 1    |
| 5   | CML-I       | Tx4n    | Transmitter Inverted Data Input     |      |
| 6   | CML-I       | Tx4p    | Transmitter Non-Inverted Data Input |      |
| 7   |             | GND     | Ground                              | 1    |
| 8   | LVTLL-I     | ModSelL | Module Select                       |      |
| 9   | LVTLL-I     | ResetL  | Module Reset                        |      |
| 10  |             | VccRx   | + 3.3V Power Supply Receiver        | 2    |
| 11  | LVC MOS-I/O | SCL     | 2-Wire Serial Interface Clock       |      |
| 12  | LVC MOS-I/O | SDA     | 2-Wire Serial Interface Data        |      |
| 13  |             | GND     | Ground                              |      |
| 14  | CML-O       | Rx3p    | Receiver Non-Inverted Data Output   |      |
| 15  | CML-O       | Rx3n    | Receiver Inverted Data Output       |      |
| 16  |             | GND     | Ground                              | 1    |

|    |          |         |                                     |   |
|----|----------|---------|-------------------------------------|---|
| 17 | CML-O    | Rx1p    | Receiver Non-Inverted Data Output   |   |
| 18 | CML-O    | Rx1n    | Receiver Inverted Data Output       |   |
| 19 |          | GND     | Ground                              | 1 |
| 20 |          | GND     | Ground                              | 1 |
| 21 | CML-O    | Rx2n    | Receiver Inverted Data Output       |   |
| 22 | CML-O    | Rx2p    | Receiver Non-Inverted Data Output   |   |
| 23 |          | GND     | Ground                              | 1 |
| 24 | CML-O    | Rx4n    | Receiver Inverted Data Output       | 1 |
| 25 | CML-O    | Rx4p    | Receiver Non-Inverted Data Output   |   |
| 26 |          | GND     | Ground                              | 1 |
| 27 | LVTTTL-O | ModPrsL | Module Present                      |   |
| 28 | LVTTTL-O | IntL    | Interrupt                           |   |
| 29 |          | VccTx   | +3.3 V Power Supply transmitter     | 2 |
| 30 |          | Vcc1    | +3.3 V Power Supply                 | 2 |
| 31 | LVTTTL-I | LPMODE  | Low Power Mode                      |   |
| 32 |          | GND     | Ground                              | 1 |
| 33 | CML-I    | Tx3p    | Transmitter Non-Inverted Data Input |   |
| 34 | CML-I    | Tx3n    | Transmitter Inverted Data Input     |   |
| 35 |          | GND     | Ground                              | 1 |
| 36 | CML-I    | Tx1p    | Transmitter Non-Inverted Data Input |   |
| 37 | CML-I    | Tx1n    | Transmitter Inverted Data Input     |   |
| 38 |          | GND     | Ground                              | 1 |

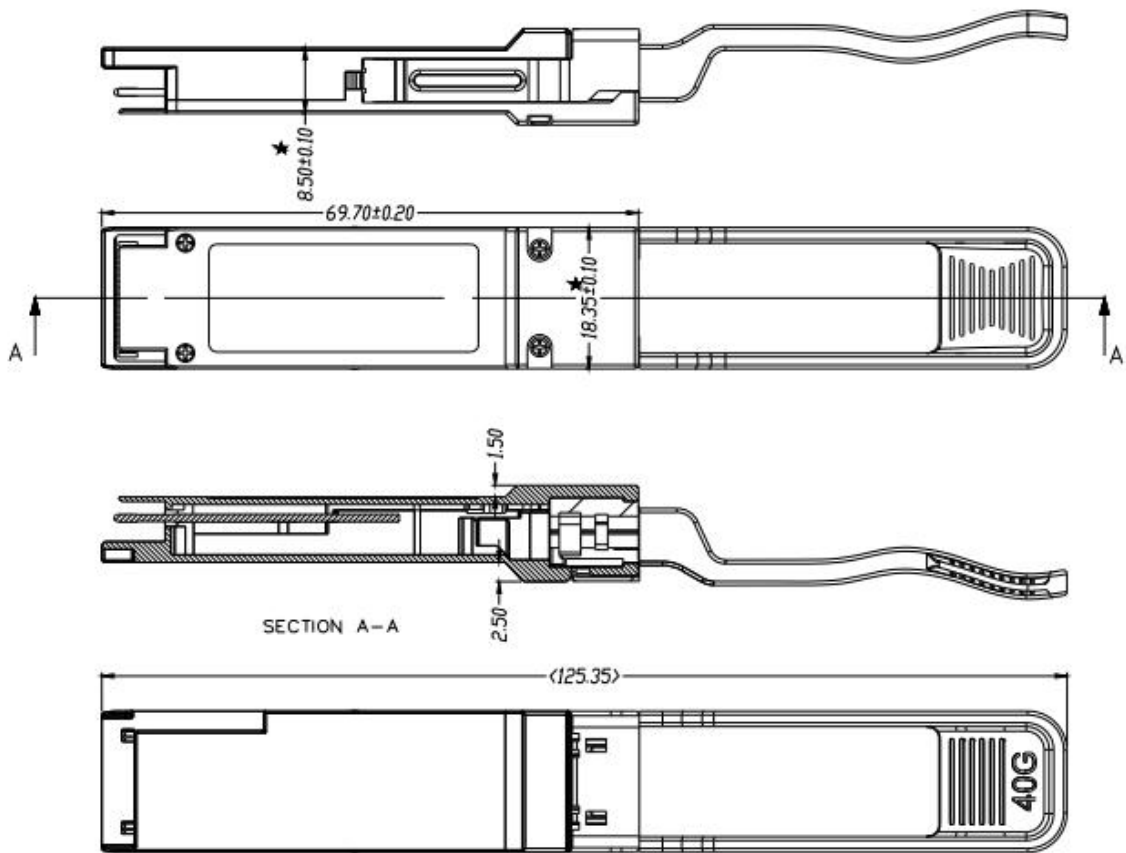
Notes:

1. GND is the symbol for signal and supply (power) common for QSFP modules. 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.

2. VccRx, Vcc1 and VccTx are the receiver and transmitter power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA.

## Mechanical Dimensions

Unit:mm



## Ordering information

| Part Number     | Product Description                           |
|-----------------|---|
| QFP-MM85FG-S1DC | 850nm, 40Gbps, MPO, 100m, 0°C~+70°C, with DDM |

## For More Information

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