

|                                                                                   |           |              |            |
|-----------------------------------------------------------------------------------|-----------|--------------|------------|
|  | Datasheet | No.          | DS10-E052  |
|                                                                                   |           | Initial Date | 2017-07-21 |
| OE                                                                                | OEMM841   | Written Team | R&D Dept.  |
|                                                                                   |           |              | GH Zheng   |

## I Preview

|             |                                |
|-------------|--------------------------------|
| PN          | OEMM841                        |
| Description | 25G SFP28 MM 850nm 100MLC DDMI |

## II Contents

1. Features
2. Applications
3. Description
4. Absolute maximum Ratings
5. Operating Environment
6. Optical and Electrical Characteristics
7. Timing and Electrical
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11. Recommended Circuit
12. Mechanical Dimensions
13. Model Name Information

## III Revision History

| No. | Date       | Items | Change Recording     | Ver. | Rev. | Customer |
|-----|------------|-------|----------------------|------|------|----------|
| 1   | 2017-07-21 | All   | Initial registration | 000  | 000  | Standard |
| 2   |            |       |                      |      |      |          |
| 3   |            |       |                      |      |      |          |
| 4   |            |       |                      |      |      |          |
| 5   |            |       |                      |      |      |          |
| 6   |            |       |                      |      |      |          |

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|                                                                                                           | Product   | SFP+ transceiver<br>OE serials | Ver.                               | 000   |
|                                                                                                           | Part No.  | OEMM841                        | Rev.                               | 000   |
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## 1. Features

- ◆ Supports up to 25.78Gbps bit rates
- ◆ Hot-pluggable SFP+ footprint
- ◆ 850nm VCSEL laser and PIN photodiode, Up to 20m for OM2-MMF, 70m for OM3-MMF and 100m for OM4-MMF transmission
- ◆ Compliant with SFP+ MSA and SFF-8472 with duplex LC receptacle
- ◆ Compatible with RoHS
- ◆ Single +3.3V power supply
- ◆ Real Time Digital Diagnostic Monitoring
- ◆ Operating case temperature: 0 to +70°C

## 2. Applications

- ◆ 25GE SR/eCPRI
- ◆ CPRI option 10, 7, 8
- ◆ 100GE SR fan out to 4x25GE SR
- ◆ Other optical links

## 3. Description

OEMM841 is high performance, cost effective modules supporting data rate of 25.78Gbps and up to 20m for OM2-MMF, 70m for OM3-MMF and 100m for OM4-MMF transmission distance. The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement and SFF-8472 digital diagnostics functions.

### Internal CDR's Locking Modes

Bits 110.3 and bits 118.3 control the locking modes of the internal retimer or CDR, default Value is "1".

| Bit 110.3 of A2h | Bit 118.3 of A2h | RX Data Rate  | TX Data Rate  | Status of RX CDR | Status of TX CDR |
|------------------|------------------|---------------|---------------|------------------|------------------|
| High/1           | High/1           | 24.33G/25.78G | 24.33G/25.78G | CDR select       | CDR select       |
| High/1           | Low/0            | 24.33G/25.78G | 9.95G/10.31G  | CDR select       | CDR bypass       |
| Low/0            | High/1           | 9.95G/10.31G  | 24.33G/25.78G | CDR bypass       | CDR select       |
| Low/0            | Low/0            | 9.95G/10.31G  | 9.95G/10.31G  | CDR bypass       | CDR bypass       |

|                                                                                                                                                                                                                                     |        |       |       |          |
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|                                |                  |     |     |                 |                 |   |  |
|--------------------------------|------------------|-----|-----|-----------------|-----------------|---|--|
| TX Fault                       | Fault            |     | 2.0 |                 | V <sub>cc</sub> | V |  |
|                                | Normal           |     | 0   |                 | 0.8             | V |  |
| <b>Receiver</b>                |                  |     |     |                 |                 |   |  |
| Optical Wavelength             | $\lambda$        | 840 | 850 | 860             | nm              |   |  |
| Receiver Sensitivity@25.78Gbps |                  |     |     | -10.3           | dBm             | 3 |  |
| Receiver Sensitivity@10.3Gbps  |                  |     |     | -12.5           | dBm             | 4 |  |
| Receiver Overload              |                  | 2.4 |     |                 | dBm             | 3 |  |
| LOS De-Assert                  | LOS <sub>D</sub> |     |     | -13             | dBm             |   |  |
| LOS Assert                     | LOS <sub>A</sub> | -30 |     |                 | dBm             |   |  |
| LOS Hysteresis                 |                  | 0.5 |     | 4               | dB              |   |  |
| Data Output Swing Differential | V <sub>out</sub> | 500 | 700 | 900             | mV              | 4 |  |
| LOS                            | High             | 2.0 |     | V <sub>cc</sub> | V               |   |  |
|                                | Low              |     |     | 0.8             | V               |   |  |

#### Notes:

- 1). The optical power is launched into MMF.
- 2). PECL input, internally AC-coupled and terminated.
- 3). Measured with a PRBS 2<sup>31</sup>-1 test pattern @25.78Gbps, BER ≤ 5E-5..
- 4). Measured with a PRBS 2<sup>31</sup>-1 test pattern @10.3Gbps, BER ≤ 1E-12.
- 5). Internally AC-coupled.

### 7. Timing and Electrical

| Parameter                                       | Symbol                    | Min | Typical | Max             | Unit |
|-------------------------------------------------|---------------------------|-----|---------|-----------------|------|
| Tx Disable Negate Time                          | t <sub>on</sub>           |     |         | 2               | ms   |
| Tx Disable Assert Time                          | t <sub>off</sub>          |     |         | 100             | μs   |
| Time To Initialize, including Reset of Tx Fault | t <sub>init</sub>         |     |         | 300             | ms   |
| Tx Fault Assert Time                            | t <sub>fault</sub>        |     |         | 100             | μs   |
| Tx Disable To Reset                             | t <sub>reset</sub>        | 10  |         |                 | μs   |
| LOS Assert Time                                 | t <sub>loss_on</sub>      |     |         | 100             | μs   |
| LOS De-assert Time                              | t <sub>loss_off</sub>     |     |         | 100             | μs   |
| Serial ID Clock Rate                            | f <sub>serial_clock</sub> |     | 100     | 400             | KHz  |
| MOD_DEF (0:2)-High                              | V <sub>H</sub>            | 2   |         | V <sub>cc</sub> | V    |
| MOD_DEF (0:2)-Low                               | V <sub>L</sub>            |     |         | 0.8             | V    |

|                                                                                                                                                                                                                                     |        |       |       |          |
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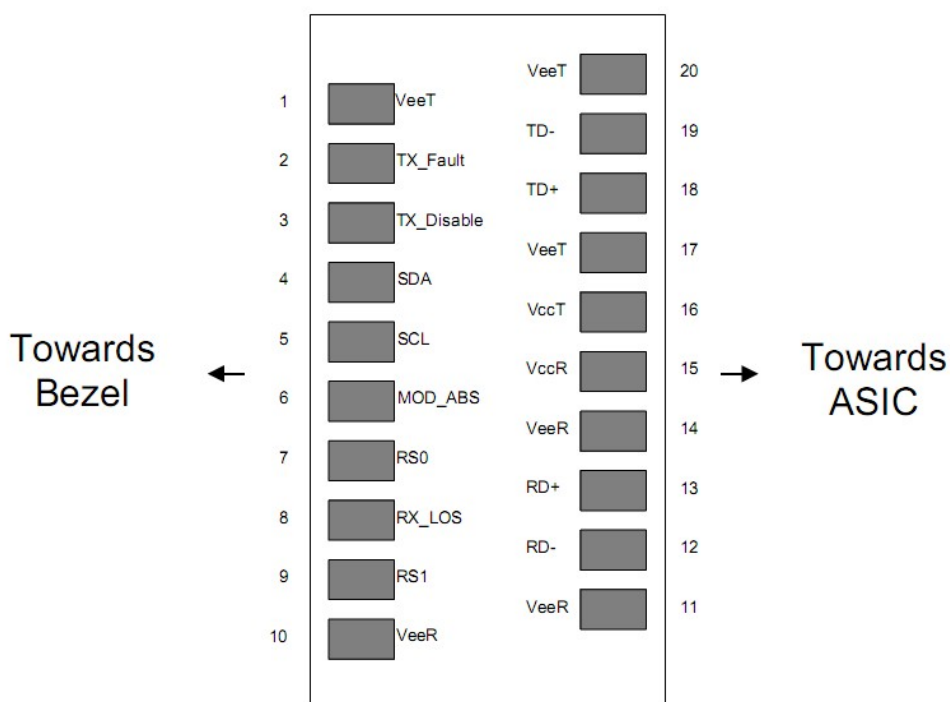
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## 8. Diagnostics

| Parameter    | Range       | Unit | Accuracy | Calibration |
|--------------|-------------|------|----------|-------------|
| Temperature  | 0 to +70    | °C   | ±3°C     | Internal    |
| Voltage      | 3.0 to 3.6  | V    | ±3%      | Internal    |
| Bias Current | 0 to 15     | mA   | ±10%     | Internal    |
| TX Power     | -8.4 to 2.4 | dBm  | ±3dB     | Internal    |
| RX Power     | -12 to 2.4  | dBm  | ±3dB     | Internal    |

## 9. Pin Information

Diagram of Host Board Connector Block Pin Numbers and Name



## Pin Function Definitions

| PIN# | Name       | Function                     | Plug Seq. | Notes  |
|------|------------|------------------------------|-----------|--------|
| 1    | VeeT       | Transmitter Ground           | 1         |        |
| 2    | Tx Fault   | Transmitter Fault Indication | 3         | Note 1 |
| 3    | Tx Disable | Transmitter Disable          | 3         | Note 2 |
| 4    | SDL        | SDA Serial Data Signal       | 3         |        |
| 5    | SCL        | SCL Serial Clock Signal      | 3         |        |

|                                                                                                                                                                                                                                     |        |       |       |          |
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|    |         |                                           |   |        |
|----|---------|-------------------------------------------|---|--------|
| 6  | MOD-ABS | Module Absent. Grounded within the module | 3 |        |
| 7  | RS0     | Not Connected                             | 3 |        |
| 8  | LOS     | Loss of Signal                            | 3 | Note 3 |
| 9  | RS1     | Not Connected                             | 3 |        |
| 10 | VeeR    | Receiver ground                           | 1 |        |
| 11 | VeeR    | Receiver ground                           | 1 |        |
| 12 | RD-     | Inv. Received Data Out                    | 3 | Note 4 |
| 13 | RD+     | Received Data Out                         | 3 | Note 4 |
| 14 | VeeR    | Receiver ground                           | 1 |        |
| 15 | VccR    | Receiver Power Supply                     | 2 |        |
| 16 | VccT    | Transmitter Power Supply                  | 2 |        |
| 17 | VeeT    | Transmitter Ground                        | 1 |        |
| 18 | TD+     | Transmit Data In                          | 3 | Note 5 |
| 19 | TD-     | Inv. Transmit Data In                     | 3 | Note 5 |
| 20 | VeeT    | Transmitter Ground                        | 1 |        |

#### Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

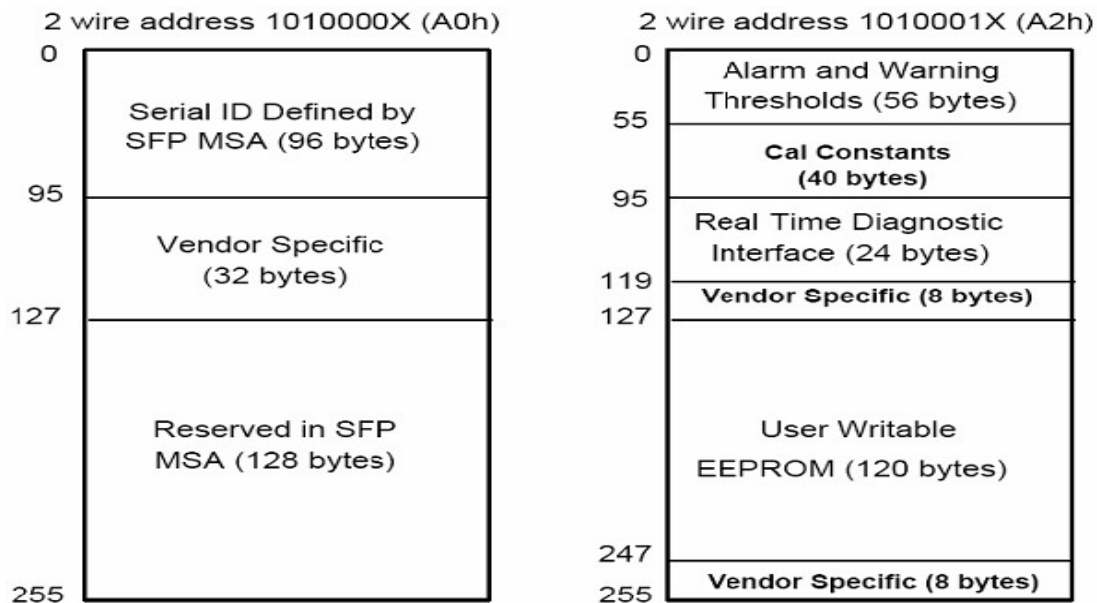
- 1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
- 2) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
- 3) LOS is open collector output. Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
- 4) RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
- 5) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

### 10. Digital Diagnostic Monitor Characteristics

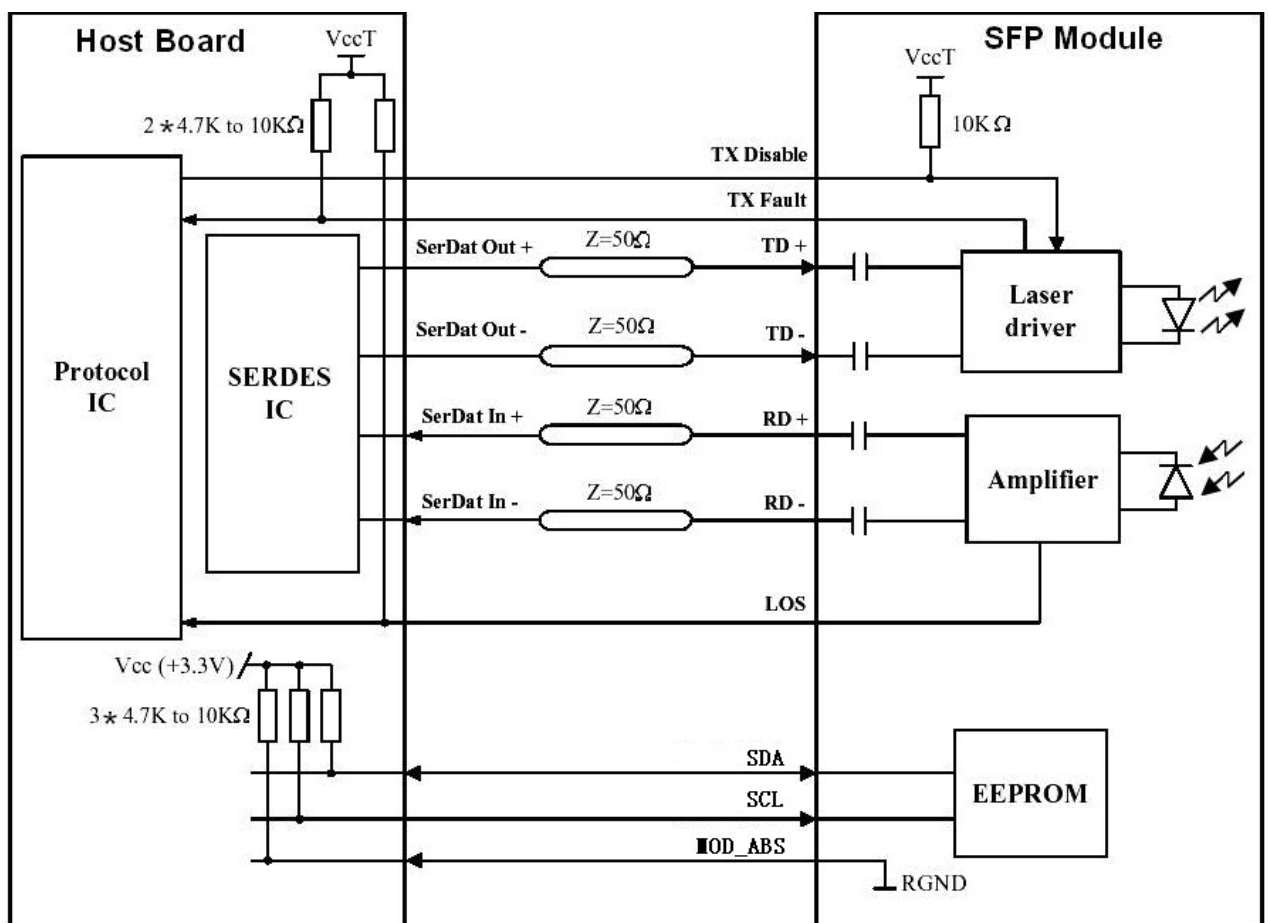
**Table 1.** Digital Diagnostic Memory Map (Specific Data Field Descriptions)

|                                                                                                                                                                                                                                     |        |       |       |          |
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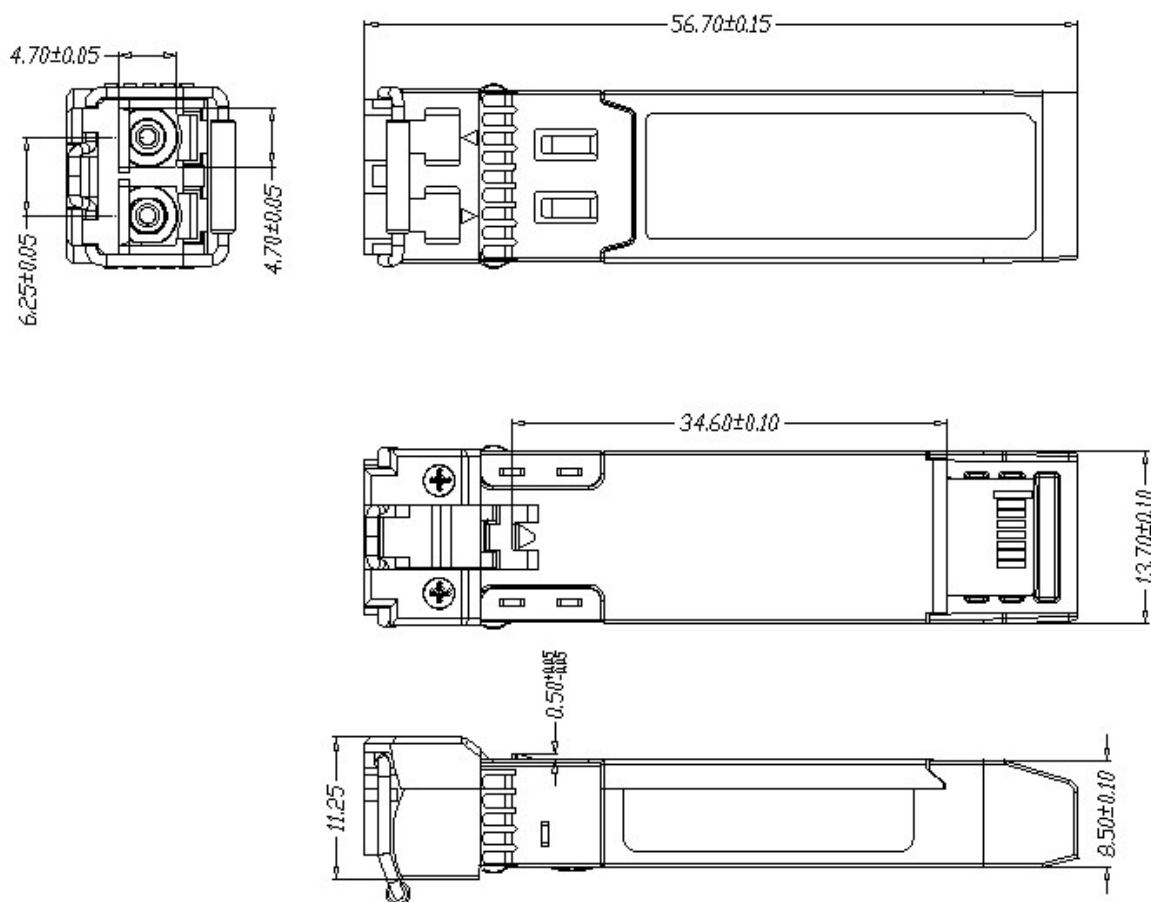
## 11. Recommended Circuit



|                                                                                                                                                                                                                                     |        |       |       |          |
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## 12. Mechanical Dimensions



## 13. Model Name information

| PN      | Description                      |
|---------|----------------------------------|
| OEMM841 | 25G SFP28 MM 850nm 100M LC DDMII |

|                                                                                                                                                                                                                                     |        |       |       |          |
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