


| | | | |
|---|------------|--------------|-------------|
|  | Datasheet | No. | DS10-J001-1 |
| | | Initial Date | 2014-05-28 |
| OJ | OJ77M8-Axx | Written Team | R&D Dept. |
| | | | GH Zheng |

I Preview


| | |
|-------------|-------------------|
| PN | OJ77M8-Axx |
| Description | 40G QSFP+ AOC xxm |

II Contents

1. Features
2. Applications
3. Description
4. Absolute maximum Ratings
5. Operating Environment
6. Optical and Electrical Characteristics
7. Digital Diagnostic Memory Map
8. Pin Descriptions
9. Mechanical Dimensions
10. Model Ordering Information

III Revision History

| No. | Date | Items | Change Recording | Ver. | Rev. | Customer |
|-----|------------|-------|----------------------|------|------|----------|
| 1 | 2014-05-28 | All | Initial registration | 000 | 000 | Standard |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |

| | | | | |
|---|-----------|-------------------------------------|---------------------------------------|-------|
|  Communication Limited | Datasheet | | DS10-J001-1 Final Rev.: 2014-05-28 | |
| | Product | 40G QSFP+ transceiver OJ serials | Ver. | 000 |
| | Part No. | OJ77M8-Axx | Rev. | 000 |
| | | | Page | 2 / 8 |

1. Features:

- ◆ 4 channels full-duplex active optical cable
- ◆ 10.3125Gb/s data rate per channel
- ◆ 4 channels 850nm VCSEL array
- ◆ 4 channels PIN photo detector array
- ◆ Low power consumption<1.5W
- ◆ Hot Pluggable QSFP+ form factor
- ◆ Maximum link length of 100m on OM3 Multimode Fiber (MMF)
- ◆ Compatible with RoHS
- ◆ Single +3.3V power supply
- ◆ Real Time Digital Diagnostic Monitoring
- ◆ Operating case temperature: 0 to +70 °C

2. Applications

- ◆ 10G/40GBASE Ethernet
- ◆ Switch, router and HBAs
- ◆ Infiniband transmission at 4 channels SDR, DDR and QDR
- ◆ High-performance Backplane Applications
- ◆ Proprietary Protocol Applications
- ◆ Data center
- ◆ Other links

3. Description

The 40G QSFP+ active optic cables are high performance, cost effective modules supporting data rate of 40Gbps and 100m transmission distance with MMF: can reach to 100m on OM3 Multimode Fiber (MMF). The transceiver part consists of three sections: 4 channels 850nm VCSEL array, 4 channels PIN photo detector array and MCU control unit. Low power consumption, long reach interconnect solution supporting 11.3G/10G/8G/4G/2G fiber channel, PCIe and SAS. It is compliant with the QSFP+ MSA and IEEE P802.3ba. OCRECOM's QSFP+ AOC is an assembly of 4 full-duplex lanes, where each lane is capable of transmitting data at rates up to 11.3Gb/s, providing an aggregated rate of 45.2Gb/s. OCRECOM's QSFP+AOC is one kind of parallel transceiver which provides increased port density and total system cost savings.

| | | | | |
|---|--------|-------|-------|----------|
| OCRE COMMUNICATION LIMITED Web: www.ocrecom.com E-Mail: sales@ocrecom.com Add. Dist.A, Building 6, Bay on the six block, Xixiang, Baoan Dist, Shenzhen, China 518000 Tel: + 86 755 2335 3855 Fax: + 86 755 2335 3855 | DESIGN | CHECK | CHECK | APPROVAL |
| | | | | |



Communication Limited

Datasheet

DS10-J001-1
Final Rev.: 2014-05-28

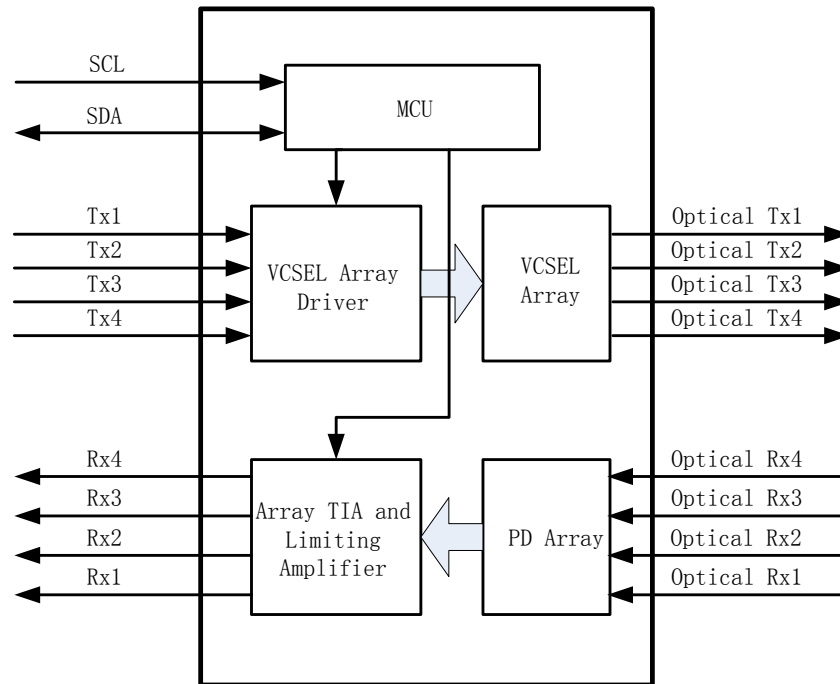
Product: 40G QSFP+ transceiver
OJ serials

Part No.: OJ77M8-Axx

Ver.: 000

Rev.: 000

Page: 3 / 8



Transceiver functional diagram

4. Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------|--------|------|-----|------|
| Supply Voltage | Vcc | -0.5 | 3.6 | V |
| Storage Temperature | Ts | -40 | +85 | °C |
| Operating Humidity | - | 5 | 85 | % |

5. Operating Environment


| 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 |
| Link distance with OM3 fiber | D | 0 | | 100 | m |

6. Electrical Characteristics

| Parameter | Symbol | Min | Typical | Max | Unit | Notes |
|--------------------------------------|-----------------|-----|---------|------|-------|-------|
| Differential input impedance | Zin | 90 | 100 | 110 | ohm | |
| Differential Output impedance | Zout | 90 | 100 | 110 | ohm | |
| Differential input voltage amplitude | ΔV_{in} | 300 | | 1100 | mVp-p | |

OCRE COMMUNICATION LIMITED
 Web: www.ocrecom.com
 E-Mail: sales@ocrecom.com
 Add. Dist.A, Building 6, Bay on the six block, Xixiang,
 Baoan Dist, Shenzhen, China 518000
 Tel: + 86 755 2335 3855 Fax: + 86 755 2335 3855

| DESIGN | CHECK | CHECK | APPROVAL |
|--------|-------|-------|----------|
| | | | |

| | | | | |
|---|-----------|-------------------------------------|---------------------------------------|-------|
|  Communication Limited | Datasheet | | DS10-J001-1 Final Rev.: 2014-05-28 | |
| | Product | 40G QSFP+ transceiver OJ serials | Ver. | 000 |
| | Part No. | OJ77M8-Axx | Rev. | 000 |
| | | | Page | 4 / 8 |

| | | | | | | |
|---------------------------------------|------------------|----------------------|--|-----------------|-------|--|
| Differential output voltage amplitude | ΔV_{out} | 500 | | 800 | mVp-p | |
| Bit Error Rate | BR | E-12 | | | | |
| Input Logic Level High | V _{IH} | 2.0 | | V _{CC} | V | |
| Input Logic Level Low | V _{IL} | 0 | | 0.8 | V | |
| Output Logic Level High | V _{OH} | V _{CC} -0.5 | | V _{CC} | V | |
| Output Logic Level Low | V _{OL} | 0 | | 0.4 | V | |

7. 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.

| | | | | |
|---|--------|-------|-------|----------|
| OCRE COMMUNICATION LIMITED Web: www.ocrecom.com E-Mail: sales@ocrecom.com Add. Dist.A, Building 6, Bay on the six block, Xixiang, Baoan Dist, Shenzhen, China 518000 Tel: + 86 755 2335 3855 Fax: + 86 755 2335 3855 | DESIGN | CHECK | CHECK | APPROVAL |
| | | | | |



Communication Limited

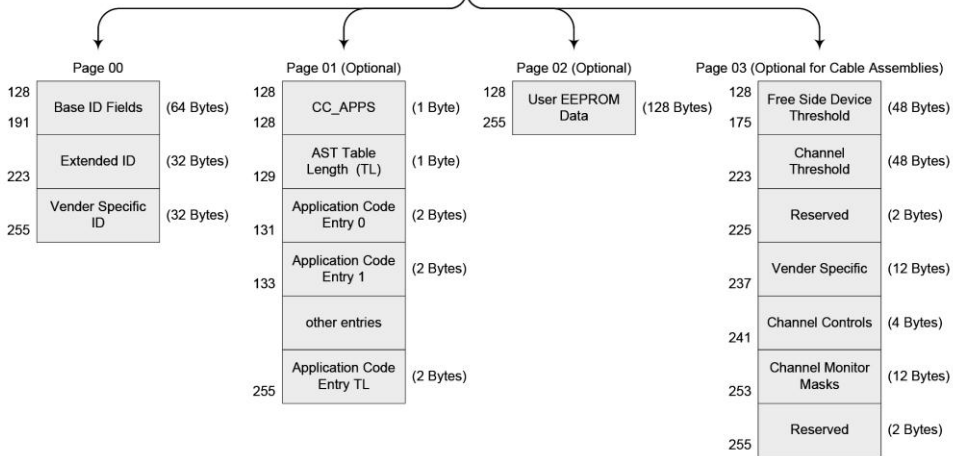
Datasheet

DS10-J001-1
Final Rev.: 2014-05-28


| | | | |
|----------|-------------------------------------|------|-------|
| Product | 40G QSFP+ transceiver OJ serials | Ver. | 000 |
| Part No. | OJ77M8-Axx | Rev. | 000 |
| | | Page | 5 / 8 |

2-Wire Serial Address: 1010000x

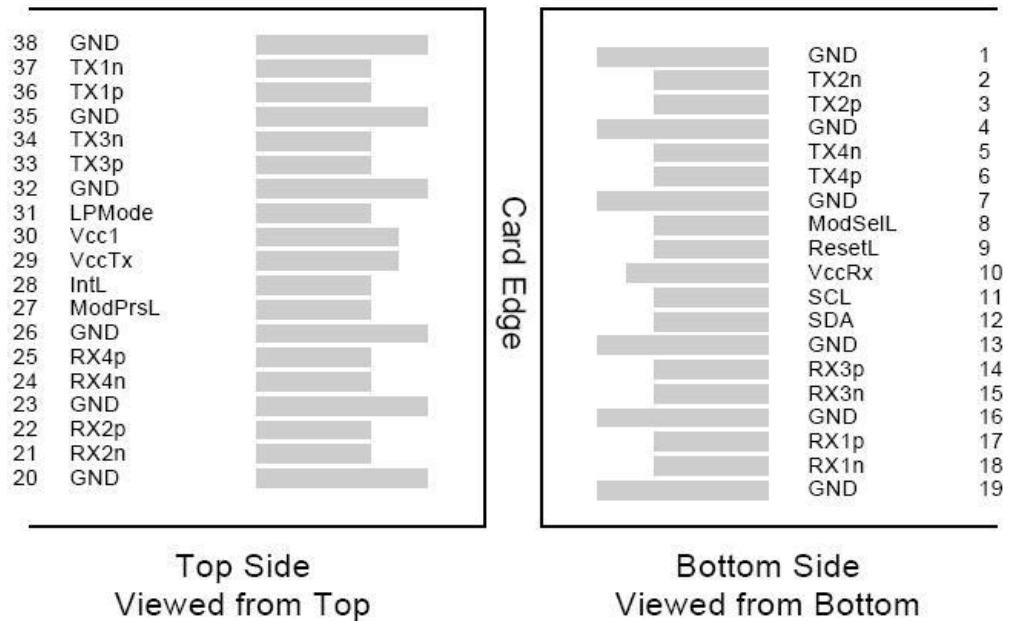
| | | |
|-----|---------------------------------------|------------|
| 0 | ID and status | (3 Bytes) |
| 2 | | |
| 21 | Interrupt Flags | (19 Bytes) |
| 33 | Module Monitors | (12 Bytes) |
| 81 | Channel Monitors | (48 Bytes) |
| 85 | Reserved | (4 Bytes) |
| 97 | Control | (12 Bytes) |
| 99 | Reserved | (2 Bytes) |
| 106 | Free Side Device and Channel Mask | (7 Bytes) |
| 107 | Reserved | (1 Bytes) |
| 111 | Free Side Device Properties | (4 Bytes) |
| 118 | Reserved | (7 Bytes) |
| 122 | Password Change Entry Area (Optional) | (4 Bytes) |
| 126 | Password Entry Area (Optional) | (4 Bytes) |
| 127 | Page Select Byte | (1 Bytes) |



| | | | | |
|---|--------|-------|-------|----------|
| OCRE COMMUNICATION LIMITED Web: www.ocrecom.com E-Mail: sales@ocrecom.com Add. Dist.A, Building 6, Bay on the six block, Xixiang, Baoan Dist, Shenzhen, China 518000 Tel: + 86 755 2335 3855 Fax: + 86 755 2335 3855 | DESIGN | CHECK | CHECK | APPROVAL |
| | | | | |


| | | | | |
|--|-----------|-------------------------------------|---------------------------------------|-------|
|  CRE Communication Limited | Datasheet | | DS10-J001-1 Final Rev.: 2014-05-28 | |
| | Product | 40G QSFP+ transceiver OJ serials | Ver. | 000 |
| | Part No. | OJ77M8-Axx | Rev. | 000 |
| | | | Page | 6 / 8 |

8. 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 output | |
| 4 | | GND | Ground | 1 |
| 5 | CML-I | Tx4n | Transmitter Inverted Data Input | |
| 6 | CML-I | Tx4p | Transmitter Non-Inverted Data output | |
| 7 | | GND | Ground | 1 |
| 8 | LVTTLL-I | ModSelL | Module Select | |
| 9 | LVTTLL-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 | |

| | | | | |
|---|--------|-------|-------|----------|
| OCRE COMMUNICATION LIMITED Web: www.ocrecom.com E-Mail: sales@ocrecom.com Add. Dist.A, Building 6, Bay on the six block, Xixiang, Baoan Dist, Shenzhen, China 518000 Tel: + 86 755 2335 3855 Fax: + 86 755 2335 3855 | DESIGN | CHECK | CHECK | APPROVAL |
| | | | | |

| | | | | |
|--|-----------|-------------------------------------|------------------------|-----|
|  CRE Communication Limited | Datasheet | | DS10-J001-1 | |
| | | | Final Rev.: 2014-05-28 | |
| | Product | 40G QSFP+ transceiver OJ serials | Ver. | 000 |
| | Part No. | OJ77M8-Axx | Rev. | 000 |
| | | Page | 7 / 8 | |


| | | | | |
|----|---------|---------|-------------------------------------|---|
| 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 | LVTTL-O | ModPrsL | Module Present | |
| 28 | LVTTL-O | IntL | Interrupt | |
| 29 | | VccTx | +3.3 V Power Supply transmitter | 2 |
| 30 | | Vcc1 | +3.3 V Power Supply | 2 |
| 31 | LVTTL-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 Output | |
| 35 | | GND | Ground | 1 |
| 36 | CML-I | Tx1p | Transmitter Non-Inverted Data Input | |
| 37 | CML-I | Tx1n | Transmitter Inverted Data Output | |
| 38 | | GND | Ground | 1 |

Notes:

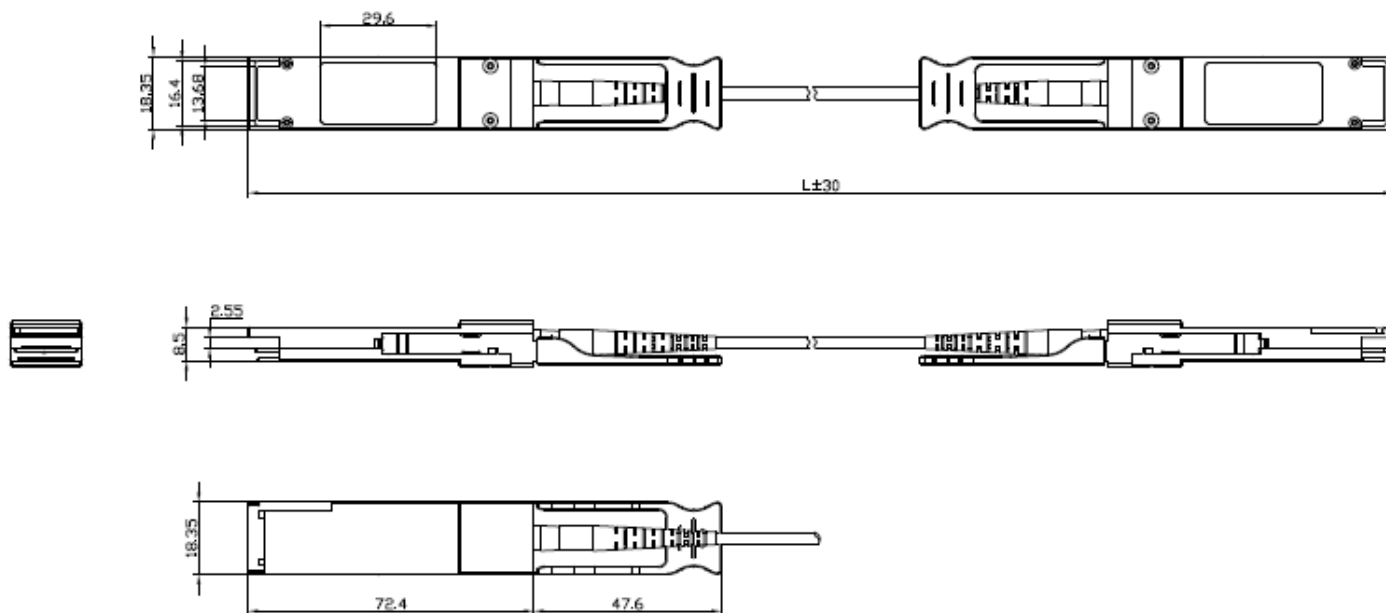
1. GND is the symbol for signal and supply (power) common for QSFP modules. All are common within the QSFP module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.

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.

| | | | | |
|---|--------|-------|-------|----------|
| OCRE COMMUNICATION LIMITED Web: www.ocrecom.com E-Mail: sales@ocrecom.com Add. Dist.A, Building 6, Bay on the six block, Xixiang, Baoan Dist, Shenzhen, China 518000 Tel: + 86 755 2335 3855 Fax: + 86 755 2335 3855 | DESIGN | CHECK | CHECK | APPROVAL |
| | | | | |

| | | | | |
|--|-----------|-------------------------------------|---------------------------------------|-------|
|  CRE Communication Limited | Datasheet | | DS10-J001-1 Final Rev.: 2014-05-28 | |
| | Product | 40G QSFP+ transceiver OJ serials | Ver. | 000 |
| | Part No. | OJ77M8-Axx | Rev. | 000 |
| | | | Page | 8 / 8 |

9. Mechanical Dimensions



10. Module Ordering information

| PN | Description |
|------------|-------------------|
| OJ77M8-Axx | 40G QSFP+ AOC xxm |

Remark: 01=1M

50=50M

A0=100M

| | | | | |
|---|--------|-------|-------|----------|
| OCRE COMMUNICATION LIMITED Web: www.ocrecom.com E-Mail: sales@ocrecom.com Add. Dist.A, Building 6, Bay on the six block, Xixiang, Baoan Dist, Shenzhen, China 518000 Tel: + 86 755 2335 3855 Fax: + 86 755 2335 3855 | DESIGN | CHECK | CHECK | APPROVAL |
| | | | | |