

### 40G QSFP+ to 4×LC Breakout

### Part Number: V40-Q4LyyyC-AA

V40-Q4LyyyC-AA is a high performance QSFP+ AOC for 40Gigabit Ethernet data links.

#### Features

- Supports various channel bit rates from: 1 Gb/s to 14.5 Gb/s (includes 40GBASE SR4)
- 4-channel full-duplex
- Single 3.3 V power supply
- Low power consumption ( $\leq 0.7$  W)
- Up to 100 m
- Attached fiber breakout
- with 4×LC duplex connectors
- SFF-8685 and SFF-8636 compliant
- Hot pluggable
- Commercial operating case temperature range: 0°C to 70°C
- RoHS compliant



#### Applications

- IEEE 802.3ba 40GBASE SR4
- Infiniband SDR/DDR/QDR/FDR
- Data center: Servers, switches, storages and NIC adapters

#### Ordering Information

| Part Number    | Link Length | Data Rate | Laser       | Detector        | Fiber Type | Temperature |
|----------------|-------------|-----------|-------------|-----------------|------------|-------------|
| V40-Q4LyyyC-AA | up to 100m  | 40G       | 850nm VCSEL | 850nm PIN array | MMF        | 0 – 70°C    |
| yyy=003        | 3m          |           |             |                 |            |             |
| yyy=005        | 5m          |           |             |                 |            |             |
| yyy=010        | 10m         |           |             |                 |            |             |
| yyy=yyy*       | yyym        |           |             |                 |            |             |

\* Customized length is available upon request

### Product Overview

Vitex V40-Q4LyyyC-AA is a 40G QSFP+ best used to distribute 40G port of a switch to 4×10G transceivers (ports) of another switch. These AOCs take full advantage of the high transmission bandwidth, low power consumption and long reach.

### Absolute Maximum Ratings

| Parameter           | Symbol           | Min | Max | Unit |
|---------------------|------------------|-----|-----|------|
| Storage Temperature | T <sub>STO</sub> | -20 | 70  | °C   |
| Supply Voltage      | V <sub>IN</sub>  | 0   | 4.0 | V    |

### Recommended Operating Conditions

| Parameter                  | Symbol          | Min  | Typical | Max  | Unit |
|----------------------------|-----------------|------|---------|------|------|
| Operating Case Temperature | T <sub>OP</sub> | 0    |         | 70   | °C   |
| Power Supply Voltage       | V <sub>CC</sub> | 3.13 | 3.3     | 3.47 | V    |
| Power Supply Current       | I <sub>CC</sub> | -    | 600     |      | mA   |
| Power Consumption          |                 |      |         | 0.7  | W    |

### Electrical Specifications

| Parameter                                                     | Symbol              | Min | Typical | Max              | Unit |
|---------------------------------------------------------------|---------------------|-----|---------|------------------|------|
| <b>Transmitter</b>                                            |                     |     |         |                  |      |
| Data Rate                                                     | DR                  | 1   | 10.3125 | 14.0625          | Gb/s |
| Input Differential Impedance                                  | R <sub>IN</sub>     | -   | 100     | -                | Ω    |
| Differential Data Input Swing                                 | V <sub>INP-P</sub>  | -   | -       | 900              | mV   |
| <b>Receiver</b>                                               |                     |     |         |                  |      |
| Data Rate per channel                                         | DR                  |     | 10.3125 | 10.3125          | Gb/s |
| Output Differential Impedance                                 | R <sub>OUT</sub>    | -   | 100     | -                | Ω    |
| Differential Data Output Swing                                | V <sub>OUTP-P</sub> | -   | -       | 800              | mV   |
| Raw Bit Error Ratio<br>(@25.78 Gbps; PRBS 2 <sup>31</sup> -1) | -                   | -   | -       | 10 <sup>-8</sup> | -    |

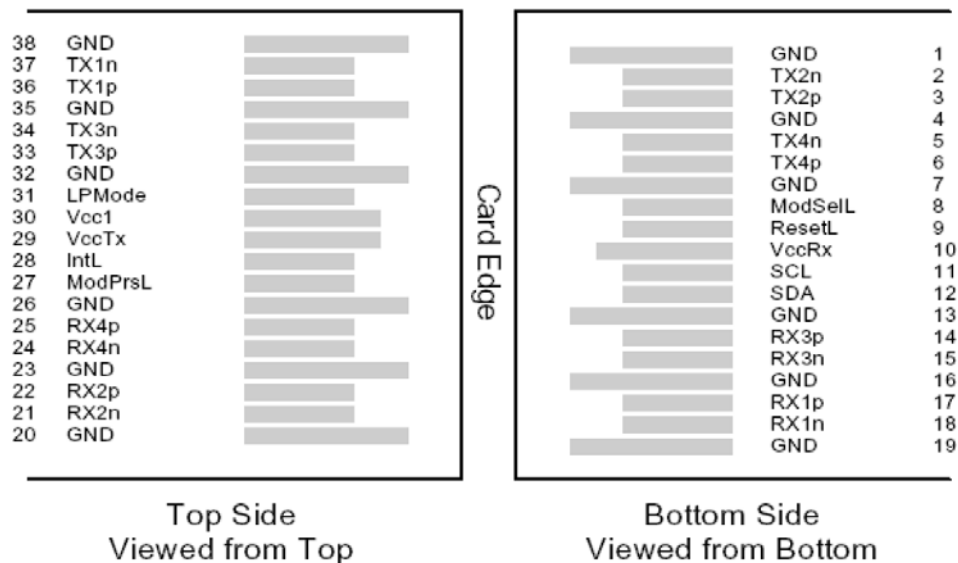
### Optical Specifications

| Parameter                                           | Symbol               | Min                               | Typical | Max  | Unit | Notes                          |
|-----------------------------------------------------|----------------------|-----------------------------------|---------|------|------|--------------------------------|
| Transmitter                                         |                      |                                   |         |      |      |                                |
| Centre Wavelength                                   | $\lambda_c$          | 840                               | 850     | 860  | nm   | -                              |
| RMS spectral width                                  | $\sigma$             | -                                 | -       | 0.65 | Nm   | -                              |
| Average launch power, each lane                     | Pavg                 | -7.6                              | -       | 2.4  | dBm  | -                              |
| Optical Modulation Amplitude (OMA), each lane       | TxOMA                | -5.6                              |         | 3    | dBm  | -                              |
| Transmitter and dispersion penalty (TDP), each lane | TDP                  |                                   |         | 3.5  | dB   |                                |
| Extinction Ratio                                    | ER                   | 3                                 | -       |      | dB   | -                              |
| Average launch power of OFF transmitter, each lane  |                      |                                   |         | -30  | dBm  | -                              |
| Eye Mask coordinates: {X1, X2, X3, Y1, Y2, Y3}      | SPECIFICATION VALUES | 0.23, 0.34, 0.43, 0.27, 0.35, 0.4 |         |      |      | Hit Ratio = 5x10 <sup>-5</sup> |
| Receiver                                            |                      |                                   |         |      |      |                                |
| Centre Wavelength                                   | $\lambda_c$          | 840                               | 850     | 860  | nm   | -                              |
| Stressed receiver sensitivity in OMA                | RxOMA                |                                   |         | -5.4 | dBm  | 1                              |
| Average power at receiver, each lane                | -9.5                 |                                   |         | 2.4  | dBm  |                                |
| Receiver Reflectance                                |                      |                                   |         | -12  | dB   | -                              |
| LOS Assert                                          | LOSA                 | -30                               |         |      | dBm  | -                              |
| LOS De-Assert                                       | LOSD                 |                                   |         | -12  | dBm  | -                              |
| LOS Hysteresis                                      |                      | 0.5                               |         |      | dB   | -                              |

Note:

1. Measured with conformance test signal at TP3 for BER =  $10^{-12}$

### Electrical Connector Layout



### Electrical Pin Definition

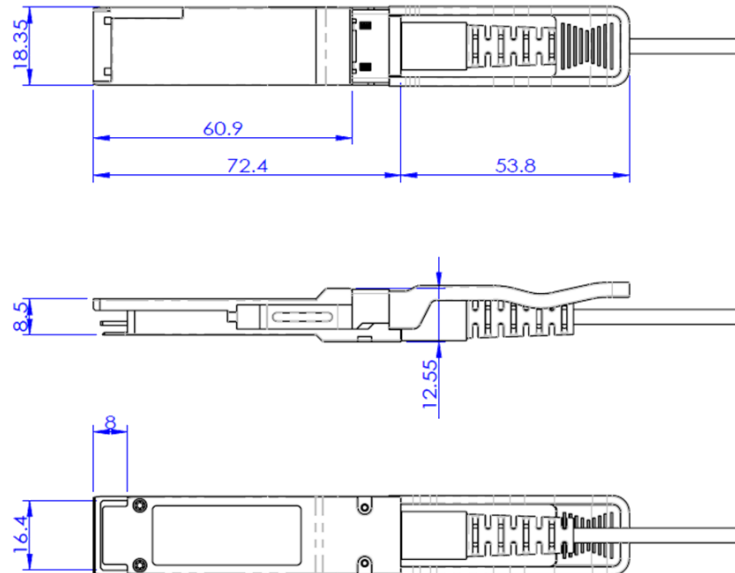
| Pin | Name    | Description                         | Note |
|-----|---------|-------------------------------------|------|
| 1   | GND     | Ground                              | 1    |
| 2   | Tx2n    | Transmitter Inverted Data Input     |      |
| 3   | Tx2p    | Transmitter Non-Inverted Data Input |      |
| 4   | GND     | Ground                              | 1    |
| 5   | Tx4n    | Transmitter Inverted Data Input     |      |
| 6   | Tx4p    | Transmitter Non-Inverted Data Input |      |
| 7   | GND     | Ground                              | 1    |
| 8   | ModSelL | Module Select                       |      |
| 9   | ResetL  | Module Reset                        |      |
| 10  | VCC Rx  | 3.3V Power supply receiver          | 2    |
| 11  | SCL     | 2-wire serial interface clock       |      |
| 12  | SDA     | 2-wire serial interface data        |      |
| 13  | GND     | Ground                              | 1    |
| 14  | Rx3p    | Receiver Non-Inverted Data Output   |      |
| 15  | Rx3n    | Receiver Inverted Data Output       |      |
| 16  | GND     | Ground                              | 1    |
| 17  | Rx1p    | Receiver Non-Inverted Data Output   |      |
| 18  | Rx1n    | Receiver Inverted Data Output       |      |
| 19  | GND     | Ground                              | 1    |
| 20  | GND     | Ground                              | 1    |
| 21  | Rx2n    | Receiver Inverted Data Output       |      |
| 22  | Rx2p    | Receiver Non-Inverted Data Output   |      |

|    |         |                                     |   |
|----|---------|-------------------------------------|---|
| 23 | GND     | Ground                              | 1 |
| 24 | Rx4n    | Receiver Inverted Data Output       |   |
| 25 | Rx4p    | Receiver Non-Inverted Data Output   |   |
| 26 | GND     | Ground                              | 1 |
| 27 | ModPrsL | Module Present                      |   |
| 28 | IntL    | Interrupt                           |   |
| 29 | Vcc Tx  | 3.3V Power supply transmitter       | 2 |
| 30 | Vcc 1   | 3.3V Power Supply                   | 2 |
| 31 | LPMODE  | Low Power Mode                      | 3 |
| 32 | GND     | Ground                              | 1 |
| 33 | Tx3p    | Transmitter Non-Inverted Data Input |   |
| 34 | Tx3n    | Transmitter Inverted Data Input     |   |
| 35 | GND     | Ground                              | 1 |
| 36 | Tx1p    | Transmitter Non-Inverted Data Input |   |
| 37 | Tx1n    | Transmitter Inverted Data Input     |   |
| 38 | GND     | Ground                              | 1 |

**Note :**

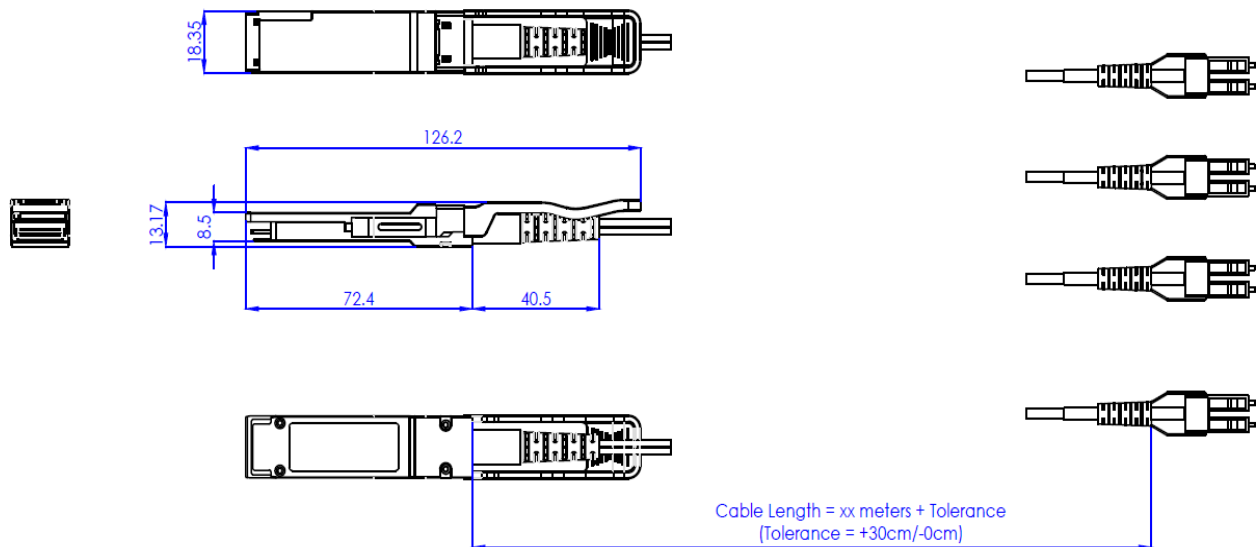
1. GND is the symbol for signal and supply (power) common for the QSFP module. All are common within the QSFP module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. 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 500 mA.
3. Not used.

### Mechanical Dimensions – QSFP+ Terminal



ALL DIMENSIONS ARE  $\pm 0.2\text{mm}$  UNLESS OTHERWISE SPECIFIED  
UNIT: mm

### Mechanical Dimensions – Breakout



ALL DIMENSIONS ARE  $\pm 0.2\text{mm}$  UNLESS OTHERWISE SPECIFIED  
UNIT: mm



# Datasheet

## 40G QSFP+ to 4xLC Breakout AOC

### Mechanical Dimensions – Breakout

| Parameter           | Value                                              | Unit | Note |
|---------------------|----------------------------------------------------|------|------|
| Cable Diameter      | $\varnothing 2.2 \pm 0.15$                         | mm   |      |
| Minimum Bend Radius | 50                                                 | mm   |      |
| Length Tolerance    | +300 / -0                                          | mm   |      |
| Cable Jacket        | PVC, Aqua (Orange color is available upon request) |      |      |

### Revision History

| Date      | Rev | Description                                    |
|-----------|-----|------------------------------------------------|
| 7/28/2020 | 1.0 | Initial release                                |
| 5/10/2022 | 1.1 | PN update from LBX-ABL40Cyyy to V40-Q4LyyyC-AA |

### Contact Information

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