

## 02311FPA-AO

Huawei® 02311FPA Compatible TAA 40GBase-SR QSFP+ Transceiver (MMF, 832nm to 918nm, 150m, LC)

### Features

- SFF-8436 Compliance
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Multi-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications

- 40GBase Ethernet
- Access and Enterprise

### Product Description

This Huawei® 02311FPA compatible QSFP+ transceiver provides 40GBase-BX throughput up to 150m over multi-mode fiber (MMF) using a wavelength of 832nm to 918nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Huawei® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



### Absolute Maximum Ratings

| Parameter           | Symbol | Min. | Typ. | Max. | Unit |
|---------------------|--------|------|------|------|------|
| Storage Temperature | Ts     | -40  |      | 85   | °C   |
| Supply Voltage      | VccT,R | -0.5 |      | 4    | V    |
| Relative Humidity   | RH     | 0    |      | 85   | %    |

### Recommended Operating Conditions

| Parameter                  | Symbol | Min.  | Typ. | Max. | Unit |
|----------------------------|--------|-------|------|------|------|
| Case operating Temperature | Tc     | 0     |      | 70   | °C   |
| Supply Voltage             | Vcct,R | +3.13 | 3.3  | 3.47 | V    |
| Supply Current             | Icc    |       |      | 1000 | mA   |
| Power Dissipation          | PD     |       |      | 3.5  | W    |

## Electrical Characteristics

| Parameter                             | Symbol | Min. | Typ.    | Max. | Unit | Notes |
|---------------------------------------|--------|------|---------|------|------|-------|
| Data Rate per Channel                 |        |      | 10.3125 | 11.2 | Gbps |       |
| Power Consumption                     |        |      | 2.5     | 3.5  | W    |       |
| Supply Current                        | ICC    |      | 0.75    | 1.0  | A    |       |
| Control I/O Voltage-High              | VIH    | 2.0  |         | Vcc  | V    |       |
| Control I/O Voltage-Low               | VIL    | 0    |         | 0.7  | V    |       |
| Inter-Channel Skew                    | TSK    |      |         | 150  | Ps   |       |
| RESETL Duration                       |        |      | 10      |      | Us   |       |
| RESETL De-assert time                 |        |      |         | 100  | ms   |       |
| Power On Time                         |        |      |         | 100  | ms   |       |
| Transmitter                           |        |      |         |      |      |       |
| Single Ended Output Voltage Tolerance |        | 0.3  |         | 4    | V    | 1     |
| Common mode Voltage Tolerance         |        | 15   |         |      | mV   |       |
| Transmit Input Diff Voltage           | VI     | 120  |         | 1200 | mV   |       |
| Transmit Input Diff Impedance         | ZIN    | 80   | 100     | 120  |      |       |
| Data Dependent Input Jitter           | DDJ    |      |         | 0.1  | UI   |       |
| Data Input Total Jitter               | TJ     |      |         | 0.28 | UI   |       |
| Receiver                              |        |      |         |      |      |       |
| Single Ended Output Voltage Tolerance |        | 0.3  |         | 4    | V    | 1     |
| Rx Output Diff Voltage                | Vo     |      | 600     | 800  | mV   |       |
| Rx Output Rise and Fall Voltage       | Tr/Tf  |      |         | 35   | ps   | 1     |
| Total Jitter                          | TJ     |      |         | 0.7  | UI   |       |
| Deterministic Jitter                  | DJ     |      |         | 0.42 | UI   |       |

### Notes:

1. 20~80%

## Optical Characteristics

| Parameter                         | Symbol    | Min. | Typ. | Max. | Unit  | Notes |
|-----------------------------------|-----------|------|------|------|-------|-------|
| Transmitter                       |           |      |      |      |       |       |
| Optical Wavelength CH1            | $\lambda$ | 832  | 850  | 868  | nm    |       |
| Optical Wavelength CH2            | $\lambda$ | 882  | 900  | 918  | nm    |       |
| RMS Spectral Width                | Pm        |      | 0.5  | 0.65 | nm    |       |
| Average Optical Power per Channel | Pavg      | -4   | -2.5 | 5.0  | dBm   |       |
| Laser Off Power Per Channel       | Poff      |      |      | -30  | dBm   |       |
| Optical Extinction Ratio          | ER        | 3.5  |      |      | dB    |       |
| Relative Intensity Noise          | RIN       |      |      | -128 | dB/Hz | 1     |
| Optical Return Loss Tolerance     |           |      |      | 12   | dB    |       |
| Receiver                          |           |      |      |      |       |       |
| Optical Center Wavelength CH1     | $\lambda$ | 882  | 900  | 918  | nm    |       |
| Optical Center Wavelength CH2     | $\lambda$ | 832  | 850  | 868  | nm    |       |
| Receiver Sensitivity per Channel  | R         |      | -11  |      | dBm   |       |
| Maximum Input Power               | Pmax      | 0.5  |      |      | dBm   |       |
| Receiver Reflectance              | Rrx       |      |      | -12  | dB    |       |
| LOS De-Assert                     | LOSD      |      |      | -14  | dBm   |       |
| LOS Assert                        | LOSA      | -30  |      |      | dBm   |       |
| LOS Hysteresis                    | LOSH      | 0.5  |      |      | dB    |       |

### Notes:

1. 12dB Reflection

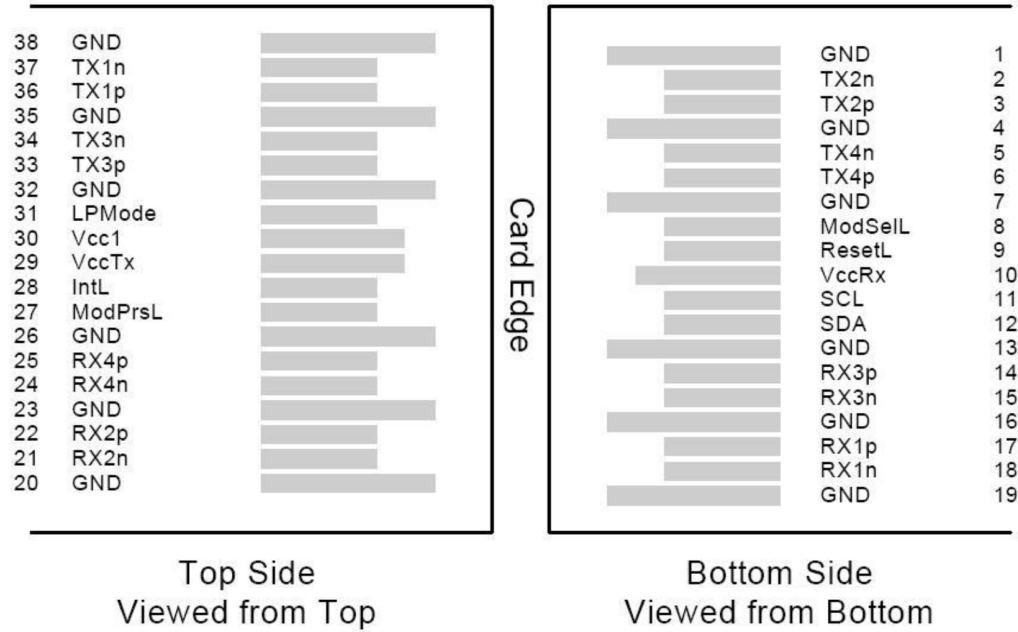
## Pin Descriptions

| Pin | Logic       | Symbol              | Name/Descriptions                                  | Ref. |
|-----|-------------|---------------------|----------------------------------------------------|------|
| 1   |             | GND                 | Module Ground                                      | 1    |
| 2   | CML-I       | Tx2-                | Transmitter inverted data input                    |      |
| 3   | CML-I       | Tx2+                | Transmitter non-inverted data input                |      |
| 4   |             | GND                 | Module Ground                                      | 1    |
| 5   | CML-I       | Tx4-                | Transmitter inverted data input                    |      |
| 6   | CML-I       | Tx4+                | Transmitter non-inverted data input                |      |
| 7   |             | GND                 | Module Ground                                      | 1    |
| 8   | LVTTL-I     | MODSEIL             | Module Select                                      | 2    |
| 9   | LVTTL-I     | ResetL              | Module Reset                                       | 2    |
| 10  |             | VCCR <sub>x</sub>   | +3.3v Receiver Power Supply                        |      |
| 11  | LVC MOS-I   | SCL                 | 2-wire Serial interface clock                      | 2    |
| 12  | LVC MOS-I/O | SDA                 | 2-wire Serial interface data                       | 2    |
| 13  |             | GND                 | Module Ground                                      | 1    |
| 14  | CML-O       | RX3+                | Receiver non-inverted data output                  |      |
| 15  | CML-O       | RX3-                | Receiver inverted data output                      |      |
| 16  |             | GND                 | Module Ground                                      | 1    |
| 17  | CML-O       | RX1+                | Receiver non-inverted data output                  |      |
| 18  | CML-O       | RX1-                | Receiver inverted data output                      |      |
| 19  |             | GND                 | Module Ground                                      | 1    |
| 20  |             | GND                 | Module Ground                                      | 1    |
| 21  | CML-O       | RX2-                | Receiver inverted data output                      |      |
| 22  | CML-O       | RX2+                | Receiver non-inverted data output                  |      |
| 23  |             | GND                 | Module Ground                                      | 1    |
| 24  | CML-O       | RX4-                | Receiver inverted data output                      |      |
| 25  | CML-O       | RX4+                | Receiver non-inverted data output                  |      |
| 26  |             | GND                 | Module Ground                                      | 1    |
| 27  | LVTTL-O     | ModPrsL             | Module Present, internal pulled down to GND        |      |
| 28  | LVTTL-O     | IntL                | Interrupt output should be pulled up on host board | 2    |
| 29  |             | VCCT <sub>x</sub>   | +3.3v Transmitter Power Supply                     |      |
| 30  |             | VCC1                | +3.3v Power Supply                                 |      |
| 31  | LVTTL-I     | LPM <sub>Mode</sub> | Low Power Mode                                     | 2    |
| 32  |             | GND                 | Module Ground                                      | 1    |
| 33  | CML-I       | Tx3+                | Transmitter non-inverted data input                |      |
| 34  | CML-I       | Tx3-                | Transmitter inverted data input                    |      |
| 35  |             | GND                 | Module Ground                                      | 1    |
| 36  | CML-I       | Tx1+                | Transmitter non-inverted data input                |      |
| 37  | CML-I       | Tx1-                | Transmitter inverted data input                    |      |
| 38  |             | GND                 | Module Ground                                      | 1    |

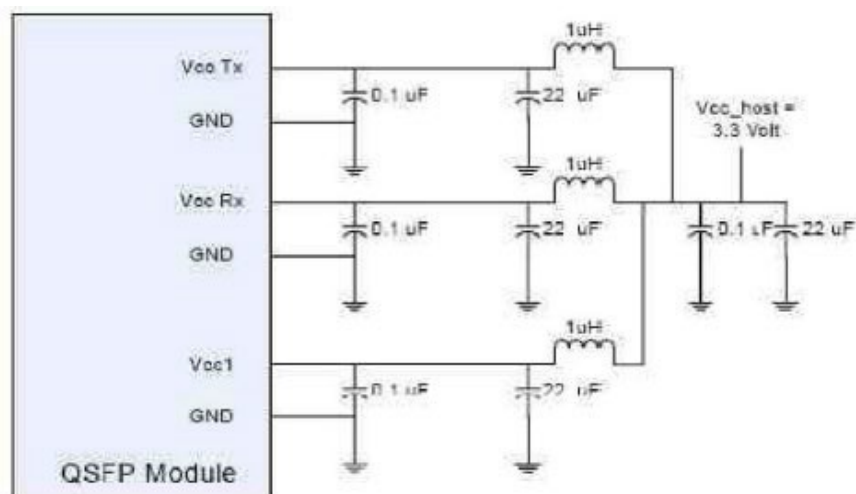
### Notes:

1. Module circuit ground is isolated from module chassis ground with in the module.
2. Open collector; should be pulled up with 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.

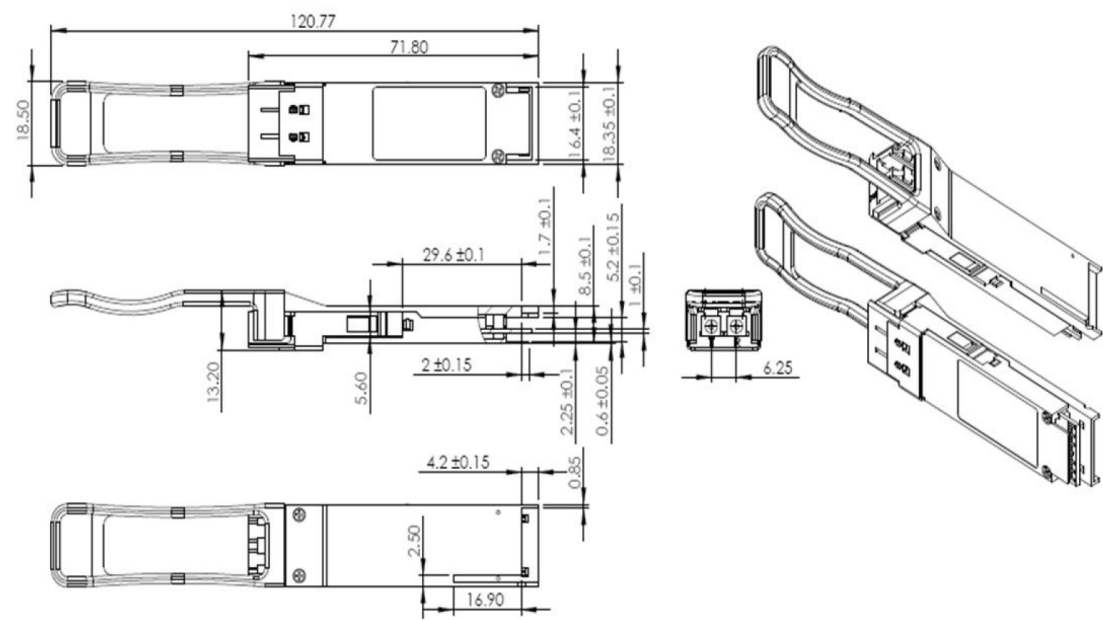
### Electrical Pin-out Details



### Recommended Circuit Schematic



Mechanical Specifications



## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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