# \*addon

### E40G-QSFP-LR4-AO

Ruckus Wireless® E40G-QSFP-LR4 Compatible TAA 40GBase-LR4 QSFP+ Transceiver (SMF, 1270nm to 1330nm, 10km, LC, DOM)

#### **Features**

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



# **Applications**

• 40GBase Ethernet

#### **Product Description**

This Ruckus Wireless® QSFP+ transceiver provides 40GBase-LR4 throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1270nm to 1330nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Ruckus Wireless® 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.	Тур.	Max.	Unit
Storage Temperature	TS	-40		85	°C
Relative Humidity	Rh	0		85	%
Supply Voltage	Vcc	-0.5		4.0	V
Case Operating Temperature	Тс	0		70	°C

# **Electrical Characteristics**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes	
Power Supply Voltage	Vcc	3.13	3.3	3.47	V		
Power Consumption				3.5	W		
Supply Current	ICC		0.75	1.0	А		
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		
AC Common mode Voltage Tolerance (RMS)		15			mV		
Tx Input Diff Voltage	VI	90		1600	mV		
Tx Input Diff Impedance	ZIN	80	100	120	Ω		
Differential Input Return Loss	See IEEE 802.3ba 86A.4.11			dB	10MHz-11.1GHz		
J2 Jitter tolerance	Jt2			0.18	UI		
J9 Jitter Tolerance	Jt9			0.26	UI		
Data Dependent Pulse Width Shrinkage	DDPWS			0.07	UI		
Eye Mask Coordinates: X1, X2, Y1, Y2	Eye Mask Coordinates: X1, X2, Y1, Y2 0.1. 0.31, 95, 350						
Receiver							
Single Ended Output Voltage Tolerance		-0.3		4	V	Preferred to TP1 signal common	
AC Common mode Voltage Tolerance (RMS)				7.5	mV		
Termination Mismatch at 1MHz				5	%		
Differential Output Return Loss	See IEEE 802.3ba 86A.4.2.1			1	dB	10MHz-11.1GHz	
Common-mode Output Return Loss	See IEEE 802.3ba 86A.4.2.1				dB	10MHz-11.1GHz	
Rx Output Diff Voltage	Vo		600	800	mV		
Rx Output Rise and Fall Time	Tr/Tf			35	ps	20% to 80%	
J2 Jitter Tolerance	Jr2			0.46	UI		
J9 Jitter Tolerance	Jr9			0.63	UI		
Eye Mask Coordinates: X1, X2, Y1, Y2	0.29, 0.5, 150, 425				UI, mV		

# **Notes:**

1. The single ended input voltage tolerance is the allowable range of the instantaneous input signals

# **Optical Characteristics**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
	LO	1264.5	1271	1277.5	nm	
Wavelength	L1	1284.5	1291	1297.5	nm	
wavelength.	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
Transmitter						
Side-mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	P <sub>T</sub>			8.3	dBm	
Average Launch Power, each Lane		-7		2.3	dBm	
Optical Modulation Amplitude, each Lane	OMA	-4		3.5	dBm	
Difference in launch Power between any two lanes (OMA)				6.5	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-4.8			dBm	
TDP, each Lane	TDP			2.3	dB	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	R <sub>in</sub>			-128	dB/Hz	12dB reflection
Optical Return Loss Tolerance				20	dB	
Transmitter Reflectance	R <sub>T</sub>			-12	dB	
Transmitter Eye Mask Definition X1, X2, X3, Y1, Y2, Y3	Specification Values 0.25, 0.4, 0.45, 0.25, 0.28, 0.4					
Average Launch Power OFF Transmitter, each Lane	P <sub>off</sub>			-30	dBm	
Receiver						
Damage Threshold	TH₀	3.3			dBm	1
Average Power at receiver Input, each Lane		-13.7		2.3	dB	
Receiver Reflectance	R <sub>R</sub>			-26	dB	
Receiver Power (OMA), each Lane				3.5	dBm	
Stressed Receiver Sensitivity in OMA, each Lane				-9.9	dBm	
Receiver Sensitivity, each Lane	S <sub>R</sub>			-11.5	dBm	
Difference in Receive Power between any Lanes (OMA)				-7.5	dBm	
Condition of Stress Receiver Sensitivity Test						
Vertical Eye Closure Penalty, each Lane			1.6		dB	
Stressed Eye Jitter, each Lane			0.3		UI	

# Notes:

1. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.

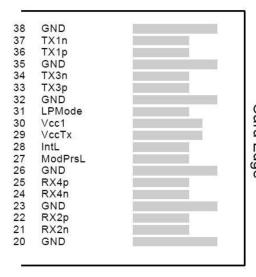
**Pin Descriptions** 

	scriptions	Cumbal	Nama / Dagwintiana	Ref.
Pin	Logic	Symbol	Name/Descriptions	Kei.
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		VCCRx	+3.3v Receiver Power Supply	
11	LVCMOS-I	SCL	2-wire Serial interface clock	2
12	LVCMOS-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		VCCTx	+3.3v Transmitter Power Supply	
30		VCC1	+3.3v Power Supply	
31	LVTTL-I	LPMode	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
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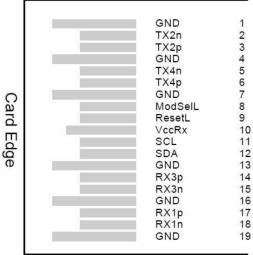
#### **Notes:**

- 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**

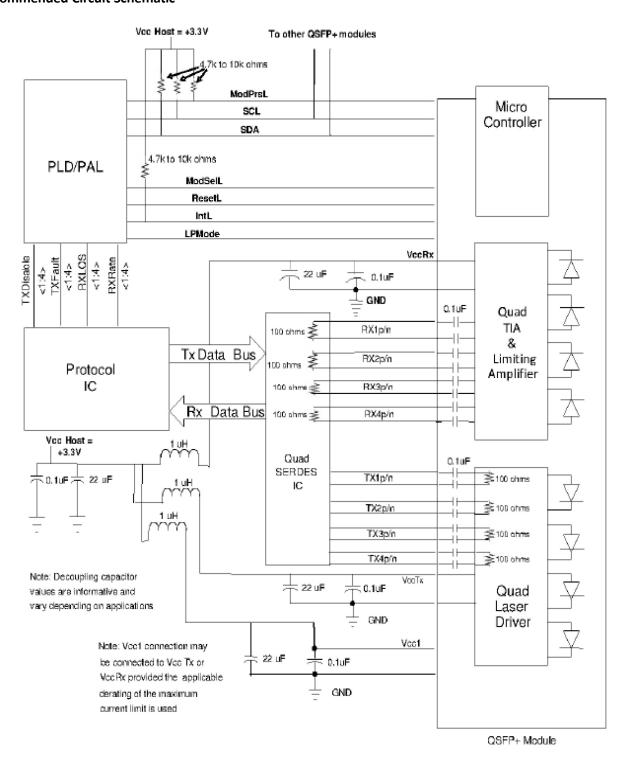


Top Side Viewed from Top



Bottom Side Viewed from Bottom

#### **Recommended Circuit Schematic**



#### **EEPROM Information** 2-Wire Serial Address: 1010000x 0 ID and status (3 Bytes) 2 Interrupt Flags (19 Bytes) 21 Module Monitors (12 Bytes) 33 Channel Monitors (48 Bytes) 81 Reserved (4 Bytes) 85 Control (12 Bytes) 97 (2 Bytes) Reserved 99 Free Side Device and (7 Bytes) Channel Mask 106 (1 Bytes) Reserved 107 Free Side Device (4 Bytes) Properties 111 Reserved (7 Bytes) 118 Password Change Entry Area (Optional) (4 Bytes) 122 Password Entry Area (4 Bytes) (Optional) 126 Page Select Byte (1 Bytes) 127 Page 00 Page 01 (Optional) Page 02 (Optional) Page 03 (Optional for Cable Assemblies) 128 128 128 128 User EEPROM Free Side Device Base ID Fields (64 Bytes) CC\_APPS (1 Byte) (128 Bytes) (48 Bytes) Data Threshold 191 128 255 175 AST Table Length (TL) Channel Extended ID (32 Bytes) (1 Byte) (48 Bytes) Threshold 129 223 223 Vender Specific Application Code (32 Bytes) (2 Bytes) Reserved (2 Bytes) ID Entry 0 255 131 225 Application Code (2 Bytes) (12 Bytes) Vender Specific Entry 1 133 237 Channel Controls (4 Bytes) other entries 241 Application Code Channel Monitor (2 Bytes) (12 Bytes)

Entry TL

255

Masks

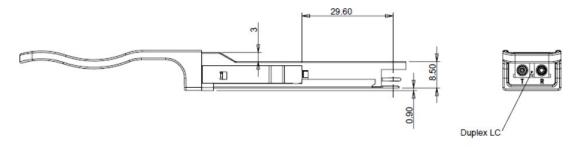
Reserved

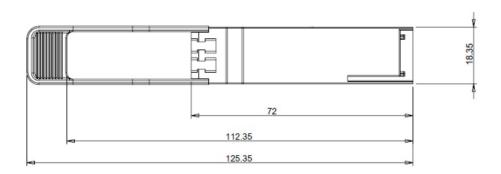
(2 Bytes)

253

255

# **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 in engrained 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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