

## DATA SHEET

### BENEFITS

#### GUARANTEED COMPATIBILITY AND COMPLIANCE

- We guarantee compatibility with Ruckus switches and APs and full compliance with industry standards. That's something you don't get from generic transceivers.
- Standards-based—802.3z, 802.3ah, 802.3u, 802.3ae, 802.3ak, and 802.3ba—and compliant as required
- Compliant with Restrictions on Hazardous Substances (RoHS), meeting RoHS 6 EU standards

#### FACTORY TESTED

- Every batch of Ruckus transceivers is factory tested, so you're assured that they function properly and reliably

#### EASY TO DEPLOY AND UPGRADE

- Hot-swappable flexibility in the field for greater ease and lower total cost of ownership

## HIGHLY RELIABLE, RUCKUS-QUALIFIED OPTICS

Ruckus offers a unique set of high-performance, reliable, and cost-effective optical transceivers to help enterprises and service providers meet the challenges of diverse network topologies. To ensure maximum quality, Ruckus selects and tests the most reliable, highest-performing optical transceivers on the market, and then warrants their availability, capacity, and performance in Ruckus® product.

Extensive performance and reliability testing reflects an ongoing commitment to quality. Ruckus tests transceivers using the industry's most advanced tools and instruments to help ensure that they provide the right mix of functionality and performance when used in conjunction with Ruckus products. The speed, capacity, reliability, and low cost of ownership that Ruckus is known for is also provided in all optical components.

By using Ruckus-qualified components, organizations can be assured that their quality, warranty and service requirements will be met and that their Ruckus products will continually provide the uptime, performance, and reliability required by today's leading enterprise service providers.

### RUCKUS GLOBAL SERVICES

Ruckus Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 20 years of expertise in storage, networking, and virtualization, Ruckus Global Services delivers world-class professional services, technical support, network monitoring services, and education, enabling organizations to maximize their Ruckus investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

### MAXIMIZING INVESTMENTS

To help optimize technology investments, Ruckus and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Ruckus sales partner or visit [www.ruckuswireless.com](http://www.ruckuswireless.com).

### ETHERNET OPTICS FAMILY FEATURES

The Ruckus Ethernet optics family includes several offerings designed to meet the performance and scalability requirements of service provider and enterprise environments.

<b>100 MbE SFP OPTICS</b>	
<ul style="list-style-type: none"> <li>100 Megabit Ethernet (MbE) transceivers support link lengths from 2Km to 40Km</li> <li>Both SMF and MMF fiber types</li> </ul>	<ul style="list-style-type: none"> <li>RoHS 5 and 6 compliant</li> <li>Enterprise switching and routing</li> </ul>
<b>1 GbE SFP OPTICS</b>	
<ul style="list-style-type: none"> <li>1GbE transceivers support link lengths from 300m to 100Km</li> <li>Both SMF and MMF fiber types</li> <li>Coarse Wavelength Division Multiplexing (CWDM) support for distances of 80Km to 100Km</li> </ul>	<ul style="list-style-type: none"> <li>RoHS 5 and 6 compliant</li> <li>For core routers and security applications</li> </ul>
<b>10 GbE SFP+ OPTICS</b>	
<ul style="list-style-type: none"> <li>10GbE transceivers support link lengths of 26m to 80Km</li> <li>Protocol-independent</li> <li>Less than one-third the power and size of MSA optic</li> <li>Hot-swappable</li> <li>Digital Optical Monitoring (DOM) support</li> </ul>	<ul style="list-style-type: none"> <li>RoHS 5 and 6 compliant</li> <li>Application delivery and acceleration</li> <li>High-Performance Computing (HPC) interconnects</li> <li>Service provider traffic management</li> </ul>
<b>25 GbE SFP28 OPTICS</b>	
<ul style="list-style-type: none"> <li>25 GbE transceivers support link lengths of 70 m to 10 km</li> <li>Hot-swappable</li> <li>Digital Optical Monitoring (DOM) support</li> </ul>	<ul style="list-style-type: none"> <li>RoHS 6 compliant</li> <li>High-Performance Computing (HPC) interconnects</li> <li>Service provider traffic management</li> </ul>
<b>40 GbE QSFP+ OPTICS</b>	
<ul style="list-style-type: none"> <li>40GbE transceivers support link lengths from 100 m to 40Km</li> <li>Hot-pluggable</li> <li>Industry-standard QSFP+</li> </ul>	<ul style="list-style-type: none"> <li>Digital Optical Monitoring (DOM) support</li> <li>High-density 40GbE connectivity options for data center, enterprise, and service provider applications</li> </ul>
<b>100 GbE QSFP28 OPTICS</b>	
<ul style="list-style-type: none"> <li>100 GbE transceivers support link lengths up to 40 km</li> <li>Hot-pluggable</li> <li>Industry-standard QSFP28</li> </ul>	<ul style="list-style-type: none"> <li>Digital Optical Monitoring (DOM) support</li> <li>Carrier, service provider, and cloud services</li> <li>Enterprise campus core routing</li> <li>RoHS 6 compliant</li> </ul>

Specifications subject to change.

## PRODUCT SUPPORT FOR FAST ETHERNET

	ICX 7000 Series						ICX 6000 Series		
FAST ETHERNET OPTICS	ICX 7150	ICX 7250	ICX 7450	ICX 7650	ICX 7750	ICX 7850	ICX 6430	ICX 6450	ICX 6610
E1MG-100FX-OM			●	●			●	●	● <sup>1</sup>
E1MG-100FX-A			●	●					
E1MG-100FX-IR-OM			●	●					● <sup>1</sup>
E1MG-100FX-LR-OM			●	●					● <sup>1</sup>

<sup>1</sup> Available only with Ruckus ICX 6610-24F.

## PRODUCT SUPPORT FOR 1 GIGABIT ETHERNET

	ICX 7000 Series						ICX 6000 Series			Wi-Fi Access Points	
1 GbE Fiber Optics	ICX 7150	ICX 7250	ICX 7450	ICX 7650	ICX 7750	ICX 7850	ICX 6430	ICX 6450	ICX 6610	T710	T811cm
E1MG-SX-OM	●	●	●	●	●	●	⊙ <sup>1</sup>	●	●	●	●
E1MG-SX-OM-T	●	●	●	●	●	●	⊙ <sup>1</sup>	●	●	●	●
E1MG-SX-A	●	●	●	●	●	●	⊙ <sup>1</sup>	●	●	●	●
E1MG-LX-OM	●	●	●	●	●	●	●	●	●	●	●
E1MG-LX-OM-T	●	●	●	●	●	●	⊙ <sup>1</sup>	●	●	●	●
E1MG-LX-A	●	●	●	●	●	●				●	●
E1MG-LHA-OM							●	●	●	●	●
E1MG-LHA-OM-T	●	●	●	●	●	●				●	●
E1MG-BXD	●	●	●	●	● <sup>2</sup>	●	●	●	●	●	●
E1MG-BXU	●	●	●	●	● <sup>2</sup>	●	●	●	●	●	●
E1MG-TX	●	●	●	●	●	●	⊙ <sup>1</sup>	●	●		
E1MG-TX-A	●	●	●	●	●	●	⊙ <sup>1</sup>	●	●		
E1MG-CWDM80-XXXX									●		
1G-SFP-TWX-XXXX	●	●	●	●			⊙ <sup>1</sup>	●			

⊙ Optics supported for both stacking links and Ethernet data links.

● Optics supported for Ethernet data links only (i.e. not for stacking).

<sup>1</sup> Stacking is not supported on the Ruckus ICX 6430 12-port compact switch.

<sup>2</sup> Requires FI software 8.0.30b or later.

Specifications subject to change.

### PRODUCT SUPPORT FOR 10 GIGABIT ETHERNET

	ICX 7000 Series						ICX 6000 Series		
10 GbE Fiber Optics	ICX 7150	ICX 7250	ICX 7450	ICX 7650	ICX 7750	ICX 7850	ICX 6430	ICX 6450	ICX 6610
10G-SFPP-USR	○	○	○	●	●	●		○ <sup>2</sup>	●
10G-SFPP-USR-SA	○	○	○	●	●	●			
10G-SFPP-SR	○	○	○	●	●	●		○ <sup>1</sup>	●
10G-SFPP-SR-SA	○	○	○	●	●	●			
10G-SFPP-SR-S	○	○	○	●	●	●			
10G-SFPP-LR	○	○	○	●	●	●		●	●
10G-SFPP-LR-SA	○	○	○	●	●	●			
10G-SFPP-LR-S	○	○	○	●	●	●			
10G-SFPP-ER	●	●	●	●	●	●		●	●
10G-SFPP-ZR	●	●	●	●	●	●			● <sup>4</sup>
10G-SFPP-LRM			●	●		●		○ <sup>1</sup>	●
10G-SFPP-LRM-X-ADP	● <sup>2</sup>	● <sup>2</sup>			● <sup>2</sup>				
10G-SFPP-BXD-S	○	○	○	●	●	●			
10G-SFPP-BXU-S	○	○	○	●	●	●			
10G-SFPP-TWX-XXXX	○	○	○	●	●	●		●	○
10G-SFPP-TWX-P-XXXX	○ <sup>3</sup>	○	○	●	●	●			
10GE-SFPP-AOC-XXXX	●	●	○	●	●	●			

○ Optics supported for both stacking links and Ethernet data links.

● Optics supported for Ethernet data links only (i.e. not for stacking).

<sup>1</sup> Stacking is not supported on the Ruckus ICX 6430 12-port compact switch.

<sup>2</sup> Requires FI software 8.0.61 or later.

<sup>3</sup> Stacking not supported with the 5-meter passive cable on the 7150.

<sup>4</sup> Requires FI software 8.0.30 or later.

### PRODUCT SUPPORT FOR 25 GIGABIT ETHERNET

	ICX 7000 Series						ICX 6000 Series		
25 GbE Fiber Optics	ICX 7150	ICX 7250	ICX 7450	ICX 7650	ICX 7750	ICX 7850	ICX 6430	ICX 6450	ICX 6610
E25G-SFP28-SR						●			
E25G-SFP28-LR						●			
E25G-SFP28-AOC-1001						●			
E25G-SFP28-TWX-P-XXXX						●			

○ Optics supported for both stacking links and Ethernet data links.

● Optics supported for Ethernet data links only (i.e. not for stacking).

Specifications subject to change.

### PRODUCT SUPPORT FOR 40 GIGABIT ETHERNET

	ICX 7000 Series						ICX 6000 Series		
40 GbE Fiber Optics	ICX 7150	ICX 7250	ICX 7450	ICX 7650	ICX 7750	ICX 7850	ICX 6430	ICX 6450	ICX 6610
E40G-QSFP-SR4			⊙	⊙	⊙	⊙			
E40G-QSFP-SR4-INT				●	●	⊙			
E40G-QSFP-ESR4			●	●	⊙	⊙			
E40G-QSFP-LR4			⊙	⊙	⊙	⊙			
E40G-QSFP-LR4-INT				●	●	●			
E40G-QSFP-LM4			●	⊙	⊙	⊙			
E40G-QSFP-ER4			●	⊙	⊙	⊙			
E40G-QSFP-SR-BIDI			●	⊙	⊙	⊙			
E40G-QSFP-4SFP-C-XXXX					●	●			
E40G-QSFP-4SFP-AOC-XXXX					●	●			
E40G-QSFP-QSFP-C-XXXX			⊙	⊙	⊙	⊙			
E40G-QSFP-C-XXXXX			⊙ <sup>1</sup>	⊙ <sup>1</sup>	⊙ <sup>1</sup>	⊙ <sup>1</sup>			⊙
40G-QSFP-C-005XX			⊙	⊙	⊙	⊙			⊙
E40G-QSFP-QSFP-P-XXXX			⊙	⊙	⊙	⊙			⊙
E40G-QSFP-QSFP-AOC-XXXX			●	⊙	⊙	⊙			

- ⊙ Optics supported for both stacking links and Ethernet data links.
- Optics supported for Ethernet data links only (i.e. not for stacking).
- ⊙ 40 GbE ports on the Ruckus ICX 6610 are supported for stacking only.
- <sup>1</sup> Stacking not supported with the 5-meter passive cable.

### PRODUCT SUPPORT FOR 100 GIGABIT ETHERNET

	ICX 7000 Series						ICX 6000 Series		
100 GbE Fiber Optics	ICX 7150	ICX 7250	ICX 7450	ICX 7650	ICX 7750	ICX 7850	ICX 6430	ICX 6450	ICX 6610
E100G-QSFP28-SR4				⊙		⊙			
E100G-QSFP-ESR4				⊙		●			
E100G-QSFP28-LR4L-2KM				⊙					
E100G-QSFP28-LR4-10KM				⊙					
E100G-QSFP28-LR4-LP-10KM				⊙		⊙			
E100G-QSFP28-CWDM4-2KM				●		⊙			
E100G-QSFP-QSFP-AOC-XXXX				●		●			
E100G-QSFP-QSFP-P-XXXX				⊙		⊙			
E100G-QSFP-4SFP-P-XXXX						●			

- ⊙ Optics supported for both stacking links and Ethernet data links.
- Optics supported for Ethernet data links only (i.e. not for stacking).

Specifications subject to change.

### KEY STANDARDS AND FEATURES

	IEEE Standards	Domestic Safety Standards	International Safety Standards	Wavelength (nm)	Fiber Type	Maximum Cable Distance	Digital Optical Monitoring
PART NUMBER	FAST ETHERNET						
E1MG-100FX-OM E1MG-100FX-A	802.3u	FDA 21CFR 1040.10 Class 1, CSA 60950-1-03/ UL 60950-1	EN 60825-1, EN 60950-1	1,310	MMF	2Km	Yes
E1MG-100FX-IR-OM	802.3			1,310	SMF	15Km	Yes
E1MG-100FX-LR-OM	802.3			1,310	SMF	40Km	Yes

PART NUMBER	1 GbE FIBER						
E1MG-SX-OM/ E1MG-SX-OM-T E1MG-SX-A	802.3z	FDA 21CFR 1040.10 Class 1, CSA 60950-1-03/ UL 60950-1	EN 60825-1, EN 60950-1	850	MMF	220m to 550m	Yes
E1MG-LX-OM/ E1MG-LX-OM-T E1MG-LX-A	802.3z			1,310	MMF/SMF	550m to 10Km	Yes
E1MG-LHA-OM/ E1MG-LHA-OM-T	802.3z			1,550	SMF	70Km	Yes
E1MG-BXD	802.3ah			TX: 1,490 RX: 1,310		10Km	No
E1MG-BXU	802.3ah			TX: 1,310 RX: 1,490		10Km	No
E1MG-CWDM80-XXXX	802.3z			1,470 to 1,610	80Km	No	

PART NUMBER	1000BASE-T COPPER						
E1MG-TX	802.3ab	CSA 60950-1-03/ UL	EN 60950-1	N/A	Cat5	100m	N/A
1G-SFP-TWX-0x01	802.3z	Direct Attach SFP copper cables				1m, 5m	No

PART NUMBER	10 GbE FIBER						
10G-SFPP-USR	N/A	FDA 21CFR 1040.10 Class 1, CSA 60950-1-03/ UL 60950-1	EN 60825-1, EN 60950-1	850	MMF	100m	Yes
10G-SFPP-SR	802.3ae			850	MMF	26m to 300m	
10G-SFPP-LR	802.3ae			1,310	SMF	10Km	
10G-SFPP-ER	802.3ae			1,550	SMF	40Km	
10G-SFPP-ZR	802.3ae			1,550	SMF	80Km	
10G-SFPP-BXD-S	802.3ae			1330-TX/ 1270-RX	SMF	10Km	
10G-SFPP-BXU-S	802.3ae			1270-TX/ 1330-RX	SMF	10Km	
10G-SFPP-LRM	802.3ae			1,310	OM3 MMF OM4 MMF	220m 300m	

Specifications subject to change.

## KEY STANDARDS AND FEATURES

	IEEE Standards	Domestic Safety Standards	International Safety Standards	Wavelength (nm)	Fiber Type	Maximum Cable Distance	Digital Optical Monitoring
<b>PART NUMBER</b>	<b>10GBASE DAC CABLE</b>						
<b>10G-SFPP-TWX-XXXX</b>	802.3ak	Direct Attach SFP+ Twinax active copper cables				1m, 3m, 5m	No
<b>10G-SFPP-AOC-XXXX</b>	N/A	Direct Attach SFP+ active optical cables				7m, 10m	Yes
<b>10G-SFPP-TWX-P-XXXX</b>	802.3ak	Direct Attach SFP+ Twinax passive copper cables				1m, 3m, 5m	No

	<b>25 GbE SFP28 FIBER</b>						
<b>E25G-SFP28-SR</b>	802.3by	North America: UL/CSA 60950, CDRH Class 1		850	OM3 MMF OM4 MMF	70m 100m	Yes
<b>E25G-SFP28-LR</b>	802.3bm	European Union: EN 60950, EB 60825 Class 1		1295, 1300, 1305, 1310	SMF	10Km	

	<b>25 GbE SFP28 DAC CABLE</b>						
<b>E25G-SFP28-AOC-1001</b>	N/A	Direct Attach SFP28 to SFP28 active direct attach copper cables				10m	No
<b>E25G-SFP28-TWX-P-00xxx</b>	N/A	Direct Attach SFP28 to SFP28 passive direct attach copper cables				0.5m, 1m, 3m	N/A

	<b>40 GbE FIBER</b>						
<b>E40G-QSFP-SR4</b>	802.3ba	FDA 21CFR 1040.10 Class 1, CSA 60950-1-03/ UL 60950-1	EN 60825-1, EN 60950-1	850	OM3 MMF OM4 MMF	100m 150m	Yes
<b>E40G-QSFP-SR4-INT</b> (compatible with 10GBASE-SR)	802.3ba				OM3 MMF OM4 MMF	100m 150m	Yes
<b>E40G-QSFP-LR4</b>	802.3ba			1264.5 to 1337.5	SMF	10Km	Yes
<b>E40G-QSFP-LR4-INT</b>	802.3ba			1310	SMF	10Km	Yes
<b>E40G-QSFP-ER4</b>	802.3ba			1310	SMF	40Km	Yes
<b>E40G-QSFP-ESR4</b>	802.3ba			850	OM3 MMF OM4 MMF	300m 400m	Yes
<b>E40G-QSFP-LM4</b>	802.3ba			1264.5 to 1337.5	OM3/OM4 MMF	160m	Yes
<b>E40G-QSFP-SR-BIDI</b>	802.3ba			850 to 900	OM3/OM4 MMF	100m	Yes

	<b>40 GbE DAC CABLE</b>						
<b>E40G-QSFP-4SFP-C-XXXX</b>	N/A	Direct Attach QSFP+ to 4 SFP+ active copper breakout cables				1m, 3m, 5m	No
<b>E40G-QSFP-QSFP-C-XXXX</b>	N/A	Direct Attach QSFP+ to QSFP+ active copper cables				1m, 3m, 5m	No
<b>40G-QSFP-C-005XX</b> <b>E40G-QSFP-C-XXXX</b> <b>E40G-QSFP-QSFP-P-XXXX</b>	N/A	Direct Attach QSFP+ to QSFP+ passive copper cables				0.5m, 1m, 3m, 5m	No
<b>E40G-QSFP-QSFP-AOC-XXXX</b>	N/A	Direct Attach QSFP+ to QSFP+ active optical cables				10m	No
<b>E40G-QSFP-4SFP-AOC-XXXX</b>	N/A	Direct Attach QSFP+ to 4 SFP+ active optical breakout cables				10m	No

Specifications subject to change.

### KEY STANDARDS AND FEATURES

	IEEE Standards	Domestic Safety Standards	International Safety Standards	Wavelength (nm)	Fiber Type	Maximum Cable Distance	Digital Optical Monitoring	
<b>PART NUMBER</b>	<b>100 GbE QSFP28 FIBER</b>							
<b>E100G-QSFP28-SR4</b>	802.3bm	North America: UL/CSA 60950, CDRH Class 1		850	MMF	100m	Yes	
<b>E100G-QSFP28-ESR4</b>	802.3bm			850	MMF	300m		
<b>E100G-QSFP28-LR4</b>	802.3bm			1295, 1300, 1305, 1310	SMF	10Km		
<b>E100G-QSFP28-LR4-LP</b>	802.3ba			European Union: EN 60950, EB 60825 Class 1		SMF		10Km
<b>E100G-QSFP28-LR4L</b>	802.3ba			1295, 1300, 1305, 1310	SMF	2Km		
<b>E100G-QSFP28-CWDM4</b>	802.3am			1310	SMF	2Km		

<b>PART NUMBER</b>	<b>100 GbE QSFP28 DAC CABLE</b>				
<b>E100G-QSFP-QSFP-AOC-1001</b>	N/A	Direct Attach QSFP28 to QSFP28 active optical cables		10m	Yes
<b>E100G-QSFP-QSFP-P-XXXX</b>	N/A	Direct Attach QSFP28 to QSFP28 passive copper cables		1m, 3m, 5m	N/A
<b>E100G-QSFP-4SFP-P-XXXX</b>	N/A	Direct Attach QSFP28 to 4 SFP28 passive copper breakout cables		1m, 3m, 5m	N/A

Specifications subject to change.



## RUCKUS ETHERNET OPTICS ORDERING INFORMATION

PART NUMBER	100 MbE SFP TRANSCEIVERS
E1MG-100FX-A	100BASE-FX SFP optic MMF, LC connector, optical monitoring capable, TAA compliant
E1MG-100FX-A8	100BASE-FX SFP optic MMF, LC connector, optical monitoring capable, TAA compliant, 8-pack
E1MG-100FX-IR-OM	100BASE-FX IR SFP optic for SMF with LC connector, optical monitoring capable. For distances up to 15Km
E1MG-100FX-LR-OM	100BASE-FX LR SFP optic for SMF with LC connector, optical monitoring capable. For distances up to 40Km
E1MG-100FX-OM	100BASE-FX SFP optic MMF, LC connector, optical monitoring capable
E1MG-100FX-OM-8	100BASE-FX SFP optic MMF, LC connector, optical monitoring capable, 8-pack

PART NUMBER	1 GbE SFP
E1MG-BXD	1000BASE-BXD SFP optic SMF, transmits at 1490nm and receives at 1310nm, LC connector, single strand SMF fiber. This optic should only be connected to an E1MG-BXU at the far end.
E1MG-BXU	1000BASE-BXU SFP optic SMF, transmits at 1310nm and receives at 1490nm, LC connector, single strand SMF fiber. This optic should only be connected to an E1MG-BXD at the far end.
E1MG-CWDM80-1470	1GbE CWDM SFP optic, 80Km, 1470nm, LC connector
E1MG-CWDM80-1490	1GbE CWDM SFP optic, 80Km, 1490nm, LC connector
E1MG-CWDM80-1510	1GbE CWDM SFP optic, 80Km, 1510nm, LC connector
E1MG-CWDM80-1530	1GbE CWDM SFP optic, 80Km, 1530nm, LC connector
E1MG-CWDM80-1550	1GbE CWDM SFP optic, 80Km, 1550nm, LC connector
E1MG-CWDM80-1570	1GbE CWDM SFP optic, 80Km, 1570nm, LC connector
E1MG-CWDM80-1590	1GbE CWDM SFP optic, 80Km, 1590nm, LC connector
E1MG-CWDM80-1610	1GbE CWDM SFP optic, 80Km, 1610nm, LC connector
E1MG-LHA-OM	1000BASE-LHA SFP optic, SMF, LC connector, optical monitoring capable
E1MG-LHA-OM-T	1000BASE-LHA SFP optic, SMF, LC connector, optical monitoring capable, industrial temperature (-40°C to 85°C)
E1MG-LX-A	1000BASE-LX SFP Optic, SMF, LC connector, TAA compliant
E1MG-LX-A8	1000BASE-LX SFP Optic, SMF, LC connector, TAA compliant, 8-pack
E1MG-LX-OM	1000BASE-LX SFP optic, SMF, LC connector, optical monitoring capable
E1MG-LX-OM-8	1000BASE-LX SFP optic, SMF, LC connector, optical monitoring capable, 8-pack
E1MG-LX-OM-T	1000BASE-LX SFP optic, SMF, LC connector, optical monitoring capable, industrial temperature (-40°C to 85°C)
E1MG-SX-A	1000BASE-SX SFP Optic, MMF, (LC), TAA compliant
E1MG-SX-A8	1000BASE-SX SFP Optic, MMF, (LC), TAA compliant, 8-pack
E1MG-SX-OM	1000BASE-SX SFP optic, MMF, LC connector, optical monitoring capable
E1MG-SX-OM-8	1000BASE-SX SFP optic, MMF, LC connector, optical monitoring capable, 8-pack
E1MG-SX-OM-T	1000BASE-SX SFP optic, MMF, LC connector, optical monitoring capable, industrial temperature (-40°C to 85°C)
E1MG-TX	1000BASE-TX SFP Copper, RJ-45 connector
E1MG-TX-A	1000BASE-TX SFP Copper, RJ-45, TAA compliant
E1MG-TX-A8	1000BASE-TX SFP Copper, RJ-45, TAA compliant, 8-pack
1G-SFP-TWX-0101	1GbE Direct Attach SFP to SFP active copper cable, 1m
1G-SFP-TWX-0501	1GbE Direct Attach SFP to SFP active copper cable, 5m

Specifications subject to change.

### RUCKUS ETHERNET OPTICS ORDERING INFORMATION

PART NUMBER	10 GbE SFP+
<b>10G-SFPP-BXD-S</b>	10GBASE-LR SFP+ Optic (LC) bidirectional downstream, standard temperature (0°C to 70°C)
<b>10G-SFPP-BXU-S</b>	10GBASE-LR SFP+ Optic (LC) bidirectional upstream, standard temperature (0°C to 70°C)
<b>10G-SFPP-ER</b>	10GBASE-ER SFP+ optic (LC), for up to 40Km over SMF
<b>10G-SFPP-ER-2</b>	10GBASE-ER SFP+ optic (LC), for up to 40Km over SMF, 2-pack
<b>10G-SFPP-LR</b>	10GBASE-LR, SFP+ optic (LC), for up to 10Km over SMF
<b>10G-SFPP-LR-8</b>	10GBASE-LR, SFPP SMF (LC), for up to 10Km over SMF, 8-pack
<b>10G-SFPP-LR-S</b>	10GBASE-LR, SFPP SMF (LC), for up to 10Km over SMF, standard temperature (0°C to 70°C)
<b>10G-SFPP-LR-S8</b>	10GBASE-LR, SFPP SMF (LC), for up to 10Km over SMF, standard temperature (0°C to 70°C), 8-pack
<b>10G-SFPP-LR-SA</b>	10GBASE-LR, SFP+ optic (LC), for up to 10Km over SMF, standard temperature (0°C to 70°C), TAA compliant
<b>10G-SFPP-LR-SA8</b>	10GBASE-LR, SFP+ optic (LC), for up to 10Km over SMF, standard temperature (0°C to 70°C), TAA compliant, 8-pack
<b>10G-SFPP-LRM</b>	10GBASE-LRM SFP+ optic (LC), for up to 220m over MMF
<b>10G-SFPP-LRM-1-ADP</b>	10GBASE-LRM SFP+ optic (LC), for up to 220m over MMF, w/ 1-LRM Optic, 1-Dual Port Adapter, & L-Bracket Mount for ICX7150, ICX7250 and ICX7750 (Optional 8 unit rack-mount shelf available)
<b>10G-SFPP-LRM-2-ADP</b>	10GBASE-LRM SFP+ Optic (LC), for up to 220m over MMF, w/ 2-LRM Optic, 1-Dual Port Adapter, & L-Bracket Mount for ICX7150, ICX7250 and ICX7750 (Optional 8 unit rack-mount shelf available)
<b>10G-SFPP-LRM-8</b>	10GBASE-LRM SFP+ optic (LC), for up to 220m over MMF, 8-pack
<b>10G-SFPP-SR</b>	10GBASE-SR, SFP+ optic (LC), target range 300m over MMF
<b>10G-SFPP-SR-8</b>	10GBASE-SR, SFPP MMF LC connector, 8-pack
<b>10G-SFPP-SR-S</b>	10GBASE-SR, SFPP MMF LC connector, standard temperature (0°C to 70°C)
<b>10G-SFPP-SR-S8</b>	10GBASE-SR, S FPP MMF LC connector, standard temperature (0°C to 70°C), 8-pack
<b>10G-SFPP-SR-SA</b>	10GBASE-SR, SFP+ optic (LC), target range 300m over MMF, standard temperature (0°C to 70°C), TAA compliant
<b>10G-SFPP-SR-SA8</b>	10GBASE-SR, SFP+ optic (LC), target range 300m over MMF, standard temperature (0°C to 70°C), TAA compliant, 8-pack
<b>10G-SFPP-TWX-0101</b>	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 1m
<b>10G-SFPP-TWX-0108</b>	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 1m, 8-pack
<b>10G-SFPP-TWX-0301</b>	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 3m
<b>10G-SFPP-TWX-0308</b>	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 3m, 8-pack
<b>10G-SFPP-TWX-0501</b>	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 5m
<b>10G-SFPP-TWX-0508</b>	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 5m, 8-pack
<b>10G-SFPP-TWX-P-0101</b>	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 1m
<b>10G-SFPP-TWX-P-0108</b>	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 1m, 8-pack
<b>10G-SFPP-TWX-P-0301</b>	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 3m
<b>10G-SFPP-TWX-P-0308</b>	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 3m, 8-pack
<b>10G-SFPP-TWX-P-0501</b>	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 5m
<b>10G-SFPP-TWX-P-0508</b>	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 5m, 8-pack
<b>10G-SFPP-USR</b>	10GBASE-USR, SFP+ optic (LC), target range 100m over MMF
<b>10G-SFPP-USR-8</b>	10GBASE-USR, SFP+ optic (LC), target range 100m over MMF, 8-pack

Specifications subject to change.

### RUCKUS ETHERNET OPTICS ORDERING INFORMATION

<b>10G-SFPP-USR-SA</b>	10GBASE-USR, SFP+ Optic (LC), Range 100m MMF, standard temperature (0°C to 70°C), TAA compliant
<b>10G-SFPP-USR-SA8</b>	10GBASE-USR, SFP+ Optic (LC), Range 100m MMF, standard temperature (0°C to 70°C), TAA compliant, 8-pack
<b>10G-SFPP-ZR</b>	10GBASE-ZR SFP+ optic (LC), for up to 80Km over SMF
<b>10G-SFPP-ZR-2</b>	10GBASE-ZR SFP+ Optic (LC), for up to 80Km over SMF, 2-pack
<b>10GE-SFPP-AOC-0701</b>	10GbE Direct Attach SFP+ to SFP+ Active Optical Cable, 7m
<b>10GE-SFPP-AOC-1001</b>	10GbE Direct Attach SFP+ to SFP+ Active Optical Cable, 10m

<b>PART NUMBER</b>	<b>25 GbE SFP28</b>
<b>E25G-SFP28-SR</b>	25GE SR SFP28 , 100 m over MMF OM4, 70 m over MMF OM3, 1-pack
<b>E25G-SFP28-LR</b>	25GE LR SFP28, 10km over SMF, 1-pack
<b>E25G-SFP28-AOC-1001</b>	25GE SFP28 AOC 10m 1-pack
<b>E25G-SFP28-TWX-P-00501</b>	25GE Direct Attached SFP28 to SFP28 Passive Copper cable, 0.5m, 1-pack
<b>E25G-SFP28-TWX-P-0101</b>	25GE Direct Attached SFP28 to SFP28 Passive Copper cable, 1m, 1-pack
<b>E25G-SFP28-TWX-P-0301</b>	25GE Direct Attached SFP28 to SFP28 Passive Copper cable, 3m, 1-pack

<b>PART NUMBER</b>	<b>40 GbE QSFP+</b>
<b>E40G-QSFP-SR4</b>	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100m over MMF OM3. 150m over MMF OM4
<b>E40G-QSFP-SR4-8</b>	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100m over MMF OM3. 150m over MMF OM4, 8-pack
<b>E40G-QSFP-SR4-INT</b>	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100m over MMF, compatible with 10GBASE-SR, 10G breakout-capable
<b>E40G-QSFP-ESR4</b>	40GBASE-ESR4 QSFP+ optic (MTP 1x8 or 1x12), 300m over MMF
<b>E40G-QSFP-ESR4-8</b>	40GBASE-ESR4 QSFP+ optic (MTP 1x8 or 1x12), 300m over MMF, 8-pack
<b>E40G-QSFP-ER4</b>	40GBASE-ER4 QSFP+ optic (LC), for up to 40Km over SMF
<b>E40G-QSFP-SR4-INT</b>	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100m over MMF (10GBASE-SR compatible, breakout-capable)
<b>E40G-QSFP-LR4</b>	40GBASE-LR4 QSFP+ optic (LC), for up to 10Km over SMF
<b>E40G-QSFP-LR4-8</b>	40GBASE-LR4 QSFP+ optic (LC), for up to 10Km over SMF, 8-pack
<b>E40G-QSFP-LR4-INT</b>	40GBASE-LR4 QSFP+ to 4 SFP+ optic (LC), for up to 10Km over SMF
<b>E40G-QSFP-LM4</b>	40GBASE-LM4 QSFP+, 1310nm, 160m over duplex LC OM4 MMF
<b>E40G-QSFP-SR-BIDI</b>	40GbE SR QSFP+ optic (LC), bidirectional, 100m over OM3 MMF
<b>E40G-QSFP-4SFP-AOC-1001</b>	4x10GbE Direct Attach QSFP+ to 4 SFP+ Active Optical Breakout Cable, 10m
<b>E40G-QSFP-4SFP-C-0101</b>	4x10GbE Direct Attach QSFP+ to 4 SFP+ Active Copper Breakout Cable, 1m
<b>E40G-QSFP-4SFP-C-0301</b>	4x10GbE Direct Attach QSFP+ to 4 SFP+ Active Copper Breakout Cable, 3m
<b>E40G-QSFP-4SFP-C-0501</b>	4x10GbE Direct Attach QSFP+ to 4 SFP+ Active Copper Breakout Cable, 5m
<b>E40G-QSFP-QSFP-AOC-1001</b>	40GbE Direct Attach QSFP+ to QSFP+ Active Optical Cable, 10m
<b>E40G-QSFP-QSFP-C-0101</b>	40GbE Direct Attach QSFP+ to QSFP+ Active Copper cable, 1m
<b>E40G-QSFP-QSFP-C-0301</b>	40GbE Direct Attach QSFP+ to QSFP+ Active Copper cable, 3m
<b>E40G-QSFP-QSFP-C-0501</b>	40GbE Direct Attach QSFP+ to QSFP+ Active Copper cable, 5m
<b>40G-QSFP-C-00501</b>	40GbE Direct Attach QSFP+ to QSFP+ Passive Copper Cable, 0.5m
<b>40G-QSFP-C-00508</b>	40GbE Direct Attach QSFP+ to QSFP+ Passive Copper Cable, 0.5m, 8-pack

Specifications subject to change.

### RUCKUS ETHERNET OPTICS ORDERING INFORMATION

E40G-QSFP-C-0101	40GbE Direct Attach QSFP+ to QSFP+ Passive Copper Cable, 1m
E40G-QSFP-QSFP-P-0101	40GbE Direct Attach QSFP+ to QSFP+ Passive Copper Cable, 1m
E40G-QSFP-QSFP-P-0301	40GbE Direct Attach QSFP+ to QSFP+ Passive Copper Cable, 3m
E40G-QSFP-C-0501	40GbE Direct Attach QSFP+ to QSFP+ Passive Copper Cable, 5m
PART NUMBER	100 GbE QSFP28
E100G-QSFP28-SR4	100GBASE-SR4 QSFP28 optic (MTP 1x12), for up to 100m over MMF
E100G-QSFP-ESR4	100GBASE-ESR4 QSFP+ optic (MTP 1x8 or 1x12), for up to 300m over MMF
E100G-QSFP28-LR4L-2KM	100GBASE-LR4 Lite QSFP28 transceiver 2Km over SMF
E100G-QSFP28-LR4-10KM	100GBASE-LR4 QSFP28 optic (LC), for distances up to 10Km over SMF
E100G-QSFP28-LR4-LP-10KM	100GBASE-LR4 Low Power, QSFP28 optic (LC), for distances up to 10Km over SMF
E100G-QSFP28-CWDM4-2KM	100GBASE-CWDM4 QSFP28 optic (LC), for distances up to 2Km over SMF
E100G-QSFP-QSFP-P-0101	100GbE QSFP28 to QSFP28 Direct Attach, Passive Copper Cable, 1m
E100G-QSFP-QSFP-P-0301	100GbE QSFP28 to QSFP28 Direct Attach, Passive Copper Cable, 3m
E100G-QSFP-QSFP-P-0501	100GbE QSFP28 to QSFP28 Direct Attach, Passive Copper Cable, 5m
E100G-QSFP-QSFP-AOC-1001	100GbE QSFP28 to QSFP28 Direct Attach, Active Optical Cable, 10m
E100G-QSFP-4SFP-P-0101	4x25GE Direct Attached QSFP28 to 4 SFP28 PASSIVE Copper Breakout Cable, 1m, 1-pack
E100G-QSFP-4SFP-P-0301	4x25GE Direct Attached QSFP28 to 4 SFP28 PASSIVE Copper Breakout Cable, 3m, 1-pack
E100G-QSFP-4SFP-P-0501	4x25GE Direct Attached QSFP28 to 4 SFP28 PASSIVE Copper Breakout Cable, 5m, 1-pack

### UNDERSTANDING PART NUMBER DESCRIPTIONS

**Operating Temperature Ranges:** When no temperature range is mentioned in the description, the transceiver temperature range is 0°C to 85°C. “standard temperature” in the description means 0°C to 70°C. “industrial temperature” means -40°C to 85°C.

**Multi-Unit Bundles:** 8-pack means the SKU is a bundle of 8 units. 2-pack, a bundle of 2 units.

**TAA Compliance:** TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581). TAA requires that the U.S. Government may acquire only “U.S. made or designated country end products”. This act requires that contractors must certify that each end product meets the applicable requirements. End products are “those articles, materials and supplies to be acquired for public use.” This includes items which have been “substantially transformed” in the United States.

**Active vs Passive Copper Cables:** Direct attach passive copper cables have transceiver shaped connectors directly soldered to the cable without any active component in the system. Passive copper cables offer the shortest distances and they are the most affordable. Ruckus recommends the use of passive copper cables for links between Ruckus switches up to 3 meters. These cables should be the default choice for stacking Ruckus switches together within a rack or across nearby racks.

Active copper cables include active components in the transceivers on each end of the cable. This enables Active copper cables to deliver a stronger signal and to support longer distances. However, they do cost more than their passive counterparts.

### WARRANTY

Ruckus optics are covered by the Ruckus switching products standard limited warranty. For details, visit [www.ruckuswireless.com/warranty](http://www.ruckuswireless.com/warranty).

### LEGAL DISCLAIMER

Product features, functionality and specifications may change or be discontinued without notice. Nothing in this document shall be deemed to create a warranty of any kind, either express or implied, statutory or otherwise, including but not limited to, any implied warranties of merchantability, fitness for a particular purpose, non-infringement of third-party rights or availability with respect to any products and services.

Refer to [www.ruckuswireless.com](http://www.ruckuswireless.com) for the latest version of this document.

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