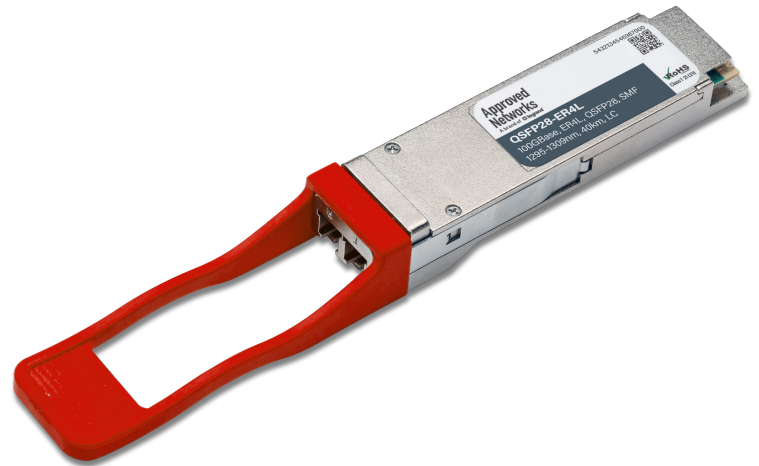


## Features

- Compliant with QSFP28 Standard:
- Supports 40km transmission with FEC and 30km transmission without FEC
- SFF-8661 Revision 1.9, SFF-8636 Revision 2.10a
- Compliant with 100G 4WDM-40 MSA technical specification rev 1.0
- High speed I/O electrical interface (CAUI-4) compliant with IEEE 802.3-2018
- Single 3.3V Supply Voltage
- Maximum power consumption 4.5W
- 0-70 °C Case Operating Temperature
- LAN WDM EML laser and APD Receiver Array
- QSFP28 MSA package with duplex LC connector
- Two Wire Serial Interface with Digital Diagnostic Monitoring
- Complies with EU Directive 2011/65/EU (RoHS compliant)
- Class 1 Laser



## 1. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Storage Temperature	TS	-40	-	+85	°C
Supply Voltage	VCC	-0.5	-	3.6	V
Relative Humidity	RH	5	-	95	%
Data Input Voltage - Differential	IVDIP-VDINI	-	-	1.0	V
Control Input Voltage	VI	-0.3	-	Vcc+0.5	V
Control Output Current	IO	-20	-	20	mA

## 2. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	TOPR	0	-	70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	

Instantaneous peak current at hot plug	ICC_IP	-	-	1800	mA	
Sustained peak current at hot plug	ICC_SP	-	-	1485	mA	
Maximum Power Dissipation	PD	-	-	4.5	W	
Maximum Power Dissipation, Low Power Mode	PDLP	-	-	1.5	W	
Aggregate Bit Rate	ABR	-	103.125	-	Gb/s	
Data Rate per Lane	DRL	-	25.78	-	Gb/s	
Control Input Voltage High	VIH	VCC*0.7	-	VCC+0.3	V	
Control Input Voltage Low	VIL	-0.3	-	VCC*0.3	V	
Two Wire Serial Interface Clock Rate	-	-	-	400	kHz	
Module power supply noise tolerance 10 Hz - 10 MHz (peak-to-peak)	-	-	-	66	mVpp	
Rx Differential Data Output Load	-	-	100	-	ohms	
Operating Distance	-	2	-	40000	m	With FEC
	-	2	-	30000	m	Without FEC

### 3. Transmitter Optical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Wavelength L0	$\lambda C0$	1294.53	1295.56	1296.59	nm
Wavelength L1	$\lambda C1$	1299.02	1300.05	1301.09	nm
Wavelength L2	$\lambda C2$	1303.54	1304.58	1305.63	nm
Wavelength L3	$\lambda C3$	1308.09	1309.14	1310.19	nm
Side-mode suppression ratio	SMSR	30			dB
Total Average Optical Launch Power	POUT	-	-	12.5	dBm
Average Launch Power Tx_Off (Each Lane)	POUT_OFF	-	-	-30	dBm
Average Optical Launch Power (Each Lane)	POUTL	-2.5	-	6.5	dBm
Extinction Ratio	ER	4.5	-	-	dB
Optical Modulation Amplitude (Each Lane)	OMA	0.5	-	6.5	dBm

Launch Power in OMA minus TDP (Each Lane)	OMA-TDP	-0.5	-	-	dBm
Difference in launch power between any two lanes (Average and OMA)	DT_OMA	-	-	4	dB
Transmitter and Dispersion Penalty (Each Lane)	TDP	-	-	3	dB
Optical Return Loss Tolerance	ORLT	20	-	-	dB
Transmitter Eye Mask Definition	-	{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}			
Transmitter Reflectance	TR	-	-	-26	dB

#### 4. Receiver Optical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Wavelength L0	$\lambda C0$	1294.53	1295.56	1296.59	nm
Wavelength L1	$\lambda C1$	1299.02	1300.05	1301.09	nm
Wavelength L2	$\lambda C2$	1303.54	1304.58	1305.63	nm
Wavelength L3	$\lambda C3$	1308.09	1309.14	1310.19	nm
Receiver sensitivity (OMA), each lane at $5 \times 10^{-5}$ BER		-	-	-18.5	dBm
Stressed receiver sensitivity (OMA), each lane, each lane at $5 \times 10^{-5}$ BER	-	-	-	-16	dBm
<b>Stressed Receiver Sensitivity Test Conditions:</b>					
Stressed Eye J2 Jitter (Each Lane)	-	-	0.33	-	UI
Stressed Eye J4 Jitter (Each Lane)	-	-	0.48	-	UI
Vertical Eye Closure Penalty	-	-	2.5	-	dB
SRS eye mask definition { X1, X2, X3, Y1, Y2, Y3}		{0.39, 0.5, 0.5, 0.39, 0.39, 0.4}			
Damage threshold, each lane	Pin, damage	-2.5	-	-	dBm
Average Receive Power (Each Lane)	-	-20.5	-	-3.5	dBm
Receive Power in OMA (Each Lane), Overload	OMA	-	-	-3.5	dBm
Receiver Reflectance	RXR	-	-	-26	dB

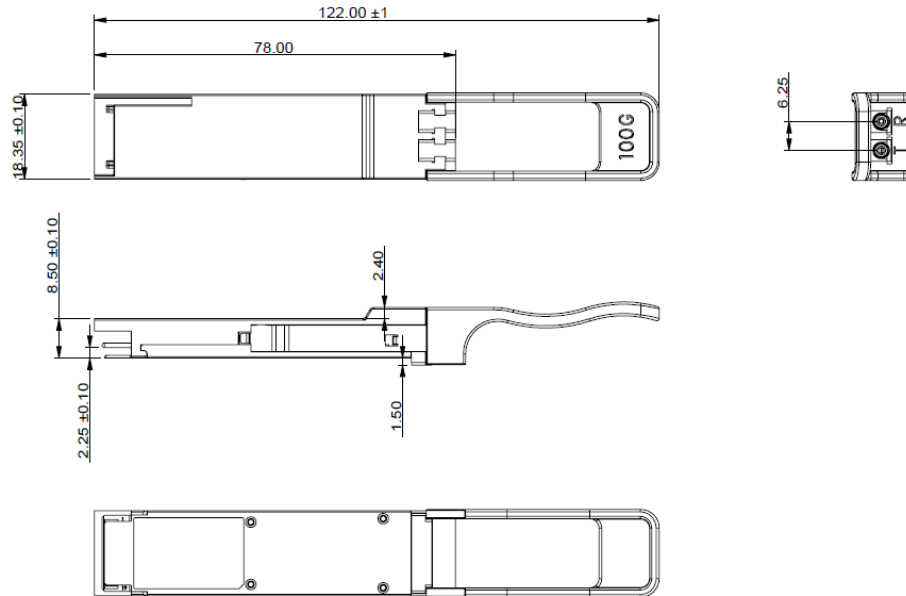
### 5. Electrical Specifications

High-Speed Signal: Compliant to CAUI-4 (IEEE 802.3bm)

Low-Speed Signal: Compliant to SFF-8679

Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>Transmitter (Module Input)</b>					
Signaling rate per lane (range)		25.78125 ± 100 ppm			GBd
Differential pk-pk input voltage tolerance	VIN,P-P	900	-	-	mVpp
Differential Termination Mismatch		-	-	10	%
Single-ended voltage tolerance range		-0.4	-	3.3	V
DC common mode voltage		-350	-	2850	mV
<b>Receiver (Module Output)</b>					
Signaling rate per lane (range)		25.78125 ± 100 ppm			GBd
AC common-mode output voltage		-	-	17.5	mV
Differential output voltage	VOUT,P-P	-	-	900	mVpp
Eye width		0.57	-	-	UI
Eye height, differential		228	-	-	mV
Vertical eye closure		-	-	5.5	dB
Differential Termination Mismatch		-	-	10	%
Output Rise/Fall Time, 20%~80%	TR	12	-	-	ps
DC common mode voltage		-350	-	2850	mV

## 6. Mechanical Diagram



**Note:** External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

## 7. Ordering Information

OEM	Part Number	OEM	Part Number
Arista	QSFP-100G-ERL4-A	MSA Champion ONE	100GQSFP28E-ER4L
Brocade	100G-QSFP28-ER4-30KM-A	Fujitsu	FIM37800-A
Calix	100-04997-A	Fujitsu	FIM37801-A
Ciena	XCVR-Q30V31-C1	HP	JL743A-A
Cisco	QSFP-100G-ER4L-S-A	Juniper	QSFP-100G-ER4L-A
Cisco	100GEQ-ER4L-CSC	Juniper	QSFP-100G-ER4L-C1
Cisco	QSFP-100G-ER4L-S-C1	MSA Generic	AN-QSFP28-ER4L
Dell	407-BBZX-A	MSA OnePort	OP-QSFP28-ER4L
Dell	407-BBZX-C1	Nokia	3HE11239AA-C1
Extreme	100G-ER4LT-QSFP40KM-A		

## 8. Contact Information

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Web: <http://www.approvednetworks.com>