

### Features:

- Compliant with industry standards 100G-ER1-40 MSA
- Compliant with SFF-8679 MSA hardware specification
- Compliant with SFF-8636
- Compliant with SFF-8661
- EML laser
- APD receiver
- Up to 40km on 9/125um SMF
- Operating temperature options- (Commercial) 0°C to +70°C
- Trouble-free installation and network bring-up
- RoHS Compliant



### Applications:

- Data Center
- 100 Gigabit Ethernet

### 1. Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TS	-40	85	°C
Relative Humidity	RH	15	85	%
Supply Voltage	VCC	-0.5	3.6	V

### 2. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature (Commercial)	TC	0	-	70	°C
Supply Voltage	VCC	3.13	3.3	3.47	V

### 3. Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit
<b>Transmitter</b>					
Module Supply Current	I <sub>cc</sub>	-	-	1435	mA
Power Dissipation	PD	-	-	4500	mW
<b>Transmitter</b>					
Input Differential Impedance	Z <sub>in</sub>	90	100	110	Ω
Differential Data Input Swing	V <sub>in</sub> , p-p	180	-	900	mVP-P
<b>Receiver</b>					
Output Differential Impedance	Z <sub>o</sub>	90	100	110	Ω
Differential Data Output Swing	V <sub>out</sub> , p-p	300	-	900	mVP-P

### 4. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
<b>Transmitter</b>						
Launch Optical Power(Average)	P <sub>o</sub>	1.7	-	7.1	dBm	1
Launch Optical Power(OMA)	P <sub>oma</sub>	4.7	-	7.9	dBm	TDECQ < 1.4 dB
		3.3+ TDECQ	-			1.4 dB ≤ TDECQ ≤ TDECQ (max)
Extinction Ratio	ER	5	-	-	dB	-
Center Wavelength Range	λ <sub>c</sub>	1308.61	1309.14	1309.66	nm	-
Transmitter and dispersion penalty eye closure for PAM4	TDECQ	-	-	3.9	dB	-
RIN <sub>15OMA</sub> (max)	RIN	-	-	-136	dB/Hz	
Optical Return Loss Tolerance	ORLT	-	-	15	dB	
P <sub>out</sub> @TX-Disable Asserted	P <sub>off</sub>	-	-	-15	dBm	
<b>Receiver</b>						
Center Wavelength	λ <sub>c</sub>	1304.06	1304.58	1305.1	nm	-
Receive power (P <sub>ave</sub> )		-16	-	-3.4	dBm	

Receiver Sensitivity (OMA)	RxSENS_oma	-	-	-13.8	dBm	TDECQ < 1.4 dB 1.4 ≤ TECQ ≤ 3.9 dB
		-	-	-15.2 + TECQ		
Receiver Sensitivity (Pave)	RxSENS_Pave	-	-	-14	dBm	
		-	-	-15.4 + TECQ		
Receiver reflectance			-	-26	dB	
LOS De-Assert	LOSD	-	-	-16	dBm	
LOS Assert	LOSA	-24	-		dBm	
LOS Hysteresis	-	0.5	-		dB	

**Notes:**

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. Measured with PRBS31Q test pattern, 53.125GBd, BER<2.4E-4.

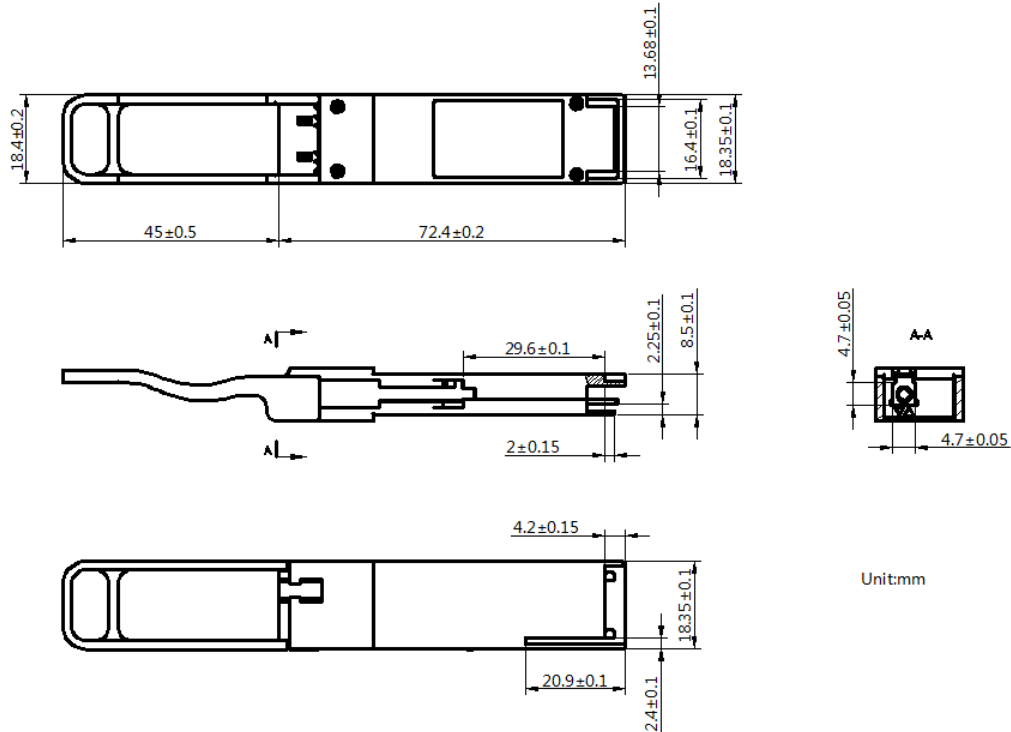
## 5. General Specifications

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Rate	BR	53.125±100ppm			GBd	-
Bit Error Rate	BER	-	-	2.4E-4	-	1
Supported Link Length on 9/125um SMF, 53.125 GBd	L	-		40	km	2

**Notes:**

1. Tested with a PRBS31Q test pattern for 53.125 GBd operation.
2. Distances are based on FC-PI-6 Rev. 3.1 and IEEE 802.3 standards, with FEC.

## 6. Mechanical Specifications



Unit:mm

**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
MSA	AN-QSFP28-ER1-BX94		

## 8. Contact Information

Tel: 800.590.9535

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