

## Features

- QSFP28 MSA compliant
- Supports 100GE aggregate bit rates
- Supports KP4 FEC @ 100G data rate
- Two independent full-duplex channels
- Up to 100m OM4 MMF transmission
- Operating case temperature:  
- 10 to 70 C @ 100G
- Single 3.3V power supply
- Maximum power consumption 4W
- LC optical connector
- RoHS-6 compliant



## Applications

- Data Center
- Infiniband HDR
- 100G Ethernet

## 1. Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	TS	-40	85	degC	
Operating Case Temperature	TOP	10	70	degC	
Power Supply Voltage	VCC	-0.5	3.6	V	
Relative Humidity (noncondensation)	RH	0	85	%	
Damage Threshold	THd	5		dBm	

## 2. Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min	Typical	Max	Units	Notes
Operating Case Temperature	TOP	10		70	degC	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Data Rate Accuracy		-100		100	ppm	
Pre- FEC Bit Error Ratio				2.4x10 <sup>-4</sup>		
Post-FEC Bit Error Ratio				1x10 <sup>-12</sup>		1
Control Input Voltage High		2		Vcc	V	

Control Input Voltage Low			0		0.8	V	
Link Distance	OM3	D1			70	m	2
	OM4	D2			100	m	2
	OM5	D3			150	m	2

**Notes:**

1. FEC provided by host system.
2. FEC required on host system to support maximum distance.

**3. Electrical Characteristics**

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Test Pt.	Min	Max	Units	Notes
Power Consumption			4	W	
Supply Current	Icc		1.21	A	
<b>Transmitter ( each Lane)</b>					
Overload Differential Voltage pk-pk	TP1 a	900		mV	
Common Mode Voltage (Vcm)	TP1	-350	2850	mV	1
Differential Termination Resistance Mismatch	TP1		10	%	At 1MHz
Differential Return Loss (SDD11)	TP1		See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion ( SDC11 ,SCD11)	TP1		See CEI-28G-VSR Equation 13-20	dB	
Stressed Input Test	TP1 a	See CEI-28G-VSR Section 13.3.11.2.1			
<b>Receiver ( each Lane)</b>					
Differential Voltage, pk-pk	TP4		900	mV	
Common Mode Voltage (Vcm)	TP4	-350	2850	mV	1
Common Mode Noise, RMS	TP4		17.5	mV	
Differential Termination Resistance Mismatch	TP4		10	%	At 1MHz

Differential Return Loss (SDD22)	TP4		See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion ( SDC22 , SCD22)	TP4		See CEI-28G-VSR Equation 13-21	dB	
Common Mode Return Loss (SCC22)	TP4		-2	dB	2
Transition Time, 20 to 80%	TP4	9.5		ps	
Vertical Eye Closure ( VEC)	TP4		5.5	dB	
Eye Width at 10-15 probability (EW15)	TP4	0.57		UI	
Eye Height at 10-15 probability (EH15)	TP4	228		mV	

**Notes:**

1. Vcm is generated by the host. Specification includes effects of ground offset voltage.
2. From 250MHz to 30GHz.

**4. Optical Characteristics**

Parameter	Symbol	KP4 FEC Mode			Unit	Notes
		Min	Typical	Max		
<b>Transmitter</b>						
Center Wavelength Line0	$\lambda_C$	844		863	nm	
Center Wavelength Line1	$\lambda_C$	900		918	nm	
RMS Spectral Width	$\Delta\lambda_{rms}$			$\lambda_1: 0.6$ $\lambda_2: 0.65$	nm	
Average Launch Power, each Lane	PAVG	-6.2		4	dBm	
Optical Modulation Amplitude (OMA), each Lane	POMA	-4.2		3	dBm	1
Peak Power, each lane				- -	dBm	
Launch power in OMA minus TDP, each lane		-5.6			dBm	
TDECQ, each lane				4.5	dB	
Extinction Ratio	ER	3.0			dB	
Transmitter transition time, each lane (max)				31	ps	

RIN12 OMA				-128	dB/Hz	
Optical Return Loss Tolerance	TOL			12	dB	
Average Launch Power OFF Transmitter, each Lane	Poff			-30	dBm	
Encircled Flux		≥ 86% at 19 μm ≤ 30% at 4.5 μm				2
Signaling rate, each lane		26.5625± 100ppm			Gbps	
Center Wavelength Lane0	λC	844	850	863	nm	
Center Wavelength Lane1	λC	900	910	918	nm	
Damage Threshold, each Lane	THd	5			dBm	3
<b>Receiver</b>						
Average Receive Power, each lane		-8.2			dBm	4
Average power at receiver input, each lane (overload)				4	dBm	
Receiver Reflectance	RR			-12	dB	
Stressed receiver sensitivity in OMA, Lane2				-3.5	dBm	5
Receiver sensitivity(OMA outer), each lane				Max (- 6.6, SECQ - 8) as per IEEE cl 150	dBm	
LOS Assert	LOSA	-30		-14.2	dBm	
LOS Deassert	LOSD			-11.2	dBm	
LOS Hysteresis	LOSH	0.5			dB	

**Notes:**

1. Even if the mTDEC<0.9 dB, the OMA (min) must exceed this value.
2. If measured into type A1a.2 50um fiber in accordance with IEC 61280-1-4.
3. 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.
4. Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
5. Measured with conformance test signal at TP3 as per following:

Stressed eye closure (SECq), each lane	4.5 dB
OMA of each aggressor, each lane	3 dBm

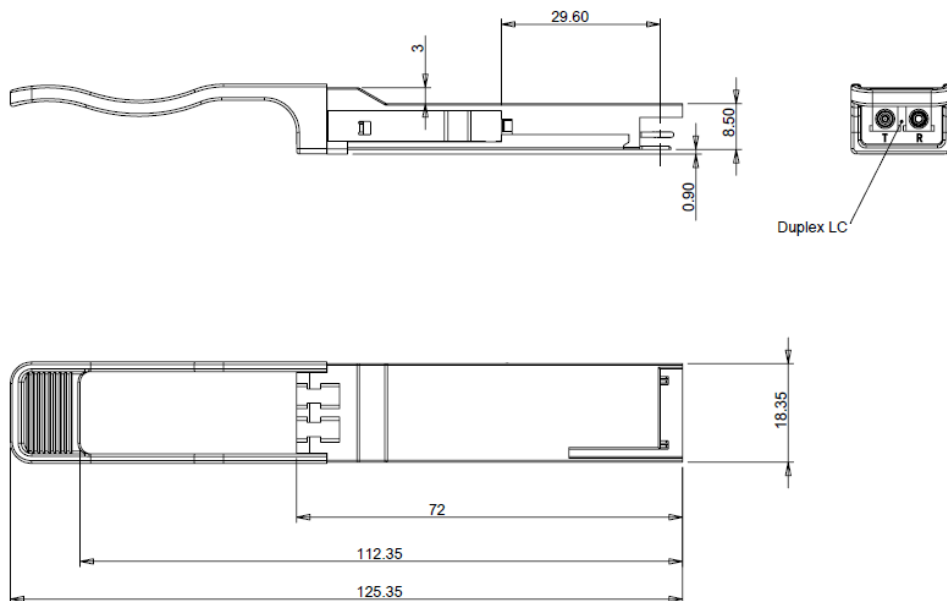
## 5. Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

Parameter	Symbol	Min	Max	Units	Notes
Temperature monitor absolute error	DMI_Temp	-3	+3	°C	Over operating temperature range
Supply voltage monitor absolute error	DMI_VCC	-0.15	0.15	V	Over full operating range
Channel RX power monitor absolute error	DMI_RX_Ch	-2	2	dB	1
Channel Bias current monitor	DMI_Ibias_Ch	-10%	10%	mA	Ch1~Ch4
Channel TX power monitor absolute error	DMI_TX_Ch	-2	2	dB	1

**Note:** Due to measurement accuracy of different single mode fibers, there could be an additional +/-1 dB fluctuation, or a +/- 3 dB total accuracy.

## 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-SR1.2-AR-A	Cisco	QSFP-40/100-SRBD-A
Cisco	QSFP-100G-SR1.2-A	MSA Generic	AN-QSFP28-SR1D2B

## 8. Contact Information

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