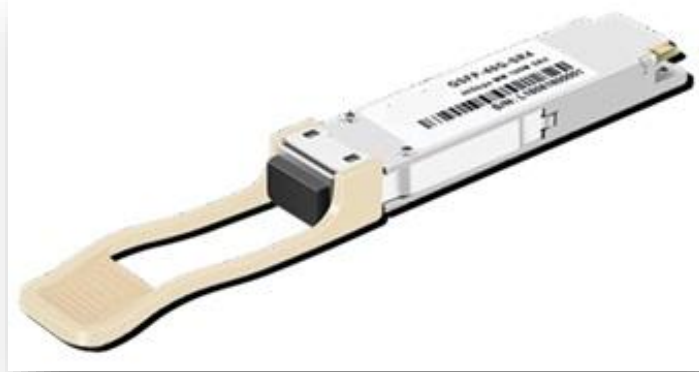


AT-QSFP28-40G-SR4

Optical SFP Module

40Gbps QSFP+SR4 Transceiver, MM, 850nm, 100m/300m



FEATURES

- High Channel Capacity: 40 Gbps per module
- Transmission data rate up to 11.2Gbps per channel
- Single MTP/MPO connector receptacle
- High Reliability 850nm VCSEL technology
- Maximum link length of 100m links on OM3-150 MM fiber or 150m links on OM4 Multi-mode fiber / Max. 300m over OM3-300 MM Fiber
- Hot Pluggable QSFP+ form factor
- Real Time Digital Diagnostic Monitoring
- Power Consumption < 0.7W
- Single +3.3V power supply
- Compatible with RoHS
- Commercial operating case temperature: 0 to +70° C

APPLICATION

- 40GB Ethernet links
- InfiniBand QDR, DDR and SDR
- 40G Telecom connections

STANDARD

- Compliant with IEEE 802.3ba
- Compliant with QSFP+ MSA
- Compliant with SFF-8436

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ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V _{cc}	-0.5	3.6	V
Storage Temperature	T _s	-40	+85	°C
Operating Humidity	-	5	95	%

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature (Commercial)	T _c	0		+70	°C
Power Supply Voltage	V _{cc}	3.135	3.3	3.465	V
Power Supply Current	I _{CC}			450	mA
Power Consumption	P _{diss}			0.7	W
Aggregate Bit Rate	BRAVE		41.25		Gbps
Data Rate, each Lane	BRAVE		10.3125	11.2	Gbps
Transmission Distance	MMF	-	100	-	m
Transmission Distance	MMF		300		m

OPTICAL AND ELECTRICAL CHARACTERISTICS

Electrical transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Input Impedance (Differential)	Z _{in}	85	100	115	ohms	R _{in} > 100 kohms @ DC

Differential data input swing	V _{in,pp}	180		1000	mV	
TX Disable	Disable	V _{IH}	2	V _{cc} +0.3	V	
	Enable	V _{IL}	0	0.8		
TX FAULT	Fault	V _{OH}	2.4	V _{cc} +0.3	V	
	Normal	V _{OL}	0	0.8		

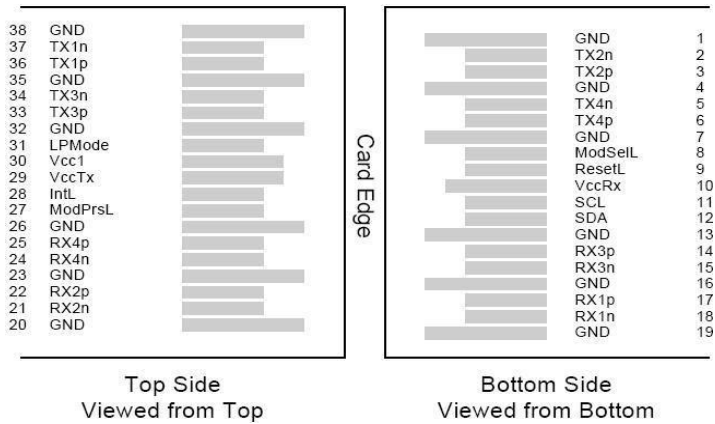
Electrical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Input Impedance (Differential)	Z _{in}	85	100	115	ohms	

Differential data output swing		Vout,pp	300		850	mV	
RX_LOS	LOS	VoH	2.4		Vcc+0.3	V	
	Normal	VoL	0		0.8		
Rise Time		tr			30	ps	10%~90%
Fall Time		tf			30	ps	10%~90%

Optical transmitter Characteristics							
Parameter		Symbol	Min	Typical	Max	Unit	Notes
Average Launch Power each lane		Pavg	-7.6		2.4	dBm	Reach 100 meters
		Pavg	-7.6		2.4	dBm	Reach 300 meters
Per Lane Bit Rate		Er		3		dB	
Center Wavelength		λ_0	840	850	860	nm	
Spectral Width(-20dB)		$\Delta\lambda$			0.65	nm	
Average launch Power off each lane		Poff			-30	dBm	
Transmitter and Dispersion Penalty each lane		TDP			3.5	dB	
Optical Return Loss Tolerance		ORL			12	dB	
Output Eye Diagram		IEEE 802.3ba-2010 Compliant					
Optical receiver Characteristics							
Parameter		Symbol	Min	Typical	Max	Unit	Notes
Receiver Wavelength		λ_{in}	840	850	860	nm	
Receiver sensitivity in OMA, each lane		Pmins			-9.5	dBm	Reach 100 meters
		Pmins			-9.9	dBm	Reach 300 meters
Input Saturation Power (Overload)		Psat	2.4			dBm	
Receiver reflectance		Rr			-12	dB	
LOS	Optical De-assert	LOSD			-12	dBm	
	Optical Assert	LOSA	-30				

PIN DEFINITIONS

Pin Diagram



QSFP MSA-compliant 38-pin connector

Pin	Symbol	Name/Description	Notes
1	GND	Transmitter Ground (Common with Receiver Ground)	1
2	TX2N	Transmitter Inverted Data Input	
3	TX2P	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	TX4N	Transmitter Inverted Data Input	
6	TX4P	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3 V Power supply receiver	2
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	
14	RX3P	Transmitter Inverted Data Input	
15	RX3N	Transmitter Non-Inverted Data Input	
16	GND	Ground	1
17	RX1P	Transmitter Inverted Data Input	
18	RX1N	Transmitter Non-Inverted Data Input	
19	GND	Ground	1
20	GND	Ground	1

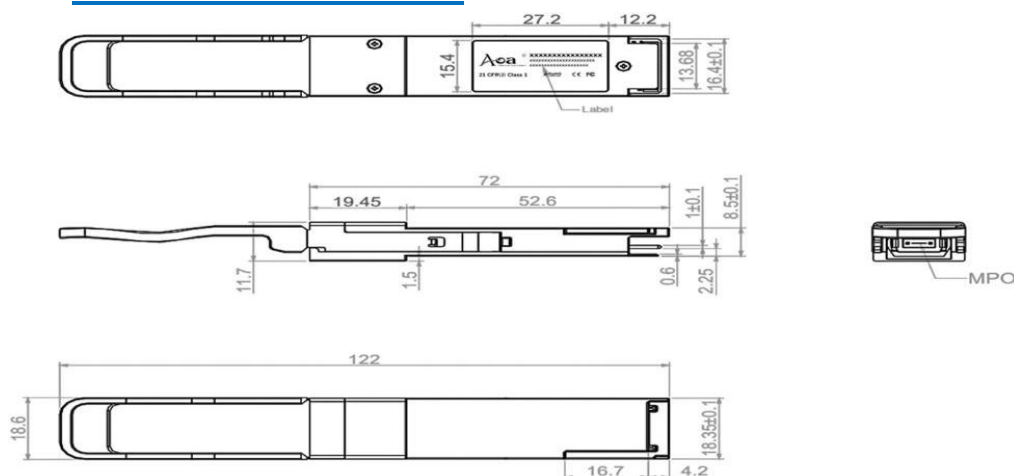
21	RX2N	Transmitter Inverted Data Input	
22	RX2P	Transmitter Non-Inverted Data Input	
23	GND	Ground	1
24	RX4N	Transmitter Inverted Data Input	1
25	RX4P	Transmitter Non-Inverted Data Input	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3 V Power supply transmitter	2
30	Vcc1	+3.3 V Power Supply	2
31	LPMODE	Low Power Mode	
32	GND	Ground	1
33	TX3P	Transmitter Inverted Data Input	
34	TX3N	Transmitter Non-Inverted Data Input	
35	GND	Ground	1
36	TX1P	Transmitter Inverted Data Input	
37	TX1N	Transmitter Non-Inverted Data Input	
38	GND	Ground	1

QSFP Module PIN Definition

NOTES

1. All Ground (GND) are common within the QSFP+ module and all module voltages are referenced to this potential unless noted otherwise. Connect these directly to the host board signal common ground plane
2. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. The connector pins are each rated for a maximum current of 500mA

MECHANICAL DIMENSIONS



ORDER INFORMATION

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Part. No	Specifications								
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	RX	Sen (dBm)	Temp (°C)	Reach (km)	DDM
AT-QSFP-40G-SR4 (100M)	QSFP+	41.25G	DFB	-7.6~2.4	PIN	<-9.5	0~70	100	Y
AT-QSFP-40G-SR4 (300M)	QSFP+	41.25G	DFB	-7.6~2.4	PIN	<-9.9	0~70	300	Y

ORDERING INFORMATION: -

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