

## 40G SR4 DUAL PORT FIBER BYPASS MODULE

### Product Description

The 850nm 40G Dual QSFP+ SR4 quad port bypass module is designed as alternative 40Gbps dual QSFP+ SR4 transceiver. Its innovated design able the fiber bypass function become selectable within single PCI card. The 850nm 40G Dual QSFP+ SR4 quad port bypass module is design expressly for Intrusion Prevention System (IPS) provides complete visibility to network traffic, It also introduces a point of failure should the IPS lose power, cable fail or application freeze.

This interconnecting system include dual ways transceivers offers 4 channels and maximum bandwidth of 40Gbps. It integrates four data lanes in each direction with 40 Gbps aggregate bandwidth. Each lane can operate at 10.3125 Gbps up to 100 m using OM3 fiber or 150 m using OM4 fiber. The optical interface uses a 12/8-fiber MTP® (MPO) connector.



### Features

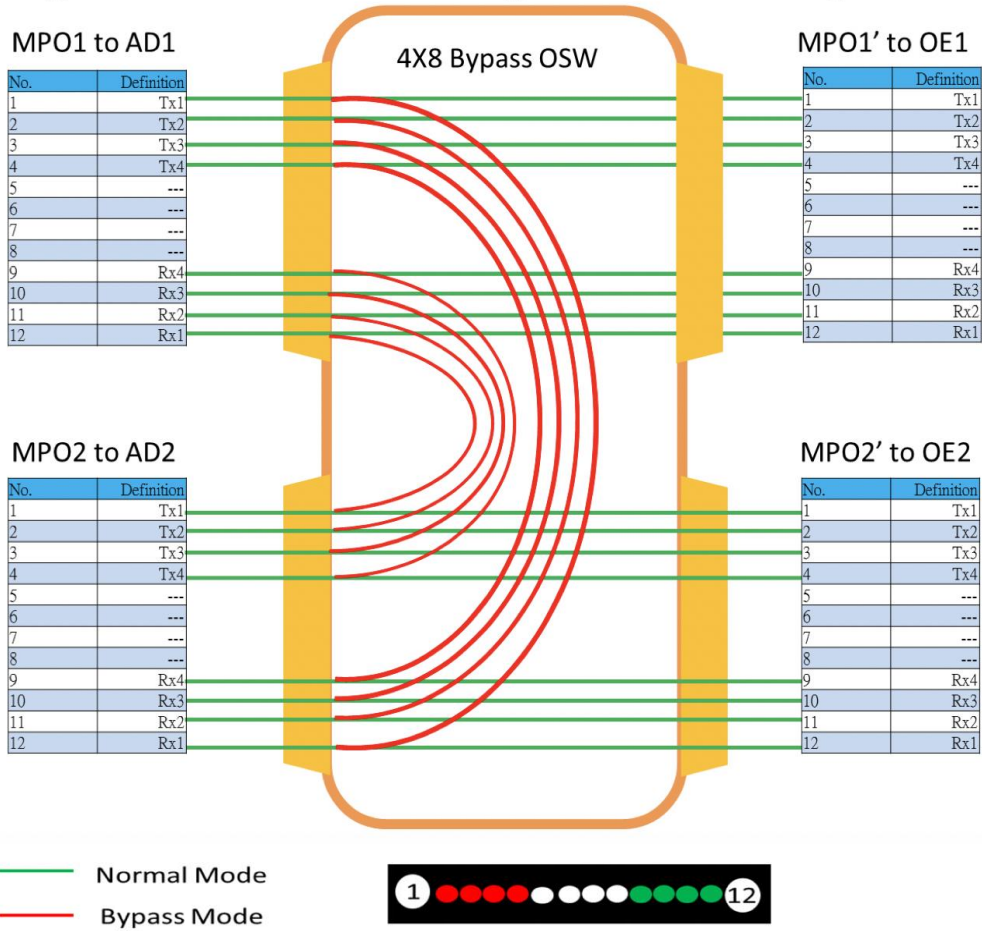
- Compliant with 40G Ethernet
- IEEE 802.3ba 40GBASE-SR4 standards
- Compliant with SFF-8436 QSFP+ specification Revision 3.5
- Unretimed XLPPI electrical interface
- Utilizes a standard 12/8 line optical fiber with MP-MTP optical connector
- Link up to 100m using OM3 MMF
- Laser Class 1 Product with comply with Requirements of IEC 60825-1 and IEC 60825-2

### Applications

- 40GbE and 40G-IB-QDR / 20G-IB-DDR / 10G-IB-SDR interconnects
- Client-side 40G Telecom connections
- 4G/8G/10G fiber Channel
- STTA/SAS Storage
- In-Line Security
- Web Acceleration Appliances

### 40G Dual QSFP+ SR Quad Port Bypass Module – Optical Path

#### Bypass Mode Between 40G Segment 1 and 40G Segment 2



### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	°C	
3.3V Supply Voltage	Vcc3(3.3V)	-0.5		3.6	V	Vcc3(3.3V)
Relative Humidity	—	5		85	%	2
Data Input Voltage — Single Endes		-0.5		Vcc+0.5	V	
Transceiver Rx damage Threshold / Lane	DT	3.4			dBm	

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operation Temperature	Ts	0	40	70	°C	1
3.3V Supply Voltage	Vcc(3.3V)	3.14	3.3	3.46	V	Vcc (3.3V)
3.3V Supply Current	Icc		1420	1500	mA	Icc (Total)
Data Rate per Channel	bps		10.3125		Gbps	

Note :

1. Consuming Temperature
2. Non Condensation

### Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
3.3V Supply Voltage (Include Vcc1, Vcc2, VccTX1, VccTR2 VccRx1, VccRx2)	Vcc3(3.3V)	3.14	3.3	3.46	V	
Data Rate per Channel	bps		10.3125		Gbps	
Control Input Voltage High	V <sub>IH</sub>	2.4		V <sub>cc</sub> +0.3	V	
Control Input Voltage Low	V <sub>IL</sub>	-0.3		0.8	V	
Two Wire serial(TWS) Interface Clock Rate				400	KHz	
Transmitter Differential input Impedance	Z <sub>d</sub>		100		Ω	1
Receiver Differential Output Impedance	Z <sub>d</sub>		100		Ω	2
Link distance on OM2 MMF		0.5		30	m	
Link distance on OM3 MMF		0.5		100	m	
Link distance on OM4 MMF		0.5		150	m	
<b>Transmitter</b>						
TRx Power-On Initiation Time				2000	mS	3
Data Differential Input Voltage Swing	V <sub>DIFF</sub>	200		1200	mV	1
Differential Input Voltage	V <sub>DT</sub>	0.5		2.4	V	1
Differential Input Return Loss	Per IEEE 802.3ba Section 86A.4.1.1				dB	5
Differential to Command Mode Input Return Loss		10			dB	5
J2 Jitter Tolerance	Jt2	0.17			UI	
J9 Jitter Tolerance	Jt9	0.29			UI	
Eye Mask Coordinate : X1, X2; Y!, Y2	Specification Value : 0.11, 0.31; 95,350				UI;mV	
<b>Receiver</b>						
Data Differential Output Voltage Swing	V <sub>DIFF</sub>	200		900	mV	2
Output Transition Time 20% to 80%	Tr, Tf	28			pS	
Differential Output Return Loss	Per IEEE 802.3ba Section 86A.4.2.1				dB	5
Differential to Command Mode Output Return Loss	Per IEEE 802.3ba Section 86A.4.2.2				dB	5
J2 Jitter Output	Jo2			0.42	UI	
J9 Jitter Output	Jo9			0.95	UI	
Eye Mask Coordinate : X1, X2; Y!, Y2	Specification Value : 0.29, 0.5; 150, 425				UI;mV	
<b>Optical Bypass Switch</b>						
Optical Switch Supply Voltage	Vcc5(5V)	4.5	5.0	5.5	V	3.3V to 5V
Operation Current (Total)	I <sub>SW</sub>			240	mA	
Latching Voltage-High	V <sub>LATH</sub>	4.5	5.0	5.5	V	
Latching Voltage-Low	V <sub>LATL</sub>	0		0.8	V	
Latching Resistance	R <sub>LAT</sub>		125		Ω	±10%
Switching Time (Input Pulse ≥20ms)	t <sub>ST</sub>			5.0	msec	

Note :

1. Internally AC couples and terminated to 100-Ohms differential load.
2. Internally AC coupled, but requires a 100-Ohms differential termination at or internal to Serializer/Deserializer.
3. "Initialization Time" is the time from when the supply voltage hot swap time reach and remain above the minimum "Recommended Operating Conditions" to the time when the module enables TWS access. The module at that point is fully functional.
4. 10M to 11.1 GHz according to IEEE 802.3ba specification.
5. Hit ratio=  $5 \times 10^{-5}$  per sample.

### Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Transmitter</b>						
Center Wavelength, each lane	$\lambda_c$	840		860	nm	
Spectral Width - RMS	$\Delta\lambda$			0.65	nm	
Average Output Optical Power, each lane	$P_o$	-7.6		2.4	dBm	1
Optical Extinction Ratio	ER	3.0			dB	
Output Optical Modulation Amplitude, per lane	OMA	-5.6		3.0	dBm	1
Difference in Power between any Two Lanes in OMA				4.0	dB	1
Transmitter and Dispersion Penalty, each lane	TDP			3.5	dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Disable Output Optical Power	$P_{O-OFF}$			-30	dB	
Optical Return Loss Tolerance		12			dB	
Eye Mask Coordinate : X1, X2, X3; Y1, Y2, Y3		Specification Value : 0.25, 0.4, 0.45; 0.25, 0.28, 0.4			UI	2
<b>Receiver</b>						
Center Wavelength, each lane	$\lambda_c$	840	850	860	nm	
Damage threshold		3.4			dBm	
Average Receiver Power, each lane	$P_{in}$	-11.0		2.4	dBm	3
Stressed Sensitivity (OMA)				-5.4	dBm	3
Receiver Reflectance				-12	dBm	
LOS Assert	$P_A$	-30			dBm	
LOS De-Assert	$P_D$			-7.5	dBm	
LOS Hysteresis	$P_A-P_D$	0.5	1	3.0	dB	
<b>Optical Bypass Switch</b>						
Center Wavelength	$\lambda_c$	670	850	980	nm	
Insertion Loss (Normal Mode)	IR	-4.0		0	dB	4

Insertion Los (Bypass Mode)	IRL	-4.0		0	dB	5
Return Loss (Bypass Mode)	ORL			30	dB	

Note :

1. Output power is power couples into a OM3 50/125um Multi-mode fiber (MMF).
2. Hit ratio=  $5 \times 10^{-5}$  per sample.
3. Measured with 10.3125Gbps of PRBS-31 at 10-12 BER.
4. Normal Mode (Bypass Mode Off).
5. Bypass Mode (Normal Mode Off).