

# Product Specifications

**QSFP-100G-SR4**

**QSFP-100G-LR4**

Version 1.0

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## Change History:

Revision:	Date:	Author:	Change List
Version 1.0	2018/11/19	Simon Yeh	Initial Release

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## 1. PRODUCT DESCRIPTION

PLANET QSFP-100G series consists of quad small form-factor pluggable (QSFP28) transceiver modules that are specifically designed for high-performance integrated duplex data link over single mode optical fiber. These transceiver modules are compliant with the QSFP28 Multisource Agreement (MSA) and hot pluggable. These modules offer an easy way to be installed in QSFP28 MSA compliant ports at any time without the interruption of the host equipment operation.

The QSFP28 100Gigabit Ethernet modules can be installed in PLANET 100 Gigabit industrial switch products with QSFP28 interface. The deployment distance can be extended from 100 meters (multi-mode, MPO) to 10 kilometers (single-mode, LC).

The QSFP-100G series also supports SFP-DDM (Digital Diagnostic Monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

PLANET QSFP-100G series comes with one of the following models.

<b>QSFP-100G-SR4</b>	100GBASE-SR4 QSFP28 Fiber Transceiver (Multimode, MPO, 850nm, DDM) – 100m
<b>QSFP-100G-LR4</b>	40GBASE-LR4 QSFP28 Fiber Transceiver (Single mode, LC, 1310nm, DDM) – 10km

## 2. PRODUCT FEATURES

- Complies with the IEEE 802.3bm 100GBASE-SR4/LR4 Ethernet standard
- QSFP28 multi-source agreement (MSA) compliant
- Single LC connector (QSFP-100G-LR4)
- MPO optical connector (QSFP-100G-SR4)
- Distance up to 70m over OM3 fiber and 100m over OM4 fiber (QSFP-100G-SR4)
- Single power supply of 3.3V
- Hot pluggable
- Support digital diagnostic monitoring (DDM)
- Plug and Play Installation
- 0 to 70 degrees C operating temperature

### 3. PRODUCT SPECIFICATIONS

#### 3.1 MAIN COMPONENT

The transceiver is fundamentally made up of two parts: transmitter and receiver. The transmitter features a TTL logic level Disable signal and a Fault indicator. The receiver features a TTL logic Loss of Signal (LoS) detection. For access to serial identification information, an EEPROM is used to store the required data via the 2-wire serial CMOS EEPROM protocol. The detailed signal descriptions are listed in the following sections.

#### 3.2 FUNCTION SPECIFICATIONS

QSFP-100G-SR4	
PHY Type	IEEE 802.3bm 100GBASE-SR4
DDM	Yes
Fiber Type	Multi-mode
Connector	MPO
Wavelength	850nm
Maximum Distance	70m (OM3), 100m (OM4)
Operating Temperature	0 ~ 70 degrees C
QSFP-100G-LR4	
PHY Type	IEEE 802.3bm 100GBASE-LR4
DDM	Yes
Fiber Type	Single mode
Connector	LC
Wavelength	1310nm
Maximum Distance	10km
Operating Temperature	0 ~ 70 degrees C

#### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature	T <sub>ST</sub>	-20	85	°C	
Supply Voltage	V <sub>CC</sub> T V <sub>CC</sub> R	-0.3	3.6	V	
Storage Relative Humidity	RH	0	85	%	

#### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	T <sub>C</sub>	0		70	°C	
Supply Voltage	V <sub>CC</sub>	3.14	3.3	3.46	V	
Module Total Power	PD			4	W	

## QSFP-100G-SR4

### Transmitter Electro-Optical Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Optical Wavelength	$\lambda$	840	850	860	nm	
RMS Spectral Width	Pm			0.6	nm	
Average Launch Power per Lane	Pout	-8.4		2.4	dBm	
Optical Modulation Amplitude per Lane	OMA	-6.4		3	dB	
Optical Extinction Ratio	ER	2			dB	
Optical Return Loss Tolerance				12	dB	

### Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Optical Center Wavelength	$\lambda_c$	840		860	nm	
Average Receive Power per Lane	Rpx	-10.3		2.4	dBm	
Receiver Sensitivity (OMA) per Channel	SRS			-4.7	dBm	
Damage Threshold	DT	3.4			dBm	
Receiver Reflectance	Rrx			-12	dB	
LOS De-Assert	LOS <sub>D</sub>			-12	dBm	
LOS Assert	LOS <sub>A</sub>	-30			dBm	
LOS Hysteresis		0.5	2		dB	

## QSFP-100G-LR4

### Transmitter Electro-Optical Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Optical Wavelength	$\lambda_{L0}$	1294.53	1295.56	1296.59	nm	
	$\lambda_{L1}$	1299.02	1300.05	1301.09	nm	
	$\lambda_{L2}$	1303.54	1304.58	1305.63	nm	
	$\lambda_{L3}$	1308.09	1309.14	1310.19	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	PT			10.5	dBm	

Average Launch Power per Lane	ER	-4.3		4.5	dBm	
Difference in Launch Power between any Two Lanes (OMA)				5	dB	
Optical Modulation Amplitude per Lane	OMA	-1.3		4.5	dBm	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP) (Each Lane)		-2.3			dBm	
TDP (Each Lane)	TDP			2.2	dB	
Extinction Ratio	ER	4			dB	
Eye Diagram	Complies with 100GBASE-LR4 eye masks when filtered					
Optical Return Loss Tolerance				20	dB	
Average Launch Power OFF Transmitter (Each Lane)	Poff			-30	dBm	

#### Receiver Electro-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Damage Threshold	THd	5.5			dBm	
Average Power at Receiver Input (Each Lane)	R	-10.6		4.5	dBm	
Receiver Power (OMA) (Each Lane)				4.5	dB	
Receiver Reflectance	Rrx			-26	dB	
Stressed Receiver Sensitivity in OMA (Each Lane)				-6.8	dBm	
Receiver Sensitivity (OMA) (Each Lane)	SR			-8.6	dBm	
LOS De-Assert	LOSd			-13	dBm	
LOS Assert	LOSA	-30			dBm	

### 3.3 ENVIRONMENTAL SPECIFICATIONS

**Operating:**

**Temperature:** 0°C ~ 70 degrees C

**Relative Humidity:** 0% ~ 85% (non-condensing)

**Storage:**

**Temperature:** -20°C ~ 85 degrees C

**Relative Humidity:** 0% ~ 95% (non-condensing)

### 3.5 ELECTRICAL SPECIFICATIONS

**Input Voltage:** 3.3V DC

### 3.6 REGULATORY COMPLIANCE

FCC Part 15 Class A, CE

### 3.7 RELIABILITY

MTBF > 50,000 hrs @ 25 degrees C

### 3.8 BASIC PACKAGING

- The QSFP-100G Ethernet Transceiver Module x 1

### 3.9 PACKING DIMENSIONS

**Box Dimensions:** 193 x 58 x 28mm (W x D x H)