Approved Networks
A brand of legrand

Q112-FLT-400G-DR4-5

400GBASE, QSFP112, DR4, SMF TRANSCEIVER
1310nm, 500m REACH, MPO-12 APC CONNECTOR

Features

- Hot-pluggable QSFP112 form factor
- EML transmitter and PIN PD receiver
- Supports 425Gb/s aggregate bit rate
- Supports both Ethernet and InfiniBand NDR
- Compliant with IEEE802.3ck standard:
  - 400GAUI-4 C2M electrical interface
- Compliant with IEEE 802.3 standard:
  - 400GBASE-DR4 optical interface
- Compliant with InfiniBand Trade Association (IBTA) Specification 1.6:
  - InfiniBand NDR electrical and optical interface
- Compliant with QSFP112 MSA Specification Rev2.0 type 2 housing with MPO-12 connector
- Compliant with CMIS Rev 5.0
- Case operating temperature: 0°C to 70°C
- Two wire serial Interface with digital diagnostic monitoring
- Complies with EU Directive 2011/65/EU (RoHS compliant)
- Class 1 Laser

Absolute Maximum Ratings				
Parameter	**Symbol**	**Minimum**	**Maximum**	**Unit**
Storage Temperature	TS	-40	85	ºC
Supply Voltage	VCC	-0.5	3.6	V
Relative Humidity (non-condensing)	RH	5	95	%
Control Input Voltage	VI	-0.3	VCC+0.5	V

Recommended Operating Environment					
Parameter	**Symbol**	**Minimum**	**Typical**	**Maximum**	**Unit**
Operating Case Temperature	TOPR	0	-	70	ºC
Power Supply Voltage	VCC	3.135	3.3	3.465	V
Instantaneous peak current at hot plug	ICC_IP	-	-	4000	mA
Sustained peak current at hot plug	ICC_SP	-	-	3300	mA

Recommended Operating Environment					
Parameter	**Symbol**	**Minimum**	**Typical**	**Maximum**	**Unit**
Maximum Power Dissipation	PD	-	-	10	W
Maximum Power Dissipation, Low Power Mode	PDLP	-	-	1.5	W
Signalling Rate per Lane (PAM4)	SRL	-	53.125	-	GBd
Two Wire Serial Interface Clock Rate	-	-	-	400	kHz
Module sinusoidal power supply noise tolerance 1 kHz - 1 MHz (p-p)	-	-	-	66	mV
Rx Differential Data Output Load	-	-	100	-	Ohm
Operating Distance	-	2	-	500	m

Electrical Characteristics - High Speed Signal					
Parameter	**Symbol**	**Minimum**	**Typical**	**Maximum**	**Unit**
Receiver (Module Output, TP4)					
Signaling rate, each lane (range)	-	53.125 ± 100 ppm			GBd
Peak-to-peak AC common-mode voltage Low-frequency, VCMLF Full-band, VCMFB	-	-	-	32 80	mV
Differential peak-to-peak output voltage Short mode Long mode	-	-	-	600 845	mV
Eye height	EH	15	-	-	mV
Vertical eye closure	VEC	-	-	12	dB
Common-mode to differential-mode return loss	RLDc	802.3ck 120G-1			dB
Effective return loss	ERL	8.5	-	-	dB
Differential termination mismatch	-	-	-	10	%
Transition time	-	8.5	-	-	ps
DC common-mode voltage tolerance	-	-0.35	-	2.85	V
Transmitter (Module Input, TP1)					
Signaling rate, each lane (range)	-	53.125 ± 100 ppm			GBd
Differential pk-pk input Voltage tolerance (TP1a)	-	750	-	-	mV
Peak-to-peak AC common-mode voltage tolerance Low-frequency, VCMLF Full-band, VCMFB	-	-	-	32 80	mV
Differential-mode to common-mode return loss	RLcd	802.3ck 120G-2			dB
Effective return loss	ERL	8.5	-	-	dB
Differential termination mismatch	-	-	-	10	%
Single-ended voltage tolerance range	-	-0.4	-	3.3	V
DC common-mode voltage tolerance	-	-0.35	-	2.85	V

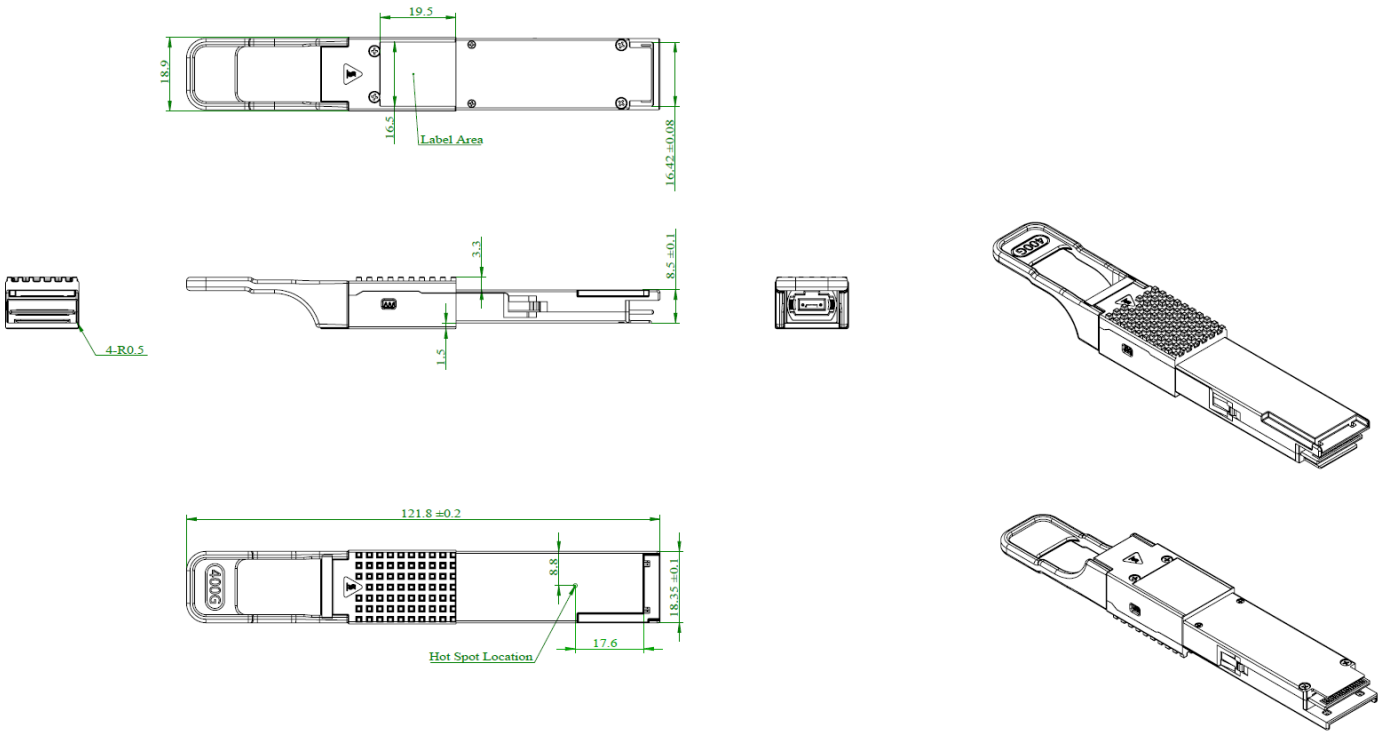
Electrical Characteristics - Low Speed Signal				
Parameter	**Symbol**	**Minimum**	**Maximum**	**Unit**
Module output SCL and SDA	VOL	0	0.4	V
Module Input SCL and SDA	VIL	-0.3	VCC*0.3	V
	VIH	VCC*0.7	VCC+0.5	V
LPMode/TxDis, ResetL, ModSelL	VIL	-0.3	0.8	V
	VIH	2	VCC+0.3	V
IntL/RxLOS	VOL	0	0.4	V
	VOH	VCC-0.5	VCC+0.3	V

Optical Characteristics						
Parameter	**Symbol**	**Minimum**	**Typical**	**Maximum**	**Unit**	**Notes**
Transmitter						
Wavelength	λC	1304.5	1311	1317.5	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Average Launch Power, each lane	AOPL	-2.9	-	4.0	dBm	1
Outer Optical Modulation Amplitude (OMAouter), each lane	TOMA	-0.8	-	4.2	dBm	2
Launch Power in OMAouter minus TDECQ, each lane	TOMA	-2.2	-	-	dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ	-	-	3.4	dB	
TDECQ – 10log10 (Ceq)	-	-	-	3.4	dB	
Average Launch Power of OFF Transmitter, each lane	TOFF	-	-	-15	dBm	
Extinction Ratio, each lane	ER	3.5	-	-	dB	
Transmitter transition time	-	-	-	17	ps	
RIN21.4OMA	RIN	-	-	-136	dB/Hz	
Optical Return Loss Tolerance	ORL	-	-	21.4	dB	
Transmitter Reflectance	TR	-	-	-26	dB	3
Receiver						
Wavelength	λC	1304.5	1311	1317.5	nm	
Damage Threshold, each lane	AOPD	5	-	-	dBm	
Average Receive Power, each lane	AOPR	-5.9	-	4.0	dBm	1
Receive Power (OMAouter), each lane	OMAR	-	-	4.2	dBm	
Receiver Reflectance	RR	-	-	-26	dB	
Receiver Sensitivity (OMAouter), each lane	SOMA	-	-	-4.4	dBm	4
Stressed Receiver Sensitivity (OMAouter), each lane	SRS	-	-	-1.9	dBm	5
Conditions of stressed receiver sensitivity test						
Stressed eye closure for PAM4 (SECQ)			3.4		dB	
SECQ – 10log10(Ceq), lane under test	-	-	-	3.4	dB	
OMAouter of each aggressor lane			4.2		dBm	

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength.
2. Even if TDECQ < 1.4dB, OMAouter (min) must exceed this value.
3. Transmitter reflectance is defined looking into the transmitter.
4. Receiver sensitivity (OMAouter), each lane (max) is informative and is defined for a transmitter with a value of SECQ up to 3.4dB.
5. Measured with conformance test signal at TP3 for the BER = 2.4×10^{-4}.

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.

Ordering Information

OEM	Part Number	OEM	Part Number
MSA	AN-Q112-FLT-400G-DR4	Nvidia	MMS1X00-NS400-A

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