Specification

Quad Small Form-factor Pluggable 28

(QSFP28) Product

T Q S – Q 1 4 H 8 – X 8 3 x x

Distance

Part Number	Description
TQS-Q14H8-X8305	100Gbps QSFP28 Active Optical Cable 5m
TQS-Q14H8-X8307	100Gbps QSFP28 Active Optical Cable 7m
TQS-Q14H8-X8310	100Gbps QSFP28 Active Optical Cable 10m
TQS-Q14H8-X8320	100Gbps QSFP28 Active Optical Cable 20m

Model Name	Voltage	Category	Device type	Interface	LOS	Temperature	Latch Color
TQS-Q14H8-X83xx	3.3V	With DDMI	VCSEL/PIN	CML/CML	LVTTL	0°C~+70°C	Beige

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Features

- Compliant with 100GBASE-SR4 and CAUI-4 specification per IEEE 802.3bm.
- Compliant to SFF-8665 (QSFP28 Solution) Revision 1.8
- Supports 103.1Gb/s aggregate bit rate
- Low power consumption of max 2.5W
- Hot pluggable electrical interface
- 0 to 70°C case temperature operating range
- RoHS-6 Compliant (lead-free)

Applications

- Ethernet for 100GBASE-SR4
- Infiniband EDR

Absolute Maximum Rating

Not necessarily applied together. Exceeding these values may cause permanent damage. Functional operation under these conditions is not implied.

Parameter	Min	Max	Unit	Note
Storage Temperature	-40	85	℃	
3.3V Power Supply Voltage	-0.5	3.6	V	
Relative Humidity	0	85	%	

Recommended Operating Conditions

Parameter	Min	Typical	Max	Unit	Note
Case Operating Temperature	0		70	℃	
Power Supply Voltage	3.135	3.3	3.465	V	
Date Rate per Channel			25.78125	Gbps	
Control Input Voltage High	2		Vcc	V	
Control Input Voltage Low	0		0.8	V	

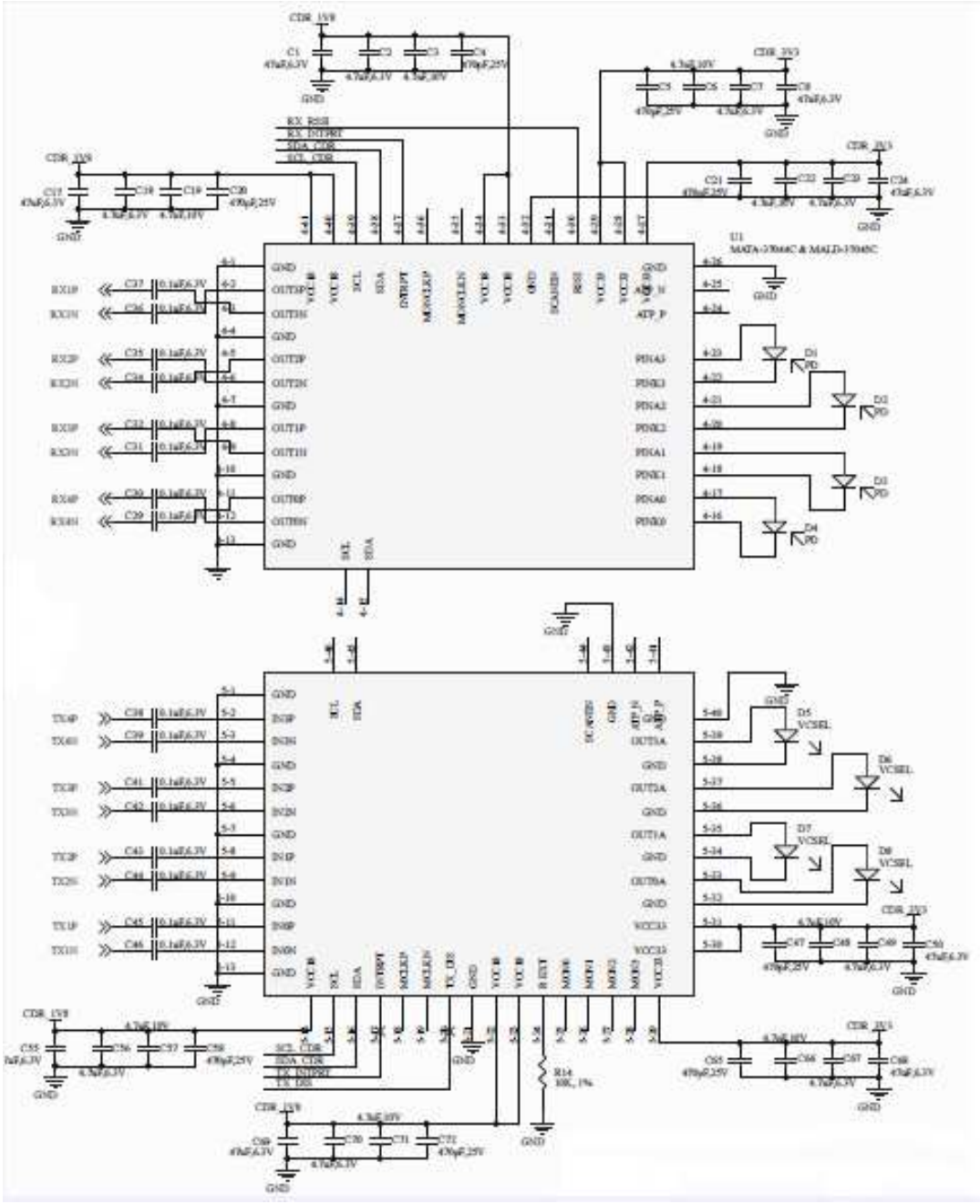
Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Transceiver Electrical Characteristics						
TRx Power Consumption				2.5	W	1
Supply Current				757	mA	1
Transmitter						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (Vcm)	TP1	-350		2850	mV	2
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	TP1a	SeeCEI-28G-VSR Section 13.3.11.2.1				
Receiver						
Differential Voltage, pk-pk	TP4			900	mV	
Common Mode Voltage (Vcm)	TP4	-350		2850	mV	2
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	3
Transition Time, 20 to 80%	TP4	9.5			Ps	
Eye Width at 10^{-15} probability	TP4	0.57			UI	
Eye Height at 10^{-15} probability	TP4	228			mV	

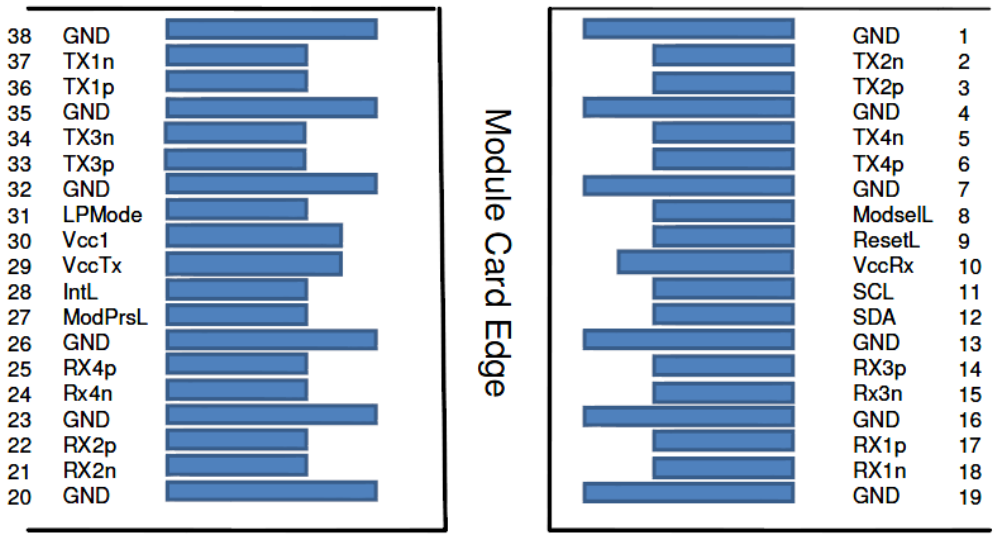
Notes:

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

Recommended Interface Circuit



QSFP+ Module Pad Assignments and Descriptions



Top Side
Viewed From Top

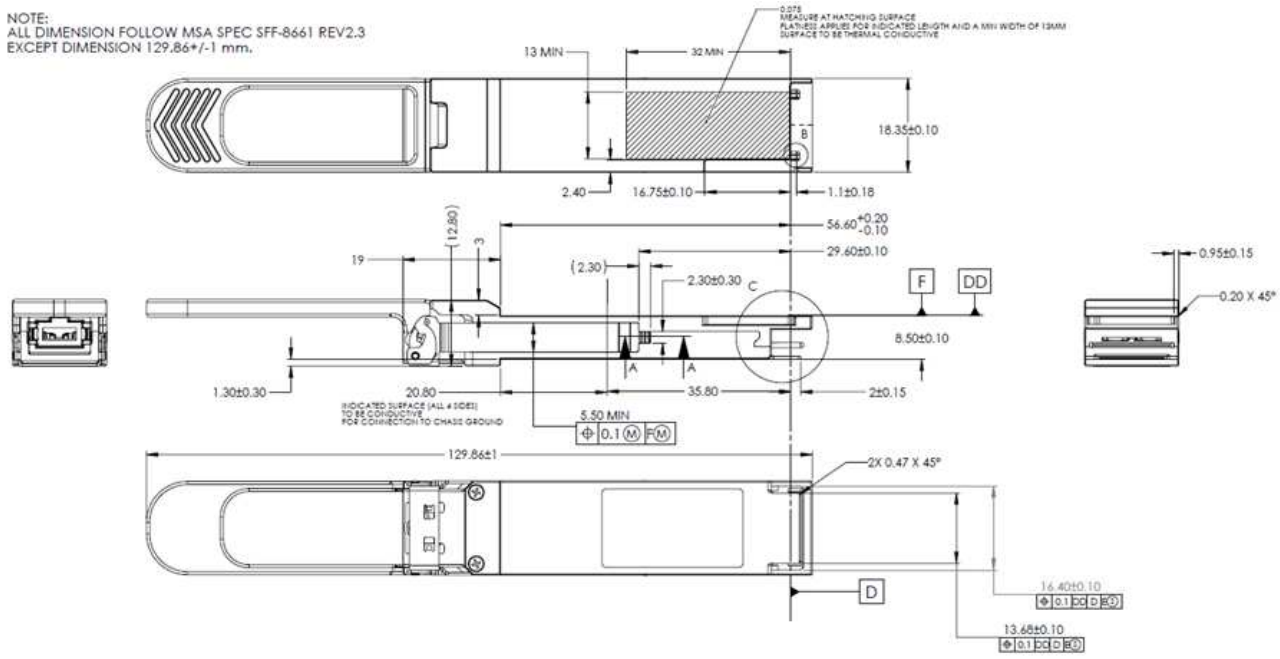
Bottom Side
Viewed From Bottom

Pin	Logic	Symbol	Description	Plug Sequence	Notes
1		GND	Ground	1	
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	
7		GND	Ground	1	
8	LVTTL-I	ModSelL	Module Select	3	
9	LVTTL-I	ResetL	Module Reset	3	
10		Vcc Rx	+3.3V Power Supply Receiver	2	
11	LVCMOS-I/O	SCL	2-wire serial interface clock	3	
12	LVCMOS-I/O	SDA	2-wire serial interface data	3	
13		GND	Ground	1	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	

15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	
20		GND	Ground	1	
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		Vcc Tx	+3.3V Power supply transmitter	2	
30		Vcc1	+3.3V Power supply	2	
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	
35		GND	Ground	1	
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Teransmitter Inverted Data Input	3	
38		GND	Ground	1	

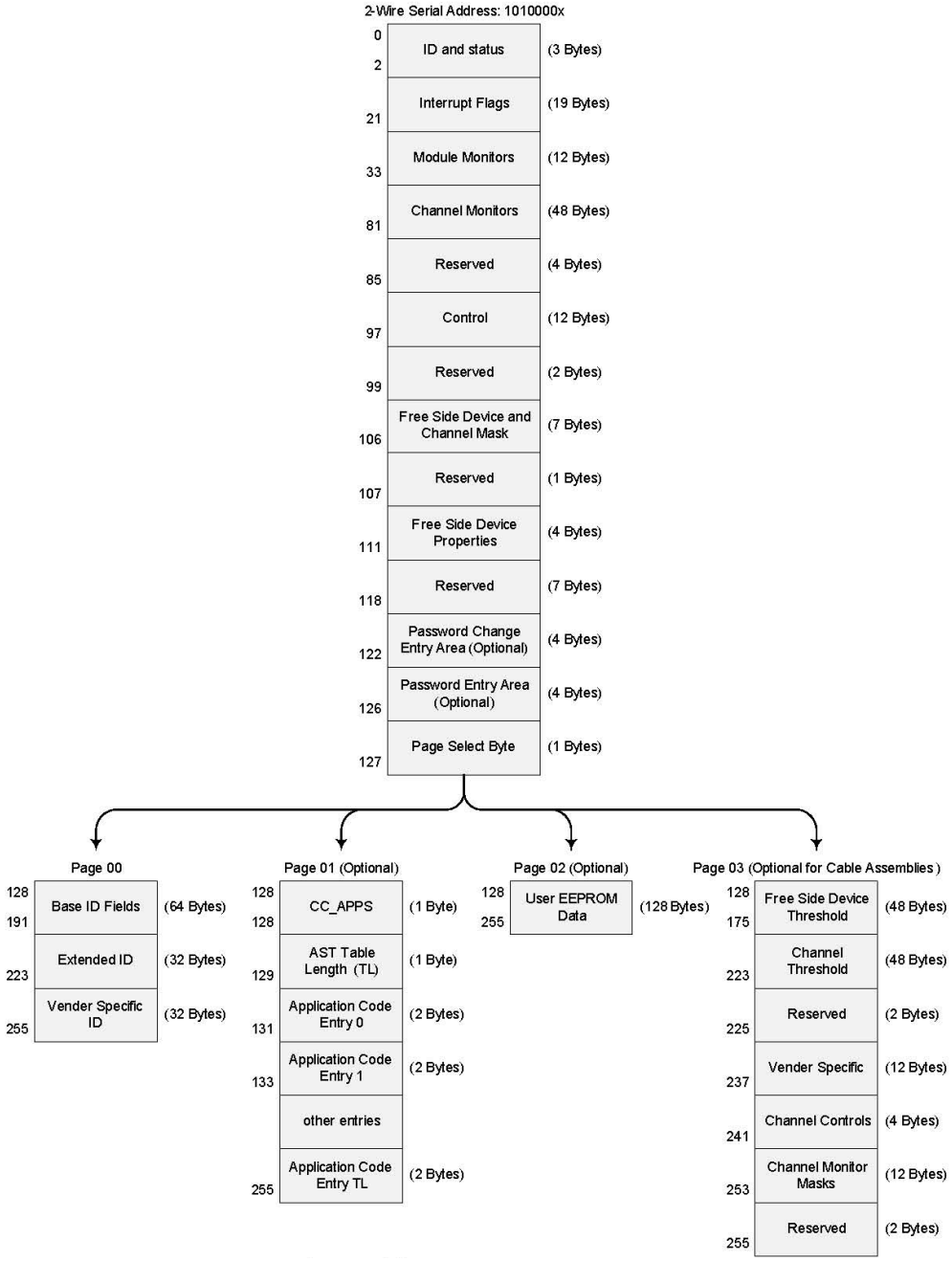
Module Outline

Unit: mm



Memory Map

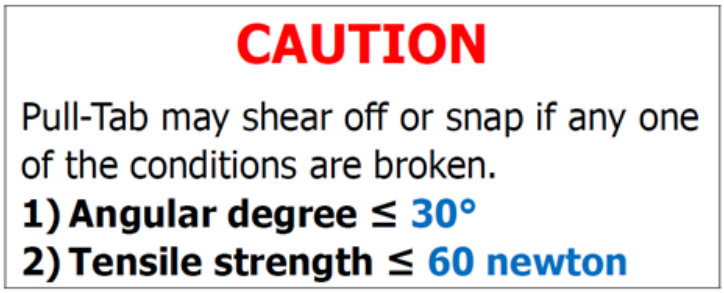
The memory map is structured as a single address and multiple page approaches, according to the QSFP28 SFF-8636 MSA specification as shown in the below. For more detailed description of this memory map or lower pages, please see our Memory Map document with flexible customization settings.



Laser Safety

This is a laser class 1M product according to IEC60825-1:2014 (Third Edition). This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

User Manual



Revision History

Date	Version	Description
01/15/2018	1.0	Initial release

Mouser Electronics

Authorized Distributor

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Formerica:

TQS-Q14H8-X8301 TQS-Q14H8-X8303 TQS-Q14H8-X8305 TQS-Q14H8-X8307 TQS-Q14H8-X8310