

## QSFP28

### EQ2A10X-34S23CDxx

#### 100G QSFP28 to 4X 25G SFP28 Active Optical Cables

- Electrical interface compliant to SFF-8436 and SFF-8431
- 850nm VCSEL laser and PIN photo-detector
- Maximum link length of 70m on OM3 MMF and 100m on OM4 MMF
- Digital diagnostics functions are available via the I2C interface
- RoHS compliant
- Hot Pluggable



## Applications

- 25GBASE-SR Ethernet
- InfiniBand QDR, SDR, DDR
- Servers, switches, storage and host card adapters

## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TST	-20	85	°C
Relative Humidity	RH	0	85	%
Case Operating Temperature	TOPC	0	70	°C
Supply Voltage	VCC	-0.3	3.6	V

## Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case temperature	T <sub>A</sub>	0		+70	°C
Supply Voltage	VCC	3.13	3.3	3.47	V
Supply current (SFP28)	I <sub>CC</sub>			300	mA
Supply current (QSFP28)	I <sub>CC</sub>			650	mA
Channel Data Rate	Dr		25.78125		Gbps

## QSFP28 Transmitter

Measured condition: Channel Data Rate 25.78125Gbps, V<sub>CC</sub>=3.3V, PRBS31, Case Operating Temperature 0~70°C

Parameter	Symbol	Min	Typical	Max	Unit
Centre Wavelength	$\lambda_c$	840	850	860	nm
RMS spectral width	$\sigma$			0.65	nm
Average launch power, each lane	P <sub>AVG</sub>	-7.5	-1	+2.5	dBm
Input differential swing	V <sub>in PP</sub>	300		1100	mV
Input differential impedance	Z <sub>in</sub>	90	100	110	Ω
Extinction Ratio	ER	2.0			dB

## SFP28 Transmitter

Measured condition: Channel Data Rate 25.78125Gbps,  $V_{CC}=3.3V$ , PRBS31, Case Operating Temperature 0~70°C

Parameter	Symbol	Min	Typical	Max	Unit
Input differential impedance	Z <sub>in</sub>	90	100	110	Ω
Differential Data Input Swing	V <sub>in PP</sub>	300		1100	mV
Transmit Enable Voltage	V <sub>EN</sub>			0.8	V
Transmit Disable Voltage	V <sub>D</sub>	2.0			V
Average launch power	P <sub>AVG</sub>	-7.5	-1	+2.5	dBm
Extinction Ratio	ER	2.0			dB
Centre Wavelength	λ <sub>c</sub>	840	850	860	nm

## QSFP28 Receiver

Measured condition: Channel Data Rate 25.78125Gbps, VRCCR=3.3V, PRBS31, Case Operating Temperature 0~70°C

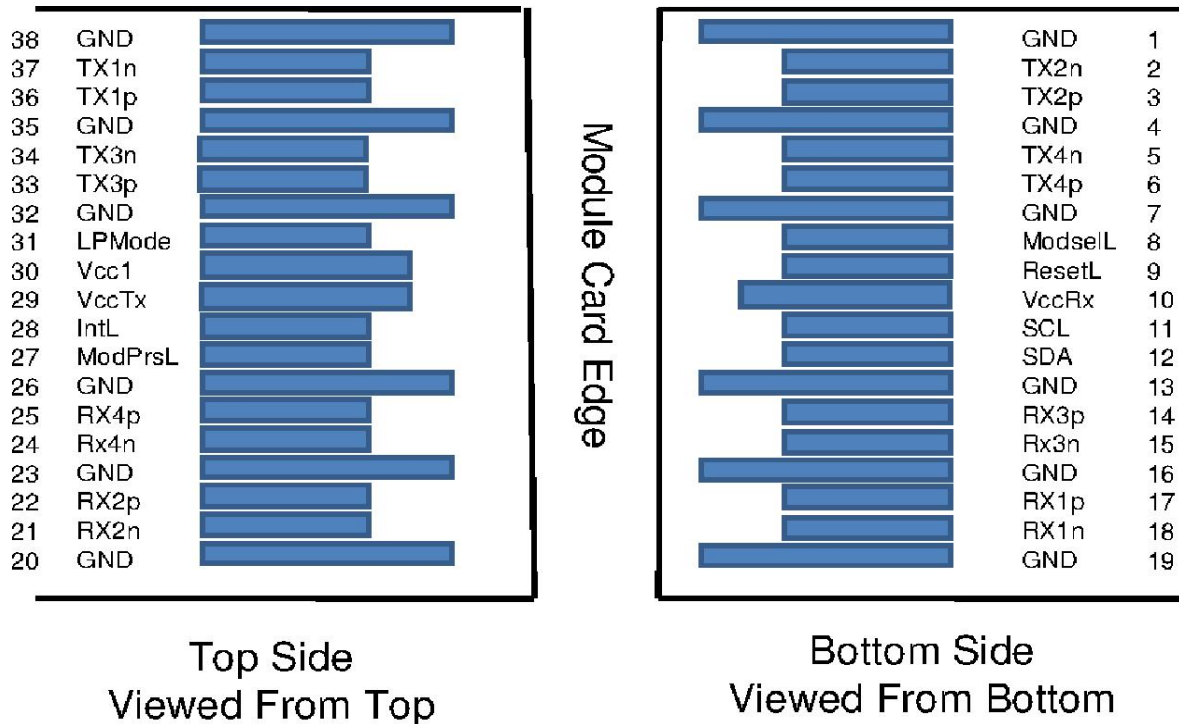
Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength	λ <sub>c</sub>	840	850	860	nm
Bit Error Rate	BER			E-12	
Receiver Overload	PinMAX	2.5			dBm
Output Differential Impedance	V <sub>out PP</sub>	500		800	mV
Output Differential Impedance	Z <sub>out</sub>	90	100	110	Ω

## SFP28 Receiver

Measured condition: Channel Data Rate 25.78125Gbps, VRCCR=3.3V, PRBS31, Case Operating Temperature 0~70°C

Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength	$\lambda_c$	840	850	860	nm
Differential Data Output Swing	Vout PP	500		800	mV
Bit Error Rate	BER			E-12	
Receiver Overload	PinMAX	2.5			dBm
Output Differential Impedance	Zout	90	100	110	ohm
LOS Fault	V <sub>OH</sub>	2.4			V
LOS Normal	V <sub>OL</sub>			0.4	V

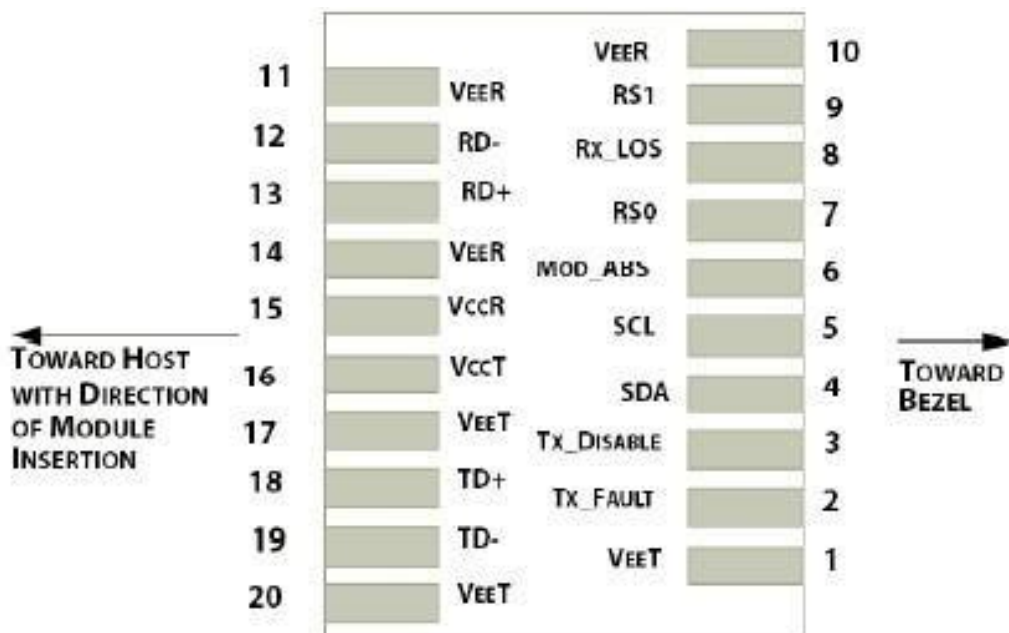
## QSFP28 Pin Descriptions



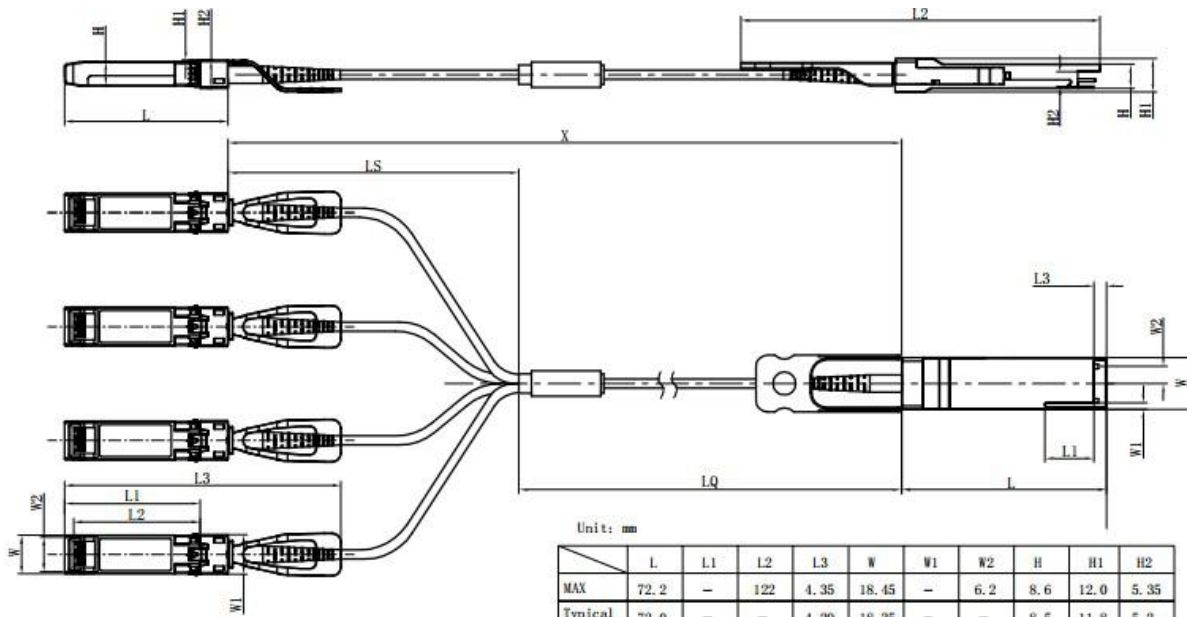
PIN	Name	Function/Description
1	GND	Module Ground
2	Tx2-	Transmitter inverted data input
3	Tx2+	Transmitter non-inverted data input
4	GND	Module Ground
5	Tx4-	Transmitter inverted data input
6	Tx4+	Transmitter non-inverted data input
7	GND	Module Ground
8	MODSEIL	Module Select
9	ResetL	Module Reset
10	VCCRx	+3.3v Receiver Power Supply
11	SCL	2-wire Serial interface clock
12	SDA	2-wire Serial interface data
13	GND	Module Ground
14	RX3+	Receiver non-inverted data output
15	RX3-	Receiver inverted data output
16	GND	Transmitter Power Supply
17	RX1+	Receiver non-inverted data output
18	RX1-	Receiver inverted data output
19	GND	Module Ground
20	GND	Module Ground
21	RX2-	Receiver inverted data output
22	RX2+	Receiver non-inverted data output
23	GND	Module Ground
24	RX4-	Receiver inverted data output
25	RX4+	Receiver non-inverted data output
26	GND	Module Ground
27	ModPrsL	Module Present, internal pulled down to GND
28	IntL	Interrupt output, should be pulled up on host board
29	VCCTx	+3.3v Transmitter Power Supply
30	VCC1	+3.3v Power Supply
31	LPMODE	Low Power Mode
32	GND	Module Ground
33	Tx3+	Transmitter non-inverted data input
34	Tx3-	Transmitter inverted data input
35	GND	Module Ground
36	Tx1+	Transmitter non-inverted data input
37	Tx1-	Transmitter inverted data input
38	GND	Module Ground

## SFP28 Pin Descriptions

PIN	Name	Function/Description
1	VeeT	Transmitter Ground
2	Tx_Fault	Transmitter Fault - High indicates a fault condition
3	Tx_Disable	TransmitterDisable—Highoropendisablesthetransmitter
4	SDA	Two wire serial interface Data Line
5	SCL	Two wire serial interface Clock Line
6	MOD_ABS	ModuleAbsent(Output),connectedtoVeeT or VeeRinthemodule
7	RS0	Rx Rate Select,not used
8	RX_LOS	Loss of Signal indication. Logic0 indicates normal operation
9	RS1	Tx Rate Select,not used
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Receiver Inverted DATA out
13	RD+	Receiver Non-inverted DATA out
14	VeeR	Receiver Ground
15	VccR	Receiver Power Supply
16	VccT	Transmitter Power Supply
17	VeeT	Transmitter Ground
18	TD+	Transmitter Non-Inverted DATA in
19	TD-	Transmitter Inverted DATA in
20	VeeT	Transmitter Ground



# Mechanical Design Diagram



Unit: mm

	L	L1	L2	L3	W	W1	W2	H	H1	H2
MAX	57.75	48.0	44.65	102.5	13.75	14.0	12.25	8.65	0.55	10.4
Typical	57.55	47.8	44.45	101.5	13.65	13.9	12.15	8.55	0.5	10.2
MIN	57.35	47.6	44.25	100.5	13.55	13.8	12.05	8.45	0.45	10.0

Total length (X)	Breakout point (measured from QSFP28) (LQ)	Breakout point (measured from SFP28) (LS)
1m	30cm	70cm
2m	60cm	1.4m
3m	1m	2m
5m	2m	3m
7m	4m	3m
10m	7m	3m
15m	12m	3m
20m	17m	3m
25m	22m	3m
30m	27m	3m
40m	37m	3m
50m	47m	3m

Cable Length (Unit: m)	Tolerant (Unit: cm)
<1.0	+5/-0
1.0~4.5	+15/-0
5.0~14.5	+30/-0
≥15.0	+2%/-0

Note: The length difference of the 4 branches is less than or equal to 3cm

## Compatibility Test

In order to ensure the product compatibility, our products will be tested on the switch before shipment. Our modules can compatible with many mainstream brand switches, such as Cisco, Juniper, Extreme, Brocade, IBM, H3C, HP, Huawei, D-Link, Mikrotik, ZTE, TP-Link...

Our test equipment: VOLKTEK MEN-4110, HP 2530-8G, CRS226-24G-25+RM, Catalyst 2960G Series, Catalyst 3850 XS 10G SFP+, Catalyst 3750-E Series, HUAWEI S5700Series, H3C S3100V2 Series, Juniper-EX4200, etc.



Cisco Catalyst 3850



HUAWEI S5700



H3C S3100V2



HP J9264AR



Juniper EX 4200



Alcatel 6850E-U24X



Mikrotik CR5226-24G-25+RM



Cisco Catalyst 2960G



Volktek MEN-4110



## Quality Assurance

Continuous introduction of new equipment, produced by strict standards, strict quality inspection, to guarantee the high quality standard of each product.



**Standardized  
Production Line**



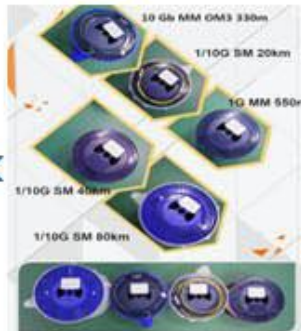
**Professional  
Welding**



**Assembling**



**Aging Testing**



**Distance Testing**



**Cleaning end face**



**Product Initial Test**



**Switch Testing**



**Product Final Test**

## Packaging

Individual package.



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