100G QSFP28 to 4*25G SFP28 Active Optical Cables

Features

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	℃
Relative Humidity	RH	0	85	%
Case Operating Temperature	TOPC	0	70	℃
Supply Voltage	VCC	-0.3	3.6	V

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case temperature	TA	0		+70	℃
Supply Voltage	VCC	3.13	3.3	3.47	V
Supply current (SFP28)	Icc			300	mA
Supply current (QSFP28)	Icc			650	mA
Channel Data Rate	Dr		25.78125		Gbps

QSFP28 Transmitter

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

Parameter	Symbol	Min	Typical	Max	Unit
Centre Wavelength	λc	840	850	860	nm
RMS spectral width	σ			0.65	nm
Average launch power, each lane	PAVG	-7.5	-1	+2.5	dBm
Input differential swing	Vin PP	300		1100	mV
Input differential impedance	Zin	90	100	110	Ω
Extinction Ratio	ER	2.0			dB

SFP28 Transmitter

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

Parameter	Symbol	Min	Typical	Max	Unit
Input differential impedance	Zin	90	100	110	Ω
Differential Data Input Swing	Vin PP	300		1100	mV
Transmit Enable Voltage	VEN			0.8	V
Transmit Disable Voltage	VD	2.0			V
Average launch power	PAVG	-7.5	-1	+2.5	dBm
Extinction Ratio	ER	2.0			dB
Centre Wavelength	λc	840	850	860	nm

QSFP28 Receiver

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

Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength	λc	840	850	860	nm
Bit Error Rate	BER			E-12	
Receiver Overload	PinMAX	2.5			dBm
Output Differential Impedance	Vout PP	500		800	mV
Output Differential Impedance	Zout	90	100	110	Ω

SFP28 Receiver

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

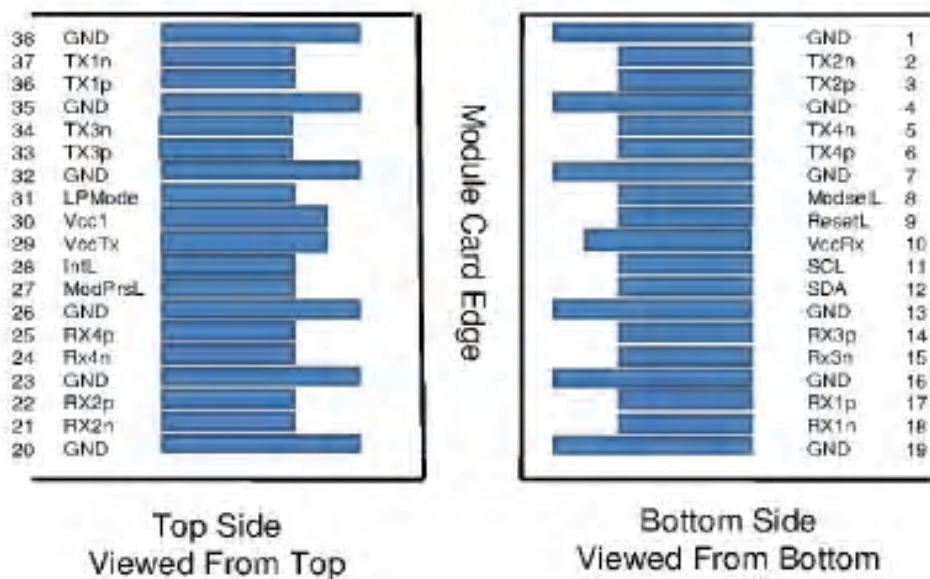| Parameter	Symbol	Min	Typical	Max	Unit
Center Wavelength	λc	840	850	860	nm
Differential Data Output Swing	Vout PP	500		800	mV
Bit Error Rate	BER			E-12	
Receiver Overload	PinMAX	2.5			dBm
Output Differential Impedance	Zout	90	100	110	ohm
LOS Fault	VOH	2.4			V
LOS Normal	VOL			0.4	V

QSFP28 Pin Descriptions

38	GND
37	TX1n
36	TX1p
35	GND
34	TX3n
33	TX3p
32	GND
31	LPMode
30	Vcc1
29	VccTx
28	IntL
27	ModPrsL
26	GND
25	RX4p
24	Rx4n
23	GND
22	RX2p
21	RX2n
20	GND

Module Card Edge

GND	1
TX2n	2
TX2p	3
GND	4
TX4n	5
TX4p	6
GND	7
ModselL	8
ResetL	9
VccRx	10
SCL	11
SDA	12
GND	13
RX3p	14
Rx3n	15
GND	16
RX1p	17
RX1n	18
GND	19

Top Side
Viewed From Top

Bottom Side
Viewed From Bottom

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	Transmitter Disable – High or open disables the transmitter
4	SDA	Two wire serial interface Data Line
5	SCL	Two wire serial interface Clock Line
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module
7	RS0	Rx Rate Select,not used
8	RX_LOS	Loss of Signal indication. Logic 0 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	V	V1	V2	D	D1	D2
MAX	72.2	—	122	1.35	18.45	—	6.2	8.6	12.0	6.35
Typical	72.0	—	—	1.20	18.35	—	8.5	11.8	5.2
MIN	88.8	16.5	118	1.05	18.25	2.2	5.8	8.1	11.8	6.08

Unit: mm

	L	L1	L2	L3	V	V1	V2	D	D1	D2
MAX	57.75	48.0	44.65	102.5	13.75	14.0	12.35	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	12.08	8.35	0.45	10.0
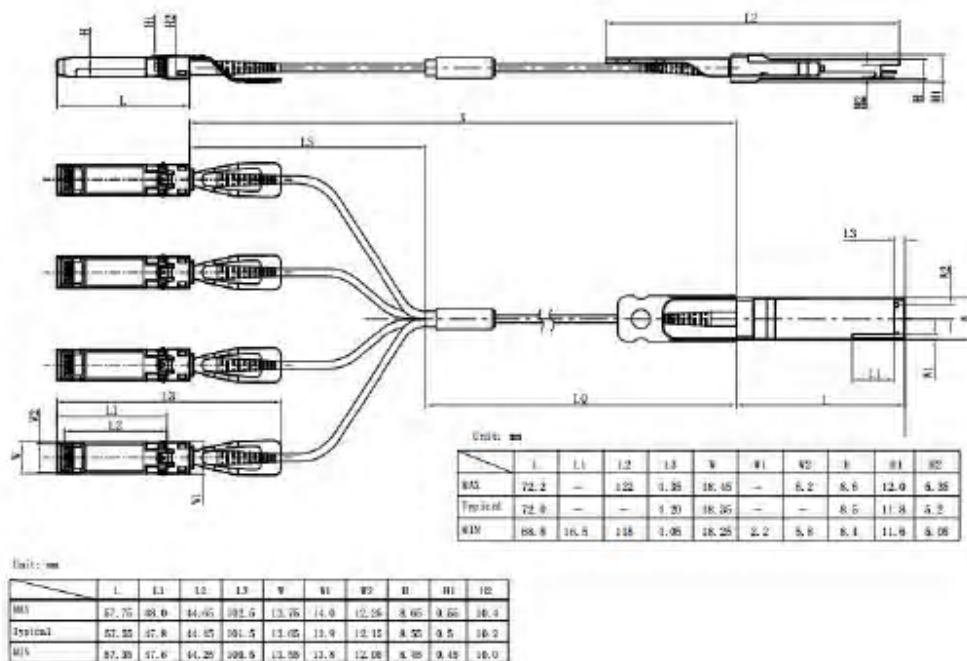
Total length (X)	Breakout point (measured from QSFP28) (LQ)	Breakout point (measured from SFP28) (LX)
1m	30cm	70cm
2m	60cm	1.4m
3m	1m	2m
5m	2m	3m
7m	4m	3m
10m	7m	3m
15m	12m	3m
20m	17m	3m
25m	22m	3m
30m	27m	3m
40m	37m	3m
50m	47m	3m

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

Ordering information

QSFP28-4*SFP28-AOC5M	5 meter 100G QSFP28 to 4* 25G SFP28 Active Optical Cable
QSFP28-4*SFP28-AOC7M	7 meter 100G QSFP28 to 4* 25G SFP28 Active Optical Cable
QSFP28-4*SFP28-AOC10M	10 meter 100G QSFP28 to 4* 25G SFP28 Active Optical Cable
QSFP28-4*SFP28-AOC15M	15 meter 100G QSFP28 to 4* 25G SFP28 Active Optical Cable
QSFP28-4*SFP28-AOC20M	20 meter 100G QSFP28 to 4* 25G SFP28 Active Optical Cable

Length can be 0~100M,OM3 fiber or OM4 fiber are available.

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