

400GbE to 8x50GbE (QSFP56-DD to 8xSFP56) Direct attach Cable

P/N: GQD-8S56P401-XXC

Features

- ◆ Hot-plug QSFP56-DD and SFP56 form factor
- ◆ Support 8x 50Gb/s PAM4 modulation
- ◆ Commercial case temperature range of 0°C to 70°C
- ◆ 26 AWG ~30 AWG support up to 3m length max
- ◆ I2C management interface
- ◆ RoHS compliant

Applications

- ◆ Data storage and communication industry
- ◆ Switch / router / HBA
- ◆ Enterprise network
- ◆ SAN
- ◆ Data Center Network

STANDARDS COMPLIANCE

- ◆ IEEE802.3cd/802.3bj/802.3by
- ◆ QSFP-DD MSA
- ◆ SFF-8636

Description

Gigalight's GQD-8S56P401-XXC cable assembly is used in 8 X 50 Gigabit Ethernet links over copper cable, which provides connectivity between system units with a 400GbE connector on one side and eight separate 50GbE connectors on the other four sides. The cable connects data signals from each of the 16 pairs on the single QSFP56-DD end to the 8 SFP56 multiport ends.

Gigalight's GQD-8S56P401-XXC cable assemblies is compliant with the QSFP-DD-MSA and IEEE802.3cd/802.3bj/802.3by, it's high performance, cost effective I/O solutions for LAN, HPC and SAN. The high speed cable assemblies meet and exceed 400Gigabit Ethernet, Infiniband EDR /HDR and temperature requirements for performance and reliability.



Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T _s	-20	85	°C
Case Operating Temperature	T _c	0	70	°C
Humidity (non-condensing)	Rh	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T _c	0		70	°C
Baud Rate per Lane (PAM4)	fd		26.5625		GBaud/s
Humidity	Rh	5		85	%

Differential Impedance

Parameter	Symbol	Min	Typical	Max	Unit
Differential Impedance(bulk cable)	Rin1,P-P	95	100	110	Ω
Differential Impedance (Mated connector)	Rin2,P-P	90	100	110	Ω
Differential Impedance(cable termination)	Rin3,P-P	85	100	110	Ω

Pin Description

Pin	Logic	Symbol	Name/Description
1		GND	Module Ground ^{Note5}
2	CML-I	Tx2-	Transmitter inverted data input
3	CML-I	Tx2+	Transmitter non-inverted data input
4		GND	Module Ground ^{Note5}
5	CML-I	Tx4-	Transmitter inverted data input
6	CML-I	Tx4+	Transmitter non-inverted data input
7		GND	Module Ground ^{Note5}
8	LVTTL-I	MODSEIL	Module Select ^{Note6}
9	LVTTL-I	ResetL	Module Reset ^{Note6}
10		VCCR _x	+3.3V Power Supply
11	LVC _{MOS} -I	SCL	2-wire Serial interface clock ^{Note6}

12	LVC MOS-I/O	SDA	2-wire Serial interface data ^{Note6}
13		GND	Module Ground ^{Note5}
14	CML-O	RX3+	Receiver non-inverted data output
15	CML-O	RX3-	Receiver inverted data output
16		GND	Module Ground ^{Note5}
17	CML-O	RX1+	Receiver non-inverted data output
18	CML-O	RX1-	Receiver inverted data output
19		GND	Module Ground ^{Note5}
20		GND	Module Ground ^{Note5}
21	CML-O	RX2-	Receiver inverted data output
22	CML-O	RX2+	Receiver non-inverted data output
23		GND	Module Ground ^{Note5}
24	CML-O	RX4-	Receiver inverted data output
25	CML-O	RX4+	Receiver non-inverted data output
26		GND	Module Ground ^{Note5}
27	LV TTL-O	ModPrsL	Module Present, internal pulled down to GND
28	LV TTL-O	IntL	Interrupt output, should be pulled up on host board ²
29		VCCTx	+3.3V Transmitter Power Supply
30		VCC1	+3.3V Power Supply
31	LV TTL-I	LPMode	Low Power Mode ^{Note6}
32		GND	Module Ground ^{Note5}
33	CML-I	Tx3+	Transmitter non-inverted data input
34	CML-I	Tx3-	Transmitter inverted data input
35		GND	Module Ground ^{Note5}
36	CML-I	Tx1+	Transmitter non-inverted data input
37	CML-I	Tx1-	Transmitter inverted data input
38		GND	Module Ground ^{Note5}
39		GND	Module Ground ^{Note5}
40	CML-I	Tx6-	Transmitter inverted data input
41	CML-I	Tx6+	Transmitter non-inverted data input
42		GND	Module Ground ^{Note5}
43	CML-I	Tx8-	Transmitter inverted data input
44	CML-I	Tx8+	Transmitter non-inverted data input

45		GND	Module Ground ^{Note5}
46		Reserved	
47		TBD	For future use
48		VCC	+3.3V Receiver Power Supply
49		TBD	For future use
50		TBD	For future use
51		GND	Module Ground ^{Note5}
52	CML-O	RX7+	Receiver non-inverted data output
53	CML-O	RX7-	Receiver inverted data output
54		GND	Module Ground ^{Note5}
55	CML-O	RX5+	Receiver non-inverted data output
56	CML-O	RX5-	Receiver inverted data output
57		GND	Module Ground ^{Note5}
58		GND	Module Ground ^{Note5}
59	CML-O	RX6-	Receiver inverted data output
60	CML-O	RX6+	Receiver non-inverted data output
61		GND	Module Ground ^{Note5}
62	CML-O	RX8-	Receiver inverted data output
63	CML-O	RX8+	Receiver non-inverted data output
64		GND	Module Ground ^{Note5}
65		NC	No connect
66		TBD	For future use
67		VCC	+3.3V Power Supply
68		VCC	+3.3V Power Supply
69		TBD	For future use
70		GND	Module Ground ^{Note5}
71	CML-I	Tx7+	Transmitter non-inverted data input
72	CML-I	Tx7-	Transmitter inverted data input
73		GND	Module Ground ^{Note5}
74	CML-I	Tx5+	Transmitter non-inverted data input
75	CML-I	Tx5-	Transmitter inverted data input
76		GND	Module Ground ^{Note5}

Note:

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector should be pulled up with 4.7K to 10K ohms on host board to a voltage between 3.15V and 3.6V.

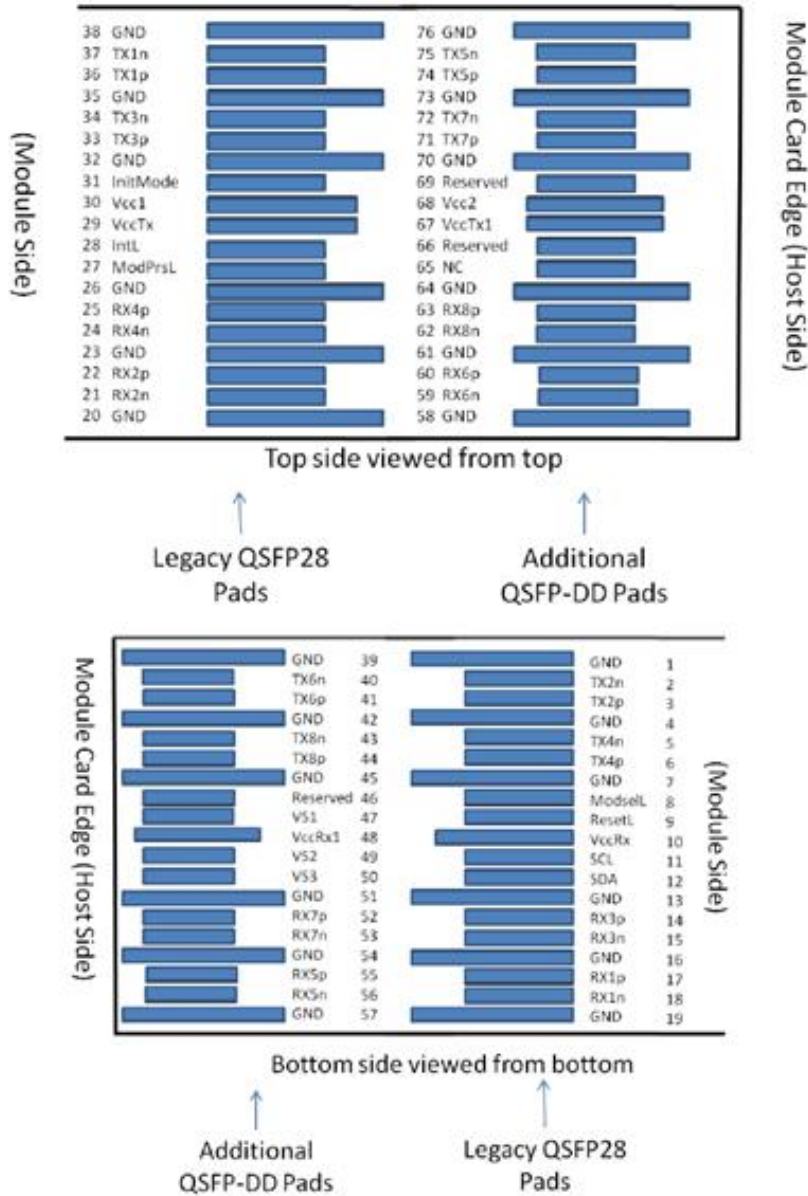


Figure 1. Electrical Pin-out Details

SIGNAL INTEGRITY

A	Time domain parameter	Test condition	Spec	Equipment
1	Differential Impedance(bulk cable)	TDR Tr:25ps	100+10/-5 ohms	E5071C
2	Differential Impedance (Mated connector)		100+/-10 ohms	
3	Differential Impedance(cable termination)		100+10/-15 ohms	
4	Intra-skew		L*15+20	

B	Frequency domain parameter	Test condition	Test spec(dB)	f(GHz)	SPEC: ps
1	SDD11/SD D22	Freq:50MHz ~ 20GHz Points:1601	$-22+20/25.78*f*10^{(-3)}$	$0.05 \leq f < 4.1$	E5071C
			$-10.66+14*\log((f*10^{(-3)})/5.5)$ $\leq 5.3\text{dB}@13.26\text{GHz}$	$4.1 \leq f \leq 19$	
2	SCC11/SC C22	Freq:50MHz ~ 20GHz Points:1601	$\leq -2\text{dB}$	$0.2 \leq f \leq 19$	
3	SDC11/SD C22	Freq:50MHz ~ 20GHz Points:1601	$-16+2*f/3$	$0.05 \leq f \leq 2$	
5	SCD21- SDD21	Freq:50MHz ~ 20GHz Points:1601	10 as $0.01 \leq f < 12.89$ $-27+29/22*f*0.001$ as $12.89 \leq f < 15.7$ 6.3 as $15.7 \leq f \leq 19$	$0.01 \leq f \leq 19$	
6	MDNEXT	Freq:50MHz ~ 20GHz Points:1601	$\leq -26\text{dB}@12.89\text{GHz}$	$0.01 \leq f \leq 19$	
7	SDD21	Freq:50MHz ~ 20GHz Points:1601 IF: 1KHz	$-0.7*(f*10^{(-3)})^{0.5}-0.3$ $*(f*10^{(-3)})-0.01*(f*10^{(-3)})^2$ $< 17.16\text{dB}@13.26\text{GHz}$	$0.01 \leq f \leq 19$	
8	COM	IEEE802.3cd	$> 3\text{dB}$		

Mechanical Dimensions

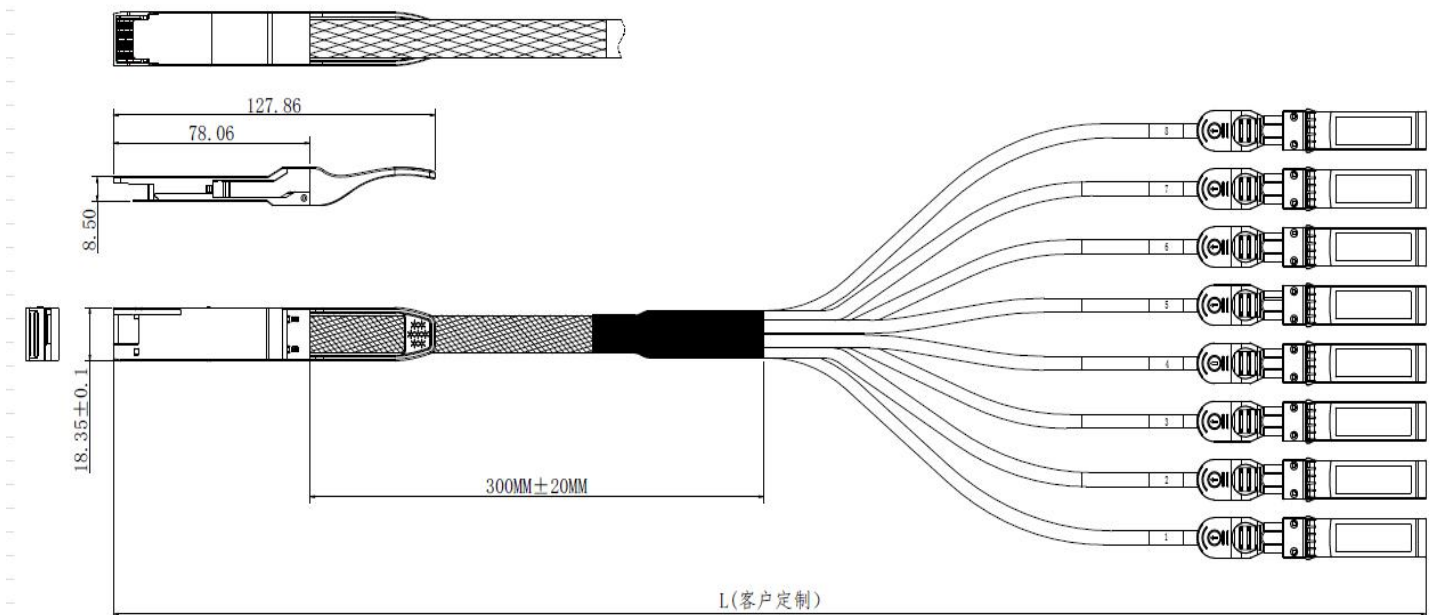


Figure 2. Typical mechanical structure

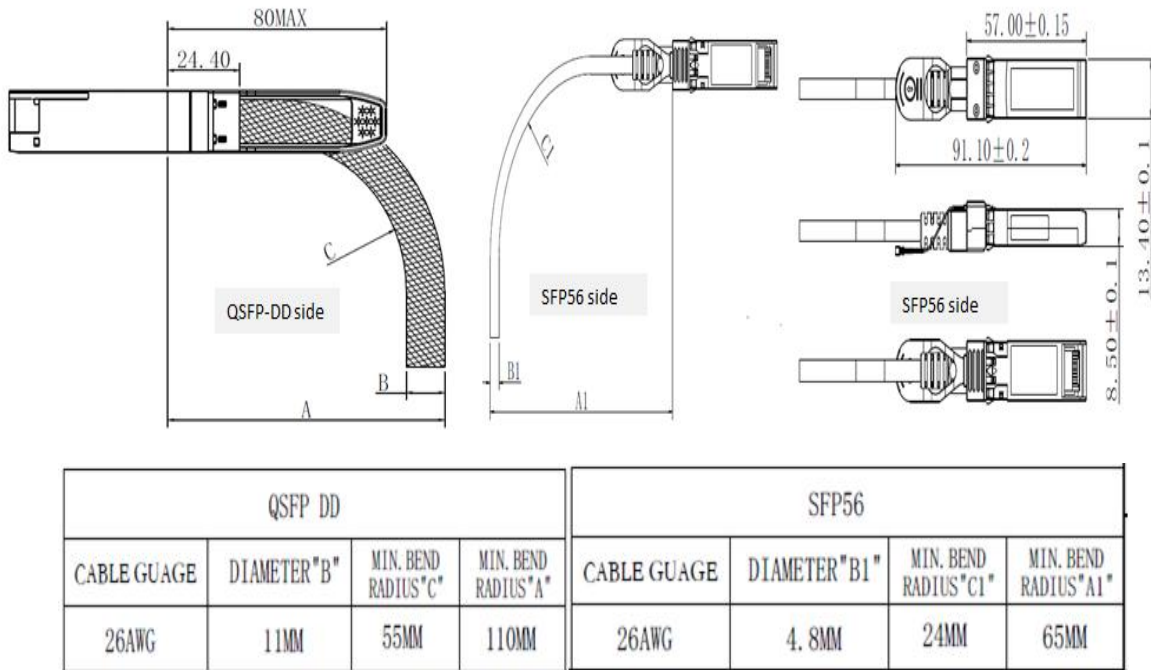


Figure 3. Typical diameter and bend radius

Wiring connection diagram

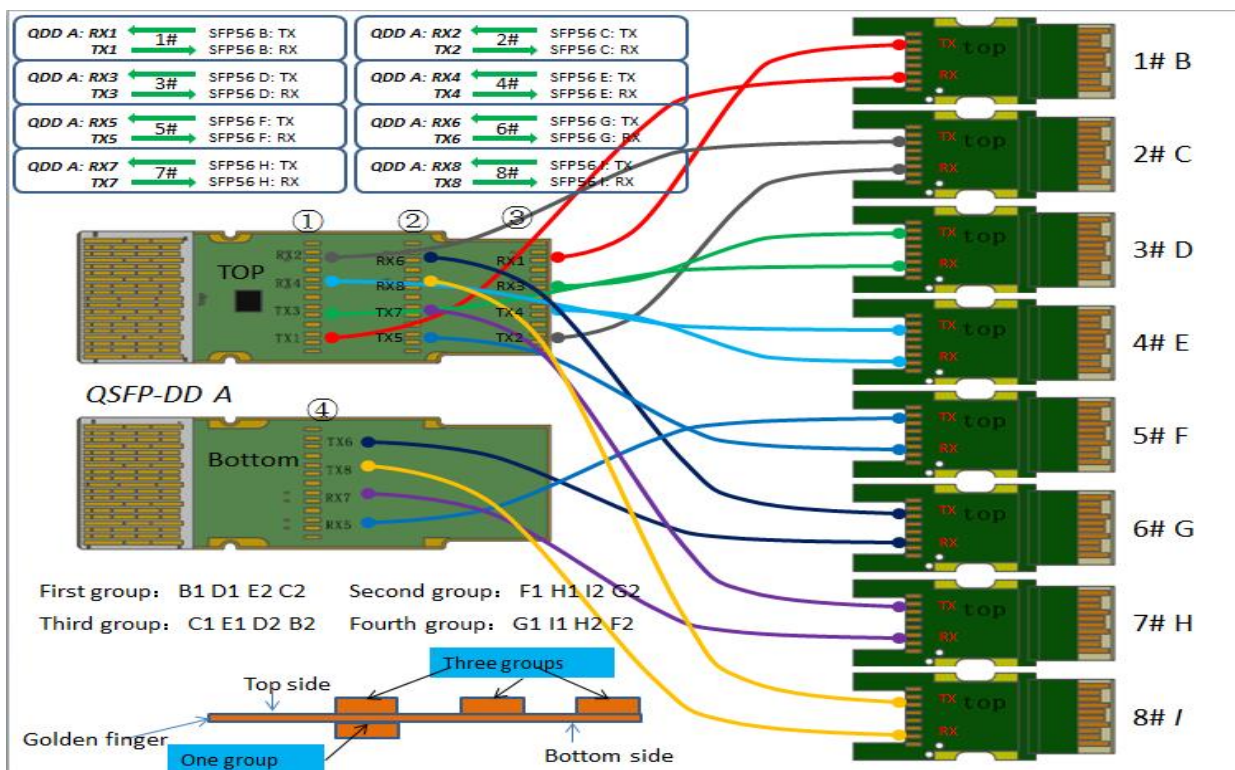


Figure 4. Wiring connection diagram

Regulatory Compliance

Gigalight GQD-8S56P401-xxC passive cable assemblies meet the requirements of the following standards:

Feature	Standard
Electrical Safety	EN 62368-1: 2014 IEC 62368-1:2014 UL 62368-1:2014
Environmental protection	Directive 2011/65/EU with amendment(EU)2015/863
CE EMC	EN55032: 2015 EN55035: 2017 EN61000-3-2:2014 EN61000-3-3:2013
FCC	FCC Part 15, Subpart B; ANSI C63.4-2014

Ordering information

Part Number	GQD-8S56P401-XXC		
Cable Length (meter)	1	2	3
Cable Wire gauge (AWG)	30/26	30/26	26
Example: GQD-8S56P401-01C/30AWG GQD-8S56P401-01C/26AWG GQD-8S56P401-03C/26AWG			
The cable length and wire gauge can be customized, further details are available from any Gigalight sales representative.			

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Revision History

Revision	Date	Description
V0	Feb. 28th, 2022	Advance Release.
V1	Apr. 2nd, 2022	Update wire gauge information. Update differential impedance information