

10GB-4-C02-QSFP-C

Enterasys® Compatible 40Gb/s 4SFP+ Direct Attach Cable Copper, Passive, 2m

FEATURES

- Compliant with SFF- 8436, SFF-8431, SFF-8432 and SFF-8472
- Up to 10. 3125Gbps data rate per channel
- Up to 7m transmission
- Operating temperature: 0°C to +70°C
- Single 3.3V power supply
- RoHS compliant
- Cost-effective copper solution
- Lowest total system power solution
- Lowest total system EMI solution
- Optimized design for Signal Integrity

APPLICATIONS

Data

- Servers
- Networked storage systems
- Routers
- External storage systems
- Data Center networking

Communications

- Switches
- Routers

INDUSTRIAL STANDARDS

- InfiniBand Trade Association (IBTA)
- IEEE802.3ba
- 40Gigabit Ethernet (40G BASE CR4)



DESCRIPTION

ATGBICS QSFP+ (Quad Small Form-factor Pluggable Plus) copper direct-attach cables are suitable for very short distances and offer a highly cost-effective way to establish a 40-Gigabit link between QSFP+ ports of QSFP+ switches within racks and across adjacent racks. These cables are used for 40GbE and Infiniband standards, to maximize performance. QSFP+ are designed to meet emerging data center and high-performance computing application needs for a high-density cabling interconnect system capable of delivering an aggregate data bandwidth of 40Gb/s. This interconnect system is fully compliant with existing industry standard specifications such as the QSFP MSA and IBTA (InfiniBand Trade Association). The QSFP+ cables support the bandwidth transmission requirements as defined by IEEE 802.3ba (40 Gb/s) and Infiniband QDR (4x10 Gb/s per channel) specifications.



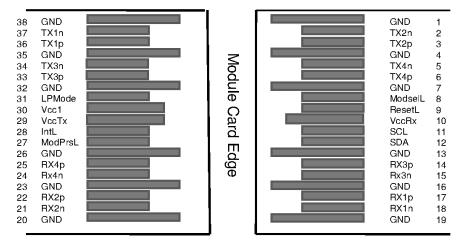
QSFP+ Pin Function Definition

Pin	Logic	Symbol	Description	
1		GND	Ground	
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	
4		GND	Ground	
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Ground	
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ResetL	Module Reset	
10		Vcc Rx	+3.3V Power Supply Receiver	
11	LVCMOS- I/O	SCL	2-wire serial interface clock	
12	LVCMOS- I/O	SDA	2-wire serial interface data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	
20		GND	Ground	
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26 27	LVTTL-O	GND ModPrsL	Ground Module Present	
27	LVTTL-O	IntL	Interrupt	
20			-	
30		Vcc 1x Vcc1	+3.3V Power supply transmitter	
30		VCCT	+3.3V Power supply	

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31	LVTTL-I	LPMode	Low Power Mode
32		GND	Ground
33	CML-I	Тх3р	Transmitter Non-Inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input
35		GND	Ground
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38		GND	Ground

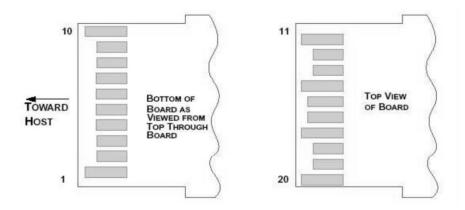


Top Side Viewed From Top Bottom Side Viewed From Bottom



SFP+ Pin Function Definition

Pin	Logic	Symbol	Description	
1		VeeT	Module Transmitter Ground	
2	LVTTL-O	Tx_Fault	Module Transmitter Fault	
3	LVTTL-I	Tx_Disable	Transmitter disable; Turns off transmitter laser output	
4	LVTTL-I/O	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 in INF- 8074i)	
5	LVTTL-I/O	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 in INF-8074i)	
6		Mod_ABS	Module Absent, connected to VeeT or VeeR in the module	
7	LVTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver	
8	LVTTL-O	Rx_LOS	Receiver Loss of Signal Indication (In FC designated as Rx_LOS and in Ethernet designated as Signal Detect)	
9	LVTTL-I	RS1	Rate Select 1, optionally controls SFP+ module transmitter	
10		VeeR	Module Receiver Ground	
11		VeeR	Module Receiver Ground	
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Non-Inverted Data Output	
14		VeeR	Module Receiver Ground	
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Transmitter 3.3 V Supply	
17		VeeT	Module Transmitter Ground	
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	





General Product Characteristics

Q/4SFP+ DAC Specifications	
Number of Lanes	Tx & Rx
Channel Data Rate	10.3125 Gbps
Operating Temperature	0 to + 70°C
Storage Temperature	-40 to + 85°C
Supply Voltage	3.3 V nominal
Electrical Interface	38 pins edge connector (QSFP+) 20 pins edge connector (SFP+)
Management Interface	Serial, I2C

High Speed Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Differential Impedance	TDR	90	100	110	Ώ	
Insertion loss	SDD21	-17.04			dB	At 5.15625 GHz
Differential Return Loss	SDD11 SDD22			See 1	dB	At 0.05 to 4.1 GHz
Dinerential Neturn 1033				See 2	dB	At 4.1 to 11.1 GHz
Differential to common mode return loss	SCD11 SCD22			-10	dB	At 0.2 to 11.1 GHz
Common-mode to common- mode output return loss	SCC11 SCC22	-3			dB	At 0.01 to 11.1 GHz

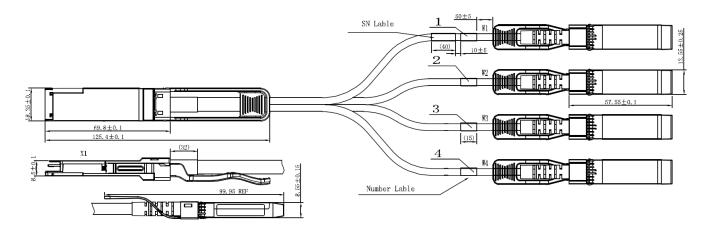
Notes:

- 1. Reflection Coefficient given by equation SDD11(dB) < -12 + 2 × SQRT(f), with f in GHz
- 2. Reflection Coefficient given by equation SDD11(dB) < $-6.3 + 13 \times \log 10(f/5.5)$, with f in GHz



Mechanical Information

The connector is compatible with the SFF-8436 to SFF-8432 specification



Length (m)	Cable AWG
1	30
3	30
5	26
7	24

Regulatory Compliance

Feature	Test Method	Performance	
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1(>2000 Volts)	
Electromagnetic	FCC Class B	Compliant with Standards	
Interference (EMI)	CENELEC EN55022 Class B		
	CISPR22 ITE Class B		
RF Immunity (RFI)	IEC61000-4-3	Typically Show no Measurable Effect from a 10V/m Field Swept from 80 to 1000MHz	
RoHS Compliance	RoHS Directive 2011/65/EU and it's Amendment Directives (EU) 2015/863	RoHS (EU) 2015/863 compliant	
REACH Compliance	REACH Regulation (EC) No 1907/2006	REACH (EC) No 1907/2006 compliant	



AWG Information

Reach @ 10Gb/s (m)	AWG
0.5	30
1	30
2	30
3	28/30
4	28
5	24
7	24