



25Gb/s SFP28 Passive Cable

APCP02-BBCxxx-yy



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SFP28 based on SFP+ the same shape, compliant with InfiniBand Architecture and 25G Ethernet standards, can provide the 25Gb/s transmission no error, SFP28 applied to high density of 25G Ethernet switches and network interface, data center server connection. It uses the popular SFP + packaging format, upgrade the 10G Ethernet connection for the enterprise, provides a more cost-effective solution.

Product Features

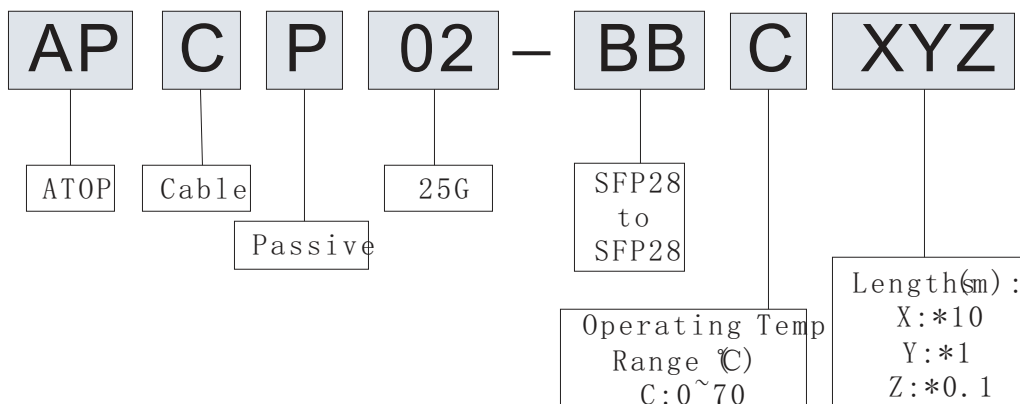
- ✓ Support hot-pluggable
- ✓ Available in lengths from 0.5m to 5m
- ✓ Low insertion loss and low crosstalk
- ✓ Single 3.3V power supply
- ✓ RoHS Compliant and Lead-Free
- ✓ Compliant with SFF-8402& IEEE802.3.bj
- ✓ Wire/Cable Type Twinax

Applications

- ✓ Data/Servers/ Routers
- ✓ Networked storage systems
- ✓ External storage systems
- ✓ Data Center networking
- ✓ Communications Switches
- ✓ InfiniBand



Product Selection



Part Number	Lengths	Conductor Size	Note
APCP02-BBC005-yy	0.5m	24/26/28/30 AWG	1,2
APCP02-BBC010-yy	1m	24/26/28/30 AWG	1,2
APCP02-BBC015-yy	1.5m	24/26/28/30 AWG	1,2
APCP02-BBC020-yy	2m	24/26/28/30 AWG	1,2
APCP02-BBC025-yy	2.5m	24/26/28/30 AWG	1,2
APCP02-BBC030-yy	3m	24/26/28/30 AWG	1,2
APCP02-BBC050-yy	5m	24/26/28/30 AWG	1,2

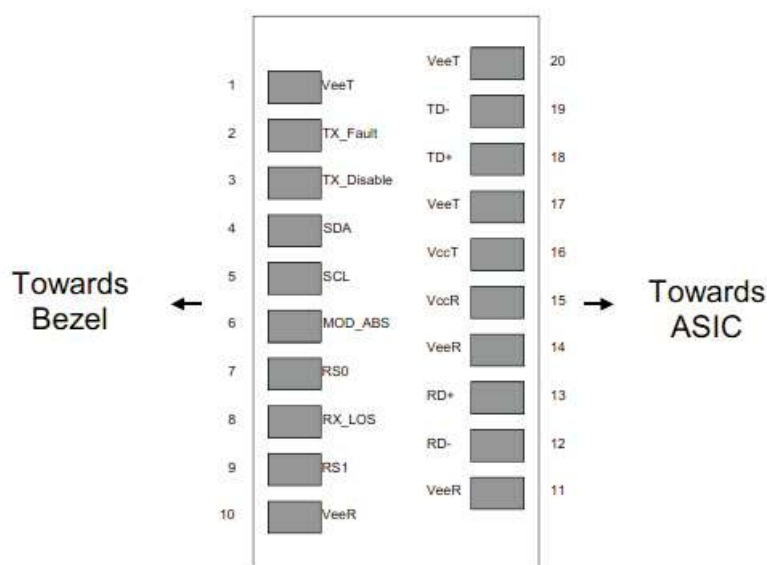
Note:

1, yy=30,28,26,24, present wire size AWG

2, 24 AWG is default

Pin Descriptions

Pin	Symbol	Name	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground)	
2	TX Fault	Transmitter Fault. LVTTTL-O	
3	TX Disable	Transmitter Disable. Laser output disabled on high or open. LVTTTL-I	
4	SDA	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O	
5	SCL	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I	
6	Mod_ABS	Module Absent, Connect to VeeT or VeeR in Module.	
7	RS0	Rate Select 0, optionally controls SFP+ module receiver LVTTTL-I	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. LVTTTL-O	
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter. LVTTTL-I	
10	VeeR	Receiver Ground (Common with Transmitter Ground)	
11	VeeR	Receiver Ground (Common with Transmitter Ground)	
12	RD-	Receiver Inverted DATA out. AC Coupled. CML-O	
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O	
14	VeeR	Receiver Ground (Common with Transmitter Ground)	
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground (Common with Receiver Ground)	
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I	
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-I	
20	VeeT	Transmitter Ground (Common with Receiver Ground)	



Pin-out of Connector Block on Host Board

Signal Integrity

ITEM	REQUIREMENT	TEST CONDITION																																				
Cable Impedance	105+5/-10Ω																																					
Differential Impedance	Paddle Card Impedance Cable Termination Impedance	100±10Ω 100±15Ω	Rise time of 25ps (20% - 80 %).																																			
[Differential (Input/Output) Return loss SDD11/SDD22]	$\text{Return_loss}(f) \geq \begin{cases} 16.5-2\sqrt{f} & 0.05 \leq f < 4.1 \\ 10.66-14\log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{cases}$ <p>Where f is the frequency in GHz Return_loss(f) is the return loss at frequency f</p>	10MHz ≤ f ≤ 19GHz																																				
[Differential to common-mode (Input/Output)Return loss SCD11/SCD22]	$\text{Return_loss}(f) \geq \begin{cases} 22-(20/25.78)f & 0.01 \leq f < 12.89 \\ 15-(6/25.78)f & 12.89 \leq f \leq 19 \end{cases}$ <p>Where f is the frequency in GHz Return_loss(f) is the Differential to common-mode return loss at frequency f</p>	10MHz ≤ f ≤ 19GHz																																				
Common-mode to Common-mode(Input/Output)Return loss SCC11/SCC22	$\text{Return_loss}(f) \geq 2\text{dB} \quad 0.2 \leq f \leq 19$ <p>Where f is the frequency in GHz Return_loss(f) is the common-mode to common-mode return loss at frequency f</p>	10MHz ≤ f ≤ 19GHz																																				
(Differential Insertion Loss Max. For TPa to TPb Excluding Test fixture)																																						
Differential Insertion Loss (SDD21 Max.)	<table border="1"> <thead> <tr> <th>AWG \ F</th> <th>1.25GHz</th> <th>2.5GHz</th> <th>5.0GHz</th> <th>7.0GHz</th> <th>10GHz</th> <th>12.89GHz</th> </tr> </thead> <tbody> <tr> <td>30(1m)Max.</td> <td>4.5dB</td> <td>5.4dB</td> <td>6.3dB</td> <td>7.5dB</td> <td>8.5dB</td> <td>10.5dB</td> </tr> <tr> <td>30/28(3m)Max.</td> <td>7.5dB</td> <td>9.5dB</td> <td>12.2dB</td> <td>14.8dB</td> <td>18.0dB</td> <td>21.5dB</td> </tr> <tr> <td>26(3m)Max.</td> <td>5.7dB</td> <td>7.2dB</td> <td>9.9dB</td> <td>11.9dB</td> <td>14.1dB</td> <td>16.5dB</td> </tr> <tr> <td>26/25(5m)Max.</td> <td>7.8dB</td> <td>10.0dB</td> <td>13.5dB</td> <td>16.0dB</td> <td>19.0dB</td> <td>22.0dB</td> </tr> </tbody> </table>	AWG \ F	1.25GHz	2.5GHz	5.0GHz	7.0GHz	10GHz	12.89GHz	30(1m)Max.	4.5dB	5.4dB	6.3dB	7.5dB	8.5dB	10.5dB	30/28(3m)Max.	7.5dB	9.5dB	12.2dB	14.8dB	18.0dB	21.5dB	26(3m)Max.	5.7dB	7.2dB	9.9dB	11.9dB	14.1dB	16.5dB	26/25(5m)Max.	7.8dB	10.0dB	13.5dB	16.0dB	19.0dB	22.0dB	10MHz ≤ f ≤ 19GHz	
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Differential to common-mode Conversion Loss-Differential Insertion Loss(SCD21-SDD21)	$\text{Conversion_loss}(f) - \text{IL}(f) \geq \begin{cases} 10 & 0.01 \leq f < 12.89 \\ 27-(29/22)f & 12.89 \leq f < 15.7 \\ 6.3 & 15.7 \leq f \leq 19 \end{cases}$ <p>Where f is the frequency in GHz Conversion_loss(f) is the cable assembly differential to common-mode conversion loss IL(f) is the cable assembly insertion loss</p>	10MHz ≤ f ≤ 19GHz																																				
MDNEXT(multiple disturber near-end crosstalk)	≥26dB @12.89GHz	10MHz ≤ f ≤ 19GHz																																				
Intra Skew	15ps/m	10MHz ≤ f ≤ 19GHz																																				

Other Electrical Performance

ITEM	REQUIREMENT	TEST CONDITION
Low Level Contact Resistance	70milliohms Max. From initial.	EIA-364-23:Apply a maximum voltage of 20mV And a current of 100 mA.
Insulation Resistance	10Mohm(Min.)	EIA364-21:AC 300V 1minute
Dielectric Withstanding Voltage	NO disruptive discharge.	EIA-364-20:Apply a voltageof 300 VDC for 1minute between adjacent terminals And between adjacent terminals and ground.

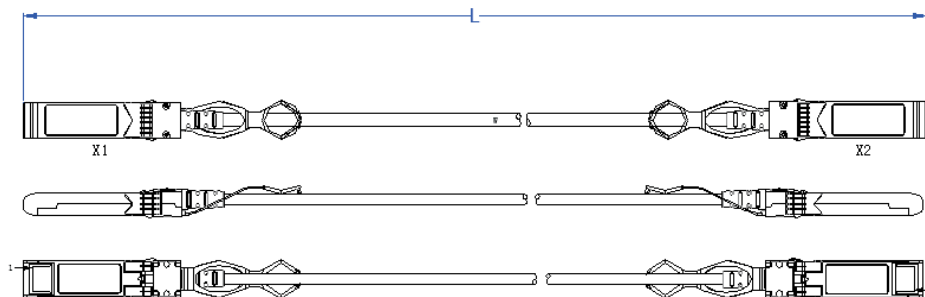
Environment Performance

ITEM	REQUIREMENT	TEST CONDITION
Operating Temp. Range	0°C to +70°C	Cable operating temperature range.
Storage Temp. Range (in packed condition)	-40°C to +80°C	Cable storage temperature range in packed condition.
Thermal Cycling Non-Powered	No evidence of physical damage	EIA-364-32D, Method A, -25 to 90C, 100 cycles, 15 min. dwells
Salt Spraying	48 hours salt spraying after shell corrosive area less than 5%.	EIA-364-26
Mixed Flowing Gas	Pass electrical tests per 3.1 after stressing. (For connector only)	EIA-364-35 Class II,14 days.
Temp. Life	No evidence of physical damage	EIA-364-17C w/ RH, Damp heat 90°C at 85% RH for 500 hours then return to ambient
Cable Cold Bend	4H, No evidence of physical damage	Condition: -20°C±2°C, mandrel diameter is 6 times the cable diameter.

Mechanical and Physical Characteristics

ITEM	REQUIREMENT	TEST CONDITION
Vibration	Pass electrical tests per 3.1 after stressing.	Clamp & vibrate per EIA-364-28E,TC-VII, test condition letter – D, 15 minutes in X, Y & Z axis.
Cable Flex	No evidence of physical damage	Flex cable 180° for 20 cycles ($\pm 90^\circ$ from nominal position) at 12 cycles per minute with a 1.0kg load applied to the cable jacket. Flex in the boot area 90° in each direction from vertical. Per EIA-364-41C
Cable Plug Retention in Cage	90N Min. No evidence of physical damage	Pull on cable jacket approximately 1 ft behind cable plug. No functional damage to cable plug below 90N. Per SFF-8432 Rev 5.0
Cable Retention in Plug	90N Min. No evidence of physical damage	Cable plug is fixtured with the bulk cable hanging vertically. A 90N axial load is applied (gradually) to the cable jacket and held for 1 minute. Per EIA-364-38B
Mechanical Shock	Pass electrical tests Per 3.1 after stressing.	Clamp and shock per EIA-364-27B, TC-G,3 times in 6 directions, 100g, 6ms.
Cable Plug Insertion	18N Max. (SFP+)	Per SFF-8432 Rev 5.0
Cable plug Extraction	12.5N Max. (SFP28)	Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per SFF-8432 Rev 5.0
Durability	50 cycles, No evidence of physical damage	EIA-364-09, perform plug & unplug cycles: Plug and receptacle mate rate: 250times/hour. 50times for module (CONNECTOR TO PCB)

Mechanical Specifications



Wiring Diagram

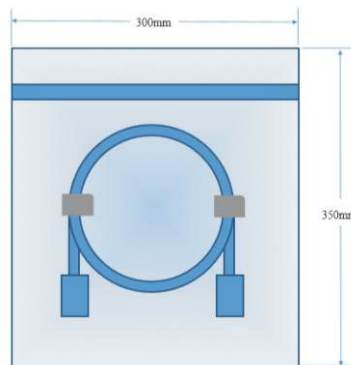
Starting	End	Remark
X1.12	X2.19	Pair
X1.13	X2.18	
X1.18	X2.13	Pair
X1.19	X2.12	
X1:1, 2, 6 8, 10, 11, 14, 17, 20	X2:1, 2, 6 8, 10, 11, 14, 17, 20	Drain wire
X1:1, 4, 5 15, 16	X2:1, 4, 5 15, 16	EEPROM point at both ends

Package diagram

The connectors at both ends are protected by protective sleeves, and each high-speed cable is separately put into an anti-static bag.

<=3m: 200mm*300mm

>3m: 300mm*350mm



Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
Version1.0	Tangzhiqiang	Li Tao	Ding zheng	New Released.	Nov 19, 2019
Version1.1	Tangzhiqiang	Li Tao	Ding zheng	Update the new template	Dec 19, 2019



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