



# 10.3Gb/s SFP+ Passive Cable

APCP01-SSCxxx-yy



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ATOP's Small Form Factor Pluggable SFP+ to SFP+ Passive Derict Attached Copper Cables. The Passive DAC cables are high performance, cost effective. It can support 10G Ethernet, 8g fibre channel and InfiniBand short distance interconnection scenarios Application

## Product Features

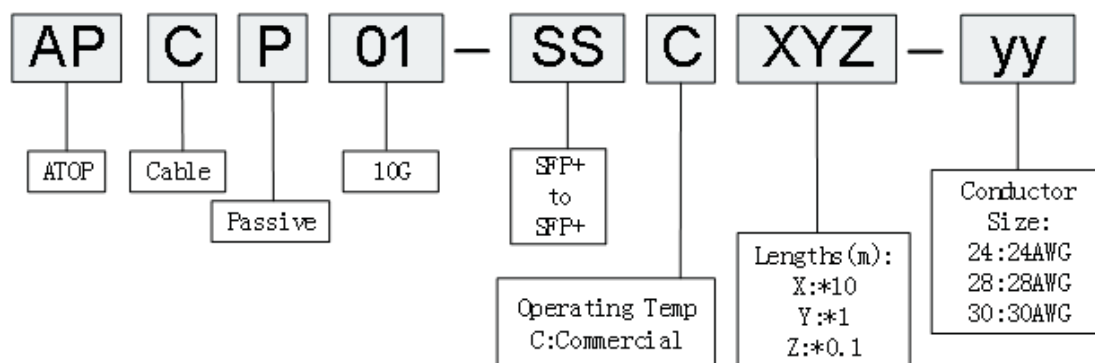
- ✓ Support hot-pluggable
- ✓ Available in lengths from 0.5m to 10m
- ✓ Low insertion loss and low crosstalk
- ✓ Single 3.3V power supply
- ✓ RoHS Compliant and Lead-Free
- ✓ Compliant with SFF-8472
- ✓ Compliant with SFP+ MSA: SFF-8431
- ✓ Wire/Cable Type Twin ax

## Applications

- ✓ 10GbE
- ✓ 8G Fiber Channel
- ✓ Switch/Switch/Hub
- ✓ Data center, cloud service



## Product Selection



Part Number	Lengths	Conductor Size	Note
APCP01-SSC005-yy	0.5m	24/26/28/30 AWG	1,2
APCP01-SSC010-yy	1m	24/26/28/30 AWG	1,2
APCP01-SSC015-yy	1.5m	24/26/28/30 AWG	1,2
APCP01-SSC020-yy	2m	24/26/28/30 AWG	1,2
APCP01-SSC025-yy	2.5m	24/26/28/30 AWG	1,2
APCP01-SSC030-yy	3m	24/26/28/30 AWG	1,2
APCP01-SSC050-yy	5m	24/26/28/30 AWG	1,2
APCP01-SSC070-yy	7m	24/26/28/30 AWG	1,2
APCP01-SSC100-yy	10m	24/26/28/30 AWG	1,2

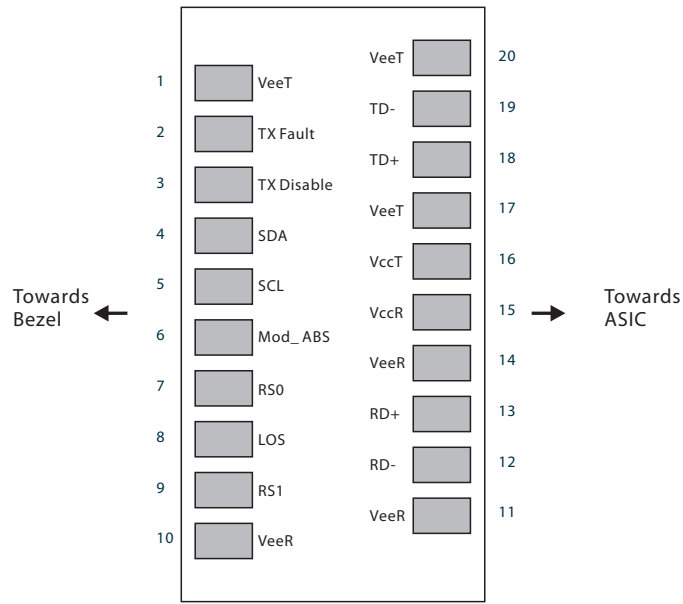
**Note:**

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

2, 24 AWG is default

## Pin Descriptions

Pin	Symbol	Name/Description	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/-5Ω																															
Differential Impedance	Paddle Card Impedance 100±10Ω	Rise time of 35ps (20% - 80%).																														
Cable Termination Impedance	100±15Ω																															
[ Differential (Input/Output) Return loss SDD11/SDD22]	Return loss(f) ≥ $\begin{cases} 10 & 0.01 \leq f < 4.1 \\ 6.3-13\log_{10}(f/5.5) & 4.1 \leq f \leq 11.1 \end{cases}$  Where f is the frequency in GHz Return loss(f) is the return loss at frequency f	0.01GHz ≤ f ≤ 11.1GHz SFF-8431 Rev.4.1																														
(Differential Insertion Loss Max.)																																
	<table border="1"> <thead> <tr> <th>AWG \ F</th> <th>600MHz</th> <th>1.25GHz</th> <th>2.5GHz</th> <th>5.0GHz</th> </tr> </thead> <tbody> <tr> <td>30(1m)Max</td> <td>2.5dB</td> <td>3.5dB</td> <td>4.5dB</td> <td>6.5dB</td> </tr> <tr> <td>30(2m)Max</td> <td>3.8dB</td> <td>5.3dB</td> <td>6.8dB</td> <td>9.8dB</td> </tr> <tr> <td>30(3m)Max</td> <td>5.0dB</td> <td>7.0dB</td> <td>9.0dB</td> <td>13.0dB</td> </tr> <tr> <td>26(5m)Max</td> <td>5.5dB</td> <td>7.0dB</td> <td>10.5dB</td> <td>15.0dB</td> </tr> <tr> <td>24(10m)Max</td> <td>7.0dB</td> <td>10.0dB</td> <td>14.0dB</td> <td>20.0dB</td> </tr> </tbody> </table>	AWG \ F	600MHz	1.25GHz	2.5GHz	5.0GHz	30(1m)Max	2.5dB	3.5dB	4.5dB	6.5dB	30(2m)Max	3.8dB	5.3dB	6.8dB	9.8dB	30(3m)Max	5.0dB	7.0dB	9.0dB	13.0dB	26(5m)Max	5.5dB	7.0dB	10.5dB	15.0dB	24(10m)Max	7.0dB	10.0dB	14.0dB	20.0dB	
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Differential Insertion Loss (SDD21 Max.)		0.01GHz ≤ f ≤ 11.1GHz																														
MDNEXT(multiple disturber near-end crosstalk)	≥26dB @5GHz	0.01GHz ≤ f ≤ 11.1GHz																														
Insertion Loss Deviation	-0.7-0.2*10 <sup>-3</sup> f ≤ ILD ≤ 0.7+0.2*10 <sup>-3</sup> f (f is the frequency in MHz)	0.01GHz ≤ f ≤ 5.0GHz																														

## 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 1 minute
Dielectric Withstanding Voltage	DC 500V 1 minute disruptive discharge.	EIA-364-20:Apply a voltage of 500 VDC for 1 minute between adjacent terminals And between adjacent terminals and ground.

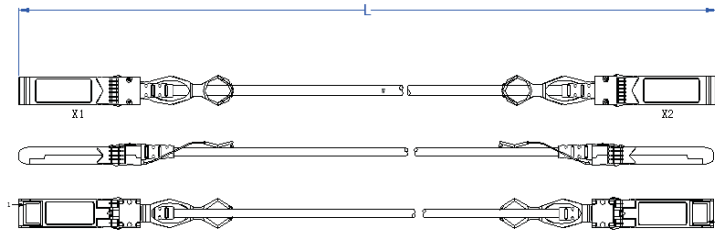
## Environment Performance

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.(SFP28)	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



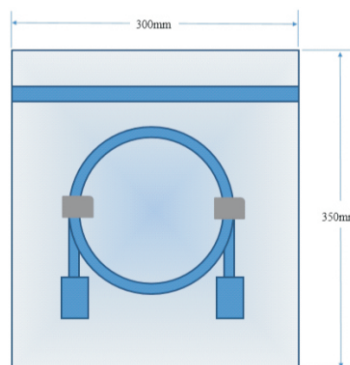
Starting	End	Remark
X1. 12	X2. 19	Pair
X1. 13	X2. 18	
X1. 18	X2. 13	Pair
X1. 19	X2. 12	
X1:1, 2, 6 8, 10, 11, 14, 17, 20	X2:1, 2, 6 8, 10, 11, 14, 17, 20	Drain wire
X1:1, 4, 5 15, 16	X2:1, 4, 5 15, 16	EEPROM point at both ends

## 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



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