

DATA SHEET

DAC-SFP28-P-xxAWG-aa.aaM

SFP28 25Gbps Passive Direct Attach Copper Cable Assembly

DAC-SFP28-P-xxAWG-aa.aaM Overview

SFP28 passive cable uses shielded high-speed differential cables, compliant with 25G Ethernet IEEE802.3by standard and SFF-8402 SFP28 standard, it supports 25G transmission rate and can be backward compatible with low-rate applications. The SFP28 passive cable is the preferred solution for 25G rate short-distance applications. It is commonly used for data transmission between data centers and cabinets or adjacent cabinets, its biggest features are low cost, ultra low power consumption (less than 0.1 watt) and high reliability.

Product Features

- Up to 25Gb/s bi-directional data links
- Compliant with SFF-8402
- Hot-pluggable
- AC coupled inputs and outputs
- 100 Ohm differential impedance
- Enhanced EMI design
- Single power supply 3.3V
- RoHS Compliant
- Operating temperature range: 0°C to 70°C



Applications

- 25GBASE Ethernet

Ordering Information

Part Number	Product ID	Description	Gauge	Length
DAC-SFP28-P-30AWG-aa.aaM	M265802	SFP28 Passive Direct Attach Copper Cable Assembly, aa.aa \leq 2	30AWG	length \leq 2m
DAC-SFP28-P-28AWG-aa.aaM	M405802	SFP28 Passive Direct Attach Copper Cable Assembly, aa.aa \leq 3	28AWG	length \leq 3m
DAC-SFP28-P-26AWG-aa.aaM	M044502	SFP28 Passive Direct Attach Copper Cable Assembly, aa.aa \leq 5	26AWG	length \leq 5m
Note: 1. "P" indicates passive cable 2. "aa.aa" indicates the cable length in meters. 3. The product with write protection. 4. The wire diameter of the products in the above list is the default value under different lengths. We can also provide other wire products to customers with special requirements. 5. The cable used in this product is produced by Huizhou LeTing Electronic Cable Co., Ltd. (brand: LTK),the cable sheath uses PVC material. 6. Product ID is the short order number of our product standard model.				
For More Information: SONGXIN TAIPEI TECH SOLUTIONS CO., LTD. Web: www.songxin.com.tw Email: oversea@songxin.com.tw				

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate	DR		25		Gb/s	1
Bit Error Rate	BER			10^{-12}		
Operating Temperature	T _c	0		70	°C	2
Storage Temperature	T _{STO}	-40		85	°C	3
Supply Current	I _{CC}			4	mA	4
Input Voltage	V _{CC}	3.14	3.3	3.46	V	4

Notes:

1. IEEE 802.3by
2. Case temperature
3. Ambient temperature
4. For electrical power interface

I2C Memory Map

Address A0					
IIC Addr	Size	Name	Description	Values (HEX)	Remarks
0	1	Identifier	SFP or SFP+	03	
1	1	Ext. Identifier	GBIC/SFP function is defined by two-wire interface ID only	04	
2	1	Connector	Copper pigtail	21	
3-10	8	Transceiver	Passive Cable	00 00 00 00 00 04 00 00	
11	1	Encoding	Code for high speed serial encoding algorithm	00	
12	1	BR, Nominal	Nominal Bit Rate 25.5GB/s	FF	
13	1	Rate Identifier	Type of rate select functionality	00	
14	1	Length(SMF,km)	Link length supported for single mode fiber, units of km	00	
15	1	Length (SMF)	Link length supported for single mode fiber, units of 100 m	00	
16	1	Length (50um)	Link length supported for 50 um OM2 fiber, units of 10 m	00	
17	1	Length (62.5um)	Link length supported for 62.5 um OM1 fiber, units of 10 m	00	

18	1	Length (OM4 or copper cable)	Link length supported for 50um OM4 fiber, units of 10m. Alternatively copper or direct attach cable, units of m	01	
19	1	Length (OM3)	Link length supported for 50 um OM3 fiber, units of 10 m	00	
20-35	16	Vendor name	SONGXIN	4D 4F 44 55 4C 45 54 45 4B 20 20 20 20 20 20 20	
36	1	Transceiver	Code for electro nic or optical compatibility	0D	
37-39	3	Vendor OUI	SFP vendor IEEE company ID	00 00 00	
40-55	16	Vendor PN	Part number in Order information	-	
56-59	4	Vendor rev	Revision level for part number provided by vendor (ASCII)	-	
60-61	2	Wavelength	Laser wavelength (Passive/Active Cable Specification Compliance)	00 00	
62	1	Unallocated		00	
63	1	CC BASE	Check code for Base ID Fields (addresses 0 to 62)	-	
64-65	2	Options	Indicates which optional transceiver signals are implemented	00 00	
66	1	BR, max	Upper bit rate margin	64	
67	1	BR, min	Lower bit rate margin	00	
68-83	16	Vendor SN	Serial number provided by vendor	Programmed by Factory	
84-91	8	Date code	Year,Month,Day	Programmed by Factory	
92	1	Diagnostic Monitoring Type	Indicates which type of diagnostic monitoring is implemented (if any) in the transceiver	00	
93	1	Enhanced Options	Indicates which optional enhanced features are implemented (if any) in the transceiver	00	
94	1	SFF-8472 Compliance	Indicates which revision of SFF-8472 the transceiver complies with.	00	

95	1	CC EXT	Check code for the Extended ID Fields (addresses 64 to 94)	-	
96-127	32	Vendor Specific	Vendor Specific EEPROM	-	
128-255	128	Vendor Specific	Vendor Specific EEPROM	-	
Address A2 Low					
IIC Addr	Size	Name	Description	Values (HEX)	Remarks
0-94	95	Reserved	Reserved	FF	
95	1	Checksum	0-94 Byte Checksum	-	
96-121	26	Reserved	Reserved	00	
122	1	Security Level	Security Level : 00=Normal Mode ; 01=User Mode (Level 1) ; 02=Factory Mode (Level 2) ;	00	
123-126	4	Password Entry	Password Entry Area	00 00 00 00	
127	1	Table Selection	Page Select Byte	00	
Address A2 Page 00h/01h					
IIC Addr	Size	Name	Description	Values (HEX)	Remarks
128-255	128	Upper Memory Map	User Code Area	FF	
Address A2 Page 8Ah					
IIC Addr	Size	Name	Description	Values (HEX)	Remarks
128-131	4	Firmware Version Number[4]	Firmware Version Number	-	
132-135	4	Total Running Time In Second	Total Running Time In Second	-	
Address A2 Page F0h					
IIC Addr	Size	Name	Description	Values (HEX)	Remarks
128-131	4	Password1 Long	Level 1 Password	00 00 10 11	
132	1	DisableA0WP	00=A0 With Write Protection ; 01=A0 Without Write Protection	00	
133	1	DisableA2T00T01WP	00=A2 T00T01 With Write Protection ; 01=A2 T00T01 Without Write Protection	00	

Notes :

- 1.Password entry area default 00000000 , read out as last written value
- 2.Module with write protection , enter the security level 1 writeable

User Mode

Module	Level 1 Default Password	Password Can Be Changed	Permissions
SFP28-SFP28	00001011	YES(A2 TF0)	1 、 Read And Write A0 、 A2 T00/T01
			2 、 Read A2 T8A
			3 、 Read And Write A2 TF0

Cable Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Wire Gauge		30AWG		26AWG	AWG	
Cable Impedance	Z	90	100	110	Ohm	

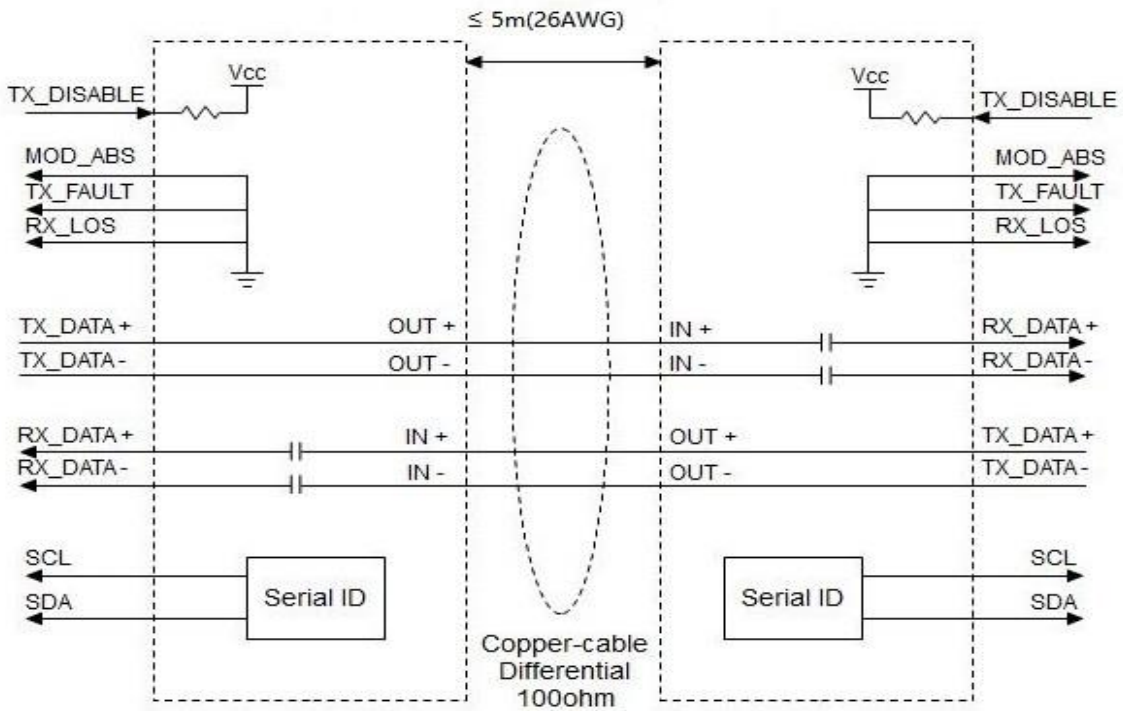
Insertion loss level

Part Number	Insertion loss level
DAC-SFP28-P-30AWG-1M	CA-25G-N
DAC-SFP28-P-30AWG-2M	CA-25G-N
DAC-SFP28-P-28AWG-2.5M	CA-25G-N
DAC-SFP28-P-28AWG-3M	CA-25G-S
DAC-SFP28-P-26AWG-5M	CA-25G-L

Note:

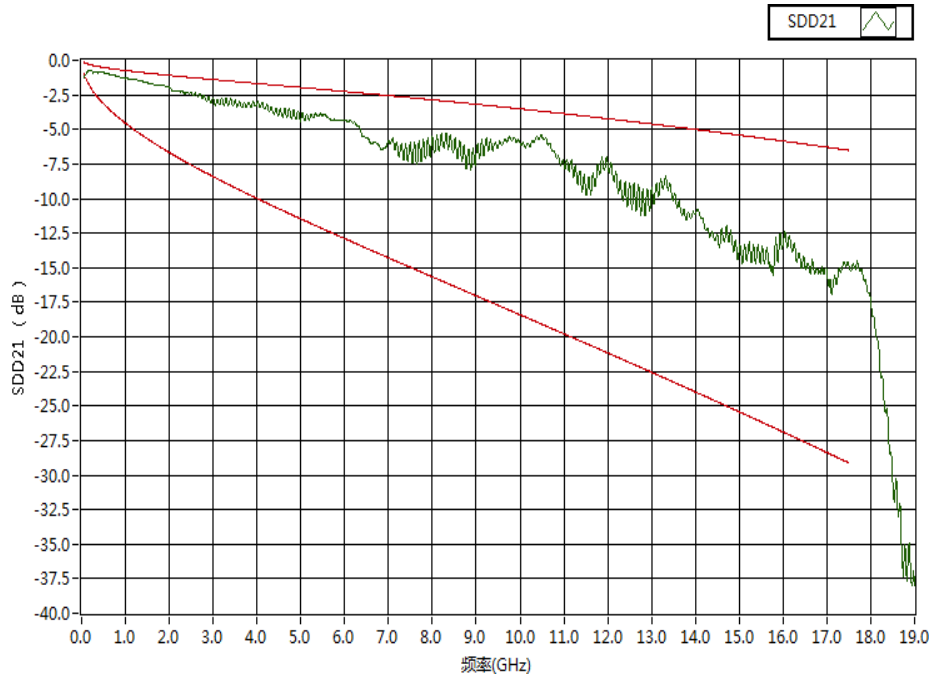
1. Cable insertion loss classification standard : IEEE 802.3by 110-10

Block Diagram of Transceiver

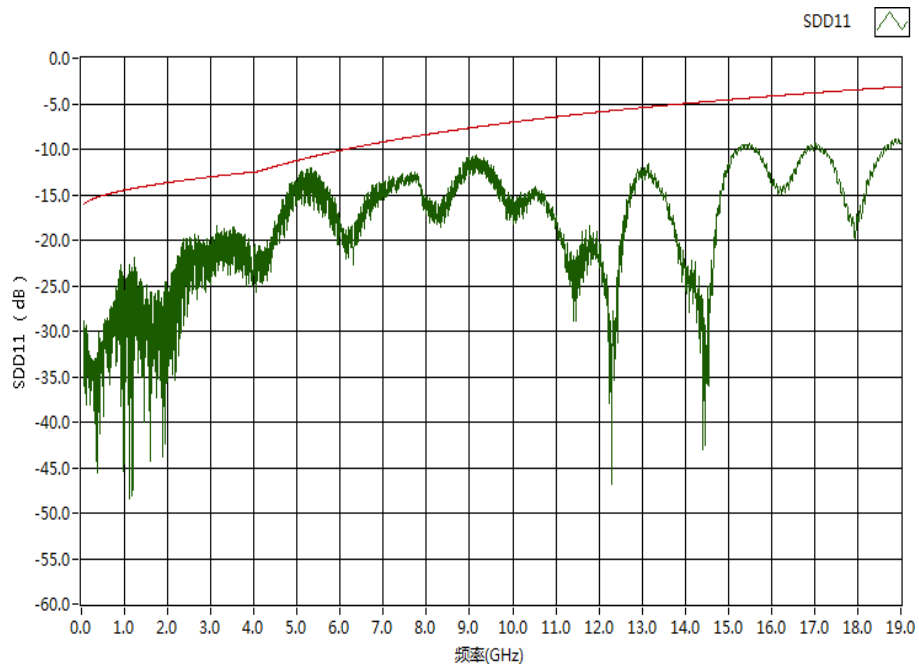


Typical S parameter

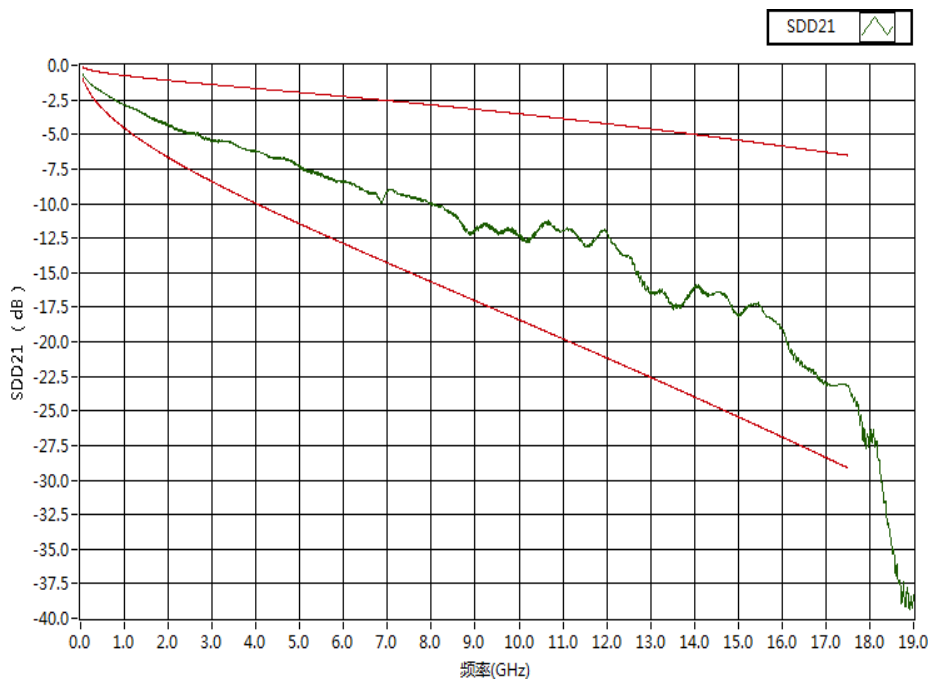
1m 30AWG typical insertion loss curve



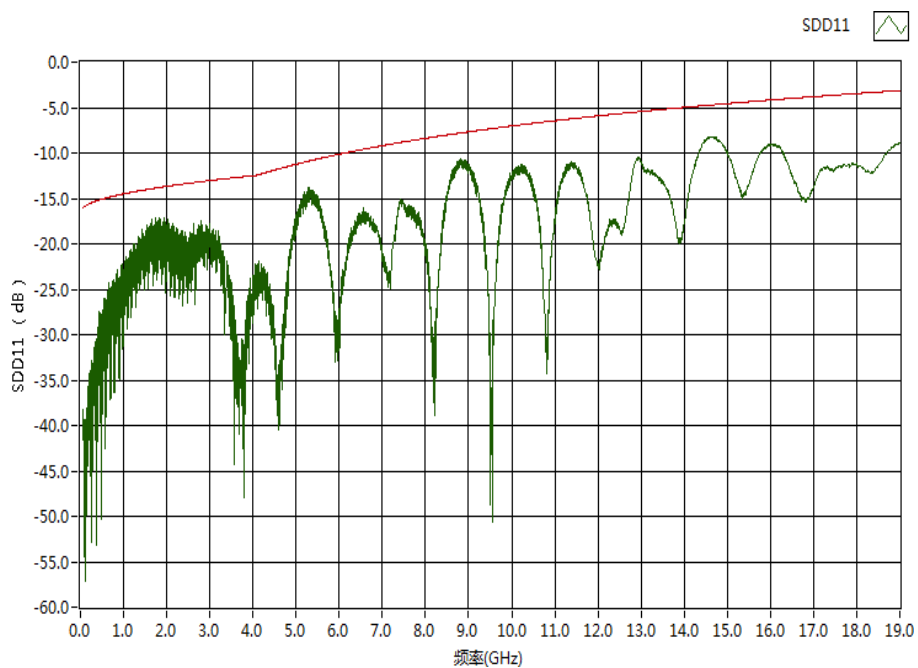
1m 30AWG typical reflection curve



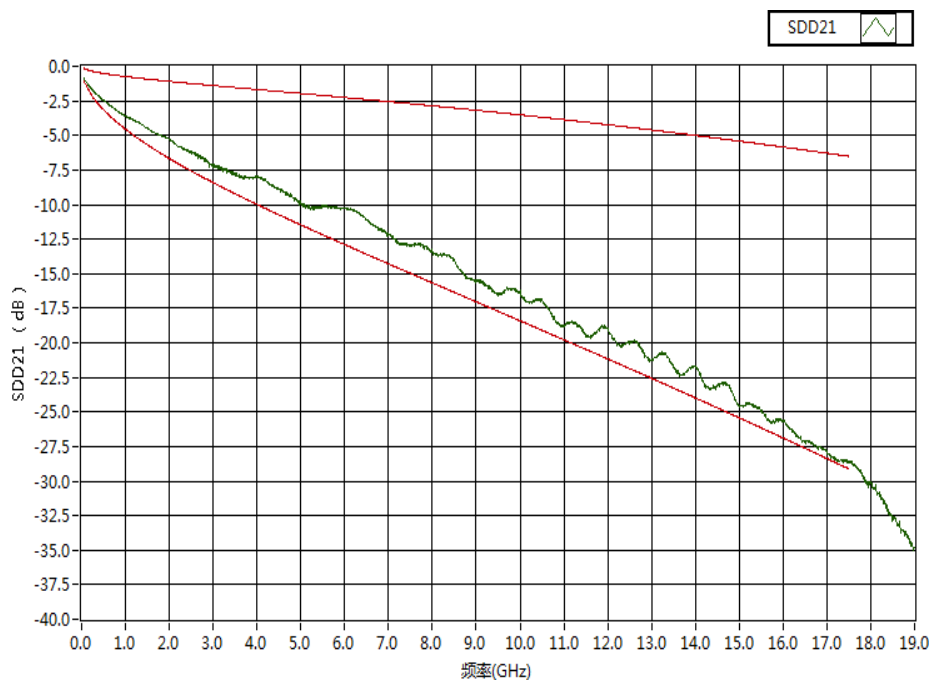
3m 28AWG typical insertion loss curve



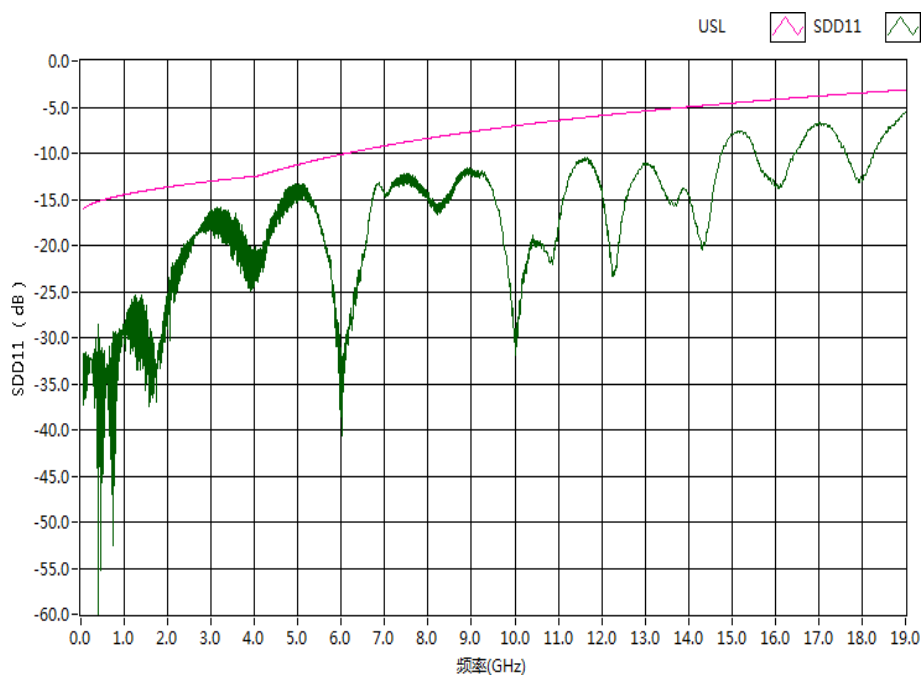
3 m 28AWG typical reflection curve



5m 26AWG typical insertion loss curve



5m 26AWG typical reflection curve



Notes:

1. Insertion loss standard reference IEEE802.3bj 92.10.2 : $IL < 22.48 \text{ dB} @ 12.89 \text{ GHz}$
2. Reflection curve standard reference IEEE802.3bj 92.10.3 : $SDD_{xx}(\text{dB}) = 16.5 - 2 \times \text{SQRT}(f)$, $0.05 \leq f < 4.1 \text{ GHz}$.
3. Reflection curve standard reference IEEE802.3bj 92.10.3 : $SDD_{xx}(\text{dB}) = 10.66 - 14 \times \log_{10}(f/5.5)$, $4.1 \leq f \leq 19 \text{ GHz}$.

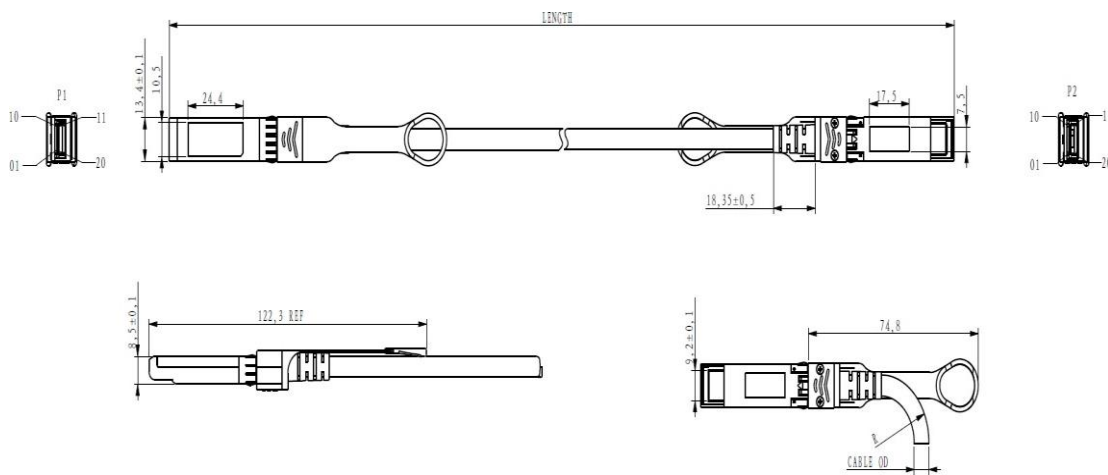
Weight

Parameter	Symbol	Typ	Unit	Remarks
30AWG Product Weight	G _{D30}	78	g/PCS	1
28AWG Product Weight	G _{D28}	84	g/PCS	1
26AWG Product Weight	G _{D26}	90	g/PCS	1
30AWG Cable Weight	G _{C30}	32	g/M	
28AWG Cable Weight	G _{C28}	38	g/M	
26AWG Cable Weight	G _{C26}	44	g/M	
Dust Cap Weight	G _s	0.80	g/PCS	

Notes :

1.The weight of DAC-SFP28-P-xxAWG-1M-C0C0B.For example:the weight of DAC-SFP28-P-26AWG-5M-C0C0B is: $90+44*(5-1)+0.80*2=267.6g$

Dimensions



未注尺寸公差 ±0.2mm

单位：毫米

Cable dimension

Serial number	Standard Wire Gauge AWG	Cable diameter OD (mm)	Minimum bending radius R (mm)
1	30	4.6	26
2	28	5.0	28
3	26	5.6	30

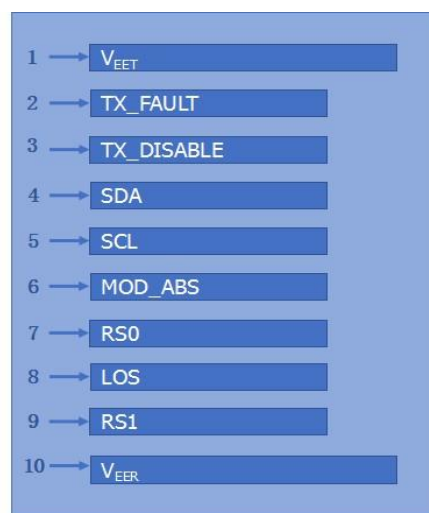
Length tolerance

Serial number	Nominal length (m)	Tolerance range ±(cm)
1	Length ≤ 3	2
2	3 < Length ≤ 4	4
3	4 < Length ≤ 5	6

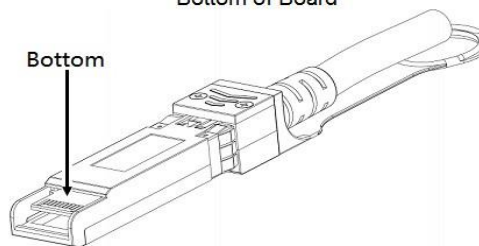
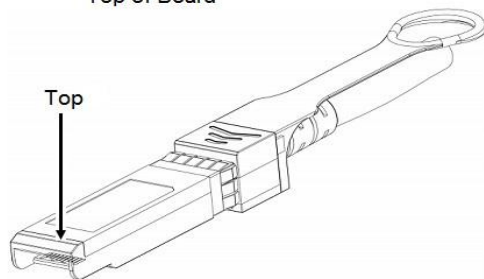
Electrical Pad Layout



Top of Board



Bottom of Board



Pin Assignment

PIN #	Symbol	Description	Remarks
1	V _{EET}	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter failure alarm, not used	
3	TX_DISABLE	The signal turns off the module transmitter when it is high or open, not used.	
4	SDA	Data line for serial ID	2
5	SCL	Clock line for serial ID	2
6	MOD_ABS	Module Absent. Grounded within the module	2
7	RS0	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	
9	RS1	No connection required	
10	V _{EER}	Receiver ground (common with transmitter ground)	1
11	V _{EER}	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	V _{EER}	Receiver ground (common with transmitter ground)	1
15	V _{CCR}	Receiver power supply	
16	V _{CCT}	Transmitter power supply	
17	V _{EET}	Transmitter ground (common with receiver ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD-	Transmitter Inverted DATA in. AC coupled	
20	V _{EET}	Transmitter ground (common with receiver ground)	1

Notes:

1. Circuit ground is isolated from chassis ground
2. Should Be pulled up with 4.7k - 10k ohm on host board to a voltage between 2V and 3.6V

References

1. IEEE standard 802.3by. IEEE Standard Department.
2. IEEE standard 802.3bj. IEEE Standard Department.