

## OSFP TO QSFP-DD

### EOQDDP40X-330CNxx

#### 400Gbps OSFP To QSFPDD Passive High Speed Cable

- Products Compliance with CMIS4.0, OSFP\_MSA, QSFP DD MSA
- Ethernet-Compliance with IEEE802.3cd
- Support 56G (PAM4) electrical data rates/channel
- Support I2C two - line string interface, easy to control
- Support for hot plugging
- Low crosstalk/Low power
- Maximum Link Length: up to 3m
- ROHS Compliance



## Applications

- 400G Ethernet
- SWITCH/ Router
- Data storage and communication industry
- Data center, cloud server

## Description

The 400G OSFP56 Passive Direct Attach Copper Twinax Cable is designed for use in 400GBASE Ethernet., OSFP56 is the module and cage/connector system based on current OSFP, targeting to support the 56Gb/s per lane speed in a 8x lane OSFP system and to enable the OSFP 400G interconnect ecosystem. This will greatly help the legacy OSFP users upgrade the link bandwidth to 400G per port with lower cost and shorter transition time.

QSFP-DD (quad small form-factor pluggable double density) doubles the density of QSFP interconnects with an eight-lane electrical interface capable of 28 Gbps NRZ or 56 Gbps PAM-4 to achieve 200 or 400 Gbps aggregate per port. The QSFP-DD portfolio's backwards compatibility allows existing QSFP modules to be plugged into QSFP-DD ports, provide low loss, less skew and better NEXT. providing superior thermal and signal integrity performance.

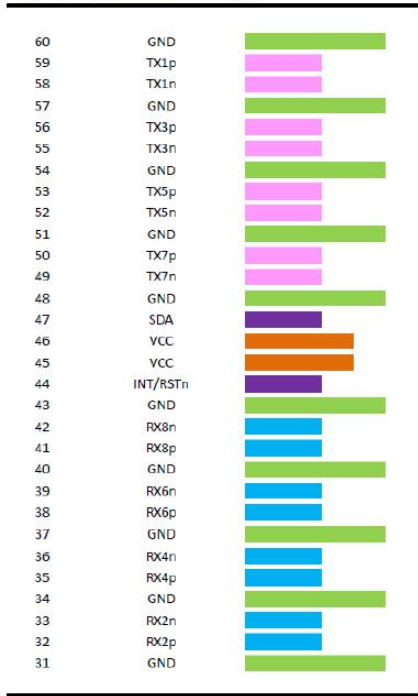
## Wiring Diagram

P1				P2	
GND	1	----	23	GND	
TX2+	2	---->	22	RX2+	
TX2-	3	---->	21	RX2-	
GND	4	----	20	GND	
TX4+	5	---->	25	RX4+	
TX4-	6	---->	24	RX4-	
GND	7	----	61	GND	
TX6+	8	---->	60	RX6+	
TX6-	9	---->	59	RX6-	
GND	10	----	58	GND	
TX8+	11	---->	61	RX8+	
TX8-	12	---->	62	RX8-	
GND	13	----	63	GND	
GND	18	----	73	GND	
RX7-	19	<----	72	TX7-	
RX7+	20	<----	71	TX7+	
GND	21	----	70	GND	
RX5-	22	<----	75	TX5-	
RX5+	23	<----	74	TX5+	
GND	24	----	73	GND	
RX3-	25	<----	34	TX3-	
RX3+	26	<----	33	TX3+	
GND	27	----	32	GND	
RX1-	28	<----	37	TX1-	
RX1+	29	<----	36	TX1+	
GND	30	----	35	GND	

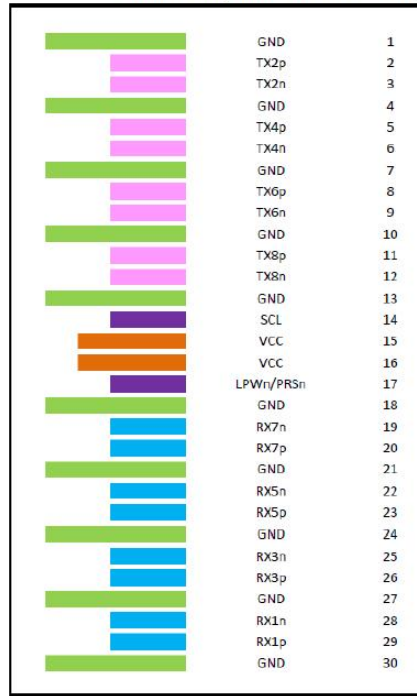
P1				P2	
GND	31	----	4	GND	
RX2+	32	<----	3	TX2+	
RX2-	33	<----	2	TX2-	
GND	34	----	1	GND	
RX4+	35	<----	6	TX4+	
RX4-	36	<----	5	TX4-	
GND	37	----	4	GND	
RX6+	38	<----	41	TX6+	
RX6-	39	<----	40	TX6-	
GND	40	----	39	GND	
RX8+	41	<----	44	TX8+	
RX8-	42	<----	43	TX8-	
GND	43	----	42	GND	
GND	48	----	54	GND	
TX7-	49	---->	53	RX7-	
TX7+	50	---->	52	RX7+	
GND	51	----	51	GND	
TX5-	52	---->	56	RX5-	
TX5+	53	---->	55	RX5+	
GND	54	----	54	GND	
TX3-	55	---->	15	RX3-	
TX3+	56	---->	14	RX3+	
GND	57	----	13	GND	
TX1-	58	---->	18	RX1-	
TX1+	59	---->	17	RX1+	
GND	60	----	16	GND	

# PIN OUT

Top Side (viewed from top)



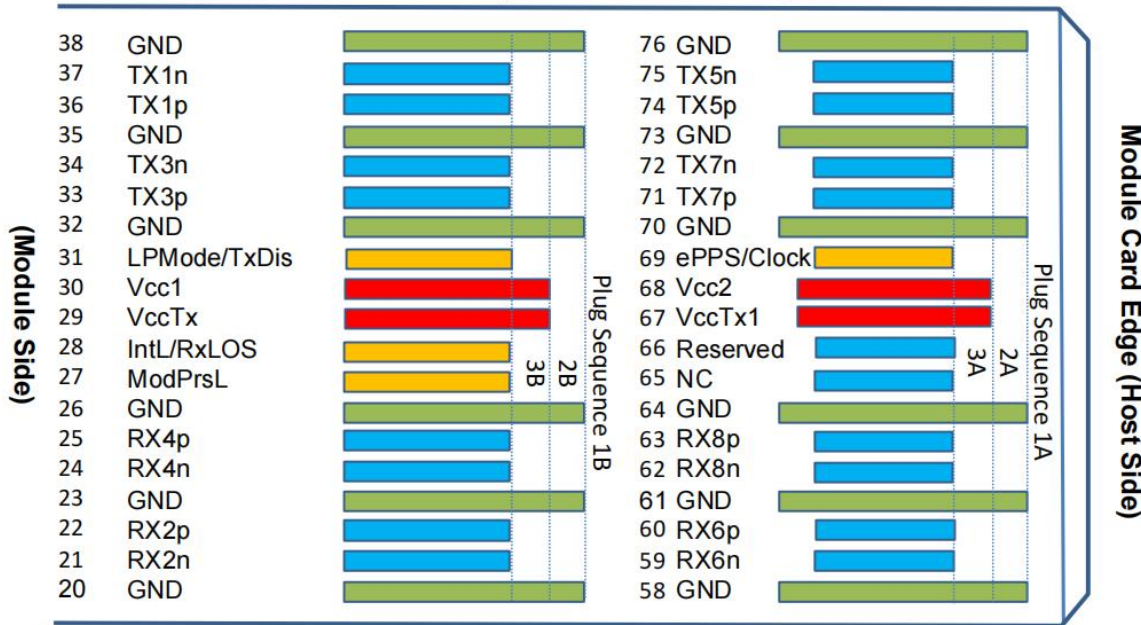
Bottom Side (viewed from bottom)



----- Module Card Edge -----

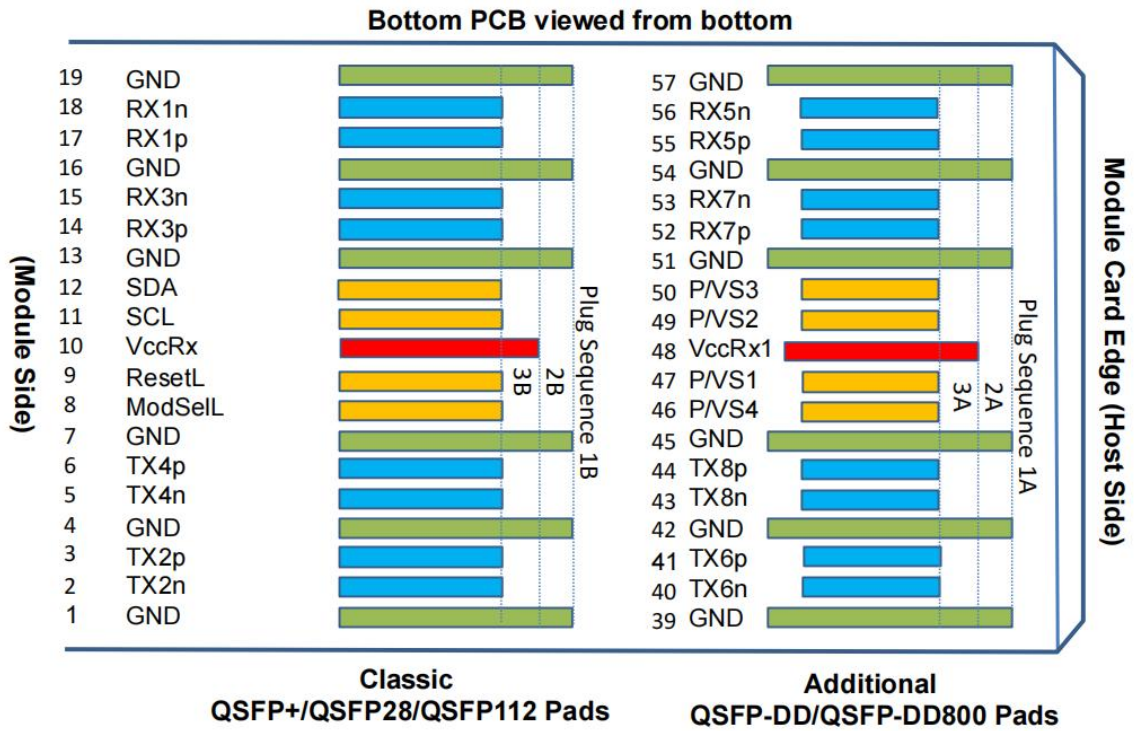
## OSFP PIN OUT

Top PCB viewed from top



(Module Side)

Module Card Edge (Host Side)



### QSFP DD PIN OUT

## Electrical Performance

#### Signal Integrity

ITEM		REQUIREMENT	TEST CONDITION
Differential Impedance	Cable Impedance	$100 \pm 5\Omega$	Rise time of 25ps (20% - 80%).
	Paddle Card Impedance	$100 \pm 10\Omega$	
	Cable Termination Impedance	$100 + 10 / - 15\Omega$	
Differential (Input/Output) Return loss $S_{DD11}/S_{DD22}$		$\text{Return\_loss}(f) \geq \begin{cases} 16.5 - 2\sqrt{f} & 0.05 \leq f < 4.1 \\ 10.66 - 14 \log_{10}(f/5.5) & 4.1 \leq f \leq 19 \end{cases}$ <p>Where  <math>f</math> is the frequency in GHz                      Return loss(f) is the return loss at frequency <math>f</math></p>	$10\text{MHz} \leq f \leq 26.5\text{GHz}$
Differential to common-mode (Input/Output) Return		$\text{Return\_loss}(f) \geq \begin{cases} 22 - 10(f/25.78) & 0.05 \leq f < 12.89 \\ 15 - (6/25.78)f & 12.89 \leq f \leq 19 \end{cases}$	$50\text{MHz} \leq f \leq 26.5\text{GHz}$

loss $S_{CD11}/S_{CD22}$	Where $f$ is the frequency in GHz $Return\_loss(f)$ is the Differential to common-mode return loss at frequency $f$	
Common-mode to Common-mode (Input/Output)Return loss $S_{CC11}/S_{CC22}$	$Return\_loss(f) \geq 2\text{dB}$ $0.05 \leq f \leq 19$ Where $f$ is the frequency in GHz $Return\_loss(f)$ is the common-mode to common-mode return loss at frequency $f$	$50\text{MHz} \leq f \leq 26.5\text{GHz}$
Differential Insertion Loss ( $S_{DD21}$ Max.)	(Differential Insertion Loss Max. For TPa to TPb Excluding Test fixture )	$50\text{MHz} \leq f \leq 26.5\text{GHz}$
	$Insertion\_loss(f) \geq -17.16\text{dB}$ $0.05 \leq f \leq 13.28\text{GHz}$  Where $f$ is the frequency in GHz Insertion Loss ( $f$ ) Differential Insertion Loss at frequency $f$	
Insertion Loss Deviation	$-0.176*f - 0.7 \leq ILD \leq 0.176*f + 0.7$	$50\text{MHz} \leq f \leq 26.56\text{GHz}$
Differential to common-mode Conversion Loss-Differential Insertion Loss ( $S_{CD21}-S_{DD21}$ )	$Conversion\_loss(f) - IL(f) \geq \begin{cases} 10 & 0.05 \leq f < 12.89 \\ 14-0.3108f & 12.89 \leq f < 26.5 \end{cases}$ 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	$50\text{MHz} \leq f \leq 26.5\text{GHz}$
[MDNEXT(multiple disturber near-end crosstalk)	$\geq 35\text{dB}$ @26.5GHz	$10\text{MHz} \leq f \leq 26.5\text{GHz}$
Intra Skew	10ps/m,	$10\text{MHz} \leq f \leq 19\text{GHz}$

## Other Electrical Performance

ITEM	REQUIREMENT	TEST CONDITON
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 voltage of 300 VDC for 1minute between adjacent terminals And between adjacent terminals and ground.

## Environment Performance

ITEM	REQUIREMENT	TEST CONDITON
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.

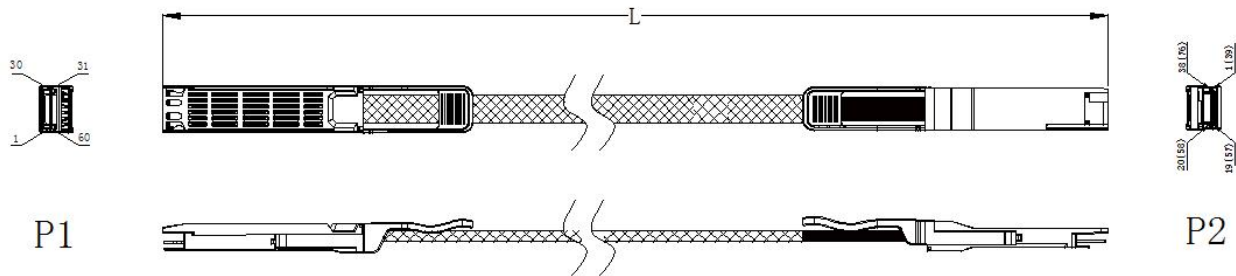
## Mechanical and Physical Characteristics

ITEM	REQUIREMENT	TEST CONDITON
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 (±90° 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	125 N Min. (OSFP) No evidence of physical damage 90N Min. (QSFP DD) No evidence of physical damage	No functional damage to module, connector, or cage with latching mechanism activated. Per OSFP _Specification_ Rev5_0 5.0 Pull on cable jacket approximately 1 ft behind cable plug. No functional damage to cable plug below 90N. Per QSFP-DD Hardware Rev 5.1
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	Clamp and shock, 3 times in 6 directions, 100g,



	Per 3.1 after stressing.	6ms. per EIA-364-27B, TC-G
Cable Plug Insertion	OSFPmodule :40N Max.(55N) QSFP-DDmodule:90N Max	Per OSFP_Specification_Rev5_0 5.0 Module to be inserted into connector and cage with latch mechanism engaged. (55N if the cage has riding heatsink) Per QSFP-DD Hardware Rev 5.1
Cable plug Extraction	OSFPmodule :30N Max. (45N) QSFP-DDmodule:50N Max.	Module to be removed from connector and cage with latching mechanism disengaged. (45N if the cage has riding heatsink) Per OSFP_Specification_Rev5_0 5.0 Place axial load on de-latch to de-latch plug, Measure without the aid of any cage kick-out springs. Place axial load on de-latch to de-latch plug. Per QSFP-DD Hardware Rev 5.1
Durability	Module:50 cycles, No evidence of physical damage	Number of cycles for an individual module, to be tested with cage, connector, and module; latches may be locked out during testing Per OSFP_Specification_Rev5_0 5.0, perform plug & unplug cycles: Plug and receptacle mate rate: 250times/hour. 50times for QSFP-DD module (CONNECTOR TO PCB) Per EIA-364-09,

## Outline drawing



PN	Data Rate	Length	Wire Gauge	Temp.Range
EOQDDP40X-330CN0	400G	0.5M	30AWG	0-70° C
EOQDDP40X-330CN1	400G	1M	30AWG	0-70° C
EOQDDP40X-330CN1.5	400G	1.5M	30AWG	0-70° C
EOQDDP40X-328CN2	400G	2M	28AWG	0-70° C
EOQDDP40X-327CN3	400G	3M	27AWG	0-70° C

## Compatibility Test

In order to ensure the product compatibility, our products will be tested on the switch before shipment. Our modules can compatible with many mainstream brand switches, such as Cisco, Juniper, Extreme, Brocade, IBM, H3C, HP, Huawei, D-Link, Mikrotik, ZTE, TP-Link...

Our test equipment: VOLKTEK MEN-4110, HP 2530-8G, CRS226-24G-25+RM, Catalyst 2960G Series, Catalyst 3850 XS 10G SFP+, Catalyst 3750-E Series, HUAWEI S5700Series, H3C S3100V2 Series, Juniper-EX4200, etc.



**Cisco Catalyst 3850**



**HUAWEI S5700**



**H3C S3100V2**



**HP J9264AR**



**Juniper EX 4200**



**Alcatel 6850E-U24X**



**Mikrotik CR5226-24G-25+RM**



**Cisco Catalyst 2960G**



**Volktek MEN-4110**



## Product Production Process

# Quality Assurance

Continuous introduction of new equipment, produced by strict standards, strict quality inspection, to guarantee the high quality standard of each product.



**Standardized  
Production Line**



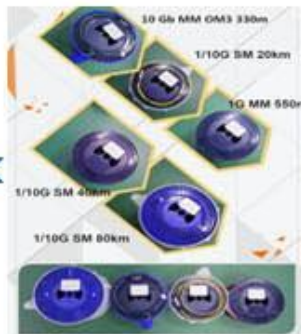
**Professional  
Welding**



**Assembling**



**Aging Testing**



**Distance Testing**



**Cleaning end face**



**Product Initial Test**



**Switch Testing**



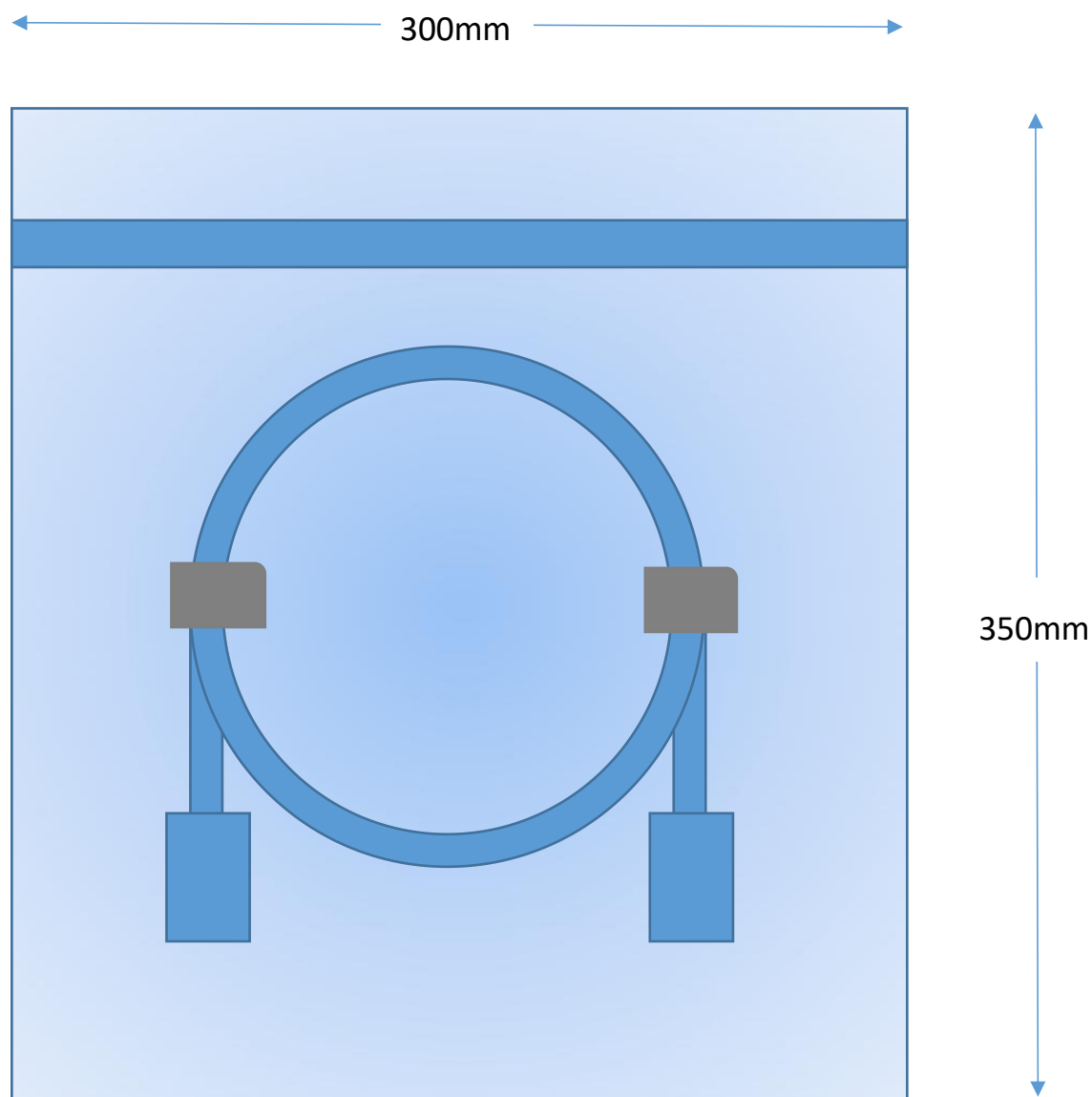
**Product Final Test**

## Packaging

Both ends of the connector use protective sleeve protection, each into a separate anti - static bag.

<=2m : 200mm\*300mm

>2m : 300mm\*400mm



Company: ETU-Link Technology Co., LTD

Address: Right side of 3rd floor, No. 102 building, Longguan expressway, Dalang street,  
Longhua District, Shenzhen city, GuangDongProvince, China

Tel: +86-755 2328 4603

Addresses and phone number also have been listed at [www.etulinktechnology.com](http://www.etulinktechnology.com).

Please e-mail us at [sales@etulinktechnology.com](mailto:sales@etulinktechnology.com) or call us for assistance.