

## Features

- Fully compliant to the latest SFP+ & QSFP MSA (Multi-Source-Agreement)
- Supports all current 10-Gigabit Ethernet and 40-Gigabit Ethernet standards
- Up to 10.3125 Gbps transfer rate per SFP+ channel (40 Gbps aggregate)
- 30 AWG to 26 AWG cable sizes available
- 100 ohm differential impedance system
- Single 3.3V power supply, low power consumption, <0.5W
- Operating case temperature: -40 to 85°C
- All-metal housing for superior EMI performance
- Precision process control for minimization of pair-to-pair skew
- AC coupling of PECL signals
- EEPROM for cable signature & system communications
- Low cross-talk and pair-to-pair skew maintains signal integrity



- Fully RoHS compliant for environmental protection

## Applications

- InfiniBand SDR, DDR, QDR
- 40G Ethernet transmission
- Fiber Channel
- Rack-to-Rack, Shelf-to-Shelf Interconnect
- Networking
- Hubs, switches, routers, servers
- Data center interconnect
- High Performance Computing application

## 1. Recommended Operation Condition

Parameter	Symbol	Min	Max	Unit
Operating Case Temperature	Topc	-40	85	°C
Relative Humidity (non-condensation)	RS	-	85	%
Supply Voltage	VCC3	3.135	3.465	V
Voltage on LVTTTL Input	Vi lvttl	-0.3	VCC3 +0.2	V
Power Supply Current	ICC3	70	-	mA
Total Power Consumption	Pd	-	0.5	W

## 2. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	Tst	-40	125	°C
Relative Humidity (non-condensation)	RS	-	85	%
Operating Case Temperature	Topc	-40	85	°C
Supply Voltage	VCC3	-0.3	3.6	V
Voltage on LVTTL Input	Vi lvttl	-0.3	VCC3 +0.2	V

**Note:** Stress or conditions exceed the above range may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those listed in the operational sections of this specification is not applied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## 3. QSFP+ Module Electrical Characteristics per SFF-8436

Parameters	Min	Typ	Max	Units
<b>QSFP+ Input electrical characteristics per lane</b>				
Single-ended input voltage tolerance	-0.3		4.0	V
SDD11-Differential input return loss	(note 1)			dB
SCD11 -Differential to common-mode input return loss	(note 2)			dB
<b>QSFP+ Output electrical characteristics per lane</b>				
Single-ended output voltage	-0.3		4.0	V
SDD22 - Differential output return loss	(note 1)			dB
SCC22 - Common-mode output return loss	(note 3)			dB

### Notes:

1. SDD11/SDD22 differential return loss is measured at TP1 and TP4 as:  $\{-12+2*\text{SQRT}(f) @ 0.01 \text{ to } 4.1\text{GHz} < -6.3 + 13 * \log_{10}(f/5.5), \text{ with } f \text{ in GHz ; } @4.1 \text{ to } 11.1\text{GHz}\}$
2. SCD11 measured at TP1  $> 10 \text{ dB } \{ 10\text{Mhz to } 11.1\text{GHz}\}$
3. SCC22 - Common-mode output return loss at TP4 is defined as:  $\{ 7-1.6f 0.01 < f < 2.5, 3 2.5 < f < 11.1 \}$  f is the frequency in GHz

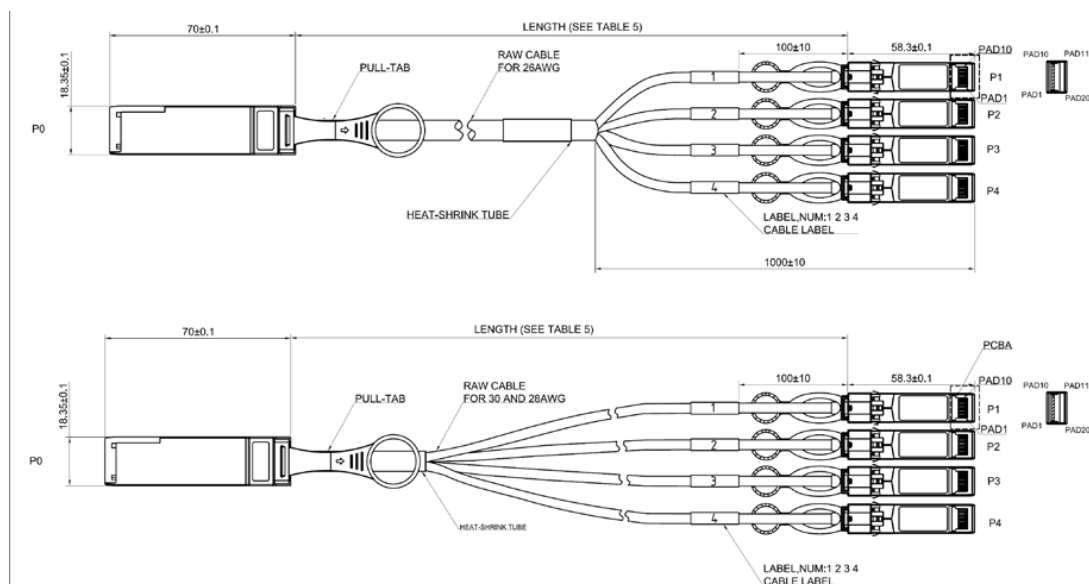
## 4. SFP+ Module Electrical Characteristics per SFF-8431

Parameters	Min	Typ	Max	Units
<b>SFP+ Input electrical characteristics per module</b>				
Single-ended input voltage tolerance	-0.3		4.0	V
Signaling rate/channel, NRZ			10.5	Gbit/s
SDD11 – differential input return loss	(note 1)			dB
SCD11- reflected differential to common mode input return loss	(note 2)			dB
<b>SFP+ Output electrical characteristics per module</b>				
Single-ended output voltage tolerance	-0.3		4	V
AC common mode output voltage			7.5	mV rms
SDD22 – differential output return loss	(note 1)			
SCC22 – Common-mode output return loss	(note 3)			dB

### Notes:

1. SDD11/SDD22 differential return loss is measured at TP1 and TP4 as:  $\{-12+2*\text{SQRT}(f) @ 0.01 \text{ to } 4.1\text{GHz} < -6.3 + 13 * \log_{10}(f/5.5), \text{ with } f \text{ in GHz} ; @4.1 \text{ to } 11.1\text{GHz}\}$
2. SCD11 measured at TP1  $> 10 \text{ dB} \{ 10\text{Mhz to } 11.1\text{GHz}\}$
3. SCC22 – Common-mode output return loss at TP4 is defined as:  $\{ 7-1.6f \text{ } 0.01 < f < 2.5, 3 \text{ } 2.5 < f < 11.1 \}$  f is the frequency in GHz

## 5. Mechanical Diagram



**Note:** External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

## 6. Ordering Information

Our 40GBase QSFP+ Multi-vendor passive DAC cables come in varying lengths and OEM connection options. To build the perfect fit for you, please view how to create your part number below.

Example:

For a **Brocade** to **Cisco** DAC measuring the length of **1m**, the part number would be as follows: Q40X10G-**BRCS**-CU-1M.

Please note that OEM abbreviations should be listed in alphabetical order.

Sample	OEM	OEM Abbreviations	Length <L>
<b>Q40X10G-XXXX-CU-&lt;L&gt;M</b>	Arista	AN	0.5m
	Brocade	BR	1m
	Cisco	CS	1.5m
	Dell	DF	2m
	Intel	IN	2.5m
	Juniper	JN	3m
	Mellanox	MX	5m
	MSA	MS	-

## 7. Contact Information

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