TITLE	DOC No.	DSPC-002294
Adapter OSFP to QSFP,	REVISION : 01	AUTHORIZED BY : Coney
	DATE : 07/31/2019	CLASSIFICATION : UNRESTRICTED

OSFP to QSFP Adapter

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1.0 SCOPE

This Product Specification covers performance of the OSFP to QSFP Adapter Module offers 400 Gigabit Ethernet transfer to 100 or 40 Gigabit Ethernet connectivity for Octal Small Form Factor Pluggable (OSFP) only. It allows smooth and cost-effective migration to 400 Gigabit Ethernet by providing an option to use lower-speed Quad Small Form-factor Pluggable (QSFP) or Enhanced Quad Small Form-factor Pluggable (QSFP+) modules in empty OSFP ports when the other end of the network is running at lower speeds.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

Product Name	Part Number
OSFP to QSFP Adapter	**P945D060*10T-1**

2.2 DIMENSIONS, MATERIS, PLATINGS AND MARKING

See Customer Drawing for information on dimensions, material, plating and marking

2.3 PIN ASSIGNMENTS

Pin assignment may vary depending on the cable assembly configuration. Different configuration will have different part numbers within the series. Refer to the appropriate cable sales drawing of the specification part number for correct pin assignment.

2.4 ADDITIONAL GENERAL SPECIFICATION

- Plug PCB:
  Material is TU883 Series
  Overall thickness of paddle PCB is 1mm over pads
  Contacts are 30u'' Min Hard Gold plated over 200u'' Min thick nickel plating
- Adapter Kit
  Back shell -Zinc die cast
  Pull / Press button – High temperature thermal plastic
  Latch - Stainless Steel
- Bulk Cable
  See Customer Drawing for information

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3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

SFF 8679 QSFP+ 4X Base Electrical Specification,

OSFP MSA OCTAL SMALL FORM FACTOR PLUGGABLE MODULE

SFF-8636 Specification for Management Interface for Cabled Environments, Rev 2.7

IEEE Std. 802.3-2012 IEEE Standard for Ethernet, Dec. 28, 2012.

IEEE Std. 802.3bj-2014 IEEE Standard for Ethernet Amendment 2: Physical Layer Specifications and Management Parameters for 100 Gb/s Operation Over Backplanes and Copper Cables, Jun. 12, 2014.

SFF-8679 Specification for QSFP28 4X Base Electrical Specification," Rev 1.7

SFF-8024 Specification for SFF Committee Cross Reference to Industry Products, Rev 3.9

SFF-8661 QSFP28 28 Gb/s 4X Pluggable Module, Rev 2.3,

SFF-8662 QSFP28 28 Gb/s 4X Connector (Style A), Rev 2.7,

SFF-8663 QSFP28 28 Gb/s Cage (Style A), Rev 1.6,

SFF-8665 QSFP28 28 Gb/s4X Pluggable Transceiver Solution (QSFP28), Rev 1.9

EIA 364 Series Electrical Connector Test Procedures Including Environmental Classifications with Test Procedure

EIA 364-1000 Environmental Test Methodology for Assessing the Performance of Electrical Connectors and Sockets Used in Controlled Environment Applications

SFF-8417 Multi Conductor Cable Flex Cycle Test Procedure

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4.0 RATINGS

ITEM	SPEC
Voltage	**30** Volts AC (RMS)/DC Max.
Current	**0.5** Amps Max
Temperature	Operating: **0°**C to **70°**C
	Storage:**-20**°C to **+80**°C
Durability	**0.76** μm Au – **100** cycles

5.0 Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	Vcc	-0.5	3.6	V	
Stroage Temperature	Ts	-20	80	℃	
Operating Humidity	RH	50	80	%	

6.0 Recommended Operating Conditions

Parameter	Type	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	Passive	Vcc	3.14	3.3	3.46	V	
Power Supply Current	Passive	Icc			1	mA	Two Side
Case Operating Temperature	Passive	Tc	0		70	℃	
Data Rate	Passive				100	Gbps	

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7.0 PERFORMANCE (MECHANICAL & ENVIRONMENTAL)

7.1 TEST GROUP 1

ITEM	TEST	TEST PROCEDURE	CONDITON	REQUIRMENT
1	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**Baseline**
2	**Durability (precondition)**	EIA-364-09 Perform plug & unplug cycles: PL2-50 times		No evidence of physical damage
3	**Temperature Life**	EIA-364-17, method A, Test Condition 3 a105°±2°C : PL2- (120 hours)	Mate	Conditioning Exposure
4	**Low Level Contact Resistance**	EIA-364-23; Apply a maximum voltage of **20** mV and a current of **100** mA.	Mated	**<10** mΩ △ max from initial
5	**Reseating**	Manually unplug & plug the connector, 3 cycles		No evidence of physical damage
6	**Low Level Contact Resistance**	EIA-364-23; Apply a maximum voltage of 20 mV and a current of 100 mA.	Mated	<**10** mΩ △max From initial

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7.2 TEST GROUP 2

ITEM	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT
1	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**Baseline**
2	**Durability (precondition)**	EIA-364-09 Perform plug & unplug cycles: PL2-**50** times		No evidence of physical damage
3	**Thermal Shock**	EIA-364-32.Test Condition I (10Cycles) PL2-**120** Hours	Mated	None
4	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**<10** mΩ △ max from initial
5	**Cyclic Temperature & Humidity**	EIA-364-31 Cycle connector between **25**°±**3**°C at 80% RH and **65**°±**3**°C at 50% RH **24** cycles. Ramp times should be 0.5 hour and dwell should be 1.0 hour	Mated	None
6	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**<10** mΩ △ max from initial
7	**Reseating**	Manually unplug & plug the connector, 3cycles		No evidence of physical damage
8	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**<10** mΩ △ max from initial

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7.3 TEST GROUP 3

ITEM	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT
1	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**PL2-baseline**
2	**Durability (precondition)**	EIA-364-09 Perform plug & unplug cycles: PL2-**50** times		No evidence of physical damage
3	**Temperature Life (Precondition)**	EIA-364-17 method A Test condition 3 at **105**°±**2**°C PL2-**72** hours	Mated	None
4	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**<10** mΩ △ max from initial
5	**Mechanical Vibration**	EIA-364-28 Test Condition VII Test Condition letter D 15 minutes in each of 3 mutually perpendicular directions. Both mating halves rigidly fixed to not contribute to relative motion of one contact against another.	Mated	Discontinuity **<1**μsec No evidence of physical damage
6	**Mechanical Shock**	EIA-364-27 Test Condition letter A **3** shocks in each axis(18) Both mating halves rigidly fixed to not contribute to relative motion of one contact against another.	Mated	Discontinuity **<1**μsec No evidence of physical damage
7	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**<10** mΩ △ max from initial

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7.4 TEST GROUP 4

ITEM	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT
1	**Dielectric Withstanding voltage**	EIA-364-20: Apply a voltage of **500** VDC for **1** minute between adjacent terminals and between adjacent terminals and ground	Mated	No disruptive discharge No leakage current in excess of 5mA
2	**Low Level Contact Resistance**	EIA-364-23 Apply a maximum voltage of **20** mV and a current of **100**mA	Mated	**baseline**
3	**Durability**	EIA-364-09 Perform plug & unplug cycles: PL2-50 times		No evidence of physical damage
4	**Low Level Contact Resistance**	EIA-364-23; Apply a maximum voltage of **20** mV and a current of **100** mA.	Mated	**<10** mΩ △ max from initial
5	**Dielectric Withstanding voltage**	EIA-364-20: Apply a voltage of **500** VDC for **1** minute between adjacent terminals and between adjacent terminals and ground	Mated	No disruptive discharge No leakage current in excess of 5mA

Note:

1. Separate set of specimens will be used to access dielectric withstanding voltage and change in low level contact resistance.
2. Dielectric withstanding voltage testing will use different contacts than those used for low level contact resistance testing

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7.5 MECHANICAL TEST GROUP 1

ITEM	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT
1	**Temperature Rise** (via current cycling)	Measure the temperature rise at the rated current after 96 hours. (45 minutes ON and 15 minutes OFF). Fixture as required.	Mated	Temperature Rise: **+30°C** maximum

7.6 MECHANICAL TEST GROUP 2

ITEM	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT
1	**Module Mate Forces** (Module only)	Mate connector at a rate of **12.7** mm per min	Mated	**40N** MAX Mating force
2	**Module Un-mate Forces** (Module only)	Un-Mate connector at a rate of **12.7** mm per min	Un-Mated	**30N** MAX Unmating force

7.7 MECHANICAL TEST GROUP 3

ITEM	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT
1	**Module Retention**	Apply force of 90N(QSFP) / 125N(OSFP) to the cable module Axial Load with latch enabled	Mated	**90N(QSFP) / 125N(OSFP)** MIN No damage

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8.0 PERFORMANCE (HIGH SPEED CHARACTERIZATION)

8.1 SIGNAL INTEGRITY REQUIREMENTS (CONNECTOR & CABLE SYSTEM, 100GBASE)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Insertion Loss (SDD21)**	Maximum insertion loss at 12.8906 GHz	IEEE 802.3bj **< 22.48dB**
2	**Insertion Loss (SDD21)**	Minimum insertion loss at 12.8906 GHz	IEEE 802.3bj **> 8dB**
3	**Differential Mode Return Loss (SDD11, SDD22)**	Frequency range 10MHz to 20GHz	IEEE 802.3bj Equation (92-27)
4	**Differential to common-mode return loss (SCD11,SCD22)**	Frequency range 10MHz to 20GHz	IEEE 802.3bj Equation (92-28)
5	**Differential to common-mode conversion loss (SCD21-SDD21)**	Frequency range 10MHz to 20GHz	IEEE 802.3bj Equation (92-29)
6	**Common-mode to common-mode return loss (SCC11,SCC22)**	Frequency range 10MHz to 20GHz	IEEE 802.3bj Equation (92-30)
7	**Cable assembly Channel Operating Margin (COM)**	COM tool for P802.3bj Draft 3.2/P802.3bm Draft 2.2 (Revision: 1.54)	**>3dB**

8.2 EEPROM INFO

See Customer drawing for information

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9.0 PACKAGING

9.1 ADAPTER ASSEMBLY

See Customer Drawing for information on packing

10.0 MODIFICATION HISTORY

Rev.	Comments	Date	Originator	Approval
01	Initial Release	08/02/2019	Stewart	Ray