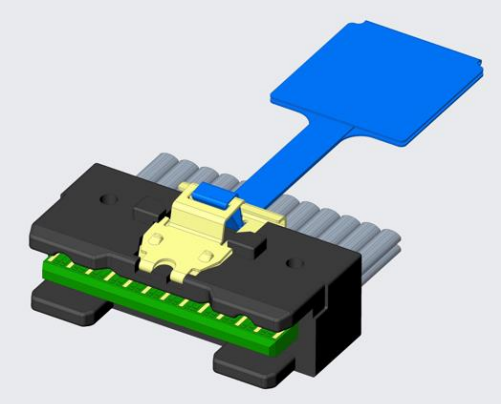
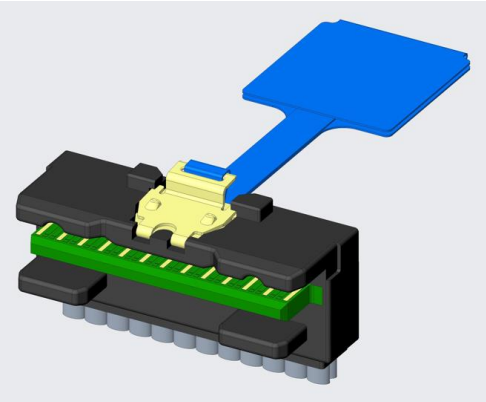
JPC
connectivity

PRODUCT SPECIFICATION

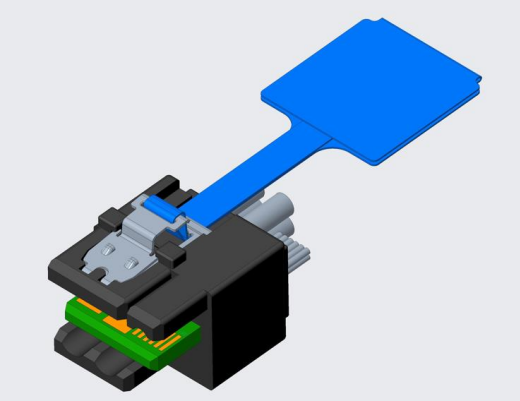
TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION：1.1	PAGE：1/15
	DATE：01/03/2024	AUTHORIZED BY：Ray



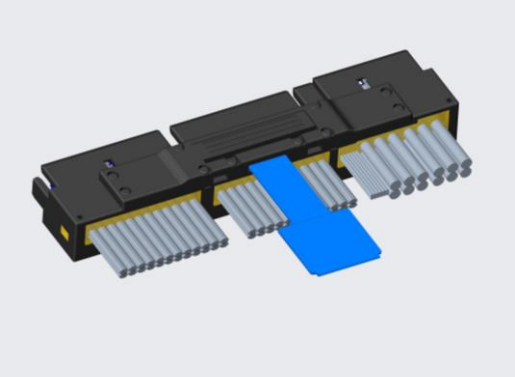
74P ST Cable Assembly



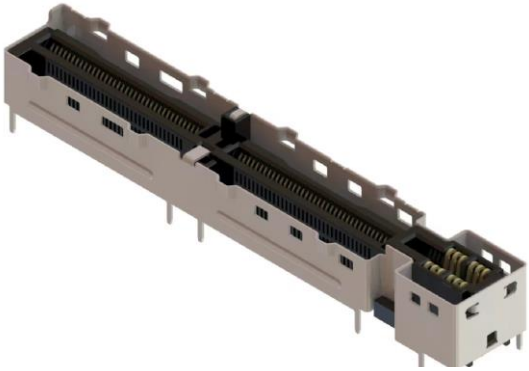
74P R/A Cable Assembly



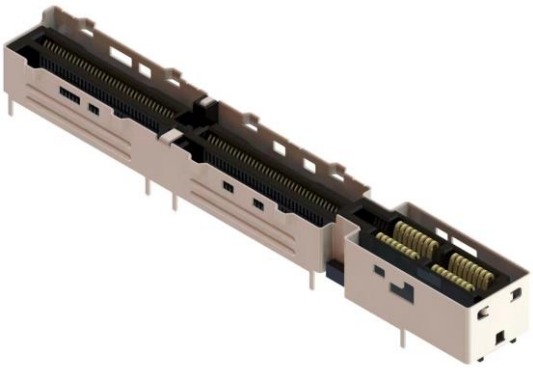
21A ST Cable Assembly



X16+55A Combo Cable Assembly



X16+21A Power Connector



X16+55A High Power Plus Connector

JPC
connectivity

PRODUCT SPECIFICATION

TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION：1.1	PAGE：2/15
	DATE：01/03/2024	AUTHORIZED BY：Ray

1.0 SCOPE

This Product Specification covers performance, test and quality requirements for the JPC Multi-Trak Cable Assembly and Connector.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

Product Name	Part Number
Multi-Trak Power Cable Ass'y	P841 series
Multi-Trak X8 74P Cable Ass'y	P842 series
Multi-Trak X16 148P Cable Ass'y	P843 series
Multi-Trak Combo X8+Power Cable Ass'y	P845 series
Multi-Trak Combo X16+Power Cable Ass'y	P846 series
Multi-Trak Connector	P947A series

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See Customer Drawing for information on dimensions, materials, platings and markings.

2.3 ADDITIONAL GENERAL SPECIFICATIONS

- Plug PCB:
  Material is Ultra Low Loss material
  Overall thickness of 1.57mm±0.15 (over pads)
- Plug Kit
  Housing : High temperature thermal plastic
  Pull Tab: Mylar
  Latch: Stainless steel
- Bulk Cable
  See Customer Drawing for information

JPC connectivity

PRODUCT SPECIFICATION

TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION：1.1	PAGE：3/15
	DATE：01/03/2024	AUTHORIZED BY：Ray

3.0 APPLICABLE DOCUMENTS

- PUBLISHED SFF-TA-1033 Rev 1.0
- CopprLink™ Internal Cable Specification for PCI Express 5.0 and 6.0 rev. 0.9
- EIA 364 Series Electrical Connector Test Procedures Including Environmental Classifications with Test Procedure

4.0 RATINGS

ITEM	SPEC
Voltage	30V DC per contact MAX
Current	0.5A per contact MAX & 10.5A for power terminal
Operating Temperature	0°C to 80°C
Storage Temperature	-20°C to 105°C
Durability	200 mating cycles

5.0 PERFORMANCE AND TEST

5.1 ELECTRICAL REQUIREMENTS

TEST	TEST PROCEDURE	REQUIREMENT
1. Low Level Contact Resistance (LLCR)	EIA-364-23 Current : 100 mA maximum Voltage : 20 mV maximum	Initial: Baseline After test: ΔR=20 milliohms maximum
2. Insulation resistance	EIA-364-21. Test voltage 100V DC. Duration: 1 minute. Measure between adjacent signal contacts.	100 MΩ min.
3. Withstanding Voltage	EIA-364-20 Apply a voltage between adjacent terminals. Voltage: 300V DC Duration: 1 minute	No defect or breakdown No disruptive discharge No leakage current in excess of 0.5mA
4. Temperature Rise for Rated Current	EIA-364-70 Measure the temperature rise at the rated current. Ambient temperature: 25℃	21A Standard version: 10.5A MAX per power pin, 0.5A MAX per signal pin. 34A High Power version: 8.5A MAX per power pin, 0.5A MAX per signal pin. 55A High Power Plus version: 27.5A MAX per power pin, 0.5A MAX per signal pin. 30℃ maximum change from initial

5.2 SIGNAL INTEGRITY REQUIREMENTS

AC Electrical Requirements for Mated Cable Assembly at 32 GT/s

Insertion Loss

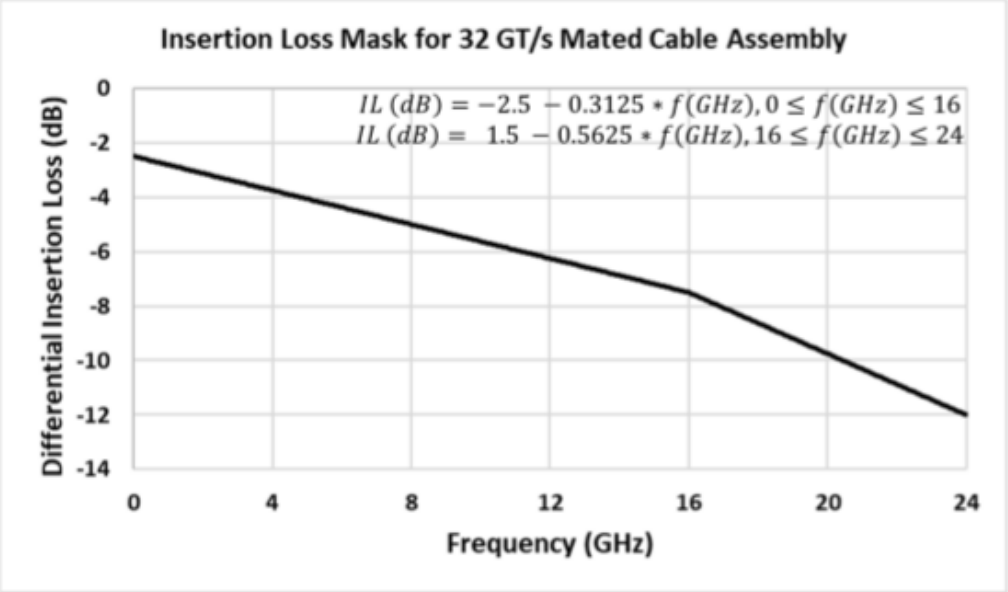


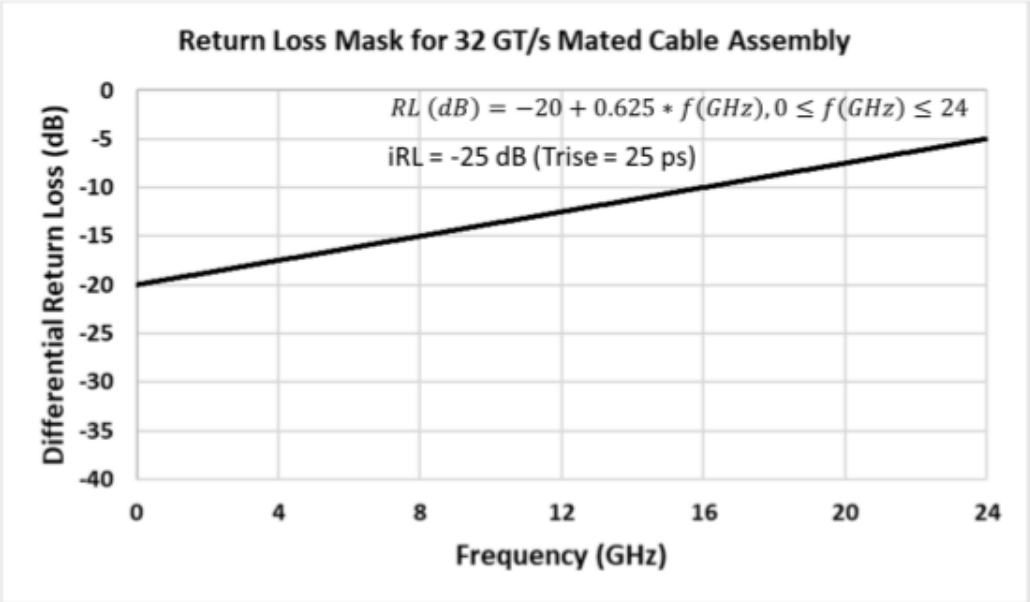
Figure 2-1 Differential Insertion Loss for PCIe 5.0 Mated Cable Assembly

Table 2-1 provides a list of maximum differential insertion loss values for 0.25m, 0.5m, 0.75m, and 1m mated cable assembly lengths at the Nyquist frequency of 16 GHz. All the values except for 1m length are informative insertion loss spec parameters.

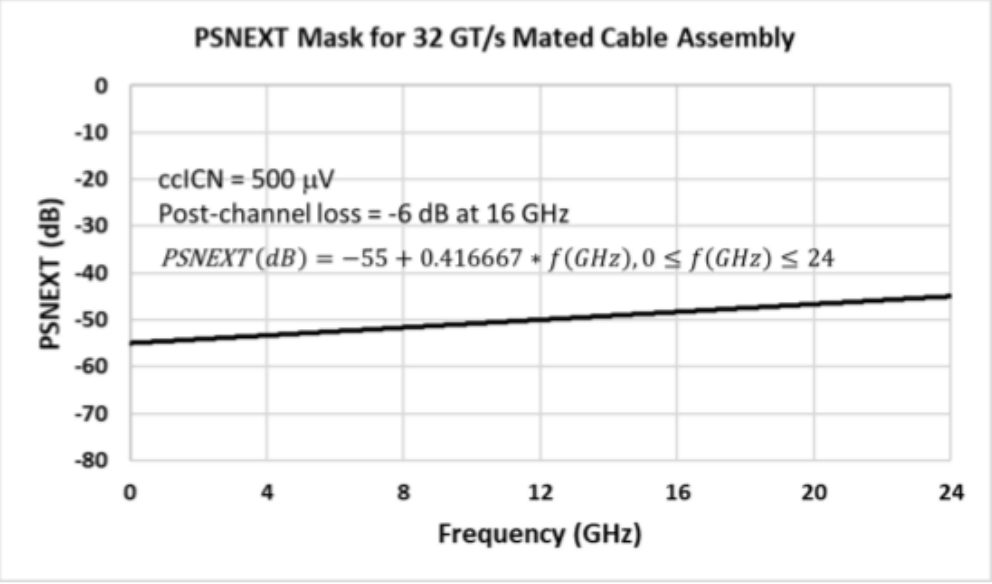
Table 2-1 Maximum differential insertion loss for PCIe 5.0 Mated Cable Assembly at 16 GHz as a function of length

Mated Cable Assembly Length (m)	Differential Insertion Loss at 16 GHz (dB)
0.25	-3.25
0.50	-4.50
0.75	-6.00
1.00	-7.50

Return Loss



Near-End Crosstalk

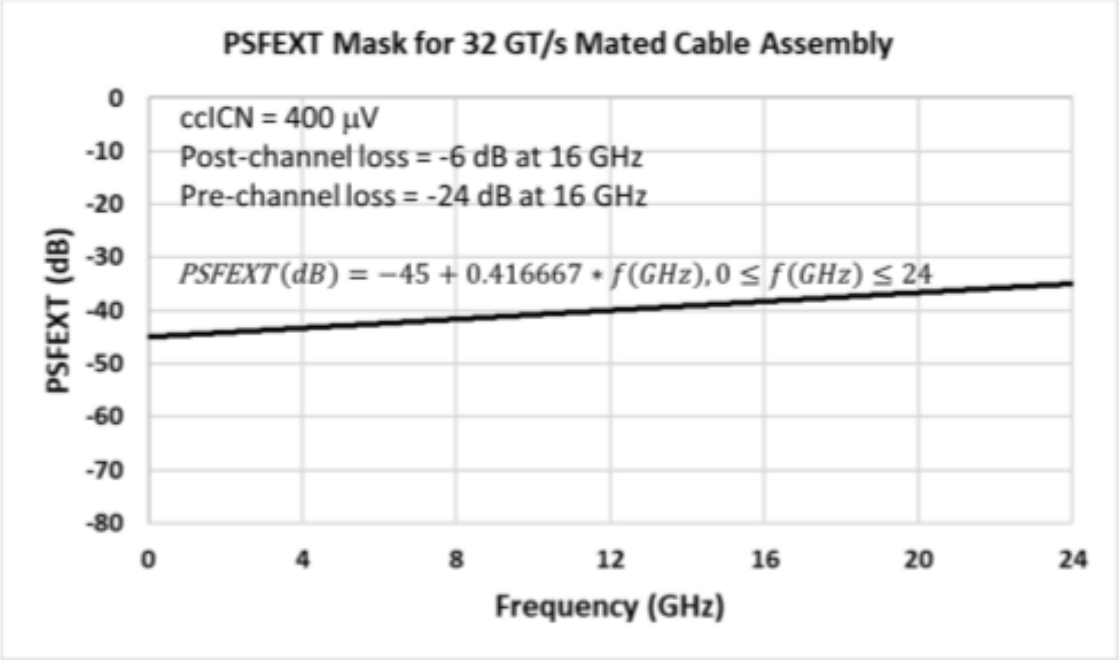


JPC connectivity

PRODUCT SPECIFICATION

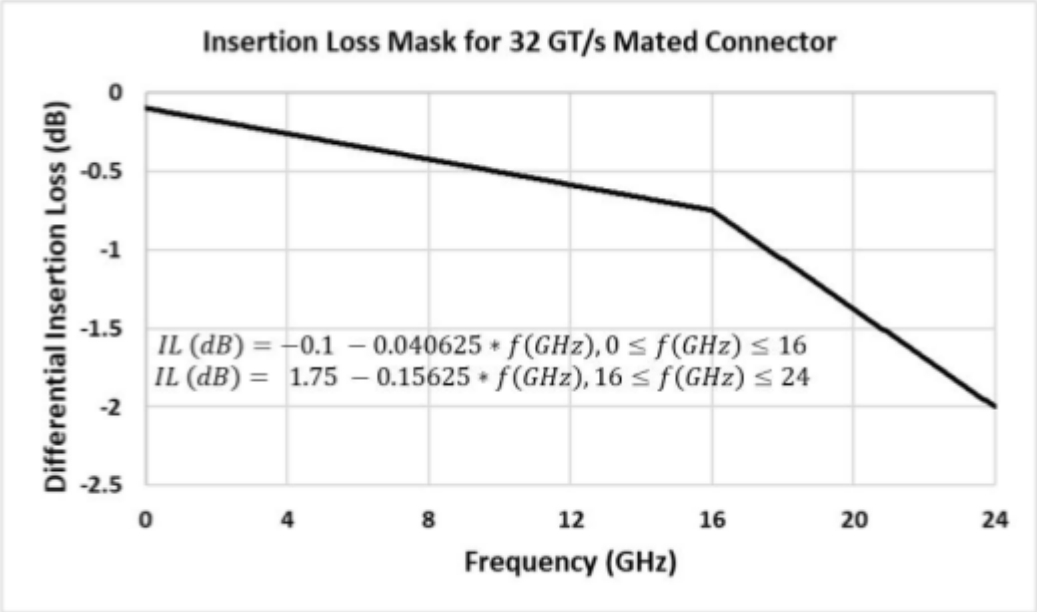
TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION : 1.1	PAGE : 7/15
	DATE : 01/03/2024	AUTHORIZED BY : Ray

Far-End Crosstalk

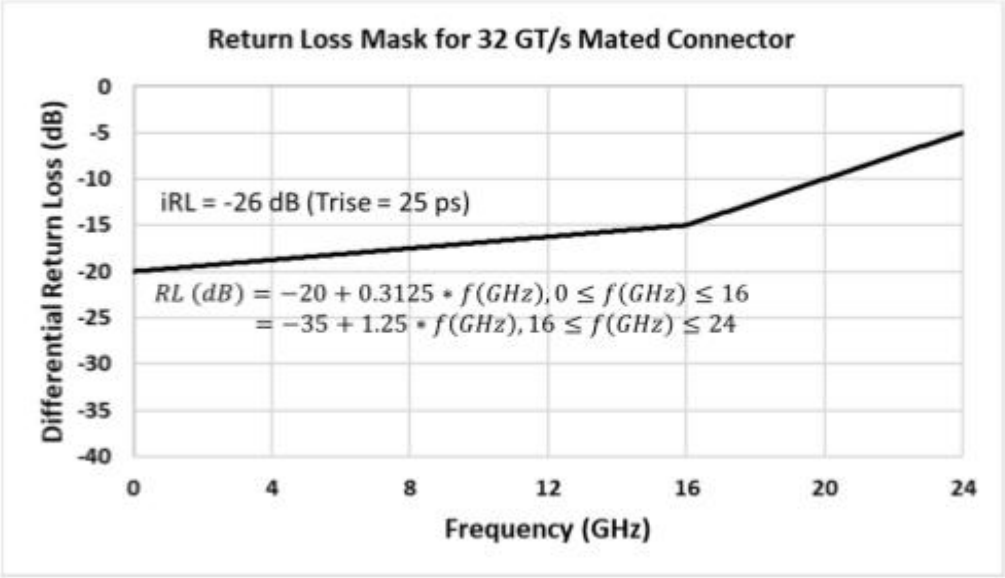


AC Electrical Requirements for Mated Cable Connector at 32 GT/s

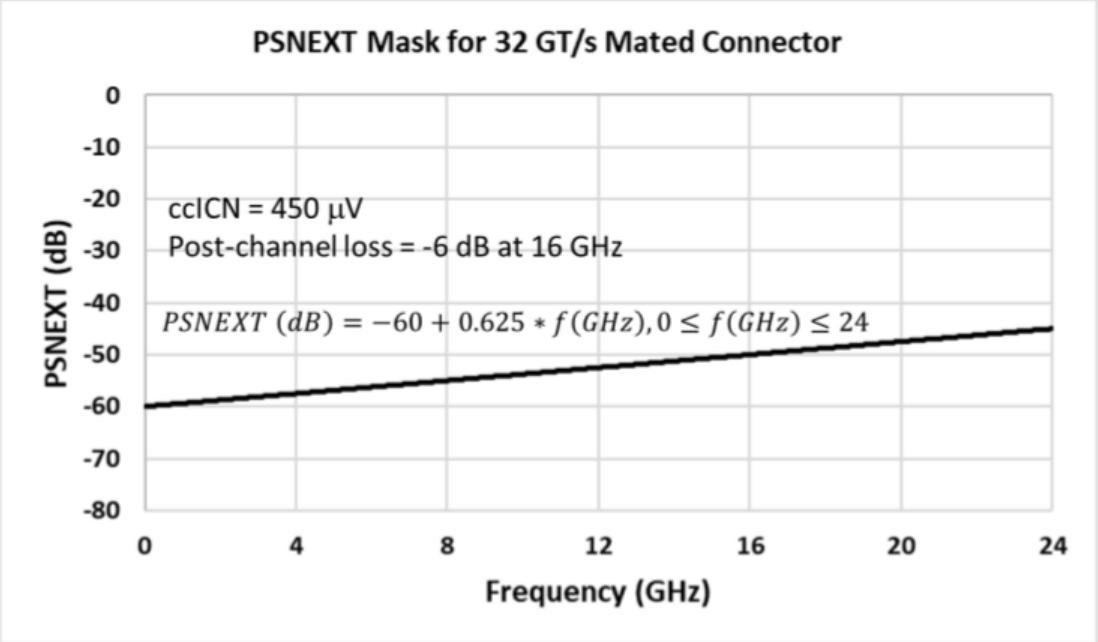
Insertion Loss



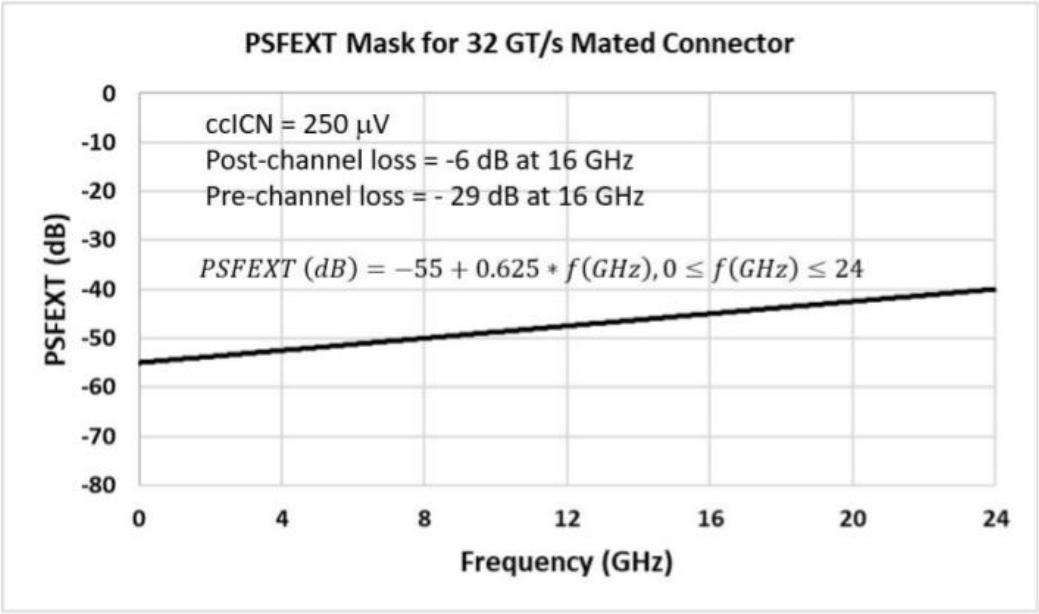
Return Loss



Near-End Crosstalk



Far-End Crosstalk



JPC connectivity

PRODUCT SPECIFICATION

TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION：1.1	PAGE：10/15
	DATE：01/03/2024	AUTHORIZED BY：Ray

5.3 MECHANICAL REQUIREMENTS

TEST	TEST PROCEDURE	REQUIREMENT
1. Durability (Pre-Conditioning)	EIA-364-09 20 un-mate/mate cycles	No evidence of physical damage.
2. Active Latch Retention Strength	EIA 364-13 Rate: 25.4 mm/minute.	50 N minimum
3. Random vibration	EIA-364-28, Test Condition VII, Condition D Subject mated specimens to 3.10 G's rms between 20-500 Hz for 15 minutes in each of 3 mutually perpendicular planes.	No Damage No discontinuity longer than 1usec allowed. 20 mΩ maximum change from initial (baseline) contact resistance
4. Mechanical shock	EIA-364-27, Test Condition H Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.	No Damage No discontinuity longer than 1usec allowed. 20 mΩ maximum change from initial (base line) contact resistance.
5. Durability	EIA-364-09 Cycle rate: 500±50 per hour Number of cycles: 200 cycles	No evidence of physical damage.
6. Contact Normal Force	EIA-364-04 Rate: 25.4 mm/minute	0.49 N (50 grams) minimum at nominal
7. Mating Force (Module only)	EIA-364-13 Rate: 25.4 mm/minute	1.1 N Max./per pair pin
8. Un-Mating Force (Module only)	EIA-364-13 Rate: 25.4 mm/minute	0.1 N Min./per pair pin
9. Wrenching strength (W/ mated Cable	Bend cable 90° at minimum bend radius. Pull in 4 axis directions for round cable. Pull in 2 axis directions	25 N minimum No discontinuity < 1 microsecond No damage to plug/ cable assembly.

Passive Latch)	for flat cable.	
10. Wrenching strength (W/ mated Cable Active Latch)	Bend cable 90° at minimum bend radius. Pull in 4 axis directions for round cable. Pull in 2 axis directions for flat cable	40 N minimum No discontinuity < 1 microsecond No damage to plug/ cable assembly.

5.4 ENVIRONMENTAL REQUIREMENTS

TEST	TEST PROCEDURE	REQUIREMENT
1. Thermal Cycling	For cable assembly, test per EIA 364-110, subject cable assemblies to 10 cycles between -40°C and 85°C, a minimum dwell of 10 minutes at extremes and a 4-6°C ramp rate	No Damage 20 mΩ maximum change from initial (baseline) contact resistance
2. Thermal shock	EIA-364-32, Method A Test condition 1 -55°C to 85°C, perform 5 cycles in mating condition	No Damage 20 mΩ maximum change from initial (baseline) contact resistance
3. Humidity/temperature cycling	For cable assembly, un-mated specimens test at 85% R.H./85°C for 168h for discrete wire only	No Damage 20 mΩ maximum change from initial (baseline) contact resistance
4. Temperature life (Preconditioning)	EIA-364-17, Method A Subject mated specimens to 105°C for 72 hours	No Damage
5. Temperature life	EIA-364-17, Method A Test Condition 2, Test Time Condition C Subject mated specimens to 105℃ for 120 hours	No Damage 20 mΩ maximum change from initial (baseline) contact resistance

JPC
connectivity

PRODUCT SPECIFICATION

TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION：1.1	PAGE：12/15
	DATE：01/03/2024	AUTHORIZED BY：Ray

6.	Salt spray	EIA-364-26B Test condition: mated connector. a.) 5±1% salt. b.) Temperature: 35±2℃. c.) Duration: 48 hours.	No evidence of physical damage LLCR Initial: baseline After test: ΔR=20 milliohms maximum
7.	Solderability	J-STD-002E Test Method A1: Temp:245℃±5∘C, Immerse and withdraw at 1mm- 5mm, per second and dwell. 95% of immersed area must show no voids or pin holes. For 5 +0/-0.5 seconds, leads and terminations shall have flux applied uniformly and to cover the surfaces to be tested.	95% of immersed area must show no voids or pin holes
8.	Mixed flowing gas (MFG)	EIA-364-65, class IIA Test condition: mated connector. RH: 70±2% Temperature: 30±1°C Cl2 : 10±3 ppb NO2 : 200±50 ppb H2S : 10±5 ppb SO2 : 100±20 ppb Duration: 7 days	No evidence of physical damage
9.	Resistance to soldering heat (Infrared reflow)	EIA-364-29 Temperature(board surface): 250 +10℃/-0℃ Duration:30~35 seconds	No evidence of physical damage
10.	Minute disturbance	Manually un-mate/mate the connector 5 cycles	No evidence of physical damage.
11.	Resistance to Soldering Heat	Refer to Section 8.0 for solder profile	No damage in appearance of connector

JPC connectivity

PRODUCT SPECIFICATION

TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION : 1.1	PAGE : 13/15
	DATE : 01/03/2024	AUTHORIZED BY : Ray

6.0 Test Sequence

Test or Examination	Test Group											
	A	B	C	D	E	F	G	H	I	J	K	L
Initial examination of product	1,10	1,9	1,10	1,8	1,5	1,8	1,3	1, 5	1,3	1,3	1,3	1,3
Low Level Contact Resistance	3,5,9	4,7	3,6,9					2, 4				
Insulation resistance				2,6								
Withstanding voltage				3,7								
Random vibration	6											
Mechanical shock	7											
Durability (Pre-conditioning)			2			2,6						
Durability					4							
Mating Force (Module only)		3										
Un-Mating Force (Module only)		8										
Active Latch Retention Strength					2							
High speed test						3,7						
Thermal shock				4								
Humidity/temperature cycling				5		4						
Temperature life		5										
Salt spray								3				
Solderability									2			
Resistance to soldering heat										2		
Temperature life (Preconditioning)	4											
Mixed flowing gas			4									
Thermal cycling			7			5						
Minute disturbance	2,8	2,6	5,8									
Temperature Rise					3							
Contact Normal Force											2	

Wrenching strength (W/mated Cable Passive Latch)							2					
Wrenching strength (W/mated Cable Active Latch)												2
Sample size	5	5	5	5	5	5	5	5	5	5	5	3

Note:

1. Test specimen: 5 PCS/ group unless otherwise specified.
2. Test specimen shall be sure to meet the drawing before the testing.
3. Connector & Cable Assembly Signal Integrity test report not specified in test sequence above but follow signal integrity requirement items.

7.0 PACKAGING

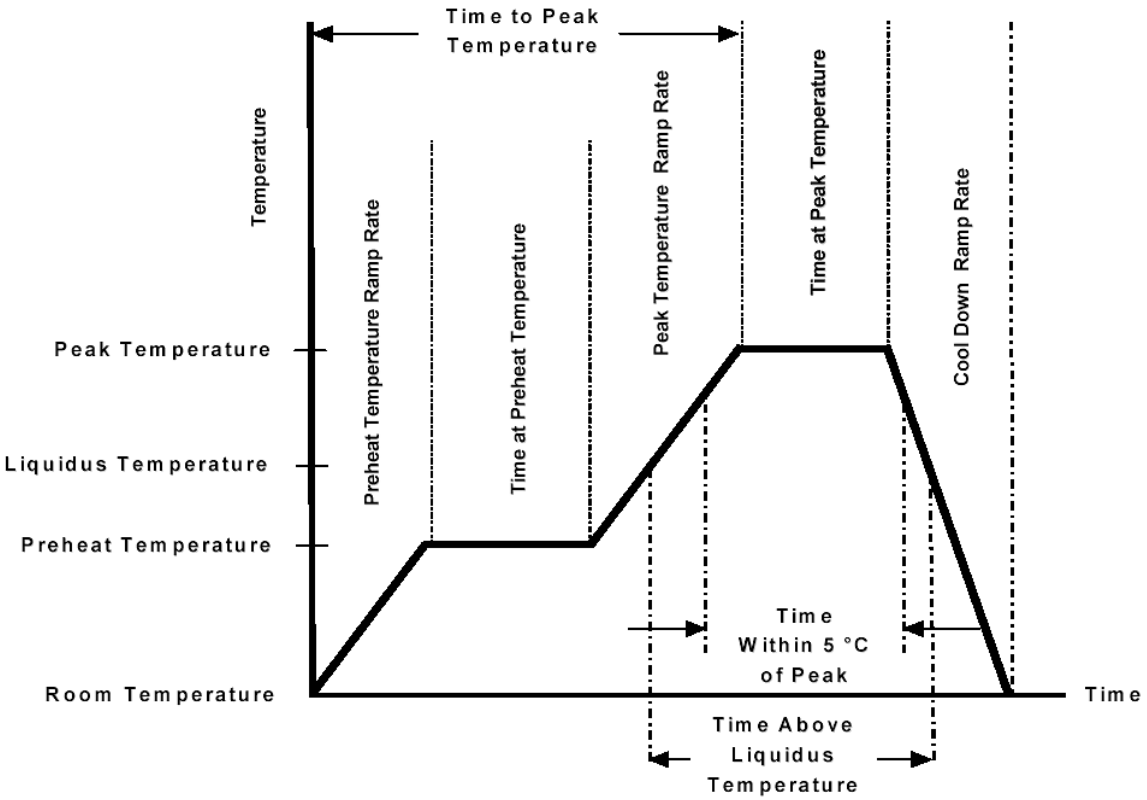
7.1 CABLE ASSEMBLY

See Customer Drawing for information on packing

7.2 Connector

See Customer Drawing for information on packing

8.0 SOLDERING PROFILE



Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquidus(217℃)	60 to 150 sec
Ramp-Cool Down	6°C/sec Max
Time 25℃ to Peak	8 min Max

JPC connectivity

PRODUCT SPECIFICATION

TITLE	DOC No.	DSPC-002401
Multi-Trak Connector & Cable Assembly (SFF-TA-1033)	REVISION： 1.1	PAGE： 16/15
	DATE： 01/03/2024	AUTHORIZED BY： Ray

9.0 REVISION RECORD

Rev.	Comments	Originator	Approval	Date
0.7	Preliminary	Albert	Ray	03/28/2023
0.9	Revised according to CopprLink Internal Cable Specification for PCI Express 5.0 and 6.0 rev 0.9	Albert	Ray	06/23/2023
0.91	Added test for connector only & SMT profile	Veera	Ray	08/30/2023
1.0	Revised according to published SFF-TA-1033 Rev 1.0 and Release	Albert	Ray	10/18/2023
1.1	Revised the title of the document (Rev 1.1)	Veera	Ray	01/03/2024