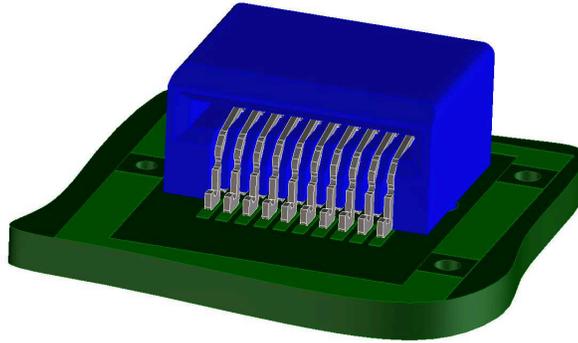




PRODUCT SPECIFICATION



zSFP+ PLUGGABLE CONNECTORS

1.0 SCOPE

This specification covers the 0.80 mm (.031 inch) centerline Small Form-factor Pluggable (zSFP+) Pluggable connectors

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

Product Name

Small Form-factor Pluggable (SFP) Connector (20 ckt)

Part Number

170382 series

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See the appropriate Sales Drawing (SD-170382-001) for information on dimensions, materials, platings and markings, and footprint patterns.

2.3 SAFETY AGENCY APPROVALS

UL FILE: SUBMITTED (ECD 9/15)

CSA FILE: SUBMITTED (ECD 9/15)

2.4 PIN ASSIGNMENTS

See appropriate sales drawing for information.

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 1 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 MOLEX DOCUMENTS

SD-170382-001zSFP connector assembly
 PK-70873-1202 Packaging Specification
 AS-170382-001 Application Specification

3.2 INDUSTRY DOCUMENTS

EIA 364 Series Electrical Connector Test Procedures Including Environmental Classifications with Test Procedures
 EIA 364-1000 Environmental Test Methodology for Assessing the Performance of Connectors and Sockets Used in Business Office Applications

4.0 RATINGS

4.1 VOLTAGE

30 Volts AC (RMS)/DC Max.

4.2 CURRENT

TBD

4.3 TEMPERATURE

Operating: - 40°C to + 85°C
 Nonoperating: - 55°C to + 105°C

4.4 DURABILITY

250 cycles

5.0 QUALIFICATION

Laboratory condition and sample selection are in accordance with EIA 364-1000

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 2 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

6.0 PERFORMANCE

6.1 TEST GROUP 1: TEMPERATURE LIFE

STEP	DESCRIPTION	TEST CONDITION	ACTUAL	RESULT
1	Low Level Contact Resistance (Includes bulk resistance)	EIA-364-23 9 connectors tested (INITIAL)	Min 6.67 Max 14.37 Avg 8.68	PASS
2	Durability (Preconditioning)	EIA-364-09 (Perform 50 Cycles)	Min -1.04 Max 0.95 Avg -0.10	PASS
3	Temperature Life	EIA-364-17 Method A 115°C, for 432 hours.	Min -1.92 Max 0.50 Avg -0.40	PASS
5	Reseating	Manually plug/unplug the connector 3 cycles	Min -0.74 Max 1.88 Avg 0.38	PASS

6.2 TEST GROUP 2: THERMAL SHOCK /CYCLIC HUMIDITY

STEP	DESCRIPTION	TEST CONDITION	ACTUAL	RESULT
1	Low Level Contact Resistance (Includes bulk resistance)	EIA-364-23 (INITIAL)	Min 6.47 Avg 8.38	PASS
2	Durability (Preconditioning)	EIA-364-09 (Perform 20 Cycles)	Min -0.87 Max 1.76 Avg -0.17	PASS
3	Shock (Thermal)	EIA-364-32 Test Condition I (10 cycles with the exception of exposure times).	Min -0.98 Max 0.55 Avg -0.25	PASS
4	Cyclic Temperature and Humidity	EIA-364-31 Cycle the connector at between 25°C±3°C at 80% RH and 65°C±3°C at 50% RH. Ramp times should be 0.5 hour and dwell should be 1.0 hour	Min -1.13 Max 0.05 Avg-0.45	PASS
5	Reseating	Manually plug/unplug the connector 3 cycles	Min -0.83 Max 4.27 Avg 0.23	PASS

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 3 of 18
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DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS
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PRODUCT SPECIFICATION

6.3 TEST GROUP 3: VIBRATION

STEP	DESCRIPTION	TEST CONDITION	ACTUAL	RESULT
1	Low Level Contact Resistance (Includes bulk resistance)	EIA-364-23 6 connectors tested (INITIAL)	Min 6.47 Max 14.97 Avg 8.87	PASS
2	Durability (Preconditioning)	EIA-364-09 (Perform 20 Cycles)	Min -1.01 Max 0.66 Avg -0.21	PASS
3	Temperature Life	EIA-364-17 Method A 115°C, for 192 hours.	Min -1.16 Max 0.61 Avg -0.32	PASS
5	Vibration	Mate connectors and vibrate per EIA 364-28, test condition VII, Test condition D 15 minutes in each of three mutually perpendicular directions.	Min -0.91 Max 0.68 Avg -0.27	PASS

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 4 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

6.4 TEST GROUP 4: ENVIRONMENTAL TESTING N=1000

STEP	DESCRIPTION	TEST CONDITION	ACTUAL	RESULT
1	Low Level Contact Resistance (Includes bulk resistance)	EIA-364-23 (INITIAL)	Min 5.85 Max 14.11 Avg 8.15	PASS
2	Durability (Preconditioning)	EIA-364-09 (Perform 20 Cycles)	Min -4.85 Max 3.03 Avg -0.04	PASS
3	Temperature Life	EIA-364-17 Method A 115°C, for 192 hours.	Min -3.54 Max 1.98 Avg -0.18	PASS
4	Mixed Flowing Gas (Unmated)	EIA-364-65 Class II 20 Days	Min -4.23 Max 3.89 Avg 0.46	PASS
5	Mixed Flowing Gas (Mated)	EIA-364-65 Class II 20 Days	Min -4.79 Max 3.98 Avg 0.38	PASS
6	Thermal Disturbance	Cycle the connector between 15°C and 85°C, as measured on the part 10 cycles	Min -4.13 Max 8.52 Avg 0.41	PASS
7	Reseating	Manually plug/unplug the connector Perform 25 cycles	Min -4.03 Max 4.27 Avg 0.55	PASS

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 5 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

6.5 TEST GROUP 7: DURABILITY

STEP	DESCRIPTION	TEST CONDITION	ACTUAL	RESULT
1	Dielectric Withstanding Voltage	EIA-364-20 300 Volts AC applied between adjacent contacts for 1 minute 6 connectors tested	No breakdown or flashover	PASS
2	Low Level Contact Resistance (Includes bulk resistance)	EIA-364-23 9 connectors tested (INITIAL)	Min 6.69 Max 13.58 Avg 8.38	PASS
3	Durability (Preconditioning)	EIA-364-09 (Perform 250 Cycles) Receptacle contact interface to be 15 or 30 microinch gold Plug interface to be 30 microinch gold	Min -0.95 Max 4.49 Avg 0.09	PASS
5	Dielectric Withstanding Voltage	EIA-364-20 300 Volts AC applied between adjacent contacts for 1 minute	No breakdown or flashover	PASS

6.6 MECHANICAL TEST GROUP 1

STEP	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT	ACTUAL
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	TBD

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 6 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

6.7 MECHANICAL TEST GROUP 2

STEP	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT	ACTUAL
1	Connector Mate Forces (Module only)	Mate connector at a rate of 25 mm per min.	Mate	2.5 N / contact pair MAX insertion force	TBD
2	Connector Un-mate Forces (Module only)	Un-mate connector at a rate of 25 mm per min.	Un-mate	0.5 N / contact pair MAX withdrawal force	TBD

6.8 MECHANICAL TEST GROUP 3

STEP	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT	ACTUAL
1	Terminal Wafer Retention Force	Axial pullout force on the terminal in the housing at a rate of 25 mm (1 in) per min.		MINIMUM retention force	TBD
2	Normal Force	Apply a perpendicular force.		MINIMUM normal force	TBD

6.9 MECHANICAL TEST GROUP 4

STEP	TEST	TEST PROCEDURE	CONDITION	REQUIREMENT	ACTUAL
1	Latitudinal Load	Mate connector and load plug with latitudinal load until open circuit. See section 9.	Mated		TBD
2	Longitudinal Load	Mate connector and load plug with longitudinal load until open circuit. See section 9.	Mated		TBD

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 7 of 18
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DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS
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PRODUCT SPECIFICATION

7.0 TEST GROUP 6: SOLDERABILITY

STEP	DESCRIPTION	TEST CONDITION	REQUIREMENT	ACTUAL
1	General Examination	1 connector tested	No evidence of physical damage Passed	TBD
2	Solderability	EIA-364-52 Category 1, no steam RMA class 1 flux Immerse in molten solder at 245°C at a rate of 25.4mm per second. Solder Duration: 5 ± 0.5 seconds;	Solderable area shall have a minimum of 95% solder coverage when testing 30 random loose contacts.	TBD
3	General Examination		No evidence of physical damage	TBD
4	SMT Process Compatibility (Pb Free)	See Section 10.0 for Molex Connector Only Test Profile	Dimensional: Conformance to Sales Drawing Requirements Visual:	TBD

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 8 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

8.0 OTHER INFORMATION

8.1 MOLEX CONNECTOR ONLY TEST PROFILE



SMT Profile

Ramp-Up: Average Rate of 3° C/second max
Preheat Temperature: 150° C min. to 200° C max. for 60-180 seconds
Time maintained above: 217° C for 60-90 seconds
Peak Temperature: 260° C
Time within 5° C of actual Peak Temperature: 10-20 seconds
Ramp-Down: Average Rate of 6° C/second max
Cycle Duration, 25° C to Peak Temperature: 8 minutes maximum

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 9 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

9.0 PERFORMANCE (HIGH SPEED CHARACTERIZATION)

7.1 SIGNAL INTEGRITY REQUIREMENTS (CONNECTOR ONLY)

ITEM	TEST	TEST SPECIFICATION	REQUIREMENT	ACTUAL
1	Application Data Rate	SFF-8081	14.025 Gbps	TBD
2	Geometry Description	Connector Only Data: Includes host board SMT pads, connector, and cable assembly paddle card up to cable termination(no channel loss)	For Reference	TBD
		IEEE 802.3ba/D3.0 Data: Includes connector only model and combined HCB/MCB losses as specified in 85.10.9.1.	For Reference	TBD
3	Data Basis	Analytical Field Solutions	For Reference	Data has been compared to measured values to ensure validity

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 10 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

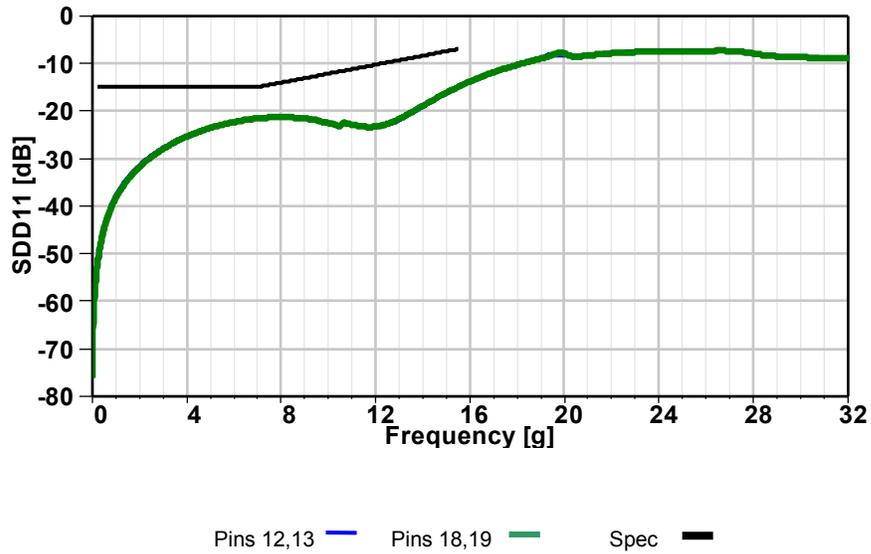
6.1 FREQUENCY DOMAIN

ITEM	DESCRIPTION	TEST SPECIFICATION	REQUIREMENT	ACTUAL
1	Differential Insertion Loss (SDDyx)	SFF-8081 Table 5-2 Connector specs de-embedded to measurement plane in Figure 5-1	$-0.5f < 7$ $0.9 - 0.2f \leq f \leq 15.5$	See Graph (Connector Only Data)
		<p style="text-align: center;">Pins 12,13 Pins 18,19 — Spec —</p>		
2	Differential Return Loss (SDDxx)	SFF-8081 Table 5-2 Connector specs de-embedded to measurement plane in Figure 5-1	$-15f < 7$ $-21.6 + 0.94f \quad 7 \leq f \leq 15.5$	See Graph (Connector Only Data)

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 11 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

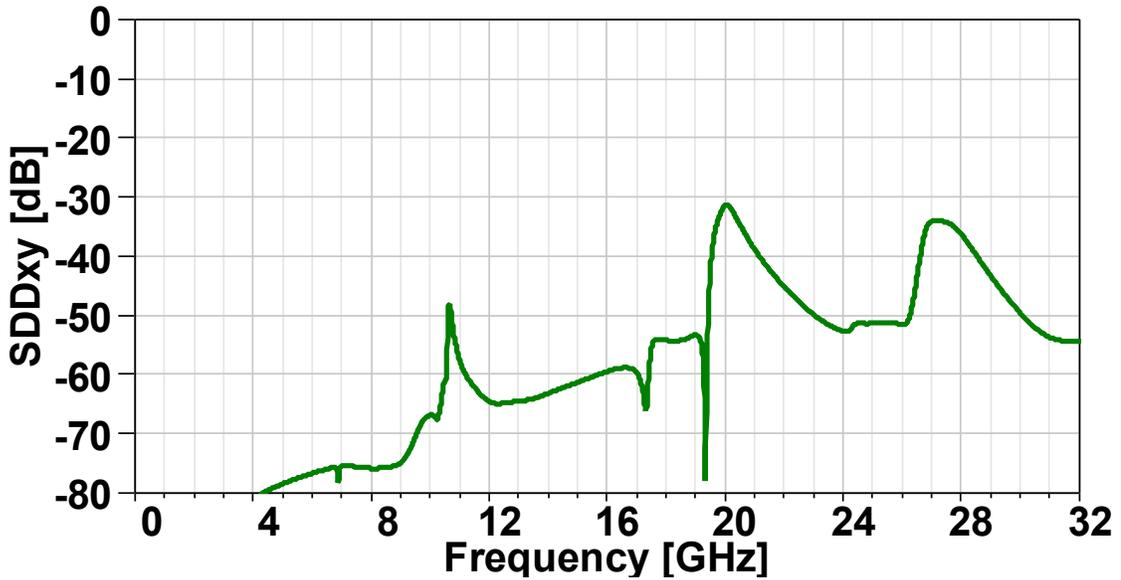


ITEM	DESCRIPTION	TEST SPECIFICATION	REQUIREMENT	ACTUAL
3	Near- End Isolation	Connector Only	For Reference	See graph
4	Near-end ICN	SFF-8081 Table 5-2 Diff Near-end Crosstalk	σ_{NEXT} 1.8 mV _{rms}	0.09 mV _{rms}
		Connector Only	σ_{NEXT} For Reference	0.11 mV _{rms}
5	Far- End Isolation	N/A; Single port 1 TX, 1 RX, no FEXT	For Reference	See Graph

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 12 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS

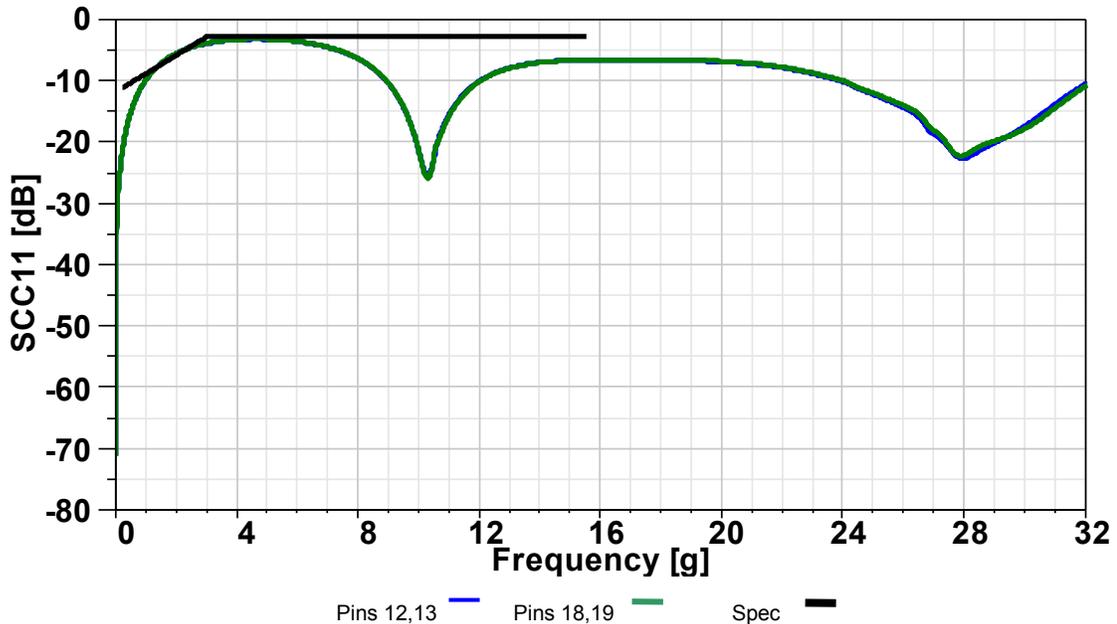


PRODUCT SPECIFICATION



6	Far-end ICN	N/A; Single port 1 TX, 1 RX, no FEXT		
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ITEM	DESCRIPTION	TEST SPECIFICATION	REQUIREMENT	ACTUAL
7	Common Mode Return Loss (SCC11)	SFF-8081 Table 5-2 Connector specs de-embedded to measurement plane in Figure 5-1	-12 + 3ff < 7 -3 7 ≤ f ≤ 15.5	See Graph (Connector Only Data)



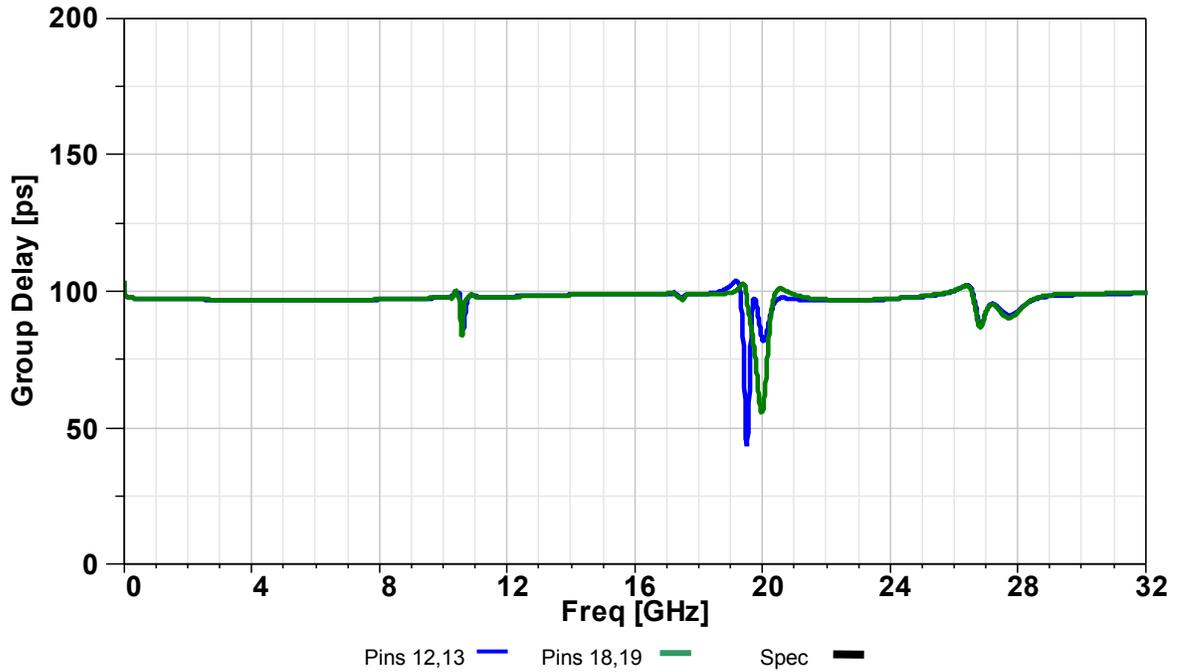
8	Group Delay	Connector Only	For Reference	See Graph
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REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 13 of 18
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DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS
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PRODUCT SPECIFICATION

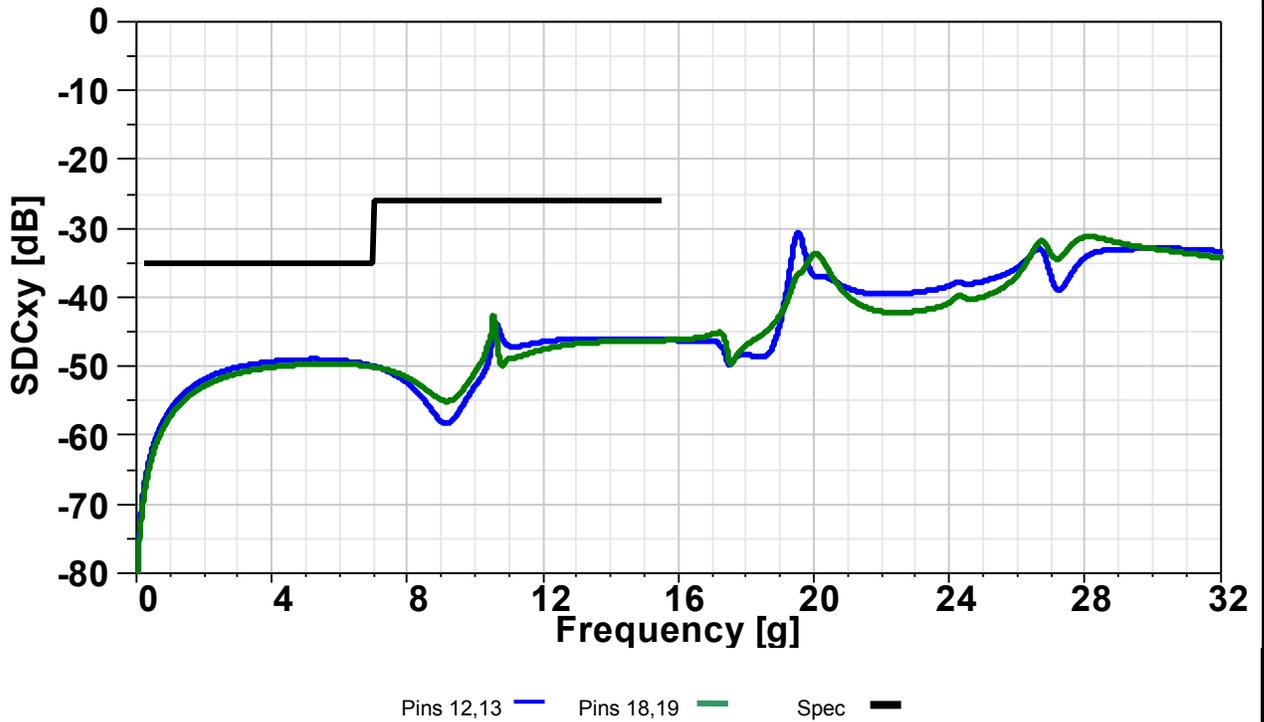


9	Through Mode Conversion	SFF-8081 Table 5-2 Connector specs de-embedded to measurement plane in Figure 5-1	-35f < 7 -26	7 ≤ f ≤ 15.5	See Graph (Connector Only Data)
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REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 14 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION



ITEM	DESCRIPTION	TEST SPECIFICATION	REQUIREMENT	ACTUAL
13	Shielding Effectiveness	None: The test was performed in the Molex stirred mode shielding effectiveness test cell. Further details available upon request.	0 - 40 GHz For Reference	See Graph
	Elastomeric Gasket Style	The device under test, DUT, included the cage, connector and cable assembly backshell, no cable. The DUT was mounted on a copper plate.		

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 15 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

6.2 TIME DOMAIN

ITEM	DESCRIPTION	TEST SPECIFICATION	REQUIREMENT	ACTUAL
1	Differential Impedance	Connector Only	For Reference at 25ps(20-80%) rise-time	See graph
2	Common Mode Impedance	Connector Only	For Reference at 25ps(20-80%) rise-time	See graph

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 16 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS



PRODUCT SPECIFICATION

10.0 PACKAGING

6.1 METHOD

6.1.1 Product shall be packaged intape and reel per the packaging specification as called out on the applicable assembly print

6.2 REQUIREMENTS

6.2.1 Packaging shall meet the requirements and be tested per Molex specification PK-70873-1201 and PK-70873-1202.

11.0 INSERTION FORCE

The following are the average insertion forces for inserting a nominal 1.0mm (.0394 inch) printed circuit board into the connector

<u>PRODUCT DESCRIPTION</u>	<u>INSERTION FORCE</u>
20 circuit SFPzSFP+	25 N (5.6 lbs)

12.0 PROCESSING GUIDELINES

PROCESSING STEP	RECOMMENDATION	COMMENTS
Resistance to Soldering Heat per Molex Document ES-40000-5013	Peak soldering temperature to be 260°C. Maximum time within 5°C of peak temperature to be 40 seconds. 3 cycle's maximum at maximum temperature.	Appearance: No physical damage.

REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 17 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS

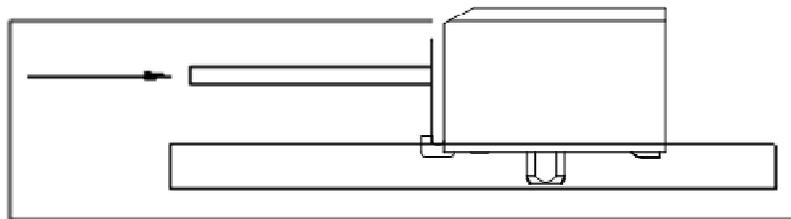
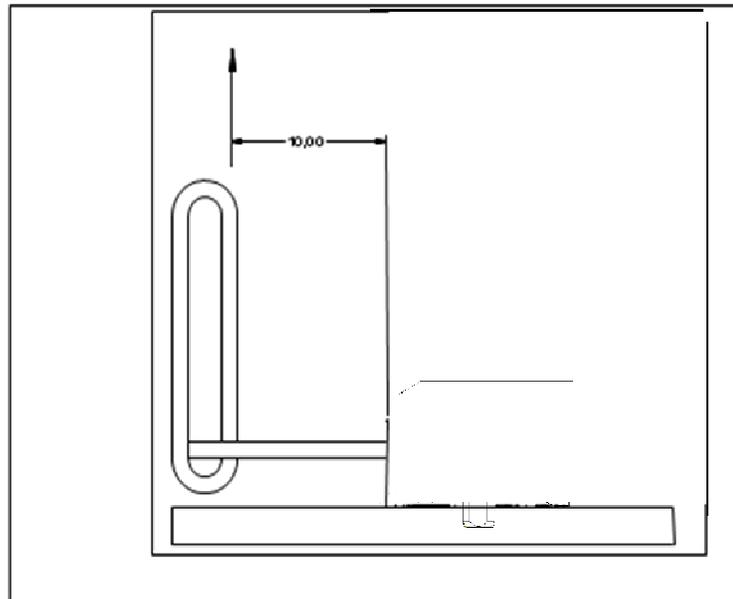


PRODUCT SPECIFICATION

1.0 GAGES AND FIXTURES

Test setup for latitudinal and longitudinal load testing and shell retention testing. Probe is about 6mm in diameter with a full radius nose. The probe is to be placed 20mm from the front edge of the receptacle and located at the centerline of the plug. Apply load to plug at a rate of 25mm per minute.

Test setup for peel and shear testing. Apply load to plug at a rate of 25mm per minute.



REVISION: 2	ECR/ECN INFORMATION: EC No: UCP2011-3337 DATE: 2011 / 05 / 12	TITLE: PRODUCT SPECIFICATION FOR zSFP+ PLUGGABLE CONNECTORS	SHEET No. 18 of 18
DOCUMENT NUMBER: PS-170382-001	CREATED / REVISED BY: GONZALEZ/JANTELEZIO	CHECKED BY: KREGNIER	APPROVED BY: MBANAKIS