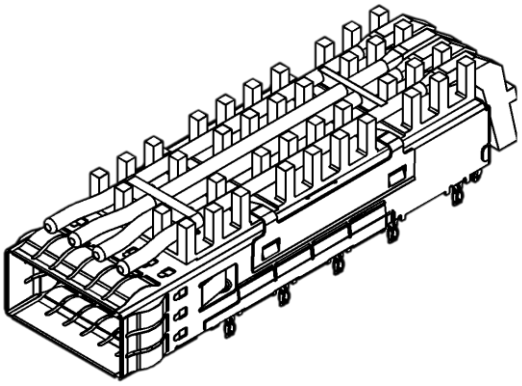
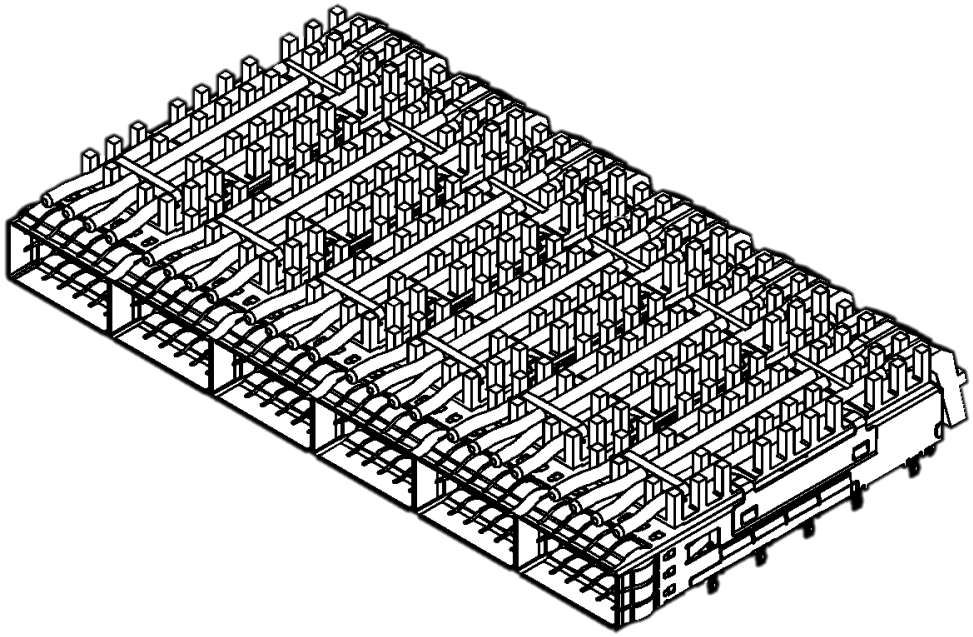
molex

PRODUCT SPECIFICATION

zQSFP+ SINGLE PORT (1X1) SHEET METAL SPRING-FINGER CAGE



THROUGH
zQSFP+ MULTI PORT (1X6) SHEET METAL SPRING-FINGER CAGE



REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
D	EC No: **636945** DATE: **2020/05/05**	**ZQSFP+ SHEET METAL SPRING-FINGER CAGES**	**1** of **13**

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
1000140001	**JEREMY TENG**	**MARSHALL CHEN**	**JASON CHIANG**

1.0 SCOPE

This Product Specification covers the zQSFP+ (Quad Small Form Factor Pluggable) 1x1 through 1x6 sheet metal spring-finger cage assemblies. The cage is connected to the host pc board by press-fit compliant legs. This product definition will cover mechanical, thermal, and EMI performance.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

Product Name: zQSFP+
Connector Series: 170432
Cage Series: 100014 (1x1), 100015 (1x2), 100016 (1x3), 100017 (1x4), 100019 (1x5) and 100086 (1x6).
Part Numbers: 100014XXXX (1x1), 100015XXXX (1x2), 100016XXXX (1x3), 100017XXXX (1x4), 100019XXXX (1x5), and 100086XXXX (1x6)

2.2 ASSEMLBY DESCRIPTION

2.2.1 Single port – Cage base attached to cage top with laser welded dovetail (hidden under panel EMI spring fingers). Panel EMI fingers attached with folded tabs. Heat sinks are captured by sink clip attached with latch tabs. Light pipes are attached with tension using post and hole design.

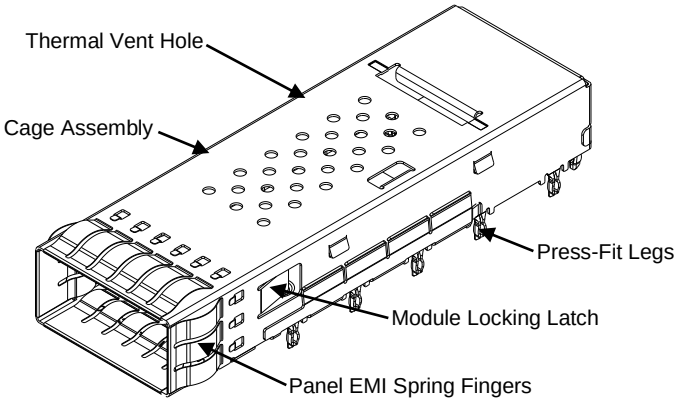
2.2.2 Multi-port – Cage base attached to cage top with laser welded dovetail (hidden under panel EMI spring fingers) and low profile tabs from the inner walls. Inner walls have a tab laser welded to the rear wall of cage top. Inner wall EMI fingers are laser welded together around inner wall. Panel EMI fingers attached with folded tabs. Heat sinks are captured by sink clip attached with latch hooks and latch tabs. Light pipes are attached with tension using post and hole design.

2.3 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

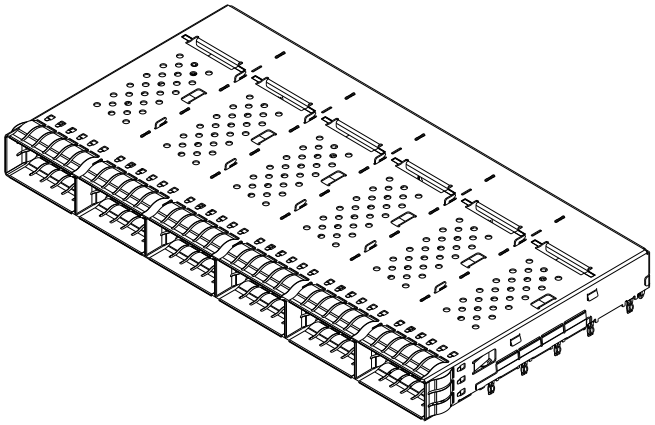
For information on single port cages refer to SD 1000141200.
For information on 2 port cages refer to SD 1000151200.
For information on 3 port cages refer to SD 1000161200.
For information on 4 port cages refer to SD 1000171200 1000171930(2D leg).
For information on 5 port cages refer to SD 1000191200.
For information on 6 port cages refer to SD 1000861200.

2.4 PRODUCT DIAMGRAMS

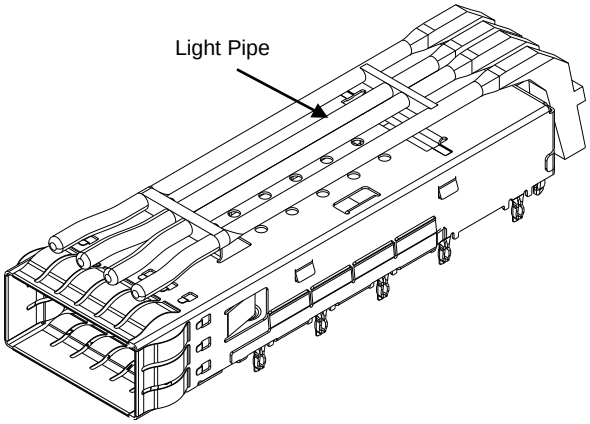
zQSFP+ Single Port Cage Assembly
Shown with optional closed top



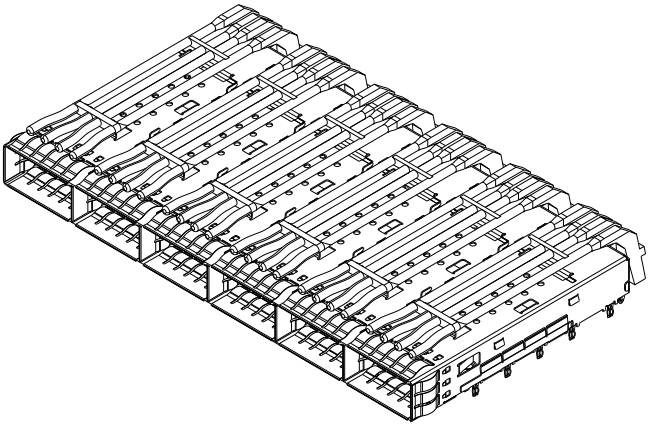
zQSFP+ 1x6 Cage Assembly
Shown with optional closed top



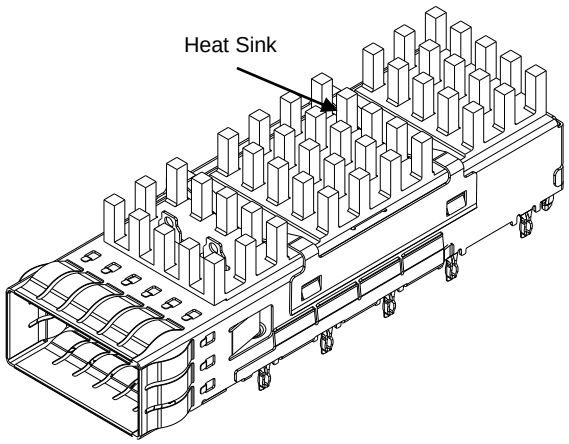
Shown with optional closed top and quad light pipe



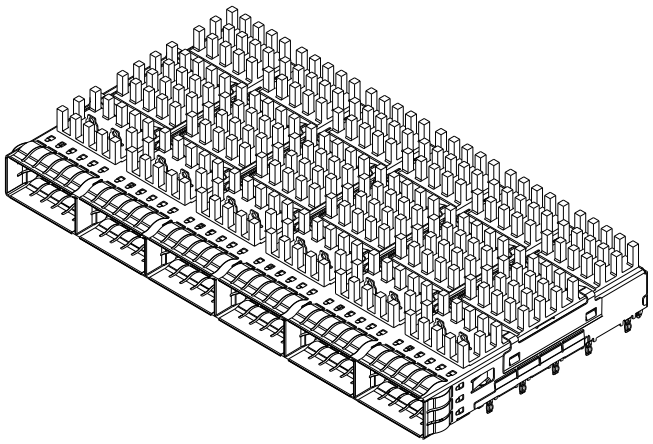
Shown with optional closed top and quad light pipe



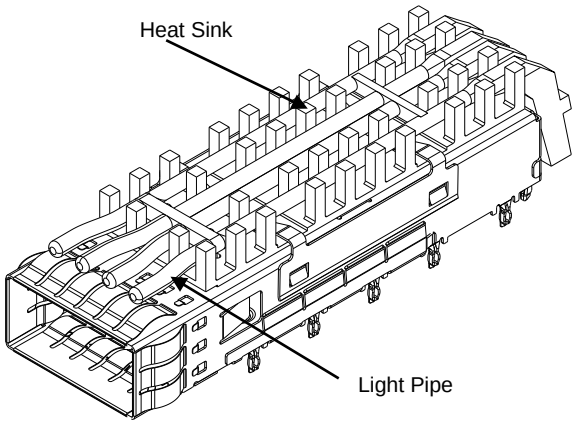
zQSFP+ Single Port Cage Assembly
Shown with optional SAN heat sink



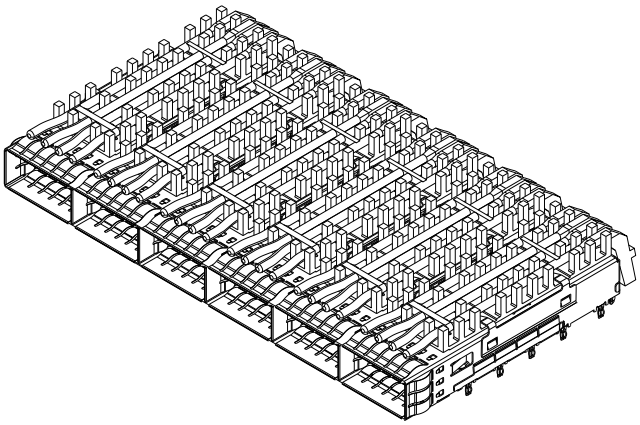
zQSFP+ 1x6 Cage Assembly
Shown with optional SAN heat sink



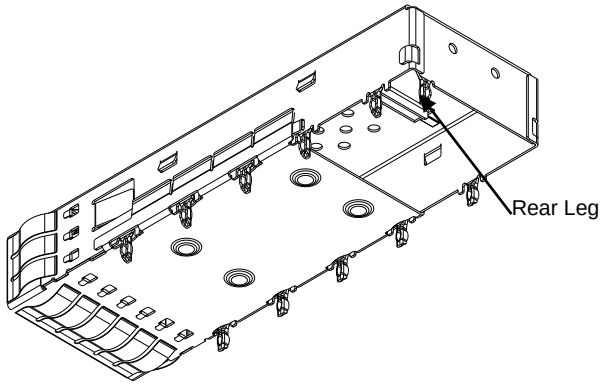
Shown with optional SAN heat sink and quad light pipe

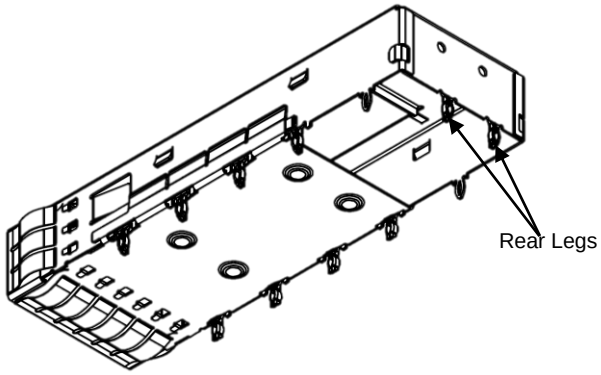


Shown with optional SAN heat sink and quad light pipe

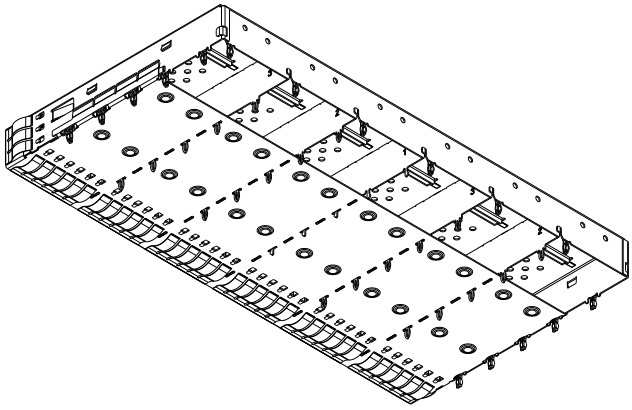


zQSFP+ Single Port Cage Assembly
Shown with optional rear press-fit legs

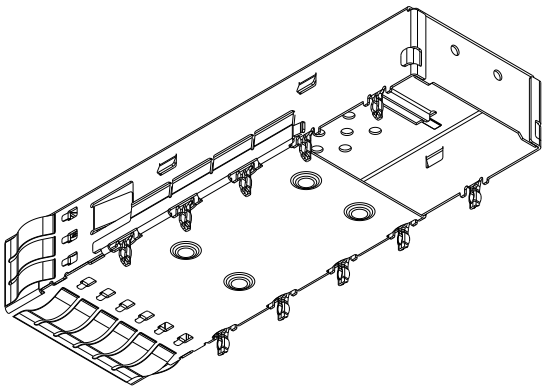




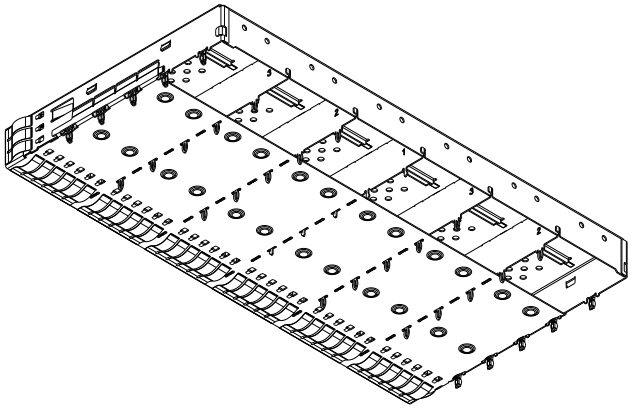
zQSFP+ 1x6 Cage Assembly
Shown with optional rear press-fit legs



Shown without optional rear press-fit legs



Shown without optional rear press-fit legs



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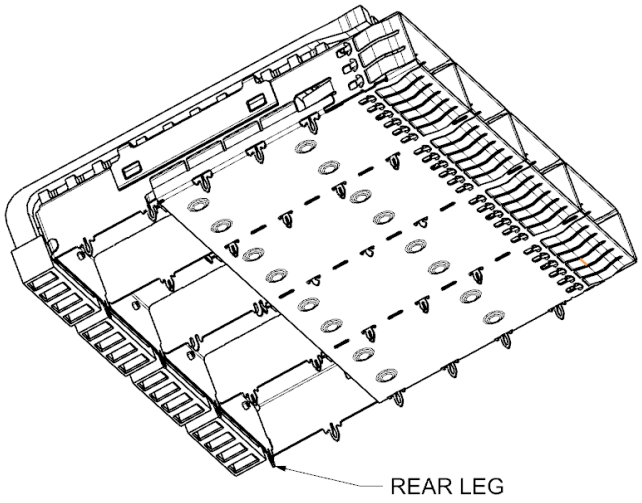
1000140001	JEREMY TENG	MARSHALL CHEN	JASON CHIANG

zQSFP+ 1x4 Cage Assembly Shown with 2D press-fit legs



3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 MOLEX DOCUMENTS

WI-HP-7-2774 Cosmetic Specification Molex HPC / HPA

3.2 INDUSTRY DOCUMENTS

SFF-8661 Specification – QSFP+ 28Gb/s 4X Pluggable Module
SFF-8662 Specification – QSFP+ 28Gb/s Connector (Style A)
SFF-8663 Specification – QSFP+ 28Gb/s Cage (Style A)
SFF-8665 Specification – QSFP+ 28Gb/s 4x Pluggable Transceiver Solution (QSFP28)

4.0 RATINGS

4.1 VOLTAGE

120 Volts AC

4.2 CURRENT

0.5 Amps Max.

4.3 TEMPERATURE

Operating: - 40°C to + 85°C
Non-operating: - 55°C to + 105°C

5.0 PERFORMANCE

5.1 MECHANICAL PERFORMANCE

	DESCRIPTION	TEST CONDITION	REQUIREMENT	RESULT
1	Random Vibration	EIA-364-28, Test Condition VII, Condition Letter D. Subject mated specimens to 3.13 G's RMS between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes. Test to include board fully populated without connectors and modules.	No components of cage assembly come apart, off, or loose.	1X1:PASS 1X2:PASS 1X3:PASS 1X4:PASS 1X5:PASS 1X6:PASS **TS 1000140006*
2	Mechanical Shock	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. Test to include board fully populated without connectors and modules.	No components of cage assembly come apart, off, or loose.	1X1:PASS 1X2:PASS 1X3:PASS 1X4:PASS 1X5:PASS 1X6:PASS **TS 1000140006*
3	Module Insertion	EIA-364-13 Measure force necessary to insert module into cage at a maximum rate of 25.4 mm per minute.	40N Max per SFF-8663	PASS **TS 1000140009*
4	Module Extraction	EIA-364-13 Measure force necessary to extract module from cage at a maximum rate of 25.4 mm per minute.	30N Max per SFF-8663	PASS **TS 1000140009*
5	Latch Retention (Latch Strength)	EIA-364-98 Apply axial load to cable assembly plugged into cage at a maximum rate of 25.4 mm per minute.	No damage to cage latch below 125N Min per SFF-8663	PASS **TS 1000140004*
6	Mate Cycling/EMI Spring Finger Retention	Insert and withdraw module into each cage port 100 cycles • 20 cycles biased up during withdrawal • 20 cycles biased down during withdrawal • 20 cycles biased left during withdrawal • 20 cycles biased right during withdrawal • 20 cycles withdrawn straight out	No damage to or loss of spring fingers below 100 cycles per SFF-8663	Single: PASS Multi: PASS **TS 1000140007*
7	Cage-Latch Intermateability	Perform test using a variety of modules from various vendors. Insert and latch module into a single port. De-latch module using de-latch pull tab and remove straight out of port. Repeat for 200 cycles using the same module in the same port.	No failures in the ability of the module to latch or de-latch in the cage port.	**TS 1000140003*

**See noted test summaries for complete test data*.

(MECHANICAL PERFORMANCE CONT'D)

	DESCRIPTION	TEST CONDITION	RESULTS
8	Cage Press-Fit (3D leg) Insertion Force into PCB	1x1 Cage (100014)	Max force: 623N (OSP) 670N (Silver) 458N (Gold)
		1x2 Cage (100015)	Max force: 528N (OSP) 610N (Silver) 448N (Gold)
		1x3 Cage (100016)	Max force: 834N (OSP) 774N (Silver) 897N (Gold)
		1x4 Cage (100017)	Max force: 1024N (OSP) 1086N (Silver) 857N (Gold)
		1x5 Cage (100019)	Max force: 1759N (OSP) 1922N (Silver) 1346N (Gold)
		1x6 Cage (100086)	Max force: 1980N (OSP) 2609N (Silver) 1757N (Gold)
	Cage Press-Fit (2D leg) Insertion Force into PCB	1x4 Cage (100017)	Max force: 1009N (Silver) 606N (Gold)

(MECHANICAL PERFORMANCE CONT'D)

	DESCRIPTION	TEST CONDITION	RESULTS
9	Cage Extraction (3D leg) Force from PCB	1x1 Cage (100014)	Min force: 227N (OSP) 218N (Silver) 151N (Gold)
		1x2 Cage (100015)	Min force: 227N (OSP) 204N (Silver) 144N (Gold)
		1x3 Cage (100016)	Min force: 256N (OSP) 290N (Silver) 269N (Gold)
		1x4 Cage (100017)	Min force: 316N (OSP) 347N (Silver) 220N (Gold)
		1x5 Cage (100019)	Min force: 495N (OSP) 523N (Silver) 365N (Gold)
		1x6 Cage (100086)	Min force: 668N (OSP) 700N (Silver) 434N (Gold)
	Cage Extraction (2D leg) Force from PCB	1x4 Cage (100017)	Min force: 359N(Silver) 214N (Gold)

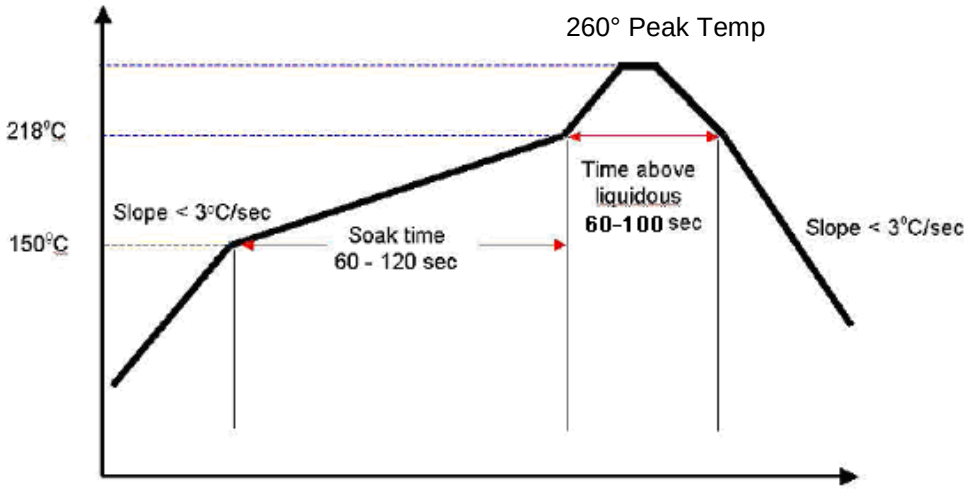
**See TS 1000140002 for complete insertion/extraction test data*

5.2 THERMAL PERFORMANCE

	DESCRIPTION	TEST CONDITION	REQUIREMENT	RESULT
10	Temperature Life/ Aging	EIA-364-17, Method A, Test Condition 4 Subject mated specimens to 105°C for 240 Hours	Show no physical damage and meet cosmetic spec WI-HP-7-2774	PASS
11	Humidity/ Temperature Cycling	EIA-364-31, Method III Cycle between 25ºC ±3ºC at 80% RH and 65ºC ±3ºC at 95% RH. Ramp times should be 0.5 hour and dwell should be 1.0 hour for 10 cycles.	Show no physical damage and meet cosmetic spec WI-HP-7-2774	PASS
12	Thermal Shock	EIA-364-32, Test Condition VII Subject specimens to 5 cycles between -55 and 105°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures	Show no physical damage and meet cosmetic spec WI-HP-7-2774	PASS
13	Resistance to Solder Heat	EIA-364-56 Subject to 4 cycles of convection solder reflow process	Show no physical damage and meet cosmetic spec WI-HP-7-2774	PASS

**See TS 1000140008 for complete thermal test data.*

Recommended Reflow Curve



Temperature vs. Time

5.3 EMI PERFORMANCE

	DESCRIPTION	TEST CONDITION
14	EMI Shielding	IEC 61000-4-21 (All Ports Populated)

Ganged Cage	FREQUENCY RANGE (GHZ)	LIMIT (dB)
1x1 zQSFP+	3 - 9	25
	9 - 35	30 – 0.578*F
	35 - 39	10
1x2 zQSFP+	2 - 35	31 – 0.5*F
	35 - 40	14
1x3 zQSFP+	2 - 15	37.3 – 1.15*F
	15 - 30	20
	30 - 34	57.5 – 1.25*F
	34 - 40	15
1x4 zQSFP+	1 – 8	37.1 – 2.1*F
	8 – 30	20
	30 – 34	57.5 – 1.25*F
	34 - 40	15
1x5 zQSFP+	1 – 8	37.1 – 2.4*F
	8 – 30	20
	30 – 34	72.5 – 1.75*F
	34 - 40	13
1x6 zQSFP+	1 – 5	43.75 – 3.75*F
	5 – 10	30 – F
	10 – 32	20
	32 - 40	52 - F

**See TS 1000140005 for complete EMI test data.*

6.0 TEST PLAN

	Group Number	A	B	C	D	E	F	G	H
	Sample Size	5	5	>5	>5	5	5	5	5
	Visual Inspection	1,4,6,8	1,4	1,4	1,3	1,4,6	1,4,6	1,4,6	1,4,6
1	Random Vibration	3							
2	Mechanical Shock	5							
3	Module Insertion		2						
4	Module Extraction		3						
5	Latch Retention (Latch Strength)		5						
6	Mate Cycling/EMI SF Retention	7				5	5	5	5
7	Cage-Latch Intermateability				2				
8	Cage Press-Fit Insertion Force			2					
9	Cage Extraction Force			3					
10	Temp Life/Aging						3		
11	Humidity/Temp Cycling							3	
12	Thermal Shock								3
13	Resistance to Solder Heat					3			
14	EMI Shielding	2,9				2,7	2,7	2,7	2,7

*Sample size depends on number of available vendor modules.

7.0 PACKAGING

7.1 Cages shall be packaged in trays to protect against damage during handling, transit and storage.

8.0 HISTORY

DATE	REV	DESCRIPTION
2016/03/25	C	INITIAL RELEASED
2019/05/15	C3	SHEET 8&9: ADDED THE 1X4 2D LEG INSERTION AND EXTRACTION FORCE
2020/05/05	D	SHEET 9 AND 10: UPDATE INSERTION FORCE AND EXTRACTION FORCE