EPC SPACE Qualification MIL-PRF-38535 EQUIVALENT

Wafer Lot Acceptance				
Sub Group	**MIL-STD-883 Test Method**	**Test**	**Class V (S)**	**Class Q (B)**
1	Static @ 25ºC	Wafer Probe	100%	
2	2018	SEM Inspection	2 Wafers each Lot 10(0) die	
3	1005	a. Steady-state life test (QCI life test coverage), 1,000 hours HTRB at 125ºC (Note 1) b. End-point electrical parameters	44 (0)	

Test/Inspection	Screening Class Level			
	Mil-STD-883 Test Method	**Class V (S)**	**Class Q (B)**	**COTS**
Internal visual inspection (pre-seal)	2010 (Note 2)	100% Cond A	100% Cond B	AQL Cond. B
Temperature cycling	1010, condition C (alternate) 20 cycles, -55ºC to 150ºC	100%	100%	-
Particle impact noise detection (PIND)	2020, condition A	100%	-	-
Constant acceleration	2001, condition E 30KG, Y1 orientation for 1 min.	100%	100%	-
Serialization & Case Mark (lot ID)	Refer to marking drawing	100%	100%	-
Pre burn-in electrical parameter 25ºC	Read & Record	100%	100%	-
Burn-in (dynamic)	1015, condition D, at 125ºC	100% 240Hours	-	-
Post burn-in (interim) electrical Parameters 25ºC	Test within 96 hours, Read & Record w/ Delta's, PDA limit 5% (3% functional parameters)	100%	-	-
Burn-in (static HTRB)	1015, condition A, at 125C	100% 160 Hours	100% 160 Hours	-
Post burn-in (final) electrical parameter 25ºC	Test within 96 hours, Read & Record w/ Delta's, combined PDA limit 5% (3% functional parameters for class S)	100%	100%	-
Out of family	Remove all outliers	100%	-	-
Post burn-in (final) DC and AC electrical parameter 25ºC,125ºC and -55ºC	Read & Record	100%	100%	AQL
Hermetic seal test (gross / fine leak)	1014	100%	100%	-
Radiography	2012, 2 views	100%	-	AQL
Lead tinning	SnPb base solder	100%	100%	100%
Hermetic seal test (gross / fine leak)	1014	100%	100%	-
Electrical test, Go-no-go @ 25ºC		100%	100%	100%
External visual inspection	2009	100%	100%	-
QCI (TM5005) & Lot acceptance review	Plant clearance - hold inspection lot	100%	100%	100%
Packaging and labeling	ESD Caution apply	100%	100%	100%

MIL-PRF-38535 Quality Conformance Inspection Group A Testing				
Sub Group	**MIL-STD-883 Test Method**	**Test**	**Class V (S)**	**Class Q (B)**
1		ATE Static tests at +25°C	116 (0)	116 (0)
2		ATE Static tests at +125°C	116 (0)	116 (0)
3		ATE Static tests at - 45°C	116 (0)	116 (0)
4	3003	ATE Dynamic tests at +25°C	116 (0)	116 (0)
5	3003	ATE Dynamic tests at +125°C	116 (0)	116 (0)
6	3003	ATE Dynamic tests at -45°C	116 (0)	116 (0)
7	3009	ATE Functional tests at +25°C	116 (0)	116 (0)
8	3009	ATE Functional tests at +125°C	116 (0)	116 (0)
9	3009	ATE Functional tests at -45°C	116 (0)	116 (0)
10	3004	ATE Switching tests at +25°C	116 (0)	116 (0)
11	3004	ATE Switching tests at +125°C	116 (0)	116 (0)
12	3004	ATE Switching tests at -45°C	116 (0)	116 (0)

MIL-PRF-38535 Quality Conformance Inspection Group B Testing				
Sub Group	**MIL-STD-883 Test Method**	**Test**	**Class V (S)**	**Class Q (B)**
1	2016	a. Physical dimensions	3 (0)	-
	1018	b. Internal water vapor (cavity packages), 5,000 ppm max.	3 (0) or 5 (1)	-
	2015	a. Resistance to solvents	N.A Laser Mark	N.A Laser Mark
2	2030 or 2011	c. Flip chip t pull off test	2 (0)	2 (0)
	2019 or 2027	d. Flip Ship die shear strength	3 (0)	Group 5 3 (0)
3	2003	Solderability, steam age (8 hours), solder temp 245C +/-5C	22 (0) Leads from 3 devices	23 (0) Leads from 3 devices
4	JESD22-B1117	-	Ball Shear test for BGA	-
5	1005	a. Steady-state life test	45 (0)	-
		Alternate: 340 hours burn-in w/ life test coverage @WLA	22 (0)	-
		b. End-point electrical parameters		
6	1010	a. Temperature Cycling, cond. C, 100 cycles, -55ºC to 150ºC	15 (0)	-
	2001	b. Acceleration, cond. E, 30KG, Y1 orientation for 1 min.		-
	1014	c. Seal (fine and gross)		-
	Part spec.	d. End-point electrical parameters		-

MIL-PRF-38535 Quality Conformance Inspection Group C Testing				
Sub Group	**MIL-STD-883 Test Method**	**Test**	**Class V (S)**	**Class Q (B)**
1	1005	a. Steady-state life test (QCI life test coverage), 1,000 hours HTRB at 125ºC b. End-point electrical parameters	45 (0)	45 (0)

MIL-PRF-38535 Quality Conformance Inspection Group D Testing				
Sub Group	**MIL-STD-883 Test Method**	**Test**	**Class V (S)**	**Class Q (B)**
1	2016	Physical dimensions	15 (0)	15 (0)
2	JESD22-B117	Ball Shear Test	45 balls from 2 devices min	45 balls from 2 devices min
	1014	Seal (fine and gross)		
3	1011	Thermal Shock, cond. B, 15 cycles, -15ºC to 125ºC	15 (0)	15 (0)
	1010	Temperature Cycling, cond. C, 100 cycles, -55ºC to 150ºC		
	1004	Moisture resistance		
	1004/1010	Visual (3X magnification)		
	1014	Seal (fine and gross)		
	Part spec.	End-point electrical parameters, < 48hours from moisture resistance		
4	2002	Shock, cond. B, 1500G, 0.5ms, 5 shocks in each x, y, z axis	15 (0)	15 (0)
	2007	Vibration, cond. A, variable frequency, in each x y, z axis		
	2001	Acceleration, cond. E, 30KG, Y1 orientation for 1 min.		
	1014	Seal (fine and gross)		
	2007	Visual (3X magnification)		
	Part spec.	End-point electrical parameters		
5	1009	Salt atmosphere, cond. A, pH level 6.5-7.2, 95F, 10-50 g/m2/day	15 (0)	15 (0)
	1009	Visual		
	1014	Seal (fine and gross)		
6	1018	Internal water vapor (cavity packages), 5,000 ppm @ 100C	3 (0) or 5 (1)	3 (0) or 5 (1)
7	2025	Adhesion of lead finish (NA for LCC), bend leads 90 degrees	3 device min. and 15 (0) leads	3 device min. and 15 (0) leads
9	2036	Soldering Heat	3(0)	3(0)
	1009	Visual		
	1014	Seal (fine and gross)		

MIL-PRF-38535 Quality Conformance Inspection Group E Testing				
Sub Group	**MIL-STD-883 Test Method**	**Test**	**Class V (S)**	**Class Q (B)**
2	1019	a. Total ionization dose (TID) @ 25ºC, cond. A @ 50-300 rad(Si)/s b. End point electrical parameters test	4 (0) ea. wafer	4 (0) ea. wafer
5	ASTM F-1192 or JESD57	a. Single event effects (SEE) typical response, at qualification or major change b. End point electrical parameters test	5 (0)	5 (0)