

EPC SPACE Qualification MIL-PRF-38535 EQUIVALENT (Rev 2)

Wafer Lot Acceptance¹

Sub Group	MIL-STD-883 Test Method	Test	Class V (S)	Class Q (B)
1	Static @ 25°C	Wafer Probe	100%	
2	2018	SEM Inspection	2 Wafers each Lot	4(0) die
3	3015	ESD Classification	Per 3015	
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, -55°C to 150°C	100%	100%	-
Constant acceleration	2001, condition E 30KG, Y1 orientation for 1 min.	100%	100%	-
Particle impact noise detection (PIND)	2020, condition A, 105 Hz at 20G	100%	-	-
Serialization & Case Mark (lot ID)	Refer to marking drawing	100%	100%	-
Radiography	2012, 2 views	100%	-	AQL
Hermetic seal test (gross / fine leak)	1014	100%	100%	-
Pre burn-in electrical parameter 25°C	Read & Record	100%	100%	-
Burn-in (dynamic)	1015, condition D, at 125°C	100% 240Hours	100% 160Hours	-
Post burn-in (final) DC electrical parameter 25°C,125°C and -55°C	Test within 96 hours, Read & Record w/ Delta's, PDA limit 5% (3% functional parameters)	100%	-	-
Post burn-in (final) AC electrical parameter 25°C,125°C and -55°C	Read & Record	100%	100%	AQL
Out of family	Remove all outliers	100%	-	-
Lead tinning	SnPb base solder	100%	100%	100%
Hermetic seal test (gross / fine leak)	1014	100%	100%	-
Electrical test DC @ 25°C	Read & Record	100%	100%	100%
External visual inspection	2009	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	3411, 3413, 3421, 3404	ATE Static tests at +25°C	116 (0)	116 (0)
2	3411, 3413, 3421, 3404	ATE Static tests at +125°C	116 (0)	116 (0)
3	3411, 3413, 3421, 3404	ATE Static tests at - 45°C	116 (0)	116 (0)
9	3411, 3413, 3421, 3404	ATE Switching tests at +25°C	116 (0)	116 (0)
10	3411, 3413, 3421, 3404	ATE Switching tests at +125°C	116 (0)	116 (0)
11	3411, 3413, 3421, 3404	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. IGA (Note 2)	3(0)	
2	2030 or 2011	c. Flip chip t pull off test	2 (0)	2 (0)
	2019 or 2027	d. Flip Chip die shear strength	3 (0)	Group 5 3 (0)
3	2003	Solderability, steam age (8 hours), solder temp 245C +/-5C	All pads (0) from 3 devices	All pads (0) from 3 devices
5	1005	a. Steady-state life test	45 (0)	-
		b. End-point electrical parameters (-55C and +125C)		
6	1010	a. Temperature Cycling, cond. C, 100 cycles, -55°C to 150°C	15 (0)	-
	2001	b. Constant Acceleration, cond. E, 30KG, Y1 orientation for 1 min.		-
	1014	c. Hermeticity (fine and gross)		-
	Part spec.	b. End-point electrical parameters (-55C and +125C)		-

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 125°C	45 (0)	45 (0)
		b. End-point electrical parameters (-55C and +125C)		

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)
3	1011	Thermal Shock, cond. B, 15 cycles, -15°C to 125°C	15 (0)	15 (0)
	1010	Temperature Cycling, cond. C, 100 cycles, -55°C to 150°C		
	1004	Moisture resistance		
	1004/1010	Visual (3X magnification)		
	1014	Hermeticity (fine and gross)		
	Part spec.	End-point electrical parameters (-55C and +125C), < 48hours from moisture resistance		
	2002	Shock, cond. B, 1500G, 0.5ms, 5 shocks in each x, y, z axis		

4	2007	Vibration, cond. A, variable frequency, in each x y, z axis	15 (0)	15 (0)
	2001	Acceleration, cond. E, 30KG, Y1 orientation for 1 min.		
	1014	Hermeticity (fine and gross)		
	2007	Visual (3X magnification)		
	Part spec.	End-point electrical parameters (-55C and +125C)		
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	Hermeticity (fine and gross)		
6	1018	Internal water vapor (cavity packages), 5,000 ppm @ 100C	3 (0) or 5 (1)	3 (0) or 5 (1)
9	2036	Soldering Heat	3(0)	3(0)
	1009	Visual		
	1014	Hermeticity (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) @ 25°C, cond. A @ 50-300 rad(Si)/s b. End point electrical parameters test (-55C and +125C)	22 (0) ea. Wafer lot	22 (0) ea. Wafer lot
5	ASTM F-1192 or JESD57	a. Single event effects (SEE) typical response, at qualification or major change b. End point electrical parameters test (-55C and +125C)	4 (0)	-

Notes

1. Wafer Lot Acceptance: Subgroup 1 and 2 are required for every wafer lot.
2. Not required for QCI lots where group D is performed on the same inspection lot