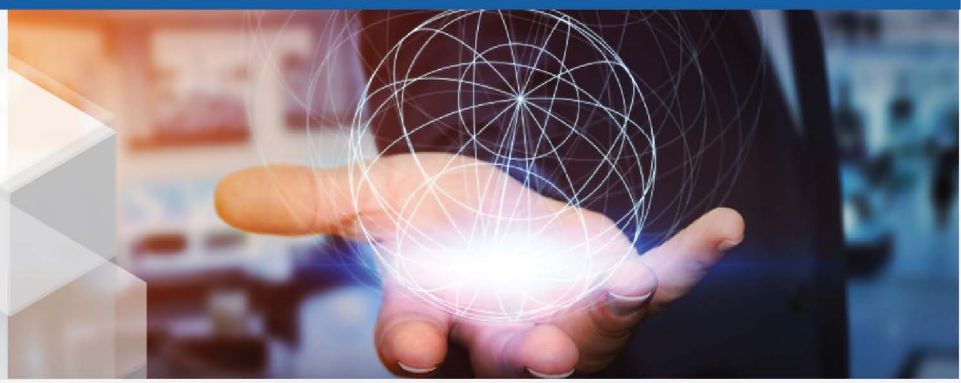
Outermost Technology

www.outermost-tech.com

Reliability & Quality Assessments



Reliability Testing

We Offer Reliability Engineering Advice at R&D Stages

Scalable Cost
Test labs in US and Asia

In-depth FA of Failed Devices
Advanced tools and methods

Advice and Project Management
Compliments your native skill sets

Tested Environmental Conditions

Why Choose Us

- JEDEC, MIL-STD, AEC & custom test methods
- R&D, qualification, and screening
- RF, μwave, millimeter-wave, and optics

Key Customers

APPLIED MATERIALS · ANALOG DEVICES · INTERMOLECULAR
SK hynix · atomera · LUMILEDS
NEXGEN · ZEISS · nanosys

Reliability Testing

Mechanical Test	Conditions	UTM
Mechanical Shock	340 g - 10,000 g; 5 shocks per orientation; JESD22-B110B	
Vibration & Resonance	20 Hz - 2000 Hz, 4 cycles for 3 axis; 12 cycles total; JESD22-B103B	
Universal Testing Machine	Shear, pull, edge break, body strength, 3 points bending tests	
Bending	Speed: 20 mm/min; JESD22-B113	
Torsion & Free Drop	1 Hz/25 times & 1.0 mm/min speed	
HALT	Optional temperature & vibrational stressing, IPC9592A	

Lifetime Test	Conditions	HTOL
Early Life Failure Rate	T ≥ 125°C; 48 hrs ≤ t ≤ 168 hrs; ELFR-JEDEC/ELFR-AEC-Q100-008	
HTOL	125°C; 1008 hrs; other conditions available; JESD22-A108	
LTOL	-65°C; 1008 hrs; other conditions available; JESD22-A108	
Erase and Write	125°C;168 hrs; other conditions available; JESD22-A117/AEC-A100-005	
PLT	25°C; 1008 hrs; other conditions available; JESD22-A108	

Environmental Test	Conditions	HTS
Temperature Cycling	-65°C to +150°C; other conditions available; TC-JEDEC/TS-Mil-Std-883	
Thermal Shock	-65°C to 150°C; JESD22-A106/Mil-Std-883, method 1011	
THB	85°C, 85% RH, 1000 hrs; other conditions available; JESD22-A101	
HTS	+85°C to +300°C; JESD22-A103/Mil Std 883, method 1008	
LTS	-65°C to -40°C; JESD22-A119/EIAJ ED-4701/200, test method 202	
HAST	130°C, 85% RH, 96 hrs; other conditions available; JESD22-A110	
Pressure Cooker Test	121°C, 100% RH, 96 hrs; other conditions available; JESD22-A102	
Salt Atmosphere Test	[Salt]: 0.5% to 3%; JESD22-A107/Mil-Std883, method 2005	
Preconditioning of SMD	Prior to THB, HAST, TC, AC, and UHST; JESD22-A113/JSTD-020	
Moisture Sensitivity Level	Level 1 to 6; JSTD-020	

Electrical Test	Conditions	Latch-Up
ESD HBM	250 V to 8000 V; JESD22 B110/AEC-Q100-002/AEC Q101-001	
ESD MM	50 V to 400 V; JESD22-A115/AEC-Q100-003/AEC-Q101-002	
ESD CDM	200 V to 1000 V; JESD22-C101/AEC-Q100-011/AEC-Q101-005	
Latch-up	JESD22-78	
EOS	IEC 61000-4-5	

Reliability Services	Description
Design for Excellence (DFX)	Avanced design for analysis, debug, manufacturing, reliability, test, service
Failure in Time (FIT)	Failure rate that occurs during one billion device hours
Failure Mode and Effects Analysis (FMEA)	Evaluate failure occurrence, detectability, severity and consequences
Acceleration Factor, Temperature (AT)	Calculated from activation energy, Boltzmann constant, stress T, failure rates
Mean Time Between Failure (MTBF)	Predicted from bill of materials (BOM), stress analysis and AT
TeraBytes Written (TBW)	Estimate the total amount of data that can be written to the NAND device in its lifetime

Contact us for questions about the test conditions and to obtain pricing for different conditions

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