

Board Level Reliability Test (BLRT)



Reliability Testing



Why Work with Us?



Scalable Cost

Test labs in US and Asia



Advice & Project Management

Compliments your native skill sets



Continuous Communication

During the entire testing process



ISO, AEC, & IPC

Certified operations



What is BLRT

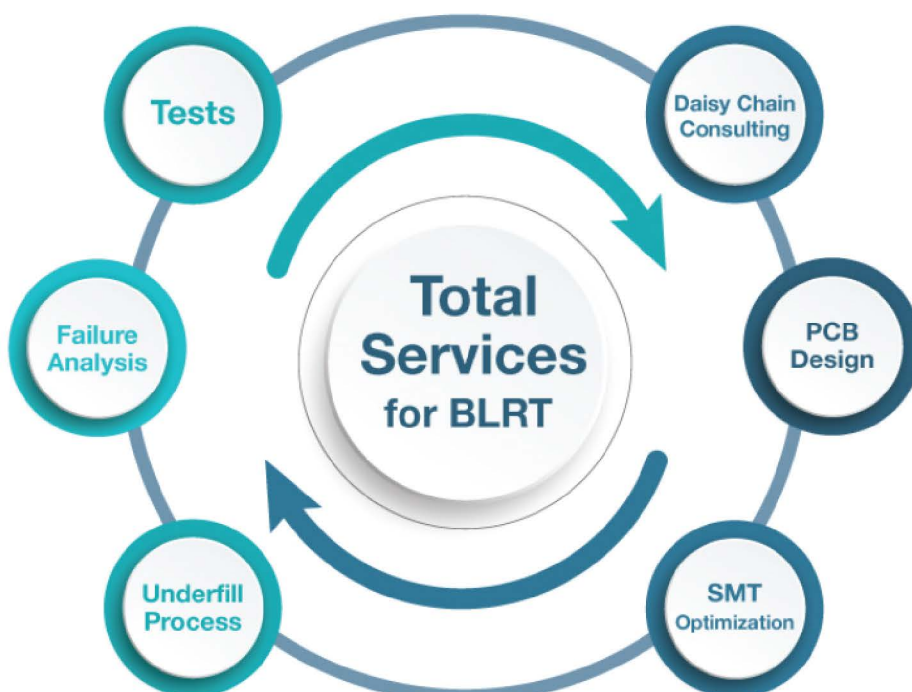
Assesses reliability of PCB fabrication and IC package solder mounting

- Lamination
- Filled vias
- Annular rings
- Soldered joints/solder balls



Why BLRT

- Ensures reliable interconnect performance under extreme conditions
- Critical assessment for portable, wearable, and automotive devices



Total Service for Board Fabrication

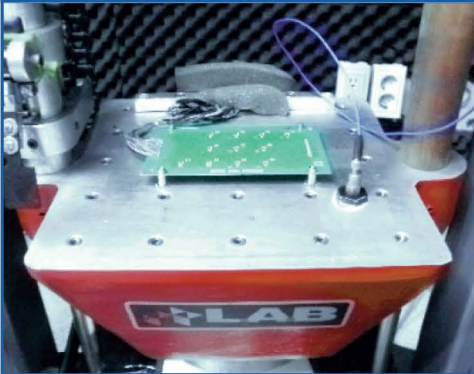
Consultation on Daisy-chain PCB design for optimized SMT profile.

Mechanical Environmental Tests

Various Board Level Testers with a high speed data logging for international standards

Physical Analysis and Fast-Feedback

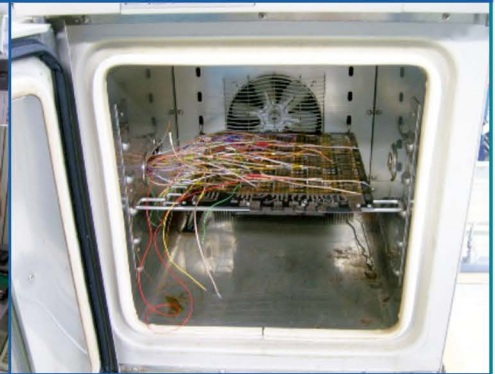
With full capabilities of cross section and Dye & Pry analysis, all test and reporting process will move on fast to update customers.

**Mechanical Shock 1 & 2**

Twist and bending stress occur during drop events especially common for hand-held devices

Temperature Cycling

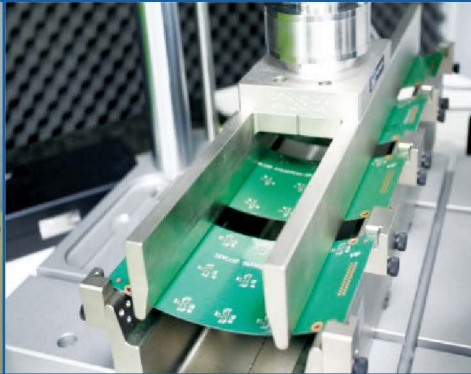
Exposure of products to low and high temperatures might cause cracks and delamination of the package

Ion Migration

The increase of current density in the bump due to shrinking critical dimensions favors electro-migration of solder

Vibration

Repeated vibrations with high accelerations are regarded as common stress in the automotive applications

Cyclic Bending

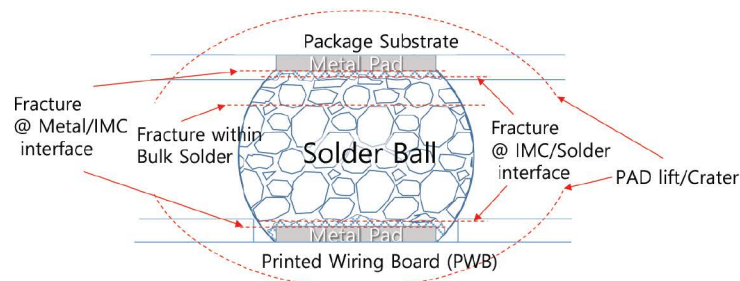
As bending occurs both in production and under normal usage conditions, testing resistance to bending is essential

Temperature Humidity High Temperature Storage

IMC is a critical layer that affects the reliability of the joint. This test studies the effect of high temperatures on the IMC

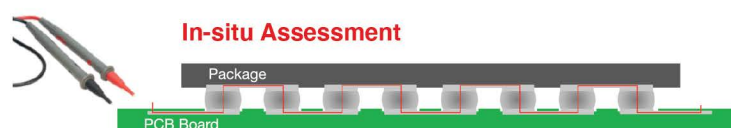
BLRT Process

BLRT detects failures in the solder joint within the solder ball or at the interfaces with the intermetallic compound (IMC).



In addition, any physical deformation in the solder pad will be noted. The mode of each failure will be determined after cross section and imaging.

Before performing the BLRT tests, the component (package and solder balls) is connected to the PCB board by solder mount technology (SMT) to form a daisy chain as described below:





Typical Test Conditions

Item	Conditions	Unit
Mechanical Shock 1	1500 g, 0.5 ms; 240 times	# of Times
Mechanical Shock 2	10,000 g, 0.2 ms; 240 times	# of Times
Vibration Test	5 Hz~500 Hz, 30 min by axis with 5 g; 2 hrs	Hours
Cycling Bend Test	Displacement 2.0 mm/1 Hz; 200,000 times	# of Times
Temperature Cycling	5~15°C/min; 500 hrs	Hours
Temperature Humidity Storage	85°C, 85% R.H; 500 hrs	Hours
High Temperature Storage	150°C; 500 hrs	Hours
Board	Daisy chain PCB including SMT	Test
Ion Migration	Contact us for details	

Typical Test Conditions for Mobile & Wearable Devices

Item	Conditions				Standard
Mechanical Shock	Acceleration	Time	Test Direction/# of Test		JESD22-B111A
	1,500 g	0.5 ms	-Z axis/1,000		
	1,500 g	1.0 ms	-Z/10		
	5,000 g	0.25 ms	+Z, -Z/9		
Temperature Cycling	Temp. Range	Temp. Change Rate	Temp. Hold Time	Cycles	JESD22-A104E
	-40°C~125°C	14°C/min	10 min	500	
	-40°C~85°C	20°C/min	23 min	1,000	
	-40°C~85°C	15°C/min	10 min	over 220	
	Frequency: 1 Hz/direction: -Z, displacement: 2.0 mm, 200,000 cycles				JESD22-B113
Cyclic Bending	Loading rate: 1.6 mm/sec, direction: -Z,max strain: 2,300µε, 3 cycles (No under-fill) Loading rate: 1.6 mm/sec, direction: -Z,max strain: 3,800µε, 3 cycles (Under-fill)				
Monotonic Bending	Loading rate : 2 mm/min/direction: -Z, max strain: 5,000µε				JESD22-9702
Vibration	Sine		Random	Time	
	Acceleration: 5 g Frequency Range: 5~500 Hz		Acceleration: 1.24 grms Frequency Range: 2~500 Hz	30 min per axis	JESD22-B103
Temperature Humidity Storage	Temperature: 85°C, humidity: 85%R.H, 1,000 hrs				JESD22-A101