

Reliability Test Summary

WJ Communications performs a series of the following tests to ensure the reliability of our parts. Not all tests apply to all devices. Actual conditions for each test vary by device type, however typical conditions for plastic encapsulated devices are listed in the table below.

Preconditioning

Preconditioning simulates the process steps that parts go through in a typical assembly process. The preconditioning flow is representative of typical industry multiple solder reflow steps.

Bias Life (High Temperature Operating Life, HTOL)

This test is performed to determine the effects of bias conditions and temperature on the device over an extended period of time. HTOL is an accelerated life test used to insure a minimum standard operating life.

HAST

This test is performed to evaluate the reliability of non-hermetic packaged devices in humid environments. It uses severe conditions of humidity, temperature, and bias, which accelerate the penetration of moisture through the encapsulant. The test can cause corrosion of metallization and bond pads, delamination of interfaces, increased intermetallic growth, and wirebond failures. HAST conditions are 130°C, 85% Relative Humidity, 33.3 psia with bias for 96 hours. HAST is an accelerated version of THB.

Temperature Cycle

This test is done to determine the resistance of a part to extremes of high and low temperatures. Test results are affected by encapsulant thickness, die size, die passivation integrity, wirebond, die cracks, and adhesion at the interfaces, including passivation to encapsulant, die pad to encapsulant, and leadfingers to encapsulant

Autoclave

This test evaluates moisture resistance. Parts are placed in saturated steam under severe conditions of pressure and temperature to accelerate moisture penetration through the package. Galvanic corrosion is the major failure mechanism. Contaminants in the encapsulant can accelerate corrosion.

Physical Dimensions

The purpose of this test is to determine whether the external physical dimensions of the device are in accordance with the package drawing.

Mark Permanency

The purpose of this test is to verify that the markings on the devices will not become illegible when subjected to solvents or cleaning solutions commonly used during the removal of solder flux residue.

Solderability

This test evaluates the susceptibility of leads on a device to solder wetting. The solderability of a metal surface depends on the integrity of the plating, cleanliness of the surface, solder temperature, specific heat of the lead material and lead design.

Lead Integrity

This test determines the integrity of the lead-to-package interface and of the lead itself when the leads are bent due to assembly or rework.

Stress or Test	Preconditioning Required?	Sample Size/ Max acc #	JEDEC Reference Document	Conditions
Preconditioning			A113	
Bias Life/High Temp Op Life	No	77/1	A108	125°C, 1000 Hrs, with bias
Accelerated Bias Humidity(HAST)	Yes	77/1	A110	+130°C, 85%RH, 33.3 psia for 96 hours
Temperature Cycle	Yes	77/1	A104	-65°C to +125°C,1000 Cycles
Autoclave	Yes	100/1	A102	121°C, 100% RH,15 psig for 96 hours
Physical Dimensions	No	2/0	B100	
Mark Permanency	No	4/0	B107	
Solderability	No	25/1	B102	
Lead Integrity	No	25/1	B105	

JEDEC documents can be downloaded from www.jedec.org