Fagor Electronica Semiconductores

FAGOR

RELIABILITY TEST ACCORDING TO Q-101 STANDARD

Test #	Test Name	Standard	Description	Purpose	Efficient for processes of	Failure due to
1	Pre- and Post-Stress Electrical Test		To measure the electrical characteristics defined in the device's data sheet at room temperature.	To assure that all devices submitted to reliability test are electrically good devices.		
2	Pre-conditioning	(JESD22-A113F)	To submitt devices to a sequence of mechanical and thermal stresses and to the exposition of flux and cleaning agents.	Evaluation of the semiconductor devices' capability to withstand the stresses imposed by a user’s printed circuit board assembly operation		
3	External Visual	(JESD22 A-113B)	External visual inspection is an examination of the external surfaces, construction, marking, and workmanship of a finished package or component	To assure that all devices submitted to reliability test are free of mecahnical defects.		
4	Parametric Verification	-55ºC/-65ºC, 25ºC, 150ºC	Test all paremeters according to user application over the device temperature range .	To assure the compliance of the electrical specifications		
5	High Temperature Reverse Bias (HTRB)	(JESD22 A-108D)	The devices are characteristically operated in a static operating mode at, or near, maximum-rated breakdown voltage and/or current levels	HTRB testing is used to determine the breakdown robustness of devices under high field and temperature conditions.	Passivation Chip Singulation Moulding	Surface charges accumulation.
7	Thermal Cycling (TC)	(JESD22 A-104D)	The device is submitted to cycled temperature change in a dual chamber cycling, with a moving platform between hot and cold chamber, in air atmosphere.	Temperature cycling is used to determine the robustness of devices and interconnects when exposed to alternating high- and lowtemperature extremes	Passivation Chip Singulation Metallization Die Attach Moulding	Thermal mismatch between chip and package
8	Autoclave (AC)	(JESD22 A-102D)	The device is stored in saturated steam, at fixed and controlled conditions of pressure and temperature	The autoclave (or pressure cooker) test is performed for the process of evaluating the moisture resistance of non-hermetic packaged devices.	Metallization Die Attach Moulding	Poor hermeticity. Contamination. Corrosion.
9	H^3TRB	(JESD22 A-101C)	The device is biased in static configuration minimising its internal power dissipation and stored at controlled conditions of ambient temperature and relative humidity	The steady-state temperature-humidity-bias life test is performed for the purpose of evaluating the reliability of non-hermetic packaged devices operating in humid environments	Metallization Die Attach Moulding	Poor hermeticity. Contamination. Corrosion.
10	Intermittent Operating Life (IOL)	(JESD22 A-105C)	The device is stressed in dynamic configuration approaching the operative max. Absolute ratings in terms of junction temperature, load current, internal power dissipation.	To simulate the worst case application stress conditions. The typical failure modes are related to electromigration, wire bonds degradation, oxide faults	Metallization Die Attach	Contact degradation.
12	D.P.A	AEC-Q101-004	To de-capsule the device in order to expose the internal structure for determining any mechanical damage	To determine the capability of a device's internal materials, design and workmanship to withstand forces induced by various stresses induced during environmental testing.		
20	Resistance to Solder Heat (RSH)	(JESD22 B-106D)	To heat devices by the solder dip method which is the most reproductible procedure for heating transmission due to its more controllable conditions	The resistance to solder heat test is intended to determine whether devices can withstand the effects of the heat to which they will be subjected during soldering of their terminations	Metallization Die Attach Moulding	Poor hermeticity. Chip damage.
21	Solderability (SD)	(JESD22 B-102E)	To immers device terminations in molten solder previous application of flux and evaluate the tested terminations.	The purpose of the solderability test is to determine the solderability of all external package terminations that are normally joined by a soldering operation	Electroplating / Dipping	Plating conditions or plating material