Texas Instruments Enhanced Product Qualification and Reliability Report

TI qualification testing is a risk mitigation process that is engineered to assure device longevity in customer applications. Wafer fabrication processes and package level reliability are evaluated in a variety of ways that may include accelerated environmental test conditions with subsequent derating to actual use conditions. Manufacturability of the device is evaluated to verify a robust assembly flow and assure continuity of supply to customers. TI Enhanced Products are qualified with industry standard test methodologies performed to the intent of Joint Electron Devices Engineering Council (JEDEC) standards and procedures. Texas Instruments Enhanced Products are certified to meet GEIA-STD-0002-1 Aerospace Qualified Electronic Components.

Qualification by Similarity (Qualification Family)

A new device can be qualified either by performing full scale quality and reliability tests on the actual device or using previously qualified device(s) through "Qualification by Similarity" (QBS) rules. By establishing similarity between the new device and those qualified previously, repetitive tests will be eliminated, allowing for timely production release. When adopting QBS methodology, the emphasis is on qualifying the differences between a previously qualified product and the new product under consideration. The QBS rules for a technology, product, test parameters or package shall define which attributes are required to remain fixed in order for the QBS rules to apply. The attributes which are expected and allowed to vary will be reviewed and a QBS plan shall be developed, based on the reliability impact assessment above, specifying what subset of the full complement of environmental stresses is required to evaluate the reliability impact of those variations. Each new device shall be reviewed for conformance to the QBS rule sets applicable to that device. See JEDEC JESD47 for more information.

Device Baseline				
TI Device:	74LVC1G3208MDBVTEP		*Assembly Site:*	ASEWH
DLA VID:	V62/13605-01XE		*Test Site:*	ASEWH
Wafer Fab:	FR-BIP-1		*Pin/Package Type:*	6 DBV SOT-23
Fab Process:	ASLNONC10		*Leadframe:*	Cu
Fab Technology	ASLNONC10		*Termination Finish:*	NiPdAu
Die Revision:	-		*Mount Compound:*	HENKEL C990J#316
Die Name:	RLVC1G3208IM		*Bond Wire:*	20.3 µm Au
ESD CDM:	1000V		*Mold Compound:*	SUMITOMO EME-G600
ESD HBM:	2000V		*Moisture Sensitivity:*	MSL 1 / 260°C

On-Going Life-Test Monitors For Technology		
Reliability:	0.5	FIT
MTBF:	1.99×10^9	Hours
Confidence Level:	60	%
Activation Energy:	0.7	eV
Stress Temperature:	125	°C
Derated Use Temperature:	55	°C
Test Duration:	1000	Hours
Sample Size:	23240	Units
Number of Failures:	0	Units

Enhanced Products New Device Qualification Matrix Note that qualification by similarity ("qualification family") per JEDEC JESD47 is allowed				
Description	Condition	Sample Size Used/Rejects	Lots Required	Test Method
Electromigration	Maximum Recommended Operating Conditions	N/A	N/A	Per TI Design Rules
Wire Bond Life	Maximum Recommended Operating Conditions	N/A	N/A	Per TI Design Rules
Electrical Characterization	TI Data Sheet	15	3	N/A
Electrostatic Discharge Sensitivity	HBM CDM	3 units/voltage	N/A	EIA/JESD22-A114 EIA/JESD22-C101
Latch-up	Per Technology	5/0	3	EIA/JESD78
Physical Dimensions	TI Data Sheet	5/0	1	EIA/JESD22- B100
Thermal Impedance	Theta-JA on board	Per Pin-Package	N/A	EIA/JESD51
Bias Life Test	125°C / 1000 hours or equivalent	45/0	3	JESD22-A108*
Biased Humidity or *Biased HAST*	85°C / 85% / 1000 hours or 130°C / 85% / 96 hours	77/0	3	JESD22-A101* JESD22-A110*
Extended Biased Humidity or *Extended Biased HAST*	85°C / 85% / 2600 hours (for reference) or 130°C / 85% / 250 hours (for reference)	77/0	1	JESD22-A101* JESD22-A110*
Unbiased HAST	130°C / 85% / 96 hours	77/0	3	JESD22-A.118*
Temperature Cycle	-65°C to +150°C non-biased for 500 cycles	77/0	3	JESD22-A104*
Solder Heat	260°C for 10 seconds	22/0	1	JESD22-B106
Resistance to Solvents	Ink symbol only	12/0	1	JESD22-B107
Solderability	Condition A (steam age for 8 hours)	22/0	1	ANSI/J-STD-002-92
Flammability	Method A / Method B	5/0	1	UL-1964
Bond Shear	Per wire size	5 units x 30/0 bonds	3	JESD22-B116
Bond Pull Strength	Per wire size	5 units x 30/0 bonds	3	ASTM F-459
Die Shear	Per die size	5/0	3	TM 2019
High Temp Storage	150 °C / 1,000 hours	15/0	3	JESD22-A103-A*
Moisture Sensitivity	Surface Mount Only	12	1	J-STD-020-A*
				*Precondition performed per JEDEC Std. 22, Method A112/A113

For additional information or technical support please contact the Texas Instruments Customer Support Center at www.ti.com/support or send an email to support@ti.com

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