



STACKED Technologies Inc

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STACKED Technologies Green Initiative

ROHS Policy



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LOGIC Devices' Green Initiative

The electronics industry has embraced environmental initiatives to reduce the level of certain materials contained in electronic components and systems. STACKED has adopted standards for hazardous materials use that comply with European Union directives (RoHS and WEEE) and the corporate initiatives of our Japanese customers. STACKED is committed to the production of Pb-free and Green packages for our products. Our strategy is to introduce Pb-free, Green packages that are fully compatible with our customers existing assembly processes as well as Pb-free assembly processes, thereby allowing our customers to transition to Pb-free assembly according to their own requirements. STACKED works with our supply chain to ensure that products are manufactured and delivered with materials that are not only robust but also provide forward compliance to environmental initiatives. Implementing these solutions will allow us to continue to meet the needs of our global customers.

Key Initiative Points

- Qualified packages to their current JEDEC moisture level classification at 260°C reflow.
- STACKED's Lead-free products are full Green, which is a step above RoHS
- Both standard (non-Green) and Green products will be offered, providing flexibility to those customers not able to convert
- All Lead-free orders will be filled with Green products

RoHS Definition (Lead-free + Below)

- Lead(Pb) < 1000 ppm
- Mercury(Hg) < 1000 ppm
- Hexavalent Chromium(Cr+6) < 1000 ppm
- Cadmium(Cd) < 100 ppm
- Polybrominated biphenyl (PBB) < 1000 ppm
- Polybrominated diphenyl ether (PBDE) < 1000 ppm



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FAQ

Do Green products have different part numbers?

Yes, STACKED’s Green products have a "G" suffix after package code on the standard part number. All Green device packages will have “G” suffix on the marked product number.

Example:

- Standard part number: ST9D3512M32DBG2
- Green part number: ST9D3512M32DBG2G

Does your process have whisker mitigation control?

Yes, our packaging supplier’s flow includes an annealing process.

Are STACKED Green parts ROHS compliant?

Yes, all LOGIC Devices Green devices are fully ROHS compliant.

What qualifications have been done?

STACKED Green packages comply with the most current JEDEC JSTD-020 standard for peak reflow temperature (260°C for small packages, 250 C for medium size packages, and 245°C for large size packages. Size is defined in JEDEC J-STD-020).

Reliability tests include Temperature Cycle, Autoclave and Temperature/Humidity under the standard test conditions. LOGIC Devices relies on the qualification process completed at our package supplier and on their certificate of compliance. Data for these tests are available upon request.

Although STACKED parts are MSL 3 when shipped, we suggest that Pb-free devices are baked prior to reflow to ensure that no moisture-induced cracking or “popcorn effect” occurs.

MSL (Moisture Sensitivity Level) for package families:

Package Family	MSL (standard)	MSL (Green)
PQFP	3	3
BGA	3	3

Package BOM:

Package	Mold Compound	Die Epoxy	Substrate	Lead Finish
PQFP	Sumitomo EME-G770J	Ablebond 2288A	--	Sn-2%Cu
LBGA	Sumitomo EME-G770J	Ablebond 2100A	BT Resin	Sn-4%Ag-0.5%Cu



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Green Product Offering

PART #	COMPLIANCE
ST9D232M64SBG5G	RoHS Compliant
ST9D232M72SBG5G	RoHS Compliant
ST9D232M80SBG5G	RoHS Compliant
ST9D264M64SBG5G	RoHS Compliant
ST9D264M72SBG5G	RoHS Compliant
ST9D264M80SBG5G	RoHS Compliant
ST9D3256M32SBG1G	RoHS Compliant
ST9D3512M32SBG1G	RoHS Compliant
ST9D3512M32DBG2G	RoHS Compliant
ST9D31024M32SBG2G	RoHS Compliant



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Banned Substances Report on Green LPGA 172 Packages

Item	Component	MDL	ppm
Mold Compound EME-G700A	Cd	2	N.D.
	Cr+6	2	N.D.
	Hg	2	N.D.
	Pb	2	N.D.
	PBB	0.0005%	N.D.
	PBDE	0.0005%	N.D.
Epoxy Ablebond 2100A	Cd	2	N.D.
	Cr+6	2	N.D.
	Hg	2	N.D.
	Pb	2	N.D.
	PBB	0.0005%	N.D.
	PBDE	0.0005%	N.D.
	Soluble Lead (Pb)	5	<5
	Soluble Antimony (Sb)	5	<5
	Soluble Arsenic (As)	2.5	<2.5
	Soluble Barium (Ba)	10	<10
	Soluble Cadmium (Cd)	5	<5
	Soluble Chromium (Cr)	5	<5
	Soluble Mercury (Hg)	5	<5
	Soluble Selenium (Se)	5	<5

- N.D.: Not Detected (<MDL)
- MDL: Method Detection Limit
- Taken from SGS test reports dated 1/19/2005 (reports supplied upon request)
- All measurements in PPM unless otherwise noted



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Pb-Free Solder Reflow Parameters NEMI Recommended Convection or IR 260 °C Reflow Profile

Ramp rate 217 °C to peak	3 °C/sec max
Preheat temperature 150 °C (+/- 25 °C)	60 to 120 seconds max
Time 50 °C to peak Temperature	3.5 minutes, 6 minutes max
Temperature maintained above 217 °C	60 to 150 seconds
Time within 5 °C of actual Peak Temperature	10~20 seconds
Peak Temp range	260 °C (-5/+0) °C
Ramp-down rate	6 °C/second max

