



SMB
Lead Free and RoHS Compliance Document

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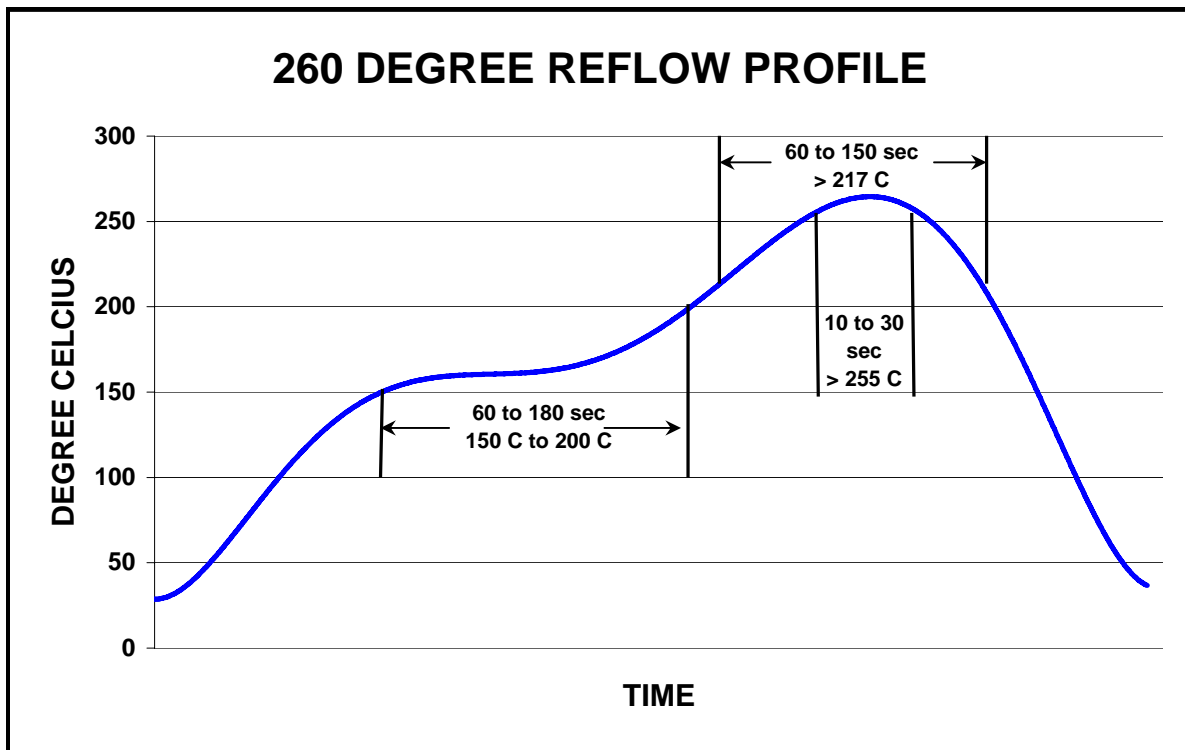
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SMB

| Component | Material Name | Material Mass (gr/ea) | Element Name Composition | Substance Mass (per device) g | Material Analysis Weight (%) | % of Total Weight |
|-------------|---------------|-----------------------|--------------------------|-------------------------------|------------------------------|-------------------|
| Chip | Silicon | 0.00460 | Si | 0.00460 | 100% | #DIV/0! |
| Encapsulant | Epoxy Resin | 0.04466 | SiO2 | 0.03126 | 70% | #DIV/0! |
| | | | Epoxy | 0.01116 | 25% | #DIV/0! |
| | | | Other | 0.00223 | 5% | #DIV/0! |
| Lead Frame | Copper | 0.03990 | Cu | 0.03900 | 98% | #DIV/0! |
| | | | Fe | 0.00850 | 21% | #DIV/0! |
| | | | Other | 0.00005 | 0% | #DIV/0! |
| Die Attach | Soft Solder | 0.00232 | Pb | 0.00217 | 94% | #DIV/0! |
| | | | Sn | 0.00012 | 5% | #DIV/0! |
| | | | Ag | 0.00003 | 1% | #DIV/0! |
| Lead Finish | Tin | 0.00006 | Sn | 0.00006 | 100% | 0.1% |

Total Weight (g) **0.09918**



This part is compliant with EU Directive 2002/95/EC (RoHS) and does not contain lead, mercury, cadmium (0.01%), hexavalent chromium, PBB or PBDE in concentrations greater than 0.1%, except as permitted by Annex (7).

The information contained in this attachment is being provided for informational purposes only. Nothing provided in this attachment is (i) a representation, warranty, or agreement to indemnification by IR, (ii) a statement which may form the basis of reliance by IR, (iii) a modification of any of the terms and conditions of sales agreed to in writing between IR and its customers with respect to any IR products, whether previously sold or to be sold in the future.



SMA, SMB & SMC Tin Whisker Report

Objective: To evaluate the Tin whisker growth for various test conditions on PBF products

Part No: SMA, SMB, SMC

Package Type: SOICN-8L

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| Test | Long Temperature Storage | Temperature Humidity Unbias | Temperature Cycling |
|-------------------------|---------------------------|-----------------------------|---------------------|
| Test Conditions | 30+/-2°C, 70-85+/-3%RH | 60+/-5°C, 93+3/-2%RH | -55 to 85°C |
| Test Status / Readpoint | NWF / 1000 hr | NWF / | WFA / |

Examples:

| | | | |
|---------------------|---|---|---|
| | | | |
| Whisker Length (µm) | 0 | 0 | 0 |

| Abbreviation | NWF | WFA | WFO |
|------------------------------------|---|---|---|
| Whisker length pass/fail criterion | No Whiskers Found Whisker length less than 10 µm is considered insignificant | Whiskers found within acceptable range Whisker length less than 40 µm is considered pass | Whiskers found over acceptable range Whisker length exceeding 40 µm is considered fail |

Sn Plating descriptions:

Plating thickness (µin): >300 to 800
 Annealing conditions: 150°C for 1 hour
 Plating finish: 100% Sn Matte

Sample size: 10 pieces per test
 Reflow: 1X @ 255°C

International IOR Rectifier


International Rectifier components and their homogeneous sub-components manufactured under the Lead Free Program ⁽¹⁾ are in compliance with European Union Directive 2002/95/EC (RoHS Directive) of the European Parliament and of the Council of 27 January 2003. IR parts that have been identified as RoHS compliant do not exceed the maximum limit for following 6 designated substances.

| Substance | Maximum Limit (ppm) |
|---|---------------------|
| Cadmium (Cd) | 100 |
| Lead (Pb) | 1000 ⁽²⁾ |
| Mercury (Hg) | 1000 |
| Hexavalent Chromium (Cr ⁶⁺) | 1000 |
| Poly Brominated Biphenyls (PBB) | 1000 |
| Poly Brominated Diphenyl Ethers (PBDE) | 1000 |


- (1) Part numbers typically contain a "PBF" suffix
- (2) Maximum limit (ppm) does not apply to applications for which exemptions have been granted by the RoHS Directive

Our statements in this letter regarding RoHS compliance and lead content do not extend to, or apply to any product subjected to unintended contamination, misuse, neglect, accident, improper installation, or to use in violation of instructions furnished by IR. We additionally note that IR products in certain specific large outline packages could contain high temperature solder die attach material having greater than 85% lead content, which is considered exempt from ELV Directive, Article 4(2)(a) by Annex II and RoHS Directive, Article 4(1) by Annex (7).

Authorized signatures for International Rectifier:

Name:  Greg Takagi Date: 8/22/2005

Position: Director, Global Environmental Health and Safety

Name:  Danny Narabal Date: 8/23/05

Position: Director, Package Engineering

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Results:

| | PBB/PDBE | Cr(VI) | PVC | Asbestos |
|--------------------------|-----------|-----------|-----------|----------|
| Sample Name | ppm (wt.) | ppm (wt.) | ppm (wt.) | P/NP |
| Blank | <10. | <1.0 | <1.0 | NP |
| IRF4905PBF (TO-220) | <10. | <1.0 | <1.0 | NP |
| IRFP450PBF (TO-247) | <10. | <1.0 | <1.0 | NP |
| IRF740SPBF (D2-PAK) | <10. | <1.0 | <1.0 | NP |
| IRFR3707ZPBF (D-PAK) | <10. | <1.0 | <1.0 | NP |
| IRLL2705PBF (SOT-223) | <10. | <1.0 | <1.0 | NP |
| IRF6603 (DirectFET) | <10. | <1.0 | <1.0 | NP |
| IRLML6401TRPBF (Micro-3) | <10. | <1.0 | <1.0 | NP |
| IRLMS6802TRPBF (Micro-6) | <10. | <1.0 | <1.0 | NP |
| IRF7821PBF(SO-8) | <10. | <1.0 | <1.0 | NP |
| IR2153PBF (8L PDIP) | <10. | <1.0 | <1.0 | NP |
| IRF7503TRPBF (Micro-8) | <10. | <1.0 | <1.0 | NP |
| IR3086AMPBF (20L MLPQ) | <10. | <1.0 | <1.0 | NP |