

International Rectifier – Temecula Reliability Laboratory

QS-9000 and ISO-9000 Certified Facility; SQ-1000 Certified Laboratory

HEXFET America Facility: 41915 Business Park Drive Temecula, CA 92590 Phone 909-676-7500 Fax 909-676-9154

QUALIFICATION REPORT

Title	SO-8 N-channel Pb free qualification
Product/Part #	N-channel SO-8 devices (Single, Dual and Fetky devices)
Qualification Level	Consumer
Silicon Generation	Gen 5,7,8,10 and derivatives
Package(s)	SO-8
Moisture Sensitivity	MSL1 @ 260°C

REVISION HISTORY

#	Date	Author	Description of Changes
A	7/15/04	Rel. Engineer	Initial Draft

INTRODUCTION

In compliance with worldwide Industry initiative of “Lead Free” material for semiconductor fabrication, IR is proposing the conversion of the existing 85%Pb/15%Sn solder plating process to a 100% Sn plating process for the assembly of SO-8 devices.

In addition to the qualification of this new plating process, the surface mount reflow temperature of these SO-8 devices will be increased to 260°C, according to the Industry “Lead-free” board mount requirements.

SUMMARY/CONCLUSION

Based on the results of Reliability Stress testing, the SO-8 N-channel devices are qualified for Pb-free applications.

The surface mount reflow for these devices should not exceed 260°C.

Reliability Engineer

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QUALIFICATION TEST RESULTS

Part Type	IRF7832
Tests	Test: Temperature Cycling R#: 2919A6 Conditions: -55°C/150°C Duration: 1000 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Humidity, High Temperature Reverse Bias (H3TRB) R#: 2919B6 Conditions: 85°C/85%RH/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Reverse Bias R#: 2919C6 Conditions: 150°C/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Gate Bias R#: 2919D6 Conditions: 150°C/16V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 2 Bvdss failures related to excessive intermetallic formation. This is to be addressed under CA# 3011501
	Test: Autoclave R#: 2919F6 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	IRF7456
Tests	Test: Temperature Cycling R#: 2919A5 Conditions: -55°C/150°C Duration: 1000 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Humidity, High Temperature Reverse Bias (H3TRB) R#: 2919B5 Conditions: 85°C/85%RH/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Reverse Bias R#: 2919C5 Conditions: 150°C/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Gate Bias R#: 2919D6 Conditions: 150°C/9.6V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2919F5 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2919F5 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	IRF7453
Tests	Test: Temperature Cycling R#: 2919A12 Conditions: -55°C/150°C Duration: 1000 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Humidity, High Temperature Reverse Bias (H3TRB) R#: 2919B12 Conditions: 85°C/85%RH/100V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Reverse Bias R#: 2919C12 Conditions: 150°C/200V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Gate Bias R#: 2919D6 Conditions: 150°C/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	IRF7341
Tests	Test: Temperature Cycling R#: 2919A13 Conditions: -55°C/150°C Duration: 1000 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Humidity, High Temperature Reverse Bias (H3TRB) R#: 2919B13 Conditions: 85°C/85%RH/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Reverse Bias R#: 2919C13 Conditions: 150°C/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 1 Bvdss failure due to wire overbonding. This is to be addressed under CA# 3011501
	Test: Autoclave R#: 2919F13 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	IRF7413
Tests	Test: Temperature Cycling R#: 2919A14 Conditions: -55°C/150°C Duration: 1000 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Humidity, High Temperature Reverse Bias (H3TRB) R#: 2919B14 Conditions: 85°C/85%RH/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Reverse Bias R#: 2919C14 Conditions: 150°C/24V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Gate Bias R#: 2919D14 Conditions: 150°C/9.6V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures.
	Test: Autoclave R#: 2919F14 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2919F14 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	IRF1902
Tests	Test: Temperature Cycling R#: 2919A18 Conditions: -55°C/150°C Duration: 1000 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2919F25 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures