

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	Pb Free D2-Pak I/O devices assembled at IRMX
Product/Part #	Input/Output devices assembled in TO-262 and TO-263 (D2Pak)
Qualification Level	Industrial (Hexfred Consumer)
Moisture Sensitivity	MSL 1 @ 260°C

REVISION HISTORY

#	Date	Author	Description of Changes
A	7/13/05	Rel. Engr	Initial Draft

INTRODUCTION

In compliance with worldwide Industry initiative of “Lead Free” material for semiconductor fabrication, IR Mexico is proposing the conversion of the existing 85%Pb/15%Sn solder plating process to a 100% Sn plating process for the assembly of D2Pak devices.

In addition to the qualification of this new plating process, the surface mount reflow temperature of these D2Pak devices will be increased to 260°C, according to the Industry “Lead-free” board mount requirements.

The purpose of this qualification is to extend the family of qualified D2Pak Pb-free devices (FET and IGBT) to include Input/Output products.

SUMMARY/CONCLUSION

Based on the results of reliability stress testing, the Pb-Free, D2-Pak family of Schottky, FRED, and Rectifier I/O devices that are described in the above table are qualified to the Industrial Level. In addition, Pb Free, D2-Pak, Hexfred devices are qualified to the Consumer Level. The surface mount reflow temperature for these products should not exceed 260°C.

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QUALIFICATION TEST RESULTS

Part Type	43CTQ100S
Voltage	100V
Tests	Test: Temperature Cycling R#: 2837-A11 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#: 2837-B11 Conditions: 85°C/85%RH/80V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Reverse Bias R#: 2837-C8 Conditions: 125°C/80V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Intermittent Operating Life (Power Cycling) R#: 2837-E11 Conditions: $\Delta T_j = 100^\circ\text{C}$ Duration: 8,572 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2837-F11 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2837-F11 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	20ETS12S
Voltage	1200V
Tests	Test: Temperature Cycling R#: 2837-A12 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#: 2837-B12 Conditions: 85°C/85%RH/100V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Intermittent Operating Life (Power Cycling) R#: 2837-E12 Conditions: $\Delta T_j = 100^\circ\text{C}$ Duration: 8,572 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2837-F12 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	MURB2020CTS
Voltage	200V
Tests	Test: Temperature Cycling R#: 2837-A4 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#: 2837-B4 Conditions: 85°C/85%RH/100V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: High Temperature Reverse Bias R#: 2837-C4 Conditions: 165°C/160V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Intermittent Operating Life (Power Cycling) R#: 2837-E4 Conditions: $\Delta T_j = 100^\circ\text{C}$ Duration: 8,572 cycles Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2837-F4 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Autoclave R#: 2837-F4 Conditions: 121°C/100%RH/15psig Duration: 96 hours Quantity: 1 lot x 77 devices Failures: 0 failures

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Part Type	HFA16TB120L
Voltage	1200V
	Test: High Temperature Reverse Bias R#: 2837-C8 Conditions: 130°C/960V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures

Part Type	HFA16TB120S
Voltage	1200V
Tests	Test: Temperature Cycling R#: 2837-5-A5 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#: 2837-5-B5 Conditions: 85°C/85%RH/100V Duration: 1000 hours Quantity: 1 lot x 77 devices Failures: 0 failures
	Test: Intermittent Operating Life (Power Cycling) R#: 2837-5-E5 Conditions: $\Delta T_j = 100^\circ\text{C}$ Duration: 8,572 cycles Quantity: 1 lot x 77 devices Failures: 0 failures