

**QR-0006:**  
**Reliability Qualification Report for**  
**IRS2453DSPBF**

Date: June 25<sup>th</sup>, 2006

**Qualification Vehicle: IRS2453DSPBF in 14L-SOICN Package:**

Based on the reliability test results, the IRS2453DSPBF has passed standard International Rectifier industrial-level qualification with MSL3 at 260 °C peak reflow temperature (PRT).

The handling, packing, shipping and use of the moisture/reflow sensitive surface mount devices need to be per IPC/JEDEC J-STD-033A spec.

**Device and Lot Information**

Rel Number	10262-1-2-3	
Product/Part #	IRS2453DSPBF (Qual Vehicle: IRS2453DSPBF)	
Qualification Level	Lead-Free Industrial per COP800-08-Rev00	
Silicon Technology	600 V HVIC	
Silicon Generation	Gen 5	
Wafer Fab	Fab11	
Wafer-Lot#	Qual Lot#1 (Lot ID 1): 311459.1 Qual Lot#2 (Lot ID 2): F311453.1 Qual Lot#3 (Lot ID 3): F311502.1	
Package	IRS2453DSPBF: 14L-SOICN	
Lead Finish Plating	100% Sn	
Assembly-Lot#	Qual Lot#1 (Lot ID 1): IC1105BW Qual Lot#2 (Lot ID 2): IC1105BX Qual Lot#3 (Lot ID 3): IC1205DX	D/C: 0549 D/C: 0549 D/C: 0604
Moisture Sensitivity Level	<u>IRS2453DSPBF/14L-SOICN: MSL3 @ 260 °C</u> Per JEDEC spec JA113 / JEDEC J-STD-020C (Test samples were subjected to preconditioning prior to AC, TC & THB reliability tests, HTB and HTSL samples do not require preconditioning).  <u>14L-PDIP: does not requires MSL</u>	
Reliability Test Location	IR Temecula, USA	

**Reliability Test Results:**

Samples from three wafer lots and three assembly lots were tested in the following reliability tests to determine typical lifetime performance under industrial level qualification. The tests samples passed AC, TC, THB, HTB and HTSL reliability test requirements.

**The Stress Tests Conditions and Results are as follows:**

**Reliability Test #1 - Autoclave Test (AC):**  
 Test Duration: 96 Hours  
 Test Condition: +121 °C, 100% RH and 15 PSIG  
 Bias Condition: None  
 Electrical Testing: @ Room

Device	Wafer Lot#	Hour	SS	Reject	Remark
IRS2453DSPBF	311459.1	96	80	0	
	F311453.1	96	80	0	
	F311502.1	96	80	0	

**Reliability Test #2 - Temperature Cycling (TC):**  
 Test Duration: 1000 Cycles  
 Test Condition: -55 °C to 150 °C ( $\Delta T=205$  °C, Dry-Air to Dry-Air)  
 Bias Condition: None  
 Electrical Testing: @ Room

Device	Wafer Lot#	Cycle	SS	Reject	Remark
IRS2453DSPBF	311459.1	1000	80	0	
	F311453.1	1000	80	0	
	F311502.1	1000	80	0	

**Reliability Test #3 - Temperature Humidity Bias (THB) Test:**  
 Test Duration: 1000 Hours  
 Test Condition: 85 °C, 85% RH  
 Bias Condition:  $V_{CC}=14$  V,  $V_{SD}=3$  V,  $V_B=14$  V,  $V_S=0$  V(Com)  
 Electrical Testing: @ Room

Device	Wafer Lot#	Hour	SS	Reject	Remark
IRS2453DSPBF	311459.1	1000	80	0	
	F311453.1	1000	80	0	
	F311502.1	1000	80	0	

**Reliability Test #4 - High Temperature Bias (HTB) Test:**  
 Test Duration: 1000 Hours  
 Test Condition:  $T_j=150$  °C  
 Bias Condition:  $V_{CC}=14$  V,  $V_{SD}=3$  V,  $V_{BS}=14$  V,  $V_S=480$  V  
 Electrical Testing: @ Room

Device	Wafer Lot#	Hour	SS	Reject	Remark
IRS2453DSPBF	311459.1	1000	80	0	
	F311453.1	1000	80	0	
	F311502.1	1000	80	0	

**Reliability Test #5 - High Temperature Storage Life (HTSL) Test:**  
 Test Duration: 1000 Hours  
 Test Condition: Tj/A=150 °C  
 Bias Condition: No bias required  
 Electrical Testing: @ Room

Device	Wafer Lot#	Hour	SS	Reject	Remark
IRS2453DSPBF	311459.1	1000	80	0	

**Other Required Tests Results:**

- Resistance to Solder Heat/Wave-Solder:** Test 30 devices from one lot per package/device-vehicle in accordance with JEDEC, JESD22A111 – Passed (reference report: 10262-1-RSH).
- Solderability:** Test 10 devices from one lot per package/device-vehicle in accordance with JESD-106-B – Passed (reference report: 10272-1-SLDR/family data).
- ESD:** The following is the results of ESD tests that were performed by the R/D (Design Center) group.

IRS2453DSPBF

Human Body Model ESD (100 pF/1500 Ω)	
Device: IRS2453DSPBF Lot# C 06DN DC: 623W Number of samples: 5 per test combination Test Date: 06/22/06 Test Method: Per JESD22-A114-B Classification Passed: Class 2 Parts passed after exposure to ESD pulse of 2000 V, but failed after exposure to ESD Pulse of 4000 V	
Test Pin Combination	Rating
All Pin Combinations	2 kV to 4 kV

Machine Model ESD (200 pF/ 0 Ω)	
Device: IRS2453DSPBF Lot# C 06DN DC: 623W Number of samples: 3 per test combination Test Date: 06/22/06 Test Method: Per EIA/JESD22-A115-A Classification Passed: Class C Parts passed after exposure to ESD pulse of 400 V	
Test Pin Combination	Rating
All Pin Combinations	400 V

- LATCH-UP:** The following is the results of the LU test that was performed by the R/D (Design Center) group.

IRS2453DSPBF

Date: 23-Jun-06  
 Parts: IRS2453DS  
 Fab: Fab11  
 Date code: 623W  
 Lot Code: C 06DN

Summary	NCH	PCH		Notes
LO1	1.0	1.8	A	NCH test breaks the part
LO2	0.6	1.8	A	NCH test breaks the part
HO1	1.6	0.8	A	NCH test breaks the well
HO2	1.6	>2.0	A	NCH test breaks the well

End of report.