

QR-0008:
Reliability Qualification Report for
IRS21864SPBF
 Date: June 14th, 2006

Qualification Vehicle: IRS21864SPBF in 14L-SOICN package:

Based on the reliability test results, the IRS21864SPBF 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	10269-1-2-3
Product/Part #	IRS21864SPBF
Qualification Level	Lead-Free Industrial per COP800-08-Rev00
Silicon Technology	600 V HVIC
Silicon Generation	Gen 5
Wafer Fab	Fab11
Lead Finish Plating	100% Sn
Moisture Sensitivity Level	14L-SOICN Package: MSL3 @ 260 °C Per JEDEC spec JA113 / JEDEC J-STD-020C (Test Samples were subjected to preconditioning prior to AC, TC & THB reliability tests, HTB samples do not require precon).
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 and HTB 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	Lot ID	Hour	SS	Reject	Remark
IRS21864SPbF	1	96	80	0	
IRS21864SPbF	2	96	80	0	
IRS21864SPbF	3	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	Lot ID	Cycle	SS	Reject	Remark
IRS21864SPbF	1	1000	80	0	
IRS21864SPbF	2	1000	80	0	
IRS21864SPbF	3	1000	80	0	

Reliability Test #3 - Temperature Humidity Bias (THB) Test:
 Test Duration: 1000 Hours
 Test Condition: 85 °C, 85%RH
 Bias Condition: $V_{CC}=20$ V, $V_B=20$ V, $V_S=0$ V (Com)
 Electrical Testing: @ Room

Device	Lot ID	Hour	SS	Reject	Remark
IRS21864SPbF	1	1000	80	0	
IRS21864SPbF	2	1000	80	0	
IRS21864SPbF	3	1000	80	0	

Reliability Test #4 - High Temperature Bias (HTB) Test:
 Test Duration: 1008 Hours
 Test Condition: $T_j=150$ °C
 Bias Condition: $V_{CC}=20$ V, $V_{BS}=20$ V, $V_S=480$ V
 Electrical Testing: @ Room

Device	Lot ID	Hour	SS	Reject	Remark
IRS21864SPbF	1	1000	80	0	
IRS21864SPbF	2	1000	77	0	
IRS21864SPbF	3	1000	80	0	

Reliability Test #5 - High Temperature Storage Life (HTSL) Test:
 Test Duration: 1008 Hours
 Test Condition: $T_{j,A}=150\text{ }^{\circ}\text{C}$
 Bias Condition: No bias required
 Electrical Testing: @ Room

Device	Lot ID	Hour	SS	Reject	Remark
IRS21864SPbF	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: 10260-1-RSH).
- Solderability:** Test 10 devices from one lot per package/device-vehicle in accordance with JESD-106-B – Passed (reference report: 10260-1-SLDR).
- ESD:** The following is the results of ESD tests that were performed by the R/D (Design Center) group.

IRS21864SPbF:

Human Body Model ESD (100 pF/1500 Ω)	
Device: IRS21864SPBF Lot # 551Q Date code: C05AQ Number of samples: 3 per test model Test date: 2/9/06	
Test Pin Combination	Rating
All Power Pin Combinations	3.5 kV

Machine Model ESD (200 pF/ 0 Ω)	
Device: IRS21864SPBF Lot # 551Q Date code: C05AQ Number of samples: 3 per test model Test date: 2/9/06	
Test Pin Combination	Rating
All Pin Combinations	200 V to 400 V

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

Device: IRS21864SPBF
 Lot # 551Q
 Date code: C05AQ
 Number of samples: 6
 Test Date: 2/9/06

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
HO > VB	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A
HO < VS	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A
LO > VCC	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A
LO < COM	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A	2.0 A

End of report