

## Automotive Reliability Qualification Plan for LFCSP Package at Amkor Philippines(ATP)

QUALIFICATION PLAN			
Test	Conditions	Sample Size	Expected Completion Date
Temperature/Humidity/Bias (THB)*	JEDEC <i>JESD22-A101</i>	3 x 77	April 2014
Temperature Cycle (TC)*	JEDEC <i>JESD22-A104</i>	3 x 77	April 2014
Autoclave (AC)*	JEDEC <i>JESD22-A102</i>	3 x 77	April 2014
Solder Heat Resistance (SHR)*	JEDEC/IPC <i>J-STD-020</i>	3 x 11	April 2014
High Temperature Storage Life (HTSL)	JEDEC <i>JESD22-A103</i>	1 x 77	April 2014
Field Induced Charged Device Model (FICDM)	JEDEC <i>JESD22-C101</i>	1 x 18	April 2014

\*These samples will be subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Soak: Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C. TCT samples will be wire-pull test after 500 cycles. Preconditioned per JEDEC/IPC J-STD-020.

BILL OF MATERIALS					
Generic	Material List	Wire Size	DIE ATTACH EPOXY	MOLD COMPOUND	
				FROM	TO
AD8137	AD8137WYCPZ-R7 AD8137YCPZ-REEL AD8137YCPZ-REEL7	1.0 mil	ABLESTIK 8290	SUMITOMO G770	SUMITOMO G700
ADA4432-1	ADA4432-1BCPZ-R7 ADA4432-1WBCPZ-R7	0.8 mil			
ADA4433-1	ADA4433-1BCPZ-R7 ADA4433-1WBCPZ-R7				

# Test Qualification Plan

## 1. SCM Correlation Data Gathering

- Loop 4 bin1 units x30
- Run 100 bin1 units on handler
- Serialize and test 10 bin1 units
- Serialize and test 5 reject units

## 2. Ship correlation package from SCM to ATP

## 3. ATP Correlation Data Gathering

- Loop 4 bin1 units x30
- Run 100 bin1 units on handler
- Test 10 already serialized bin1
- Test 5 already serialized rejects

## 4. SCM/ATP send data to ADGT for Data Crunching and Analysis

## 5. CorL8 Analysis of x30 loop /100 units handler data

- X30 loop must pass Mean Shift, Sigma Spread and CPK criteria
- 100 Bin1 Correlation units must pass Mean Shift, Sigma Spread and CPK criteria
- 10 serialized units must pass bin1 both in ATP and in SCM
- 5 serialized rejects must fail the same parameter for both ATP and SCM

## 6. Correlation Data Approval

- For TRB movement to Available with Condition

## 7. Validation lot run handled by ATP

Note: CorL8 is ADI data analysis tool.



Reject Correlation		
Unit	SCM	ATP
1	TnumX: XXXXX	TnumX: XXXXX
...	TnumX: XXXXX	TnumX: XXXXX
5	TnumX: XXXXX	TnumX: XXXXX

Bin1 Correlation		
Unit	SCM	ATP
1	Pass	Pass
...	Pass	Pass
10	Pass	Pass

Correlation Test Criteria(TST00137)	
% Mean Shift Criteria	$((SCM\_mean - ATP\_Mean) / (Upper\_Limit - Lower\_Limit)) \times 100 \leq 5$
Sigma Spread Criteria	$(ATP\_Sigma / SCM\_Sigma) \leq 1.300000$
Cpk Criteria	If Cpk to the test limits is >10, then test given automatically PASS

# Test Qualification estimated Timeline

Devices	Oct, 2013 to Nov, 2013	Dec, 2013 to Apr, 2014	May, 2014
SCM Correlation Data Gathering & Shipment	PLANNED	PLANNED	
ATP Correlation Data Gathering		PLANNED	
Data Review and Approved by ADGT		PLANNED	
Validation Run/TRB Closure		PLANNED	PLANNED

 PLANNED  
 ACTUAL/ADJUSTED