Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia Final Test to KESM Test, Kuala Lumpur, Malaysia Final Test Expansion 3M17W - MPC5674F Correlation

08/01/2013, KW Soon

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0. Introduction – Reason for Final Test Transfer

- Capacity Expansion - Freescale internal test capacity is reaching maximum utilization and an external (Sub Con) Test site must be qualified for assurance of supply – to avoid delivery interruptions.

1. Objective and Considerations

1.1 Objective

- Objective is to qualify KESM Test, Kuala Lumpur, Malaysia Final Test facility as joint Final Test site for testing M17W**.** Complete list of affected parts is outlined in PCN 15483.
- This report details the correlation result of below FSL part# to demonstrate that Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia Final Test facility correlates with the KESM Test, Kuala Lumpur, Malaysia Final Test facility.
- The correlation units were first tested at the current Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia Final Test facility (full flow) and then both rejects and good units were tested at the KESM Test, Kuala Lumpur, Malaysia Final Test facility.
- No impact of customer deliveries
- Completed on 01/08/2013

1.2 Considerations

- Test Platform Hardware in KESM Test, Kuala Lumpur, Malaysia Final Test is identical platform used in Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia, and verified by tester calibration and dual site correlation analysis.
- Identical Final test load board design used in both sites
- Test Program Revision and test limits are the same in both sites.
- Measurement Systems Analysis (GR&R) performed per 12MRM97179A.

2. Qualification/Correlation Plan

2.1 Requirements:

The requirements and acceptance criteria are based on Freescale specification 12MQS10009G.

Qualification Plan	Brief Description	Detail description	Acceptance Criteria
3.0	minimum 15 reject units included) bin-to-bin	A minimum sample of 300* units in total from minimum 3 different wafer lots shall be used for correlating bin-to-bin per production test flow for every production test insertion. < Refer to Appendix II for sample size guideline of input quantity.> *Not applicable for analog products	100% correlation for all good and reject units
4.1	Class A	A minimum sample of 300* good units in total, from 3 different wafer lots shall be tested 100% at QA Gate (Hot / Room / Cold). These lots need to be processed trough final production test flow. The prerequisite requirements for Class A are stated below: 1. Hardware configuration shall meet agreed planning configuration. 2. The final production test flow must be used for manufacturing certification. 3. The test program used shall be production intended program which is released with appropriate software control. Refer to Appendix II for sample size guideline of input quantity. Optional for AMPD (Analog, Mix signal and Power Division)	0 failure
4.2	Parametric comparison	A minimum sample of 30 good units between Site A and Site B shall be used for parametric comparison. Minimum 2 critical parametric tests shall be used for all specified test insert temperatures for every production test insertion.	As minimum requirement, T-test and f-test should be no significant difference with p-value more than 0.05.

2.2 General Method:

Using the production test program, perform 100% screening of 3 lots for Mamba at 145°C temperature and –45°C cold temperatures in the new test site, KESM Test, Kuala Lumpur, Malaysia. Test the same lots under the same conditions in the current test site, Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia. Any miss-correlations at KESM Test, Kuala Lumpur, Malaysia will be sent to Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia for evaluation.

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3. Correlation Results

3.1 Bin-to-bin Correlation Results:

Tables below summarize the correlation results. All numbers filled in green boxes means correlation was achieved. All numbers filled in yellow boxes means results did not correlate and requires further explanation.

Bin-to-Bin Correlation Matrix for Hot Test

	MHA1T6LJ00	KESM Test, Kuala Lumpur, Malaysia RESULT							
	BIN	1	2	3	4	5	6	7	8
Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia RESULT	1	Pass							
	2		100%						
	3			100%					
	4				100%				
	5					100%			
	6						100%		
	7							100%	
	8								100%

	MHA1T6LM00	KESM Test, Kuala Lumpur, Malaysia RESULT							
	BIN	1	2	3	4	5	6	7	8
Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia RESULT	1	Pass							
	2		100%						
	3			100%					
	4				100%				
	5					100%			
	6						100%		
	7							100%	
	8								100%

	MHA1T88M00	KESM Test, Kuala Lumpur, Malaysia RESULT							
	BIN	1	2	3	4	5	6	7	8
Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia RESULT	1	Pass							
	2		100%						
	3			100%					
	4				100%				
	5					100%			
	6						100%		
	7							100%	
	8								100%

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3. Correlation Results

Bin-to-Bin Correlation Matrix for Cold Test

MHA1T6LJ00	KESM Test, Kuala Lumpur, Malaysia RESULT							
Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia RESULT / BIN	1	2	3	4	5	6	7	8
1	Pass							
2		100%						
3			100%					
4				100%				
5					100%			
6						100%		
7							100%	
8								100%

MHA1T6LM00	KESM Test, Kuala Lumpur, Malaysia RESULT							
Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia RESULT / BIN	1	2	3	4	5	6	7	8
1	Pass							
2		100%						
3			100%					
4				100%				
5					100%			
6						100%		
7							100%	
8								100%

MHA1T88M00	KESM Test, Kuala Lumpur, Malaysia RESULT							
Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia RESULT / BIN	1	2	3	4	5	6	7	8
1	Pass							
2		100%						
3			100%					
4				100%				
5					100%			
6						100%		
7							100%	
8								100%

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4. QA GATE Results

4.1 QA Gate results (tested at spec limits):
Table below shows the QA Gate results Qual in new Test site KESM Test, Kuala Lumpur, Malaysia.

QA Gate Results

	Hot 140C		Cold -40C		Room 25C	
Lot	**# Pass**	**# Fail**	**# Pass**	**# Fail**	**# Pass**	**# Fail**
MHA1T6LJ00	100%	0	100%	0	100%	0
MHA1T88M00	100%	0	100%	0	100%	0
MHA1T6LM00	100%	0	100%	0	100%	0

Results: Pass.

4.3 Parametric Comparison:
T-test and f-test should not demonstrate significant difference. P-value should be greater than 0.05.

P-value	Cold		Hot	
	Stop IDD	OSC Ibias	Run IDD	Trip IDD
t-test	0.0773	0.4203	0.7182	0.4903
f-test	0.1475	0.5239	0.6952	0.2976

Results: Pass.

5.0 Analysis Conclusions and Verification

- Bin-to-bin activity shows 100% correlation of >300 good units/ lot at hot and cold temperatures between the new Test site KESM Test, Kuala Lumpur, Malaysia and the current Test site Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia .
- The QA Gate correlation passes at the new Test site KESM Test, Kuala Lumpur, Malaysia
- Parametric comparison between new Test site KESM Test, Kuala Lumpur, Malaysia and the current Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia passes. The results demonstrate that the new Test site KESM Test, Kuala Lumpur, Malaysia Final Test Site has qualified as a test site for this product line.

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6. Conclusion and Recommendation

6.1 Conclusion

- Based on this report, M17W passed all correlation requirements without any issues.
- Bin-to-bin activity shows 100% correlation at room/cold/hot temperature between the new KESM Test, Kuala Lumpur, Malaysia and the current Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia.
- The QA Gate correlation passes at KESM Test, Kuala Lumpur, Malaysia.
- Parametric comparison between new KESM Test, Kuala Lumpur, Malaysia and the current Freescale FSL-KLM-FM, Kuala Lumpur, Malaysia for 30 good units per lot passes. The results demonstrate that the new KESM Test, Kuala Lumpur, Malaysia Final Test Site has qualified as a test site for this product.

6.2 Recommendation

- Test program for M17W, package code # 5193, 5252, 5328, 5366 can be released in KESM Test, Kuala Lumpur, Malaysia Final Test.

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