S40410081B1B1W

CS Q100627

Qualification of: S40410081B1B1W, 8GB eMMC Product in RLH153 (11.5 x 13 x 1mm) 153 Ball, Multi-Chip Fine Pitch Ball Grid Array Package (MCP)

Reliability Qualification Summary

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Additionally, the package details (material set, assembly location, etc.) are specific to the qual vehicle used for the qualification. Alternate material sets and assembly locations may be qualified for the product. Production material can be assembled with any qualified material set and at any qualified assembly location. Tests are performed in accordance with AEC-Q100 and relevant JEDEC specifications.

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I. Product Information

Product Description: S40410081B1B1W

8GB eMMC Product in RMA153

Package:	RLH153	**Qualification:**	Q100627
Description:	(11.5 x 13 x 1mm) 153 Ball, Multi-Chip Fine Pitch Ball Grid Array Package (MCP)		
Theta Ja:	35 °C/W	**Psi Jt:**	9.5 °C/W
Assembly Location:	STS Korea	**Molding Compound:**	RoHS Compliant Epoxy Resin
Substrate/Leadframe:	Laminate Substrate	**Die Attachment:**	Film
Lead Finish:	98.3Sn1.2Ag0.5Cu Spheres	**Bond Wire:**	Gold
Comments:			

Est. Field Temperature:	55 °C	**Life Test Temperature:**	125 °C
Est. DC Field Current:	100 mA	**Life Test Dynamic Current:**	100 mA
Est. Field Voltage:	3.0 V	**Life Test Voltage:**	3.6 V
Est. Field Power Dissipation:	300 mWatts	**Est. Stress Power Dissipation:**	360 mWatts
Est. Field Tj:	65.5 °C	**Est. Stress Tj:**	137.6 °C

Number of Dies: 2

Die #1: (Bottom)	**Die:**	ET5GZ9-HS	**Die Size:**	12.0 x 7.92 mm
	Process:	19nm	**Fab:**	Toshiba
	Type:	NAND	**Density:**	8G
Die #2:	**Die:**	20-W8211EE102	**Die Size:**	3.69 x 0.96 mm
	Process:	55nm	**Fab:**	UMC
	Type:	MCU	**Density:**	32G

II. Summary of Stress Test Results

Stress Test	Stress Condition	Package Type	Sample Size	Num. of Lots	Num. of Fails	Failure Rate %	Comments
Data From Qualification Q100627:							
HTOL (EL)	(3.6V, 125°C)	RLH153 [1]	77	1	0	0.00	168 hours
ESD CDM	N/A	RLH153 [1]	15	1	Passed 1.0kV		
ESD HBM	(100pF, 1500 Ohms)	RLH153 [1]	60	1	Passed 2.0kV		
Latch Up	(125°C, +/- 100mA)	RLH153 [1]	6	1	Passed		
Preconditioning	(PC1/260°C, +0°C/-5°C)	RLH153 [1]	75	1	Passed Jedec L3 / Jeita Rank E		
Precon+Temp Cycle	(PC1/260°C, -55°C/125°C)	RLH153 [1]	25	1	0	0.00	1000 cycles
Precon+HAST	(PC1/260°C, Biased, 110°C/85% RH)	RLH153 [1]	25	1	0	0.00	264 hours
Precon+uHAST	(PC1/260°C, Unbiased, 130°C/85% RH)	RLH153 [1]	25	1	0	0.00	96 hours
Generic Reference Data:							
ELFR	(3.6V, 125°C)	RMA153 [2]	2395	3	0	0.00	48 hours
HTOL (EL)	(3.6V, 125°C)	RMA153 [2]	214	3	0	0.00	168 hours
HTOL (IL)	(3.6V, 125°C)	RMA153 [2]	214	3	0	0.00	500 hours
HTOL (XL)	(3.6V, 125°C)	RMA153 [2]	35	1	0	0.00	1000 hours
High Temp Bake	(200°C)	RMA153 [2]	42	1	0	0.00	500 hours
Drop Test	1500g	RMA153 [2]	60	1	0	0.00	30 drops

Notes / Justification: 1) Results from Qual Q100627, S40410081B1B1W, 8G 19nm NAND + 32G 55nm MCU in 153 Ball MCP (11.5 x 13 x 1mm)

2) Results from Qual Q100617, S40410161B1B1W in 153 Ball MCP (11.5 x 13 x 1mm) - Similar product in 16GB

Preconditioning Flows: PC1 (Exceeds JEDEC L3 and JEITA Rank E): Bake 125°C, 24hr => Soak @ 30°C/70%RH, 216hr => 3x Reflow

III. Revision History

Section	Description
Revision A - 10/24/2014	
	Initial Release.

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