S70GL02GS

CS Q100082

Qualification of S70GL02GS, Two 1 Gigabit, 3.0 Volt-only Page Mode Flash Memories featuring 65 nm MirrorBit® process technology in LSH064 Package.

Reliability Qualification Summary

CONFIDENTIAL

NOTICE: The material in this report is confidential. It is prepared to assist in the qualification of our product. It is declassified for the internal use of our customers only, and may be modified to meet the needs of specific customers. It also serves as a record of full qualification according to JESD47 and AEC-Q100 requirements.

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: S70GL02GS

Two 1 Gigabit, 3.0 Volt-only Page Mode Flash Memories featuring 65 nm MirrorBit® process technology

Package:	LSH064	**Qualification:**	Q100082
Description:	(13 x 11 x 1.4mm) 64 Ball, Multi-Chip Fine Pitch Ball Grid Array Package (MCP)		
Theta Ja:	35 °C/W	**Psi Jt:**	11 °C/W
Assembly Location:	Cypress Thailand	**Molding Compound:**	RoHS Compliant Epoxy Resin
Substrate/Leadframe:	Laminate Substrate	**Die Attachment:**	Paste & Film
Lead Finish:	96.5Sn3.0Ag0.5Cu Spheres	**Bond Wire:**	Gold
Comments:			

Est. Field Temperature:	55 °C	**Life Test Temperature:**	125 °C
Est. DC Field Current:	25 mA	**Life Test Dynamic Current:**	10 mA
Est. Field Voltage:	3.0 V	**Life Test Voltage:**	3.6 V
Est. Field Power Dissipation:	75 mWatts	**Est. Stress Power Dissipation:**	36 mWatts
Est. Field Tj:	57.6 °C	**Est. Stress Tj:**	126.2 °C

Number of Dies: 2

Die #1:	**Die:**	98661A	**Die Size:**	6.80 x 7.45	mm
(Bottom)	**Process:**	CS239LS (65nm)	**Fab:**	Cypress Fab25	
	Type:	MirrorBit Eclipse	**Density:**	1G	
Die #2:	**Die:**	98661A	**Die Size:**	6.80 x 7.45	mm
	Process:	CS239LS (65nm)	**Fab:**	Spansion Fab25	
	Type:	MirrorBit Eclipse	**Density:**	1G	

II. CS239LS Life Test Failure Rate Calculation

HTOL Stress Temperature - 125 °C

Failure Mechanism	Read Points / Test Results				Modeling Parameters @55°C					Avg. Failure Rate FITS @55°C, 60% Conf.	
	24 hrs	168 hrs	1000 hrs	2000 hrs	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life	Inherent Life
PLASTIC											
Sample Size	4950	4615	842	50							
Zero fails, Process ave. Ea	0	0 *	0	0	0.66	53	1	53		48	11
Totals	**0**	**0**	**0**	**0**					**10378**	**48**	**11**

* Contributes to early life FITS

Data Retention Bake - 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate %	Failure Mechanism
500 hrs	0	1735	0.00	No Failures
1000 hrs	0	1208	0.00	No Failures

III. 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 Q100082:							
ESD CDM	N/A	LSH064 [1]	3	1	Passed 1.0kV		
Preconditioning	(PC1/260°C, +0°C/-5°C)	LSH064 [1]	154	1	Passed Jedec L3 / Jeita Rank E		
Precon+Temp Cycle	(PC1/260°C, -55°C/125°C)	LSH064 [1]	77	1	0	0.00	500 cycles
Precon+uHAST	(PC1/260°C, Unbiased, 130°C/85% RH)	LSH064 [1]	77	1	0	0.00	96 hours
Generic Reference Data:							
HTOL (EL)	(3.6V, 125°C)	LAE064 [2]	288	4	0	0.00	168 hours
Data Retention Bake	(150°C)	LAE064 [2]	120	1	0	0.00	168 hours
ESD CDM	N/A	LAE064 [2]	15	1	Passed 1.0kV		
ESD HBM	(100pF, 1500 Ohms)	LAE064 [2]	84	1	Passed 2.0kV		
Latch Up	(125°C, +/- 100mA)	LAE064 [2]	6	1	Passed		
Endurance (10k)	(-40°C, 3.6V)	LAE064 [2]	100	2	0	0.00	10k cycles
	(90°C, 3.6V)	LAE064 [2]	100	2	0	0.00	10k cycles
Preconditioning	(PC1/260°C, +0°C/-5°C)	LAE064 [2]	385	2	Passed Jedec L3 / Jeita Rank E		
Precon+Temp Cycle	(PC1/260°C, -40°C/150°C)	LAE064 [2]	154	2	0	0.00	1000 cycles
Precon+HAST	(PC1/260°C, Biased, 110°C/85% RH)	LAE064 [2]	154	2	0	0.00	264 hours
Precon+uHAST	(PC1/260°C, Unbiased, 130°C/85% RH)	LAE064 [2]	77	1	0	0.00	96 hours

Notes / Justification: 1) Results from Qual Q100082, S70GL02GS, 1G CS239LS (65nm) MirrorBit Eclipse + 1G CS239LS (65nm) MirrorBit Eclipse in 64 Ball MCP (13 x 11 x 1.4mm)

2) Results from Qual Q99891, S29GL01GS in 64 Ball fFBGA (9 x 9 x 1.4mm) - Same Flash in BGA Package

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

IV. Revision History

Section	Description
Revision A - 8/12/2011	
	Initial Release.
Revision B - 12/19/2012	
Cover Page, Section I: Packaging Details Section II: Technology Information Section III: Summary of Stress Test Data	Corrected typo of 90nm to 65nm. Updated technology to most recent data. Corrected Stress Data for same product.