

# Am29SL800D

## CS 4877

Qualification of: Am29SL800D, 8 Megabit (1M x 8-Bit/512K x 16-Bit) 1.8 Volt-only Super Low Voltage Flash Memory in FBA048 (8.15 x 6.15 x 1.2mm) 48 Ball, Fine Pitch Ball Grid Array Package (FBGA)



## Reliability Qualification Summary

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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 Grade 1 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.

### Table of Contents

- I. Product Information
- II. Life Test Failure Rate Calculation
- III. Summary of Stress Test Results
- IV. Revision History

## I. Product Information

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Product Description: Am29SL800D  
 8 Megabit (1M x 8-Bit/512K x 16-Bit) 1.8 Volt-only  
 Super Low Voltage Flash Memory

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Package:	FBA048	Qualification:	4877
Description:	(8.15 x 6.15 x 1.2mm) 48 Ball, Fine Pitch Ball Grid Array Package (FBGA)		
Theta Ja:	39 °C/W	Psi Jt:	11 °C/W
Assembly Location:	Spansion Thailand	Molding Compound:	RoHS Compliant Epoxy Resin
Substrate/Leadframe:	BT Resin Substrate	Die Attachment:	Paste
Lead Finish:	SnPb Plating	Bond Wire:	Gold
Comments:			

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Est. Field Temperature:	55 °C	Life Test Temperature:	150 °C
Est. DC Field Current:	30 mA	Life Test Dynamic Current:	5 mA
Est. Field Voltage:	1.8 V	Life Test Voltage:	1.95 V
Est. Field Power Dissipation:	54 mWatts	Est. Stress Power Dissipation:	9.7 mWatts
Est. Field Tj:	57.1 °C	Est. Stress Tj:	150.3 °C

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Die:	98H18A	Die Size:	4.73 x 3.57 mm
Process:	CS49S (230nm)	Fab:	FSET
Type:	Floating Gate	Density:	8M

## II. CS49S/LS Life Test Failure Rate Calculation

HTOL Stress Temperature - 150 °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	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life	Inherent Life
PLASTIC										
Sample Size	4147	4138	461							
Zero fails, Process ave. Ea	0 *	0	0	0.66	152	1	152		55	6
Totals	0	0	0					19026	55	6

\* Contributes to early life FITS

Data Retention Bake - 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate %	Failure Mechanism
500 hrs	0	1617	0.00	No Failures
1000 hrs	0	1848	0.00	No Failures
2000 hrs	0	1920	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
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Data From Qualification 4877:

HTOL (EL)	(1.95V, 150°C)	FBA048 <sup>1</sup>	165	1	0	0.00	168 hours
ESD CDM	N/A	FBA048 <sup>1</sup>	4	1	0	0.00	Passed 1.0kV
ESD HBM	(100pF, 1500 Ohms)	FBA048 <sup>1</sup>	28	1	0	0.00	Passed 2.0kV
Preconditioning	(PC1/260°C, +0°C/-5°C)	FBA048 <sup>1</sup>	330	1	0	0.00	Passed Jedec L3 / Jeita Rank E
Precon+Temp Cycle	(-40°C/150°C)	FBA048 <sup>1</sup>	165	1	0	0.00	1000 cycles
Precon+Steam Pressure	(PC1/260°C, 121°C/100%RH/15PSIG)	FBA048 <sup>1</sup>	165	1	0	0.00	168 hours

Generic Reference Data:

Preconditioning	(PC1/260°C, +0°C/-5°C)	FBC048 <sup>2</sup>	231	1	0	0.00	Passed Jedec L3 / Jeita Rank E
Precon+Temp Cycle	(PC1/260°C, -40°C/150°C)	FBC048 <sup>2</sup>	77	1	0	0.00	1000 cycles
Precon+HAST	(PC1/260°C, Biased, 110°C/85% RH)	FBC048 <sup>2</sup>	77	1	0	0.00	264 hours
Precon+Steam Pressure	(PC1/260°C, 121°C/100%RH/15PSIG)	FBC048 <sup>2</sup>	77	1	0	0.00	168 hours

Notes / Justification: 1) Results from Qual 4877, Am29SL800D, 8M CS49S (230nm) Floating Gate in 48 Ball FBGA (8.15 x 6.15 x 1.2mm)  
 2) Results from Qual 80667E, Am29LV160D in 48 Ball FBGA (9 x 8 x 1.2mm) - similar package with FBA048

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 - 10/14/2008	Initial Release.

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