



THIS SPEC IS OBSOLETE.

Spec No: 002-00939

Spec Title: AM29F160D

Replaced by: None

# Am29F160D

## CS 3966

Qualification of: AM29F160D, 16 Megabit, CMOS 5.0 Volt-Only in TS048 (18.4 x 12.0 x 1.0mm) 48 Lead, Thin Small Outline Package (TSOP)



### 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

Product Description: AM29F160D  
16 Megabit, CMOS 5.0 Volt-Only

Package:	TS048	Qualification:	3966
Description:	(18.4 x 12.0 x 1.0mm) 48 Lead, Thin Small Outline Package (TSOP)		
Theta Ja:	40 °C/W	Psi Jt:	17 °C/W
Assembly Location:	Spansion Thailand	Molding Compound:	RoHS Compliant Epoxy Resin
Substrate/Leadframe:	Copper Leadframe	Die Attachment:	Paste
Lead Finish:	SnPb Plating	Bond Wire:	Gold
Comments:			

Est. Field Temperature:	55 °C	Life Test Temperature:	150 °C
Est. DC Field Current:	20 mA	Life Test Dynamic Current:	10 mA
Est. Field Voltage:	5.0 V	Life Test Voltage:	5.5 V
Est. Field Power Dissipation:	100 mWatts	Est. Stress Power Dissipation:	55 mWatts
Est. Field Tj:	59.0 °C	Est. Stress Tj:	152.2 °C

Die:	98K11A	Die Size:	5.50 x 6.10 mm
Process:	CS49HS (230nm)	Fab:	FSET
Type:	Floating Gate	Density:	16M

## 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	700	707	120							
Zero fails, Process ave. Ea	0	0*	0	0.66	148	1	148		52	28
Totals	0	0	0					4077	52	28

\* Contributes to early life FITS

Data Retention Bake - 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate %	Failure Mechanism
500 hrs	0	77	0.00	No Failures
1000 hrs	0	77	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 3966:

HTOL (EL)	(5.5V, 150°C)	TS048 <sup>1</sup>	150	1	0	0.00	168 hours
ESD HBM	(100pF, 1500 Ohms)	TS048 <sup>1</sup>	28	1	Passed	2.0kV	
Latch Up	( +/- 200mA)	TS048 <sup>1</sup>	6	1	Passed		
Endurance Cycling	(90°C, 5.5V)	TS048 <sup>1</sup>	64	1	0	0.00	10K cycles
Preconditioning	(PC2/240°C, +0°C/-5°C)	TS048 <sup>1</sup>	150	1	Passed	Jedec L3	
Precon+Temp Cycle	(PC2/240°C, -40°C/150°C)	TS048 <sup>1</sup>	150	1	0	0.00	1000 cycles

Generic Reference Data:

ESD CDM	N/A	TS048 <sup>2</sup>	15	3	Passed	750V	
Preconditioning	(PC1/260°C, +0°C/-5°C)	TS048 <sup>2</sup>	693	3	Passed	Jedec L3 / Jeita Rank E	
Precon+Temp Cycle	(PC1/260°C, -40°C/150°C)	TS048 <sup>2</sup>	231	3	0	0.00	1000 cycles
Precon+HAST	(PC1/260°C, Biased, 130°C/85% RH)	TS048 <sup>2</sup>	231	3	0	0.00	96 hours
Precon+Steam Pressure	(PC1/260°C, 121°C/100%RH/15PSIG)	TS048 <sup>2</sup>	231	3	0	0.00	168 hours
Lead Integrity	N/A	TS048 <sup>2</sup>	5	1	Passed		
Solderability	N/A	TS048 <sup>2</sup>	30	3	Passed		

Notes / Justification: 1) Results from Qual 3966, AM29F160D, 16M CS49HS (230nm) Floating Gate in 48 Lead TSOP (18.4 x 12 x 1mm)  
 2) Results from Qual 80341, Am29LV160D in 48 Lead TSOP (18.4 x 12 x 1.1mm) - Same Flash Technology

Preconditioning Flows: PC1 (Exceeds JEDEC L3 and JEITA Rank E): Bake 125°C, 24hr => Soak @ 30°C/70%RH, 216hr => 3x Reflow  
 PC2 (JEDEC L3): Bake 125°C, 24hr => Soak @ 30°C/60%RH, 192hr => 3x Reflow

## IV. Revision History

Section	Description
Revision A - 1/4/2011	Initial Release.

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