THIS SPEC IS OBSOLETE.

Spec No: 002-00944

Spec Title: AM29F032B

Replaced by: None

Am29F032B

CS Q99375a, Q99375c

Qualification of: AM29F032B, 32 Megabit (4 M x 8-Bit), CMOS 5.0 Volt-only, Uniform Sector Flash Memory in SO044 and TS040 Packages

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 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.

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I.A. Product Information

Product Description: AM29F032B

32 Megabit (4 M x 8-Bit), CMOS 5.0 Volt-only, Uniform Sector Flash Memory

Package:	SO044	Qualification:	Q99375a
Description:	(28.2 x 13.3 x 2.8mm) 44 Lead, Small Outline Integrated Circuit (SOIC)		
Theta Ja:	88 °C/W	Psi Jt:	16 °C/W
Assembly Location:	Spansion Thailand	Molding Compound:	RoHS Compliant Epoxy Resin
Substrate/Leadframe:	Copper Leadframe	Die Attachment:	Paste
Lead Finish:	100% Matte Sn Plating	Bond Wire:	Gold
Comments:			

Est. Field Temperature:	150 °C	Life Test Temperature:	55 °C
Est. DC Field Current:	30 mA	Life Test Dynamic Current:	5 mA
Est. Field Voltage:	5.0 V	Life Test Voltage:	6 V
Est. Field Power Dissipation:	150 mWatts	Est. Stress Power Dissipation:	30 mWatts
Est. Field Tj:	163.2°C	Est. Stress Tj:	57.6 °C

Die:	98325A	Die Size:	6.46 x 11.50 mm
Process:	CS39S (320nm)	Fab:	FSET
Type:	Floating Gate	Density:	32M

I.B. Product Information

Product Description: AM29F032B

32 Megabit (4 M x 8-Bit), CMOS 5.0 Volt-only, Uniform Sector Flash Memory

Package:	TS040	Qualification:	Q99375c
Description:	(18.4 x 10.0 x 1.0mm) 40 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:	100% Matte Sn Plating	Bond Wire:	Gold
Comments:			

Est. Field Temperature:	150 °C	Life Test Temperature:	55 °C
Est. DC Field Current:	30 mA	Life Test Dynamic Current:	5 mA
Est. Field Voltage:	5.0 V	Life Test Voltage:	6 V
Est. Field Power Dissipation:	150 mWatts	Est. Stress Power Dissipation:	30 mWatts
Est. Field Tj:	156.0°C	Est. Stress Tj:	56.2 °C

Die:	98325A	Die Size:	6.46 x 11.50 mm
Process:	CS39S (320nm)	Fab:	FSET
Type:	Floating Gate	Density:	32M

II. CS39S/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	7376	7256	2160							
Zero fails, Process ave. Ea	0 *	0	0	0.66	150	1	150		31	2
Totals	0	0	0					57078	31	2

* Contributes to early life FITS

Data Retention Bake - 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate %	Failure Mechanism
500 hrs	0	2105	0.00	No Failures
1000 hrs	0	2405	0.00	No Failures
2000 hrs	0	1971	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 Q99375a:							
Preconditioning	(PC1/260°C, +0°C/-5°C)	SO044 [1]	77	1	Passed Jedec L3 / Jeita Rank E		
Precon+Temp Cycle	(PC1/260°C, -40°C/150°C)	SO044 [1]	77	1	0	0.00	1000 cycles
Generic Reference Data:							
HTOL (EL)	(5.5V, 150°C)	SO044 [2]	154	2	0	0.00	168 hours
ESD CDM	N/A	SO044 [2]	30	2	Passed 1.0kV		
	N/A	TS032 [3]	45	3	Passed 1.0kV		
ESD HBM	(100pF, 1500 Ohms)	TS040 [4]	60	1	Passed 2.0kV		
Endurance (10k)	(90°C, 5.65V)	TS040 [4]	64	1	0	0.00	10k cycles
Preconditioning	(PC1/260°C, +0°C/-5°C)	SO044 [2]	616	2	Passed Jedec L3 / Jeita Rank E		
	(PC9/260°C, +0°C/-5°C)	TS032 [3]	462	3	Passed Jedec L3 / Jeita Rank E		
Precon+Temp Cycle	(PC1/260°C, -40°C/150°C)	SO044 [2]	154	2	0	0.00	1000 cycles
	(PC1/260°C, -50°C/150°C)	SO044 [2]	154	2	0	0.00	1000 cycles
	(PC9/260°C, -40°C/150°C)	TS032 [3]	231	3	0	0.00	1000 cycles
Precon+HAST	(PC1/260°C, Biased, 130°C/85% RH)	SO044 [2]	154	2	0	0.00	96 hours
Precon+Steam Pressure	(PC1/260°C, 121°C/100%RH/15PSIG)	SO044 [2]	154	2	0	0.00	168 hours
Precon+uHAST	(PC9/260°C, Unbiased, 130°C/85% RH)	TS032 [3]	231	3	0	0.00	96 hours
Lead Integrity	N/A	SO044 [2]	6	1	Passed		
	N/A	TS032 [3]	6	1	Passed		
Solderability	N/A	SO044 [2]	40	2	Passed		
	N/A	TS032 [3]	120	3	Passed		

Notes / Justification:
1) Results from Qual Q99375a, AM29F032B, 32M CS39S (320nm) Floating Gate in 44 Lead SOIC (28.2 x 13.3 x 2.3mm)
2) Results from Qual 80969a, Am29F400B in 44 Lead SOIC (28.2 x 13.3 x 2.8mm) - Same Flash technology in SO044 package
3) Results from Qual Q99148, Am29LV040B in 32 Lead TSOP (18.4 x 8 x 1mm) - Same Flash Technology in TS032. Similar Package to TS040
4) Results from Qual 3664, AM29F032B in 40 Lead TSOP (18.4 x 10 x 1mm) - Same Product, Technology, and TS040 package.

Preconditioning Flows: PC1 (Exceeds JEDEC L3 and JEITA Rank E): Bake 125°C, 24hr => Soak @ 30°C/70%RH, 216hr => 3x Reflow
PC9 (Accelerated JEDEC L3 / JEITA Rank E): Bake 125°C, 24hr => Soak @ 60°C/70%RH, 72hr => 3x Reflow

IV. Revision History

Section	Description
Revision A - 12/28/2010	
	Initial Release.