

S29WS256N

CS 80033

Qualification of: S29WS256N, 256 Megabit (16M x 16-Bit) 1.8 Volt-only Simultaneous Read/Write, Burst Mode Flash Memory in VBG088 (11.0 x 8.0 x 1.0mm) 88 Ball, Very Thin 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.

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I. Product Information

Product Description: S29WS256N
256 Megabit (16M x 16-Bit) 1.8 Volt-only
Simultaneous Read/Write, Burst Mode Flash Memory

Package:	VBG088	Qualification:	80033
Description:	(11.0 x 8.0 x 1.0mm) 88 Ball, Very Thin Fine Pitch Ball Grid Array Package (FBGA)		
Theta Ja:	78 °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:	63Sn37Pb Spheres	Bond Wire:	Gold
Comments:			

Est. Field Temperature:	55 °C	Life Test Temperature:	150 °C
Est. DC Field Current:	40 mA	Life Test Dynamic Current:	9 mA
Est. Field Voltage:	1.8 V	Life Test Voltage:	1.95 V
Est. Field Power Dissipation:	72 mWatts	Est. Stress Power Dissipation:	17.5 mWatts
Est. Field Tj:	60.6 °C	Est. Stress Tj:	151.3 °C

Die:	98447A	Die Size:	5.35 x 9.57 mm
Process:	CS119LS (110nm)	Fab:	Spansion Takaku
Type:	MirrorBit	Density:	256M

II. CS119S/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	2000 hrs	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life	Inherent Life
PLASTIC											
Sample Size	10150	11246	1930	200							
Zero fails, Process ave. Ea	0 *	0	0	0	0.66	130	1	130		22	2
Totals	0	0	0	0					57078	22	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	2881	0.00	No Failures
1000 hrs	0	2753	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 80033:							
HTOL (EL)	(1.95V, 150°C)	VBG088 ¹	2199	3	0	0.00	168 hours
ESD CDM	N/A	VBG088 ¹	36	3	0	0.00	Passed 1.0kV
ESD HBM	(100pF, 1500 Ohms)	VBG088 ¹	180	3	0	0.00	Passed 2.0kV
Latch Up	(125°C, +/- 100mA)	VBG088 ¹	15	3	0	0.00	Passed
Endurance (10k)	(90°C, 1.95V)	VBG088 ¹	1278	3	0	0.00	10k cycles
Preconditioning	(PC1/260°C, +0°C/-5°C)	VBG088 ¹	454	3	0	0.00	Passed Jedec L3 / Jeita Rank E
Precon+Temp Cycle	(PC1/260°C, -40°C/150°C)	VBG088 ¹	151	3	0	0.00	1000 cycles
Precon+HAST	(PC1/260°C, Biased, 110°C/85% RH)	VBG088 ¹	143	3	0	0.00	264 hours
Precon+Steam Pressure	(PC1/260°C, 121°C/100%RH/15PSIG)	VBG088 ¹	160	3	0	0.00	168 hours

Notes / Justification: 1) Results from Qual 80033, S29WS256N, 256M CS119LS (110nm) MirrorBit in 88 Ball vFBGA (11 x 8 x 1mm)

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 - 8/7/2012	Initial Release.

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