

S25FL128P

CS 81252, 81301

Qualification of: S25FL128P, 128 Megabit 3.0 Volt Flash Memory with 104 Mhz SPI (Serial Peripheral Interface) Bus in SO3016 and WNF008 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: S25FL128P
128 Megabit 3.0 Volt Flash Memory with 104 Mhz SPI (Serial Peripheral Interface) Bus

Package:	SO3016	Qualification:	81252
Description:	(10.3 x 10.3 x 2.65mm) 16 Lead, Small Outline Integrated Circuit (SOIC)		
Theta Ja:	38 °C/W	Psi Jt:	7.8 °C/W
Assembly Location:	Amkor Manila	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:	55 °C	Life Test Temperature:	150 °C
Est. DC Field Current:	26 mA	Life Test Dynamic Current:	4 mA
Est. Field Voltage:	3.0 V	Life Test Voltage:	3.6 V
Est. Field Power Dissipation:	78 mWatts	Est. Stress Power Dissipation:	14.4 mWatts
Est. Field Tj:	57.9 °C	Est. Stress Tj:	150.5 °C

Die:	98U26A	Die Size:	3.52 x 5.96 mm
Process:	CS129 (90nm)	Fab:	Spansion Fab25
Type:	MirrorBit	Density:	128M



I.B. Product Information

Product Description: S25FL128P
128 Megabit 3.0 Volt Flash Memory with 104 Mhz SPI (Serial Peripheral Interface) Bus

Package:	WNF008	Qualification:	81301
Description:	(6.0 x 8.0 x 0.75mm) 8 Contact, Small Outline No Lead Package (WSON)		
Theta Ja:	18 °C/W	Psi Jt:	8.8 °C/W
Assembly Location:	UTAC 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:	55 °C	Life Test Temperature:	150 °C
Est. DC Field Current:	26 mA	Life Test Dynamic Current:	4 mA
Est. Field Voltage:	3.0 V	Life Test Voltage:	3.6 V
Est. Field Power Dissipation:	78 mWatts	Est. Stress Power Dissipation:	14.4 mWatts
Est. Field Tj:	56.3 °C	Est. Stress Tj:	150.2 °C

Die:	98U26A	Die Size:	3.52 x 5.96 mm
Process:	CS129 (90nm)	Fab:	Spansion Fab25
Type:	MirrorBit	Density:	128M

II. CS129/AL 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	504 hrs	1000 hrs	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life	Inherent Life
PLASTIC											
Sample Size	7640	7876	960	164							
Zero fails, Process ave. Ea	0 *	0	0	0	0.66	145	1	145		29	3
Totals	0	0	0	0					38052	29	3

* Contributes to early life FITS

Data Retention Bake - 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate %	Failure Mechanism
500 hrs	0	2310	0.00	No Failures
1000 hrs	0	2171	0.00	No Failures
2000 hrs	0	1402	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 81252, 81301:							
HTOL (EL)	(3.6V, 150°C)	SO3016 ¹	77	1	0	0.00	168 hours
ESD CDM	N/A	SO3016 ¹	15	1	Passed	1.0kV	
	N/A	WNF008 ²	15	1	Passed	1.0kV	
ESD HBM	(100pF, 1500 Ohms)	SO3016 ¹	60	1	Passed	1.0kV	
	(100pF, 1500 Ohms)	WNF008 ²	60	1	Passed	1.0kV	
Latch Up	(125°C, +/- 100mA)	SO3016 ¹	6	1	Passed		
	(125°C, +/- 100mA)	WNF008 ²	6	1	Passed		
Decade Cycling (10k)	(90°C, 3.6V)	SO3016 ¹	64	1	0	0.00	10k cycles
Preconditioning	(PC1/260°C, +0°C/-5°C)	SO3016 ¹	230	1	Passed	Jedec L3 / Jeita Rank E	
	(PC1/260°C, +0°C/-5°C)	WNF008 ²	229	1	Passed	Jedec L3 / Jeita Rank E	
Precon+Temp Cycle	(PC1/260°C, -40°C/150°C)	SO3016 ¹	77	1	0	0.00	1000 cycles
	(PC1/260°C, -40°C/150°C)	WNF008 ²	77	1	0	0.00	1000 cycles
Precon+HAST	(PC1/260°C, Biased, 130°C/85% RH)	SO3016 ¹	76	1	0	0.00	96 hours
	(PC1/260°C, Biased, 130°C/85% RH)	WNF008 ²	77	1	0	0.00	96 hours
Precon+Steam Pressure	(PC1/260°C, 121°C/100%RH/15PSIG)	SO3016 ¹	77	1	0	0.00	168 hours
	(PC1/260°C, 121°C/100%RH/15PSIG)	WNF008 ²	75	1	0	0.00	168 hours
Solderability	N/A	WNF008 ²	20	1	Passed		

Notes / Justification: 1) Results from Qual 81252, S25FL128P, 128M CS129 (90nm) MirrorBit in 16 Lead SOIC (10.3 x 10.3 x 2.65mm)
 2) Results from Qual 81301, S25FL128P, 128M CS129 (90nm) MirrorBit in 8 Contact WSON (6 x 8 x 0.75mm)

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 - 12/16/2010	Initial Release.

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