Cypress Semiconductor
Reliability Qualification Report

QTP# 171705, Q100087, Q100173 Version **

Extended AEC-Q006 Data on FL-S 65nm MirrorBit Products

Extended AEC-Q006 Data on FL-S 65nm MirrorBit Products in Aaccordance with AEC-Q006

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT reliability@cypress.com or via a CYLINK CRM CASE

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I.A. Product and Package Information

Product Description: S25FL512S

Cypress Division: Memory Product Division

512 Megabit (64 Megabyte) MirrorBit® Flash Non-Volatile Memory CMOS 3.0 Volt Core with Versatile I/O

Package: FAB024

QTP: 171705

Description: (8 x 6 x 1.2mm) 24 Ball, Fine Pitch Ball Grid Array Package (FBGA)

Flammability: UL-V0

O2 Index: >28

Assembly: Cypress Thailand

Molding Compound: ShinEtsu KMC 3580LVA

Electrical Test: Cypress Thailand

Theta Ja / Psi Jt: 37 °C/W / 5 °C/W

Substrate/Leadframe: Laminate Substrate

Die Attachment: Hitachi HR9070G-20

Lead Finish: 96.5Sn3.0Ag0.5Cu Spheres

Bond Wire: Copper

Comments:

Est. Field Temperature: 55 °C

Est. DC Field Current: 33 mA

Est. Field Voltage: 3.0 V

Life Test Temperature: 125 °C

Life Test Dynamic Current: 16 mA

Life Test Voltage: 3.6 V

Est. Field Power Dissipation: 99 mWatts

Est. Field Tj: 58.6 °C

Est. Stress Power Dissipation: 57.6 mWatts

Est. Stress Tj: 127.1 °C

Die: 98289A

Process: CS239LS (65nm)

Type: MirrorBit

Die Size: 6.58 x 4.90 mm

Fab: Cypress Fab25

Density: 512M

I.B. Product and Package Information

Product Description: S25FL256S
Cypress Division: Memory Product Division

256-Mbit CMOS 3.0 Volt Flash Memory with 104-MHz SPI (Serial Peripheral Interface) with Multi I/O Bus

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Package: FAB024
QTP: Q100087
Description: (8 x 6 x 1.2mm) 24 Ball, Fine Pitch Ball Grid Array Package (FBGA)
Flammability: UL-V0
O2 Index: >28
Assembly: Cypress Thailand
Molding Compound: ShinEtsu KMC 3580LVA
Electrical Test: Cypress Thailand
Theta Ja / Psi Jt: 36 °C/W / 5 °C/W
Substrate/Leadframe: Laminate Substrate
Die Attachment: FH 900
Lead Finish: 96.5Sn3.0Ag0.5Cu Spheres
Bond Wire: Copper
Comments:

Est. Field Temperature: 55 °C
Est. DC Field Current: 25 mA
Est. Field Voltage: 3.0 V
Life Test Temperature: 125 °C
Life Test Dynamic Current: 14 mA
Life Test Voltage: 3.6 V

Est. Field Power Dissipation: 75 mWatts
Est. Field Tj: 57.7 °C
Est. Stress Power Dissipation: 50.4 mWatts
Est. Stress Tj: 126.8 °C

Die: 98222A
Process: CS239LS (65nm)
Type: MirrorBit
Die Size: 4.93 x 5.30 mm
Fab: Cypress Fab25
Density: 256M

I.C. Product and Package Information

Product Description: S25FL128S
Cypress Division: Memory Product Division

128-Mbit CMOS 3.0 Volt Flash Memory with SPI (Serial Peripheral Interface) Multi I/O Bus

Package: FAB024
QTP: Q100173

Description: (8 x 6 x 1.2mm) 24 Ball, Fine Pitch Ball Grid Array Package (FBGA)

Flammability: UL-V0
O2 Index: >28

Assembly: Cypress Thailand
Molding Compound: ShinEtsu KMC 3580LVA

Electrical Test: Cypress Thailand
Theta Ja / Psi Jt: 36 °C/W / 5 °C/W

Substrate/Leadframe: Laminate Substrate
Die Attachment: QMI 546

Lead Finish: 96.5Sn3.0Ag0.5Cu Spheres
Bond Wire: Copper

Comments:

Est. Field Temperature:	55 °C	**Life Test Temperature:**	125 °C
Est. DC Field Current:	25 mA	**Life Test Dynamic Current:**	12 mA
Est. Field Voltage:	3.0 V	**Life Test Voltage:**	3.6 V
Est. Field Power Dissipation:	75 mWatts	**Est. Stress Power Dissipation:**	43.2 mWatts
Est. Field Tj:	57.7 °C	**Est. Stress Tj:**	126.5 °C

Die:	98740A	**Die Size:**	4.63 x 4.36 mm
Process:	CS239LS (65nm)	**Fab:**	Fab25
Type:	MirrorBit	**Density:**	128M

II. 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 171705:							
High Temp Bake	(200°C)	FAB024 [1]	45	1	0	0.00	350 hours
Preconditioning	(PC2/260°C, +0°C/-5°C)	FAB024 [1]	241	1	Passed Jedec L3		
Precon+Temp Cycle	(PC2/260°C, -65°C/150°C)	FAB024 [1]	82	1	0	0.00	500 cycles
Precon+Temp Cycle (Ext.)	(PC2/260°C, -65°C/150°C)	FAB024 [1]	72	1	0	0.00	1000 cycles
Precon+HAST	(PC2/260°C, Biased, 110°C/85% RH)	FAB024 [1]	82	1	0	0.00	264 hours
Precon+HAST (Ext.)	(PC2/260°C, Biased, 110°C/85% RH)	FAB024 [1]	72	1	0	0.00	528 hours
Precon+uHAST	(PC2/260°C, Unbiased, 130°C/85% RH)	FAB024 [1]	77	1	0	0.00	96 hours
High Temp Bake (Ext.)	(200°C)	FAB024 [1]	40	1	0	0.00	500 Hours

Notes / Justification: 1) Results from Qual 171705, S25FL512S, CS239LS (65nm) MirrorBit in 24 Ball FBGA (8 x 6 x 1.2mm)

Preconditioning Flows: PC2 (JEDEC L3): Bake 125°C, 24hr => Soak @ 30°C/60%RH, 192hr => 3x Reflow

Reliability Tests Performed per Specification Requirements

Stress	Condition	Specification Reference
High Temp Bake	(200°C)	JESD22-A103
High Temp Bake (Ext.)	(200°C)	JESD22-A103
Precon+HAST	(PC2/260°C, Biased, 110°C/85% RH)	JESD22-A110
Precon+HAST (Ext.)	(PC2/260°C, Biased, 110°C/85% RH)	JESD22-A110
Precon+Temp Cycle	(PC2/260°C, -65°C/150°C)	JESD22-A104
Precon+Temp Cycle (Ext.)	(PC2/260°C, -65°C/150°C)	JESD22-A104
Precon+uHAST	(PC2/260°C, Unbiased, 130°C/85% RH)	JESD22-A118
Preconditioning	(PC2/260°C, +0°C/-5°C)	J-STD-020

III. Revision History

Document Number: 002-21888

Document Title: Extended AEC-Q006 Data on FL-S 65nm MirrorBit Products

Rev.	Issue Date	ECN#	Originator	Description
**	10/31/2017	5952159	EKNG	Initial Release.

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