



Cypress Semiconductor Corporation, 198 Champion Court, San Jose, CA 95134. Tel: (408) 943-2600

PRODUCT INFORMATION NOTIFICATION

PIN: PIN174403

Date: November 05, 2017

Subject: Qualification of WXIC, China as an Additional Wafer Foundry Site for 65nm GL-S MirrorBit® Eclipse Flash Memory Products

To: PHILIP MAILLET
FUTURE
pcn.system2@future.ca

Change Type: Major

Description of Change:

The qualification of Wuhan Xinxin Semiconductor Manufacturing Corporation (WXIC) in China as an additional wafer foundry site for the 65nm GL-S MirrorBit® Eclipse Flash Memory products was announced in 2012 (Advanced Change Notification # 2844 dated 18-Jan-2012). This notification covered all densities (128Mb, 256Mb, 512Mb, 1Gb) of the GL-S products but not all marketing part numbers (MPNs) were included. Cypress is now correcting the affected parts list by including all MPNs in the 65nm GL-S MirrorBit® Eclipse Flash Memory products.

Cypress is currently supply constrained and the addition of WXIC as a foundry for these parts allows Cypress to improve the overall availability of the product.

There are no changes to ordering part numbers. Product datasheets remain the same and can be downloaded from the Cypress Website (www.cypress.com).

Benefit of Change:

This qualification is part of Cypress's continuous improvement in our flexible manufacturing initiative providing Cypress with the added capability to meet upside market demand, reduce business continuity risk, and ensure consistent and reliable delivery to customers in dynamic, changing market conditions.

Part Numbers Affected: 402

See the attached 'Affected Parts List' file for a list of all part numbers affected by this change. Note that any new parts that are introduced after the publication of this PIN will include all changes outlined in this PIN.

Qualification Status:

The additional wafer foundry site has been qualified through a series of tests documented in the Qualification Summaries (002-21356, 002-21364, 002-02816, and 002-02823). These qualification summaries can be found as attachments to this PIN.

Approximate Implementation Date:

This change will be implemented effective with the date of this notification.

Anticipated Impact:

Products manufactured are completely compatible with existing product from a functional, parametric, and quality performance perspective.

Cypress also recommends that customers take this opportunity to review these changes against current application notes, system design considerations and customer environment conditions to assess impact (if any) to their application.

Method of Identification:

Cypress maintains traceability of product to wafer level, including wafer fabrication location, through the lot number marked on the package.

Response Required:

This is an information only announcement. No response is required.

For additional information regarding this change, contact your local sales representative or contact the PCN Administrator at pcn_adm@cypress.com.

Sincerely,

Cypress PCN Administration

S29GL01GS



Qualification Summary

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 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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1. Product Information

1.1 LAE064

Product Description: S29GL01GS 1-Gbit, 3.0 Volt-only Page Mode Flash Memory featuring 65 nm MirrorBit® Eclipse process technology	
Package: LAE064	Qualification: Q100127
Description: (9 x 9 x 1.4 mm) 64 Ball, Fortified Ball Grid Array Package (fBGA)	
Theta Ja: 39 °C/W	Psi Jt: 11 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 75 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 57.9 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98661B	Die Size: 6.80 × 7.45 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 1G

1.2 TS056

Product Description: S29GL01GS 1-Gbit, 3.0 Volt-only Page Mode Flash Memory featuring 65 nm MirrorBit® Eclipse process technology	
Package: TS056	Qualification: Q100127a
Description: (18.4 x 14.0 x 1.0mm) 56 Lead, Thin Small Outline Package (TSOP)	
Theta Ja: 40 °C/W	Psi Jt: 17 °C/W
Assembly Location: Cypress Kuala Lumpur	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Copper Leadframe	Die Attachment: Paste
Lead Finish: 100% Matte Sn Plating	Bond Wire: Copper
Comments:	
Est. Field Temperature: 72 °C	Life Test Temperature: 125 °C
Est. DC Field Current: 25 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 75 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 75.0 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98661B	Die Size: 6.80 × 7.45 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 1G

1.3 LAA064

Product Description: S29GL01GS 1-Gbit, 3.0 Volt-only Page Mode Flash Memory featuring 65nm MirrorBit Eclipse Process Technology	
Package: LAA064	Qualification: Q100127b
Description: (13.0 x 11.0 x 1.4mm) 64 Ball, Fortified Ball Grid Array Package (FBGA)	
Theta Ja: 39 °C/W	Psi Jt: 11 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 75 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 57.9 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98661B	Die Size: 6.80 × 7.45 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 1G



2. CS239LS Life Test Failure Rate Calculation

HTOL Stress Temperature @ 125 °C

Failure Mechanisms	Read Points / Test Results				Modeling Parameters @ 55°C					Average 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	4950	4615	842	50							
Zero fails, Process ave. Ea	0	0 (1)	0	0	0.66	53	1	53		48	11
Totals	0	0	0	0					10378	48	11

Note:

1. Contributes to Early Life FITS.

Data Retention Bake @ 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate%	Failure Mechanism
500 hrs	0	1735	0.00	No Failures
1000 hrs	0	1208	0.00	No Failures

3. Summary of Stress Test Results

Table 3.1 Summary of Stress Test Results

Stress Test	Stress Condition	Package Type	Samples Size	Number of Lots	Number of Fails	Failure Rate%	Comments
Data From Qualification Q100127:							
HTOL (EL)	3.6 V, 125 °C	LAE064 (1)	154	2	0	0.00	168 hrs
HTOL (IL)	3.6 V, 125 °C	LAE064 (1)	154	2	0	0.00	500 hrs
Data Retention Bake	150 °C	LAE064 (1)	118	2	0	0.00	500 hrs
ESD CDM	N/A	LAE064 (1)	30	2	Passed 1.0 kV		
ESD HBM	100 pF, 1500 Ohms	LAE064 (1)	168	2	Passed 2.0 kV		
Latch Up	125 °C, ±100 mA	LAE064 (1)	12	2	Passed		
Endurance (10k)	90 °C, 3.6 V	LAE064 (1)	100	2	0	0.00	10k cycles
Preconditioning	PC9/260 °C, +0 °C / -5 °C	LAE064 (1)	230	1	Passed Jedec L3 (Accel.)		
Preconditioning + Temp Cycle	PC9/260 °C, -40 °C / 150 °C	LAE064 (1)	77	1	0	0.00	1000 cycles
Preconditioning + HAST	PC9/260 °C, Biased, 110 °C / 85% RH	LAE064 (1)	77	1	0	0.00	264 hours
Preconditioning + uHAST	PC9/260 °C, Unbiased, 130 °C / 85% RH	LAE064 (1)	76	1	0	0.00	96 hours
Generic Reference Data							
Preconditioning	PC1/260 °C, +0 °C / -5 °C	TS056 (2)	67	1	Passed Jedec L3 / Jeita Rank E		
	PC9/260 °C, +0 °C / -5 °C	LAA064 (3)	77	1	Passed Jedec L3 / Jeita Rank E		
Preconditioning + Temp Cycle	PC1/260 °C, -40 °C / 150 °C	TS056 (2)	67	1	0	0.00	1000 cycles

Notes / Justification:

- Results from Qual Q100127, S29GL01GS, 1G CS239LS (65 nm) MirrorBit Eclipse in 64 Ball fFBGA (9 x 9 x 1.4 mm).
- Results from Qual Q100181a, S29GL01GS in 56 Lead TSOP (18.4 x 14 x 1 mm) - Same TS056 Package, Same Product and Process Technology at Fab25.
- Results from Qual Q100182, S29GL01GS in 64 Ball fFBGA (13 x 11 x 1.4 mm) - Same LAA064 Package, Same Product and Process Technology at Fab25.

Preconditioning Flows

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



4. Document History

Document Title: S29GL01GS Qualification Summary Document Number: 002-02823				
Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	—	—	12/15/2011	Initial release.
*A	5898168	NFB	09/27/2017	Updated to Cypress template.

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S29GL256S



Qualification Database

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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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1. Product Information

1.1 LAE064

Product Description: S29GL256S 256-Mbit, 3.0 Volt-only Flash Memory Featuring 65nm MirrorBit Eclipse Flash Process Technology	
Package: LAE064	Qualification: Q100199
Description: (9 x 9 x 1.4 mm) 64 Ball, Fortified Ball Grid Array Package (fBGA)	
Theta Ja: 39 °C/W	Psi Jt: 5 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 61.4 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98223B	Die Size: 4.58 × 5.10 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 256M

1.2 LAA064

Product Description: S29GL256S 256-Mbit, 3.0 Volt-only Flash Memory Featuring 65nm MirrorBit Eclipse Flash Process Technology	
Package: LAA064	Qualification: Q100227
Description: (13.0 x 11.0 x 1.4 mm) 64 Ball, Fortified Ball Grid Array Package (FBGA)	
Theta Ja: 39 °C/W	Psi Jt: 5 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 61.4 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98223B	Die Size: 4.58 × 5.10 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 256M

1.3 TS056

Product Description: S29GL256S 256-Mbit, 3.0 Volt-only Flash Memory Featuring 65nm MirrorBit Eclipse Flash Process Technology	
Package: TS056	Qualification: Q100239
Description: (20.0 x 14.0 x 1.2 mm) 56 Lead, Thin Small Outline Package (TSOP)	
Theta Ja: 84 °C/W	Psi Jt: 17 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Copper Leadframe	Die Attachment: Paste
Lead Finish: 100% Matte Sn Plating	Bond Wire: Copper
Comments:	
Est. Field Temperature: 55 °C	Life Test Temperature: 125 °C
Est. DC Field Current: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 68.8 °C	Est. Stress Delta Tj: 128.0 °C
Die: 98223B	Die Size: 4.58 × 5.10 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 256M

1.4 VBU056

Product Description: S29GL256S 256-Mbit, 3.0 Volt-only Flash Memory Featuring 65nm MirrorBit Eclipse Flash Process Technology	
Package: VBU056	Qualification: Q100373
Description: (9.0 x 7.0 x 1.0 mm) 56 Ball, Very Thin Fine Pitch Ball Grid Array Package (FBGA)	
Theta Ja: 39 °C/W	Psi Jt: 5 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 61.4 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98223B	Die Size: 4.58 × 5.10 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 256M



2. CS239LS Life Test Failure Rate Calculation

HTOL Stress Temperature @ 125 °C

Failure Mechanisms	Read Points / Test Results				Modeling Parameters @ 55 °C					Average 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	4950	4615	842	50							
Zero fails, Process ave. Ea	0	0 (1)	0	0	0.66	53	1	53		48	11
Totals	0	0	0	0					10378	48	11

Note:

1. Contributes to Early Life FITS.

Data Retention Bake @ 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate%	Failure Mechanism
500 hrs	0	1735	0.00	No Failures
1000 hrs	0	1208	0.00	No Failures

3. Summary of Stress Test Results

Table 3.1 Summary of Stress Test Results

Stress Test	Stress Condition	Package Type	Samples Size	Number of Lots	Number of Fails	Failure Rate%	Comments
Data From Qualification Q100227, Q100239, Q100199:							
HTOL (EL)	3.6 V, 125 °C	LAE064 (3)	154	2	0	0.00	168 hrs
HTOL (IL)	3.6 V, 125 °C	LAE064 (3)	154	2	0	0.00	504 hrs
ESD CDM	N/A	LAA064 (1)	15	1	Passed 1.0 kV		
	N/A	TS056 (2)	15	1	Passed 1.0 kV		
	N/A	LAE064 (3)	15	1	Passed 1.0 kV		
ESD HBM	100 pF, 1500 Ohms	LAE064 (3)	84	1	Passed 2.0 kV		
Latch Up	±100 mA	LAE064 (3)	10	1	Passed		
Endurance (10k)	105 °C, 3.6 V	LAE064 (3)	64	1	0	0.00	10k cycles
	-40 °C, 3.6 V	LAE064 (3)	64	1	0	0.00	10k cycles
	90 °C, 3.6 V	LAE064 (3)	64	1	0	0.00	10k cycles
Endurance (100k)	90 °C, 3.6 V	LAE064 (3)	64	1	0	0.00	100k cycles
Generic Reference Data:							
ESD CDM	N/A	VBU056 (4)	15	1	Passed 1.0 kV		
Endurance (10k)	-40 °C, 3.6 V	LAE064 (7)	64	1	0	0.00	10k cycles
	90 °C, 3.6 V	LAE064 (7)	64	1	0	0.00	10k cycles
Endurance (100k)	90 °C, 3.6 V	LAE064 (7)	64	1	0	0.00	100k cycles
Decade Cycling + DRB	90 °C, 3.6 V, DRB 1h @ 150 °C	LAE064 (7)	64	1	0	0.00	100k cycles
Preconditioning	PC9/260 °C, +0 °C / -5 °C	VBU056 (4)	77	1	Passed Jedec L3 / Jeita Rank E		
	PC1/260 °C, +0 °C / -5 °C	LAA064 (5)	231	1	Passed Jedec L3 / Jeita Rank E		
	PC9/260 °C, +0 °C / -5 °C	TS056 (6)	164	1	Passed Jedec L3 / Jeita Rank E		
Preconditioning + Temp Cycle	PC9/260 °C, -40 °C / 150 °C	VBU056 (4)	77	1	0	0.00	1000 cycles
	PC1/260 °C, -40 °C / 150 °C	LAE064 (5)	77	1	0	0.00	1000 cycles
	PC9/260 °C, -40 °C / 150 °C	TS056 (6)	87	1	0	0.00	500 cycles
Preconditioning + HAST	PC1/260 °C, Biased, 110 °C / 85% RH	LAE064 (5)	77	1	0	0.00	264 hrs
	PC9/260 °C, Biased, 130 °C / 85% RH	TS056 (6)	77	1	0	0.00	96 hrs
Preconditioning + uHAST	PC1/260 °C, Unbiased, 130 °C / 85% RH	LAE064 (5)	76	1	0	0.00	96 hrs

Notes / Justification:

- Results from Qual Q100227, S29GL256S, CS239LS (65 nm) MirrorBit Eclipse in 64 Ball fFBGA (13 x 11 x 1.4 mm).
- Results from Qual Q100239, S29GL256S, CS239LS (65 nm) MirrorBit Eclipse in 56 Lead TSOP (20 x 14 x 1.2 mm).
- Results from Qual Q100199, S29GL256S, CS239LS (65 nm) MirrorBit Eclipse in 64 Ball fFBGA (9 x 9 x 1.4 mm).
- Results from Qual Q100333, S29GL512S in 56 Ball vFBGA (9 x 7 x 1 mm) - Same VBU056 Package and Technology.
- Results from Qual Q100167, S29GL01GS in 64 Ball fFBGA (9 x 9 x 1.4 mm) - Same LAE064 Package (Similar to LAA064), Technology and Fab location (WXIC).
- Results from Qual Q100013, S29GL256S in 56 Lead TSOP (20 x 14 x 1.2 mm) - Same TSOP package and Technology, Same die from a different fab.
- Results from Qual Q100368, S29GL256S in 64 Ball fFBGA (9 x 9 x 1.4 mm) - Same WXIC Technology and Product in LAE064 Package.

Preconditioning Flows

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



4. Document History

Document Title: S29GL256S Qualification Database Document Number: 002-21364				
Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	-	-	02/27/2013	Initial release.
*A	-	-	03/10/2015	Included 100K Cycling and Decade Cycling data
*B	5896802	NFB	09/26/2017	Updated to Cypress template.

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S29GL128S



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1. Product Information

1.1 LAE064

Product Description: S29GL128S 128-Mbit, 3.0 Volt-only Page Mode Flash Memory Featuring 65nm MirrorBit Eclipse Process Technology	
Package: LAE064	Qualification: Q100255
Description: (9 x 9 x 1.4 mm) 64 Ball, Fortified Ball Grid Array Package (fBGA)	
Theta Ja: 39 °C/W	Psi Jt: 5 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 61.4 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98741B	Die Size: 4.58 × 4.20 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 128M

1.2 LAA064

Product Description: S29GL128S 128-Mbit, 3.0 Volt-only Page Mode Flash Memory Featuring 65nm MirrorBit Eclipse Process Technology	
Package: LAA064	Qualification: Q100313
Description: (13.0 x 11.0 x 1.4 mm) 64 Ball, Fortified Ball Grid Array Package (FBGA)	
Theta Ja: 39 °C/W	Psi Jt: 5 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 61.4 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98741B	Die Size: 4.58 × 4.20 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 128M

1.3 VBU056

Product Description: S29GL256S 256-Mbit, 3.0 Volt-only Flash Memory Featuring 65nm MirrorBit Eclipse Flash Process Technology	Qualification: Q100373
Package: VBU056	
Description: (9.0 x 7.0 x 1.0 mm) 56 Ball, Very Thin Fine Pitch Ball Grid Array Package (FBGA)	
Theta Ja: 39 °C/W	Psi Jt: 5 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 61.4 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98223B	Die Size: 4.58 x 5.10 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 256M

1.4 TS056

Product Description: S29GL128SH 128-Mbit, 3.0 Volt-only Page Mode Flash Memory Featuring 65nm MirrorBit Eclipse Process Technology	Qualification: Q100315
Package: TS056	
Description: (20.0 x 14.0 x 1.2 mm) 56 Lead, Thin Small Outline Package (TSOP)	
Theta Ja: 84 °C/W	Psi Jt: 17 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Copper Leadframe	Die Attachment: Paste
Lead Finish: 100% Matte Sn Plating	Bond Wire: Copper
Comments:	
Est. Field Temperature: 55 °C	Life Test Temperature: 125 °C
Est. DC Field Current: 55 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 165 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 68.8 °C	Est. Stress Delta Tj: 128.0 °C
Die: 98741B	Die Size: 4.58 x 4.20 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 128M



2. CS239LS Life Test Failure Rate Calculation

HTOL Stress Temperature @ 125 °C

Failure Mechanisms	Read Points / Test Results				Modeling Parameters @ 55°C					Average 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	4950	4615	842	50							
Zero fails, Process ave. Ea	0	0 (1)	0	0	0.66	53	1	53		48	11
Totals	0	0	0	0					10378	48	11

Note:

1. Contributes to Early Life FITS.

Data Retention Bake @ 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate%	Failure Mechanism
500 hrs	0	1735	0.00	No Failures
1000 hrs	0	1208	0.00	No Failures

3. Summary of Stress Test Results

Table 3.1 Summary of Stress Test Results

Stress Test	Stress Condition	Package Type	Samples Size	Number of Lots	Number of Fails	Failure Rate%	Comments
Data From Qualification Q100255, Q100313, Q100315:							
HTOL (EL)	3.6 V, 125 °C	LAE064 (1)	154	2	0	0.00	168 hrs
HTOL (IL)	3.6 V, 125 °C	LAE064 (1)	154	2	0	0.00	504 hrs
HTOL (XL)	3.6 V, 125 °C	LAE064 (1)	154	2	0	0.00	1000 hrs
ESD CDM	N/A	LAE064 (1)	15	1	Passed 1.0 kV		
	N/A	LAA064 (2)	15	1	Passed 1.0 kV		
	N/A	WND008 (3)	15	1	Passed 1.0 kV		
ESD HBM	100 pF, 1500 Ohms	LAE064 (1)	84	2	Passed 2.0 kV		
Latch Up	125 °C, ±100 mA	LAE064 (1)	6	1	Passed		
Endurance (10k)	105 °C, 3.6 V	LAE064 (1)	64	1	0	0.00	10k cycles
	-40 °C, 3.6 V	LAE064 (1)	64	1	0	0.00	10k cycles
	90 °C, 3.6 V	LAE064 (1)	64	1	0	0.00	10k cycles
Endurance (100k)	105 °C, 3.6 V	LAE064 (1)	40	1	0	0.00	100k cycles
	90 °C, 3.6 V	LAE064 (1)	60	1	0	0.00	100k cycles
Generic Reference Data							
High Temp Bake (200 °C)	200 °C	LAE064 (5)	45	1	0	0.00	500 hrs
	200 °C	TS048 (7)	45	1	0	0.00	350 hours
ESD CDM	N/A	LAE064 (4)	15	1	Passed 1.0 kV		
Preconditioning	PC1/260 °C, +0 °C / -5 °C	LAE064 (5)	231	1	Passed Jedec L3 / Jeita Rank E		
	PC9/260 °C, +0 °C / -5 °C	LAA064 (6)	77	1	Passed Jedec L3 / Jeita Rank E		
	PC9/260 °C, +0 °C / -5 °C	TS048 (7)	392	2	Passed Jedec L3 / Jeita Rank E		
	PC1/260 °C, +0 °C / -5 °C	FAB024 (8)	154	1	Passed Jedec L3 / Jeita Rank E		
Preconditioning + Temp Cycle	PC1/260 °C, -40 °C / 150 °C	LAE064 (5)	77	1	0	0.00	1000 cycles
	PC9/260 °C, -40 °C / 150 °C	TS048 (7)	154	2	0	0.00	1000 cycles
	PC1/260 °C, -40 °C / 150 °C	FAB024 (8)	77	1	0	0.00	1000 cycles
Preconditioning + HAST	PC1/260 °C, Biased, 110 °C / 85% RH	LAE064 (5)	77	1	0	0.00	264 hrs
	PC9/260 °C, Biased, 130 °C / 85% RH	TS048 (7)	84	2	0	0.00	96 hrs
Preconditioning + uHAST	PC1/260 °C, Unbiased, 130 °C / 85% RH	LAE064 (5)	76	1	0	0.00	96 hrs
	PC9/260 °C, Unbiased, 130 °C / 85% RH	TS048 (7)	154	2	0	0.00	96 hrs
	PC1/260 °C, Unbiased, 130 °C / 85% RH	FAB024 (8)	77	1	0	0.00	96 hrs

Notes / Justification:

- Results from Qual Q100255, S29GL128S, CS239LS (65 nm) MirrorBit Eclipse in 64 Ball fFBGA (9 x 9 x 1.4 mm).
- Results from Qual Q100313, S29GL128S, CS239LS (65 nm) MirrorBit Eclipse in 64 Ball fFBGA (13 x 11 x 1.4 mm).
- Results from Qual Q100315, S29GL128SH, CS239LS (65 nm) MirrorBit Eclipse in 56 Lead TSOP (20 x 14 x 1.2 mm).
- Results from Qual Q100314, S29GL128SH in 64 Ball fFBGA (9 x 9 x 1.4 mm).
- Results from Qual Q100167, S29GL01GS in 64 Ball fFBGA (9 x 9 x 1.4 mm) - Same Fab location and Same Flash.
- Results from Qual Q100182, S29GL01GS in 64 Ball fFBGA (13 x 11 x 1.4 mm) - Same Package and Package BOM.
- Results from Qual Q100252, 3ML01G12 in 48 Lead TSOP (20 x 12 x 1.2 mm) - Same Package and Package BOM.
- Results from Qual Q100087, S25FL256S in 24 Ball FBGA (8 x 6 x 1.2 mm) - Same Package and Same Package BOM.

Preconditioning Flows

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



4. Document History

Document Title: S29GL128S Qualification Database Document Number: 002-21356				
Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	—	—	03/31/2013	Initial release.
*A	5896366	NFB	09/26/2017	Updated to Cypress template.

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S29GL512S



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1. Product Information

1.1 TS056

Product Description: S29GL512S 512-Mbit, 3.0 Volt-only Page Mode Flash Memory featuring 65 nm MirrorBit® Eclipse process technology	
Package: TS056	Qualification: Q100125
Description: (18.4 x 14.0 x 1.0mm) 56 Lead, Thin Small Outline Package (TSOP)	
Theta Ja: 40 °C/W	Psi Jt: 17 °C/W
Assembly Location: Cypress Kuala Lumpur	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Copper Leadframe	Die Attachment: Paste
Lead Finish: 100% Matte Sn Plating	Bond Wire: Copper
Comments:	
Est. Field Temperature: 55 °C	Life Test Temperature: 125 °C
Est. DC Field Current: 25 mA	Life Test Dynamic Current: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 75 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 58.0 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98290B	Die Size: 6.80 × 5.02 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 512M

1.2 LAA064

Product Description: S29GL512S 512-Mbit, 3.0 Volt-only Page Mode Flash Memory featuring 65 nm MirrorBit® Eclipse process technology	
Package: LAA064	Qualification: Q100226
Description: (13.0 x 11.0 x 1.4mm) 64 Ball, Fortified Ball Grid Array Package (FBGA)	
Theta Ja: 39 °C/W	Psi Jt: 11 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 75 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 57.9 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98290B	Die Size: 6.80 × 5.02 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 512M

1.3 LAE064

Product Description: S29GL512S 512-Mbit, 3.0 Volt-only Page Mode Flash Memory featuring 65 nm MirrorBit® Eclipse process technology	
Package: LAE064	Qualification: Q100156
Description: (9 x 9 x 1.4mm) 64 Ball, Fortified Ball Grid Array Package (fBGA)	
Theta Ja: 39 °C/W	Psi Jt: 11 °C/W
Assembly Location: Cypress Thailand	Molding Compound: RoHS Compliant Epoxy Resin
Substrate/Leadframe: Laminate Substrate	Die Attachment: Paste
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: 10 mA
Est. Field Voltage: 3.0 V	Life Test Voltage: 3.6 V
Est. Field Power Dissipation: 75 mWatts	Est. Stress Power Dissipation: 36 mWatts
Est. Field Delta Tj: 57.9 °C	Est. Stress Delta Tj: 126.4 °C
Die: 98290B	Die Size: 6.80 × 5.02 mm
Process: CS239LS (65 nm)	Fab: WXIC
Type: MirrorBit Eclipse	Density: 512M



2. CS239LS Life Test Failure Rate Calculation

HTOL Stress Temperature @ 125 °C

Failure Mechanisms	Read Points / Test Results				Modeling Parameters @ 55°C					Average 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	4950	4615	842	50							
Zero fails, Process ave. Ea	0	0 (1)	0	0	0.66	53	1	53		48	11
Totals	0	0	0	0					10378	48	11

Note:

1. Contributes to Early Life FITS.

Data Retention Bake @ 150 °C

Reliability Stress	Number of Rejects	Sample Size	Failure Rate%	Failure Mechanism
500 hrs	0	1735	0.00	No Failures
1000 hrs	0	1208	0.00	No Failures

3. Summary of Stress Test Results

Table 3.1 Summary of Stress Test Results

Stress Test	Stress Condition	Package Type	Samples Size	Number of Lots	Number of Fails	Failure Rate%	Comments
Data From Qualification Q100255, Q100313, Q100315:							
HTOL (EL)	3.6 V, 125 °C	LAE064 (3)	77	1	0	0.00	168 hrs
ESD CDM	N/A	TS056 (1)	15	1	Passed 1.0 kV		
	N/A	LAA064 (2)	15	1	Passed 1.0 kV		
	N/A	LAE064 (3)	15	1	Passed 1.0 kV		
ESD HBM	100 pF, 1500 Ohms	LAE064 (3)	84	1	Passed 2.0 kV		
Latch Up	125 °C, ±100 mA	LAE064 (3)	6	1	Passed		
Endurance (10k)	-40 °C, 3.6 V	LAE064 (3)	64	1	0	0.00	10k cycles
	90 °C, 3.6 V	LAE064 (3)	128	1	0	0.00	10k cycles
Generic Reference Data							
Preconditioning	PC9/260 °C, +0 °C / -5 °C	LAE064 (4)	230	1	Passed Jedec L3 (Accel.)		
	PC9/260 °C, +0 °C / -5 °C	TS056 (5)	77	1	Passed Jedec L3 (Accel.)		
Preconditioning + Temp Cycle	PC9/260 °C, -40 °C / 150 °C	LAE064 (4)	77	1	0	0.00	1000 cycles
	PC9/260 °C, -40 °C / 150 °C	TS056 (5)	77	1	0	0.00	1000 cycles
Preconditioning + HAST	PC9/260 °C, Biased, 110 °C / 85% RH	LAE064 (4)	77	1	0	0.00	264 hours
Preconditioning + uHAST	PC9/260 °C, Unbiased, 130 °C / 85% RH	LAE064 (4)	76	1	0	0.00	96 hours

Notes / Justification:

1. Results from Qual Q100125, S29GL512S, 512M CS239LS (65 nm) MirrorBit Eclipse in 56 Lead TSOP (18.4 x 14 x 1 mm).
2. Results from Qual Q100226, S29GL512S, 512M CS239LS (65 nm) MirrorBit Eclipse in 64 Ball fBGA (13 x 11 x 1.4 mm).
3. Results from Qual Q100156, S29GL512S, 512M CS239LS (65 nm) MirrorBit Eclipse in 64 Ball fBGA (9 x 9 x 1.4 mm).
4. Results from Qual Q100127, S29GL01GS in 64 Ball fBGA (9 x 9 x 1.4 mm) - Same LAE064 package, Same Process Technology, Same Fab Location, Similar Product.
5. Results from Qual Q99990, S29GL512S in 56 Lead TSOP (18.4 x 14 x 1 mm) - Same TS056 package, Same Process Technology and Product from Fab25.

Preconditioning Flows

PC9 (Accelerated JEDEC L3 / JEITA Rank E): Bake 125 °C, 24 hr => Soak @ 60 °C/70%RH, 72 hr => 3x Reflow.



4. Document History

Document Title: S29GL512S Qualification Summary Document Number: 002-02816				
Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	-	-	12/06/2011	Initial release.
*A	5898290	NFB	09/28/2017	Updated to Cypress template.

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324	S99-50559	S29GL512S10GHI020
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336	S99GL128S0050	S29GL128S90DHI010
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338	S99GL128S0090	S29GL128S10FHIV20
339	S99GL128S0100	S29GL128S90TFI020
340	S99GL128S90DHI010	S29GL128S90DHI010
341	S99GL128S90TFI010	S29GL128S90TFI010
342	S99GL128S90TFI020	S29GL128S90TFI020
343	S99GL256S0010	S29GL256S90TFI010
344	S99GL256S0020	S29GL256S90TFI020
345	S99GL256S0030	S29GL256S90DHI010
346	S99GL256S0040	S29GL256S90DHI020
347	S99GL256S0070	S29GL256S10TFIV10
348	S99GL256S0100	S29GL256S90TFI020
349	S99GL256S0140	S29GL256S90GHI020
350	S99GL256S0150	S29GL256S10GHIV20
351	S99GL512S0010	S29GL512S10TFI010
352	S99GL512S0020	S29GL512S10TFI020
353	S99GL512S0030	S29GL512S11TFV020
354	S99GL512S0040	S29GL512S10DHI010
355	S99GL512S0050	S29GL512S10DHI020
356	S99GL512S0070	S29GL512S11TFIV20

357	S99GL512S0110	S29GL512S10TFI020
358	S99GL512S0120	S29GL512S11DHIV10
359	S99GL512S0180	S29GL512S10TFI010
360	S99GL512S10TFI010	S29GL512S10TFI010
361	S99GL512S11DHA020	S29GL512S11DHA020
362	S99GL512S11TFIV20	S29GL512S11TFIV20
363	40060325	S29GL256S10TFIV10
364	40060327	S29GL512S11TFIV20
365	40060423	S29GL01GS10TFI010
366	40060424	S29GL01GS10TFI010
367	40060425	S29GL512S11TFI020
368	40060426	S29GL512S11TFI020
369	40060427	S29GL256S10TFI010
370	40060428	S29GL256S10TFI010
371	40060430	S29GL128S10TFI010
372	40060431	S29GL128S10TFI010
373	40060493	S29GL01GS12TFIV10
374	40060542	S29GL128S10TFIV10
375	16-3636-01-P	S29GL128S90TFI020
376	16-4072-01A	S29GL128S10TFIV20
377	16-4072-01A-T	S29GL128S10TFIV23
378	16-4186-01	S29GL256S11FHIV10
379	16-4369-01	S29GL01GS11TFIV10
380	16-4369-01-T	S29GL01GS11TFIV13
381	580970-002-00	S29GL01GS11DHI020
382	584271-001-00	S29GL512S11DHI020
383	584271-003-00	S29GL256S10TFI010
384	586228-001-00	S70GL02GS11FHI010
385	588127-001-00	S29GL128S10TFI020
386	IS29GL01GS-11TFIV2	S29GL01GS11TFIV20
387	IS29GL01GS-11TFIV2-TR	S29GL01GS11TFIV23
388	IS29GL128S-90DHI02	S29GL128S90DHI020
389	IS29GL128S-90DHI02-TR	S29GL128S90DHI023
390	IS29GL256S-10DHB02-TR	S29GL256S10DHB023
391	IS29GL256S-10FHIV2	S29GL256S10FHIV20
392	IS29GL256S-10FHIV2-TR	S29GL256S10FHIV20
393	IS29GL256S-10TFV01	S29GL256S10TFV010
394	IS29GL256S-10TFV01-TR	S29GL256S10TFV013
395	IS29GL256S-90DHI02	S29GL256S90DHI020
396	IS29GL256S-90DHI02-TR	S29GL256S90DHI023
397	IS29GL256S-90TFI01	S29GL256S90TFI010
398	IS29GL256S-90TFI01-TR	S29GL256S90TFI013
399	IS29GL512S-11DHIV2	S29GL512S11DHIV20
400	IS29GL512S-11DHIV2-TR	S29GL512S11DHIV23
401	IS29GL512S-11TFV01	S29GL512S11TFV010
402	IS29GL512S-11TFV01-TR	S29GL512S11TFV013