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SUPPLEMENT

S99GL064S Sorted Die

64-Mb, 3 V Page Mode Flash 65-nm MirrorBit® Process Technology

Distinctive Characteristics

■ CMOS 3.0 V Core with Versatile I/O

Architectural Advantages

■ Single Power Supply Operation

■ Manufactured on 65-nm MirrorBit® Process Technology

■ Secure Silicon Region (SSR)
- ❒ 128-word/256-byte sector for permanent, secure identification through an 8-word / 16-byte random Electronic Serial Number, accessible through a command sequence
- ❒ Programmed and locked at the factory or by the customer

■ Flexible Sector Architecture
- ❒ 64-Mb (uniform sector models): One hundred twenty-eight 32-kword (64-KB) sectors
- ❒ 64-Mb (boot sector models): One hundred twenty-seven 32-kword (64-KB) sectors + eight 4k word (8 KB) boot sectors

■ Automatic Error Checking and Correction (ECC) - internal hardware ECC with single bit error correction

■ Enhanced Versatile I/O Control
- ❒ All input levels (address, control, and DQ input levels) and outputs are determined by voltage on V_{IO} input. V_{IO} range is 1.65 to V_{CC}

■ Compatibility with JEDEC Standards
- ❒ Provides pinout and software compatibility for single-power supply flash, and superior inadvertent write protection

■ 100,000 Erase Cycles per Sector Minimum

■ 20-year Data Retention Typical

Performance Characteristics

■ High Performance
- ❒ 8-word / 16-byte page read buffer
- ❒ 15 ns page read time
- ❒ 128-word / 256-byte write buffer which reduces overall programming time for multiple-word updates

■ Low Power Consumption
- ❒ 25 mA typical initial read current @ 5 MHz
- ❒ 7.5 mA typical page read current @ 33 MHz
- ❒ 50 mA typical erase / program current
- ❒ 40 µA typical standby mode current

Software and Hardware Features

■ Software Features
- ❒ Advanced Sector Protection: Offers Persistent Sector Protection and Password Sector Protection
- ❒ Program Suspend and Resume: Read other sectors before programming operation is completed
- ❒ Erase Suspend and Resume: Read / program other sectors before an erase operation is completed
- ❒ Data# polling and toggle bits provide status
- ❒ Common Flash Interface (CFI) Compliant: Allows host system to identify and accommodate multiple flash devices
- ❒ Unlock Bypass Program command reduces overall multiple-word programming time

■ Hardware Features
- ❒ WP#/ACC input supports manufacturing programming operations (when high voltage is applied). Protects first or last sector regardless of sector protection settings on uniform sector models
- ❒ Hardware reset input (RESET#) resets device
- ❒ Ready/Busy# output (RY/BY#) detects program or erase cycle completion

Sorted Die Features

■ The sorted die has limited AC/DC parameters tested at temperature

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General Description

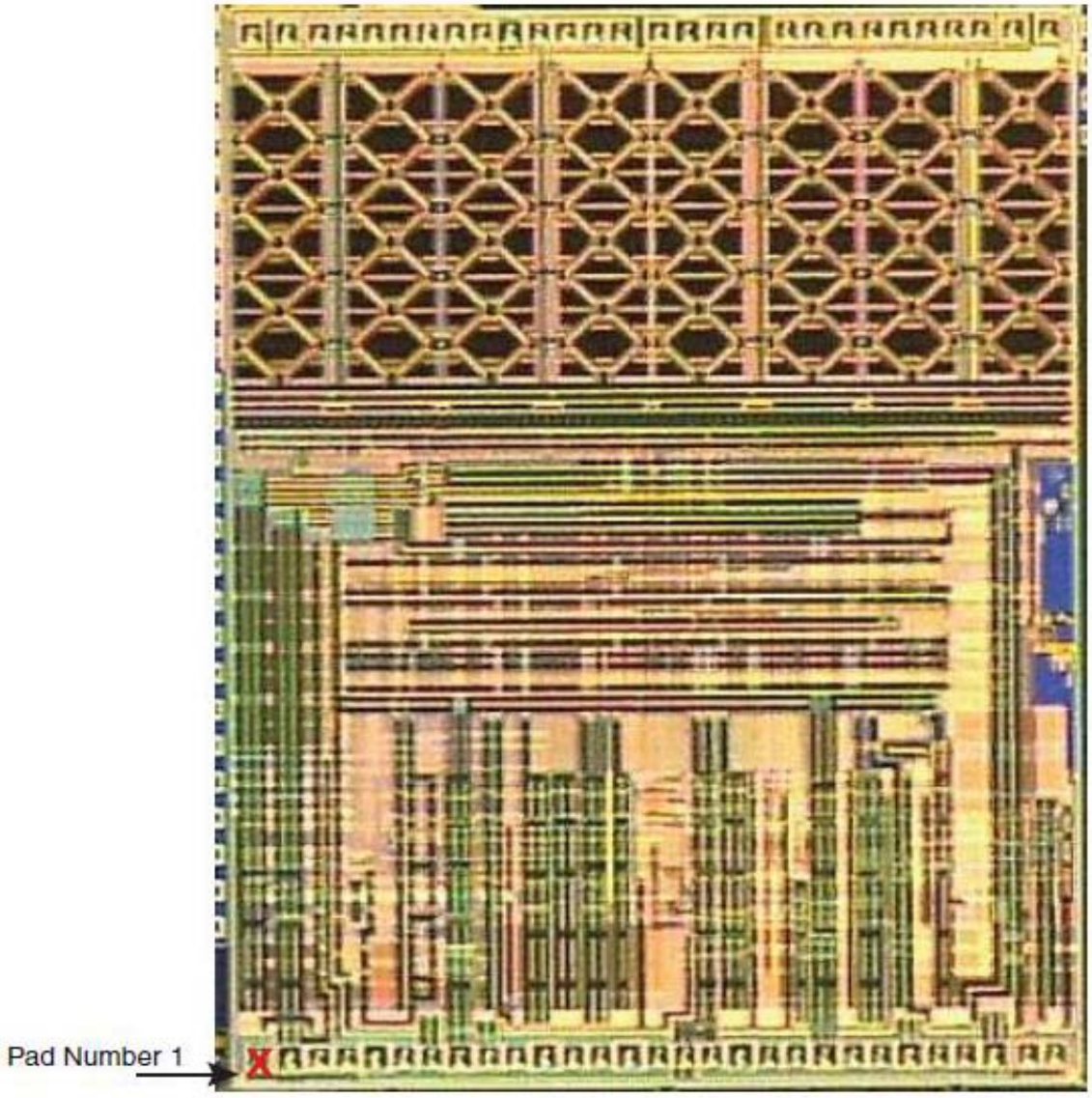
The S29GL064S in Sorted Die form is a 64-Mb, 3.0 V-only flash memory. Cypress defines Sorted Die as standard product in die form, tested for functionality and speed.

Electrical Specifications

Refer to the S29GL064S Datasheet for full electrical specifications on the S29GL064S in Sorted Die form.

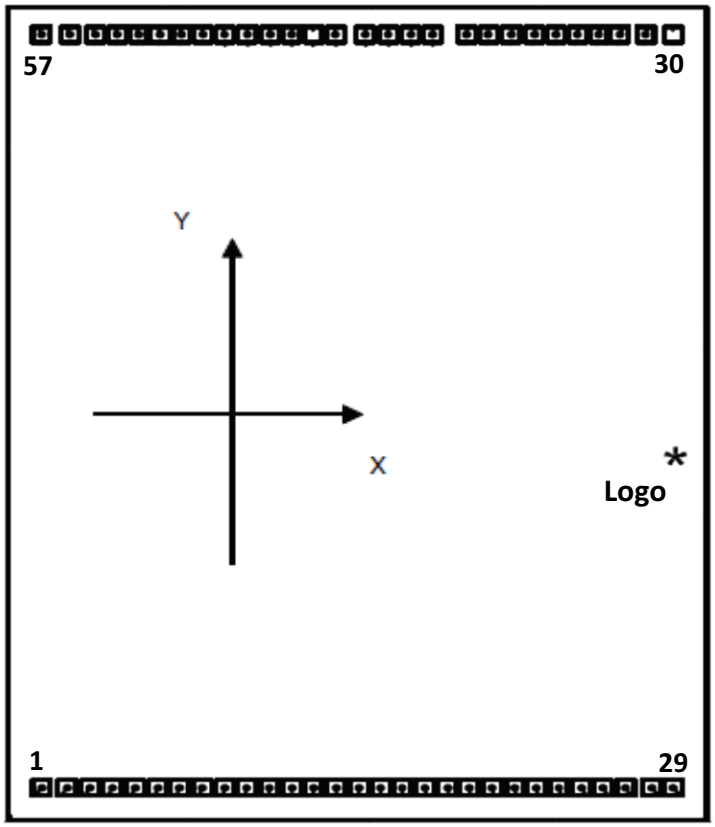
Die Photograph and Pad Locations

Figure 1. Die Photo[1]



Note
1. X in the diagram is pad #1. Count counter clockwise.

Figure 2. Pad Locations



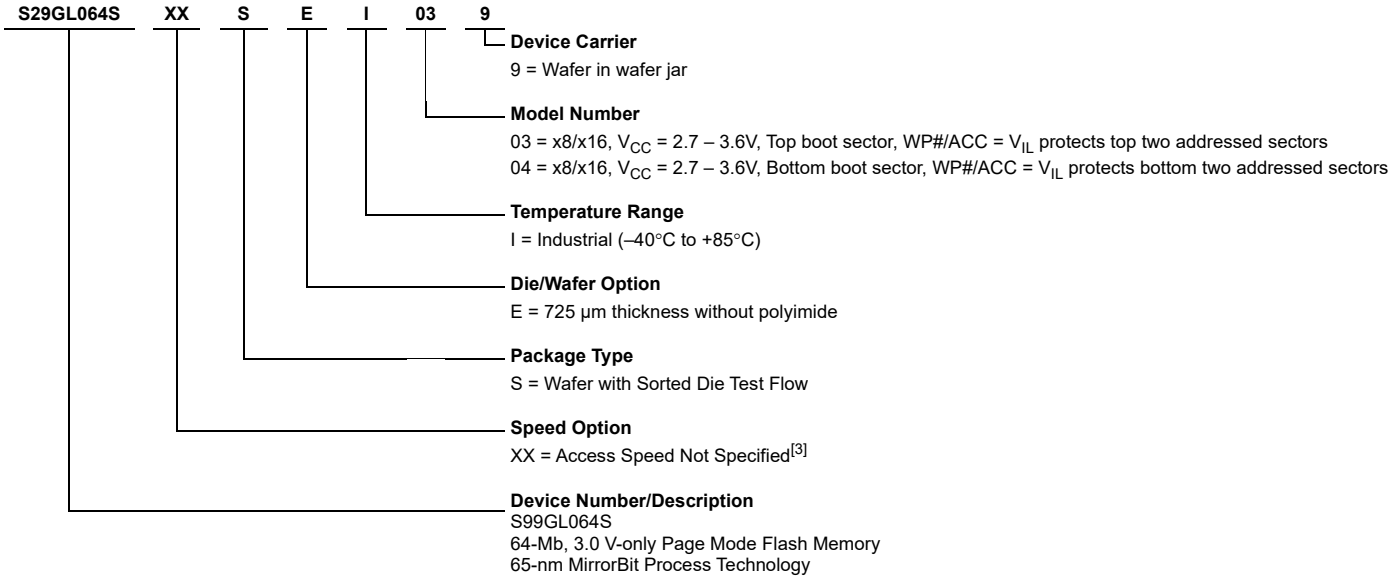
Pad Description For Models 03 and 04

Pad No.	Pad Name	X (mils)	Y (mils)
1	A0	–48.091	–66.169
2	V_{SS}	–44.232	–66.169
3	CE#	–40.740	–66.169
4	OE#	–37.354	–66.169
5	DQ0	–33.890	–66.169
6	DQ8	–30.425	–66.169
7	V_{SS}	–27.157	–66.169
8	V_{CC}	–23.693	–66.169
9	V_{CC}	–20.228	–66.169
10	DQ1	–16.961	–66.169
11	DQ9	–13.496	–66.169
12	DQ2	–10.031	–66.169
13	DQ10	–6.764	–66.169
14	DQ3	–3.299	–66.169
15	DQ11	0.165	–66.169
16	V_{SS}	3.433	–66.169
17	DQ4	6.701	–66.169
18	DQ12	10.165	–66.169
19	DQ5	13.630	–66.169
20	DQ13	16.898	–66.169
21	V_{CC}	20.362	–66.169
22	DQ6	23.827	–66.169
23	DQ14	27.094	–66.169
24	NC	30.559	–66.169
25	DQ7	34.024	–66.169
26	DQ15	37.291	–66.169
27	V_{SS}	40.795	–66.169
28	BYTE#	44.823	–66.169
29	A16	48.091	–66.169

Pad No.	Pad Name	X (mils)	Y (mils)
30	NC	48.110	67.272
31	A15	43.858	67.272
32	A14	39.922	67.272
33	A13	36.654	67.272
34	A12	33.386	67.272
35	A11	30.119	67.272
36	A10	26.851	67.272
37	A9	23.308	67.272
38	A8	19.764	67.272
39	A19	16.497	67.272
40	A20	11.300	67.272
41	WE#	8.032	67.272
42	RESET#	4.568	67.272
43	A21	1.103	67.272
44	WP#/ACC	–3.460	67.272
45	NC	–6.846	67.272
46	RY/BY#	–10.113	67.272
47	V_{CC}	–13.381	67.272
48	V_{SS}	–16.846	67.272
49	A18	–20.310	67.272
50	A17	–23.578	67.272
51	A7	–26.846	67.272
52	A6	–30.113	67.272
53	A5	–33.381	67.272
54	A4	–36.649	67.272
55	A3	–39.917	67.272
56	A2	–43.858	67.272
57	A1	–48.110	67.272

Note
2. The coordinates above are relative to the die center and can be used to operate wire bonding equipment.

Ordering Information



Valid Combinations

Valid Combinations list configurations planned to be supported in volume for this device. Contact the local Cypress sales office to confirm availability of specific valid combinations and to check on newly released combinations.

Table 1. S99GL064S Valid Combinations

Device Number	Speed Option	Package Type and Temperature Range	Model Number	Device Carrier
S29GL064S	XX[3]	SEI	03, 04	9

Note
3. Access speed of 90 ns only tested at room temperature.

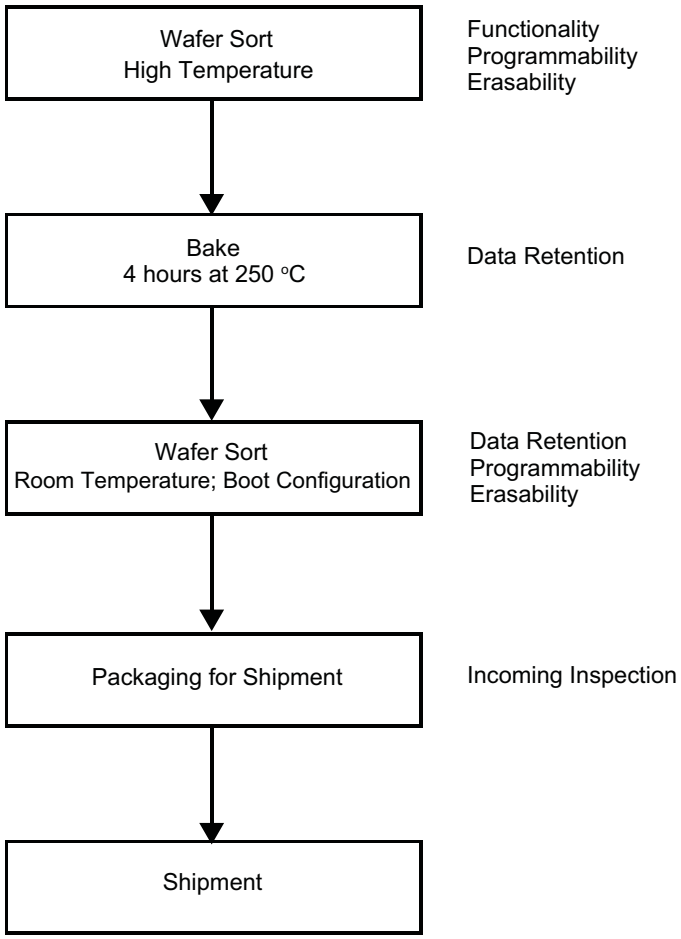
Wafer Map

S99GL064S Sorted Die products utilize inkless wafer mapping.

Product Test Flow

Figure 3 provides an overview of Cypress's Sorted Die test flow. For detailed information, refer to the S29GL064S product qualification database supplement for Sorted Die. Cypress implements quality assurance procedures throughout the product test flow.

Figure 3. Sorted Die Test Flow



Physical Specifications

Die Dimensions	144.09 mils × 106.46 mils
	3.660 mm × 2.704 mm
Die Thickness	725 µm
Bond Pad Size	2.76 mils × 2.76 mils
	70 µm × 70 µm
Pad Area Free of Passivation	192.91 $mils^2$
	4900 μm^2
Pads Per Die	57
Bond Pad Metalization	Al/Cu
Die Backside	No metal
Passivation	SiN / TEOS
Scribe Line Width	0.1 mm

DC Operating Conditions

V_{IO} = 2.7V to 3.6V — V_{CC} (Supply Voltage)		2.7V to 3.6V
Operating Temperature	**Industrial**	–40 °C to +85 °C

Manufacturing Information

Manufacturing	Cypress
Test	Fab25
Preparation for Shipment	Austin, TX
Fabrication Process	CS239LS
Die Revision	1

Special Handling Instructions

Processing

Do not expose Sorted Die products to ultraviolet light or process them at temperatures greater than 250 °C. Failure to adhere to these handling instructions will result in irreparable damage to the devices. For best yield, Cypress recommends assembly in a Class 10K clean room with 30% to 60% relative humidity.

Storage

Store at a maximum temperature of 30 °C in a nitrogen-purged cabinet or vacuum-sealed bag. Observe all standard ESD handling procedures.

Terms and Conditions of Sale for Cypress NonVolatile Memory Die

All transactions relating to unpackaged die under this agreement shall be subject to Cypress's standard terms and conditions of sale, or any revisions thereof, which revisions Cypress reserves the right to make at any time and from time to time. In the event of conflict between the provisions of Cypress's standard terms and conditions of sale and this agreement, the terms of this agreement shall be controlling.

Cypress warrants its manufactured unpackaged die whether shipped to customer in individual dice or wafer form (Sorted Die or Wafer(s)) will meet Cypress's published specifications and against defective materials or workmanship for a period of one (1) year from date of shipment.

This limited warranty does not extend beyond the first purchaser of said Die or Wafer(s).

Buyer assumes full responsibility to ensure compliance with the appropriate handling, assembly and processing of Sorted Die (including but not limited to proper Die preparation, Die attach, backgrinding, singulation, wire bonding and related assembly and test activities), and compliance with all guidelines set forth in Cypress's specifications for Sorted Die, and Cypress assumes no responsibility for environmental effects on Sorted Die or for any activity of Buyer or a third party that damages the Die or Wafer(s) due to improper use, abuse, negligence, improper installation, improper backgrinding, improper singulation, accident, loss, damage in transit, or unauthorized repair or alteration by a person or entity other than Cypress ("Limited Warranty Exclusions")

The liability of Cypress under this limited warranty is limited, at Cypress's option, solely to repair the Die or Wafer(s), to send replacement Die or Wafer(s), or to make an appropriate credit adjustment or refund in an amount not to exceed the original purchase price actually paid for the Die or Wafer(s) returned to Cypress, provided that: (a) Cypress is promptly notified by Buyer in writing during the applicable warranty period of any defect or nonconformity in the Die or Wafer(s); (b) Buyer obtains authorization from Cypress to return the defective Die or Wafer(s); (c) the defective Die or Wafer(s) is returned to Cypress by Buyer in accordance with Cypress's shipping instructions set forth below; and (d) Buyer shows to Cypress's satisfaction that such alleged defect or nonconformity actually exists and was not caused by any of the above-referenced Warranty Exclusions. Buyer shall ship such defective Die or Wafer(s) to Cypress via Cypress's carrier, collect. Risk of loss will transfer to Cypress when the defective Die or Wafer(s) is provided to Cypress's carrier. If Buyer fails to adhere to these warranty returns guidelines, Buyer shall assume all risk of loss and shall pay for all freight to Cypress's specified location. The aforementioned provisions do not extend the original limited warranty period of any Die or Wafer(s) that has either been replaced by Cypress.

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Document History Page

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**	6595603	06/17/2019	Initial release
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