

CYPRESS

# ASYNCHRONOUS SRAMs WITH ON-CHIP ERROR-CORRECTING CODE (ECC)



## PRODUCT OVERVIEW

### COMPLETE FREEDOM FROM SOFT-ERRORS

The latest generation Asynchronous SRAMs from Cypress make the best of an advanced process technology by integrating single-bit error correction capability and bit-interleaving techniques to mitigate the effects of soft errors. The result is a family of devices that provide best-in-class features and the highest levels of reliability.

With the performance to serve a wide variety of industrial, communication, data processing, medical, consumer and military applications, Cypress's latest technology Fast and MoBL® SRAM devices are form-fit-function compatible with existing Asynchronous SRAM devices based on older technology nodes. This allows customers to boost system performance and reliability without investing on PCB re-design.

### SOFT-ERROR MITIGATION IN ASYNCHRONOUS SRAM

Cypress's latest generation Asynchronous SRAM devices use (38,32) Hamming Code for single-bit error detection and correction. A hardware ECC block performs all ECC-related functions in line, without user intervention and without affecting the access time performance of the device. The single-bit error detection and correction capability is supplemented by a bit-interleaving scheme to prevent the occurrence of multi-bit errors. Together, these features provide significant improvement in Soft Error Rate (SER) performance, resulting in FIT rates less than 0.1 FIT/Mbit.

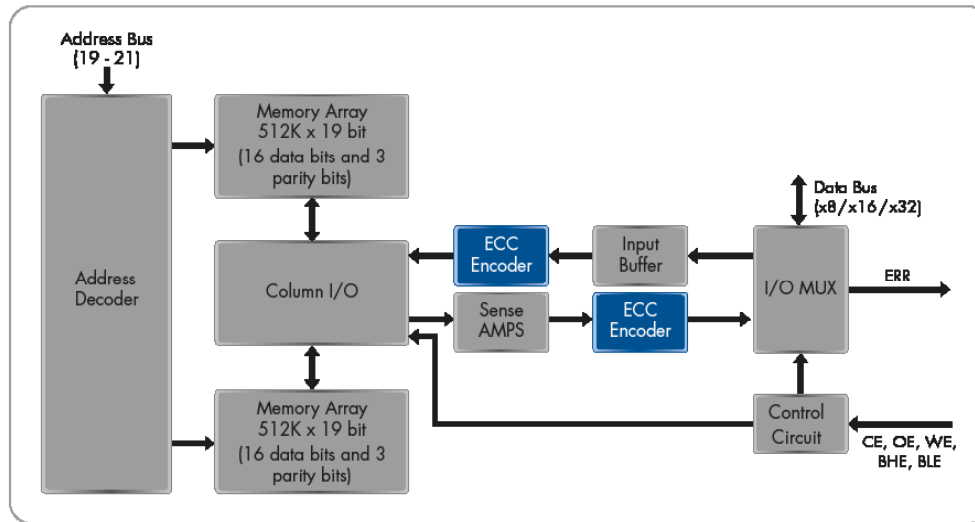
### ENHANCED RELIABILITY WITH ERR PIN

Over a period of time, multiple single event upsets (SEUs) may affect the same word, resulting in an accumulated multi-bit upset (two or more single-bit upsets in the same word). Such an event is highly improbable. But if it does occur, an accumulated multi-bit upset cannot be detected by the ECC logic, and the system may read incorrect data.

To mitigate this problem, Cypress's latest generation Asynchronous SRAM devices include an optional error indication (ERR) pin. During read operation, the ERR pin signals detection and correction of a single-bit error at the accessed memory location. The system can use this information to recognize a single-bit error and write-back corrected data to the memory.

### ADVANTAGES

- Highest level of reliability: Soft-Error Rate < 0.1FIT/Mbit
- Embedded ECC to detect and correct all single-bit errors
- Bit-interleaving to avoid multi-bit upsets
- Optional ERR pin to indicate the occurrence of single-bit error
- Industry leading access time: 10ns (16-Mbit FAST)
- Ultra-low standby current: 16uA (16-Mbit MoBL)
- Multiple configurations: x8, x16, and x32
- Multiple operating voltages: 1.8V, 3V, 5V
- Available in industrial and automotive temperature grades
- Form-fit-function compatible with current generation ASYNC SRAM devices



Internal Block Diagram of ASYNCHRONOUS SRAM with ECC

### 16-MBIT FAST ASYNCHRONOUS SRAM

Part Number	Organization	Voltage	Speed <sup>(2)</sup>	Package	Temperature Grade
CY7C1069G	2M x 8	1.8V, 3V, 5V	10ns, 12ns, 15ns, 17ns	54-TSOP II, 48-VFBGA	Industrial, Automotive
CY7C1069GE <sup>(1)</sup>	2M x 8	1.8V, 3V, 5V	10ns, 12ns, 15ns, 17ns	54-TSOP II, 48-VFBGA	Industrial, Automotive
CY7C1061G	1M x 16	1.8V, 3V, 5V	10ns, 12ns, 15ns, 17ns	48-TSOP I, 54-TSOP II, 48-VFBGA	Industrial, Automotive
CY7C1061GE <sup>(1)</sup>	1M x 16	1.8V, 3V, 5V	10ns, 12ns, 15ns, 17ns	48-TSOP I, 54-TSOP II, 48-VFBGA	Industrial, Automotive
CY7C1062G	512K x 32	1.8V, 3V	10ns, 12ns, 15ns, 17ns	119-BGA	Industrial, Automotive
CY7C1062GE <sup>(1)</sup>	512K x 32	1.8V, 3V	10ns, 12ns, 15ns, 17ns	119-BGA	Industrial, Automotive

### 16-MBIT MOBL<sup>®</sup> ASYNCHRONOUS SRAM

Part Number	Organization	Voltage	Speed <sup>(4)</sup>	Package	Temperature Grade
CY62167G	1M x 16 <sup>(3)</sup>	1.8V, 3V, 5V	45ns, 55ns	48-TSOP I, 48-VFBGA	Industrial, Automotive
CY62167GE <sup>(1)</sup>	1M x 16 <sup>(3)</sup>	1.8V, 3V, 5V	45ns, 55ns	48-TSOP I, 48-VFBGA	Industrial, Automotive
CY62168G	2M x 8	1.8V, 3V, 5V	45ns, 55ns	48-VFBGA	Industrial, Automotive
CY62168GE <sup>(1)</sup>	2M x 8	1.8V, 3V, 5V	45ns, 55ns	48-VFBGA	Industrial, Automotive
CY62162G	512K x 32	1.8V, 3V	45ns, 55ns	119-BGA	Industrial, Automotive
CY62162GE <sup>(1)</sup>	512K x 32	1.8V, 3V	45ns, 55ns	119-BGA	Industrial, Automotive

Notes: 1. Part with ERR pin

2. Operating speed is 10ns for Industrial Grade 3 V, 5 V part; 15ns for Industrial Grade 1.8 V part; 12ns for Automotive Grade 3 V, 5 V part; and 17ns for Automotive Grade 1.8 V part

3. 48-pin TSOP I configurable as 1Mx16 or as 2Mx8 SRAM

4. Operating speed is 45ns for Industrial Grade and 55ns for Automotive Grade

### GET STARTED NOW

For more information please visit us at [www.cypress.com/go/AsyncSRAM](http://www.cypress.com/go/AsyncSRAM)

### Cypress Semiconductor Corporation

198 Champion Court, San Jose CA 95134

phone +1 408.943.2600 fax +1 408.943.6848

toll free +1 800.858.1810 (U.S. only) Press "1" to reach your local sales representative

© 2013 - 2014 Cypress Semiconductor Corporation. All rights reserved. All other trademarks are the property of their respective owners.  
Doc#001-86366 Rev.\*B 052014/SHPT/TONE/BENY





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.