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Complete Freedom From Soft Errors

Asynchronous SRAMs with Error-Correcting Code (ECC)



Soft error: How bad is it?

With every new process technology node, there is significant improvement in performance and power consumption along with reduction in the size of the chip. Each new process technology reduces voltage and shrinks the capacitance of the node. This reduced node capacitance makes these devices more susceptible to bit failures caused by energetic particles. These bit failures are called ‘soft errors’.

Electronic devices are frequently exposed to extraterrestrial energetic particles like alpha particles, cosmic rays, and thermal neutrons. With today’s advanced process nodes, memories are highly likely to fail due to soft errors caused by such extraterrestrial radiation.

Soft errors not only corrupt data, but can also lead to loss of function and system-critical failures. Industrial controllers, military equipment, networking systems, medical devices, automotive electronics, and consumer electronics are especially vulnerable to the adverse effects of soft errors. An uncorrected soft error can lead to system failures in mission-critical industrial automation, automotive engine control, and high-end security systems.





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What’s the solution?

Soft errors are usually dealt with through redundancy and software. Redundancy involves storing the same data on multiple chips to prevent data loss. It’s quite expensive and takes up a lot of board space. While software doesn’t take up extra board space, it is tedious, expensive and time-consuming. Both these solutions are impractical in latest- generation devices due to board space and product cycle time restrictions.



Complete freedom from soft errors

Infineon Asynchronous SRAM with on-chip Error Correcting Code (ECC) provides a faster, simpler, and more cost-effective solution than software or redundancy-based ECC schemes. It is the industry's highest reliability chip, built to service a wide variety of applications.

Error Correcting Code (ECC)

Infineon's latest generation Asynchronous SRAM devices use (38,32) Hamming Code for single-bit error detection and correction using ECC.
The hardware ECC block in Infineon ultra-reliable Asynchronous SRAMs performs all ECC-related functions inline, withoutuser intervention.

Bit Interleaving

Higher energy extraterrestrial radiation can flip multiple adjacent bits, leading to multi-bit errors. The single-bit error detection and correction capability of ECC 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 industry-leading FIT rates less than 0.1 FIT/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: 10 ns (FAST)



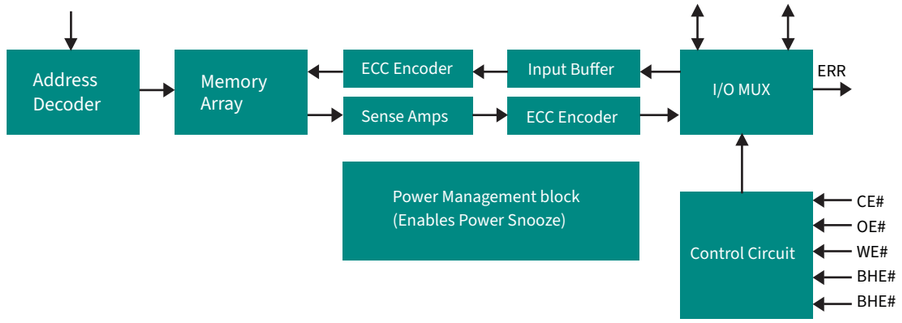
High performance and low power. Now a reality.

Fast SRAM with Power Snooze is a revolutionary product that eliminates the tradeoff between performance and power consumption in Asynchronous SRAM applications. In this new family of devices, the best features of Fast SRAMs (high speed) and Low-power SRAMs (low power consumption) are available through a novel on-chip power saving mode called ‘Power Snooze’.

Performance and power tradeoff in asynchronous SRAMs

Parameters	16-Mbit Fast SRAM	16-Mbit Low-power SRAM	16-Mbit Fast SRAM with Power Snooze
Access time	10 ns	45 ns	10 ns
Active current	110 mA	35 mA	110 mA
Standby current	30 mA	8 µA	22 µA

Power Snooze is an additional power saving mode to standard Asynchronous SRAM operating modes (Active, Standby, and Data Retention). The Deep Sleep pin (DS#) enables switching between the high-performance active mode and the ultra-low-power Power Snooze mode. With deep sleep current as low as 15 µA (in 4-Mbit devices), Fast SRAM with Power Snooze combines the best features of fast and low-power SRAM in a single device.



Ordering code

FAST Asynchronous SRAM with ECC

Part Number	Organization	Voltage	Speed	Temperature Grade
CY7C1049G(E)	512 K x 8	1.8 V, 3 V, 5 V	10 ns, 15 ns	Industrial
CY7C1041G(E)	256 K x 16	1.8 V, 3 V, 5 V	10 ns, 12 ns, 15 ns, 17 ns	Industrial, Automotive
CY7C1069G(E)	2 M x 8	1.8 V, 3 V, 5 V	10 ns, 15 ns	Industrial
CY7C1061G(E)	1 M x 16	1.8 V, 3 V, 5 V	10 ns, 12 ns, 15 ns, 17 ns	Industrial, Automotive, Militray
CY7C1062G(E)	512 K x 32	1.8 V, 3 V	10 ns, 15 ns	Industrial

54-pin TSOP-II, 44-pin TSOP-II, 44-pin SOJ, 48-pin BGA, 48-pin TSOP-I, 119-pin BGA

Low-Power Asynchronous SRAM with ECC

Part Number	Organization	Voltage	Speed	Temperature Grade
CY62148G	512 K x 8	1.8 V, 3 V, 5 V	45 ns, 55 ns	Industrial
CY62146G(E)	256 K x 16	1.8 V, 3 V, 5 V	45 ns, 55 ns	Industrial, Automotive
CY62147G(E)	256 K x 16	1.8 V, 3 V, 5 V	45 ns, 55 ns	Industrial, Automotive
CY62168G(E)	2 M x 8	1.8 V, 3 V, 5 V	45 ns, 55 ns	Industrial
CY62167G(E)	1 M x 16	1.8 V, 3 V, 5 V	45 ns, 55 ns	Industrial, Automotive
CY62162G(E)	512 K x 32	1.8 V, 3 V	45 ns, 55 ns	Industrial

44-pin TSOP-II, 48-pin TSOP-I, 48-pin BGA, 119-pin BGA

FAST SRAM with Power Snooze

Part Number	Organization	Voltage	Speed	Temperature Grade
CY7S1049G(E)	512 K x 8	1.8 V, 3 V, 5 V	10 ns, 15 ns	Industrial
CY7S1041G(E)	256 K x 16	1.8 V, 3 V, 5 V	10 ns, 15 ns	Industrial
CY7S1061G(E)	1 M x 16	1.8 V, 3 V, 5 V	10 ns, 15 ns	Industrial
CY7S1062G	2 M x 8	1.8 V, 3 V, 5 V	10 ns, 15 ns	Industrial

48-pin BGA, 48-pin TSOP-I, 119-pin BGA

FAST Asynchronous SRAM

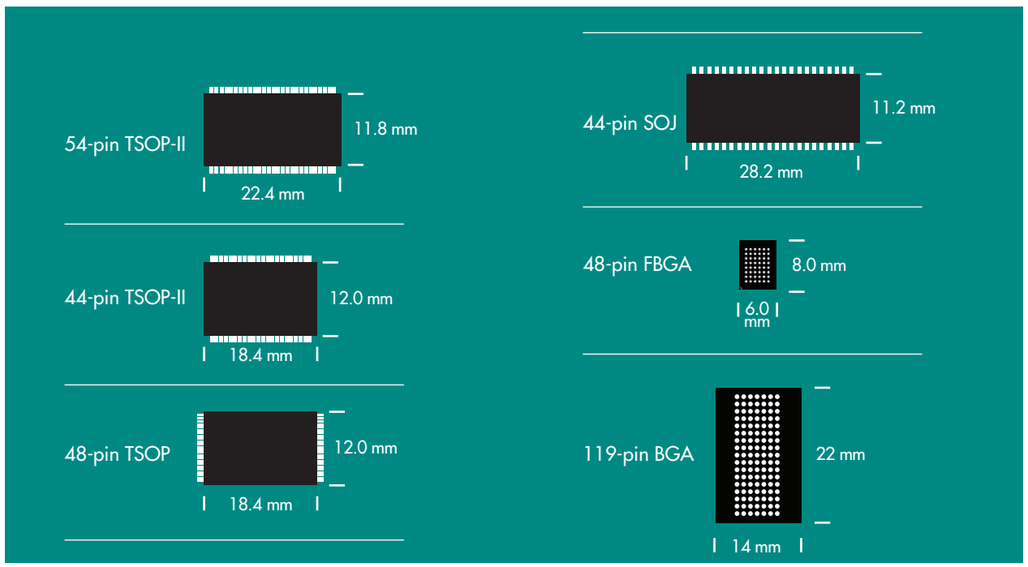
Part Number	Organization	Voltage	Speed	Temperature Grade
CY7C1019DV33	128K x 8	3.3 V	10 ns	Military

32-pin SOJ



Package Dimensions

Package dimensions are shown as nominal measurements and are intended for quick reference only. Refer to detailed product datasheets for precise package dimensions and complete specifications.



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