www.infineon.com/memory

Infineon commercial space memories

Optimize NewSpace missions with the best of commercial space technology



COMMERCIAL MEMORIES FOR NEWSPACE APPLICATIONS

Reliability meets performance with Infineon Commercial Space memories

Infineon's Commercial Space portfolio leverages the best of automotive technology and space electronics to offer high performing and reliable memory solutions. Designed for low Earth orbit (LEO) satellite constellations and applications, our commercial-off-the-shelf (COTs) parts enable a right-sized mix of performance and reliability based on size, weight, power, and cost (SWaP-c) considerations.

From our intrinsically rad hard memories to our rad tolerant devices, our Commercial Space portfolio boasts industry-leading memory solutions.

What's in the portfolio?

This document will review key features and applications of our Commercial Space memories:

1. NOR Flash
2. F-RAM
3. Sync SRAM
4. pSRAM

NOR Flash

With endurance cycles starting at 100K P/E to 1000K P/E and decades of data retention, our NOR Flash memories are not only reliable, but also high-performing.

Available in the industry standard QSPI interface, our NOR Flash devices can match or exceed traditional parallel interfaces while reducing pin count, helping conserve board space. These memories also support XIP (eXecute In Place) functionality, allowing host controllers to execute directly from the NOR Flash memory without needing to copy the code to a RAM. SEMPER™ X1 is the latest addition to our vast NOR Flash family; it offers enhanced security features and ultra-high data throughput up to 26 Gbps, utilizing a LPDDR4 high speed and low power interface.

NOR Flash Applications

- Space grade FPGA configuration image storage
- Standalone boot code for space processors

F-RAM

Our F-RAMs are intrinsically rad hard, making them highly reliable in extreme space conditions. With virtually infinite endurance, instant non-volatile write technology, and over 100-years of data retention, our F-RAMs optimize mission critical applications. SEU immunity and a TID rating >50 krad(Si) make our ultra-low power F-RAMs an industry standout. Between serial and parallel interface options, our F-RAM devices are uniquely flexible and the only available 12C interface memory option on the market.

F-RAM Applications

- Data storage for sensors and instruments
- Data logging for calibration in satellites
- Boot code storage for microcontrollers

Commercial space

Sync SRAM

Infineon's QDR®-IV synchronous static RAM combines high-speed memory technology with improved data throughput, enabled by flip-flop based latching circuitry and a clocked interface. We offer an industry-leading RTR (random transaction rate) of 2132 MT/s. With on-chip error correction code (ECC) and single event latchup immunity, our sync SRAMs are highly reliable. Flexible Read/Write ports make the QDR®-IV SRAM an ideal high-speed data sharing buffer between two processors or FPGAs at an unprecedented transaction speed. Improved signal integrity is another key feature of our SRAMs, made possible by our On-Die-Termination technology. An advanced circuit design (ODT, de-skew) and support for multiple I/O standards make these memories particularly flexible.

Sync SRAM Applications

- High speed signal processing and data buffering
- FPGA and processor data sharing
- L3 cache optimization

pSRAM

Our Pseudostatic RAM (pSRAM) devices are ideal for a wide range of data-intensive operations. An optimal expansion memory choice, these pSRAM memories externally act like a serial SRAM with reliable DRAM memory as a back-end storage element. The device's hybrid sleep mode and partial-array-refresh help conserve energy. A high throughput up to 3.2 Gbps maximizes system performance by enabling a high read/write bandwidth. Our memories' low pin-count simplifies overall design and reduces system cost.

Visit the IFX Development Center for RTL (register-transfer level) source code and documentation for further support.

pSRAM Applications

- Expansive RAM for buffering data
- Expansion memory solution in FPGAs

Ecosystem support

Infineon's Ecosystem Partners are chosen for their expertise in designing and delivering reliable solutions. They bring diverse knowledge in hardware, software, tools, services, and end-applications.

Our partners help our customers speed up development and get to market faster. Infineon collaborates with chipset partners to ensure compatibility between Infineon memories and partner SoCs, providing early access to products and dedicated support.

Whether you have a question on pairing Infineon memory with a particular chipset or would like more information on our partners, get in touch with us to learn more.

Radiation information

Product	Density	Interface	Part Number	Description	TID krad	SEU Err/bit.day (GEO Solar min)	SEL LET	SEFI Err/dev.day (GEO Solar min)	Note
QDR®-IV SRAM	144 Mbit	x18, x36	CY7C4122KV13-106FCXC CY7C4142KV13-106FCXC	144 Mb, 2 Burst, 1066 MHz QDR	50	Immune	>56 (125°C)	<3.0e-4	Burst Errors
FRAM	2 Mbit	SPI (x1)	CY15B102Q-SXM	2 Mb, SPI F-RAM	50	Immune	>114 (115°C)	<1.34e-4	Read SEFI
	2 Mbit	SPI (x1)	CY15B102Q-SXE	2 Mb, SPI F-RAM					
	4 Mbit	SPI (x1)	CY15B104Q-SXI	4 Mb, SPI F-RAM					
	2 Mbit	Parallel (128K x 16)	CY15B102N-SZ60XM	2 Mb, parallel F-RAM				<5.3e-5 (active/stdby) Immune (sleep)	Read SEFI
	2 Mbit	Parallel (128K x 16)	FM28V202A-TG	2 Mb, parallel F-RAM					
	1 Mbit	I2C	FM24V10-G	1 Mb, I2C F-RAM			>58 (110°C)	<6.1e-4	Read SEFI
	256 Kbit	I2C	CY15B256J-SXE	256 Kb, I2C F-RAM	50	Immune	>69 (125°C)	<1.59e-3	Read SEFI
NOR Flash	256 Mbit	QSPI	S25FL256LAGMFM001	256 Mb, QSPI, NOR Flash	30	<1e-16	>60 (85°C)	<1.1e-4	Erase function SEFI
	256 Mbit	QSPI	S25FL256LAGNFM010	256 Mb, QSPI, NOR Flash					
Serial p SRAM	256 Mbit	x8	S80KS2562GABHM020	256Mb, x8 HyperBus, Pseudo SRAM	100	<1.54e-14	>58 (125°C)	<6.9e-5	Static or Read SEFI
	256 Mbit	x8	S80KS2563GABHM020	256Mb, x8 xSPI, Pseudo SRAM					
	512 Mbit	x8	S80KS5122GABHM020	512Mb, x8 HyperBus, Pseudo SRAM					
	512 Mbit	x8	S80KS5123GABHM020	512Mb, x8 xSPI, Pseudo SRAM					
SEMPER™ X1	288 Mbit	LPDDR4 / QSPI	S22HM288ENABHM020	288Mbit, LPDDR4/QSPI NOR Flash	30	Immune	>58 (125°C)	<3.1e-4	Read SEFI

Ordering information

Product	Density	Interface	Part Number	Description	Package	Temp Range	MOQ		EAR
							Production	Sampling	
QDR®-IV SRAM	144 Mbit	x18, x36	CY7C4122KV13-106FCXC CY7C4142KV13-106FCXC	144 Mb, 2 Burst, 1066 MHz QDR	361-ball VFPGA	-40°C to 85°C	120	5	3A991.B.2.B
FRAM	2 Mbit	SPI (x1)	CY15B102Q-SXM	2 Mb, SPI F-RAM	8-pin SOIC	-55°C to 125°C	470	5	3A001.A.2.C
	2 Mbit	SPI (x1)	CY15B102Q-SXE	2 Mb, SPI F-RAM	8-pin SOIC	-40°C to 125°C	940	5	EAR99
	4 Mbit	SPI (x1)	CY15B104Q-SXI	4 Mb, SPI F-RAM	8-pin SOIC	-40°C to 85°C	940	5	EAR99
	2 Mbit	Parallel (128K x 16)	CY15B102N-SZ60XM	2 Mb, parallel F-RAM	44-pin TSOP II	-55°C to 125°C	270	5	3A001.A.2.C
	2 Mbit	Parallel (128K x 16)	FM28V202A-TG	2 Mb, parallel F-RAM	44-pin TSOP II	-40°C to 85°C	675	5	EAR99
	1 Mbit	I2C	FM24V10-G	1 Mb, I2C F-RAM	8-pin SOIC	-40°C to 85°C	485	5	EAR99
	256 Kbit	I2C	CY15B256J-SXE	256 Kb, I2C F-RAM	8-pin SOIC	-40°C to 125°C	485	5	EAR99
NOR Flash	256 Mbit	QSPI	S25FL256LAGMFM001	256 Mb, QSPI, NOR Flash	16-pin SOIC	-40°C to 125°C	705	5	3A991.B.1.A
	256 Mbit	QSPI	S25FL256LAGNFM010	256 Mb, QSPI, NOR Flash	8-pin WSON	-40°C to 125°C	338	5	3A991.B.1.A
Serial pSRAM	256 Mbit	x8	S80KS2562GABHM020	256Mb, x8 HyperBus, Pseudo SRAM	24-pin FBGA	-40°C to 125°C	676	5	3A991.B.2
	256 Mbit	x8	S80KS2563GABHM020	256Mb, x8 xSPI, Pseudo SRAM	24-pin FBGA	-40°C to 125°C	676	5	3A991.B.2
	512 Mbit	x8	S80KS5122GABHM020	512Mb, x8 HyperBus, Pseudo SRAM	24-pin FBGA	-40°C to 125°C	676	5	3A991.B.2
	512 Mbit	x8	S80KS5123GABHM020	512Mb, x8 xSPI, Pseudo SRAM	24-pin FBGA	-40°C to 125°C	676	5	3A991.B.2
SEMPER™ X1	288 Mbit	LPDDR4 / QSPI	S22HM288ENABHM020	288Mbit, LPDDR4/QSPI NOR Flash	123-pin FBGA	-40°C to 125°C	2400	5	3A991.B.1.A



Summary

Infineon's extensive portfolio of volatile and non-volatile memories offers a combination of high reliability and robust performance, making it an ideal choice for commercial space applications. With decades of space flight heritage, our memory solutions have consistently met the stringent and ever-changing needs of space-based systems.

Where to Buy

Infineon distribution partners and sales offices:
www.infineon.com/WhereToBuy

Service Hotline

Infineon offers its toll-free **0800/4001** service hotline as one central number, available 24/7 in English, Mandarin and German.

Germany	0800 951 951 951 (German/English)
China, mainland	4001 200 951 (Mandarin/English)
India	000 800 4402 951 (English)
USA	1-866 951 9519 (English/German)
Other countries	00* 800 951 951 951 (English/German)
Direct access	+49 89 234-0 (interconnection fee, German/English)

* Please note: Some countries may require you to dial a code other than "00" to access this international number, please visit www.infineon.com/service for your country!

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