Infineon memory solutions for aerospace and defense

www.infineon.com/hirelmemory

Infineon's radiation hardened volatile and non-volatile memories adhere to the most stringent standards in the industry and are DLAM QML certified meeting the reliability and life cycle demands of space applications.

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Radiation hardened and high reliability memories that perform in the harshest environments

Quality, reliability and longevity delivered! Aerospace and defense platforms require reliable, secure and robust memory solutions capable of meeting strict performance and environmental metrics. Infineon radiation hardened and high reliability memories adhere to the most stringent standards in the industry. Dedicated process flows and proprietary manufacturing processes ensure zero-defect products with long lifecycles based on mature and reliable process technologies. Our longevity programs deliver the industry's most trustworthy, long-term products support.

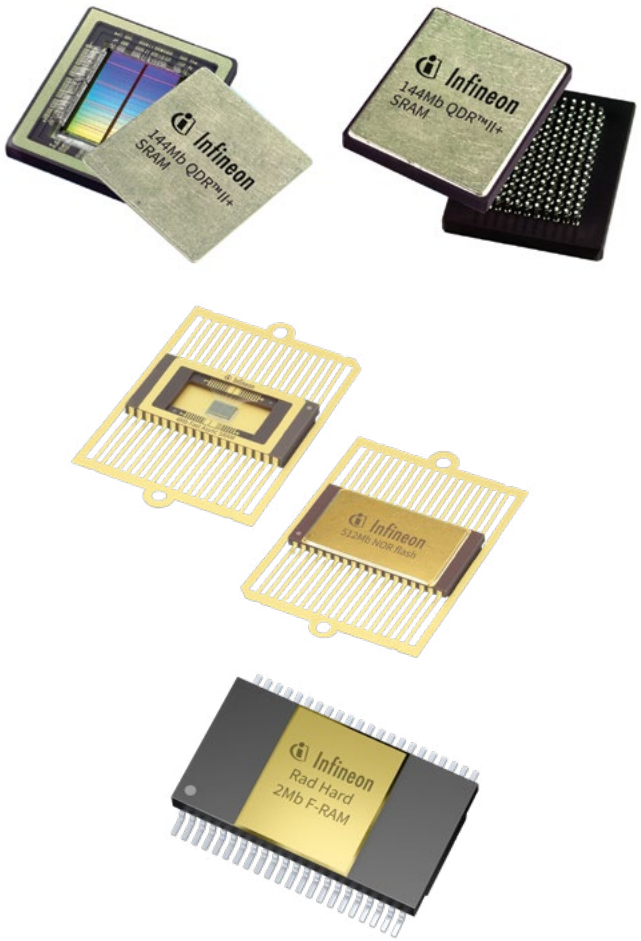
Infineon offers a differentiated portfolio of rad hard memories for extreme environments such as those found in space, aviation, defense, and other industries. Our extensive portfolio supports volatile and non-volatile memories with serial and parallel interfaces. Infineon's high reliability memories adhere to the most stringent standards in the industry and are DLAM QML certified, meeting the reliability and life cycle demands of aerospace and defense applications.

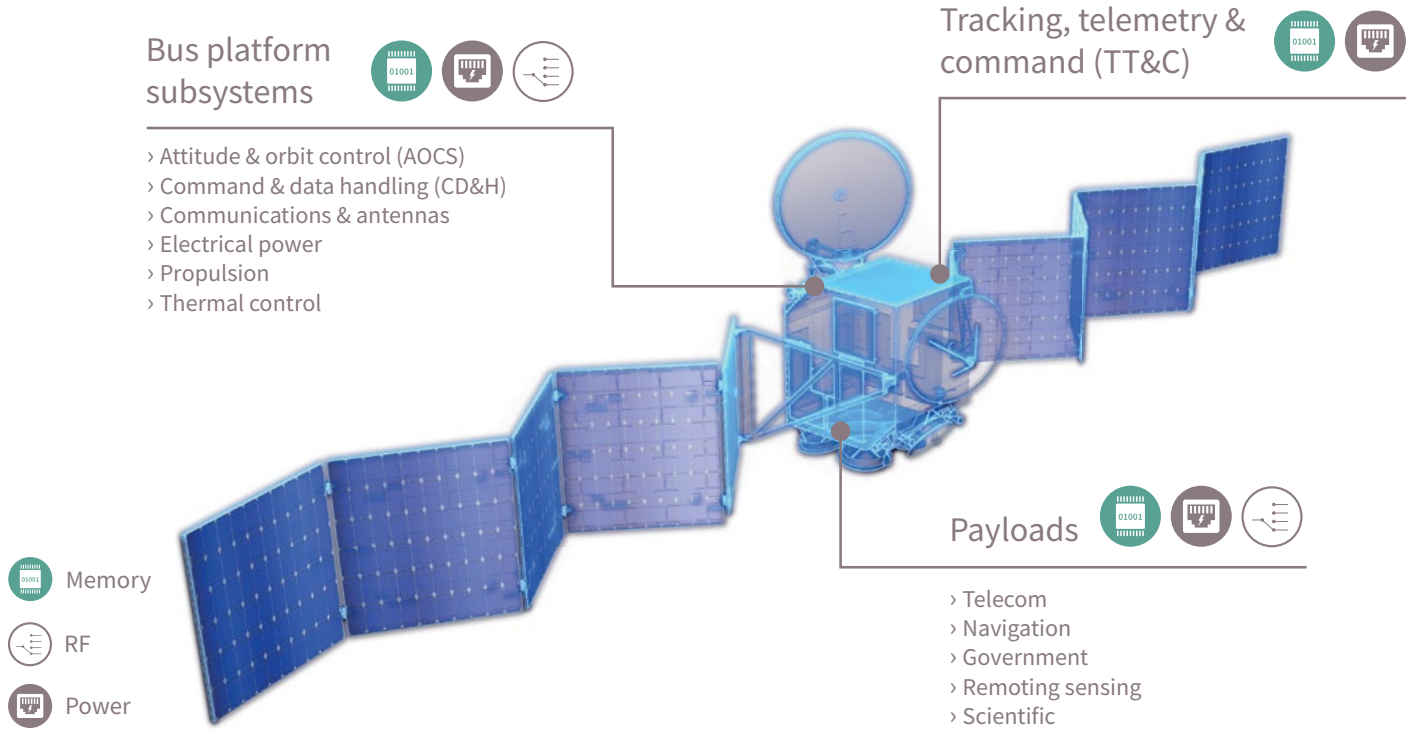
Trusted supplier for space applications

Space platforms require reliable, secure, and robust memory solutions capable of enduring harsh operating environments. These compute intensive applications put increasing demands on memory performance and density to handle the large amounts of data sourced from multiple sensors and processor nodes. Infineon's rad hard space memories are QML-V certified, meeting space applications' reliability, performance, and life cycle demands. Our space memory solutions enhance overall system computing limits while providing Size, Weight and Power (SWaP) benefits and greater design flexibility.

Our portfolio includes:

- Volatile memories
  - Quad Data Rate (QDR)® II+ Synchronous SRAMs
  - Asynchronous SRAMs
- Non-volatile memories
  - Serial NOR Flash
  - Serial and Parallel F-RAMs





Our HiRel space memories are used throughout satellite sub-systems. Whether you're designing satellite payloads, buses, communications or other spacecraft systems, our memories provide the highest reliability, highest performance and superior radiation and single event effects (SEE) performance on the market.

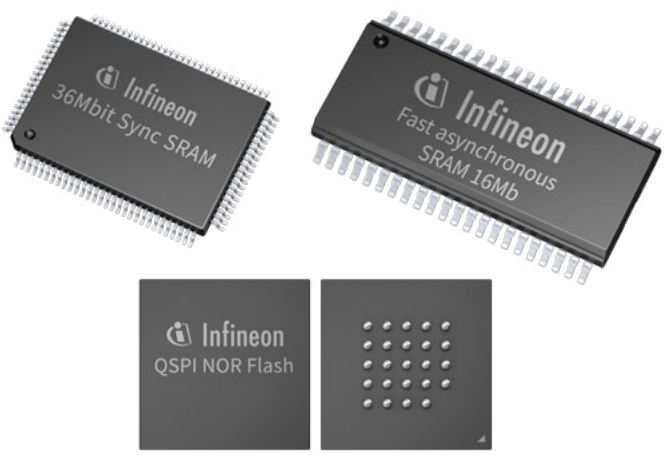
› The QDR synchronous SRAMs are true, high-speed cache memories that provide low latency and random memory access capability needed for high-performance applications such as on-board image processing, radar imaging payload applications and satellite communications
› The asynchronous SRAM family provides high-performance buffer support for space FPGA payload processing applications
› Our rad hard QSPI NOR Flash is ideal for space FPGA boot configuration and FPGA data storage for compute-intensive processing where flexibility and high performance have become stringent requirements
› Our rad hard F-RAMs are well suited for data logging and calibration data storage for telemetry, command and control and payload applications, and boot code storage for microcontrollers and ASICs

Highly reliable memory solutions for defense applications

Infineon's defense memory portfolio offers a wide selection of NOR Flash, F-RAM, nvSRAM and SRAM memories that provide design options and flexibility while reducing system cost in defense applications for VPX communications.

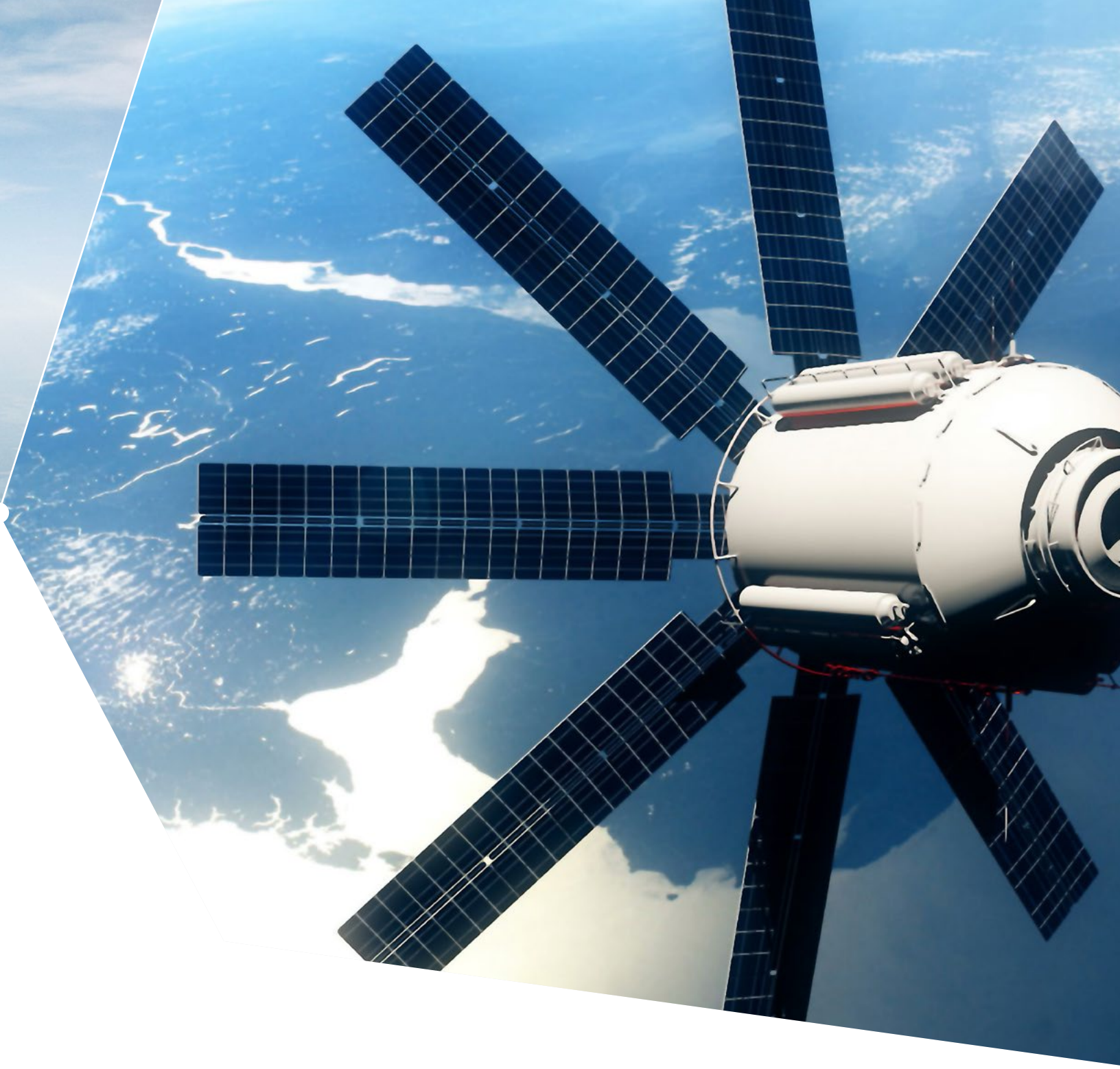
Our portfolio includes:

- Volatile memories
  - Synchronous SRAMs
  - Asynchronous SRAMs
- Non-volatile memories
  - Non-volatile SRAM (nvSRAM)
  - Serial and Parallel NOR Flash
  - Serial and Parallel F-RAMs



Infineon's HiRel defense memories are used for several applications such as communications, GPS equipment and ground-based radar.

- Our high performance and reliable synchronous and asynchronous SRAMs meet the processing power demands of VPX form factors for defense sensor processing systems and communication equipment
- Our QML-Q certified nvSRAM memories offer the high performance of traditional SRAMs while providing the added benefits of non-volatility and are ideal for error logging in flight data recorders
- For boot code storage, Infineon's NOR flash memories are well suited for GPS applications
- The F-RAM products are ideal for demanding persistent code storage and fault logging applications for defense applications



Infineon memory solutions QML manufacturing sites

Mission and product assurance are key priorities for our customers. Here at Infineon, we have our own HiRel certified designated sites and procure processed wafers from domestic and international industry-leading manufacturing partners that deliver quality services and are committed to strict quality and stringent reliability standards.

QML screening

Our customers' applications demand high-reliability devices that perform to specification in the harshest environments. QML certification is the highest reliability standard for microcircuit devices issued by the United States Government. This certification indicates that the device can be relied upon to function properly while being subjected to the harshest of conditions. Infineon's rad hard memories feature both QML V and QML Q certifications.

Manufacturing process flow chart

		Ceramic		Plastic		
		Hermetic		Non-hermetic		
Main process flow steps	Method / condition	QML-V wire bond	QML-Q wire bond	QML-P wire bond	Mil Temp wire bond	Standard wire bond, flip chip
	Specification references	MIL-PRF-38535	MIL-PRF-38535	MIL-PRF-38535	Internal procedure	Internal procedure
Wafer lot acceptance	MIL-STD-883 TM5007 / QM Plan	x	x	x	Internal or subcontractor procedure	
Die sawing/select	Internal procedure / MIL-STD-883 TM2010 / ESCC 20400	Cond A	Cond B	Cond A		
Die attach/cure	Internal or subcontractor procedure	x	x	x		
Internal visual inspection	MIL-STD-883 TM2010 / ESCC 20400	x	x			
Wire bonding	Internal or subcontractor procedure	x	x	x		
Internal visual inspection	MIL-STD-883 TM2010 / ESCC 20400	x	x	x		
Molding / dam & fill / cure	Internal or subcontractor procedure			x		
Solder balls report / reflow	Internal or subcontractor procedure			if appl		
Precap inspection	MIL-STD-883 TM2010 / ESCC 20400	x		x		
Lid seal	Internal procedure	x	x			
Marking	Internal or subcontractor procedure	x		x	x	x
Serialization marking	Internal procedure	x		x		
Fine & gross leaks test	MIL-STD-883 TM1014 / A / C	x	x			
Xray inspection	MIL-STD-883 TM 2012	x				
Incoming inspection	Internal procedure			if appl	if appl	if appl
Temperature cycling	MIL-STD-883 TM1010 Cond C / +150°C / -65°C	50 cy		20 cy		
Constant acceleration	MIL-STD-883 TM2001 / E/ Y1 orientation	x				
PIND test	MIL-STD-883 TM2020 / A	x		if appl		
Pre-ambient electrical	Per device specification (25°C)	x	x	x	if appl	if appl
Static burn-in	MIL-STD-883 TM1015 cond A or B or C (+125°C)	144 hrs		144 hrs		
Intermediate-ambient electrical	Per device specification / +25°C	x		x		
Dynamic burn-in	MIL-STD-883 TM1015 cond. D (125°C)	240 hrs	160 hrs	240 hrs	if appl	if appl
Post burn in electrical	Per device specification / +25°C	x		x	if appl	if appl
Delta calculation	Internal procedure / per device spec	x		x		
PDA	5% parametric parameters (amb temp post Dyn)	x	x	x		
PDA	3% functional parameters (amb temp post Dyn)	x		x		
Fine & gross leaks test	MIL-STD-883 TM1014 / A / C	x	x			
Final electrical	Per device specification / +25°C	x	x	x	x	x

Manufacturing process flow chart

		Ceramic		Plastic		
		Hermetic		Non-hermetic		
Main process flow steps	Method / condition	QML-V wire bond	QML-Q wire bond	QML-P wire bond	Mil Temp wire bond	Standard wire bond, flip chip
	Specification references	MIL-PRF-38535	MIL-PRF-38535	MIL-PRF-38535	Internal procedure	Internal procedure
Extreme temperature electrical	Per device specification / -55°C to +125°C	x	x	x	x	if appl
Column attach	Per device specification	if appl				
Post column electrical	Per device specification / 25°C	if appl				
C-SAM	Internal procedure / 1 view per interface / 100%			x		
External visual	MIL-STD-883 TM2009	x	x	x	x	x
Final source inspection	MIL-STD-883 TM2009 / A	x		x		
Bake	J-STD-033 / 125°C			x	x	x
Packing	Per device specification	x	x	x	x	x
Certificate of compliance	MIL-PRF-38535	x	x	x		

Quality conformance inspection

		Ceramic		Plastic		
		Hermetic		Non-hermetic		
Main process flow steps	Method / condition	QML-V wire bond	QML-Q wire bond	QML-P wire bond	Mil Temp wire bond	Standard wire bond, flip chip
Quality conformance inspection (MIL)	QCI report delivered with parts	MIL-PRF-38535	MIL-PRF-38535	MIL-PRF-38535	Internal procedure	Internal procedure
Group A - Amb temp elect test	MIL-PRF-38535 / delivered parts	x	x	x		
Group A - Extreme temp elec test	MIL-PRF-38535 / delivered parts	x	x	x		
Group B - Assembly capability	MIL-PRF-38535	x	x	x		
Group C - Steady-state life test	MIL-PRF-38535 / 125°C	1000 hrs	1000 hrs	1000 hrs		
Group D.1 - Physical dimension	MIL-PRF-38535	x	x	x		
Group D.2 - Lead integrity	MIL-PRF-38535	x	x	x		
Group D.3 - Thermal shock	MIL-PRF-38535	x	x			
Group D.3 - Precon / C-SAM	JESD22-A113 / J-STD-020E			x	Qual only	Qual only
Group D.3 - Temp cycle	MIL-PRF-38535 / JESD22-A104, JESD47 (Cond C - 65°C, +150°C)	100 cy	100 cy	500 cy	Qual only	Qual only
Group D.3 - HAST / uHAST / HTOL	JESD22-A110 / JESD22-A118 / JESD22-A117			x	Qual only	Qual only
Group D.3 - Moisture resistance	MIL-PRF-38535	x	x			
Group D.4 - Mechanical shock, vibration, constant acceleration	MIL-PRF-38535	x	x			
Group D.5 - Salt atmosphere	MIL-PRF-38535	x	x	if appl		
Group D.6 - Internal water vapor test	MIL-PRF-38535	x	x			
Group D.7 - Adhesion to lead finish	MIL-PRF-38535	if appl	if appl	if appl		
Group D.9 - Soldering heat	MIL-PRF-38535	x	x			
Group E - RHA	MIL-PRF-38535	x		x		

We also offer the following services by request, single fab assembly and test sites, single dice diffusion lots, single bill of material, change notification process, lot traceability reports, electrical data log and qualification reports.

Other resources

Datapacks
Infineon offers the option of purchasing a datapack with QML-certified products. This datapack tabulates data gathered during the part certification process, including radiation data, read and record electrical data, and tri-temperature test data. The datapack is offered in hard and soft copy formats and is matched to individual device serial numbers.

Memory controller
QDR® II+ SRAM memory controllers are available free of charge for Xilinx Virtex® V5, Kintex® US, and Microchip's RTG4 and RTPolarFire FPGAs for the rad hard 72Mb and 144Mb QDR® II+ SRAM devices. The QDR® II+ SRAM controllers manage the intricate timing details of a DDR-based source synchronous timing architecture and ensure reliable data traffic between the FPGA and the QDR® II+ SRAM memory. Controller embedded ECC (SECDEC) is also available as an RTL option if a higher level of radiation immunity is required to mitigate single event effects. Contact Infineon IR HiRel Sales for more information.

Commercial-off-the Shelf (COTS) solutions
Infineon supplies a wide range of memory products designed for demanding automotive, industrial and medical applications and leverages this broad portfolio for use in aerospace and defense applications where systems may not require traditional aerospace certifications but do require robust performance in harsh environments.
For more information, visit www.infineon.com/memories

Customizable solutions

Infineon custom solutions simplify your design process by solving the challenges you face. Our worldwide partner network and technology expertise enable you to develop innovative products.

Custom solutions include:
- Die and wafer sales
- Extreme environment solutions
- Custom-screened products

Contact your Infineon IR HiRel Sales to find out more!

Infineon space memory portfolio

QDR® II+ SRAM

Density	Part number	Description	Operating temp range	Qual level	Product status	TID rating [krad]	SEL [LET]	SEU [err/bit.dy] Geo sync-solar min	SEFI [err/dev.dy] Geo sync-solar min	PD [Rad(Si)/s]
72 Mbit	CYRS1542AV18-250GCMB	72M QDR II+ x18 BURST of 2	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	5962F1120101VXA	72M QDR II+ x18 BURST of 2 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	CYPT1542AV18-250GCMB	72M QDR II+ x18 BURST of 2 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
72 Mbit	CYRS1543AV18-250GCMB	72M QDR II+ x18 BURST of 4	-55°C to 125°C	QML-V	PRODUCTION	30	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	5962F1120102VXA	72M QDR II+ x18 BURST of 4 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	CYPT1543AV18-1X24M	72M QDR II+ Prototype Die	-55°C to 125°C	PROTOTYPE	PRODUCTION					
72 Mbit	CYPT1543AV18-250GCMB	72M QDR II+ x18 BURST of 4 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
72 Mbit	CYRS1543AV18-1X24M	72M QDR II+ QML-V Die	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	5962F1120201VXA	72M QDR II+ x36 BURST of 2 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	CYPT1544AV18-250GCMB	72M QDR II+ x36 BURST of 2 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
72 Mbit	CYRS1544AV18-250GCMB	72M QDR II+ x36 BURST of 2	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	CYRS1545AV18-250GCMB	72M QDR II+ x36 BURST of 4	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	5962F1120202VXA	72M QDR II+ x36 BURST of 4 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<1.34e-7	Immune 120 LET	>2e9
72 Mbit	CYPT1545AV18-250GCMB	72M QDR II+ x36 BURST of 4 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
144 Mbit	CYRS2642KV18-250GCMB	144M QDR II+ x18 BURST of 2	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT2642KV18-250GCMB	144M QDR II+ x18 BURST of 2 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
144 Mbit	5962R1821401VXF	144M QDR II+ x18 BURST of 2 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYRS2643KV18-250GCMB	144M QDR II+ x18 BURST of 4	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	5962R1821402VXF	144M QDR II+ x18 BURST of 4 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT2643KV18-250GCMB	144M QDR II+ x18 BURST of 4 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
144 Mbit	CYRS2643KV18-1X24M	144M QDR II+ QML-V Die	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT2643KV18-1X24M	144M QDR II+ Prototype Die	-55°C to 125°C	QML-V	PRODUCTION	200				
144 Mbit	5962R1821501VXF	144M QDR II+ x36 BURST of 2 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT2644KV18-250GCMB	144M QDR II+ x36 BURST of 2 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
144 Mbit	CYRS2644KV18-250GCMB	144M QDR II+ x36 BURST of 2	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYRS2645KV18-250GCMB	144M QDR II+ x36 BURST of 4	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	5962R1821502VXF	144M QDR II+ x36 BURST of 4 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT2645KV18-250GCMB	144M QDR II+ x36 BURST of 4 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
144 Mbit	CYRS1642KV18-250GCMB	144M QDR II+ x18 BURST of 2 w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT1642KV18-250GCMB	144M QDR II+ x18 BURST of 2 Prototype w/o ODT	-55°C to 125°C	PROTOTYPE	PRODUCTION					

QDR® II+ SRAM

Density	Part number	Description	Operating temp range	Qual level	Product status	TID rating [krad]	SEL [LET]	SEU [err/bit.dy] Geo sync-solar min	SEFI [err/dev.dy] Geo sync-solar min	PD [Rad(Si)/s]
144 Mbit	5962R1821403VXF	144M QDR II+ x18 BURST of 2 DLAM QML V w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYRS1643KV18-250GCMB	144M QDR II+ x18 BURST of 4 w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	5962R1821404VXF	144M QDR II+ x18 BURST of 4 DLAM QML V w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT1643KV18-250GCMB	144M QDR II+ x18 BURST of 4 Prototype w/o ODT	-55°C to 125°C	PROTOTYPE	PRODUCTION					
144 Mbit	5962R1821503VXF	144M QDR II+ x36 BURST of 2 DLAM QML V w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT1644KV18-250GCMB	144M QDR II+ x36 BURST of 2 Prototype w/o ODT	-55°C to 125°C	PROTOTYPE	PRODUCTION					
144 Mbit	CYRS1644KV18-250GCMB	144M QDR II+ x36 BURST of 2 w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYRS1645KV18-250GCMB	144M QDR II+ x36 BURST of 4 w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	5962R1821504VXF	144M QDR II+ x36 BURST of 4 DLAM QML V w/o ODT	-55°C to 125°C	QML-V	PRODUCTION	200	>120 (120°C)	<3.34e-7	Immune 120 LET	>1e9
144 Mbit	CYPT1645KV18-250GCMB	144M QDR II+ x36 BURST of 4 Prototype w/o ODT	-55°C to 125°C	PROTOTYPE	PRODUCTION					

Fast async SRAM

Density	Part number	Description	Operating temp range	Qual level	Product status	TID rating [krad]	SEL [LET]	SEU [err/bit.dy] Geo sync-solar min	SEFI [err/dev.dy] Geo sync-solar min	PD [Rad(Si)/s]
4 Mbit	CYRS1049DV33-12FZMB	4M Fast Asynchronous SRAM x8	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<5.0e-8	Immune 120 LET	>2e9
4 Mbit	5962F1123501VXC	4M Fast Asynchronous SRAM x8 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<5.0e-8	Immune 120 LET	>2e9
4 Mbit	CYPT1049DV33-12FZMB	4M Fast Asynchronous SRAM x8 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
4 Mbit	CYRS1049DV33-1X18M	4M Fast Asynchronous SRAM DLAM QML V Die	-55°C to 125°C	QML-V	PRODUCTION	300	>120 (125°C)	<5.0e-8	Immune 120 LET	>2e9
4 Mbit	CYPT1049DV33-1X18M	4M Fast Asynchronous SRAM Prototype Die	-55°C to 125°C	PROTOTYPE	PRODUCTION					
16 Mbit	CYRS1069G30-10FZMB	16 Fast Asynchronous SRAM x8 DLAM QML V	-55°C to 125°C	QML-V	2022	200	>60 (95°C)	<3e-12	>80 LET	>1e9
16 Mbit	CYPT1069G30-10FZMB	16 Fast Asynchronous SRAM x8 Prototype	-55°C to 125°C	PROTOTYPE	2022					
16 Mbit	CYRS1061G30-10GGMB	16 Fast Asynchronous SRAM x16 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	200	>60 (95°C)	<3e-12	>80 LET	>1e9
16 Mbit	5962R2020201VXC	16 Fast Asynchronous SRAM x16 DLAM QML V	-55°C to 125°C	QML-V	PRODUCTION	200	>60 (95°C)	<3e-12	>80 LET	>1e9
16 Mbit	CYPT1061G30-10GGMB	16 Fast Asynchronous SRAM x16 Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					

F-RAM

Density	Part number	Description	Operating temp range	Qual level	Product status	TID rating [krad]	SEL [LET]	SEU [err/bit.dy] Geo sync-solar min	SEFI [err/dev.dy] Geo sync-solar min	PD [Rad(Si)/s]
2 Mbit	CYRS15B102Q-GGMB	2M FRAM Serial	-55°C to 125°C	QML-V	PRODUCTION	150	>114 (115°C)	Immune	<1.34e-4	>1e11 (static)
2 Mbit	CYPT15B102Q-GGMB	2M FRAM Serial Prototype	-55°C to 125°C	PROTOTYPE	PRODUCTION					
2 Mbit	CYRS15B102Q-1X11I	2M FRAM Serial QML-V Die	INDUSTRIAL	QML-V	PRODUCTION	150	>114 (115°C)	Immune	<1.34e-4	>1e11 (static)
2 Mbit	5962R1821601VXC	2M FRAM Serial DLAM QML-V	-55°C to 125°C	QML-V	Q2'22	150	>114 (115°C)	Immune	<1.34e-4	>1e11 (static)

RadTol NOR FLASH

Density	Part number	Description	Operating temp range	Qual level	Product status	TID rating [krad]	SEL [LET]	SEU [err/bit.dy] Geo sync-solar min	SEFI [err/dev.dy] Geo sync-solar min	PD [Rad(Si)/s]
256 Mbit	CYRS16B256-133FZMB	256M Serial NOR Flash QSPI	-55°C to 125°C	QML-V Equivalent	PRODUCTION	30 /125 biased/ unbiased	>60 (85°C)	<1e-16	Immune 60 LET	TBD
256 Mbit	CYPT16B256-133FZMB	256M Serial NOR Flash QSPI	-55°C to 125°C	PROTOTYPE	PRODUCTION					
512 Mbit	CYRS16B512-133FZMB	512M Serial NOR Flash Dual QSPI	-55°C to 125°C	QML-V Equivalent	PRODUCTION	30 /125 biased/ unbiased	>60 (85°C)	<1e-16	Immune 60 LET	TBD
512 Mbit	CYPT16B512-133FZMB	512M Serial NOR Flash Dual QSPI	-55°C to 125°C	PROTOTYPE	PRODUCTION					

Rad hard NOR FLASH

Density	Part number	Description	Operating temp range	Qual level	Product status	TID rating [krad]	SEL [LET]	SEU [err/bit.dy] Geo sync-solar min	SEFI [err/dev.dy] Geo sync-solar min	PD [Rad(Si)/s]
512 Mbit	CYRS17B512-133UZMB	512M Serial NOR Flash QSPI	-55°C to 125°C	QML-V	2023	300	>80 (125°C)	<1e-16	Immune 80 LET	>1e9
512 Mbit	CYPT17B512-133UZMB	512M Serial NOR Flash QSPI	-55°C to 125°C	PROTOTYPE	2022					
512 Mbit	CYRS17B512-133AZMB	512Mb Serial NOR Flash QSPI, 100 TQFP Plastic	-55°C to 125°C	QML-P	2023	300	>80 (125°C)	<1e-16	Immune 80 LET	>1e9
512 Mbit	CYPT17B512-133AZMB	512Mb Serial NOR Flash QSPI, 100 TQFP Plastic	-55°C to 125°C	PROTOTYPE	2022					

Infineon defense memory portfolio

Sync SRAM

- Operating temp range: -55°C to 125°C
- Qual level: Industrial
- Product status: Production
- Package type: Plastic
- Endurance @ 85°C: Infinite
- Technology fit rate: 11

Density	Part number	Description	Package	ROHS compliant	PB Free	Shipping type	SEU FIT/Mb (a +n(NYC))	Process node
9 Mbit	CY7C1361KVE33-133AXM	(256k x36) Flow-Through	TQFP	Y	Y	TRAY	590	65 nm CMOS
18 Mbit	CY7C1370KVE33-167AXM	(512k x36) NoBL	TQFP	Y	Y	TRAY	590	65 nm CMOS
18 Mbit	CY7C1381KVE33-133AXM	(512k x36) Flow-Through	TQFP	Y	Y	TRAY	590	65 nm CMOS
36 Mbit	CY7C1441KV33-133AXM	(1M x36) Flow-Through	TQFP	Y	Y	TRAY	590	65 nm CMOS
36 Mbit	CY7C1441KV33-133BZM	(1M x36) Flow-Through	FBGA	N	N	TRAY	590	65 nm CMOS

Async SRAM

- Operating temp range: -55°C to 125°C
- Qual level: Industrial
- Product status: Production
- Package type: Plastic
- Endurance @ 85°C: Infinite
- Technology fit rate: 11

Density	Part number	Description	Package	ROHS compliant	PB Free	Shipping type	SEU FIT/Mb (a +n(NYC))	Process node
16 Mbit	CY7S1061GE30-10BVM	Async SRAM	BGA	N	N	TRAY	0	65 nm CMOS

F-RAM

- Operating temp range: -55°C to 125°C
- Qual level: Automotive
- Product status: Production
- Package type: Plastic
- Endurance @ 85°C: 10-trillion
- Technology fit rate: 9

Density	Part number	Description	Package	ROHS compliant	PB Free	Shipping type	Data retention	SEU FIT/Mb (a +n(NYC))	Process node
2 Mbit	CY15B102Q-SXM	F-RAM Memory Serial	EIAJ	Y	Y	TUBE	11 khrs @ 125°C	0	130 nm FRAM
2 Mbit	CY15B102N-ZS60XM	F-RAM Memory Parallel	TSOP	Y	Y	TUBE	11 khrs @ 125°C	0	130 nm FRAM
1 Mbit	CY15B101N-ZS60XM	F-RAM Memory Parallel	TSOP	Y	Y	TUBE	11 khrs @ 125°C	0	130 nm FRAM

nvSRAM

- Operating temp range: -55°C to 125°C
- Qual level: QML-Q
- Product status: Production
- Package type: Ceramic
- Endurance @ 85°C: Infinite
- Technology fit rate: 1

Density	Part number	Description	Package	ROHS compliant	PB Free	Shipping type	Data retention	SEU FIT/Mb (a +n(NYC))	Process node
256 kbit	STK14C88C-5C35M	Non Volatile SRAMs	CERDIP	N	N	TUBE	1 yrs @ 125°C	1390	130 nm CMOS
256 kbit	STK14C88C-35C35M	Non Volatile SRAMs	CERDIP	N	N	TUBE	1 yrs @ 125°C	1390	130 nm CMOS
256 kbit	5962-1821101QXC	Non Volatile SRAMs	CERDIP	N	N	TUBE	1 yrs @ 125°C	1390	130 nm CMOS
1 Mbit	STK14CA8C-5C35M	Non Volatile SRAMs	CERDIP	N	N	TUBE	1 yrs @ 125°C	1390	130 nm CMOS
1 Mbit	5962-1821201QXC	Non Volatile SRAMs	CERDIP	N	N	TUBE	1 yrs @ 125°C	1390	130 nm CMOS
1 Mbit	STK14CA8C-35C35M	Non Volatile SRAMs	CERDIP	N	N	TUBE	1 yrs @ 125°C	1390	130 nm CMOS

NOR FLASH

- Operating temp range: -55°C to 125°C
- Qual level: Industrial
- Product status: Production
- Package type: Plastic
- Endurance @ 85°C: 100 K
- Technology fit rate: 11

Density	Part number	Description	Package	ROHS compliant	PB Free	Shipping type	Sector info	Data retention	SEU FIT/Mb (a +n(NYC))	Process node
128 Mbit	S25FL128SAGBAEA00	Serial NOR Flash	FBGA	N	N	TRAY	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
128 Mbit	S25FL128SAGBAEA03	Serial NOR Flash	FBGA	N	N	REEL	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
128 Mbit	S25FL128SAGBHEA00	Serial NOR Flash	FBGA	Y	Y	TRAY	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
128 Mbit	S25FL128SAGBHEA03	Serial NOR Flash	FBGA	Y	Y	REEL	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
256 Mbit	S25FL256SAGBAEA00	Serial NOR Flash	FBGA	N	Y	TRAY	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
256 Mbit	S25FL256SAGBAEA03	Serial NOR Flash	FBGA	N	Y	REEL	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
256 Mbit	S25FL256SAGBHEA00	Serial NOR Flash	FBGA	Y	Y	TRAY	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
256 Mbit	S25FL256SAGBHEA03	Serial NOR Flash	FBGA	Y	Y	REEL	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
256 Mbit	S25FL256SAGNFE000	Serial NOR Flash	WSON	Y	Y	TRAY	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
256 Mbit	S25FL256SAGNFE003	Serial NOR Flash	WSON	Y	Y	REEL	Uniform 64 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBAEA10	Serial NOR Flash	FBGA	N	N	TRAY	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBAEA13	Serial NOR Flash	FBGA	N	N	REEL	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBAEC10	Serial NOR Flash	FBGA	N	N	TRAY	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBAEC13	Serial NOR Flash	FBGA	N	N	REEL	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBHEA10	Serial NOR Flash	FBGA	Y	Y	TRAY	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBHEA13	Serial NOR Flash	FBGA	Y	Y	REEL	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBHEC10	Serial NOR Flash	FBGA	Y	Y	TRAY	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
512 Mbit	S25FL512SAGBHEC13	Serial NOR Flash	FBGA	Y	Y	REEL	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
1 Gbit	S70FL01GSAGBHEC10	Serial NOR Flash	FBGA	Y	Y	TRAY	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
1 Gbit	S70FL01GSAGBAEC13	Serial NOR Flash	FBGA	N	N	REEL	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
1 Gbit	S70FL01GSAGBAEC10	Serial NOR Flash	FBGA	N	N	TRAY	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
1 Gbit	S70FL01GSAGBHEC13	Serial NOR Flash	FBGA	Y	Y	REEL	Uniform 256 k Sectors	13 yrs	0	65 nm MB Flash
128 Mbit	S29GL128S13FAEV10	Parallel NOR Flash	FBGA	N	N	TRAY	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash
128 Mbit	S29GL128S13FAEV13	Parallel NOR Flash	FBGA	N	N	REEL	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash
512 Mbit	S29GL512S12DHE010	Parallel NOR Flash	FBGA	Y	Y	TRAY	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash
512 Mbit	S29GL512S12DHE013	Parallel NOR Flash	FBGA	Y	Y	REEL	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash
1 Gbit	S29GL01GS12DHE020	Parallel NOR Flash	FBGA	Y	Y	TRAY	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash
1 Gbit	S29GL01GS12DHE023	Parallel NOR Flash	FBGA	Y	Y	REEL	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash
1 Gbit	S29GL01GS12DAE020	Parallel NOR Flash	FBGA	N	N	TRAY	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash
1 Gbit	S29GL01GS12DAE023	Parallel NOR Flash	FBGA	N	N	REEL	Uniform 256 k Sectors	47 yrs	0	65 nm MB Flash

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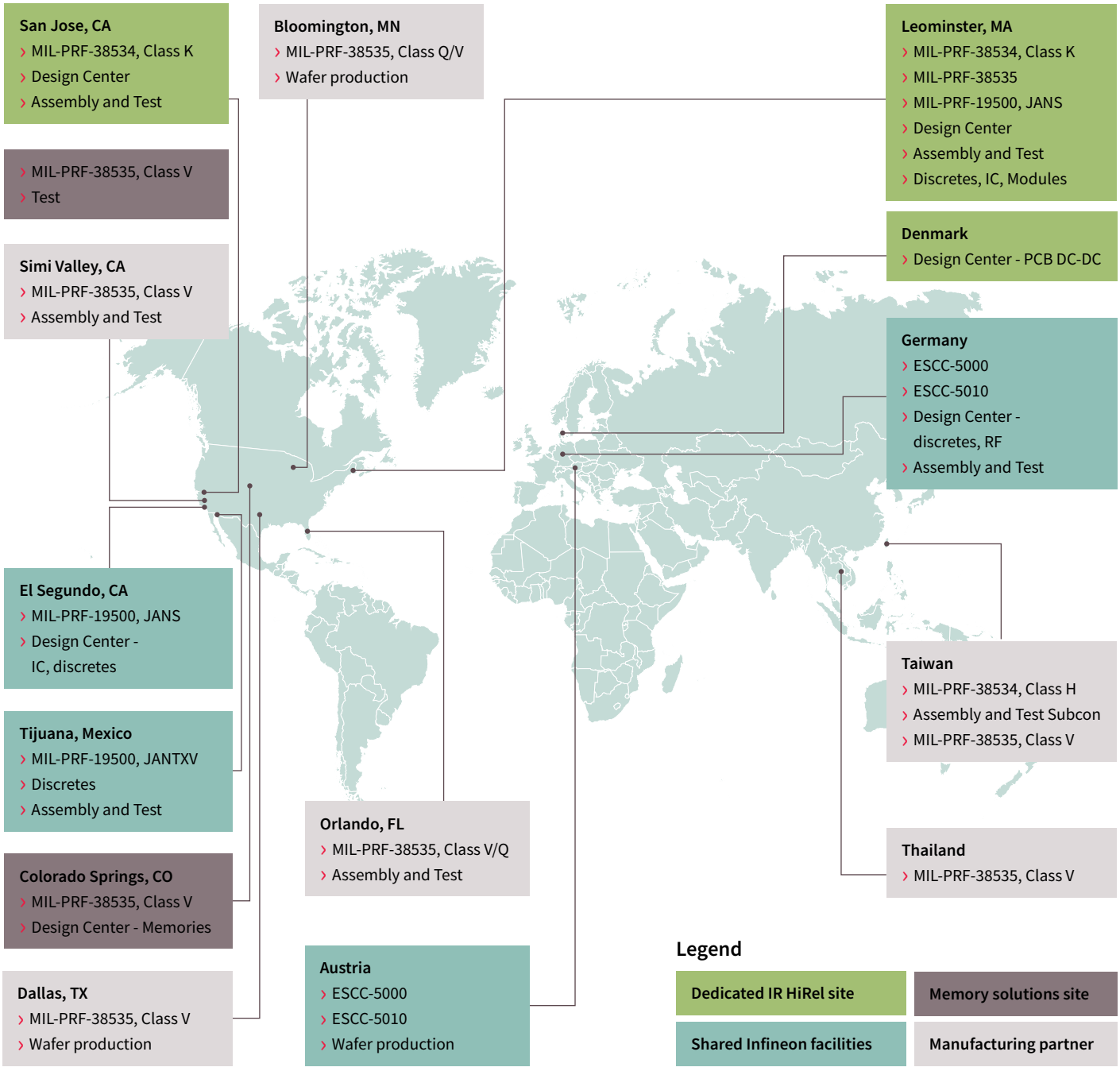

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