



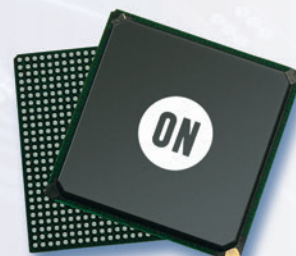
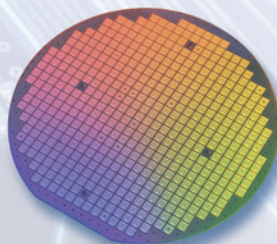
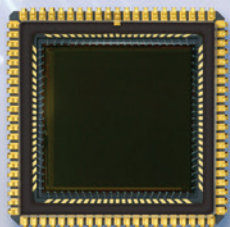
Military & Aerospace Solutions



*Specialized products, processes, and
services from ON Semiconductor.*



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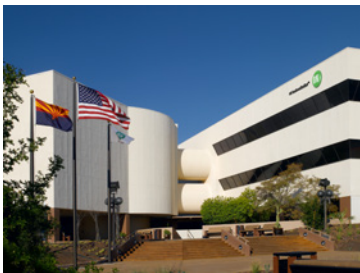
Trusted Source

With headquarters in Phoenix, Arizona, and on-shore design and manufacturing centers, ON Semiconductor offers a secure, stable environment for the development of advanced semiconductor solutions for military and aerospace applications.

ON Semiconductor has been granted Category 1A Trusted Foundry accreditation for its on-shore fabrication facilities in Idaho and Oregon. The Department of Defense (DOD) Trusted Foundry Program accredits trusted, secure sources for the development and manufacture of Application Specific Integrated Circuits (ASICs) for a wide range of critical DOD applications including GPS, thermal imaging, image sensors, and encrypted media. The program seeks to negate the potential risk of system counterfeiting, tampering or sabotage.

ON Semiconductor has also been granted 'Trusted Broker' accreditation with Defense Microelectronics Activity (DMEA), enabling the company to support the entire trusted manufacturing process through engagement with other trusted suppliers for design, packaging, and test. The combination of the two accreditations benefits military and defense customers by providing a fully integrated trusted manufacturing solution.

In addition, ON Semiconductor maintains ITAR certification and QML flows required for military designs.



Processes and Capabilities

ON Semiconductor is certified to the following process standards:

- | | | | |
|-----------------|------------------|------------|----------------|
| • MIL-PRF-38535 | • ISO/TS 16949 | • ISO 9000 | • ESCC-9020 |
| • MIL-PRF-19500 | • AS 9100 Rev. B | • QS9000 | • ESCC-2269000 |
| • MIL-STD-750 | • STACK | • TL9000 | |

Environmental Performance

ON Semiconductor provides robust silicon technologies for both ASIC and discrete products, characterized over an extended temperature range from cryogenic to 150°C, as well as a portfolio of plastic and hermetic packaging suitable for high reliability end applications.

Process Longevity

ON Semiconductor operates modularized wafer fabrication processes that enable the company to offer extended process lifetimes, meeting the market need for secure, long life-cycle processes to support long product lives of ten years or more. This approach also allows the company to support low volume requirements of military and aerospace customers. An established, flexible EOL process enables adequate transition or EOL planning.

Product Processing

Special Packaging

- Custom package developments
- Drop in replacement for ASICs / FPGAs
 - No need to modify the board footprint
- Military / Aerospace packaging
 - From ceramic packages to complex flip-chip BGAs
 - On-shore assembly capabilities
 - Thermally enhanced packages

Extended Temperature

- ON Semiconductor supports extended temperature in several technologies
 - -55°C to +125°C supported for 0.5 μ m and 0.35 μ m process technology
 - -55°C to +150°C supported for 180 nm process technology
 - -55°C to +150°C supported for 110 nm process technology

Security Capability

- ON Semiconductor partners with third party IP providers
- Offers anti-tamper, error correction, and encryption capabilities with third parties

Avionics

- Demonstrated SEL immunity
- Soft error rate data available for logic and memories for 110 nm and 180 nm process technologies

Non-Volatile Memory

- 0.5 μ m and 0.35 μ m process technologies offer up to 1 kb EEPROM with a maximum configuration of 32 x 32; temperature ranges vary
- ONC18 (180 nm) offers two memory options
 - One Time Programmable (OTP) up to 256 kb; -40°C to +125°C
 - EE Array up to 1 kb
- SP110 (110 nm) capable of supporting OTP



Advanced Processes and Intellectual Property

Digital Standard Cell Product Families

Standard Cell Product Families					
Family	Core Voltage	I/O Voltage	I/O Types	System Performance	Special Features
SC5 0.5 μm	5 V	5 V, 3.3 V	PCI, TTL, LVTTTL, LVCMOS	75 MHz	Long-Term 5 V Support, High Temp
SC3 0.35 μm	3.3 V, 2.5 V	5 V, 3.3 V	PCI, GTL, HSTL, SSTL, LVTTTL, LVCMOS, LVPECL	100 MHz	Freeprom, High Temp
ONC18 180 nm	1.8 V, 1.5 V	3.3 V, 2.5 V, 1.8 V	PCI, DCI, HSTL, SSTL, LVTTTL, LVCMOS, LVPECL, LVDS	266 MHz	NVM, OTP, High Vt, High Temp
SP110 110 nm	1.2 V	3.3 V, 2.5 V, 1.8 V, 1.5 V, 1.2 V	PCI, DCI, HSTL, SSTL, LVTTTL, LVCMOS, LVPECL, LVDS, CML	450 MHz	OTP, Dual Source Capability, Mil Temp
SP65 65 nm	1.2 V, 1.0 V	3.3 V, 2.5 V, 1.8 V, 1.5 V, 1.2 V	PCI, DCI, HSTL, SSTL, LVTTTL, LVCMOS, LVPECL, LVDS, CML	600 MHz	Extensive IP Portfolio
SP40 40 nm	1.1 V, 0.9 V	3.3 V, 2.5 V, 1.8 V, 1.5 V, 1.2 V	PCI, DCI, HSTL, SSTL, LVTTTL, LVCMOS, LVPECL, LVDS, CML	850 MHz	Extensive IP Portfolio

Comprehensive Intellectual Property Offering

ON Semiconductor offers a suite of system IP suitable for a variety of applications, including those requiring high-speed serial I/O (SerDes), external high performance memory interfaces, processors and a variety of other hard and soft IP. Combined with support for a rich family of I/O standards, our digital ASIC technologies and IP provide optimal solutions for military/aerospace, communications, industrial, consumer, computing, and medical applications. ON Semiconductor is an ARM® microprocessor licensee, and has access to multiple ARM cores for integration into silicon products.

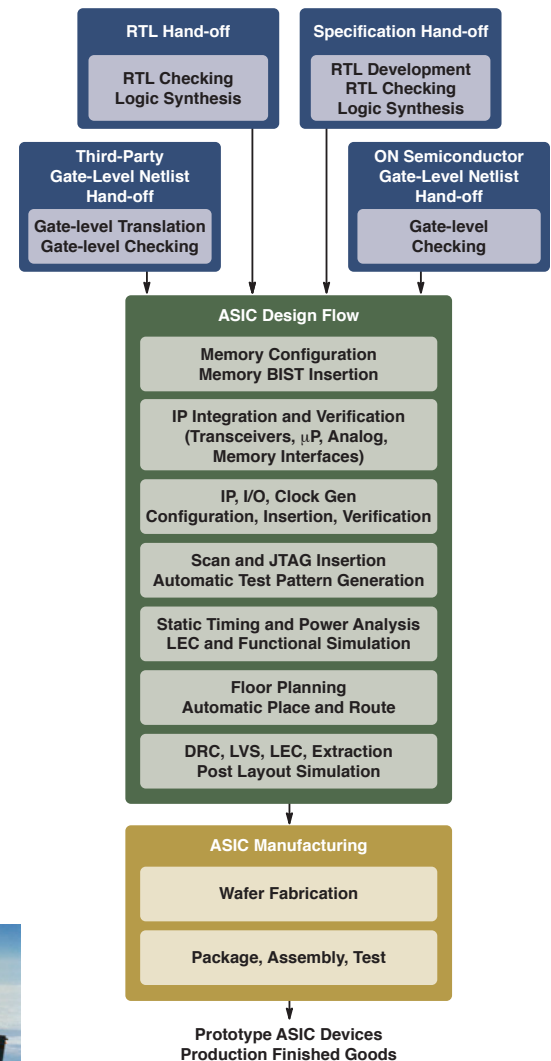
Category	IP Cores
Hi-Speed SerDes	PCI Express Gen 1/2/3, XAUI, SATA I/II/III, EPON, Serial Rapid I/O (SRIO), 1G Ethernet, 10G Ethernet, Fibre Channel
Source Synchronous Links	Multiprotocol memory interface (DDRx), System Packet Interface
Serial Interfaces	USB 3.0/2.0/1.1, HDMI, I2C, CAN, UART
Application Layer Support	10/100 Ethernet, 1G Ethernet, 10G Ethernet, PCI Express Gen 1/2/3, SATA I/II/III, SRIO, USB 3.0/2.0/1.1, DDRX Controllers, EMAC4, MII, RMII, SMII, XFI, HDMI
Bus Interfaces	PCI, AMBA/AHB, ARM7, PLB, PCMCIA
Microprocessors	ARM, PowerPC, R-Core, M8051, AMBA/AHB Peripherals
Memory Interfaces	DDR, DDR2, DDR3, QDR-II
Data Converters	ADC, DAC
Memory	SRAM, DPRAM, Register File, ROM
Clocking	PLLs, DLLs, MSDLL
Error Correction, Encryption & Anti-Tamper	ECC, DES, 3DES, Reed-Solomon, RNG, PK Processor, Secure SRAM
DSP Functions	FFT, Mult, Divide, Accumulate, Up/Down Converter, FIR
FPGA Conversion IP	Memory Wrappers, LUT RAM, I/O Standards, Hardware DSP Functions, FIFOs, Clocking Emulation



Custom Designs

Digital solutions from 0.5 μm to 40 nm

- Flexible ASIC design interfaces including whole or partial RTL, Netlist, and GDSII content
- Robust FPGA proof-of-concept validation flow when targeting an ASIC
- FPGA-to-ASIC, ASIC-to-ASIC, and multi-chip-to-ASIC conversions
- EOL support with ASIC-to-ASIC conversion approach
- Big D (Digital) / Small A (Analog) ASIC capability to increase integration and simplify board design
- Up to 20 million gates and 20 million bits of memory
- System architects to advise on best overall solution
- Proven technologies to ensure long term, continuous supply
- Secure supply with domestic manufacturing
- Support for long-life, small volume applications
- High reliability, high temperature, special packaging and handling
- Complete solutions including product development, test, package engineering, quality engineering, and failure analysis
- Full ITAR handling available
- DO-254 compliance support
- Custom packaging capability to match most pin-outs and package types

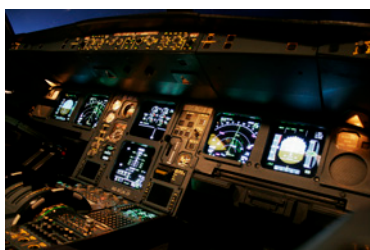


High Reliability Discrete Products Qualified to MIL-PRF-19500

ON Semiconductor supplies discrete transistor devices that are fully qualified in accordance with the MIL-PRF-19500 and MIL-STD-750 standards for semiconductors used in a wide range of military and aerospace equipment. These devices are on the US Defense Logistics Agency (DLA) Qualified Products List (QPL), and are available in versions meeting JAN, JANTX, and JANTXV quality levels.

Device	Package	DLA QPL
PNP Switching Transistors		
2N2905A	T0-39	/290
2N2907A	T0-18	/291
2N4029*	T0-18	/512
2N4033	T0-39	/512
NPN Switching Transistors		
2N2219A	T0-39, T0-5	/251
2N2222A	T0-18	/255
PNP Low Power Transistors		
2N3634	T0-39, T0-5	/357
2N3635	T0-39, T0-5	/357
2N3636	T0-39, T0-5	/357
2N3637	T0-39, T0-5	/357
NPN Low Power Transistors		
2N3700	T0-18	/391
2N3019S	T0-39	/391
2N3019	T0-5	/391

* Pending 4Q13.

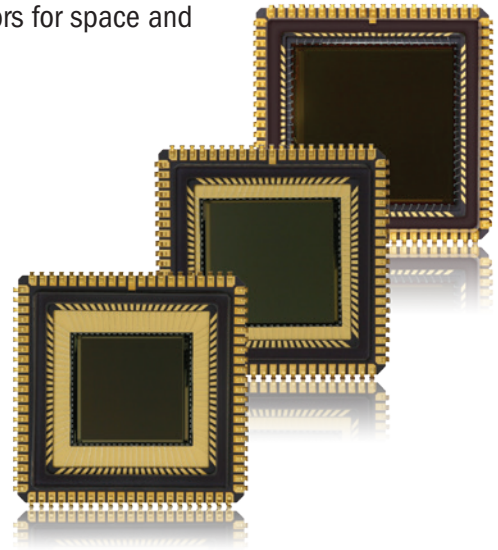


Radiation-Tolerant Image Sensors

ON Semiconductor supplies radiation-tolerant standard CMOS image sensors for space and nuclear applications.

STAR & HAS Family Key Features

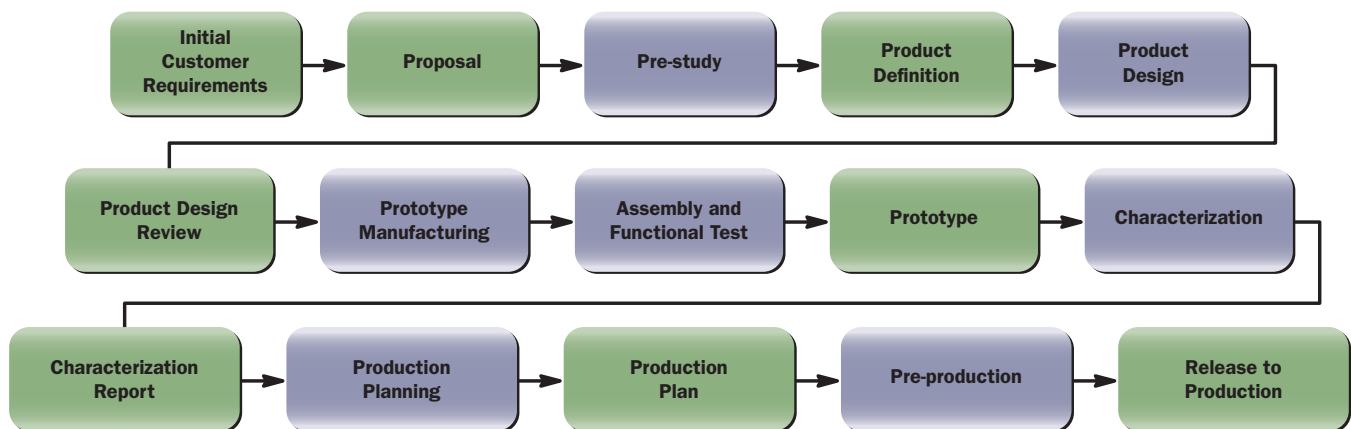
- GNC guidance, navigation, and control applications
- AOCS attitude and orbit control systems
- Nuclear inspection
- Qualified radiation tolerance up to 300 krad
- Family devices: STAR250 - 512 x 512 pixels
STAR1000 - 1024 x 1024 pixels
HAS2 - 1024 x 1024 pixels



Proprietary design and manufacturing technology enables the company to customize pixel size, shape and rate, saturation and noise level, dynamic range and sensitivity, outputs and frame rate.

Custom Key Features

- Key differentiator in the end application
- Full flexibility in specifications
- High level of architectural and operational flexibility, resulting in improved performance



Typical Custom Design Cycle

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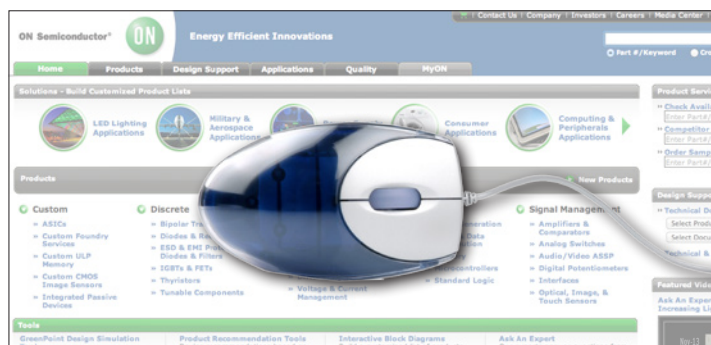
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