

Aerospace and Defense Newsletter



Feedback | Microchip.com

Edition 2: Sept. 2019

Welcome to our second edition of Microchip's Aviation and Defense newsletter. Microchip products have been used in all major aviation platforms for many decades. As a result of our acquisition of Microsemi, Microchip has evolved to become a leading-edge systems solution provider for the most demanding aerospace applications. We offer a broad portfolio of products and capabilities that come with a proven track record of innovation, quality and reliability on aerospace platforms over the past 20 years. As a key partner for your existing and future aerospace platforms, Microchip will continue to leverage our technology and extensive capabilities in this segment to support the ever-increasing electronic content in today's aircraft.

Microchip's product portfolio has a heritage of supporting the most demanding requirements in defense microelectronics, with our strategic focus on Integrated Circuit (IC) security, reliability, availability, integrity and supply chain security. Our array of products spans RF front end modules and discretes; Flash-based FPGAs; highly secure, accurate and flexible time and frequency platforms for synchronizing mission-critical electronics systems and instrumentation applications; secure memory modules; a broad security IP portfolio and more. We've leveraged our expertise and product knowledge to build applications-based solution platforms that reduce your integration risk, improve your productivity and speed your time to mission.

In this newsletter we will provide important updates about new product releases, qualification and neutron testing results, hardware/kits, engineering samples, events, documentation, and software. Please forward this newsletter to your colleagues and friends who are interested in receiving important updates about our solutions.

Demos and Kits

Kick Start Your Designs with PolarFire® FPGA Development Kits

PolarFire FPGA development kits are user-friendly evaluation platforms built for quick prototyping, demonstrating specific applications, and analyzing the features and capabilities of the selected family of PolarFire FPGAs. Development is simple with a rich collection of easily accessible demonstration guides, application notes and sample designs. [The PolarFire FPGA Video and Imaging Kit](#) offers specific peripherals and components to implement applications that span across [smart embedded vision](#) applications such as machine vision, thermal imaging, gaming, video surveillance, robotics, machine learning and Human-Machine Interfaces (HMI). With onboard DDR4, DDR3, SPI-flash and a wide variety of connectors, the [PolarFire FPGA Evaluation Kit](#) is well suited for high-speed transceiver evaluation, 10 Gb Ethernet, JESD204B, CPRI, BMR and more. The [PolarFire FPGA Splash Kit](#) provides general-purpose interfaces for evaluation and development of a broad range of generic functions. For more information visit the [PolarFire FPGA Development Kits](#) page.

For questions please contact
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Microchip Launches Smart Embedded Vision Initiative

To help accelerate designs, Microchip launched its [Smart Embedded Vision](#) initiative which provides you with solutions for designing intelligent machine vision systems with our low-power [PolarFire FPGAs](#). As compute workloads move to the edge, PolarFire FPGAs offer 30-50% lower total power than competing mid-range FPGAs, making them ideal for a new breed of compute-intensive edge devices deployed in thermally and power-constrained environments.



PolarFire FPGA Smart Embedded Vision solutions include video, imaging and machine learning IP and tools for accelerating designs that require high performance in low-power, small form-factors across the industrial, medical, broadcast, automotive, aerospace and defense markets. Learn more about our PolarFire FPGA Smart Embedded Vision offering [here](#).

[Order](#) your Smart Embedded Vision Kit today.



For questions, please contact
Tim Morin, Director of Product Line Management Defense, FPGA Group.
Tim.Morin@microchip.com for questions.

Documentation Update

New PCIe® DO-254 FPGA Validation Artifact for PolarFire FPGAs

DO-254 validation artifacts are internal FPGA design verification and validation reports turned into a customer-friendly format. These documents include more detailed block diagrams and validation results not typically found in a datasheet.

Visit the resources area of the Commercial Aviation page on our website to find all the DO-254 validation artifacts for SmartFusion®2, IGLOO®2, and PolarFire FPGAs. Since our last edition of the Aviation and Defense newsletter, new DO-254 PolarFire PCIe validation artifacts have been posted to the website covering end port and root port validation results.

To request new validation artifacts for PolarFire FPGAs or to obtain a copy of the existing ones, please reach out to aviation@microchip.com

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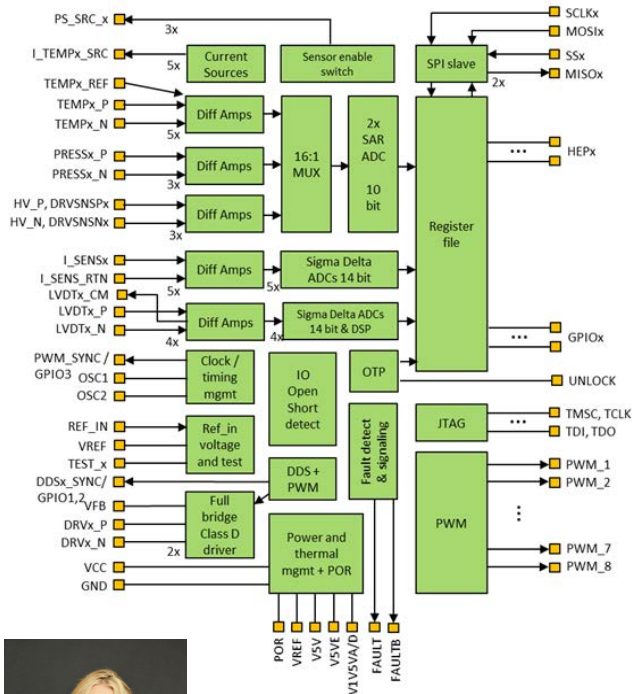
LX4580 Actuation System Manager AFE

The LX4580 is a new IC targeting aviation and defense applications for actuation control and sensor monitoring. Integrated actuation control and monitoring enables lower component count for a significant reduction in mass and volume. This results in fuel savings, increased range, greater fuel and payload capacity, and reduced power dissipation and cooling requirements.

The LX4580 interfaces with a microprocessor system or an FPGA to execute digital control system algorithms in real time. Its robust sensor interfaces are designed to operate in a DO-160 aircraft environment. The microprocessor/FPGA interface is based on an Error Control Code (ECC) over a redundant slave SPI or UART interface. The LX4580 is typically powered from +15V and generates its own intermediate power rails.

LX4580 FEATURES:

- Redundant SPI or UART interface to external processing
- Five temperature sensor interfaces
- Three pressure sensor interfaces
- Two Linear Variable Differential Transformer (LVDT) drivers and driver monitors
- Four LVDT monitor differential pairs with instantaneous and RMS outputs
- Five current sense interfaces
- One voltage measurement interface
- Three Hall effect proximity sensor inputs
- Eight PWM outputs
- On-chip power regulators
- Register-programmable GPIOs
- JTAG scan and test IF
- Small 144-pin LQFP pin package



Samples scheduled to be available in CQ4 2019.

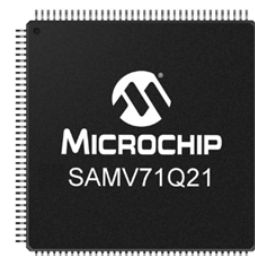
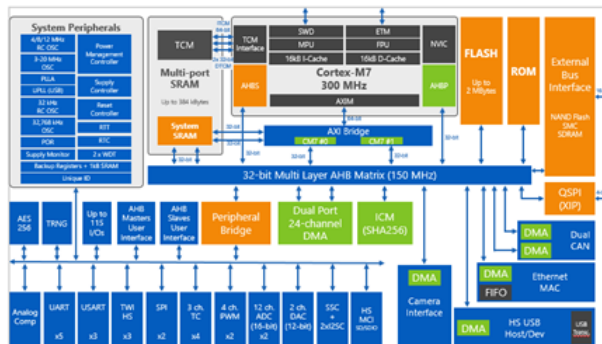


For product information, please contact
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SAMV71ET MCU is now available for Aviation and Defense Markets

The [SAMV71](#) device has been added to Microchip's offering of extended operating temperature and high-reliability microcontroller (MCU) solutions for aviation and defense applications. This is a high-performance 32-bit Arm® Cortex®-M7 based processor with a double precision Floating Point Unit (FPU) operating up to 300 MHz. It also features up to 2048 KB of Flash and up to 384 KB of multi-port SRAM.

The SAMV71 series includes a 10/100 Ethernet MAC with IEEE1588, Hi-Speed USB interface with integrated PHY, dual CAN FD, QSPI, CMOS imager interface, TDM/I2S (SSC), multiple serial interfaces as well as on-board hardware cryptography including a TRNG, AES-256 and SHA-256 engines.



Key enhancements for aviation and defense applications

- Full wafer lot traceability and long-term supply
- Full operating temperature range -55°C to 125°C
- Hi-Rel qualification flow including QML-N, AQEC and AEC-Q100 equivalent.
- Characterization and qualification reports available
- Plastic and hermetic ceramic package option with same pin out
- Neutron latch-up (SEL) immune
- Functional block SEU characterization ongoing
- Additional screening options available as required
- required

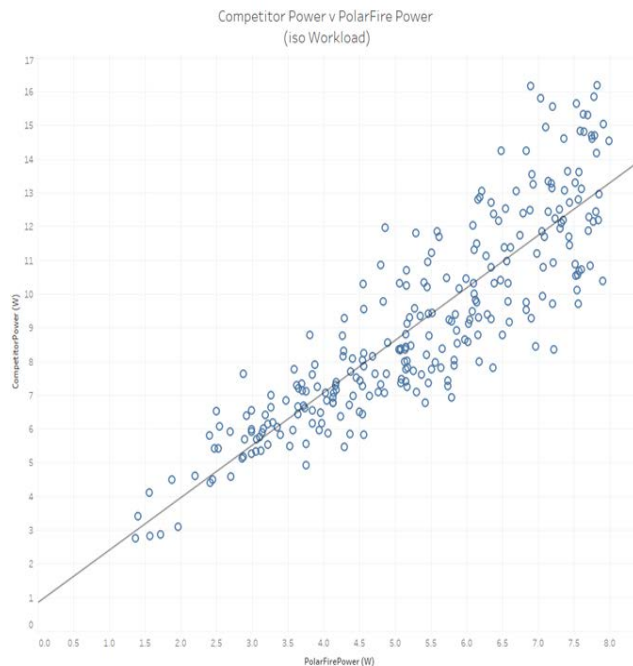


For additional information and to see our complete high reliability MCU offering please visit our High Reliability products page

Please contact Nicolas Ganry, Product Marketing Manager, Aerospace and Defense group.
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Power Matters

Power matters. PolarFire FPGAs deliver on market-leading power vs. performance. The product name aptly describes the art of balancing power and performance. To give you a sense of how much power you can save, we created hundreds of benchmark designs using varied amounts of Logic Elements, transceivers, RAMs, clock rates, transceiver count and bandwidth and compared them to competitive SRAM devices. We accounted for the LUT 4 to LUT 6 differences by inflating the LUT 4 count by 1.5 (actual designs on average are around 1.4). The chart below illustrates the power efficiency of PolarFire FPGAs. Competitor power is on the vertical axis and PolarFire FPGA power is on the horizontal axis. Pick a circle and draw a straight line to both axis and you'll see, for that benchmark design, a comparison between a PolarFire FPGA and competitive devices. Generally, a 2:1 power advantage exists with PolarFire devices.



This is significant and can impact your systems in positive ways:

- Lowers cost
- Performs twice the compute within the same thermal envelope
- Performs identical compute at half the power
- Creates systems where no forced air cooling is required
- Extends the life of battery-operated systems
- Reduces the size of a heat sink, if needed, giving you more freedom in your industrial designs



PolarFire FPGAs are in volume production and a variety of tools, kits and solutions are available to get

you started. To estimate your total power using PolarFire FPGAs try our [PolarFire Power Estimator](#). To learn more about the product offering see the [Product Overview](#). To learn more about our solutions please visit the PolarFire FPGA page.

Please contact Tim Morin, Director of Product Line Management, Defense, FPGA Group.
Tim.Morin@microchip.com for questions.

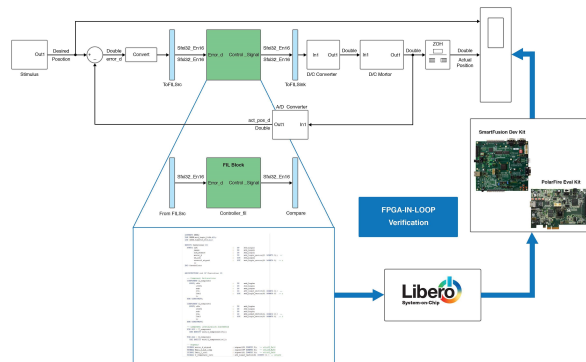
Integrated FPGA-in-the-Loop Workflow with MATLAB® and Simulink® Supports PolarFire FPGAs and SmartFusion®2 Development Board

System level engineers widely use MATLAB and Simulink to develop algorithms targeting FPGAs. Using MathWorks®' HDL Coder™ and HDL Verifier™, engineers can implement their MATLAB and Simulink designs directly on to FPGA boards and connect these boards directly to MATLAB and Simulink System Level testbenches. This helps engineers in validating mission-critical systems for aerospace and defense applications.

The new integrated Field Programmable Gate Array (FPGA)-in-the-loop (FIL) workflow with MathWorks' HDL Coder and HDL Verifier enables you to automatically generate test benches for hardware description language (HDL) verification, including VHSIC Hardware Description Language (VHDL) and Verilog, providing rapid prototyping and verification of designs.

The new workflow, available in MATLAB's [R2019A](#) release, enables you to integrate MathWorks' MATLAB, a multi-paradigm numerical computing environment, and MathWorks' Simulink, a graphical programming environment, with our [PolarFire FPGA](#) and [SmartFusion2 system-on-chip \(SoC\) FPGA](#) development boards, which allows the stimulation of designs through FIL verification using the Libero® SoC Design Suite.

The FIL verification workflow enables you to analyze the results back in MATLAB and Simulink. Delivering the FIL feature for Microchip boards with MATLAB and Simulink, the collaboration provides a hardware support package and an integrated workflow from algorithms to implementation. Leveraging MathWorks' HDL Verification, enabled by Microchip's Accelerate Ecosystem, makes Microchip's FPGAs ideal for a wide variety of applications within the aerospace market, including motor control and imaging, digital signal processing, communication systems, control systems and payloads.



Watch the “Targeting Algorithms to Microsemi FPGAs using MATLAB and Simulink”

webinar [here](#). For further information, please contact Puneet.Kumar@microchip.com



IEEE-1394/AS5643 in Aerospace and Defense Webinar

The Aerospace and Defense IEEE-1394/AS5643 webinar is now available on demand. Learn about our solutions supporting the IEEE-1394/AS5643 communication protocol for aircraft flight control systems, including typical application scenarios and DAP Technology. The WebEx presentation covers AS5643 Specification Overview, IEEE-1493 Interface Architecture, AS5643 Interface Architecture, DAP Technology's FireCore IGLOO2 Development Kit and more. Click here to [watch](#) a recording of the webinar.

Thank you for reading. Do not hesitate to forward the Aviation and Defense Newsletter to your colleagues. They can subscribe to receive future editions [here](#).

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