Enabling Intelligence at the Edge

Welcome to Issue 9 of FPGA & SOC TechBytes. Since our last issue was published, we've kicked off our newest video and image processing solutions portfolio with the February release of the PolarFire® FPGA Video and Imaging Kit. The new kit enables developers to implement Smart Embedded Vision systems with the lowest power and smallest form factor for edge applications leveraging artificial intelligence and high-resolution imaging. We've also been helping developers get started with the RISC-V based PolarFire SoC with a series of new training webinars, and have been getting MATLAB®/Simulink® users up to speed on FPGA-in-the-Loop simulation with a new webinar and participation at a number of MATLAB Expos being held around the world. The PolarFire family continues to hit key milestones, while RTG4 enables new network technology for the space industry. Read on to learn more.

Smart Embedded Vision Solutions Rolling Out

PolarFire FPGAs are ideal for mid-bandwidth (4K/2K) imaging/video and machine learning edge applications due to their rich memory, their Digital Signal Processor (DSP) resources and their low power consumption that is up to 50 percent lower than equivalent static random-access memory (SRAM)-based devices. With artificial intelligence (AI) increasingly being integrated into embedded vision systems, Microchip is making sure developers have the resources they need to meet both their system requirements and production schedules. Our growing Smart Embedded Vision solutions portfolio includes our new PolarFire FPGA Video and Imaging Kit, imaging software and IP and machine learning inference IP. Click here to learn more. **DON'T MISS** our "Enabling Intelligence at the Edge with Low-Power FPGAs" webinar hosted by Embedded Computing Design on July 17. Register here.

Enabling the Lowest-Power, Smallest-Form-Factor 4K Video and Imaging Applications

In February we released our new PolarFire FPGA Video and Imaging Kit, which offers high-performance evaluation of 4K image processing and rendering using dual camera sensors as well as numerous display interfaces. Now featuring the PolarFire MPF300T production device, the kit is purpose-built for effortless prototyping of popular imaging and video protocols including MIPI CSI-2 TX, MIPI CSI-2 RX, HDMI 1.4 TX, HDMI2.0, DSI, and HD/3G SDI. The kit is part of our broader Smart Embedded Vision solutions for implementing systems that rely on visual data to make decisions across a broad spectrum of applications like drones, machine vision, thermal imaging, gaming, video surveillance, robotics, Advanced Driver Assistance Systems (ADAS), machine learning and Human-Machine Interfaces (HMIs).

Libero® SoC Design Suite v12.1 Delivers Production Timing for PolarFire Devices

Downlond the latest version of the Libero SoC Design Suite to get all the latest features and device support. Libero SoC Design Suite version 12.1 features production timing and power support for the MPF100T/S/TS (1.0V), MPF200T/S/TS (1.0V), and MPF300T/S/TS (1.0V) devices, as well as production status for DDR3, DDR4, LPDDR3 and QDR memories. You'll also see an additional average Fmax improvement of 6% for all 100, 200, and 500 PolarFire devices.

Please refer to the Libero SoC Design Suite v12.1 Release Notes to learn about the enhancements for PolarFire, RTG4, SmartFusion2, and IGLOO2 FPGA families.

New System-on-Module Offerings from Our Partners

We have four more System-on-Module offerings from our partners. For PolarFire, we have the Aries Embedded M100PF and the Sundance DSP SoM-2-MPF300T , which joins the SoM-3-MPF300T that we added earlier. From Trenz Electronic, we have two SmartFusion 2 boards: the SMF2000 FPGA Module and the SmartBerry FPGA Module with its Raspberry Pi® form factor. These modules deliver system solutions to fit a variety of needs for wired and wireless communications, military areospace and industrial applications.

Getting Started with the RISC-V Based PolarFire SoC FPGA Webinar Series

On May 2, we kicked off our webinar series on how to get started with the PolarFire SoC FPGA using the free Renode™ development platform from Mi-V™ partner Antmicro that is available with our SoftConsole v6.0 software development environment. During this webinar, you will see demo applications, learn how to create projects and find out how to set up and configure your own systems targeting the new SoC FPGA architecture. Click here to register for the next webinar and view recordings of our first two webinars, "Discover Renode for PolarFire SoC Design and Debug," and "How to Get Started with Renode for PolarFire SoC."

Mi-V Partner Update

Mi-V The Mi-V RISC-V ecosystem is a continuously expanding, comprehensive suite of tools and design resources offered by Microchip and our partners to fully support RISC-V designs. We've added some new partners over the past few months, including AdaCore, Amazon Free RTOS, Enclustra, SundanceDSP and Trenz Electronic. Click here to visit the Mi-V partner page to learn more about them and our many other partners.
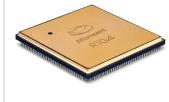
Accelerate Your MATLAB and Simulink Algorithms Using FPGA-in-the-Loop Workflows

In May we held a webinar on using MATLAB and Simulink software with Microchip FPGA development boards to model, simulate and verify algorithms. The workflow automatically generates test benches for HDL verifications for both VHDL and Verilog. You can then use MATLAB and Simulink with PolarFire FPGA, SmartFusion® 2 SoC FPGA or RTG4™ Radiation Tolerant FPGA development kits to stimulate the Device Under Test (DUT) through FPGA-in-the-Loop (FIL) workflows and analyze the results. Click here to view a recording of the webinar.

Microchip and STAR-Dundee Create First SpaceVPX-Compliant Development Platform Featuring Radiation-Tolerant FPGAs and SpaceFibre Technology

Microchip collaborated with STAR-Dundee to create an evaluation platform that implements SpaceFibre technology, which was recently recognized by the VITA Standards Organization (VSO) as a control-and-data plane option for its SpaceVPX interconnect standard. The SpaceFibre standard is already published by the European Cooperation for Space Standardization as a very high-speed serial link standard. The STAR-Dundee 3U SpaceVPX demonstration board speeds the development of flexible, high-speed SpaceVPX (VITA-78)-compliant data-networking systems for space applications. As the first of its kind to feature FPGAs that are immune to radiation-induced configuration changes, the development board uses the unique architecture of Microchip's RTG4 devices to optimize performance while providing systems with a critical additional level of failure protection in space. Click here to learn more.

- Archived Webinars and Training -

- Getting Started with the RISC-V Based PolarFire SoC FPGA Webinar Series
- FPGA in the Loop
- Mi-V Embedded Ecosystem
- SoftConsole and Renode from Antmicro
- LiberoDesign Suite Overview

- Events and Workshops -

- Arrow PolarFire Workshops - North America, Multiple Locations through November 13, 2019
- MATLAB Expo - Paris, France - June 18, 2019
- SiFive Symposium - Hsinchu, Taiwan - June 18, 2019
- Future Electronics Practical Machine Learning and AI Seminar - Ankara, Turkey - June 27, 2019
- Getting Started with PolarFire Webinar 3: Learn to Debug a Bare-Metal PolarFire SoC Application with Renode - July 4, 2019 - 8:00 a.m. PDT
- NSREC 2019 (Booth 102) - San Antonio, TX - July 8-12, 2019
  - Paper: "Proton Characterization of RTG4 Flash-Based FPGA for LEO Environment" - July 10 at 2:00 p.m.
- Enabling Intelligence at the Edge with Low-Power FPGAs - *Embedded Computing Design* Webcast - July 17, 2019 at 11:00 a.m. PDT
- Space Computing Conference - Pasadena, CA - July 30-August 1, 2019
  - Paper: "FPGAs Enable New Solutions for RISC-V Microprocessors and Deep Learning," July 31 at 2:00 p.m.
- Getting Started with PolarFire Webinar 4: Tips and Tricks for Even Easier PolarFire SoC Debug with Renode - August 1, 2019 at 8:00 a.m. PDT
- SiFive Symposium - Bangalore, India - August 1, 2019
- Small Satellite Conference (Booth 234) - Utah State University, Logan, Utah - August 3-8, 2019
- 23rd Annual Worldwide MASTERS Conference - Phoenix, Arizona - August 5-10, 2019; Berlin, Germany - September 16-19, 2019
- Getting Started with PolarFire Webinar 5: Add and Debug PolarFire Peripherals with Renode - September 5, 2019 @ 8:00 a.m. PDT
- RISC-V EMEA Roadshow - Tel Aviv, Munich, Berlin, Tallinn, Paris, London - September 16-26, 2019
- Getting Started with PolarFire Webinar 6: Intro to PolarFire SoC MSS Configuration and Software Flow - October 3, 2019 at 8:00 a.m. PDT
- SiFive Symposium- Beijing and Shenzhen, China - October
- Space Forum - Europe, Netherlands - October 24, 2019; US, Virtual - November 13, 2019; Bangalore, India - November 19, 2019; Ahmedabad, India - November 21, 2019
- RISC-V Summit - San Jose, California - December 9-12, 2019

- News and Articles -

Microchip's First Libero SoC Design Suite Release Boosts FPGA Designer Productivity and Delivers One Unified Design Suite for Latest Families - Microchip, January 29, 2019

Using RISC-V to Simplify Data Logging in Space - Areospace & Defense, February 1, 2019

Open Source Hardware Benefits Procurement Practices - EBN, February 14, 2019

PolarFire FPGA-Based Solution Enables Lowest-Power, Smallest-Form-Factor 4K Video and Imaging Applications - Microchip, February 20, 2019

UltraSoC demonstrates advanced multicore debug at Embedded World 2019 - UltraSoC, February 26, 2019

Running Hard Real-Time Applications and Linux on PolarFire SoC - All About Circuits, March 26, 2019

SiFive Launched the World's Smallest Commercial 64-bit Embedded Core - SiFive, April 10, 2019

Safe & Affordable Space Travel Starts with Sourcing - EPS News, April 11, 2019

8 RISC-V Companies to Watch - Design News, April 20, 2019

4 Reasons to use RISC-V for aerospace and defense applications - Electronics 360, April 29, 2019

Spacecraft Communications Call for Sophisticated Data-Transmission Techniques - EE Times, May 3, 2019

IAR Systems Takes RISC-V to the Next Level with Launch of Professional Development Tools - IAR Systems, May 22, 2019

Future Electronics Now Carries Microchip's New PolarFire FPGA Imaging and Video Kit - Future Electronics, May 27, 2019