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![Microsemi logo]

SmartFusion2 Starter Kit
Quickstart Card

Kit Contents – SF2-STARTER-KIT-ES
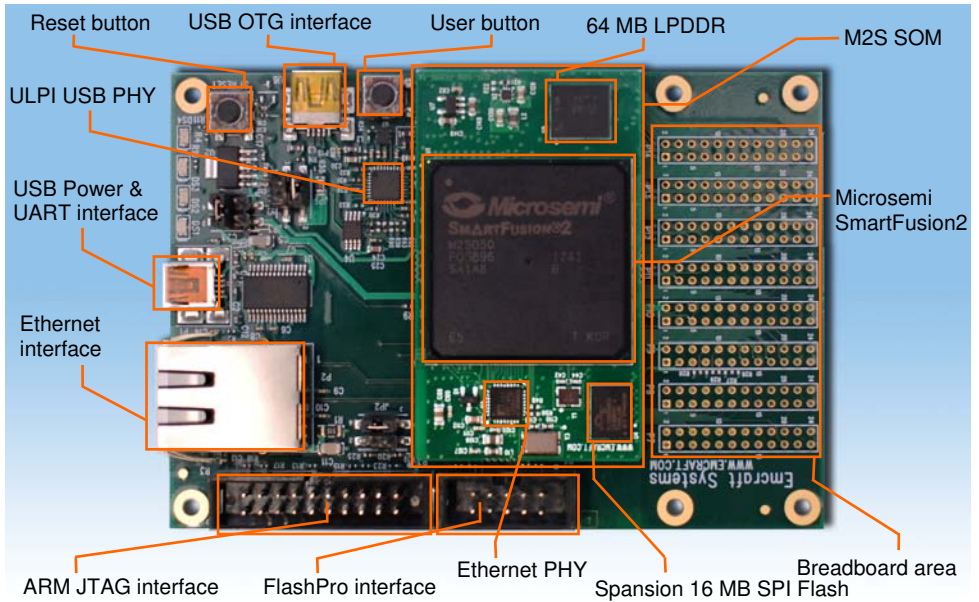
Quantity	Description
1	M2S-SOM SmartFusion2 System-On-Module with M2S050T-FG896
1	SOM-BSB-EXT SmartFusion2 System-On-Module baseboard
1	FlashPro4 JTAG programmer for programming and debugging of SmartFusion2
1	USB 2.0 A Male to mini-B Y-cable for UART/power interface (up to 1A) to PC
1	USB 2.0 A Male to mini-B cable for connection of SmartFusion2 to PC in USB device ("gadget") role, and also FlashPro4 connection
1	Mini-B to USB 2.0 A Female cable for connection of USB devices to SmartFusion2
1	Ethernet cable
1	USB WiFi module
1	Leather case

Note: The SF2-STARTER-KIT-ES is RoHS compliant.

Overview

Microsemi's SmartFusion2 Starter Kit provides designers with a prototyping platform for SmartFusion2 system-on-chip (SoC) FPGAs, which integrate inherently reliable flash-based FPGA fabric, a 166 MHz ARM Cortex-M3 processor, advanced security processing accelerators, DSP blocks, SRAM, eNVM and industry-required high-performance communication interfaces all on a single chip.

The SmartFusion2 device resides on Emcraft Systems' miniature (34mm x 59mm) mezzanine form factor System-On-Module (M2S-SOM), which integrates the SmartFusion2 SoC (FG896 package), 64MB LPDDR, 16MB SPI Flash and an Ethernet PHY. The SOM-BSB-EXT baseboard provides easy-to-use benchtop access to the SmartFusion2 SoC and System-On-Module interfaces.

Reset button — USB OTG interface — User button — 64 MB LPDDR — M2S SOM

ULPI USB PHY

USB Power & UART interface

Microsemi SmartFusion2

Ethernet interface

ARM JTAG interface — FlashPro interface — Ethernet PHY — Spansion 16 MB SPI Flash — Breadboard area

Jumpers Settings, Programming, and Debug

Prior to powering up the SF2-STARTER-KIT-ES for the first time, make sure the jumpers are in the following positions:

Jumper	Location	Purpose	Setting
JP1	Below USB OTG connector	Enable power on the SmartFusion2 SOM (VCC3)	1–2 closed, 3–4 open
JP2	To the right of the RJ-45 Ethernet jack	Select appropriate JTAG mode and enable power to the SmartFusion2 JTAG controller	1–2 open, 3–4 closed
JP3	Above USB Power and UART I/F connector	Use the mini-USB port as the power source	1–3 open, 2–4 closed

To power the SF2-STARTER-KIT-ES, connect it to a PC / notebook by plugging the mini-USB Y-cable into the P1 mini-USB connector on the SOM-BSB-EXT board. As soon as the connection to the PC has been made, the on-board LED DS2 will light up, indicating that the board is up and running. A single USB connection provides a 500 mA power to the SF2-STARTER-KIT-ES, which is sufficient for basic functionality. Note however that some advanced operations, such as WiFi connectivity using the USB WiFi module, may require more than 500 mA for reliable operation. Use the second link of the mini-USB Y-cable to connect to the PC for such configurations.

On the PC side, the USB link provides a serial console device to the SF2-STARTER-KIT-ES. The software installed on the board is configured for a 57.6 K baud terminal. On a Windows host, this will show up as a COM port. On a Linux host, the serial console is available using a */dev/ttyUSBn* device.

To provide network connectivity to the board, connect it into your LAN by plugging a standard Ethernet cable into the J1 connector. The module is pre-configured with an IP address of 192.168.0.2.

Running Linux

The SF2-STARTER-KIT-ES comes with a preloaded Linux (uClinux) demo configuration. To initiate the Linux bootstrap, simply power-up the SF2-STARTER-KIT-ES or reset it by pushing the Reset Push Button (S1 on the SOM-BSB-EXT baseboard).

The Linux bootstrap will proceed to boot the U-Boot firmware from the on-chip eNVM. Unless interrupted, U-Boot proceeds to load the Linux bootable image from the SPI Flash into the LPDDR and passes control to the Linux kernel entry point in LPDDR. Linux bootstraps the kernel, mounts a root filesystem in RAM and enters the interactive shell command interface:

```
U-Boot 2010.03-linux-cortexm-1.9.0 (Dec 06 2012 - 18:08:53)

CPU  : SmartFusion2 SoC (Cortex-M3 Hard IP)
Freqs: CORTEX-M3=166MHz,PCLK0=83MHz,PCLK1=83MHz
Board: M2S-SOM Rev A, www.emcraft.com
...
Starting kernel ...
...
Freeing init memory: 936K
init started: BusyBox v1.17.0 (2012-12-06 17:35:01 MSK)
~ #
```

The configuration installed into the SF2-STARTER-KIT-ES provides a demonstration of basic shell, networking and Flash management capabilities provided by Linux on the SmartFusion2.

The Linux development environment for the SF2-STARTER-KIT-ES, including the configuration installed into the SF2-STARTER-KIT-ES, can be downloaded from this page, Section "Software Materials": http://www.emcraft.com/som/m2s

Running the SoftConsole Demo Project

The SF2-STARTER-KIT-ES is fully compatible with the Microsemi SoftConsole IDE. A simple SoftConsole "Hello, world" demo project, immediately ready for running on the SF2-STARTER-KIT-ES, can be downloaded from the "Software Materials" section of this web page:

http://www.emcraft.com/som/m2s

As configured, the demo project runs from the eSRAM of the SmartFusion. Connect the FlashPro JTAG programmer to the FlashPro interface connector (P5) on the SOM-BSB-EXT and then build and run the demo project using the SoftConsole IDE.

When run on the SF2-STARTER-KIT-ES, the demo prints messages to the serial console and blinks the user LEDs on the SOM-BSB-EXT.

Software and Licensing

The SmartFusion2 Starter Kit is supported by Libero® System-on-Chip (SoC) v11.0 or later, which includes a web install option. SoftConsole Software IDE and FlashPro are enabled by default in the web install; these software tools can be used for software design and debug.

Software releases: http://www.actel.com/download/software/liberosocv11/default.aspx

Libero SoC v11.0 requires a valid Gold, Platinum, or Standalone Libero license.

If you need a new license, select FREE Libero SoC Gold license and request a new one from your Microsemi Customer Portal account. This license supports all tools for designing with the SmartFusion2 family and associated development kits.

License updates: www.microsemi.com/soc/Portal/default.aspx?r=1

Documentation Resources

For further kit information, refer to the following on-line resources.

Emcraft Systems provides detailed kit information and materials from this page:

http://www.emcraft.com/som/m2s

The first document to start with is the SmartFusion2 SOM Starter Kit Guide. It provides detailed description of the kit set-up and operation and also references other materials and documents included in the kit.

As new SmartFusion2 and kit related materials become available, they will be posted on the Microsemi and Emcraft Systems web sites. Microsemi recommends that you sign up for Product Updates to be notified when new material is available.

Microsemi product updates: https://www.actel.com/portal/default.aspx?r=2

Emcraft Systems product updates: http://www.emcraft.com/som/m2s/register

Technical Support and Contacts

Technical support is available online at www.microsemi.com/soc/support and by email at soc_tech@microsemi.com.

Microsemi SoC Sales offices, including Representatives and Distributors, are located worldwide. To find your local representative visit www.microsemi.com/soc/company/contact.

Emcraft Systems provides support for any matters related to the Linux Board Support Package for the SF2-STARTER-KIT-ES. Contact Emcraft Systems by email at a2f-linux-support@emcraft.com.