Overview

Microsemi’s SmartFusion®2 SoC FPGA Advanced Development Kit offers a full featured 150K LE device SmartFusion2 system-on-chip (SoC) FPGA. This 150K LE device inherently integrates reliable flash-based FPGA fabric, a 166 MHz Cortex™-M3 processor digital signal processing (DSP) blocks, static random-access memory (SRAM), embedded nonvolatile memory (eNVM), and industry-required high-performance communication interfaces—all on a single chip.

The Advanced Development Kit board has numerous standard and advanced peripherals such as: PCIe® x4 edge connector, two FMC connectors for using many off the shelf daughter cards, USB, Philips inter-integrated circuit (I²C), two gigabit Ethernet ports, serial peripheral interface (SPI), and UART. A high precision operational amplifier circuitry on the board helps to measure core power consumption by the device.

The SmartFusion2 SoC FPGA memory management system is supported by 1 GByte (GB) of on-board double data rate3 (DDR3) memory and 2 GBytes (GB) SPI flash—1GB connected to the Microcontroller Subsystem (MSS) and 1GB connected to the FPGA fabric. The serializer and deserializer (SERDES) blocks can be accessed through the peripheral component interconnect express (PCIe) edge connector or high speed sub-miniature push-on (SMA) connectors or through on-board FPGA mezzanine card (FMC) connector.

This kit enables you to design applications that involve one or more of the following:

- Microprocessor applications
- Embedded ARM® Cortex™-M3 processor-based systems
- Motor control
- Industrial automation
- Power measurement
- Security applications
- FMC expansion
- High speed I/O applications
- Universal serial bus (USB) applications (OTG support)

Hardware Feature Overview

- SmartFusion2 SoC FPGA in the FCG1152 package (M2S150T-1FCG1152ES, 150K LE)
- DDR3 synchronous dynamic random access memory (SDRAM)
  - 4x256 MB for storing data.
  - 256 MB for storing the ECC bits
- SPI flash memory
  - 1 GB SPI flash connected to SPI port 0 of the SmartFusion2 SoC FPGA MSS.
  - 1 GB SPI flash connected to SmartFusion2 SoC FPGA fabric
- PCI Express Gen 2 x1 interface
- One pair SMA connectors for testing of the full-duplex SERDES channel
- Two FMC connectors with HPC/LPC pinout for expansion
- PCIe x4 edge connector

Kit Contents – M2S150-ADV-DEV-KIT-ES

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SmartFusion2 SoC FPGA 150K LE M2S150T-1FCG1152ES</td>
</tr>
<tr>
<td>1</td>
<td>USB A male to micro-B male cable, three feet long 28/28AWG USB 2.0</td>
</tr>
<tr>
<td>1</td>
<td>USB A to mini-B cable</td>
</tr>
<tr>
<td>1</td>
<td>12 V, 5 A AC power adapter</td>
</tr>
<tr>
<td>1</td>
<td>Quickstart guide</td>
</tr>
<tr>
<td>1</td>
<td>Libero SoC Platinum software one year license</td>
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Note: The M2S150-ADV-DEV-KIT-ES is a RoHS compliant.
SmartFusion2 SoC FPGA Advanced Development Kit Quickstart Card

- RJ45 interface for 10/100/1000 Ethernet
- USB micro-AB connector
- Headers for I2C, SPI, GPIOs
- FTDI programmer interface to program the external SPI flash
- JTAG/SPI programming interface
- RVI header for application programming and debug
- Flashpro programming header
- Embedded trace macro (ETM) cell header for debug
- QUAD 2:1 MUX/DEMUX high bandwidth bus switch
- Dual in-line package (DIP) switches for user application
- Push-button switches and LEDs for demo purposes
- Current measurement test points

Development Board Callout

Embedded FlashPro5 Programming Procedures – REQUIRED FOR PROGRAMMING WITHOUT A STANDALONE FLASHPRO PROGRAMMER:

Development Board Block Diagram

SMARTFUSION²
SoC FPGA
M2S150T-FCG1152ES

Development Board Block Diagram

FMC Connector-LPC (J60)
FMC Connector-HPC (J30)
Breadboard Connector

DDR3 SDRAMs
4 x 256MB

DDR3 SDRAMs
256MB (SECDED)

Debug LEDS

Debug Switches

SMARTFUSION²
SoC FPGA
M2S150T-FCG1152ES

MDRD (Bank2)

MDRD

Bank 1

USB_D(Bank3)

1Gb Flash

FT4232

USB mini B connector

JTAG

USB3320

USB micro AB connector

1Gb Flash

UART

Buffer

PCI EXPRESS
PCIe x4 Edge Connector

FMC Connector J30

Gigabit Ethernet PHY

RJ45

M30

Lanes

lane6

lane5

lane4

lane3

lane2

lane1

lane0

lane6

lane5

lane4

lane3

lane2

lane1

lane0

FMC Connector J60

Downloaded from Arrow.com.
Software and Licensing

The SmartFusion2 SoC FPGA Advanced Development Kit is supported by the Libero® System-on-Chip (SoC) v11.4 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. Refer to the SmartFusion2 SoC FPGA Advanced Development Kit User’s Guide for more information.

The M2S150-ADV-DEV-KIT-ES requires a valid Platinum Libero SoC software license.

Upon receiving this kit, email your:
1. Full name
2. Address
3. Access code: (available with kit)
4. Sales or Purchase Order Number

to Microsemi at:
M2S150AdvDevKit.License@microsemi.com to receive your free 1-year Platinum license.

Documentation Resources

For further kit information, including user's guide, tutorial, and full design examples, refer to the SmartFusion2 SoC FPGA Advanced Development Kit page.

New Demos and Tutorials will be posted as they become available.

Microsemi recommends that you sign up for Product Updates to be notified when new material is available. You can sign up for product updates from your Microsemi Customer Portal account.

Technical Support and Contacts

Technical support is available online and by email. To find your local representative visit Microsemi SoC Sales offices, including Representatives and Distributors, which are located worldwide.