Overview
The Small Form Factor (SFF) Software-Defined Radio (SDR) Development Platform is a unique new product that addresses the special portable SDR needs of public safety and commercial markets. It was designed around the latest DSP and FPGA technology as a low-cost, off-the-shelf, integrated hardware and software development solution.

The SFF SDR Development Platform is separated into three distinct modules — the Digital Processing Module, Data Conversion Module and RF Module — offering developers highly flexible development capabilities.

Potential Applications
The following applications will benefit greatly from using the SFF SDR Development Platform.

Public safety
- Such public safety applications as TETRA and APCO band communications, vehicular systems, transponders and broadband data systems will be greatly enhanced by their use of the SFF SDR Development Platform.

Commercial
- RFID readers, WiMAX and Wi-Fi customer-premises equipment (CPE), broadband data systems, vehicular systems, as well as femto and pico base stations are but a few applications that can be developed with the SFF SDR Development Platform.

Key Features
The SFF SDR Development Platform includes the following leading-edge features:
- TMS320DM6446 DSP system-on-chip from Texas Instruments
- TMS320C64x™ DSP core, 594 MHz

Key Benefits
- Small form factor for easy portability
- Self-contained
- Embedded, independent power monitoring for each processor
- Seamless hardware and software integration from baseband to antenna
- Supports model-based design tools, accelerating prototyping
- Integrated troubleshooting and hardware-in-the-loop co-verification capabilities
- The platform incorporates GPP, DSP and FPGA, making it easy to implement all protocol layers for a complete radio
- Easy adoption of third-party RF and I/O boards
- Ethernet remote access capabilities
- ARM926 core, 297 MHz
- Rich set of peripherals including serial ports, USB, EMAC, DDR2 EMIF, as well as video ports
- Virtex-4 SX35 FPGA from Xilinx
- ADS5500, 125-MSPS, 14-bit dual-channel analog-to-digital converter from Texas Instruments
- DAC5687, 500-MSPS, 16-bit dual-channel digital-to-analog converter from Texas Instruments
- Selection of bandwidth (5 MHz or 20 MHz)
- Modular — allows additional boards to be stacked
- RF module operating between 360 MHz and 960 MHz
- Optional supports of a second RF module for full-duplex operation or to cover additional bands
- Boot loader located in the flash memory for autonomous use of the platform

**Specifications**

**Digital Processing Module**
- TMS320DM6446 DSP system-on-chip from Texas Instruments
  - 297-MHz ARM926EJ-S RISC CPU
  - 594-MHz C64x+ DSP
- Virtex-4 SX35 FPGA from Xilinx
- MSP430 MCU from Texas Instruments for power management
- 128-MB DDR2 SDRAM
- 128-MB NAND Flash memory
- Stereo audio codec (8 kHz to 48 kHz) from Texas Instruments
- 10/100-Mbps Ethernet
- JTAG probing access
- HMI (LED, push buttons, dip switches)

**Data Conversion Module**
- Two 14-bit, 125-MSPS input channels (ADS5500 ADC from Texas Instruments)
- Dual-channel 16-bit, 500-MSPS output channels (DAC5687 DAC from Texas Instruments)
- Multiple clock sources
  - Two external clock inputs (ADC and DAC)
  - 10-MHz onboard reference clock
  - Reference clock input for synchronization

**RF Module**
- RF frequency range of 360 MHz to 960 MHz
- Selectable bandwidth: 5 MHz/20 MHz
- IF at 70 MHz
- Separate RF input and output SMA connectors
- Phase noise at 20 kHz from carrier: −70 dBc
- Half-duplex transceiver
- Stackable for full-duplex operation
- RF input
  - Gain: 22 dB
  - Saturation level: −30 dBm
  - Sensitivity: −110 dBm typical (S/N = 10 dB, BW = 1 kHz)
- RF output

**Supported Software Development Tools**
- The SPF SDR Development Platform supports the following software development tools:
  - Texas Instruments Code Composer Studio™ Integrated Development Environment
  - Xilinx ISE Foundation for FPGA development
  - Xilinx System Generator for DSP
• Green Hills Software MULTI® IDE
• Green Hills Software POSIX-compliant INTEGRITY® real-time operating system
• The MathWorks MATLAB® and Simulink™

**System Requirements**
The following system requirements must be met to use the SFF SDR Development Platform.

**Operating system**
• Windows® XP Professional (service pack 2)

**Hardware**
• IBM-compatible computer
• Processor: Pentium III (or equivalent) or better
• RAM: 1 GB
• Hard disk drive: 40 GB of free space or more

• Display: 800 x 600 pixels or more

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