DSP56603EVM

Advance Information

DSP56603EVM Evaluation Module

The DSP56603 Evaluation Module (DSP56603EVM) is designed as a low-cost platform for developing real-time software and hardware products to support a new generation of applications in wireless and wireline communications, multimedia, speech, control, and general digital signal processing. The user can download software to on-chip or on-board RAM, then run and debug it. The user can also connect hardware, such as external memories and A/D or D/A converters, for product development. The 16-bit precision of the DSP56603 Digital Signal Processor (DSP) combined with the on-board 32 K of external SRAM and Crystal Semiconductor's CS4215 stereo, CD-quality, audio codec makes the DSP56603EVM ideal for implementing and demonstrating many communications and speech processing algorithms, as well as for learning the architecture and instruction set of the DSP56603 processor. **Figure 1** shows the functional block diagram for the DSP56603EVM.

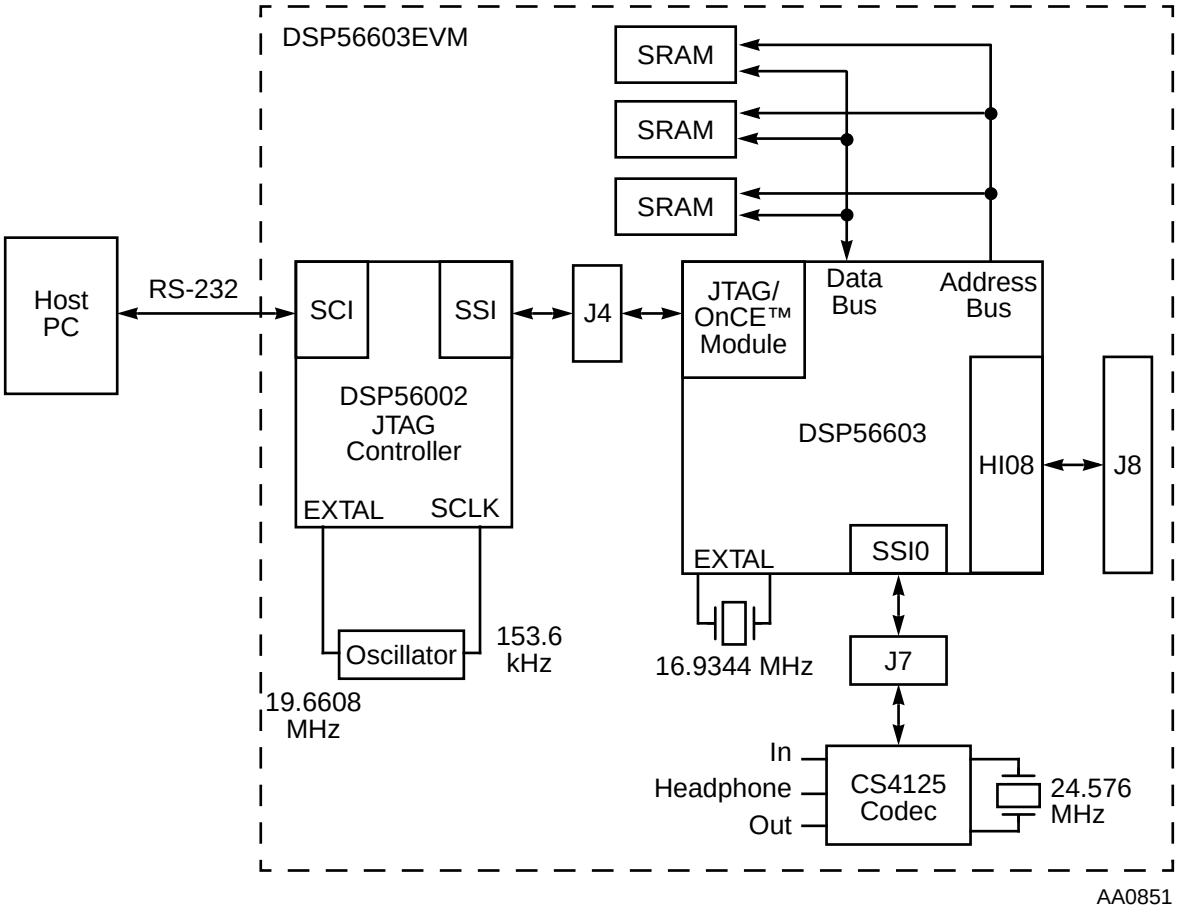

Figure 1 DSP56603EVM Functional Block Diagram

This document contains information on a new product. Specifications and information herein are subject to change without notice.

Preliminary Information

HARDWARE FEATURES

- 16-bit DSP56603 Digital Signal Processor
  - High Performance DSP56600 Core
    - 60 Million Instructions Per Second (MIPS) with a 60 MHz clock (at 2.7 volts)
    - Object-code compatible with the DSP56000 and DSP56300 cores
    - Highly parallel instruction set
    - Fully pipelined 16 × 16-bit parallel Multiplier-Accumulator (MAC)
    - Two 40-bit accumulators including extension bits
    - 40-bit parallel barrel shifter
    - Position Independent Code (PIC) Support
    - Unique DSP addressing modes
    - On-chip memory-expandable hardware stack
    - Nested hardware DO loops
    - Fast auto-return interrupts
    - On-chip Phase Lock Loop (PLL)
    - On-Chip Emulation (OnCE™) module
    - JTAG port
    - Address Tracing mode reflects internal Program RAM accesses at external port
    - On-chip support for software patching and enhancements
  - On-Chip Memories
    - Program RAM, X data RAM, and Y data RAM size is programmable:

Switch Mode	Program RAM Size	X Data RAM Size	Y Data RAM Size
disabled	16.5 K × 24-bit	8 K × 16-bit	8 K × 16-bit
enabled	11.5 K × 24-bit	10.5 K × 16-bit	10.5 K × 16-bit

    - 3 K × 24-bit bootstrap ROM
  - Off-Chip Memory Expansion
    - Program memory expansion to one memory space of 64 K × 24-bit words

  - On-Chip Peripherals
    - Enhanced DSP56000-like 8-bit parallel Host Interface (HI08)
    - Two Synchronous Serial Interfaces (SSI0 and SSI1)
    - Triple timer module
    - As many as thirty-four programmable General Purpose Input/Output (GPIO) pins, depending on which peripherals are enabled
  - Reduced Power Dissipation
    - Very low power CMOS design
    - Wait and Stop low power standby modes
    - Fully static logic, operation from the device maximum frequency down to DC
- 32 K × 24-bit fast Static RAM for external Program memory expansion
- 16-bit CD-quality audio codec
  - Two channels of 16-bit Analog-to-Digital (A/D) conversion
  - Two channels of 16-bit Digital-to-Analog (D/A) conversion
  - Software-selectable 8-bit and 16-bit data formats, including µ-law and A-law companding
  - Stereo jacks for audio input, output, and headphones
- JTAG Controller
  - On-board DSP56002 for high-speed JTAG/OnCE serial transfers
  - JTAG connector for use with the Application Development System (ADS) command converter card
- Connectors
  - Host port connector
  - External memory expansion connector
  - SSI0, SSI1, and GPIO connector
  - RS-232 serial connector to host computer

SOFTWARE FEATURES

- Motorola's DSP56xxx cross assembler
  - Produces DSP56603 binary code from source code using labels, sections, and macro definitions incorporating the DSP's complete instruction set, all addressing modes, and all memory spaces
  - Offers macros, expression evaluation, and functions for strings, data conversion, and transcendentals
  - Creates reports for cross-references, instruction cycle count, and memory usage
  - Provides extensive error checking and reporting
- Domain Technologies debug software with Windows-based user interface
  - Symbolic debugging
  - Windows for data, code, DSP registers, commands, peripherals, etc.
  - Data and registers displayed in fractional, decimal, or hexadecimal format
  - Graphical display of memory segments
  - Up to eight simultaneous software breakpoints
  - Built-in-line assembler and disassembler
- Demonstration software and example pass-through code
- Self-test files—executable and source code

INCLUDED WITH THE DSP56603EVM

The DSP56603EVM kit contains the following items:

- DSP56603 Evaluation Module board
- *DSP56603EVM Product Information (DSP56603EVMP/D*—this document)
  - Overview description of the DSP56603EVM, including block diagram and list of features
- *DSP56603EVM User's Manual (DSP56603EVMUM/AD)*
  - Detailed functional description of the DSP56603EVM, including requirements, installation, and general operating guidelines
- *DSP56600 Family Manual (DSP56600FM/AD)*
  - Detailed description of the DSP56600 family processor core and instruction set
- *DSP56603 User's Manual (DSP56603UM/AD)*
  - Detailed functional description of the DSP56603 memory configuration, operation, and register programming
- *DSP56603 Technical Data (DSP56603/D)*
  - DSP56603 features list and physical, electrical, timing, and package specifications
- *DSP56603 Chip Errata*
  - Differences between how the DSP56603 is described in previous documentation and how a particular mask version of the chip actually operates
- Crystal Semiconductor CS4215 16-Bit Multimedia Audio Codec Data Sheet
- Domain Technologies Debug-56K Debugger manual for Motorola's 16- and 24-bit DSPs
- GUI Debugger from Domain Technologies (one diskette)
- Assembler/Linker/example software from Motorola (one diskette)
- Motorola Digital Signal Processor Registration Form

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USER REQUIREMENTS

The user must provide the following:

- Power supply (7–9 V AC or DC with 2.1 mm power connector)
- RS-232 cable (DB9 male to DB9 female)
- Audio source, headphones, and a cable with 1/8-inch stereo plugs
- IBM PC compatible computer (386 class or higher) running Windows 3.1 (or higher) with an RS-232 serial port capable of 9,600–57,600 bit-per-second operation, 4 Mbytes RAM minimum, 3-1/2 inch diskette drive, hard drive with a minimum of 4 Mbyte of free disk space, and a mouse

To operate the DSP56603EVM with any system other than a Windows-based PC, the use of the Motorola DSPCOMMAND Command Converter board and DSPxHOST Host Adapter board is required (see *DSPTOOLSP/D*). In addition, the DSPCOMMAND and DSPxHOST may be required to use some third-party products developed for the DSP56603EVM.

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