

DSP56303

Advance Information 24-BIT DIGITAL SIGNAL PROCESSOR

The DSP56303 is a member of the DSP56300 core family of programmable CMOS Digital Signal Processors (DSPs). This family uses a high performance, single clock cycle per instruction engine providing a twofold performance increase over Motorola's popular DSP56000 core family while retaining code compatibility. Significant architectural enhancements to the DSP56300 core family include a barrel shifter, 24 bit addressing, instruction cache, and DMA. The DSP56303 offers 66/80 MIPS using an internal 66/80 MHz clock at 3.0–3.6 volts. The DSP56300 core family offers a new level of performance in speed and power provided by its rich instruction set and low power dissipation, enabling a new generation of wireless, telecommunications, and multimedia products.

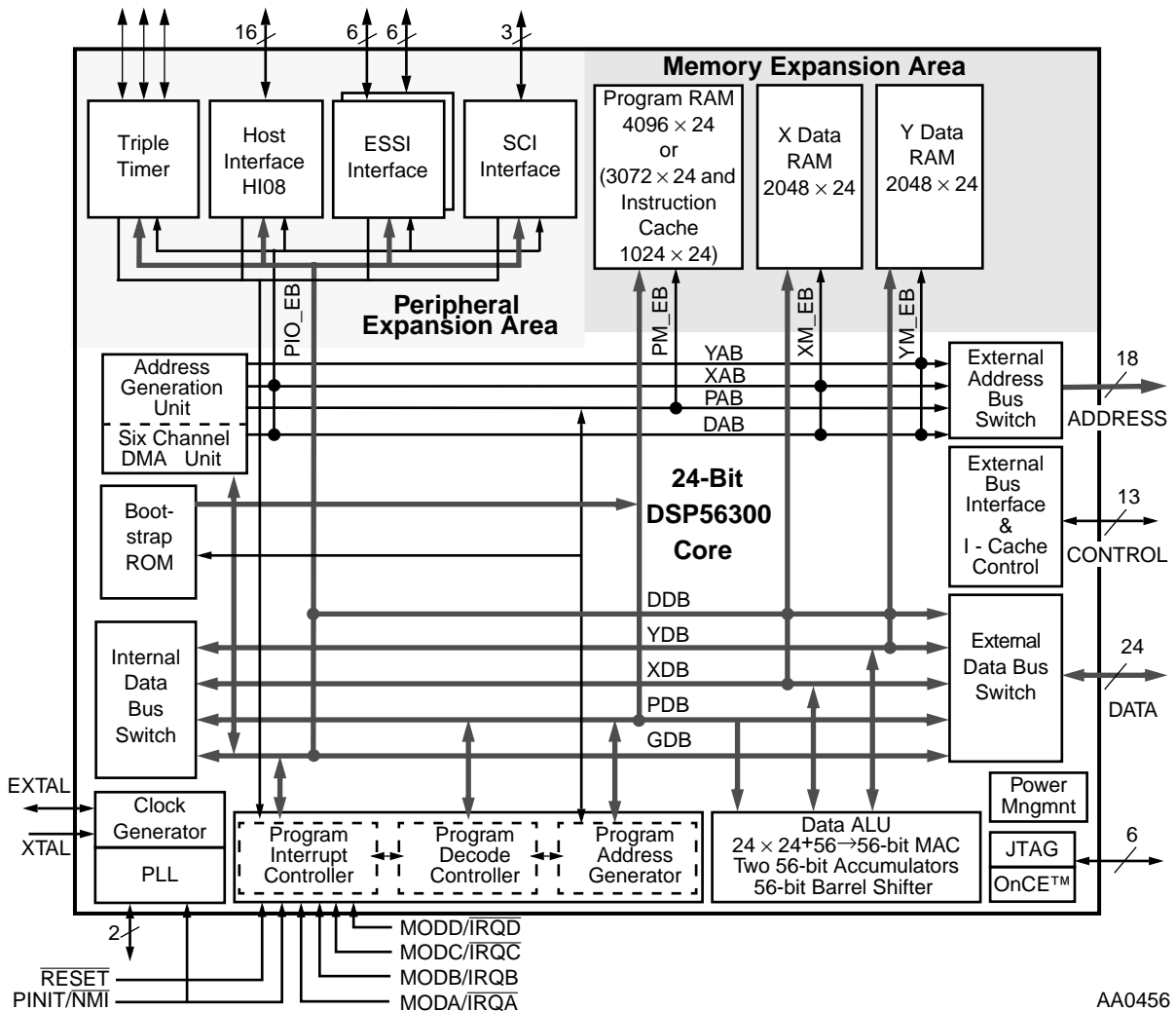


Figure 1 DSP56303 Block Diagram

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

DSP56303 FEATURES

- High performance DSP56300 core
 - 66/80 Million Instructions Per Second (MIPS) with a 66/80 MHz clock
 - Object code compatible with the DSP56000 core
 - Highly parallel instruction set
 - Fully pipelined 24 x 24-bit parallel multiplier-accumulator
 - 56-bit parallel barrel shifter
 - 24-bit or 16-bit arithmetic support under software control
 - Position independent code support
 - Addressing modes optimized for DSP applications
 - On-chip instruction cache controller
 - On-chip memory-expandable hardware stack
 - Nested hardware DO loops
 - Fast auto-return interrupts
 - On-chip concurrent six-channel DMA controller
 - On-chip Phase Lock Loop (PLL) and clock generator
 - On-Chip Emulation (OnCE™) module
 - JTAG Test Access Port (TAP)
 - Address tracing mode reflects internal accesses at the external port
- On-chip memories
 - Program RAM, Instruction Cache, X data RAM, and Y data RAM size is programmable:

Instruction Cache	Switch Mode	Program RAM Size	Instruction Cache Size	X Data RAM Size	Y Data Ram Size
disabled	disabled	4096 × 24-bit	0	2048 × 24-bit	2048 × 24-bit
enabled	disabled	3072 × 24-bit	1024 × 24-bit	2048 × 24-bit	2048 × 24-bit
disabled	enabled	2048 × 24-bit	0	3072 × 24-bit	3072 × 24-bit
enabled	enabled	1024 × 24-bit	1024 × 24-bit	3072 × 24-bit	3072 × 24-bit

- 192 × 24-bit bootstrap ROM

- Off-chip memory expansion
 - Data memory expansion to two 256 K x 24-bit word memory spaces
 - Program memory expansion to one 256 K x 24-bit word memory space
 - External memory expansion port
 - Chip select logic requires no additional circuitry to interface to SRAMs and SSRAMs
 - On-chip DRAM controller requires no additional circuitry to interface to DRAMs
- On-chip peripherals
 - 8-bit parallel Host Interface (HI08), ISA-compatible bus interface, providing a cost-effective solution for applications not requiring the PCI bus
 - Two Enhanced Synchronous Serial Interfaces (ESSI)
 - Serial Communications Interface (SCI) with baud rate generator
 - Triple timer module
 - Up to thirty-four programmable General Purpose I/O pins (GPIO), 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 frequency down to DC
 - Optimized power management circuitry

TARGET APPLICATIONS


The DSP56303 is intended for use in telecommunication applications, such as multi-line voice/data/fax processing, videoconferencing, audio applications, control, and general digital signal processing.

PRODUCT DOCUMENTATION

The three manuals listed in **Table 1** are required for a complete description of the DSP56303 and are necessary to design with the part properly. Documentation is available from a local Motorola distributor, a Motorola semiconductor sales office, a Motorola Literature Distribution Center, or the World Wide Web.

Table 1 DSP56303 Documentation

Document Name	Description of Contents	Order Number
DSP56300 Family Manual	Detailed description of the DSP56300 family architecture and the 24-bit core processor and instruction set	DSP56300FM/AD
DSP56303 User's Manual	Detailed description of DSP56303 memory, peripherals, and interfaces	DSP56303UM/AD
DSP56303 Technical Data	DSP56303 pin and package descriptions, and electrical and timing specifications	DSP56303/D

OnCE is a trademark of Motorola, Inc.
Motorola, and  are registered trademarks of Motorola, Inc.



Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typical", must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part.

How to reach us:

USA/Europe:

Motorola Literature Distribution
P.O. Box 20912
Phoenix, Arizona 85036
1 (800) 441-2447

Hong Kong:

Motorola Semiconductors H.K. Ltd.
8B Tai Ping Industrial Park
51 Ting Kok Road
Tai Po, N.T., Hong Kong
852-2662928

Japan:

Nippon Motorola Ltd.
Tatsumi-SPD-JLDC
Toshikatsu Otsuki
6F Seibu-Butsuryu-Center
3-14-2 Tatsumi Koto-Ku
Tokyo 135, Japan
03-3521-8315

MFAX:

RMFAX0@email.sps.mot.com
TOUCHTONE (602) 244-6609

DSP Helpline:

1 (800) 521-6274
dsphelp@dsp.sps.mot.com

Internet:

<http://www.motorola-dsp.com>

