



ADSP-BF544 High Performance Convergent Multimedia Blackfin Processor

Key Features

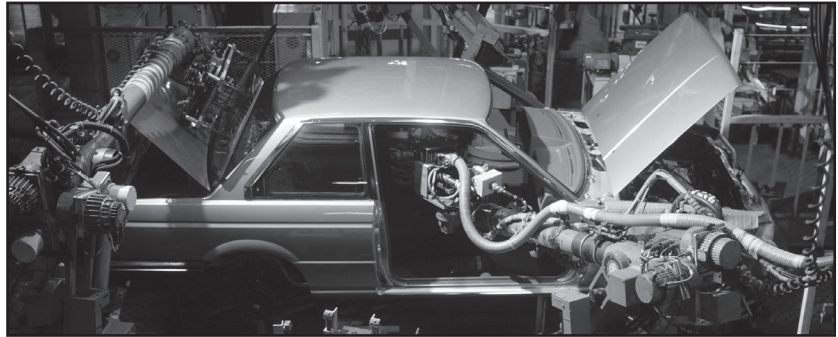
- Higher system performance that accommodates advanced systems while also decreasing overall system cost via:
 - Increased on-chip memory
 - High bandwidth bus infrastructure
 - System peripherals that provide glueless connectivity to a greater range of external devices
- Lockbox™ Technology Hardware-enabled security for code protection

Architectural Features

- Blackfin Processor core with up to 533 MHz (1066 MMACS) performance
- 2 independent DMA controllers

High Level of Integration

- Human interface: 18-bit/24-bit LCD controller, 32-bit up/down counter/thumbwheel interface
- Connectivity: Host DMA, UARTs, SPORTs, SPIs, TWI, and CAN®
- Multimedia: multiple enhanced parallel peripheral interfaces (EPPI) and pixel compositor hardware accelerator
- Synchronous memory interface for DDR/mobile DDR connectivity
- Asynchronous memory interface for SRAM, EEPROM, NAND/NOR flash connectivity
- 400-ball, 17 mm × 17 mm mini-BGA, 0.8 mm pitch
- Industrial temperature ranges: -40°C to +85°



Overview

The ADSP-BF544 Blackfin® Processor delivers greater system performance for the most challenging converged signal processing applications. With increased on-chip memory, system bandwidth, and numerous peripherals, designers can build demanding applications while reducing system costs.

The high performance 16-bit/32-bit Blackfin embedded processor core, the flexible cache architecture, the enhanced DMA subsystem, and the dynamic power management (DPM) functionality allow system designers a flexible platform to address a wide range of applications, including consumer, communications, automotive, and industrial/instrumentation.

The ADSP-BF544 offers up to 500 MHz/1066 MMACS of performance. This processor core is supported by two independent, advanced DMA controllers supporting one- and two-dimensional DMA transfers between on-chip memory, off-chip memory, and system peripherals. The combination of the processor core speed and the DMA controller allows for efficient processing of audio, voice, video, and image data.



Blackfin Processors also offer enhanced power management capabilities by integrating on-chip core voltage regulation circuitry. This on-chip controller allows for the core and system clocks to be dynamically modified via a digital divider circuit, providing system designers an additional tool for optimization of power and performance.

Designed for Security: Lockbox Technology

IP protection has become a necessary part of today's embedded applications. The ADSP-BF544 provides a security scheme that balances flexibility and upgradability with performance through the inclusion of a firmware-based solution including OTP memory to enable users to implement private keys for secure access to program code.

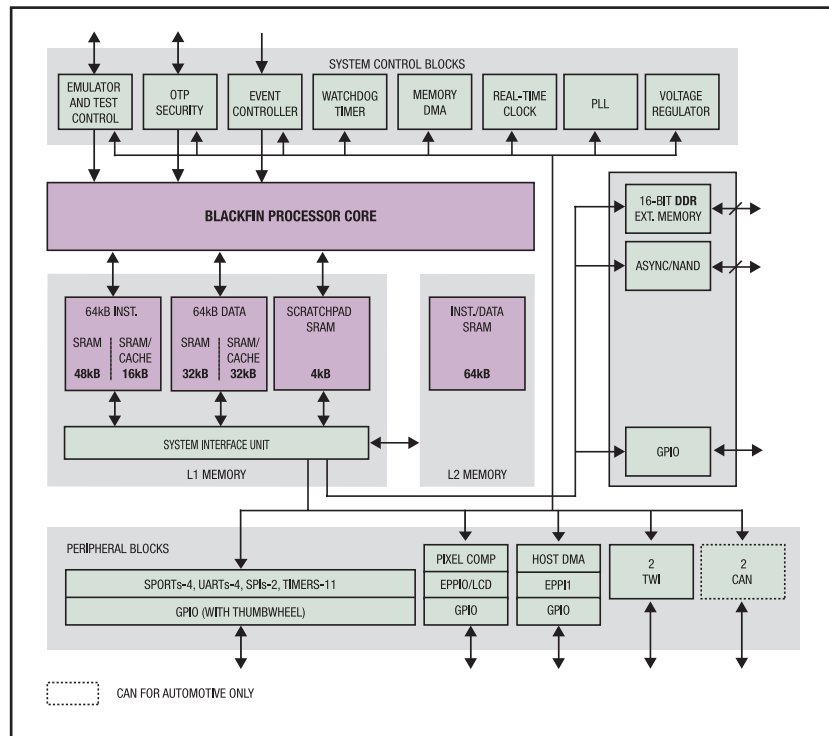
ADSP-BF544 Designed for System Performance

The ADSP-BF544 was specifically designed to meet the needs of convergent multimedia applications where system performance and low cost are essential ingredients. The integration of multimedia, human interface, and connectivity peripherals combined with increased system bandwidth and on-chip memory provides customers a platform to design the most demanding applications.

Many multimedia enhancements have also been included on the ADSP-BF544 to offload processor MIPS through hardware integration, expand LCD capabilities, and shorten customer development time. The multiple enhanced parallel peripheral interfaces support ITU-R BT.656 video formats and can drive 18-bit/24-bit LCD displays. A hardware acceleration block, the pixel compositor, has been developed to execute text/graphics overlays, color conversion, and alpha blending. This block significantly reduces processor core overhead associated with software RGB-YUV color conversion and alpha blending.

Expanded Peripherals

The ADSP-BF544 provides peripheral flexibility to complement its high performance processing. These rich system-level peripherals are well suited for automotive infotainment and industrial multimedia applications where multiple standards are prevalent and system performance is required.



For human interface capability, the ADSP-BF544 provides a 32-bit up/down counter that can sense 2-bit quadrature or binary codes as typically emitted by industrial drives or manual thumbwheels.

To enhance connectivity, an 8-bit/16-bit host DMA interface is integrated along with standard serial connections provided by multiple on-chip SPORT, SPI, UART, TWI, and CAN (available for automotive) interfaces. These provide glueless interfaces to multiple off-chip devices, including consumer and communication products, Bluetooth® and other application-specific interfaces. This level of integration is perfect for the emerging and constantly changing products and standards in the car infotainment and multimedia segments.

Development Tools

Blackfin Processors are supported by:

- The Analog Devices CROSSCORE® brand of industry-leading development tools. The CROSSCORE components include the VisualDSP++® software development environment, EZ-KIT Lite® evaluation systems, EZ-Extender® daughterboards, and USB-based emulators.
- Third-party developers: Over 100 third parties provide software, hardware, and consulting services to support Blackfin embedded processors. For more information, visit www.analog.com/processors/collaborative.

Analog Devices, Inc.
Worldwide Headquarters
 Analog Devices, Inc.
 One Technology Way
 P.O. Box 9106
 Norwood, MA 02062-9106
 U.S.A.
 Tel: 781.329.4700
 (800.262.5643,
 U.S.A. only)
 Fax: 781.461.3113

Analog Devices, Inc.
Europe Headquarters
 Analog Devices, Inc.
 Wilhelm-Wagenfeld-Str.6
 80807 Munich
 Germany
 Tel: 49.89.76903.0
 Fax: 49.89.76903.157

Analog Devices, Inc.
Japan Headquarters
 Analog Devices, KK
 New Pier Takeshiba
 South Tower Building
 1-16-1 Kaigan, Minato-ku,
 Tokyo, 105-6891
 Japan
 Tel: 813.5402.8200
 Fax: 813.5402.1064

Analog Devices, Inc.
Southeast Asia Headquarters
 Analog Devices
 22/F One Corporate Avenue
 222 Hu Bin Road
 Shanghai, 200021
 China
 Tel: 86.21.5150.3000
 Fax: 86.21.5150.3222

Embedded Processing and DSP Support
 U.S.A.:
processor.support@analog.com
 Fax: 781.461.3010
 Europe:
processor.europe@analog.com
 Fax: 49.89.76903.157
www.analog.com/processors