



# ADSP-BF548 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 600 MHz (1200 MMACS) performance
- 2 independent DMA interface

## High Level of Integration

- Multimedia: multiple enhanced parallel peripheral interfaces (EPPI), pixel compositor hardware accelerator, and media transceiver (MXVR) for connection to a MOST® Network\*
- Human interface: 18-bit/24-bit LCD controller, 32-bit up/down counter/thumbwheel interface
- Connectivity: high speed USB OTG, Host DMA, UARTs, SPORTs, SPIs, TWI, and CAN®
- Expansion: SD/SDIO and ATAPI-6 interface
- Synchronous memory interface for DDR/mobile DDR connectivity
- Asynchronous memory interface for SRAM, EEPROM, NAND/NOR flash connectivity
- 400-ball, 17 mm × 17 mm, 0.8 mm pitch mini-BGA
- Industrial temperature ranges: -40°C to +85°C

\*MXVR included on ADSP-BF549 only



## Overview

The ADSP-BF548 Blackfin® Processor delivers greater system performance for the most challenging converged signal processing applications. With more than two times the on-chip memory and system bandwidth, plus 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-BF548 offers up to 600 MHz/1200 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-BF548 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-BF548 Designed for System Performance

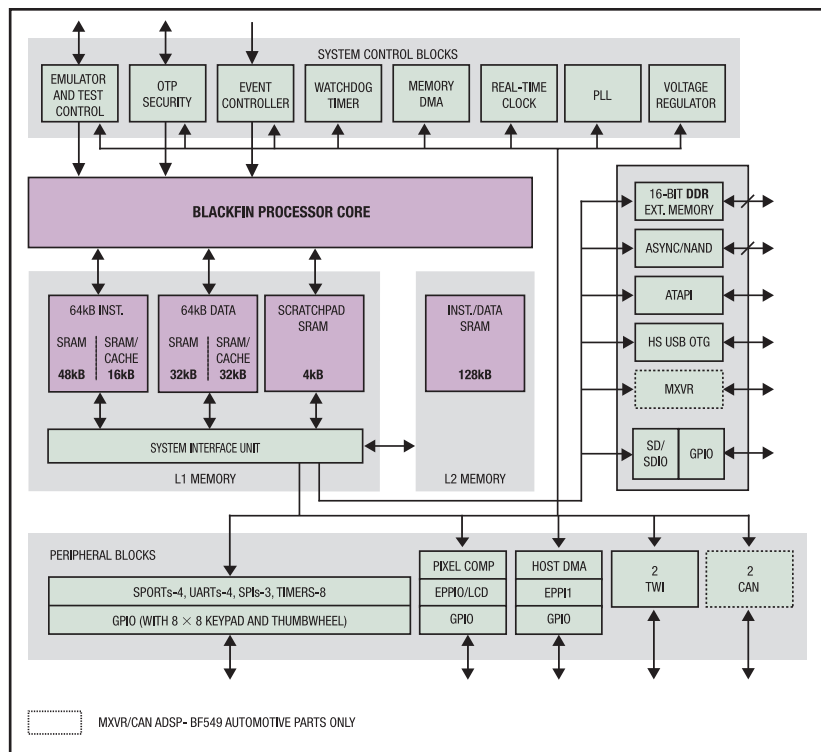
The ADSP-BF548 was specifically designed to meet the needs of convergent multimedia applications where system performance and low cost are essential ingredients. The integration of multimedia, human interface, and connectivity peripherals combined with increased system bandwidth and on-chip memory provides customers a platform to design the most demanding applications.

Many multimedia enhancements have also been included on the ADSP-BF548 to offload processor MIPS through hardware integration, expand display capabilities, and shorten customer development time. The multiple enhanced parallel peripheral interfaces that support ITU-R BT.656 video formats now can also 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-BF548 provides peripheral flexibility to complement its high performance processing. These rich system-level peripherals are well suited for advanced vehicle infotainment and industrial multimedia applications where multiple standards are prevalent and system performance is required.

To enhance connectivity, a high speed USB On-the-Go (OTG) module with integrated PHY has been incorporated along with an 8-bit/16-bit host DMA interface. These system-level peripherals along with standard serial connections provided by multiple on-chip SPORT, SPI, UART, TWI, and CAN (available for



automotive) interfaces 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.

For interfacing off-chip to storage media including hard drives, CD/DVD drives, and NAND flash products, the ADSP-BF548 has implemented an SD/SDIO controller, an ATAPI-6 interface, and an 8-bit/16-bit NAND flash controller.

For human interface capability, the ADSP-BF548 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. An 8 × 8 keypad interface is also included.

## 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

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