

# Blackfin ADSP-BF70x Series of DSP Processors

## Industry's Performance Leading Ultralow Power DSP Solution

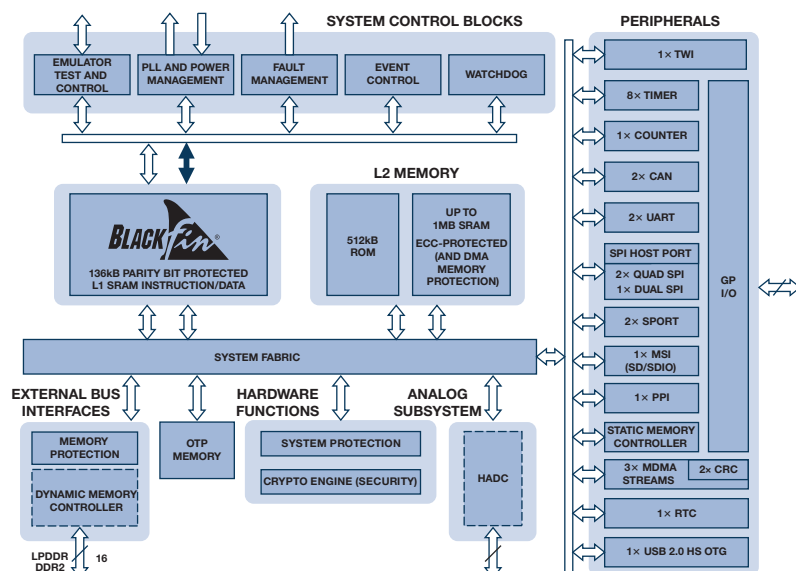


### Overview

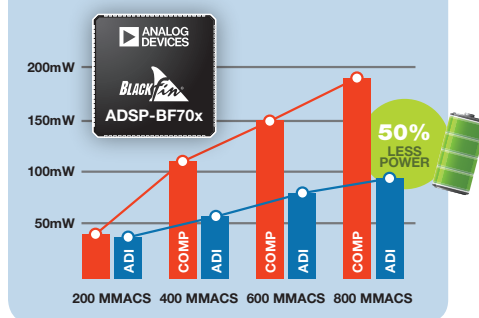
The new ADSP-BF70x Blackfin® processor series is a high performance DSP that delivers a class leading 800 MMACS of processing power at less than 100 mW. The cost-effective eight member series includes up to 1 MB of internal L2 SRAM, eliminating external memory in many applications, while a second configuration features an optional DDR2/LPDDR memory interface. Using the enhanced Blackfin+ core, the combination of performance, power efficiency, memory integration, security, and value allows designers to incorporate advanced 16- and 32-bit fixed-point processing into a range of new use cases, including industrial imaging and building controls as well as portable and automotive audio. The ADSP-BF70x series offers designers unparalleled flexibility and functionality through an array of advanced connectivity options (including USB, SDIO, CAN, ePPI, SPORT, QuadSPI) while enabling bus-powered applications and extending the life of battery-powered devices.

### Target Applications Include

- Intelligent lighting and occupancy detection
- Industrial imaging and biometrics
- Portable audio, DJ equipment, and effects
- Automotive audio
- Communications
- Military and aerospace
- Portable healthcare



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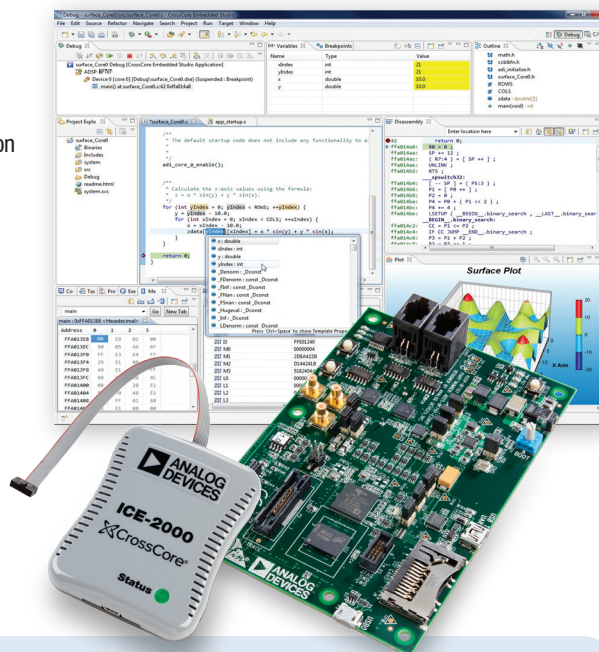
| Generic Device              | ADSP-BF700                                                                                                   | ADSP-BF702         | ADSP-BF704 | ADSP-BF706 | ADSP-BF701                            | ADSP-BF703         | ADSP-BF705 | ADSP-BF707 |
|-----------------------------|--------------------------------------------------------------------------------------------------------------|--------------------|------------|------------|---------------------------------------|--------------------|------------|------------|
| Package                     | 12 mm × 12 mm, 88-lead LFCSP                                                                                 |                    |            |            | 12 mm × 12 mm, 0.8p, 184-ball CSP_BGA |                    |            |            |
| Max Speed Grades            | 100 MHz<br>200 MHz                                                                                           | 300 MHz<br>400 MHz |            |            | 100 MHz<br>200 MHz                    | 300 MHz<br>400 MHz |            |            |
| L1 Cache/SRAM (with Parity) | 136 kB                                                                                                       |                    |            |            | 136 kB                                |                    |            |            |
| L2 SRAM (with ECC)          | 128 kB                                                                                                       | 256 kB             | 512 kB     | 1024 kB    | 128 kB                                | 256 kB             | 512 kB     | 1024 kB    |
| L2 ROM                      | 512 kB                                                                                                       |                    |            |            | 512 kB                                |                    |            |            |
| DDR2/LPDDR                  | No                                                                                                           |                    |            |            | 16 bit                                |                    |            |            |
| USB 2.0 HS (MAC/PHY)        | 1× OTG/device                                                                                                |                    |            |            | 1× OTG/device                         |                    |            |            |
| SD/SDIO/MMC/eMMC            | 4-bit                                                                                                        |                    |            |            | 8-bit                                 |                    |            |            |
| 4-Channel 12-Bit ADC        | No                                                                                                           |                    |            |            | Yes                                   |                    |            |            |
| GPIOs                       | 43                                                                                                           |                    |            |            | 47                                    |                    |            |            |
| Key Common Peripherals      | ePPI for video I/O, SPORT with I²S (2), quad/dual SPI (2/1) including host mode, I²C, UART (2), CAN 2.0B (2) |                    |            |            |                                       |                    |            |            |
| Other Features              | Security cryptographic accelerators, OTP, WDT, RTC, timer (8), counter                                       |                    |            |            |                                       |                    |            |            |

## Features and Benefits

|                                |                                                                                                                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scalable DSP Performance       | Up to 400 MHz Blackfin+ core with single cycle MAC (2 × 16-bit, 32-bit, or complex); many efficiency improvements and Blackfin family code compatibility; benchmark example for 1024 pt cFFT: 23 μs (16-bit), 94 μs (32-bit) |
| Best-in-Class Power Efficiency | 118 μW/MMAC @ 400 MHz delivering 95 mW at 800 MMACs (40 nm LP)                                                                                                                                                               |
| Lowest BOM Cost                | Large SRAM (up to 1 MB L2), multiple glueless connectivity options, 4-channel, 12-bit ADC and DDR2/LPDDR option, and cost optimized packaging                                                                                |
| Advanced Security              | IP protection and run-time security including AES128/256 and SHA-2 (224/256); fast secure boot (<55 ms for 512 kB boot image)                                                                                                |
| Other New Features to Blackfin | Increased L1 cache bandwidth: Up to 3× from L2 SRAM and DDR2/LPDDR; high speed memory mapped quad-SPI with HOST and execute in place modes                                                                                   |
| Memory Protection              | SRAM parity and ECC for safety providing best-in-class SER-FIT performance                                                                                                                                                   |
| Industry Standard Connectivity | USB2.0HS, SDIO/eMMC, CAN 2.0, and more                                                                                                                                                                                       |
| Fast Time to Market            | Efficient C compiler, optimized libraries, and hardware reference designs                                                                                                                                                    |

## CrossCore Embedded Studio

- CrossCore® Embedded Studio™ is ADI's New Eclipse™-based tool chain
  - IDE and debugger
  - Compilers, assemblers, linker, loader
  - Algorithms and DSP libraries
- Add-ins enable graphical configuration and code generation
- Low cost ADSP-BF70x development board
  - ADZS-BF707-EZLITE
  - Optional EZ-Extenders for increased features
- USB-based JTAG Emulators
  - Low cost ICE-1000 (ADZS-ICE-1000)
  - High performance ICE-2000 (ADZS-ICE-2000)
  - USB powered and JTAG/SWD up to 46 MHz
  - ARM® CoreSight™-based trace for program and system debug



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