



Phoenix 3 CD SoC

Product Brief

The **Phoenix III CD** is an SoC targeted for CD home-theater receivers and mini-components applications. It integrates all required CD AFE/servo, audio and microcontroller (MCU) functions in a 176-pin Low Profile Quad Flat Pack (LQFP) package.

For lowest system BOM, the **Phoenix III CD** adopts a unified memory architecture to minimize memory cost. The **Phoenix III CD** eliminates the external MCU by integrating an IR receiver, 3 key ADCs, a VFD controller interface, timers, GPIOs, 2 I2C master controllers, 2 UART controllers, and advanced power management to support remote control, VFD display, buttons/LEDs, software real-time clock, system monitoring/control and extremely low power consumption in standby mode.

In addition to the CD front-end and servo controller, **Phoenix III CD** SoC integrates a 32-bit RISC and a 64-bit media processor for audio decoding, post-processing, lip-synchronization and sound effects such as virtual surround and bass enhancement, a hardware parametric equalizer (PEQ) for speaker equalization, an automatic gain limiter (AGL) for anti-clipping control, a user-programmable 32-bit Audio Coprocessor for custom sound algorithms, a 2.1-channel patented HyperStream™ Class D or D/A converter for driving digital or analog power stages, a 4-input HyperStream™ stereo ADC for connection to line input sources, a MIC ADC for Karaoke microphone input, a 2-input SPDIF/ARC receiver for connection to coaxial, optical, HDMI and ARC input sources, a full-speed USB host controller for firmware upgrade or music playback from thumb drives or iPod, and an SDIO interface for connection to embedded storage like eMMC.

For best sound, the **Phoenix III CD** SoC is built on the ESS SABRE DAC technology normally found only in high-end audiophile and professional audio equipments to deliver spectacular music with an unsurpassed sound stage, utilizing the ESS patented HyperStream™ modulator capable of 100% modulation and unconditional stability to drive analog or digital amplifiers.

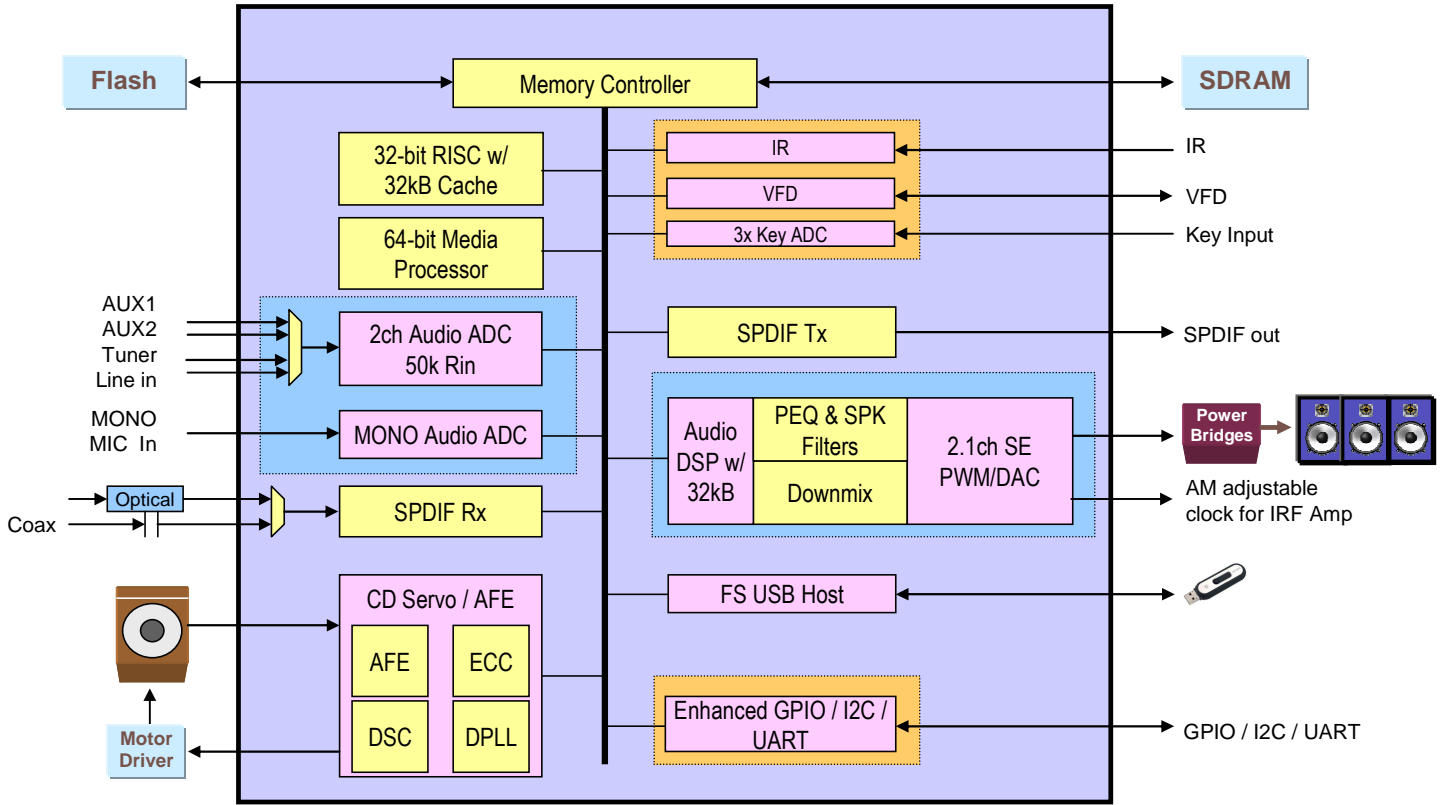
FEATURE	BENEFIT
Highest integration for CD home theater receivers and soundbars	Lowest system BOM cost
Enhanced 32-bit RISC controller with IR receiver, 3 key ADCs, timers, GPIOs, VFD controller, I2C master, UART and advanced power management	Eliminate multiple MCUs for system control/monitoring <ul style="list-style-type: none"> IR, VFD, Keys and system control Low standby power
Field proven CD/HTiB Decoder Core <ul style="list-style-type: none"> CD/MP3/WMA Decoder 5th generation CD Servo/AFE FS USB Host SDIO interface 	<ul style="list-style-type: none"> Playback CD and all popular audio formats Superior media compatibility & playability Firmware upgrade, playback from iPod or thumbdrives Embedded storage such as eMMC
Patented Hyperstream™ PWM/DAC <ul style="list-style-type: none"> 2.1ch output in PWM/DAC/I2S modes Hardware Parametric Equalizer Hardware AGL 	Eliminate external DSP/PWM modulator <ul style="list-style-type: none"> Drive analog or digital amplifier Realistic audio from tiny speaker/enclosure Support amplifier anti-clipping
Audio Postprocessing <ul style="list-style-type: none"> Sound effects Audio DSP w/ 32kB SRAM 	Eliminate external DSP <ul style="list-style-type: none"> Virtual Surround Speaker, AV sync etc. Custom algorithms
Versatile Audio Input <ul style="list-style-type: none"> 4-input enhanced ADC (50kΩ impedance) MIC ADC with digital echo mixer 2-input SPDIF/ARC receiver 	Eliminate external SPDIF receiver & ADC <ul style="list-style-type: none"> CD quality analog audio input Karaoke input and mixing Connect to optical/coax/HDMI or Audio Return Channel



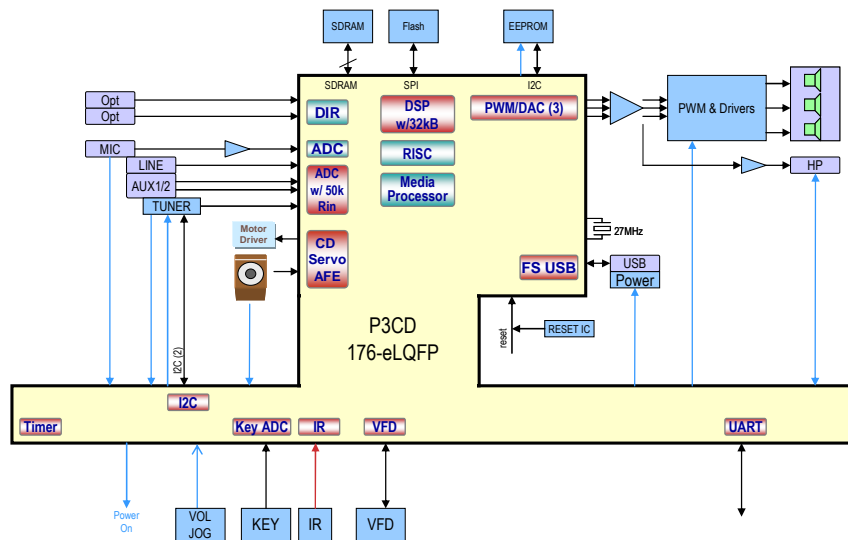
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FUNCTIONAL BLOCK DIAGRAM

P3CD – 176eLQFP



APPLICATION DIAGRAM



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