portalplayer™

PP5002

digital media management system-on-chip

Description

The PP5002 SuperIntegration™ System-On-Chip is a complete digital audio system featuring dual ARM7TDMI® microprocessors and twice the performance of the leading competitors.

The PP5002 supports encoding/decoding of digital audio data directly to and from flash or rotating storage media. A GLF™ (Glue-Logic Free) interface to most major storage media, including leading solid-state formats and Enhanced IDE devices, is included. Integration of key peripheral controllers, including USB, LCD, and communications interfaces, equip the PP5002 with the functionality required to build a complete embedded consumer audio system.

PortalPlayer™ supports the PP5002 with an embedded OS that includes robust development tools enabling custom feature sets and enhancements. The PP5002 is designed to provide an easy upgrade path for next generation codecs and DRMs.

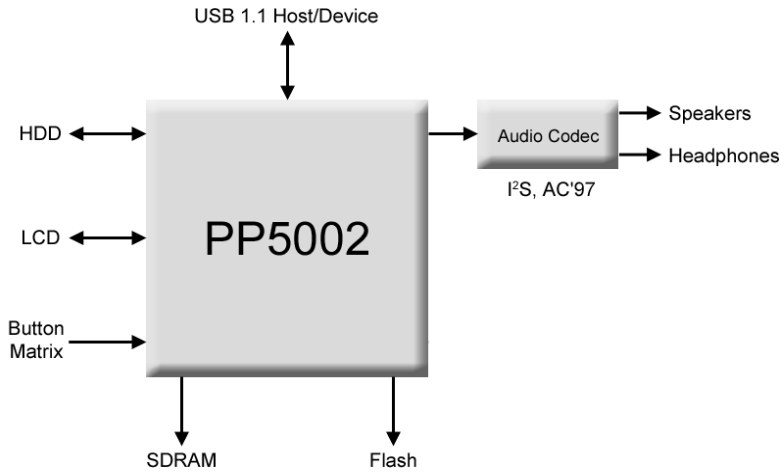
Features

- Real-time encoding of MP3 and ACELP.NET audio formats
- Real-time decoding MP3, WMA, AAC, and ACELP.NET formats
- Supports robust data encryption/decryption, including Microsoft® DRM technologies
- Capable of multiple audio processing effects (5-band graphic EQ, preset listening modes, bass boost, etc.)
- Low power and suspend mode operation provide more than 13 hours of playback from a single AA battery
- Provides integrated SDRAM, SRAM, and NAND Flash controllers
- GLF™ interface to E-IDE CD-ROMs, CD-R/Ws, HDDs, and/or IBM Microdrives™
- GLF™ interface to Memory Stick®, SmartMedia™, MultiMediaCard, SD Card, and CompactFlash™
- Integrated USB 1.1 device controller
- Controller and bridge interface to LCD panels
- Two RS232 serial interfaces
- I^2C Serial Control Interface and S/P-DIF interface supporting industry standard digital audio
- Supports 'AC97 and I^2S Audio Codecs

Applications

- HDD-based audio jukeboxes
- "PC-Free" MP3 CD-R/W recorders
- Automotive audio equipment
- Consumer and commercial media servers

Typical Application



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Dual ARM Processors

- Symmetric dual 32-bit ARM7TDMI processors capable of running at 90 MHz per core
- Latest generation AMBA high-speed internal bus interconnect for improved inter-module performance
- Four routable interrupts with multi-level capabilities provide an efficient multi-threaded, multi-tasking operating environment
- Efficient cross-bar implementation provides multiprocessor support while reducing memory and interrupt latencies

Memory and Storage Media Controller

- Integrated memory subsystems include 96 KB of on-chip SRAM
- Supports two banks of SDRAM (up to 128 MB per bank) on 16-bit data bus
- Supports two banks of NOR flash (up to 128 MB per bank) on 8- or 16-bit data bus
- Support for up to four banks of SRAM
- Dual-bank support for NAND flash with up to 128 MB per bank
- Integrated cache controller supports 8 KB per processor

Peripheral Controllers

- An integrated USB 1.1 device controller
- Integrated RS-232 ports (2) and I^2C interface to provide enhanced flexibility in connecting to other systems
- Integrated LCD controller for 4-bit single-scan monochrome panel
- Integrated GLF™ LCD interface
- 8x8 button matrix enabling support for up to 64 buttons.
- E-IDE interface for hard disk drives, CD-R/W drives, IBM Microdrives™ and other storage devices
- Multiple interfaces to solid-state memory formats
- Support for infrared (RC5), key matrix and GPIO interfaces

Audio CODEC and Serial Interfaces

- Multi-channel digital interface supports AC '97 and I^2C codecs (including AMC97 Modem extensions)
- Multiple serial interfaces including I^2S stereo in/out as master or slave and I^2C
- Industry-standard S/P-DIF interface

Power Management

The PP5002 features advanced power management capabilities that enable shutdown of most functional modules when not in use, providing significant power savings and longer battery life. Advanced clock management and battery management capabilities are also available.

- More than 13 hours of playback from one AA alkaline battery*
- Modular suspend/resume for intelligent power management
- Clock frequencies programmable from 32KHz to 90MHz for optimal performance and power consumption
- Smart battery logic for energy level monitoring

Development Support

PortalPlayer drives the PP5002 with the powerful Digital Media Firmware Developer's Kit (FDK).

The FDK allows developers to rapidly create differentiated platforms based on a complete suite of standard functions, database engines, codecs, etc.

PortalPlayer's in-house development staff can help develop or support your specific firmware requirements.

Test and Debug Support

The PP5002 features a JTAG port that permits full in-circuit emulation and device control using industry standard emulation tools from ARM. In addition to in-circuit emulation, flash programming and product testing can be performed through the JTAG port.

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* Actual playing time may vary, depending on system components and features enabled.

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Architecture

The Architectural Diagram for this product is available under NDA.

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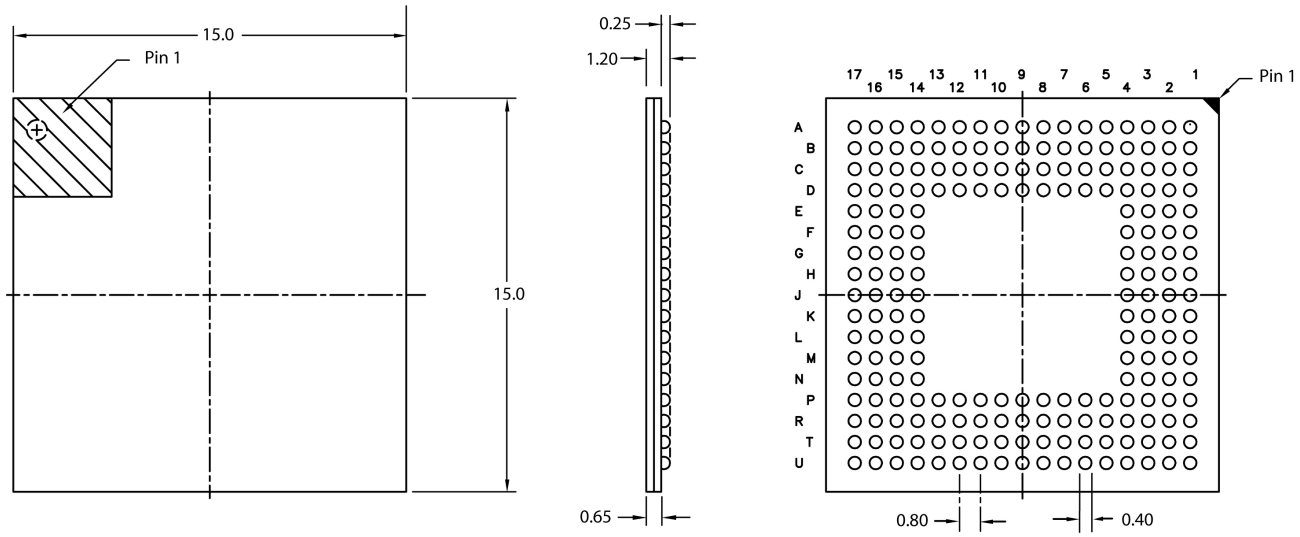
Specifications

	Min	Typ	Max	Units
Operating Conditions				
Core Supply Voltage	1.7	1.8	2.0	VDC
I/O Supply Voltage	3.0	3.3	3.6	VDC
Operating Temperature				
Standard	0	25	70	^{O}C
Automotive	-50		85	^{O}C
Power Consumption				
MP3 Decode	—	170	—	mW
Standby	—	300	—	µW
General				
Operating Frequency	32 KHz	—	90 MHz	—
LBGA Dimensions	L: 15.0	W: 15.0	H: 1.2	mm
TQFP Dimensions	L: 28.0	W: 28.0	H: 1.6	mm

Package

The 208-pin LBGA package is shown for illustration. A 208-pin TQFP package is also available. Please contact PortalPlayer for details.



PortalPlayer Digital Audio Platform

This document describes one of four components included in PortalPlayer's digital audio platform: System-On-Chip ICs, a customizable firmware suite, PC software, and integrated third-party services. PortalPlayer's extensive systems experience ensures support for your design and integration programs; from portable digital audio player/recorders and hybrid home stereo systems, to mass-storage-equipped digital jukeboxes and car audio systems. We blend PC knowledge and embedded design expertise to deliver innovative base platforms for consumer-friendly, feature-rich audio products.

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