portalplayer™

PP5020

digital media management system-on-chip

Description

The PP5020 SuperIntegration™ System-On-Chip is a complete digital media system featuring dual ARM7TDMI® microprocessors, Hi-Speed USB 2.0 with "On-The-Go" support, and FireWire® (IEEE1394a) connectivity.

The PP5020 has 160 MIPS of processing horsepower for encoding of digital audio and decoding of JPEG images and digital audio. A dedicated, high-performance ATA-66 IDE controller with its own DMA engine frees the processors from mundane management tasks.

The level of integration in the PP5020 minimizes system BOM cost for HDD- and CD-based digital media devices. You can design a battery powered HDD-based portable jukebox using the PP5020 without the need for an external USB controller, battery monitor ADC, or LCD controller.

PortalPlayer™ supports the PP5020 with an embedded OS that includes robust development tools enabling custom feature sets and enhancements.

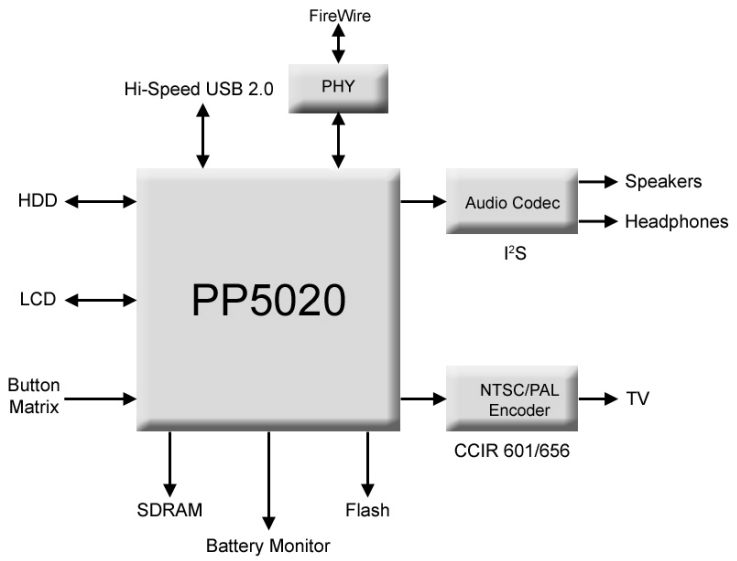
Features

- High-speed encoding of MP3 and ACELP.NET audio formats
- Real-time decoding of MP3, WMA, AAC, and ACELP.NET formats
- Real-time decoding of JPEG and MJPEG formats
- TV Out—CCIR 601/656 8-bit digital video output to external NTSC/PAL encoder
- Support for up to four Enhanced IDE CD-ROMs, CD-R/W drives, ATA-66 HDDs, and/or IBM Microdrives™
- Integrated SDRAM and NOR flash controllers
- Integrated Hi-Speed USB 2.0 host and device controllers with "On-The-Go" dual role support
- Integrated FireWire Link Layer Controller with UTML interface
- Direct interface and bridge interface to LCD panels
- RS-232, I^2C, and three-wire controller (TWC) serial interfaces
- S/P-DIF interface supporting industry standard digital audio
- Integrated 8-bit 4-channel ADC for battery monitor, thermal monitor, and touchscreen
- Four channels of pulse-width modulated outputs

Applications

- HDD-based audio/photo jukeboxes
- "PC-Free" MP3 CD-R/W recorders
- HDD-based portable still image storage devices

Typical Application



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Dual ARM Processors

- Dual 32-bit ARM7TDMI processors
- Up to 80 MHz processor operation per core with independent clock-skipping feature on COP
- Efficient cross-bar implementation providing zero wait state access to internal RAM
- Integrated 96KB of SRAM
- 8KB of unified cache per processor
- Six DMA channels

Memory Controller

- 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

Audio Interfaces

- Direct interface to I^2S stereo audio codec in master or slave modes
- Direct interface to S/P-DIF optical transceiver for digital audio input or output

Display Interfaces

- DTV controller supports TFT panels up to 640 x 480, 18-bit, 5:6:5 RGB data, 60Hz refresh rate
- Integrated LCD controller drives single-scan 1-, 2-, or 4-bit monochrome STN panels
- Bridge interface to intelligent LCD panel drives 1-bit, 4-bit or 8-bit interfaces
- TV output connects directly to an external NTSC/PAL encoder via a CCIR 601/656 standard interface

Peripheral Interfaces

- Integrated Hi-Speed USB 2.0 “On-The-Go” controller and transceivers that can operate in host, device, or “On-The-Go” dual role mode, at any USB transfer speed
- Integrated FireWire Link Layer Controller conforming to IEEE1394-1995 at 400 Mbps and connects to an external FireWire Phy via an 8-bit Link-Phy interface
- Support for 13 dedicated GPIOs for player navigation controls
- 5 x 8 matrix enabling up to 40 buttons
- ATA-66 interface for hard disk drives, CD-R/W drives, IBM Microdrives™ and other storage devices
- Interface to CompactFlash™ cards
- XIO-emulated interface to SmartMedia™ cards
- TWC interface provides support for CD-ROMs, playback of CDDA audio, and compressed digital audio formats
- Support for infrared remote, key matrix, and GPIO interfaces
- Four optosensor inputs enabling next-generation multi-dimension human interface controllers such as 3D joysticks and XYZ controllers
- Four PWM outputs for contrast and brightness control
- I^2C serial control interface operating in both master and slave mode

Power Management

The PP5020 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 and battery management capabilities are also available.

- More than 15 hours of playback from one AA alkaline battery *
- Modular suspend/resume for intelligent power management
- Clock frequencies programmable from 32KHz to 80MHz for optimal performance and power consumption
- Integrated 8-bit, 4-channel ADC for energy level monitoring

Test and Debug Support

The PP5020 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.

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

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Development Support

PortalPlayer drives the PP5020 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 requirement.

Architecture

The Architectural Diagram for this product is available under NDA.

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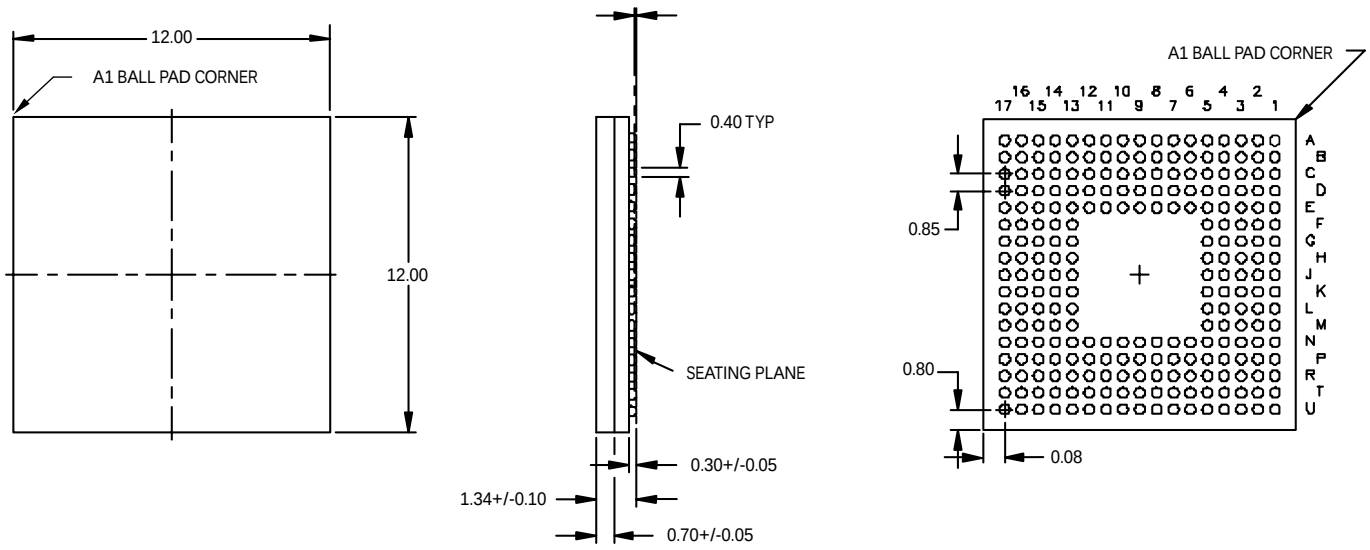
Specifications

	Min	Typical	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	0	25	70	OC
Power Consumption				
MP3 Decode	-	TBD	-	mW
Standby	-	TBD	-	µW
General				
Operating Frequency	32KHz	-	80MHz	-
Package Body Dimensions	L:12	W:12	H:1.5 (max)	mm

Package

The following diagram shows the PP5020 240-pin TFBGA package.



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-arty services. PortalPlayer's extensive systems experience ensures support for your design and integration programs; from portable digital audio player/recorders and hybrid home stereo /stems, 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-iendly, feature-rich audio products.

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