PP5022

**digital media management system-on-chip**

Description

The PP5022 SuperIntegration System-On-Chip is a complete digital media system featuring dual ARM7TDMI® microprocessors, integrated MAC for high efficiency encoding and decoding, extremely low power consumption, Hi-Speed USB 2.0 with host and device support, and various other system features.

The PP5022 has 200 MIPS of processing power for encoding / decoding of digital audio and JPEG images. A dedicated, high-performance, dual-channel ATA-66 IDE controller provides support for up to four drives and, with its own DMA engine, frees the processors from mundane management tasks.

The level of integration in the PP5022 minimizes system BOM cost for audio and photo/video-based digital media devices. A battery powered HDD-based portable media player can be designed using the PP5022 without the need for an external USB controller, battery monitor ADC, or LCD controller.

Features

- Real-time decoding of MP3, WMA, AAC, and ACELP.NET formats
- High-speed encoding of MP3 and ACELP.NET audio and JPEG image formats
- Real-time decoding of JPEG, MJPEG, and MPEG4 image and video formats
- Low power design – uses ultra-low 1.2V core supply voltage and system enabled dynamic voltage scaling
- Video Input – CCIR compatible video input enables simple connection of image sensors
- 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 1'' drives from Hitachi, GS Magic, Seagate and Cornice
- Integrated SDRAM and NOR flash controllers with support for 1.8V and 2.5V low power mobile SDRAM
- Integrated Hi-Speed USB 2.0 host and device controllers
- Integrated TFT and STN Color Display controllers and bridge interface
- RS-232, I^{2}C, and three-wire controller (TWC) serial interfaces
- Integrated SDMMC controller enables SDIO compatibility
- Integrated 8-bit 4-channel ADC for battery monitor, thermal monitor, and touchscreen
- Four channels of pulse-width modulated outputs for tone generation and other system control
- Register-set compatible with the PP5020, allowing easy code migration
- Available in a new, thinner TFBGA package with a 12mm X 12mm footprint
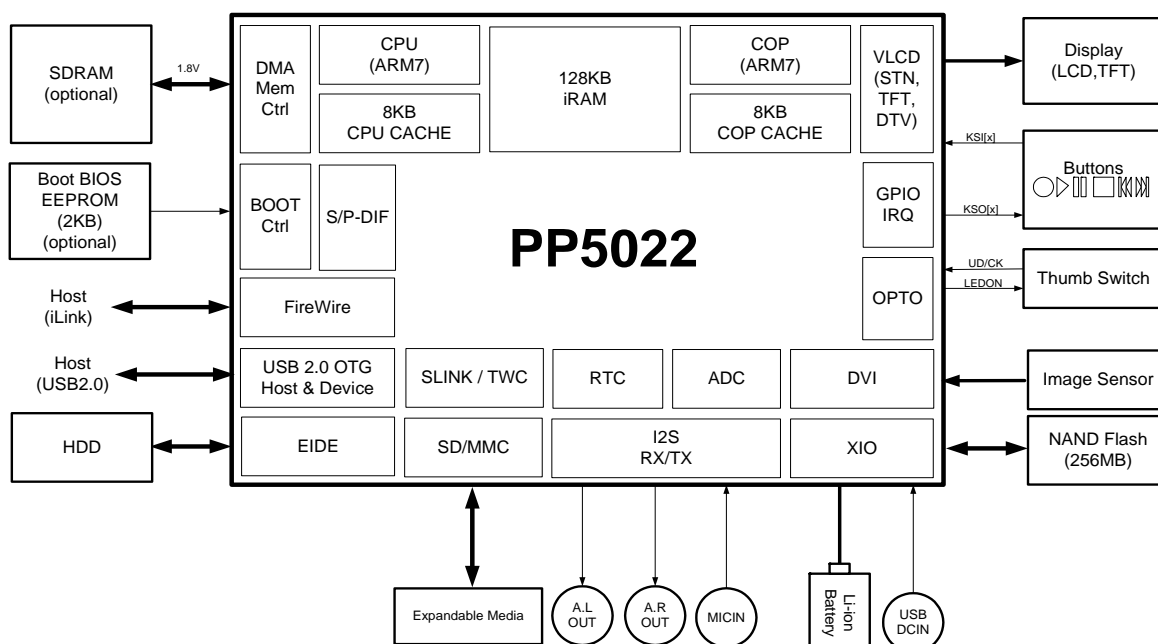
Dual ARM Processors

- Dual 32-bit ARM7TDMI processors
- Up to 100 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 128KB of SRAM
- Integrated MAC for ultra-efficient encode and decode
- 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
- Supports 1.8V and 2.5V low power mobile SDRAM

Display Interfaces

- DTV controller supports color 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 color or grayscale 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
- Digital Video input provides standard CCIR interface for direct image sensor input

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

Peripheral Interfaces

- Integrated Hi-Speed USB 2.0 controller and transceivers that can operate in host or device mode, at any USB transfer speed
- SDIO Controller – Provides high-speed data throughput for memory and system upgrade cards
- ATA-66 interface for hard disk drives, CD-R/W drives, 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 13 dedicated GPIOs for player navigation controls
- 5 x 8 matrix enabling up to 40 buttons
- 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 PP5022 features advanced power management capabilities that enable shutdown of most functional modules when not in use, providing significant power savings and longer battery life.

- Supports mobile SDRAM @ 1.8V or 2.5V
- 300% power reduction compared to PP5020
- Modular suspend/resume for intelligent power management
- Clock frequencies programmable from 32 KHz to 100 MHz for optimal performance and power consumption
- Integrated 8-bit, 4-channel ADC for battery level monitoring
- Ultra-low 1.2V core supply voltage and system enabled dynamic voltage scaling

Development Support

PortalPlayer™ supports the PP5022 with an embedded firmware framework and FDK that includes robust development tools enabling custom feature sets and enhancements.

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.
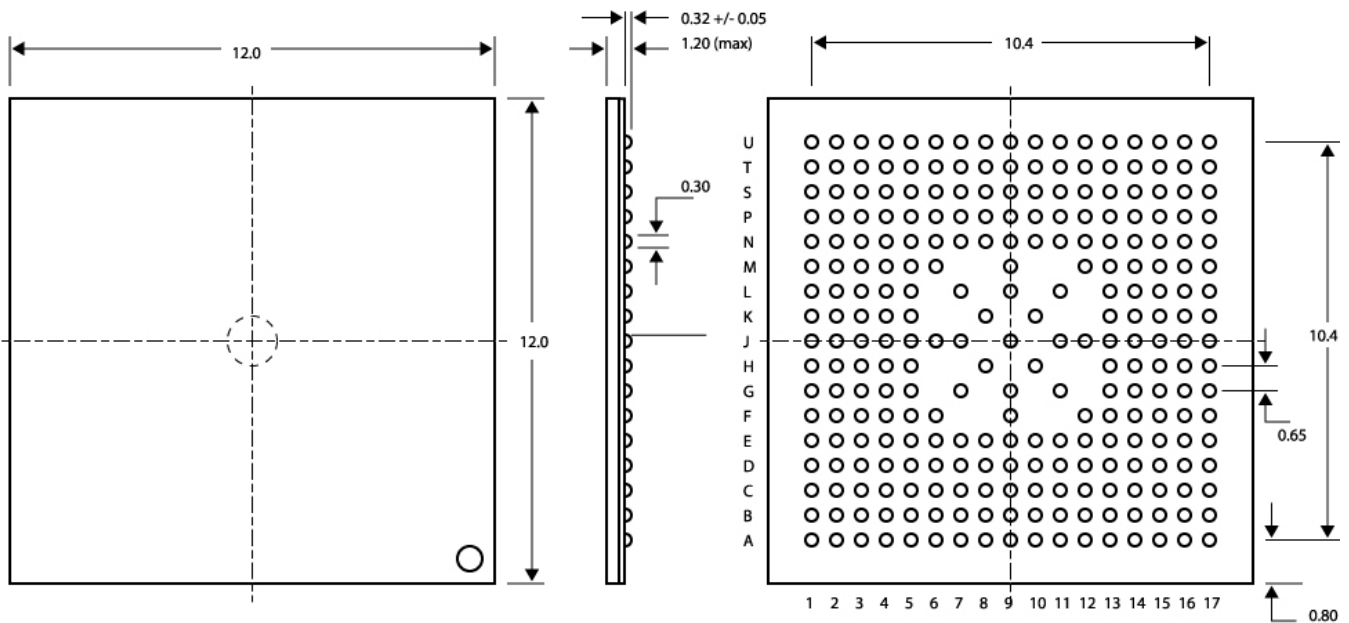
Test and Debug Support

The PP5022 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.

Specifications

	Min	Typical	Max	Units
Operating Conditions				
Core Supply Voltage	1.14V	1.2V	1.32V	VDC
I/O Supply Voltage	1.8V	3.3V	3.6V	VDC
Operating Temperature	-40C	25C	85C	OC
Power Consumption				
MP3 Decode	-	60-80	-	mW
Standby	-	TBD	-	µW
General				
Operating Frequency	32KHz	-	100MHz	-
Package Body Dimensions	L:12	W:12	H:1.2 (max)	mm

Package

The following diagram shows the PP5022 261-pin TFBGA package.