PM-36

Driving the Digital Lifestyle

JPEG Image Processor

Imaging | Software | Processors | Quatro SOCs | Solutions

Product Brief

Zoran Corporation
1390 Kifer Road
Sunnyvale, CA 94086-5305

www.zoran.com

The PM-36 is a fixed-function Codec device that delivers high speed JPEG compression/decompression of color and grayscale image data. An ISO standard for lossy image compression, JPEG can reduce the size of image data without a noticeable difference in image quality. This improves system performance of peripheral-based applications by reducing bandwidth and storage requirements. The PM-36 is ideal for high resolution imaging applications such as copiers, scanners, printers and multifunction peripherals, particularly in networked environments.

Benefits

- **High Performance**–JPEG Imaging Codec–Delivers sustained data rates of up to 110 MB per second
- **Efficient Coding**–four loadable Q-Tables and two loadable Huffman table pairs
- **Highly Integrated**–Internal Phase-Locked Loop (PLL)
- **3.3 Volt supply**–5 Volt Tolerant I/O
- **Standard Compliant**–ISO IS 10918-1/10918-2

Key Features

- Conforms to ISO IS 10918-1/10918-2 JPEG baseline for grayscale and color
- 80 MHz clock speed for sustained 80 MB/second throughput (Raster or Block mode operations)
- 110 MHz clock speed for sustained 110 MB/second throughput (Block mode operations only)
- 3.3 Volt power supply
- Four selectable quantization tables
- Two pairs of loadable Huffman tables
- Programmable code rate control
- Programmable code size control (single pass)
- Raster and block data formats
- Internal 256-byte buffers on input and output ports
- I/O modes supporting transfer rates up to 40 MHz (280 MB/per second)
- Internal Phase-Locked Loop (PLL)
- Horizontal 2:1 subsampling and upsampling support for 4:2:2 formats using 2 or 3 point filters (Raster mode operations only)

Description

High Throughput

The PM-36 can sustain data rates of 80 or 110 MB per second to support real time operations. In addition, it implements two advanced features that maximize throughput and system performance:

- Programmable code rate control–This optional mode limits the encoded output data bandwidth to a predefined rate by dynamically reducing the quantization accuracy on a block-by-block basis, as required. This assures maximum throughput in high-speed peripherals.
- Programmable code size control–This mode allows definition of an upper limit for the size of the encoded output file so that it does not exceed a fixed memory buffer size. This is achieved in a single pass of the data, with no degradation in performance.

Efficient Coding

The PM-36 features several advanced JPEG coding techniques for improved efficiency. Four loadable Q-tables are available for dynamic quantization control on a block-by-block basis. In addition, The PM-36 contains two loadable Huffman table pairs, which improves coding efficiency by allowing the system to use different encoding factors with out reprogramming the device.

Highly Integrated

The PM-36 features an internal Phase-Locked Loop (PLL) that enables the chip to generate its main internal clock frequency from a lower-frequency signal. This reduces emissions and simplifies board design, particularly in systems using low-power CPUs and no external SRAM.

Product Brief

Descriptions (continued)

PM-36 Capabilities

The PM-36 enables the following combinations of operations to be performed on the data stream during one pass through the device:

- Raster format image data: Converted to Block mode, subsampled 2:1, and JPEG encoded
- Block format image data: JPEG encoded
- JPEG-encoded data: JPEG decoded to raw format, upsampled 2:1, and output in Block or Raster format

Design Considerations

The PM-36 can be easily integrated into a variety of systems. Design features include:

- A simple peripheral interface for use with any standard processor
- Programmable control port bus width (16 or 32 bits)
- Flexible input and output ports, which simplify system design
- Input and output ports can be sized at 8, 16, 24, or 32 bits wide and contain bit, byte and word order controls to match any processor bus requirements
- 256-byte buffer on both input and output ports can minimize or even eliminate external buffering requirements
- High speed I/O modes, synchronous FIFO and Burst DMA modes

The PM-36 requires little in the way of external support chips. A minimal system requires only a frequency source. An external SRAM array (up to 4 MB) may be added to enable raster format data streams. The external SRAM is used to store input or output lines for raster-to-block or block-to-raster conversion operations

PM-36 Specifications

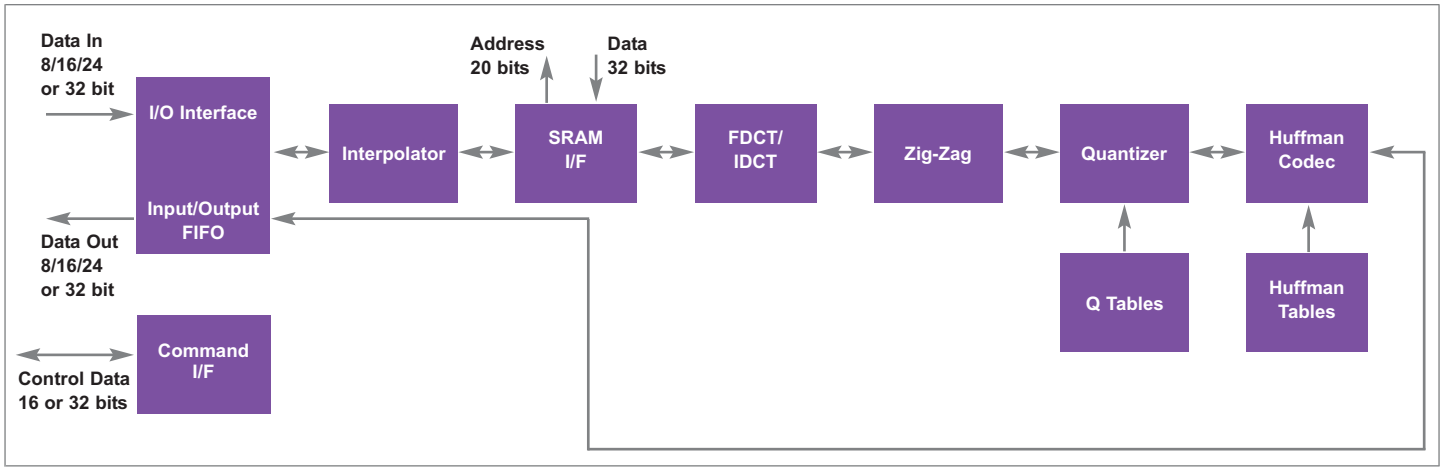
Formats Supported

- Grayscale pixels in Raster or Block format (8 bits per pixel)
- Color pixels in Raster or Block format (8 bits per component)
- JPEG-encoded data

Electrical Specification

- 3.3 Volt power supply
- 5 Volt tolerant I/O (TTL-compatible I/O)
- Designed and fabricated in 0.35 micron standard cell technology
- Available industry-standard 208 PQFP package with 0.5 mm lead spacing
- Also available in lead-free “green” packaging

PM-36 Block Diagram



© Copyright 1999-2006 Zoran Corporation. All rights reserved. Zoran and the Zoran logo are trademarks of Zoran Corporation. All other names used are owned by their respective owners. Zoran Corporation makes no guarantee concerning the accuracy of the information contained herein and further does not guarantee that the use of such information will not infringe the rights of any third party. Zoran will not be responsible for any loss or damage of whatever nature resulting from the use of, or reliance upon, the information. Zoran reserves the right to make changes in the product and/or specifications presented herein at any time without notice.

Zoran Corporation **www.zoran.com**

imaging.usa@zoran.com • **imaging.japan@zoran.com** • **imaging.taiwan@zoran.com** • **imaging.korea@zoran.com**