Product Brief

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The PM-36 is a fixed-function iCODEC 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 multi-function peripherals, particularly in networked environments.

Benefits

• High Performance JPEG Imaging CODEC—Delivers sustained data rates of up to 110 MB per second

• Efficient Coding—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 and 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 requements

• 256-bytes 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
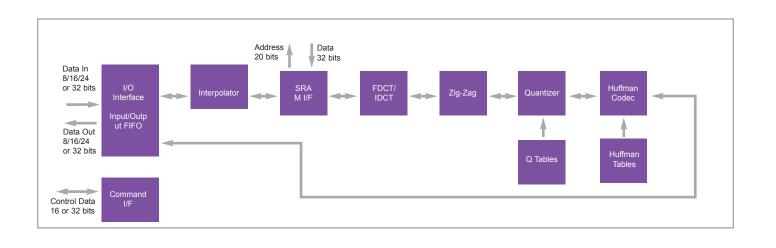
PM-36 Specifications

Formats Supported

• Gray scale 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

PM-36 Block Diagram