

# LM9701 Digital Image Processor w/ Integrated Pre-processor

## General Description

The LM9701 is a cost effective, digital image processor based around the ARM7™ 32 bit RISC processor. The chip has been designed to operate with National's family of advanced CMOS image sensors allowing a complete camera solution for imaging applications.

## Features

- Embedded 32 bit ARM7™ TDNI RISC processor system
  - 16K bytes of internal SRAM
  - 8K bytes of instruction Cache
  - 4 channel DMA
- External memory bus supporting:
  - 64 M-byte address space for SRAM and Flash
  - 64 M-bit address space for SDRAM
- Processor Peripherals
  - Two full duplex UARTs
  - $\mu$ wire/SPI serial port
  - Versatile timer
  - ARM timer
  - Interrupt controller
  - 16 general purpose IOs
  - Real time clock
- Glueless CMOS image sensor interface
  - 10 bit data, vsync, hsync and pclk
  - Fast I<sup>2</sup>C compatible serial Interface
- Image Pre-processor
  - Defective pixel correction (up to 1024)
  - Linearization table
  - 4 channel digital gain and offset adjustment
  - Raw data statistics
- Integrated USB v1.1 for connection to PC
- System management
  - Internal Clock generation from 12MHz Crystal
  - Power management
  - Reset generation
  - JTAG based serial on-chip debug interface

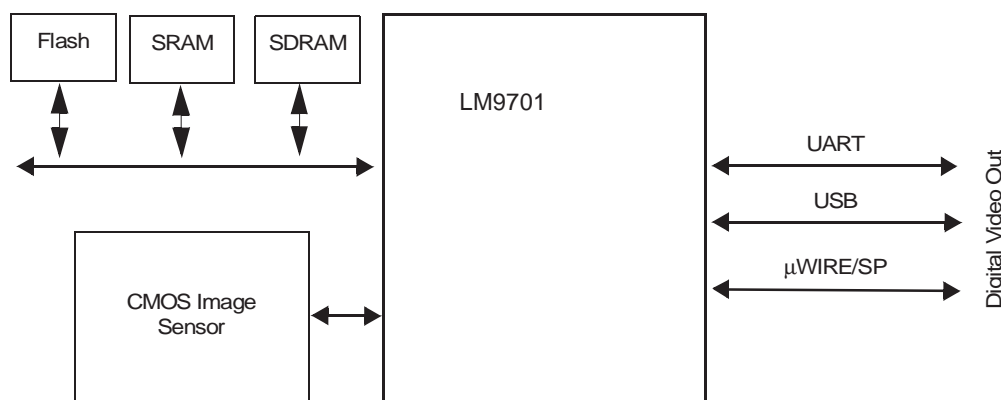
## Applications

- Clip On Camera
- Digital Still Camera
- Industrial Camera
- Automotive Camera
- Security Camera

## Key Specifications

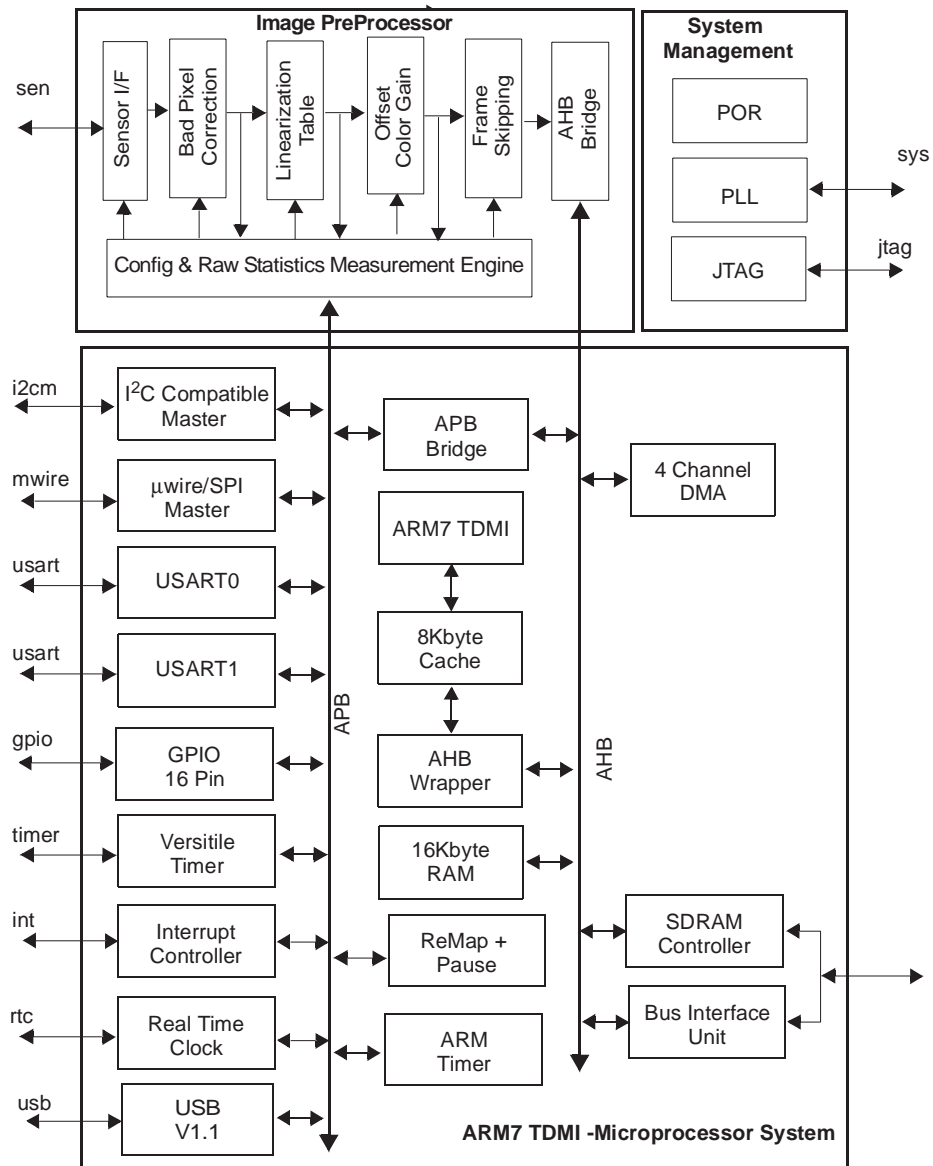
Input Format	Color Bayer Pattern Monochrome
Input Pixel Rate	12 Meg-pixels/s
Digital Image Pre-Processor	10 bit
External Memory <ul style="list-style-type: none"> <li>- Memory Type</li> <li>- Address Space</li> <li>- Speed</li> </ul>	SRAM, Flash, SDRAM 24 bit up to 75MHz
Serial Interfaces <ul style="list-style-type: none"> <li>- I<sup>2</sup>C compatible master</li> <li>- <math>\mu</math>wire/SPI</li> <li>- UART</li> </ul>	up to 400KHz up to 6.0 MHz up to 921.6 K bits/s
32 bit ARM7 Processor <ul style="list-style-type: none"> <li>- MIPS</li> <li>- Internal Memory</li> <li>- Instruction Cache</li> </ul>	up to 75 16K-bytes 8K-bytes
Clock Inputs <ul style="list-style-type: none"> <li>- System</li> <li>- Real Time Clock</li> </ul>	12 Mhz Crystal 32 KHz Crystal
Power Supply <ul style="list-style-type: none"> <li>- Core</li> <li>- IO</li> </ul>	1.8 Volt 3.3 Volt
Power Dissipation	< 100mW
Package	144 LQFP
Operating temperature	-40°C to +85°C

## System Block Diagram



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# Overall Chip Block Diagram



# Connection Diagram

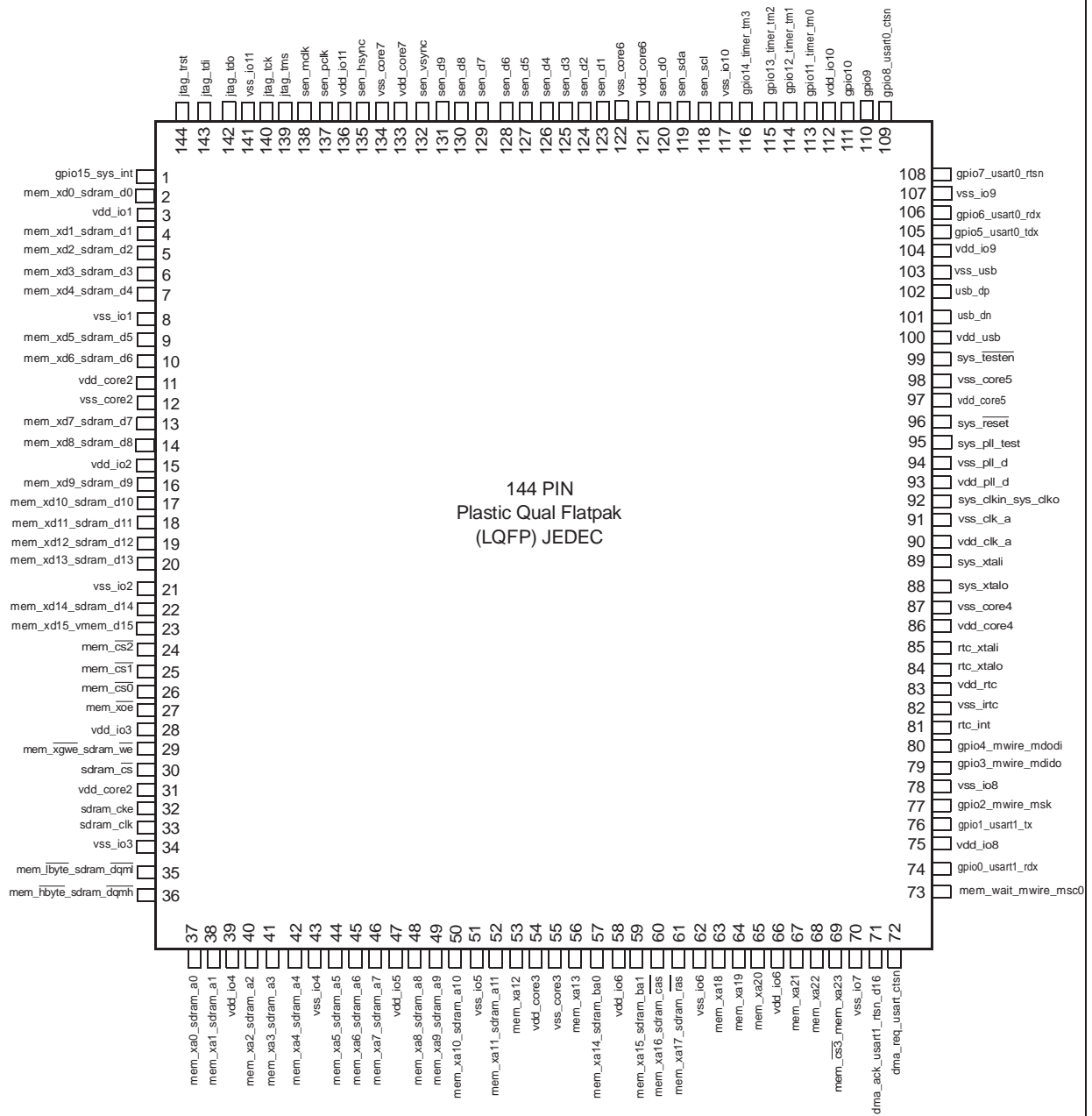


Figure 1. Pin Diagram

## Signal Grouping Diagram

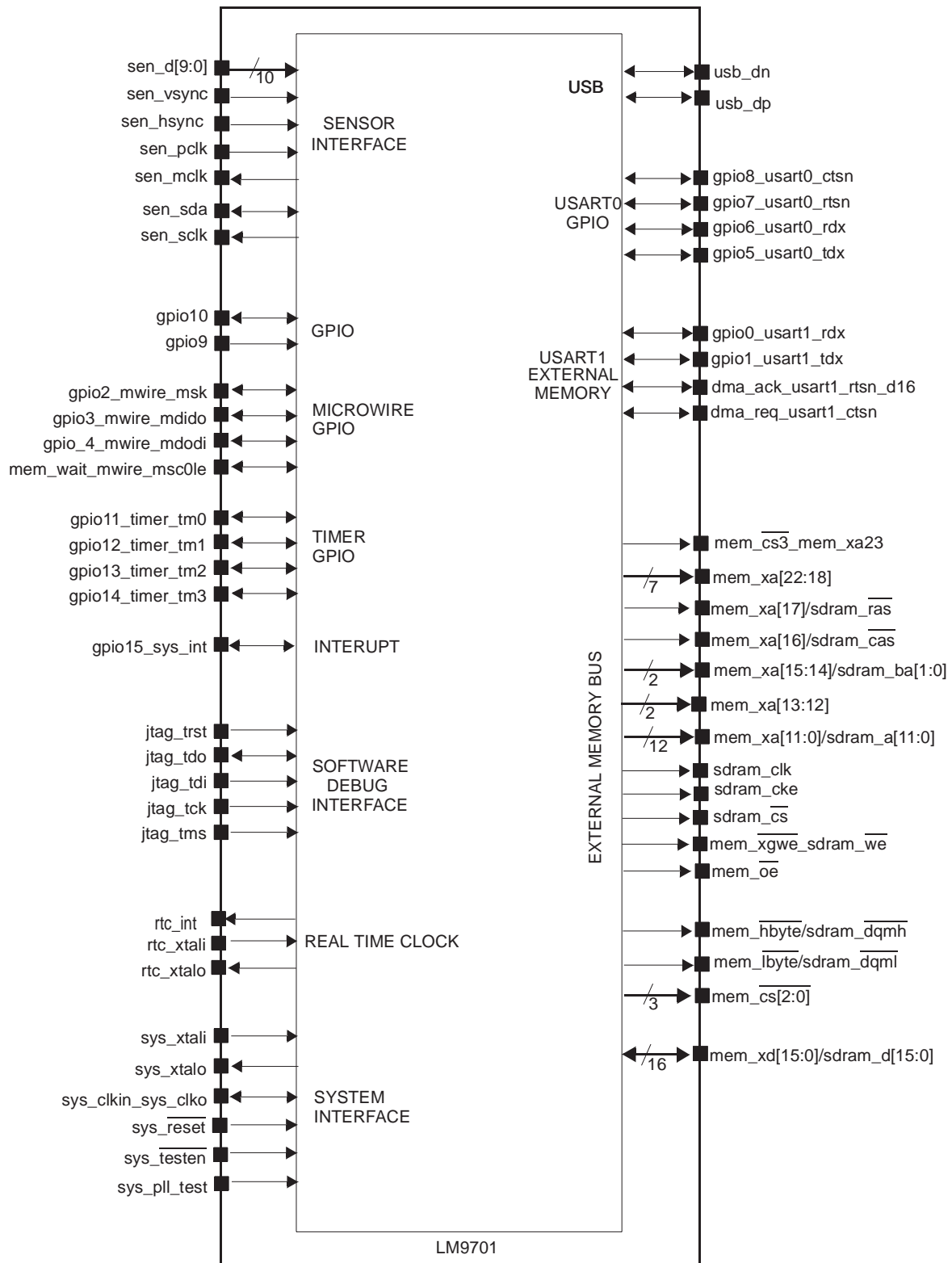
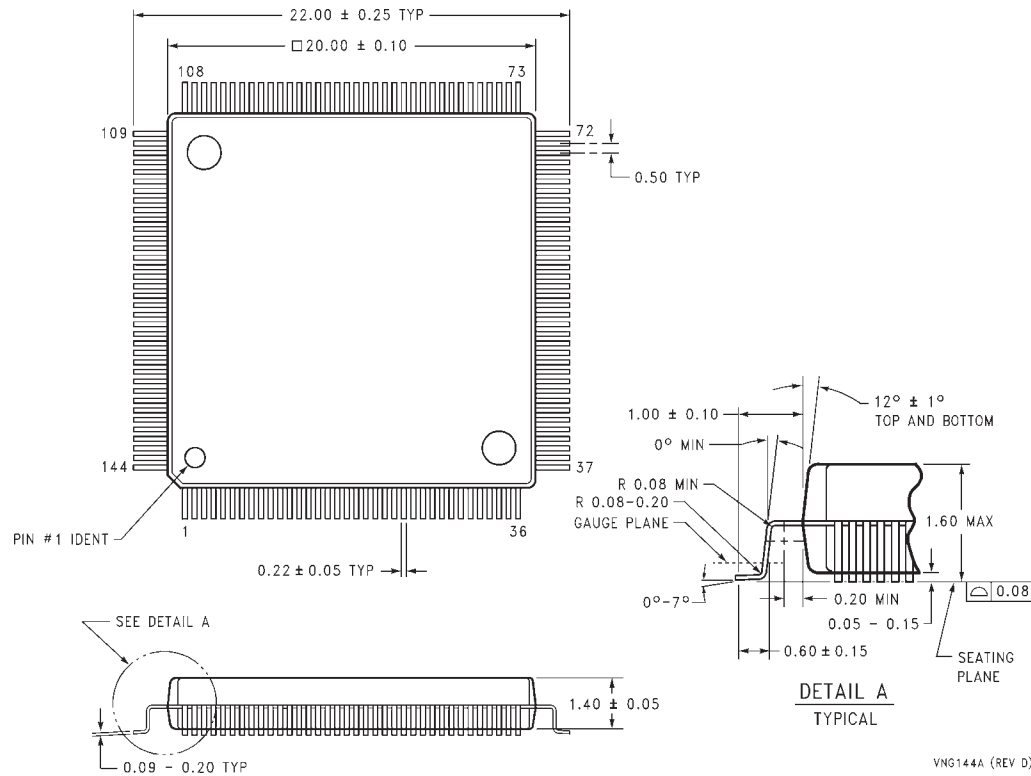


Figure 2. Signal Grouping Diagram

## PACKAGE INFORMATION



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