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Design to a higher standard

VRS51L2070 & VRS51L3074

High performance Versa 8051 MCUs

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Fast + Flexible = Cost-efficient

- The VRS51L2070 and VRS51L3074 **meet the current market demand for a high performance MCU**, without a costly investment in new architecture and code
  - Has the power and speed to **compete with a 16-bit MCU without migrating from an 8-bit device**
  - Compatible with **8051-based architecture, code and development environment**
- Comprehensive set of **highly configurable digital peripherals** enables full integration and **eases the load on the processor**

- Solid and versatile device that can be used to develop a wide array of products and applications
  - Ideal for embedded **data acquisition, sensor and control applications** in the industrial, medical, consumer, instrumentation and automotive markets

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High Performance Single-Cycle 8051 Processor with 40 MHz Operation

- Order of magnitude **faster than standard 8051s**: One of the fastest processors on the market
- Same instruction set as standard 8051s, for **easy device migration**
- Up to **40 MIPS of processing power**
- Allows the **VRS51L2070** and **VRS51L3074 to "muscle" into 16-bit MCU territory** at an 8-bit MCU price

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VRS51L3074: The First FRAM-Enhanced 8051 MCU

- The VRS51L3074 integrates **8K Bytes of FRAM** memory for a quick, reliable **nonvolatile data storage & processing system**
  - Virtually unlimited endurance
  - No need for battery or super cap for data retention
  - Accessed like XRAM
    - Unlike Flash, content of individual FRAM cell can be modified without having to perform a sector erase
  - Fast write access compared to EEPROM
    - Byte write - 366 nanoseconds
  - Fast read access
    - Byte read - 760 nanoseconds

- FRAM **simplifies the design cycle** by eliminating the limited endurance issues accompanying EEPROM/Flash data storage

MULT/ACCU/DIV Unit with Barrel Shifter

- Significantly **outperforms 8-bit processors when executing DSP** operations
- Hardware-based calculation engine that performs:
  - 16-bit signed division (**5 cycles**)
  - 16-bit signed multiplication (**1 cycle**)
  - 32-bit addition (**1 cycle**)
- 32-bit barrel shifter enables **logic/arithmetic shift** operations (scale result upward/downward)
- Access to MULT/ACCU/DIV unit via SFR registers
- Used to implement: FIR filtering, sensor output linearization, multiple bytes arithmetic operations, etc.

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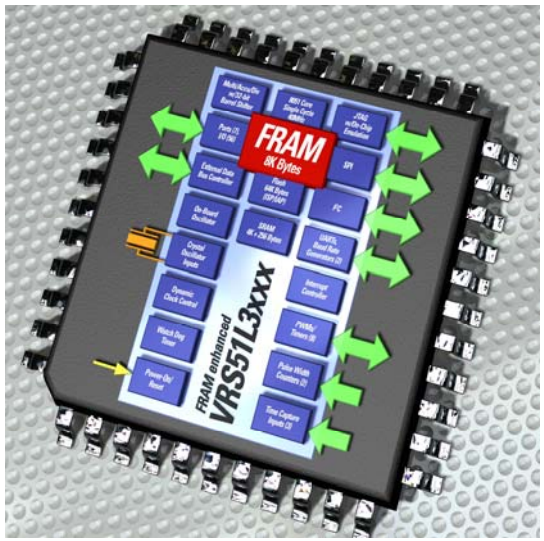
JTAG Interface for Programming/ Debugging/Emulation

- User-friendly and **quick device programming**
- **Real-time in-circuit debugging** of user application without a costly emulator
- Can be used for boundary scan operations to detect system faults

40MHz Precision Internal Oscillator

- No need for an external oscillator, **cutting costs**
- Provides **2% accuracy**
- Internal and external oscillators can be swapped on the fly



Clock Configuration

- **Highly configurable** system clock
  - System clock can be dynamically adjusted from Fosc/1 to Fosc/32768
  - Dynamic clock control significantly **saves power**

Dual UARTs with Baud Rate Generator

- UARTs can **operate at up to 1.25 Mbps**
- Each UART includes a dedicated baud rate generator that features **16-bit resolution** and **4-bit micro baud rate adjustment**
  - Frees the internal timers for other uses
  - Can be used as general purpose, 16-bit timers if the corresponding UART is not used

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Enhanced SPI Interface

- Communication speed is configurable up to **20 Mbps**
- Transaction size is **adjustable from 1 to 32 bits**
- Transmit/receive in **MSB or LSB first format**
- Supports all four standard SPI modes
- Operates in master or slave modes
- Can control up to 4 devices
  - CS lines are controlled automatically
- Provides **many configuration options**

Other Features

- 64KB ISP/IAP Flash, 4KB RAM
- 8KB FRAM (VRS51L3074)
- I²C Interface (Master/Slave)
- Pulse Width Counter Modules
- Three 16-bit Timers
- 8 PWMs (adjustable resolution)
- Watchdog Timer
- 49 Interrupts that share 16 Interrupt Vectors
- Port Change and Pin Change Interrupt

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VersaKit-20xx/30xx

- VersaKit-20xx/30xx includes:
  - Development Board
  - JTAG Programming/Debugging Interface
- Versa Ware JTAG Software:
  - In-Circuit Programming
  - In-Circuit Debugging Interface
- Most standard 8051 ASM and C Compilers can be used to develop code for the VRS51L2070 and the VRS51L3074