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PIC24 Industrial Microcontroller

MCUPIC24-USB

RoHS COMPLIANT

2.0 | RS232 | UART | I2C | SPI | 500ksps | DIO

CPU:
16-bit PIC24F

Performance:
16 MIPS
@ 32MHz

Memory:
16KB SRAM
256KB Flash

Power:
~ 40 mA runtime
~ 100 nA sleep mode

10-bit ADC @ 500ksps

User LEDs

User toggle switches

Form Factor:
2.5" x 2.5"
(63.5mm x 63.5mm)

Operating Temp:
-40°C to +85°C

Operating Humidity:
5% to 95%
non-condensing

Storage Temp:
-55°C to +85°C

MADE IN USA

The MCUPIC24-USB is a mid-range 16-bit microcontroller board designed for low power applications which require a reliable, moderate-performance MCU.

Powered by Microchip's PIC24F microcontroller, the module offers designers a host of features including a 10-bit ADC @ 500ksps, Digital I/O, UART, RS232, I^2C, SPI, Timers / Counters, 8 general purpose LEDs, 8 general purpose toggle switches, USB 2.0 Full Speed (functional as a Host or Client), and much more. The modified Harward Architecture also features a single-cycle hardware Multiplier and Hardware Divider. Furthermore, the module can be configured to receive power through the USB connector or an external system power source via a terminal block.

Using the free MPLAB IDE and vast resources of software libraries and example software available, developers can bring their projects to life with ease and a quick time to market.

The module's small size and low power usage (requiring only 40mA for 16 MIPS performance) also makes the MCUPIC24-USB an excellent candidate for mobile applications and those requiring low power.

The MCUPIC24-USB can be purchased Module only, or as a Development kit which includes a complete Cable Set, and ICD3 Programmer / Debugger.

Software Support

Software Libraries:
- USB
- File System
- Encryption
- and much more!

Example Software:
- C/C++ MCU Code
- Windows App for USB comm.

Development Tools

- Microchip MCPAB IDE
- C30 Compiler
- ICD3 Programmer / Debugger

Electrical @25°C:

Supply Voltage.....+5V DC
Typical Operating Current..... 40mA
Max Operating Current..... 125mA
Idle Current..... 9mA
** Low Power Operating mode and sleep modes available

Memory:

CPU SRAM..... 16 KB
CPU Flash (Program Memory)..... 256 KB
- ▸10,000 erase/write endurance (min)
- ▸20 year data retention (min)
- ▸Selectable write protection boundary
- ▸Self-programmable via software

External EEPROM..... 256 Kbits
- ▸64-byte page
- ▸1,000,000 erase/write endurance
- ▸>200 year data retention
- ▸Self-Timed Erase and Write Cycles

CPU:

- ▸16-bit Modified Harvard Architecture
- ▸Up to 16 MIPS performance @ 32MHz
- ▸17-bit x 17-bit Single-Cycle Multiplier
- ▸32-bit x 16-bit Divider
- ▸16 x 16-bit working Register Array
- ▸Two address generation units for separate read and write addressing
- ▸Internal 32kHz Crystal for low power mode
- ▸Switch between clock sources in Real-Time
- ▸Idle, Sleep and Doze modes with Fast Wake-Up and Two-Speed Start-Up
- ▸Fail-Safe Clock Monitor: detects clock failure and switches to internal clock
- ▸Power-on Reset (POR)
- ▸Power-up Timer (PWRT)
- ▸Low-Voltage Detect (LVD)
- ▸Oscillator Start-up Timer (OST)
- ▸Watchdog Timer (WDT)
- ▸Brown-out Reset (BOR)

Peripherals:

- ▸ Peripheral Pin Select (PPS)
  - ▸Allows I/O pin remapping at runtime
  - ▸Up to 44-pins available
- ▸Five 16-bit Timers/Counters
- ▸Nine 16-bit Capture Inputs
- ▸Nine 16-bit Compare/PWM Outputs
- ▸Digital I/O
  - ▸5.5V Tolerant Inputs
  - ▸Configurable Open-Drain Outputs
  - ▸High-Current Sink/Source (18mA)
- ▸8-bit Parallel Master/Slave Port (PMP/PSP)
  - ▸Up to 16 address pins
  - ▸Programmable polarity on control signals
- ▸Hardware Real-Time Clock/Calendar (RTCC)
  - ▸Provides cloock, calendar, alarms
- ▸Cyclic Redundancy CheckGenerator (CRC)
- ▸Up to five External Interrupt Sources

Communication Protocols:

- ▸ Up to three 3-Wire/4-Wire SPI modules
  - ▸4 Frame Modes
  - ▸8-level FIFO Buffer
- ▸Up to three I^2C modules
  - ▸Multi-Master or slave modes
  - ▸7-bit/10-bit addressing modes
- ▸Up to four UART modules
  - ▸Supports RS-485, RS232, LIN/J2602 protocols and hardware IrDA.
  - ▸Auto-wakeup and Baud-Rate Detect
  - ▸4-level FIFO buffer
- ▸Dual RS232
  - ▸Two UART ports connected to RS232 transceiver
  - ▸Hardware flow-control via RTS & CTS
  - ▸±15kV ESD Protected
- ▸USB 2.0 On-The-Go Compliant
  - ▸Dual-Role: can be Host or Client
  - ▸Full-Speed (12MB/s)

Analog Features:

- ▸10-bit, up to 16 channel ADC @ 500ksps
- ▸ADC available in sleep mode
- ▸Three Analog Comparators with programmable input/output config.
- ▸Charge Time Measurement Unit (CTMU)

Programming/Debugging:

- ▸2-wire ICSP interface
- ▸Unintrusive hardware based instruction trace

LEDs & Switches:

Power (Green)..... D1
8- User LEDs (Yellow)..... D2-D9
8- User Toggle Switches..... SW1

Jumpers:

Power Select..... W1
USB Config..... W2
I^2C Pullup Enable..... W3

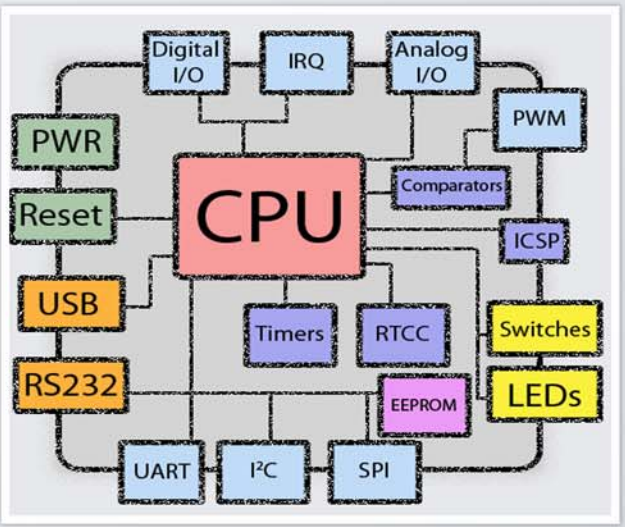
External Connectors:

USB 2.0 Full Speed..... J1
Reset..... J2
50-pin I/O connector..... J3/J5
Dual RS232 (±15kV ESD Protected)..... J4
ICSP Programming Header..... J6
Power TB1

Cable Set (optional)

USB Cable (3ft).....(1)
Dual RS232 Cable.....(1)
DB9 Female to DB9 Female (5ft)..... (1)
50-Pin Twisted-Pair Cable (1ft) ..... (2)

Development Kit includes MCU Module, Cable Set, two 50-pin breakout boards with screw terminals, and ICD3.



Ordering Information

MCUPIC24-USB ..... PIC24 Industrial MCU Module

MCUPIC24-USB-CS..... Cable Set

MCUPIC24-USB-DK ..... Development Kit

**Stand-offs, Nuts, and Screws are provided with all boards

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