Low Current Microcontroller for Wireless Communication

The M44Cx90 and M44Cx92 are members of the TEMIC family of 4-bit single chip microcontrollers.

Features

- Programmable system–clock with prescaler and four clock sources
  – 4-MHz crystal oscillator
  – RC-oscillator without external resistor
  – RC-oscillator adjustable with external resistor
  – External clock input
- 32-kHz crystal oscillator
- Wide supply voltage range (1.8 V to 6.5 V)
- Very low sleep current (< 1 µA)
- 2/4 KByte ROM, 128 × 4-bit RAM
- 512 bit EEPROM optional (M44C890/892)
- 12/16 bidirectional I/O's
- Up to 7 external / 7 internal interrupt sources
- 2-wire serial interface
- Multi-functional timers / counters with
  – IR remote control carrier generator
  – Biphase-, Manchester- and pulse width modulator
  – Biphase-, Manchester- and pulse width demodulator (only M44Cx92)
  – Phase control function (only M44Cx92)
- Prescaler / interval timer
- Watchdog, POR and brown-out function
- Voltage monitoring
- OTP M48C892
- SSO20-, SO20-, SO16- and SO8 (M44C090) package

Application

The two MARC4 products M44C892/092 and M44C890/090 offer highest integration for IR and RF data communication, remote control and phase control. The M44C890/090 controller is optimized for the transmitter side and the M44C892/092 for the transmitter side as well as the receiver side.

TEMIC's system know-how was used to integrate modulators and demodulators for commonly-used wireless protocols and phase control into the controllers.

Both controllers perfectly match the RF front end device U2740B and the IR driver chip U426B. This – along with the very small SSO package and the approach to minimize the number of external components – leads to extremely compact remote control units, e.g., for electronic keys. Finally, the very low current consumption and the extended supply voltage range optimizes battery life time.

Development is supported with the OTP M48C892 which covers the features of the M44C892 included the optional 512 bit EEPROM and both includes the performance of the M44C090.

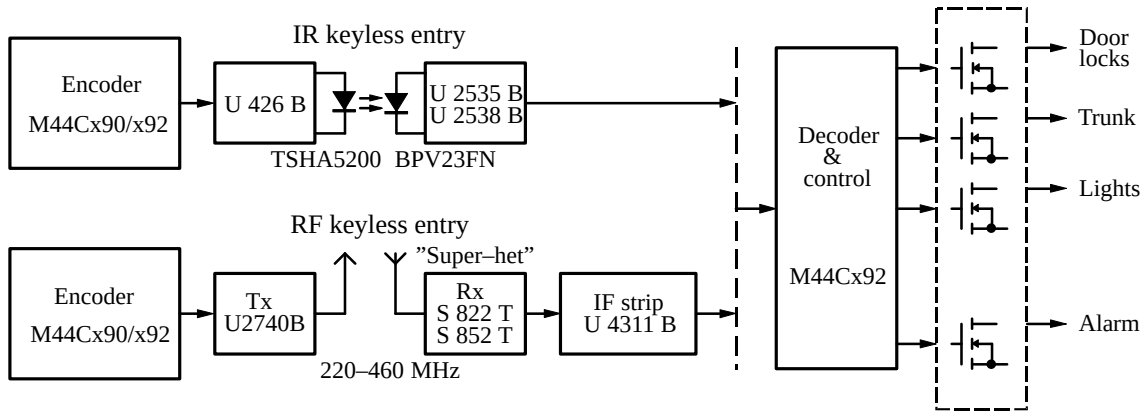

Figure 1. Application example

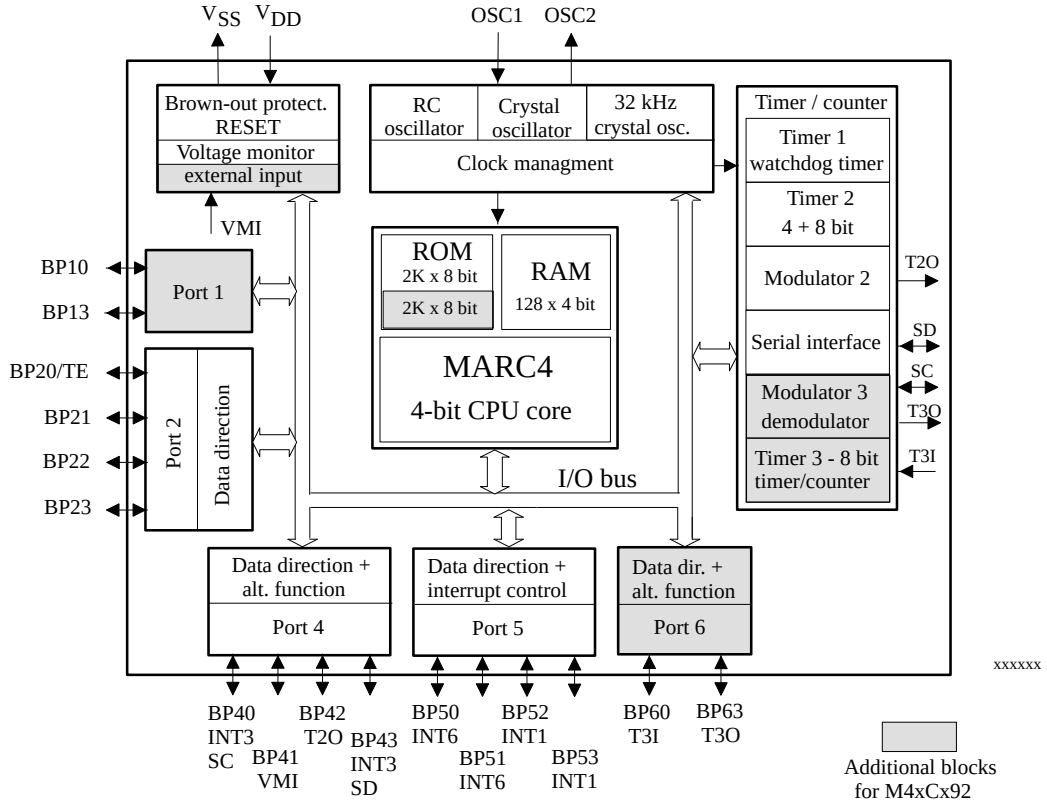

Figure 2. M44Cx90/x92

Table 1. Pin description

Name	Function
V_{DD}	Power supply voltage
V_{SS}	Circuit ground
BP10, BP13	2 bidirectional I/O lines of Port 1
BP20-TE	Bidirectional I/O line of Port 20, testmode enable (TE)
BP21 – BP23	3 bidirectional I/O lines of Port 2 - bitwise configurable I/O
BP40-SC-INT3	Bidirectional I/O line of Port 40, serial clock I/O and interrupt 3 input
BP41-VMI	Bidirectional I/O line of Port 41, voltage monitor input
BP42-T2O	Bidirectional I/O line of Port 42, Timer 2 output
BP43-SD-INT3	Bidirectional I/O line of Port 43, serial data I/O and interrupt 3 input
IP50-INT6	Input Port 50 line/interrupt 6 input
IP51-INT6	Input Port 51 line/interrupt 6 input
IP52-INT1	Input Port 52 line/interrupt 1 input
IP53-INT1	Input Port 53 line/interrupt 1 input
BP60-T3I	Bidirectional I/O line of Port 60, Timer 3 output
BP63-T3O	Bidirectional I/O line of Port 63, Timer 3 input and phase control input
OSC1	Oscillator input for 32-kHz or 4 MHz crystal, extern. system clock input , trimming resistor pin
OSC2	Oscillator output for 32-kHz or 4 MHz crystal

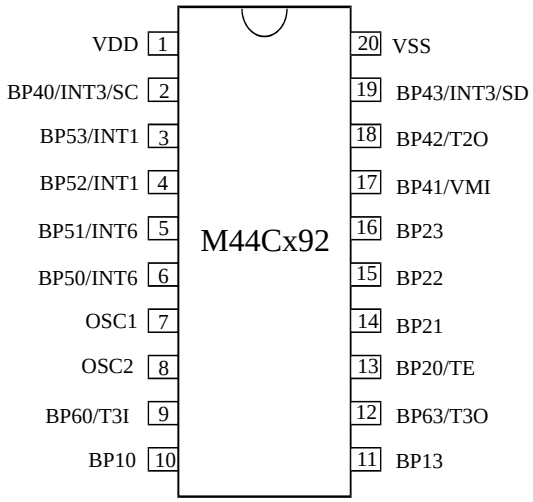

Figure 3. Pin connections for M44Cx92 in SSO20 package (M48C892 only in SO20 package)

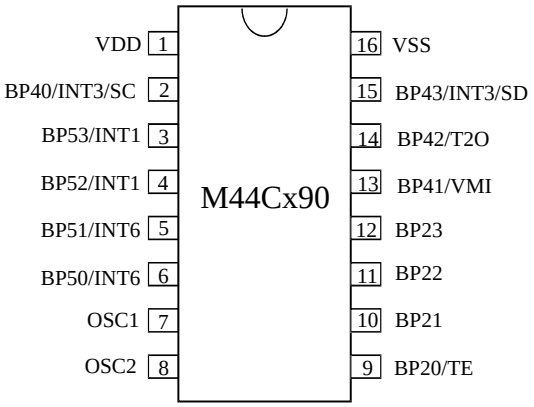

Figure 4. Pin connections for M44Cx90 in SO16 package

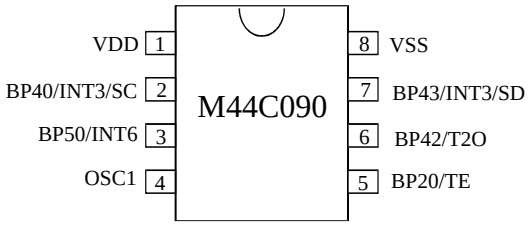

Figure 5. Pin connections for M44C090 in SO8 package

We reserve the right to make changes to improve technical design without further notice.
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