



# Embedded Development: tmote-sky platform

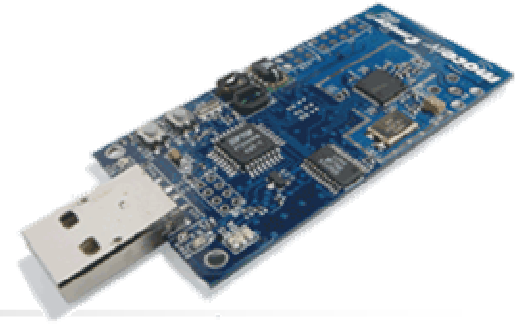
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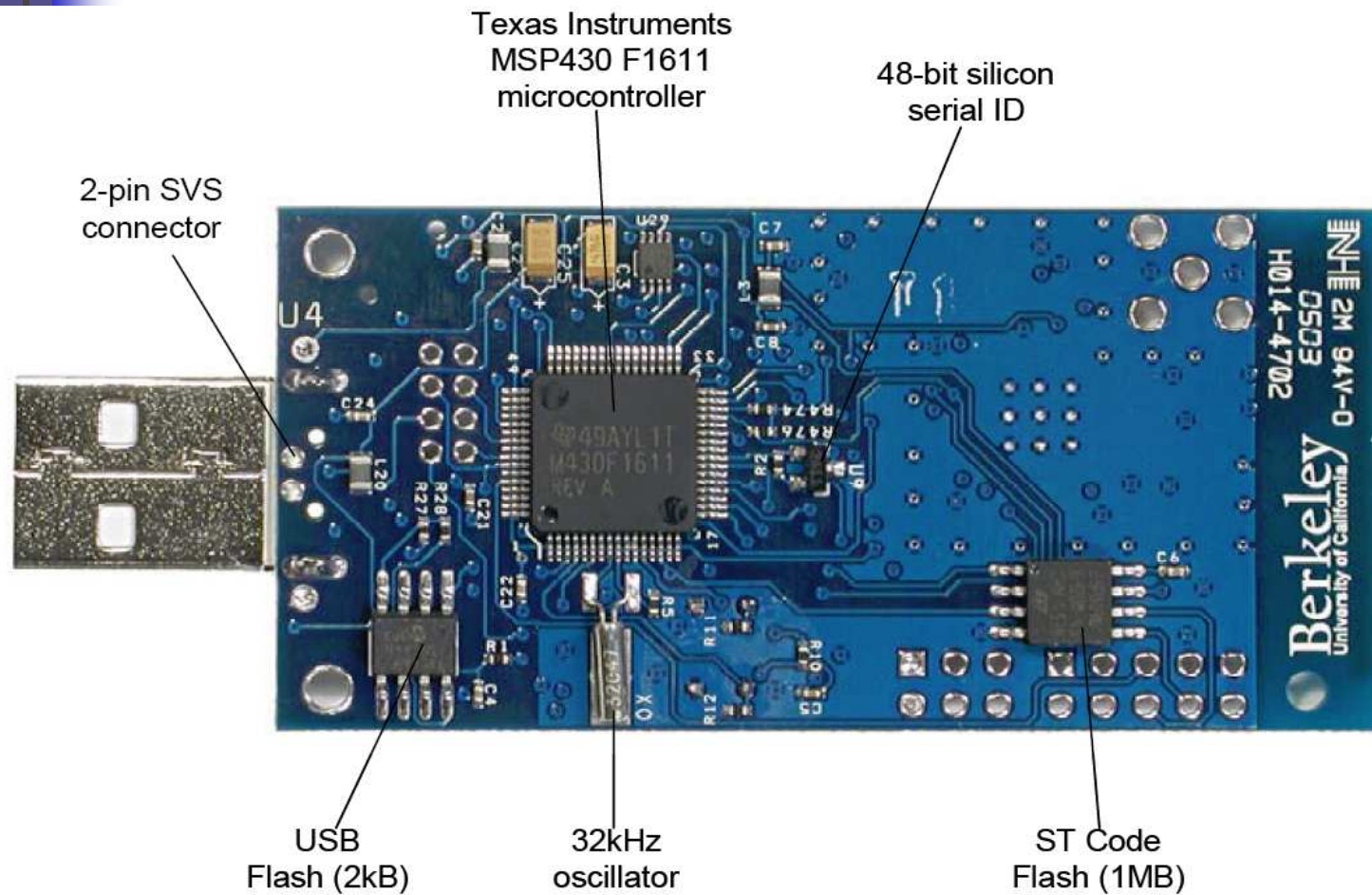
Northeastern University

# Tmote Sky

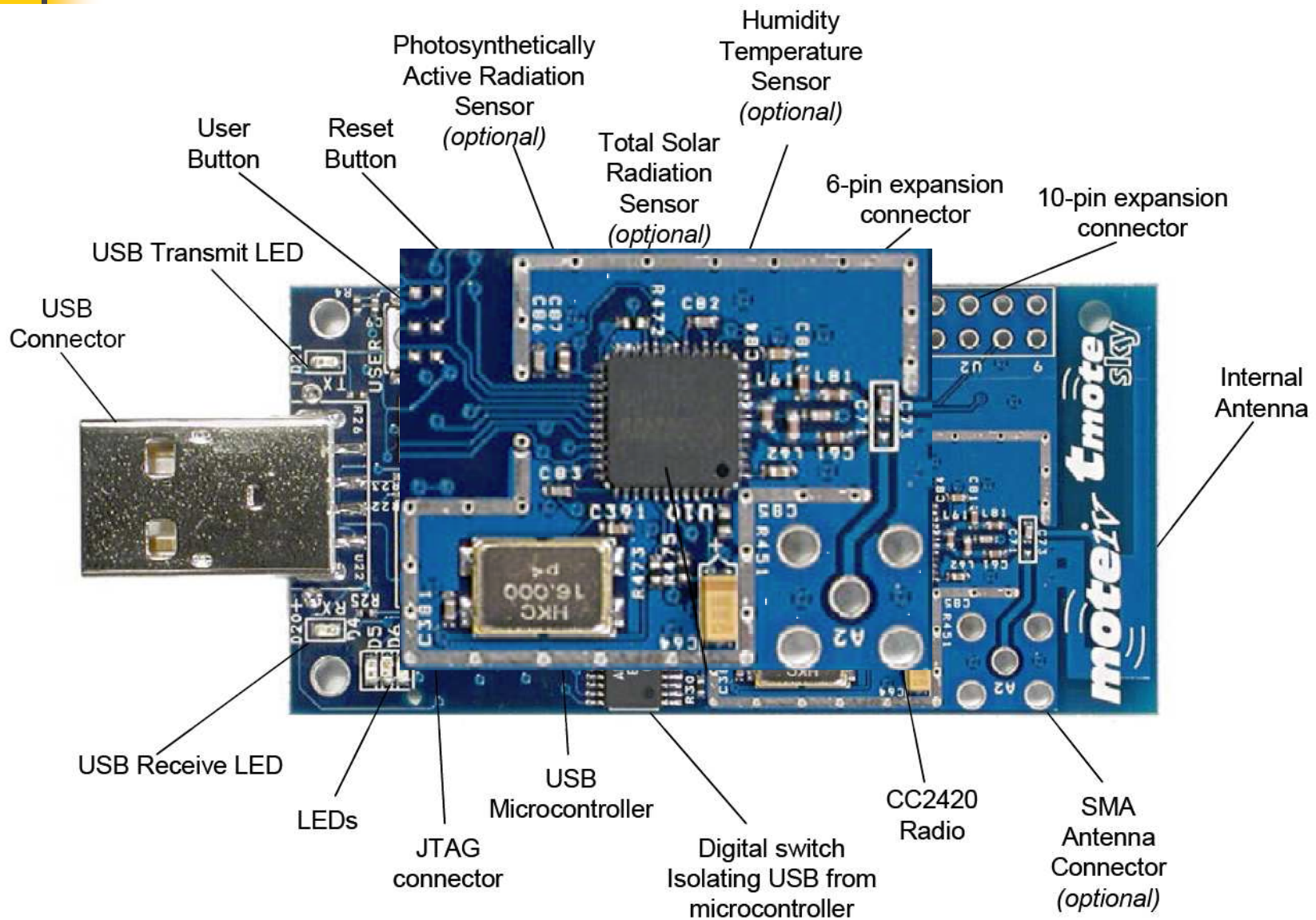


- n 8MHz Texas Instruments MSP430 microcontroller (10k RAM, 48k Flash)
- n 250kbps 2.4GHz IEEE 802.15.4 Chipcon Wireless Transceiver
- n Integrated onboard antenna with 50m range indoors / 125m range outdoors
- n Integrated Humidity, Temperature, and Light sensors
- n Hardware link-layer encryption and authentication

# Tmote Sky Structure (Back)



# Tmote Sky Structure (Front)



# Chipcon CC2420



- n True single-chip 2.4 GHz IEEE 802.15.4/ ZigBee RF transceiver with MAC support
- n DSSS modem with 2 Mchips/s and 250 kbps effective data rate
- n Programmable output power in 8 steps from -25 to 0 dBm
- n Low current consumption: RX=19.7 mA; TX=17.4 mA@0dBm
- n Low supply voltage (2.1 V - 3.6 V)
- n Few external components
- n Hardware MAC encryption and authentication (AES-128)



# Chipcon CC2420

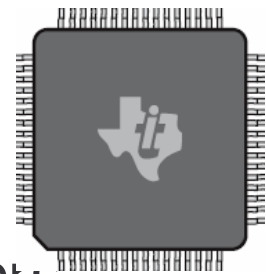
	<b>CC2420</b>
<b>Frequency</b>	2.4GHz
<b>Data rate</b>	250kb/s
<b>Tx Power</b>	-25 to 0dBm, 8 steps
<b>Power Consumption</b>	Tx 17.4mA@0dBm Rx 19.7mA
<b>Rx Sensitivity</b>	-95dBm
<b>MAC Support</b>	802.15.4
<b>Encryption</b>	AES-128



# MSP430F1611

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- n 16-Bit RISC Architecture, up to 8 MHz
- n 48KB+256B Flash Memory
- n 10KB RAM
- n Low Supply-Voltage Range, 1.8 V-3.6 V
- n Ultralow-Power Consumption
- n 2 x 16-bit Timers
- n 2 x Serial Communication Interfaces
- n 8 x 12-Bit A/D Converter & 2 x D/A Converters





# Basic Commands

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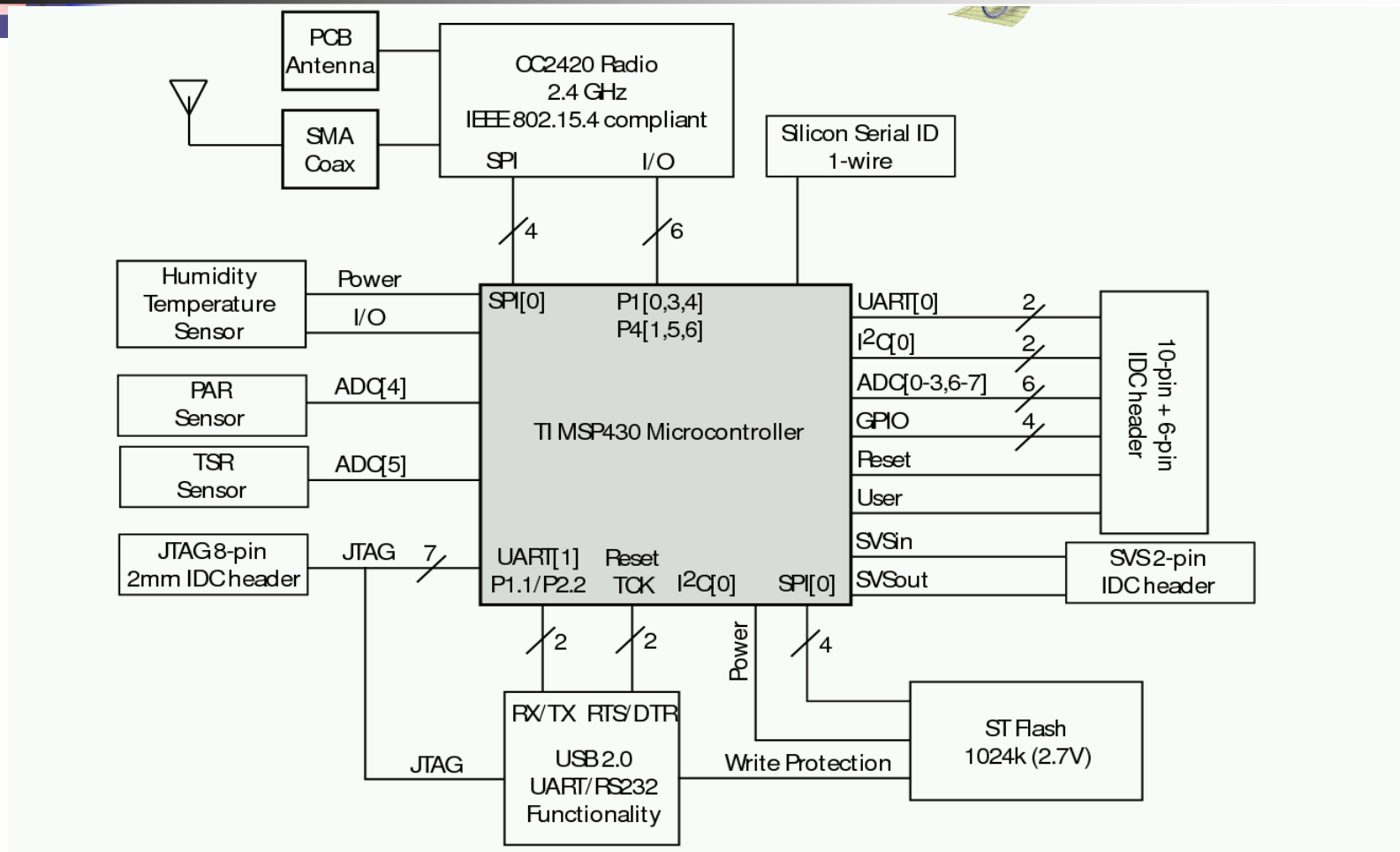
```
n motelist
```

```
n msp430-gcc
```

```
n msp430-bsl.exe --telosb -c 16 -r -e  
-I -p ${NAME}.a43
```

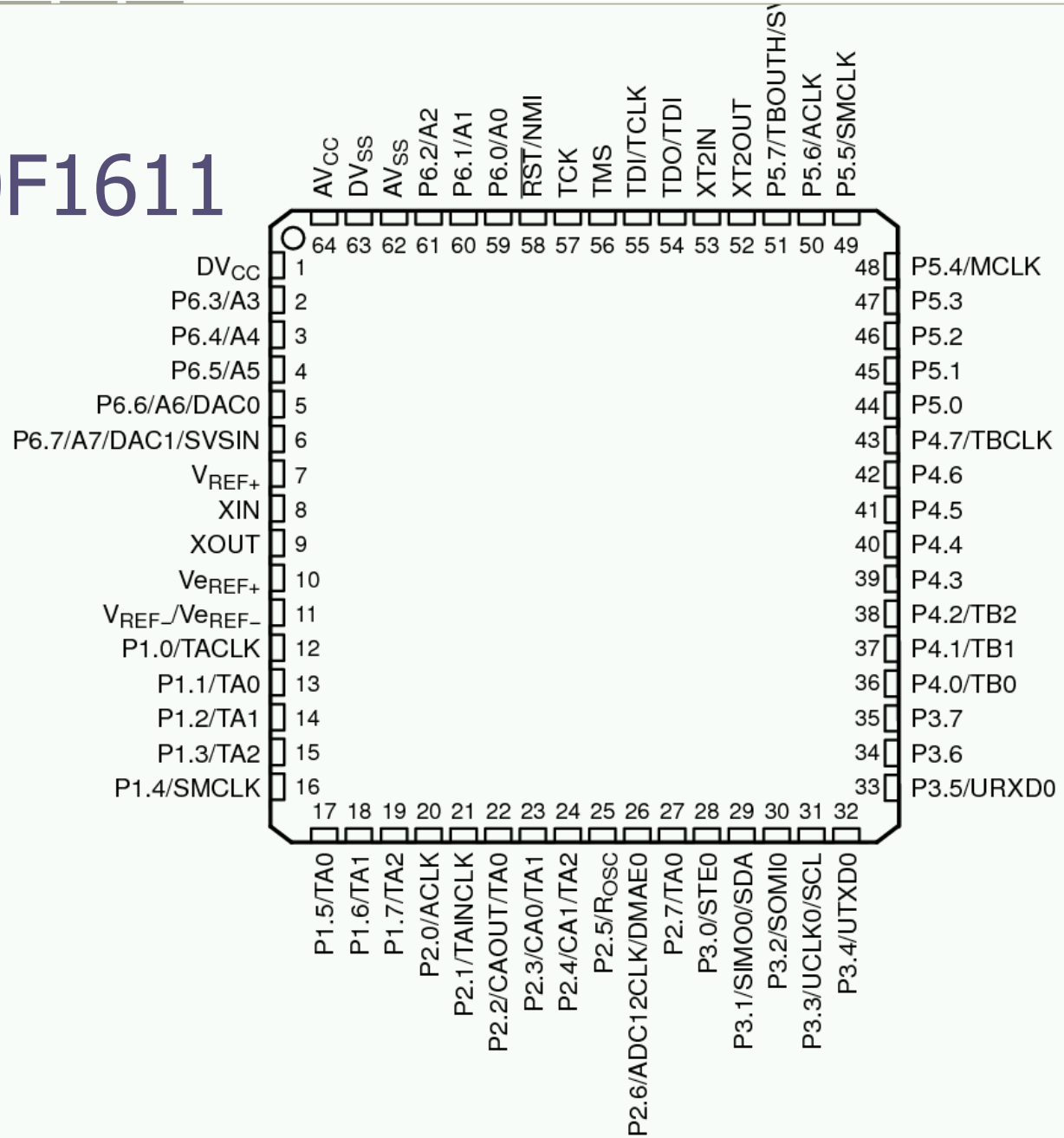


# Tmote-sky Block Diagram

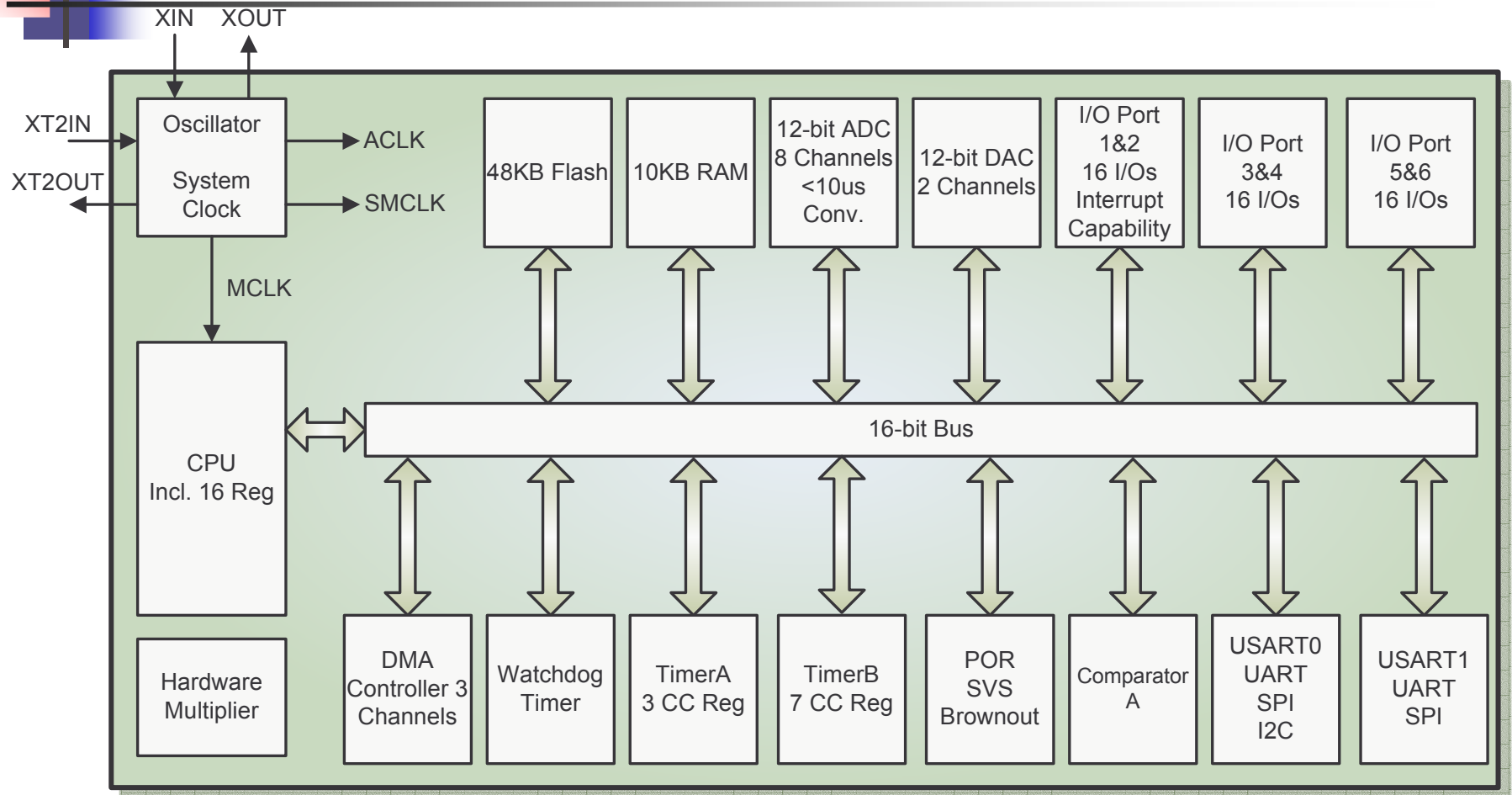




# MSP430F1611



# MSP430F1611 Function Block Diagram



# MSP430x161x

