

Carlton Duffett
EC450 HW4
Professor Giles
3/4/2015

EC450 Homework 4

Procedure:

I used a PicoScope connected between pin P1.1 and GND to monitor the square wave output to P1.1 from the WDT interrupt handler. Every 512 cycles of the SMCLK the WDT handler was called, XORing the P1.1 bit. This means that every period of the square wave generated by the WDT was 1024 cycles.

To see the effect of changing the DCOCTL and BCSCTL1 parameters, I periodically paused the MSP430 in debug mode and manually changed the register values. This was used to experiment with the maximum DCO clock rate and for tuning the DCO to 4MHz.

DCO Parameters:

The Digitally Controlled Oscillator (DCO) was tuned to the following configurations using the DCOCTL and BCSCTL1 registers.

DCO Configuration	DCO Frequency (MHz)	WDT Frequency (kHz)	DCOx	RSELx	MODx
Default	1.11	1.08	3	7	0
Maximum	19.7	19.2	7	15	0
Tuned to 4MHz	4.01	3.92	3	11	3

Accuracy:

While the PicoScope is relatively accurate, there are some inaccuracies in the way I measured clock frequency. I visually estimated the period of the WDT displayed by the PicoScope program. Since there was no greater accuracy in the way the information was displayed, these estimates are only accurate to 3 significant figures. Also, since the MSP430 is a temperature sensitive device, changing the operating temperature of the chip (hotter or colder than room temperature) would affect the DCO frequency generated by these parameters.