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Assignment 1: Datasheet Fun

Answers to Questions

1.

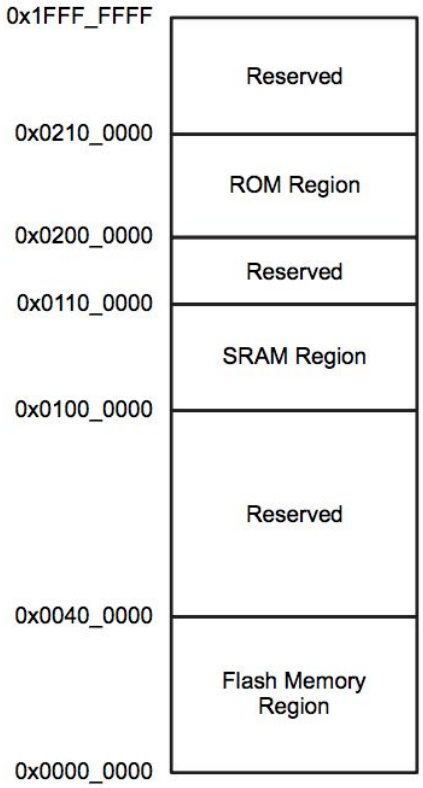

Figure 1: Code zone memory map

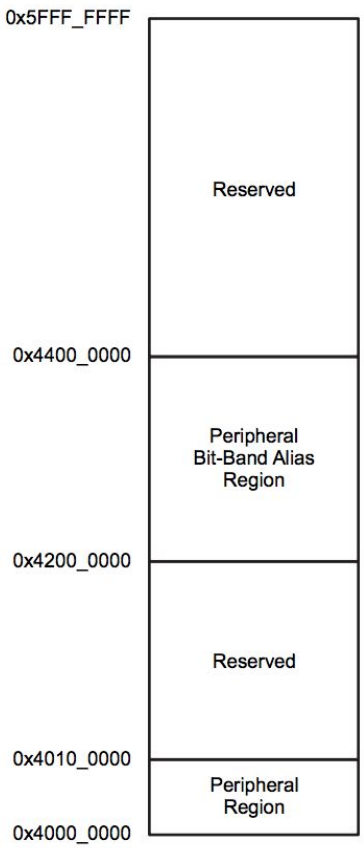

Figure 2: Peripheral zone memory map

2. The MSP432 has 4 internal oscillators (pg. 379) :
    a. DCOCLK
    b. VLOCLK
    c. REFOCLK
    d. MODCLK
    e. SYSOSC
3. The MSP432 has 8 timers in 4 categories with the following breakdowns:
    a. System timer (24-bit) (pg. 81)
    b. Watchdog timer (32-bit) (pg. 756)

    c. 4 Timer-A timers (16-bit, and there can be multiple Timer_A modules on a board) (pg. 783)
    d. 2 Timer32 timers (2 capable of both being 32-bit or 16-bit). (pg. 764)
4. The maximum sampling rate of Precision ADC is limited to 200 ksps when the internal reference is used together with BUF_EXT (ADC14VRSEL = 0001b and REFOUT = 1). In all other reference settings the Precision ADC sampling rate can be up to 1 Msps. (pg. 846)
5. This is the equation for the digital output of an analog signal in single-ended mode

$$N_{ADC} = 16384 \times \frac{V_{in+} - V_{R-}}{V_{R+} - V_{R-}}, 1LSB = \frac{V_{R+} - V_{R-}}{16384}$$

6. PCMCTL0 register
7. “Down” is a relative term but looking at Figures 5-19 to 5-26 in the datasheet we can see that when T_A increases from 25 ℃ to 85 ℃ the absolute current produced decreases every time.
8. According to Figures 5-23 and 5-19 in the datasheet, at 2V, high drive produces up to 5.5 X more current than regular drive. This appears consistent as comparing figures 5-25 and 5-20 results in a similar value ~5.3 X.