

ECEN 5823

Si7021 and Load Power Management

Spring 2018

Preliminary

Objective: Adding the Si7021 temp/humidity via the I2C bus and enabling / disabling the Si7021 to implement load power management.

Note: This assignment will begin with the completed Managing Energy Mode Assignment

Due: Monday, February 12th, 2018

Instructions:

1. Make any changes required to the Managing Energy Mode Assignment
2. LETIMER0 should be set to the following conditions at startup / reset.
 - a. Period = 2.0 seconds
 - b. No LED heart beat requirement
 - c. During the LETIMER0 period interrupt
 - i. Load Power Management ON the Si7021
 - ii. Take temperature reading from Si7021
 - iii. Turn on LED1 if temperature is below 15C
 - iv. Load Power Management OFF the Si7021
3. Si7021 I2C temp sensor
 - a. It should be running at the lowest energy possible while enabled and while taking temperature measurements
 - b. Temperature measurements should be 14-bit and calculated in degrees C
 - c. There should be a define statement that sets the default temperature in degrees C to indicate whether the temperature is too low
 - i. The default temperature should be 15C
 - d. If the temperature read from the Si7021 is below the set temperature, LED1 is should remain ON until the temperature is above the temperature set point
4. The Blue Gecko should be running at the lowest possible energy state at all time
5. LED0 is not used in this assignment
6. The program should be written using a scheduler to minimize the code within the Interrupt Service Routine

Questions:

In a separate document to be placed in the drop box with the program code, please answer the following questions:

1. After resetting the Energy Profiler measurements, what is the average current after 30 seconds?
2. What is the lowest average current when the Si7021 is Load Power Management OFF?
3. What is the lowest average current when the Si7021 is Load Power Management ON?
4. How long is the Si7021 Load Power Management ON for 1 temperature reading?

Deliverables:

1. One document that provides the answers to Si7021 and Load Power Management.
2. The completed program project or required files to enable the code to be ran on the instructing team's computer for grading.