

## **Saturn (RevA)**

**Date:** 3/12/15

### **Introduction:**

The Saturn board is a stripped down version of the MAD\_Oreo door sensor board. This unit strips away the multiple functions of Oreo to provide a smaller footprint, capable of transmitting via ZigBee, whether or not a door/window is closed. This board is based on the EM3585 micro-controller, implemented as a discrete design, allowing direct interfacing with the antenna. Other components used on the board include a Hall Effect Sensor (MRMS511H), a thermistor (NTCLE203), a tamper switch (SPVM110200), a reset switch, and a tri-color LED (LTST-C19HE1WT).

### **Hardware Description:**

The Jupiter board is based on the EM3585 micro-controller operating at 24 MHz. The CPU interfaces directly to 1 or 2 switches, 1 tri-color LED, 1 Hall Effect Sensor, and 1 Thermistor. A JTAG port is also available for programming/debugging the internal CPU Flash memory. The board is powered by a 2450 Coin Cell Battery, supplying +3V. This device uses a ceramic balun in its TX/RX circuit.

The pin assignments for the JTAG Port (J1):

**Pin 1: VDD (3V)**

**Pin 2: JTDO**

**Pin 3: JRST**

**Pin 4: JTDI**

**Pin 5: GND**

**Pin 6: JTCK**

**Pin 7: JTMS**

**Pin 8: RESET**

**Pin 9: PTI\_EN**

**Pin 10: PTI\_DATA**

Pin listings for GPIO lines on the EM3585:

**PA0: NC**

**PA1: NC**

**PA2: NC**

**PA3: NC**

**PA4: PTI\_EN**

**PA5: PTI\_DATA**

**PA6: NC**

**PA7: GREEN\_LED ("1" to turn LED off, "0" to turn LED on)**

**PB0: THERM\_VDC (Voltage output for thermistor divider circuit)**

**PB1: NC**

**PB2: NC**

**PB3: NC**

**PB4: READ\_TAMPER**

**PB5: Reset Switch**

**PB6: RED\_LED ("1" to turn LED off, "0" to turn LED on)**

**PB7: BLUE\_LED ("1" to turn LED off, "0" to turn LED on)**

**PC0: JRST**

**PC1: THERM\_READ (Value from thermistor divider circuit)**

**PC2: JTDO**

**PC3: JTDI**

**PC4: JTMS**

**PC5: NC**

**PC6: DOOR\_OUT**

**PC7: NC**