

## Cranberry Board (V1.0) Power Budget

3.3 Volt Module	Datasheet Values			Calculated Values			XBee Characteristics	
	Idle (mA)	Typical Current Draw (mA)	Max Current Draw (mA)	Avg. Current Draw (mA)	Avg. Power Consumed (mW)	Max Power Consumed (mW)	Transmit Time	Idle Time
Device Name								
XBee Transmit	15.00	205.00	220.00	15.02	49.57	49.57	0.0109%	99.9891%
XBee Receive	/	/	/	0.00	0.00	0.00		
Barometer	0.01	0.01	0.01	0.01	0.02	0.02		
Humidity (HIH6031)	0.00	0.65	1.00	0.33	1.07	3.30		
V. Reg 3.3V (Main)	/	0.35	0.90	0.18	0.58	2.97		
V. Reg 3.3V (Xbee)	/	0.35	0.90	0.18	0.58	2.97		
Atmega 328P MCU	0.70	1.70	2.70	1.20	3.96	8.91		
Irradiance ADC	0.01	0.15	0.30	0.08	0.26	0.99		
Irradiance Op Amp	/	0.80	2.20	0.40	1.32	7.26		
<b>Total Current Draw (mA)</b>	15.72	209.01	228.01	17.38	57.36	75.99		
<b>Supply Voltage (V)</b>	3.30	3.30	3.30	3.30	3.30	3.30		
<b>Total Power Consumption (mW)</b>	<b>51.86</b>	<b>689.72</b>	<b>752.42</b>	<b>57.36</b>	<b>57.36</b>	<b>75.99</b>		

Rechargeable Li-Po Batteries (3.7V)			
Battery	Voltage (V)	Current (mAH)	Useable Energy (%)
6600 mAh Li-ion 3.7V	3.7	6600	80.0%
15600 mAh Li-ion 3.7V	3.7	15600	80.0%

Estimated Battery Running Time						
Battery	Energy (mWH)	V. Reg Efficiency (%)	Max Power Consumption (mW)	Max (Hrs)	Max w/ V. Reg Efficiency (Hrs)	Max w/ V. Reg Efficiency (Days, Hrs)
6600 mAh Li-ion 3.7V	19536	80.0%	75.99	257.1	205.67	8 Days, 13.67 Hours
15600 mAh Li-ion 3.7V	46176	80.0%	75.99	607.7	486.14	20 Days, 6.14 Hours

## Cranberry Notes and Documentation

**Revision: R1.0**

- \* Current Draw (mA) and Avg. Power (mW) calculations assume sensors (barometer, etc.) are polling 1/2 of time.
- \* V. Reg current values are taken from datasheet values for loads of Iout = 50mA, because total average system current draw is approximately 57mA for the 3.3V regulator.
- \* Assume XBee leakage currents are negligible ( $\mu\text{A} \ll \text{mA}$ ).
- \* Assume XBee only operates in transmit/idle mode (i.e. does not receive data from the server).
- \* For XBee Transmit/Idle Time, use given parameters: 82bytes (Transmit Rate = 250 kbps), sent to the server every 3 seconds.