

Test Data

Energy Harvesting LaunchPad BoosterPack for Brushed DC Motor Control (TIDA-00616)

Figure 1: Device mAhr/day Consumption

Operating Modes	Current (mA)	Mode Duration (s)	Mode Period (s)	Mode Hours/Day	mAhr Per Day
CC3200 SSID Scan	25.000	3	1024	0.070	1.758
Motor Operation	150.000	2.25	21600	0.003	0.375
Off (Timer Only)	0.050			23.927	1.196
Power Gating Mode mAhr/day Consumed (Minimum Battery Capacity)					3.329
MCU Sleep Mode	0.700			23.974	16.782
MCU Low Power Mode mAhr/day consumed (Min. Battery Capacity)					17.743

Figure 2: System Power over Time

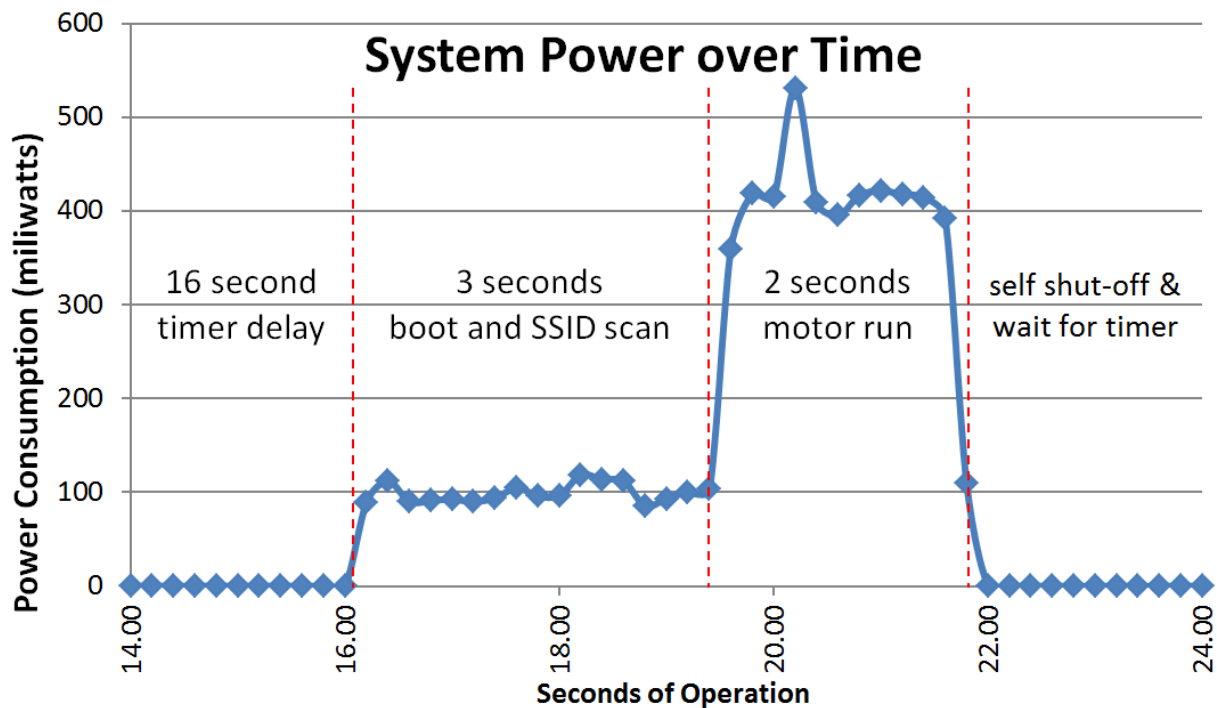


Figure 3: Solar Panel Dimension Calculation

Total mWhr / day consumed	12.984	mWhr / day
Multiply by operating days per week	7.000	days / week
Total mWhr /week required for system operation for the week	90.886	mWhr / week
Divide by charging days per week	4.000	days / week
Total mWhr / day required to be collected by solar panel during charging days	22.722	mWhr / day
Divide by charging hours / day	6.000	hours / day
Instantaneous power required from the solar panel	3.787	mW
Divide by low estimate of bq25570 efficiency per datasheet	0.500	
Minimum input power required for system operation	7.574	mW
Divide by panel power per panel datasheet	3.000	mW/cm ²
Minimum solar panel area required	2.525	cm²

Figure 4: Short Circuit Current produced by One Solar Panel

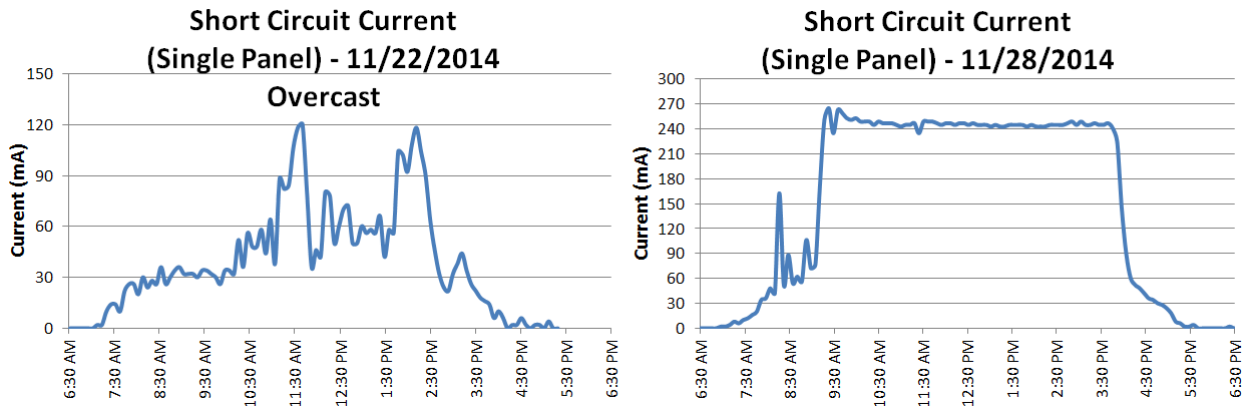
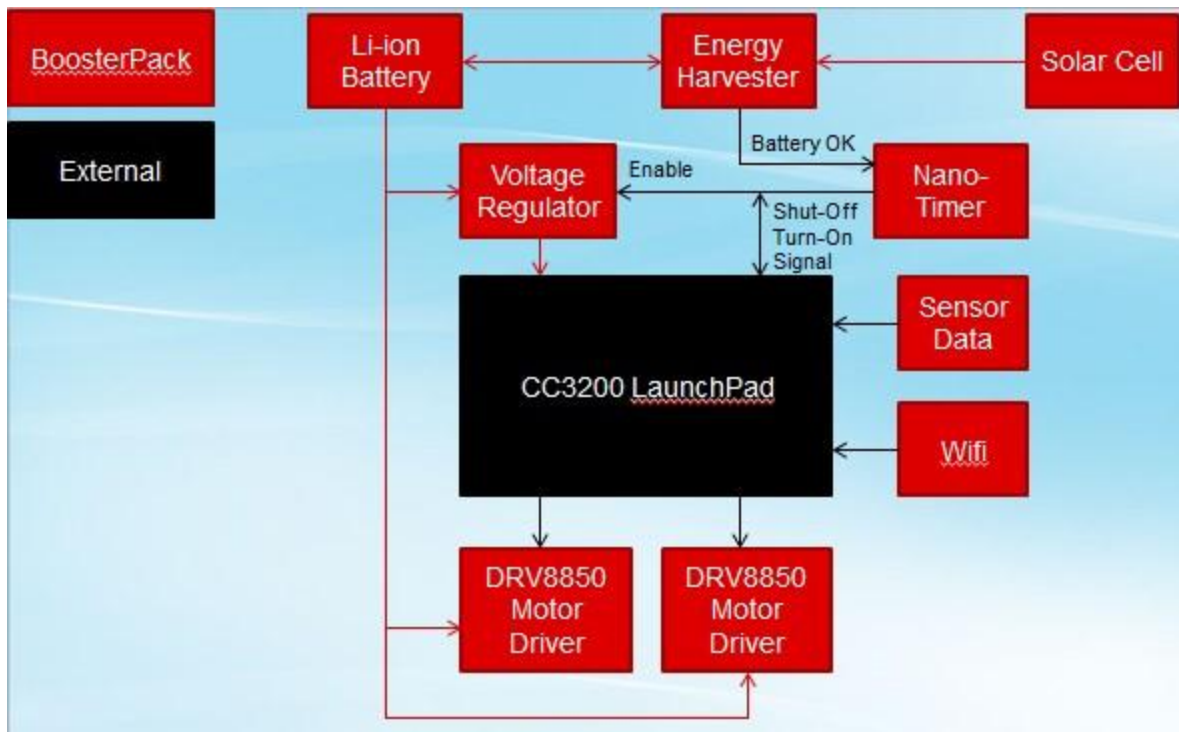


Figure 5: Leakage Current and Current vs. Load

24.5 mA @5V unloaded
19.9 mA @4.3V unloaded
48.0mA @5V unloaded w/ MSP430f5529LP
47.3mA @4.3V unloaded w/ MSP430F5529LP

For the entire BoosterPack Design, the leakage current is only 24.5 mA with a 5 V input and no load. The leakage current dwindles to 19.9 mA unloaded at 4.3 V input.

Figure 6: Block Diagram



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