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SOLAR

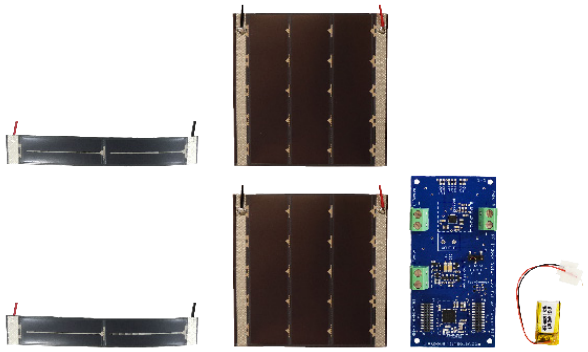
Solar Development Kit with Nordic BLE (DEV-BLE-NS)

System Overview

The Solar Development Kit with Nordic BLE (DEV-BLE-NS) is a complete energy harvesting power management solution and Nordic nRF52832 BLE development platform. It is perfect for developers looking to design or add PowerFilm's flexible solar to Nordic BLE products. This complete energy harvesting solution is capable of operating in dim indoor environments when using our Indoor Light panels, and outdoors using the Classic Application panels.

The kit is able to efficiently extract power, charge a variety of storage elements, and supply power to the BLE circuit. It includes two user selectable energy harvesting modules, one implementing the BQ25570 PMIC and the other being a dedicated 'Cap-Charger' for batteryless applications.

Fully compatible with Nordic's development tools, the kit comes programmed with a low power optimized HRM demo.



Solar panel leads cropped for photo

Kit Contents

- DEV-BLE-NS circuit board assembly
- (2) LL200-3.6-75 Indoor Solar Panel with 6" leads
- (2) ONP2.4-15x94 Classic Application Solar Panel with 6" leads
- 60mAh rechargeable Li-Polymer battery
- Instructions, hardware and software files, and product documentation

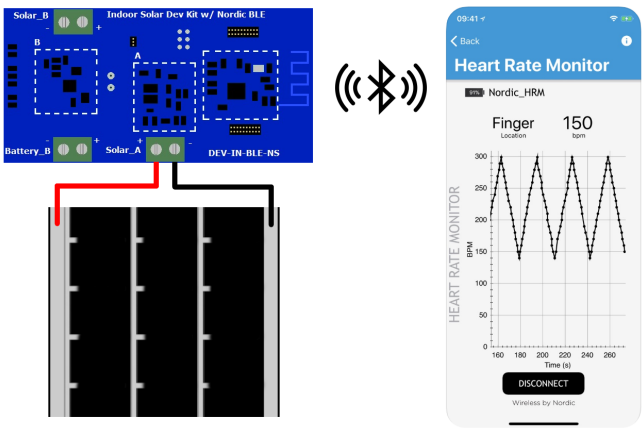
Panel Specifications

Indoor Series	Classic Application
LL200-3.6-75	ONP2.4-15x94
1000 lux: • 1.354mW • 0.423mA • 3.2V	100% Sun • 45mW • 18.6mA • 2.4V
200 lux: • 0.206mW • 0.086mA • 2.4V	25% Sun • 10.1mW • 4.2mA • 2.4V

Use Cases - Power Source For

- BLE Beacons and Tags
- E-Paper Displays
- Telematics
- Smart Locks
- Thermostats
- Smart Windows and Shades
- Wireless Sensors
- Wearables
- Field and Herd Monitoring
- Other Low Power Electronics

System Diagram



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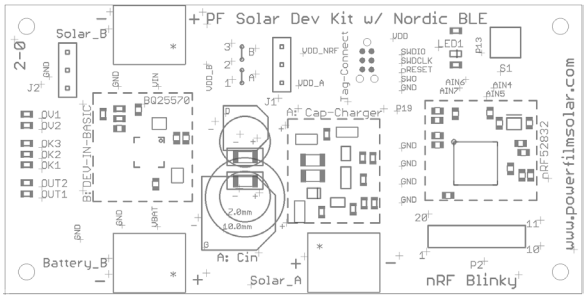
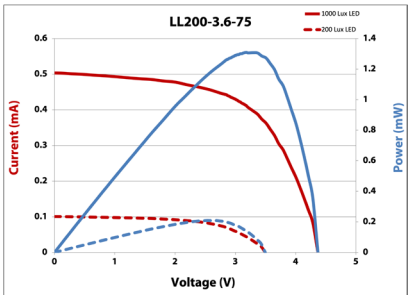
Board Layout

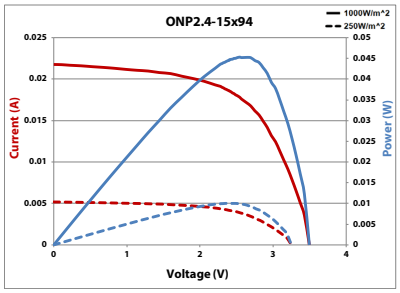


IV Curves

Indoor Series



Classic Application



nRF52832 Nordic BLE Module

Fully functional BLE module configured for ultra-low power operation. Connects to iOS and Android devices through Nordic's example mobile applications.

- iOS and Android connectivity
- IO Break-out connectors for additional sensors or components
- Segger Embedded Studio project solution files
- Small footprint with compact meandering antenna design

Energy Harvesting Modules

Includes the two charging circuits detailed below. The first is a custom battery-free capacitor charger ("Cap-Charger") and the second implements TI's BQ25570 energy harvesting/power management IC and is identical to the Solar Development Kit. The desired charging circuit can be chosen with jumper J1.

Cap-Charger

- Up to 2x performance vs standard energy harvesting IC solutions
- Rapid charging during initial off state (0-2V)
- Low voltage load disconnect with hysteresis and high voltage charge termination
- Low cost and small footprint

BQ25570 IC

- MPPT Input with low voltage boost converter
- Regulated power output (default 3V)
- Integrated battery charger (default 4.2V Li-ion) with low voltage load disconnect and high voltage charge termination