

Power Management Board Type (2) (VK-PM2-5V)

Instructions for use

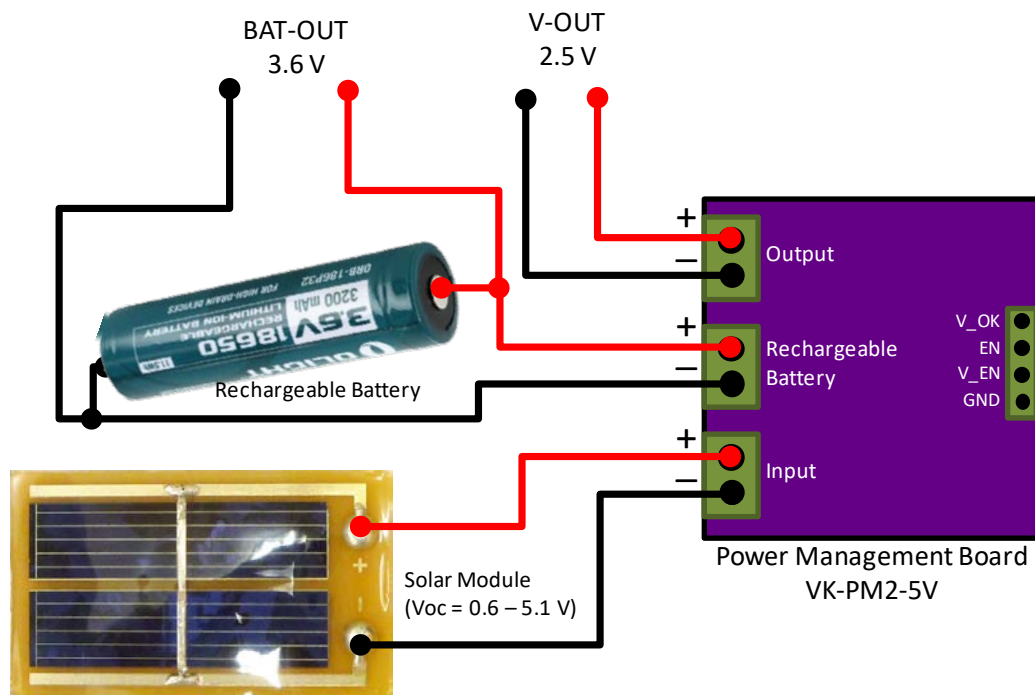


Figure 1. Wiring diagram for connecting a solar cell and rechargeable Li-battery to the power management board. There are two separate outputs you can use for your devices.

Table1. Electrical characteristics of the power management board

PARAMETER	MIN	TYP	MAX	UNIT
BOOST CONVERTER \ CHARGER STAGE				
DC input voltage	100		5100	mV
Cycle-by-cycle current limit of the charger		230	285	mA
Input power range for normal charging	0.005		510	mW
Minimum input voltage for cold start circuit to start charging VSTOR		600	700	mV
Minimum cold-start input power to start normal charging		15		μW
Voltage when cold start operation ends and normal charger operation begins	1.6	1.73	1.9	V
Boost converter mode switching frequency			1	MHz
BATTERY MANAGEMENT				
Quiescent current EN = 0, VOUT_EN = 1 - Full operating mode		488	700	nA
Quiescent current EN = 0, VOUT_EN = 0 - Partial standby mode		445	615	nA
Programmable voltage range for overvoltage threshold (VBAT_OV)	2.2	4.2*	5.5	V
Programmable voltage range for under-voltage threshold (VBAT_UV)	1.91		2.0	V
BIAS and MPPT CONTROL STAGE				
Sampling period of VIN_DC open circuit voltage		16		s
Sampling period of VIN_DC open circuit voltage		256		ms
Regulation of VIN_DC during charging			10%	
Voltage on VOC_SAMP to set MPPT threshold to 0.80 of open-circuit voltage of VIN_DC	VSTOR - 0.015			V
BUCK CONVERTER				
Output regulation (excluding resistor tolerance error)	-2%		2%	
Output line regulation		0.09		%V

Output load regulation		-0.01		%mA
Output ripple		30		mV _{pp}
Programmable voltage range for output voltage threshold	1.3	2.5	VSTOR-0.2	V
Output Current	93	110		mA
Cycle-by-cycle current limit of buck converter	160	185	205	mA

* Default Battery charging maximum voltage VBAT_OV = 4.2 V and V-OUT = 2.5 V

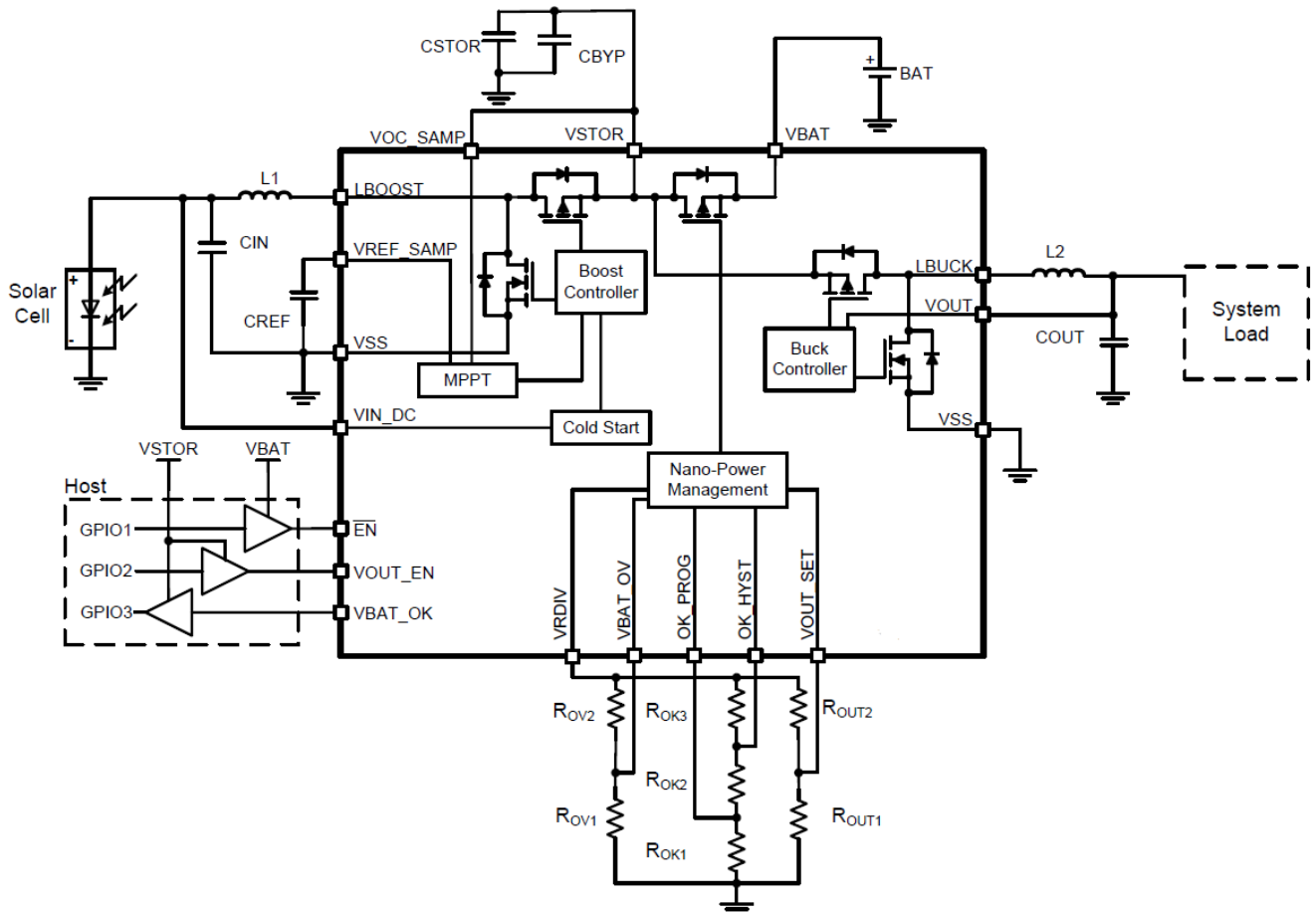


Figure 2. Schematic diagram of the circuit board.

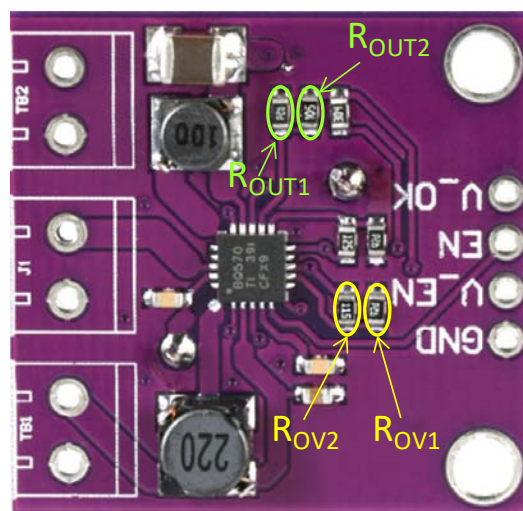


Figure 3. Output voltage V-OUT and VBAT_OV controlling resistors (R_{OUT1}, R_{OUT2}, R_{OV1}, and R_{OV2}) locations.

The factory set output voltages of the power management board are given below.

V_{BAT_OV} = maximum charging voltage of the battery = 4.2 V

V-OUT = output voltage of the buck converter = 2.5 V

If you wish to change those to different values please use the following table to calculate new replacement resistor values.

Table 2. Example of R_{OV1} and R_{OV2} resistor values (and codes on SMD part) for some of the most common output voltages.

Desired Max Charging Voltage (V) (V _{BAT_OV})	R _{OV1}		R _{OV2}	
	Value (MΩ)	Code on Resistor	Value (MΩ)	Code on Resistor
2.5	9.53	95E	3.57	54E
3.3	7.15	83E	5.9	75E
4.2	5.62	73E	7.32	84E
5.0	4.75	66E	8.25	89E

Table 3. Example of R_{OUT1} and R_{OUT2} resistor values (and codes on SMD part) for some of the most common output voltages.

Desired Output Voltage (V) (V-OUT)	R _{OUT1}		R _{OUT2}	
	Value (MΩ)	Code on Resistor	Value (MΩ)	Code on Resistor
1.8	8.66	91E	4.22	61E
3.3	4.75	66E	8.25	89E
4.2	3.74	56E	9.31	94E
4.8	3.24	50E	9.76	96E

This section only for advanced users.

Pin names and function of 4 pin connector

The Power Management Board is equipped with a 4 pin connector for enabling/disabling boost converter and buck converter. The default connections (both converters enabled) are shown in Figure 4. The name and function of each pin are described in Table 4.

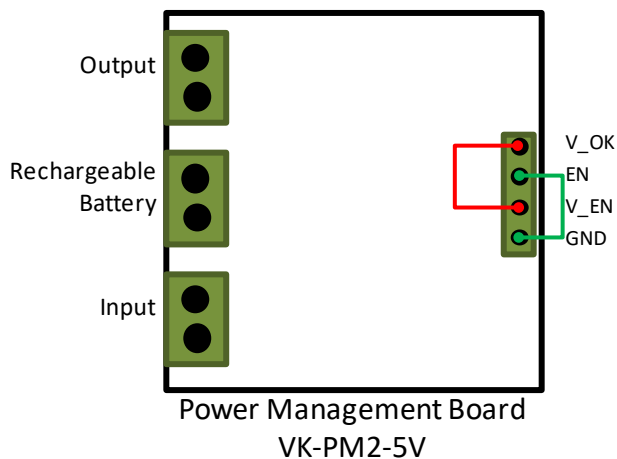


Figure 4. Pin identification of the 4-pin connector.

Table 4. Description of pins in 4 pin connector.

Pin Name	Function Description
GND	General ground connection for the device
V_EN	Output buck converter enable-pin. This pin should be connected to VSTOR voltage or V_OK pin to enable the output.
EN	Active low digital programming input for enabling/disabling the IC. Connect to GND to enable the IC.
V_OK	Digital output for battery good indicator. Internally referenced to the VSTOR voltage.

If you need more information, please contact Viraj without hesitation.

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