

SPV1040 20160129 20160203

SPV1040 is a boost controller, so VOUT must be higher than VIN, otherwise the SPV1040 turns off and the input power is transferred to the output stage through the integrated Pchannel MOS without entering the switching mode.

Input source solar cell is typically between 1-3V

input capacitor:
10uF

VMPP-SET pin can be directly connected to PV+ rail through a 1 kΩ R3 resistor

Assuming R3= 1 kΩ then C4 ≤ 10μF, 100nF in example

Usually, inductances ranging between 10 μH to 100 μH satisfy most application requirements. Inductor value given from Vmp and Imp, higher Vmp -> higher inductance.

Output voltage partitioning by two resistors R1 and R2.

For Vout_max=5
 $R1/R2=5/1.25-1=3$
 $R1=3*R2$

The current flowing into the series R1+R2 should be in the range between 2 μA and 20 μA.

$U=R*I \Rightarrow 5=R2*4*20*10^{-6} \Rightarrow R2=5/(4*20*10^{-6})=62500\text{ohm} \Rightarrow R2=62\text{K ohms}$
 $R1=180\text{K ohms}$
Found 100k and 300k

output voltage sensing cap depends mostly on system switching freq, Voltage sensing capacitor 1 nF

Output current sensing filter:
 $RF1 = RF2 = 1 \text{ k}\Omega$
 $CF = 1 \text{ }\mu\text{F}$
 $Rs=50\text{mV}/I_{\text{out_max}}$
 $I_{\text{out_max}}=100\text{mA} \Rightarrow Rs=50\text{mV}/0.1=0.05$

Rs can be from cyntec, e.g. <http://www.cyntec.com/productDetail.aspx?id=40>
RL1220TR000FN

The inductor used in first experiment is listed at 160mA max. Went well over that.

If no dout and resistive load instead of battery it dies. With voltmeter it works.

Schottky mandatory for vout above 5v.

Dout didnt help for resistive load, worked fine for battery charging

Dangerous to run from constant voltage psu maybe?

SMM4F5.0 should work but didnt?

Dout direct on Vout

Maybe use

http://m.littelfuse.com/~media/electronics/datasheets/tvs_diode_arrays/littelfuse_tvs_diode_array_sd05c_datasheet.pdf.pdf bidirectional och 450w