

SP6656 Li-Ion Battery Input to 2.7V or 3.3V Output at 50mA - 100mA

Date: June 21, 2006

Designed by: Brian Kennedy

Part Number: SP6656ER3

Application Description: Li-Ion battery to 2.7V or 3.3V output @ 50 - 100mA

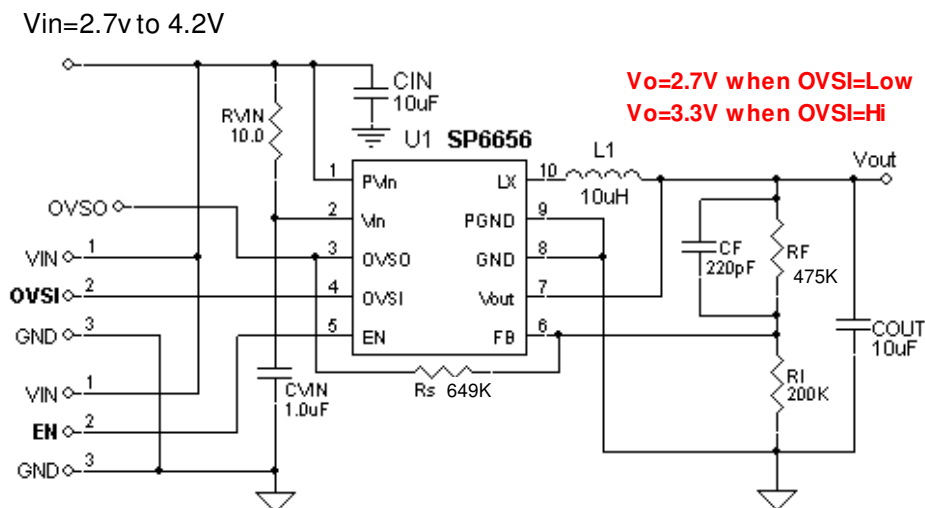
Electrical Requirements:

Input Voltage	2.7V – 4.2V
Output Voltage	2.7V or 3.3V
Output Current	50mA to 100mA

Circuit Description:

This application has been designed for a single Li-Ion battery input with 2.7V or 3.3V output that requires small size and low output ripple. The input voltage range is from 2.75V to 4.2V and is bucked down to a 2.7V or 3.3V output, depending on the state of the OVSI logic input: if High then 2.7Vout, if Low then 3.3Vout. The target application is for a voltage source to power White LEDs from either 2.7V or 3.3V. All the external components have been optimized for an output current of 50mA to 100mA output and have been laid out for small size and to minimize output ripple.

This report includes the application schematic complete with component part numbers and figures 1-5 illustrating electrical performance of the design.



Application Schematic

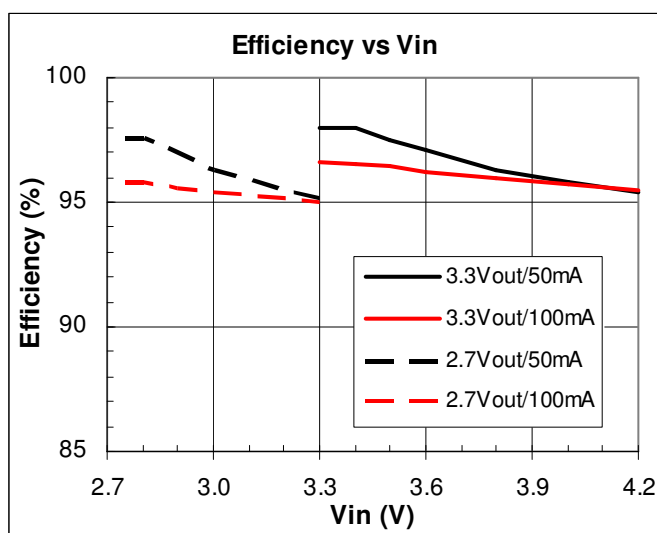


Figure 1. Efficiency Graph

Vo=3.3V(OVSI=Hi), Io=50mA						
Vin	Iin	Vout	Iout	Effi	Ripple	Freq
(V)	(mA)	(V)	(mA)	(%)	(mV)	(Khz)
3.3	49.46	3.198	50.01	98.0	33	82
3.4	49.45	3.293	50.02	98.0	37	80
3.5	49.01	3.344	50.03	97.5	53	80
3.6	48.15	3.363	50.03	97.1	56	85
3.8	46.01	3.365	50.05	96.3	52	113
4.0	43.88	3.357	50.08	95.8	43	150
4.2	41.87	3.353	50.02	95.4	39	173

Figure 2. 3.3V Output Ripple

Vo=3.3V(OVSI=Hi), Io=100mA						
Vin	Iin	Vout	Iout	Effi	Ripple	Freq
(V)	(mA)	(V)	(mA)	(%)	(mV)	(Khz)
3.3	97.65	3.108	100.20	96.6	60	74
3.4	95.40	3.132	100.00	96.6	48	107
3.5	93.40	3.151	100.03	96.4	40	145
3.6	91.53	3.166	100.11	96.2	34	172
3.8	87.53	3.187	100.16	96.0	28	256
4.0	83.79	3.200	100.28	95.7	25	303
4.2	80.72	3.234	100.08	95.5	22	360

Figure 3. 3.3V Output Ripple

Vo=2.7V(OVSI=Low), Io=50mA						
Vin	Iin	Vout	Iout	Effi	Ripple	Freq
(V)	(mA)	(V)	(mA)	(%)	(mV)	(Khz)
2.75	49.32	2.647	50.00	97.6	32	80
2.8	49.36	2.695	50.06	97.6	35	80
3.0	47.82	2.760	50.07	96.3	54	83
3.3	43.98	2.760	50.06	95.2	47	125

Figure 4. 2.7V Output Ripple

Vo=2.7V(OVSI=Low), Io=100mA						
Vin	Iin	Vout	Iout	Effi	Ripple	Freq
(V)	(mA)	(V)	(mA)	(%)	(mV)	(Khz)
2.75	97.20	2.556	100.17	95.8	57	73
2.8	95.93	2.568	100.18	95.8	48	94
2.9	93.35	2.585	100.08	95.6	44	130
3.0	90.90	2.597	100.17	95.4	32	168
3.3	83.78	2.620	100.27	95.0	22	256

Figure 5. 2.7V Output Ripple