

SP7653: 1A to 3A LED Driver, 6V-16V Input Range

Designed by: Tim Sullivan

Part Number: SP7653ER

Application Description: LED driver from 6V – 16V input

Electrical Requirements:

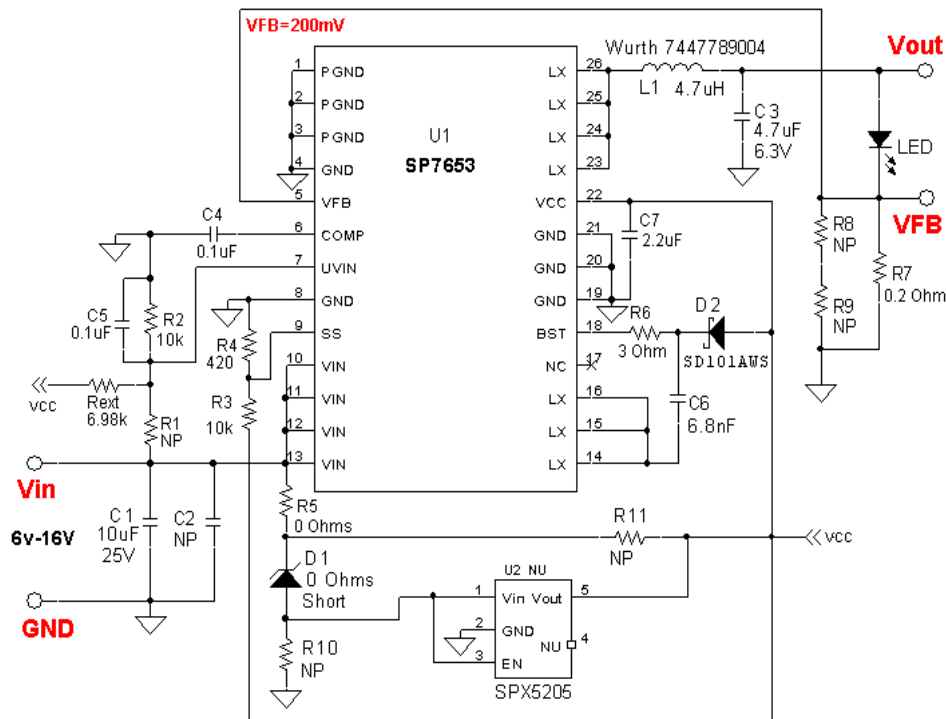
Input Voltage: 6-16V
Output Current: 1A to 3A

Circuit Description:

This circuit has been designed to provide up to 3A of output current from a 6V to 16V supply. It uses the Power Blox solution SP7653 and 16 parts (not including pcb and I/O pins) and uses approximately 0.5 square inches of board space. It is possible to maintain this small area usage due to the incorporation of the high and low side FETs and the PWM controller in to one package. The solution uses a Würth low profile inductor which is a good balance of size and performance for this solution. An inexpensive Sipex SPX5205 LDO was used to provide the 5V Vcc for the part. Ceramic capacitors were used on the input and output.

This report includes an application schematic complete with component values, a complete Bill of Materials, and figures illustrating the electrical performance of the design.

Application Schematic:



Performance Measurements

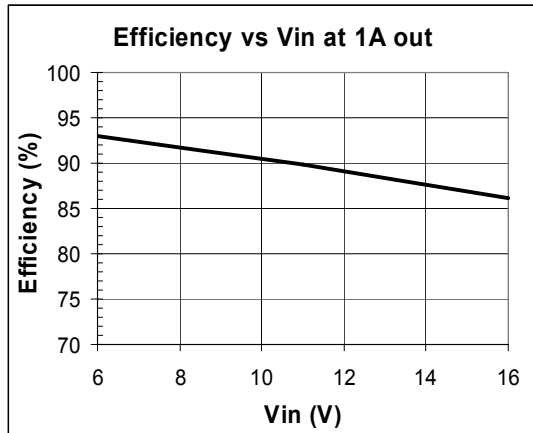


Figure 1 – Efficiency vs Vin

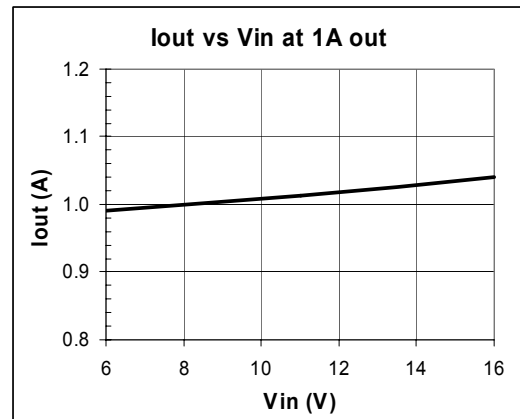


Figure 2 – Output Regulation

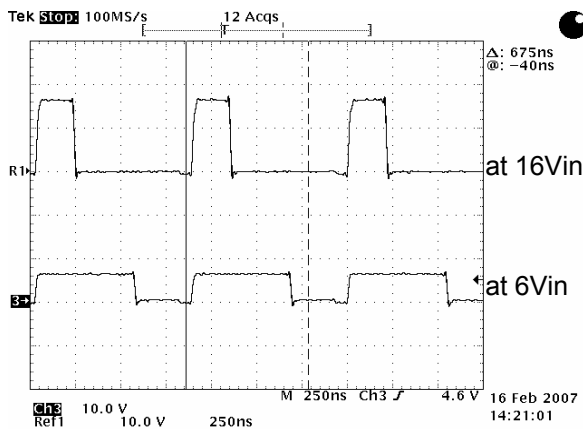


Figure 3 – Converter Switchnode

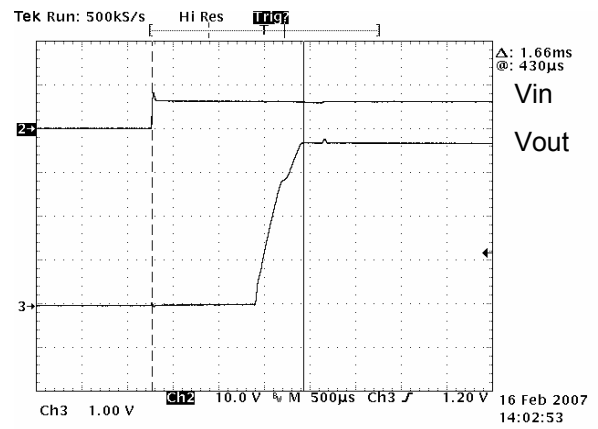


Figure 4 – Start Up, 6Vin, 1A out

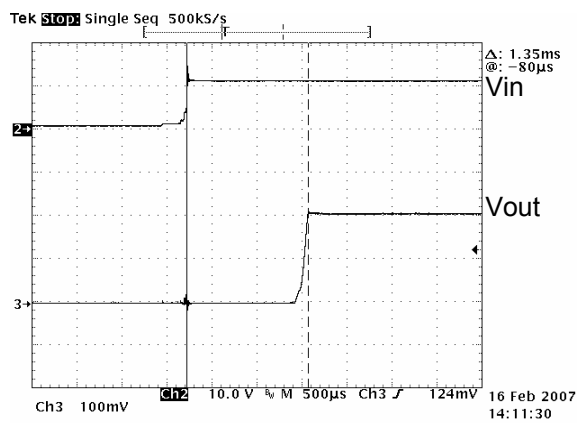


Figure 5 – Start Up, 11Vin, 1A out

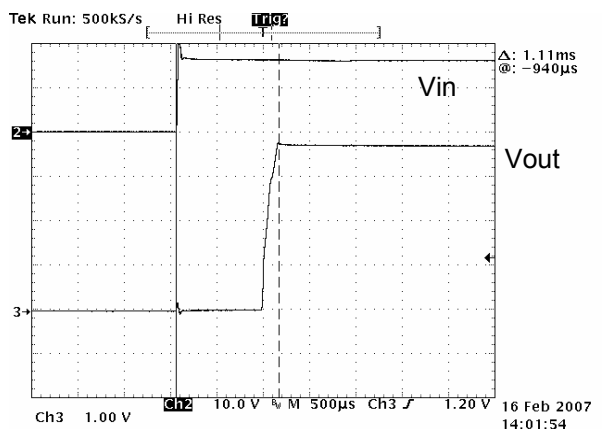


Figure 6 – Start Up, 16Vin, 1A out

Converter Bill of Materials:

Bill Of Materials					February 13,2007
Item #	Qty.	Ref.	Manuf.	Component part #	Component
PCB	1	PCB	Sipex	146-6637-00	SP765XLEDEB
1	1	C1	muRata	GRM32DR61E106K	10uF/25V, 1210, X5R
2	6	R1,C2,R8, R9,R10,R1	NP	NP	NP
3	1	C3	muRata	GRM188R60J475K	4.7uF/6.3V, 0603, X5R
4	2	C5,C4	muRata	GRM188R71E104K	0.1uF/25V, 0603, X7R
5	1	C6	muRata	GRM188R71H682K	6.8nF/50V, 0603, X7R
6	1	C7	muRata	GRM188R61A225K	2.2uF/10V, 0603, X7R
7	2	D1,R5	0 Ohms	0 Ohms	0 Ohms
8	1	D2	Vishay	SD101AWS	SOD323 Schottky diode
9	1	L1	Wurth	744311470	4.7uH
14	1	Rext	Vishay	CRCW06036981F	6.98k, 0603, 1%
15	2	R2,R3	Vishay	CRCW06031002F	10k, 0603, 1%
16	1	R4	Vishay	CRCW0603421F	420 Ohms, 0603, 1%
17	1	R6	Vishay	CRCW060320R0F	20 Ohm, 0603, 1%
18	1	R7	Vishay	CRCW2512R200J	0.2 Ohm, 2512, 1 Watt, 5%
19	1	U1	Sipex	SP7653	DFN-26, 2FETs Buck Ctrl.
20	1	U2	Sipex	SPX5205M5-5.0	SOT23-5, LDO

For further assistance:

Email: Sipexsupport@sipex.com
 WWW Support page: <http://www.sipex.com/content.aspx?p=support>
 Sipex Application Notes: <http://www.sipex.com/applicationNotes.aspx>



Sipex Corporation

Headquarters and
 Sales Office
 233 South Hillview Drive
 Milpitas, CA95035
 tel: (408) 934-7500
 faX: (408) 935-7600

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