



1.0 Design Specifications

Inputs	Outputs #1
VinMin=9.0 V	Vout1=2.3 V
VinMax=40.0 V	Iout1=0.35 A

2.0 Design Description

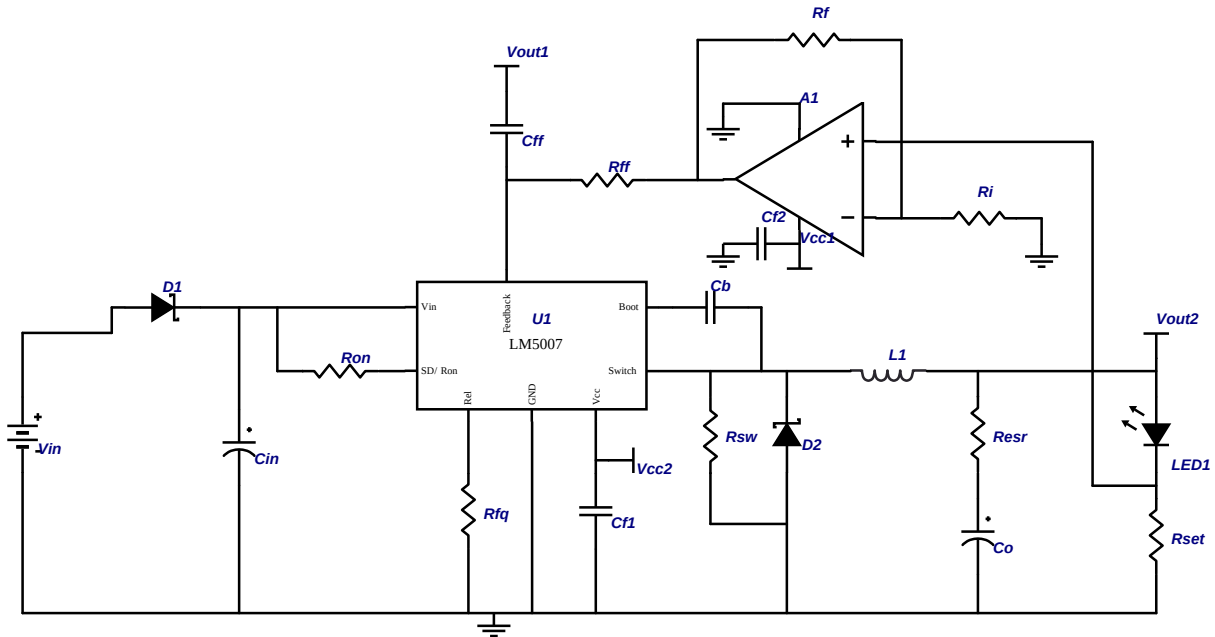
This circuit is designed to replace a single-filament incandescent bulb in an automobile tail light, brake light, turn signal, reverse light, or interior light (dome light, map light). It operates at approximately 600kHz, and regulates the current in the LED at 350mA from inputs of 9V to 40V. This makes it suitable for standard passenger cars and trucks with 8V-16V batteries as well as freight trucks, tow trucks, fork lifts, and other vehicles that use a double lead-acid battery system (16V-32V). Diode D1 provides reverse battery protection, and

the LM5007 can withstand inputs voltages of up to 75V. This circuit does not need additional protection from 'load dump' events of up to 75V.

Although not shown, the brightness of the LED can be dimmed with a PWM input by placing a signal-level NFET from the RON pin to ground and driving the gate with the PWM signal. This circuit is also compatible with 100Hz PWM of the input voltage for 'theater dimming' of interior lights.

Please note that A1 in the schematic is shown as U2 in the PCB layout.

3.0 Schematic



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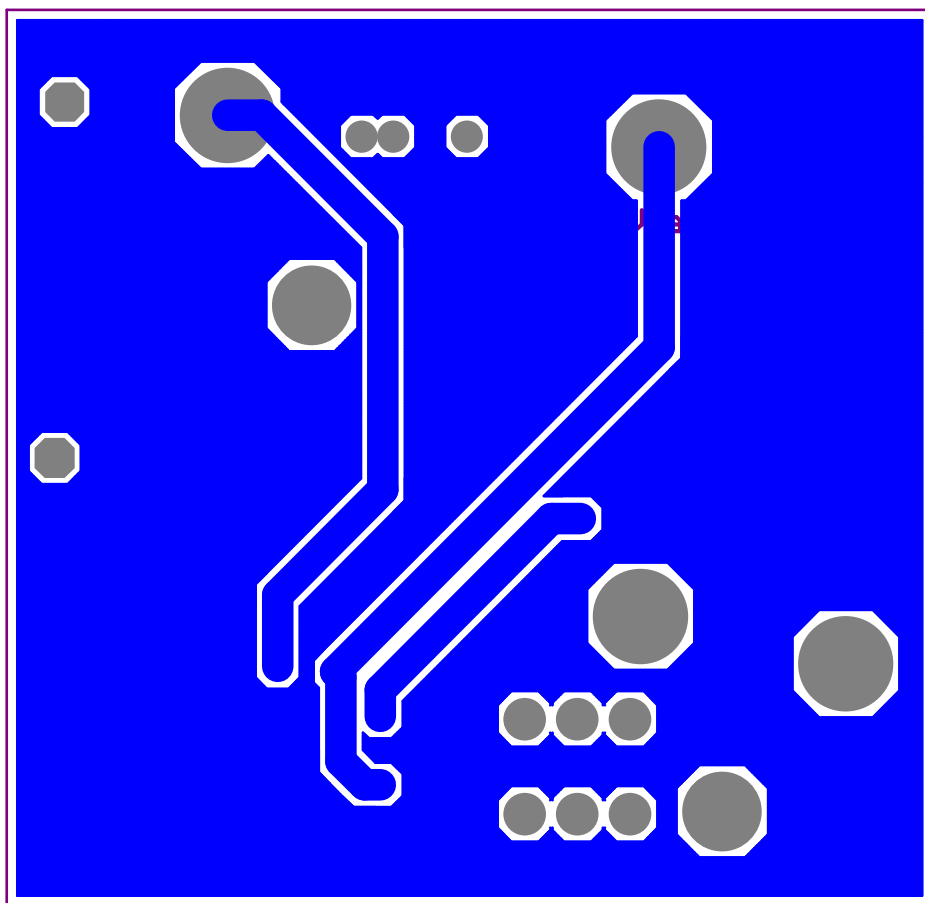
FIGURE 1. Example Schematic Showing Connection for all Components.

4.0 Bill Of Materials

Part	Manufacturer	Part#	Attributes
A1	National Semiconductor	LM321	
Cb	TDK	C2012X7R2E103K	10n F
Cf1	Vishay	VJ0805Y104KXXAT	100n F

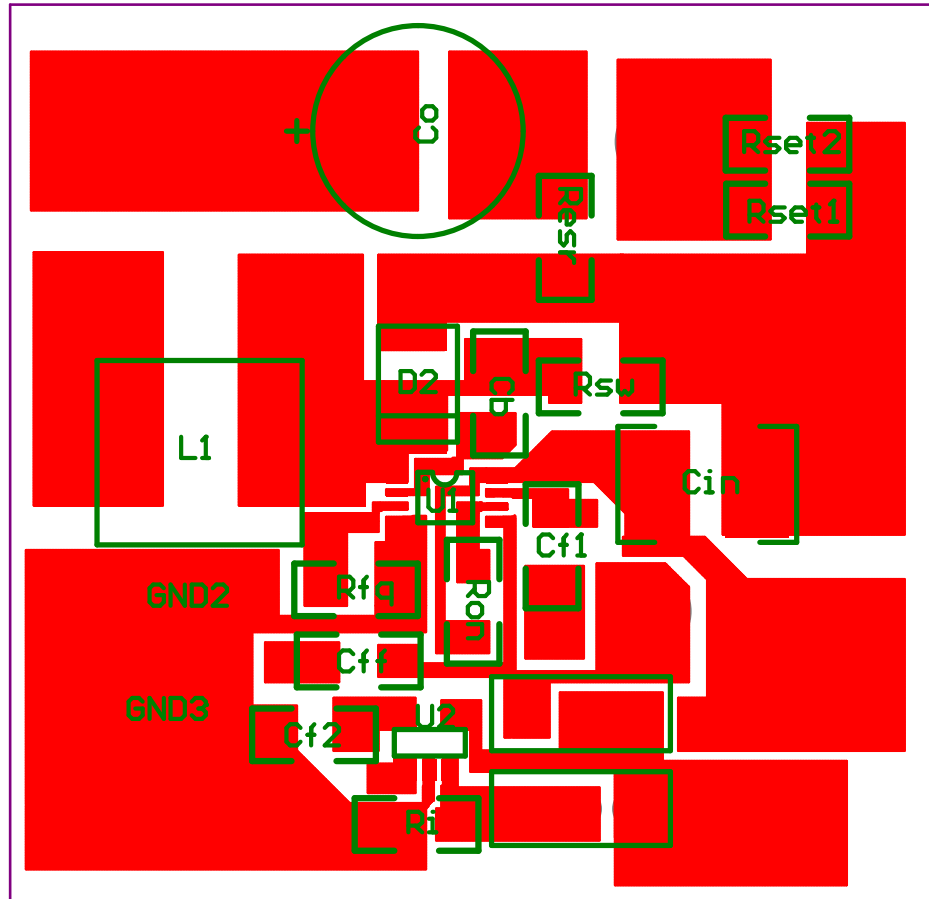
Part	Manufacturer	Part#	Attributes
Cf2	Vishay	VJ0805Y104KXXAT	100n F
Cff	Vishay	VJ0805Y102KXXAT	1n F
Cin	TDK	C3225X7R2A105M	NumCaps=1, 1u F, 0 Ohms
Co	TDK	C3216X7R1A106M	10u F, 0 Ohms
D1	Vishay	S397D	0.75 V
D2	Vishay	S397D	0.75 V
L1	TDK	SLF6028T-470MR59	47u H, 0.21 Ohms
Resr	Vishay	CRCW08051R00F	1 Ohms
Rf	Vishay	CRCW08053483F	348k Ohms
Rff	Vishay	CRCW08051002F	10k Ohms
Rfq	Vishay	CRCW08052742F	27.4k Ohms
Ri	Vishay	CRCW08051002F	10k Ohms
Ron	Vishay	CRCW0805153J	150k Ohms
Rset	Vishay	CRCW0805R20J	0.2 Ohms
Rsw	Vishay	CRCW0805471J	4.7k Ohms
U1	National Semiconductor	LM5007	

5.0 Layout



PADC_NSCXXX_lo_1

FIGURE 2. Board's Bottom View



PADC_NSCXXXX_lo_2

FIGURE 3. Board's Top View

Notes

Notes

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 - (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
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National Semiconductor Americas Customer Support Center
 Email: new.feedback@nsc.com
 Tel: 1-800-272-9959

National Semiconductor Europe Customer Support Center
 Fax: +49 (0) 180-530-85-86
 Email: europe.support@nsc.com
 Deutsch Tel: +49 (0) 69 9508 6208
 English Tel: +49 (0) 870 24 0 2171
 Français Tel: +33 (0) 1 41 91 8790

National Semiconductor Asia Pacific Customer Support Center
 Email: ap.support@nsc.com

National Semiconductor Japan Customer Support Center
 Fax: 81-3-5639-7507
 Email: jpn.feedback@nsc.com
 Tel: 81-3-5639-7560