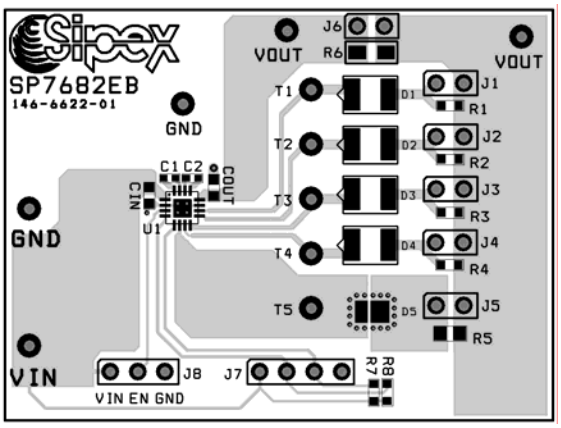
Evaluation Board Manual

- Output current up to 500mA for Flash LED
- Triple mode 1x, 1.5x and 2x charge pump
- 2.4MHz switching frequency
- I^2C serial interface
- Flash LED output current adjustable in 10mA steps to 500mA
- Backlight LED output current adjustable in 0.5mA steps to 30mA
- Time Out function to protect the LED in Flash mode (2s)
- Built-in over-voltage and over-current protection
- Automatic soft start limits in-rush current
- Thermal shutdown protection
- Automatic soft start limits in-rush current
- Space saving 16-pin 3x3 QFN package



DESCRIPTION

The **SP7682 Evaluation Board** is designed to help the user evaluate the performance of the SP7682 for use as a Backlight and Flash LED Driver. The evaluation board is a completely assembled and tested surface mount board which provides easy probe access points to all SP7682 inputs and outputs so that the user can quickly connect and measure electrical characteristics and waveforms. The Evaluation Board schematic diagram is shown at Figure 1.

BOARD SCHEMATIC

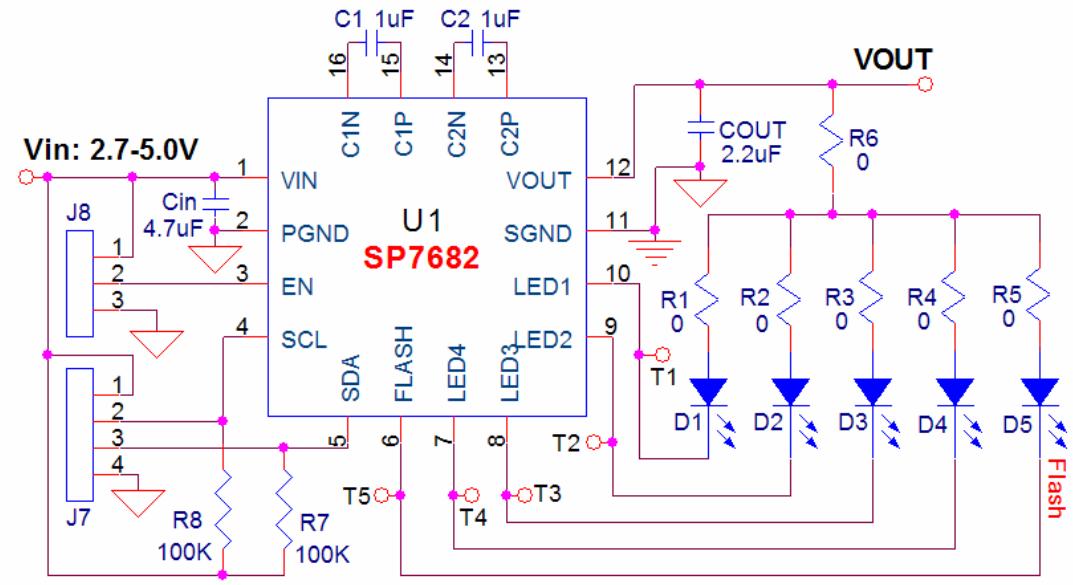


Figure 1.The SP7682 Evaluation Board Schematic Diagram

USING THE EVALUATION BOARD

1) Powering Up the SP7682 Circuit

The SP7682 Evaluation Board can be powered from a 2.7V to 5V power supply or from 3 alkaline cells. Connect the power supply with a short leads directly to the “Vin” and “GND” posts. Connect the J8 ENABLE connector EN pin to Vin pin using a shunt (J8 pin 1 to 2). Connect J7 4 pin I^2C connector to the SPI2CEB board 4 pin connector. For using another I2C board connect the SCL, SDA and GND connections to the I2C board respective connections.

2) Selecting the output current

Backlight LEDs need to be connected to the D1, D2, D3 and D4 positions on the SP7682EB. A Flash LED should be connected to the D5 position on the board. The LED current may be set using the I^2C software for Backlight current in 0.5mA steps to 31.5mA. Each LED can be selected on or off. The Flash LED current can be may be set in 10mA steps to 500mA.

It is recommended to enable the Flash timeout. It can be set for 0.5, 1.0, 2.0 or 4.0 sec in the I^2C software. The device provides high output current for the desired seconds and will shut off to protect the LED and user.

For shutdown set the ENABLE pin LOW (J8 shunt in the position pin 2 to 3) and then to enable set it HIGH (J8 shunt in the position pin 1 to 2).

3) Dimming

The SP7682 can be pulse width modulated using the EN pin. First you need to set the output current level in step 2. Then remove the shunt on J8 and connect the EN J8 pin 2 to the pulse generator with desired modulation frequency (positive pulse with amplitude from 2.4V to Vin voltage range). Changing the pulse duty cycle changes the average LED current. Recommended modulation frequencies are from 60Hz to 200Hz with 10 – 90% duty cycle.

EVALUATION BOARD LAYOUT

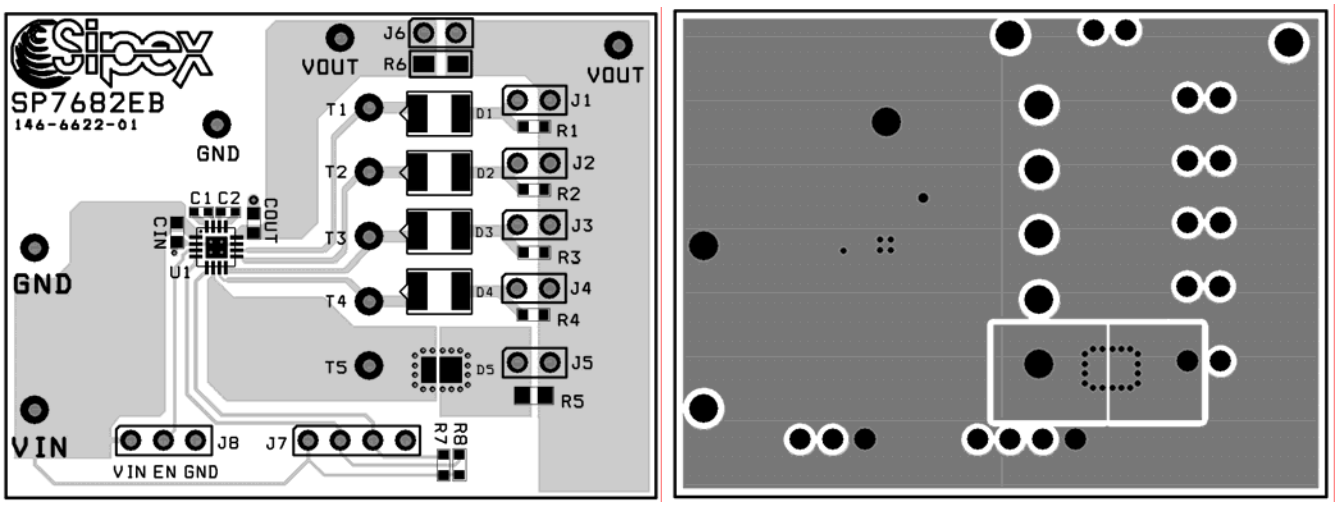


Figure 2. SP7682 Evaluation Board Layout top and bottom side

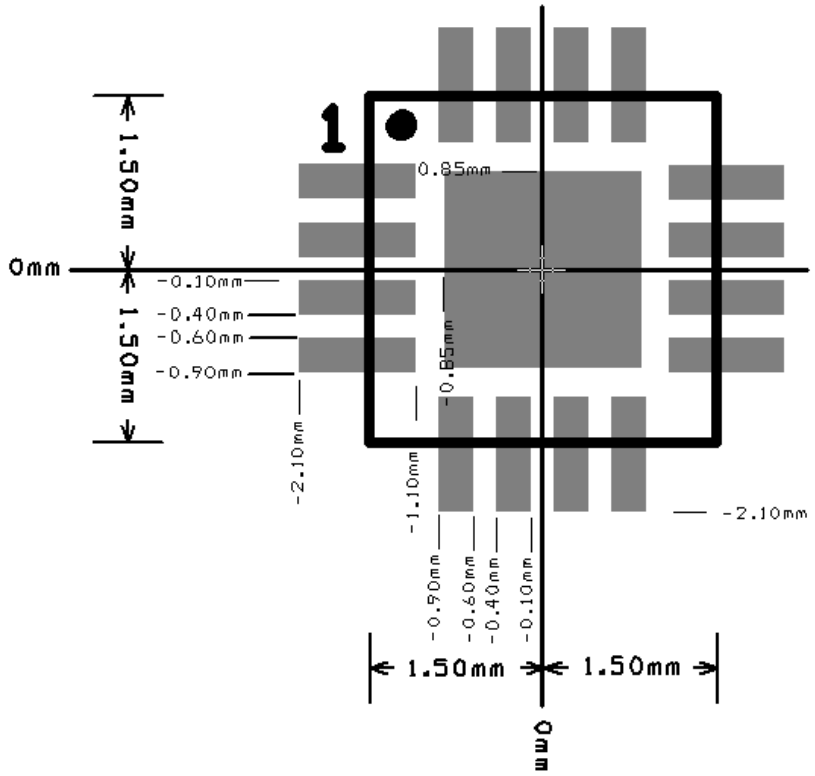


Figure 3. SP7682EB 16 Pin 3X3 QFN recommend foot print dimension

Part Reference	Qty	Part Number	Value	Size	Manufacturers
U1	1	SP7682ER-L		3x3mm QFN-16 pin	www.sipex.com
PCB	1	146-6622-01	Eval bd PCB		www.sipex.com
Cin	1	GRM188R60J475k	4.7uF/6.3V	0603, X5R, 0.9mm ht.	www.murata.com
Cout	1	GRM188R61A225k	2.2uF/10V	0603, X5R, 0.9mm ht.	www.murata.com
C1,C2	2	GRM155R60J105k	1uF/6.3V	0402, X5R, 0.7mm ht.	www.murata.com
R1,R2,R3 R4,R5,R6	6	CRCW06030000Z0EA	0 Ohm	0603, 1/10 watt	www.vishay.com
R7,R8	2	CRCW0603100K	100K	0603, 1/10 watt	www.vishay.com
J1,J2,J3 J4,J5,J6	Opt	61303611121	2 pin Header	6x2.54mm	www.we-online.com
	Opt	60900213421	Shunt	5x2.54mm	
J7	1	61304011021	Angled pin Header	4 Pos, 2.54mm R/A	www.we-online.com
J8	1	61303611121	3 pin Header	6x2.54mm	www.we-online.com
Vin,Vouts,GNDs T1,T2,T3,T4,T5	10	0300-1-15-01-47-01-10-0	Test Point Female pin	0.042" dia	Mil-Max www.digikey.com

Table1. SP7682EB List of Materials

ORDERING INFORMATION

Model	Temperature Range	Package Type
SP7682EB	-40°C to +85°C	SP7682 Evaluation Board
SP7682ER1-L	-40°C to +85°C	Lead Free 16 Pin QFN (3mm x 3mm)
SP7682ER1-L/TR	-40°C to +85° C	Lead Free 16 Pin QFN (3mm x 3mm)

/TR = Tape and Reel
Pack quantity is 3,000 for DFN.

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

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