EVAL5981

1 A step-down switching regulator demonstration board based on the L5981

Data Brief

Features

- 1 A DC output current
- 2.9 V to 18 V input voltage
- Output voltage adjustable from 0.6 V to 16 V
- 250 kHz switching frequency, programmable up to 1 MHz
- Internal soft-start and inhibit
- Low dropout operation: 100 % duty cycle
- Zero-load current operation
- Over-current and thermal protection
- VFQFPN8 3 mm x 3 mm package



EVAL5981

Description

The EVAL5981 demonstration board provides the design engineer with a fully functional step-down switching regulator with an output current of up to 1 A. The L5981 integrates STMicroelectronics step-down switching regulator, together with all the external components required for a typical application.

The rated voltage of the input capacitor and the Schottky diode rectifier repetitive peak reverse voltage are both 25 V, making the board capable of covering the entire 2.9 V - 18 V input voltage range of the L5981 device.

The board features an external resistor divider (R1 and R2) designed for an output voltage of 3.3 V.

The output voltage can be set to a level from 0.6 V up to the rated voltage of the output capacitor (16 V).

The compensation network on the demonstration board allows the use of MLCC as output filter to keep the loop stable. The inductor saturation current and forward current of the Schottky diode are within the current limit values.

The switching frequency on the demonstration board is set to 500 kHz by means of the R5 resistor connected to pin Fsw.

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1 EVAL5981 application circuit and component list

Figure 1. Application circuit

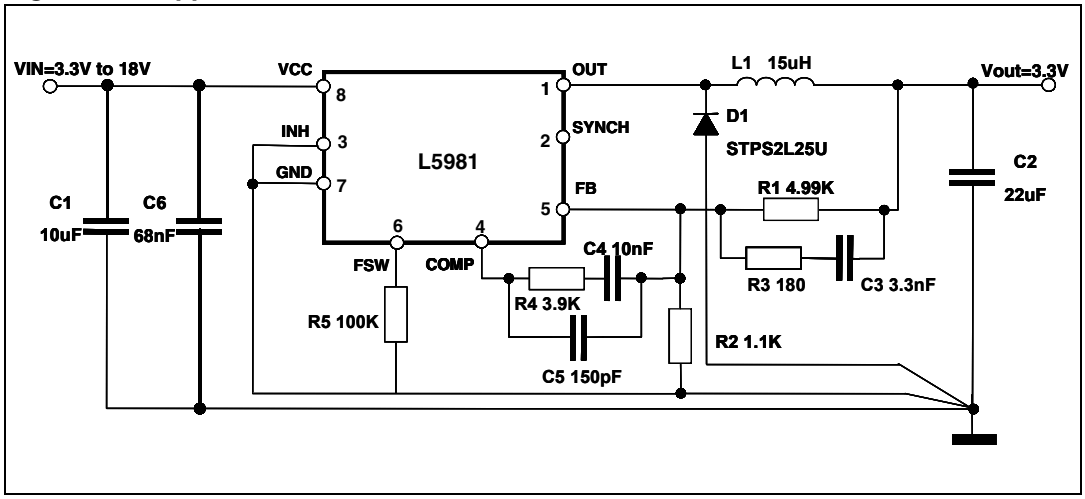


Table 1. Component list

Reference	Part number	Description	Manufacturer
C1	GRM31CR61E106KA12	10 µF, 25 V	MURATA
C2	GRM32ER61E226KE15	22 µF, 25 V	MURATA
C3		3.3 nF, 50 V	
C4		10 nF, 50 V	
C5		150 pF, 50 V	
C6		68 nF, 25 V	
R1		4.99 kΩ, 1 %, 0.1 W 0603	
R2		1.1 kΩ, 1 %, 0.1 W 0603	
R3		180 Ω, 1 %, 0.1 W 0603	
R4		3.9 kΩ, 1 %, 0.1 W 0603	
R5		100 kΩ, 1 %, 0.1 W 0603	
D1	STPS2L25V	2 A, 25 V	STMicroelectronics
L1	7447779115	15 µH, 20 %, 2.2 A	Wurth elektronik

2 PCB layout

Figure 2. PCB layout (component side)

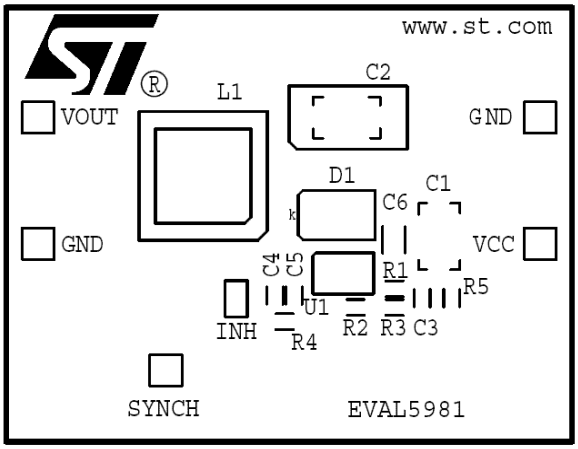


Figure 3. PCB layout (bottom side)

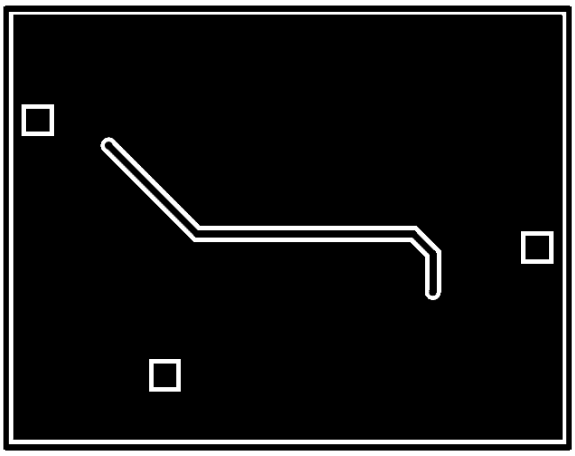
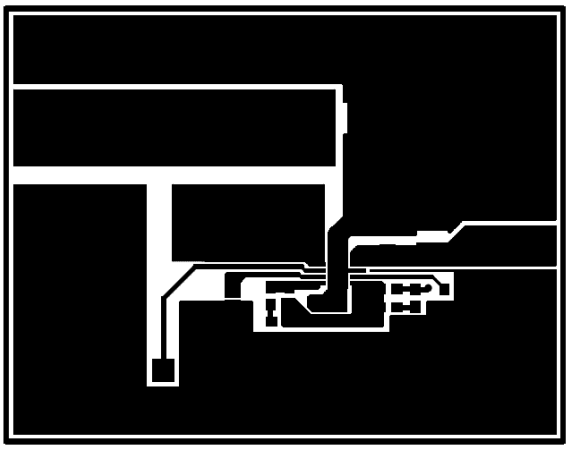


Figure 4. PCB layout (front side)



3 Package mechanical data

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4 Revision history

Table 2. Document revision history

Date	Revision	Changes
02-Mar-2009	1	Initial release

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