

LM3485 Evaluation Board

National Semiconductor
Application Note 1227
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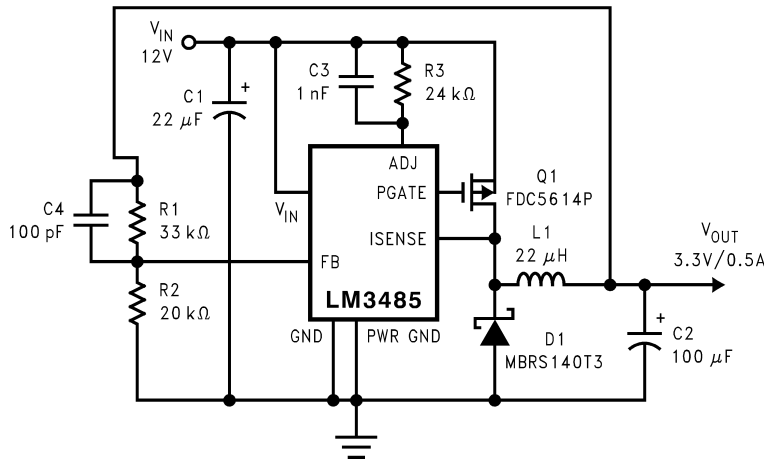


Introduction

The LM3485 is a Hysteretic P-FET Buck Controller, which uses a pulse-frequency modulation (PFM) scheme to regulate the output voltage. This LM3485 demo board and the recommended components are intended to demonstrate the performance with a 3.3V output from a 12V source. The

demo board can be used with source voltages from 7V to 28V to deliver output load currents up to 1A. By changing the size of a single resistor, regulated output voltages from 1.242V to 5V can be obtained.

The circuit schematic is shown in *Figure 1* and the bill of materials is given in *Table 1*.



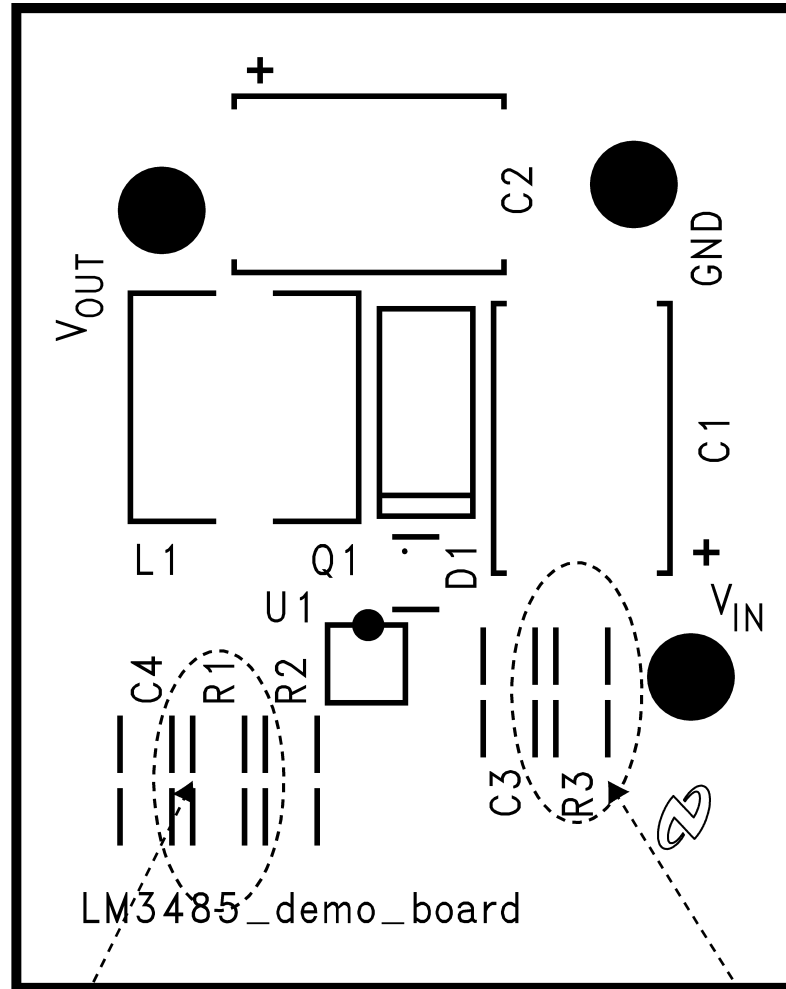
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FIGURE 1. Regulator with 3.3V Output at 0.5A

TABLE 1. Bill of Materials

Code	Description	Manufacturer
C1	Input Capacitor CAP-Tantalum 22μF 35V EEJL1VD226R	Panasonic
C2	Output Capacitor CAP-POSCAP 100μF 6.3V 6TPC100M	Sanyo
C3	C _{ADJ} CAP-Ceramic Chip 1nF 50V GRM39X7R102K50	Murata
C4	C _{ff} CAP-Ceramic Chip 100pF 50V GRM39X7R101K50	Murata
D1	Catch Diode Schottky Diode 1A 30V MBRS130T3	On Semiconductor
L1	Inductor 22μH LQH66SN220M01L	Murata
Q1	P-channel MOSFET -60V FDC5614P	Fairchild
R1	Feedback high side resistor Chip Resistor 33KΩ MCR10EZHF3302	Rohm
R2	Feedback low side resistor Chip Resistor 20KΩ MCR10EZHF2002	Rohm
R3	R _{ADJ} Chip Resistor 24KΩ MCR10EZHF2402	Rohm
U1	Buck Controller LM3485	National Semiconductor

Output Voltage Current Limit Setting



Output Voltage setting

Find the value of R1 by:

$$R1 = (V_{OUT}/1.242 - 1) \times 20k$$

For 1.242V minimum output voltage, the output node is connected to the FB pin directly. Delete R2 and C4 and replace R1 with a short circuit.

Current Limit setting

Find the value of R3 by:

$$R3 = (R_{DS(on)} \times I_{ind_peak})/I_{CL}$$

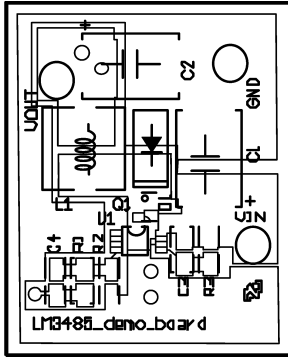
FIGURE 2. Component Location (Top Side)

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Layout Fundamentals

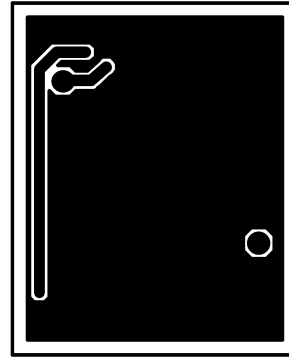
The LM3485 can work in a wide range of applications. For your application circuit, proper layout for the buck regulator should be implemented by following a few simple guidelines.

1. Place the power components, which are the MOSFET, diode, inductor and filter capacitors, close together. Make the traces between them as short and as wide as possible.
2. Place the trace for the Gate of the external PFET as close as possible to the PGATE pin of the LM3485.
3. Separate any noise sensitive traces, primarily in the voltage feedback path, from noise source traces associated with the inductor.
4. Keep the trace short between the ground pin of the input capacitor and the anode of the diode.
5. Ensure the ground is low impedance.



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Top Layer



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Bottom Layer

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