LM3485

Application Note 1227 LM3485 Evaluation Board



Literature Number: SNVA052A

National Semiconductor Application Note 1227 Naomi Sugiura May 2002



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.

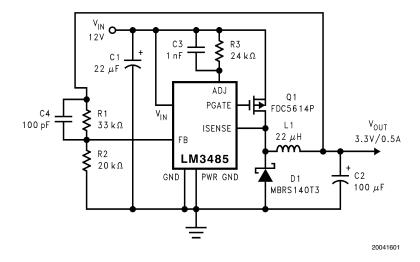


FIGURE 1. Regulator with 3.3V Output at 0.5A

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 CQ1 L 1 U 1 LM3485_demo_board **Current Limit setting** Find the value of R3 by: $R3 = (R_{DSON} \times lind_{peak})/l_{CL}$ **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

FIGURE 2. Component Location (Top Side)

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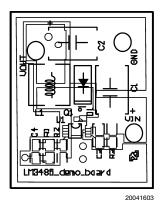
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R2 and C4 and replace R1 with a short circuit.

Layout Fundamentals

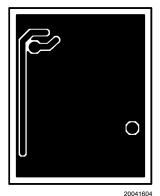
The LM3485 can work in a wide range of applications. For your application circuit, proper layout for the buck regulator should be implemented by following a few simple guidelines.

- 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.



Top Layer

- 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.
- Ensure the ground is low impedance.



Bottom Layer

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