50V To 5V 7Amps Synchronous Buck Controller

This module is a non-isolated 7A DC-DC converter. The module can convert any DC voltage between 7V to 50V to a 5V DC with load current up to 7Amps. Project has been designed using LM5116 IC, 6uH toroid inductor and two N channel Mosfets, Operating frequency 250 KHz.

The LM5116 is a synchronous buck controller intended for step-down regulator applications from a high-voltage or widely varying input supply. The control method is based upon current mode control utilizing an emulated current ramp. Current mode control provides inherent line feed-forward, cycle-by-cycle current limiting, and ease-of-loop compensation. The use of an emulated control ramp reduces noise sensitivity of the pulse-width modulation circuit, allowing reliable control of very small duty cycles necessary in high-input voltage applications.

The operating frequency is programmable from 50 kHz to 1 MHz the LM5116 drives external high-side and low-side NMOS power switches with adaptive dead-time control. A user-selectable diode emulation mode enables discontinuous mode operation, for improved efficiency at light load conditions. A low quiescent current shutdown disables the controller and consumes less than 10 μ A of total input current.

Additional features include a high-voltage bias regulator, automatic switch-over to external bias for improved efficiency, thermal shutdown, frequency synchronization, cycle-by-cycle current limit, and adjustable line under voltage lockout. The device is available in a power enhanced HTSSOP-20 package featuring an exposed die attach pad to aid thermal dissipation

Features

- Wide Operating Range 7V 50V
- Output 5V DC
- Load Current Up To 7Amps
- Thermal Shutdown
- Operating Frequency 250Khz
- PCB Dimensions 45.04MM X 22.82MM





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ВОМ			
SR.	QNTY.	REF	DESC.
1	1	CN1	4 PIN HEADER CONNECTOR
2	1	CN2	4 PIN HEADER CONNECTOR
3	1	C1	1uF/100V SMD 1210
4	3	R5,C7,C9	OMIT
5	5	C10,C11,C13,C14,C15	100uF/10V SMD 1210
6	1	C12	270PF SMD 0805
7	1	C16	3K3PF SMD 0805
8	1	C17	100PF SMD 0805
9	1	C18	10KPF SMD 0805
10	1	D1	SS34 FAST SWITCHING SMD
11	1	L1	6uH 10A TOROID
12	1	Q1	IRLR024N SMD DPAK
13	1	Q2	IRLR024N SMD DPAK
14	1	R1	102K 1% SMD 0805
15	1	R2	1M SMD 0805
16	1	R3	21K 1% SMD 0805
17	1	R4	12K4 1% SMD 0805
18	1	R6	0.01E 1% SMD 2512
19	2	R7,R12	0E SMD 0805
20	1	R8	3K74 1% SMD 0805
21	1	R9	10K 1% SMD 0805
22	1	R10	1K21 1% SMD 0805
23	1	R11	18K SMD 0805
24	1	U1	LM5116 SMD
25	3	C5,C6,C8	1uF/25V SMD 0805
26	2	C3,C4	10uF/100V 1210
27	1	C2	0.1uF 100V 0805







