

XL2006 DEMO Board manual

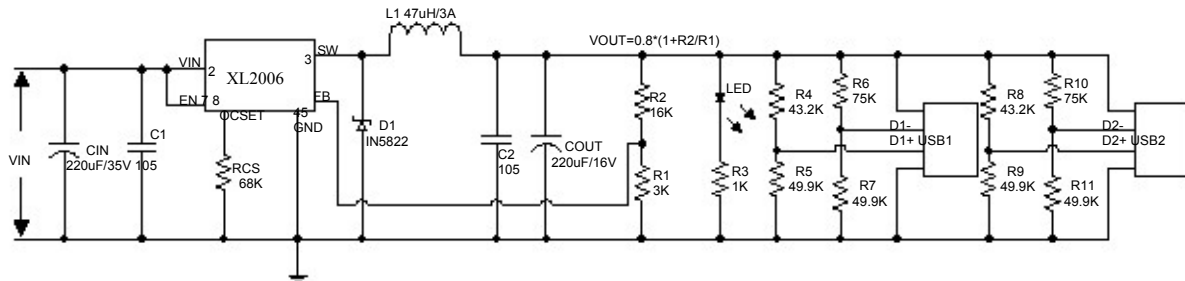
Introduction

Demonstration circuit XL2006 in a 160KHz BUCK converter circuit , designed for 5V/2.1A output from a 8V to 32V input .

The XL2006 operates over an input range of 8V to 32V, suitable for car charger , battery charger .Output current up to 3A,efficiency up to 92%,with output constant voltage and constant current control loop ,design with very low parts count.

This document contains the converter specification, schematic, PCB diagram, bill of materials.

Schematic



XL2006 VIN=8V~32V, VOUT=5V, IOU=2.1A Typical Application Circuit

Pin Description

Pin Number	Pin Name	Description
1	NC	No Connected
2	VIN	Supply Voltage Input Pin. XL2006 operates from a 8V to 32V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
3	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output. (Note: Connected the back exposed PAD to SW.)
4	GND	Ground Pin.
5	FB	Feedback Pin (FB). Through an external resistor divider network, Feedback senses the output voltage and regulates it.The feedback threshold voltage is 0.8V.
6	NC	No Connected
7	EN	Enable Pin. Drive EN pin low to turn off the device, drive it high to turn it on.
8	OCSET	Output Constant Current Set Pin

Bill of Materials

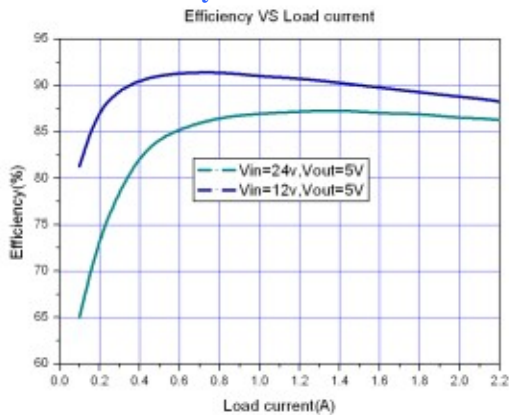
Qty	Ref Des	Description	Mfg Part Number	Mfg
2	C1, C2	1uF, 50V, Ceamic, X7R, 0805	C2012X7R1H105K	TDK
1	CIN	220uF, 35V, Electrolytic, (8x11)		Samwha
1	COUT	220uF, 16V, Electrolytic, (6.3x11)		Samwha
1	D1	40V, 3A, DIP, Schottky Barrier Rectifier	1N5822	MCC
1	D3	Φ 3, LED, Blue, DIP		
1	L1	47uH, 3A, (10*4)		
1	R1	3K Ω , 1%, 1/10W, Thick Film, 0603	RC0603XR-073001	Yageo
1	R2	16K Ω , 1%, 1/10W, Thick Film, 0603	RC0603XR-071602	Yageo
1	R3	1K Ω , 1%, 1/10W, Thick Film, 0805	RC0805XR-071001	Yageo
2	R4, R8	43.2K Ω , 1%, 1/10W, Thick Film, 0603	RC0603XR-074322	Yageo
4	R5, R7, R9, R11	49.9K Ω , 1%, 1/10W, Thick Film, 0603	RC0603XR-074992	Yageo
2	R6, R10	75K Ω , 1%, 1/10W, Thick Film, 0603	RC0603XR-077502	Yageo
1	RCS	68K Ω , 1%, 1/10W, Thick Film, 0603	RC0603XR-076802	Yageo
1	U1	Xlsemi, XL2006, SOP8-EP	XL2006	XLSEMI
2	USB	DIP		

Component Selection Table

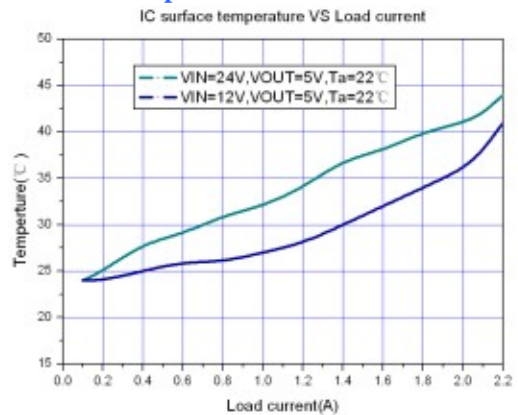
Application	CIN	L1	D1	R1	R2	COUT	RCS
5V/1.2A	220μF/35V	47μH/3A	B340	3K	16K	220μF/16V	11K
5V/1.5A	220μF/35V	47μH/3A	B340	3K	16K	220μF/16V	20K
5V/2.1A	220μF/35V	47μH/3A	B340	3K	16K	220μF/16V	68K

Performance Data

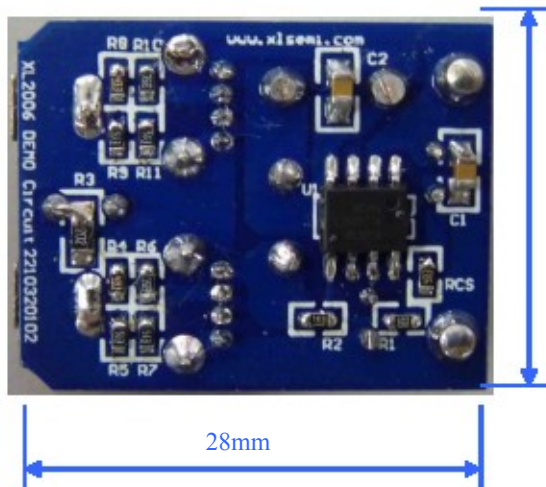
Efficiency VS Load current



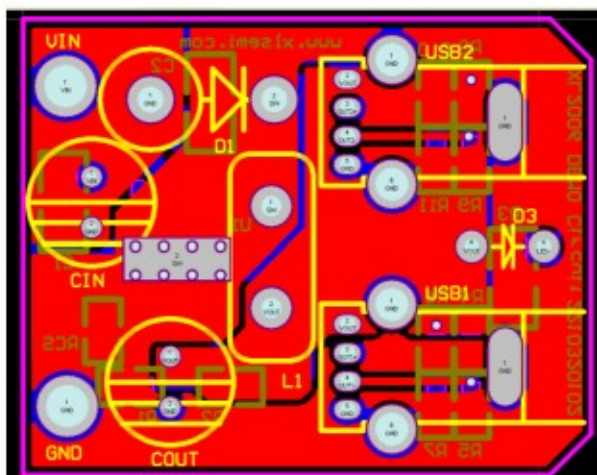
IC Surface temperature VS Load current



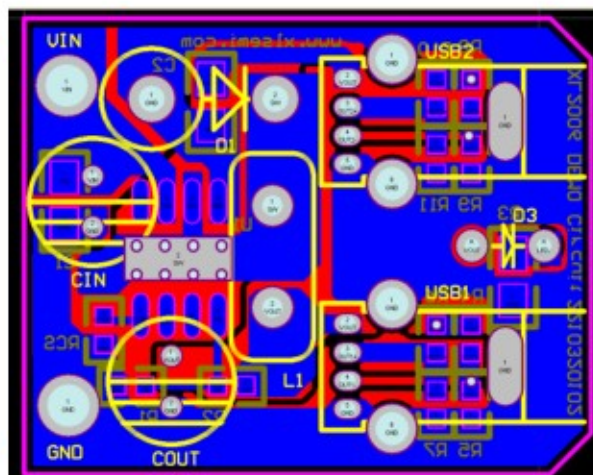
Populated Circuit Board Phtograph



PCB Layout



Top side



Bottom side

Note

1. Keep feedback wiring away from inductor and schottky.
2. VIN,SW lines must be short and ground plane construction for best results.
3. Input capacitor as close as possible with the XL2006.

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