XL2003 DEMO Board Manual

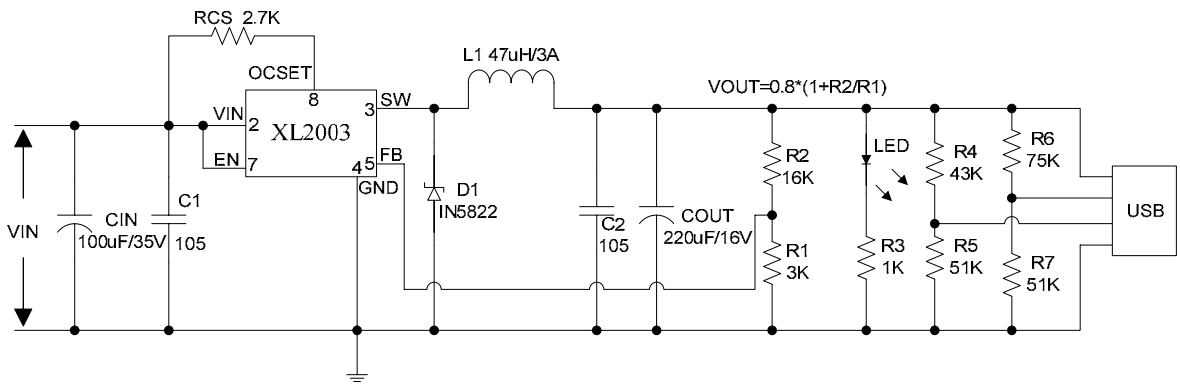
Introduction

Demonstration circuit XL2003 in a 180KHz BUCK converter circuit , designed for 5V/2.1A output from a 8V to 30V input .

The XL2003 operates over an input range of 8V to 30V, suitable for car charger , battery charger. Output current up to 3A , efficiency up to 90%,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



XL2003 VIN=8V~30V,VOUT=5V,IOUT=2.1A Typical Application Circuit

Pin Description

Pin Number	Pin Name	Description
1	NC	No Connected
2	VIN	Supply Voltage Input Pin. XL2003 operates from a 8V to 30V 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

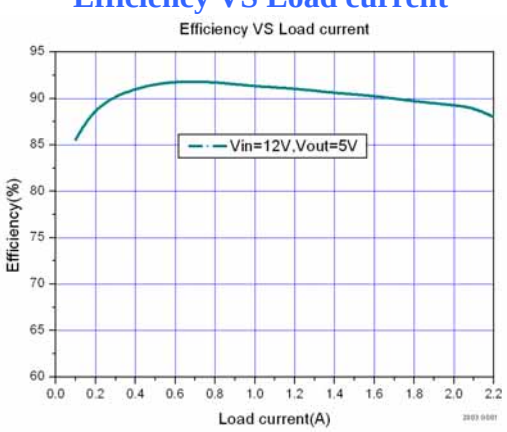
Qty	Ref Des	Description	Mfg Part Number	Mfg
2	C1,C2	1uF,50V,Ceamic,X7R,0805	C2012X7R1H105K	TDK
1	CIN	100uF,35V, Electrolytic,(6.3x11)	035YXA00100±20%	Rubycon
1	COUT	220uF,16V, Electrolytic,(6.3x11)	016YXA00220±20%	Rubycon
1	D1	40V,3A,SMA,Schottky Barrier Rectifier	1N5822	MCC
1	D3	Φ3,LED,Blue,DIP		
1	L1	47uH,3A,(10*4)		
1	R1	3KΩ,1%,1/8W,Thick Film,0805	RC0805XR-073001	Yageo
1	R2	16KΩ,1%,1/8W,Thick Film,0805	RC0805XR-071602	Yageo
1	R3	2KΩ,1%,1/8W,Thick Film,0805	RC0805XR-072001	Yageo
1	R4	43KΩ,1%,1/10W,Thick Film,0603	RC0603XR-074302	Yageo
2	R5,R7	51KΩ,1%,1/10W,Thick Film,0603	RC0603XR-075102	Yageo
1	R6	75KΩ,1%,1/10W,Thick Film,0603	RC0603XR-077502	Yageo
1	RCS	2.7KΩ,1%,1/8W,Thick Film,0805	RC0805XR-072701	Yageo
1	U1	Xlsemi,XL2003,SOP8-EP	XL2003	XLSEMI
1	USB	DIP		

Component Selection Table

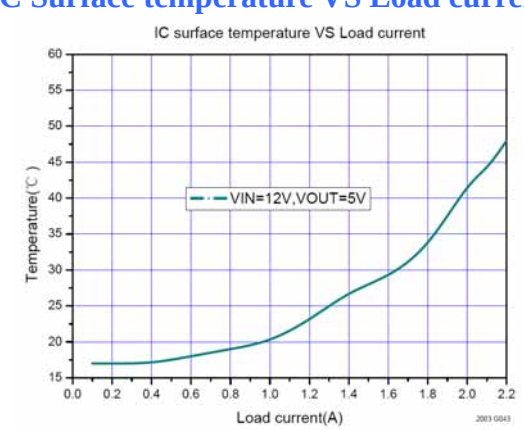
Application	CIN	L1	D1	R1	R2	COUT	RCS
5V/1.2A	100μF/35V	47μH/3A	1N5822	3K	16K	220μF/16V	1.25K
5V1.5A	100μF/35V	47μH/3A	1N5822	3K	16K	220μF/16V	1.9K
5V/2.1A	100μF/35V	47μH/3A	1N5822	3K	16K	220μF/16V	2.7K

Performance Data

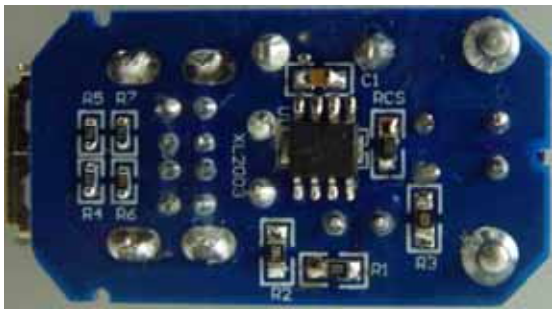
Efficiency VS Load current

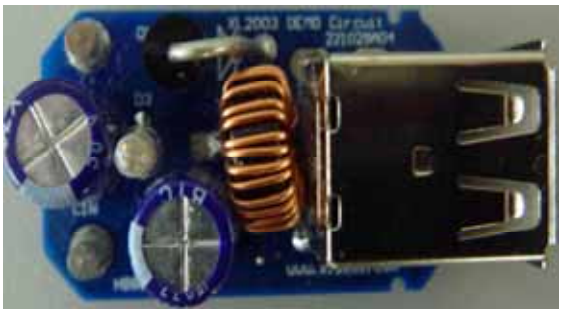


IC Surface temperature VS Load current

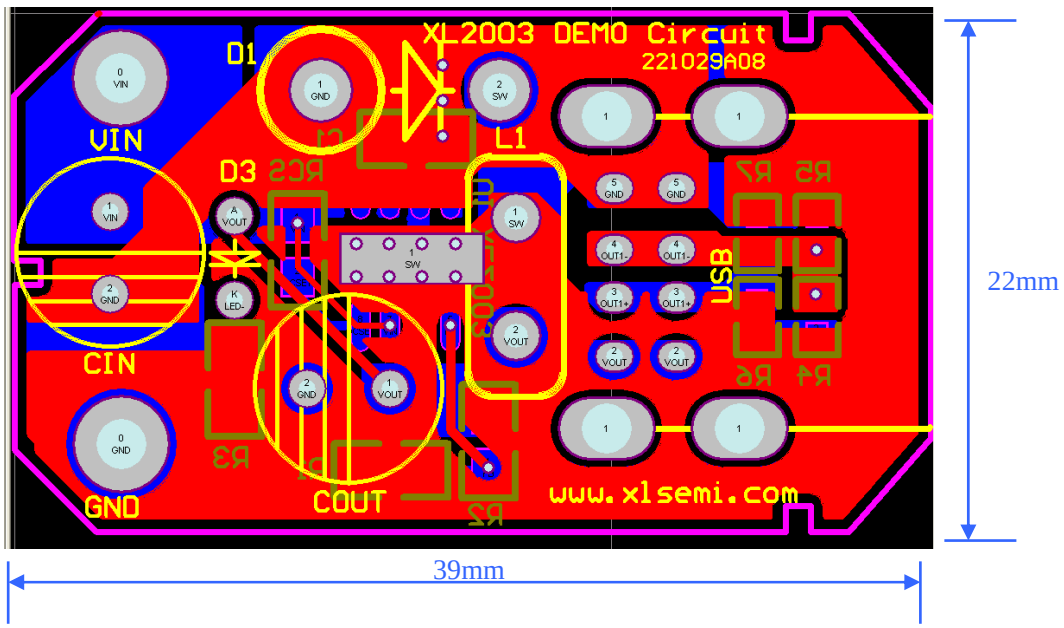


Populated Circuit Board Phtograph

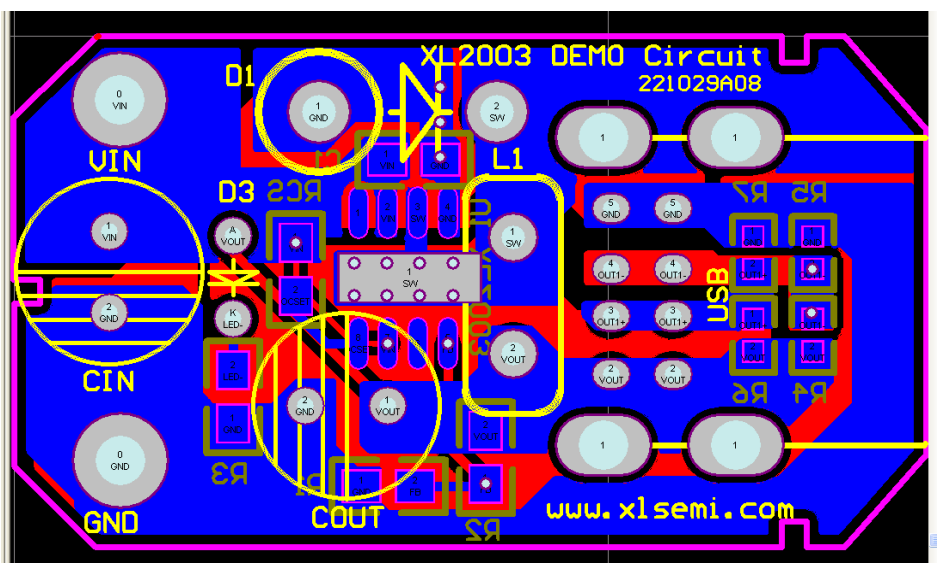




PCB Layout



Top side



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