100KHz 56V 0.5A Switching Current Dual Channel Buck DC/DC Converter XL7001

Features

- Wide 24V to 56V Input Voltage Range
- Fixed 12V Channel and 5V Channel
- Fixed 100KHz Switching Frequency
- Maximum 0.5A Switching Current
- Excellent line and load regulation
- Internal Optimize HV Transient
- Built in Frequency Compensation
- Built in Soft-Start Function
- Built in Thermal Shutdown Function
- Built in Current Limit Function
- Available in SOP8L-EP package

Applications

- Ebike Power Manager Solution
- Portable Electronic Equipment

General Description

The XL7001 regulator is a wide input range, voltage mode, dual channel DC/DC converter. The XL7001 built in high voltage power transient.

The XL7001 regulator is special design for EBIKE power solution and portable electronic equipment power supply.

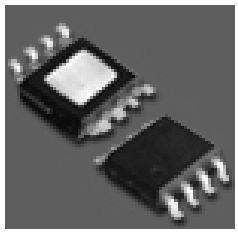


Figure1. Package Type of XL7001

Pin Configurations

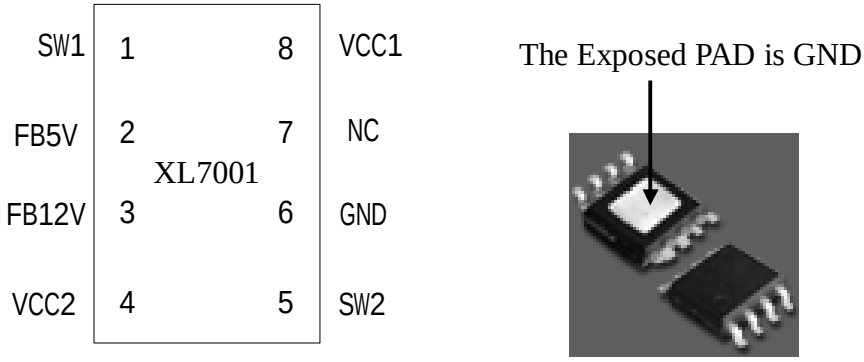


Figure2. Pin Configuration of XL7001 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	SW1	Channel1 Power Switch Output Pin (SW1).
2	FB5V	Channel2 Feedback Pin (FB5V). The feedback threshold voltage is 5V.
3	FB12V	Channel1 Feedback Pin (FB12V). The feedback threshold voltage is 12V.
4	VCC2	Channel2 Supply Voltage Input Pin.
5	SW2	Channel2 Power Switch Output Pin (SW2).
6	GND	Ground Pin.
7	NC	No Connected.
8	VCC1	Channel1 and Whole Chip Supply Voltage Input Pin.

Function Block

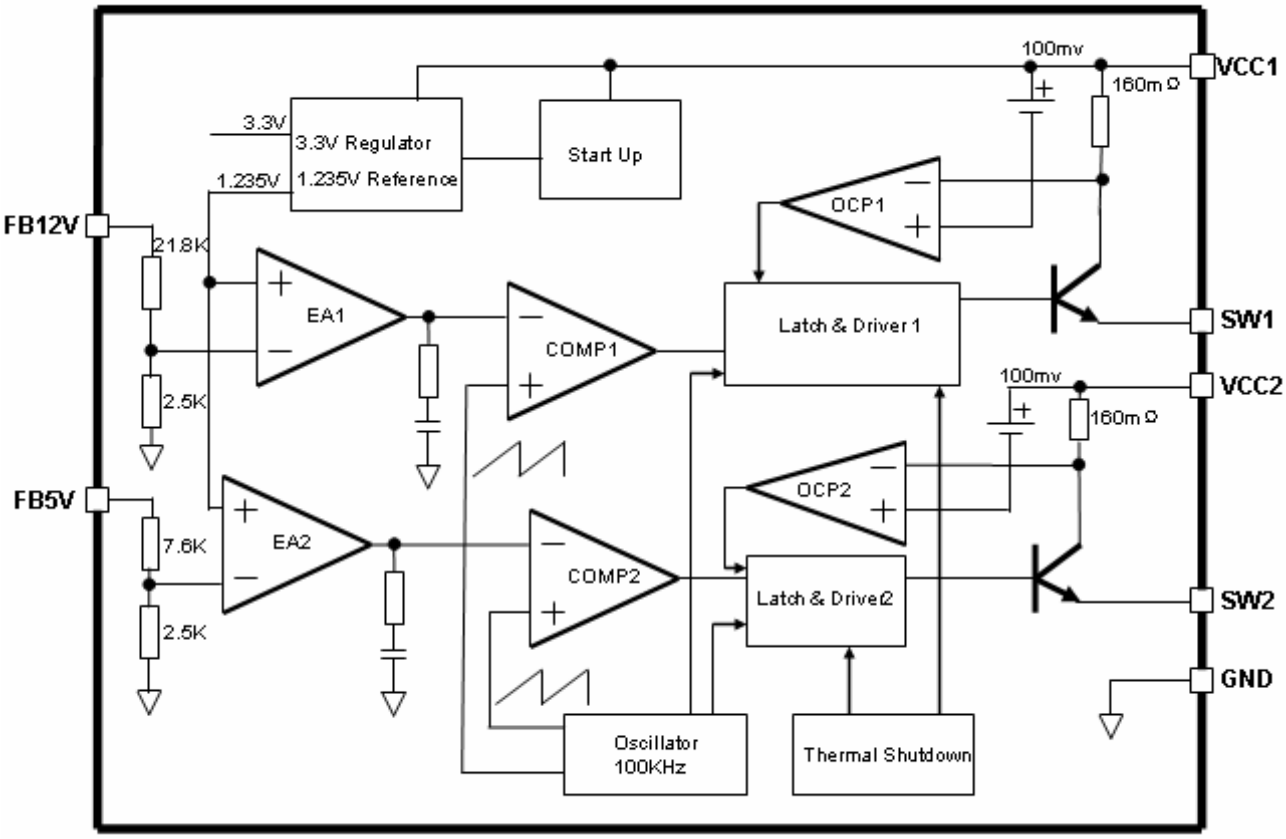


Figure3. Function Block Diagram of XL7001

Ordering Information

Package	Temperature Range	Part Number	Marking ID	Packing Type
		Lead Free	Lead Free	
		XL7001E1	XL7001E1	Tube
		XL7001E1	XL7001E1	Tape & Reel

XLSEMI Pb-free products, as designated with "E1" suffix in the par number, are RoHS compliant.

Absolute Maximum Ratings（Note1）

Parameter	Symbol	Value	Unit
Input Voltage	VCC1	-0.3 to 60	V
Feedback Pin Voltage	V_{FB}	-0.3 to Vin	V
Output Switch Pin Voltage	V_{SW}	-0.3 to Vin	V
Power Dissipation	P_D	Internally limited	mW
Thermal Resistance (SOP8L-EP) (Junction to Ambient, No Heatsink, Free Air)	R_{JA}	60	ºC/W
Operating Junction Temperature	T_J	-40 to 125	ºC

Storage Temperature	T_{STG}	-65 to 150	ºC
Lead Temperature (Soldering, 10 sec)	T_{LEAD}	260	ºC
ESD (HBM)		2000	V

Note1: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

XL7001 Electrical Characteristics

T_a = 25℃;unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure4						
VFB5V	Channel2 FB5V	VCC1 = 24V to 48V, VOUT2=5V Iload=0.2A	4.9	5	5.1	V
VFB12V	Channel1 FB12V	VCC1 = 24V to 48V, VOUT1=12V Iload=0.2A	11.52	12	12.48	V

Electrical Characteristics (DC Parameters)

VCC1 = 24V, GND=0V, Vin & GND parallel connect a 47uf/50V capacitor; Iout=0.2A, T_a = 25℃; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	VCC1		24		56	V
Quiescent Supply Current	I_q	V_{FB12V}=12.4V, V_{FB5V}=5.2V, VCC1=VCC2=24V		2	4	mA
Oscillator Frequency	Fosc		80	100	120	Khz
Max. Duty Cycle	D_{MAX}	V_{FB12V}=V_{FB5V}=0		85		%
Switch Current Limit	$I_{L\_channel1}$	V_{FB12V}= 0		0.6		A
Switch Current Limit	$I_{L\_channel2}$	V_{FB5V}= 0		0.6		A

Typical System Application – EBIKE Power Supply Solution

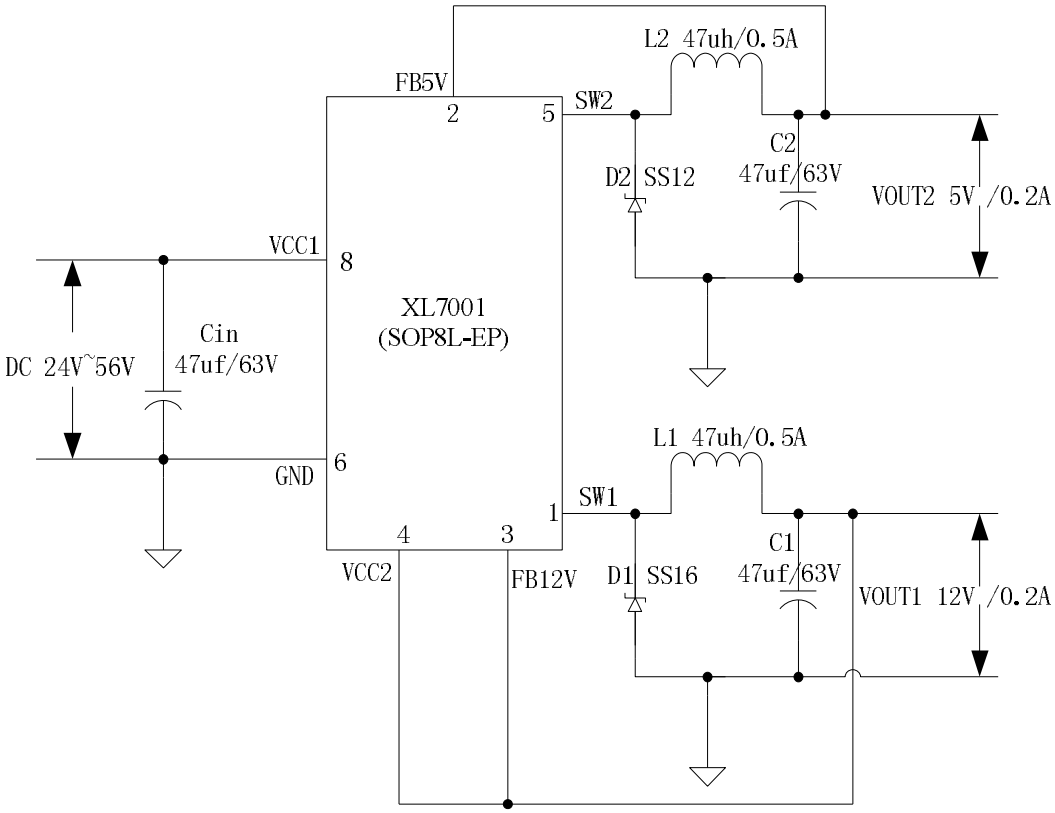


Figure4. XL7001 Typical System Application (EBIKE Controller Power Supply Solution)

Schottky Diode Selection Table

Current	Surface Mount	Through Hole	VR (The same as system maximum input voltage)				
			20V	30V	40V	50V	60V
1A	√		SS12	SS13	SS14	SS15	SS16
		√	1N5817	1N5818	1N5819		

Typical System Application – Single Channel1 Application

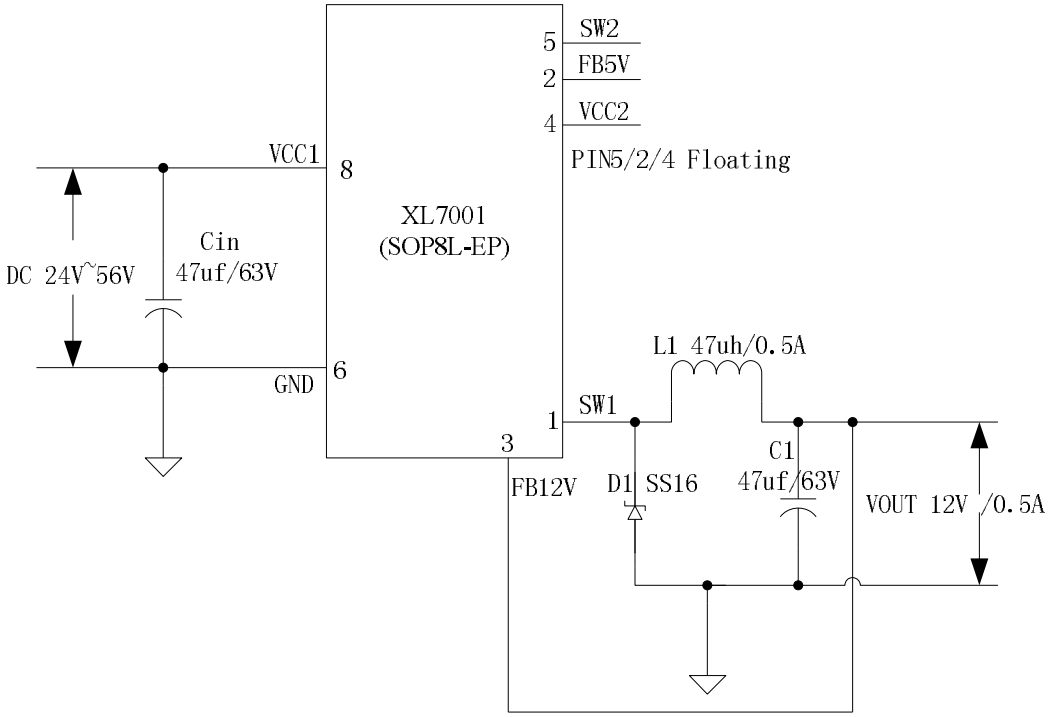


Figure5. XL7001 Single Channel1 Application (VIN=24V~56V, VOUT=12V/0.5A)

Typical System Application – Single Channel2 Application

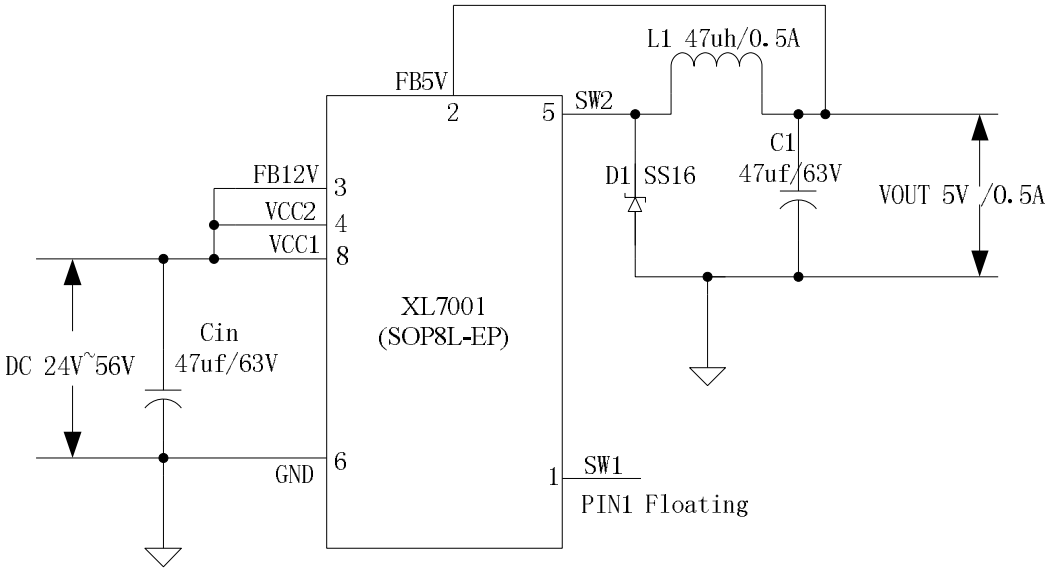
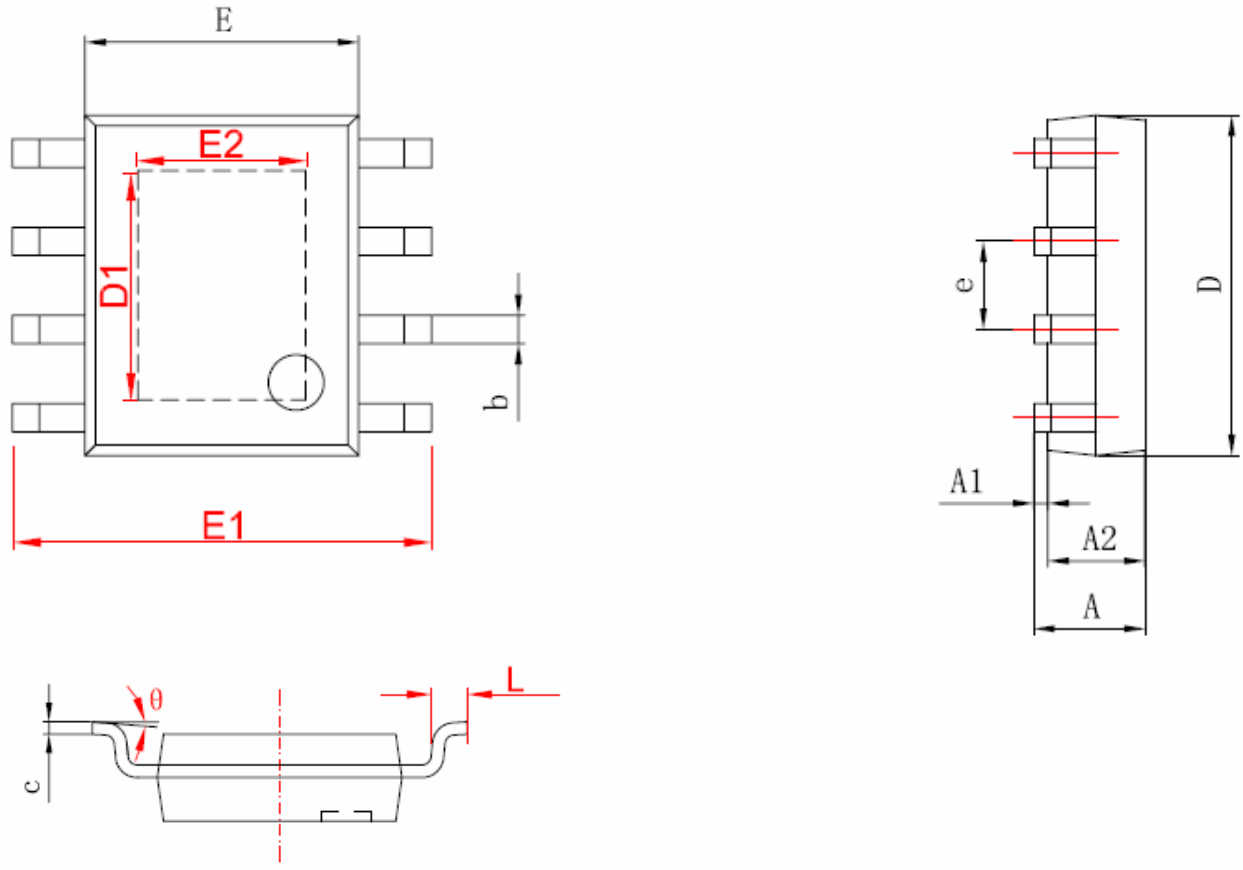


Figure6. XL7001 Single Channel2 Application (VIN=24V~56V, VOUT=5V/0.5A)

Package Information

Package Information (SOP8-EP)



字符	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°