



Description

The SE3901 is a green-mode Pulse Width Modulation (PWM) controller. It is specifically designed for low power applications such as 5W-20W Adaptors and Off-line battery Chargers. In these typical applications, the low standby power, space saving, and low cost are all required. SE3901 is a perfect solutions to meet these challenges. The typical standby power is only 0.13Watt.

In normal operation, the SE3901 switches on and off at a fixed switching frequency of 60 kHz. With a current limit capability of about 420mA, the SE3901 can directly drive the emitter of a high voltage NPN transistor. When the output power falls below a given level, the IC enters skip cycle mode to reduce power consumption.

The SE3901 also features Under-Voltage Lockout , Over-Temperature Protection, Over-Current and Short Circuit Protections.

The SE3901 is available in TO-94 Packages.

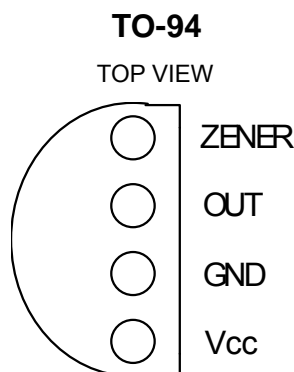
Features

- Internal Zener Diode
- Low Cost Emitter Drive PWM Solution
- 0.13W Standby Power
- Current Mode Operation
- Short Circuit Protection
- Over-Current Protection
- Over-Temperature Protection
- Under-Voltage Lockout with Auto-restart
- Available in TO-94 Packages
- RoHS Compliant and 100% Lead (Pb)-Free

Application

- Battery Chargers
- Universal Off-line Power Supplies
- Power Adaptors
- LED 3W-9W Lighting Solutions with SE1051

Pin Configuration



Pin Description

Name	Pin#	Function
VCC	1	The power supply of the IC, and is generally connected to opto-coupler's emitter
GND	2	Supply ground
OUT	3	The output pin, connected to the emitter of NPN transistor.
ZENER	4	The output pin, connected to Internal ZENER



Absolute Maximum Rating

Symbol	Parameter	Maximum	Units
VCC	DC Supply Voltage	-0.3 ~ 6	V
OUT	Voltage at OUT	-0.3~ 18	V
θ_{JA}	Thermal Resistance Junction to Ambient (TO92)	220	°C/W
T_J	Operating Junction Temperature Range	0 to 125	°C
T_{STG}	Storage Temperature Range	-40 to 150	°C
T_{LEAD}	Lead Temperature (Soldering 10 Sec)	260	°C

Electrical Characteristics

(Vcc=4V, $T_J=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
UVLO SECTION						
Start-up Voltage	$V_{TH} (ST)$		5.00	5.25	5.5	V
Minimal Operating Voltage	$V_{OPR} (Min)$		3.4	3.65	3.9	V
THERMAL PROTECT						
Thermal Shutdown	T_{SD}			150		°C
Thermal Hysteresis	T_{Hy}			20		°C
STANDBY CURRENT SECTION						
Start-up Current	I_{ST}	Vcc=4V		0.22	0.4	mA
Operating Current	$I_{CC(OPR)}$			0.45	0.7	mA
VCC Zener Voltage	V_Z	$I_{CC} = 10\text{mA}$	6	6.3		V
Dynamic Impedance	R_{VCC}	Vcc=3.8 to 4.8V		9		K Ω
INTERNAL OSCILLATOR						
Switching Frequency	f		50	60	75	KHz
DRIVE OUTPUT SECTION						
OUT Start-up Voltage	V_{ST}			8.5	11	V
Short Circuit Threshold Voltage	V_{SC}			6		V
Maximum Duty Cycle	D_{max}	$V_{OPR} (Min) + 0.2$		75		%
Minimum Duty Cycle		$V_{CC} = V_{th(st)} - 0.2$		3		%
Driver OUT On-Resistance	R_{OUT}	$I_{OUT} = 0.06\text{A}$		3		Ω
Switch Off Current		Driver off, Vout=10V		20	40	uA
Effective Current Limit	I_{LIM}	$V_{CC} = V_{OPR} + 0.1\text{V}$	420			mA
OUT Current Coefficient	G_A			-0.3		A/V



Typical Application

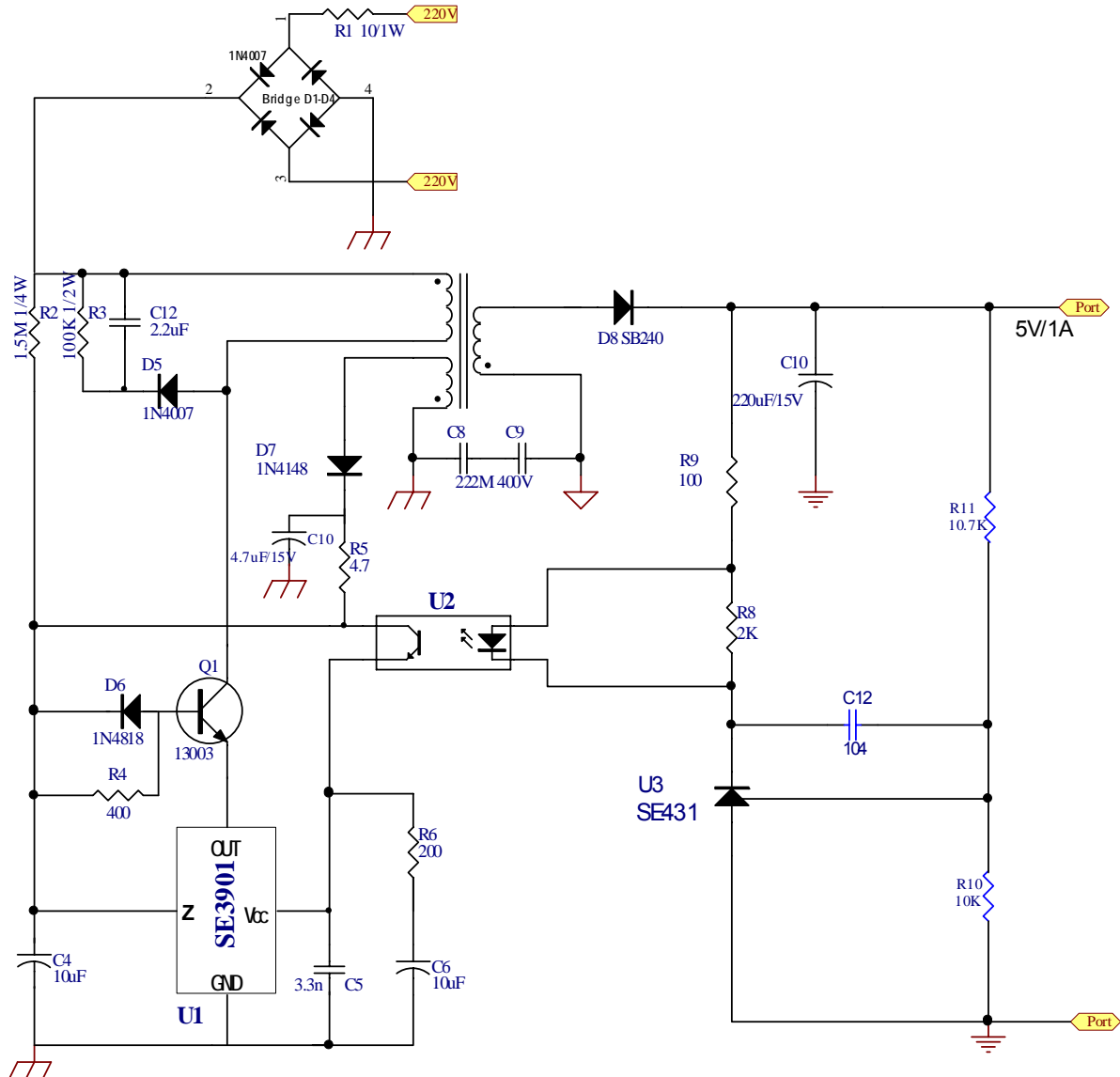


Fig.1 5V/1A Mobile Phone USB Charger Using SE3901(TO94) and SE431.

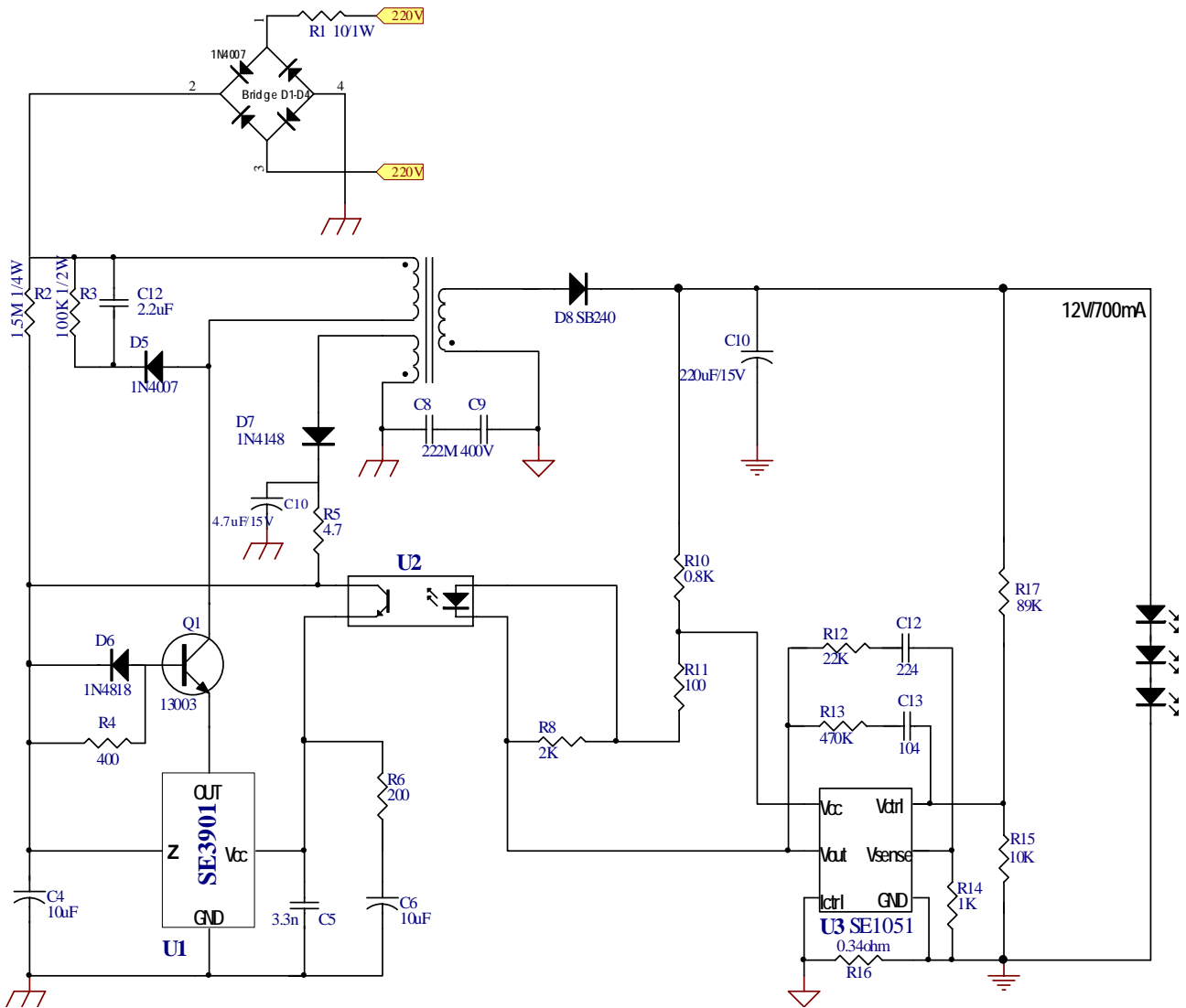
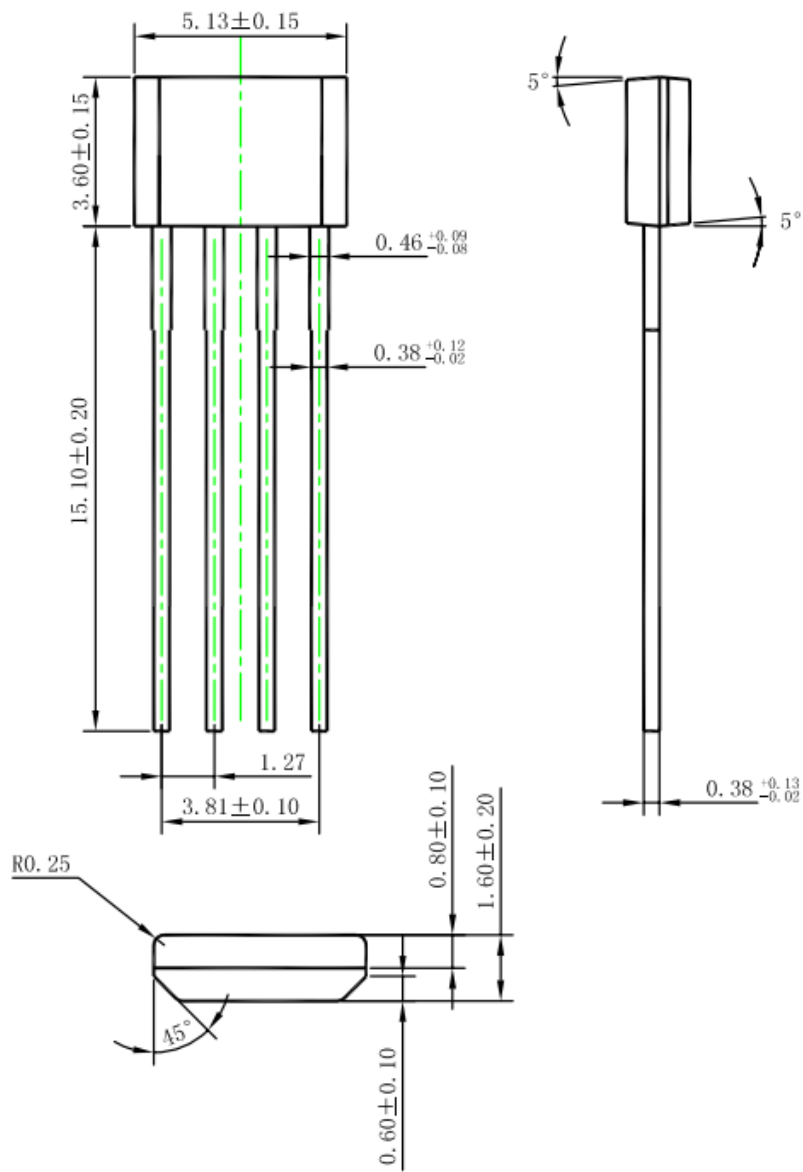


Fig.2 12V/700mA Lighting 9W LED Solution Using SE3901(TO94) and SE1051.

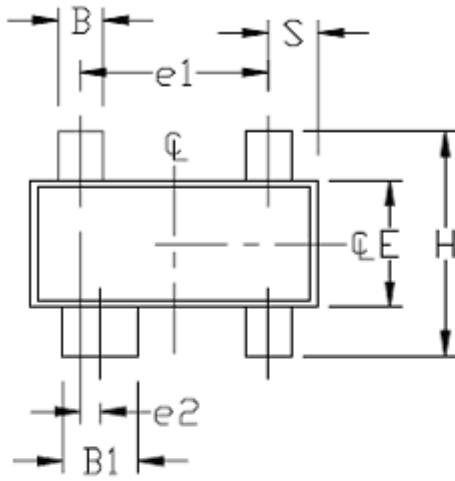


OUTLINE DRAWING TO94





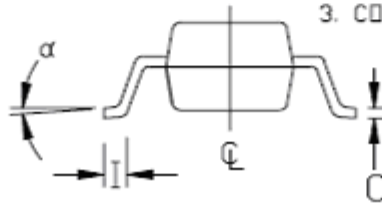
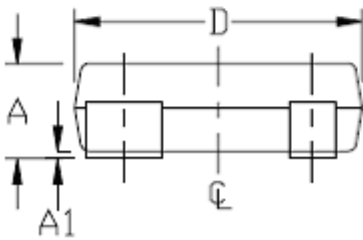
OUTLINE DRAWING SOT143



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.031	0.047	0.787	1.194
A1	0.001	0.005	0.025	0.127
B	0.014	0.022	0.356	0.559
B1	0.030	0.038	0.762	0.965
C	0.0034	0.006	0.086	0.152
D	0.105	0.120	2.667	3.048
E	0.047	0.055	1.194	1.397
e1	0.071	0.079	1.803	2.007
e2	0.008 BSC		0.200 BSC	
H	0.082	0.098	2.083	2.489
I	0.004	0.012	0.102	0.305
S	0.018	0.024	0.450	0.600
α	0°	8°	0°	8°

NOTES:

1. D&E DO NOT INCLUDE MOLD FLASH.
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED .15mm (.006")
3. CONTROLLING DIMENSION: MILLIMETER





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