



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.

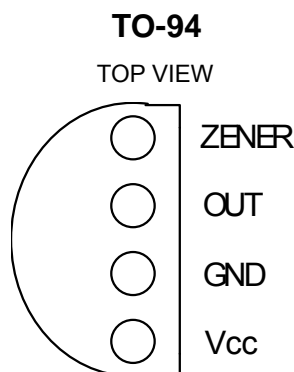
Features

- 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

(V_{CC}=4V, T_J=25°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}	V _{CC} =4V		0.22	0.4	mA
Operating Current	I _{CC(OPR)}			0.45	0.7	mA
VCC Zener Voltage	V _Z	I _{CC} =10mA	6	6.3		V
Dynamic Impedance	R _{VCC}	V _{CC} =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} =0.06A		3		Ω
Switch Off Current		Driver off, V _{out} =10V		20	40	uA
Effective Current Limit	I _{LIM}	V _{CC} = V _{OPR} +0.1V	420			mA
OUT Current Coefficient	G _A			-0.3		A/V



Typical Application

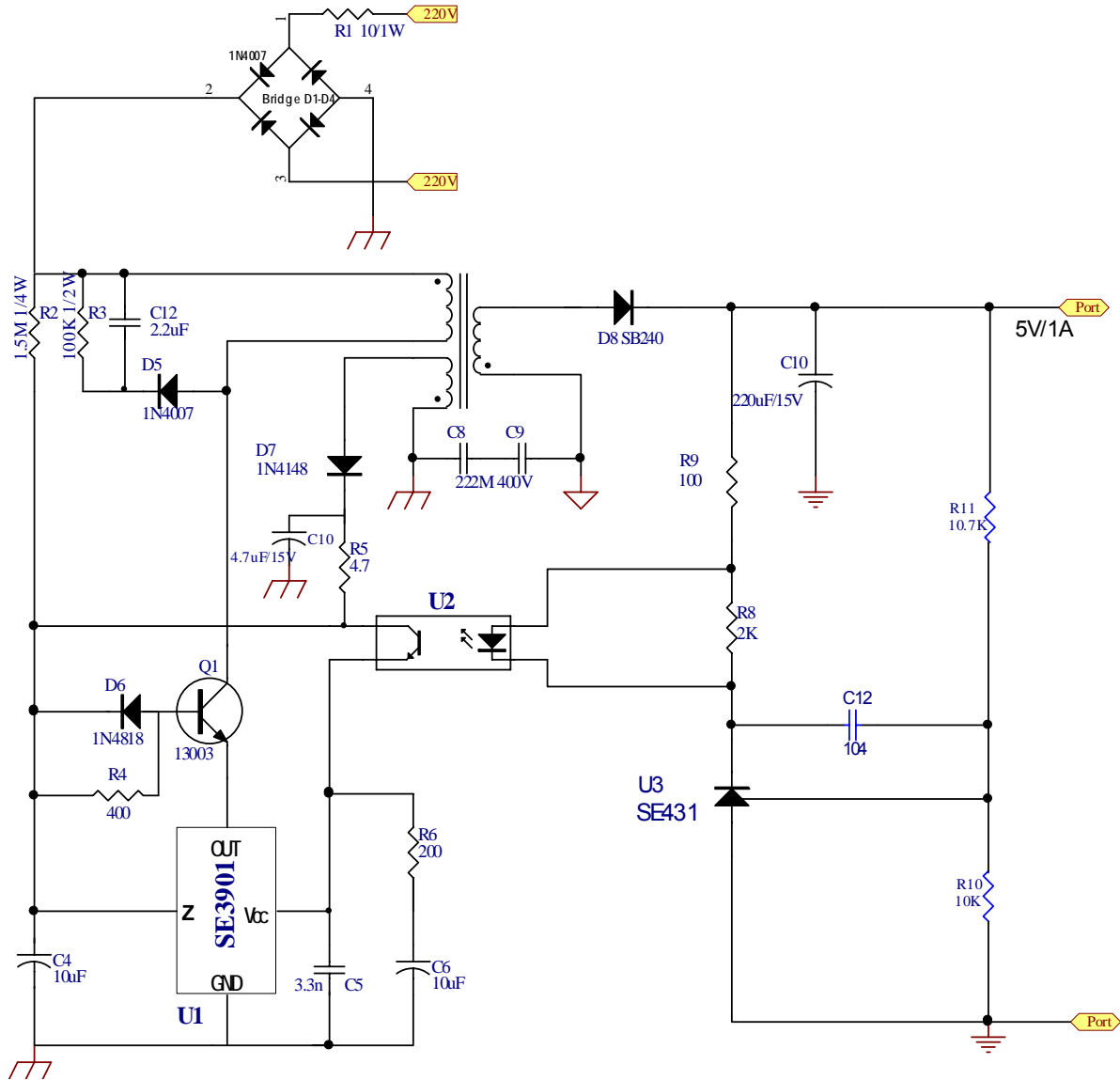


Fig.1 5V/1A Mobile Phone USB Charger Using SE3901(TO94) and SE431.

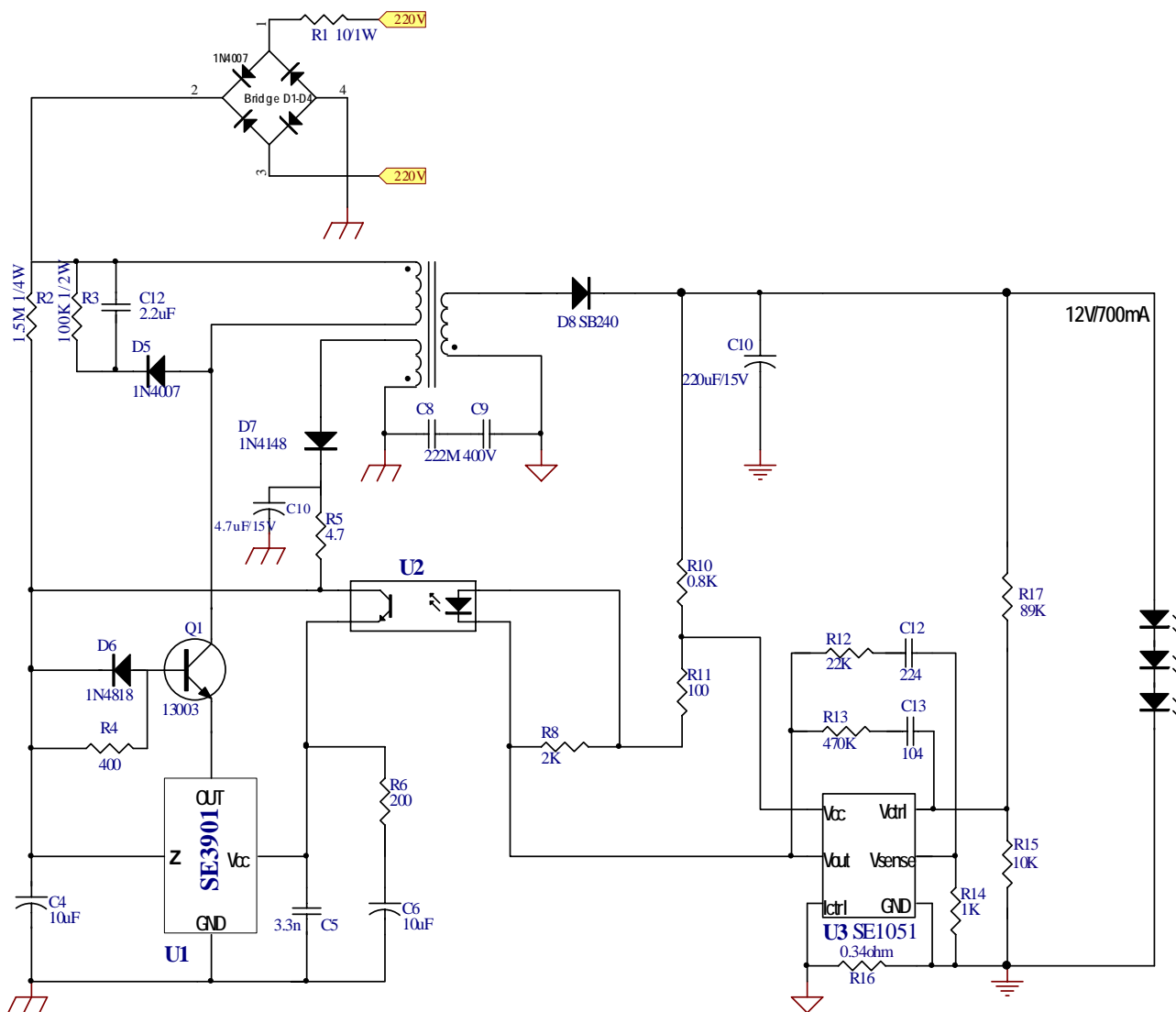


Fig.2 12V/700mA Lighting 9W LED Solution Using SE3901(TO94) and SE1051.

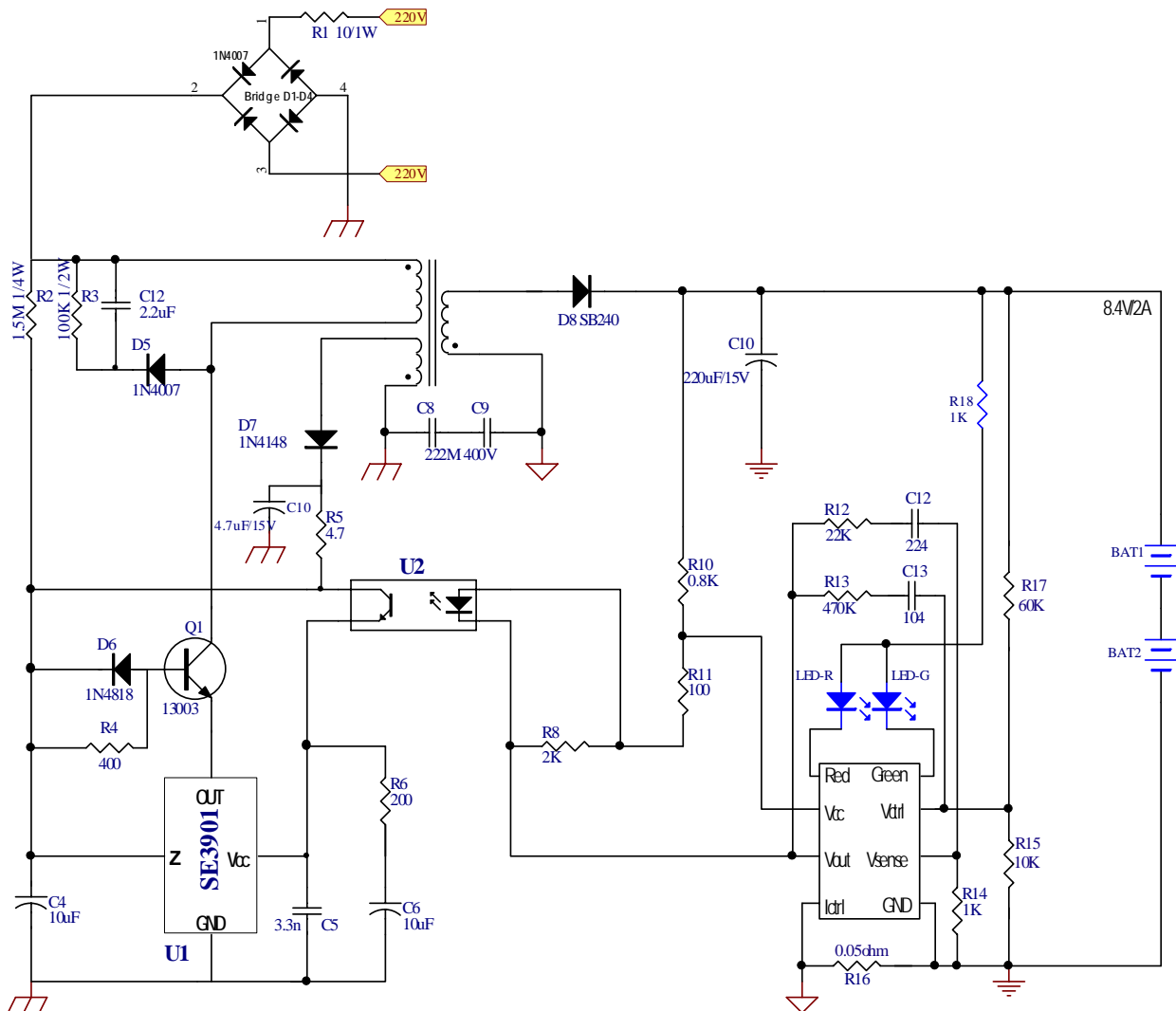
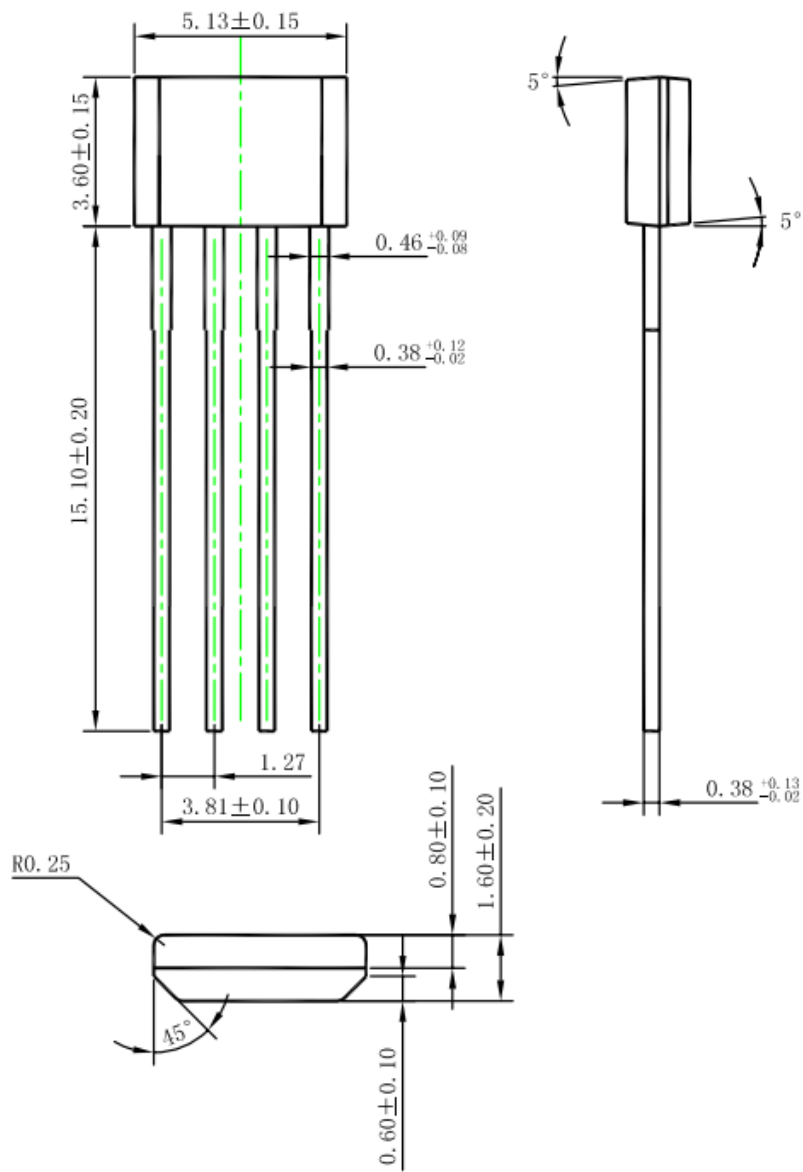


Fig.3 8.4V/1A 2 Cell Batteries Charger, using SE3901(TO94) and SE1052.

Note: SE1052 integrates Voltage reference, Voltage setting and Current setting and LED drivers all in the same IC. When the charging is on-going, the Red LED is On and the Green LED is Off. When the Charging is completed, the Green LED is On and the Red LED is Off. The charging current can be programmed by setting the R16 to the proper value. Please refer to SE1052 datasheet for details.

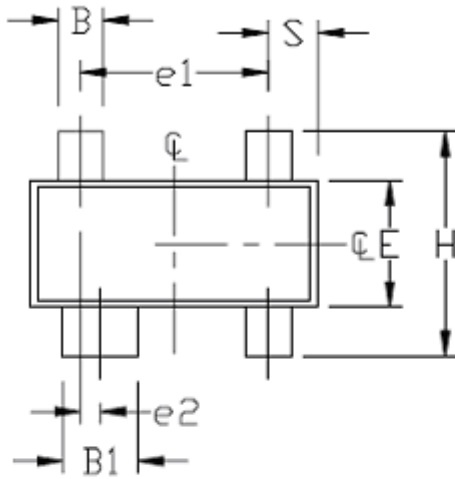


OUTLINE DRAWING TO94

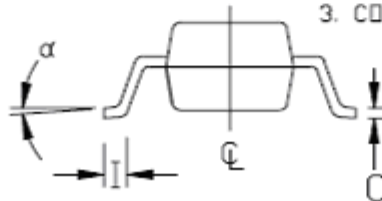
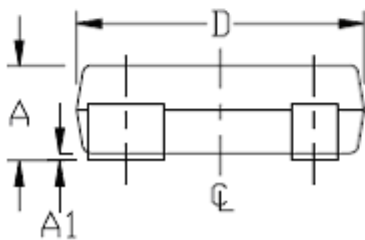




OUTLINE DRAWING SOT143



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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