Description

The SE3900 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. SE3900 is a perfect solution to meet these challenges. The typical standby power is only 0.13Watt.

In normal operation, the SE3900 switches on and off at a fixed switching frequency of about 60 kHz. With a current limit capability of about 420mA, the SE3900 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 SE3900 also features Under-Voltage Lockout , Over-Temperature Protection, Over-Current and Short Circuit Protections.

The SE3900 is available in TO-92 Packages.

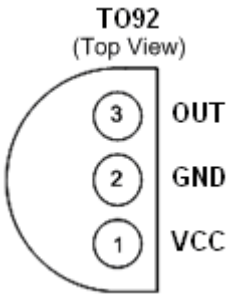
Features

- 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-92 Packages
- RoHS Compliant and 100% Lead (Pb)-Free

Application

- Battery Chargers
- Universal Off-line Power Supplies
- Power Adaptors
- LED 3W-9W Low Cost 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

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℃, 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		℃
Thermal Hysteresis	T_{Hy}			20		℃
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	Vz	I_{CC} =10mA	6	6.3		V
Dynamic Impedance	R_{VCC}	Vcc=3.8 to 4.8V		9		KΩ
INTERNAL OSCILLATOR						
Switching Frequency	f		50	60	75	KHz
DRIVE OUTPUT SECTION						
OUT Start-up Voltage	V_{ST}			8.5	11	V
Short Circuit Threashold Voltage	V_{SC}			6		V
Maximum Duty Cycle	D_{max}	V_{OPR} (Min)+0.2		75		%
Minimum Duty Cycle		Vcc=Vth(st)-0.2		3		%
Driver OUT On-Resistance	R_{OUT}	I_{OUT} =0.06A		3		Ω
Switch Off Current		Driver off, Vout=10V		20	40	uA
Effective Current Limit	I_{LIM}	Vcc= V_{OPR} +0.1V	420			mA
OUT Current Coefficient	G_A			-0.3		A/V

Typical Application

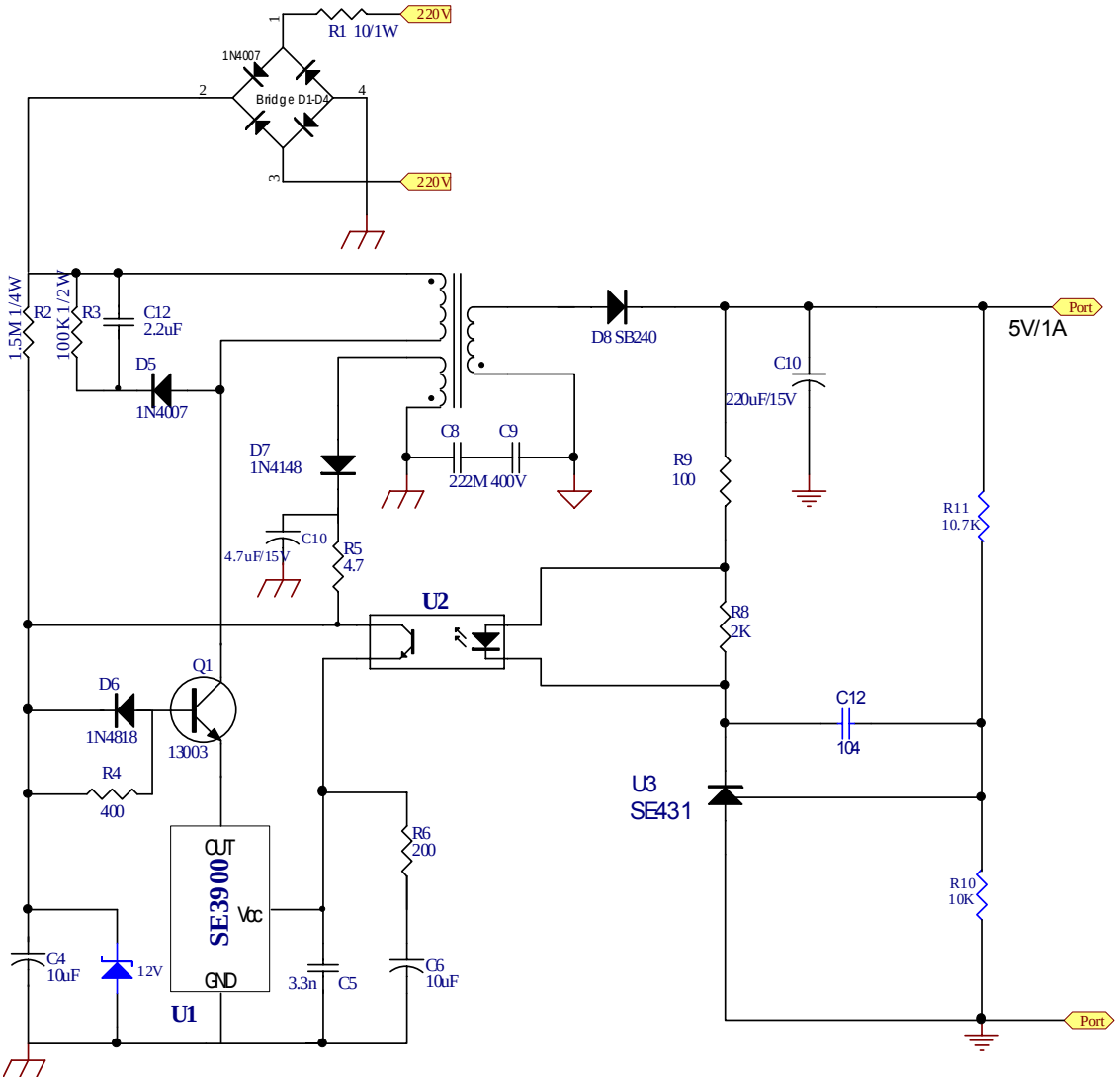


Fig.1 5V/1A Mobile Phone USB Charger Using SE3900(TO92) and SE431.

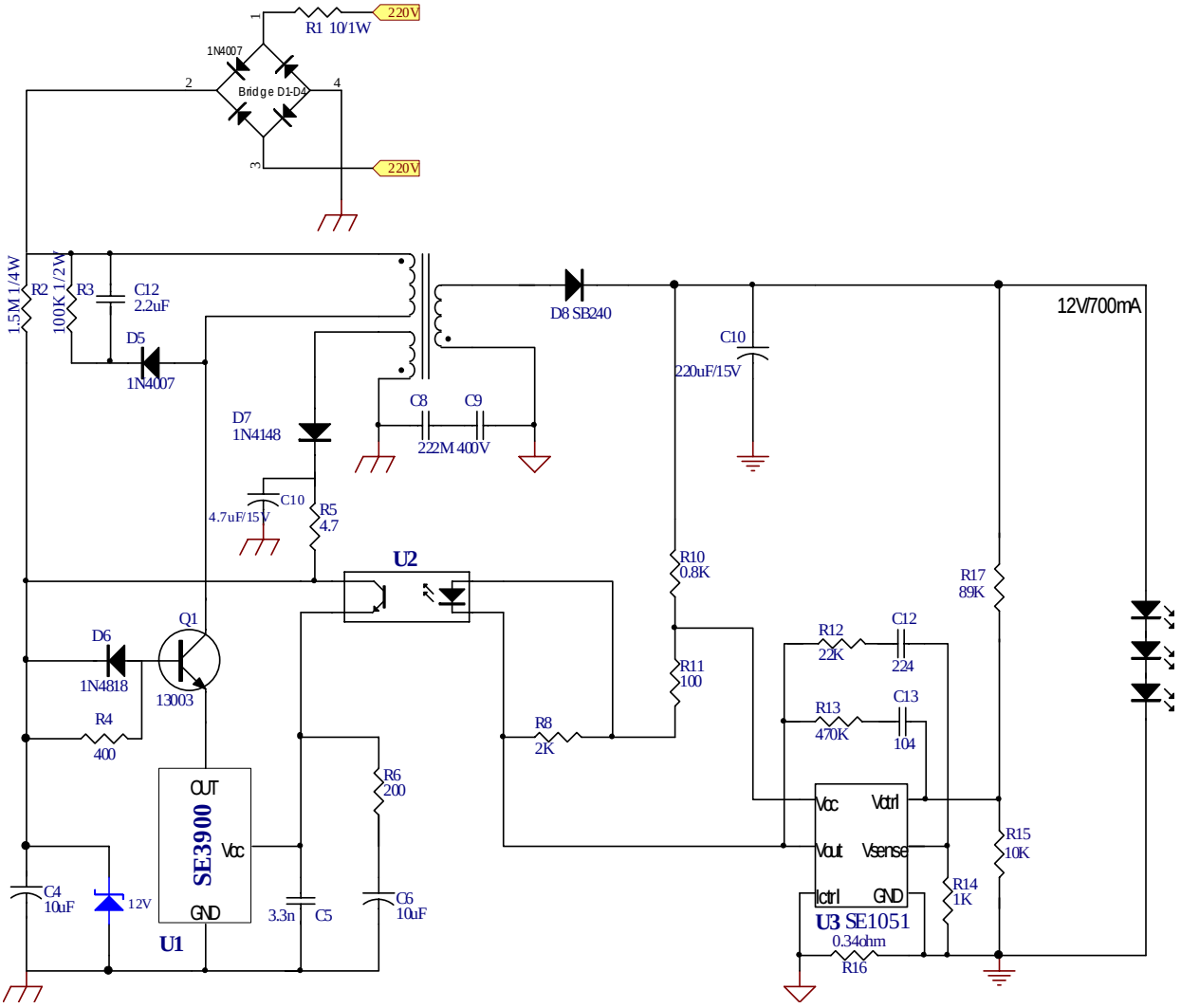


Fig.2 12V/700mA Lighting 9W LED Solution Using SE3900(TO92) and SE1051.

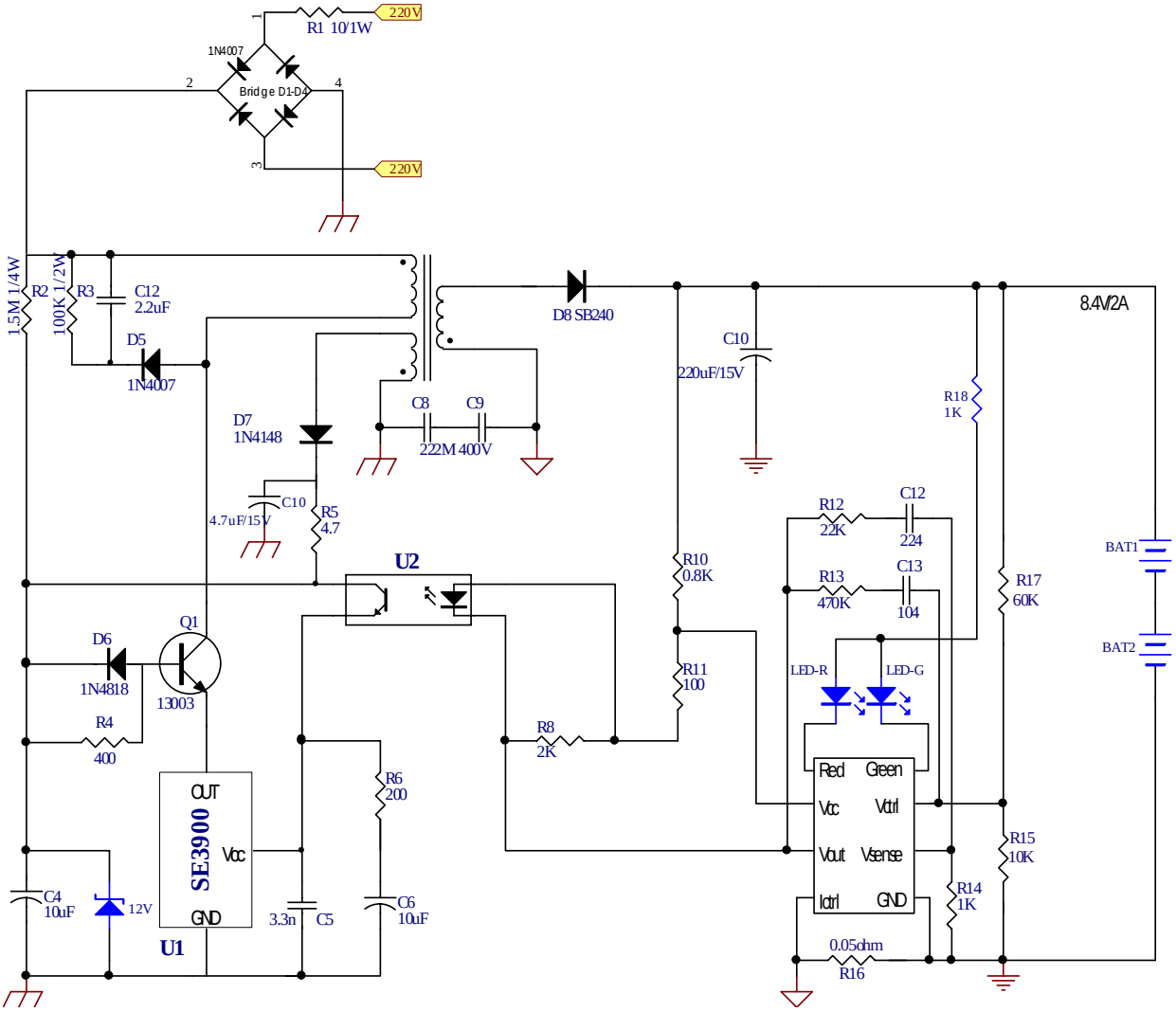
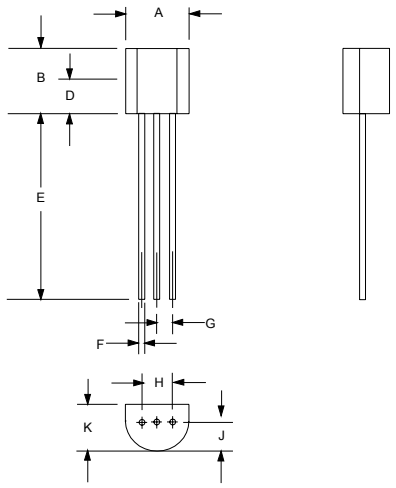


Fig.3 8.4V/1A 2 Cell Batteries Charger, using SE3900(TO92) and SE1052.

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 TO-92



DIMENSIONS				
DIM[N]	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.445	5.207
B	0.170	0.210	4.318	5.334
E	0.500	0.610	12.70	15.50
F	0.016	0.021	0.407	0.533
G	0.045	0.055	1.143	1.397
H	0.095	0.105	2.413	2.667
J	0.080	0.105	2.032	2.667
K	0.125	0.165	3.175	4.191

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