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SiGma Micro
IC Solution Designing

Specification

SGL8022W

Single-channel DC LED control touch chip

Version 1.6

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1. GENERAL DESCRIPTION

SGL8022W is a single-channel touch chip for LED lightness regulation. This chip can control the on-off state of LED light and regulate its lightness on a continuous range, which could be used on incandescent and halogen.

- Lightness could be regulated optionally on a wide range with a low operational difficulty.
- High applicability. Touching function is still effective with the existance of medium (such as glass, arcrylic, plastic, ceram, etc.) isolation.
- A wide range of applied voltage, which could be chosen optionally within 2.4V~5.5V.
- Low cost. SGL8022W could be drived by a simple peripheral circuit, easy to machining.
- High stability and good anti-interfere property. SGL8022W has a value of EFT over ±2KV. Under the interference of mobile phones which exist in a near-field and multi-angle situation, the touching sensitivity and response time of SGL8022W proves to be fine.

2. FEATURES

- A touch operation through TI corresponds to the output of SO, which could control lightness of LED. Four functional options are available, which are determined by input state of OPT1 and OPT2 before electrified:
  1) OPT1=1, OPT2=1: regulate lightness discretely without lightness-memory.
  2) OPT1=0, OPT2=1: regulate lightness continuously without lightness-memory.
  3) OPT1=1, OPT2=0: regulate lightness continuously with lightness-memory.
  4) OPT1=0, OPT2=0: regulate lightness on a three-sections mode.
- The function that regulate lightness of LED discretely without lightness-memory is as follows:
  - Light hold off state when the circuit electrified initially.
  - A touch operation with a duration less than 550ms could regulate the on-off state of the light. One touch operation turns the light on and one more operation turns it off. There are no lightness buffer when LED switches between on and off state, and the initial lightness is permanently half of the max lightness.

- A long-playing touch operation with a duration more than 550ms could regulate the lightness on a continuous range. A long-playing touch opration make the lightness increase continuously and when the touch operation ends the lightness is on the current level. One more long-playing touch operation will make the lightness decrease continuously and when the touch opration ends the lightness is also on the current level. If the duration of the touch operation is more than 3s, the lightness will be lowest.
- At any time, users could switch between common touch operation and long-playing touch operation, and either function will not be influence by one another.

◆ The function that regulate lightness of LED continuously without lightness-memory is based on the first workng mode. When a touch operation switches the on-off state of LED, the lightness will be regulated gradually to the corresponding level, which brings about a vision protecting effect on users.

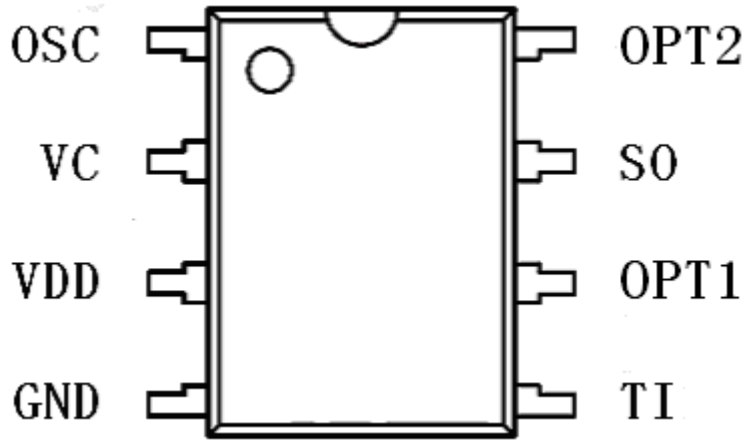
◆ The function that regulate lightness continuously with lightness-memory is realized by adding lightness-memory function based on the second function. In other words, on condition that the 220VAC not being cut off, the lightness level when LED being turned off is memoried, which will be set as the initial lightness when next touch operation turning on the LED. If 220V AC is cut off, the initial lightness will be half of the maximum when the LED is reelectrified.

◆ The function that regulate LED on a three-sections mode is as follows:

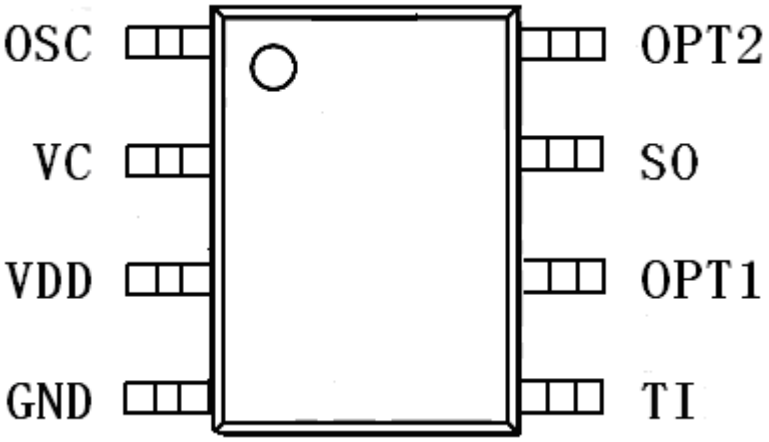
- Light hold off state when the circuit electrified initially.
- Each touch operation will regulate the lightness orderly as low -> middle -> high rule.

3. PACKAGING and PIN ASSIGNMENT

DIP8



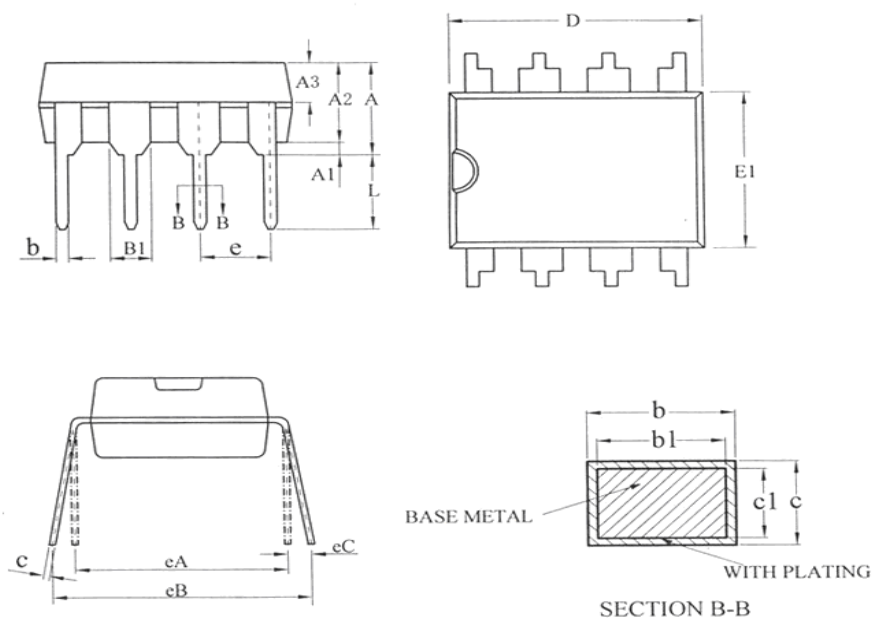
SOP8



Pin number	Pin name	Input/Output	Functional Specification
1	OSC	input	Rosc access
2	VC	input	sampling capacitor access
3	VDD	source	positive electrical source
4	GND	source	negative electrical source
5	TI	Input	touch input
6	OPT1	input	functional option input 1
7	SO	output	control output
8	OPT2	output	functional option input 2

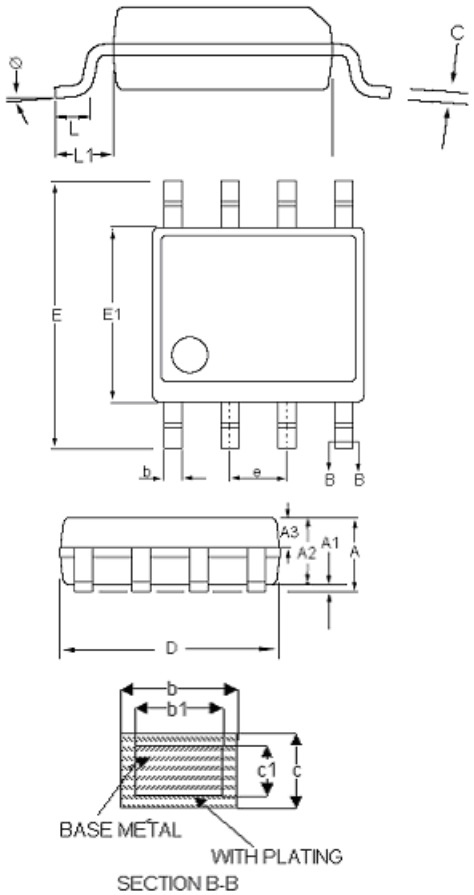
4. PACKAGING INFORMATION

DIP8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	3.60	3.80	4.00
A1	0.51	—	—
A2	3.10	3.30	3.50
A3	1.50	1.60	1.70
b	0.44	—	0.53
b1	0.43	0.46	0.48
B1	1.52BSC		
c	0.25	—	0.31
c1	0.24	0.25	0.26
D	9.05	9.25	9.45
E1	6.15	6.35	6.55
e	2.54BSC		
eA	7.62BSC		
eB	7.62	—	9.50
eC	0	—	0.94
L	3.00	—	—

SOP8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.77
A1	0.08	0.18	0.28
A2	1.20	1.40	1.60
A3	0.55	0.65	0.75
b	0.39	—	0.48
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	0.65	0.80
L1	1.05BSC		
θ	0	—	8°

5. APPLICATION CIRCUIT

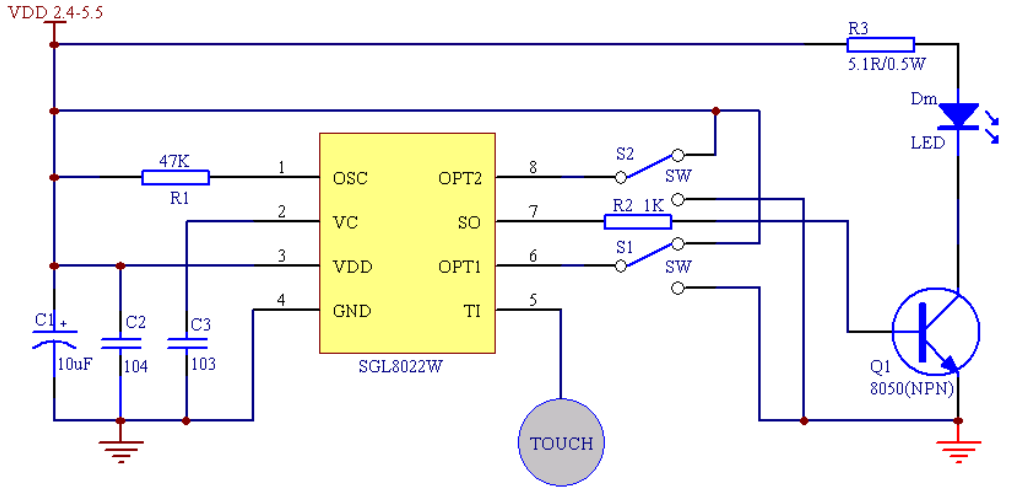


Figure 1. graph of applied circuit with dry battery or regulartor as the power supply

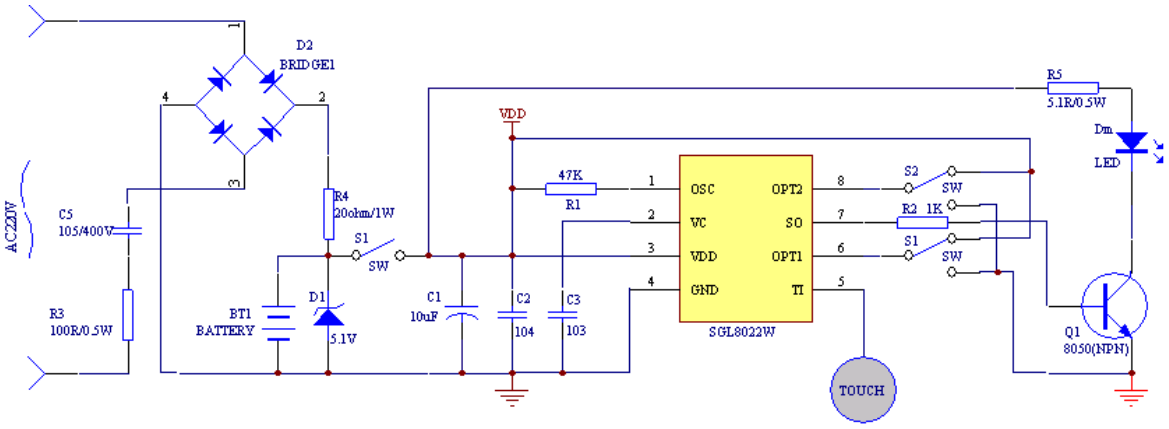


Figure 2. graph of applied circuit with rechargeable battery as the power supply

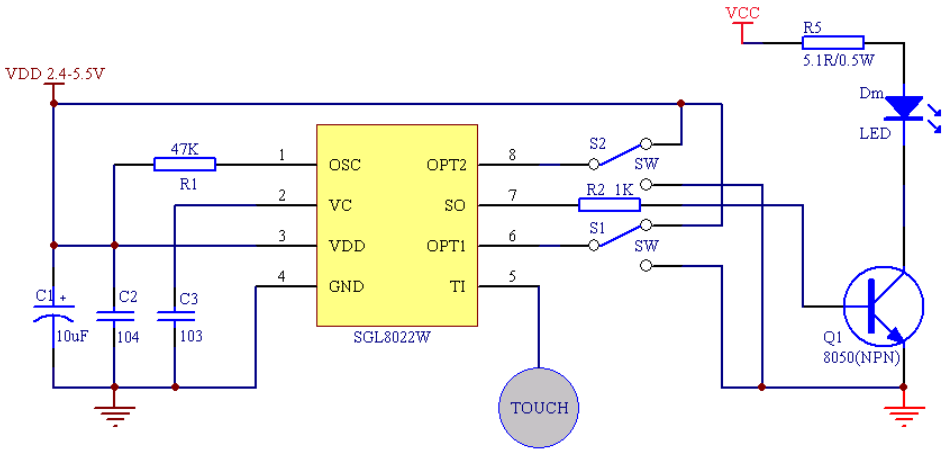


Figure 3. graph of applied circuit with switching source as the power supply

Attention: The touching sensitivity could be regulated by modifying the value of C3 (the sampling capacitor between VC and GND) when the difference between practical medium material and medium in the form.

Medium Types	C3 (sampling capacitor between VC and GND)	
	Capacitor Types	Capacitance
metallic shell	472 terylene capacitor	0.033uF/25V
3mm arcrylic glass	222 terylene capacitor	0.01uF/25V
3-6mm arcrylic glass	472 terylene capacitor	0.02uF/25V
6-10mm arcrylic glass	103 terylene capacitor	0.047uF/25V

6. ELECTRICAL CHARACTERISTICS

Parameter Name	Typical Value	Unit
work voltage	3.3V	V
work current	400	uA
Standby current	12	uA
input (high level)	(2/3)VDD	V
input (Low level)	(1/3)VDD	V
output (high level)	5	mA
output (low level)	9	mA
work temperature	-20~70	℃
work voltage	-50~100	℃

7. BOM Table

Device Symbol	Device Name	Device Value
R1	carbon film resistor	47KΩ/0.25W
R2	carbon film resistor	1KΩ/0.25W
R3	carbon film resistor	100Ω/0.5W
R4	carbon film resistor	20Ω/1W
R5	carbon film resistor	5.1Ω/0.5W
C1	electrolytic capacitor	10uF/25V
C2	ceramic capacitor	0.1uF/25V
C3	ceramic capacitor	0.01uF/25V
C4	electrolytic capacitor	10uF/25V
C5	ceramic capacitor	1uF/400V
Q1	NPN transistor	8050
D1	Zener diode	5.1V/1W
U1	LDO	3.3V
Dm	LED	LED