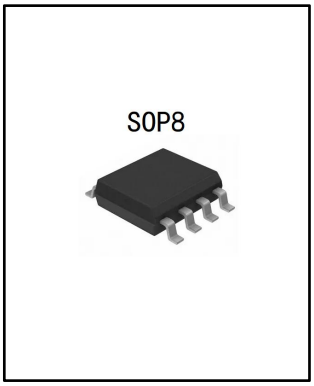
CMOS Leakage Current Protector A type

SSP54123A

General Description

The SSP54123A is a CMOS high-performance leakage protection integrated circuit. It encompasses a voltage regulator, an amplifier circuit, a comparison circuit, a delay circuit, a self-recovery control circuit, a latch controller, and an SCR drive circuit. This configuration allows it to effectively detect both AC leakage and DC pulsating leakage. It is primarily utilized in Type A leakage protectors.



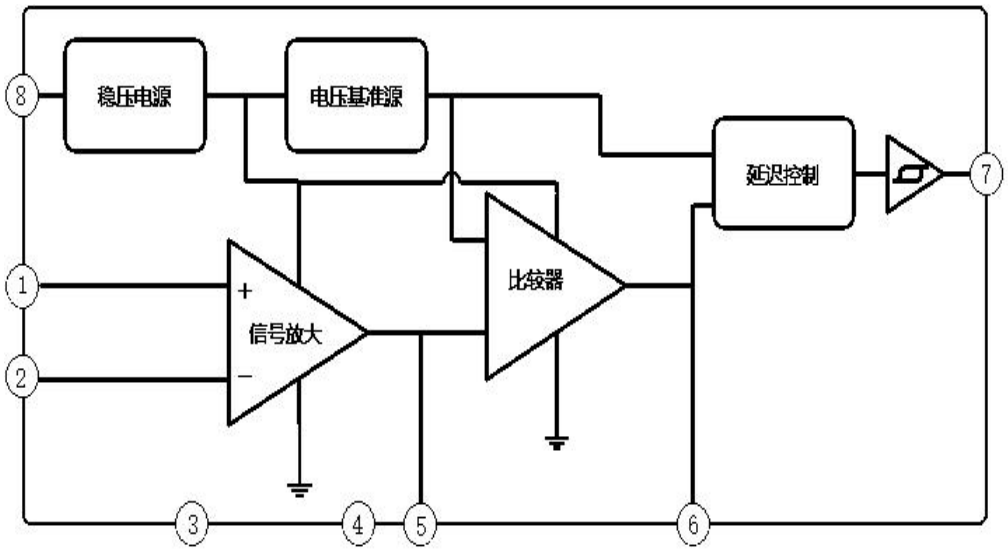
Features

- When there is a leakage signal, the OUT output pulse width is greater than 20ms and can directly drive the SCR
- Used to detect A-type (including AC-type) leakage signals
- Various types of leakage signal tripping accuracy consistency is good
- Strong anti-electromagnetic interference (EMC) capability
- Applicable to AC voltage of 50Hz~60Hz, also applicable to DC voltage
- Wide operating temperature range (-20~+85℃)

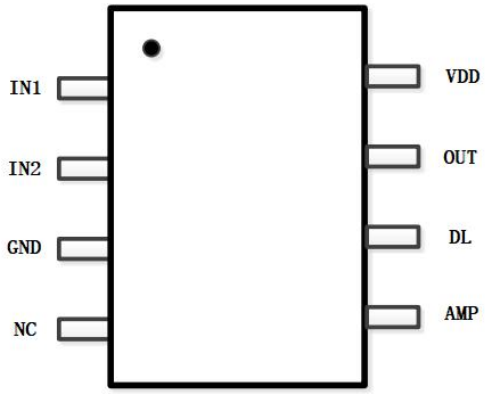
Order Information

Part No	Package	Manner of Packing	Devices per reel
SSP54123A	SOP8	Reel	2500PCS

Block Diagram



Pin Arrangement Diagram and Pin Assignment



Pin No.	Pin Name	Description
1	IN1	Amplifier input 1
2	IN2	Amplifier input 2
3	GND	Ground
4	NC	No connection
5	AMP	Internal amplifier output, external filter capacitor
6	DL	Delay adjustment, external capacitor
7	OUT	Trip signal output
8	VDD	Power supply

Functional Description

The SSP54123A leakage protector is a specialized integrated circuit designed to detect leakage currents on both the Live wire and Neutral wire. When a leakage current occurs, the Zero-Sequence Current Transformer (ZCT) senses this leakage and the secondary coil of the ZCT produces an output current. This output current serves as the input signal for the leakage protector chip. The leakage current may be in the form of DC, AC, or pulsating DC, which includes leakage signals at 0°, 90°, and 135° phase angles. If the Root Mean Square (RMS) value of the leakage current exceeds the rated current threshold specified by the leakage protector, the chip's output pin, labeled OUT, will trigger an action signal. The duration of this signal, or pulse width, will be greater than 20ms.

Absolute Maximum Ratings

Unless otherwise specified， T_{amb}= 25℃

Parameter	Value		Unit
	Min	Max	
Operating Temperature	-20	+85	℃
Storage Temperature	-55	+150	℃
Voltage at any pin to ground	-0.8	+6.5	V
Operating voltage	/	8.0	V
Operating current	/	8.0	mA

Electrical Characteristics

Unless otherwise specified， Tamb= 25℃

Parameter	Symbol	Conditions	Test Circuits	Recommended Value			Unit
				Min	Typ	Max	
Supply Current	I1	Vs=5V	1	/	/	2.6	mA
Supply Voltage	Vdd	Vs=5V	2	4.7	4.8	4.9	V
PIN6 Output high current	I3	Vs=5.5V, Vin1-Vin2=30mV	3	50	/	68	μA
PIN6 Output low current	I4	Vs=5.5V, Vin1~Vin2 shorted	4	0.6	/	1.2	μA
PIN7 Output high curren	I7	Vs=5.5V, Vin1-Vin2=30mV	5	2.0	/	2.5	mA
PIN7 Output low level	Vo	Vs=5.5V,Vin1~Vin2 Short circuit，I6=50mA	6	/	/	0.2	V
Positive operating voltage	V+	Vs=5.5V,Vin1-Vin2 (Note 1)	7	4.5	5.1	5.7	mV
Negative operating voltage	V-	Vs=5.5V,Vin1-Vin2 (Note 1)	8	4.5	5.1	5.7	mV
Latching time	TON	Vs=5.5V,	9	20	/	/	ms

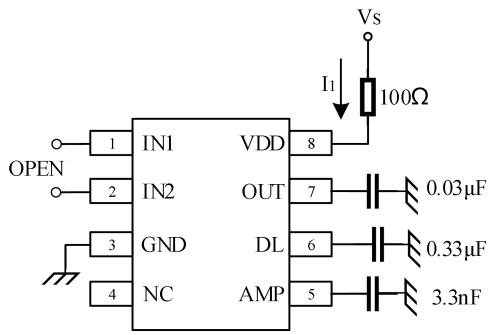
		Vin1-Vin2=30mV(Note 2)					

Note 1: When the DC voltage V+/V- between Vin1 and Vin2 is less than 4.5mV, the OUT pin outputs a low level. When V+/V- is greater than 5.7mV, the OUT pin outputs a high level.

Note 2: TON is the duration of OUT output high level.

Test Circuits

1



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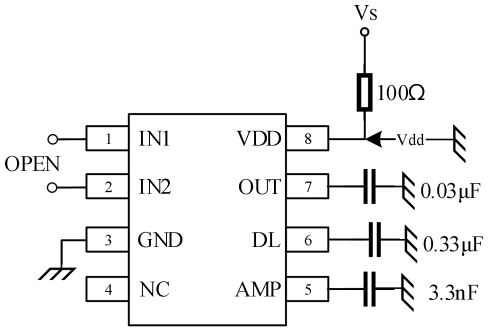

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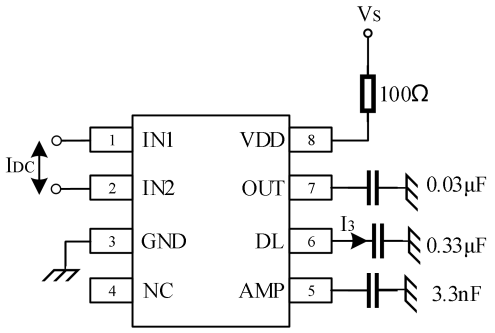

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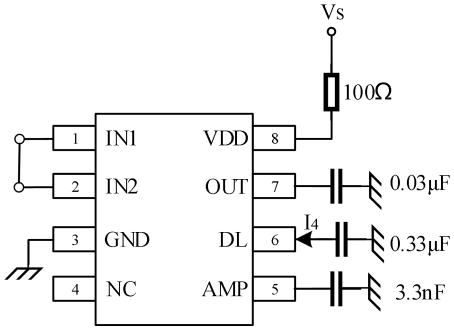

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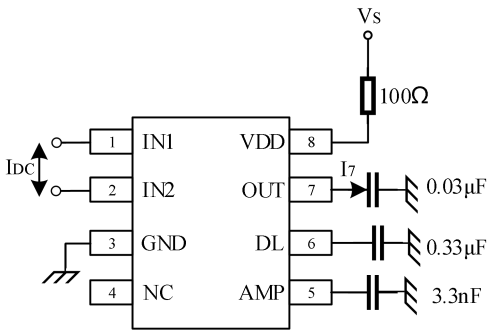

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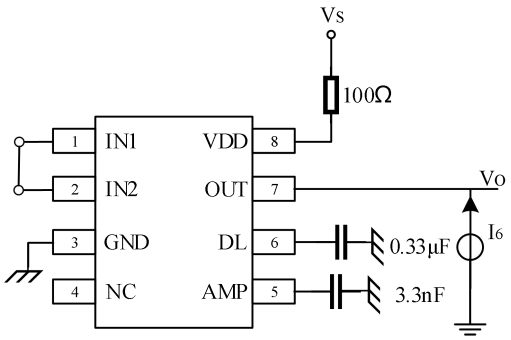

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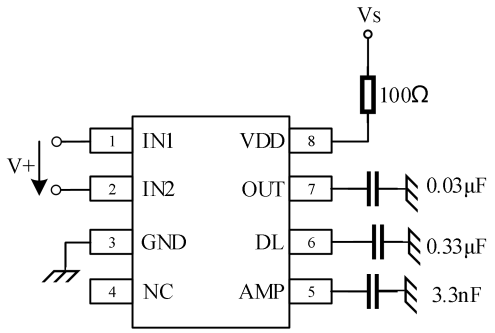

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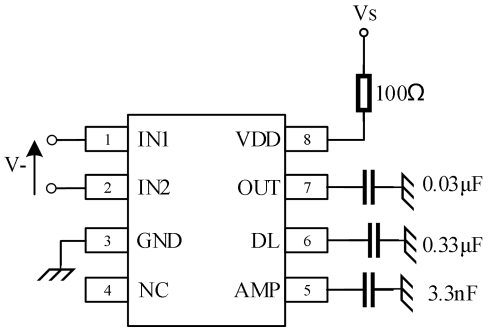

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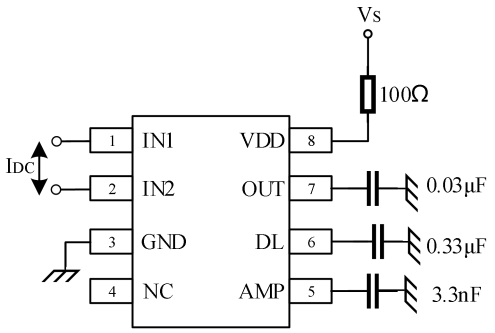
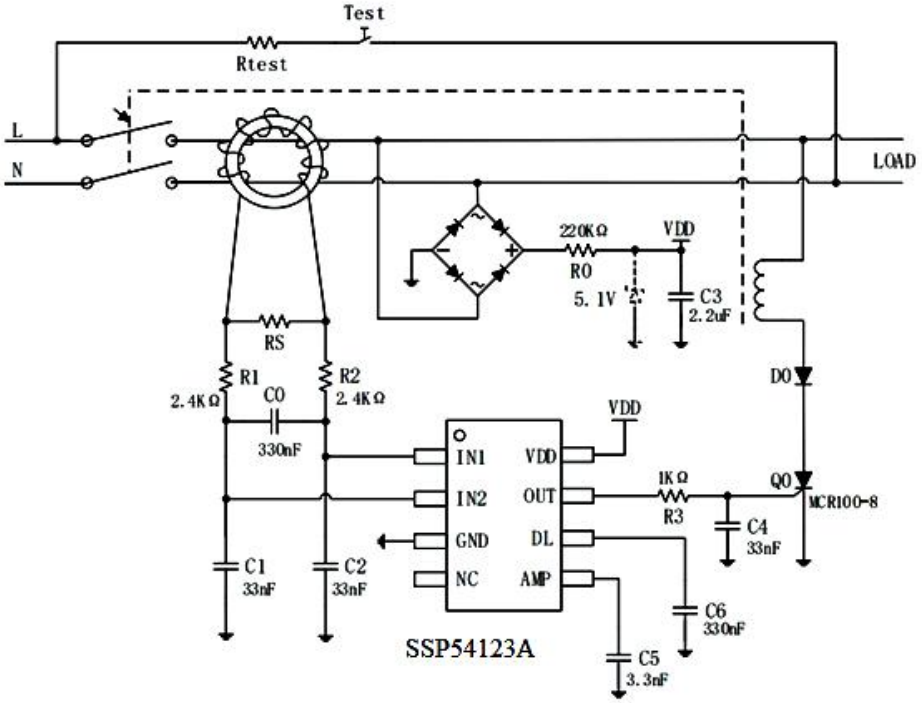
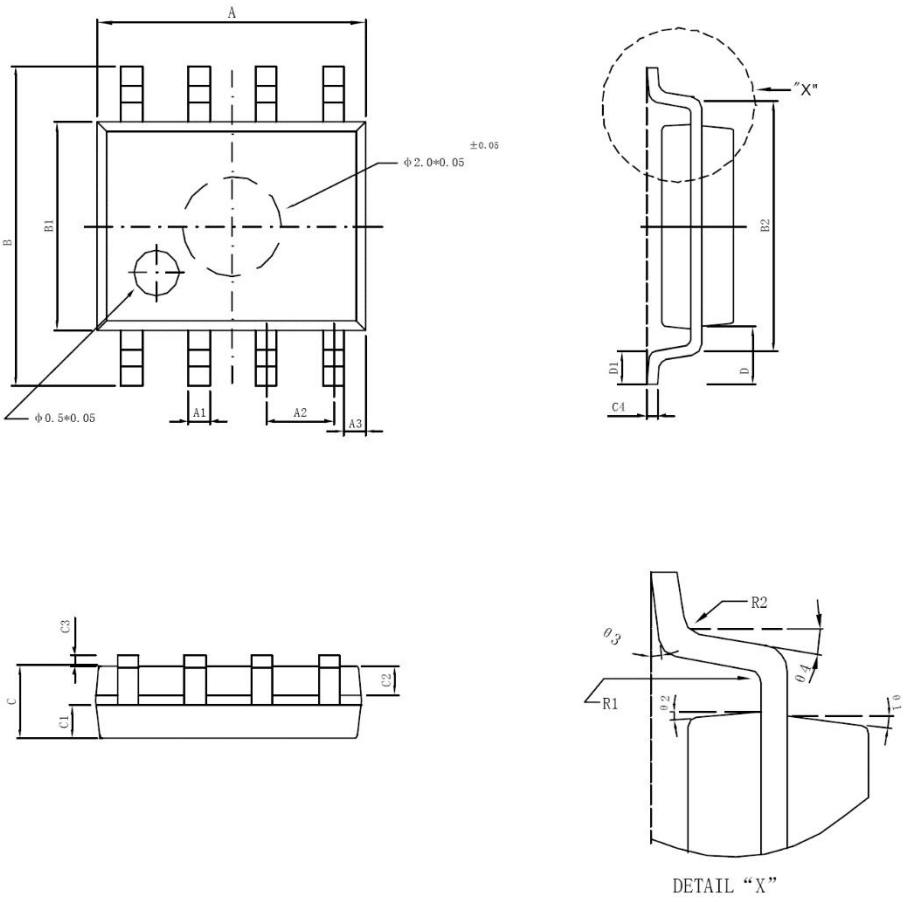


Application Circuits



Package Information（SOP8）



Symbol	Min.（mm）	Max（mm）	Symbol	Min （mm）	Max（mm）
A	4.95	5.15	C3	0.10	0.20
A1	0.37	0.47	C4	0.20TYP	
A2	1.27TYP		D	1.05TYP	
A3	0.41TYP		D1	0.50TYP	
B	5.80	6.20	R1	0.07TYP	
B1	3.80	4.00	R2	0.07TYP	
B2	5.0TYP		θ1	17°TYP	
C	1.30	1.50	θ2	13°TYP	
C1	0.55	0.65	θ3	4°TYP	
C2	0.55	0.65	θ4	12°TYP	

Special Instructions

The company reserves the right of final interpretation of this specification.

Version Change Description

Version：V1.0	Author：Yang	Time：2023.04.26

Modify the record：

1. First promulgation

Statement

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