上海复旦微电子股份有限公司
SHANGHAI FUDAN MICROELECTRONICS CO., LTD

Earth Leakage Current Detector VG54123

The VG54123 is a semiconductor integrated circuit with amplifier for a high-speed earth leakage circuit breaker

FEATURES

- Wide temperature range (Ta=-20°C ~ +80°C)
- Good temperature characteristics of input sensitivity current
- High input sensitivity(Vt=6.1mV Typ.)
- Low external component count
- High noise and surge-proof
- Low power dissipation (Pd=5mW Typ.)and may be used both as 110V and 220V
- Sip8,Sop8 or Dip8 Package

FUNCTION

The VG54123 circuit for the amplifying parts of earth leakage circuit breaker consists of differential amplifier,latch circuit and voltage regulator.It is connected to the secondary side of the zero current transformer (ZCT) which detects leakage current in the both input of the differential amplifier.Signals amplified by differential amplifier are integrated by an external capacitor, and connects to the input terminal of latch circuit with output suitable for the characteristics of high-speed earth leakage circuit breaker. Latch circuit keeps low in the output till the input voltage reaches the fixed level ,and output becomes high when the leakage current more than fixed flows.It drives a thyristor connected to the output terminal of latch circuit.

PIN FUNCTIONS

PIN	Symbol	Function	PIN	Symbol	Function
1	VR	Reference.voltage	2	IN	Input
3	GND	Ground	4	OD	Differential amplifier outout
5	SC	Latch input	6	NR	Terminal for noise absorption
7	OS	Output	8	VS	Supply Voltage

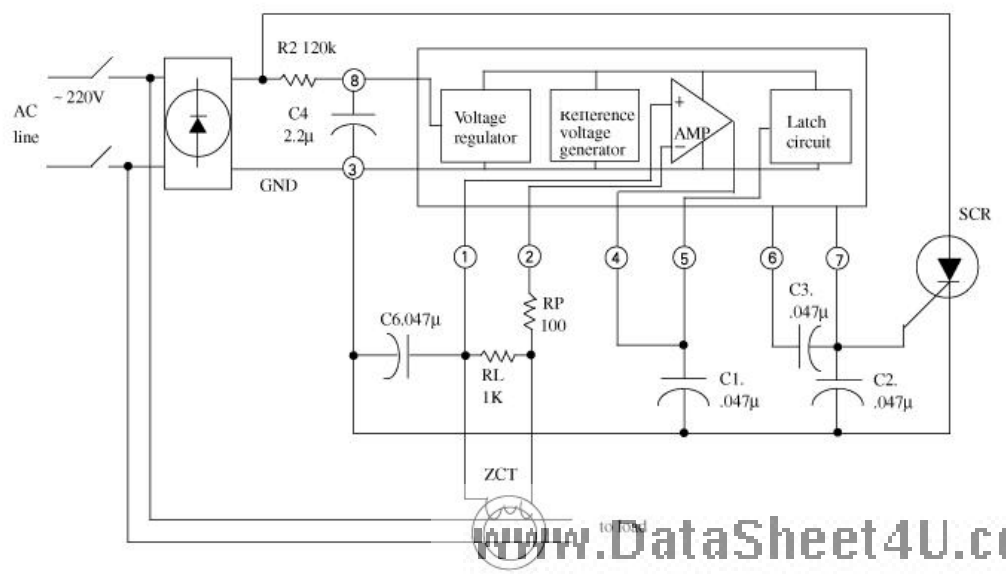
ABSOLUTE MAXIMUM RATINGS(Ta=-20-80 unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
IS	Supply current		8	mA
Ivr	VR pin current	Between VR-IN Between VR-GND Between IN-VR	250 30 -250	mA
Iin	IN terminal current	Between IN-VR Between IN-GND Between VR-IN	250 30 -250	mA
Isc	SC terminal current		6	mA
Pd	Power dissipation		200	mW
Topr	Operating temperature		-20-80	℃
Tstg	Storage temperature		-55-125	℃

ELECTRICAL CHARACTERISTICS (Ta=-20-80 unless otherwise noted)

Symbol	Parameter	Test conditions	Temperature(℃)	Min	Typ	Max	Unit
I_{s1}	Supply current	Vs=12V, VR-VIN=30mV	-20 25 80		400	580 530 480	μA
V_t	Trip voltage	Vs=12V,VR-VIN	-20 ~ +80	4	6.1	9	mVrms
I_{TD1}	Timed current 1	Vs=12V,VR-VIN=30mV VOD=1.2V	25	-12		-30	μA
I_{TD2}	Timed current 2	Vs=12V, VOD=0.8V	25	17		37	μA
I_o	Output current	Vsc=1.4V Is1=580μA Is1=530μA Vos=0.8V Is1=480μA	-20 25 80	-200 -100 -75			μA
Vsc "ON"	SC"ON"voltage	Vs=12V	25	0.7		1.4	V
Isc "ON"	SC input current	Vs=12V	25			5	μA
I_{OSI}	output low-level current	Vs=12V,VOSL=0.2V	-20 ~ +80	200			μA
V_{ic}	Input clamp voltage	Vs=12V,Iic=20mA	-20 ~ +80	4.3		6.7	V
V_{idc}	Differential input clamp voltage	IIDC=100mA	-20 ~ +80	0.4		2	V
V_s "OFF"	Latch circuit is off-state supply voltage		25	0.5			V
T_{ON}	Operating time	Vs=12V,VR-VIN=0.3V	25	3		6	ms

APPLICATION CIRCUIT



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