



FEATURES

- ◆ Wide temperature range ($T_a = -20^{\circ}\text{C} \sim +80^{\circ}\text{C}$)
- ◆ Good temperature characteristics of input sensitivity current
- ◆ High input sensitivity ($V_I = 6.1\text{mV Typ.}$)
- ◆ Low external component count
- ◆ High noise and surge-proof
- ◆ Low power dissipation ($P_d = 5\text{mW Typ.}$) and may be used both as 110V and 220V
- ◆ Stp8, 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 output |
| 5 | SC | Latch input | 6 | NR | Terminal for noise absorption |
| 7 | OS | Output | 8 | VS | Supply Voltage |

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

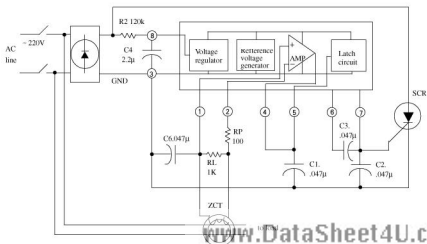
| Symbol | Parameter | Conditions | Ratings | Unit |
|------------------|-----------------------|--------------------------------------------------|-------------------|------|
| IS | Supply current | | 8 | mA |
| I _{vr} | VR pin current | Between VR-IN Between VR-GND Between IN-VR | 250 30 -250 | mA |
| I _{in} | IN terminal current | Between IN-VR Between IN-GND Between VR-IN | 250 30 -250 | mA |
| I _{sc} | SC terminal current | | | |
| P _d | Power dissipation | | 200 | mW |
| T _{opr} | Operating temperature | | -20-80 | °C |
| T _{stg} | Storage temperature | | -55-125 | °C |

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

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| Symbol | Parameter | Test conditions | Temperature(C) | Min | Typ | Max | Unit |
|----------------|-------------------------------------------|-------------------------------------------------------------------------|-----------------|---------------------|-----|-------------------|---------|
| I_{cs} | Supply current | Vs=12V, VR-VIN=30mV | -20 25 80 | | 400 | 580 530 480 | μ A |
| V_t | Trip voltage | Vs=12V,VR-VIN | -20 ~ +80 | 4 | 6.1 | 9 | mVrms |
| I_{m1} | Timed current 1 | Vs=12V,VR-VIN=30mV VOD=1.2V | 25 | -12 | | -30 | μ A |
| I_{m2} | Timed current 2 | Vs=12V, VOD=0.8V | 25 | 17 | | 37 | μ A |
| I_o | Output current | Vsc=1.4V Is1=580 μ A Is1=530 μ A Vos=0.8V Is1=480 μ A | -20 25 80 | -200 -100 -75 | | | μ A |
| Vsc "ON" | SC"ON" voltage | Vs=12V | 25 | 0.7 | | 1.4 | V |
| Isc "ON" | SC inoat current | Vs=12V | 25 | | | 5 | μ A |
| I_{o1} | output low-level current | Vs=12V,Vost=0.2V | -20 ~ +80 | 200 | | | μ A |
| V_{ic} | Input clamp voltage | Vs=12V,Ic=20mA | -20 ~ +80 | 4.3 | | 6.7 | V |
| V_{ic} | Differential input clamp voltage | IIOC=100mA | -20 ~ +80 | 0.4 | | 2 | V |
| V_{ic} "OFF" | Latch circuit is off-state supply voltage | | 25 | 0.5 | | | V |
| T_{OS} | Operating time | Vs=12V,VR-VIN=0.3V | 25 | 3 | | 6 | ms |

APPLICATION CIRCUIT



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