



## GF4141

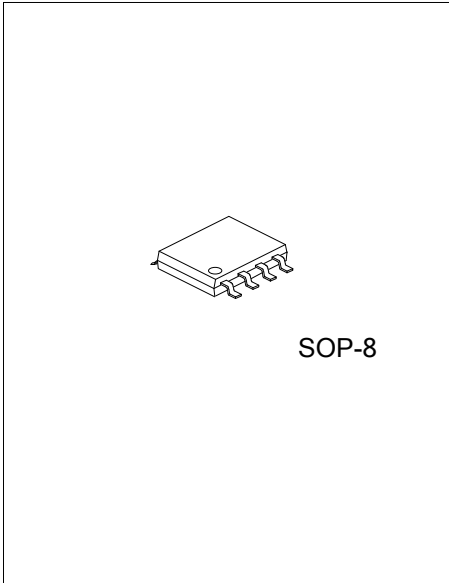
Preliminary

LINEAR INTEGRATED CIRCUIT

# LOW POWER GROUND FAULT INTERRUPTER

### DESCRIPTION

The UTC **GF4141** is a low power controller for AC receptacle ground fault circuit interrupters. These devices detect hazardous current paths to ground and ground to neutral faults. The circuit interrupter then disconnects the load from the line before a harmful or lethal shock occurs. It is powered only during the positive half period of the line voltage, but can sense current faults independent of its phase relative to the line voltage. The simple layout and minimum component count insure ease of application and long term reliability.



### FEATURES

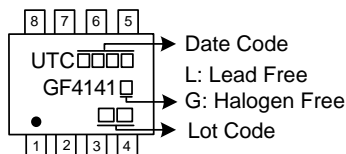
- \* Powered from the AC line
- \* Low quiescent current
- \* Built-in diode rectifier
- \* Direct interface to SCR
- \* Precision sense amplifier
- \* Time delay
- \* For use with 110V or 220V systems

### ORDERING INFORMATION

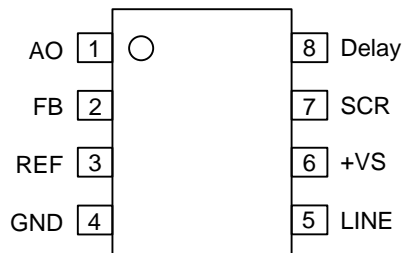
Ordering Number		Package	Packing
Lead Free	Halogen Free		
GF4141L-S08-R	GF4141G-S08-R	SOP-8	Tape Reel

<p>GF4141G-S08-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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### MARKING



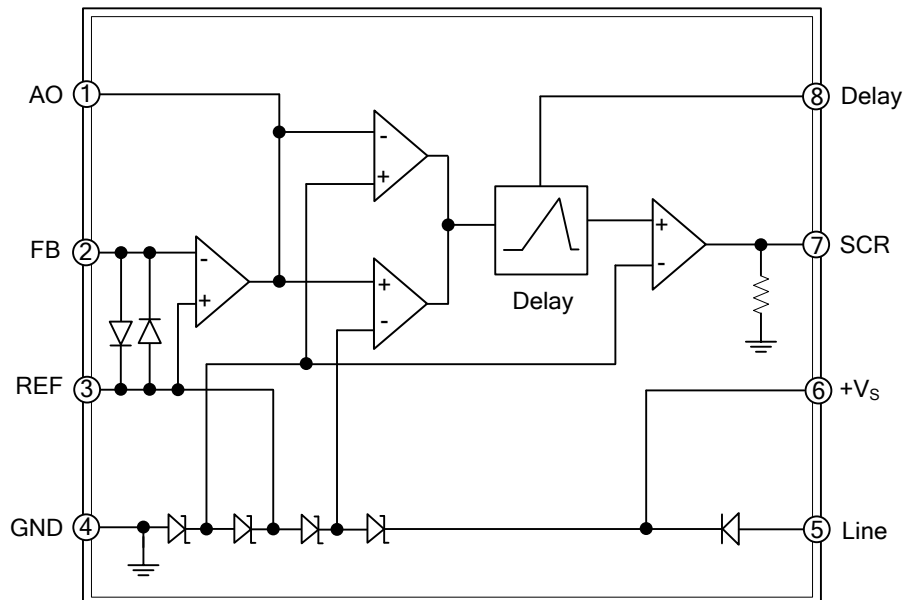
## ■ PIN CONFIGURATION



## ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	AO	Sense Amplifier Output
2	FB	Sense amplifier negative input
3	REF	Reference Voltage
4	GND	Ground
5	Line	AC line
6	+Vs	Supply input for GF4141 circuitry
7	SCR	Output for triggering external SCR when a fault is detected
8	Delay	Connect an external capacitance and set the delay time

## ■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Current	$I_{CC}$	10	mA
Power Dissipation	$P_D$	500	mW
Junction Temperature	$T_J$	125	°C
Operating Temperature	$T_{OPR}$	-20 ~ +85	°C
Storage Temperature	$T_{STG}$	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

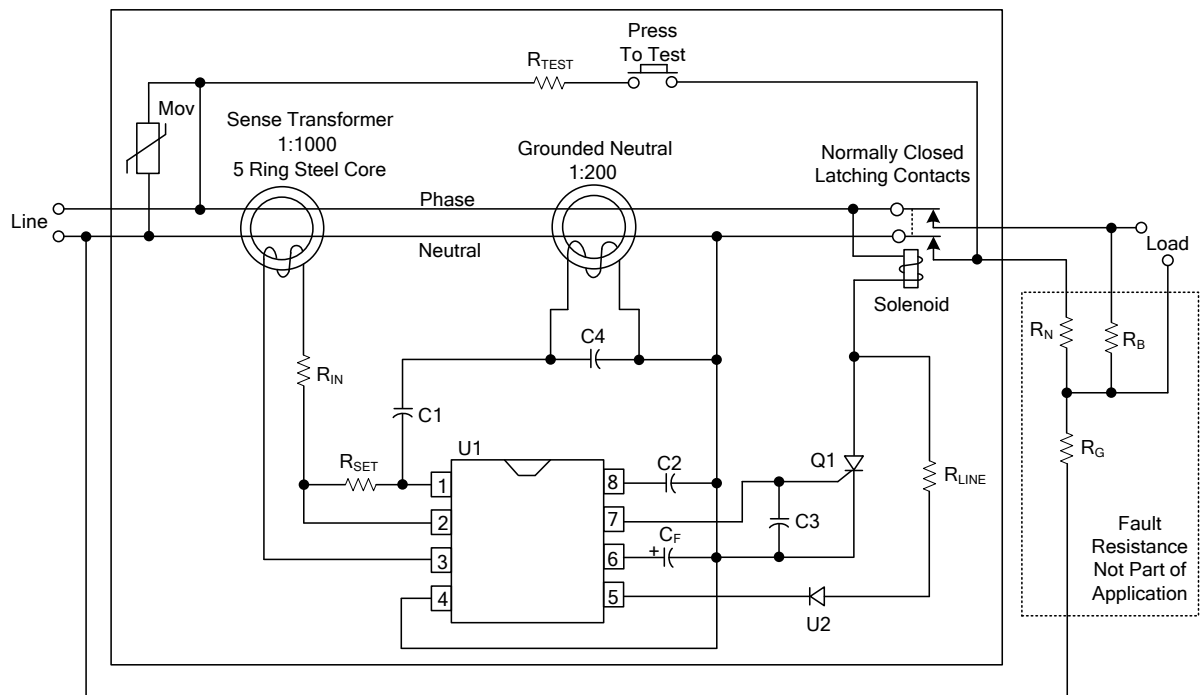
### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	240	°C/W

### ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SHUNT REGULATOR (Pins 5 to 4)</b>						
Regulated Voltage	$V_{REG}$	$I_{LINE}=750\ \mu\text{A}$	24.0	26.0	29.0	V
Quiescent Current	$I_Q$	$V_{5-4}=24\text{V}$		500		$\mu\text{A}$
<b>Sense Amplifier (Pins 2 to 3)</b>						
Offset Voltage	$V_{OS}$		-200	0	200	$\mu\text{V}$
<b>SCR Trigger (Pins 7 to 4)</b>						
Output Voltage	$V_O$		0	0.1	10	mV
Output Voltage			2.4	3.0	4.0	V
Output Current	$I_O$	$V_{7-4}=0\text{V}, I_{2-3}=11\ \mu\text{A}$	400	600		$\mu\text{A}$
<b>Reference Voltage (Pins 3 to 4)</b>						
Reference Voltage	$V_{REF}$	$I_{LINE}=750\ \mu\text{A}$	12.0	12.5	14.0	V
<b>Delay Timer (Pins 8 to 4)</b>						
Delay Time	$t_{DELAY}$	$C_{8-4}=12\text{nF}$		2.0		ms
Delay Current			30	40	55	$\mu\text{A}$

### ■ TYPICAL APPLICATION CIRCUIT



### BOM

Reference	Component	Reference	Component
C1	10nF	R <sub>TEST</sub>	15K
C2	12nF	R <sub>IN</sub>	470
C3	10nF	R <sub>SET</sub>	1.1 Meg
C4	1000pF	R <sub>LINE</sub>	24K 1W
C <sub>F</sub>	1μF 35V	R <sub>G</sub>	1.6
Q1	TAG X0103DA	R <sub>N</sub>	0.4
		R <sub>B</sub>	20K
		U1	IC UTC <b>GF4141</b>
		U2	1N4004

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