



## GF4145

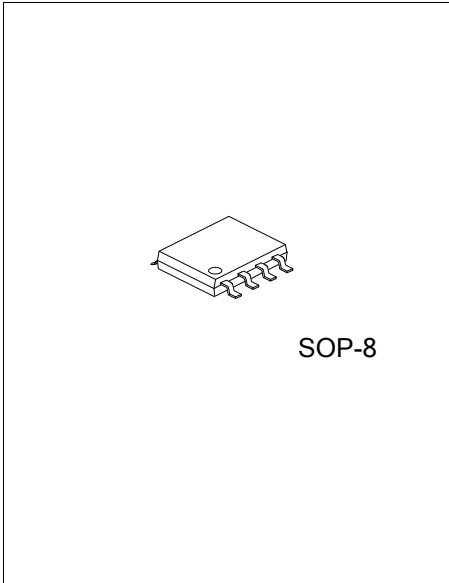
Preliminary

LINEAR INTEGRATED CIRCUIT

### LOW POWER GROUND FAULT INTERRUPTER

#### DESCRIPTION

The UTC GF4145 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. The simple layout and minimum component count insure ease of application and long term reliability.



#### FEATURES

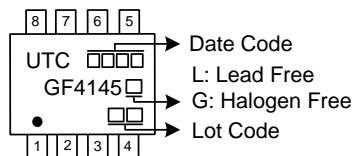
- \* Powered from the AC line
- \* Direct interface to SCR
- \* Adjustable sensitivity
- \* Grounded neutral fault detection
- \* Low quiescent current
- \* For use with 110V or 220V systems

#### ORDERING INFORMATION

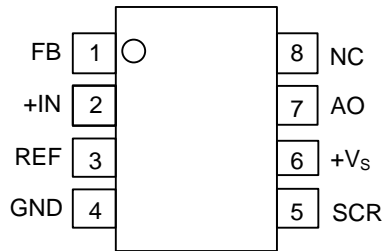
Ordering Number		Package	Packing
Lead Free	Halogen Free		
GF4145L-S08-R	GF4145G-S08-R	SOP-8	Tape Reel

<p>GF4145G-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



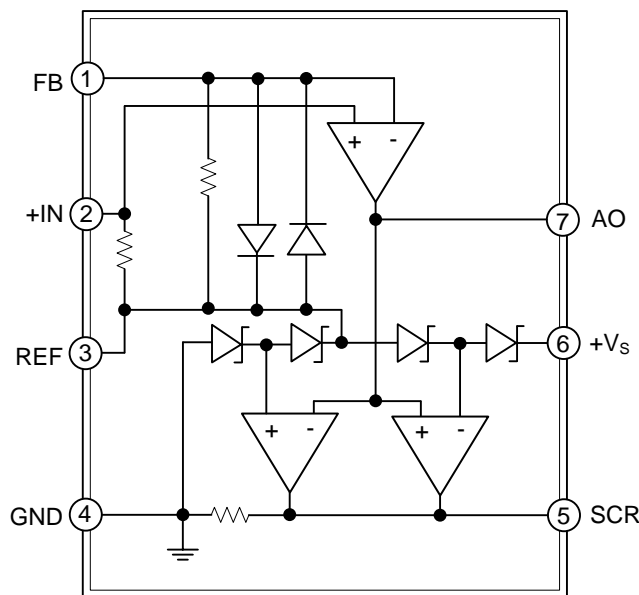
## ■ PIN CONFIGURATION



## ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	FB	Sense amplifier negative input
2	+IN	Sense amplifier positive input
3	REF	Reference Voltage
4	GND	Ground
5	SCR	Output for triggering external SCR when a fault is detected
6	+Vs	Supply input for GF4145 circuitry
7	AO	Sense Amplifier Output
8	NC	No Connect

## ■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Current	$I_{CC}$	18	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 specific)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>SHUNT REGULATOR</b>						
Zener Voltage	$V_Z$	Pin 6 ~ Pin 4	24	25	29	V
Reference Voltage	$V_{REF}$	Pin 3 ~ Pin 4	12	12.5	14.6	V
Quiescent Current	$I_Q$	$+V_s=24\text{V}$		450	750	$\mu\text{A}$
<b>OPERATIONAL AMPLIFIER</b>						
Offset Voltage	$V_{OS}$	PIN 2 ~ PIN 3	-3.0	0.5	+3.0	mV
+Output Voltage Swing	$V_{OH}$	Pin 7 ~ Pin 3	6.8	7.2	8.1	V
- Output Voltage Swing	$V_{OL}$	Pin 7 ~ Pin 3	-9.5	-11	-13.5	V
+Output Source Current	$I_{O(SOURCE)}$	Pin 7 ~ Pin 3		800		$\mu\text{A}$
- Output Source Current	$I_{O(SINK)}$	Pin 7 ~ Pin 3		1.0		mA
SCR Trigger Voltage Detector ON	$V_{ON(SCR)}$	Pin 5 ~ Pin 4	1.5	2.8		V
SCR Trigger Voltage Detector OFF	$V_{OFF(SCR)}$	Pin 5 ~ Pin 4	0	1	10	mV

■ TYPICAL APPLICATION CIRCUIT

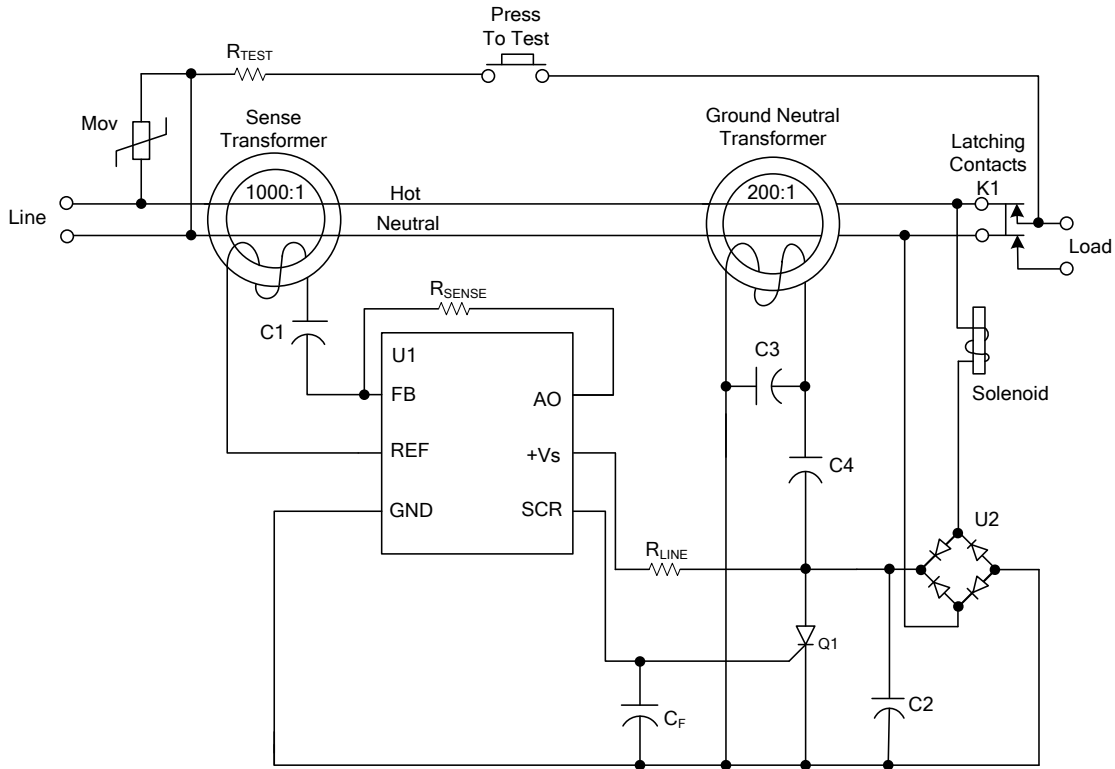


Figure 1. GFI Application Circuit (Three-Wire Outlet)

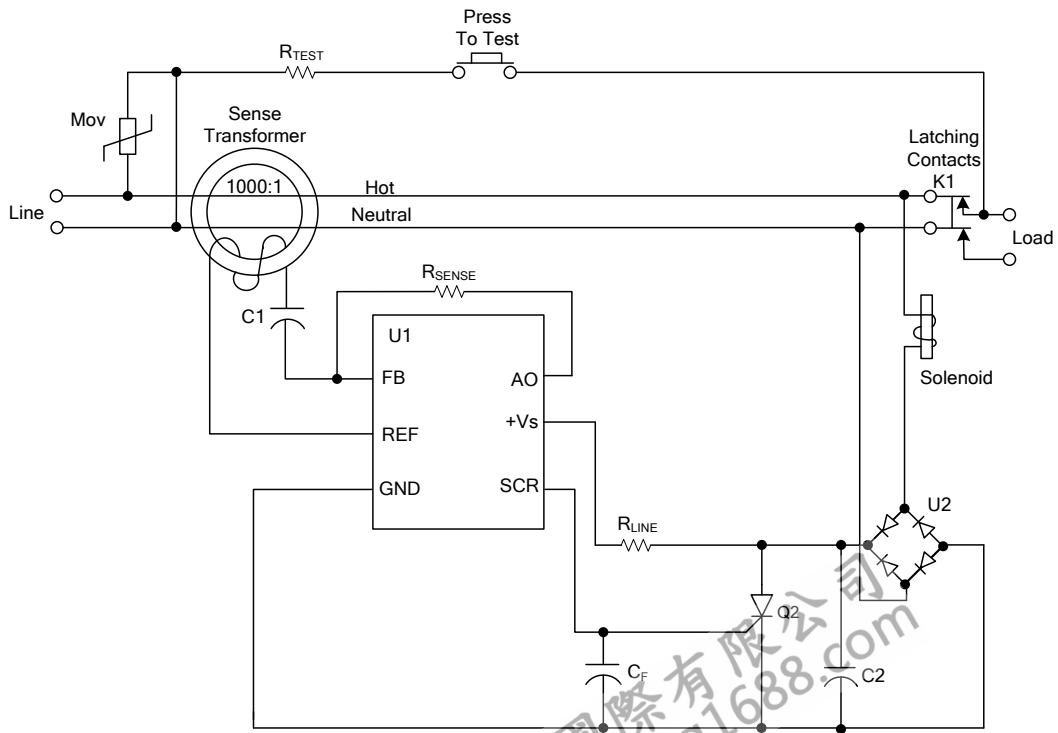


Figure 2. GFI Application Circuit (Two-Wire Outlet)

Note: Value depends on transformer characteristics.

### ■ TYPICAL APPLICATION CIRCUIT (Cont.)

#### BOM

Reference	Component	Reference	Component
C1	10 $\mu$ F	R <sub>TEST</sub>	15K
C2	0.01 $\mu$ F	R <sub>SENSE</sub>	1M
C3	0.01 $\mu$ F	R <sub>LINE</sub>	24K
C4	0.03 $\mu$ F	U1	IC UTC <b>GF4145</b>
C <sub>F</sub>	2.2 $\mu$ F	U2	DB1 1N4004 (4)
Q1	MCR100-6		
Q2	Tag X0103DA		

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