



GF4147

Preliminary

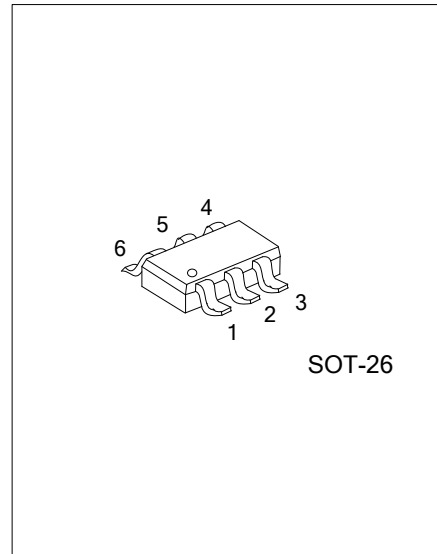
LINEAR INTEGRATED CIRCUIT

GROUND FAULT INTERRUPTER

DESCRIPTION

The UTC **GF4147** is a low-power Ground Fault Interrupter controller for detecting hazardous current paths to ground and ground-to-neutral faults. The UTC **GF4147** application circuit opens the load contacts before a harmful shock occurs.

The UTC **GF4147** circuitry has a built-in rectifier and shunt regulator that operates with a low quiescent current. The low- V_{OS} offset-sense amplifier allows direct coupling of the sense coil to the amplifier's feedback signal. This eliminates the large 50/60Hz AC-coupling capacitor.



SOT-26

FEATURES

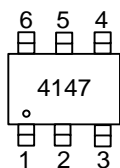
- * For GFCI and RCD Applications
- * Built-in AC Rectifier
- * Built-in Noise Filter
- * Low-Voltage SCR Disable
- * Direct DC Coupled to Sense Coil
- * SCR Gate Driver
- * Adjustable Sensitivity
- * Low Quiescent Current
- * Minimum External Components
- * Meets UL 943 Requirements
- * Ideal for 120V or 220V Systems

ORDERING INFORMATION

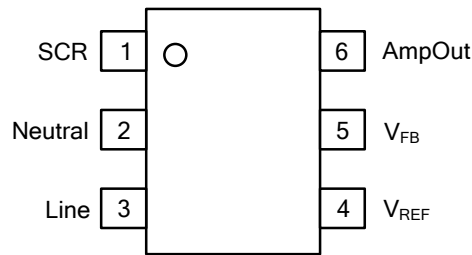
Ordering Number		Package	Packing
Lead Free	Halogen Free		
GF4147L-AG6-R	GF4147G-AG6-R	SOT-26	Tape Reel

<p>GF4147G-AG6-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) AG6: SOT-26 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



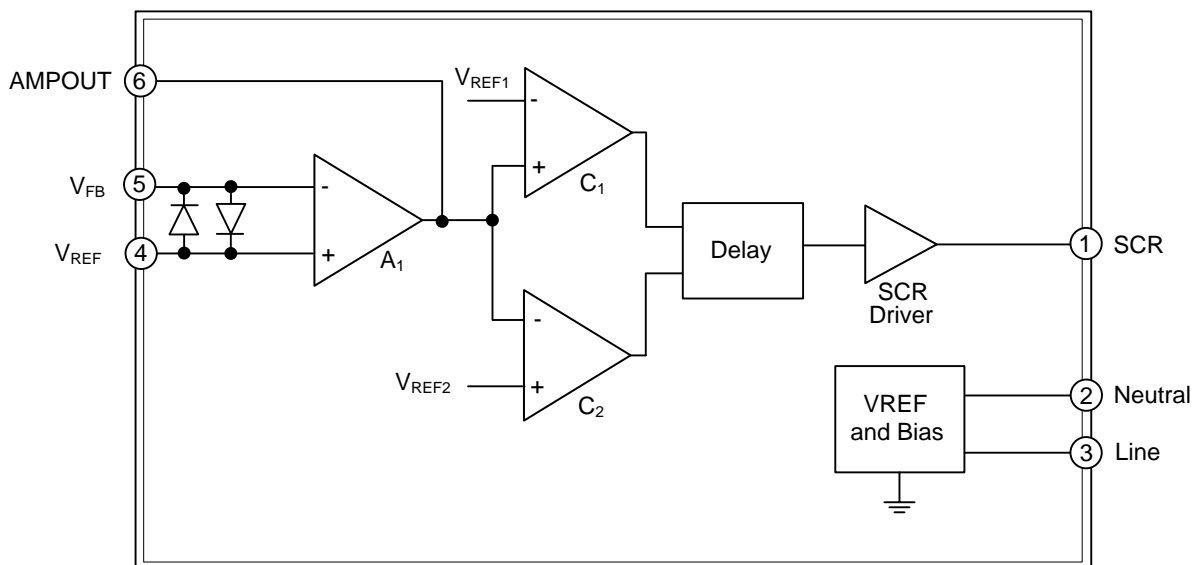
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	SCR	Gate drive for external SCR
2	Neutral	Supply input
3	Line	Supply input
4	V _{REF}	Non-inverting input for current-sense amplifier
5	V _{FB}	Inverting input for current-sense amplifier
6	AmpOut	current-sense amplifier output

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

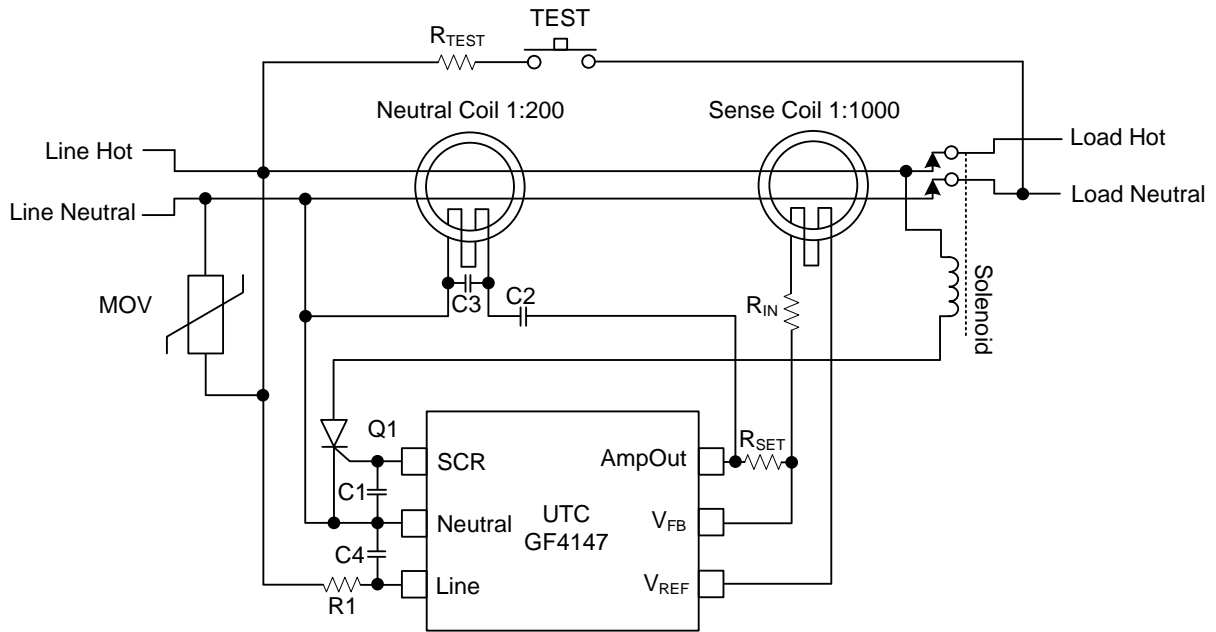
PARAMETER	SYMBOL	RATINGS	UNIT
Continuous Supply Current, Line to Neutral	I_{CC}	15	mA
Continuous Supply Voltage, Line to Neutral	V_{CC}	16	V
Continuous Voltage to Neutral, All Other Pins		-0.8~15	V
Storage Temperature	T_{STG}	-65~+150	°C

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.

■ ELECTRICAL CHARACTERISTICS ($I_{LINE}=1.5mA$ and $T_A=25^{\circ}C$, $R_{SET}=650k\Omega$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
DC Electrical Parameters ($T_A=25^{\circ}C$, $I_{shunt}=1mA$)						
Power Supply Shunt Regulator Voltage	V_{REG}	Line to Neutral	12.2	12.7	13.2	V
		Line to Neutral $I_{shunt}=-2mA$	-0.9	-0.7		V
Quiescent Current	I_Q	Line to Neutral=10V	350	415	480	μA
Reference Voltage	V_{REF}	VREF to Neutral	5.8	6.0	6.2	V
Trip Threshold	V_{TH}	AmpOut to VREF	3.4	3.5	3.6	V
Amplifier Offset	V_{OS}	Gain=1000	-450	0	450	μV
Amplifier Positive Voltage Swing	V_{SW+}	AmpOut to VREF, $I_{FAULT}=10\mu A$	4.0			V
Amplifier Negative Voltage Swing	V_{SW-}	VREF to AmpOut, $I_{FAULT}=-10\mu A$	4.0			V
Amplifier Current Sink	I_{SINK}	AmpOut= $V_{REF} - 3V$, $V_{FB}=V_{REF} + 100mV$	400			μA
Amplifier Current Source	I_{SRL}	AmpOut= $V_{REF} + 3V$, $V_{FB}=V_{REF} - 100mV$	400			μA
Delay Filter	t_d	Delay from C_1 trip to SCR L->H	1.3	1.5	1.7	ms
SCR Output Resistance	R_{OUT}	SCR to Neutral=250mV, AmpOut= V_{REF}		0.5	1.0	K Ω
SCR Output Voltage	V_{OUT}	SCR to Neutral AmpOut= V_{REF}		1	10	mV
		SCR to Neutral AmpOut= $V_{REF}+4V$	2.5			V
SCR Output Current	I_{OUT}	SCR to Neutral=1V, AmpOut= $V_{REF} + 4V$	350	500		μA

■ TYPICAL APPLICATION CIRCUIT



BOM

Reference	Component	Reference	Component
C1	22nF	R _{TEST}	15KΩ
C2	10nF	R _{IN}	470Ω
C3	1nF	R _{SET}	511KΩ
C4	10nF	R1	91KΩ

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