



## ABSOLUTE MAXIMUM RATINGS (Note 1)

Power Dissipation ..... Internally Limited  
 Input to Output Voltage Differential ..... 40V  
 Storage Temperature Range ..... -65°C to 150°C

Operating Junction Temperature  
 Hermetic (K, R, T, IG-Packages) .....150°C  
 Lead Temperature (Soldering, 10 Seconds) ..... 300°C

Note 1. Exceeding these ratings could cause damage to the device.

## THERMAL DATA

K Package:

Thermal Resistance-Junction to Case,  $\theta_{JC}$  ..... 3.0°C/W  
 Thermal Resistance-Junction to Ambient,  $\theta_{JA}$  ..... 35°C/W

R Package:

Thermal Resistance-Junction to Case,  $\theta_{JC}$  ..... 5.0°C/W  
 Thermal Resistance-Junction to Ambient,  $\theta_{JA}$  ..... 40°C/W

T Package:

Thermal Resistance-Junction to Case,  $\theta_{JC}$  ..... 15°C/W  
 Thermal Resistance-Junction to Ambient,  $\theta_{JA}$  ..... 120°C/W

IG Package:

Thermal Resistance-Junction to Case,  $\theta_{JC}$  ..... 3.5°C/W  
 Thermal Resistance-Junction to Ambient,  $\theta_{JA}$  ..... 42°C/W

Note A. Junction Temperature Calculation:  $T_J = T_A + (P_D \times \theta_{JA})$ .

Note B. The above numbers for  $\theta_{JC}$  are maximums for the limiting thermal resistance of the package in a standard mounting configuration. The  $\theta_{JA}$  numbers are meant to be guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

## RECOMMENDED OPERATING CONDITIONS (Note 2 & 3)

Input Voltage Range ..... ( $V_{OUT} + 3.5V$ ) to 37V

Operating Junction Temperature Range  
 SGR117A .....-55°C to 150°C

Note 2. Range over which the device is functional.

Note 3. These ratings are applicable for junction temperatures of less than 150°C.

## ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, these specifications apply over full operating ambient temperatures for SGR117 with  $-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ ,  $V_{IN} - V_{OUT} = 5.0V$ , and for  $I_{OUT} = 500\text{mA}$  (K and IG), and  $I_{OUT} = 100\text{mA}$  (T package). Although power dissipation is internally limited, these specifications are applicable for power dissipations of 2W for the T package, and 20W for the K and IG packages.  $I_{MAX}$  is 1.5A for the K and IG packages and 500mA for the T package. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

Parameter	Test Conditions	PRE RAD		POST NEUTRON 5 x 10 <sup>12</sup> N/cm <sup>2</sup>			Units	
		SGR117A			SGR117A			
		Min.	Typ.	Max.	Min.	Typ.		Max.
Reference Voltage	$I_{OUT} = 10\text{mA}$ , $T_A = 25^\circ\text{C}$ $3V \leq (V_{IN} - V_{OUT}) \leq 40V$ , $P \leq P_{MAX}$	1.238	1.250	1.262	1.220		1.275	V
	$10\text{mA} \leq I_{OUT} \leq I_{MAX}$	1.225	1.250	1.270	1.220	1.25	1.275	V
Line Regulation (Note 4)	$3V \leq (V_{IN} - V_{OUT}) \leq 40V$ , $I_L = 10\text{mA}$ $T_A = 25^\circ\text{C}$		0.005	0.01		0.01	0.03	%/V
	$T_A = T_{MIN}$ to $T_{MAX}$		0.01	0.02		0.02	0.05	%/V
Load Regulation (Note 4)	$10\text{mA} \leq I_{OUT} \leq I_{MAX}$							
	$V_{OUT} \leq 5V$ , $T_A = 25^\circ\text{C}$		5	15		5	50	mV
	$V_{OUT} \geq 5V$ , $T_A = 25^\circ\text{C}$		0.1	0.3		0.1	1	%
	$V_{OUT} \leq 5V$		20	50		20	50	mV
	$V_{OUT} \geq 5V$		0.3	1		0.3	1	%
Thermal Regulation (Note 5)	$T_A = 25^\circ\text{C}$ , 20ms pulse		0.002	0.02		0.03	0.07	%/W
Ripple Rejection	$V_{OUT} = 10V$ , $f = 120\text{Hz}$ $C_{ADJ} = 1\mu\text{F}$ , $T_A = 25^\circ\text{C}$ $C_{ADJ} = 10\mu\text{F}$	66	65		66	65		dB
Adjust Pin Current			80	100		80	100	$\mu\text{A}$
Adjust Pin Current Change	$10\text{mA} \leq I_{OUT} \leq I_{MAX}$ , $2.5V \leq (V_{IN} - V_{OUT}) \leq 40V$		0.2	5		0.2	8	$\mu\text{A}$

## ELECTRICAL CHARACTERISTICS (continued)

Parameter	Test Conditions	PRE RAD			POST NEUTRON 5 x 10 <sup>12</sup> N/cm <sup>2</sup>			Units
		SGR117A			SGR117A			
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Minimum Load Current	(V <sub>IN</sub> - V <sub>OUT</sub> ) = 40V		3.5	5		3.5	8	mA
Current Limit	(V <sub>IN</sub> - V <sub>OUT</sub> ) ≤ 15V							
	K, R, IG Packages	1.5	2.2		1.5	2.2		A
	T Package	0.5	0.8		0.5	0.8		A
	(V <sub>IN</sub> - V <sub>OUT</sub> ) = 40V, T <sub>J</sub> = 25°C							
	K, R, IG Packages	0.3	0.4		0.3	0.4		A
	T Package	0.15	0.2		0.15	0.2		A
Temperature Stability (Note 5)			1	2				%
Long Term Stability (Note 5)	T <sub>A</sub> = 125°C, 1000 Hours		0.3	1				%
RMS Output Noise (% of V <sub>OUT</sub> )	T <sub>A</sub> = 25°C, 10Hz ≤ f ≤ 10 KHz (Note 5)		0.001					%

Note 4. Regulation is measured at constant junction temperature, using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification for thermal regulation.

Note 5. These parameters, although guaranteed, are not tested in production.

## CONNECTION DIAGRAMS & ORDERING INFORMATION (See Notes Below)

Package	Part No.	Ambient Temperature Range	Connection Diagram
3-TERMINAL TO-3 METAL CAN K-PACKAGE	SGR117AK SGR117AK/883B	-55°C to 125°C -55°C to 125°C	
3-TERMINAL TO-66 METAL CAN R-PACKAGE	SGR117AR SGR117AR/883B	-55°C to 125°C -55°C to 125°C	
3-PIN TO-39 METAL CAN T-PACKAGE	SGR117AT SGR117AT/883B	-55°C to 125°C -55°C to 125°C	
3-PIN HERMETIC TO-257 IG-PACKAGE (Isolated)	SGR117AIG/883B SGR117AIG	-55°C to 125°C -55°C to 125°C	

Note 1. Contact factory for JAN and DESC product availability.  
 Note 2. All parts are viewed from the top.

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