

PRECISION 2.5-VOLT REFERENCE

DESCRIPTION

This monolithic integrated circuit is a fully self-contained precision voltage reference generator, internally trimmed for $\pm 1\%$ accuracy. Requiring less than 2mA in quiescent current, this device can deliver in excess of 10mA with total load- and line-induced tolerances of less than 0.5%. In addition to voltage accuracy, internal trimming achieves a temperature coefficient of output voltage of typically 10 ppm/ $^{\circ}\text{C}$. As a result, these references are excellent choices for application to critical instrumentation and D-to-A converter systems.

The SG1503 is specified for operation over the full military ambient temperature range of -55°C to 125°C , while the SG2503 is designed for -25°C to 85°C and the SG3503 for commercial applications of 0°C to 70°C .

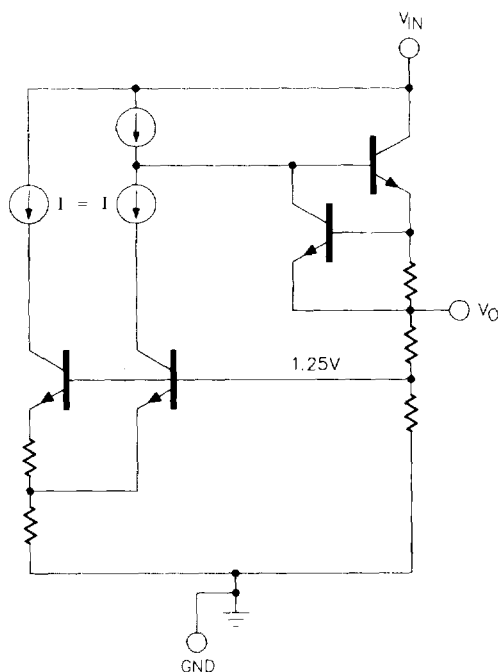
FEATURES

- Output voltage trimmed to $\pm 1\%$
- Input voltage range of 4.5 to 40V
- Temperature coefficient of 10ppm/ $^{\circ}\text{C}$
- Quiescent current typically 1.5mA
- Output current in excess of 10mA
- Interchangeable with MC1503 and AD580

HIGH RELIABILITY FEATURES - SG1503

- ♦ Available to MIL-STD-883 and DESC SMD
- ♦ Radiation data available
- ♦ SG level "S" processing available

FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Voltage 40V
Storage Temperature Range -65°C to 150°C

Operating Junction Temperature

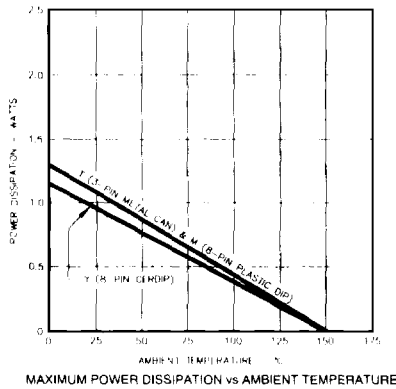
Hermetic (J, Y - Package) 150°C

Plastic (M-Package) 150°C

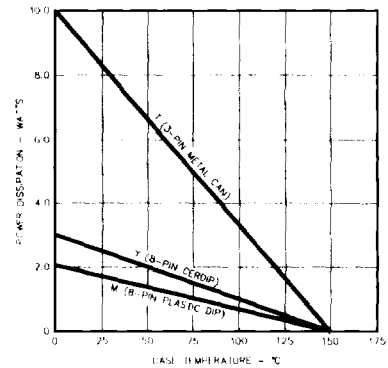
Lead Temperature (Soldering, 10 Seconds) 300°C

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

THERMAL DERATING CURVES



MAXIMUM POWER DISSIPATION vs AMBIENT TEMPERATURE



MAXIMUM POWER DISSIPATION vs CASE TEMPERATURE

RECOMMENDED OPERATING CONDITIONS (Note 2)

Input Voltage 4.5V to 40V

Operating Ambient Temperature Range

SG1503 -55°C to 125°C

SG2503/SG3503 0°C to 70°C

Note 2. Range over which the device is functional.

ELECTRICAL SPECIFICATIONS

(Unless otherwise specified, these specifications apply over the operating ambient temperatures for SG1503 with -55°C ≤ T_A ≤ 125°C, SG2503/SG3503 with 0°C ≤ T_A ≤ 70°C, V_{IN} = 15V, and I_L = 0mA. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

Parameter	Test Conditions	SG1503/2503			SG3503			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Output Voltage	T _A = 25°C	2.485	2.500	2.515	2.475	2.500	2.525	V
Input Voltage		4.7		40	4.7		40	V
	T _A = 25°C	4.5		40	4.5		40	V
Line Regulation	V _{IN} = 5V to 15V		1	3		1	3	mV
	V _{IN} = 15V to 40V		3	5		3	10	mV
Load Regulation	ΔI _L = 10mA		3	5		3	10	mV
	ΔI _L = 10mA, V _{IN} = 30V		4	8		4	15	mV
Temperature Regulation	(SG1503 only)		15	20				mV
	(SG2503/3503 only)		2.5	5		5	10	mV
Quiescent Current	V _{IN} = 40V		1.5	2.0		1.5	2.0	mA
Short Circuit Current	T _A = 25°C	15	20	30	15	20	30	mA
Ripple Rejection	f = 120Hz, T _A = 25°C		76			76		dB
Output Noise	BW = 10KHz, T _A = 25°C		100			100		μV rms
Voltage Stability			250			250		μV/Khr

CHARACTERISTIC CURVES

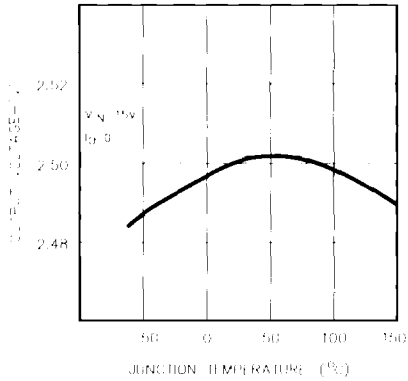


FIGURE 1
OUTPUT VOLTAGE VS.
TEMPERATURE

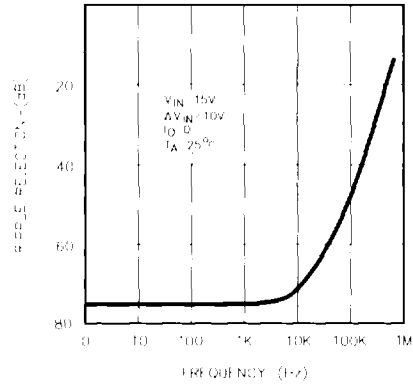


FIGURE 2
RIPPLE REJECTION

CONNECTION DIAGRAMS & ORDERING INFORMATION (See Notes Below)

Package	Part No.	Ambient Temperature Range	Connection Diagram
8-PIN CERAMIC DIP Y - PACKAGE	SG1503Y/883B	-55°C to 125°C	V_{IN} 1 8 N.C. $V_{IO,1}$ 2 7 N.C. GND 3 6 N.C. N.C. 4 5 N.C.
	SG1503Y	-55°C to 125°C	
	SG2503Y	0°C to 70°C	
	SG3503Y	0°C to 70°C	
8-PIN PLASTIC DIP M - PACKAGE	SG2503M	0°C to 70°C	 V_{IN} ① $V_{IO,1}$ ② ③ GND
	SG3503M	0°C to 70°C	
3-PIN TO-39 METAL CAN T - PACKAGE	SG1503T/883B	-55°C to 125°C	 V_{IN} ① $V_{IO,1}$ ② ③ GND
	SG1503T	-55°C to 125°C	
	SG2503T	0°C to 70°C	
	SG3503T	0°C to 70°C	

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