May 1, 2000

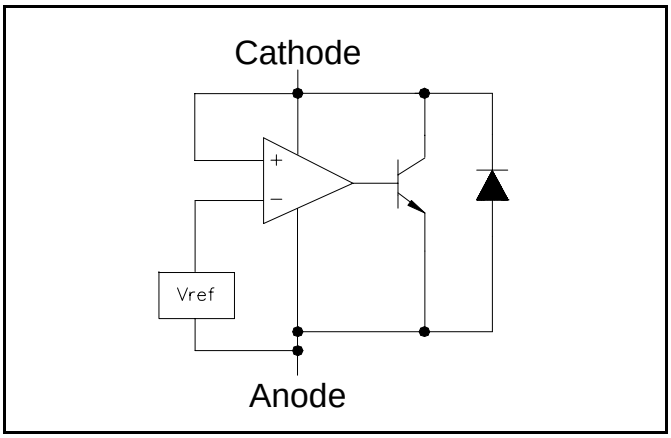
TEL:805-498-2111 FAX:805-498-3804 WEB:http://www.semtech.com

DESCRIPTION

The SC1004(A) is a two terminal precision voltage reference with thermal stability guaranteed over temperature. The SC1004(A) has a typical dynamic output impedance of 0.2Ω. Active output circuitry provides a very sharp turn on characteristic - the minimum operating current is 20µA, with a maximum of 20mA.

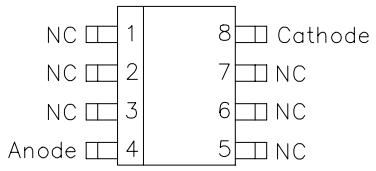
Coming with an initial tolerance of ± 0.8% (0.32% for SC1004A), and with two available voltage options (1.235V and 2.5V) in a small SO-8 package, the SC1004(A) is ideally suited for very low power circuitry such as temperature sensors and portable meters.

BLOCK DIAGRAM

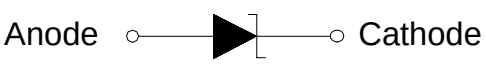


PIN CONFIGURATION

SO-8 Lead (Top View)



SYMBOL DIAGRAM



FEATURES

- Trimmed bandgap design (0.8%, 0.32% for SC1004A version)
- Wide operating current range 20µA to 20mA
- Low dynamic impedance (0.2Ω)
- SO-8 package

APPLICATIONS

- Micropower circuitry
- Portable meters
- Battery powered systems
- Temperature sensors

ORDERING INFORMATION

VOLTAGE(1)		INITIAL ACCURACY
1.235 V	**2.5 V**	
SC1004CS8-1.2.TR	SC1004CS8-2.5.TR	±0.8%
SC1004ACS8-1.2.TR	-	±0.32%

Notes:
(1) Only available in tape and reel packaging. A reel contains 2500 devices.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Units
Reverse Current		20	mA
Operating Temperature Range	T_A	-40 to +85	°C
Operating Junction Temperature Range	T_J	-40 to +150	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C
Lead Temperature (Soldering) 10 seconds	T_{LEAD}	300	°C

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ELECTRICAL CHARACTERISTICS

T_A = 25°C unless otherwise specified.				-1.2			-2.5			
Parameter	**Symbol**	**Condition**		**MIN**	**TYP**	**MAX**	**MIN**	**TYP**	**MAX**	**UNITS**
Reverse Breakdown Voltage, SC1004	V_Z	I_Z = 100µA	T_A = 25°C	1.225	1.235	1.245	2.480	2.500	2.520	V
			T_A = 0 to +70°C	1.220	1.235	1.250	2.470	2.500	2.530	
			T_A = -40 to +85°C	1.215	1.235	1.255	2.460	2.500	2.535	
Reverse Breakdown Voltage, SC1004A	V_Z	I_Z = 100µA	T_A = 25°C	1.231	1.235	1.239	N/A	N/A	N/A	V
			T_A = 0 to +70°C	1.225	1.235	1.245	N/A	N/A	N/A	
			T_A = -40 to +85°C	1.220	1.235	1.245	N/A	N/A	N/A	
Average Temperature Coefficient	$\frac{\Delta V_Z}{\Delta T}$	$I_{Z(min)} \leq I_Z \leq$ 20mA			20			20		ppm/°C
Minimum Operating Current	$I_{Z(min)}$		T_A = -40 to +85°C		8	10		12	20	µA
Ratio of Change in V_Z to Change in I_Z	$\frac{\Delta V_Z}{\Delta I_Z}$	$I_{Z(min)} \leq I_Z \leq$ 1mA	T_A = 25°C			1.0			1.0	mV
			T_A = -40 to +85°C			1.5			1.5	
		1mA $\leq I_Z \leq$ 20mA	T_A = 25°C			10			10	
			T_A = -40 to +85°C			20			20	
Reverse Dynamic Impedance	Z_R	I_Z = 100µA	T_A = 25°C		0.2	0.6		0.2	0.6	Ω
			T_A = -40 to +85°C			1.5			1.5	
Wideband Noise (RMS)	e_N	I_Z = 100µA, 10Hz $\leq f \leq$ 10kHz			60			120		µV
Long Term Stability of Reverse Breakdown Voltage	ΔV_Z	t = 1000 hours, T = 25°C ± 0.1°C, I_Z = 100µA			20			20		ppm

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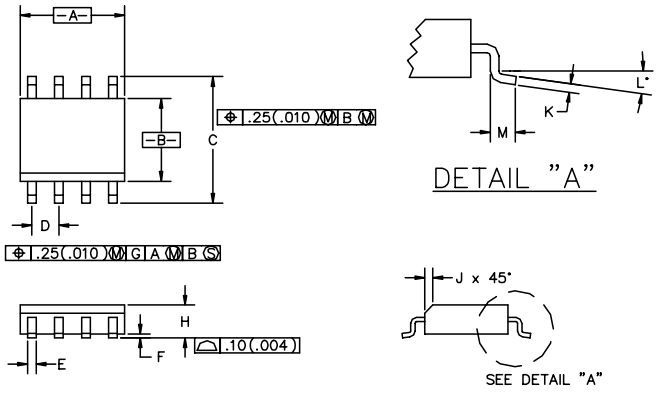
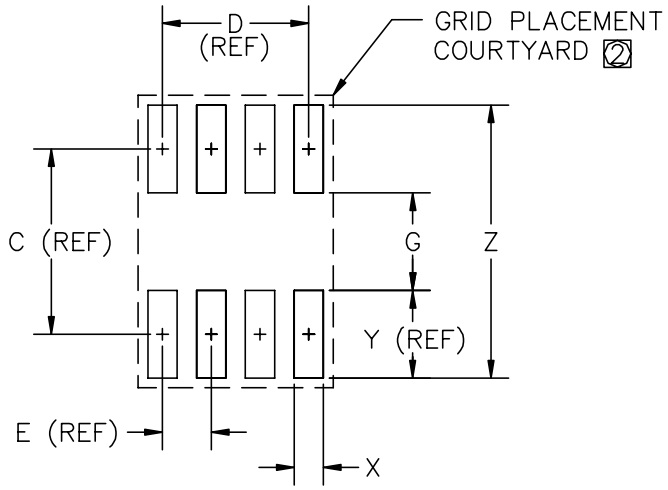
OUTLINE DRAWING - SO-8



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.188	.197	4.80	5.00	
B	.149	.158	3.80	4.00	
C	.228	.244	5.80	6.20	
D	.050 BSC		1.27 BSC		
E	.013	.020	0.33	0.51	
F	.004	.010	0.10	0.25	
H	.053	.069	1.35	1.75	
J	.011	.019	0.28	0.48	
K	.007	.010	.19	.25	
L	0°	8°	0°	8°	
M	.016	.050	0.40	1.27	

LAND PATTERN - SO-8



DIMENSIONS (1)					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
C	–	.19	–	5.00	–
D	–	.15	–	3.81	–
E	–	.05	–	1.27	–
G	.10	.11	2.60	2.80	–
X	.02	.03	.60	.80	–
Y	–	.09	–	2.40	–
Z	–	.29	7.20	7.40	–

(2) GRID PLACEMENT COURTYARD IS 12x16 ELEMENTS (6 mm X 8mm) IN ACCORDANCE WITH THE INTERNATIONAL GRID DETAILED IN IEC PUBLICATION 97.

(1) CONTROLLING DIMENSION: MILLIMETERS

ECN00-1051

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