

POWER MANAGEMENT

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 $20\mu\text{A}$, with a maximum of 20mA .

The SC1004(A) is ideally suited for very low power circuitry such as temperature sensors and portable meters. It is available with an initial tolerance of $\pm 0.8\%$ (0.32% for SC1004A), and with a voltage option of 1.235V and is offered in a small SO-8 package.

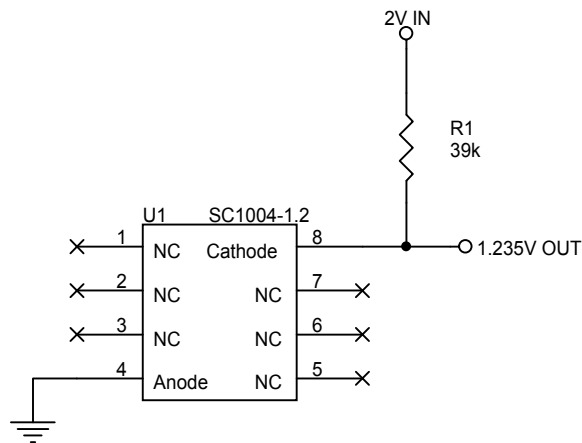
Features

- ◆ Trimmed bandgap design (0.8% for SC1004, 0.32% for SC1004A version)
- ◆ Wide operating current range: $20\mu\text{A}$ to 20mA
- ◆ Low dynamic impedance (0.2Ω)
- ◆ Fully stable with all combinations of operating current/bypass cap. (down to no bypass cap.)
- ◆ Industrial temperature range
- ◆ SO-8 package

Applications

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

Typical Application Circuits



Micropower reference from a 2V battery

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Absolute Maximum Ratings

Exceeding the specifications below may result in permanent damage to the device, or device malfunction. Operation outside of the parameters specified in the Electrical Characteristics section is not implied.

Parameter	Symbol	Maximum	Units
Reverse Current	I_Z	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 Sec.	T_{LEAD}	300	°C
ESD Rating (Human Body Model)	V_{ESD}	2	kV

Electrical Characteristics

Unless otherwise specified: $T_A = 25^\circ\text{C}$

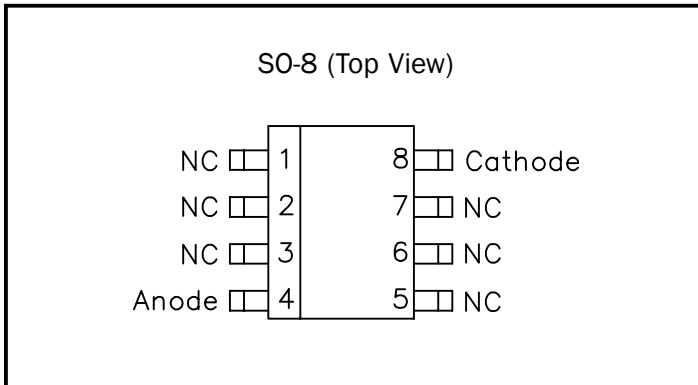
Parameter	Symbol	Conditions	Min	Typ	Max	Units	
Reverse Breakdown Voltage, SC1004	V_Z	$I_Z = 100\mu\text{A}$	$T_A = 25^\circ\text{C}$	1.225	1.235	1.245	V
			$T_A = 0 \text{ to } +70^\circ\text{C}$	1.220		1.250	
			$T_A = -40 \text{ to } +85^\circ\text{C}$	1.215		1.255	
Reverse Breakdown Voltage, SC1004A	V_Z	$I_Z = 100\mu\text{A}$	$T_A = 25^\circ\text{C}$	1.231	1.235	1.239	V
			$T_A = 0 \text{ to } +70^\circ\text{C}$	1.225		1.245	
			$T_A = -40 \text{ to } +85^\circ\text{C}$	1.220		1.245	
Average Temperature Coefficient ⁽¹⁾	TC	$I_{Z(MIN)} \leq I_Z \leq 20\text{mA}$		20		ppm/°C	
Minimum Operating Current	$I_{Z(MIN)}$		$T_A = -40 \text{ to } +85^\circ\text{C}$	8	10	μA	
Ratio of Change in V_Z to Change in I_Z	$\frac{\Delta V_Z}{\Delta I_Z}$	$I_{Z(MIN)} \leq I_Z \leq 1\text{mA}$	$T_A = 25^\circ\text{C}$			1.0	mV
			$T_A = -40 \text{ to } +85^\circ\text{C}$			1.5	
		$1\text{mA} \leq I_Z \leq 20\text{mA}$	$T_A = 25^\circ\text{C}$			10	
			$T_A = -40 \text{ to } +85^\circ\text{C}$			20	
Reverse Dynamic Impedance	Z_R	$I_Z = 100\mu\text{A}$	$T_A = 25^\circ\text{C}$		0.2	0.6	Ω
			$T_A = -40 \text{ to } +85^\circ\text{C}$			1.5	
Wideband Noise (RMS)	e_N	$I_Z = 100\mu\text{A}, 10\text{Hz} \leq f \leq 10\text{kHz}$			60		μV
Long Term Stability of Reverse Breakdown Voltage	ΔV_Z	$t = 1000 \text{ hours}, T = 25^\circ\text{C} \pm 0.1^\circ\text{C}, I_Z = 100\mu\text{A}$			20		ppm

Note:

(1) Average temperature coefficient is defined as the worst case voltage change divided by total temperature range.

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Pin Configuration



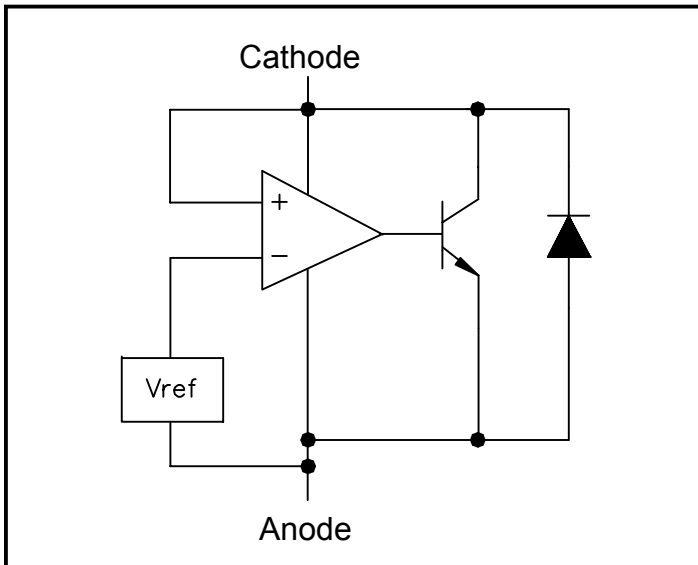
Ordering Information

Device ⁽¹⁾	V _z (V)	Initial Accuracy
SC1004CS8-1.2.TR	1.235	±0.8%
SC1004ACS8-1.2.TR	1.235	±0.32%

Note:

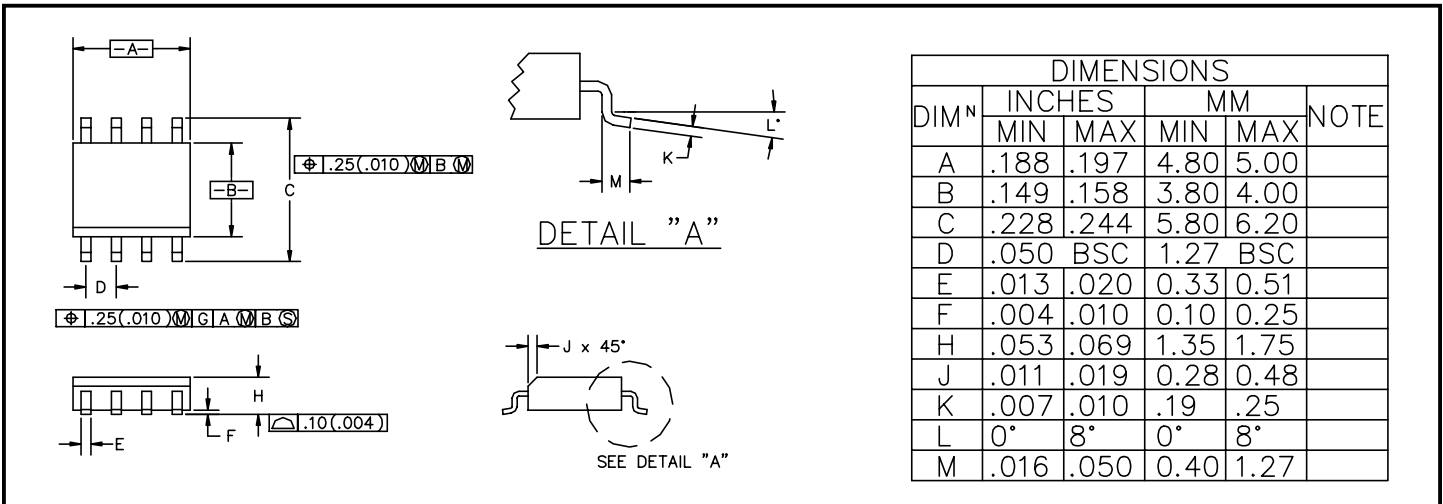
(1) SO-8 package only available in tape and reel packaging. A reel contains 2500 devices.

Block Diagram

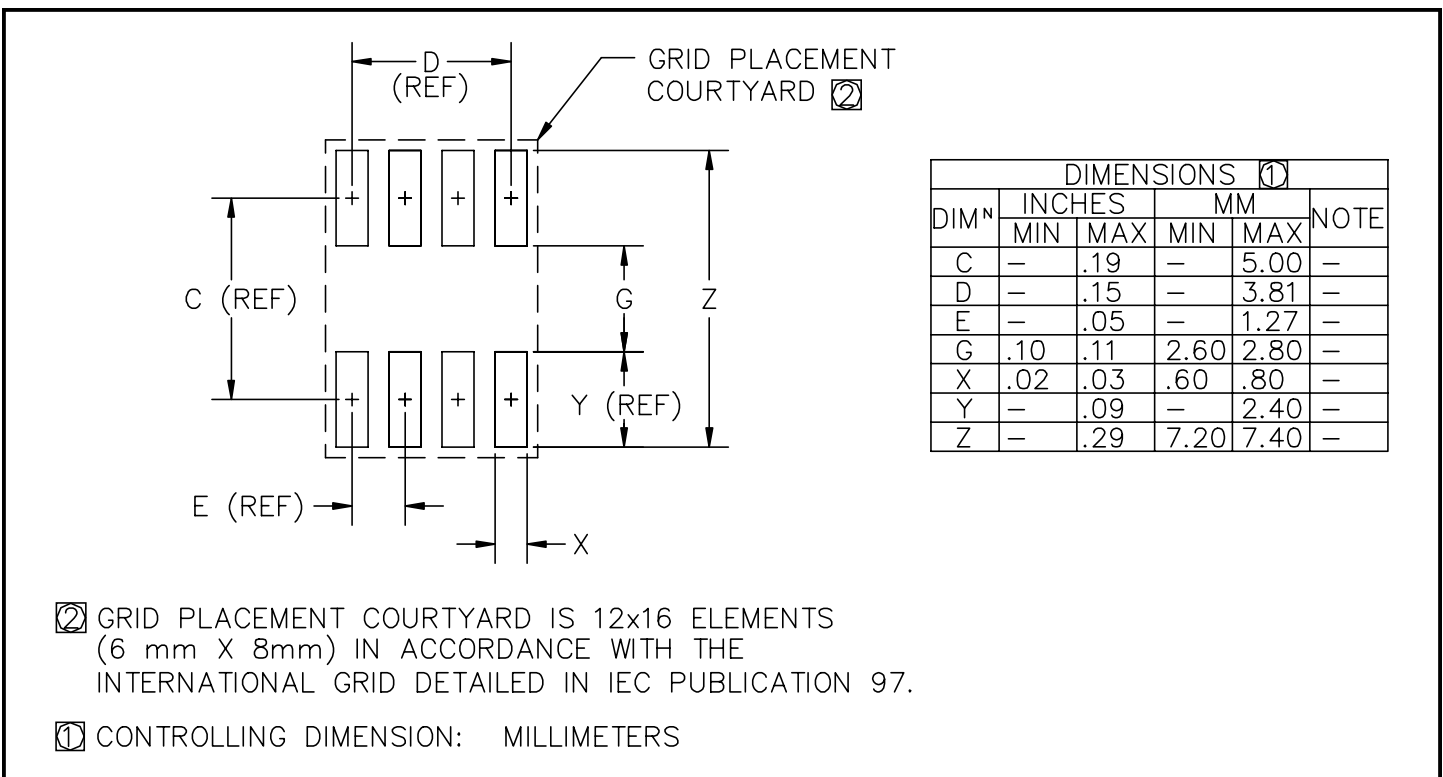


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Outline Drawing - SO-8



Land Pattern - SO-8



Contact Information

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