

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

**RT9013**

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产品手册

## 概述

RT9013 系列是高纹波抑制率、低功耗、低压差，具有过流和短路保护的 CMOS 降压型电压稳压器。这些器件具有很低的静态偏置电流（60  $\mu$ A Typ.），它们能在输入、输出电压差极小的情况下提 500mA 的输出电流，并且仍能保持 良好的调整率。由于输入输出间的电压差很小和静态偏置电流很小，这些器件特别适用于希望延长有 用电池寿命的 电池供电类产品，如计算机、消费类产品和工业设备等。

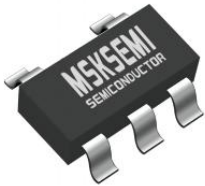
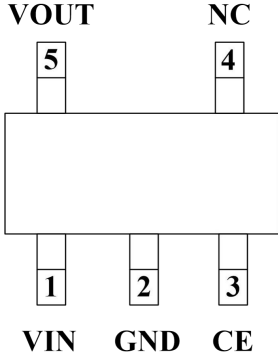
## 特点

- 输出范围：1.2V-5.0V
- 500mA 输出电流
- 高电源抑制比：75 分贝 1 千赫
- 极低的静态偏置电流：60 $\mu$ A（典型）
- 在关机模式下小于 1  $\mu$ A
- 交界处的温度运作为 -40 $^{\circ}$ C 至 +85 $^{\circ}$ C

## 应用范围

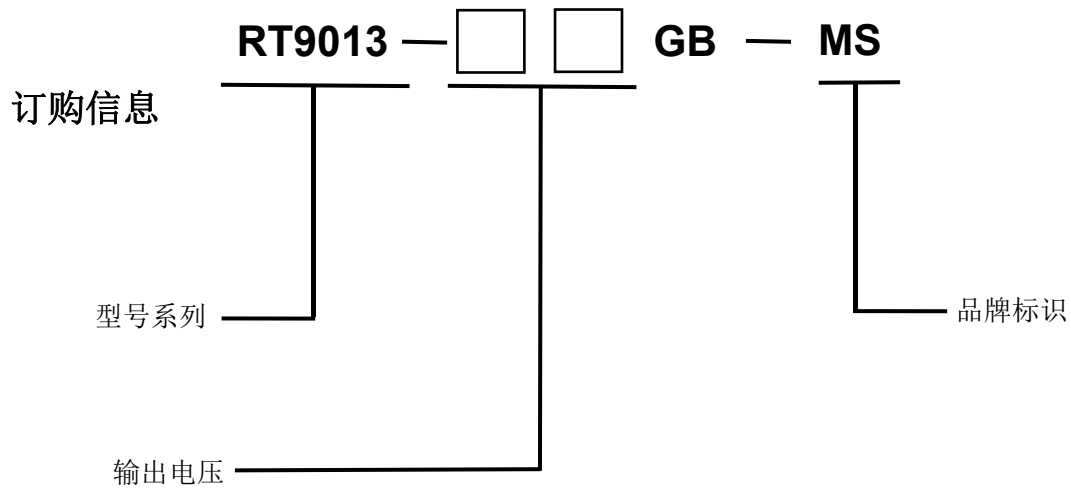
- CDMA / GSM 移动电话
- PDAS/MP3
- WLAN 和蓝牙设备
- 无绳电话
- 电池供电系统

## 参考信息

封装	管脚分布图
	
SOT-23-5	

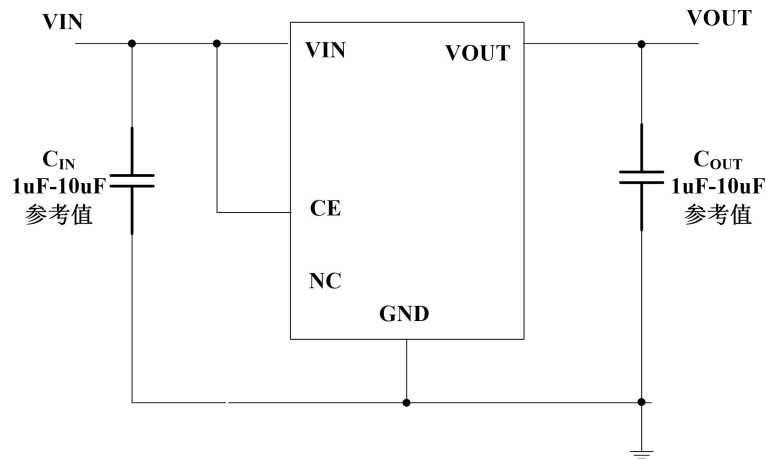
## 管脚描述

管脚号	管脚名	描述
1	VIN	电源端
2	GND	接地端
3	CE	即EN，使能端
4	NC	悬空
5	VOUT	输出端



型号	封装	输出电压
RT9013-12GB-MS	SOT-23-5	1.2V
RT9013-15GB-MS	SOT-23-5	1.5V
RT9013-18GB-MS	SOT-23-5	1.8V
RT9013-25GB-M	SOT-23-5	2.5V
RT9013-28GB-MS	SOT-23-5	2.8V
RT9013-30GB-MS	SOT-23-5	3V
RT9013-33GB-MS	SOT-23-5	3.3V

## 典型应用



## 封装耗散等级

封装	Pd (mW)
SOT-23-5L	300

## ESD 与 Latch-up 等级

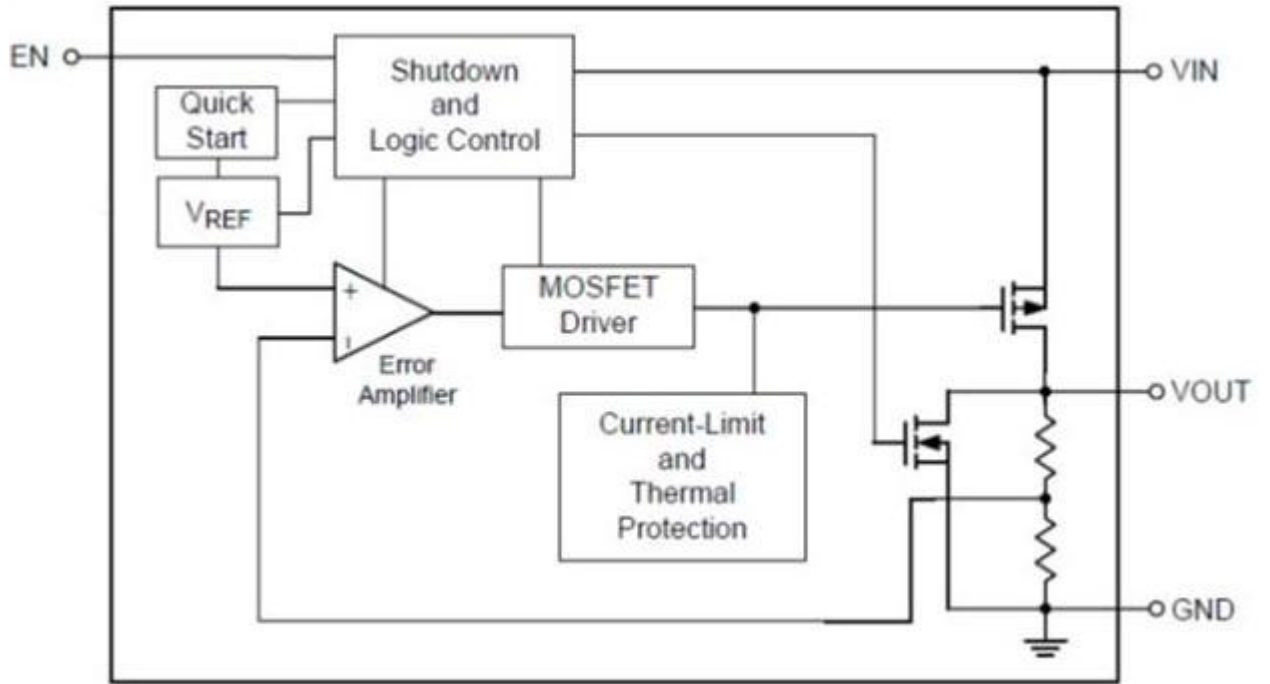
人体模型 ESD 级别	4000V
机器模型 ESD 级别	400V
Latcu-up 级别	400mA

## 极限参数

参数	符号	极限值	单位
Vin 脚电压	VIN	7	V
Vout 脚电流	Iout	600	mA
Vout 脚电压	Vout	V <sub>SS</sub> -0.3 ~ Vout+0.3	V
工作温度	T <sub>opr</sub>	-40~+85	°C
存贮温度	T <sub>stg</sub>	-55~+125	°C
焊接温度和时间	T <sub>solder</sub>	260°C, 10s	°C

**注释：**超出“绝对极限参数”可能损毁器件。推荐工作范围内器件可以工作，但不保证其特性。长时间运行在绝对极限参数条件下可能会影响器件的可靠性。

结构框图



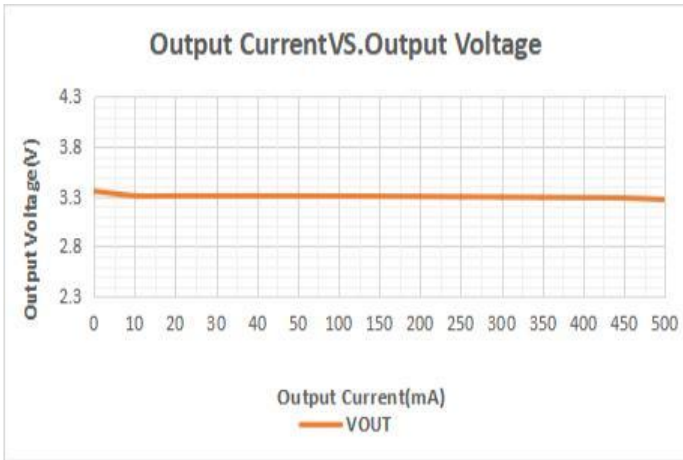
## 主要参数及工作特性

( $V_{in}=V_{out}+1V$ ,  $C_{in}=C_{out}=1\mu$ ,  $T_a=25C$ 。除特别指定)

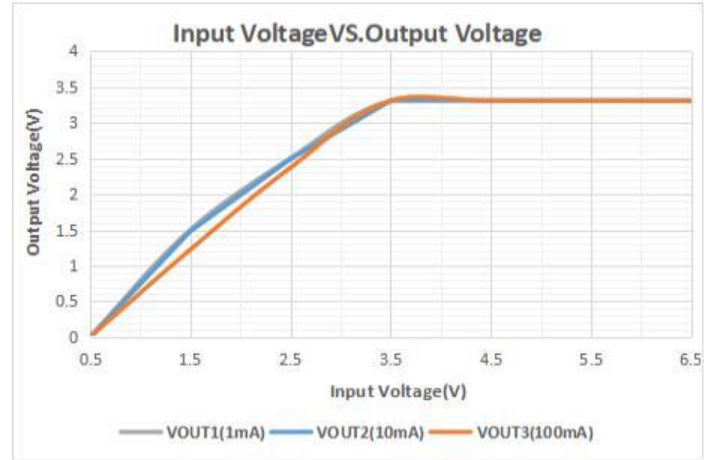
特性	符号	条件	最小值	典型值	最大值	单位
输出电压	$V_{OUT}(E)$ (Note 2)	$I_{OUT}=40mA$ , $V_{IN}=V_{out}+1V$	$\times 0.98$	$V_{OUT}(T)$ (Note 1)	$\times 1.02$	V
输入电压	$V_{IN}$				5.5	V
最大输出电流	$I_{OUTmax}$	$V_{IN}=V_{out}+1V$		500		mA
CE 使能电压	$V_{CE}(\text{Note3})$	$V_{IN}=V_{out}+1V$		1.1		mV
负载特性	$\Delta V_{OUT}$	$V_{IN}=V_{out}+1V$ , $1mA \leq I_{OUT} \leq 100mA$		50		mV
压差 (Note 3)	$V_{dif1}$	$I_{OUT} = 100mA$		100		mV
	$V_{dif2}$	$I_{OUT} = 200mA$		300		mV
静态电流	$I_{SS}$	$V_{IN}=V_{out}+1V$		60		$\mu A$
关断电流	$I_{CEL}$	$V_{ce} = 0V$		1		$\mu A$
电源电压调整率	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $V_{out}+1V \leq V_{IN} \leq 8V$		0.03		%/V
输出噪声	$e_n$	$I_{OUT} = 40mA$ , $300Hz \sim 50kHz$		50		$\mu V_{rms}$
纹波抑制比	PSRR	$V_{in} = [V_{out}+1]V$ $+ 1V_{p-pAC}$ $I_{OUT}=40mA, f=1kHz$		75		dB

- 注释:**
- $V_{OUT}(T)$  : 规定的输出电压
  - $V_{OUT}(E)$  : 有效输出电压 ( 即当  $I_{OUT}$  保持一定数值,  $V_{IN} = (V_{OUT}(T)+1.0V)$  时的输出电压。
  - $V_{CE}$  : 考虑到高低温和工艺偏差, 建议客户将 CE PIN 的使能电压设置为 1.1V, 保留有余量。  
芯片内部 CE PIN 对 GND PIN 之间有内置 1M $\Omega$  电阻。
  - $V_{dif}$  :  $V_{IN1} - V_{OUT}(E)'$   
 $V_{IN1}$  : 逐渐减小输入电压, 当输出电压降为  $V_{OUT}(E)$  98% 时的输入电压。  
 $V_{OUT}(E)' = V_{OUT}(E) \times 98\%$

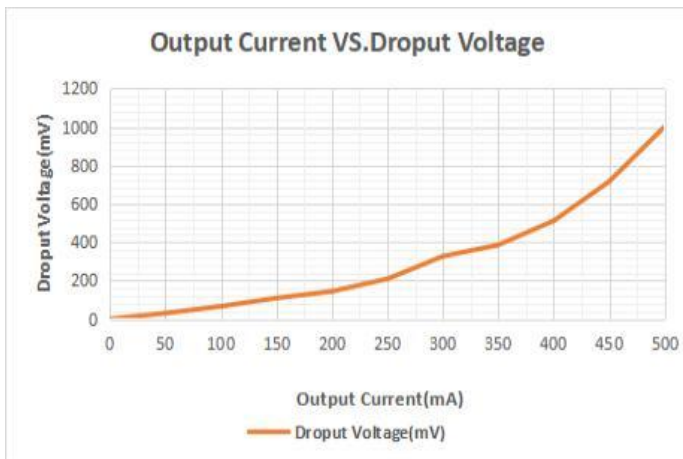
特性曲线



输出电流与输出电压关系

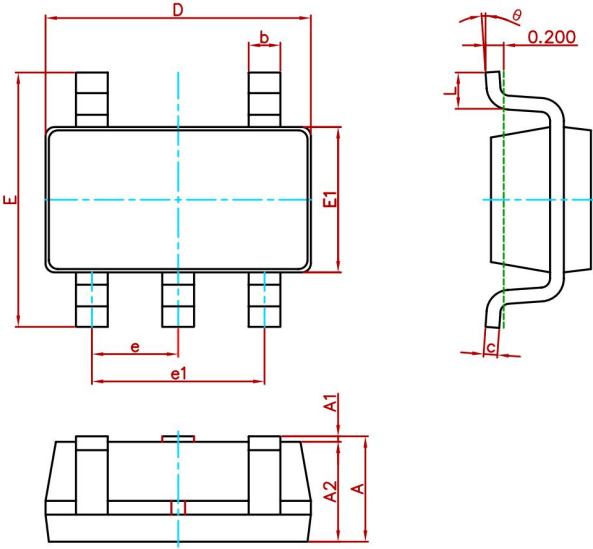


输入电压与输出电压关系



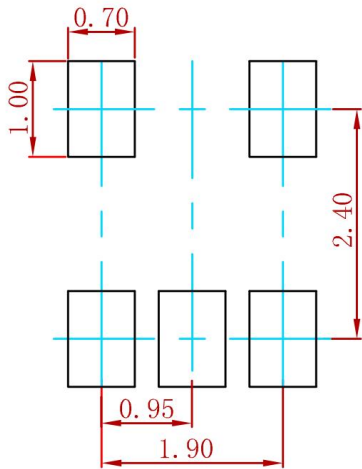
输出电流与压差的关系

封装说明



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

焊盘布局



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance: ±0.05mm.  
 3. The pad layout is for reference purposes only.

卷轴规格

P/N	PKG	QTY
RT9013	SOT-23-5	3000



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