

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

MIC5205

产品手册

概述

MIC5205 系列是一组低压差 (LDO) 转换器, 具有 2.8V 至 24V 宽电压输入范围、低压差、低功耗和小型化封装的特性, 输出电压范围为 3.0-5.0V。

MIC5205 低至 1.8 μ A 低静态电流特性, 电路也带有 CE 使能控制端口, 可使电路进入休眠状态。特别适用于电池供电、长时间待机系统设备应用, 能帮助降低系统设备的待机功耗, 有效延长待机时间和电池使用寿命。

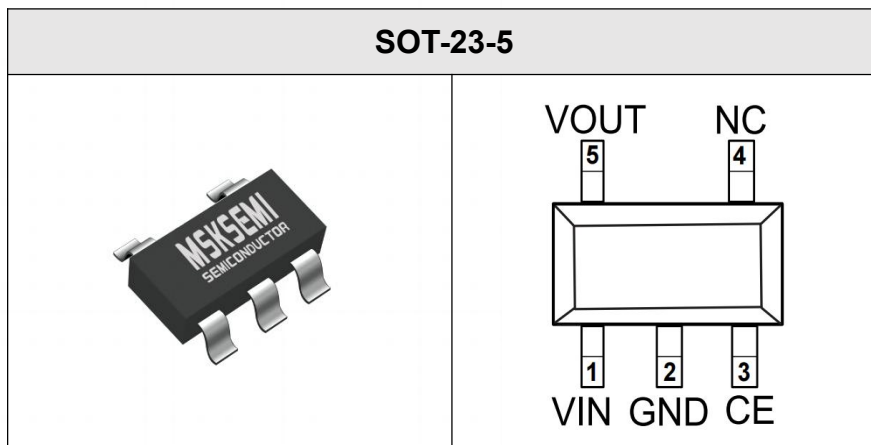
特性

- 输入输出电压差低
- 温度漂移系数小
- 耐压 24V
- 工作静态电流 1.8 μ A, 最大 4 μ A
- 休眠静态电流最大 0.2 μ A
- 输出电压精度: $\pm 2\%$
- 输出过载保护
- 带有 CE 使能控制端口
- 工作温度 $-20^{\circ}\text{C} \sim +85^{\circ}\text{C}$

应用

- 手持式、电池供电设备
- 通信设备
- 音频、视频设备
- 低功耗微处理器
- 笔记本电脑、掌上型电脑和 PDA
- 车载导航系统
- 工业控制
- 智能家居

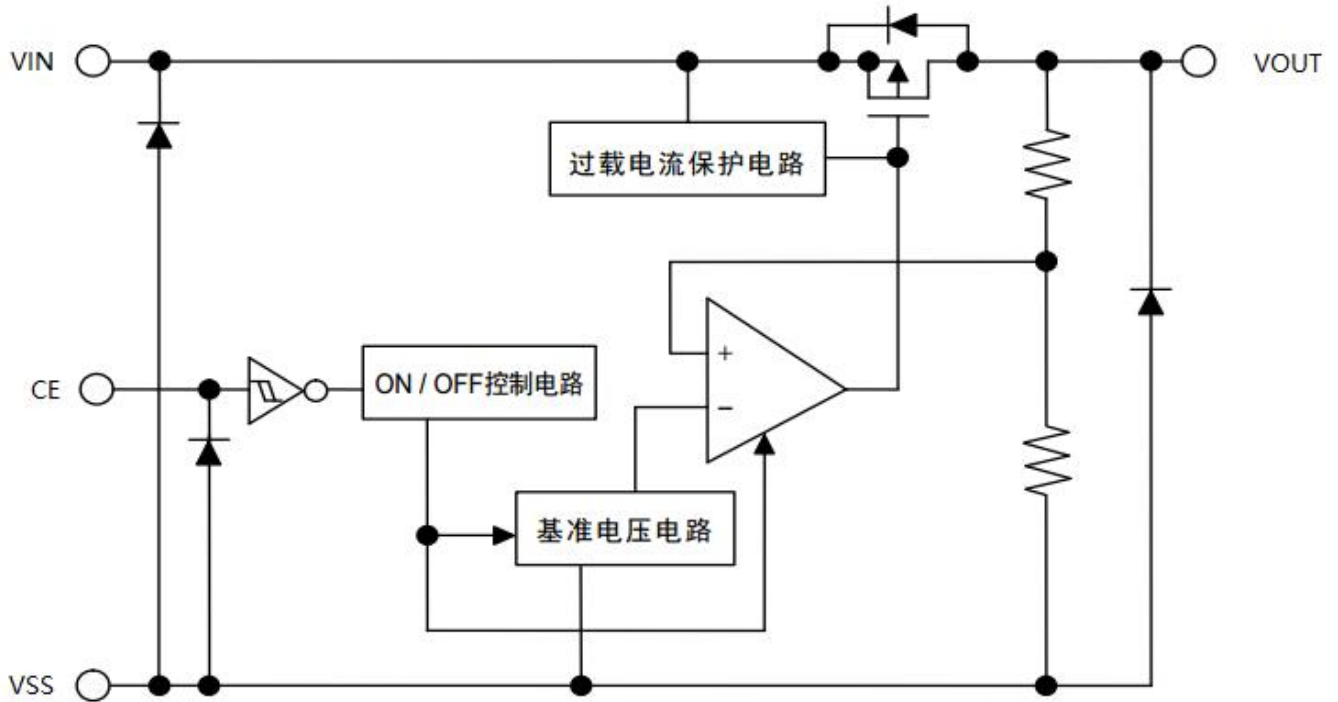
封装外形及引脚排列



引脚功能描述

序号	符号	功能描述
1	VIN	输入端
2	VSS	地端
3	CE	使能端
4	NC	悬空
5	VOUT	输出端

电路方框图



最大额定值 (无特别说明情况下, $T_A=25^{\circ}\text{C}$)

参数说明	符号	数值范围	单位
输入极限电压	V_{IN}	$-0.3 \sim +26$	V
使能口极限电压	V_{CE}	$-0.3 \sim +26$	V
输出极限电流	I_{out}	600	mA
贮存温度	T_{STG}	$-50 \sim +125$	$^{\circ}\text{C}$
工作温度	T_A	$-20 \sim +85$	$^{\circ}\text{C}$
结温 ⁽¹⁾	T_j	150	$^{\circ}\text{C}$

注：超最大额定值应用可能会对器件造成永久性损伤。

散热信息

参数说明	符号	数值范围	单位
功耗	P_D	200	mW

电气参数 (无特别说明情况下, $T_A=25^{\circ}\text{C}$, $C_{IN}=C_{OUT}=1\mu\text{F}$)

参数说明	符号	测试条件	最小值	典型值	最大值	单位
输入电压	V_{IN}		3.0		24	V
输出电压	V_{OUT}		3.0		5.0	V
输出电压精度		$I_{OUT}=1\text{mA}$	-2		+2	%
输出电流	I_{OUT}	$V_{IN}=V_{OUT}+2.0\text{V}$	—	350	—	mA
负载调整率	ΔV_{OUT}	$V_{IN}=V_{OUT}+2.0\text{V}$ $1\text{mA}\leq I_{OUT}\leq 150\text{mA}$	—	15	—	mV
线性调整率	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0\text{V}\leq V_{IN}\leq 20\text{V}$ $I_{OUT}=10\text{mA}$	—	0.015	0.2	%/V
低压差	$V_{DIF}^{\text{①}}$	$I_{OUT}=100\text{mA}, V_{OUT}=3.3\text{V}$	—	200	—	mV
静态电流	I_{SS}	$V_{CE}=V_{IN}$	—	1.8	4	μA
休眠电流	$I_{STANDBY}$	$V_{CE}=V_{SS}$			0.2	μA
使能高电平	V_{CEH}	$V_{IN}=V_{OUT}+2.0\text{V}$	1.7		24	V
使能低电平	V_{CEL}	$V_{IN}=V_{OUT}+2.0\text{V}$	0		0.3	V
短路电流	I_{SHORT}	$V_{IN}=V_{OUT}+2.0\text{V}$	—	400	—	mA
温度系数	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0\text{V}$ $I_{OUT}=10\text{mA}$ $-40^{\circ}\text{C}\leq T_A\leq 125^{\circ}\text{C}$	—	± 100	—	ppm/ $^{\circ}\text{C}$
输出有源放电电阻	$R_{DIS}^{\text{②}}$	$V_{CE}<0.5\text{V}$		300		Ω

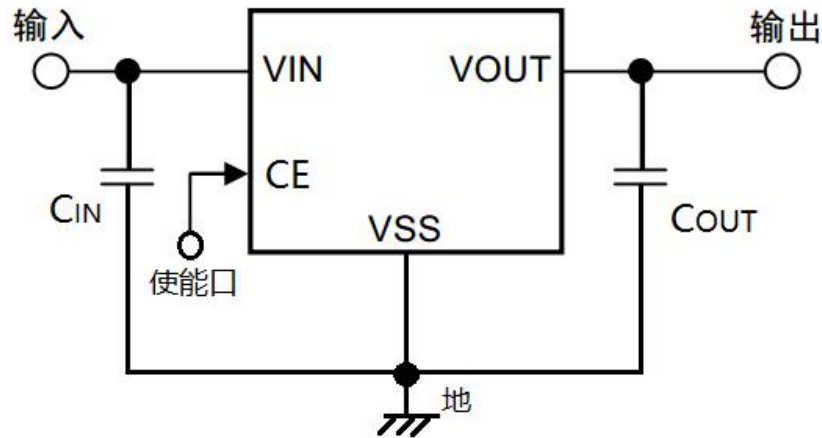
注:

- ①当 $V_{IN}=V_{OUT}+2.0\text{V}$, 固定负载条件下使输出电压下降 2%, 此时输入电压和输出电压的差值为低压差值 V_{DIF} 。
- ②输出有源放电电阻 R_{DIS} , 随着 V_{IN} 电压增大而降低。

应用说明

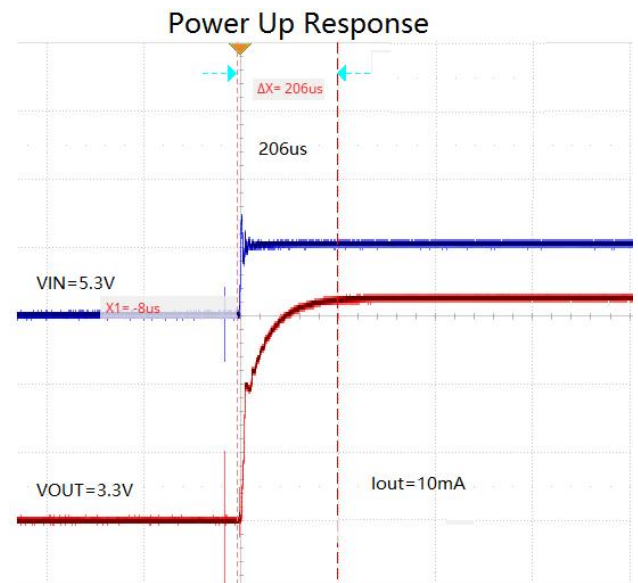
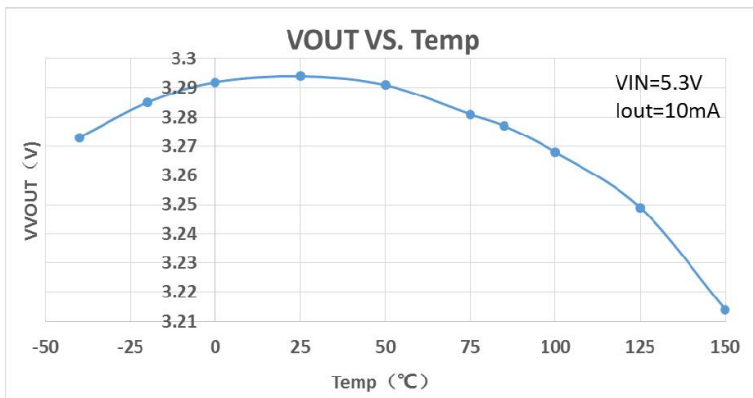
- 1、应用时尽量将电容接到 VIN 和 VOUT 脚位附近。
- 2、电路内部使用了相位补偿电路和利用输出电容的 ESR 来补偿。所以输出到地一定要接大于或者等于 1 μ F 的电容器。
- 3、注意输入输出电压、负载电流的使用条件，避免 IC 内部的功耗超出封装允许的最大功耗值

应用电路



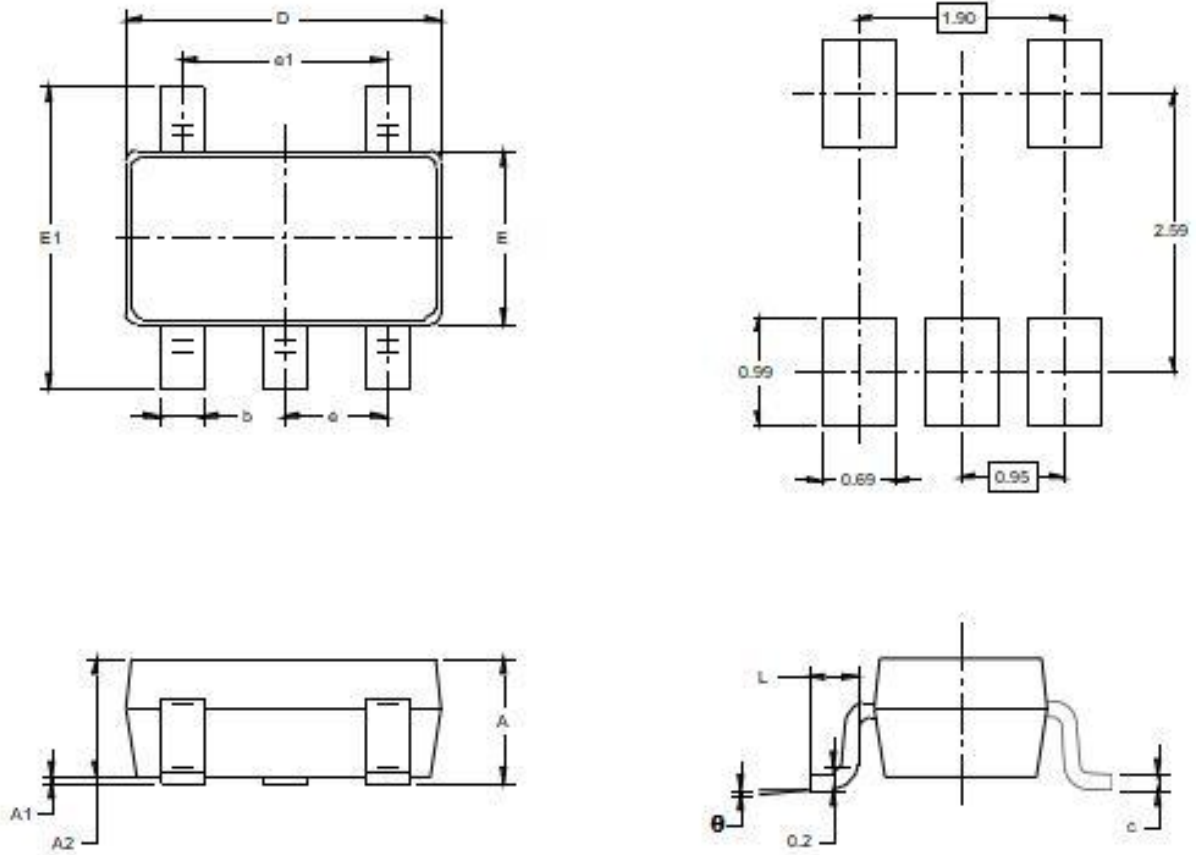
1. C_{IN} 用于稳定输入电容
2. C_{OUT} 可以使用的大于或等于 1 μ F 的陶瓷电容

典型的性能曲线



封装描述

SOT-23-5 封装



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	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

封装/订购信息

订单型号	输出电压	容差	封装形式	包装/数量
MIC5205-3.0YM5-MS	3.0V	2%	SOT-23-5	盘装/3000pcs
MIC5205-3.3YM5-MS	3.3V			
MIC5205-3.6YM5-MS	3.6V			
MIC5205-4.0YM5-MS	4.0V			
MIC5205-4.4YM5-MS	4.4V			
MIC5205-5.0YM5-MS	5.0V			

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