

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## AP2205-xxW5-7-MS

产品手册

概述

AP2205-xxW5-7-MS 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等特性，输出电压范围为 3.0-5.0V。

AP2205-xxW5-7-MS 低至 1.8uA 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。 特别适合于电池供电、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。

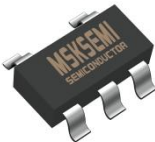
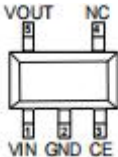
主要特点

- 输入输出电压差低
- 温度漂移系数小
- 耐压 24V
- 工作静态电流 1.8μA，最大 4μA
- 休眠静态电流最大 0.2μA
- 输出电压精度：±2%
- 输出过载保护
- 带有 CE 使能控制端口
- 工作温度 - 20℃ ~ + 85℃

典型应用

- 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

封装脚位信息

| SOT-23-5                                                                            | 封装脚位图                                                                                 |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |

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  |

管体标记

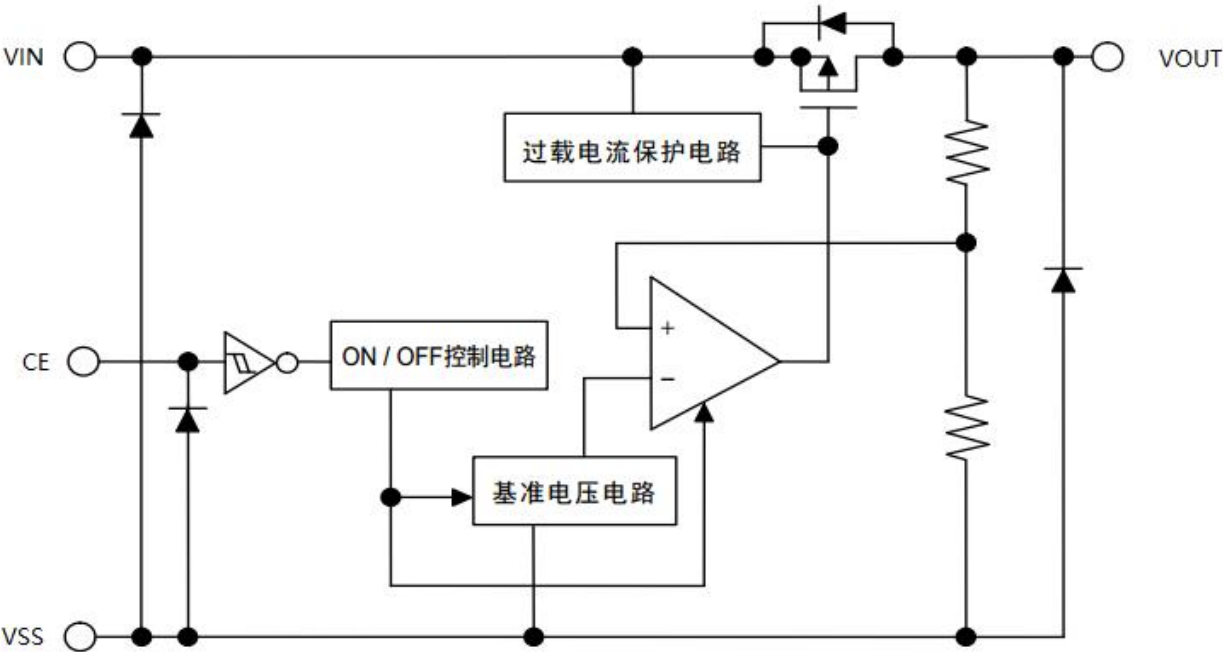
| AP2205-30W5-7-MS                                                                  | AP2205-33W5-7-MS                                                                  | AP2205-36W5-7-MS                                                                    |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |

| AP2205-40W5-7-MS                                                                  | AP2205-44W5-7-MS                                                                  | AP2205-50W5-7-MS                                                                    |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |

订货信息

| 型号               | 输出电压 | 容差 | 封装类型     | 最小包装    |
|------------------|------|----|----------|---------|
| AP2205-30W5-7-MS | 3.0V | 2% | SOT-23-5 | 3000PCS |
| AP2205-33W5-7-MS | 3.3V |    |          |         |
| AP2205-36W5-7-MS | 3.6V |    |          |         |
| AP2205-40W5-7-MS | 4.0V |    |          |         |
| AP2205-44W5-7-MS | 4.4V |    |          |         |
| AP2205-50W5-7-MS | 5.0V |    |          |         |

电路方框图



最大额定值 (无特别说明情况下, TA=25℃)

| 参数说明              | 符号               | 数值范围       | 单位 |
|-------------------|------------------|------------|----|
| 输入极限电压            | V <sub>IN</sub>  | -0.3 ~ +26 | V  |
| 使能口极限电压           | V <sub>CE</sub>  | -0.3 ~ +26 | V  |
| 输出极限电流            | I <sub>out</sub> | 600        | mA |
| 贮存温度              | T <sub>STG</sub> | -50 ~ +125 | ℃  |
| 工作温度              | T <sub>A</sub>   | -20 ~ +85  | ℃  |
| 结温 <sup>(1)</sup> | T <sub>J</sub>   | 150        | ℃  |

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 <sub>D</sub> | 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     | $I_{OUT}$                                            | $V_{IN}=V_{OUT}+2.0\text{V}$                                                                                   | —   | 300       | —   | mA                      |
| 负载调整率    | $\Delta V_{OUT}$                                     | $V_{IN}=V_{OUT}+2.0\text{V}$<br>$1\text{mA}\leq I_{OUT}\leq 150\text{mA}$                                      | —   | 15        | —   | mV                      |
| 线性调整率    | $\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$ | $V_{OUT}+1.0\text{V}\leq V_{IN}\leq 20\text{V}$<br>$I_{OUT}=10\text{mA}$                                       | —   | 0.015     | 0.2 | %/V                     |
| 低压差      | $V_{DIF}^{\textcircled{1}}$                          | $I_{OUT}=100\text{mA}, V_{OUT}=3.3\text{V}$                                                                    | —   | 200       | —   | mV                      |
| 静态电流     | $I_{SS}$                                             | $V_{CE}=V_{IN}$                                                                                                | —   | 1.8       | 4   | $\mu\text{A}$           |
| 休眠电流     | $I_{STANDBY}$                                        | $V_{CE}=V_{SS}$                                                                                                |     |           | 0.2 | $\mu\text{A}$           |
| 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     | $\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$    | $V_{IN}=V_{OUT}+2.0\text{V}$<br>$I_{OUT}=10\text{mA}$<br>$-40^{\circ}\text{C}\leq T_A\leq 125^{\circ}\text{C}$ | —   | $\pm 100$ | —   | ppm/ $^{\circ}\text{C}$ |
| 输出有源放电电阻 | $R_{DIS}^{\textcircled{2}}$                          | $V_{CE}<0.5\text{V}$                                                                                           |     | 300       |     | $\Omega$                |

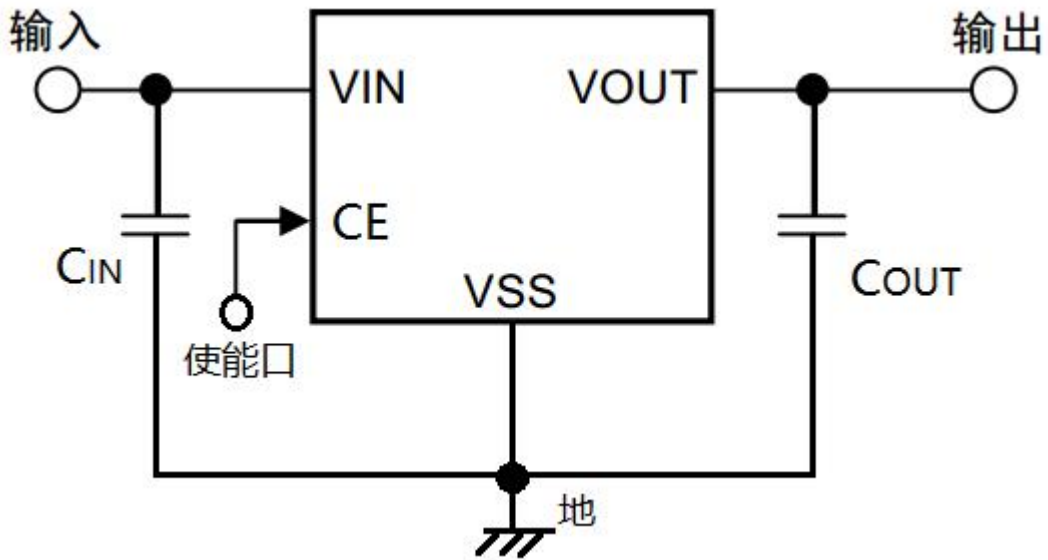
## 注:

- 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

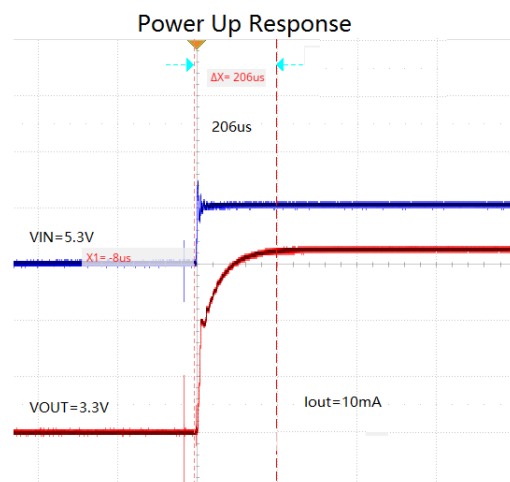
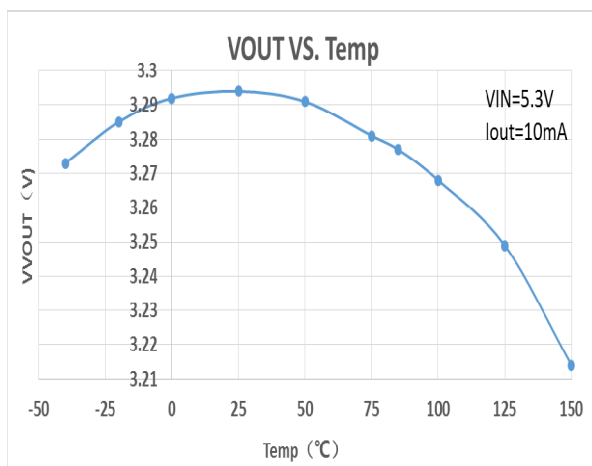
- 1、应用时尽量将电容接到VIN 和VOUT 脚位附近。
- 2、电路内部使用了相位补偿电路和利用输出电容的ESR 来补偿。所以输出到地一定要接大于或者 等于  $1\mu\text{F}$  的电容器。
- 3、注意输入输出电压、负载电流的使用条件，避免IC 内部的功耗超出封装允许的最大功耗值

## 应用电路



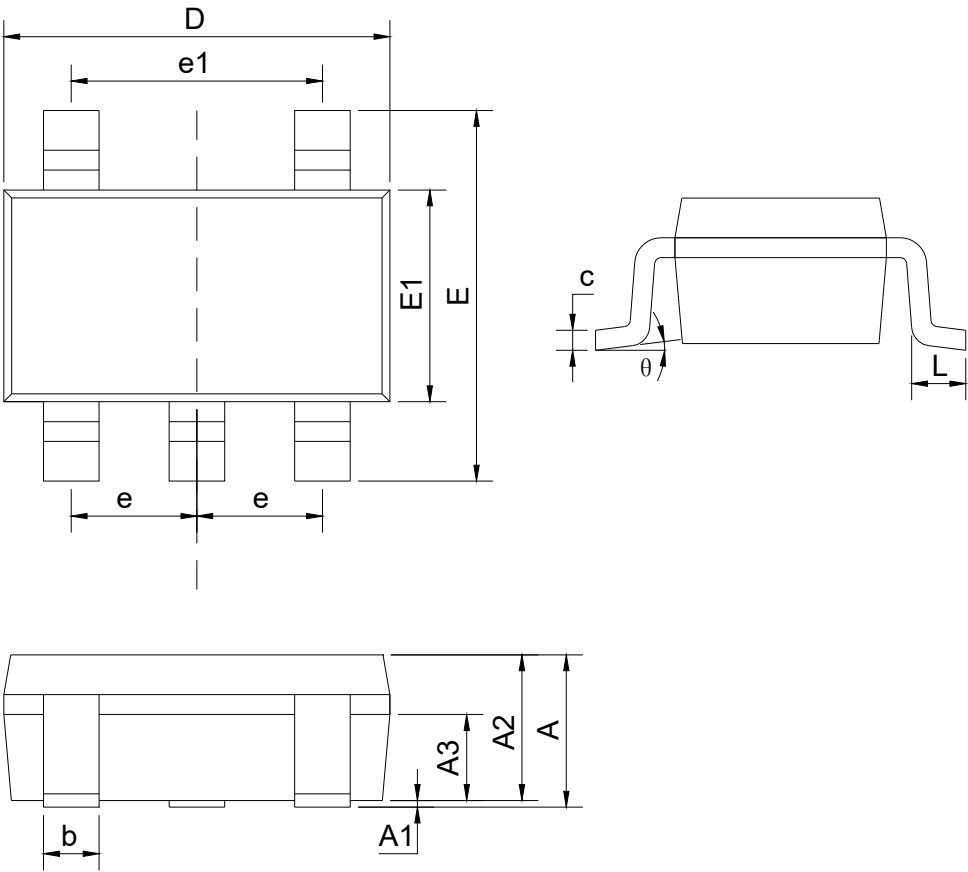
1.  $C_{IN}$  用于稳定输入电容
2.  $C_{OUT}$  可以使用的大于或等于  $1\mu\text{F}$  的陶瓷电容

## 典型的性能曲线



封装外形图和尺寸

SOT-23-5



| SYMBOL | mm      |      |
|--------|---------|------|
|        | min     | max  |
| A      |         | 1.35 |
| A1     | 0.04    | 0.15 |
| A2     | 1.00    | 1.20 |
| A3     | 0.55    | 0.75 |
| b      | 0.38    | 0.48 |
| c      | 0.10    | 0.25 |
| D      | 2.72    | 3.12 |
| E      | 2.60    | 3.00 |
| E1     | 1.40    | 1.80 |
| e      | 0.95BSC |      |
| e1     | 1.90BSC |      |
| L      | 0.30    | 0.60 |
| θ      | 0       | 8°   |

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