

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## **MC33063ADR-MS**

### **Product specification**

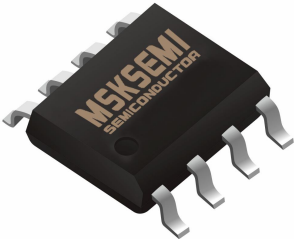
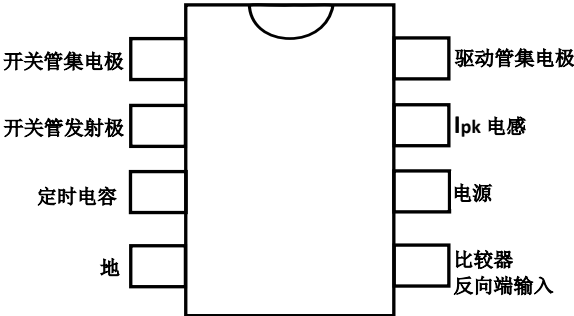
概述

MC33063ADR-MS 为一单片 DC-DC 变换集成电路，内含温度补偿的参考电压源（1.25V）、比较器、能有效限制电流及控制工作周期的振荡器，驱动器及大电流输出开关管等，外配少量元件，就能组成升压、降压及电压反转型 DC-DC 变换器。该电路采用 SOP8 封装形式。

主要特点

- 工作电压范围宽 3.0V~32V
  - 静态电流小
  - 管脚排列图
  - 具有输出电流限制功能, 输出电流保护功能
- 输出开关极限电流达 1.2A
  - 输出电压可调
  - 工作频率可达 100kHz
  - 内部基准参考电压精度 2%

引脚描述和标记

| SOP-8                                                                              | 引脚排列                                                                                | 标记                                                                                    |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |

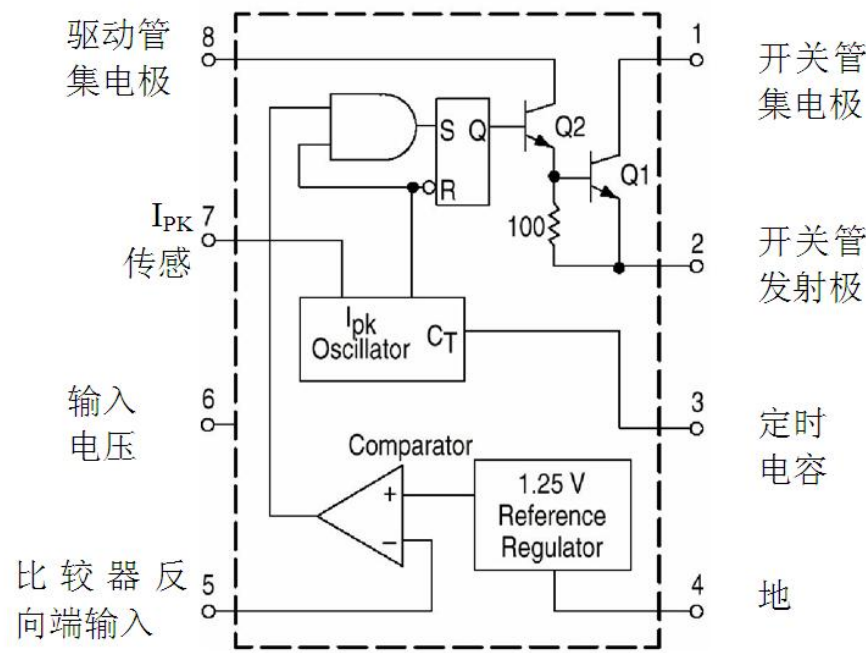
引出端功能说明

| 引出端序号 | 功能      | 符号  | 引出端序号 | 功能       | 符号  |
|-------|---------|-----|-------|----------|-----|
| 1     | 开关管集电极  | SC  | 5     | 比较器反向端输入 | FB  |
| 2     | 开关管发射极  | SE  | 6     | 输入电压     | VCC |
| 3     | 定 时 电 容 | CT  | 7     | 检测       | Ipk |
| 4     | 地       | GND | 8     | 驱动管集电极   | DC  |

订单信息

| 型号            | 封装    | 最小包装    |
|---------------|-------|---------|
| MC33063ADR-MS | SOP-8 | 2500PCS |

功能框图



极限值

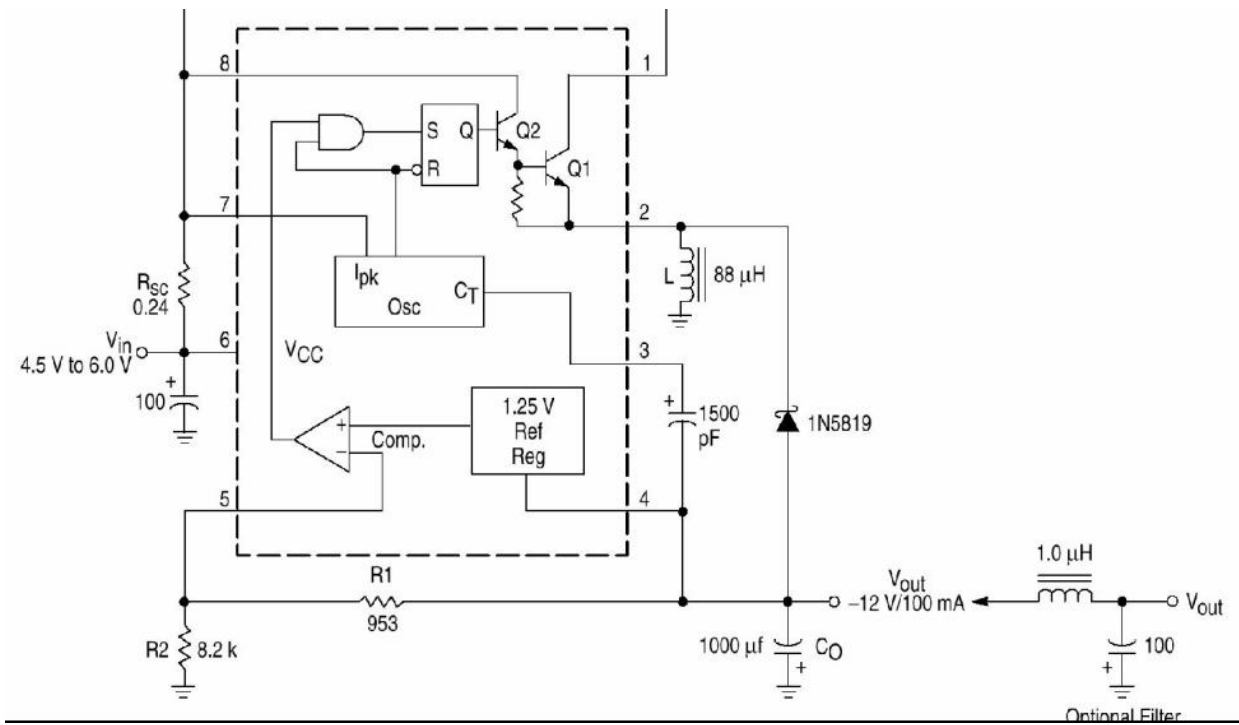
| 参数名称                 | 符 号         | 数 值  |      | 单 位 |
|----------------------|-------------|------|------|-----|
|                      |             | 最小   | 最大   |     |
| 电源电压                 | Vcc         |      | 32   | V   |
| 比较器输入电压范围            | VIR         | -0.3 | 30   | V   |
| 输出管集电极电压             | Vc(switch)  |      | 32   | V   |
| 输出管发射极电压 (VPIN1=32V) | VE(switch)  |      | 32   | V   |
| 输出管集电极与发射极间的电压       | VCE(switch) |      | 32   | V   |
| 驱动管集电极电压             | Vc(driver)  |      | 32   | V   |
| 驱动管集电极电流             | Ic(driver)  |      | 100  | mA  |
| 输出电流                 | ISW         |      | 1.2  | A   |
| 功耗                   | PD          |      | 1.25 | W   |
| 工作环境温度               | TA          | 0    | +70  | ℃   |
| 贮存温度                 | Tstg        | -65  | +150 | ℃   |

电特性 (Vcc=5.0V;TA=0℃~70℃, 除非另外规定)

| 特性条件                                                                                              | 符号                    | 规范值          |           |              | 单 位 |
|---------------------------------------------------------------------------------------------------|-----------------------|--------------|-----------|--------------|-----|
|                                                                                                   |                       | 最小           | 典型        | 最大           |     |
| 振荡器部分:                                                                                            |                       |              |           |              |     |
| 振荡频率 (VPIN5=0V, CT=1.0F, TA=25℃)                                                                  | fosc                  | 24           | 33        | 42           | KHz |
| 充电电流 (VCC=5.0V~32V, TA=25℃)                                                                       | Ichg                  | 24           | 33        | 42           | uA  |
| 放电电流 (VCC=5.0V~32V, TA=25℃)                                                                       | Idischg               | 140          | 200       | 260          | uA  |
| 放电与充电电流之比 (VPIN7=VCC, TA=25℃)                                                                     | Idischg/Ichg          | 5.2          | 6.2       | 7.5          | —   |
| 电流限制器电压灵敏度 (Ichg=Idischg, TA=25℃)                                                                 | V <sub>IPK</sub>      | 250          | 300       | 350          | mV  |
| 输出部分:                                                                                             |                       |              |           |              |     |
| 饱和压降 (ISW=1.0A, PIN1, 8连接)                                                                        | V <sub>CE</sub> (sat) | —            | 1.0       | 1.3          | V   |
| 饱和压降 (ISW=1.0A, RPIN8=82到VCC)                                                                     | V <sub>CE</sub> (sat) | —            | 0.45      | 0.7          | V   |
| 直流放大倍数 (ISW=1A, VCE=5V, TA=25℃)                                                                   | hfe                   | 50           | 120       | —            | —   |
| 集电极漏电流 (VCE=30V)                                                                                  | I <sub>c</sub> (off)  | —            | 0.01      | 100          | uA  |
| 特性条件                                                                                              | 符号                    | 规范值          |           |              | 单 位 |
|                                                                                                   |                       | 最小           | 典型        | 最大           |     |
| 比较器部分:                                                                                            |                       |              |           |              |     |
| 阈值电压 (TA=25℃)<br>(TA=0~70℃)                                                                       | V <sub>th</sub>       | 1.23<br>1.21 | 1.25<br>— | 1.27<br>1.29 | V   |
| 输入偏置电流 (VIN=0V)                                                                                   | I <sub>IB</sub>       | —            | -40       | -400         | nA  |
| 阈值电压线性调整率 (VCC=3.0~30V)                                                                           | Regline               | —            | 1.4       | 5.0          | mV  |
| 整体部分:                                                                                             |                       |              |           |              |     |
| 电源电流 (VCC=5.0V~30V, CT=1.0nF,<br>VPIN7=V <sub>cc</sub> , VPIN5>V <sub>th</sub> , VPIN2=GND, 其余悬空) | I <sub>CC</sub>       | — — — —      | 2.5       | 4.0          | mA  |

应用电路图

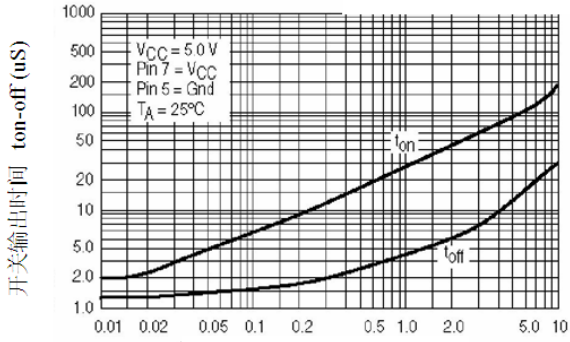
MC33063ADR-MS 作反转式 DC-DC 变换器



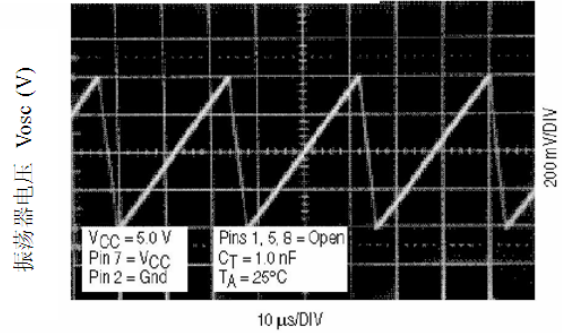
如图 所示， 当加接LC 滤波器后, 能进一步减小电压纹波及噪声, 特性见下表

| 参数     | 测试条件                     | 结果              |
|--------|--------------------------|-----------------|
| 线性调整率  | VIN=4. 5~6. 0V, Io=100mA | 3. 0mV=0. 012%  |
| 负载调整率  | VIN=5. 0V, Io=10~100mA   | 0. 022V=+0. 09% |
| 输出纹波   | VIN=5. 0V, Io=100mA      | 500mVpp         |
| 电路限制电流 | VIN=5. 0V, RL=0. 1       | 910mA           |
| 效率     | VIN=5. 0V, Io=100mA      | 64. 5%          |
| 输出纹波   | VIN=5. 0V, Io=100mA      | 70mVpp          |

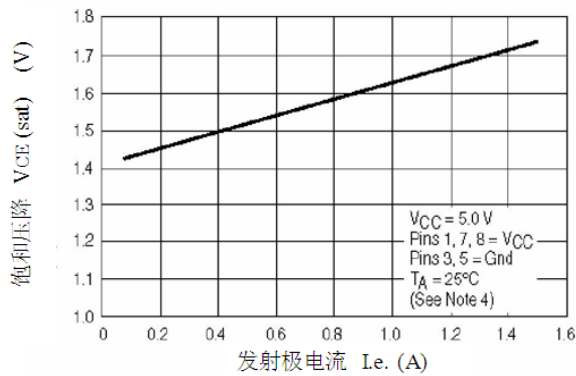
## 特性曲线



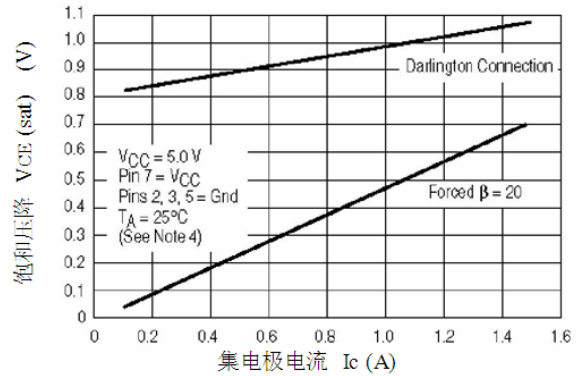
振荡器定时电容开关特性曲线



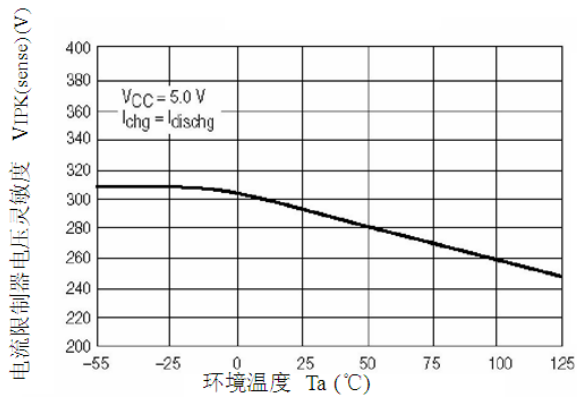
振荡器定时电容波形



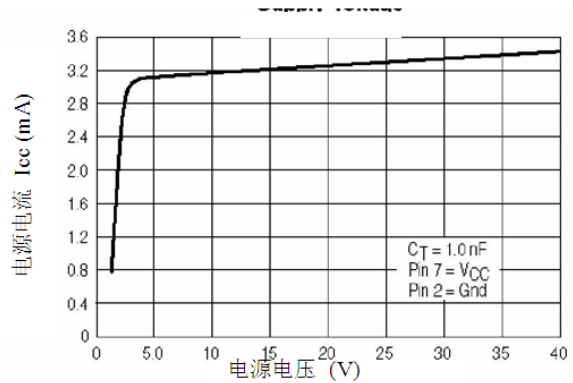
发射极输出饱和压降—发射极电流特性曲线



共发射极开关输出饱和压降—集电极电流特性曲线



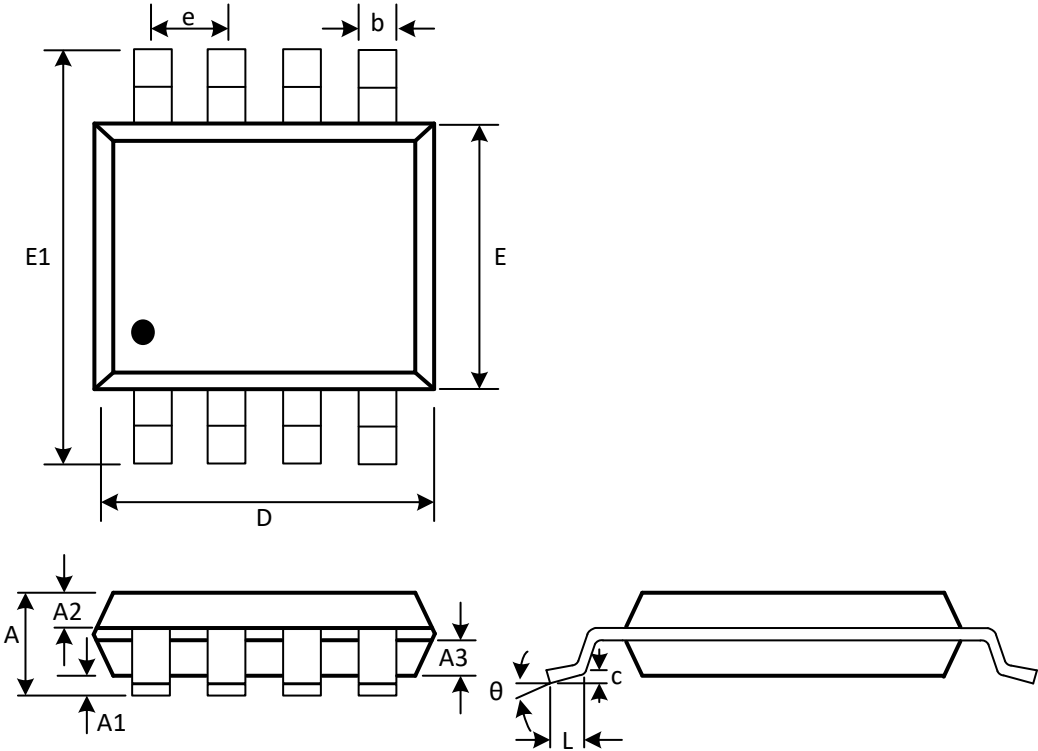
电流限制器电压灵敏度—温度特性曲线



静态工作电流—工作电压特性曲线

封装信息

SOP-8



(Unit: mm)

| Symbol   | Min        | Max   |
|----------|------------|-------|
| A        | 1.300      | 1.600 |
| A1       | 0.050      | 0.200 |
| A2       | 0.550      | 0.650 |
| A3       | 0.550      | 0.650 |
| b        | 0.356      | 0.456 |
| c        | 0.203      | 0.233 |
| D        | 4.800      | 5.000 |
| e        | 1.270(BSC) |       |
| E        | 3.800      | 4.000 |
| E1       | 5.800      | 6.200 |
| L        | 0.400      | 0.800 |
| $\theta$ | 0°         | 8°    |

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