

N-沟道功率 MOS 管/ N-CHANNEL POWER MOSFET

SIF10N70C

●特点: 热阻低 开关速度快 输入阻抗高 符合RoHS规范

●FEATURES: ■LOW THERMAL RESISTANCE ■FAST SWITCHING ■HIGH INPUT RESISTANCE
■RoHS COMPLIANT

●应用: 电子镇流器 电子变压器 开关电源

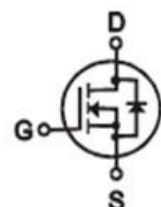
●APPLICATION: ■ELECTRONIC BALLAST ■ELECTRONIC TRANSFORMER ■SWITCH MODE POWER SUPPLY

●最大额定值 (TC=25°C)

●Absolute Maximum Ratings (Tc=25°C)

TO-220/220FP(L)/262/263

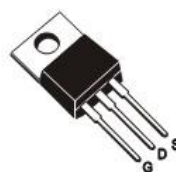
| 参数 PARAMETER | 符号 SYMBOL | 额定值 VALUE | 单位 UNIT |
|--|------------------|----------------|------------|
| 漏-源电压 Drain-source Voltage | V _{DS} | 700 | V |
| 栅-源电压 gate-source Voltage | V _{GS} | ±30 | V |
| 漏极电流 Continuous Drain Current TC=25°C | I _D | 10 | A |
| 漏极电流 Continuous Drain Current TC=100°C | I _D | 6 | A |
| 最大脉冲电流 Drain Current — Pulsed ① | I _{DM} | 40 | A |
| 耗散功率 Power Dissipation | P _{tot} | TO-220:156 | W |
| | | TO-220FP(L):50 | |
| | | TO-262/263:126 | |
| 最高结温 Junction Temperature | T _J | 150 | °C |
| 存储温度 Storage Temperature | T _{STG} | -55-150 | °C |
| 单脉冲雪崩能量 Single Pulse Avalanche Energy② | E _{AS} | 500 | mJ |



V_{DS}=700V

R_{DS(ON)}=0.92Ω

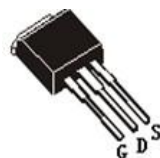
I_D=10A



TO-220



TO-220FP(L)



TO-262 (I²PAK)



TO-263 (D²PAK)

●电特性 (Tc=25°C)

●Electronic Characteristics (Tc=25°C)

| 参数 PARAMETER | 符号 SYMBOL | 测试条件 TEST CONDITION | 最小值 MIN | 典型值 TYP | 最大值 MAX | 单位 UNIT |
|---|-------------------------------------|--|------------|------------|------------|------------|
| 漏-源击穿电压 Drain-source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250μA | 700 | | | V |
| 击穿电压温度系数 Breakdown Voltage Temperature Coefficient | ΔBV _{DSS} /ΔT _J | I _D =250uA, Referenced to 25°C | | 0.65 | | V/°C |
| 栅极开启电压 Gate Threshold Voltage | V _{GS(TH)} | V _{GS} =V _{DS} , I _D =250μA | 2.0 | | 4.0 | V |
| 漏-源漏电流 Drain-source Leakage Current | I _{DSS} | V _{DS} =600V, V _{GS} =0V, T _J =25°C | | | 1 | μA |
| | | V _{DS} =480V, V _{GS} =0V, T _J =125°C | | | 10 | μA |
| 跨导 Forward Transconductance | g _{fs} | V _{DS} =40V, I _D =5.0A ③ | | 8 | | S |
| 二极管电压变动率 Reverse Diode dv/dt | dv/dt | I _{SD} ≤10A, T _J =25°C | | 10 | | V/ns |

●订单信息/ORDERING INFORMATION:

| 包装形式/PACKING | 订货编码/ORDERING CODE | |
|--------------------------------|--|--|
| | 普通塑封料/ Normal Package Material | 无卤塑封料/Halogen Free |
| TO-220 条管装/TUBE PACKING | SIF10N70C TO-220-TU | SIF10N70C TO-220-TU-HF |
| TO-220FP(L) 条管装/TUBE PACKING | SIF10N70C TO-220FP(L)-TU | SIF10N70C TO-220FP(L)-TU-HF |
| TO-262 或 263 条管装/TUBE PACKING | SIF10N70C TO-262-TU 或 SIF10N70C TO-263-TU | SIF10N70C TO-262-TU-HF 或 SIF10N70C TO-263-TU-HF |
| TO-263 编带装/TAPE & REEL PACKING | SIF10N70C TO-263-TR | SIF10N70C TO-263-TR-HF |

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| 参数 PARAMETER | 符号 SYMBOL | 测试条件 TEST CONDITION | 最小值 MIN | 典型值 TYP | 最大值 MAX | 单位 UNIT |
|---|--------------|--|------------|------------|------------|------------|
| 栅极漏电流 Gate-body Leakage Current ($V_{DS} = 0$) | I_{GSS} | $V_{GS} = \pm 30V$ | | | ± 100 | nA |
| 漏-源导通电阻 Static Drain-source On Resistance | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D = 5.0A$ ③ | | 0.92 | 1.1 | Ω |
| 输入电容 Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = 25V$ $F = 1.0MHz$ | | 1570 | | pF |
| 输出电容 Output Capacitance | C_{oss} | | | 150 | | |
| 反向传输电容 Reverse transfer Capacitance | C_{rss} | | | 13 | | |
| 关断延迟 Turn -Off Delay Time | $T_d(off)$ | $V_{DD} = 300V, I_D = 10.0A$ $R_G = 25\Omega$ ③ | | 130 | | ns |
| 开启延迟时间 Turn-on delay time | $T_d(on)$ | | | 50 | | |
| 开启上升时间 Rise time | T_r | | | 37 | | |
| 关断下降时间 Fall time | T_f | | | 190 | | |
| 栅极电荷 Total Gate Charge | Q_g | $I_D = 10.0A, V_{DS} = 480V$ $V_{GS} = 10V$ ③ | | 45 | | nC |
| 栅源电荷 Gate-to-Source Charge | Q_{gs} | | | 7.5 | | |
| 栅极开启电荷量 Gate charge at threshold | $Q_{g(th)}$ | | | 2.1 | | |
| 栅漏电荷 Gate-to-Drain Charge | Q_{gd} | | | 18.5 | | |
| 二极管正向电流 Continuous Diode Forward Current | I_s | | | | 10.0 | A |
| 二极管正向压降 Diode Forward Voltage | V_{SD} | $T_j = 25^\circ C, I_s = 10.0A$ $V_{GS} = 0V$ ③ | | | 1.4 | V |
| 反向恢复时间 Reverse Recovery Time | t_{rr} | $T_j = 25^\circ C, I_f = 10.0A$ $di/dt = 100A/\mu s$ ③ | | 420 | | ns |
| 反向恢复电荷 Reverse Recovery Charge | Q_{rr} | | | 4.2 | | μC |
| 输入阻抗 Gate resistance | R_G | | | | 7 | Ω |

●热特性

●Thermal Characteristics

| 参数 PARAMETER | 符号 SYMBOL | 最大值 MAX | | | 单位 UNIT |
|---|--------------|------------|-------------|------------|--------------|
| | | TO-220 | TO-220FP(L) | TO-262/263 | |
| 热阻结-壳 Thermal Resistance Junction-case | R_{thJC} | 0.80 | 2.50 | 1.0 | $^\circ C/W$ |
| 热阻结-环境 Thermal Resistance Junction-ambient | R_{thJA} | 62.5 | 62.5 | 62.5 | $^\circ C/W$ |

注释(Notes):

- ① 脉冲宽度: 以最高节温为限制
Repetitive rating: Pulse width limited by maximum junction temperature
- ② 初始结温=25 $^\circ C$, $V_{DD} = 50V, L = 10mH, R_G = 25\Omega, I_{AS} = 10A$
Starting $T_j = 25^\circ C, V_{DD} = 50V, L = 10mH, R_G = 25\Omega, I_{AS} = 10A$
- ③ 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

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● 特性曲线

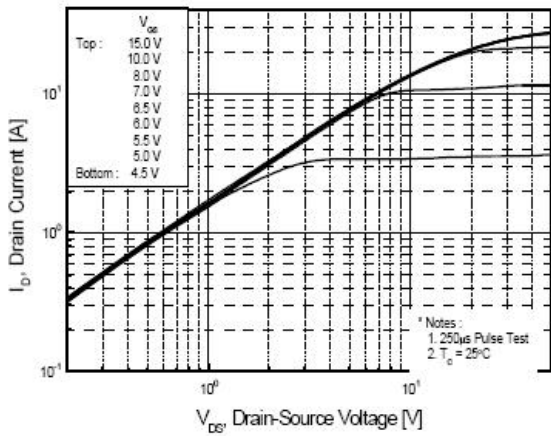


图 1 输出特性曲线, Tc=25°C

Fig1 Typical Output Characteristics, Tc=25°C

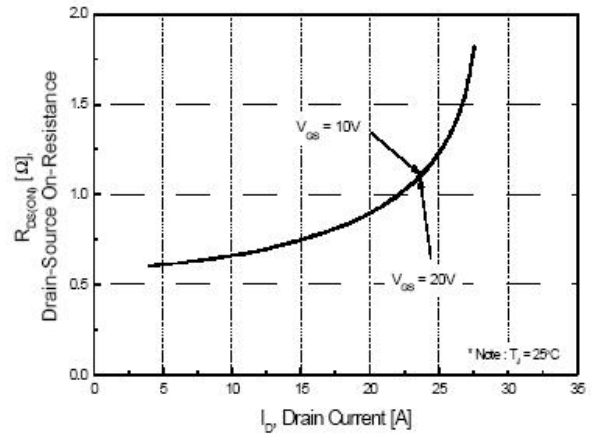


图 2 导通电阻与漏极电流和栅极电压曲线

Fig2 On-Resistance Vs. Drain Current and Gate Voltage

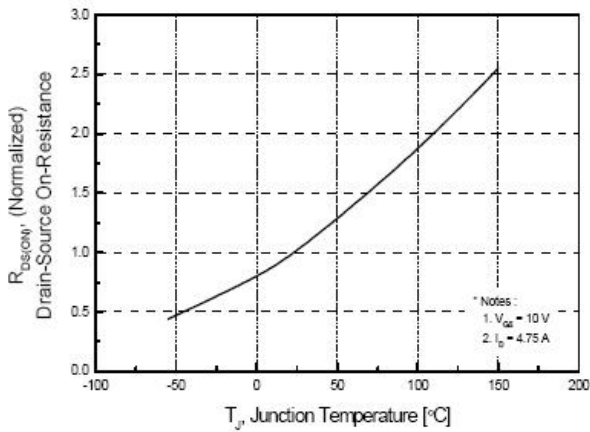


图 3 导通电阻与温度曲线

Fig3 Normalized On-Resistance Vs. Temperature

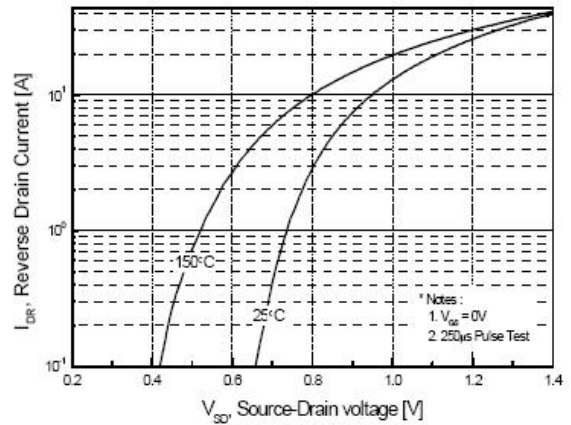


图 4 二极管正向电压曲线

Fig4 Typical Source-Drain Diode Forward Voltage

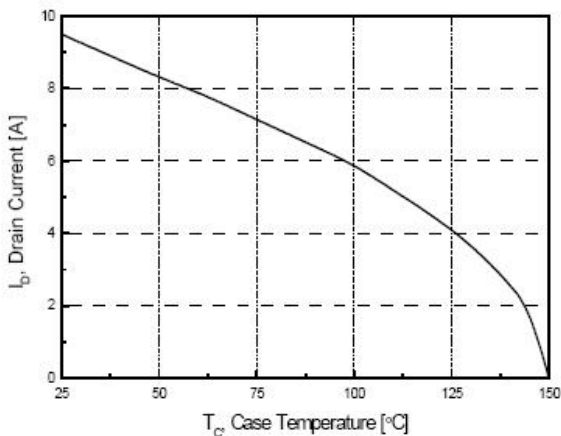


图 5 最大漏极电流与壳温曲线

Fig5 Maximum Drain Current Vs. Case Temperature

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● 特性曲线

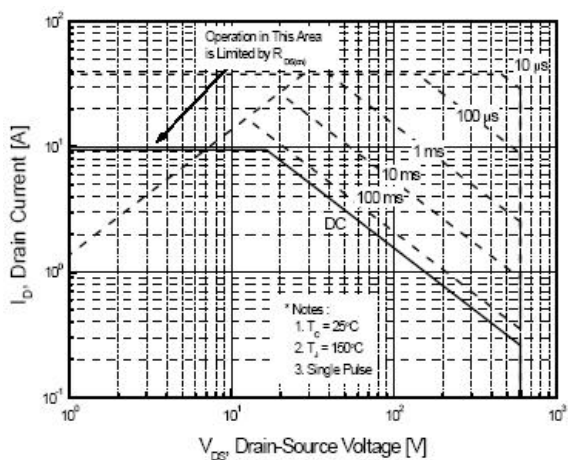


图 6-1 SIF10N70C(TO-220)

最大安全工作区曲线

Fig6-1 Maximum Safe Operating Area

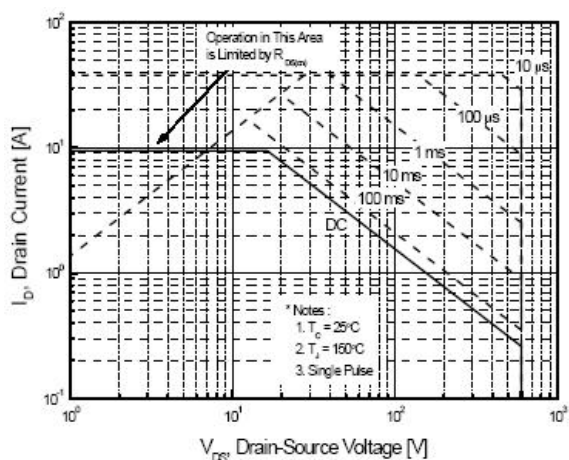


图 6-2 SIF10N70C(TO-220FP(L))

最大安全工作区曲线

Fig6 -2Maximum Safe Operating Area

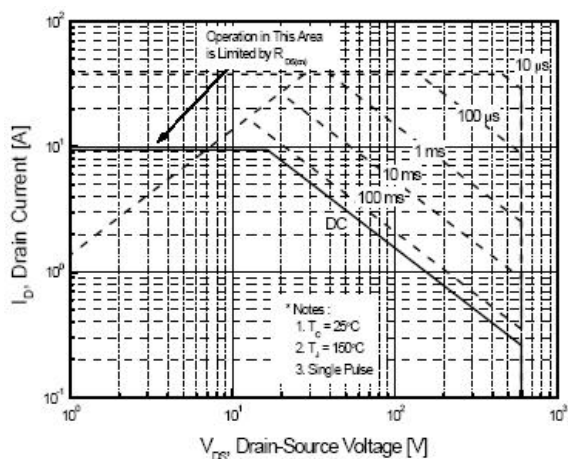


图 6-3 SIF10N70C(TO-262&263)

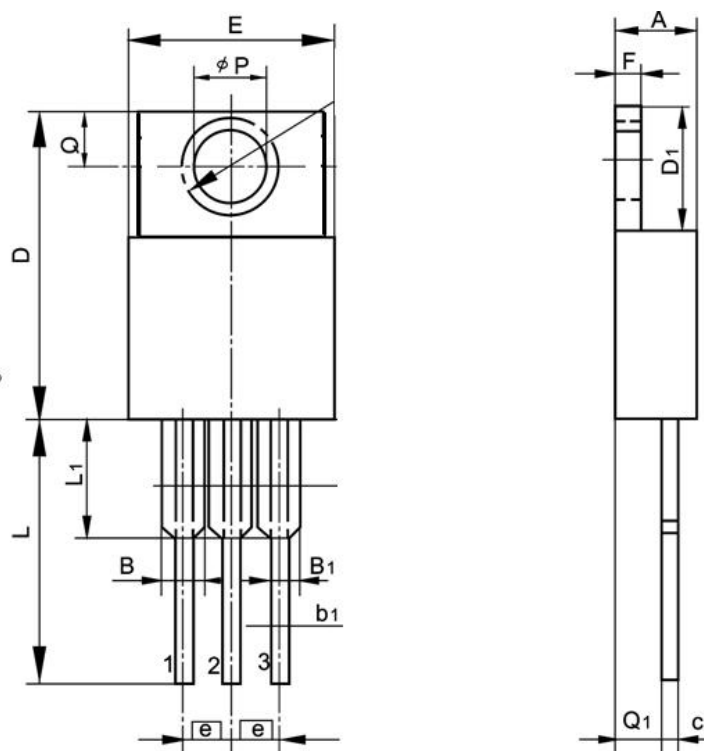
最大安全工作区曲线

Fig6-3 Maximum Safe Operating Area

TO-220 封装机械尺寸 TO-220 MECHANICAL DATA

单位：毫米/UNIT: mm

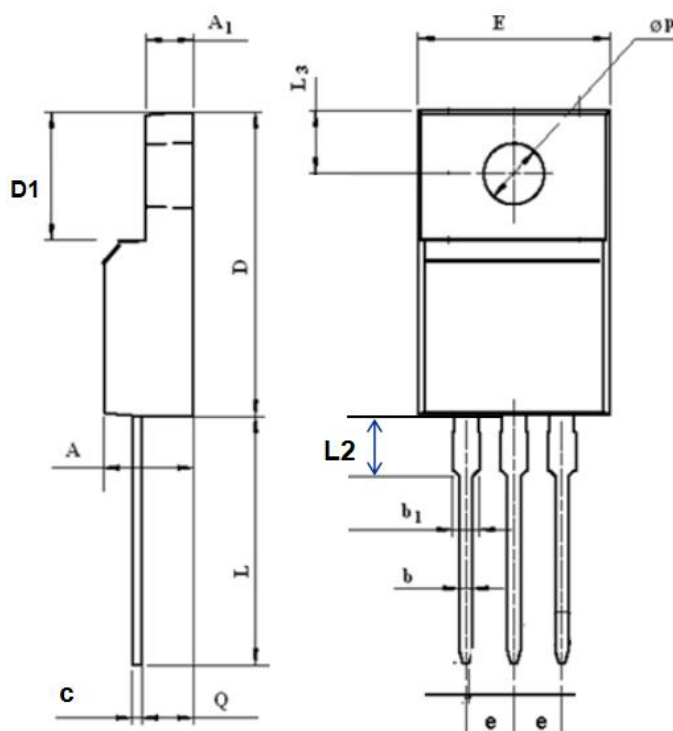
| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|--------------|------------|------------|------------|--------------|-------------|------------|------------|
| A | 4.00 | | 4.80 | E | 9.90 | | 10.70 |
| B | 1.20 | | 1.50 | e | | 2.54 | |
| B1 | 1.00 | | 1.40 | F | 1.10 | | 1.45 |
| b1 | 0.65 | | 1.00 | L | 12.50 | | 14.50 |
| c | 0.35 | | 0.75 | L1 | 2.75 | | 4.00 |
| D | 15.00 | | 16.50 | Q | 2.50 | | 3.00 |
| D1 | 5.90 | | 6.90 | Q1 | 2.00 | | 3.00 |
| | | | | φP | 3.60 | | 3.90 |



TO-220FP 封装机械尺寸 TO-220FP MECHANICAL DATA

单位:毫米/UNIT: mm

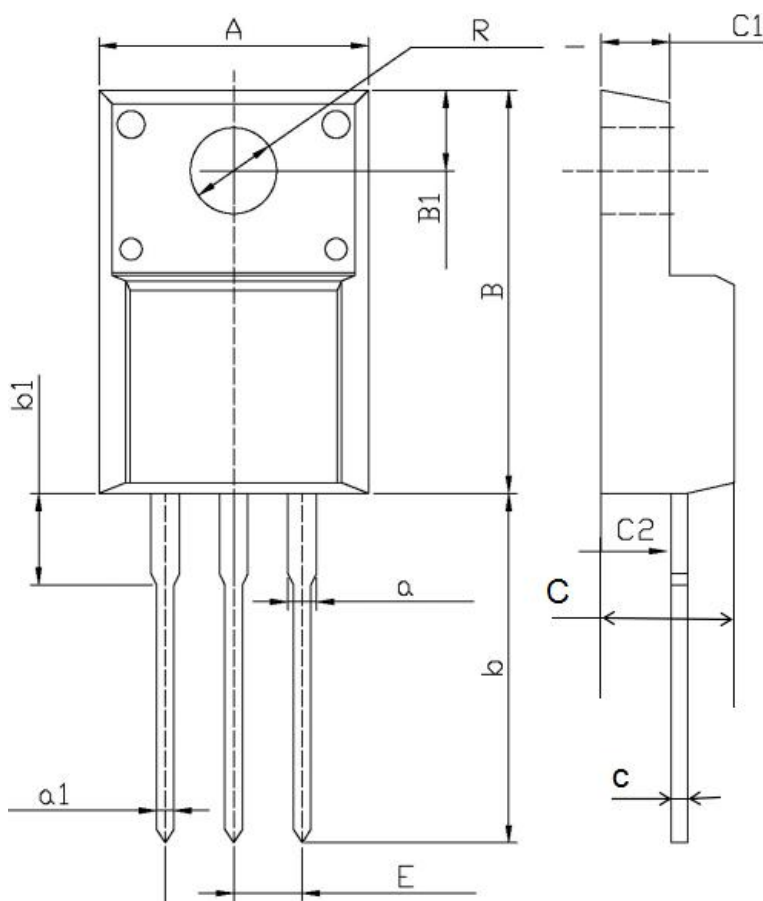
| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|----------------|-------------|------------|-------------|----------------------|--------------|------------|--------------|
| A | 4.40 | | 4.95 | E | 9.60 | | 10.30 |
| A ₁ | 2.30 | | 2.90 | e | | 2.54 | |
| b | 0.70 | | 0.90 | L | 12.40 | | 14.00 |
| b ₁ | 1.18 | | 1.45 | L₂ | 2.30 | | 2.60 |
| c | 0.40 | | 0.70 | L ₃ | 3.00 | | 4.00 |
| D | 14.50 | | 17.00 | øp | 3.00 | | 3.50 |
| D1 | 6.10 | | 9.00 | Q | 2.30 | | 2.80 |



TO-220FPL 封装机械尺寸 TO-220FPL MECHANICAL DATA

单位:毫米/UNIT: mm

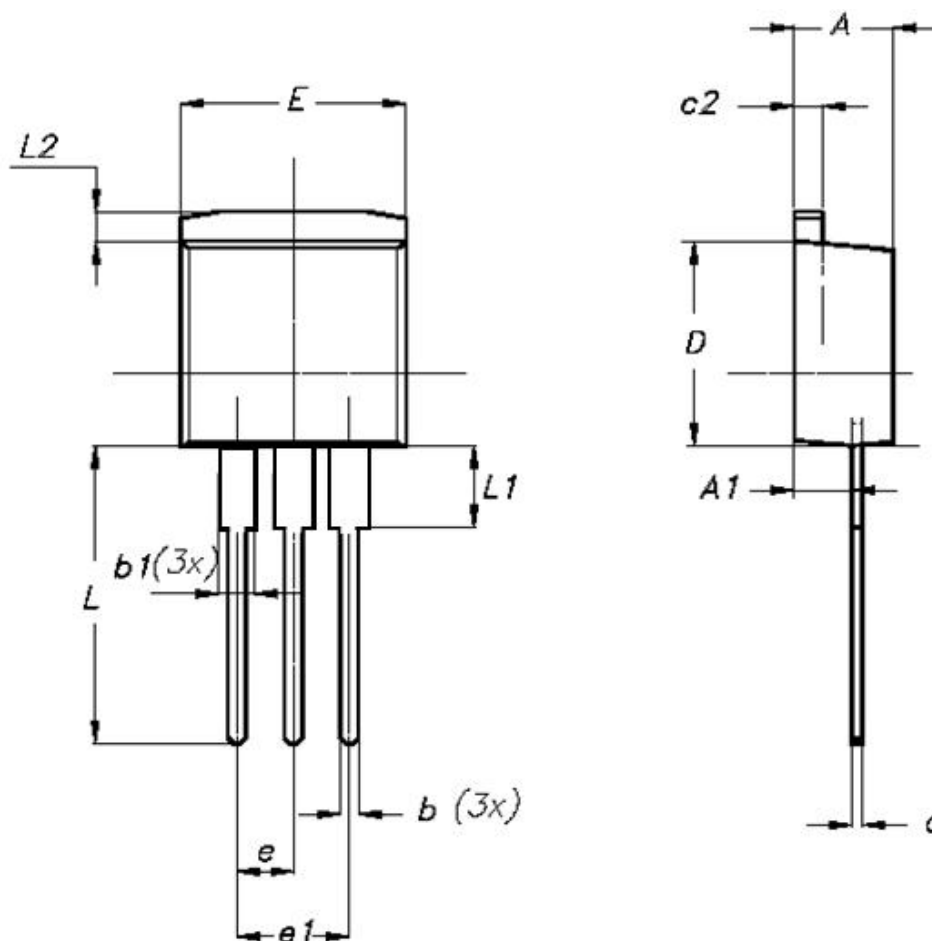
| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|--------------|------------|------------|------------|--------------|------------|------------|------------|
| A | 9.90 | | 10.36 | a | 1.08 | | 1.48 |
| B | 15.40 | | 16.40 | a1 | 0.70 | | 0.90 |
| B1 | 3.05 | | 3.55 | E | 2.34 | | 2.75 |
| C | 4.40 | | 5.00 | C1 | 2.25 | | 2.85 |
| c | 0.40 | | 0.60 | C2 | 2.45 | | 3.05 |
| b | 12.40 | | 13.50 | R | 2.90 | | 3.35 |
| b1 | 2.90 | | 3.90 | | | | |



TO-262 封装机械尺寸 TO-262 MECHANICAL DATA

单位：毫米/UNIT: mm

| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|--------------|------------|------------|------------|--------------|------------|------------|------------|
| A | 3.80 | | 4.80 | e | | 2.54 | |
| A1 | 2.00 | | 2.80 | e1 | | | 5.30 |
| b | 0.60 | | 1.00 | E | 9.90 | | 10.70 |
| b1 | 1.20 | | 1.40 | L | 12.50 | | 14.50 |
| c | 0.40 | | 0.70 | L1 | 0.80 | 1.00 | 1.20 |
| c2 | 1.10 | | 1.40 | L2 | | | 1.50 |
| D | | | 9.60 | | | | |

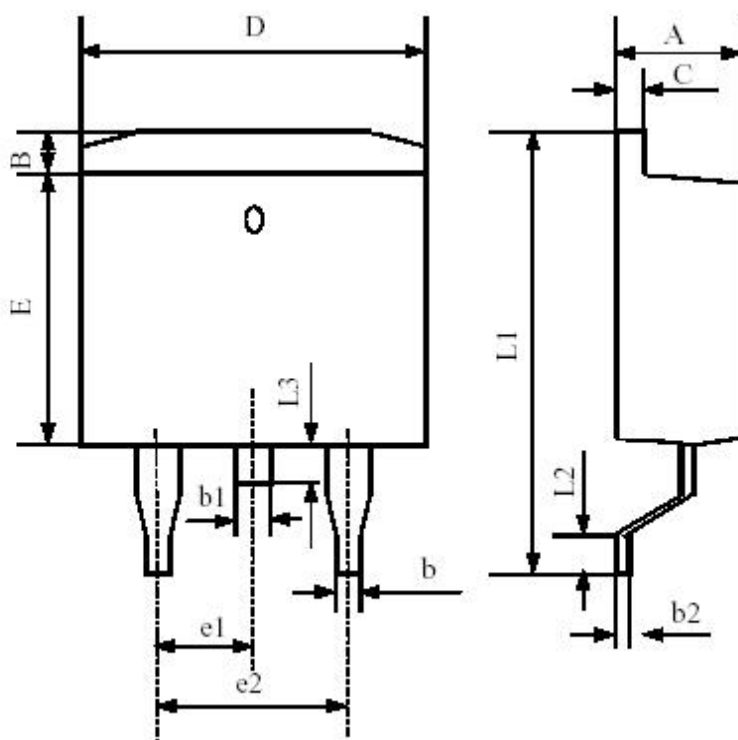


TO-263 封装机械尺寸

TO-263(D2PAK) MECHANICAL DATA

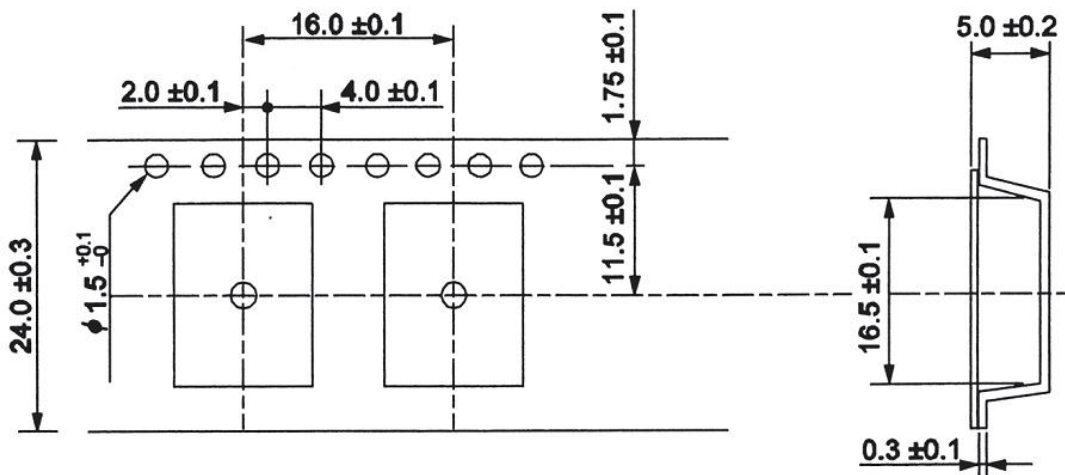
单位：毫米/UNIT: mm

| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|--------------|------------|------------|------------|--------------|------------|------------|------------|
| A | 4.42 | | 4.72 | E | 8.99 | | 9.29 |
| B | 1.22 | | 1.32 | e1 | 2.44 | | 2.64 |
| b | 0.76 | | 0.86 | e2 | 4.98 | | 5.18 |
| b1 | 1.22 | | 1.32 | L1 | 15.19 | | 15.79 |
| b2 | 0.33 | | 0.43 | L2 | 2.29 | | 2.79 |
| C | 1.22 | | 1.32 | L3 | 1.30 | | 1.75 |
| D | 9.95 | | 10.25 | | | | |

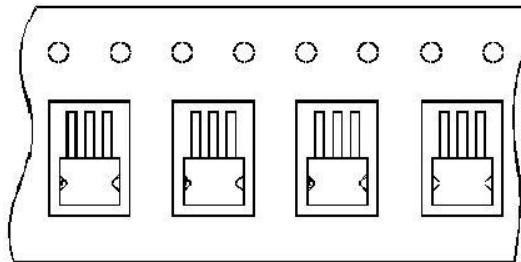


TO-263 编带规格尺寸 TO-263 TAPE AND REEL DATA

单位:毫米/UNIT: mm



使用供带方向/USER DIRECTION OF FEED



编带器件定位示意图/UNIT ORIENTATION