

BRCS070P03RA

Rev.A Jun.-2024

描述 / Descriptions

TO-220 塑封封装 P 沟道场效应管。
P-CHANNEL MOSFET in a TO-220 Plastic Package.

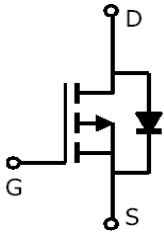
特征 / Features

$V_{DS}=-30V$ $I_D=-98A$
 $R_{DS(on)}@-10V \leq 7.0m\Omega$ (Type.6.7m Ω)
 $R_{DS(on)}@-4.5V \leq 15m\Omega$ (Type.9.0m Ω)

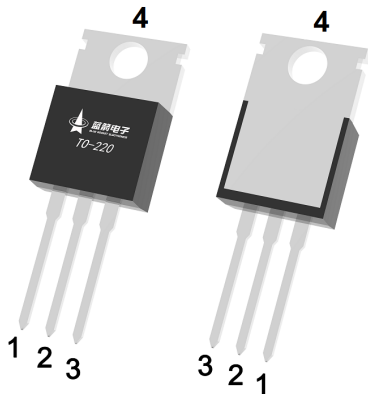
用途 / Applications

高频开关和同步整流、BMS、电机。
High frequency switching and synchronous rectification, BMS, Motor.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : G PIN 2、4 : D PIN 3 : S

印章代码 / Marking

见印章说明。
See Marking Instructions.

极限参数 / Absolute Maximum Ratings(T_a=25°C)

| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|----------------------------------------|---------------------------------------|--------------|------------|
| Drain-Source Voltage | V _{DS} | -30 | V |
| Drain Current - Continuous | I _D (T _c =25°C) | -98 | A |
| Drain Current – Pulsed | I _{DM} | -310 | A |
| Gate-Source Voltage | V _{GS} | ±20 | V |
| Power Dissipation | P _D (T _c =25°C) | 100 | W |
| Single Pulse Avalanche Energy(L=0.5mH) | E _{AS} | 360 | mJ |
| Avalanche Current(L=0.5mH) | I _{AS} | 30 | A |
| Junction and Storage Temperature Range | T _j , T _{stg} | -55 to 150 | °C |
| Thermal resistance, junction - ambient | Steady-State R _{θJA} | 65 | °C/W |
| Thermal resistance, junction - case | Steady-State R _{θJC} | 1.25 | |

电性能参数 / Electrical Characteristics(T_a=25°C)

| 参数 Parameter | 符号 Symbol | 测试条件 Test Conditions | 最小值 Min | 典型值 Typ | 最大值 Max | 单位 Unit |
|-----------------------------------|----------------------|-----------------------------------------------------------------------|------------|------------|------------|------------|
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D =-250μA V _{GS} =0V | -30 | -34 | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-30V V _{GS} =0V | | | -1 | uA |
| Gate-Body leakage current | I _{GSS} | V _{DS} =0V, V _{GS} =±20V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} I _D =-250μA | -1 | -1.4 | -2.5 | V |
| Static Drain-Source On-Resistance | R _{DS(ON)} | V _{GS} =-10V, I _D =-20A | | 6.7 | 7 | mΩ |
| | | V _{GS} =-4.5V, I _D =-10A | | 9.0 | 15 | |
| Diode Forward Voltage | V _{SD} | I _S =-1A, V _{GS} =0V | | | -1.2 | V |
| Input Capacitance | C _{iss} | V _{DS} =-25V V _{GS} =0V f=1.0MHz | | 3260 | | pF |
| Output Capacitance | C _{oss} | | | 335 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 330 | | |
| Gate resistance | R _g | V _{GS} =0V V _{DS} =0V f=1MHz | | 5.6 | | Ω |
| Total Gate Charge | Q _{g(10V)} | V _{GS} =-10V, V _{DS} =-15V, I _D =-20A | | 51 | | nC |
| Total Gate Charge | Q _{g(4.5V)} | | | 32 | | |
| Gate Source Charge | Q _{gs} | | | 11 | | |
| Gate Drain Charge | Q _{gd} | | | 13 | | |

电性能参数 / Electrical Characteristics(Ta=25°C)

| 参数 Parameter | 符号 Symbol | 测试条件 Test Conditions | 最小值 Min | 典型值 Typ | 最大值 Max | 单位 Unit |
|---------------------|--------------|-------------------------------------------------------------------|------------|------------|------------|------------|
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=-10V$ $V_{DS}=-15V$ $R_L=0.75\Omega$ $R_{GEN}=3\Omega$ | | 12.5 | | ns |
| Turn-On Rise Time | t_r | | | 19 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 125 | | |
| Turn-Off Fall Time | t_f | | | 67 | | |

电参数曲线图 / Electrical Characteristic Curve

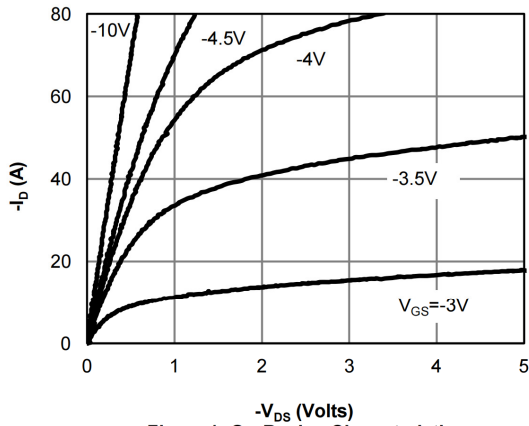


Figure 1: On-Region Characteristics

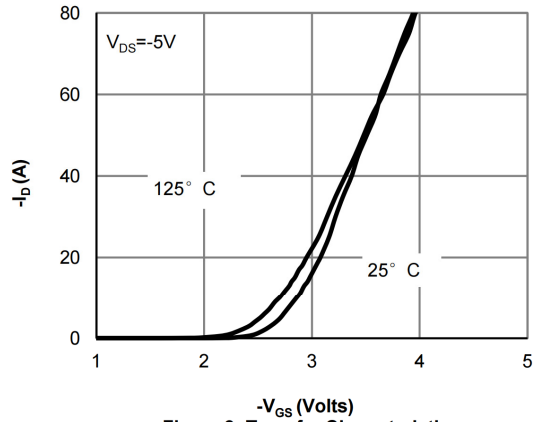


Figure 2: Transfer Characteristics

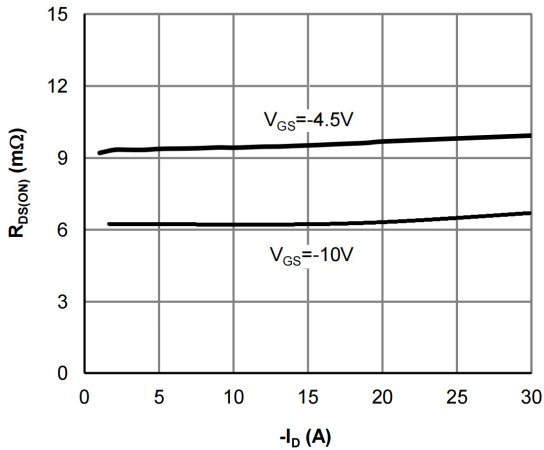


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

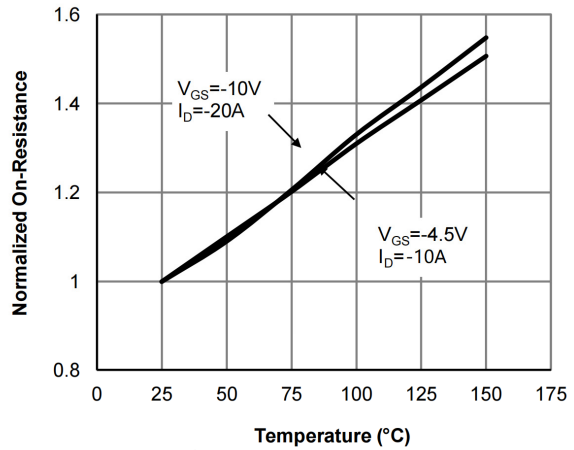


Figure 4: On-Resistance vs. Junction Temperature

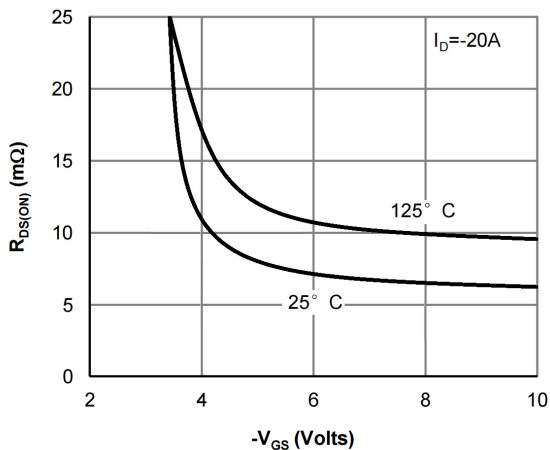


Figure 5: On-Resistance vs. Gate-Source Voltage

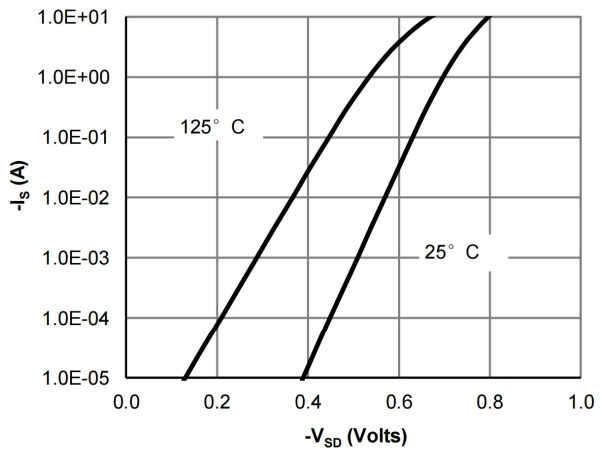


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

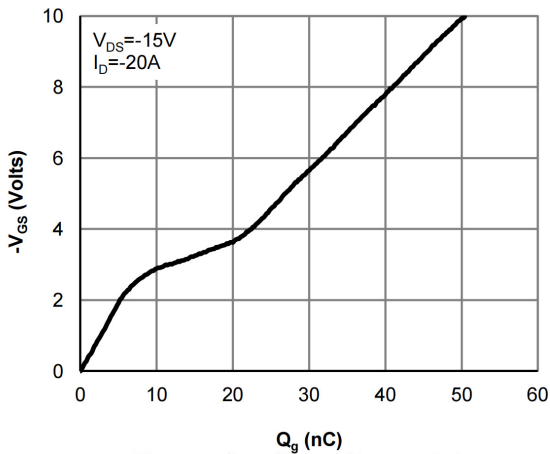


Figure 7: Gate-Charge Characteristics

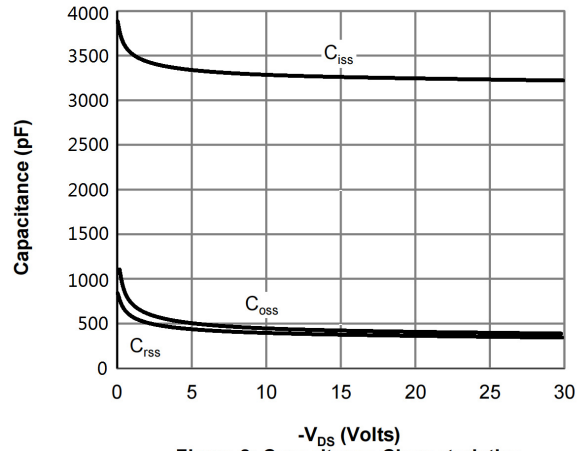


Figure 8: Capacitance Characteristics

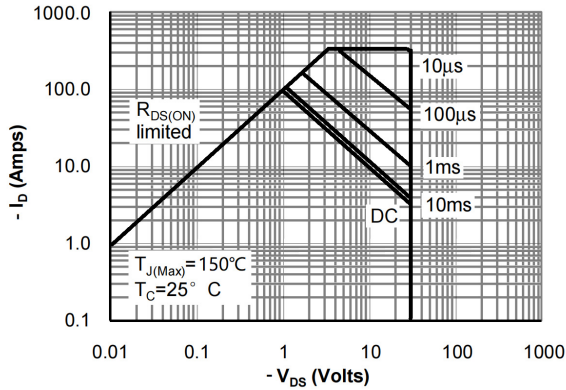


Figure 9: Maximum Forward Biased Safe Operating Area

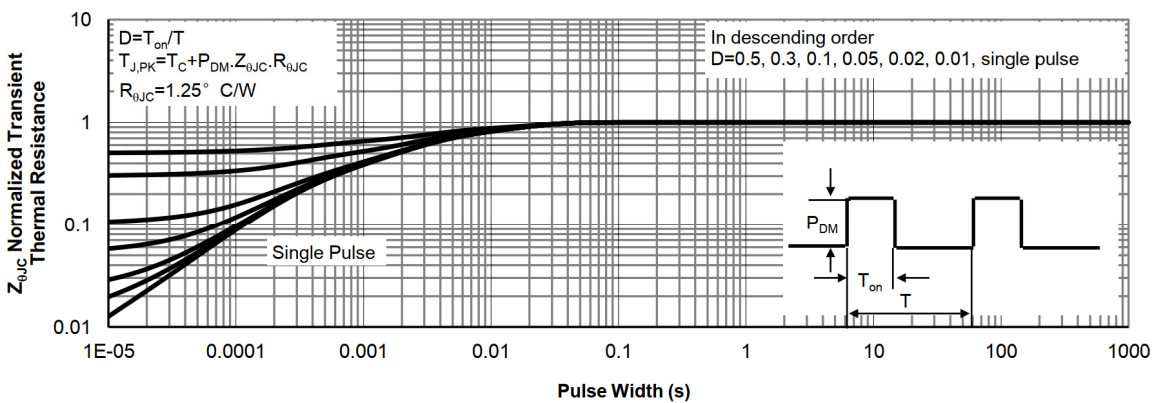
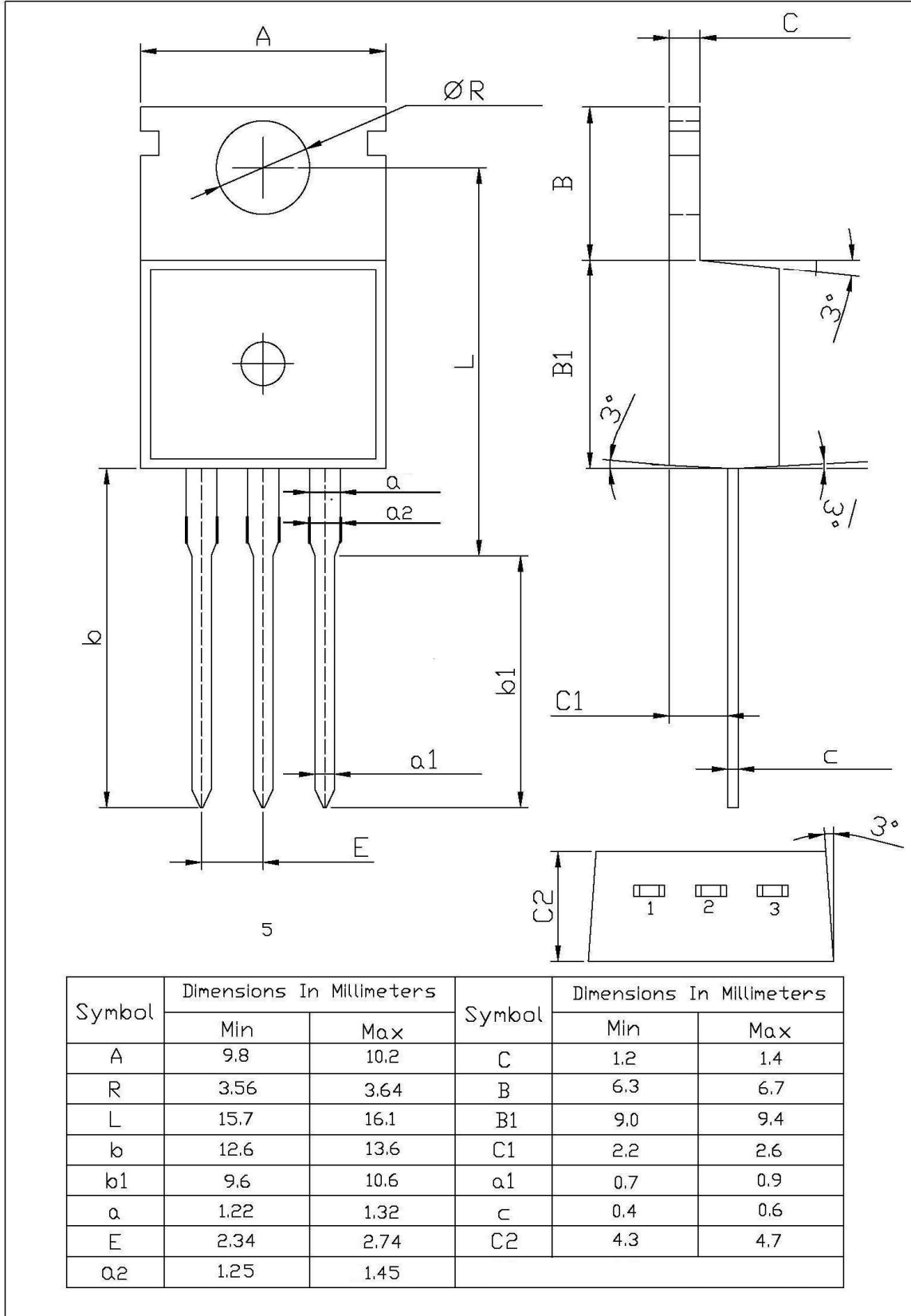


Figure 10: Normalized Maximum Transient Thermal Impedance

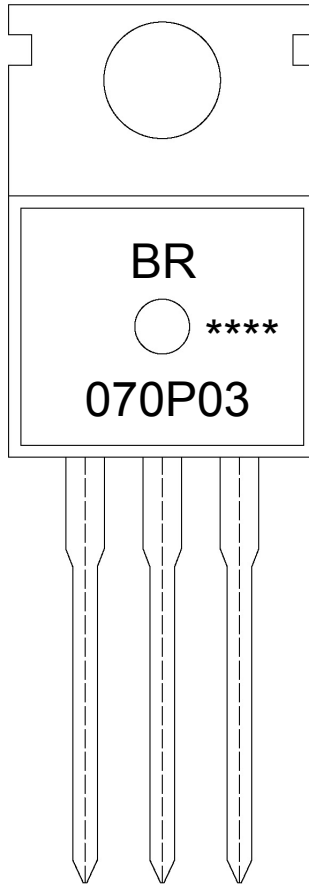
外形尺寸图 / Package Dimensions

T□-220

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

070P03： 为型号代码

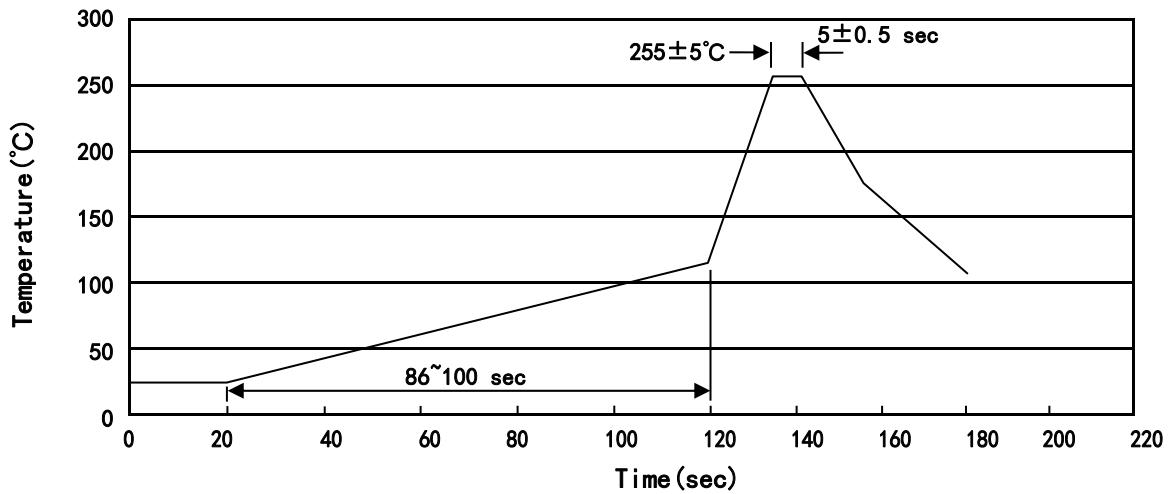
****： 为生产批号代码，随生产批号变化

Note:

BR: Company Code

070P03: Product Type Code

****: Lot No. Code, code change with Lot No

波峰焊温度曲线图(无铅) / Temperature Profile for Dip Soldering(Pb-Free)


说明：

- 1、预热温度 25~150°C，时间 60~90sec;
- 2、峰值温度 255±5°C，时间持续为 5±0.5sec;
- 3、焊接制程冷却速度为 2~10°C/sec.

Note:

- 1.Preheating:25~150°C, Time:60~90sec.
- 2.Peak Temp.:255±5°C, Duration:5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions

温度：270±5°C

时间：10±1 sec.

Temp.:270±5°C

Time:10±1 sec

包装规格 / Packaging SPEC.

散件包装 / BULK

| Package Type 封装形式 | Units 包装数量 | | | | | Dimension 包装尺寸 (unit: mm ³) | | |
|----------------------|------------------|-----------------------|------------------------|------------------------------|------------------------|-----------------------------------------|-------------|-------------|
| | Units/Bag 只/袋 | Bags/Inner Box 袋/盒 | Units/Inner Box 只/盒 | Inner Boxes/Outer Box 盒/箱 | Units/Outer Box 只/箱 | Bag 袋 | Inner Box 盒 | Outer Box 箱 |
| TO-220/F | 200 | 10 | 2,000 | 5 | 10,000 | 135×190 | 237×172×102 | 560×245×195 |

套管包装 / TUBE

| Package Type 封装形式 | Units 包装数量 | | | | | Dimension 包装尺寸 (unit: mm ³) | | |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|-----------------------------------------|-------------|-------------|
| | Units/Tube 只/套管 | Tubes/Inner Box 套管/盒 | Units/Inner Box 只/盒 | Inner Boxes/Outer Box 盒/箱 | Units/Outer Box 只/箱 | Tube 套管 | Inner Box 盒 | Outer Box 箱 |
| TO-220/F | 50 | 20 | 1,000 | 5 | 5,000 | 532×31.4×5.5 | 555×164×50 | 575×290×180 |

使用说明 / Notices