

描述 / Descriptions

N 沟道 TO-252 塑封封装场效应管。

N-CHANNEL MOSFET in a TO-252 Plastic Package.

特征 / Features

具有低导通电阻的超高密度设计，表面贴装封装。无卤产品。

Super high dense cell design for low $R_{DS(on)}$, Rugged and reliable, surface mount package.

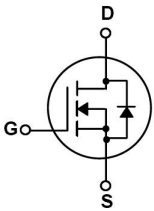
Halogen-free Product.

用途 / Applications

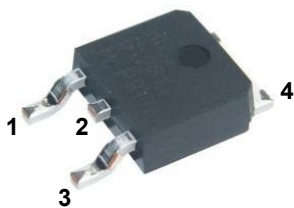
用于高功率 DC/DC 转换和功率开关。

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : G

PIN 2 : D

PIN 3 : S

PIN 4 : D

放大及印章代码 / h_{FE} Classifications & Marking

见印章说明。See Marking Instructions.

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

| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit | |
|---|-----------------------------|-----------------|--------------------|----|
| Drain-Source Voltage | V_{DSS} | 30 | V | |
| Drain Current | $I_D(T_C=25^\circ\text{C})$ | 80 | A | |
| Drain Current - Pulsed | I_{DM} | 300 | A | |
| Gate-Source Voltage | V_{GSS} | ± 20 | V | |
| Single Pulsed Avalanche Energy | E_{AS} | 211 | mJ | |
| Avalanche Current | I_{AS} | 23 | A | |
| Power Dissipation | $P_D(T_C=25^\circ\text{C})$ | 90 | W | |
| Operating and Storage Temperature Range | T_J, T_{stg} | -55 to 150 | $^\circ\text{C}$ | |
| Junction-to-Ambient | $t \leq 10$ | $R_{\theta JA}$ | $^\circ\text{C/W}$ | |
| Junction-to-Ambient | Steady-State | | | 18 |
| Junction-to-Ambient | Steady-State | | | 45 |
| Junction-to-Case | Steady-State | $R_{\theta JC}$ | 1.38 | |

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 |
|------------------------------------|---------------|----------------------------------|-----------------------------------|------------|------------|------------|------------|
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V$ | $I_D=250\mu A$ | 30 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=30V$ | $V_{GS}=0V$ | | | 1 | μA |
| Gate-Body Leakage Current Forward | I_{GSS} | $V_{GS}=\pm 20V$ | $V_{DS}=0V$ | | | ± 0.1 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ | $I_D=250\mu A$ | 1.0 | 1.7 | 2.5 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V$ | $I_D=70A$ | | 4.8 | 6.5 | $m\Omega$ |
| | | $V_{GS}=4.5V$ | $I_D=35A$ | | 7.0 | 9 | $m\Omega$ |
| Drain-Source Diode Forward Voltage | V_{SD} | $V_{GS}=0V$ | $I_S=10A$ | | | 1.2 | V |
| Input Capacitance | C_{iss} | $V_{DS}=25V$ $f=1.0MHz$ | $V_{GS}=0V$ | | 2090 | | pF |
| Output Capacitance | C_{oss} | | | | 790 | | |
| Reverse Transfer Capacitance | C_{rss} | | | | 634 | | |
| Gate resistance | R_g | $V_{GS}=0V$ $f=1MHz$ | $V_{DS}=0V$ | | 1.9 | | Ω |
| Total Gate Charge | $Q_{g(10V)}$ | $V_{GS}=10V$ $I_D=20A$ | $V_{DS}=15V$ | | 30 | 42 | nC |
| Total Gate Charge | $Q_{g(4.5V)}$ | | | | 14 | 20 | |
| Gate Source Charge | Q_{gs} | | | | 5.1 | | |
| Gate Drain Charge | Q_{gd} | | | | 6.3 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=10V$ $R_L=0.75\Omega$ | $V_{DS}=15V$ $R_{GEN}=3\Omega$ | | 8 | | ns |
| Turn-On Rise Time | t_r | | | | 4 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 29 | | |
| Turn-Off Fall Time | t_f | | | | 5.5 | | |
| Body Diode Reverse Recovery Time | t_{rr} | $I_F=20A, di/dt=500A/us$ | | | 16.5 | | ns |
| Body Diode Reverse Recovery Charge | Q_{rr} | $I_F=20A, di/dt=500A/us$ | | | 34.2 | | nC |

电参数曲线图 / Electrical Characteristic Curve

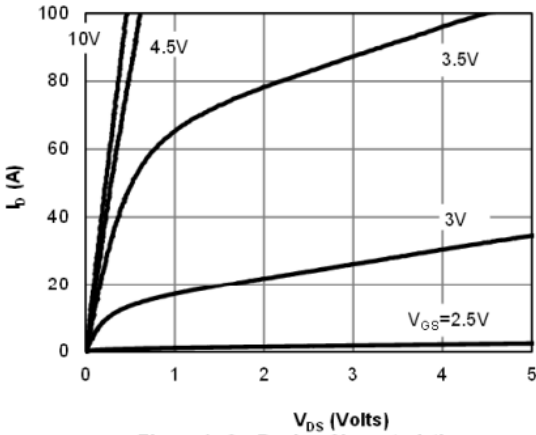


Figure 1: On-Region Characteristics

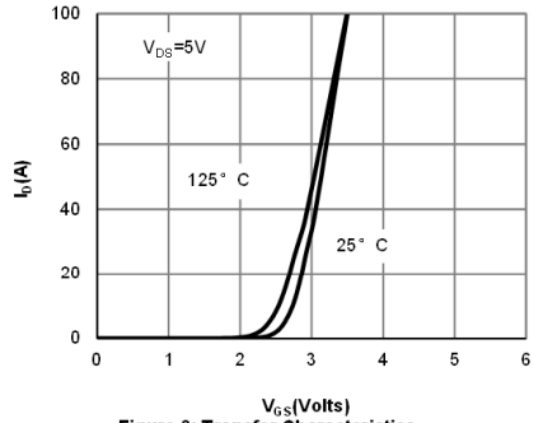


Figure 2: Transfer Characteristics

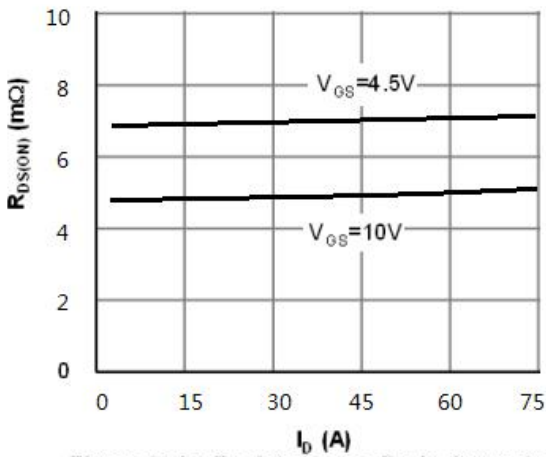


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

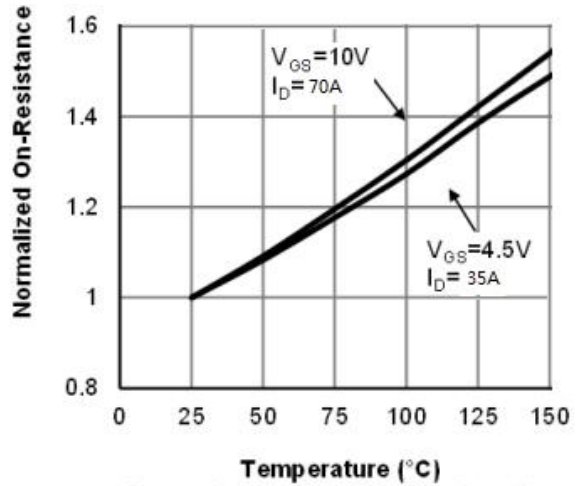


Figure 4: On-Resistance vs. Junction Temperature

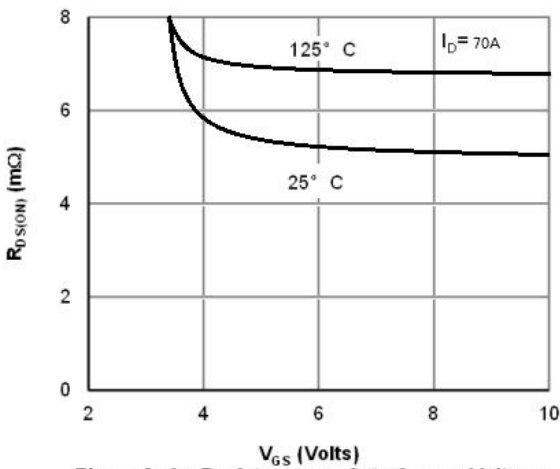


Figure 5: On-Resistance vs. Gate-Source Voltage

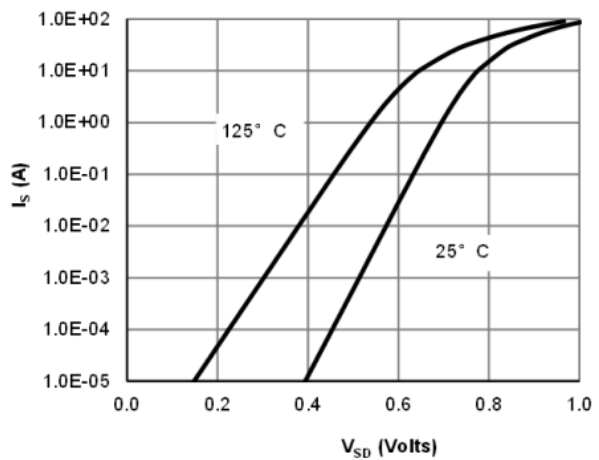


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

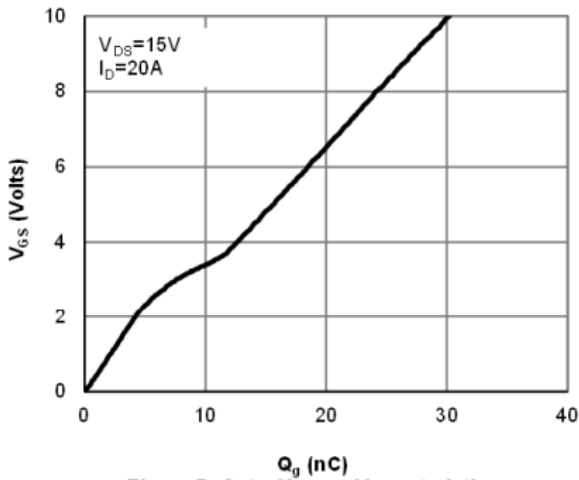


Figure 7: Gate-Charge Characteristics

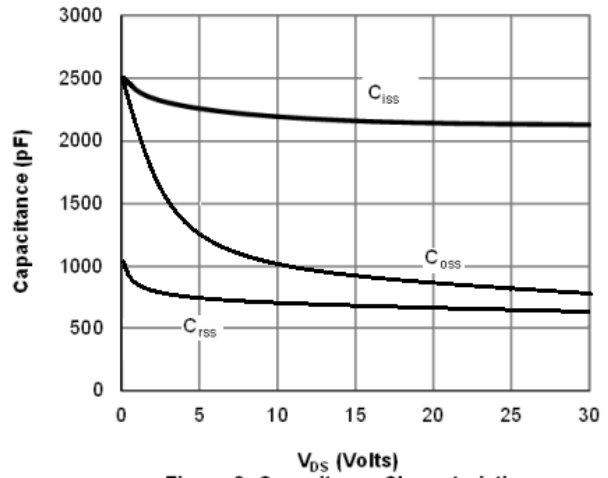


Figure 8: Capacitance Characteristics

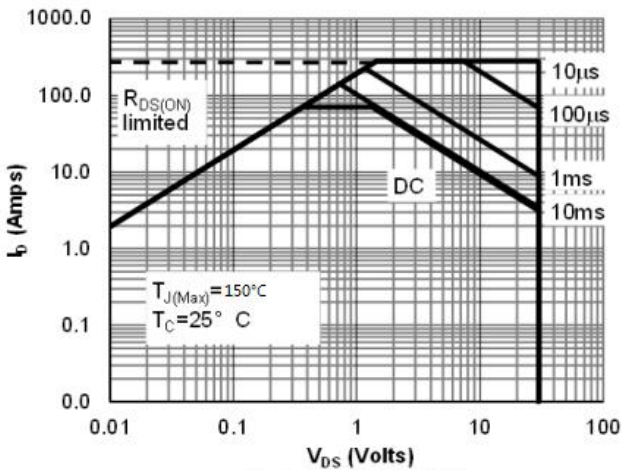


Figure 9: Maximum Forward Biased Safe Operating Area
 $V_{GS} > \text{or equal to } 4.5V$

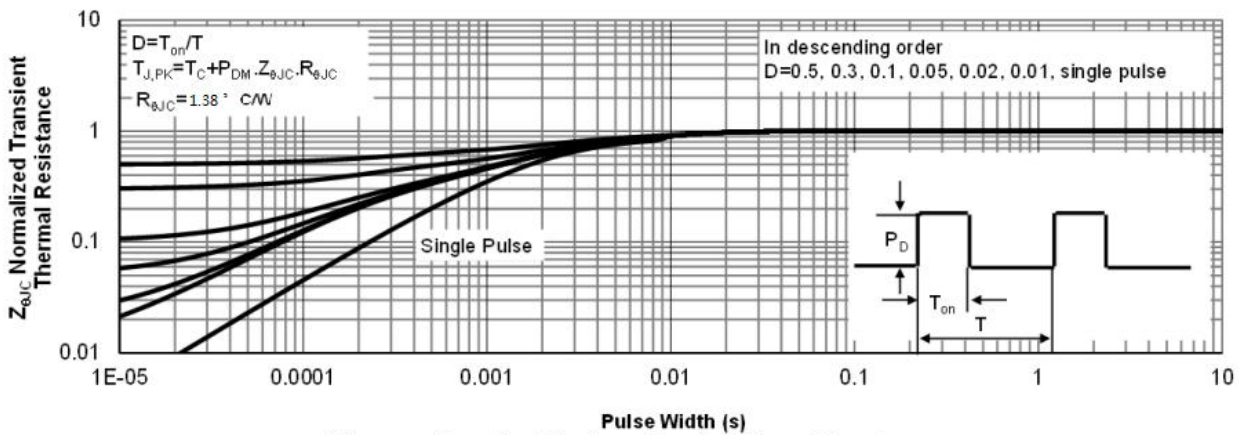
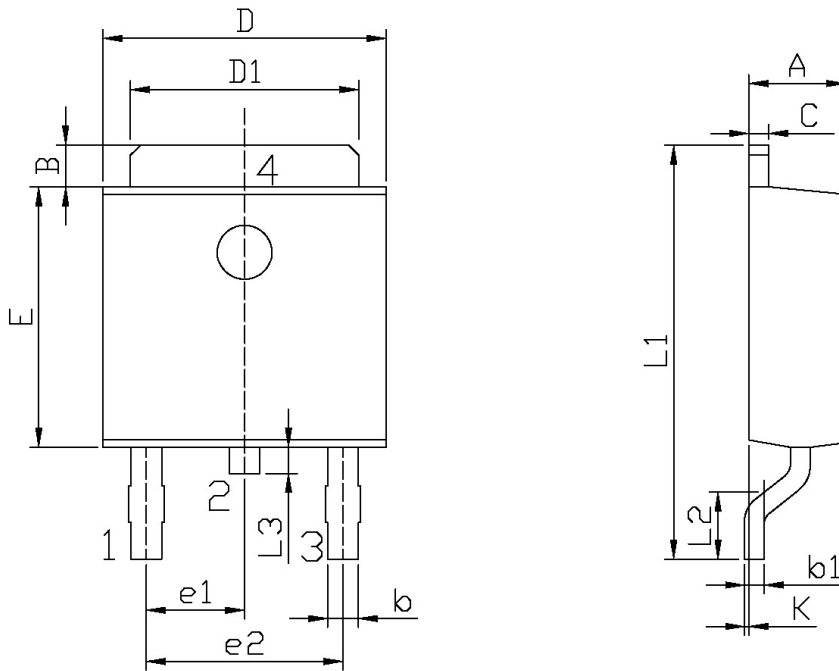


Figure 10: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

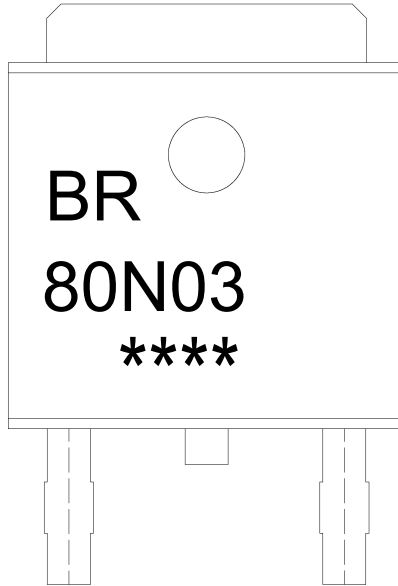


单位: mm

| Symbol | Dimensions In Millimeters | | Symbol | Dimensions In Millimeters | |
|--------|---------------------------|------|--------|---------------------------|------|
| | Min | Max | | Min | Max |
| A | 2.20 | 2.40 | E | 5.95 | 6.25 |
| B | 0.95 | 1.25 | e1 | 2.24 | 2.34 |
| b | 0.50 | 0.70 | e2 | 4.43 | 4.73 |
| b1 | 0.45 | 0.55 | L1 | 9.45 | 9.95 |
| C | 0.45 | 0.55 | L2 | 1.25 | 1.75 |
| D | 6.45 | 6.75 | L3 | 0.60 | 0.90 |
| D1 | 5.10 | 5.50 | K | 0.00 | 0.10 |

TO-252

印章说明 / Marking Instructions



说明：

BR： 为公司代码

80N03： 为型号代码

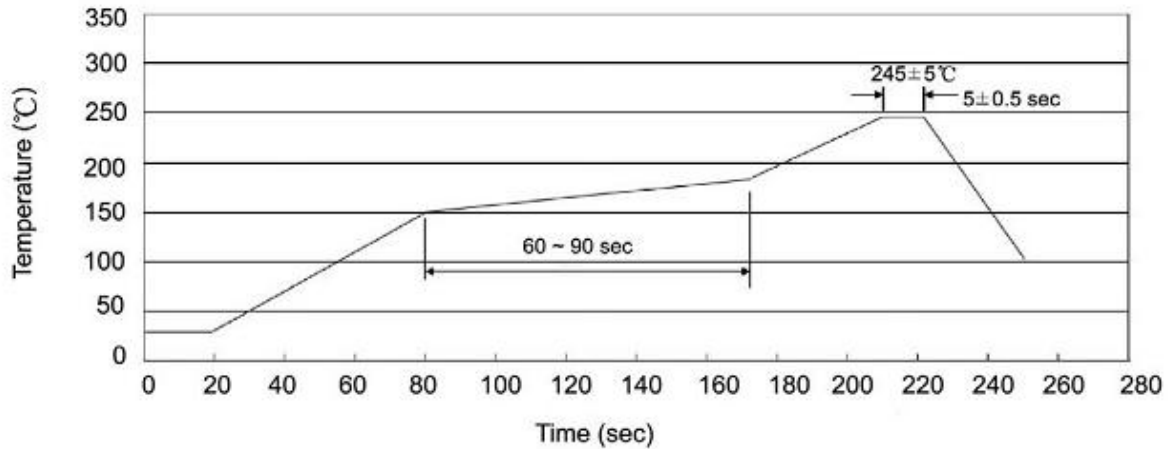
****： 为生产批号代码，随生产批号变化

Note:

BR: Company Code.

80N03: Product Type Code.

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

回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)


说明：

- 1、预热温度 150~180°C，时间 60~90sec;
- 2、峰值温度 245±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:150~180°C, Time:60~90sec.
- 2.Peak Temp.:245±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：260±5°C

时间：10±1 sec.

Temp.:260±5°C

Time:10±1 sec

包装规格 / Packaging SPEC.

卷盘包装 / REEL

| Package Type 封装形式 | Units 包装数量 | | | | | Dimension 包装尺寸 (unit: mm ³) | | |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|---|-------------|-------------|
| | Units/Reel 只/卷盘 | Reels/Inner Box 卷盘/盒 | Units/Inner Box 只/盒 | Inner Boxes/Outer Box 盒/箱 | Units/Outer Box 只/箱 | Reel | Inner Box 盒 | Outer Box 箱 |
| TO-252 | 2,500 | 2 | 5,000 | 5 | 25,000 | 13" × 16 | 360×360×50 | 385×257×392 |

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-251/252 | 75 | 48 | 3,600 | 5 | 18,000 | 526×20.5×5.25 | 555×164×50 | 575×290×180 |

使用说明 / Notices

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