

## 描述 / Descriptions

TO-252 塑封封装 N 沟道 MOS 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，可靠性好。

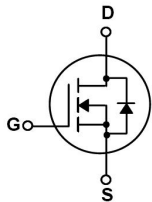
Super high dense cell design for low  $R_{DS(ON)}$ , Rugged and reliable.

## 用途 / Applications

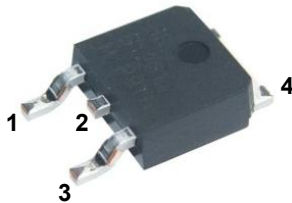
用于高功率 DC/DC 转换和功率开关。

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



PIN1 : 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.

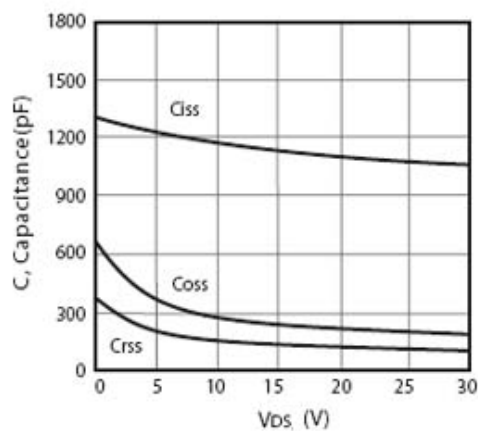
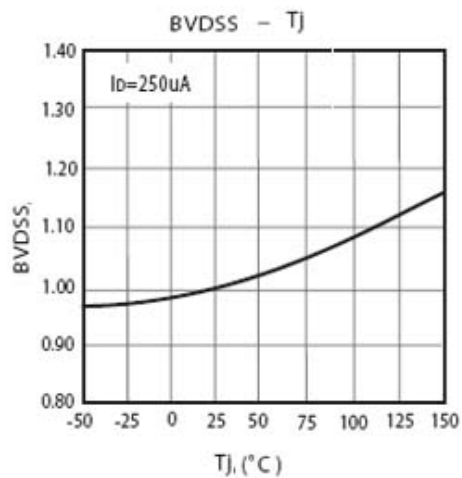
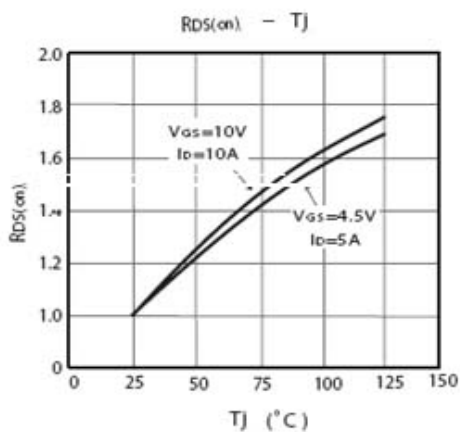
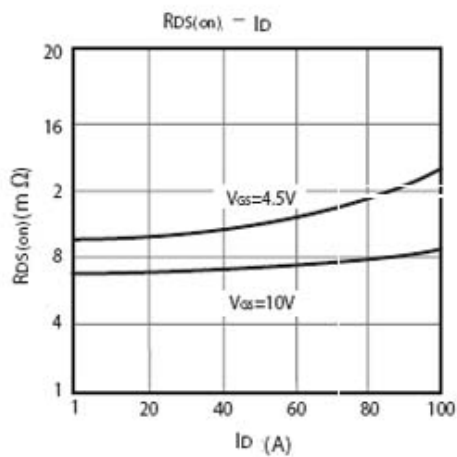
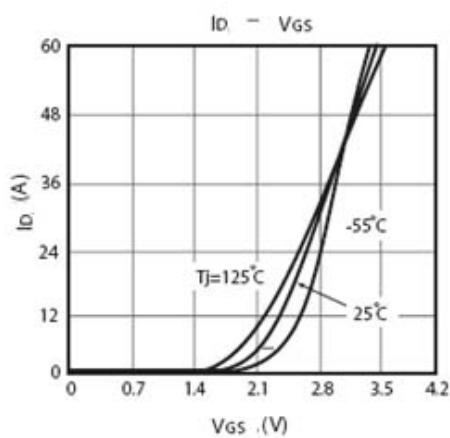
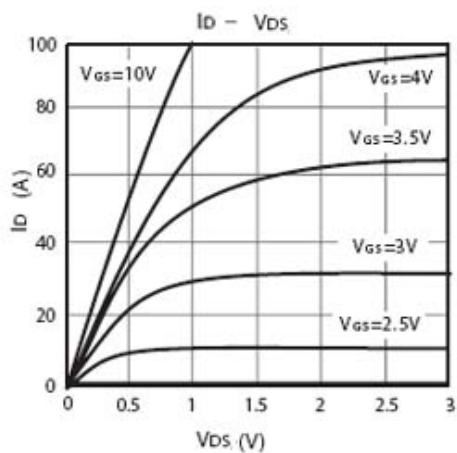
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

| 参数<br>Parameter                         | 符号<br>Symbol                  | 数值<br>Rating | 单位<br>Unit         |
|-----------------------------------------|-------------------------------|--------------|--------------------|
| Drain-Source Voltage                    | $V_{DS}$                      | 40           | V                  |
| Drain Current                           | $I_D(T_c=25^{\circ}\text{C})$ | 50           | A                  |
| Drain Current                           | $I_D(T_c=70^{\circ}\text{C})$ | 40           | A                  |
| Drain Current - Pulsed                  | $I_{DM}$                      | 147          | A                  |
| Gate-Source Voltage                     | $V_{GS}$                      | $\pm 20$     | V                  |
| Single Pulsed Avalanche Energy          | $E_{AS}$                      | 130          | mJ                 |
| Total Power Dissipation                 | $P_D(T_c=25^{\circ}\text{C})$ | 42           | W                  |
| Operating and Storage Temperature Range | $T_J, T_{STG}$                | -55 to 150   | $^{\circ}\text{C}$ |

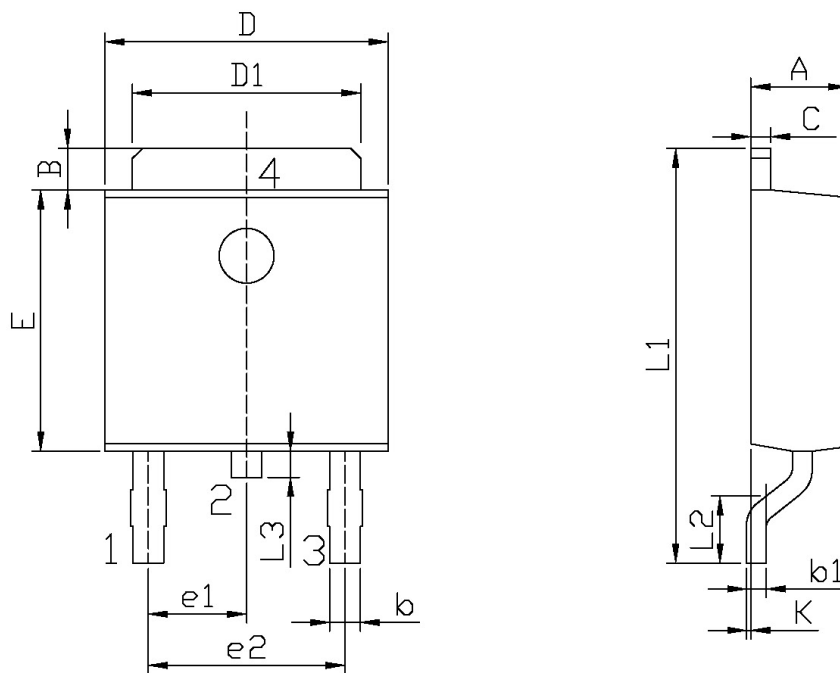
**电性能参数 / Electrical Characteristics(Ta=25°C)**

| 参数<br>Parameter                    | 符号<br>Symbol | 测试条件<br>Test Conditions                                 | 最小值<br>Min | 典型值<br>Typ | 最大值<br>Max | 单位<br>Unit |
|------------------------------------|--------------|---------------------------------------------------------|------------|------------|------------|------------|
| Drain-Source Breakdown Voltage     | $BV_{DS}$    | $V_{GS}=0V$ $I_D=250\mu A$                              | 40         |            |            | V          |
| Zero Gate Voltage Drain Current    | $I_{DSS}$    | $V_{DS}=32V$ $V_{GS}=0V$                                |            |            | 1.0        | $\mu A$    |
| Gate-Body Leakage Current Forward  | $I_{GSS}$    | $V_{GS}=\pm 20V$ $V_{DS}=0V$                            |            |            | $\pm 0.1$  | $\mu A$    |
| Gate Threshold Voltage             | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ $I_D=250\mu A$                          | 1.25       | 1.6        | 3.0        | V          |
| Static Drain-Source On-Resistance  | $R_{DS(on)}$ | $V_{GS}=10V$ $I_D=10A$                                  |            | 7          | 9          | m $\Omega$ |
|                                    |              | $V_{GS}=4.5V$ $I_D=5A$                                  |            | 9          | 11         | m $\Omega$ |
| Forward Transconductance           | $g_{FS}$     | $V_{DS}=10V$ $I_D=10A$                                  |            | 28         |            | S          |
| Drain-Source Diode Forward Voltage | $V_{SD}$     | $V_{GS}=0V$ $I_S=20A$                                   |            | 0.91       | 1.3        | V          |
| Input Capacitance                  | $C_{iss}$    | $V_{DS}=15V$ $V_{GS}=0V$<br>$f=1.0MHz$                  |            | 1130       |            | pF         |
| Output Capacitance                 | $C_{oss}$    |                                                         |            | 240        |            |            |
| Reverse Transfer Capacitance       | $C_{rss}$    |                                                         |            | 145        |            |            |
| Turn-On Delay Time                 | $t_{d(on)}$  | $V_{DD}=15V$ $I_D=1.0A$<br>$V_{GS}=10V$ $R_G=3.3\Omega$ |            | 18         |            | ns         |
| Turn-On Rise Time                  | $t_r$        |                                                         |            | 22         |            |            |
| Turn-Off Delay Time                | $t_{d(off)}$ |                                                         |            | 61         |            |            |
| Turn-Off Fall Time                 | $t_f$        |                                                         |            | 9.6        |            |            |

**电参数曲线图 / Electrical Characteristic Curve**



### 外形尺寸图 / Package Dimensions

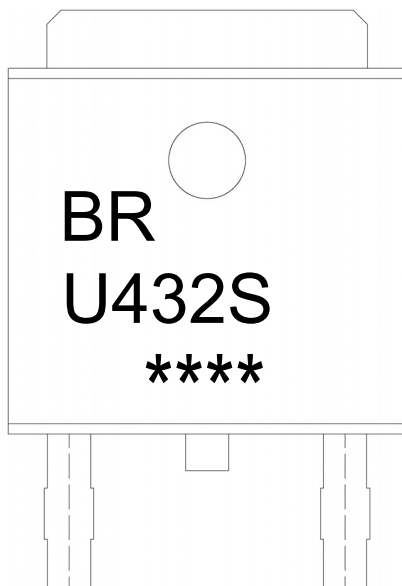


单位: mm

| 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 |

T0-252

**印章说明 / Marking Instructions**



说明：

BR： 为公司代码

U432S： 为产品型号

\*\*\*\*： 为生产批号代码，随生产批号变化。

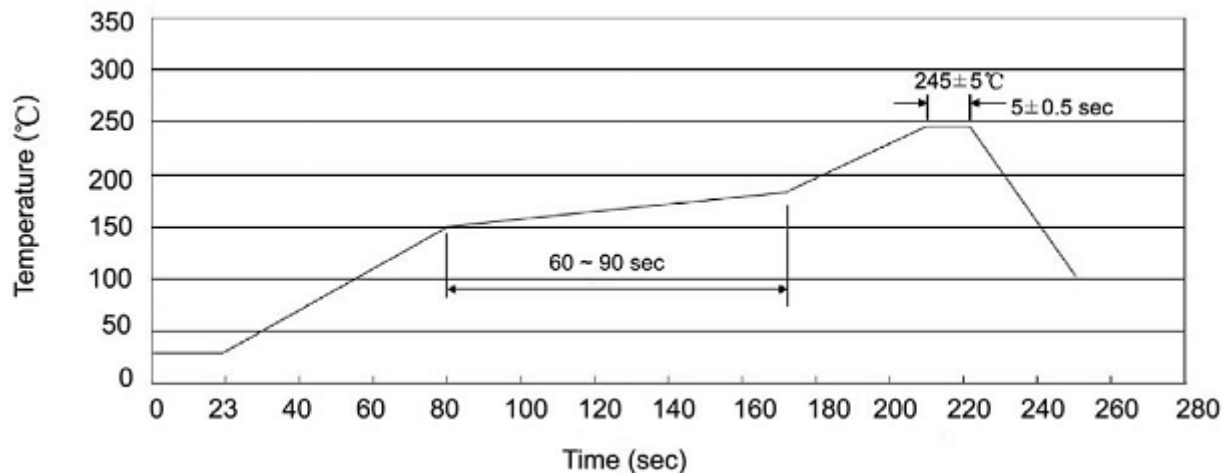
Note:

BR: Company Code

U432S: Product Type.

\*\*\*\*: 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 25~150°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:25~150°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<br>封装形式 | Units 包装数量         |                         |                        |                              |                        | Dimension 包装尺寸 (unit: mm <sup>3</sup> ) |             |             |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|-----------------------------------------|-------------|-------------|
|                      | Units/Reel<br>只/卷盘 | Reels/Inner Box<br>卷盘/盒 | Units/Inner Box<br>只/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>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<br>封装形式 | Units 包装数量         |                         |                        |                              |                        | Dimension 包装尺寸 (unit: mm <sup>3</sup> ) |             |             |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|-----------------------------------------|-------------|-------------|
|                      | Units/Tube<br>只/套管 | Tubes/Inner Box<br>套管/盒 | Units/Inner Box<br>只/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>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