

# 3710

## 主要参数 MAIN CHARACTERISTICS

|                           |              |
|---------------------------|--------------|
| $I_D$                     | 57A          |
| $V_{DS}$                  | 100V         |
| $R_{ds(on)} (V_{GS}=10V)$ | 17m $\Omega$ |

### 用途

- 负载开关
- 脉宽调制
- 电源管理

### APPLICATIONS

- Load Switch
- PWM Application
- Power Management

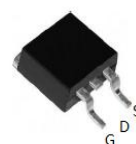
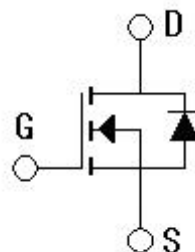
### 产品特性

- 先进沟槽技术
- 符合环保标准
- 产品无卤素
- 湿敏等级3级

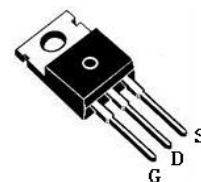
### FEATURES

- Advanced Trench Technology
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

## 封装 Package



TO-263



TO-220C

## 产品中有害有害物质或元素的名称及含量

| 部件名称   | 有害物质或元素                                                                                                                                   |           |           |                 |               |                 |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------------|---------------|-----------------|
|        | 铅<br>(Pb)                                                                                                                                 | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| (含量要求) | ≤0.1%                                                                                                                                     | ≤0.1%     | ≤0.01%    | ≤0.1%           | ≤0.1%         | ≤0.1%           |
| 引线框    | ○                                                                                                                                         | ○         | ○         | ○               | ○             | ○               |
| 塑封树脂   | ○                                                                                                                                         | ○         | ○         | ○               | ○             | ○               |
| 管芯     | ○                                                                                                                                         | ○         | ○         | ○               | ○             | ○               |
| 内引线    | ○                                                                                                                                         | ○         | ○         | ○               | ○             | ○               |
| 焊料     | ×                                                                                                                                         | ○         | ○         | ○               | ○             | ○               |
| 说明     | <p>○: 表示该元素的含量在 SJ/T11363-2006 标准的限量要求以下。</p> <p>×: 表示该元素的含量超出 SJ/T11363-2006 标准的限量要求。</p> <p>目前产品的焊料中含有铅 (Pb) 成分, 但属于欧盟 RoHS 指令豁免范围。</p> |           |           |                 |               |                 |

绝对最大额定值    **ABSOLUTE RATINGS** (Tc=25℃)

| 项 目<br>Parameter                                            | 符 号<br>Symbol                         | 数 值<br>Value | 单 位<br>Unit |
|-------------------------------------------------------------|---------------------------------------|--------------|-------------|
| 最高漏极—源极直流电压<br>Drain-Source Voltage                         | V <sub>DSS</sub>                      | 100          | V           |
| 连续漏极电流<br>Drain Current-continuous                          | I <sub>D</sub><br>T=25℃<br>T=100℃     | 57<br>40     | A           |
| 最大脉冲漏极电流<br>Drain Current – pulse <sup>Note 1</sup>         | I <sub>DM</sub>                       | 200          | A           |
| 最高栅源电压<br>Gate-Source Voltage                               | V <sub>GSS</sub>                      | ±20          | V           |
| 单脉冲雪崩能量<br>Single Pulsed Avalanche Energy <sup>Note 1</sup> | E <sub>AS</sub>                       | 755          | mJ          |
| 耗散功率<br>Power Dissipation                                   | P <sub>D</sub><br>T <sub>C</sub> =25℃ | 200          | W           |
| 最高结温及存储温度<br>Operating and Storage Temperature Range        | T <sub>J</sub> , T <sub>STG</sub>     | -55~+150     | ℃           |

## 电特性 ELECTRICAL CHARACTERISTICS

| 项 目<br>Parameter                                  | 符 号<br>Symbol | 测试条件<br>Tests conditions                  | 最小<br>Min | 典型<br>Typ | 最大<br>Max | 单位<br>Units |
|---------------------------------------------------|---------------|-------------------------------------------|-----------|-----------|-----------|-------------|
| <b>关态特性 Off –Characteristics</b>                  |               |                                           |           |           |           |             |
| 漏—源击穿电压<br>Drain-Source Voltage                   | $BV_{DSS}$    | $I_D=250\mu A, V_{GS}=0V, T_J=25^\circ C$ | 100       | -         | -         | V           |
| 零栅压下漏极漏电流<br>Zero Gate Voltage Drain Current      | $I_{DSS}$     | $V_{DS}=100V, V_{GS}=0V, T_C=25^\circ C$  | -         | -         | 10        | $\mu A$     |
| 正向栅极体漏电流<br>Gate-body leakage current,<br>forward | $I_{GSSF}$    | $V_{DS}=0V, V_{GS}=20V$                   | -         | -         | 100       | nA          |
| 反向栅极体漏电流<br>Gate-body leakage current,<br>reverse | $I_{GSSR}$    | $V_{DS}=0V, V_{GS}=-20V$                  | -         | -         | -100      | nA          |
| <b>通态特性 On-Characteristics</b>                    |               |                                           |           |           |           |             |
| 阈值电压<br>Gate Threshold Voltage                    | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$             | 2.0       | -         | 4.0       | V           |
| 静态导通电阻<br>Static Drain-Source<br>On-Resistance    | $R_{DS(ON)}$  | $V_{GS}=10V, I_D=28A$                     | -         | 17        | 25        | m $\Omega$  |
| <b>动态特性 Dynamic Characteristics</b>               |               |                                           |           |           |           |             |
| 输入电容<br>Input capacitance                         | $C_{iss}$     | $V_{DS}=25V,$<br>$V_{GS}=0V,$<br>$f=1MHz$ | -         | 2.75      | -         | nF          |
| 输出电容<br>Output capacitance                        | $C_{oss}$     |                                           | -         | 590       | -         | pF          |
| 反向传输电容<br>Reverse transfer capacitance            | $C_{rss}$     |                                           | -         | 215       | -         | pF          |

## 电特性 ELECTRICAL CHARACTERISTICS

| 开关特性 Switching Characteristics                                        |                   |                                                      |   |      |     |          |  |
|-----------------------------------------------------------------------|-------------------|------------------------------------------------------|---|------|-----|----------|--|
| 延迟时间 Turn-On delay time                                               | $t_d(\text{on})$  | $V_{DD}=50V, I_D=28A, R_G=2.5\Omega$<br>$V_{GS}=10V$ | - | 15   | -   | ns       |  |
| 上升时间 Turn-On rise time                                                | $t_r$             |                                                      | - | 60   | -   | ns       |  |
| 延迟时间 Turn-Off delay time                                              | $t_d(\text{off})$ |                                                      | - | 46   | -   | ns       |  |
| 下降时间 Turn-Off Fall time                                               | $t_f$             |                                                      | - | 37   | -   | ns       |  |
| 栅极电荷总量 Total Gate Charge                                              | $Q_g$             | $V_{DS}=80V$ ,<br>$I_D=28A$<br>$V_{GS}=10V$          | - | 114  | -   | nC       |  |
| 栅-源电荷 Gate-Source charge                                              | $Q_{gs}$          |                                                      | - | 12   | -   | nC       |  |
| 栅-漏电荷 Gate-Drain charge                                               | $Q_{gd}$          |                                                      | - | 57   | -   | nC       |  |
| 栅极电阻 Gate Resistance                                                  | $R_g$             | $f=1MHz$                                             | - | 0.6  | -   | $\Omega$ |  |
| 漏-源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings |                   |                                                      |   |      |     |          |  |
| 正向压降<br>Drain-Source Diode Forward Voltage                            | $V_{SD}$          | $V_{GS}=0V$ , $I_S=28A$                              | - | -    | 1.4 | V        |  |
| 反向恢复时间<br>Reverse Recovery Time                                       | $T_{RR}$          | $V_{GS}=0V, I_S=28A$ ,<br>$di_F/dt=100A/\mu s$       | - | 200  | -   | ns       |  |
| 反向恢复电荷<br>Reverse Recovery Charge                                     | $Q_{RR}$          |                                                      | - | 0.63 | -   | $\mu C$  |  |

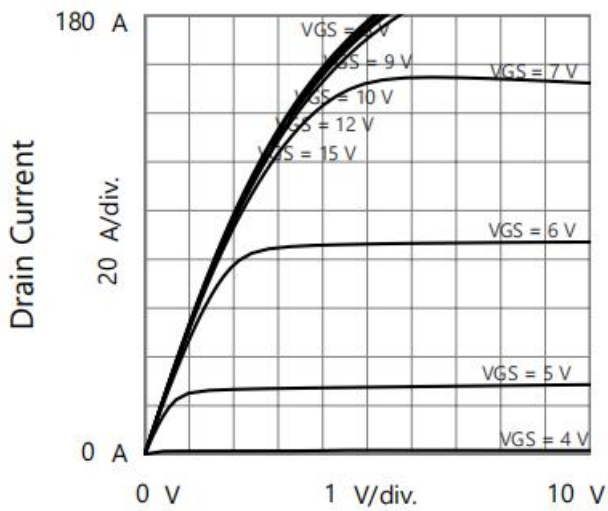
## 热特性 THERMAL CHARACTERISTIC

| 项 目<br>Parameter                                   | 符号<br>Symbol  | 值<br>Value | 单位<br>Unit    |
|----------------------------------------------------|---------------|------------|---------------|
| 结到管壳的热阻<br>Thermal Resistance, Junction to Case    | $R_{th(j-c)}$ | 0.70       | $^{\circ}C/W$ |
| 结到环境的热阻<br>Thermal Resistance, Junction-to-Ambient | $R_{th(j-A)}$ | 62         | $^{\circ}C/W$ |

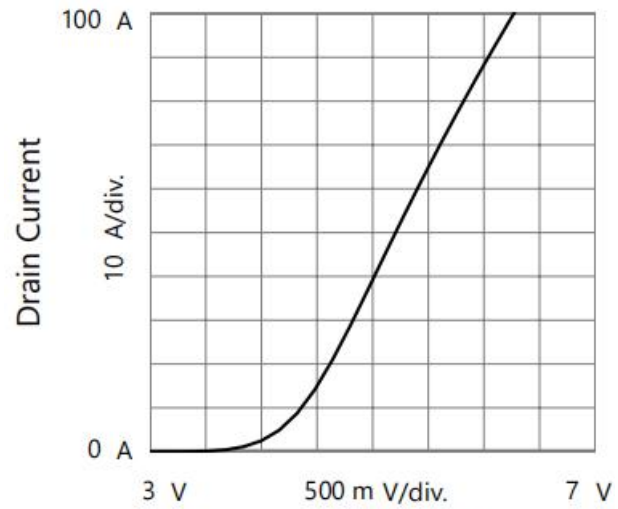
## NOTES:

1. L = 0.5mH, VDD = 50V, RG=25 $\Omega$ , Starting at TJ = 25 $^{\circ}C$

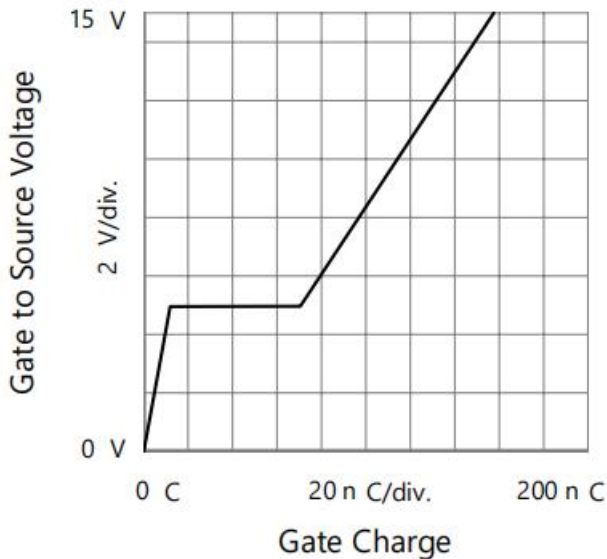
## 特征曲线 ELECTRICAL CHARACTERISTICS



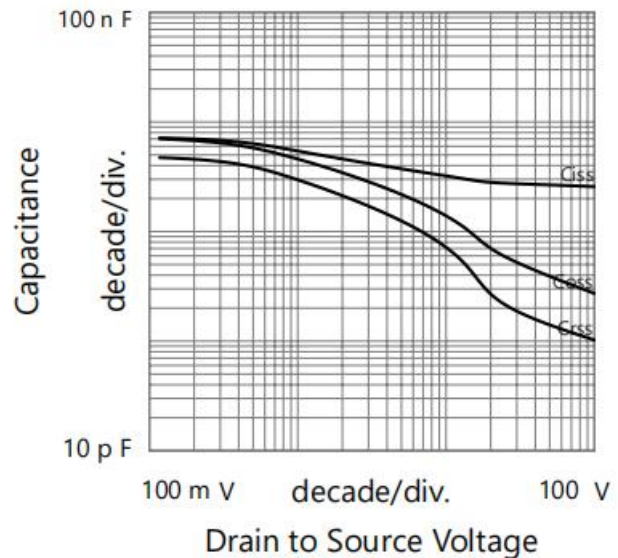
Drain to Source Voltage  
Fig1. Output characteristics  $T_J = 25^\circ\text{C}$



Gate to Source Voltage  
Fig2. Transfer characteristics



Gate Charge  
Fig3. Gate charge characteristics



Drain to Source Voltage  
Fig 4. Capacitance Characteristics

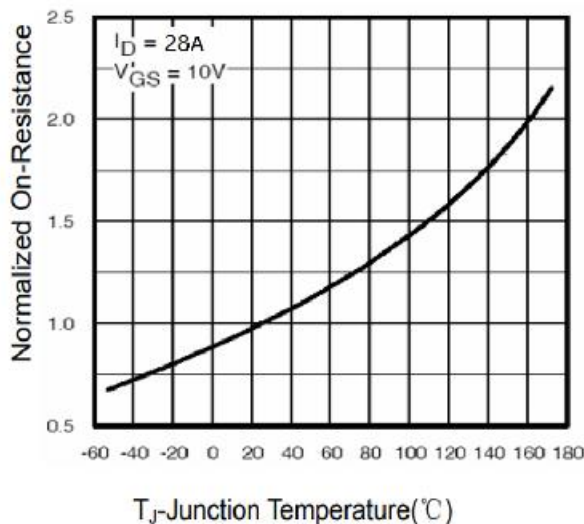


Fig 5.  $R_{DS(ON)}$  vs junction temperature

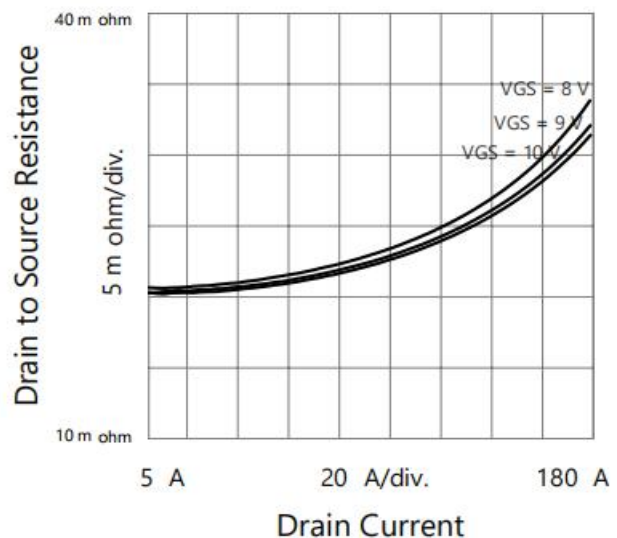


Fig 6.  $I_D$  VS  $R_{Dson}$

## 特征曲线 ELECTRICAL CHARACTERISTICS

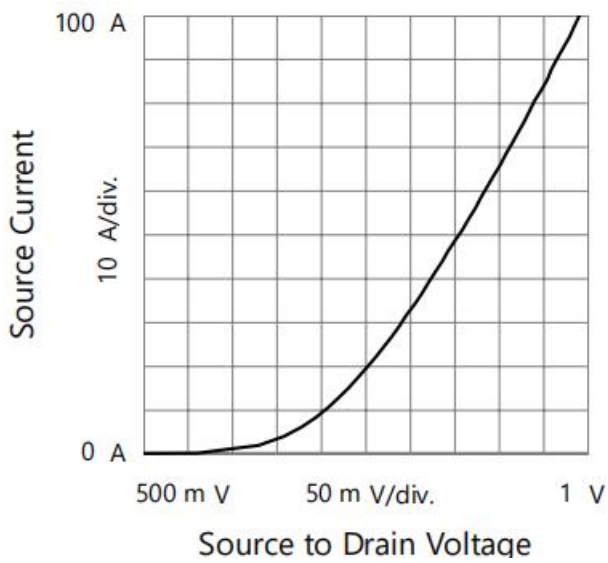


Fig 7 . Forward characteristics of reverse diode

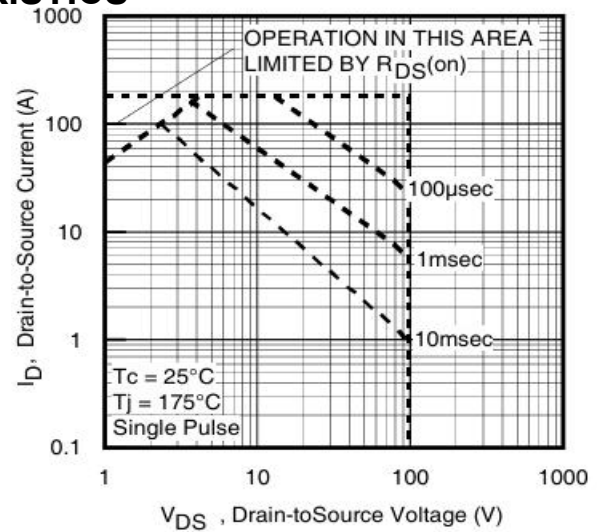


Fig 8 .Safe operating area

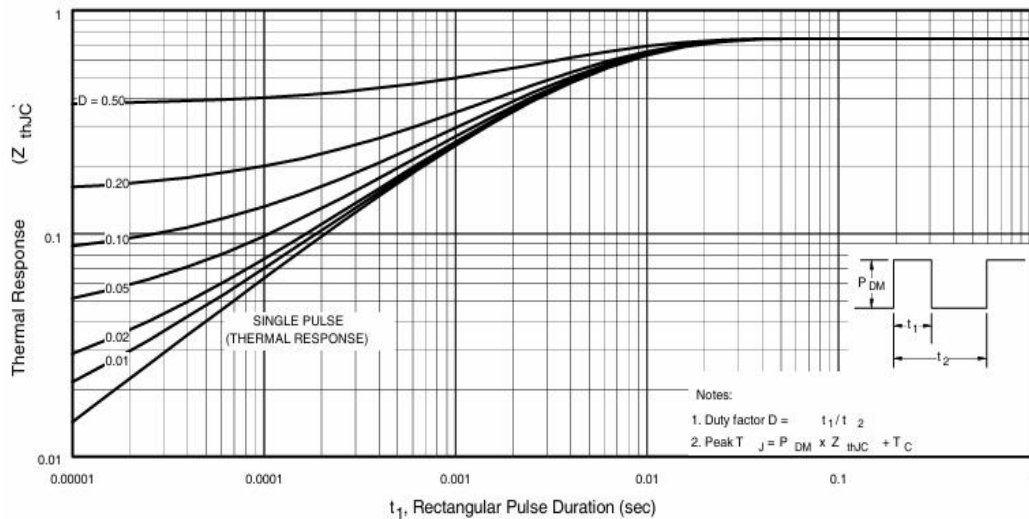
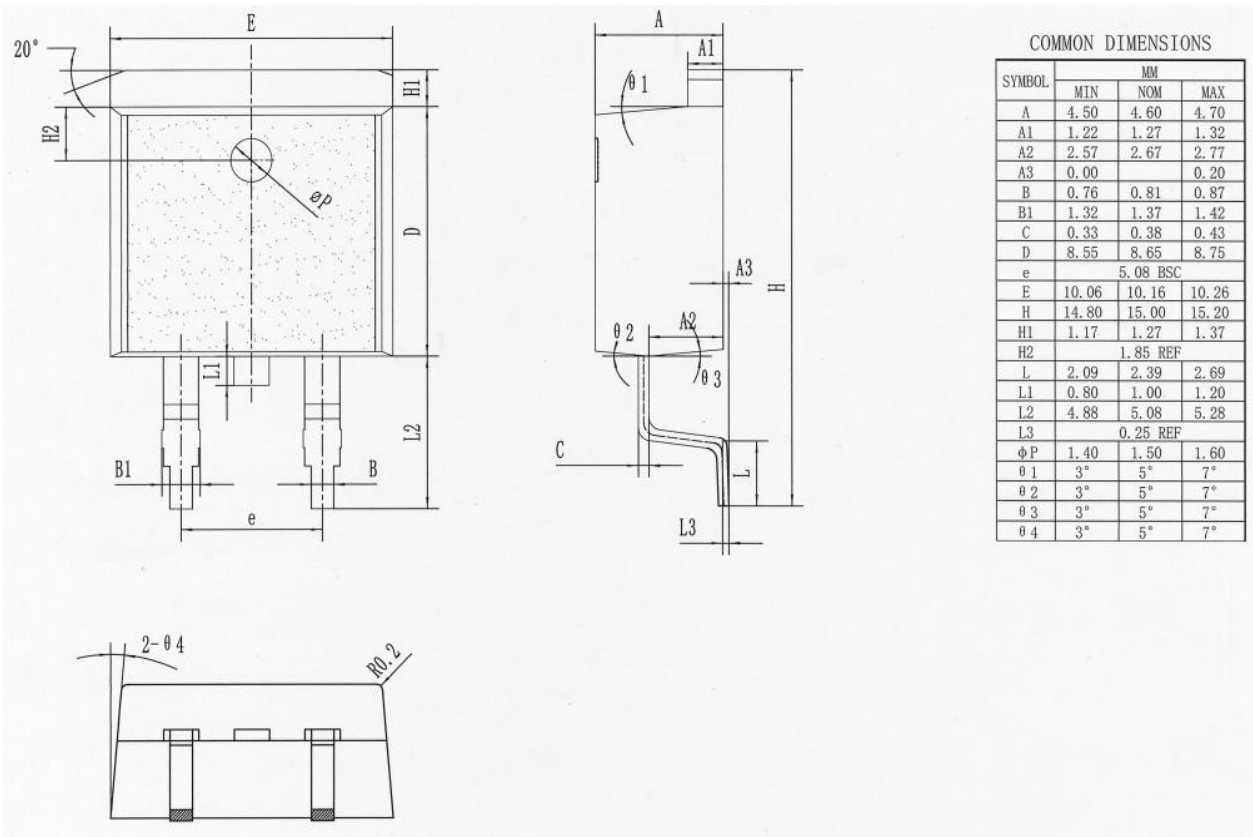


Fig 9 .Transient thermal impedance

外形尺寸 PACKAGE MECHANICAL DATA

TO-263



TO-220C

