



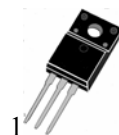
## ■ 主要用途

高速开关应用。

■ 极限值 ( $T_a=25^{\circ}\text{C}$ ) $T_{\text{stg}}$ ——贮存温度.....  $-55\sim 150^{\circ}\text{C}$  $T_j$ ——结温.....  $150^{\circ}\text{C}$  $V_{\text{DSS}}$ ——漏极—源极电压.....  $600\text{V}$  $V_{\text{GS}}$ ——栅极—源极电压.....  $\pm 30\text{V}$  $I_{\text{D}}$ ——漏极电流 ( $T_c=25^{\circ}\text{C}$ ) .....  $7.0\text{A}$  $I_{\text{D}}$ ——漏极电流(脉冲)(注1).....  $28\text{A}$  $P_{\text{D}}$ ——耗散功率 ( $T_c=25^{\circ}\text{C}$ ) .....  $48\text{W}$ 

## ■ 外形图及引脚排列

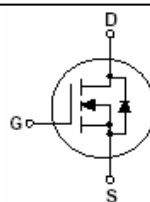
TO-220F



1—栅极 G

2—漏极 D

3—源极 S

■ 电参数 ( $T_a=25^{\circ}\text{C}$ )

| 参数符号                 | 符 号 说 明      | 最小值 | 典型值  | 最大值       | 单 位                  | 测 试 条 件                                                                                            |
|----------------------|--------------|-----|------|-----------|----------------------|----------------------------------------------------------------------------------------------------|
| $BV_{\text{DSS}}$    | 漏—源极击穿电压     | 600 |      |           | V                    | $I_{\text{D}}=250\mu\text{A}, V_{\text{GS}}=0\text{V}$                                             |
| $I_{\text{DSS}}$     | 零栅压漏极电流      |     |      | 1         | $\mu\text{A}$        | $V_{\text{DS}}=600\text{V}, V_{\text{GS}}=0$                                                       |
| $I_{\text{GSS}}$     | 栅极泄漏电流       |     |      | $\pm 100$ | nA                   | $V_{\text{GS}}=\pm 30\text{V}, V_{\text{DS}}=0\text{V}$                                            |
| $V_{\text{GS(th)}}$  | 栅—源极开启电压     | 2.0 |      | 4.0       | V                    | $V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$                                         |
| $R_{\text{DS(on)}}$  | 漏—源极导通电阻     |     | 0.91 | 1.2       | $\Omega$             | $V_{\text{GS}}=10\text{V}, I_{\text{D}}=3.5\text{A}$                                               |
| $C_{\text{iss}}$     | 输入电容         |     | 970  | 1260      | pF                   | $V_{\text{DS}}=25\text{V}, V_{\text{GS}}=0, f=1\text{MHz}$                                         |
| $C_{\text{oss}}$     | 输出电容         |     | 80   | 110       | pF                   |                                                                                                    |
| $C_{\text{rss}}$     | 反向传输电容       |     | 17   | 22        | pF                   |                                                                                                    |
| $t_{\text{d(on)}}$   | 导通延迟时间       |     | 20   | 40        | nS                   | $V_{\text{DS}}=300\text{V},$<br>$I_{\text{D}}=7.0\text{A}$ (峰值)<br>$R_{\text{G}}=25\Omega$<br>(注2) |
| $t_{\text{r}}$       | 上升时间         |     | 55   | 110       | nS                   |                                                                                                    |
| $t_{\text{d(off)}}$  | 断开延迟时间       |     | 90   | 180       | nS                   |                                                                                                    |
| $t_{\text{f}}$       | 下降时间         |     | 60   | 120       | nS                   | $V_{\text{DS}}=480\text{V}$<br>$V_{\text{GS}}=10\text{V}$<br>$I_{\text{D}}=7.0\text{A}$ (注2)       |
| $Q_{\text{g}}$       | 栅极总电荷        |     | 40   | 52        | nC                   |                                                                                                    |
| $Q_{\text{gs}}$      | 栅极—源极电荷      |     | 6.5  |           | nC                   |                                                                                                    |
| $Q_{\text{gd}}$      | 栅极—漏极电荷      |     | 16.5 |           | nC                   |                                                                                                    |
| $I_{\text{S}}$       | 源极—漏极二极管正向电流 |     |      | 7.0       | A                    | $I_{\text{S}}=7.0\text{A}, V_{\text{GS}}=0$                                                        |
| $V_{\text{SD}}$      | 源极—漏极二极管导通电压 |     |      | 1.4       | V                    |                                                                                                    |
| $R_{\text{th(j-c)}}$ | 热阻           |     |      | 2.6       | $^{\circ}\text{C/W}$ | 结到外壳                                                                                               |

\*注1：漏极电流受最大结温限制。

\*注2：脉冲测试，宽度 $\leq 300\mu\text{S}$ ，占空比 $\leq 2\%$



特性曲线

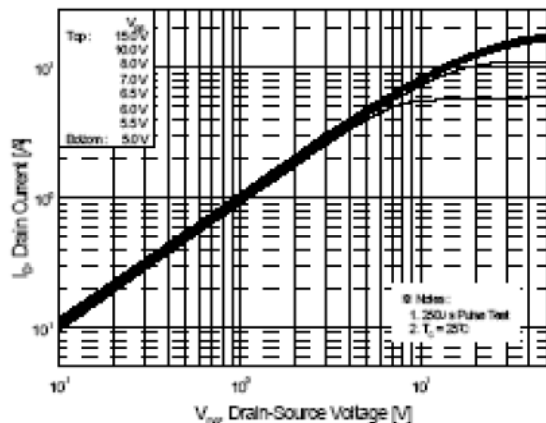


Figure 1. On Region Characteristics

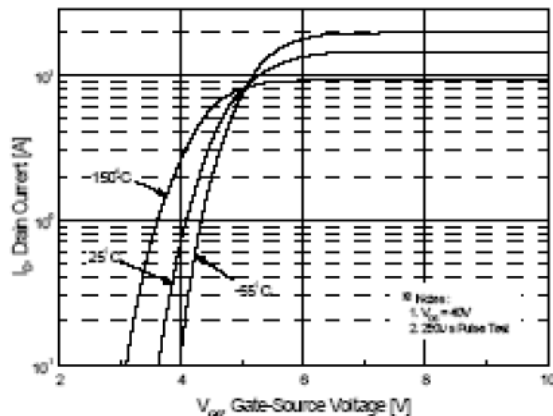


Figure 2. Transfer Characteristics

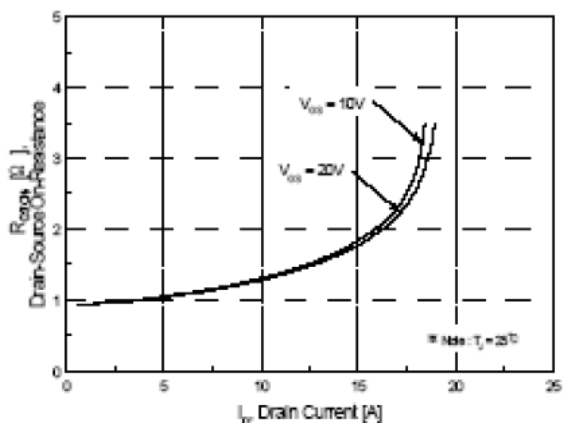


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

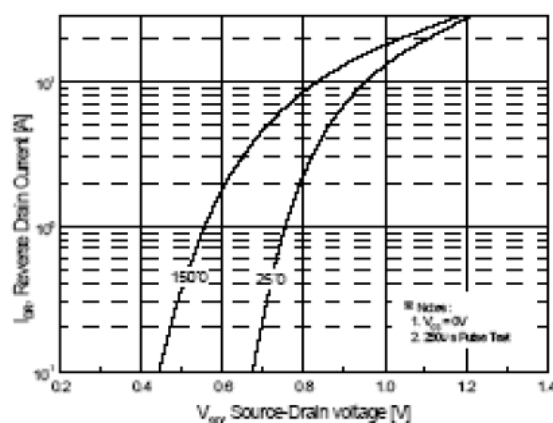


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

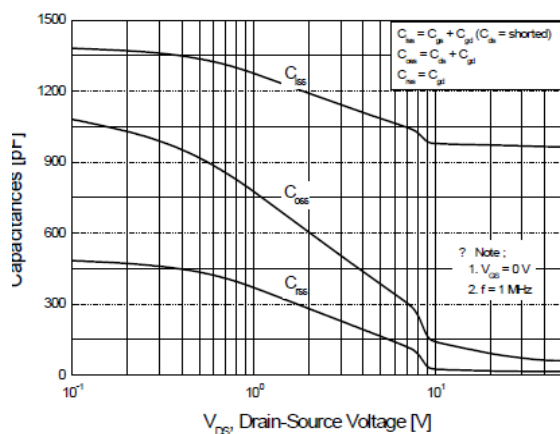


Figure 5. Capacitance Characteristics

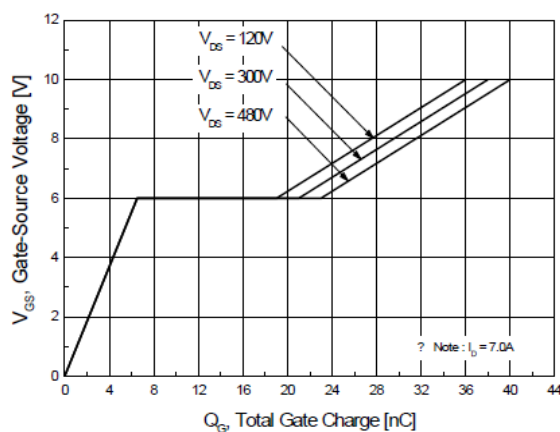


Figure 6. Gate Charge Characteristics



## 特性曲线

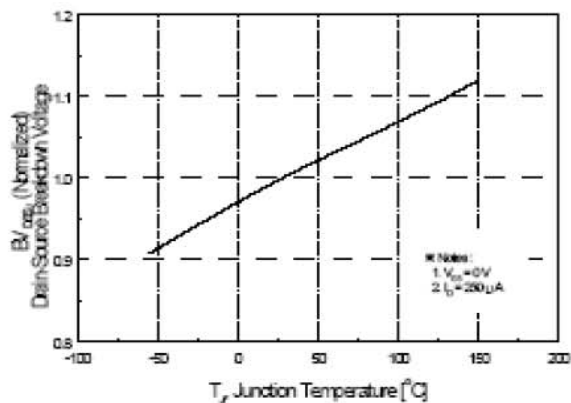


Figure 7. Breakdown Voltage Variation vs Temperature

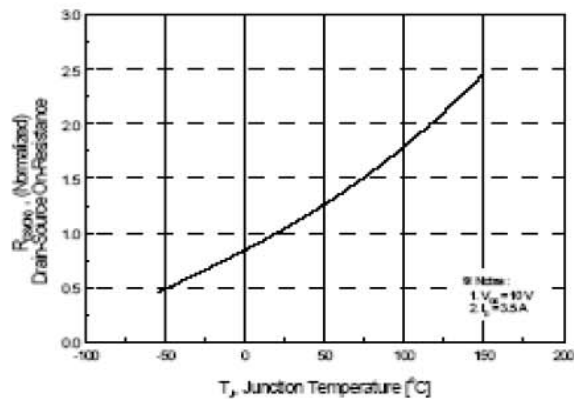


Figure 8. On-Resistance Variation vs Temperature

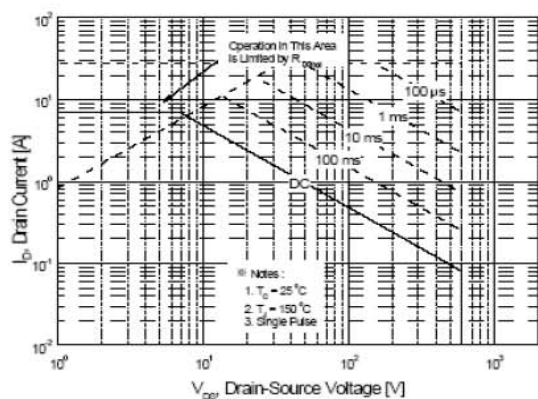


Figure 9. Maximum Safe Operating Area

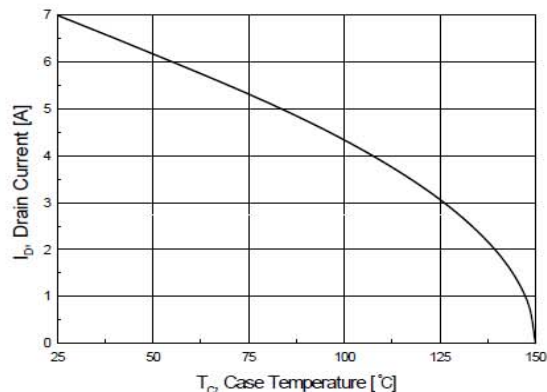


Figure 10. Maximum Drain Current vs Case Temperature

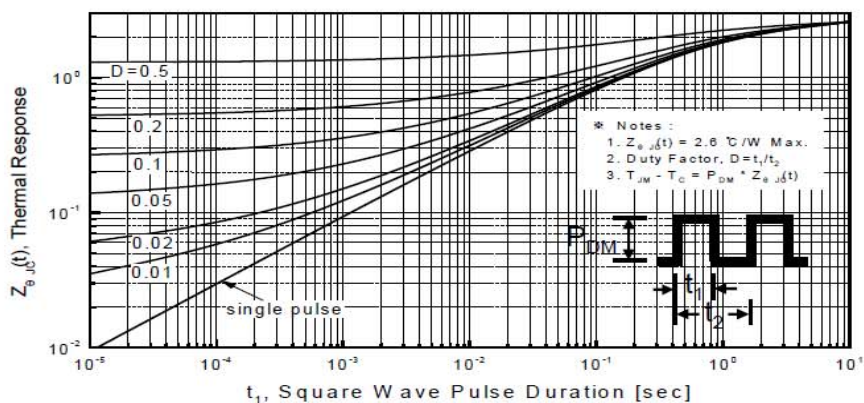


Figure 11. Transient Thermal Response Curve



## ■ 特性曲线

Fig 12. Gate Charge Test Circuit & Waveform

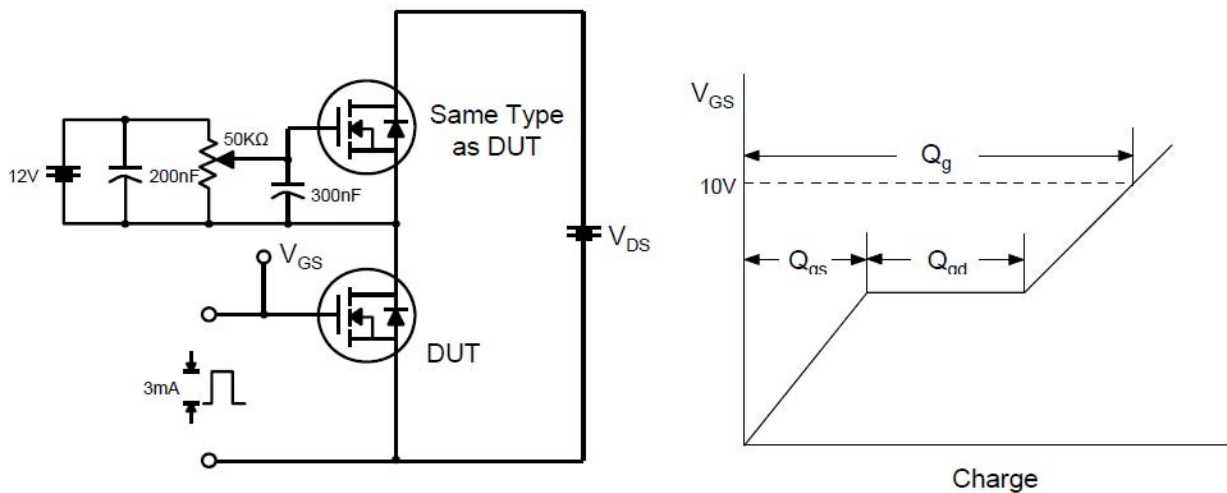


Fig 13. Resistive Switching Test Circuit & Waveforms

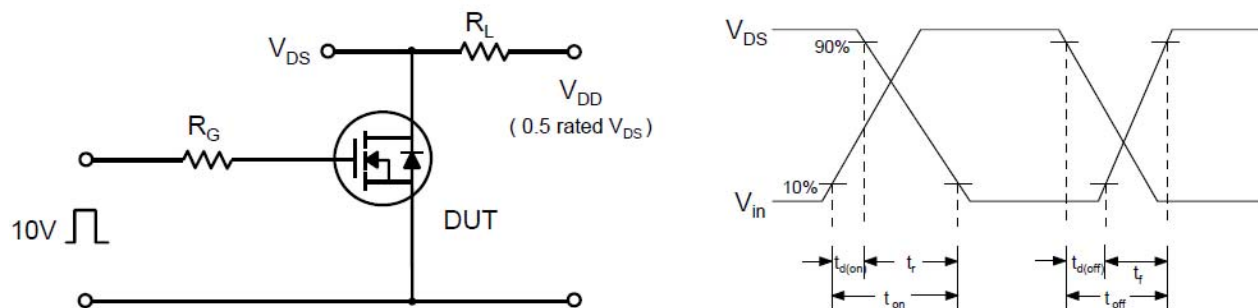
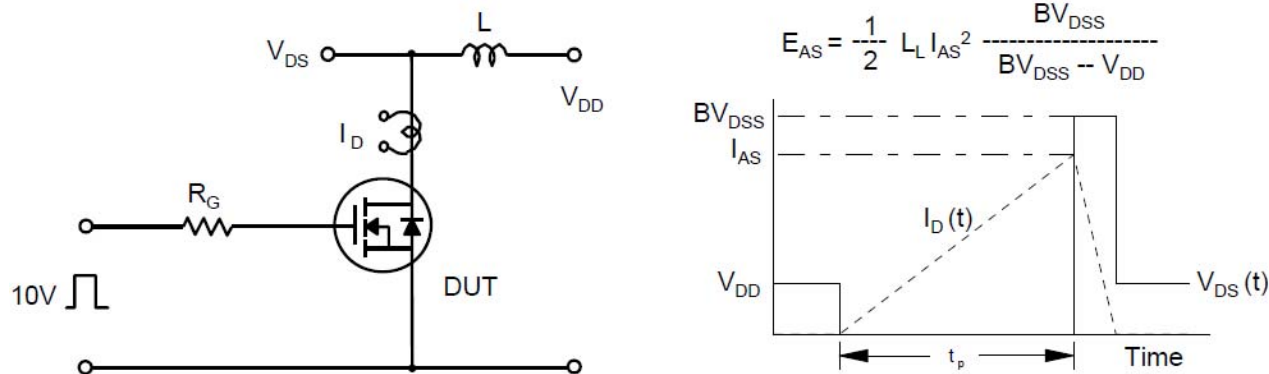


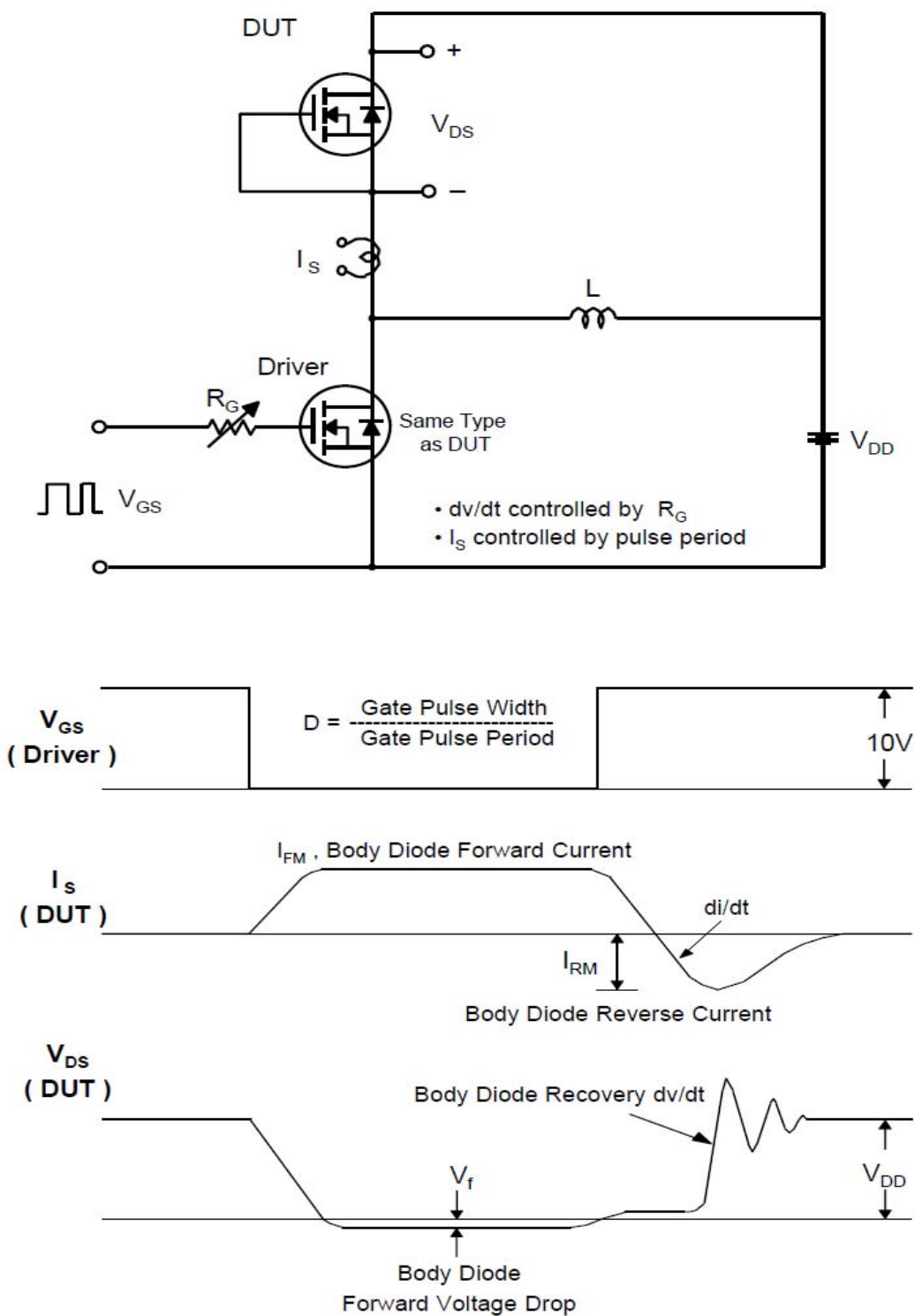
Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms





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Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms





汕头华汕电子器件有限公司

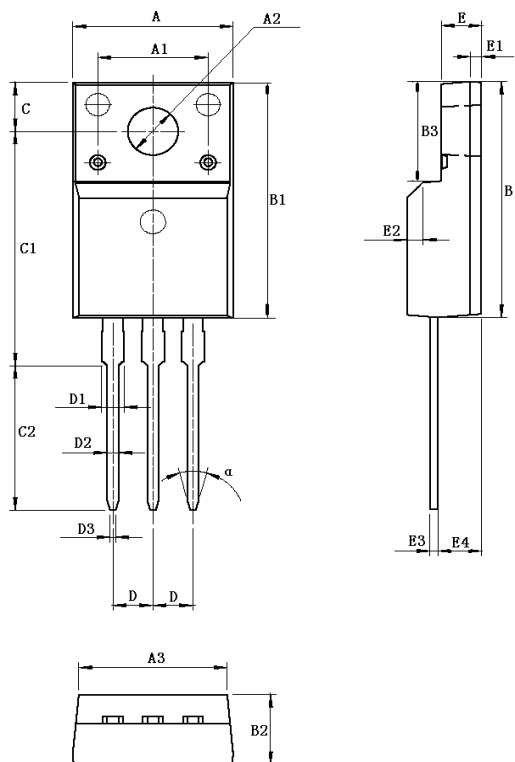
N-Channel Enhancement Mode Field Effect Transistor

**HFF7N60**

对应国外型号

FQPF7N60

■ 外形尺寸图



| Symbol | Millimeters |     |       | Symbol | Millimeters |         |      |
|--------|-------------|-----|-------|--------|-------------|---------|------|
|        | Min         | Nom | Max   |        | Min         | Nom     | Max  |
| A      | 9.96        |     | 10.36 | D      |             | 2.54    |      |
| A1     |             | 7.0 |       | D1     |             |         | 1.47 |
| A2 (Φ) | 3.08        |     | 3.28  | D2     | 0.70        |         | 0.90 |
| A3     | 9.26        |     | 9.66  | D3     | 0.25        |         | 0.45 |
| B1     | 15.67       |     | 16.07 | E      | 2.34        |         | 2.74 |
| B2     | 4.50        |     | 4.90  | E1     |             | 0.70    |      |
| B3     | 6.48        |     | 6.88  | E2     |             | 1.0×45° |      |
| C      | 3.20        |     | 3.40  | E3     | 0.45        |         | 0.60 |
| C1     | 15.60       |     | 16.00 | E4     | 2.56        | 2.76    | 2.96 |
| C2     | 9.55        |     | 9.95  | α(°)   |             | 30°     |      |