

## TSSOP-8 20V Dual N Channel Enhancement 双 N 沟道增强型带静电保护 MOS Field Effect Transistor 场效应管

### ■Features 特点

Low on-resistance 低导通电阻

$R_{DS(ON)}=12.5m\Omega(\text{Type})@V_{GS}=4.5V$

$R_{DS(ON)}=16m\Omega(\text{Type})@V_{GS}=2.5V$

$R_{DS(ON)}=22m\Omega(\text{Type})@V_{GS}=1.8V$

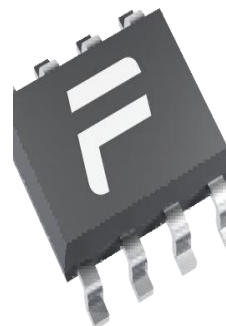
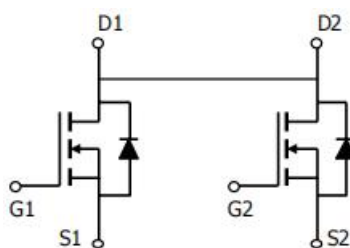
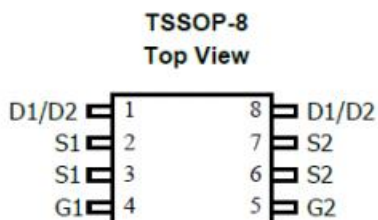
### ■Applications 应用

Portable Equipment 桌面设备

Battery Powered System 电池电源系统

Power Management in Note Book 笔记本电源管理

### ■Internal Schematic Diagram 内部结构



### ■Absolute Maximum Ratings 最大额定值

| Characteristic 特性参数                    | Symbol 符号                          | Rat 额定值  | Unit 单位      |
|----------------------------------------|------------------------------------|----------|--------------|
| Drain-Source Voltage 漏极-源极电压           | $BV_{DSS}$                         | 20       | V            |
| Gate- Source Voltage 栅极-源极电压           | $V_{GS}$                           | $\pm 10$ | V            |
| Drain Current (continuous)漏极电流-连续      | $I_D$ (at $T_A = 25^\circ C$ )     | 7        | A            |
| Drain Current (pulsed)漏极电流-脉冲          | $I_{DM}$                           | 30       | A            |
| Total Device Dissipation 总耗散功率         | $P_D(\text{at } T_A = 25^\circ C)$ | 1500     | mW           |
| Thermal Resistance Junction-Ambient 热阻 | $R_{\theta JA}$                    | 83       | $^\circ C/W$ |
| Junction/Storage Temperature 结温/储存温度   | $T_J, T_{stg}$                     | -55~150  | $^\circ C$   |

**■ Electrical Characteristics 电特性**

 (T<sub>A</sub>=25°C unless otherwise noted 如无特殊说明, 温度为 25°C)

| Characteristic<br>特性参数                                                                                                                                                                         | Symbol<br>符号        | Min<br>最小值 | Typ<br>典型值       | Max<br>最大值     | Unit<br>单位 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------|------------------|----------------|------------|
| Drain-Source Breakdown Voltage<br>漏极-源极击穿电压(I <sub>D</sub> =250uA, V <sub>GS</sub> =0V)                                                                                                        | BV <sub>DSS</sub>   | 20         | —                | —              | V          |
| Gate Threshold Voltage<br>栅极开启电压(I <sub>D</sub> =250uA, V <sub>GS</sub> =V <sub>DS</sub> )                                                                                                     | V <sub>GS(th)</sub> | 0.4        | 0.75             | 1.0            | V          |
| Zero Gate Voltage Drain Current<br>零栅压漏极电流(V <sub>GS</sub> =0V, V <sub>DS</sub> =20V)                                                                                                          | I <sub>DSS</sub>    | —          | —                | 1              | μA         |
| Gate Body Leakage<br>栅极漏电流(V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V)                                                                                                                          | I <sub>GSS</sub>    | —          | —                | ±10            | μA         |
| Static Drain-Source On-State Resistance<br>静态漏源导通电阻(I <sub>D</sub> =7A, V <sub>GS</sub> =4.5V)<br>(I <sub>D</sub> =6.5A, V <sub>GS</sub> =2.5V)<br>(I <sub>D</sub> =5A, V <sub>GS</sub> =1.8V) | R <sub>DS(ON)</sub> | —          | 12.5<br>16<br>22 | 19<br>22<br>30 | mΩ         |
| Diode Forward Voltage Drop<br>内附二极管正向压降(I <sub>SD</sub> =1A, V <sub>GS</sub> =0V)                                                                                                              | V <sub>SD</sub>     | —          | 0.7              | 1.3            | V          |
| Input Capacitance 输入电容<br>(V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz)                                                                                                                  | C <sub>ISS</sub>    | —          | 1300             | —              | pF         |
| Common Source Output Capacitance<br>共源输出电容(V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz)                                                                                                  | C <sub>OSS</sub>    | —          | 195              | —              | pF         |
| Reverse Transfer Capacitance 反馈电容<br>(V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, f=1MHz)                                                                                                       | C <sub>RSS</sub>    | —          | 155              | —              | pF         |
| Total Gate Charge 栅极电荷密度<br>(V <sub>DS</sub> =10V, I <sub>D</sub> =7A, V <sub>GS</sub> =4.5V)                                                                                                  | Q <sub>g</sub>      | —          | 16               | —              | nC         |
| Gate Source Charge 栅源电荷密度<br>(V <sub>DS</sub> =10V, I <sub>D</sub> =7A, V <sub>GS</sub> =4.5V)                                                                                                 | Q <sub>gs</sub>     | —          | 2                | —              | nC         |
| Gate Drain Charge 栅漏电荷密度<br>(V <sub>DS</sub> =10V, I <sub>D</sub> =7A, V <sub>GS</sub> =4.5V)                                                                                                  | Q <sub>gd</sub>     | —          | 7                | —              | nC         |
| Turn-ON Delay Time 开启延迟时间<br>(V <sub>DS</sub> =10V I <sub>D</sub> =7A, R <sub>GEN</sub> =3.3 Ω, V <sub>GS</sub> =4.5V)                                                                         | t <sub>d(on)</sub>  | —          | 7                | —              | ns         |
| Turn-ON Rise Time 开启上升时间<br>(V <sub>DS</sub> =10V I <sub>D</sub> =7A, R <sub>GEN</sub> =3.3 Ω, V <sub>GS</sub> =4.5V)                                                                          | t <sub>r</sub>      | —          | 11               | —              | ns         |
| Turn-OFF Delay Time 关断延迟时间<br>(V <sub>DS</sub> =10V I <sub>D</sub> =7A, R <sub>GEN</sub> =3.3 Ω, V <sub>GS</sub> =4.5V)                                                                        | t <sub>d(off)</sub> | —          | 64               | —              | ns         |
| Turn-OFF Fall Time 关断下降时间<br>(V <sub>DS</sub> =10V I <sub>D</sub> =7A, R <sub>GEN</sub> =3.3 Ω, V <sub>GS</sub> =4.5V)                                                                         | t <sub>f</sub>      | —          | 32               | —              | ns         |

■ Typical Characteristic Curve 典型特性曲线

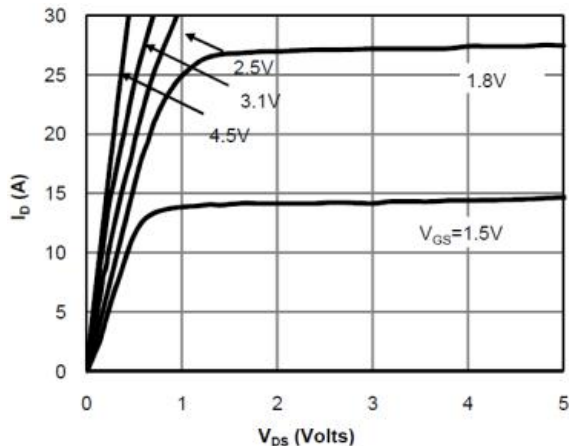


Figure 1: Output Characteristics

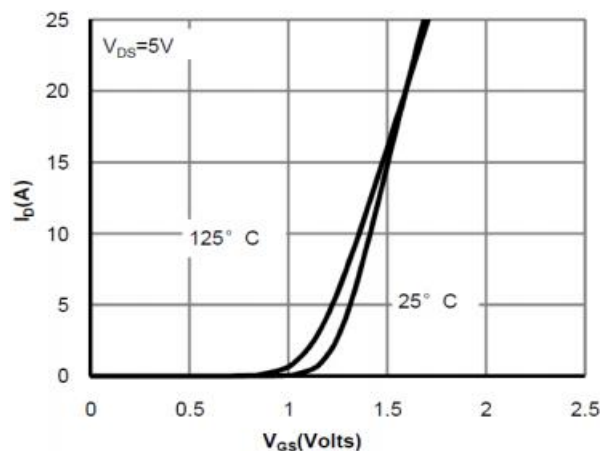


Figure 2: Transfer Characteristics

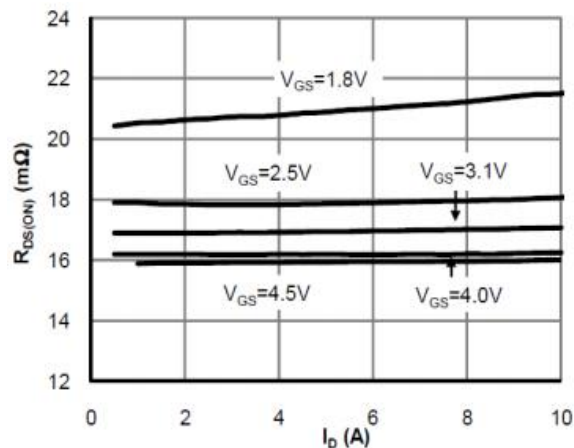


Figure 3: On-Resistance vs. Drain Current

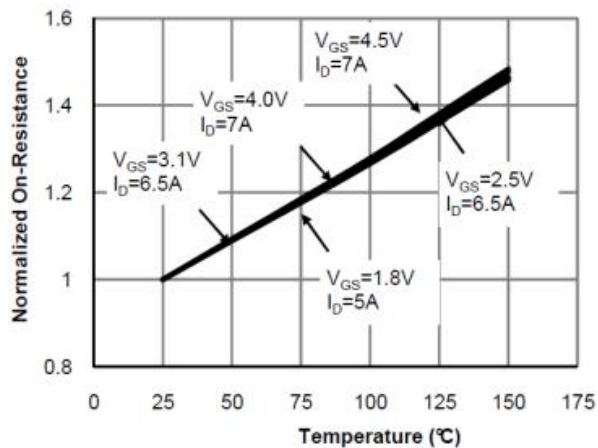


Figure 4: On-Resistance vs. Temperature

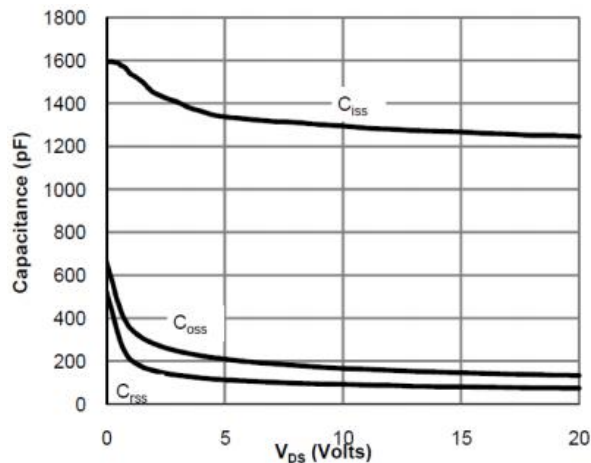


Figure 5: Capacitance Characteristics

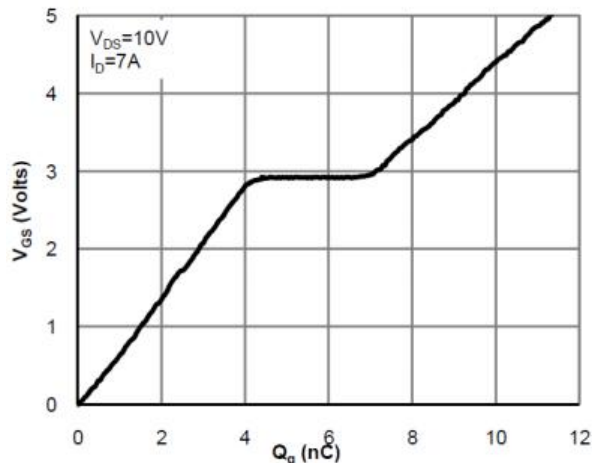


Figure 6: Gate-Charge Characteristics

■ Typical Characteristic Curve 典型特性曲线

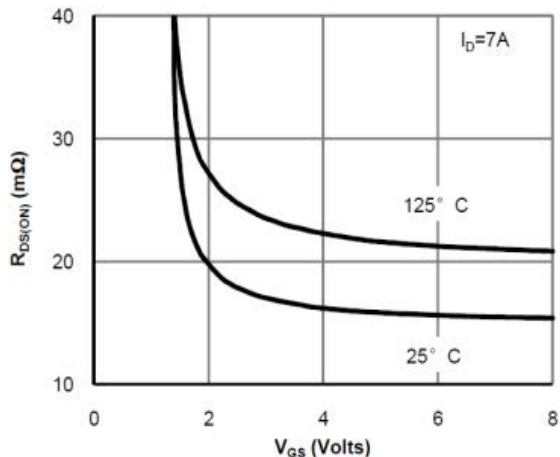


Figure 7: Drain Current vs.  $V_{GS}$

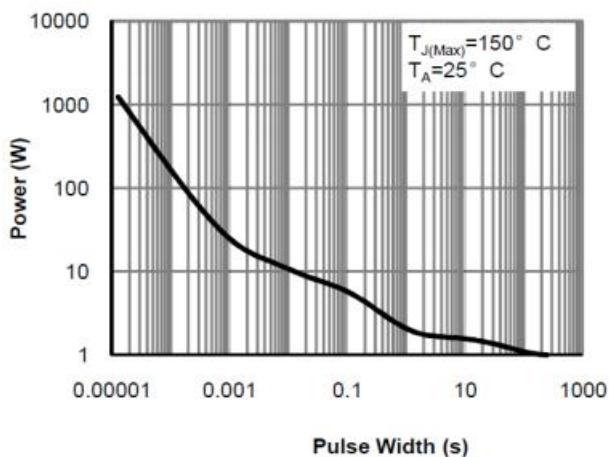


Figure 8: Power Rating Curve

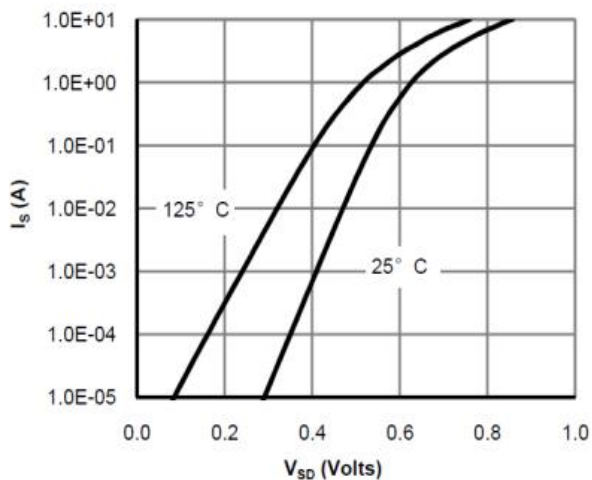


Figure 9: Diode Characteristics

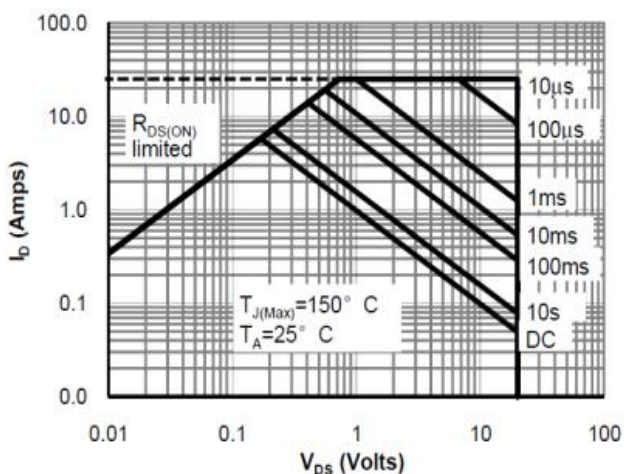


Figure 10: Safe Operating Area

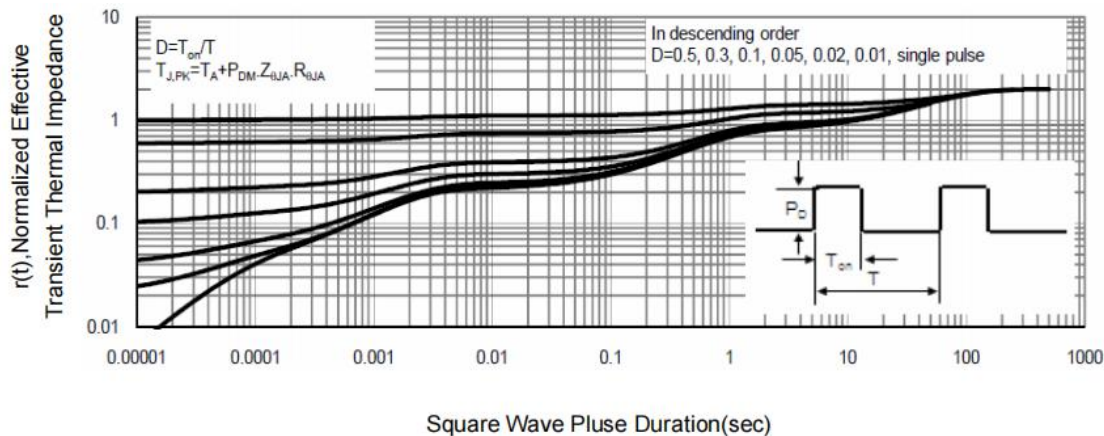
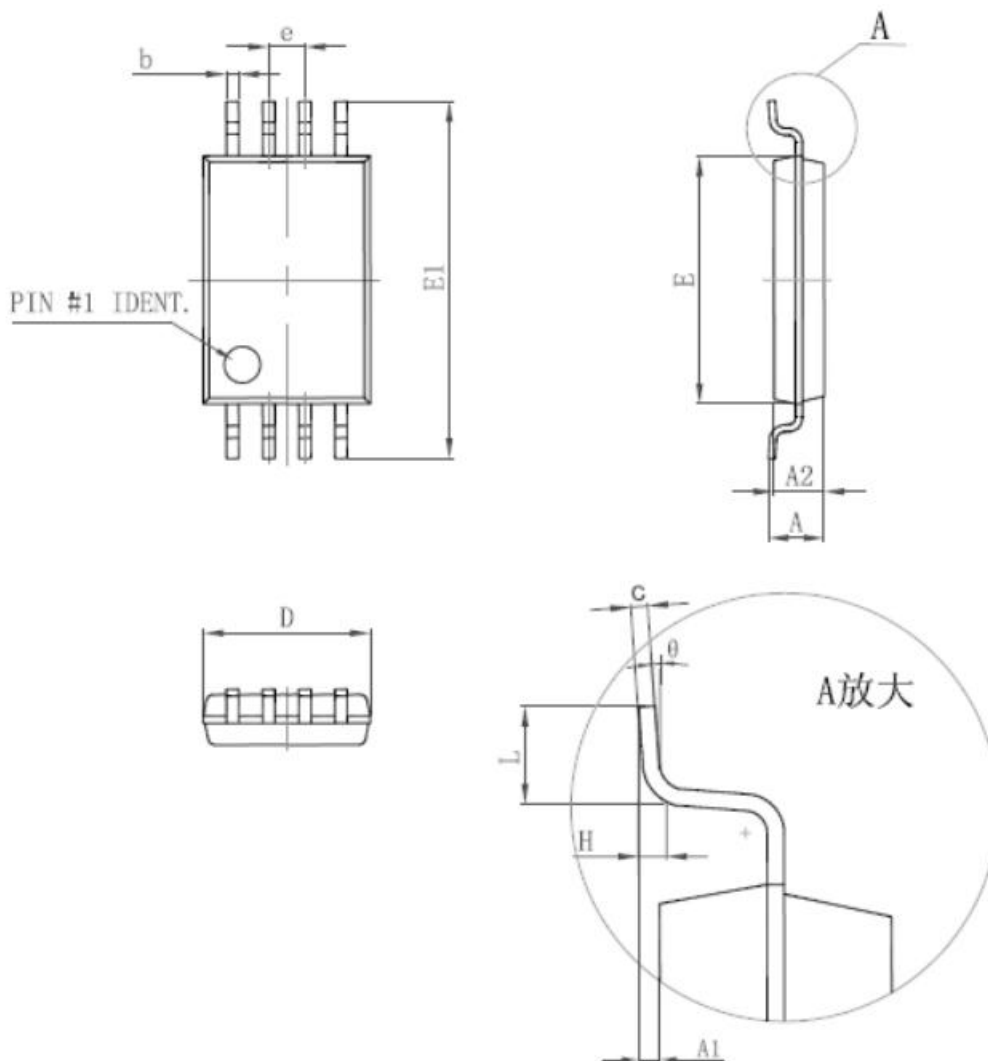


Figure 11: Transient Thermal Response Curve

■ Dimension 外形封装尺寸



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min                       | Max   | Min                  | Max   |
| D        | 2.900                     | 3.100 | 0.114                | 0.122 |
| E        | 4.300                     | 4.500 | 0.169                | 0.177 |
| b        | 0.190                     | 0.300 | 0.007                | 0.012 |
| c        | 0.090                     | 0.200 | 0.004                | 0.008 |
| E1       | 6.250                     | 6.550 | 0.246                | 0.258 |
| A        |                           | 1.100 |                      | 0.043 |
| A2       | 0.800                     | 1.000 | 0.031                | 0.039 |
| A1       | 0.020                     | 0.150 | 0.001                | 0.006 |
| e        | 0.65 (BSC)                |       | 0.026 (BSC)          |       |
| L        | 0.500                     | 0.700 | 0.020                | 0.028 |
| H        | 0.25 (TYP)                |       | 0.01 (TYP)           |       |
| $\theta$ | 1°                        | 7°    | 1°                   | 7°    |