

## PDFN3.3X3.3-8 P Channel Enhancement 沟道增强型 MOS Field Effect Transistor 场效应管

### ■ Features 特点

Low on-resistance 低导通电阻

$R_{DS(ON)}=6m\Omega(\text{Type})@V_{GS}=-10V$

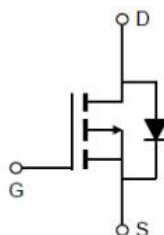
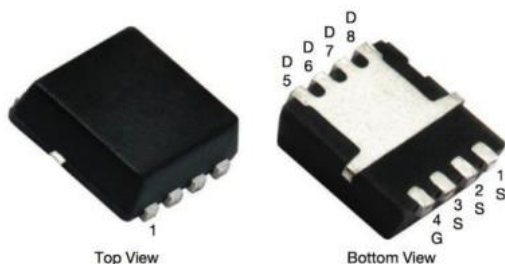
$R_{DS(ON)}=11m\Omega(\text{Type})@V_{GS}=-4.5V$

### ■ Applications 应用

Portable Equipment 便携设备

Power Management 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           | $BV_{DSS}$                                                  | -30        | V            |
| Gate- Source Voltage 栅极-源极电压           | $V_{GS}$                                                    | $\pm 20$   | V            |
| Drain Current (continuous)漏极电流-连续      | $I_D$ (at $T_A = 25^\circ C$<br>at $T_C = 25^\circ C$ )     | -16<br>-50 | A            |
| Drain Current (pulsed)漏极电流-脉冲          | $I_{DM}$                                                    | -70        | A            |
| Total Device Dissipation 总耗散功率         | $P_{TOT}$ (at $T_A = 25^\circ C$<br>at $T_C = 25^\circ C$ ) | 3.1<br>30  | W            |
| Avalanche Energy(Single Pulse)雪崩能量     | $E_{AS}$                                                    | 49         | mJ           |
| Thermal Resistance Junction-Ambient 热阻 | $R_{\theta JA}/R_{\theta JC}$                               | 40/4.2     | $^\circ C/W$ |
| 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℃ unless otherwise noted 如无特殊说明, 温度为 25℃)

| 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>   | -30        | —          | —          | 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> | -1         | -1.5       | -3         | V          |
| Zero Gate Voltage Drain Current<br>零栅压漏极电流(V <sub>GS</sub> =0V, V <sub>DS</sub> = -30V)                                                               | I <sub>DSS</sub>    | —          | —          | -1         | μA         |
| Gate Body Leakage<br>栅极漏电流(V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V)                                                                                | I <sub>GSS</sub>    | —          | —          | ±100       | nA         |
| Static Drain-Source On-State Resistance<br>静态漏源导通电阻(I <sub>D</sub> = -16A, V <sub>GS</sub> = -10V)<br>(I <sub>D</sub> = -8A, V <sub>GS</sub> = -4.5V) | R <sub>DS(ON)</sub> | —          | 6<br>11    | 8<br>15    | 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         | V          |
| Input Capacitance 输入电容<br>(V <sub>GS</sub> =0V, V <sub>DS</sub> = -15V, f=1MHz)                                                                       | C <sub>ISS</sub>    | —          | 2300       | —          | pF         |
| Common Source Output Capacitance<br>共源输出电容(V <sub>GS</sub> =0V, V <sub>DS</sub> = -15V, f=1MHz)                                                       | C <sub>OSS</sub>    | —          | 400        | —          | pF         |
| Reverse Transfer Capacitance 反馈电容<br>(V <sub>GS</sub> =0V, V <sub>DS</sub> = -15V, f=1MHz)                                                            | C <sub>RSS</sub>    | —          | 350        | —          | pF         |
| Total Gate Charge 栅极电荷密度<br>(V <sub>DS</sub> = -15V, I <sub>D</sub> = -16A, V <sub>GS</sub> = -10V)                                                   | Q <sub>g</sub>      | —          | 20         | —          | nC         |
| Gate Source Charge 栅源电荷密度<br>(V <sub>DS</sub> = -15V, I <sub>D</sub> = -16A, V <sub>GS</sub> = -10V)                                                  | Q <sub>gs</sub>     | —          | 1          | —          | nC         |
| Gate Drain Charge 栅漏电荷密度<br>(V <sub>DS</sub> = -15V, I <sub>D</sub> = -16A, V <sub>GS</sub> = -10V)                                                   | Q <sub>gd</sub>     | —          | 8          | —          | nC         |
| Turn-ON Delay Time 开启延迟时间<br>(V <sub>DS</sub> = -15V I <sub>D</sub> = -1A, R <sub>GEN</sub> =6Ω, V <sub>GS</sub> = -10V)                              | t <sub>d(on)</sub>  | —          | 12         | —          | ns         |
| Turn-ON Rise Time 开启上升时间<br>(V <sub>DS</sub> = -15V I <sub>D</sub> = -1A, R <sub>GEN</sub> =6Ω, V <sub>GS</sub> = -10V)                               | t <sub>r</sub>      | —          | 11         | —          | ns         |
| Turn-OFF Delay Time 关断延迟时间<br>(V <sub>DS</sub> = -15V I <sub>D</sub> = -1A, R <sub>GEN</sub> =6Ω, V <sub>GS</sub> = -10V)                             | t <sub>d(off)</sub> | —          | 38         | —          | ns         |
| Turn-OFF Fall Time 关断下降时间<br>(V <sub>DS</sub> = -15V I <sub>D</sub> = -1A, R <sub>GEN</sub> =6Ω, V <sub>GS</sub> = -10)                               | t <sub>f</sub>      | —          | 50         | —          | ns         |

■ Typical Characteristic Curve 典型特性曲线

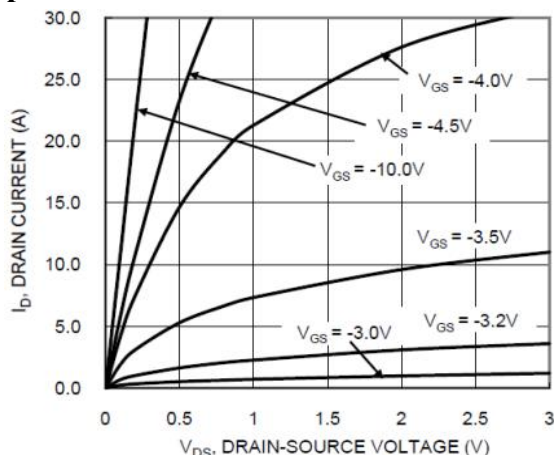


Figure 1: Output Characteristics

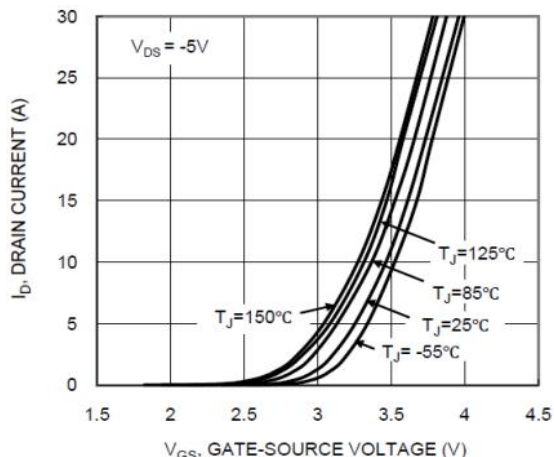


Figure 2: Transfer Characteristics

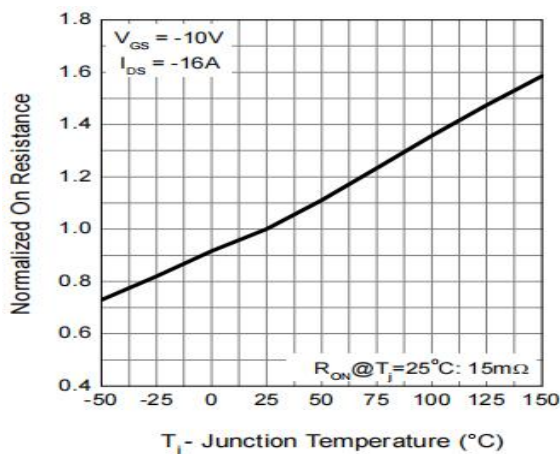


Figure 3: On-Resistance vs.  $T_J$

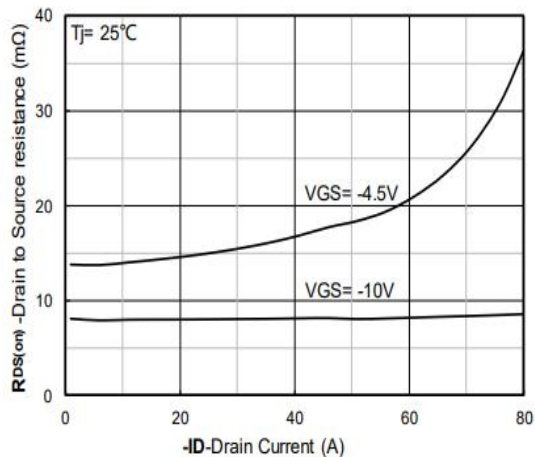


Figure 4: On-Resistance vs. Drain Current

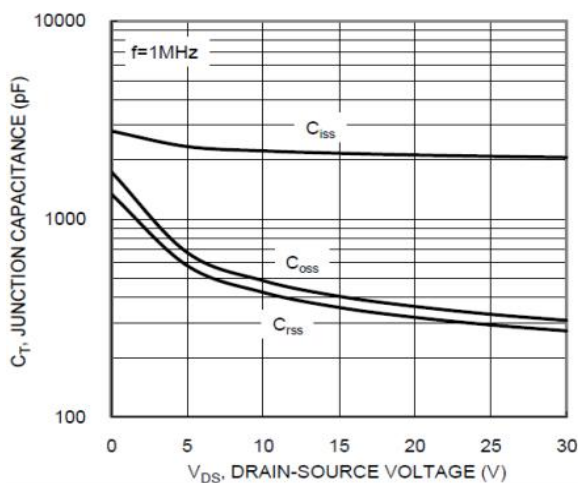


Figure 5: Capacitance Characteristics

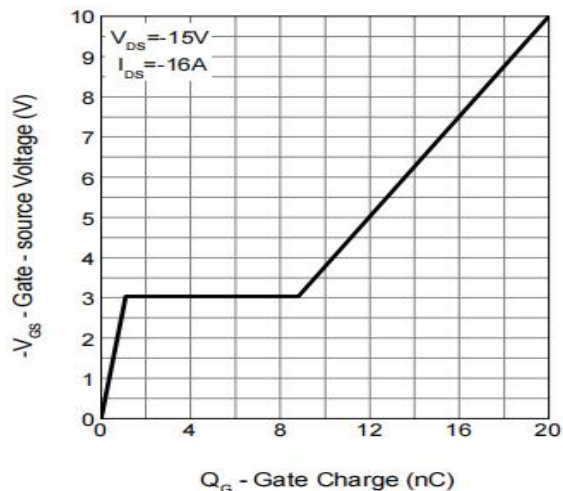


Figure 6: Gate-Charge Characteristics

■ Typical Characteristic Curve 典型特性曲线

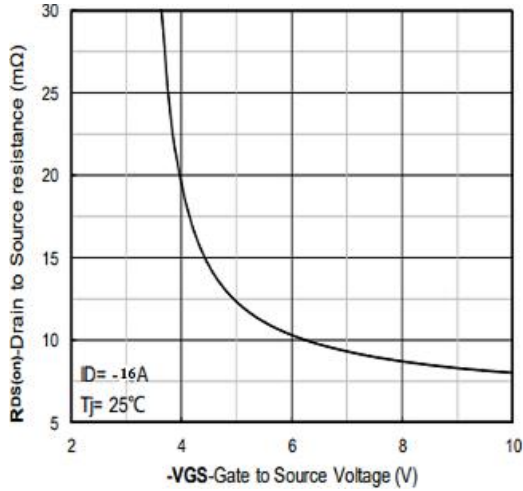


Figure 7: On-Resistance vs.  $V_{GS}$

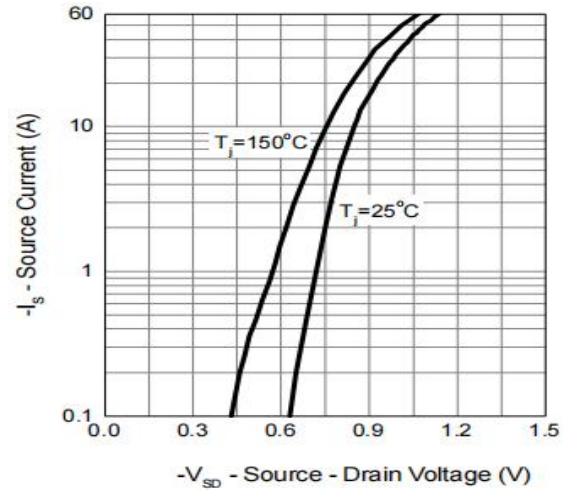


Figure 8: Diode Characteristics

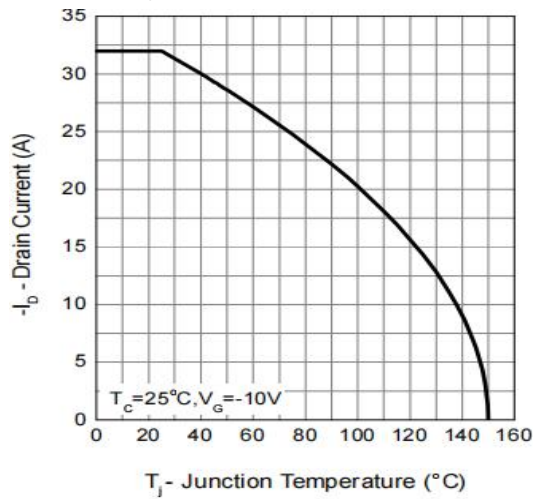


Figure 9: Drain Current Characteristics

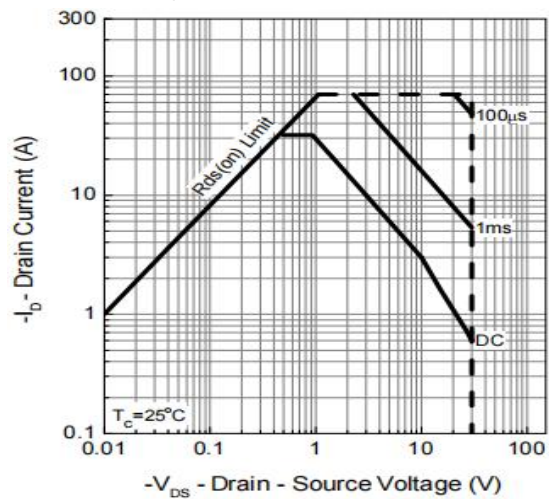


Figure 10: Safe Operating Area

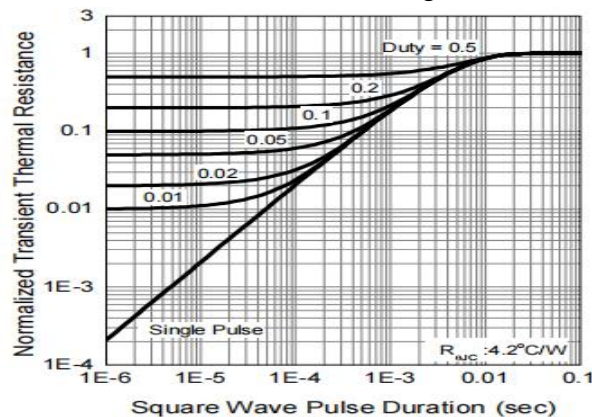
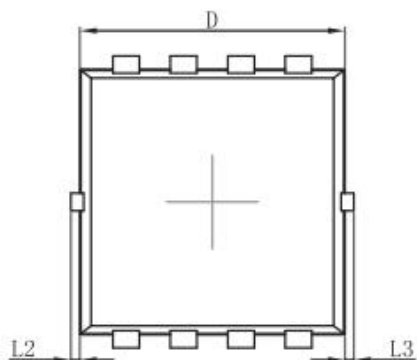
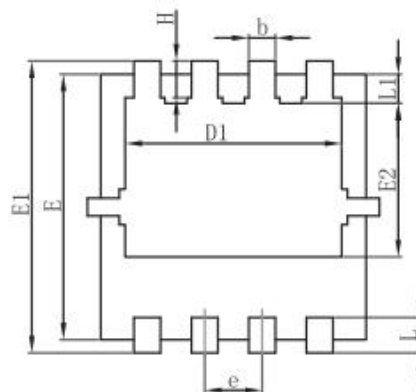


Figure 11: Transient Thermal Response Curve

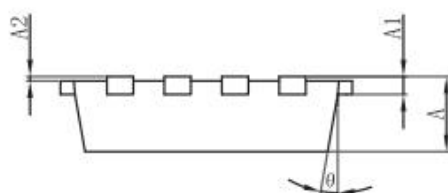
■ **Dimension 外形封装尺寸**



Top View



Bottom View



Side View

| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.650                     | 0.850 | 0.026                | 0.033 |
| A1     | 0.152 REF.                |       | 0.006 REF.           |       |
| A2     | 0~0.05                    |       | 0~0.002              |       |
| D      | 2.900                     | 3.100 | 0.114                | 0.122 |
| D1     | 2.300                     | 2.600 | 0.091                | 0.102 |
| E      | 2.900                     | 3.100 | 0.114                | 0.122 |
| E1     | 3.150                     | 3.450 | 0.124                | 0.136 |
| E2     | 1.535                     | 1.935 | 0.060                | 0.076 |
| b      | 0.200                     | 0.400 | 0.008                | 0.016 |
| e      | 0.550                     | 0.750 | 0.022                | 0.030 |
| L      | 0.300                     | 0.500 | 0.012                | 0.020 |
| L1     | 0.180                     | 0.480 | 0.007                | 0.019 |
| L2     | 0~0.100                   |       | 0~0.004              |       |
| L3     | 0~0.100                   |       | 0~0.004              |       |
| H      | 0.315                     | 0.515 | 0.012                | 0.020 |
| θ      | 9°                        | 13°   | 9°                   | 13°   |