

**描述 / Descriptions**

PDFN3×3-8L 塑封封装互补增强模式 MOS 场效应管。

Complementary Enhancement MOSFET in a PDFN3×3-8L Plastic Package.

**特征 / Features**

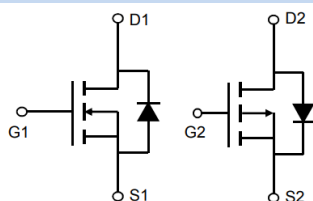
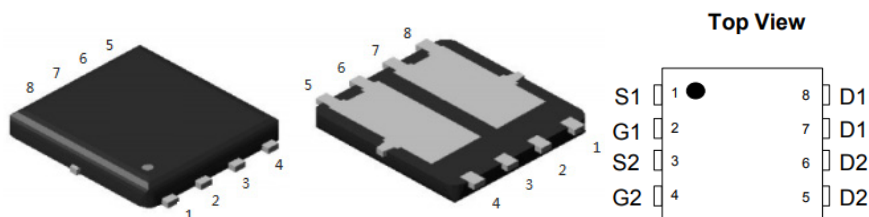
|                         |                          |
|-------------------------|--------------------------|
| N-channel               | P-channel                |
| VDS(V)=30V              | VDS(V)=-30V              |
| ID=20A                  | ID=-12A                  |
| RDS(ON)<25mΩ (VGS=10V)  | RDS(ON)<60mΩ (VGS=-10V)  |
| RDS(ON)<40mΩ (VGS=4.5V) | RDS(ON)<85mΩ (VGS=-4.5V) |

无卤产品。Halogen-free Product.

**用途 / Applications**

用于高功率 DC/DC 转换和功率开关。适用于作负载开关或脉宽调制应用。

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies. And suitable for use as a load switch or in PWM applications.

**内部等效电路 / Equivalent Circuit****引脚排列 / Pinning****印章代码 / 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 |
|----------------------------------------|--------------------------------------|--------------|----------|------------|
|                                        |                                      | N-CHANNE     | P-CHANNE |            |
| Drain-Source Voltage                   | $V_{DSS}$                            | $\pm 30$     |          | V          |
| Gate-Source Voltage                    | $V_{GSS}$                            | $\pm 20$     |          | V          |
| Continuous Drain Current               | $I_D (T_A=25^\circ\text{C})$         | 20           | 12       | A          |
| Power Dissipation                      | $P_D (T_A=25^\circ\text{C})$         | 11.2         | 10       | W          |
| Junction and Storage Temperature Range | $T_J, T_{STG}$                       | -55 to +150  |          | °C         |
| Maximum Junction-to-Case               | $R_{\theta JC}(\text{Steady-State})$ | 11.2         | 12.5     | °C/W       |
| Maximum Junction-to-Ambient            | $R_{\theta JA}(\text{Steady-State})$ | 45           |          | °C/W       |

## N-沟道电性能参数/N-CHANNEL Electrical Characteristics(Ta=25℃)

| 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    | $BV_{DSS}$   | $V_{GS}=0V$ $I_D=250\mu A$                                     | 30         | 35         |            | V          |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=30V$ $V_{GS}=0V$                                       |            |            | 1.0        | $\mu A$    |
|                                   |              | $V_{DS}=30V$ $V_{GS}=0V$<br>$T_J=55^\circ C$                   |            |            | 5.0        | $\mu A$    |
| Gate-Body leakage current         | $I_{GSS}$    | $V_{GS}=\pm 20V$ $V_{DS}=0V$                                   |            |            | 100        | nA         |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ $I_D=250\mu A$                                 | 1.0        | 1.6        | 2.5        | V          |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V$ $I_D=6.9A$                                        |            | 20         | 25         | m $\Omega$ |
|                                   |              | $V_{GS}=4.5V$ $I_D=5.0A$                                       |            | 28         | 40         | m $\Omega$ |
| Diode Forward Voltage             | $V_{SD}$     | $V_{GS}=0V$ $I_S=1.0A$                                         |            | 0.78       | 1.2        | V          |
| Input Capacitance                 | $C_{iss}$    | $V_{DS}=25V$ $V_{GS}=0V$<br>$f=1.0MHz$                         |            | 690        |            | pF         |
| Output Capacitance                | $C_{oss}$    |                                                                |            | 200        |            | pF         |
| Reverse Transfer Capacitance      | $C_{rss}$    |                                                                |            | 130        |            | pF         |
| Gate resistance                   | $R_g$        | $V_{DS}=0V$ $V_{GS}=0V$<br>$f=1.0MHz$                          |            | 2.7        |            | $\Omega$   |
| Total Gate Charge(10V)            | $Q_g$        | $V_{GS}=10V$ $V_{DS}=15V$<br>$I_D=6A$                          |            | 5.2        |            | nC         |
| Total Gate Charge(4.5V)           |              |                                                                |            | 2.5        |            | nC         |
| Gate-Source Charge                | $Q_{gs}$     |                                                                |            | 0.8        |            | nC         |
| Gate-Drain Charge                 | $Q_{gd}$     |                                                                |            | 1.3        |            | nC         |
| Turn-On Delay Time                | $t_{d(on)}$  | $V_{DS}=15V$ $V_{GS}=10V$<br>$R_L=2.5\Omega$ $R_{GEN}=3\Omega$ |            | 4.5        |            | ns         |
| Turn-On Rise Time                 | $t_r$        |                                                                |            | 2.5        |            | ns         |
| Turn-Off Delay Time               | $t_{d(off)}$ |                                                                |            | 14.5       |            | ns         |
| Turn-Off Fall Time                | $t_f$        |                                                                |            | 3.5        |            | ns         |

## N-沟道电参数曲线图 / N-CHANNEL Electrical Characteristic Curve

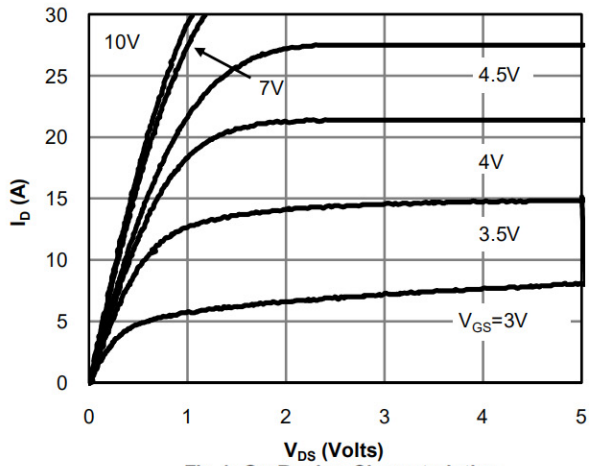


Fig 1: On-Region Characteristics

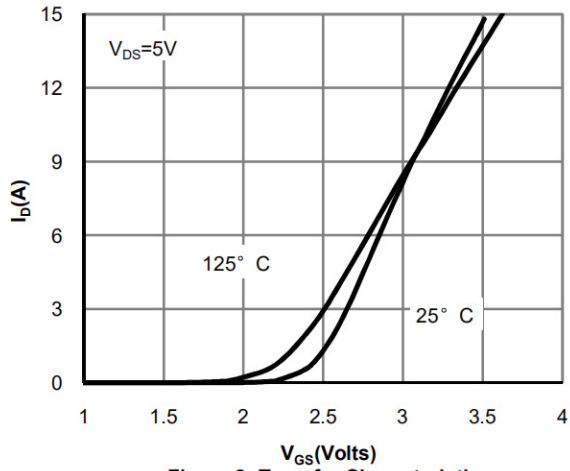


Figure 2: Transfer Characteristics

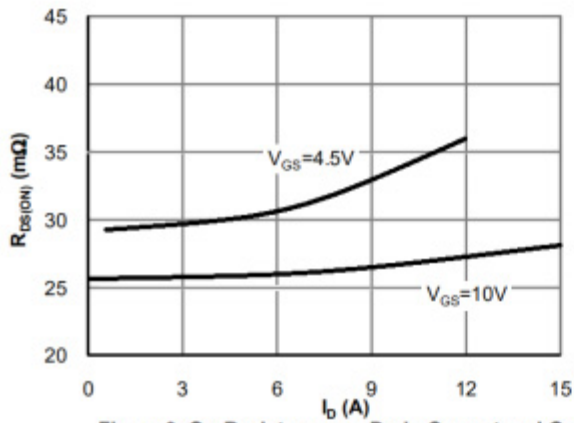


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

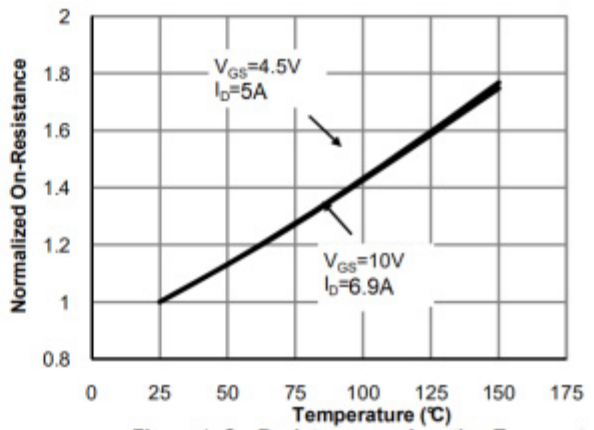


Figure 4: On-Resistance vs. Junction Temperature

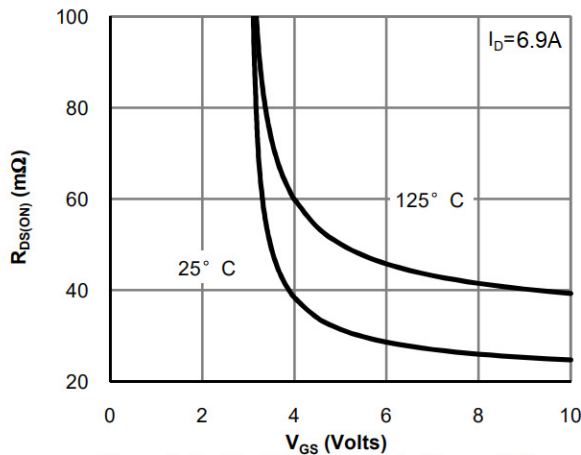


Figure 5: On-Resistance vs. Gate-Source Voltage

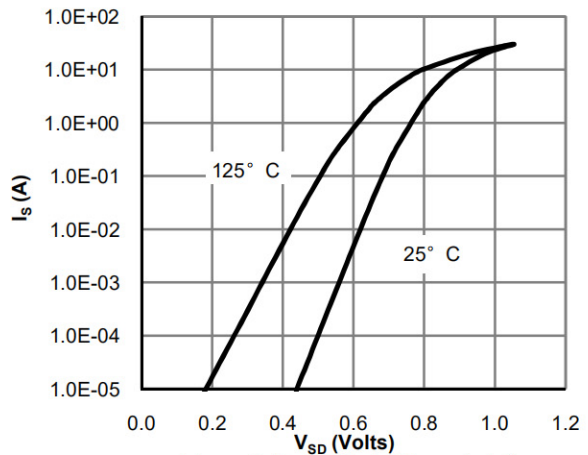
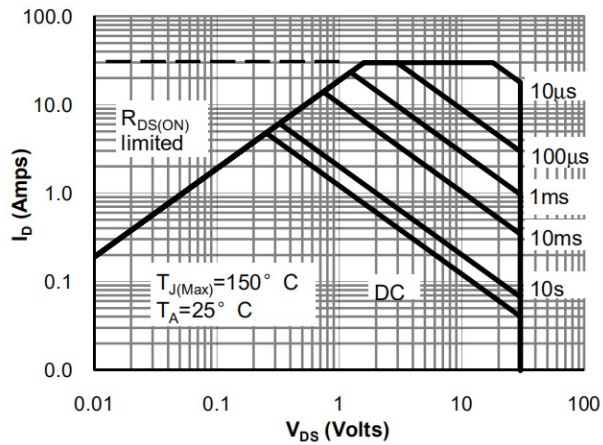
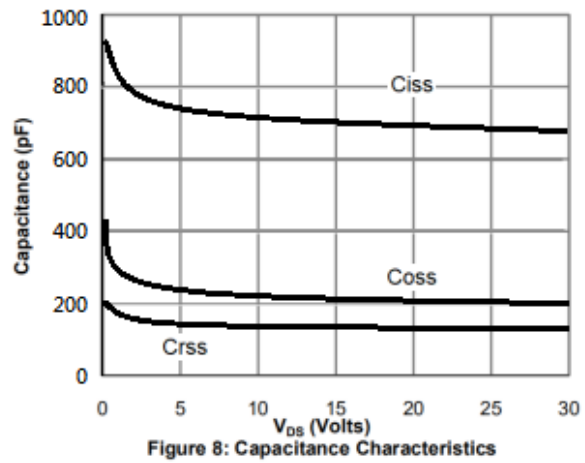
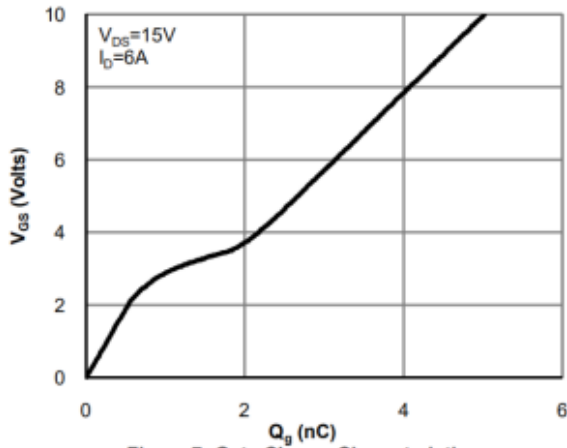


Figure 6: Body-Diode Characteristics

## N-沟道电参数曲线图 / N-CHANNEL Electrical Characteristic Curve



## P-沟道电性能参数/P-CHANNEL 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 <sub>DSS</sub>   | V <sub>GS</sub> =0V I <sub>D</sub> =-250μA                                               | -30        | -34        |            | V          |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | V <sub>DS</sub> =-30V V <sub>GS</sub> =0V                                                |            |            | -1.0       | μA         |
|                                   |                     | V <sub>DS</sub> =-30V V <sub>GS</sub> =0V<br>T <sub>J</sub> =55°C                        |            |            | -5.0       | μA         |
| Gate-Body leakage current         | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V V <sub>DS</sub> =0V                                                |            |            | ±100       | nA         |
| Gate Threshold Voltage            | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250μA                                  | -1.0       | -1.85      | -2.5       | V          |
| Static Drain-Source On-Resistance | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V I <sub>D</sub> =-6.0A                                              |            | 52         | 60         | mΩ         |
|                                   |                     | V <sub>GS</sub> =-4.5V I <sub>D</sub> =-5.0A                                             |            | 73         | 85         | mΩ         |
| Diode Forward Voltage             | V <sub>SD</sub>     | V <sub>GS</sub> =0V I <sub>S</sub> =-1.0A                                                |            | -0.81      | -1.2       | V          |
| Input Capacitance                 | C <sub>iss</sub>    | V <sub>DS</sub> =-25V V <sub>GS</sub> =0V<br>f=1.0MHz                                    |            | 900        |            | pF         |
| Output Capacitance                | C <sub>oss</sub>    |                                                                                          |            | 235        |            | pF         |
| Reverse Transfer Capacitance      | C <sub>rss</sub>    |                                                                                          |            | 195        |            | pF         |
| Gate resistance                   | R <sub>g</sub>      | V <sub>DS</sub> =0V V <sub>GS</sub> =0V<br>f=1.0MHz                                      |            | 26         |            | Ω          |
| Total Gate Charge(10V)            | Q <sub>g</sub>      | V <sub>GS</sub> =-10V V <sub>DS</sub> =-15V<br>I <sub>D</sub> =-6.5A                     |            | 13.6       |            | nC         |
| Total Gate Charge(4.5V)           |                     |                                                                                          |            | 6.7        |            | nC         |
| Gate-Source Charge                | Q <sub>gs</sub>     |                                                                                          |            | 2.5        |            | nC         |
| Gate-Drain Charge                 | Q <sub>gd</sub>     |                                                                                          |            | 3.2        |            | nC         |
| Turn-On Delay Time                | t <sub>d(on)</sub>  | V <sub>DS</sub> =-15V V <sub>GS</sub> =-10V<br>R <sub>L</sub> =2.3Ω R <sub>GEN</sub> =3Ω |            | 8          |            | ns         |
| Turn-On Rise Time                 | t <sub>r</sub>      |                                                                                          |            | 6          |            | ns         |
| Turn-Off Delay Time               | t <sub>d(off)</sub> |                                                                                          |            | 17         |            | ns         |
| Turn-Off Fall Time                | t <sub>f</sub>      |                                                                                          |            | 5          |            | ns         |

## P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve

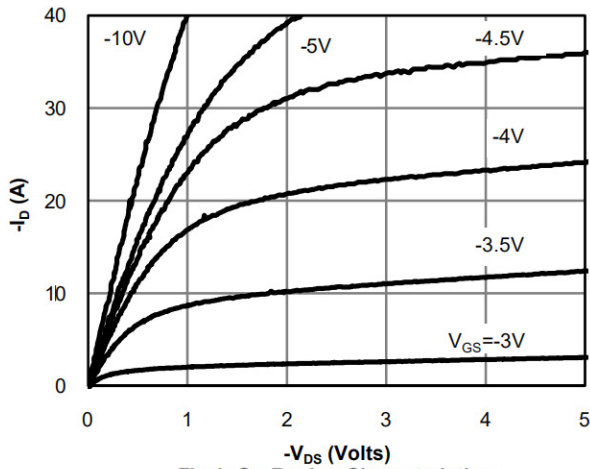


Fig 1: On-Region Characteristics

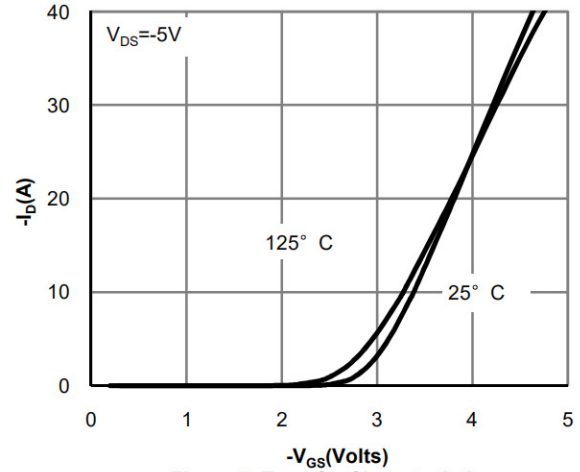


Figure 2: Transfer Characteristics

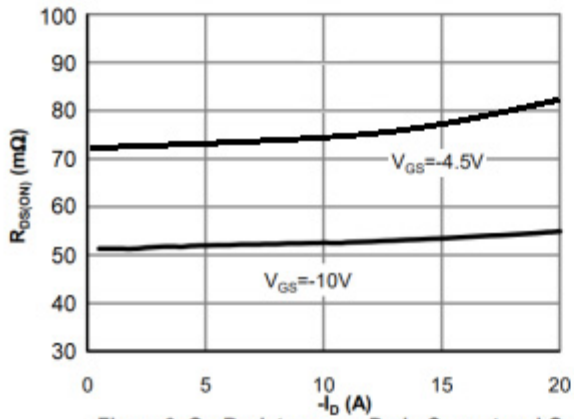


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

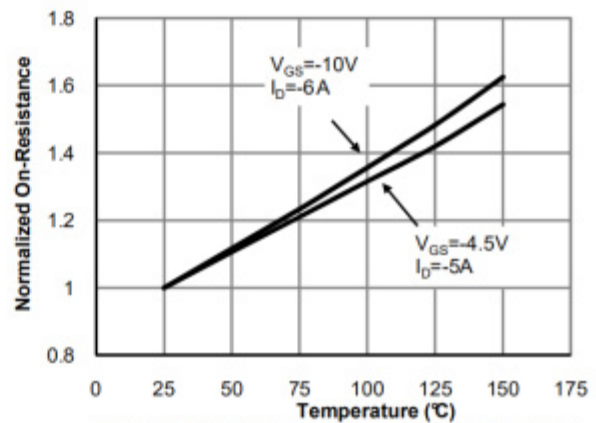


Figure 4: On-Resistance vs. Junction Temperature

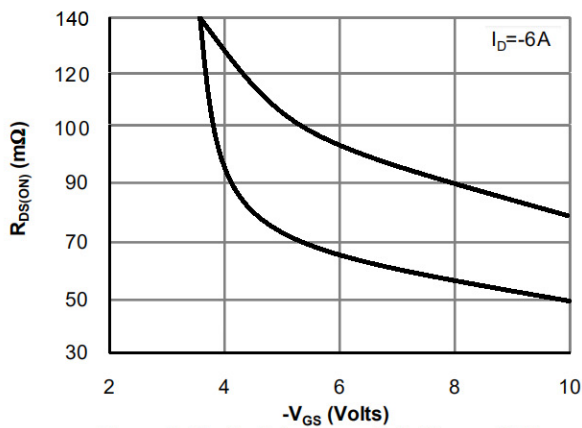


Figure 5: On-Resistance vs. Gate-Source Voltage

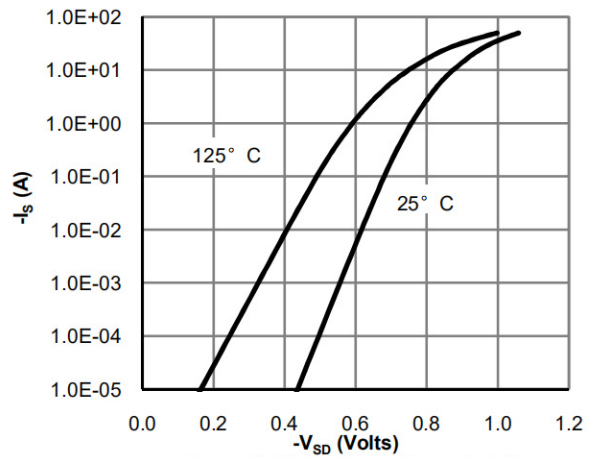
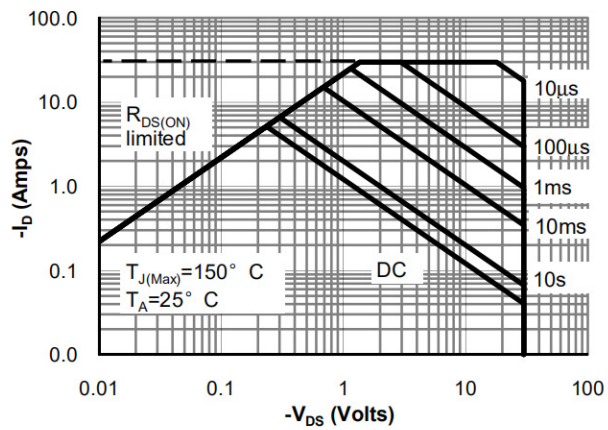
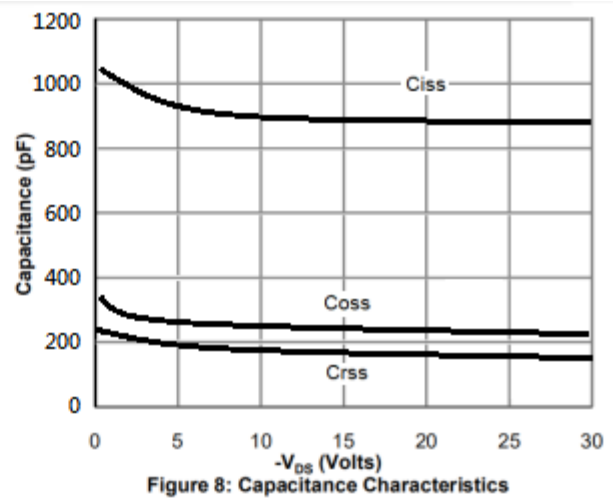
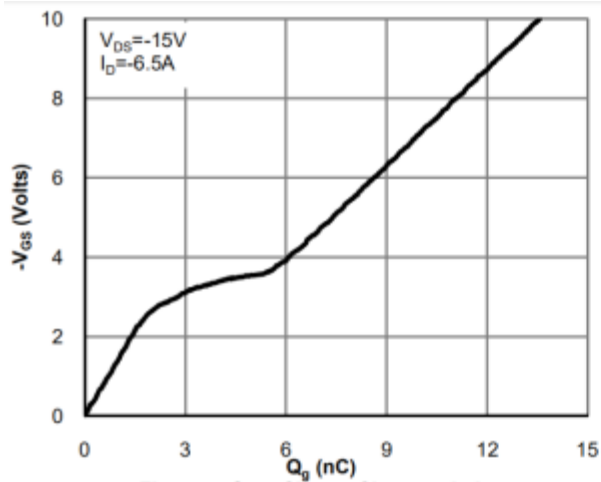


Figure 6: Body-Diode Characteristics

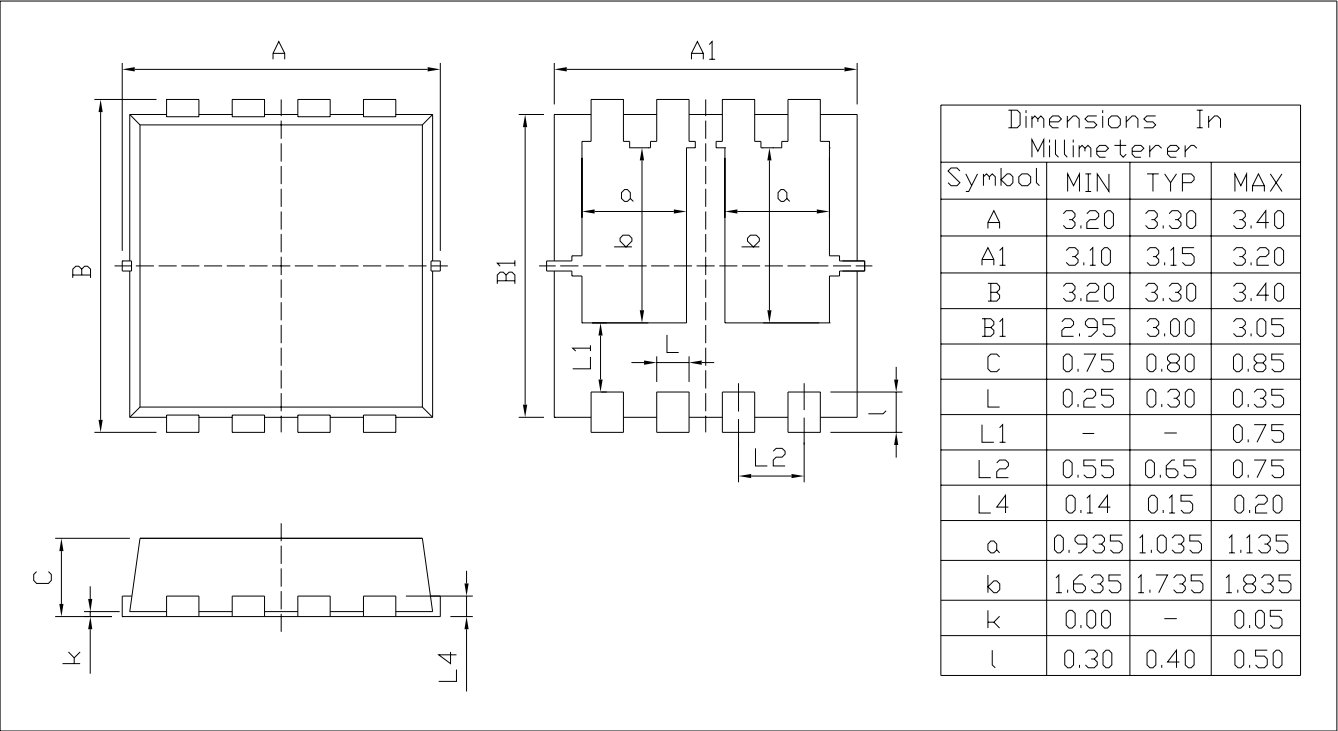
## P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve



外形尺寸图 / Package Dimensions

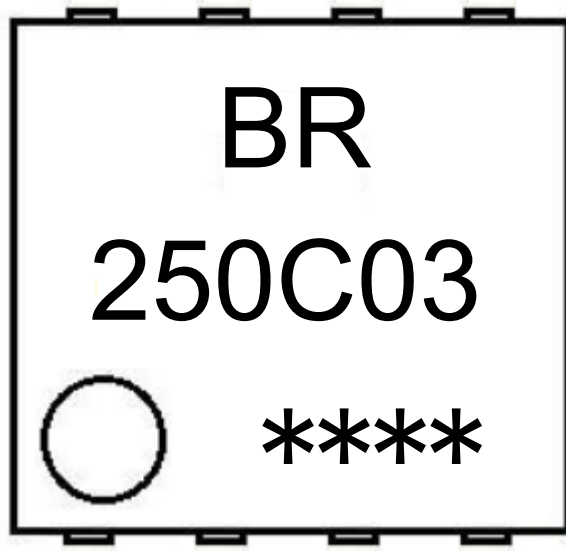
PDFN3X3-8L

Unit:mm



Rev.00 202011

**印章说明 / Marking Instructions**



说明：

BR： 为公司代码

250C03： 为型号代码

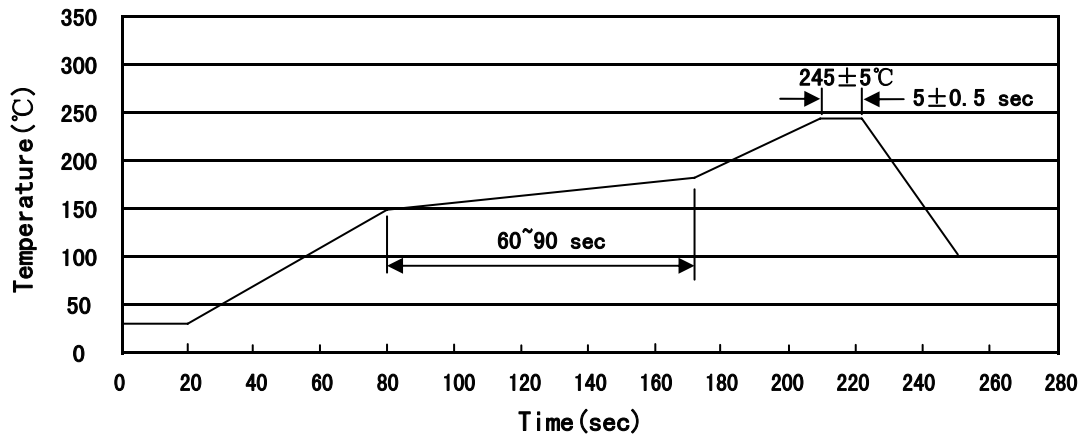
\*\*\*\*： 为生产批号代码，随生产批号变化

Note:

BR: Company Code.

250C03: Product Type Code.

\*\*\*\*: 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 150 ~ 180°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:150~180°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 |
| PDFN 3 × 3-8L        | 5,000              | 2                       | 10,000                 | 6                            | 60,000                 | 13" × 12                                | 360×360×50  | 380×335×366 |

**使用说明 / Notices**