

# BRCS070P03YBQ

Rev.A Oct.-2023

## 描述 / Descriptions

PDFN 3×3A-8L 塑封封装 P 沟道 MOS 场效应管。

P-Channel Enhancement Mode Field Effect Transistor in a PDFN 3×3A-8L Plastic Package.

## 特征 / Features

$V_{DS} (V) = -30V$

$I_D = -45A (V_{GS} = \pm 20V)$

$R_{DS(ON)} @ -10V \leq 7.5mR (Typ. 6.5mR)$

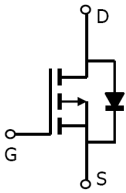
符合 AEC-Q101 标准高可靠性要求，无卤产品。Qualified to AEC-Q101 Standards for High Reliability, HF Product.

## 用途 / Applications

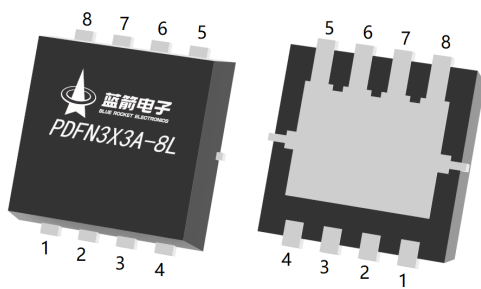
笔记本交流输入负载开关，电池保护充电/放电，满足汽车应用的严格要求。

Notebook AC-in load switch, Battery protection charge/discharge, Meet the stringent requirements of automotive applications.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



| 出脚   | 定义 |
|------|----|
| Pin1 | S  |
| Pin2 | S  |
| Pin3 | S  |
| Pin4 | G  |
| Pin5 | D  |
| Pin6 | D  |
| Pin7 | D  |
| Pin8 | D  |

## 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 |
|--|---------------------------------------|--------------|------------|
| Drain-Source Voltage                   | V <sub>DS</sub>                       | -30          | V          |
| Drain Current - Continuous             | I <sub>D</sub> (T <sub>c</sub> =25°C) | -45          | A          |
| Drain Current – Pulsed                 | I <sub>DM</sub>                       | -126         | A          |
| Gate-Source Voltage                    | V <sub>GS</sub>                       | ±20          | V          |
| Power Dissipation                      | P <sub>D</sub> (T <sub>c</sub> =25°C) | 30           | W          |
| Single Pulse Avalanche Energy(L=0.5mH) | E <sub>AS</sub>                       | 360          | mJ         |
| Avalanche Current(L=0.5mH)             | I <sub>AS</sub>                       | -30          | A          |
| Junction and Storage Temperature Range | T <sub>j</sub> , T <sub>stg</sub>     | -55 to 150   | °C         |
| Thermal resistance, junction - ambient | t ≤ 10s                               | 22           | °C/W       |
|  | Steady-State                          | 55           |            |
| Thermal resistance, junction - case    | Steady-State                          | 4.17         |            |

**电性能参数 / 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>    | I <sub>D</sub> =-250μA V <sub>GS</sub> =0V                            | -30        | -33        |            | V          |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>     | V <sub>DS</sub> =-30V V <sub>GS</sub> =0V                             |            |            | -1         | μA         |
| Gate-Body leakage current         | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V                           |            |            | ±100       | nA         |
| Gate Threshold Voltage            | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250μA               | -1         | -1.5       | -2.5       | V          |
| Static Drain-Source On-Resistance | R <sub>DS(ON)</sub>  | V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A                           |            | 6.5        | 7.5        | mΩ         |
|                                   |                      | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A                          |            | 9.3        | 15         |            |
| Diode Forward Voltage             | V <sub>SD</sub>      | I <sub>S</sub> =-1A, V <sub>GS</sub> =0V                              |            |            | -1.2       | V          |
| Input Capacitance                 | C <sub>iss</sub>     | V <sub>DS</sub> =-25V V <sub>GS</sub> =0V<br>f=1.0MHz                 |            | 3260       |            | pF         |
| Output Capacitance                | C <sub>oss</sub>     |   |            | 335        |            |            |
| Reverse Transfer Capacitance      | C <sub>rss</sub>     |   |            | 330        |            |            |
| Gate resistance                   | R <sub>g</sub>       | V <sub>GS</sub> =0V V <sub>DS</sub> =0V<br>f=1MHz                     |            | 5.6        |            | Ω          |
| Total Gate Charge                 | Q <sub>g(10V)</sub>  | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V,<br>I <sub>D</sub> =-20A |            | 51         |            | nC         |
| Total Gate Charge                 | Q <sub>g(4.5V)</sub> |   |            | 32         |            |            |
| Gate Source Charge                | Q <sub>gs</sub>      |   |            | 11         |            |            |
| Gate Drain Charge                 | Q <sub>gd</sub>      |   |            | 13         |            |            |

## 电性能参数 / 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 |
|---------------------|--------------|---|------------|------------|------------|------------|
| Turn-On Delay Time  | $t_{d(on)}$  | $V_{GS}=-10V$ $V_{DS}=-15V$<br>$R_L=0.75\ \Omega$ $R_{GEN}=3\ \Omega$ |            | 12.5       |            | ns         |
| Turn-On Rise Time   | $t_r$        |   |            | 19         |            |            |
| Turn-Off Delay Time | $t_{d(off)}$ |   |            | 125        |            |            |
| Turn-Off Fall Time  | $t_f$        |   |            | 67         |            |            |

## 电参数曲线图 / Electrical Characteristic Curve

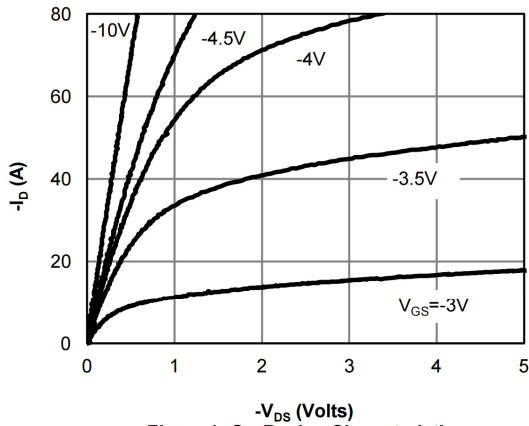


Figure 1: On-Region Characteristics

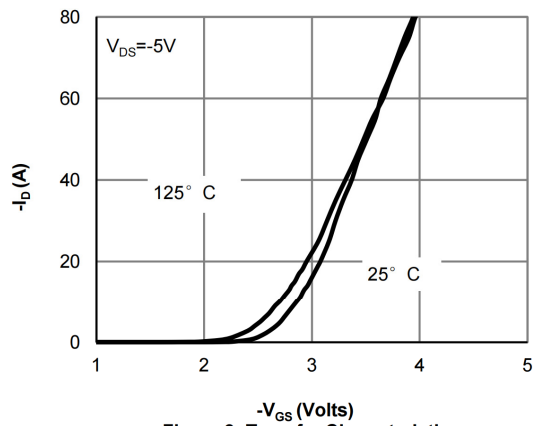


Figure 2: Transfer Characteristics

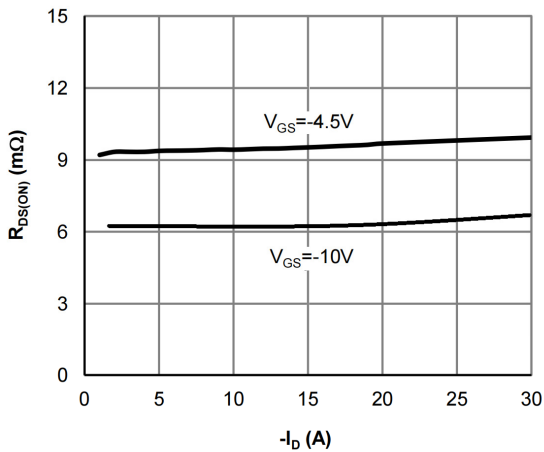


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

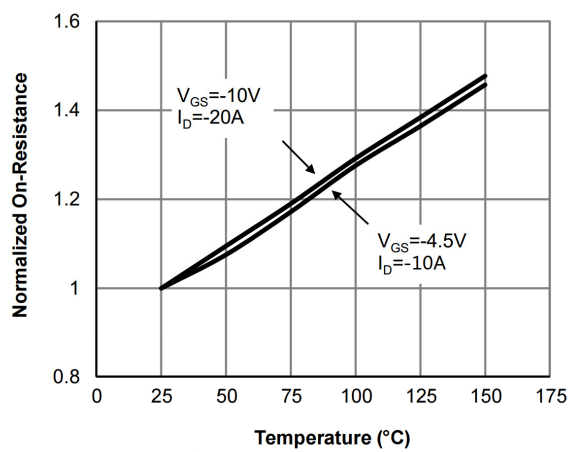


Figure 4: On-Resistance vs. Junction Temperature

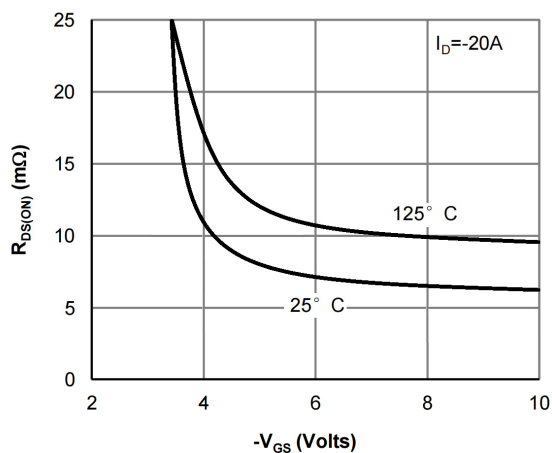


Figure 5: On-Resistance vs. Gate-Source Voltage

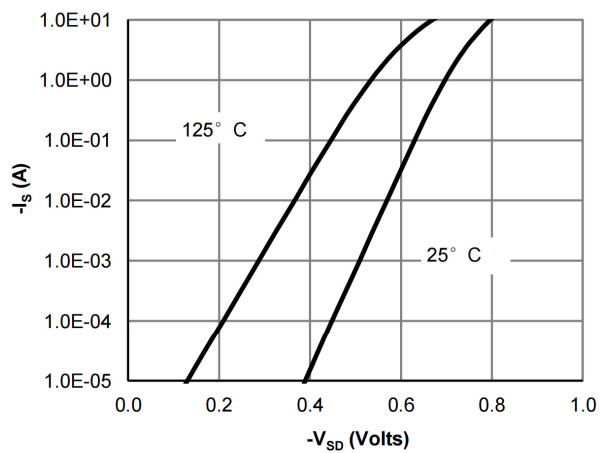


Figure 6: Body-Diode Characteristics

## 电参数曲线图 / Electrical Characteristic Curve

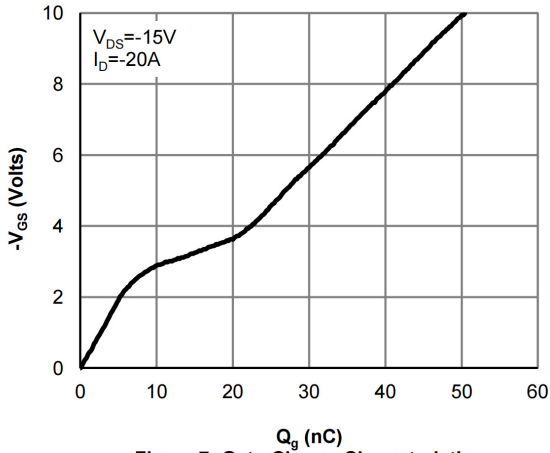


Figure 7: Gate-Charge Characteristics

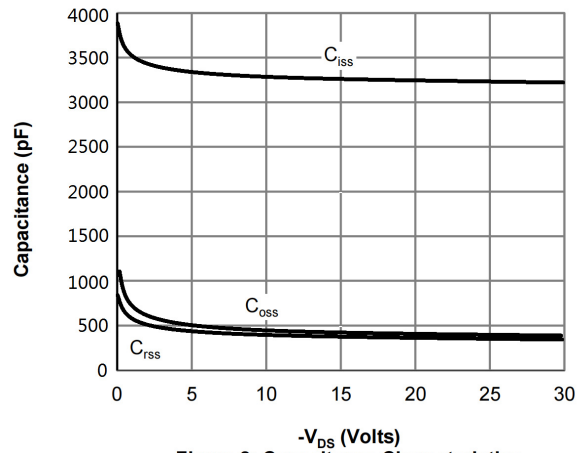


Figure 8: Capacitance Characteristics

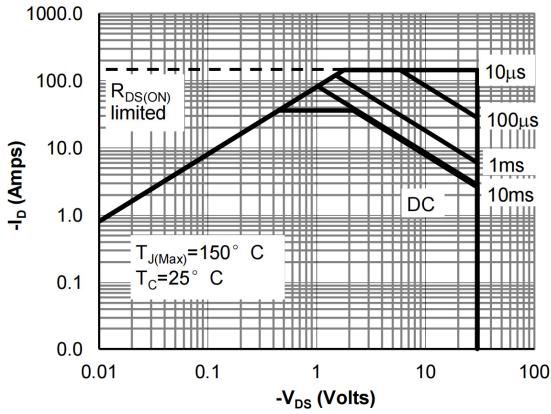


Figure 9: Maximum Forward Biased Safe Operating Area

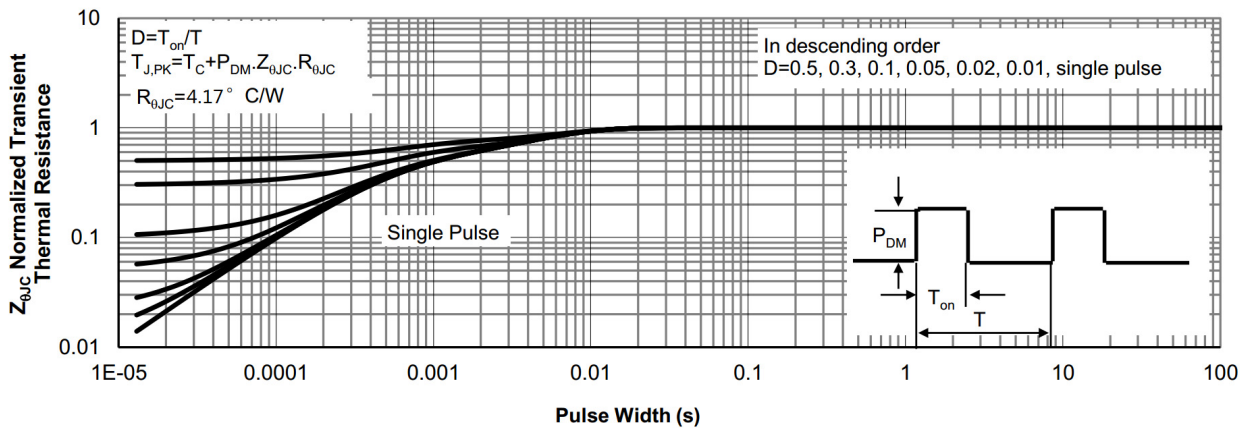
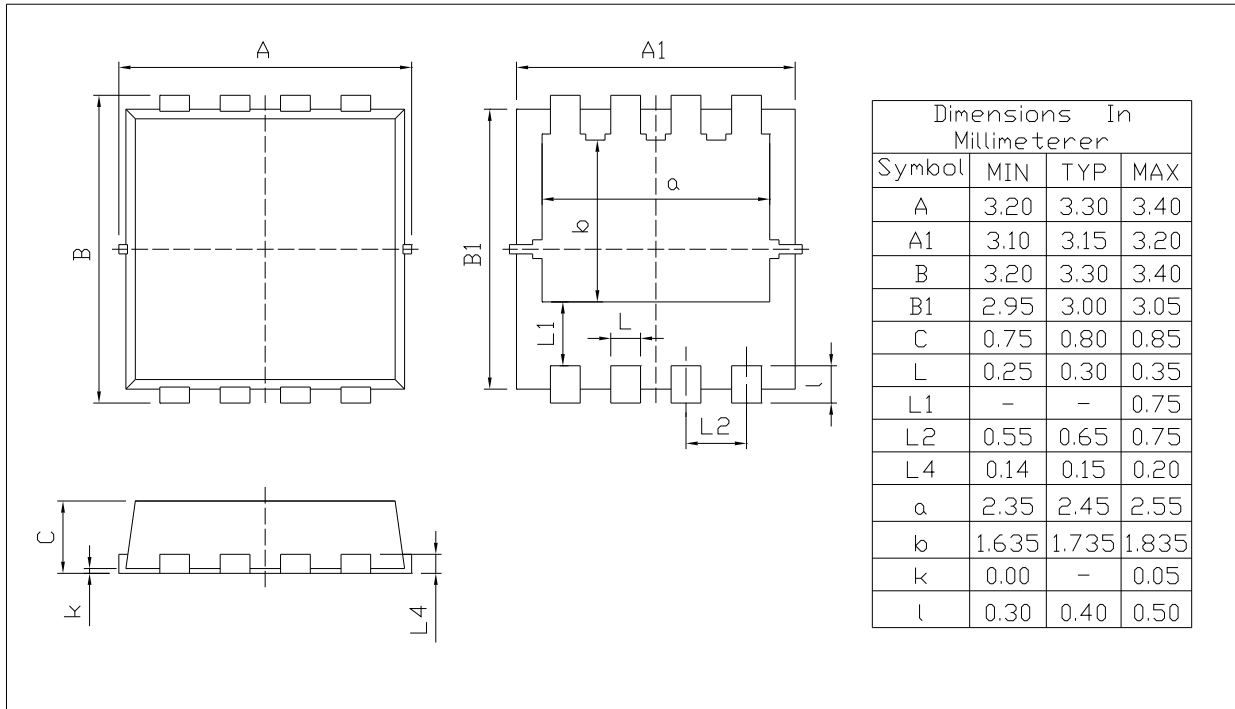


Figure 10: Normalized Maximum Transient Thermal Impedance

**外形尺寸图 / Package Dimensions**

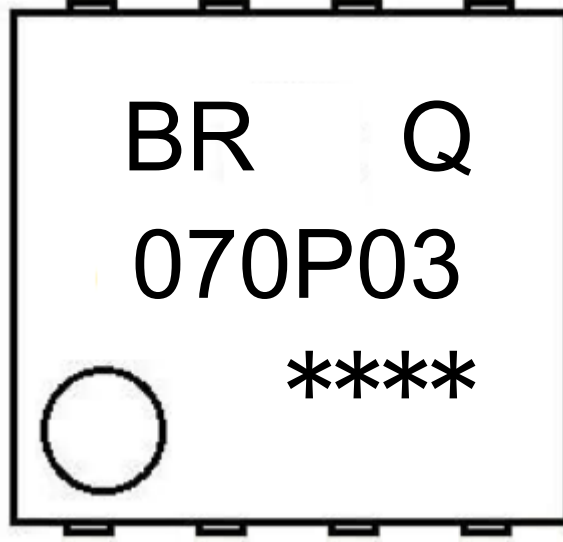
PDFN3X3A-8L

Unit:mm



Rev.00 202011

**印章说明 / Marking Instructions**



说明：

BR： 为公司代码

Q： 为汽车无卤产品标识

070P03： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化

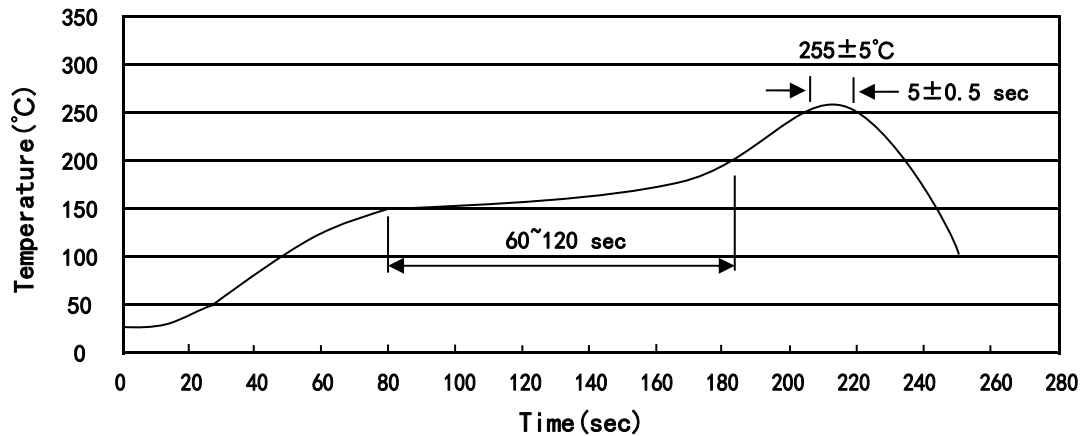
Note:

BR: Company Code

Q: Automobile halogen-free product Code

070P03: 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 150~200°C，时间 60~120sec;
- 2、峰值温度 255±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:150~200°C, Time:60~120sec.
- 2.Peak Temp.:255±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 |
| PDFN3×3A-8L          | 5,000              | 2                       | 10,000                 | 6                            | 60,000                 | 13" ×12                                 | 360×360×50  | 380×335×366 |

**使用说明 / Notices**