

# BRCS030N04YBQ

Rev.A Nov.-2023

## 描述 / Descriptions

PDFN3×3A-8L 塑封封装 N 沟道 MOS 场效应管。

N-Channel Enhancement Mode Field Effect Transistor in a PDFN3×3A-8L Plastic Package.

## 特征 / Features

$V_{DS} (V) = 40V$

$I_D = 82A (V_{GS} = \pm 20V)$

$R_{DS(ON)}@10V \leq 3mR (Typ. 2.5mR)$

$R_{DS(ON)}@4.5V \leq 5mR (Typ. 3.5mR)$

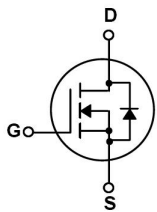
符合 AEC-Q101 标准高可靠性要求，无卤产品。Qualified to AEC-Q101 Standards for High Reliability, HF Product.

## 用途 / Applications

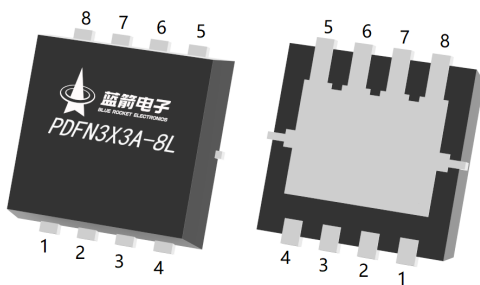
负载开关应用、电池电源管理，满足汽车应用的严格要求。

Load Switch Applications, Battery Power Management, 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.

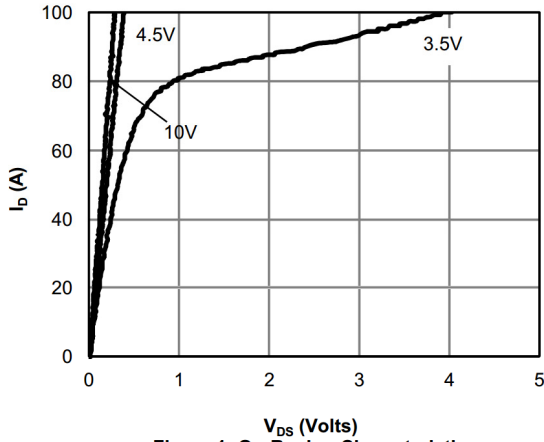
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

参数 Parameter		符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage		V <sub>DSS</sub>	40	V
Drain Current		I <sub>D</sub> (T <sub>C</sub> =25°C)	57	A
Drain Current - Pulsed		I <sub>DM</sub>	137	A
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Single Pulsed Avalanche Energy		E <sub>AS</sub>	348	mJ
Avalanche Current		I <sub>AS</sub>	33	A
Power Dissipation		P <sub>D</sub> (T <sub>C</sub> =25°C)	37	W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	-55 to 150	°C
Junction-to-Ambient	t ≤ 10	R <sub>θJA</sub>	42	°C/W
Junction-to-Ambient	Steady-State		78	
Junction-to-Case	Steady-State	R <sub>θJC</sub>	3.4	

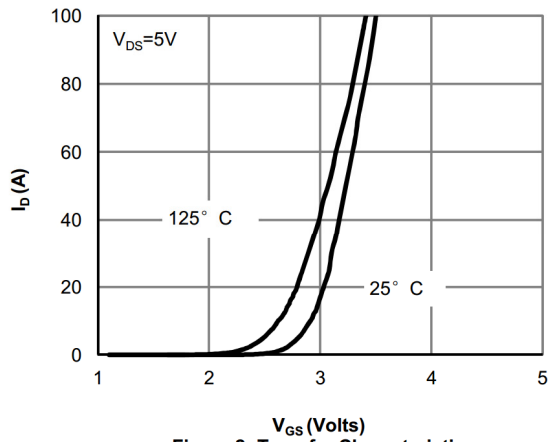
## 电性能参数 / Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions		最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V$	$I_D=250\mu A$	40	47		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=40V$	$V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current Forward	$I_{GSS}$	$V_{GS}=\pm 20V$	$V_{DS}=0V$			$\pm 0.1$	$\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu A$	1.0	1.7	3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=20A$		2.5	3	$m\Omega$
		$V_{GS}=4.5V$	$I_D=10A$		3.5	5	$m\Omega$
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$	$I_S=1A$			1.2	V
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $f=1.0MHz$	$V_{GS}=0V$		9600		pF
Output Capacitance	$C_{oss}$				740		
Reverse Transfer Capacitance	$C_{rss}$				650		
Gate resistance	$R_g$	$V_{GS}=0V$ $f=1MHz$	$V_{DS}=0V$		1.3		$\Omega$
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$ $I_D=20A$	$V_{DS}=20V$		51		nC
Total Gate Charge	$Q_{g(4.5V)}$				23		
Gate Source Charge	$Q_{gs}$				13.2		
Gate Drain Charge	$Q_{gd}$				3.1		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $R_L=1\Omega$	$V_{DS}=20V$ $R_{GEN}=3.0\Omega$		11		ns
Turn-On Rise Time	$t_r$				11		
Turn-Off Delay Time	$t_{d(off)}$				40		
Turn-Off Fall Time	$t_f$				10		

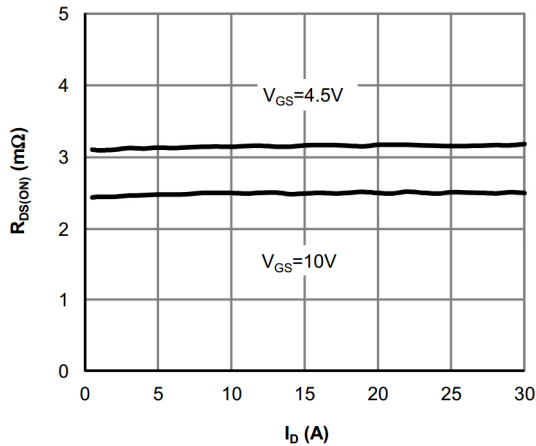
**电参数曲线图 / Electrical Characteristic Curve**



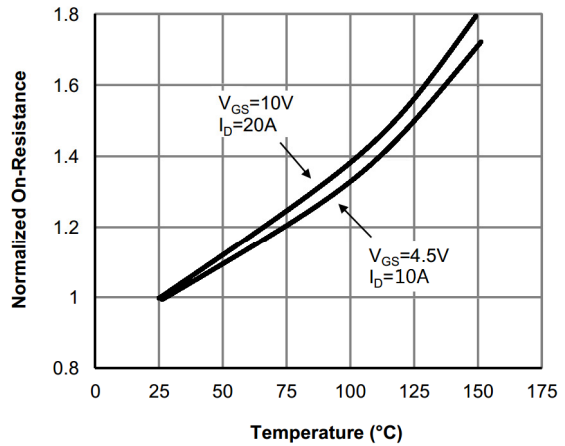
**Figure 1: On-Region Characteristics**



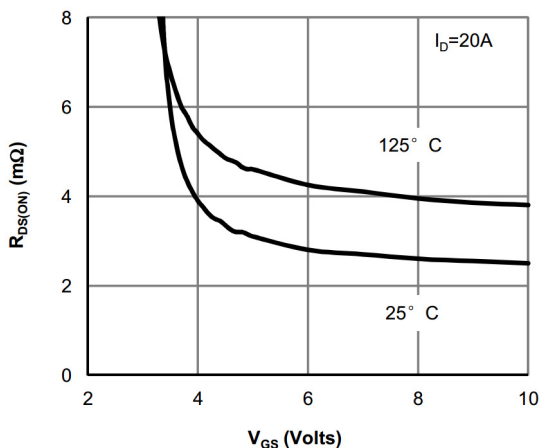
**Figure 2: Transfer Characteristics**



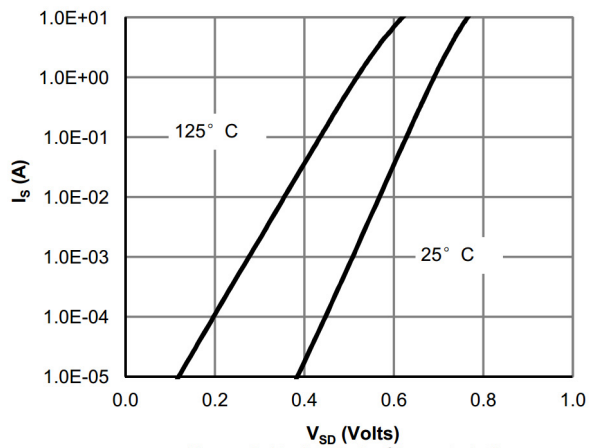
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**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

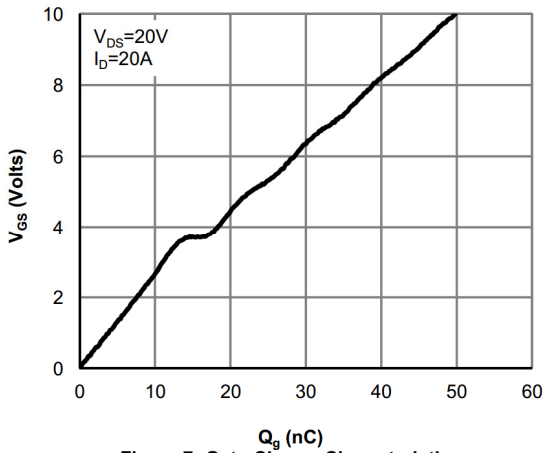


Figure 7: Gate-Charge Characteristics

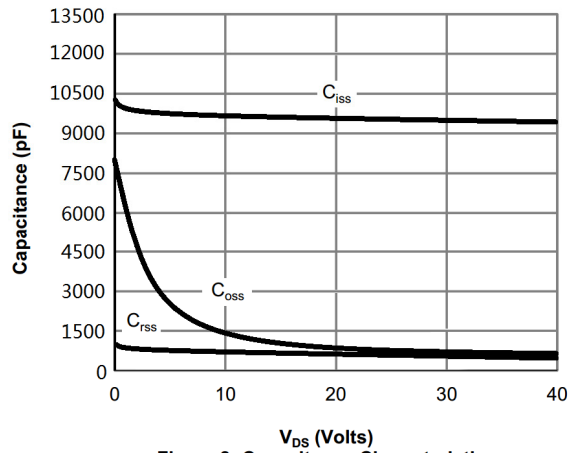


Figure 8: Capacitance Characteristics

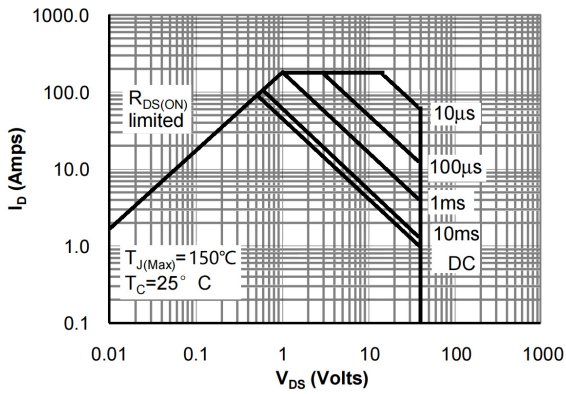


Figure 9: Maximum Forward Biased Safe Operating Area

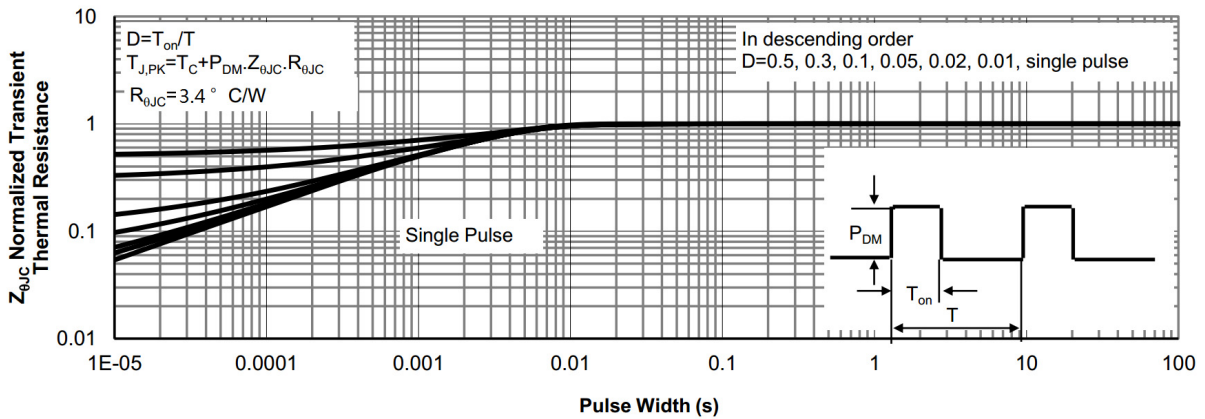
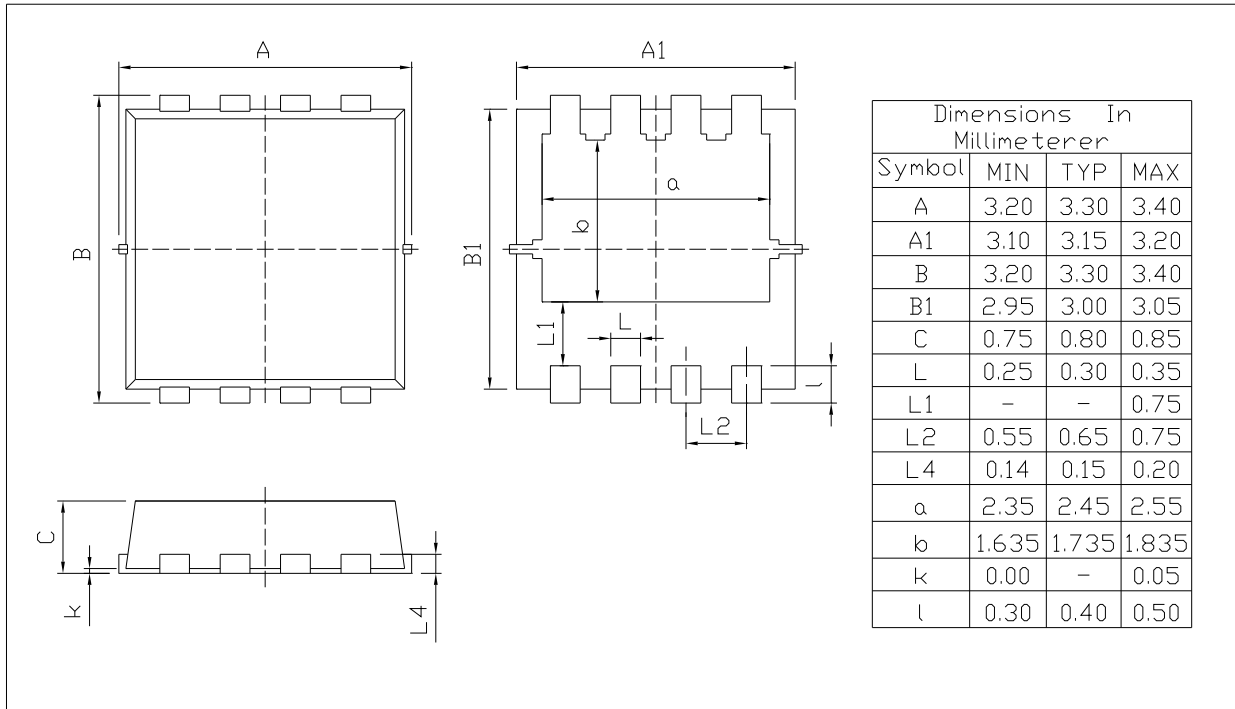


Figure 10: Normalized Maximum Transient Thermal Impedance

**外形尺寸图 / Package Dimensions**

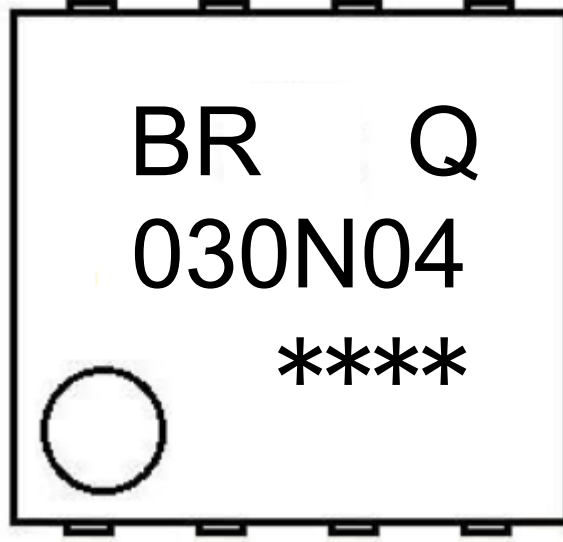
PDFN3X3A-8L

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

030N04： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化

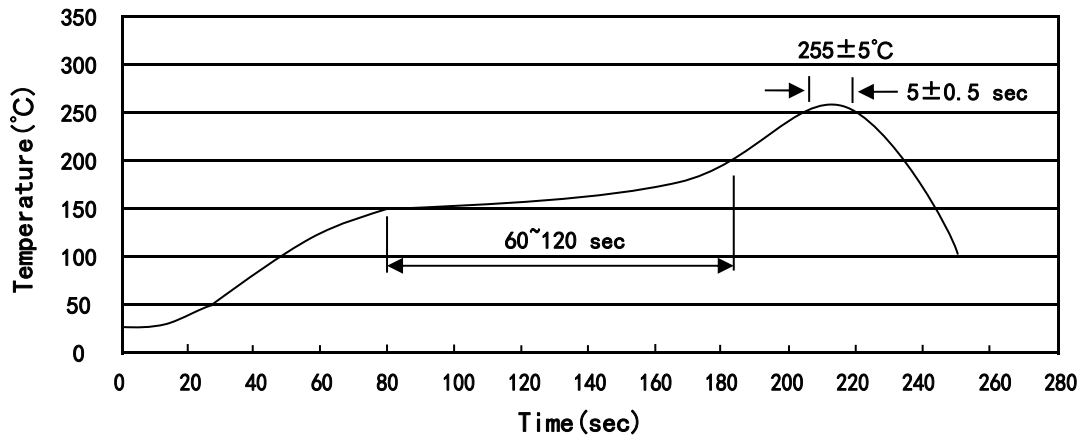
Note:

BR: Company Code

Q: Automobile halogen-free product Code

030N04: 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 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 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**