

# BRCS080C03YMQ

Rev.A Aug.-2023

## 描述 / Descriptions

PDFN5×6A 塑封封装互补增强模式 MOS 场效应管。

Complementary Enhancement MOSFET in a PDFN5×6A Plastic Package.

## 特征 / Features

N-channel

P-channel

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

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

$I_D=24A$

$I_D=-24A$

$R_{DS(ON)}<10m\Omega$  ( $V_{GS}=10V$ )

$R_{DS(ON)}<12m\Omega$  ( $V_{GS}=-10V$ )

$R_{DS(ON)}<15m\Omega$  ( $V_{GS}=4.5V$ )

$R_{DS(ON)}<20m\Omega$  ( $V_{GS}=-4.5V$ )

符合 AEC-Q101 标准高可靠性要求；无卤产品。

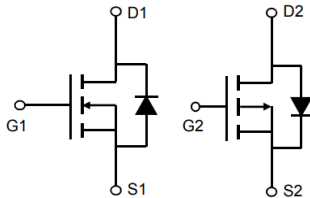
Qualified to AEC-Q101 Standards for High Reliability; HF Product.

## 用途 / Applications

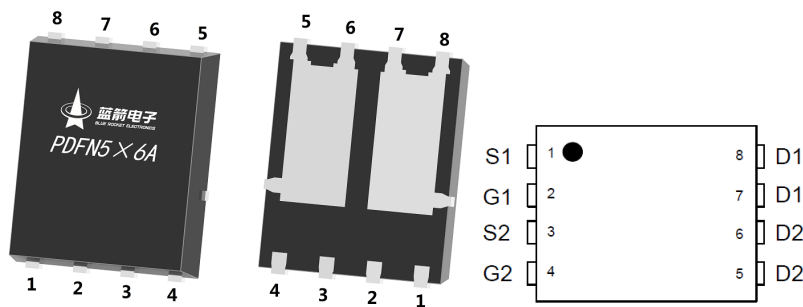
用于高功率 DC/DC 转换和功率开关。适用于作负载开关或脉宽调制应用，满足汽车应用的严格要求。

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, Meet the stringent requirements of automotive 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.

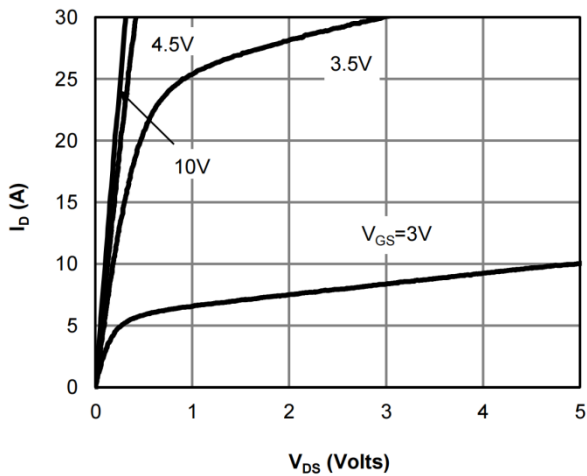
**极限参数 / Absolute Maximum Ratings( $T_a=25^{\circ}\text{C}$ )**

参数 Parameter	符号 Symbol	数值 Rating		单位 Unit
		N-channe	P-channell	
Drain-Source Voltage	$V_{DSS}$	$\pm 30$		V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$		V
Continuous Drain Current	$I_D(T_C=25^{\circ}\text{C})$	24	-24	A
Pulsed Drain Current	$I_{DM}$	50	-50	A
Avalanche Current(L=0.5mH)	$I_{AS}$	17	13	A
Avalanche energy(L=0.5mH)	$E_{AS}$	115	67	mJ
Power Dissipation	$P_D(T_A=25^{\circ}\text{C})$	12.5	12.5	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150		$^{\circ}\text{C}$
Maximum Junction-to-Ambient	$R_{\theta JA}(t \leq 10s)$	35	35	$^{\circ}\text{C}/\text{W}$
	$R_{\theta JA}(\text{Steady-State})$	70	70	
Maximum Junction-to-Case	$R_{\theta JA}(\text{Steady-State})$	10	10	

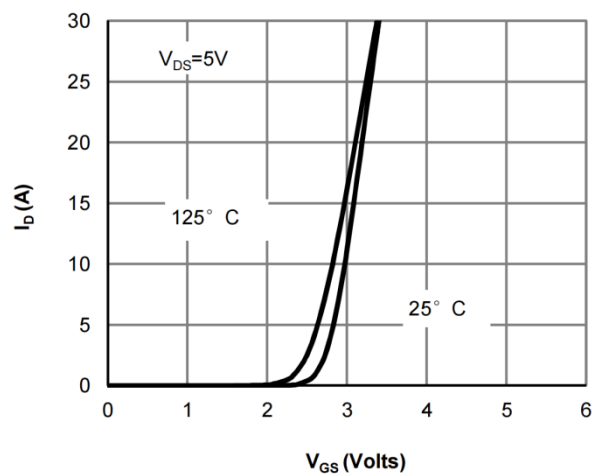
## N-沟道电性能参数/N-CHANNEL Electrical Characteristics(Ta=25°C)

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	$BV_{DSS}$	$V_{GS}=0V$	$I_D=250\mu A$	30	35		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V$	$V_{GS}=0V$			1.0	$\mu A$
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	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=10A$		8	10	m $\Omega$
		$V_{GS}=4.5V$	$I_D=5A$		12	15	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$	$I_S=1.0A$			1.2	V
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $f=1.0MHz$	$V_{GS}=0V$		930		pF
Output Capacitance	$C_{oss}$				100		pF
Reverse Transfer Capacitance	$C_{rss}$				70		pF
Gate resistance	$R_g$	$V_{DS}=0V$ $f=1.0MHz$	$V_{GS}=0V$		2.8		$\Omega$
Total Gate Charge(10V)	$Q_g$	$V_{GS}=10V$ $I_D=12A$	$V_{DS}=15V$		14		nC
Total Gate Charge(4.5V)					6.5		nC
Gate-Source Charge	$Q_{gs}$				2.3		nC
Gate-Drain Charge	$Q_{gd}$				3		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=15V$ $R_L=1.25\Omega$	$V_{GS}=10V$ $R_{GEN}=3\Omega$		4.5		ns
Turn-On Rise Time	$t_r$				10		ns
Turn-Off Delay Time	$t_{d(off)}$				15		ns
Turn-Off Fall Time	$t_f$				6		ns

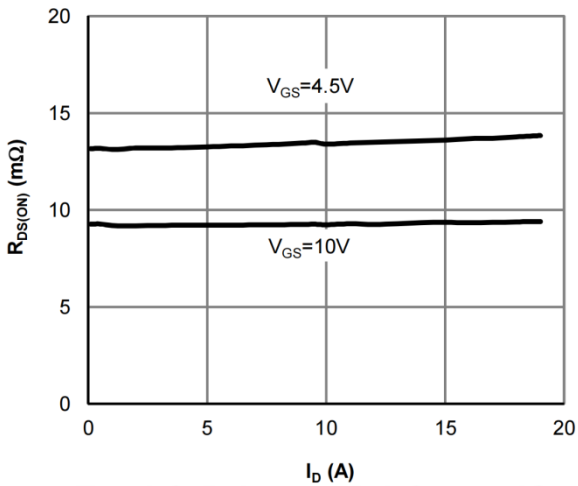
**N-沟道电参数曲线图 / N-CHANNEL Electrical Characteristic Curve**



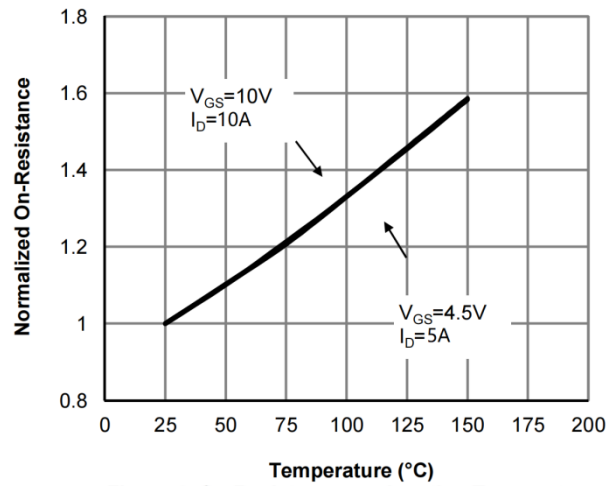
**Figure 1: On-Region Characteristics**



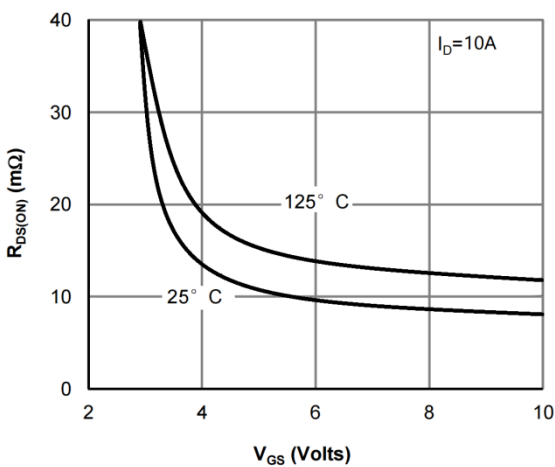
**Figure 2: Transfer Characteristics**



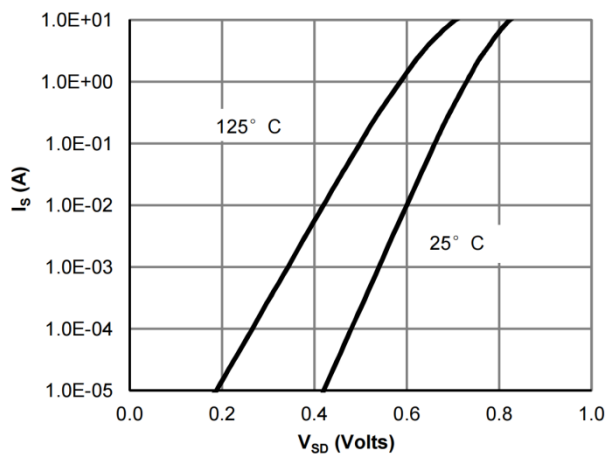
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



**Figure 4: On-Resistance vs. Junction Temperature**



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



**Figure 6: Body-Diode Characteristics**

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

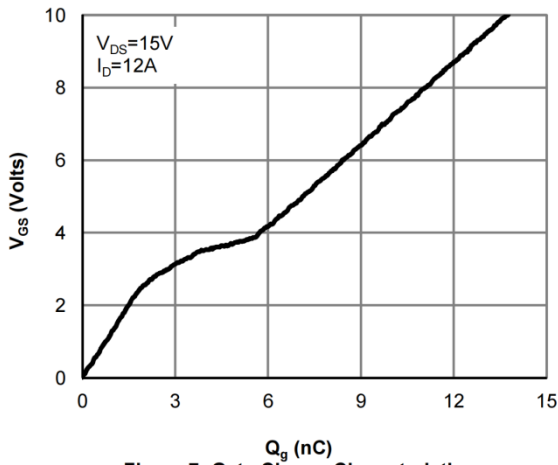


Figure 7: Gate-Charge Characteristics

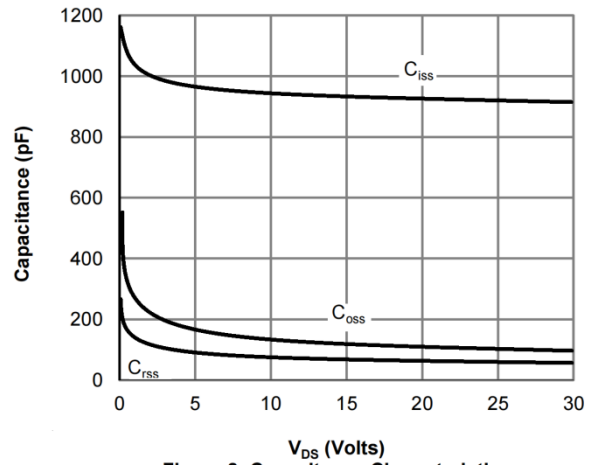


Figure 8: Capacitance Characteristics

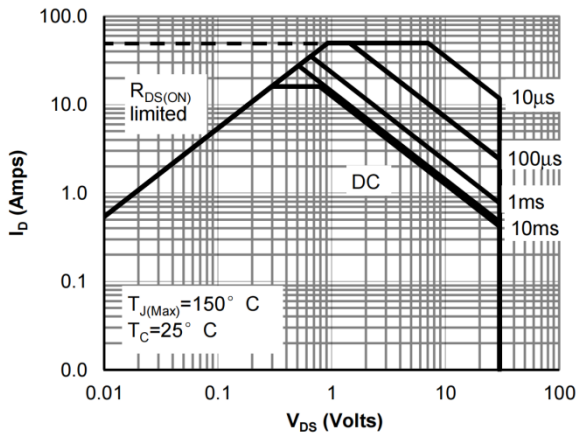


Figure 9: Maximum Forward Biased Safe Operating Area

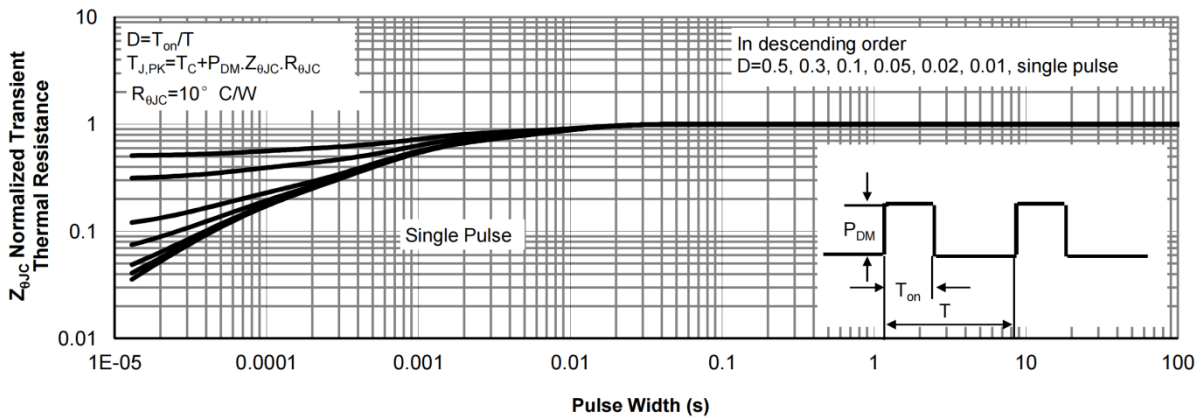


Figure 10: Normalized Maximum Transient Thermal Impedance

## P-沟道电性能参数/P-CHANNEL 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 <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =-250μA	-30	-37		V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V V <sub>GS</sub> =0V			-1.0	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	-1.7	-2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V I <sub>D</sub> =-10A		10	12	mΩ
		V <sub>GS</sub> =-4.5V I <sub>D</sub> =-5A		16	20	mΩ
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V I <sub>S</sub> =-1.0A			-1.2	V
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V V <sub>GS</sub> =0V f=1.0MHz		3350		pF
Output Capacitance	C <sub>oss</sub>			2400		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			1050		pF
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> =0V V <sub>GS</sub> =0V f=1.0MHz		6.8		Ω
Total Gate Charge(10V)	Q <sub>g</sub>	V <sub>GS</sub> =-10V V <sub>DS</sub> =-15V I <sub>D</sub> =-16A		36		nC
Total Gate Charge(4.5V)				16		nC
Gate-Source Charge	Q <sub>gs</sub>			5.5		nC
Gate-Drain Charge	Q <sub>gd</sub>			9		nC
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =-15 V V <sub>GS</sub> =-10V R <sub>L</sub> =0.9Ω R <sub>GEN</sub> =3Ω		11		ns
Turn-On Rise Time	t <sub>r</sub>			7.4		ns
Turn-Off Delay Time	t <sub>d(off)</sub>			44		ns
Turn-Off Fall Time	t <sub>f</sub>			18		ns

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

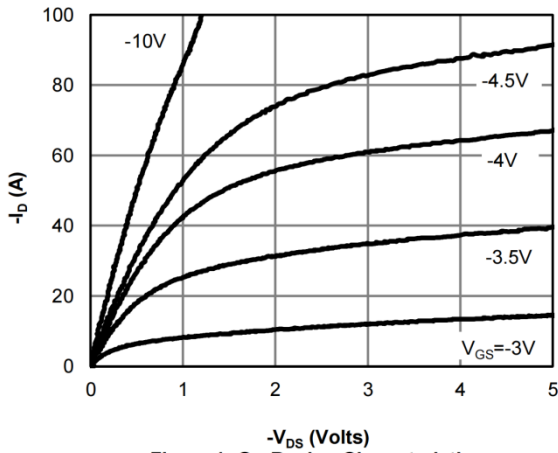


Figure 1: On-Region Characteristics

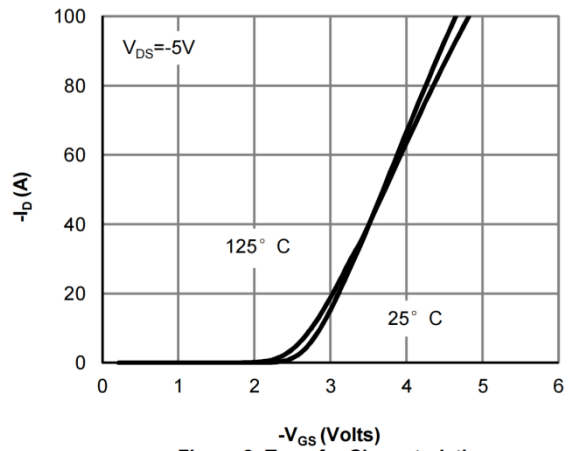


Figure 2: Transfer Characteristics

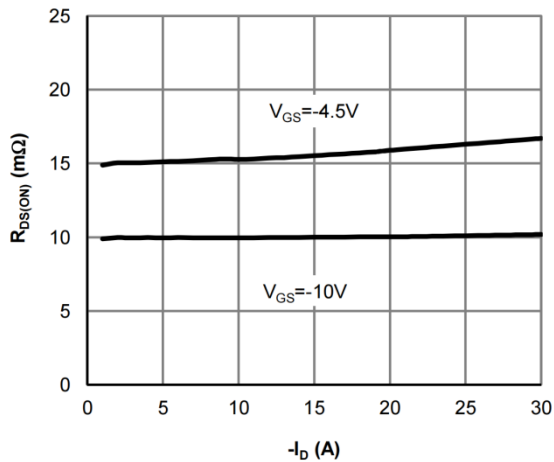


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

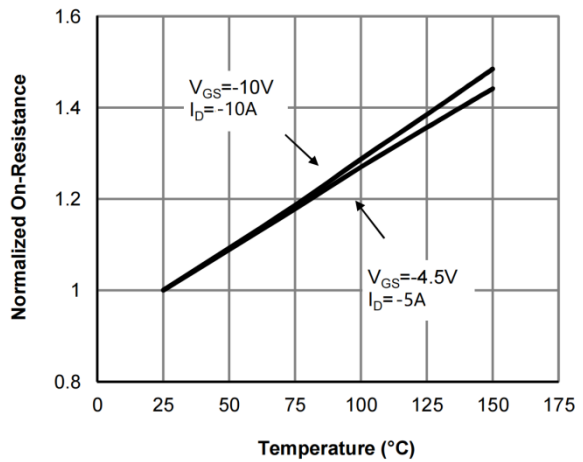


Figure 4: On-Resistance vs. Junction Temperature

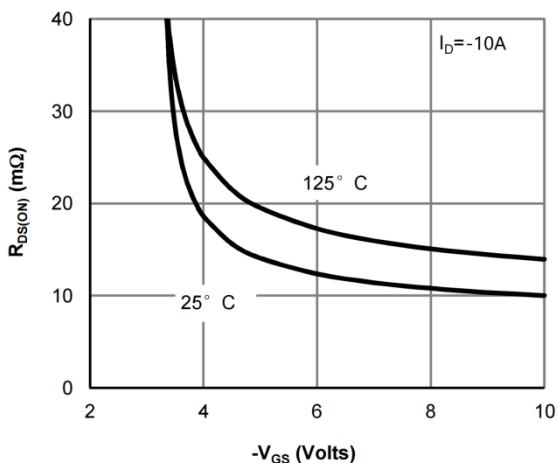


Figure 5: On-Resistance vs. Gate-Source Voltage

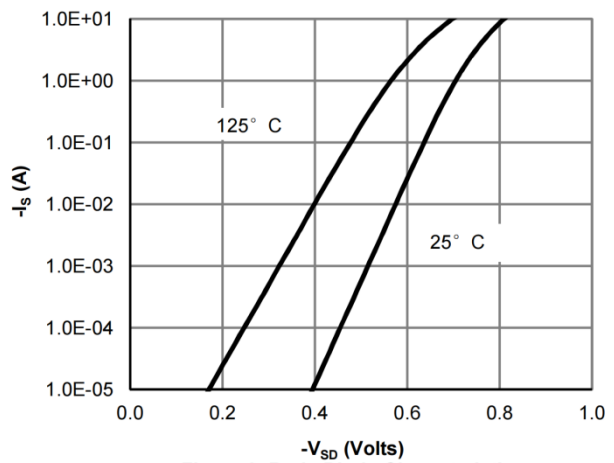
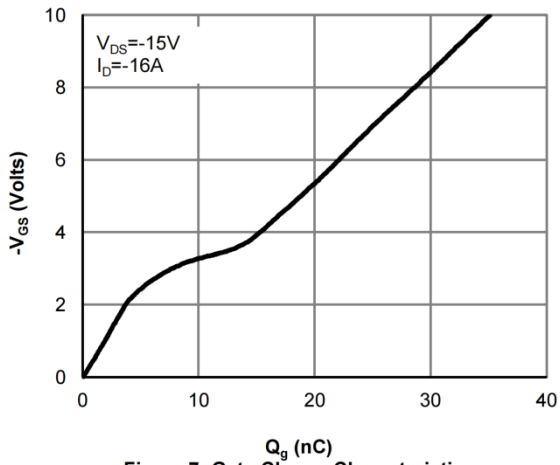
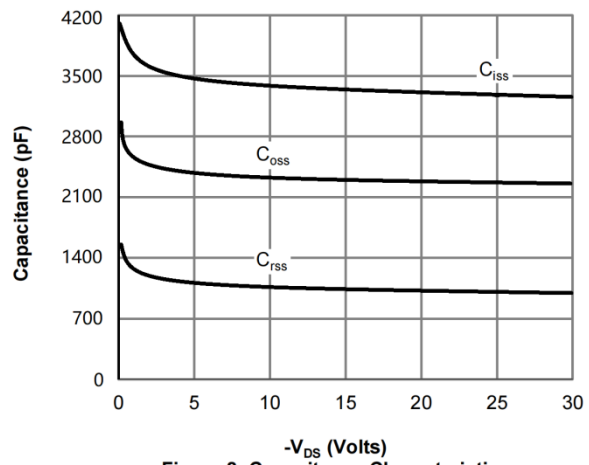


Figure 6: Body-Diode Characteristics

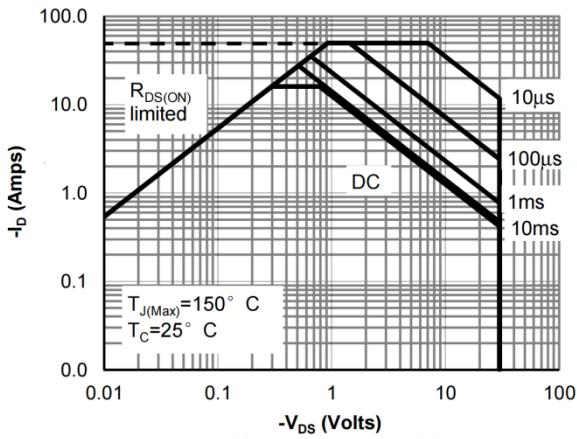
**P-沟道电参数曲线图 / P-CHANNEL Electrical Characteristic Curve**



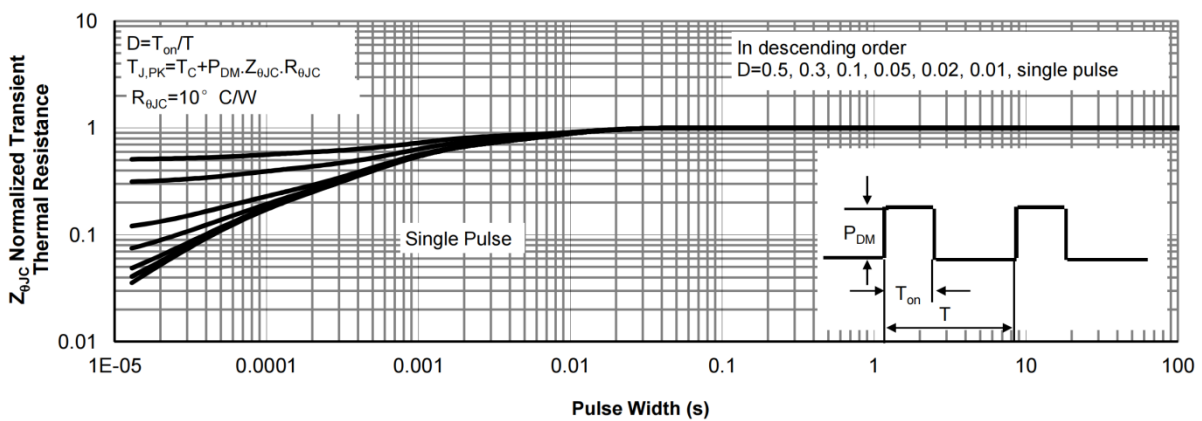
**Figure 7: Gate-Charge Characteristics**



**Figure 8: Capacitance Characteristics**



**Figure 9: Maximum Forward Biased Safe Operating Area**



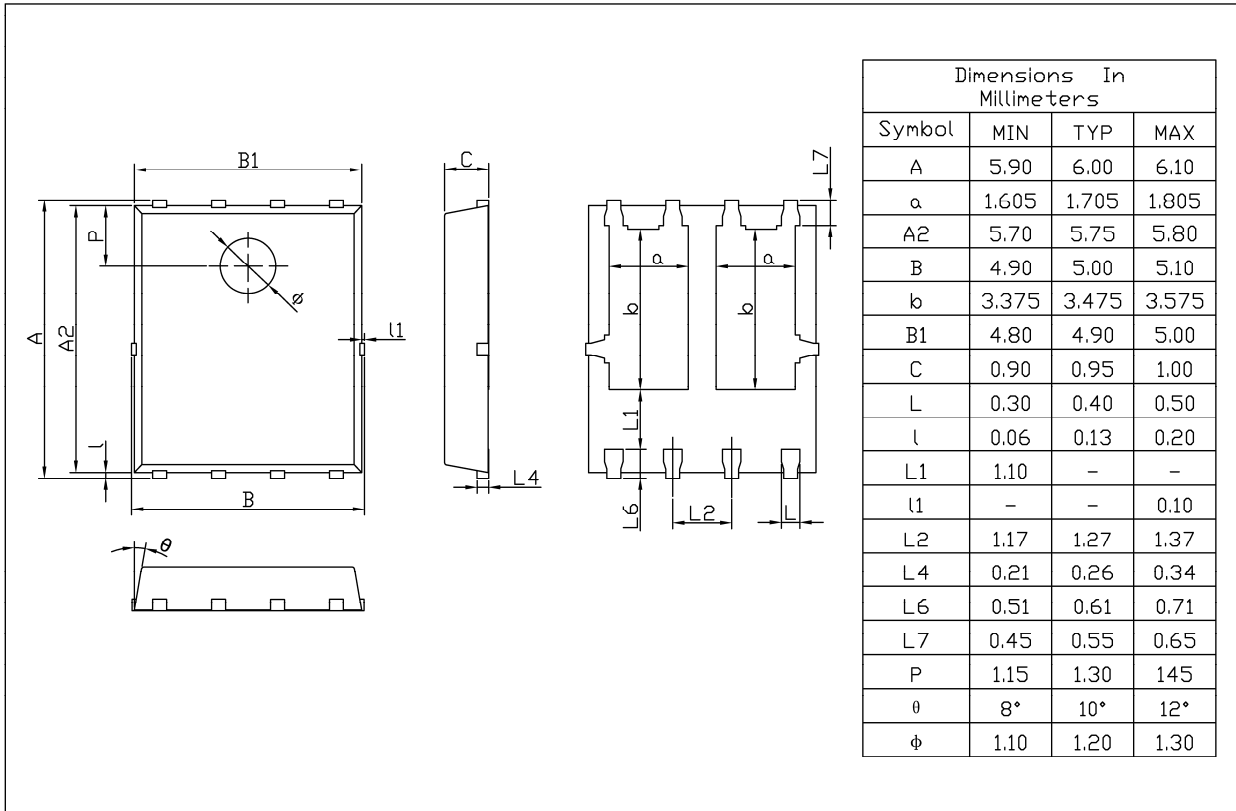
**Figure 10: Normalized Maximum Transient Thermal Impedance**



**外形尺寸图 / Package Dimensions**

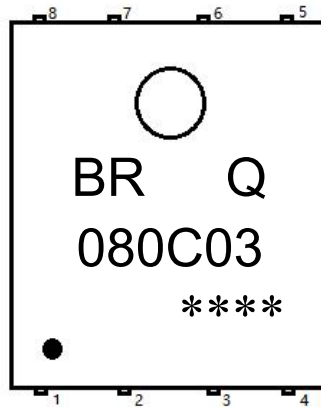
PDFN5 X6A

Unit:mm



Rev.01 202209

**印章说明 / Marking Instructions**



说明：

BR： 为公司代码

Q： 为汽车无卤产品标识

080C03： 为产品型号

\*\*\*\*： 为生产批号代码，随生产批号变化

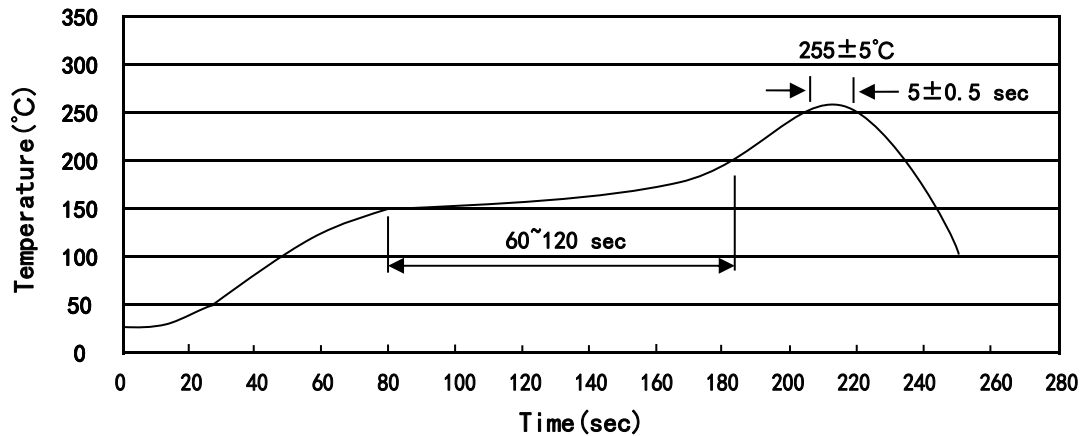
Note：

BR： Company Code

Q: Automobile halogen-free product Code

080C03： Product Type

\*\*\*\*: 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
PDFN5×6A	5,000	2	10,000	6	60,000	13"×12	360×360×50	380×335×366

**使用说明 / Notices**