

BRCS4614YAQ

Rev.A May.-2023

DATA SHEET

描述 / Descriptions

PDFN3×3-8L 塑封封装互补增强模式场效应管。

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

特征 / Features

N-channel	P-channel
VDS(V)=40V	VDS(V)=-40V
ID=17A	ID=-12A
RDS(ON)<25mΩ (VGS=10V)	RDS(ON)<45mΩ (VGS=-10V)
RDS(ON)<35mΩ (VGS=4.5V)	RDS(ON)<60mΩ (VGS=-4.5V)

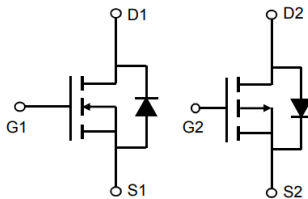
符合 AEC-Q101 标准高可靠性要求，无卤产品。Qualified to AEC-Q101 Standards for High Reliability, HF Product.

用途 / Applications

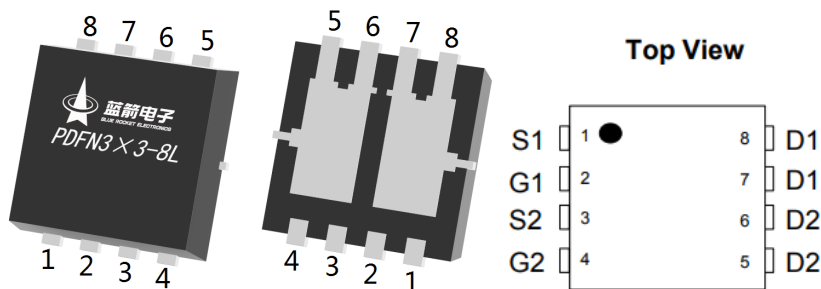
电池保护开关，移动设备电池充放电，负载开关，满足汽车应用的严格要求。

Battery protection switch, Mobile device battery charging and discharging, Load switch, 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(Ta=25°C)

参数 Parameter	符号 Symbol	数值 Rating		单位 Unit
		N-channe	P-channell	
Drain-Source Voltage	V_{DSS}	±40		V
Gate-Source Voltage	V_{GSS}	±20		V
Continuous Drain Current	$I_D (T_C=25^\circ\text{C})$	17	-12	A
Pulsed Drain Current	I_{DM}	34	-23	A
Power Dissipation	$P_D (T_C=25^\circ\text{C})$	12	10	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150		°C
Maximum Junction-to-Ambient	$R_{\theta JA}$	95		°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	10.4	12.5	°C/W

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}	$V_{GS}=0V$	$I_D=250\mu A$	40	45		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V$	$V_{GS}=0V$			1.0	μA
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	1.8	3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$	$I_D=6.0A$		18	25	m Ω
		$V_{GS}=4.5V$	$I_D=5.0A$		24	35	m Ω
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$	$I_S=1.0A$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $f=1.0MHz$	$V_{GS}=0V$		1200		pF
Output Capacitance	C_{oss}				350		pF
Reverse Transfer Capacitance	C_{rss}				250		pF
Gate resistance	R_g	$V_{DS}=0V$ $f=1.0MHz$	$V_{GS}=0V$		2.5		Ω
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$ $I_D=6A$	$V_{DS}=20V$		9.2		nC
Total Gate Charge	$Q_{g(4.5V)}$				4.5		
Gate-Source Charge	Q_{gs}				2.5		nC
Gate-Drain Charge	Q_{gd}				1.5		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=20V$ $R_L=3.3\Omega$	$V_{GS}=10V$ $R_{GEN}=3\Omega$		6.5		ns
Turn-On Rise Time	t_r				3.7		ns
Turn-Off Delay Time	$t_{d(off)}$				18.2		ns
Turn-Off Fall Time	t_f				7.1		ns

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

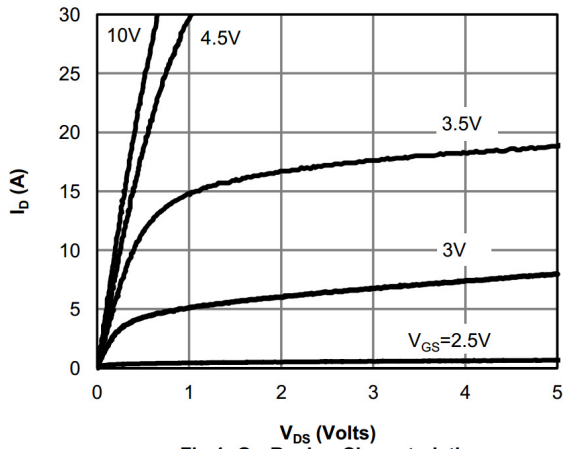


Fig 1: On-Region Characteristics

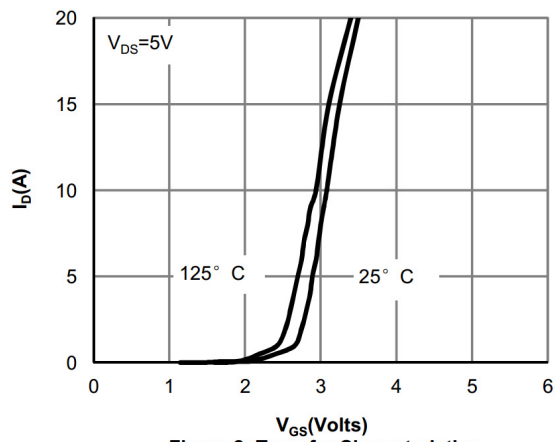


Figure 2: Transfer Characteristics

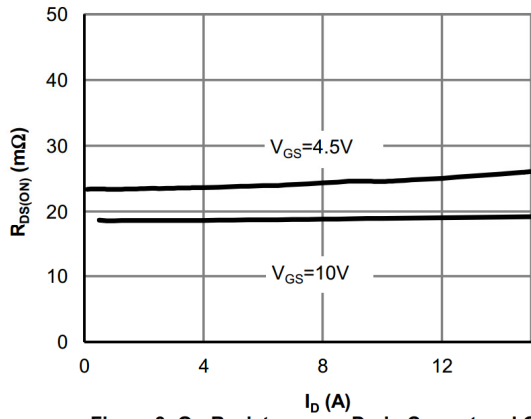


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

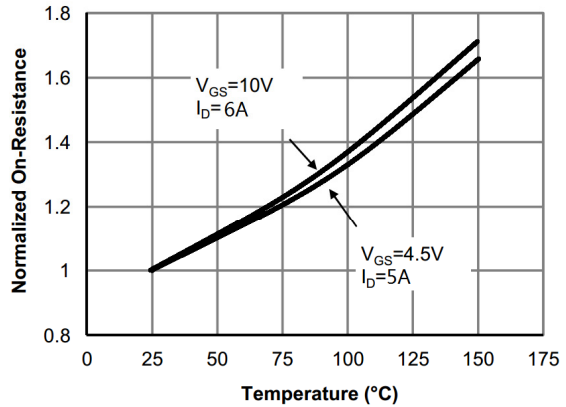


Figure 4: On-Resistance vs. Junction Temperature

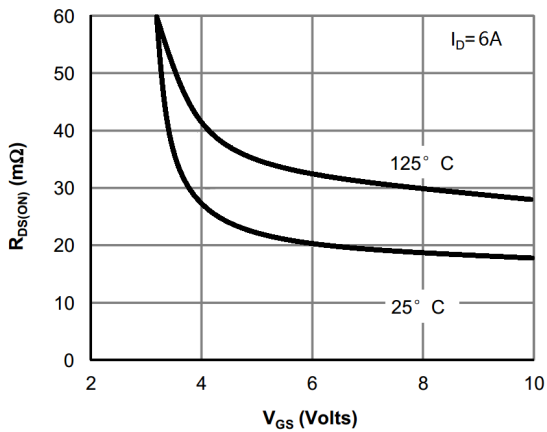


Figure 5: On-Resistance vs. Gate-Source Voltage

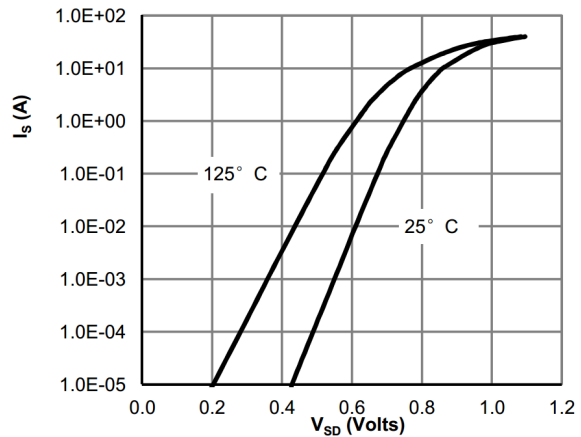


Figure 6: Body-Diode Characteristics

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

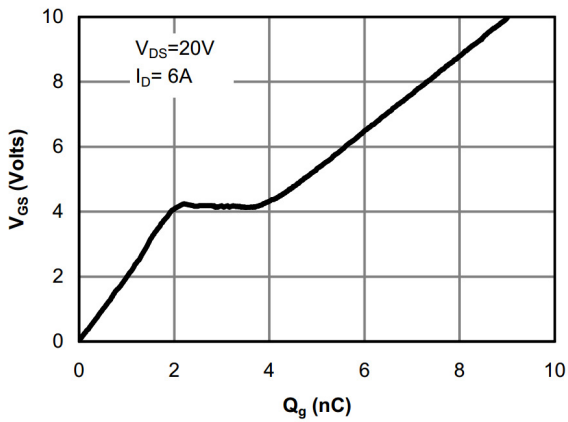


Figure 7: Gate-Charge Characteristics

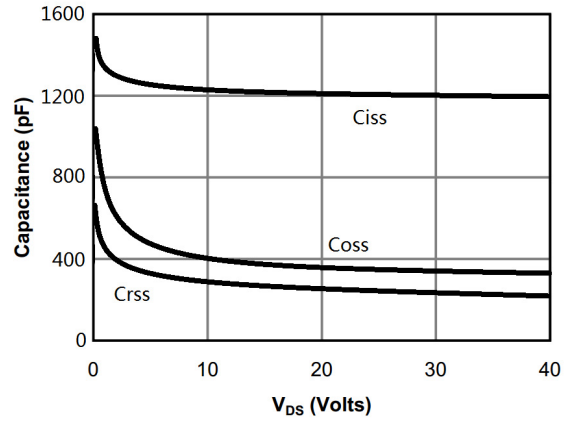


Figure 8: Capacitance Characteristics

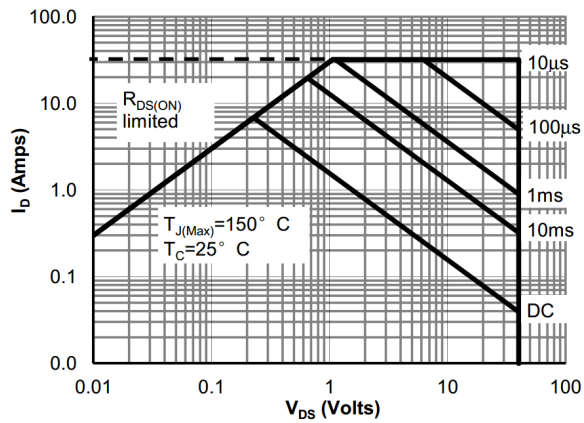


Figure 9: Maximum Forward Biased Safe Operating Area

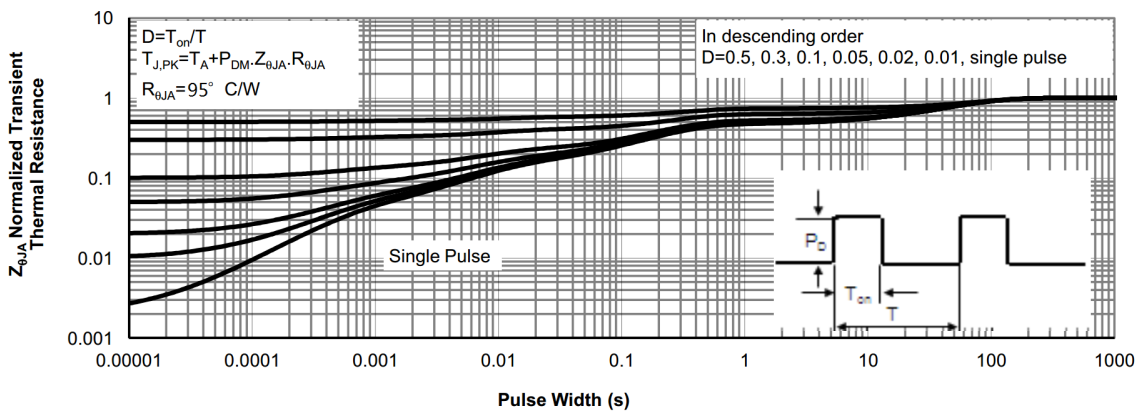


Figure 10: Normalized Maximum Transient Thermal Impedance

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_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-40	-46		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V$ $V_{GS}=0V$			-1.0	μA
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	-1.4	-3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-5.0A$		32	45	m Ω
		$V_{GS}=-4.5V$ $I_D=-2.0A$		40	60	m Ω
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1.0A$			-1.2	V
Input Capacitance	C_{iss}	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		1000		pF
Output Capacitance	C_{oss}			90		pF
Reverse Transfer Capacitance	C_{rss}			70		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		10		Ω
Total Gate Charge	$Q_{g(-10V)}$	$V_{GS}=-10V$ $V_{DS}=-20V$ $I_D=-5A$		17.5		nC
Total Gate Charge	$Q_{g(-4.5V)}$			8.2		
Gate-Source Charge	Q_{gs}			3.5		nC
Gate-Drain Charge	Q_{gd}			3.3		nC
Turn-On Delay Time	$t_{d(on)}$				6.3	
Turn-On Rise Time	t_r	$V_{DS}=-20V$ $V_{GS}=-10V$ $R_L=4\Omega$ $R_{GEN}=3\Omega$		8.5		ns
Turn-Off Delay Time	$t_{d(off)}$			45.2		ns
Turn-Off Fall Time	t_f			43.4		ns

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

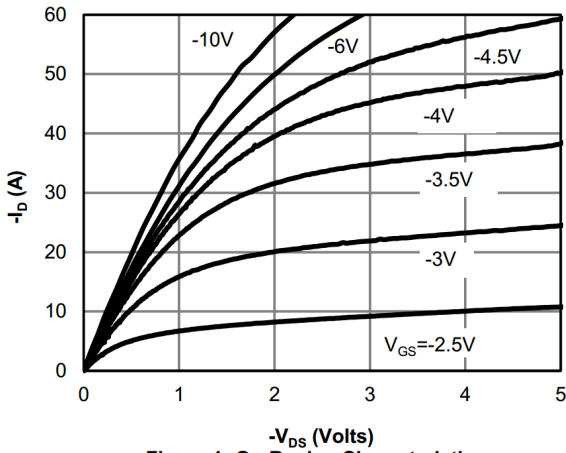


Figure 1: On-Region Characteristics

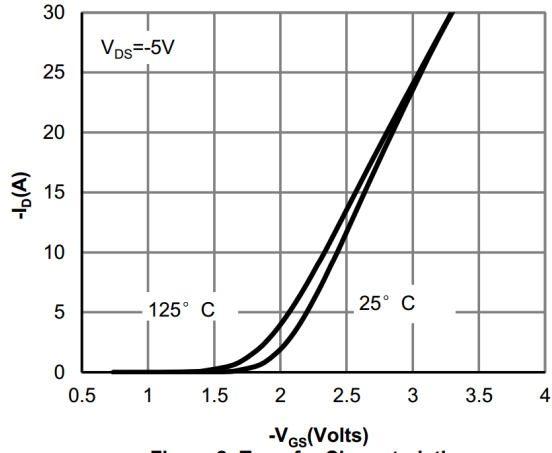


Figure 2: Transfer Characteristics

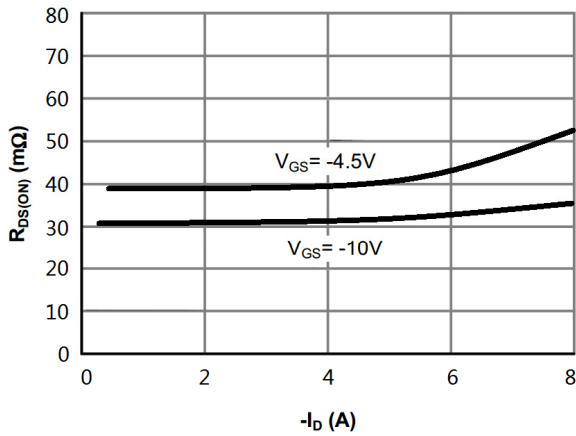


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

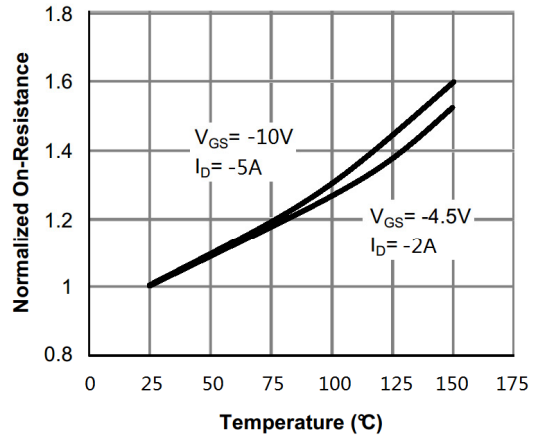


Figure 4: On-Resistance vs. Junction Temperature

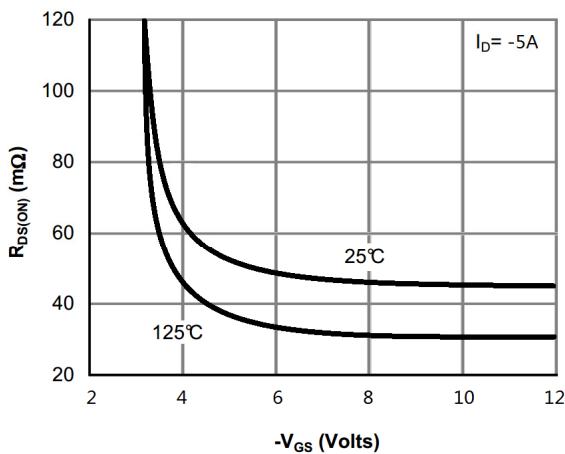


Figure 5: On-Resistance vs. Gate-Source Voltage

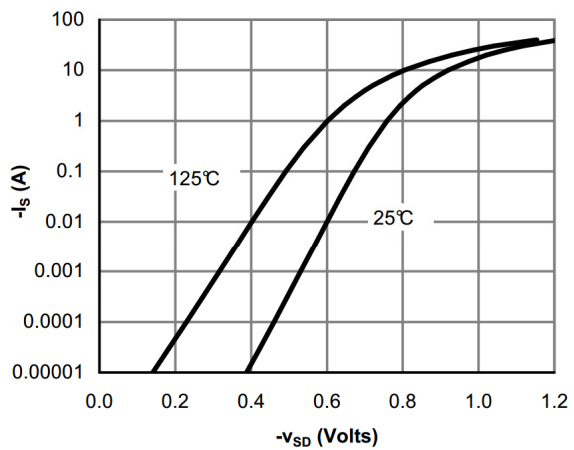


Figure 6: Body-Diode Characteristics

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

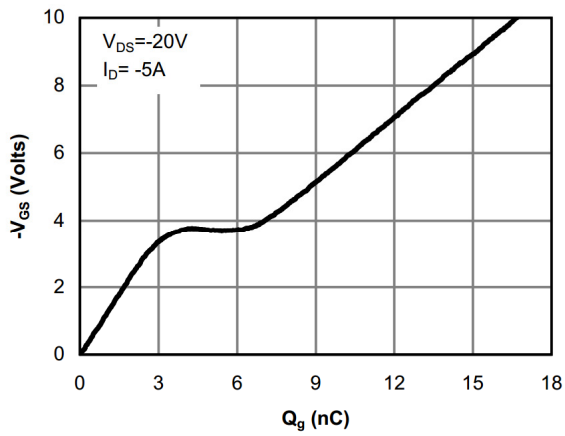


Figure 18: Gate-Charge Characteristics

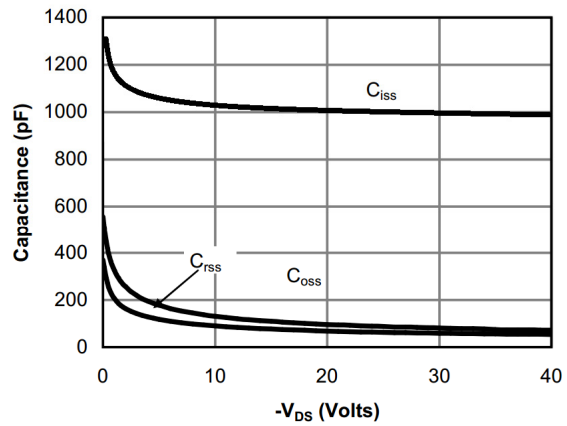


Figure 19: Capacitance Characteristics

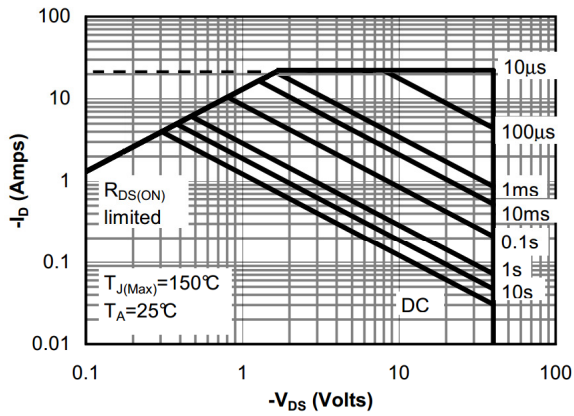


Figure 20: Maximum Forward Biased Safe Operating Area

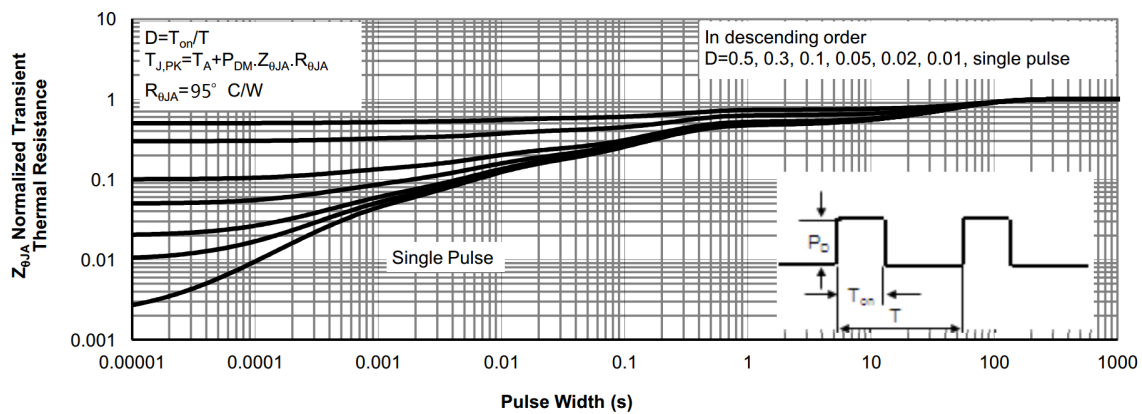
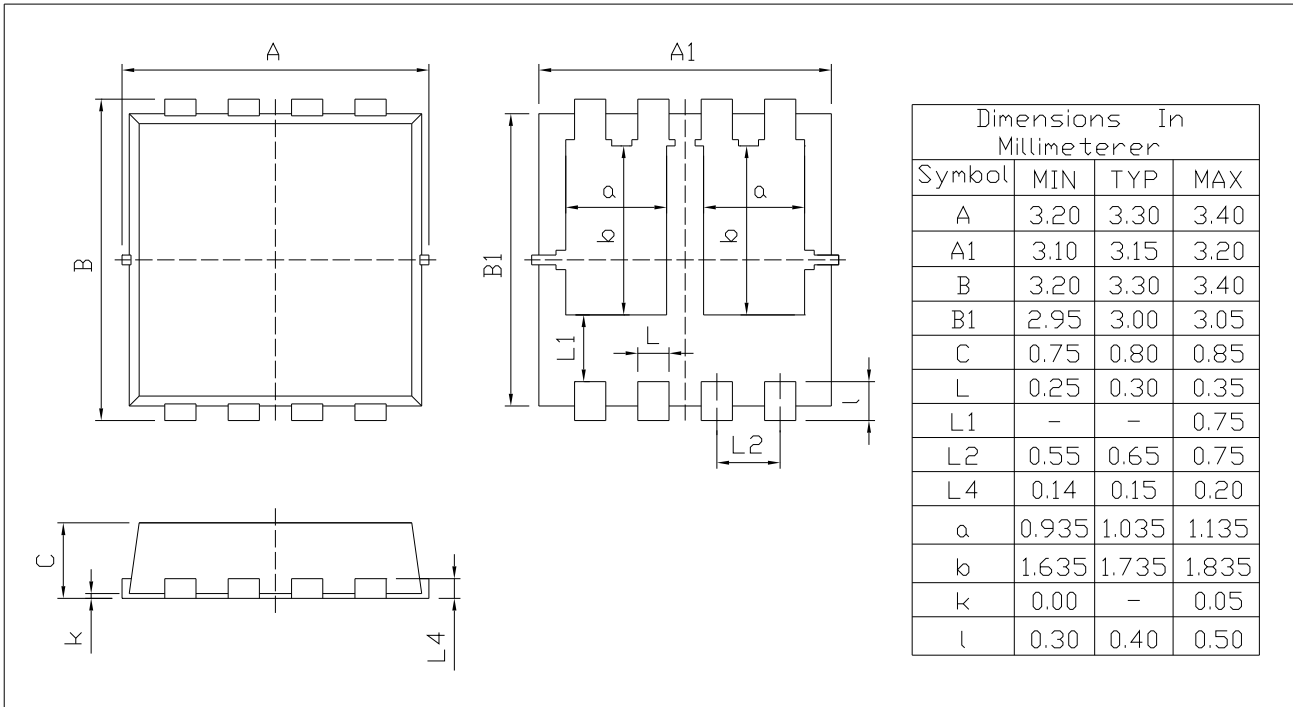


Figure 10: Normalized Maximum Transient Thermal Impedance

外形尺寸图 / Package Dimensions

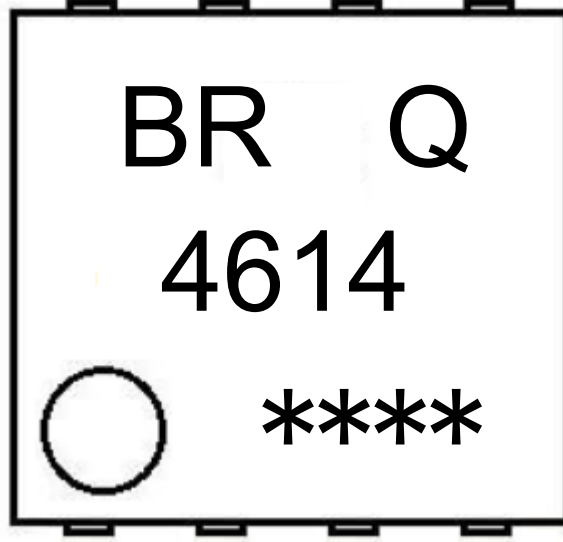
PDFN3X3-8L

Unit:mm



Rev.00 202011

印章说明 / Marking Instructions



说明：

BR： 为公司代码

Q： 为汽车无卤产品标识

4614： 为型号代码

****： 为生产批号代码，随生产批号变化

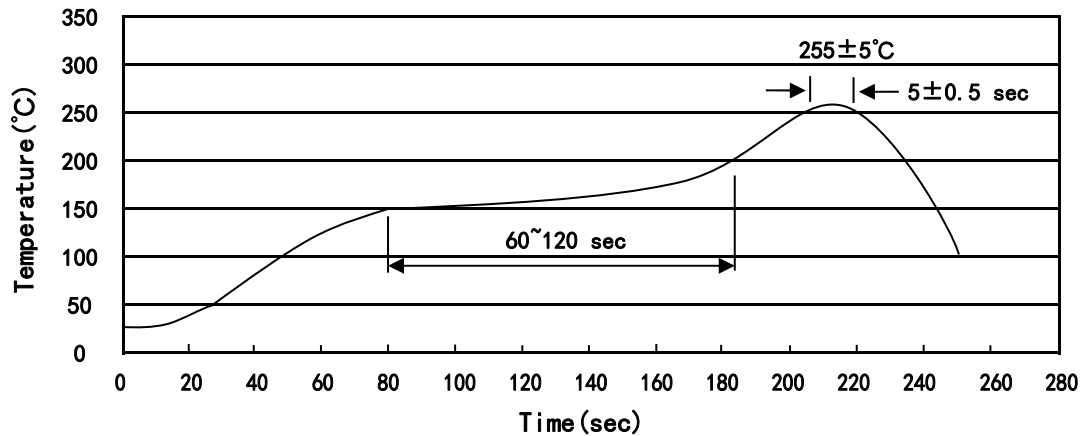
Note:

BR: Company Code

Q: Automobile halogen-free product Code

4614: 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 ³)		
	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
PDFN3×3-8L	5,000	2	10,000	6	60,000	13" ×12	360×360×50	380×335×366

使用说明 / Notices