

# BRFL70R900C

Rev.A Jul.-2024

## 描述 / Descriptions

TO-220FL 塑封封装 N 沟道 700V 超结工艺功率场效应管。

N-CHANNEL 700V Super-Junction Power MOSFET in a TO-220FL Plastic Package.

## 特征 / Features

低  $R_{DS(on)} \times Q_g$  , 100%雪崩测试, 符合 RoHS 标准, 无卤产品。

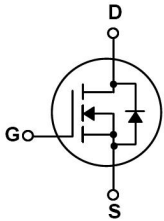
Very low  $R_{DS(on)} \times Q_g$ , 100% avalanche tested, RoHS compliant, HF product.

## 用途 / Applications

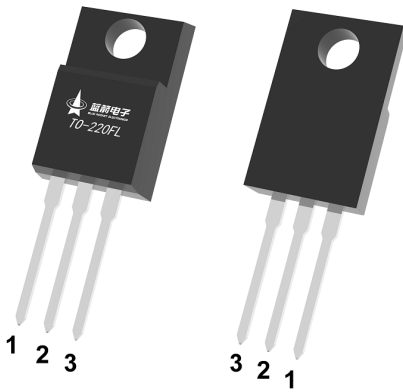
用于开关电源, 不间断电源, 功率因素校正。

For switch mode power supply, uninterruptible power supply, power factor correction.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



PIN1 : G

PIN 2 : D

PIN 3 : S

## 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	$V_{DS}$	700	V
Drain Current	$I_D(T_c=25^\circ\text{C})$	3.6	A
Drain Current - Pulsed	$I_{DM}$	14.5	A
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Single Pulsed Avalanche Energy	$E_{AS}$	23.7	mJ
Avalanche Current	$I_{AS}$	2.1	A
Power Dissipation	$P_D(T_c=25^\circ\text{C})$	30	W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$
Junction-to-Case	$R_{\theta JC}$	4.2	$^\circ\text{C/W}$
Junction-to-Ambient	$R_{\theta JA}$	80	$^\circ\text{C/W}$

**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	$BV_{DSS}$	$V_{GS}=0V$ $I_D=250\mu A$	700	750		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=700V$ $V_{GS}=0V$ $T_J=25^\circ\text{C}$			1.0	$\mu A$
Gate-Body Leakage Current, Forward	$I_{GSS}$	$V_{GS}=\pm 30V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.5A$		770	900	m $\Omega$
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$ $I_{SD}=5A$ $T_J=25^\circ\text{C}$			1.4	V
Gate Resistance	$R_g$	$V_{GS}=0V$ $f=1.0\text{MHz}$		6.5		$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=100V$ $V_{GS}=0V$ $f=1.0\text{MHz}$		435		pF
Output Capacitance	$C_{oss}$			20		pF
Reverse Transfer Capacitance	$C_{rss}$			0.55		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=350V$ $I_D=5.0A$ $V_{GS}=10V$ $R_G=24\Omega$		13		ns
Turn-On Rise Time	$t_r$			28		ns
Turn-Off Delay Time	$t_{d(off)}$			30		ns
Turn-Off Fall Time	$t_f$			24		ns

## 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
Continuous Diode Forward Current	$I_S$				5.5	A
Total Gate Charge	$Q_g$	$V_{DS}=560V$ $I_D=5.0A$ $V_{GS}=10V$		13		nC
Gate-Source Charge	$Q_{gs}$			4.3		nC
Gate-Drain Charge	$Q_{gd}$			6.1		nC
Reverse recovery time	$T_{rr}$	$I_F=5.0A,$ $dI_F/dt=100 A/\mu s$		223		ns
Reverse recovery charge	$Q_{rr}$			1.9		$\mu C$

电参数曲线图 / Electrical Characteristic Curve

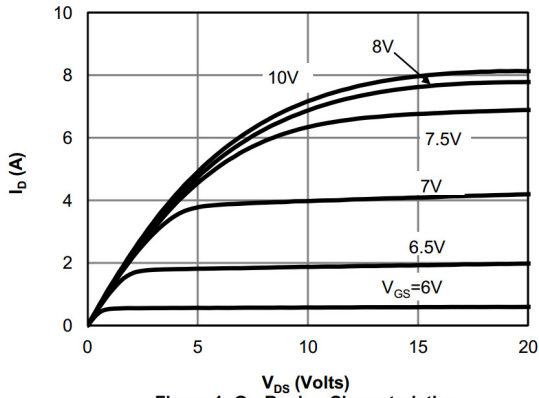


Figure 1: On-Region Characteristics

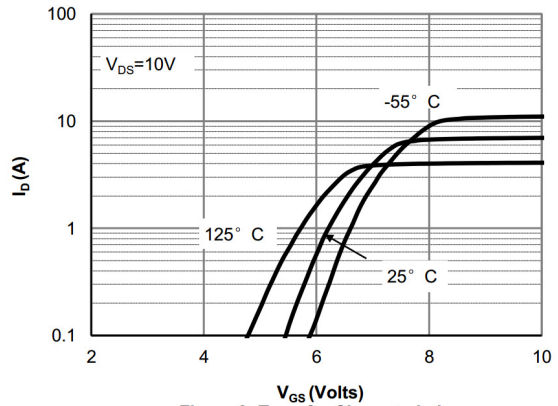


Figure 2: Transfer Characteristics

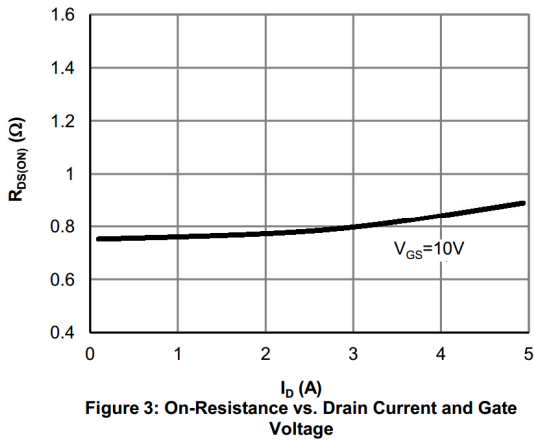


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

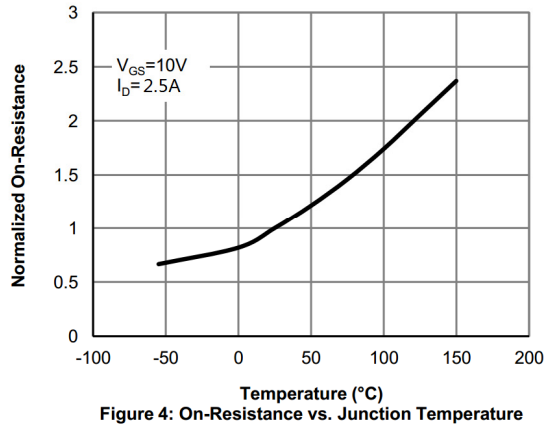


Figure 4: On-Resistance vs. Junction Temperature

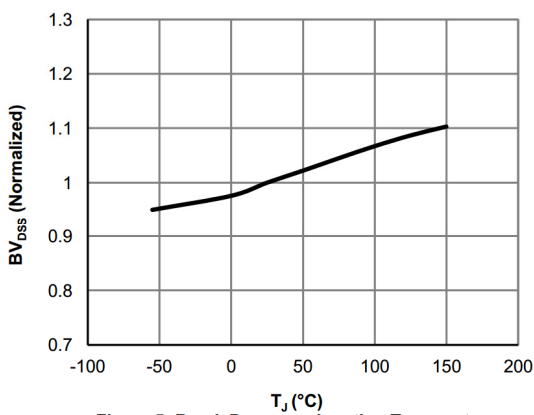


Figure 5: Break Down vs. Junction Temperature

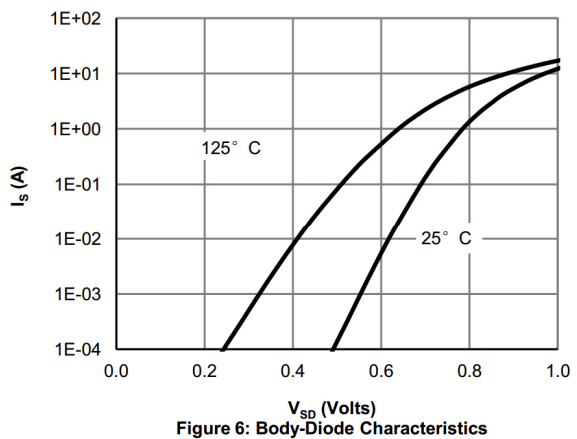


Figure 6: Body-Diode Characteristics

## 电参数曲线图 / Electrical Characteristic Curve

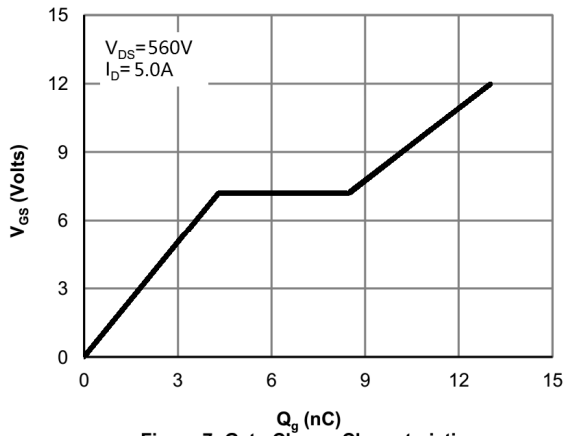


Figure 7: Gate-Charge Characteristics

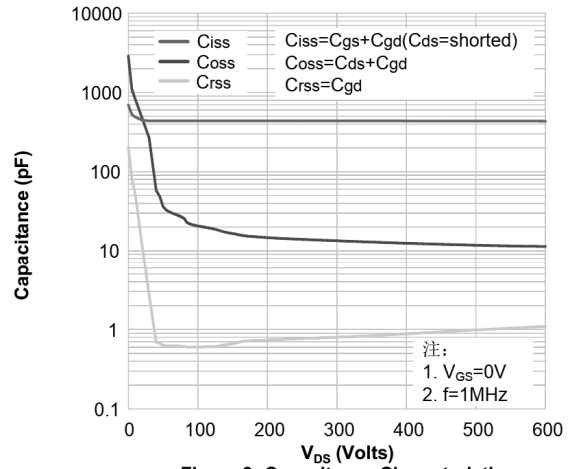


Figure 8: Capacitance Characteristics

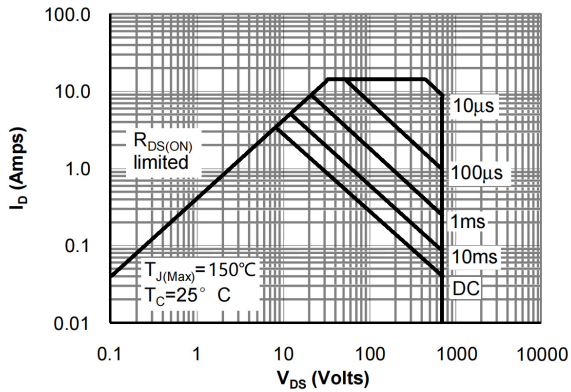


Figure 9: Maximum Forward Biased Safe Operating Area

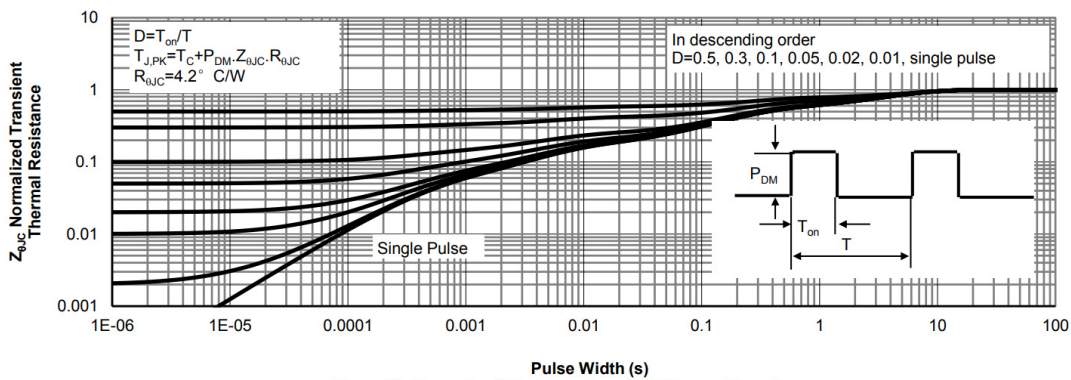
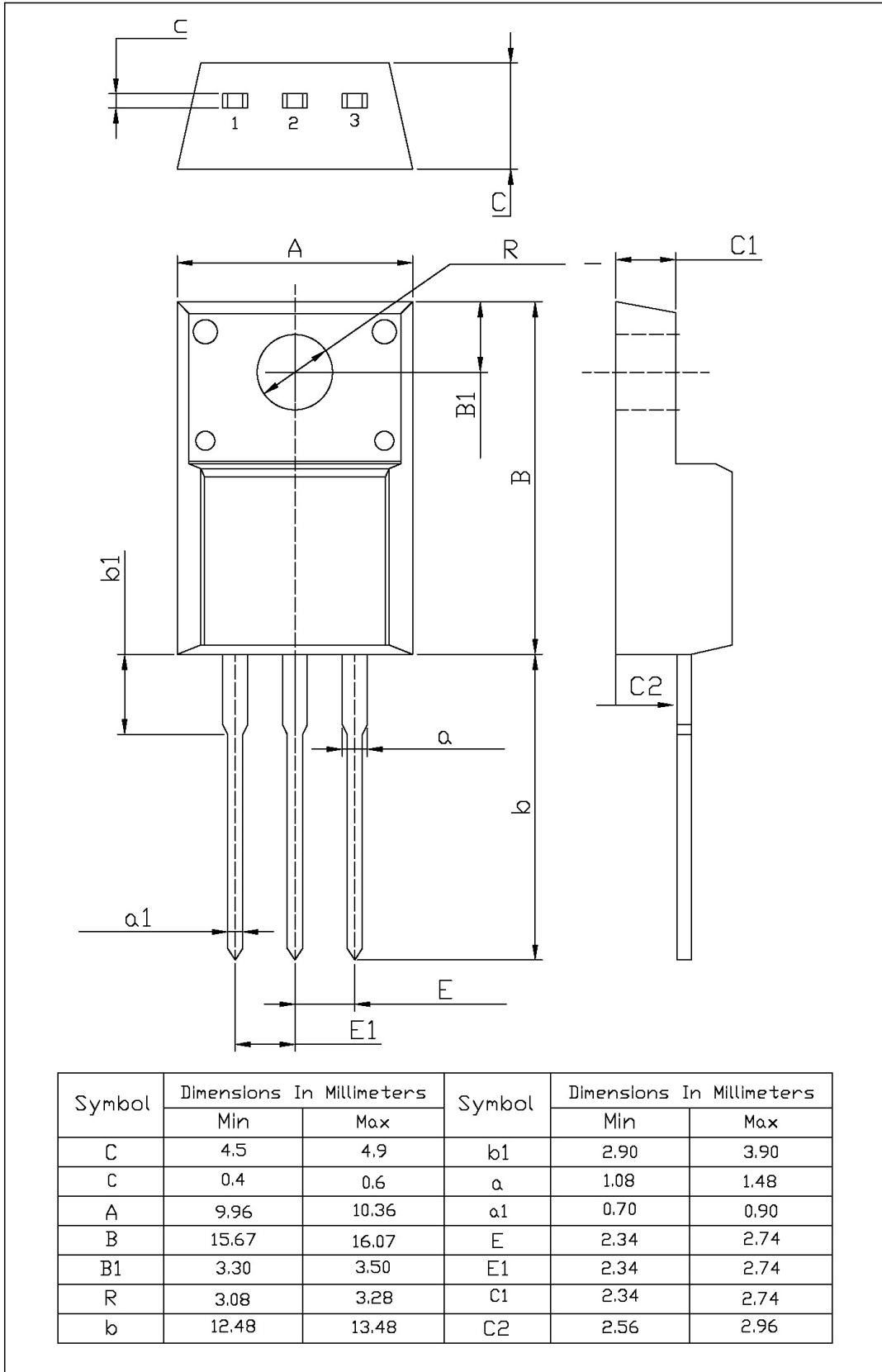


Figure 10: Normalized Maximum Transient Thermal Impedance

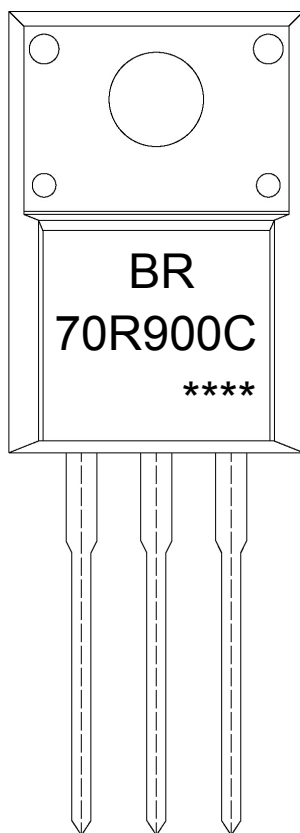
外形尺寸图 / Package Dimensions

TO-220FL

单位: mm



## 印章说明 / Marking Instructions



说明：

BR： 为公司代码

70R900C： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化

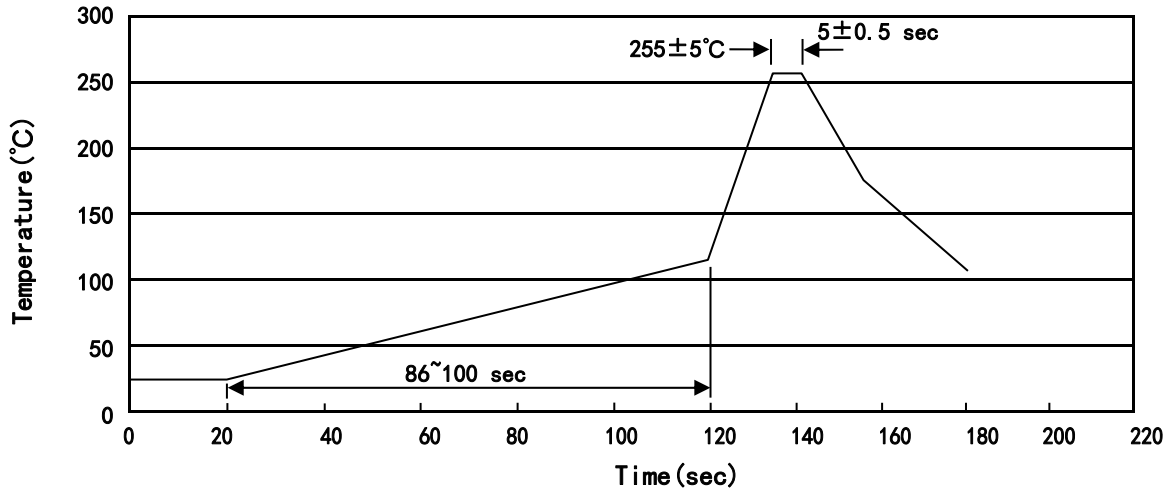
Note:

BR: Company Code

70R900C: Product Type Code

\*\*\*\*: Lot No. Code, code change with Lot No

波峰焊温度曲线图(无铅) / Temperature Profile for Dip Soldering(Pb-Free)



说明：

- 1、预热温度 25~150°C，时间 60~90sec;
- 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:25~150°C, Time:60~90sec.
- 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：270±5°C

时间：10±1 sec.

Temp.:270±5°C

Time:10±1 sec

包装规格 / Packaging SPEC.

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-220FL	50	20	1,000	5	5,000	532×33×7.0	555×164×50	575×290×180

使用说明 / Notices