

# BRFL24N50

Rev.A Sep.-2023

## 描述 / Descriptions

TO-220FL 塑封封装 N 沟 MOS 场效应管。  
N-Channel MOSFET in a TO-220FL Plastic Package.

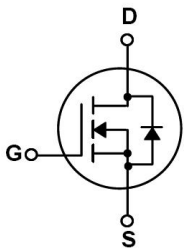
## 特征 / Features

$V_{DS}=500V$      $I_D=24A$   
 $R_{DS(ON)}@10V \leq 0.25\Omega$  (Typ.  $0.17\Omega$ )  
 $R_{DS(ON)}@6V \leq 0.3\Omega$  (Typ.  $0.18m\Omega$ )

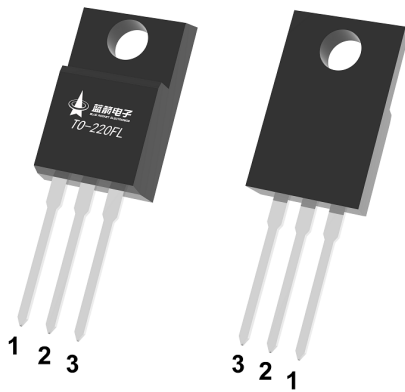
## 用途 / Applications

用于高电压、高速功率开关应用，如高效率开关模电源、功率因数校正。  
 Designed for high voltage, high speed power switching applications such as high efficiency switched mode power supplies, active 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.

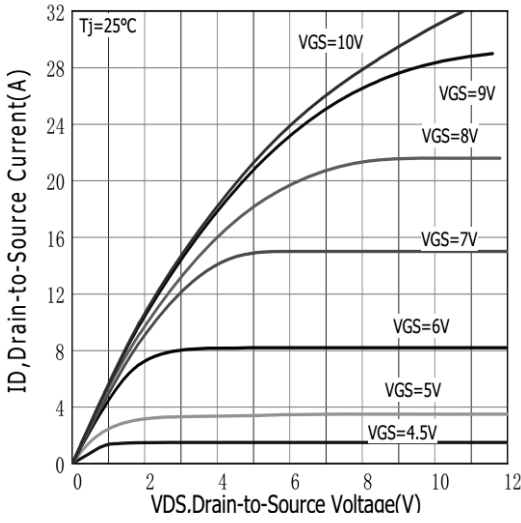
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-to-Source Breakdown Voltage	$V_{DSS}$	500	V
Continuous Drain Current	$I_D(T_c=25^\circ\text{C})$	24	A
Drain Current Pulsed	$I_{DM}$	90	A
Gate-to-Source Voltage	$V_{GS}$	$\pm 30$	V
Avalanche Current	$I_{AS}$	21	A
Single Pulse Avalanche Energy	$E_{AS}$	1960	mJ
Power Dissipation	$P_D(T_c=25^\circ\text{C})$	50	W
Junction Temperature Range	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ\text{C}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$

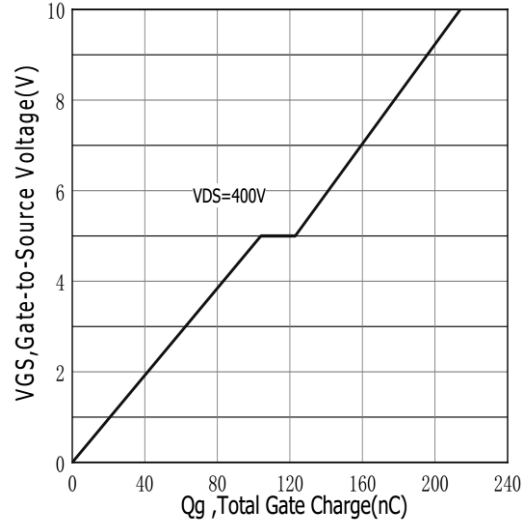
**电性能参数 / Electrical Characteristics(Ta=25°C)**

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-to-Source Breakdown Voltage	$V_{DSS}$	$V_{GS}=0V$ $I_D=250\mu A$	500	550		V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=500V$ $V_{GS}=0V$			1.0	$\mu A$
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{GS}=\pm 30V$ $V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=12A$		0.17	0.25	$\Omega$
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=6V$ $I_D=6A$		0.18	0.3	$\Omega$
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$ $I_{SD}=24A$			1.4	V
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		4364		pF
Output Capacitance	$C_{oss}$			311		
Reverse Transfer Capacitance	$C_{rss}$			138		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=250V$ $I_D=24A$ $R_G=10\Omega$		28.8		ns
Rise Time	$t_r$			5.6		
Turn-Off Delay Time	$t_{d(off)}$			106.4		
Fall Time	$t_f$			9.6		
Total Gate Charge	$Q_g$	$V_{DS}=400V$ $I_D=24A$ $V_{GS}=10V$		214		nC
Gate-Source Charge	$Q_{gs}$			104		
Gate-Drain Charge	$Q_{gd}$			19		

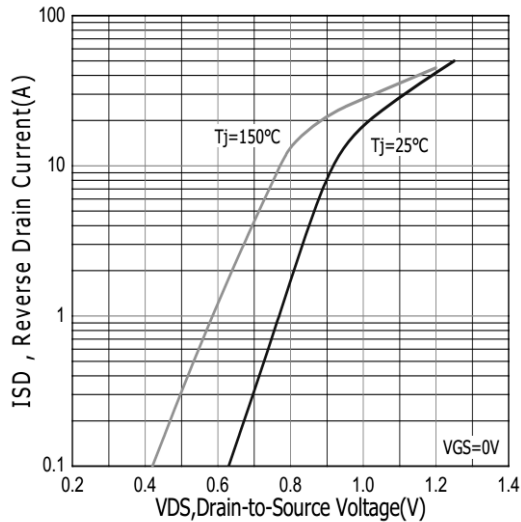
电参数曲线图 / Electrical Characteristic Curve



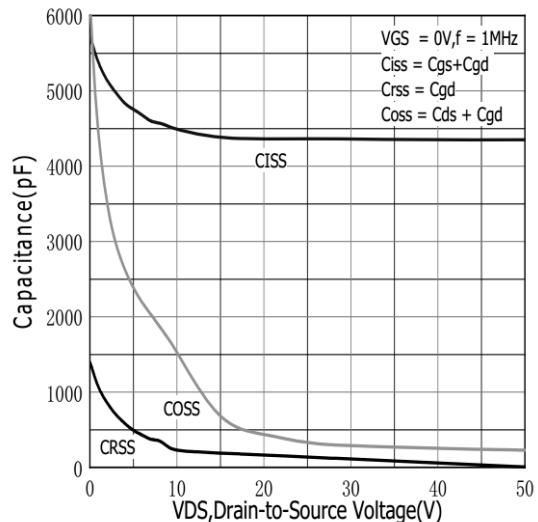
1. Typical Output Characteristics



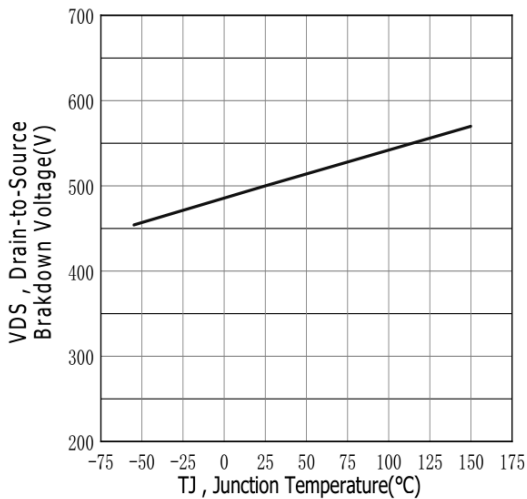
2. Typical Gate Charge vs Gate to Source Voltage



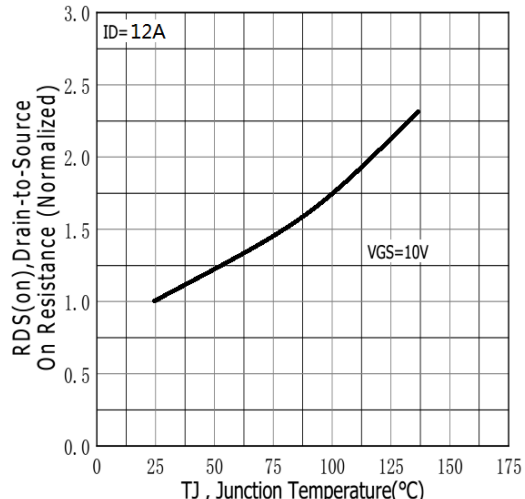
3. Typical Body Diode Transfer Characteristics



4. Typical Capacitance vs Drain to Source Voltage

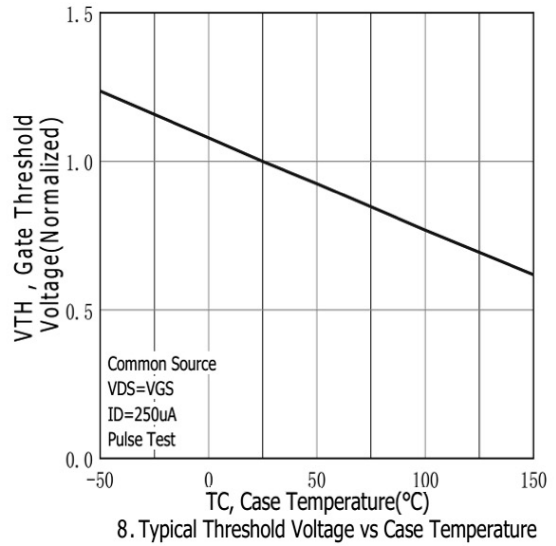
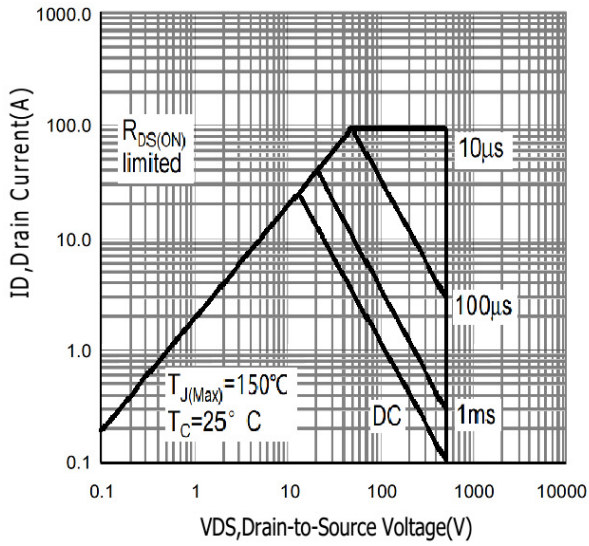


5. Typical Breakdown Voltage vs Junction Temperature



6. Typical Drian to Source on Resistance vs Junction Temperature

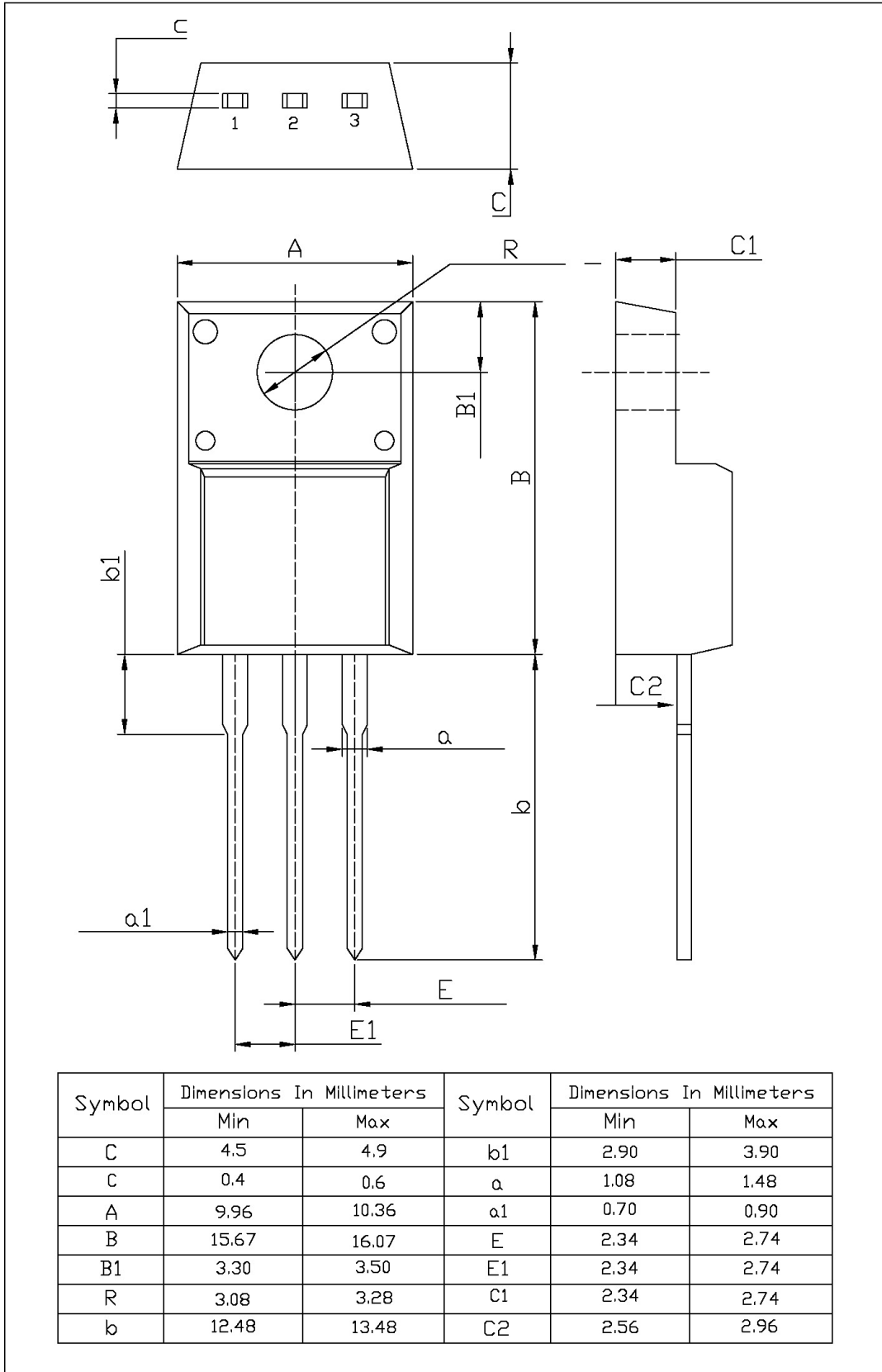
电参数曲线图 / Electrical Characteristic Curve



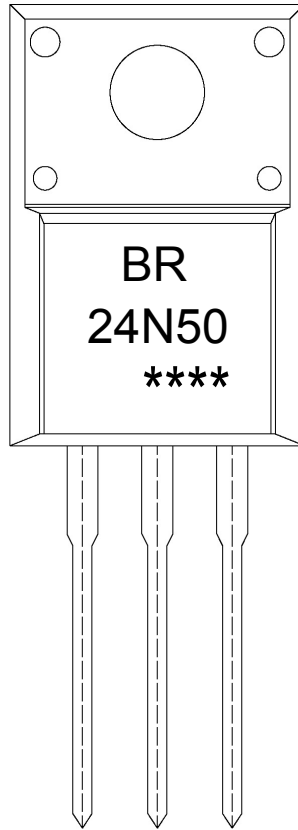
外形尺寸图 / Package Dimensions

TO-220FL

单位: mm



**印章说明 / Marking Instructions**



说明：

BR： 为公司代码

24N50： 为型号代码

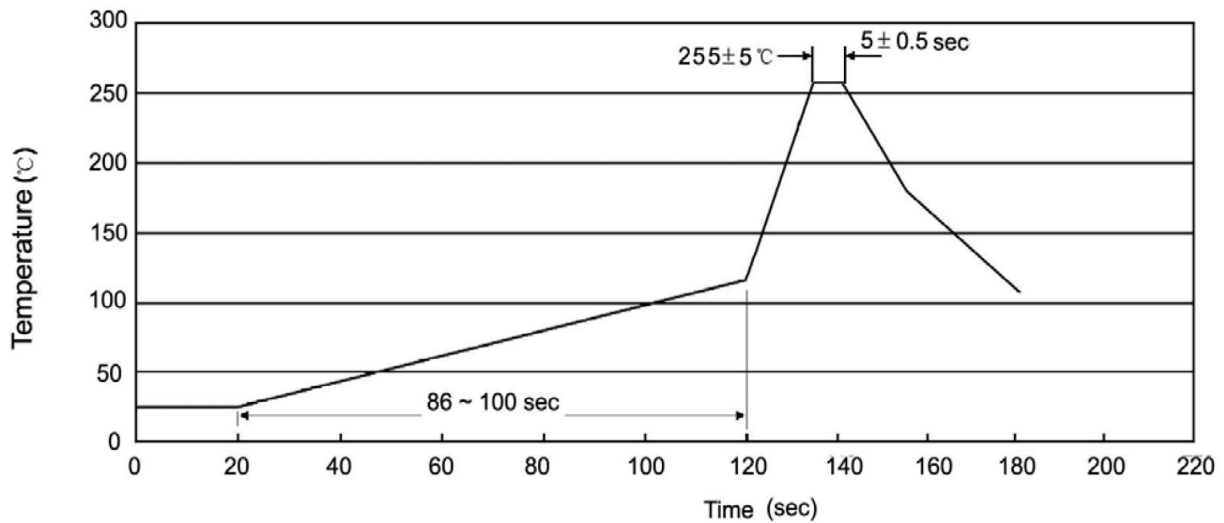
\*\*\*\*： 为生产批号代码，随生产批号变化

Note:

BR: Company Code

24N50: Product Type

\*\*\*\*: 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**