

### 描述 / Descriptions

TO-220 塑封封装 N 沟道 MOS 场效应管。N-CHANNEL MOSFET in a TO-220 Plastic Package.

### 特征 / Features

热阻低,开关速度快。

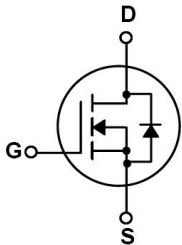
Low thermal resistance, fast switching.

### 用途 / Applications

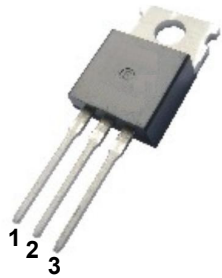
用于电子变压器,开关电源。

For Electronic transformer, Switch mode power supply.

### 内部等效电路 / Equivalent Circuit



### 引脚排列 / Pinning



PIN1 : G

PIN 2 : D

PIN 3 : S

### 放大及印章代码 / $h_{FE}$ Classifications & 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
Gate-Source Voltage	$V_{GS}$	±30	V
Drain Current	$I_D(T_c=25^\circ\text{C})$	4.0	A
Drain Current	$I_D(T_c=100^\circ\text{C})$	2.5	A
Drain Current - Pulsed	$I_{DM}^{①}$	16	A
Single Pulsed Avalanche Energy	$E_{AS}^{②}$	260	mJ
Power Dissipation	$P_{tot}$	106	W
Junction Temperature Range	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C
Thermal Resistance Junction-case	$R_{\theta-JC}$	1.18	°C/W
Thermal Resistance Junction-ambient	$R_{\theta-JA}$	62.5	°C/W

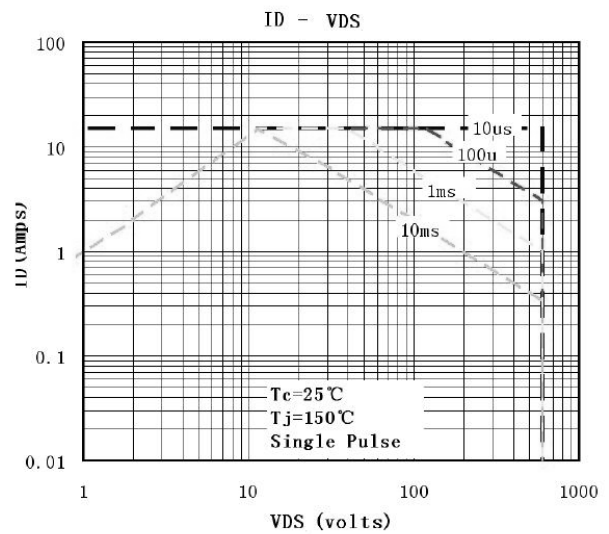
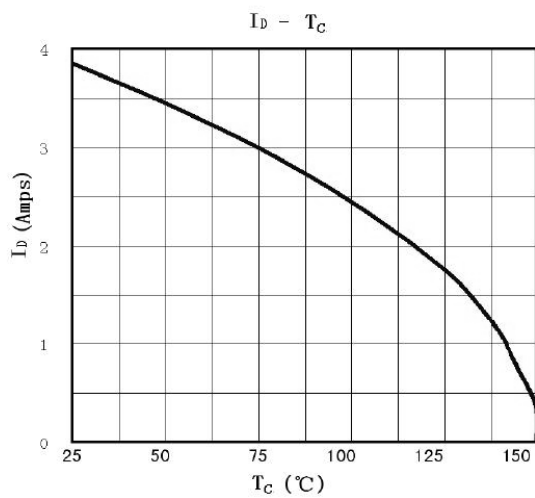
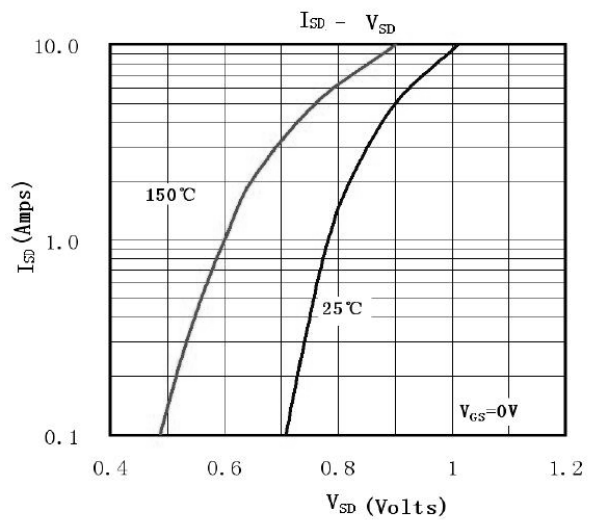
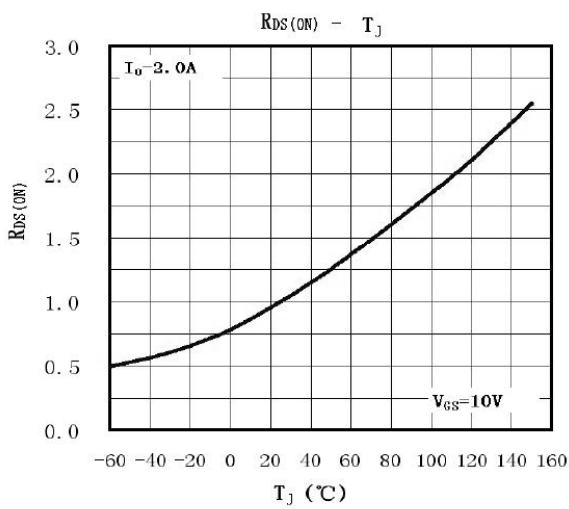
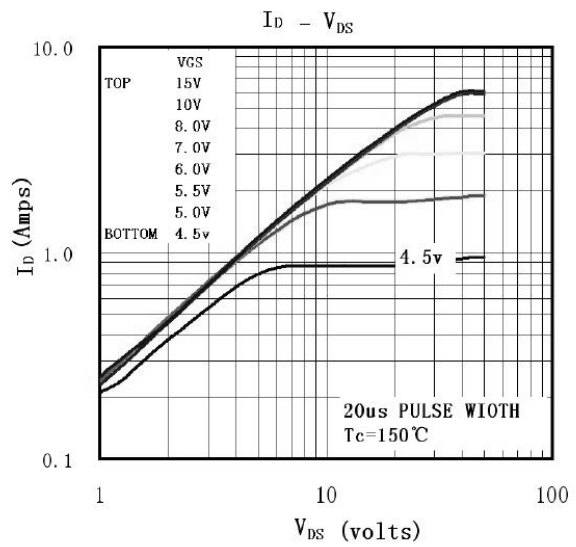
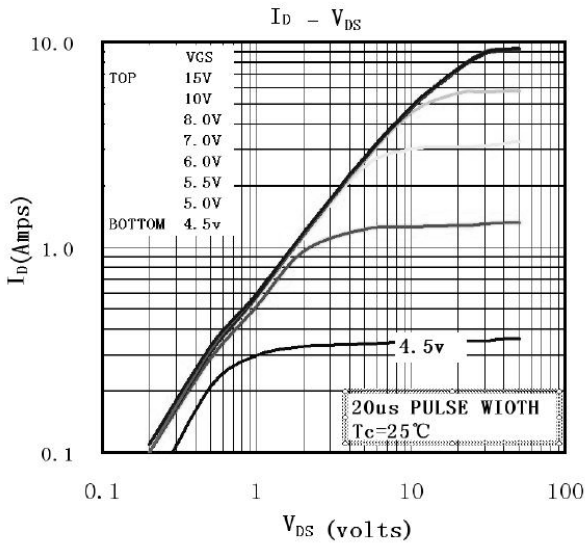
电性能参数 / Electrical Characteristics(Ta=25°C)

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			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=700V$ $V_{GS}=0V$ $T_j=25^\circ\text{C}$			1	$\mu A$
		$V_{DS}=560V$ $V_{GS}=0V$ $T_j=125^\circ\text{C}$			10	$\mu A$
Gate-Body Leakage Current, Forward	$I_{GSS}$	$V_{GS}=\pm 30V$			±100	nA
Continuous Diode Forward Current	$I_S$				4.0	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=4.0A$ $V_{GS}=0V^{③}$ $T_j=25^\circ\text{C}$			1.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.0A^{③}$			2.8	$\Omega$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}$ $I_D=250\mu A$	2.0		4.0	V
Reverse Recovery Time	$t_{rr}$	$I_f=4.0A$ $T_j=25^\circ\text{C}$ $di/dt=100A/\mu s^{③}$		250		nS
Reverse Recovery Charge	$Q_{rr}$			1.5		$\mu C$
Input Capacitance	$C_{iss}$	$V_{GS}=0V$ $V_{DS}=25V$ $V_F=1.0MHz$		520		pF
Turn-Off Delay Time	$t_{d(off)}$	$V_{DD}=350V$ $I_D=4.0A$ $R_G=25\Omega^{③}$		25		ns
Forward Transconductance	$g_{fs}$	$V_{DS}=40V$ $I_D=2.0A^{③}$		4.0		S
Total Gate Charge	$Q_g$	$I_D=4.0A$ $V_{DS}=560V$ $V_{GS}=10V^{③}$		17.4		nC
Gate-to-Source Charge	$Q_{gs}$			4.8		nC
Gate-to-Drain Charge	$Q_{gd}$			5.4		nC

注释(Notes):

- ① : 脉冲宽度: 以最高结温为限制 / Repetitive rating: Pulse width limited by maximum junction temperature
- ② : 初始结温=25°C,  $V_{DD}=50V$ ,  $L=30mH$ ,  $R_G=25\Omega$ ,  $I_{AS}=4.0A$  / Starting  $T_j=25^\circ\text{C}$ ,  $V_{DD}=50V$ ,  $L=30mH$ ,  $R_G=25\Omega$ ,  $I_{AS}=4.0A$
- ③ : 脉冲测试: 脉冲宽度 $\leq 300\mu s$ , 占空比 $\leq 2\%$  / Pulse Test: Pulse width $\leq 300\mu s$ , Duty cycle $\leq 2\%$

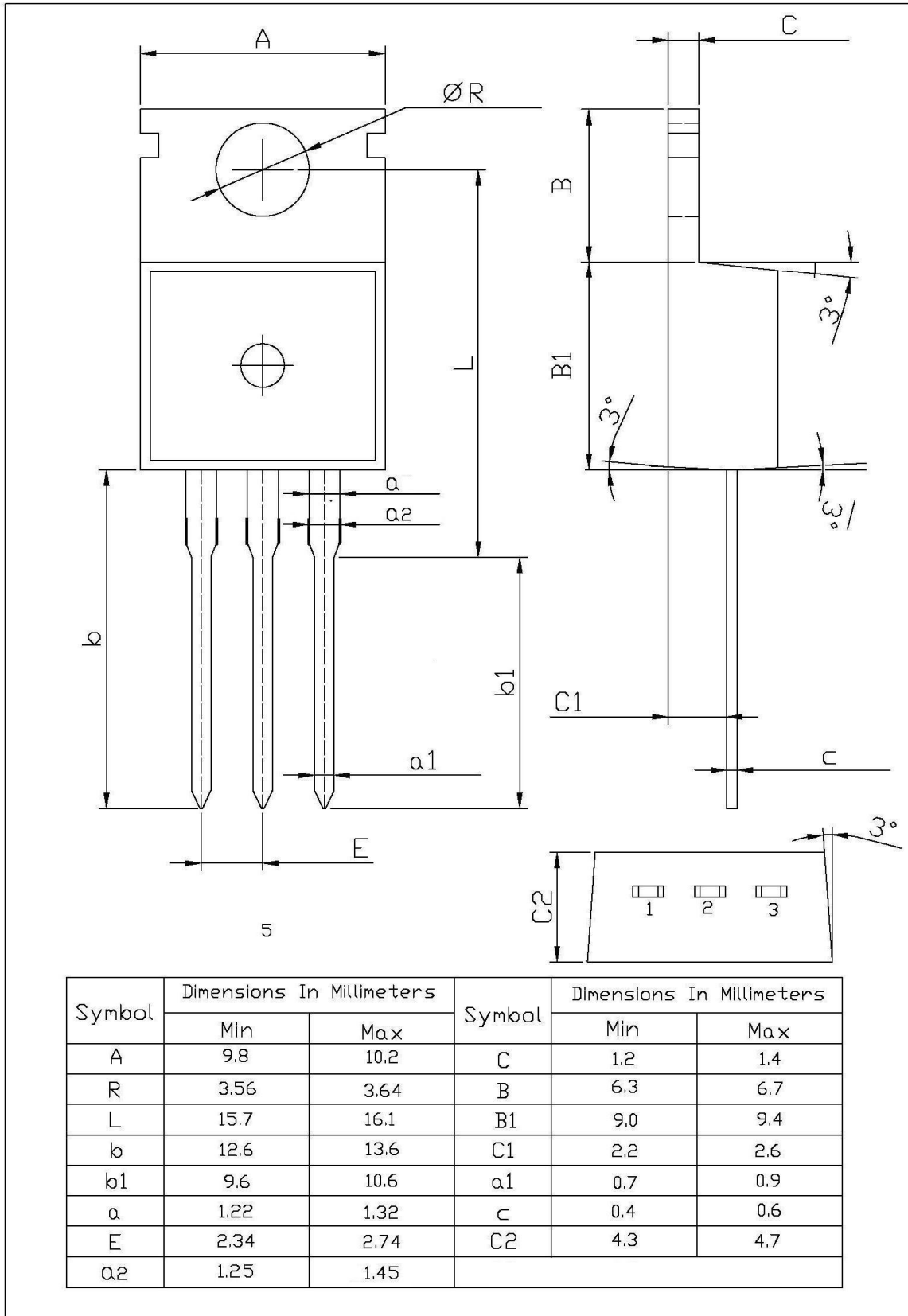
**电参数曲线图 / Electrical Characteristic Curve**



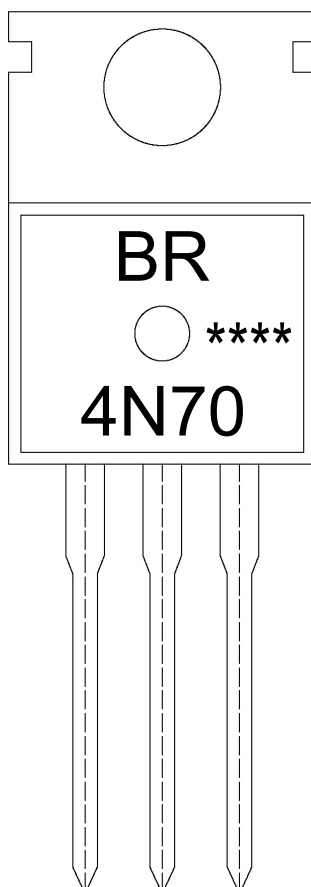
外形尺寸图 / Package Dimensions

T□-220

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

4N70： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化。

Note:

BR: Company Code

4N70: 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.**

散件包装 / BULK

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Bag 只/袋	Bags/Inner Box 袋/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Bag 袋	Inner Box 盒	Outer Box 箱
TO-220/F	200	10	2,000	5	10,000	135×190	237×172×102	560×245×195

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-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

**使用说明 / Notices**