

描述 / Descriptions

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

特征 / Features

热阻低,开关速度快。

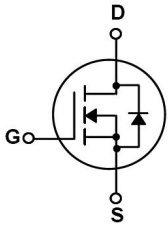
Low thermal resistance, fast switching.

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



PIN 1 : 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}	36	W
Junction Temperature Range	T_j	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C
Junction-to-Case	$R_{\theta JC}$	3.47	°C/W
Junction-to-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
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	$I_D=250\mu A$ Referenced to 25°C		0.65		V/°C
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$ $I_D=250\mu A$	2.0		4.0	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=700V$ $V_{GS}=0V$ $T_j=25^\circ\text{C}$			1	μA
		$V_{DS}=560V$ $V_{GS}=0V$ $T_j=125^\circ\text{C}$			10	μA
Forward Transconductance	g_{FS}	$V_{DS}=40V$ $I_D=2.0A^{③}$		4.0		S
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 30V$			±100	nA
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.0A^{③}$		1.93	2.2	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V$ $V_{DS}=25V$ $V_F=1.0\text{MHz}$		520		pF
Turn-Off Delay Time	$t_{d(off)}$	$V_{DD}=350V$ $I_D=4.0A$ $R_G=25\Omega^{③}$		25		ns

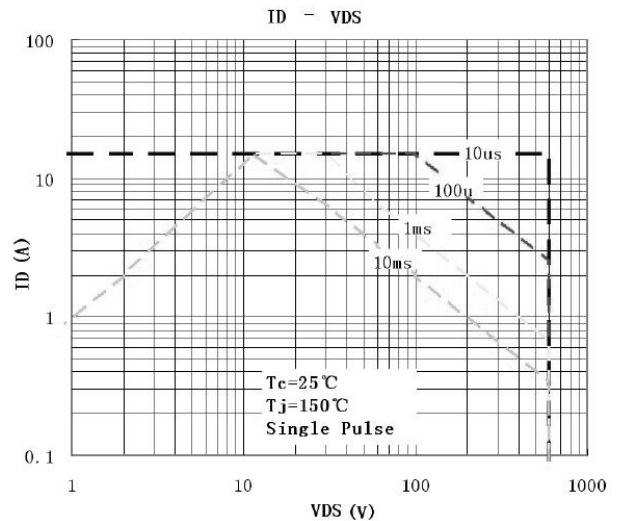
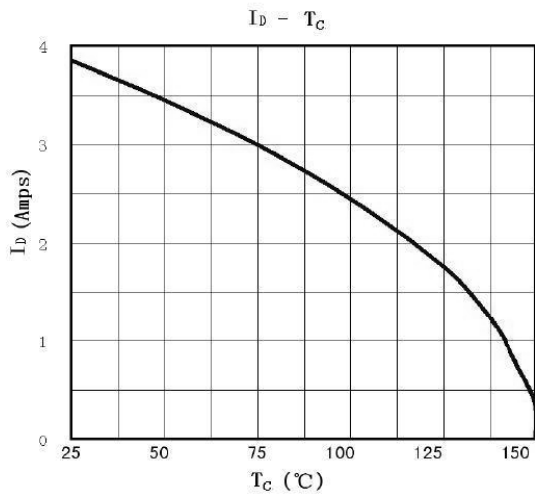
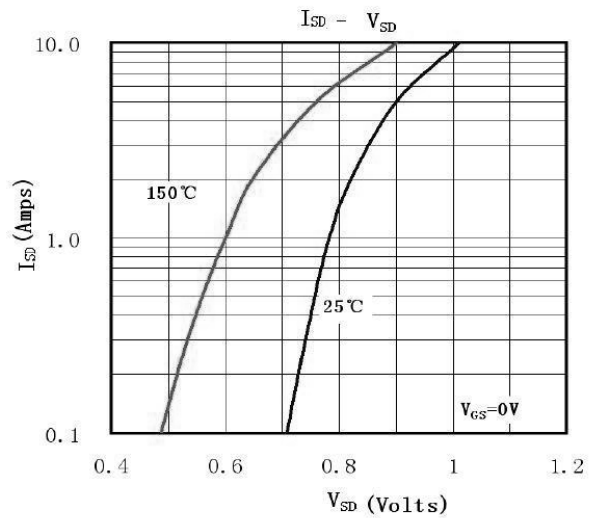
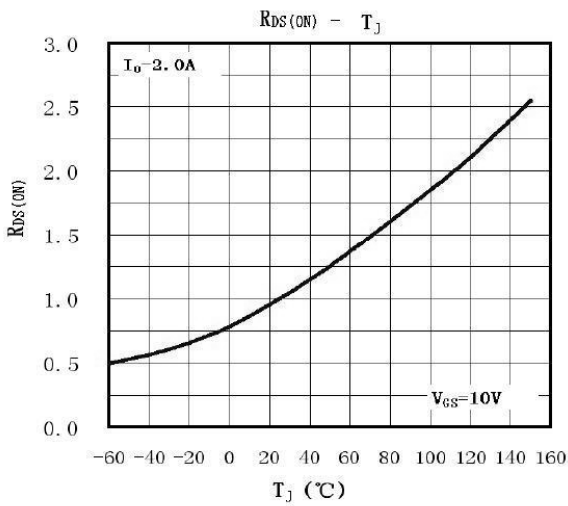
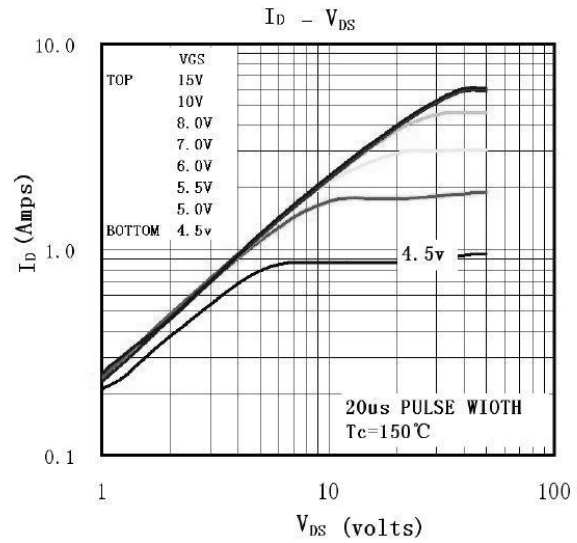
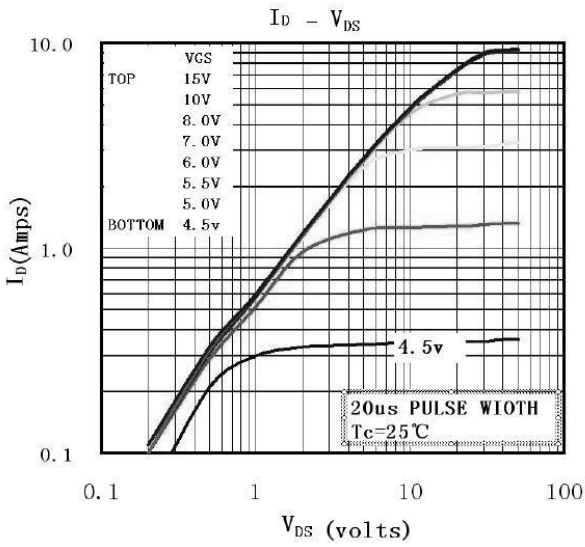
电性能参数 / Electrical Characteristics(Ta=25°C)

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
Total Gate Charge	Q_g	$I_D=4.0A$ $V_{DS}=560V$ $V_{GS}=10V^{②}$		17.4		nC
Gate-to-Source Charge	Q_{gs}			4.8		nC
Gate-to-Drain Charge	Q_{gd}			5.4		nC
Continuous Diode Forward Current	I_S				4.0	A
Diode Forward Voltage	V_{SD}	$I_S=4.0A$ $V_{GS}=0V^{③}$ $T_J=25^\circ C$			1.4	V
Reverse Recovery Time	t_{rr}	$I_f=4.0A$ $T_J=25^\circ C$ $di/dt=100A/\mu s^{③}$		250		nS
Reverse Recovery Charge	Q_{rr}			1.5		uC

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 $T_J=25^\circ C$, $V_{DD}=50V$, $L=30mH$, $R_G=25\Omega$, $I_{AS}=4.0A$
- 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 $\leq 2\%$

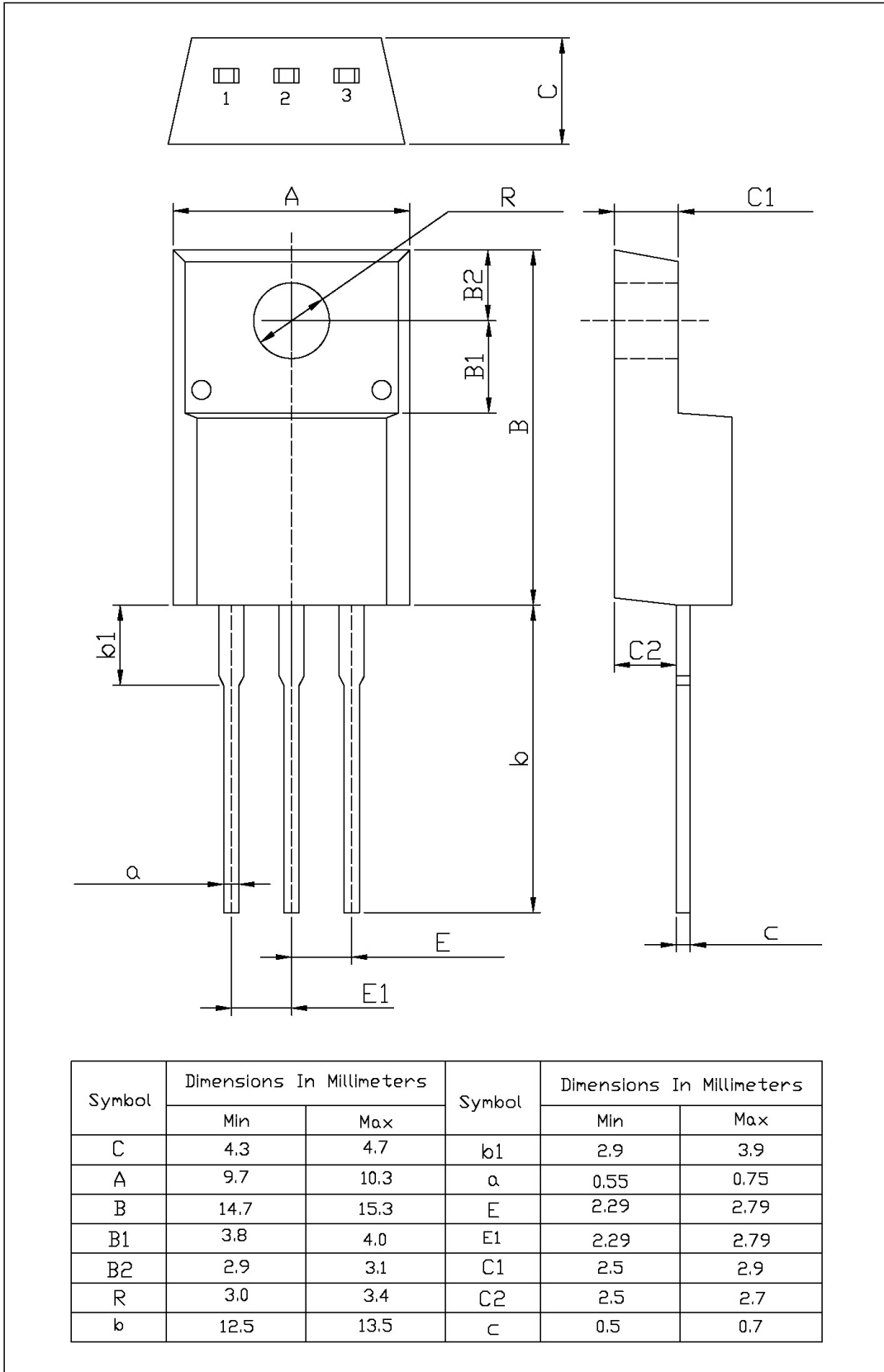
电参数曲线图 / Electrical Characteristic Curve



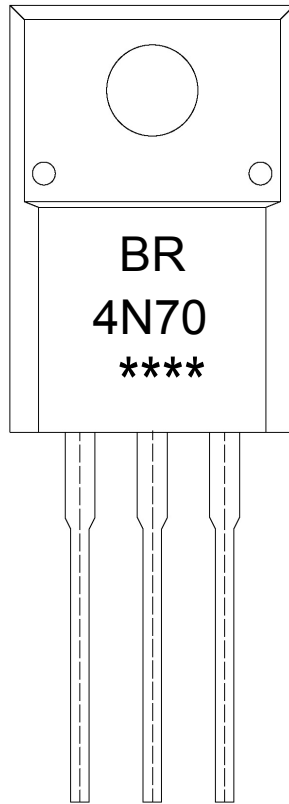
外形尺寸图 / Package Dimensions

T0-220F

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。

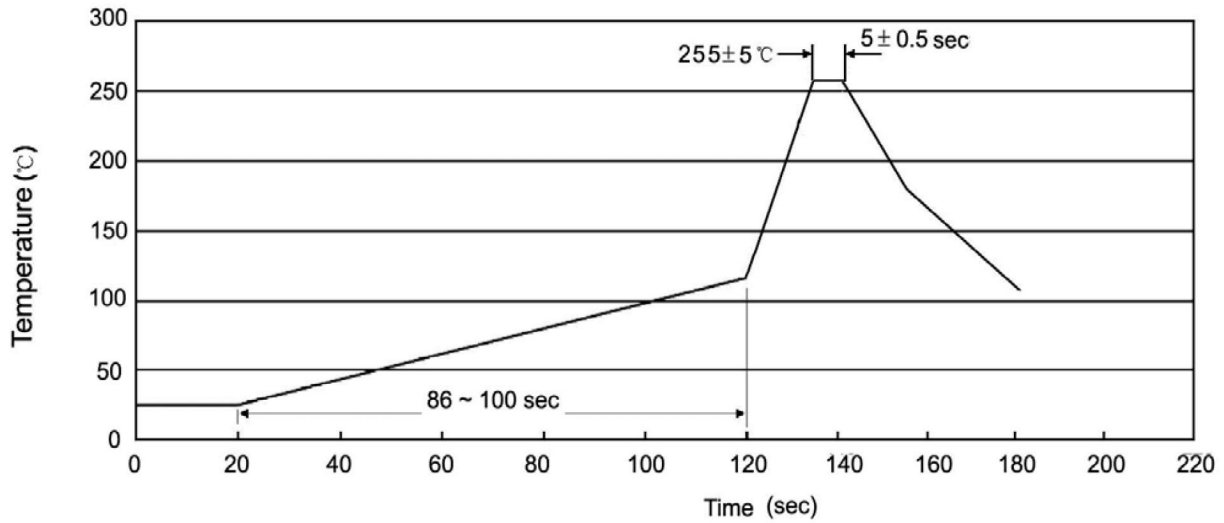
Note:

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 ³)		
	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 ³)		
	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