

### 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

低栅极电荷，开关速度快，雪崩能量高，dv/dt 能力强。

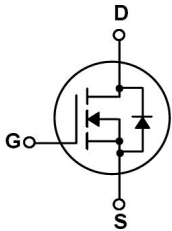
Low gate charge, Fast switching capability, Avalanche energy specified, Improved dv/dt capability.

### 用途 / Applications

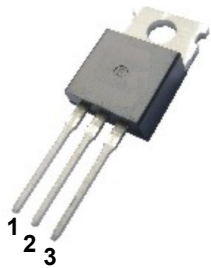
用于高电压、高速功率开关应用，如高效率开关模电源、功率因数校正。

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



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.

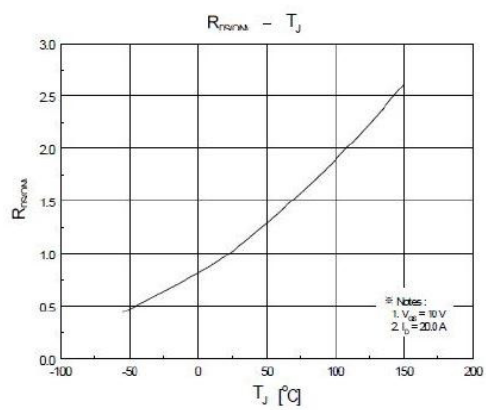
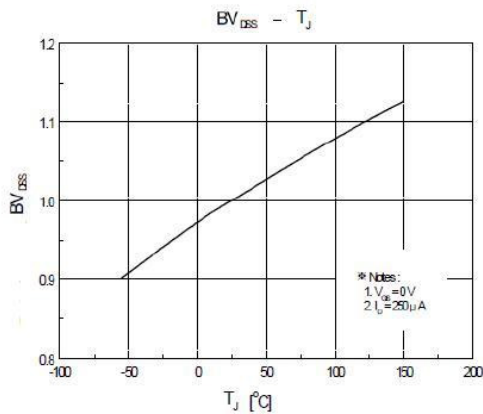
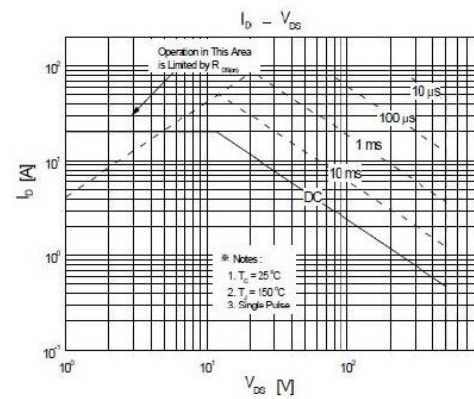
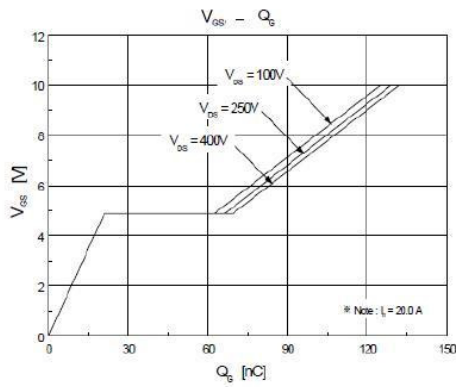
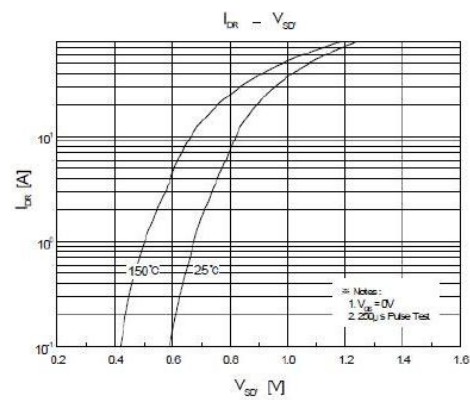
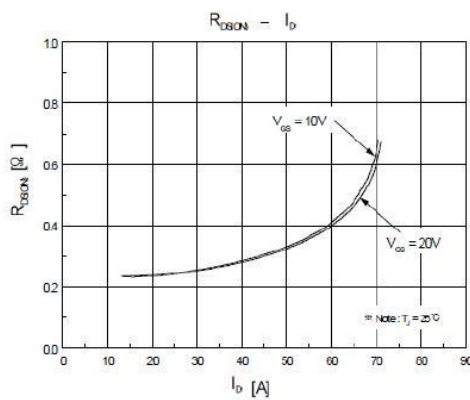
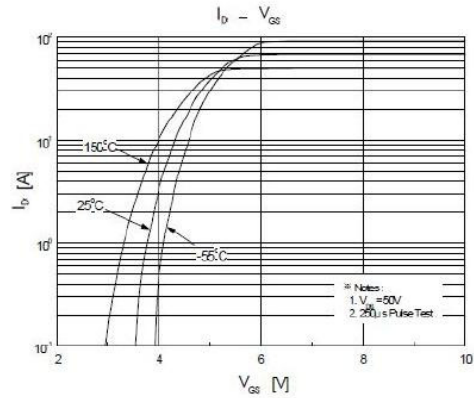
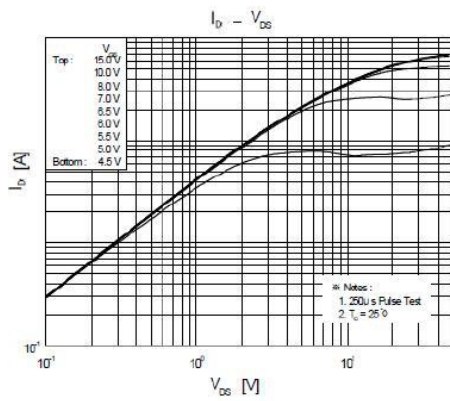
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	$V_{DSS}$	400	V
Drain Current	$I_D(T_C=25^\circ C)$	20	A
Drain Current	$I_D(T_C=100^\circ C)$	13	A
Drain Current - Pulsed	$I_{DP}$	80	A
Gate-Source Voltage	$V_{GSS}$	±20	V
Single Pulsed Avalanche Energy	$E_{AR}$	28	mJ
Repetitive Avalanche Energy	$E_{AS}$	1110	mJ
Peak Diode Recovery dv/dt	dv/dt	4.5	V/ns
Power Dissipation	$P_D(T_C=25^\circ C)$	280	W
Junction Temperature Range	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C
Thermal Resistance Junction-Ambient	$R_{thJA}$	40	°C/W
Thermal Resistance Junction-Case	$R_{thJC}$	0.44	°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	$V_{DSS}$	$V_{GS}=0V$ $I_D=250\mu A$	400			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=400V$ $V_{GS}=0V$			1.0	$\mu A$
		$V_{DS}=400V$ $T_C=125^\circ C$			10	
Gate-Body Leakage Current, Forward	$I_{GSS}$	$V_{GS}=\pm 20V$ $V_{DS}=0V$			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=10A$		0.23	0.40	$\Omega$
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V$ $I_S=20A$			1.5	V
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		2700		pF
Output Capacitance	$C_{oss}$			400		
Reverse Transfer Capacitance	$C_{rss}$			40		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=250V$ $I_D=20A$ $R_G=2.5\Omega$		100		ns
Turn-On Rise Time	$t_r$			400		
Turn-Off Delay Time	$t_{d(off)}$			100		
Turn-Off Fall Time	$t_f$			100		
Total Gate Charge	$Q_g$	$V_{DS}=400V$ $I_D=20A$ $V_{GS}=10V$		70		nC
Gate-Source Charge	$Q_{gs}$			18		
Gate-Drain Charge	$Q_{gd}$			35		

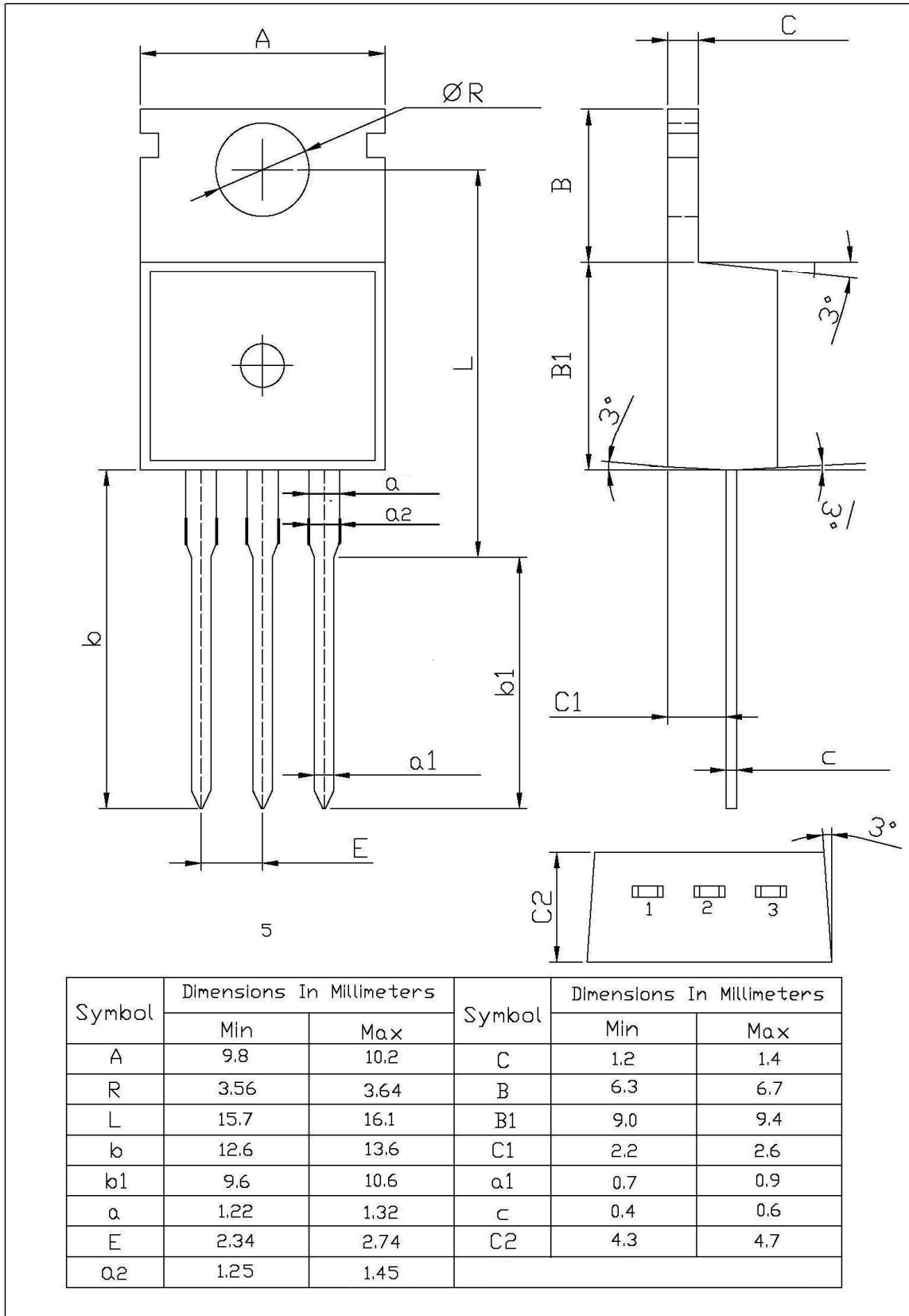
电参数曲线图 / Electrical Characteristic Curve



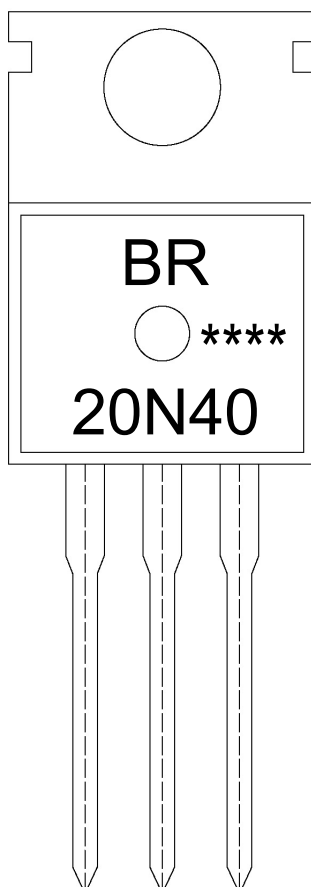
外形尺寸图 / Package Dimensions

T□-220

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

20N40： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化。

Note:

BR: Company Code

20N40: 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**