

描述 / Descriptions

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

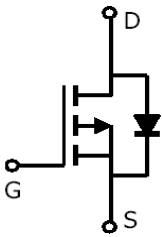
特征 / Features

$R_{DS(on)}$ 小, 门电荷低, C_{rss} 小, 开关速度快。
Low $R_{DS(on)}$, low gate charge, low C_{rss} , fast switching.

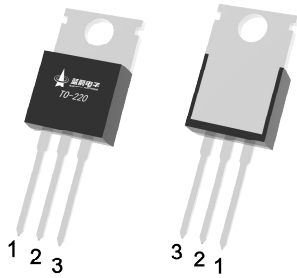
用途 / Applications

用于低压电路如: 汽车电路、DC/DC 转换、便携式产品的电源高效转换。
Suited for low voltage applications such as automotive, DC/DC Converters, and high efficiency switching for power management in portable and battery operated products.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : 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}	-60	V
Drain Current	$I_D(T_C=25^\circ C)$	-50	A
Drain Current - Pulsed	I_{DM}	-200	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	$P_D(T_C=25^\circ C)$	118	W
Single Pulsed Avalanche Energy	E_{AS}	250	mJ
Avalanche Current(L=0.5mH)	I_{AS}	25	A
Junction and Storage Temperature Range	T_j, T_{stg}	-55 to 150	$^\circ C$
Thermal resistance, junction - ambient	$t \leq 10s$	$R_{\theta JA}$	$^\circ C/W$
	Steady-State		
Thermal resistance, junction - case	Steady-State	$R_{\theta JC}$	

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}	$V_{GS}=0V \quad I_D=-250\mu A$	-60	-68		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-60V \quad V_{GS}=0V$			-1.0	μA
		$V_{DS}=-48V \quad T_C=150^\circ C$			-10	
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20V \quad V_{DS}=0V$			± 0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS} \quad I_D=-250\mu A$	-1	-1.6	-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V \quad I_D=-20A$		30	35	$m\Omega$
	$R_{DS(on)}$	$V_{GS}=-4.5V \quad I_D=-10A$		40	45	$m\Omega$
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V \quad I_S=-1A$			-1.2	V
Gate resistance	R_g			10		Ω
Input Capacitance	C_{iss}	$V_{DS}=-25V \quad V_{GS}=0V$ $f=1.0MHz$		3200		pF
Output Capacitance	C_{oss}			800		pF
Reverse Transfer Capacitance	C_{rss}			270		pF
Total Gate Charge	$Q_{g(10V)}$				45	
Total Gate Charge	$Q_{g(4.5V)}$	$V_{GS}=-10V, \quad V_{DS}=-30V,$ $I_D=-20A$		23		
Gate Source Charge	Q_{gs}			9.3		
Gate Drain Charge	Q_{gd}			10.2		

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
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V$ $V_{DS}=-30V R_L=1.5$ $R_{GEN}=3 \Omega$		12		ns
Turn-On Rise Time	t_r			14.5		
Turn-Off Delay Time	$t_{d(off)}$			38		
Turn-Off Fall Time	t_f			15		

电参数曲线图 / Electrical Characteristic Curve

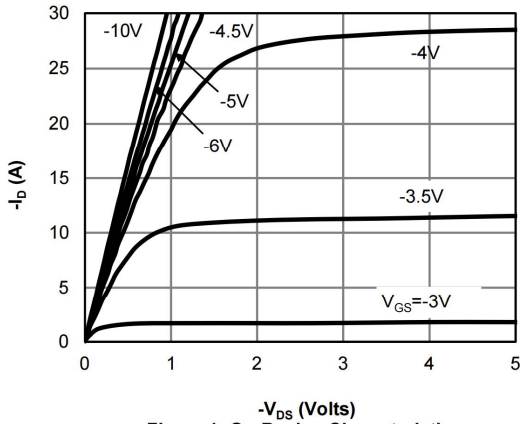


Figure 1: On-Region Characteristics

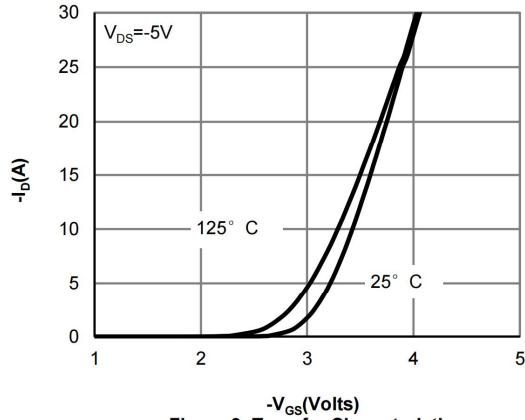


Figure 2: Transfer Characteristics

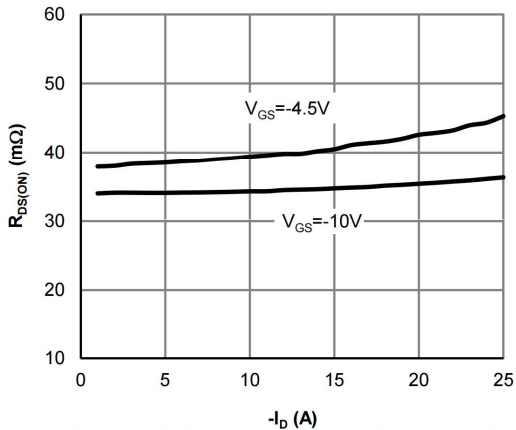


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

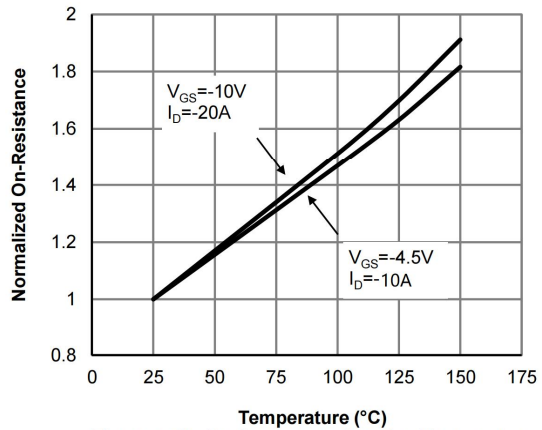


Figure 4: On-Resistance vs. Junction Temperature

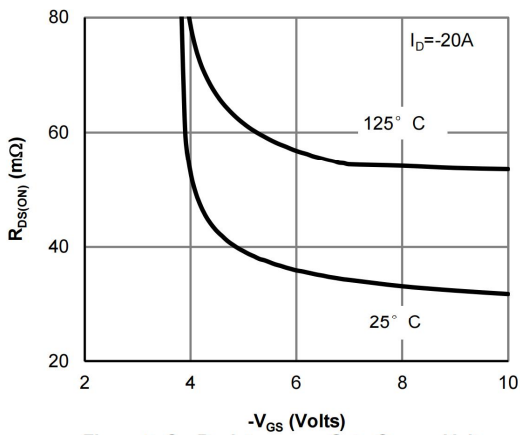


Figure 5: On-Resistance vs. Gate-Source Voltage

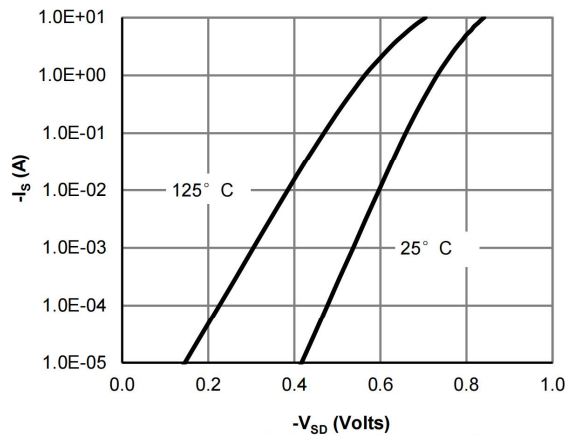


Figure 6: Body-Diode Characteristics

电参数曲线图 / Electrical Characteristic Curve

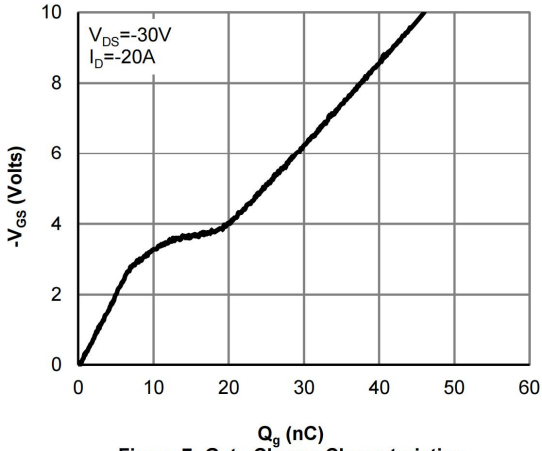


Figure 7: Gate-Charge Characteristics

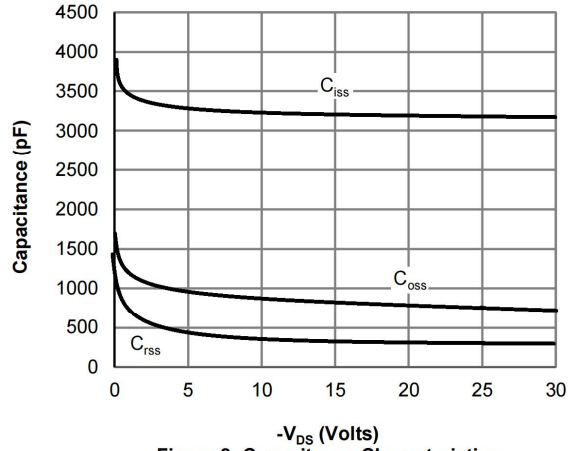


Figure 8: Capacitance Characteristics

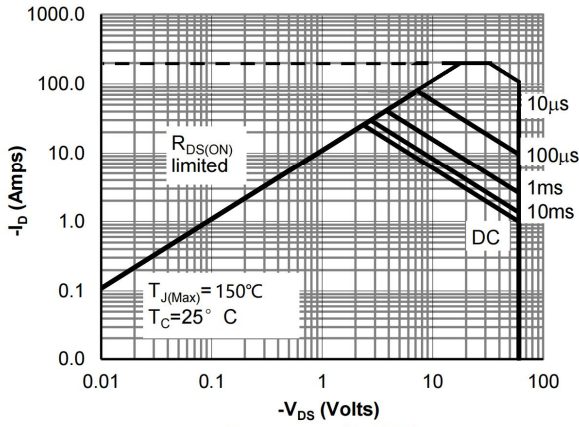


Figure 9: Maximum Forward Biased Safe Operating Area

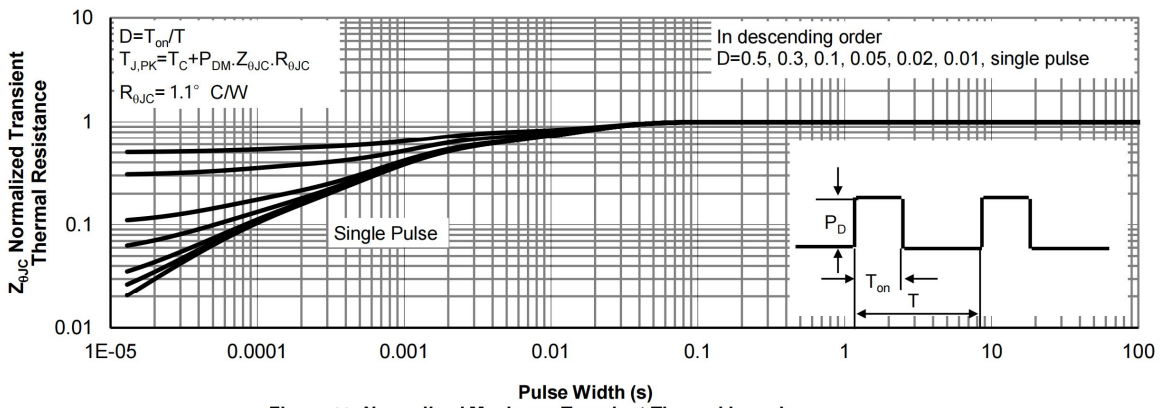
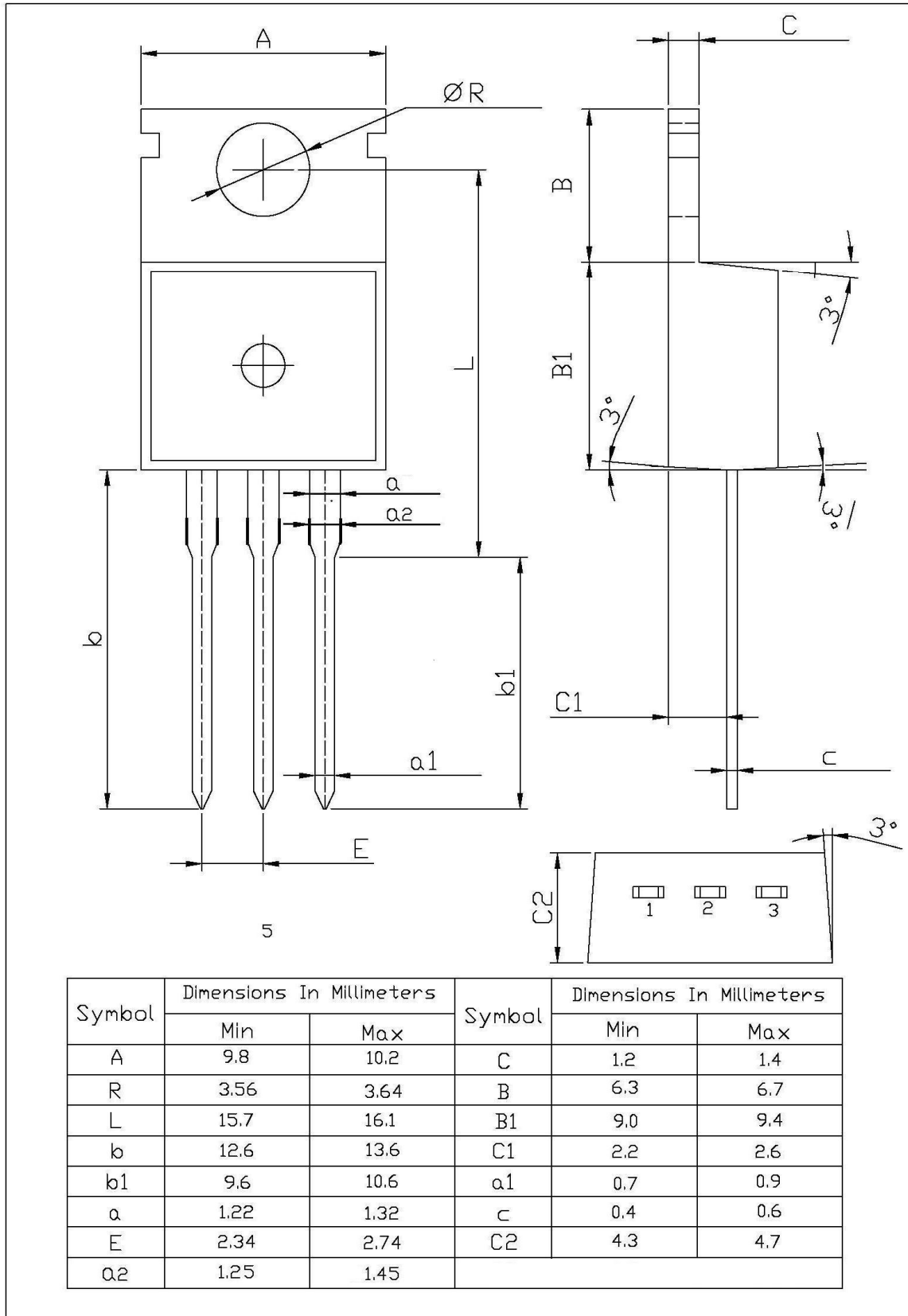


Figure 10: Normalized Maximum Transient Thermal Impedance

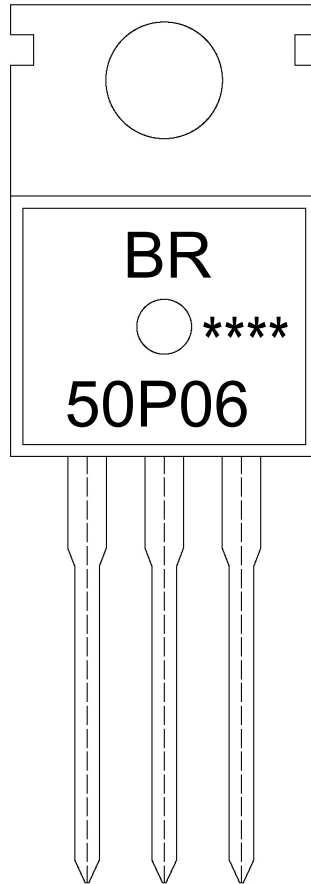
外形尺寸图 / Package Dimensions

T□-220

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

50P06： 为型号代码

****： 为生产批号代码，随生产批号变化

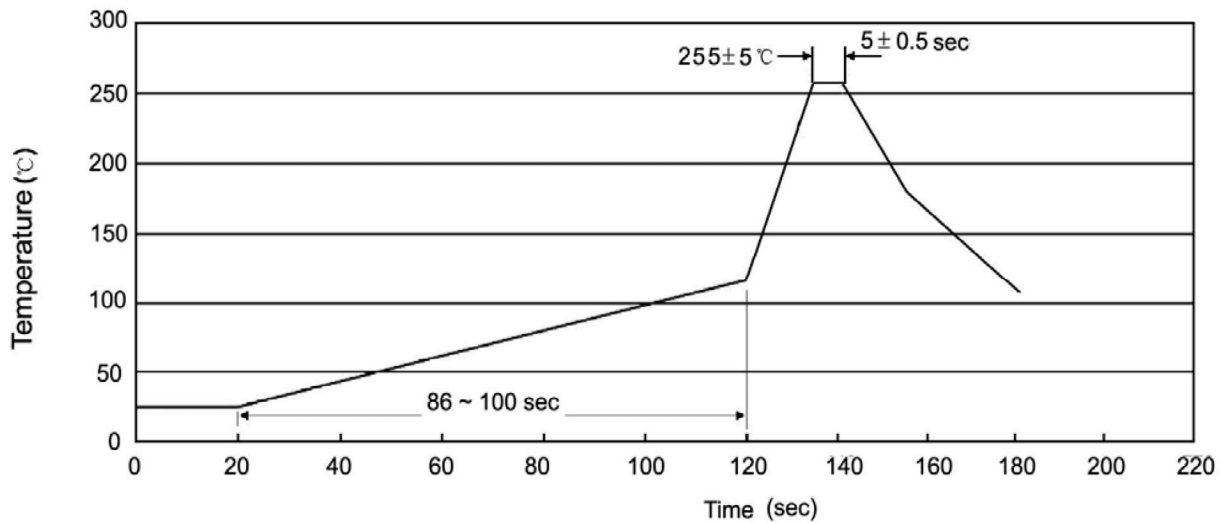
Note:

BR: Company Code

50P06: 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