

描述 / Descriptions

N 沟道 TO-220 塑封封装场效应管。

N-Channel MOSFET in a TO-220 Plastic Package.

特征 / Features

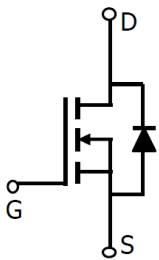
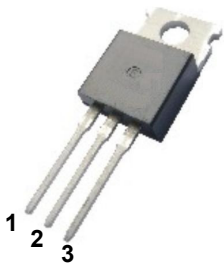
低栅电荷,开关速度快。

Low gate charge, 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**

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_{DSS}	100	V
Drain Current ^G	$I_D(T_C=25^{\circ}C)$	120	A
	$I_D(T_C=100^{\circ}C)$	86	A
Drain Current - Pulsed ^C	I_{DM}	400	A
Gate-Source Voltage	V_{GSS}	±20	V
Single Pulsed Avalanche Energy(L=0.5mH)	E_{AS}	1340	mJ
Avalanche Current ^C	I_{AS}	57.9	A
Power Dissipation ^B	$P_D(T_C=25^{\circ}C)$	267	W
	$P_D(T_C=100^{\circ}C)$	134	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Maximum Junction-to-Ambient ^A	$t \leq 10s$	$R_{\theta JA}$	°C/W
Maximum Junction-to-Ambient ^{AD}	Steady-State		
Maximum Junction-to-Case	Steady-State		

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}	$V_{GS}=0V$ $I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V$ $V_{GS}=0V$			1	μA
		$V_{DS}=100V$ $T_J=55^{\circ}C$			5	
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	3.1	4	V
Total gate charge	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=50A$		3.9	4.5	mΩ
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=50A$			1.2	V

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
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$		3.2		Ω
Input Capacitance	C_{iss}	$V_{DS}=50V$ $V_{GS}=0V$ $f=1.0MHz$		7000		pF
Output Capacitance	C_{oss}			2920		pF
Reverse Transfer Capacitance	C_{rss}			164		pF
Total Gate Charge	Q_g	$V_{GS}=10V$ $V_{DS}=50V$ $I_D=20A$		107		nC
Gate Source Charge	Q_{gs}			28.5		nC
Gate Drain Charge	Q_{gd}			40		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=50V$ $R_L=2.5\Omega$ $R_{GEN}=3\Omega$		28		ns
Turn-On Rise Time	t_r			22		ns
Turn-Off Delay Time	$t_{d(off)}$			43.5		ns
Turn-Off Fall Time	t_f			14.5		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=20A$ $dI/dt=500A/\mu s$		27		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=20A$ $dI/dt=500A/\mu s$		177		nC

A: The value of $R_{\theta JA}$ is measured with the device in a still air environment with $T_A=25^\circ C$.

B: The power dissipation PD is based on $T_J(MAX)=150^\circ C$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C: Repetitive rating, pulse width limited by junction temperature $T_J(MAX)=150^\circ C$.

D: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

E: The static characteristics in Figures 1 to 6 are obtained using $<300 \mu s$ pulses, duty cycle 0.5%max.

F: These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_J(MAX)=150^\circ C$.

G: The maximum current rating is limited by bond-wires.

电参数曲线图 / Electrical Characteristic Curve

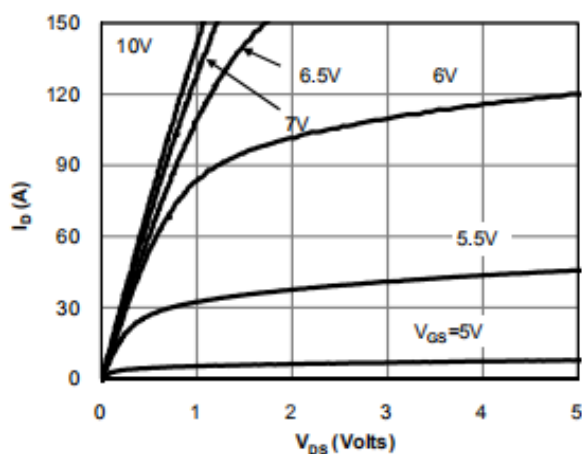


Fig 1: On-Region Characteristics

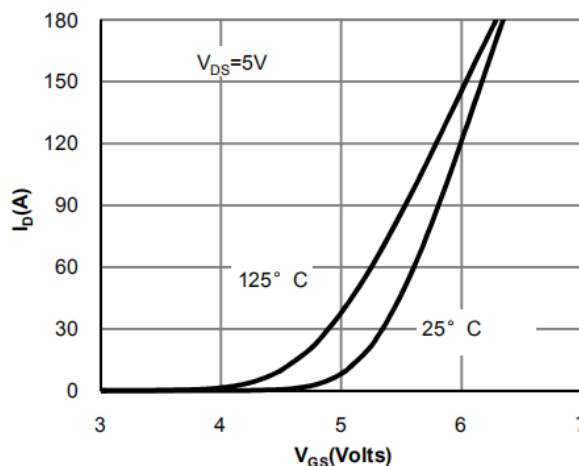


Figure 2: Transfer Characteristics

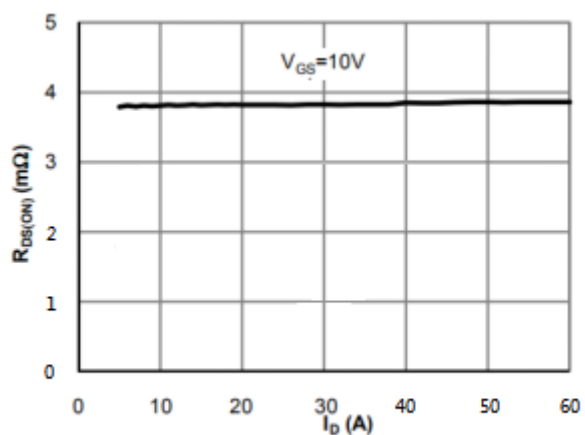


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

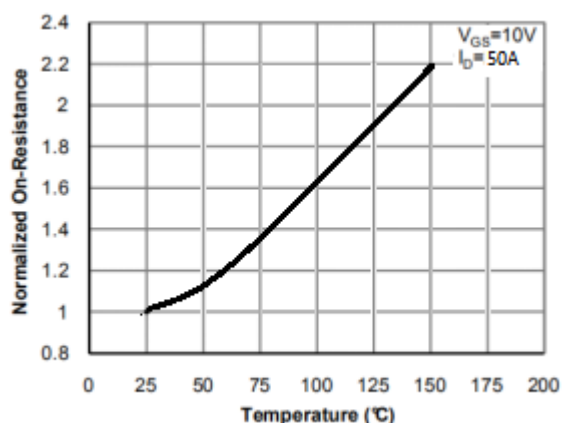


Figure 4: On-Resistance vs. Junction Temperature

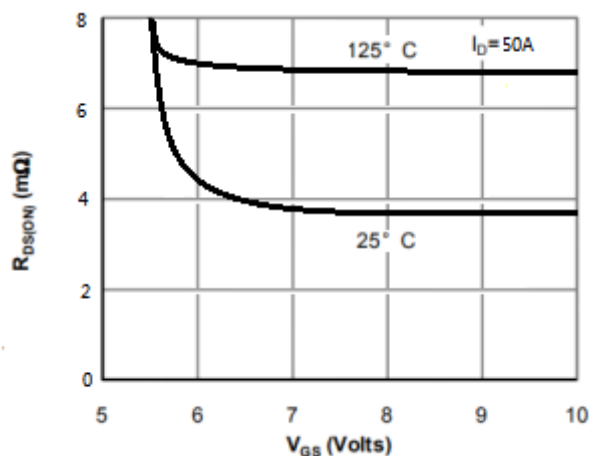


Figure 5: On-Resistance vs. Gate-Source Voltage

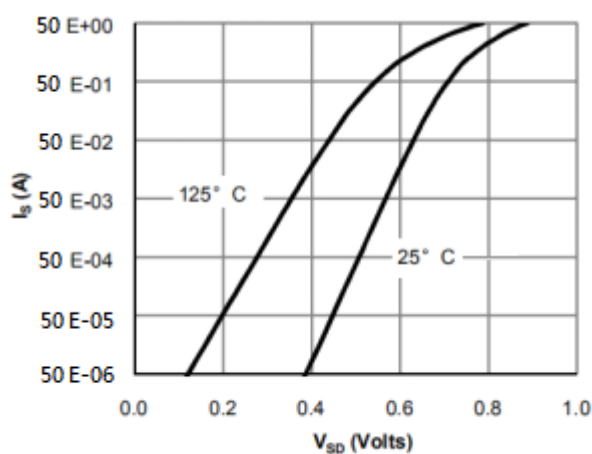
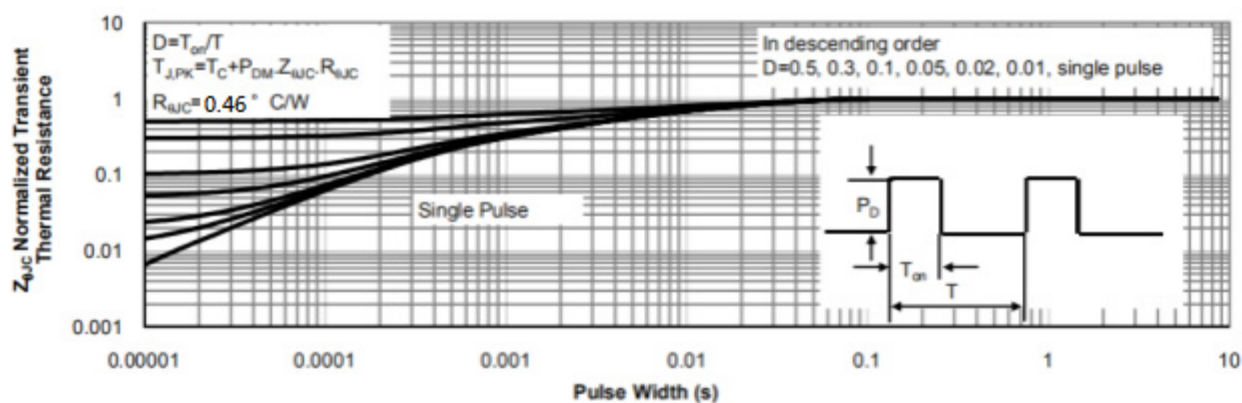
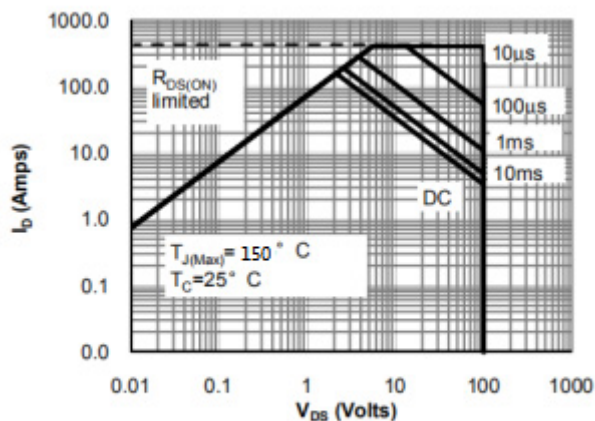
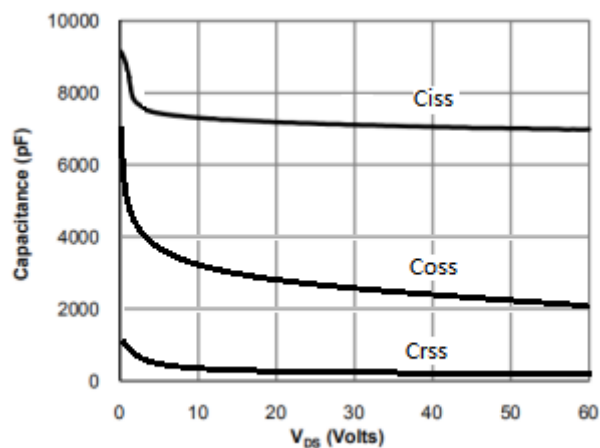
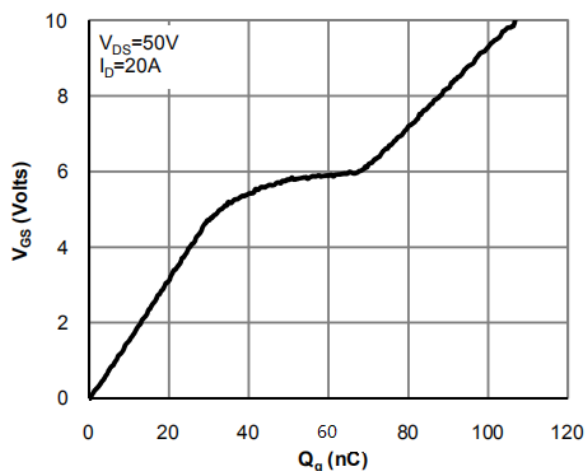


Figure 6: Body-Diode Characteristics

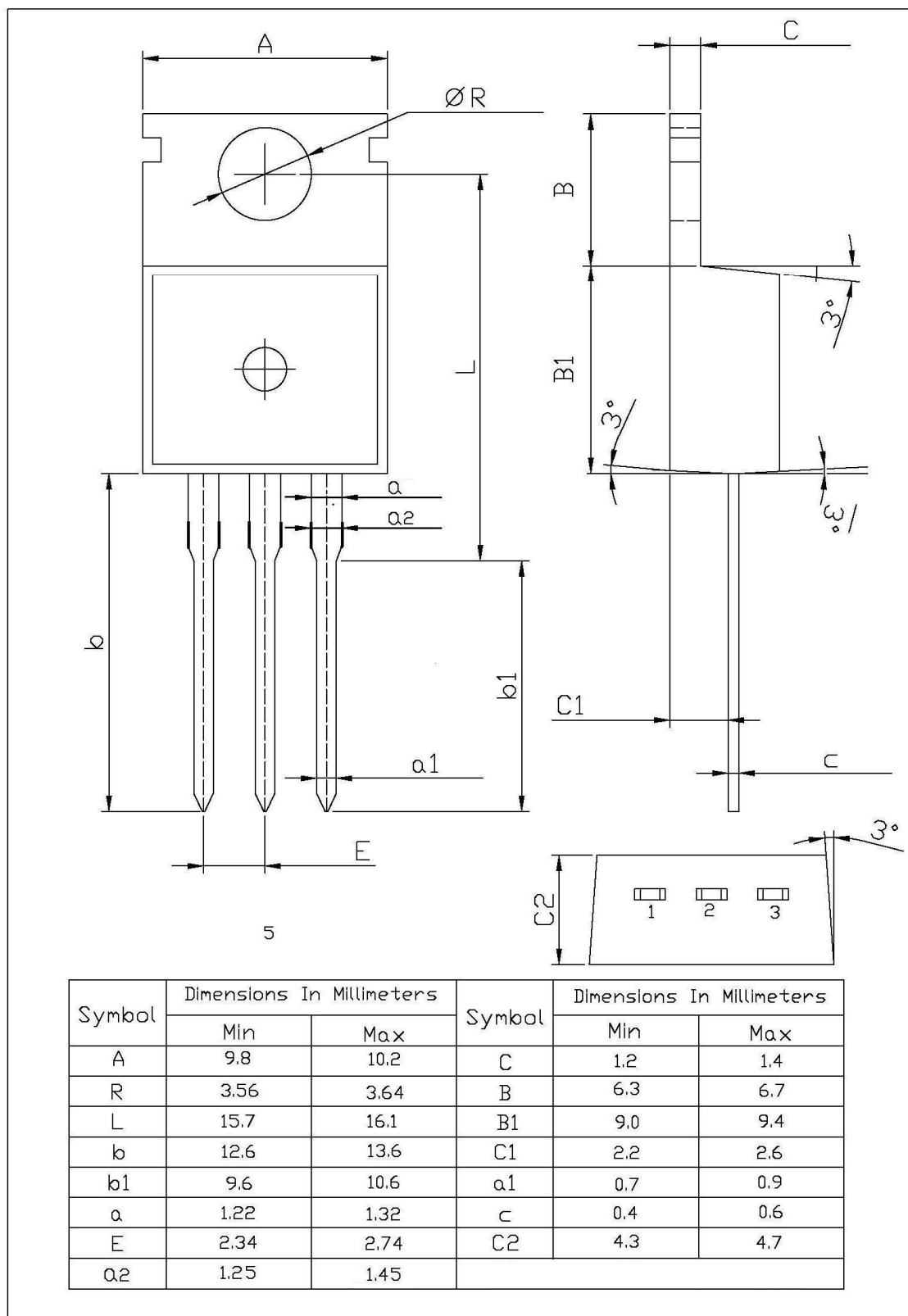
电参数曲线图 / Electrical Characteristic Curve



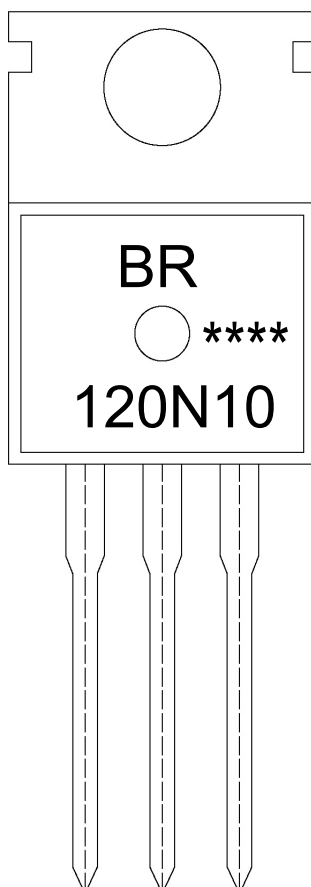
外形尺寸图 / Package Dimensions

TO-220

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

120N10： 为型号代码

****： 为生产批号代码，随生产批号变化。

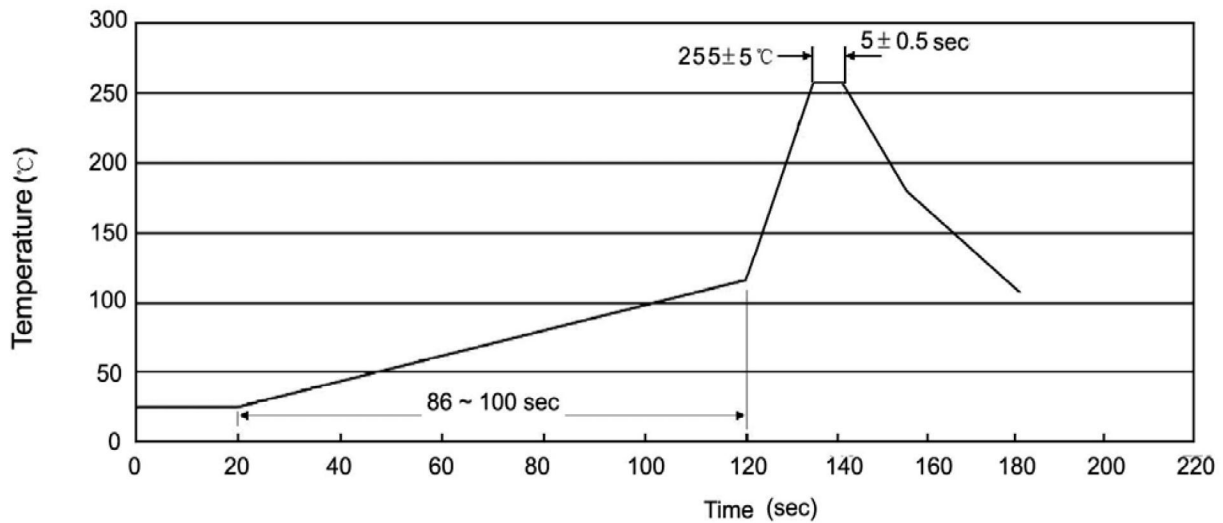
Note:

BR: Company Code

120N10: 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