

# BRCS060N15SHRA

Rev.A Apr.-2023

## 描述 / Descriptions

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

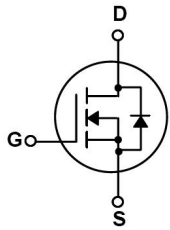
## 特征 / Features

$V_{DS}=150V$  ;  $I_D=123A$  ;  $V_{GS}=\pm 20V$   
 $R_{DS(on)}@10V \leq 6.2m\Omega$  (Type.5.8m $\Omega$ )  
 无卤产品。HF Product.

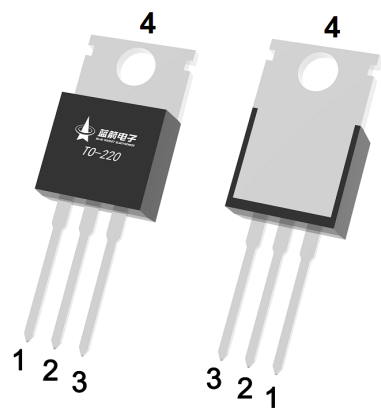
## 用途 / Applications

电信、工业电源、负载开关。  
Telecom, Industrial Power Supply, Load switch.

## 内部等效电路 / Equivalent Circuit



## 引脚排列 / Pinning



PIN1 : G      PIN 2、4 : 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 <sub>DSS</sub>	150	V
Drain Current	I <sub>D</sub> (Tc=25°C)	123	A
Pulsed Drain Current	I <sub>DM</sub>	327	A
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Single Pulsed Avalanche Energy L=0.5mH	E <sub>AS</sub>	1190	mJ
Avalanche Current	I <sub>AS</sub>	63	A
Total Power Dissipation	P <sub>D</sub> (Tc=25°C)	200	W
Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C
Thermal Resistance-Junction to Ambient	t ≤ 10s	15	°C/W
	Steady-State	60	
Thermal Resistance-Junction to Case	Steady-State	0.63	

**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 <sub>DSS</sub>	V <sub>GS</sub> =0V I <sub>D</sub> =250μA	150	170		V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =150V V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage Current Forward	I <sub>GSS</sub>	V <sub>GS</sub> =±20V V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =250μA	2	3	4	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V I <sub>D</sub> =20A		5.8	6.5	mΩ
Forward On Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V I <sub>S</sub> =1A			1.2	V
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V V <sub>DS</sub> =0V, f=1MHz		1.1		Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V V <sub>GS</sub> =0V f=1MHz		6200		pF
Output Capacitance	C <sub>oss</sub>			2900		
Reverse Transfer Capacitance	C <sub>rss</sub>			160		
Total Gate Charge	Q <sub>g(10V)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A V <sub>DS</sub> =75V,		85		nC
Total Gate Charge	Q <sub>g(4.5V)</sub>			23		
Gate Source Charge	Q <sub>gs</sub>			33		
Gate Drain Charge	Q <sub>gd</sub>			16		

## 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	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=75V$ $R_L=2.5\Omega$ $R_{GEN}=3\Omega$		27.3		ns
Turn-On Rise Time	$t_r$			21		
Turn-Off Delay Time	$t_{d(off)}$			50.1		
Turn-Off Fall Time	$t_f$			29.3		

## 电参数曲线图 / Electrical Characteristic Curve

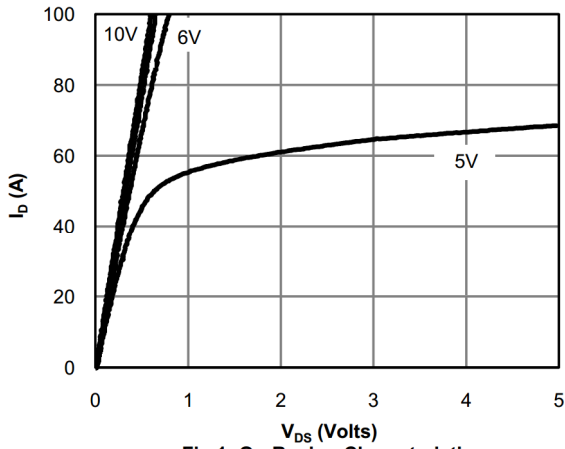


Fig 1: On-Region Characteristics

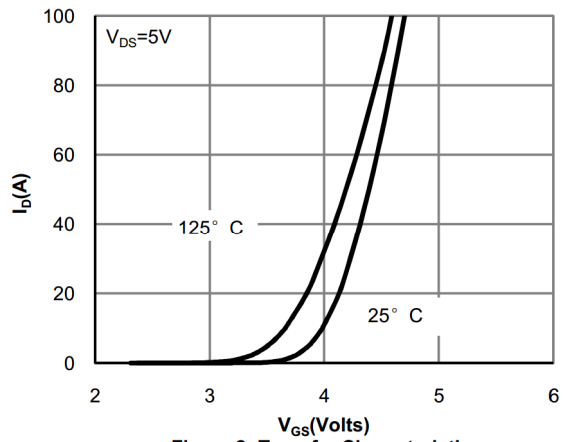


Figure 2: Transfer Characteristics

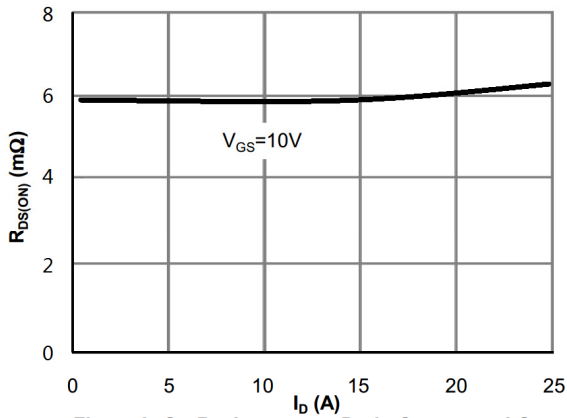


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

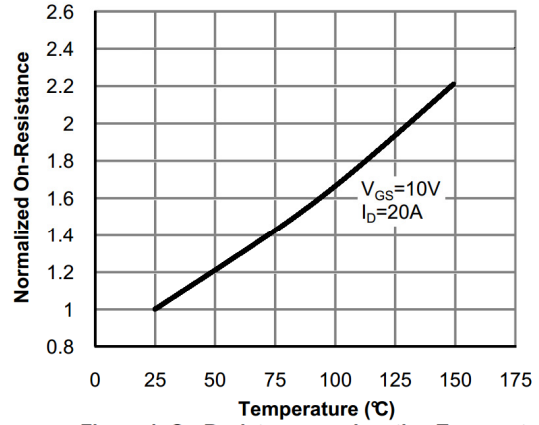


Figure 4: On-Resistance vs. Junction Temperature

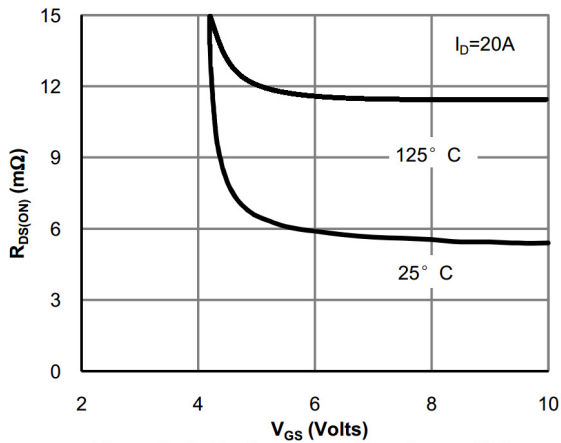


Figure 5: On-Resistance vs. Gate-Source Voltage

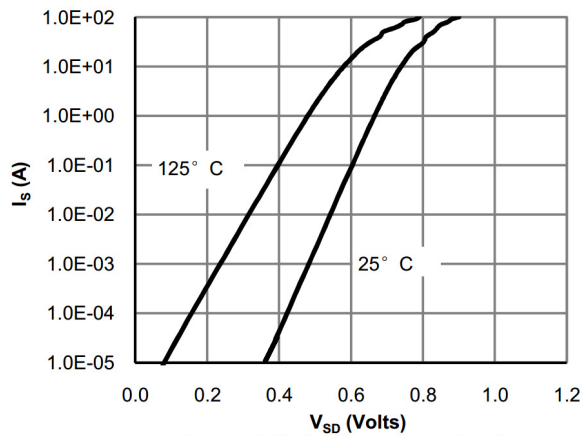


Figure 6: Body-Diode Characteristics

## 电参数曲线图 / Electrical Characteristic Curve

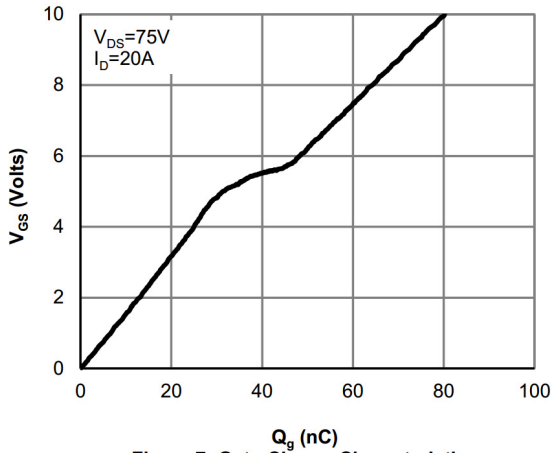


Figure 7: Gate-Charge Characteristics

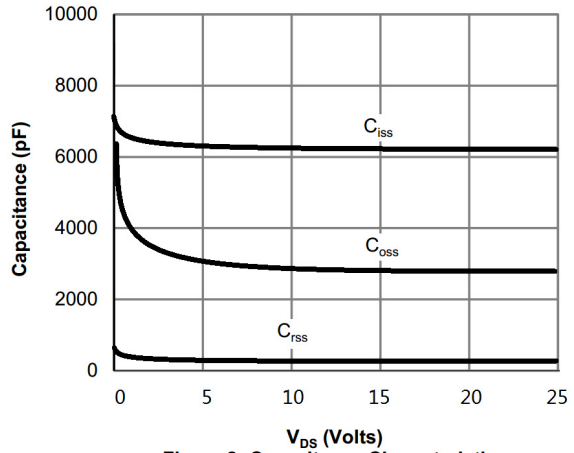


Figure 8: Capacitance Characteristics

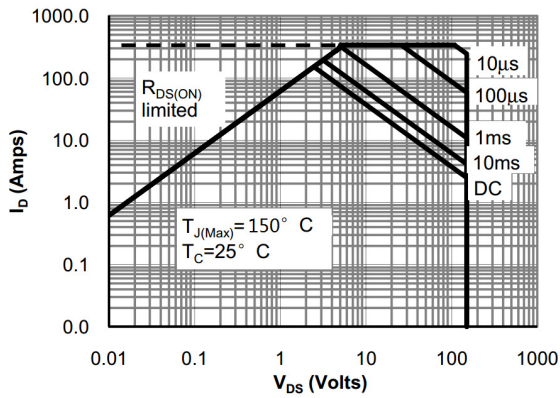


Figure 9: Maximum Forward Biased Safe Operating Area

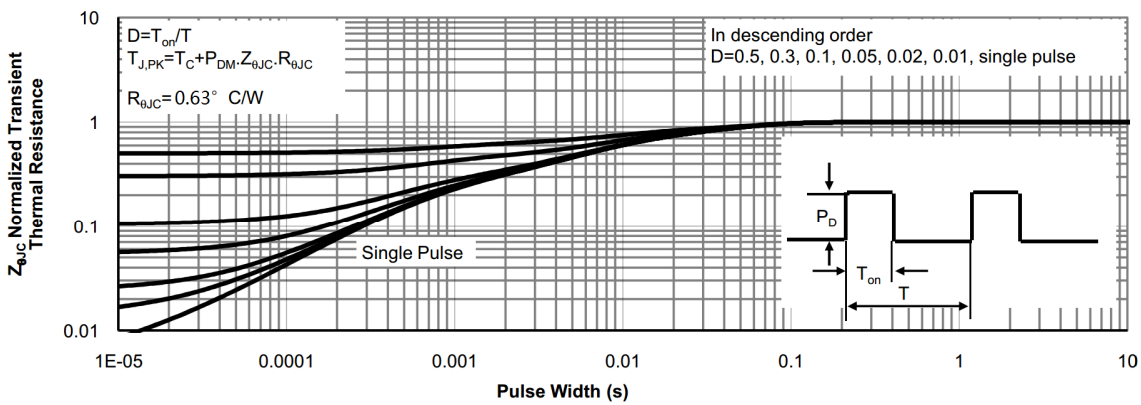
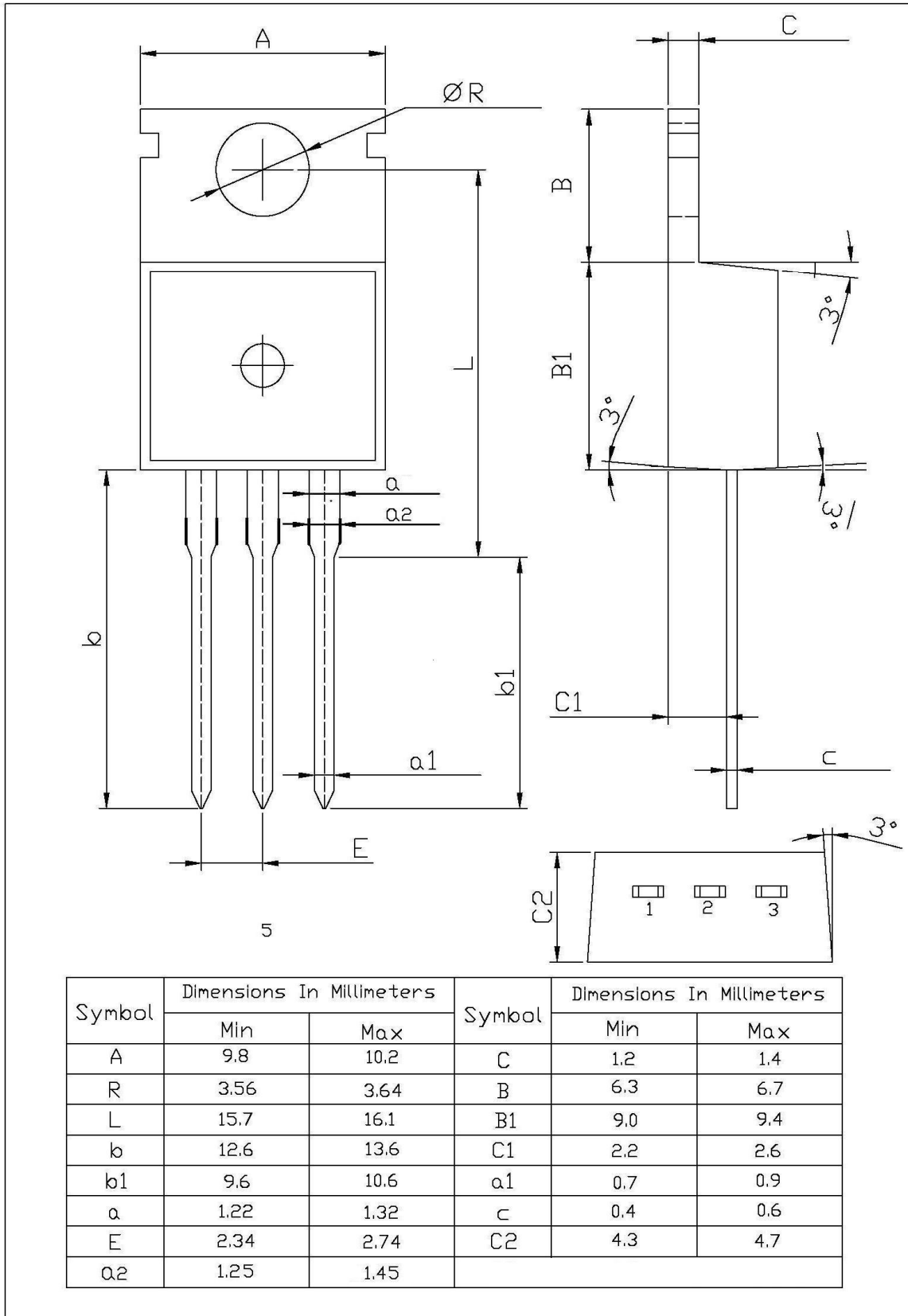


Figure 10: Normalized Maximum Transient Thermal Impedance

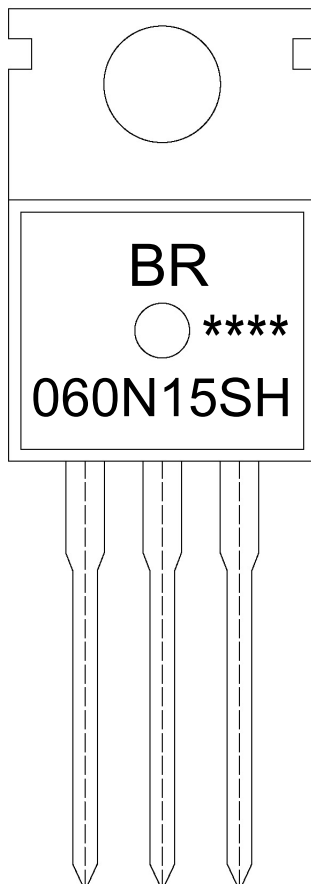
外形尺寸图 / Package Dimensions

T□-220

单位: mm



## 印章说明 / Marking Instructions



说明：

BR： 为公司代码

060N15SH： 为型号代码

\*\*\*\*： 为生产批号代码，随生产批号变化

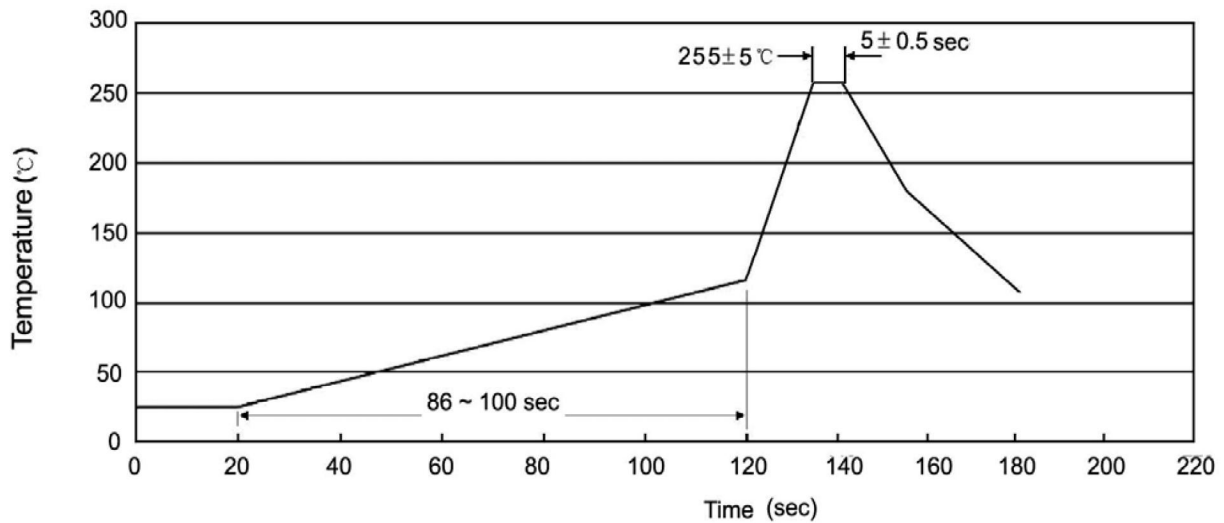
Note:

BR: Company Code

060N15SH: 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**