BRF65R600C

Rev.D Jul.-2016

蓝箭电子
BLUE ROCKET ELECTRONICS
DATA SHEET

描述 / Descriptions

TO-220F 塑封封装 N 沟道 650V 超结工艺功率场效应管。

N-CHANNEL 650V Super-Junction Power MOSFET in a TO-220F Plastic Package.

特征 / Features

低 $R_{DS(on)}$×Qg，100%雪崩测试，符合 ROHS 标准。

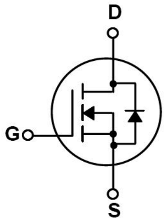
Very low $R_{DS(on)}$×Qg,100%avalanche tested,RoHS compliant.

用途 / Applications

用于开关电源，不间断电源，功率因素较正。

For switch mode power supply, uninterruptible power supply, power factor correction.

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℃)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	V_{DSS}	650	V
Drain Current	I_D(Tc=25℃)	7.0	A
Drain Current - Pulsed(note1)	I_{DM}	21	A
Gate-Source Voltage	V_{GSS}	±30	V
Single Pulsed Avalanche Energy(note2)	E_{AS}	140	mJ
Repetitive Avalanche Energy(note1)	E_{AR}	0.2	mJ
Avalanche Current(note1)	I_{AR}	3.0	A
Power Dissipation	P_D(Tc=25℃)	27.8	W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to 150	℃
Junction-to-Case	$R_{\theta JC}$	4.5	℃/W
Junction-to-Ambient	$R_{\theta JA}$	80	℃/W

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

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=250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V V_{GS}=0V T_J=25℃			1.0	μA
		V_{DS}=650V T_J=150℃			100	μA
Gate-Body Leakage Current, Forward	I_{GSS}	V_{GS}=±30V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	2.5		4.0	V
Static Drain-Source On-Resistance(note3)	$R_{DS(on)}$	V_{GS}=10V I_D=3.0A		0.6	0.62	Ω
Forward Transconductance(note3)	g_{FS}	V_{DS}=10V I_D=3.0A		2.5		S
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V I_{SD}=7.0A T_J=25℃		0.9	1.2	V
Input Capacitance	C_{iss}	V_{DS}=50V V_{GS}=0V f=1.0MHz		450		pF
Output Capacitance	C_{oss}			82		pF
Reverse Transfer Capacitance	C_{rss}			4.0		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=300V I_D=7.0A R_G=25Ω		14	31	ns
Turn-On Rise Time	t_r			32	66	ns
Turn-Off Delay Time	$t_{d(off)}$			53	109	ns
Turn-Off Fall Time	t_f			15	32	ns

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

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
Continuous Body Diode Current	I_S	T_C=25℃			7.0	A
Pulsed Diode Forward Current	I_{SM}				21	A
Total Gate Charge	Q_g	V_{DD}=480V I_D=7.0A V_{GS}=10V		10		nC
Gate-Source Charge	Q_{gs}			2.5		nC
Gate-Drain Charge	Q_{gd}			4.5		nC
Reverse Recovery Time	t_{rr}	V_R= 480V I_F=I_S di_F/dt=100A/μs		400		ns
Reverse Recovery Charge	Q_{rr}			1.5		μC
Peak Reverse Recovery Current	I_{rrm}			7.0		A

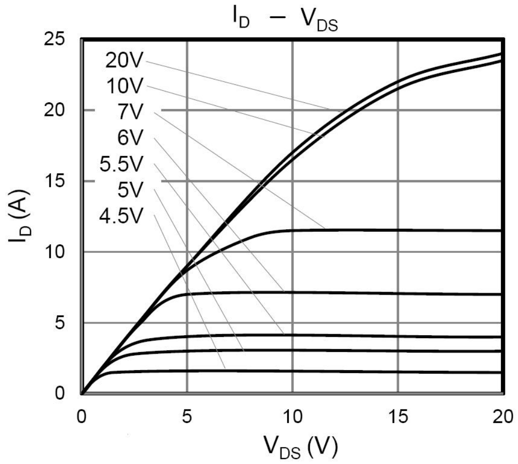
Notes

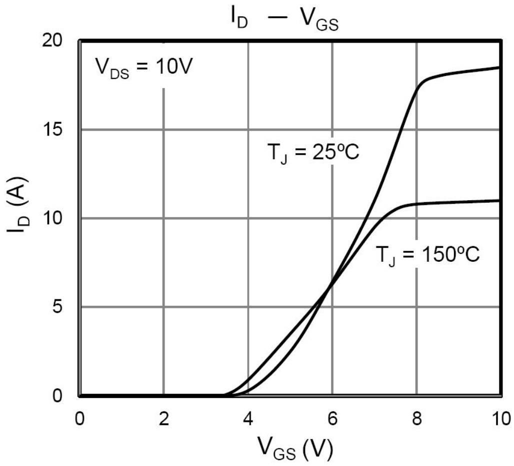
1.Repetitive Rating: Pulse width limited by maximum junction temperature

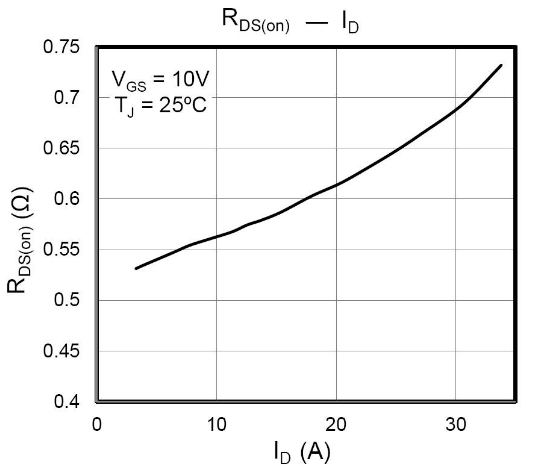
2.I_{AS}= 3.0A, V_{DD}= 50V, R_G= 25Ω, Starting T_J= 25°C

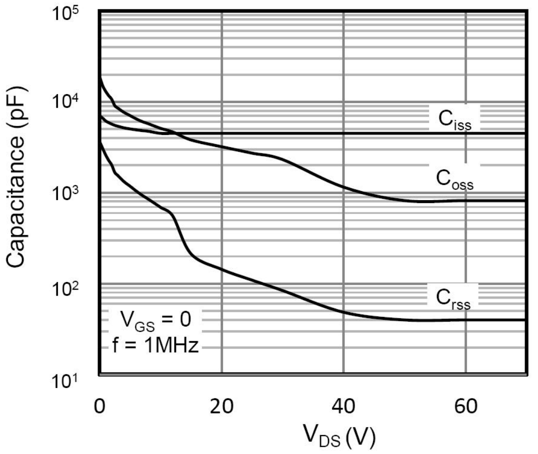
3.Pulse Test: Pulse width ≤ 300μs, Duty Cycle≤ 1%

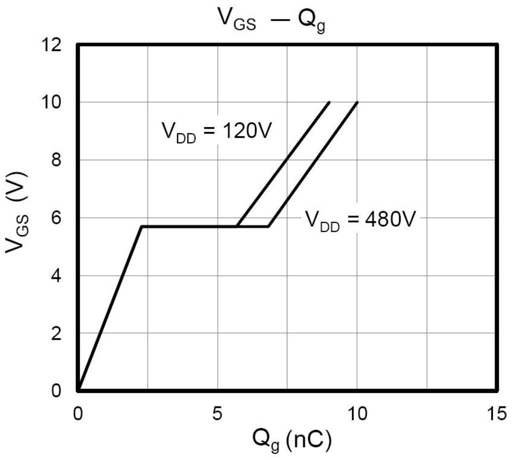
电参数曲线图 / Electrical Characteristic Curve

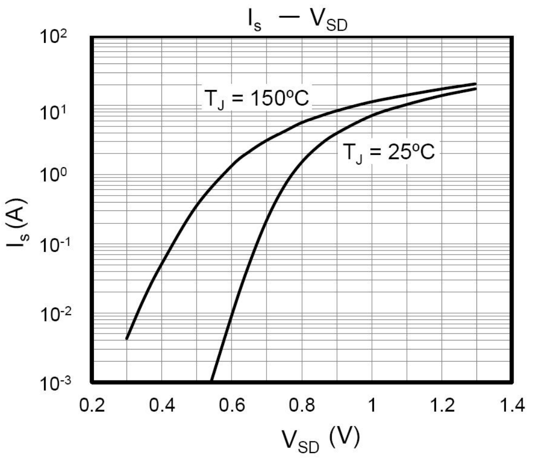




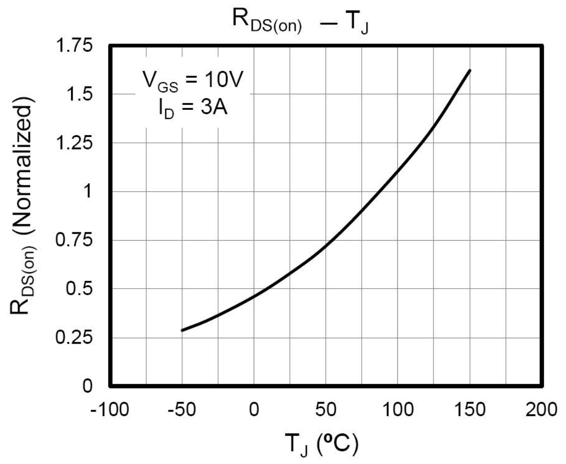


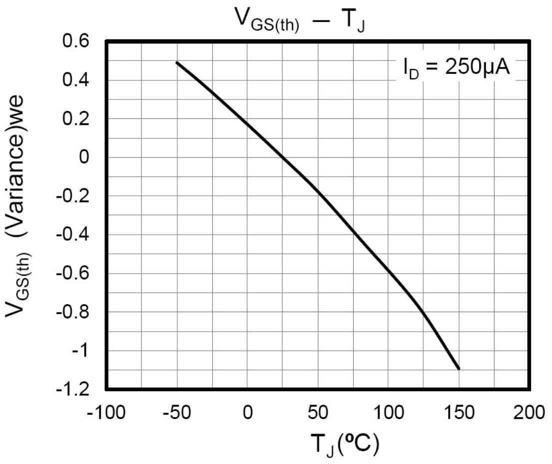


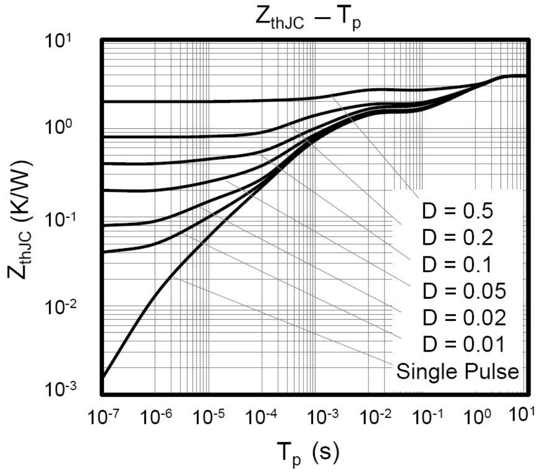




电参数曲线图 / Electrical Characteristic Curve

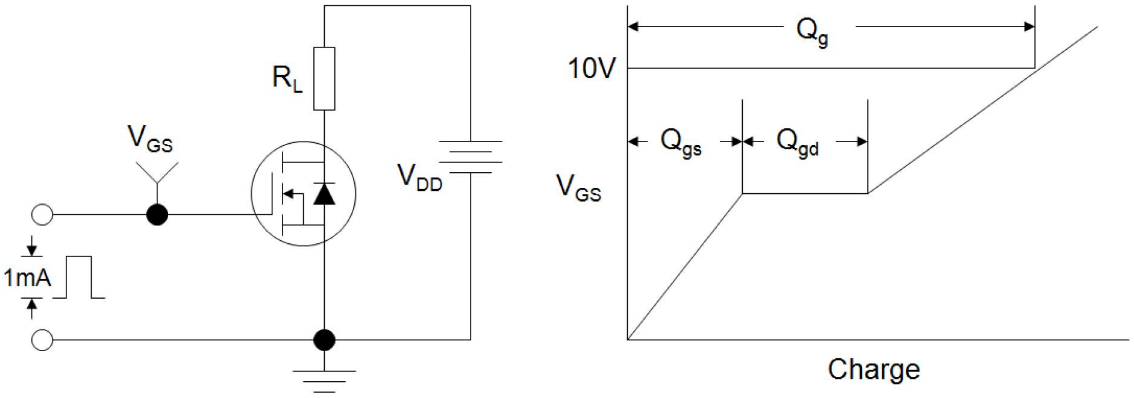




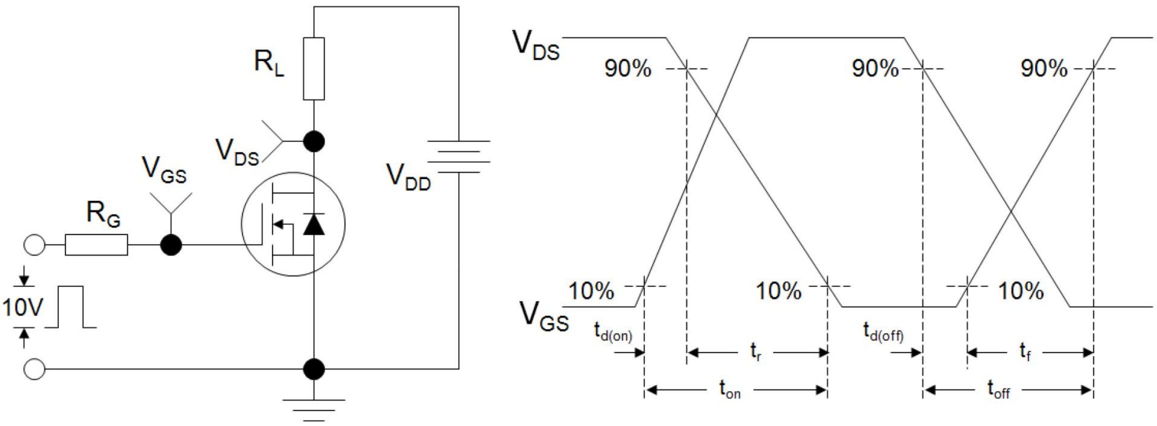


测试电路与波形图 / Test Circuit and Waveform Curve

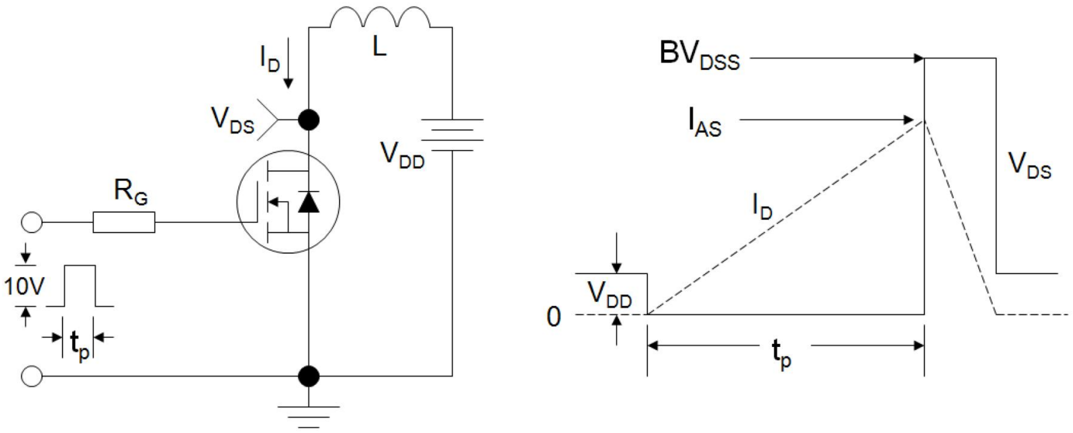
Gate Charge Test Circuit and Waveform



Resistive Switching Test Circuit and Waveform

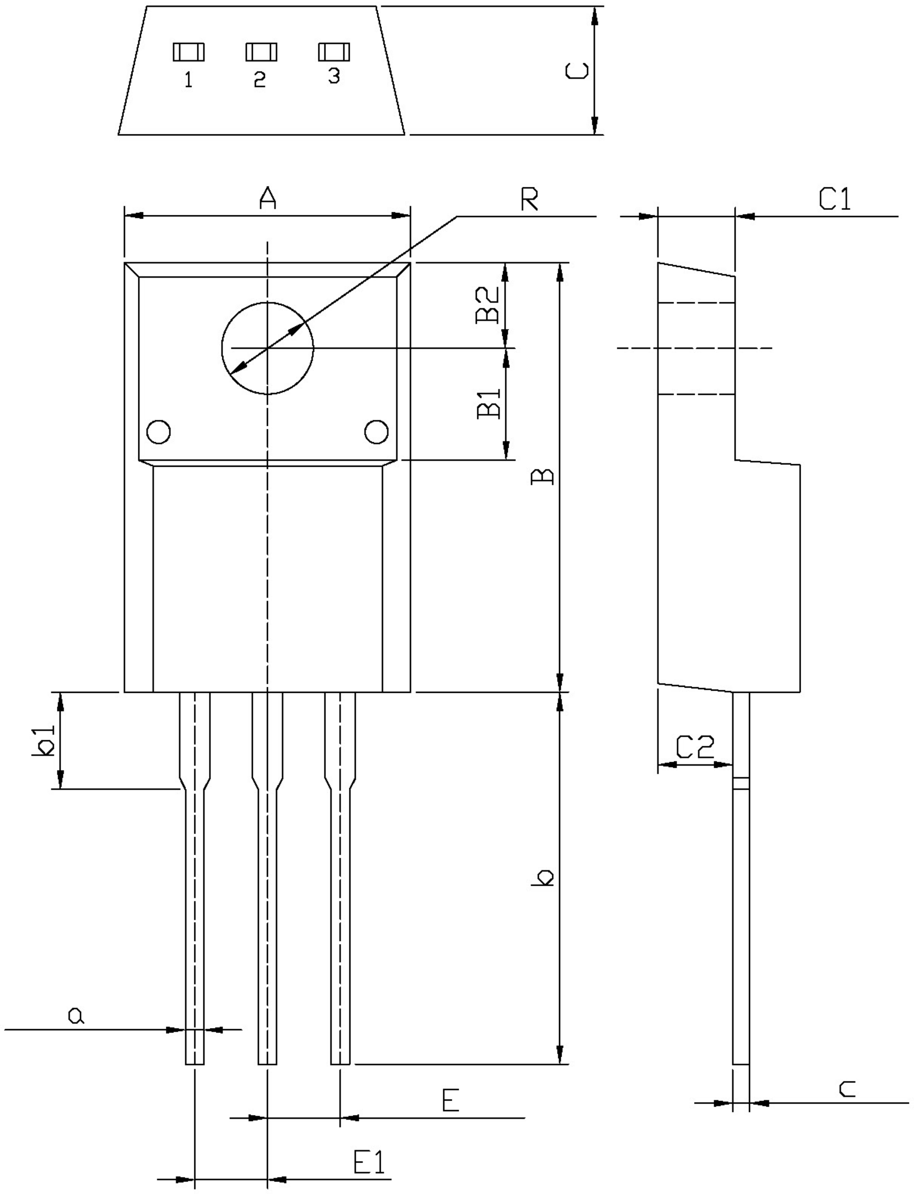


Unclamped Inductive Switching Test Circuit and Waveform



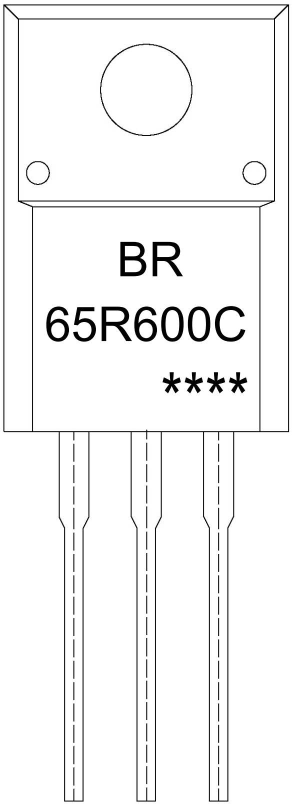
外形尺寸图 / Package Dimensions

TO-220F 单位：mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
C	4.3	4.7	b1	2.9	3.9
A	9.7	10.3	a	0.55	0.75
B	14.7	15.3	E	2.29	2.79
B1	3.8	4.0	E1	2.29	2.79
B2	2.9	3.1	C1	2.5	2.9
R	3.0	3.4	C2	2.5	2.7
b	12.5	13.5	c	0.5	0.7

印章说明 / Marking Instructions



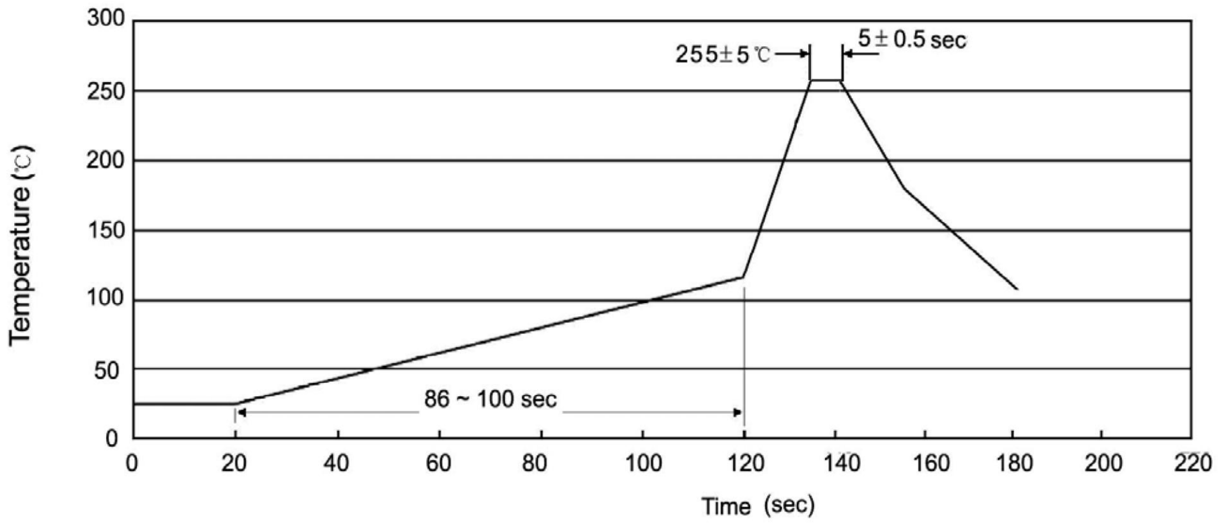
说明：

BR：	为公司代码
65R600C：	为型号代码
****：	为生产批号代码，随生产批号变化。

Note:

BR:	Company Code
65R600C:	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：	Note:
1、预热温度 25～150℃，时间 60～90sec;	1.Preheating:25~150℃, Time:60~90sec.
2、峰值温度 255±5℃，时间持续为 5±0.5sec;	2.Peak Temp.:255±5℃, Duration:5±0.5sec.
3、焊接制程冷却速度为 2～10℃/sec.	3. Cooling Speed: 2~10℃/sec.

耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions

温度：270±5℃ 时间：10±1 sec.

Temp.:270±5℃ 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