

描述 / Descriptions

TO-252 塑料封装 N 沟道 MOS 场效应管。N-Channel MOSFET in a TO-252 Plastic Package.

特征 / Features

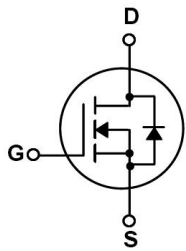
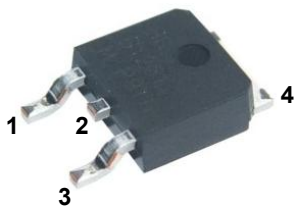
600V 超结功率场效应管, $R_{DS(on)} \times Q_g$ 低, 100%雪崩测试, 符合 RoHS。

600V Super-Junction Power MOSFET. Very Low $R_{DS(on)} \times Q_g$, 100%avalanche tested, RoHS compliant.

用途 / Applications

适用于开关模式、不间断电源, 功率因数校正。

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、4 : 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_{DS}	600	V
Drain Current	I_D	6.0	A
Drain Current - Pulsed	$I_{DM}^{(note1)}$	18	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy	$E_{AS}^{(note2)}$	50	mJ
Repetitive Avalanche Energy	$E_{AR}^{(note1)}$	0.4	mJ
Avalanche Current	$I_{AR}^{(note1)}$	6.0	A
Power Dissipation	P_D	73	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	75	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.7	$^{\circ}\text{C/W}$
Operating and Storage Temperature Range	T_j, T_{stg}	-55~150	$^{\circ}\text{C}$

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_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	600			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V$ $V_{GS}=0V$ $T_J=25^{\circ}\text{C}$			1.0	μA
		$V_{DS}=600V$ $V_{GS}=0V$ $T_J=150^{\circ}\text{C}$			100	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 30V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.5		3.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=3A$		0.67	0.75	Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V$ $I_D=6A$		5.5		S
Drain-Source Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}\text{C}$ $I_{SD}=6A$ $V_{GS}=0V$		0.95	1.2	V
Input Capacitance	C_{iss}	$V_{DS}=50V$ $V_{GS}=0V$ $f=1.0\text{MHz}$		671		pF
Output Capacitance	C_{oss}			142		pF
Reverse Transfer Capacitance	C_{rss}			5.5		pF

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	$t_{d(on)}$	$V_{DD}=300V \quad I_D=6A$ $R_G=25\Omega$		25	57	ns
Turn-On Rise Time	t_r			39	85	ns
Turn-Off Delay Time	$t_{d(off)}$			53	114	ns
Turn-Off Fall Time	t_f			22	53	ns
Total Gate Charge	Q_g	$V_{DD}=480V \quad I_D=6A$ $V_{GS}=10V$		15		nC
Gate-Source Charge	Q_{gs}			3		nC
Gate-Drain Charge	Q_{gd}			6		nC
Continuous Body Diode Current	I_S	$T_C=25^\circ C$			6	A
Pulsed Diode Forward Current	I_{SM}				18	A
Reverse Recovery Time	t_{rr}	$V_R=480V \quad I_F=I_S$ $di_F/dt=100A/\mu S$		300		ns
Reverse Recovery Charge	Q_{rr}			2.4		μC
Peak Reverse Recovery Current	I_{rrm}			16		A

注释/Notes

1. 脉冲宽度由最高结温限制;

Repetitive Rating: Pulse width limited by maximum junction temperature;

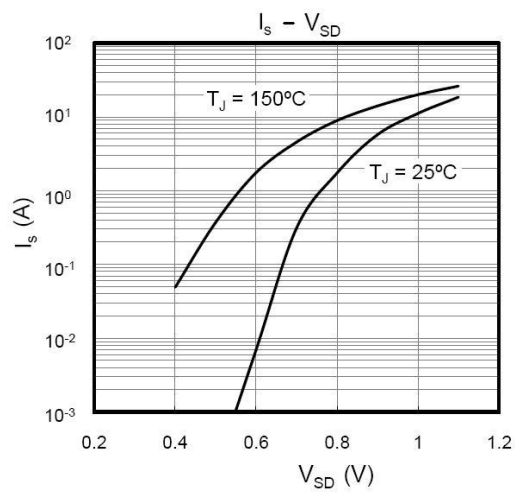
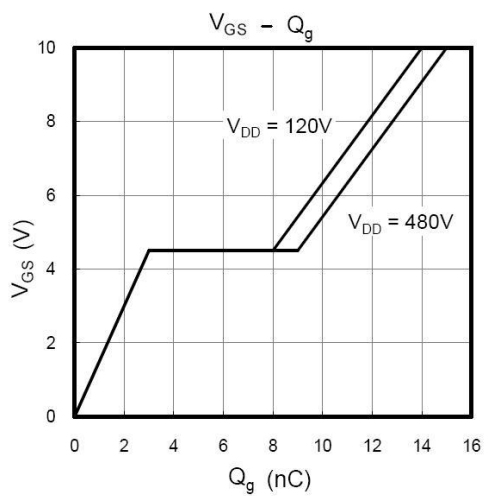
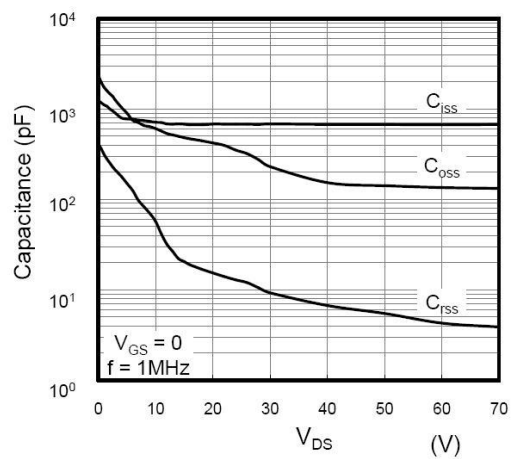
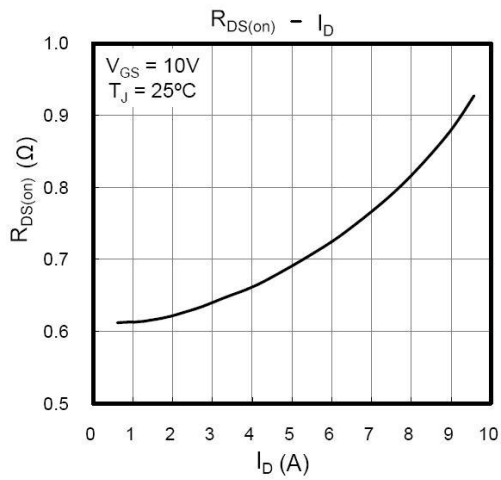
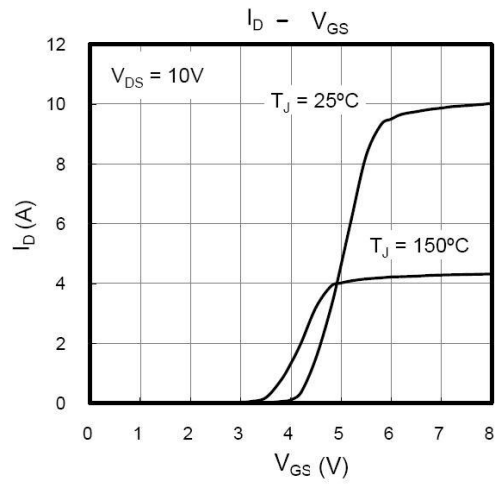
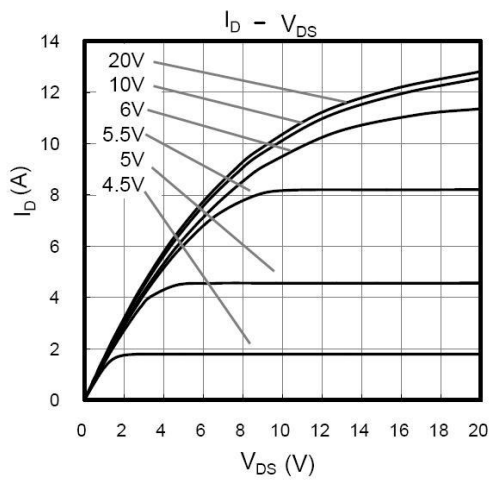
2. $I_{AS}=3A, V_{DD}=50V, R_G=25\Omega$, 起始温度 $T_J=25^\circ C$;

$I_{AS}=3A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$;

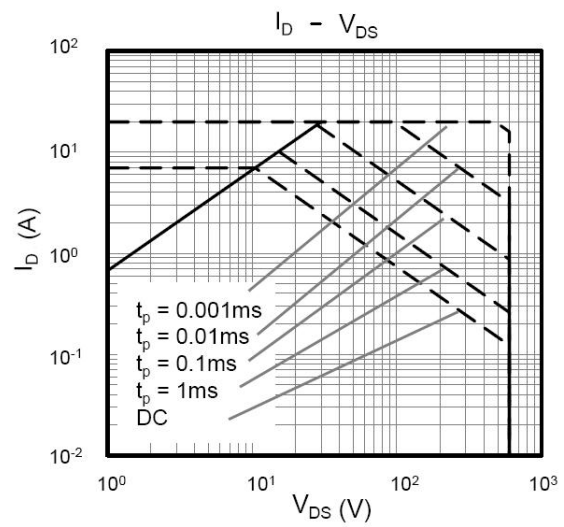
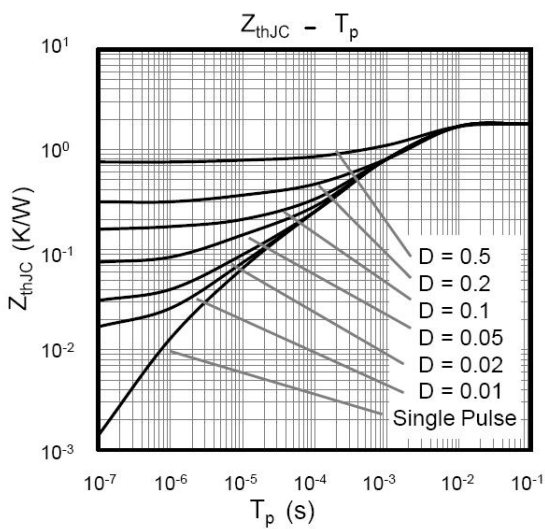
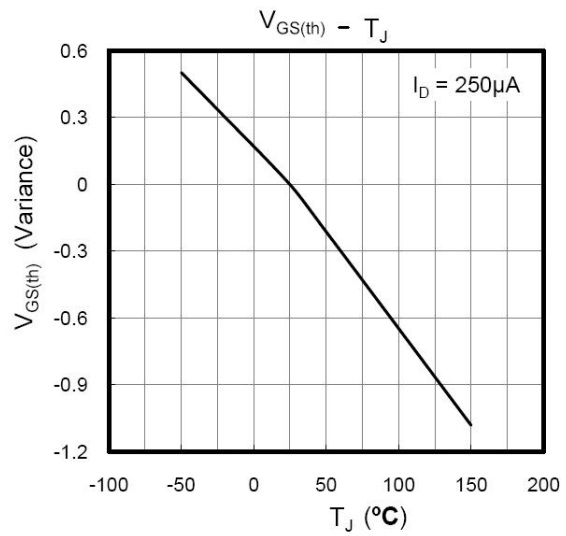
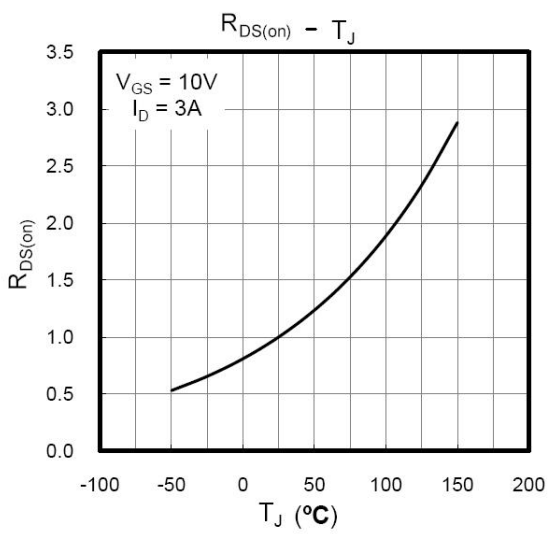
3. 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 1\%$.

Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$.

电参数曲线图 / Electrical Characteristic Curve



电参数曲线图 / Electrical Characteristic Curve



测试电路和波形 / Test Circuit and Waveform

Figure A: Gate Charge Test Circuit and Waveform

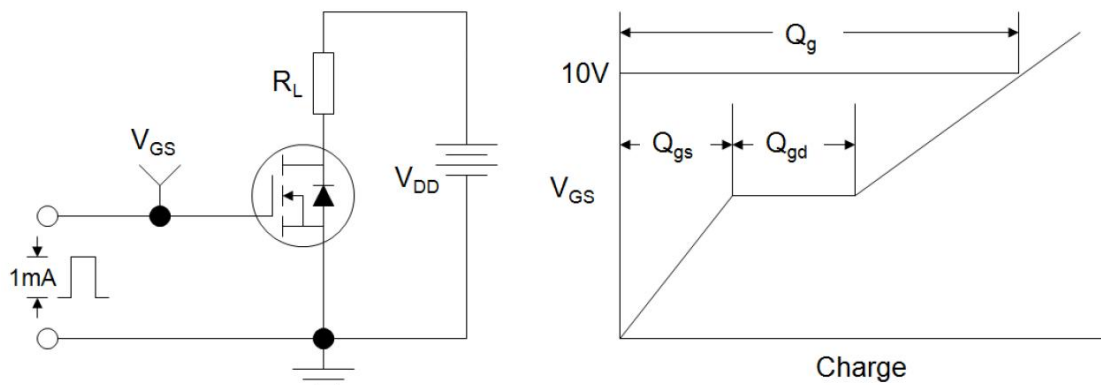


Figure B: Resistive Switching Test Circuit and Waveform

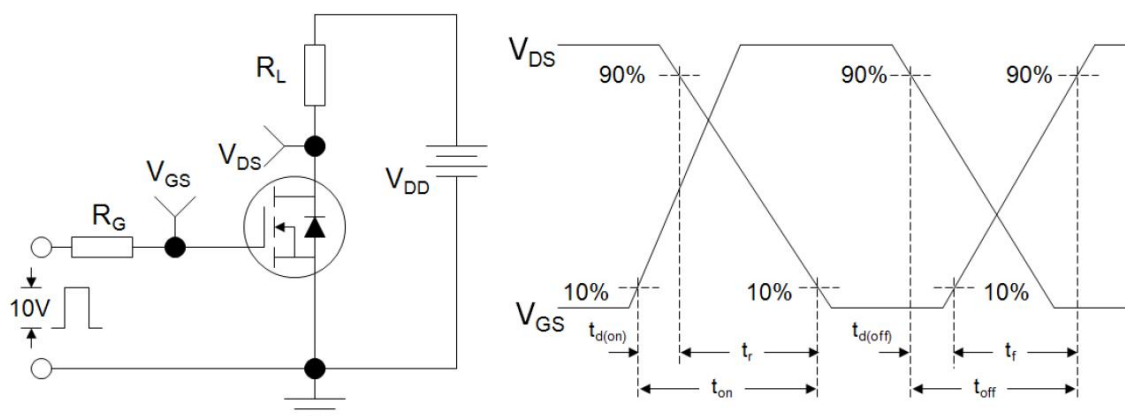
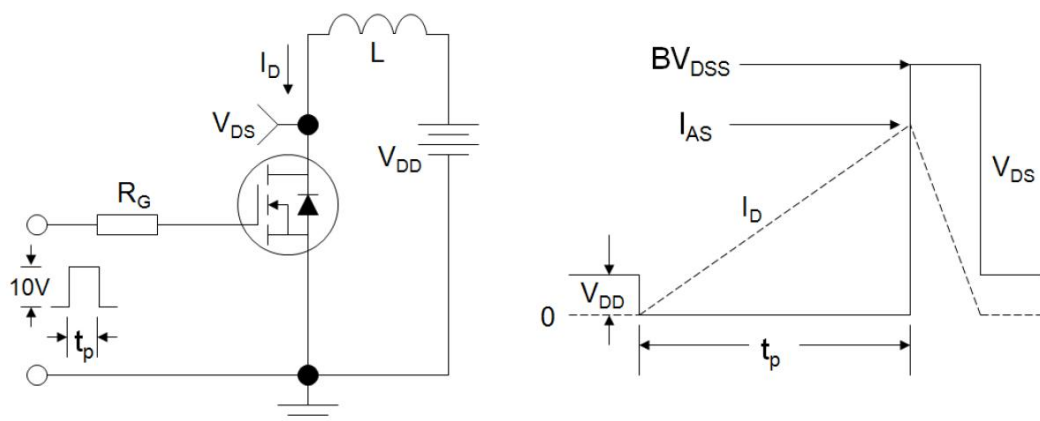
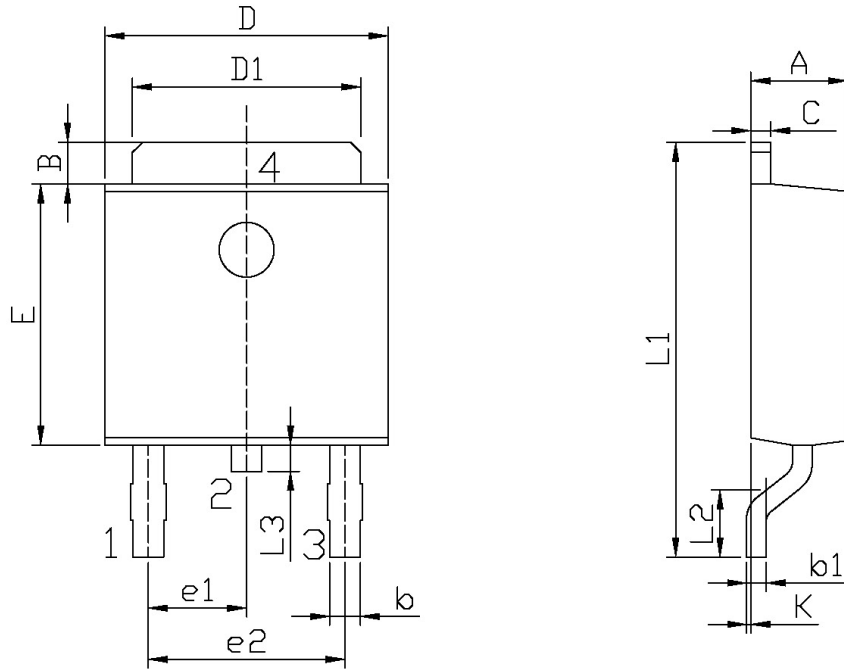


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



外形尺寸图 / Package Dimensions

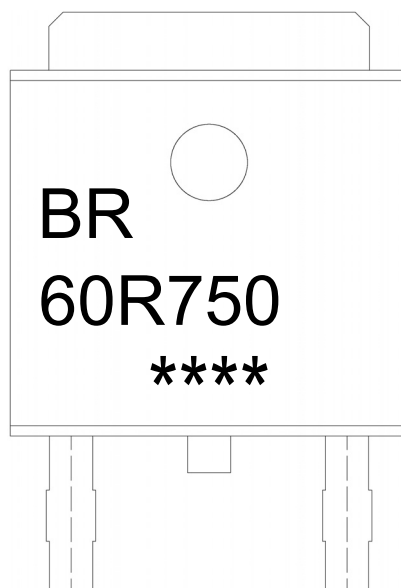


单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.50	0.70	e2	4.43	4.73
b1	0.45	0.55	L1	9.45	9.95
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10

T□-252

印章说明 / Marking Instructions



说明：

BR： 为公司代码

60R750： 为型号代码

****： 为生产批号代码，随生产批号变化

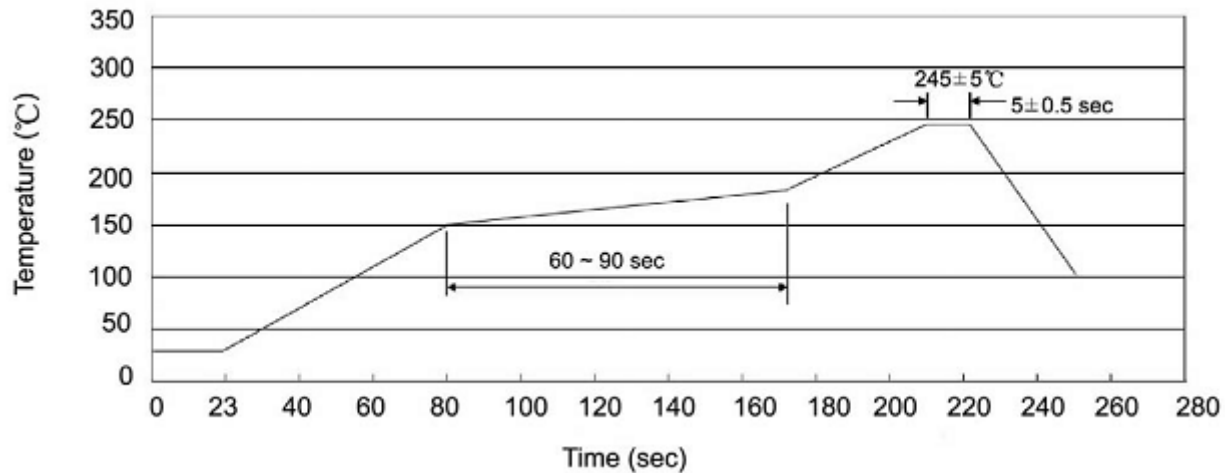
Note:

BR: Company Code

60R750: Product Type

****: Lot No. Code, code change with Lot No.

回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)



说明：

- 1、预热温度 25~150°C，时间 60~90sec;
- 2、峰值温度 245±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.:245±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：260±5°C

时间：10±1 sec.

Temp.:260±5°C

Time:10±1 sec

包装规格 / Packaging SPEC.

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
TO-252	2,500	2	5,000	5	25,000	13" ×16	360×360×50	385×257×392

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-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

使用说明 / Notices