BRD60R850

Rev.D May.-2016

描述 / Descriptions

TO-252 塑封封装 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.优值 $R_{DS(on)}$×Qg 很低、100%雪崩测试、符合 RoHS。

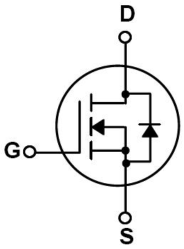
600V Super-Junction Power MOSFET. Very Low R_{DS}(on)×Q_g,100%avalanche tested, RoHS compliant.

用途 / Applications

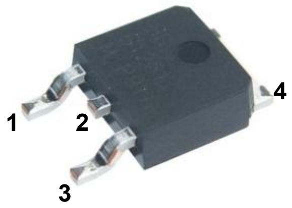
用于开关模式电源、不间断电源、功率因数校正。

Switch Mode Power Supply, Uninterruptible Power Supply、Power Factor Correction s.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN1：G PIN 2：D PIN 3：S PIN 4：D

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}	600	V
Drain Current	I_D	5	A
Drain Current - Pulsed(note1)	I_{DM}(note1)	20	A
Gate-Source Voltage	V_{GS}	±30	V
Single Pulsed Avalanche Energy(note2)	E_{AS}(note2)	67.5	mJ
Repetitive Avalanche Energy(note1)	E_{AR}(note1)	34	mJ
Avalanche Current(note1)	I_{AR}(note1)	1	A
Power Dissipation	P_D	65	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	℃/ W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.9	℃/ W
Junction and Storage Temperature Range	T_j T_{stg}	-55～150	℃

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	V_{DSS}	V_{GS}=0V I_D=250μA	600			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=600V V_{GS}=0V T_J= 25℃			1.0	μA
		V_{DS}=480V V_{GS}=0V T_J=150℃			10	
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±30V V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	2.5		4.5	V
Forward Transconductance(note3)	g_{fs}	V_{DS}=40V I_D=2.5A		8		S
Static Drain-Source On-Resistance(note3)	$R_{DS(on)}$	V_{GS}=10V I_D=2.5A		0.77	0.85	Ω
Drain-Source Diode Forward Voltage	V_{SD}	T_J= 25°C I_{SD}=3A V_{GS}= 0V			1.5	V
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1.0MHz		320		pF
Output Capacitance	C_{oss}			75		
Reverse Transfer Capacitance	C_{rss}			4		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=300V I_D=3A R_G=25Ω		18		ns
Turn-On Rise Time	t_r			40		
Turn-Off Delay Time	$t_{d(off)}$			50		
Turn-Off Fall Time	t_f			30		

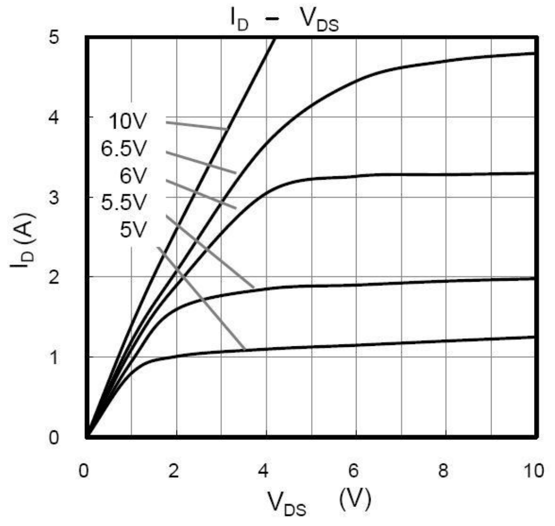
电性能参数 / Electrical Characteristics(Ta=25℃)

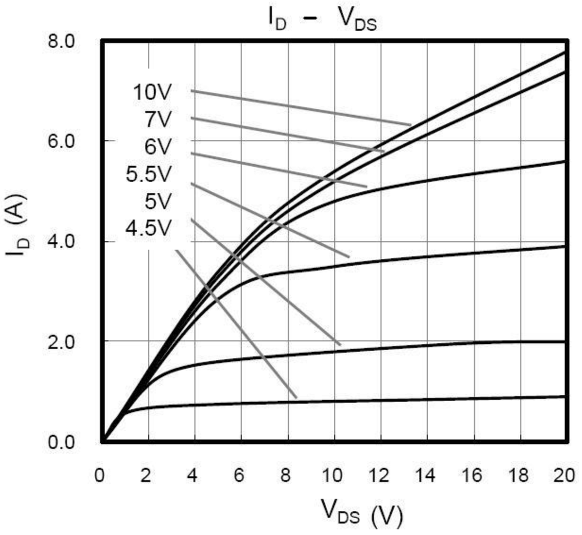
参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Total Gate Charge	Q_g	V_{DD}=480V I_D=3A V_{GS}=10V		15		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			6		
Continuous Source Current	I_S	T_C=25 ºC			5	A
Pulsed Source Current	I_{SM}				20	
Reverse Recovery Time	t_{rr}	V_R=480V I_F=I_S di_F/dt=100A/μS		180		ns
Reverse Recovery Charge	Q_{rr}			2.5		μC
Peak Reverse Recovery Current	I_{rrm}			10		A

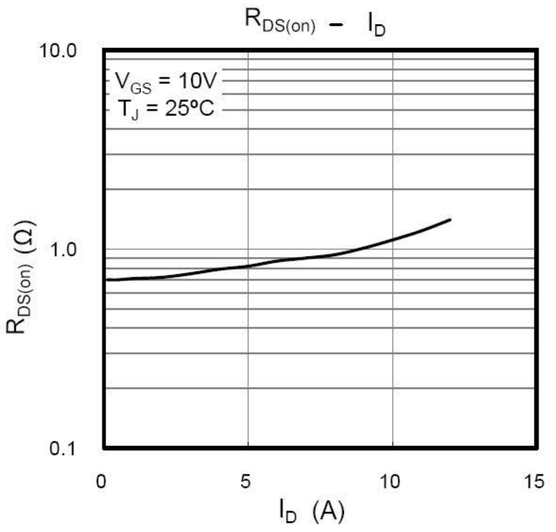
注释/Notes

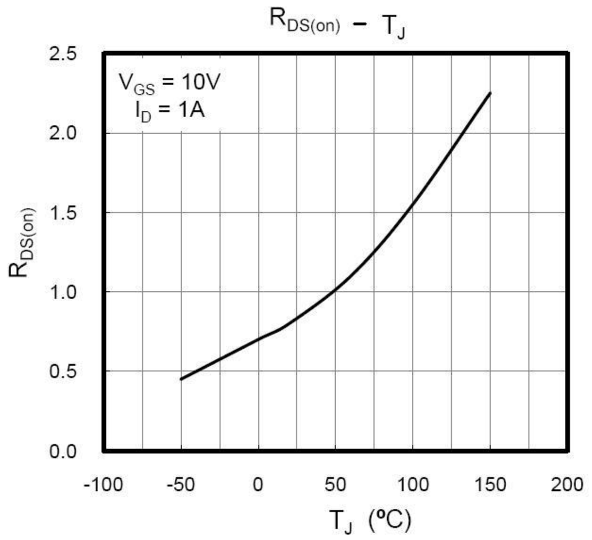
1. 脉冲宽度由最高结温限制
   Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=60mH, I_{AS}= 1.5A, VDD= 150V, 起始温度 T_J= 25°C
   L=60mH, I_{AS}= 1.5A, VDD= 150V, Starting T_J= 25°C
3. 脉冲测试：脉冲宽度≤300μs，占空比≤1%
   Pulse Test: Pulse width ≤ 300μs, Duty Cycle≤ 1%

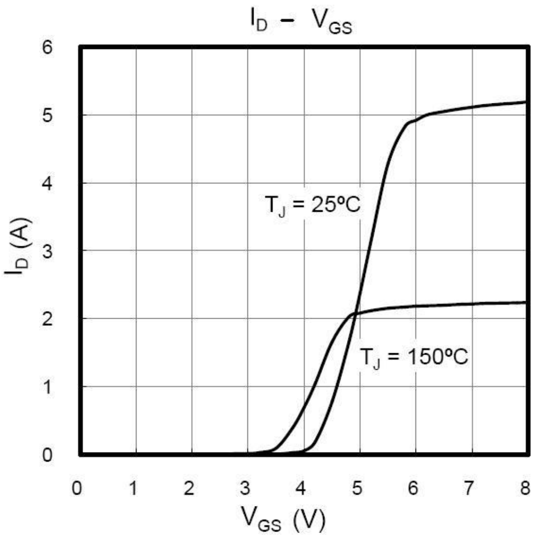
电参数曲线图 / Electrical Characteristic Curve

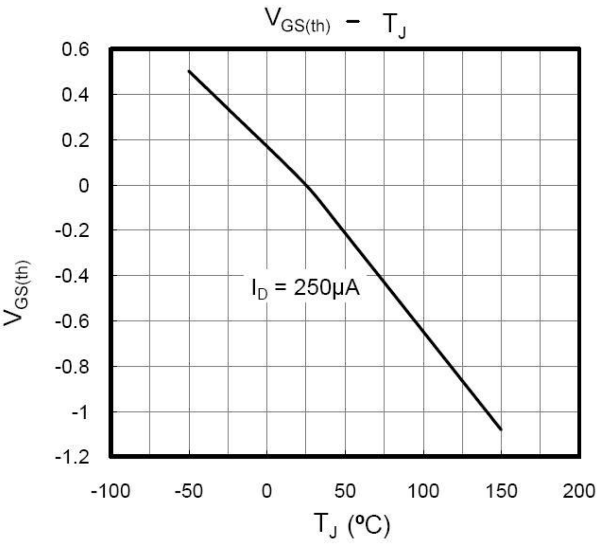




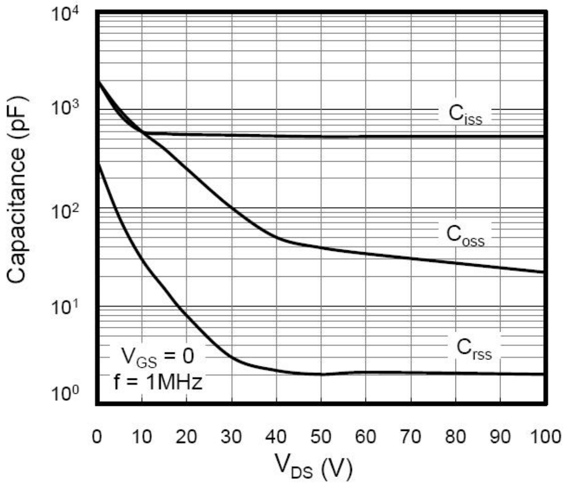


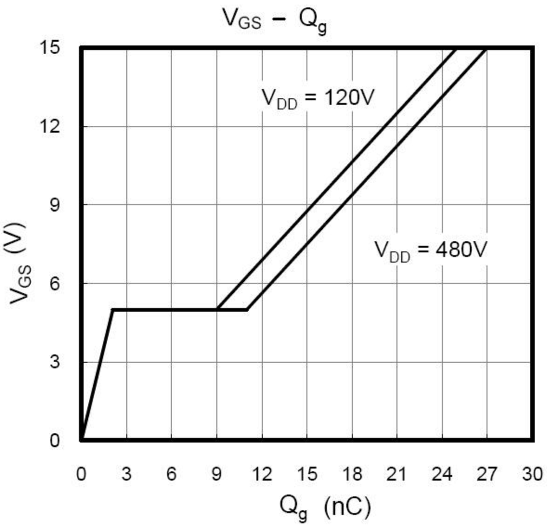


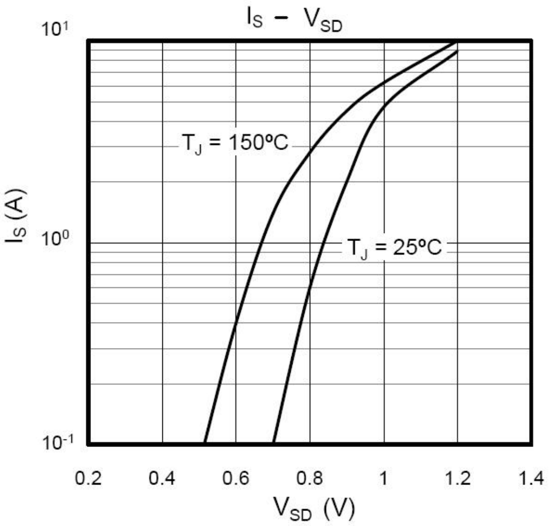


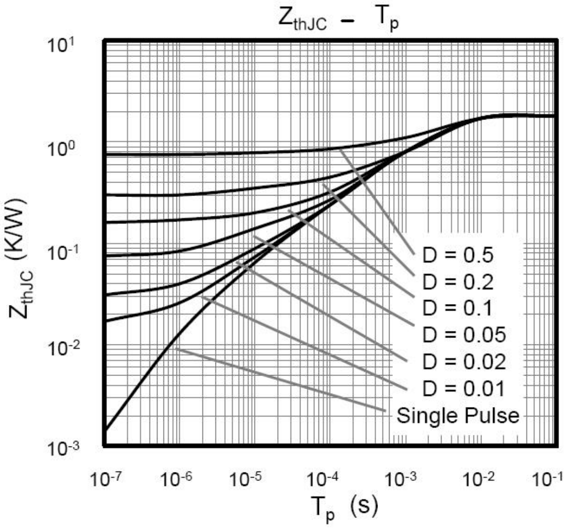


电参数曲线图 / Electrical Characteristic Curve









测试电路和波形 / Test Circuit and Waveform

Figure A：Gate Charge Test Circuit and Waveform

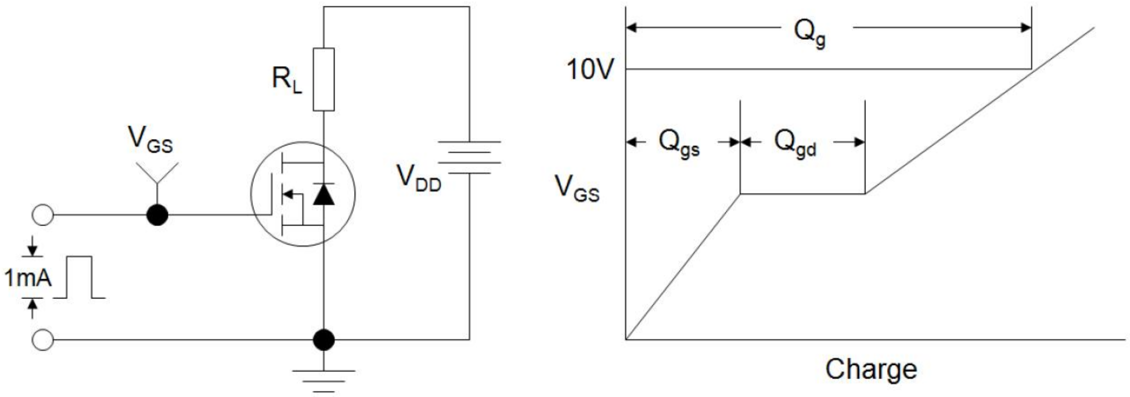


Figure B：Resistive Switching Test Circuit and Waveform

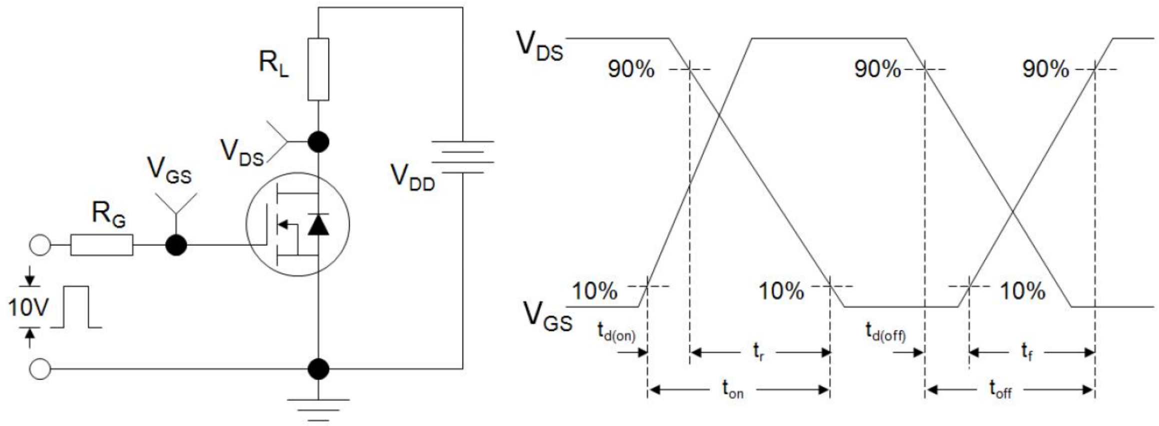
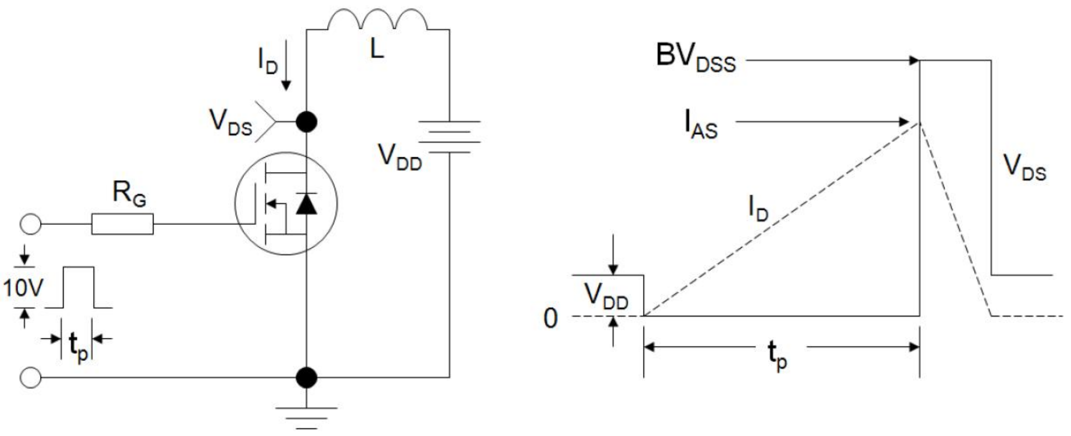
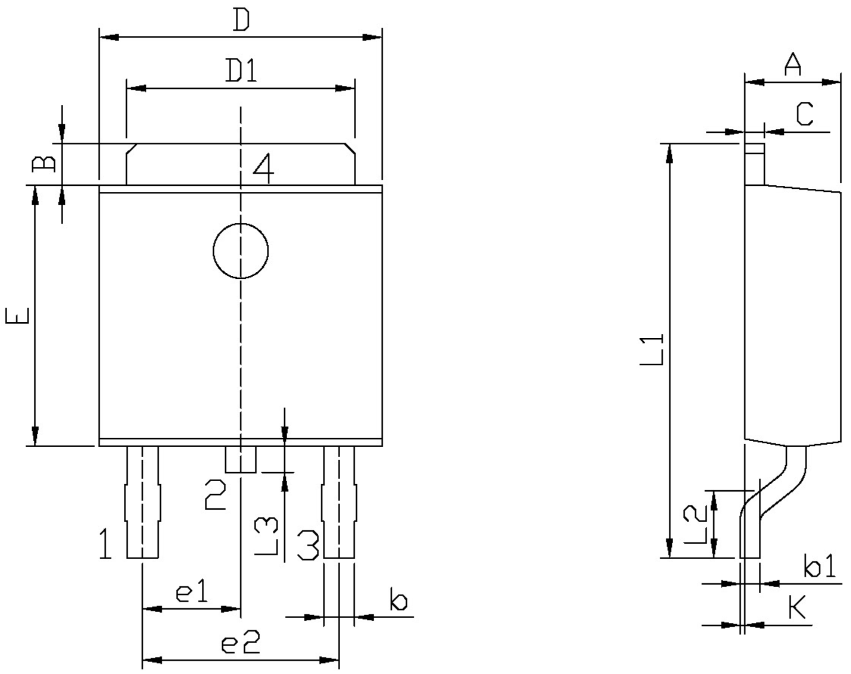


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



外形尺寸图 / Package Dimensions

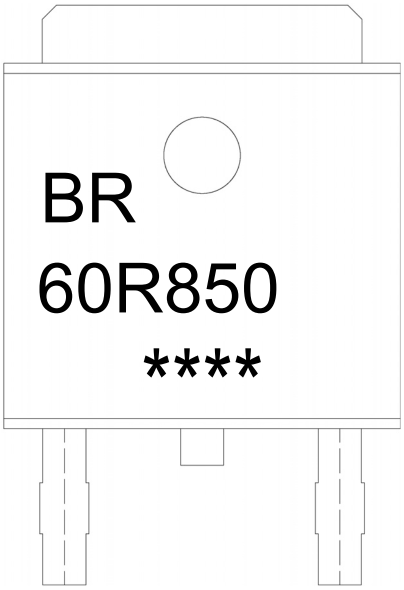


单位：mm

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

TO-252

印章说明 / Marking Instructions



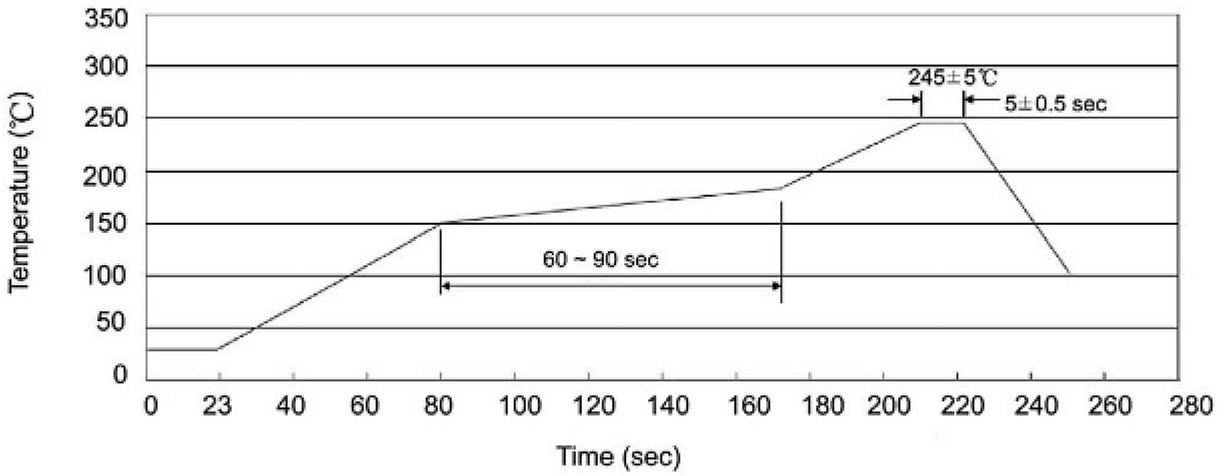
说明：

BR：	为公司代码
60R850：	为型号代码
****：	为生产批号代码，随生产批号变化

Note:

BR:	Company Code
60R850:	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℃，时间 60 ~ 90sec;
2、峰值温度 245±5℃，时间持续为 5±0.5sec;
3、焊接制程冷却速度为 2 ~ 10℃/sec.

Note:
1.Preheating:25~150℃, Time:60~90sec.
2.Peak Temp.:245±5℃, Duration:5±0.5sec.
3. Cooling Speed: 2~10℃/sec.

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

温度：260±5℃　　时间：10±1 sec.

Temp.:260±5℃　　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