

描述 / Descriptions

TO-251 塑封封装 N 沟道 MOS 场效应管。N-CHANNEL MOSFET in a TO-251 Plastic Package.

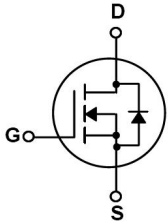
特征 / Features

低栅电荷,低 $R_{DS(on)}$,开关速度快。
Low gate charge, Low ON Resistance, fast switching.

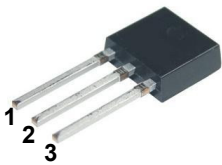
用途 / Applications

适用于适配器和充电器的电源开关电路。
Power switch circuit of adaptor and charger.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : G

PIN 2 : 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_{DSS}	700	V
Drain Current	I_D	2.0	A
Drain Current ($T_C=100^\circ\text{C}$)		1.45	A
Drain Current - Pulsed	I_{DM}^{a1}	8.0	A
Gate-Source Voltage	V_{GSS}	± 30	V
Single Pulsed Avalanche Energy	E_{AS}^{a2}	80	mJ
Avalanche Energy ,Repetitive	E_{AR}^{a2}	6.4	mJ
Avalanche Current	I_{AR}^{a1}	1.1	A
Peak Diode Recovery dv/dt	dv/dt^{a3}	5	V/ns
Power Dissipation	P_D	35	W
Operating Temperature Range	T_J	150	$^\circ\text{C}$
Maximum Temperature for Soldering	T_L	300	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Thermal Resistance - Junction to Case	$R_{\theta JC}$	3.57	$^\circ\text{C}/\text{W}$

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}	$V_{GS}=0V$ $I_D=250\mu A$	700			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=700V$ $V_{GS}=0V$			10	μA
		$V_{DS}=560V$ $V_{GS}=0V$ $T_a=125^\circ\text{C}$			100	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=\pm 30V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=1.0A$		4.7	6.5	Ω
Forward Transconductance	g_{FS}	$V_{DS}=30V$ $I_D=1.0A$		1.5		S
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=2.0A$			1.5	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0\text{MHz}$		280		pF
Output Capacitance	C_{oss}				30	pF
Reverse Transfer Capacitance	C_{rss}				3.8	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	$t_{d(on)}$	$V_{DD}=350V$ $I_D=2.0A$ $V_{GS}=10V$ $R_G=25\Omega$		7.8		ns
Turn-On Rise Time	t_r			5.5		ns
Turn-Off Delay Time	$t_{d(off)}$			33		ns
Turn-Off Fall Time	t_f			16		ns
Total Gate Charge	Q_g	$I_D=2.0A$ $V_{DD}=350V$ $V_{GS}=10V$		8.5		nC
Gate to Source Charge	Q_{gs}			1.5		nC
Gate to Drain (“Miller”)Charge	Q_{gd}			4.0		nC
Continuous Source Current (Body Diode)	I_S				2.0	A
Maximum Pulsed Current (Body Diode)	I_{SM}				8.0	A
Reverse Recovery Time	t_{rr}	$I_S=2.0A$ $T_J=25^\circ C$ $di_F/dt=100A/us$ $V_{GS}=0V$		455		ns
Reverse Recovery Charge	Q_{rr}			1370		nC

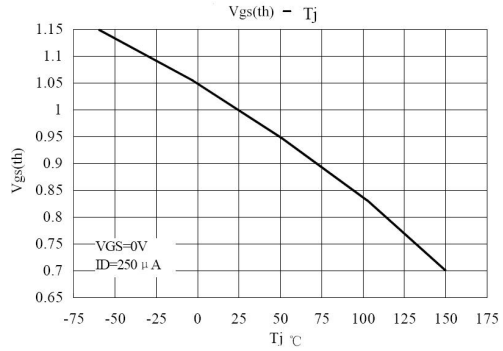
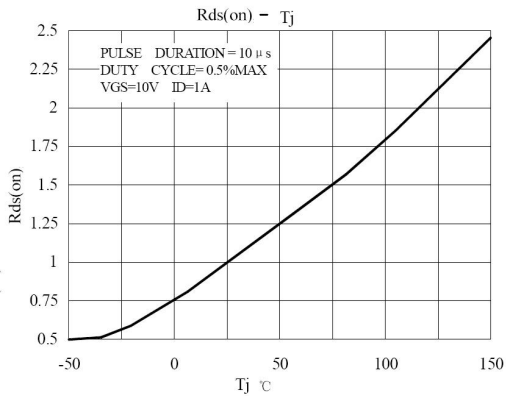
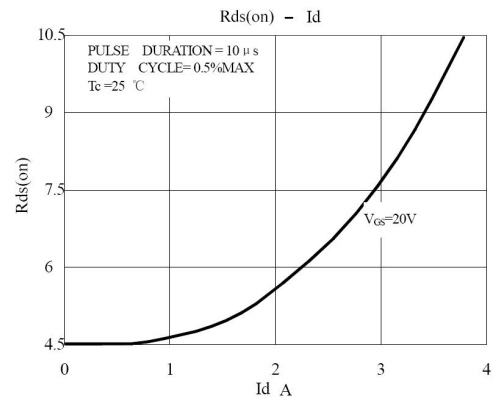
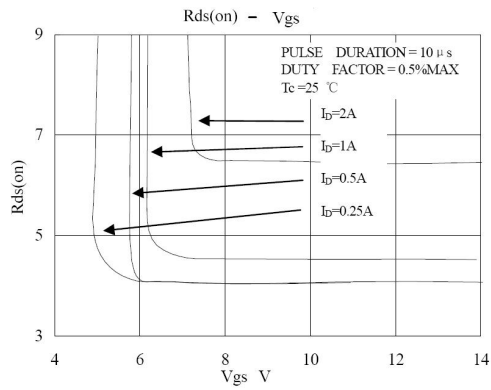
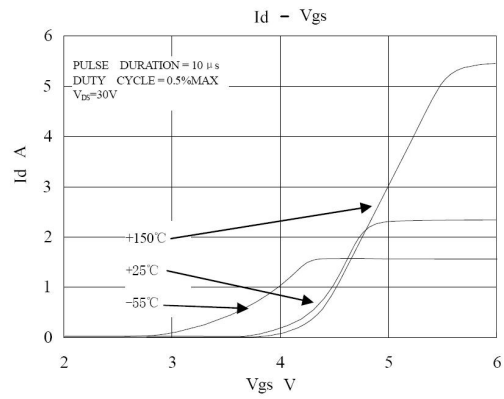
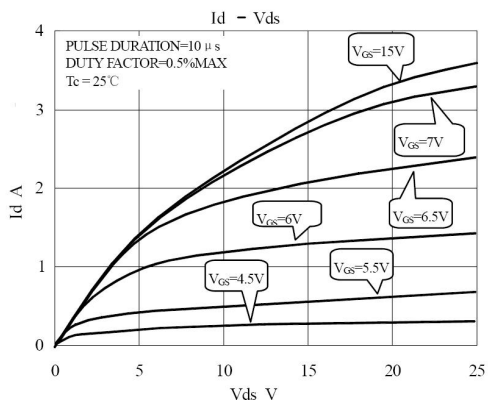
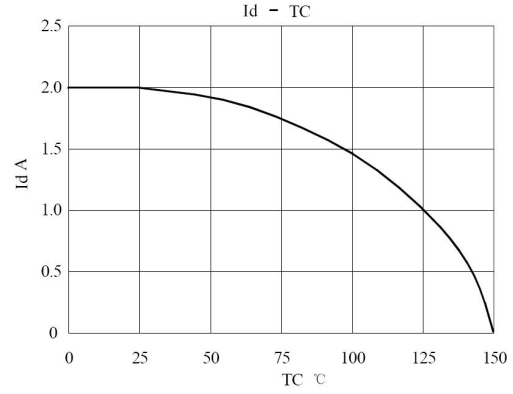
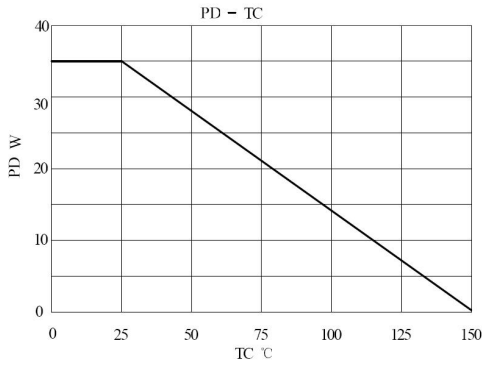
Notes:

a1: Repetitive rating; pulse width limited by maximum junction temperature

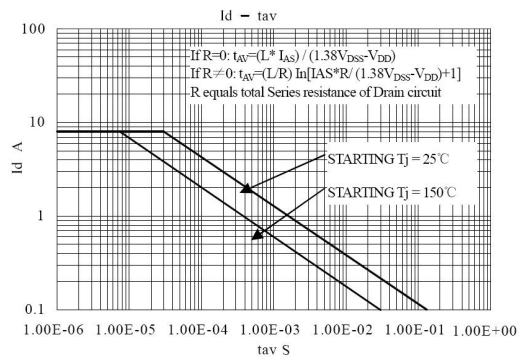
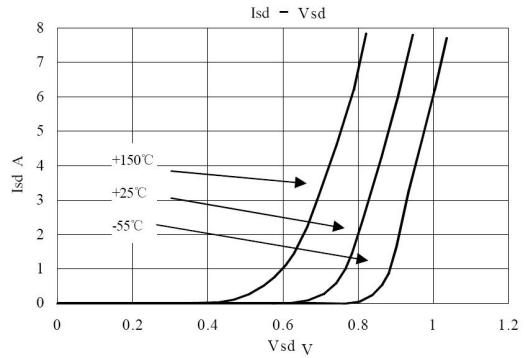
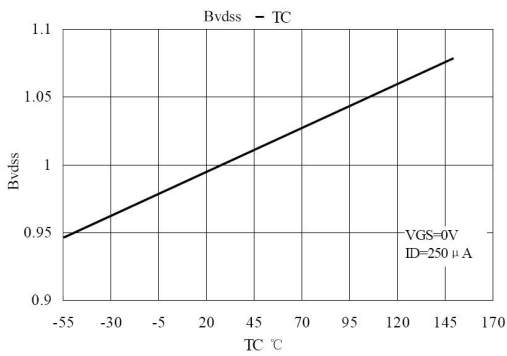
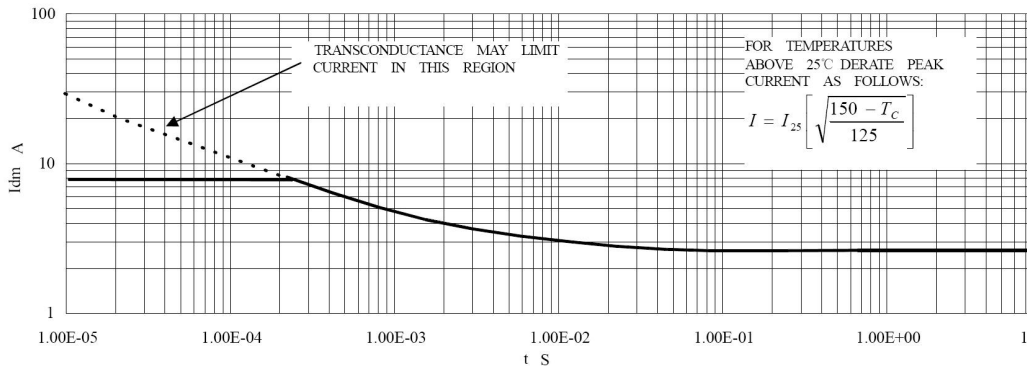
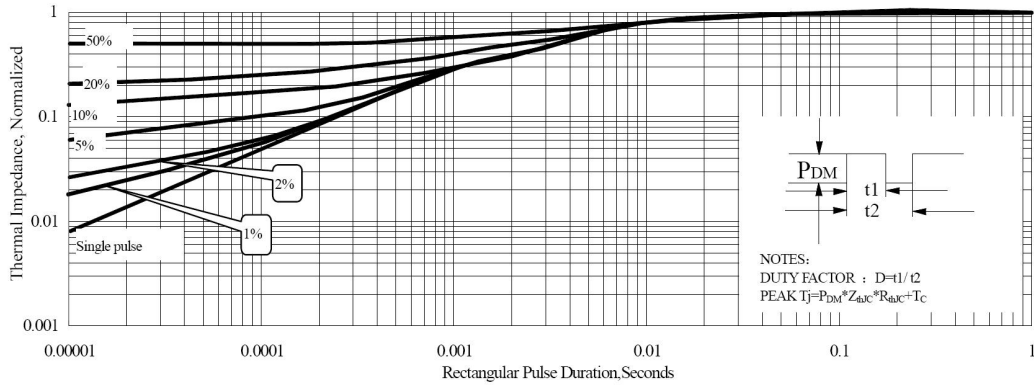
a2: L=10.0mH, $I_D=4A$, Start $T_J=25^\circ C$

a3: $I_{SD}=2A$, $di/dt \leq 100A/us$, $V_{DD} \leq BV_{DS}$, Start $T_J=25^\circ C$

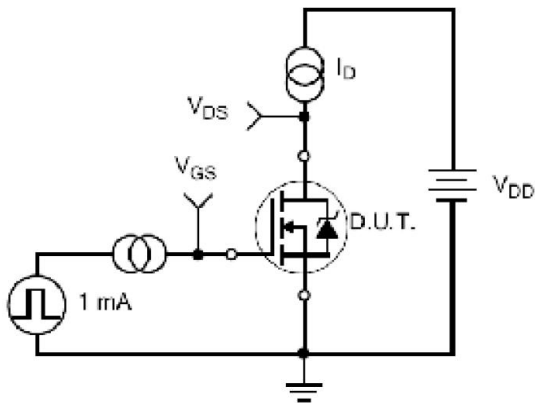
电参数曲线图 / Electrical Characteristic Curve



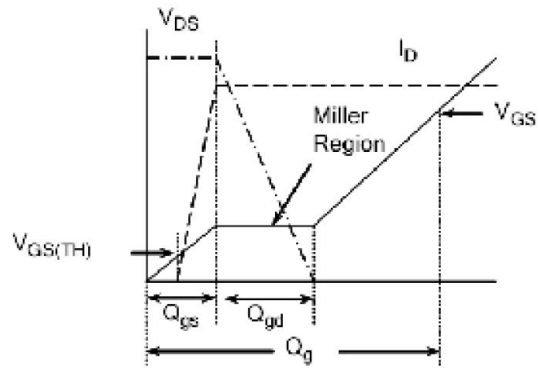
电参数曲线图 / Electrical Characteristic Curve



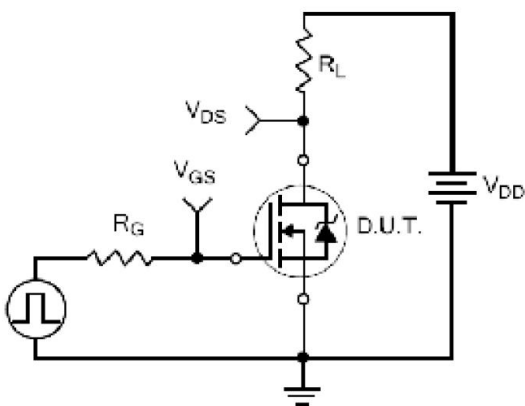
测试电路与波形图 / Test Circuit and Waveform Curve



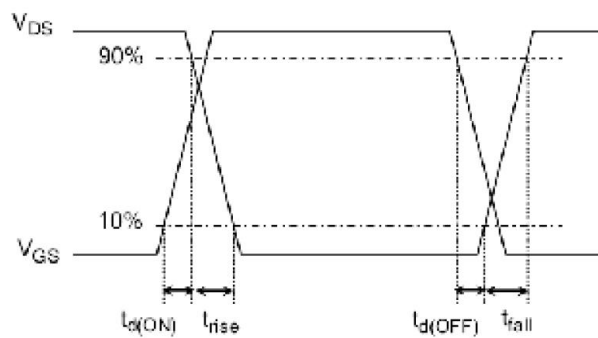
Gate Charge Test Circuit



Gate Charge Waveform

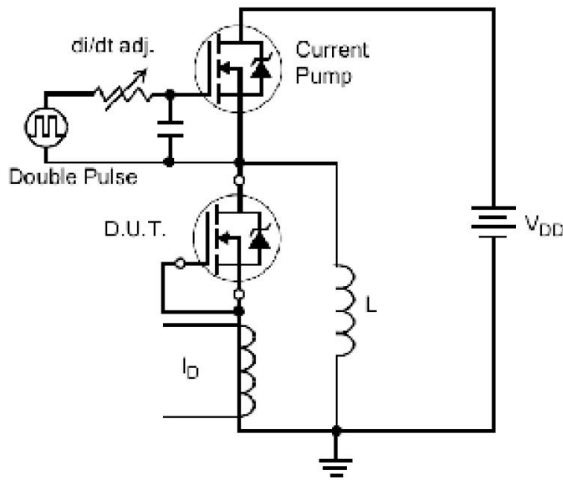


Resistive Switching Test Circuit

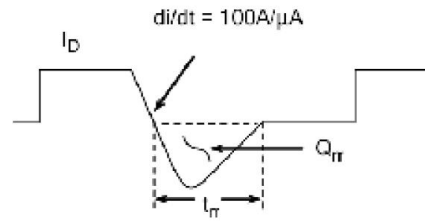


Resistive Switching Waveforms

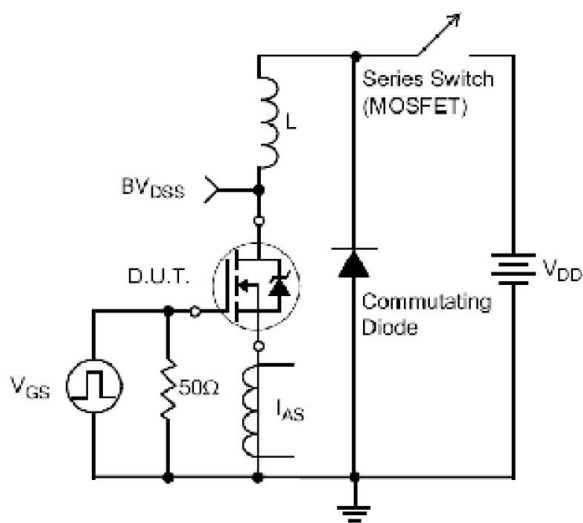
测试电路与波形图 / Test Circuit and Waveform Curve



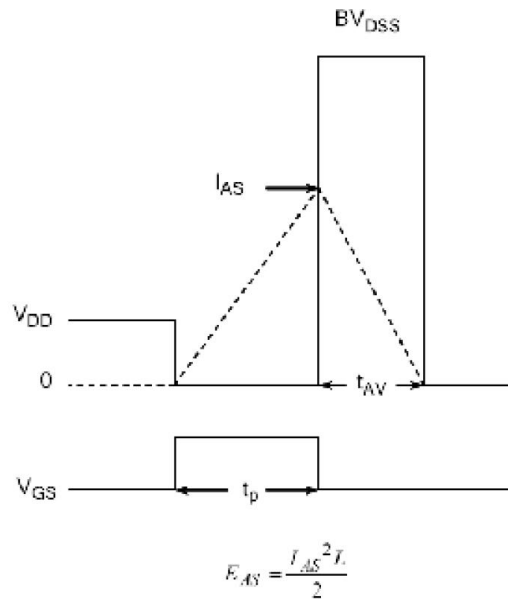
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform

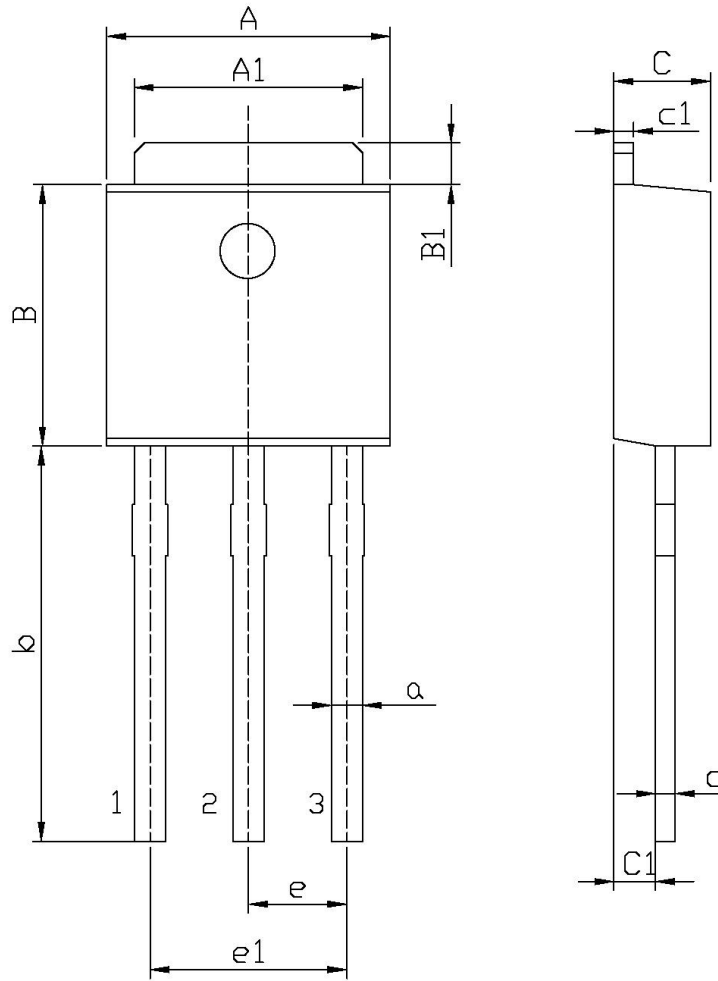


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

外形尺寸图 / Package Dimensions

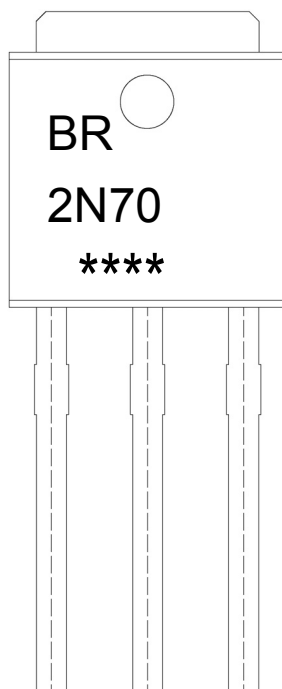


单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	6.45	6.75	a	0.50	0.70
A1	5.10	5.50	b	9.00	9.40
B	5.95	6.25	c	0.45	0.55
B1	0.95	1.25	c1	0.45	0.55
C	2.20	2.40	e	2.24	2.34
C1	0.95	1.15	e1	4.43	4.73

TO-251

印章说明 / Marking Instructions



说明：

BR： 为公司代码

2N70： 为型号代码

****： 为生产批号代码，随生产批号变化。

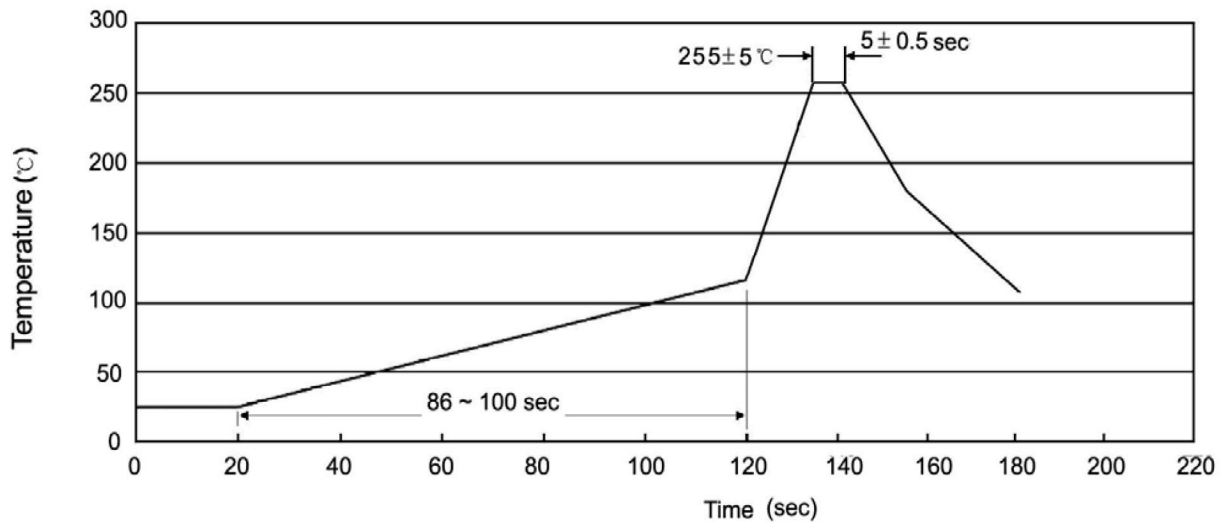
Note:

BR: Company Code

2N70: 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-251	1,000	10	10,000	5	50,000	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-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