

描述 / Descriptions

SOP-8 塑封封装 N 沟道 MOS 场效应管。

N-Channel Enhancement Mode Field Effect Transistor in a SOP-8 Plastic Package.

特征 / Features

$V_{DS}=30V$

$I_D=13A$ ($V_{GS} = 10V$)

$R_{DS(ON)} < 11.5m\Omega$ ($V_{GS}=10V$)

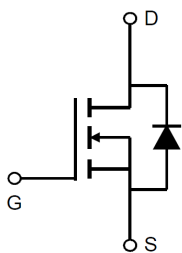
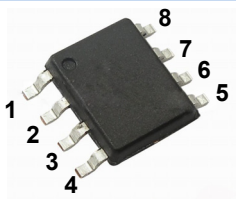
$R_{DS(ON)} < 15.5m\Omega$ ($V_{GS}=4.5V$)

无卤产品。Halogen-free Product.

用途 / Applications

适用于开关电源中的高电平端或通用设备。

This device is suitable for high side switch in SMPS and general purpose applications.

内部等效电路 / Equivalent Circuit**引脚排列 / Pinning**

PIN1 : S PIN 2 : S PIN 3 : S PIN4 : G

PIN 5 : D PIN 6 : D PIN 7 : D PIN 8 : 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°C)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ^A	$I_D (T_A=25^\circ\text{C})$	13	A
	$I_D (T_A=70^\circ\text{C})$	10.4	A
Pulsed Drain Current ^B	I_{DM}	100	A
Avalanche Current ^C	I_{AS}	22	
Avalanche energy L=0.1mH ^C	E_{AS}	24	
Power Dissipation ^B	$P_D (T_A=25^\circ\text{C})$	3.1	W
	$P_D (T_A=70^\circ\text{C})$	2	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

热特性 / Thermal Characteristics

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
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	$t \leq 10s$		31	40	°C/W
Maximum Junction-to-Ambient ^{A D}		Steady-State		59	75	
Maximum Junction-to-Lead	$R_{\theta JL}$	Steady-State		16	24	°C/W

Note:

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.

B. The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using $\leq 10s$ junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep Initial $T_J=25^\circ\text{C}$.

D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of $T_{J(MAX)}=150^\circ\text{C}$. The SOA curve provides a single pulse rating.

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}	$V_{GS}=0V$ $I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V$ $V_{GS}=0V$			1.0	μA
		$V_{DS}=30V$ $V_{GS}=0V$ $T_J=55^\circ C$			5.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	1.5	1.9	2.5	V
On state drain current	$I_{D(on)}$	$V_{DS}=5V$ $V_{GS}=10V$	100			A
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=12A$		9.5	11.5	m Ω
		$V_{GS}=10V$ $I_D=12A$ $T_J=125^\circ C$		14	17	m Ω
		$V_{GS}=4.5V$ $I_D=10A$		12.5	15.5	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5.0V$ $I_D=12A$		45		S
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1.0A$		0.75	1	V
Maximum Body-Diode Continuous Current	I_S				4	A
Input Capacitance	C_{iss}	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$		760		pF
Output Capacitance	C_{oss}			125		pF
Reverse Transfer Capacitance	C_{rss}			70		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$	0.8	1.6	2.4	Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=10V$ $V_{DS}=15V$ $I_D=12A$		14	25	nC
Total Gate Charge(4.5V)				6.6	12	nC
Gate-Source Charge	Q_{gs}			2.4		nC
Gate-Drain Charge	Q_{gd}			3		nC
Gate-Source Charge	Q_{gs}	$V_{GS}=4.5V$ $V_{DS}=15V$ $I_D=12A$		2.4		nC
Gate-Drain Charge	Q_{gd}			3		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=15V$ $V_{GS}=10V$ $R_L=1.25\Omega$ $R_{GEN}=3\Omega$		4.4		ns
Turn-On Rise Time	t_r			9		ns
Turn-Off Delay Time	$t_{d(off)}$			17		ns
Turn-Off Fall Time	t_f			6		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=12A$ $dI/dt=100A/\mu s$		7		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=12A$ $dI/dt=100A/\mu s$		8		nC

电参数曲线图 / Electrical Characteristic Curve

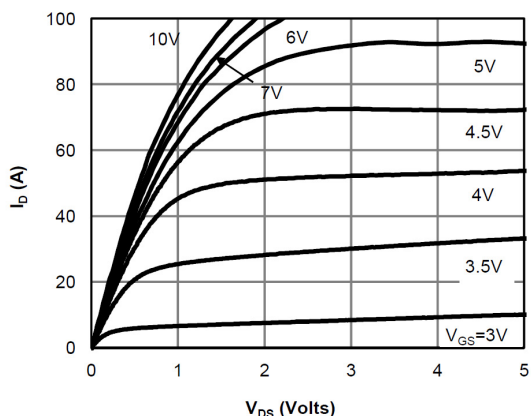


Fig 1: On-Region Characteristics (Note E)

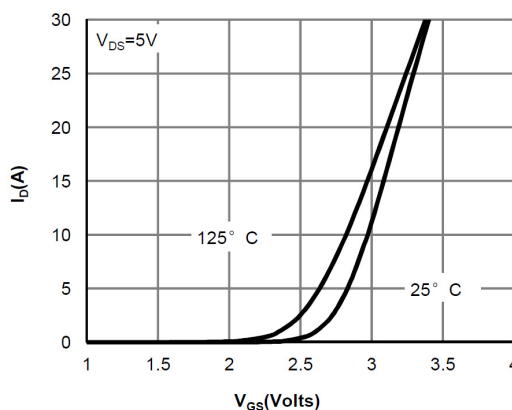


Figure 2: Transfer Characteristics (Note E)

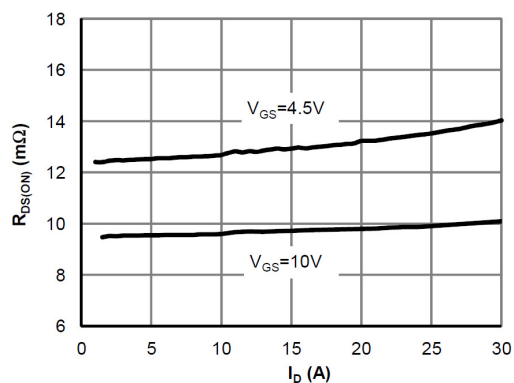


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

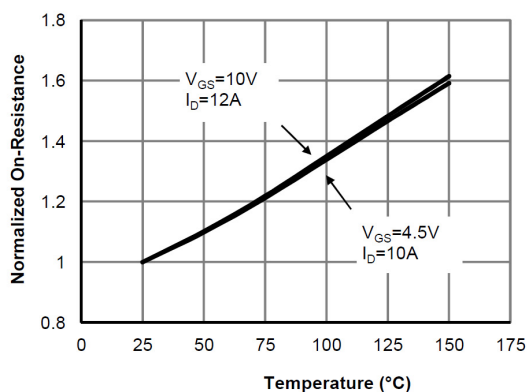


Figure 4: On-Resistance vs. Junction Temperature (Note E)

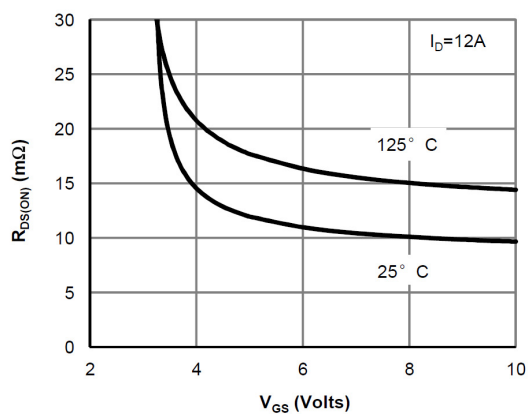


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

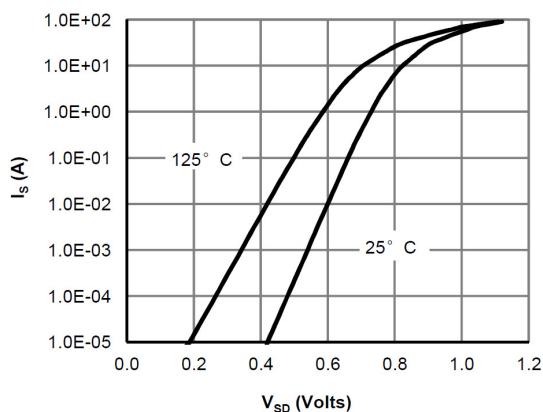


Figure 6: Body-Diode Characteristics (Note E)

电参数曲线图 / Electrical Characteristic Curve

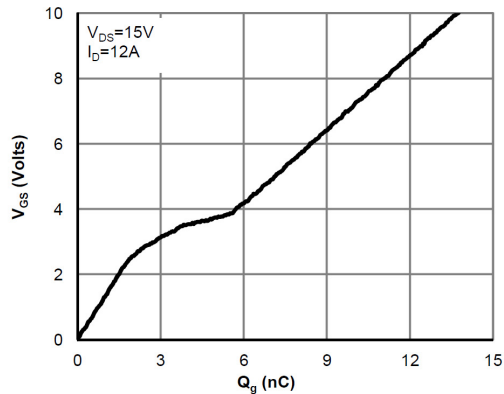


Figure 7: Gate-Charge Characteristics

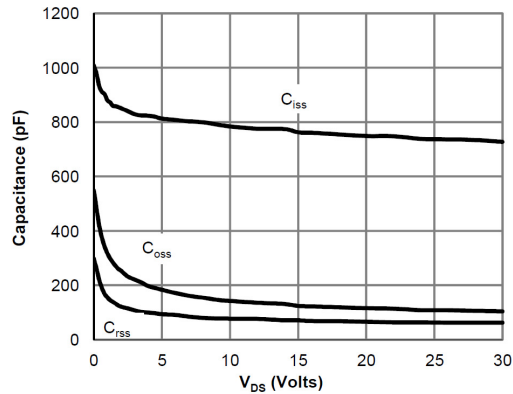


Figure 8: Capacitance Characteristics

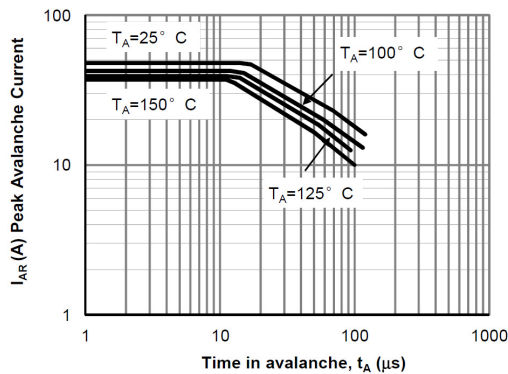


Figure 9: Single Pulse Avalanche capability (Note C)

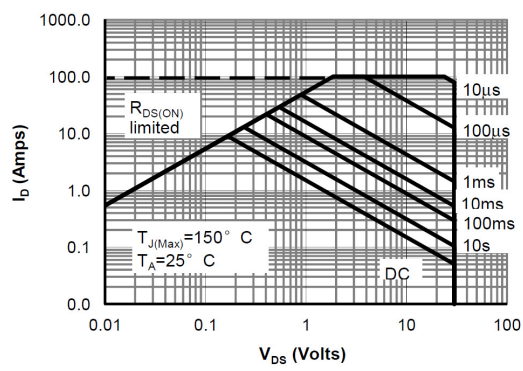


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

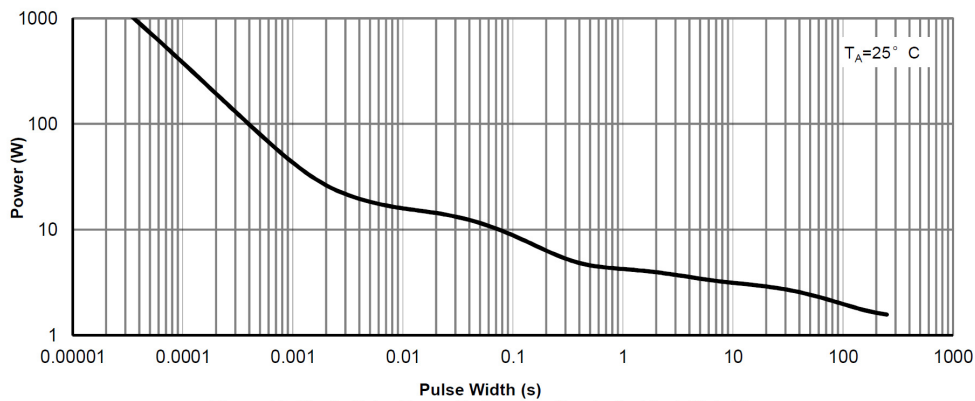


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

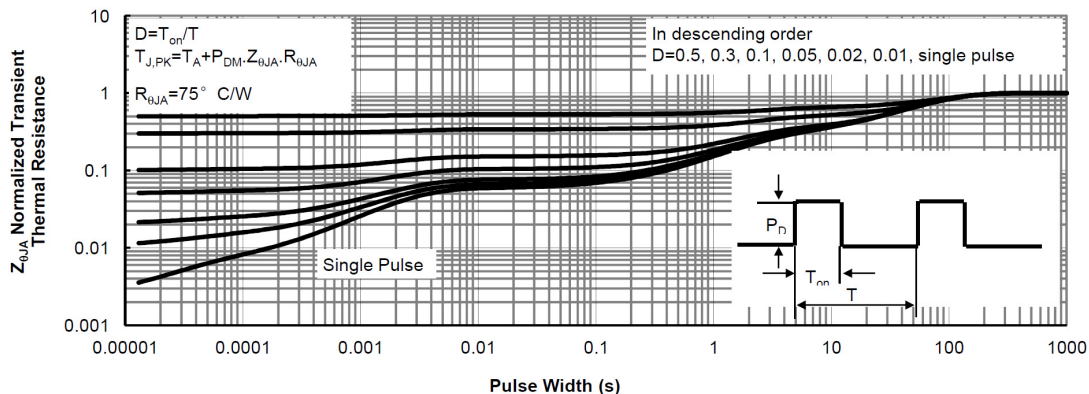
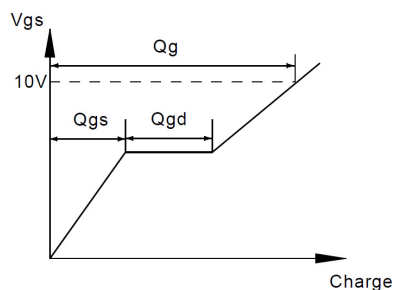
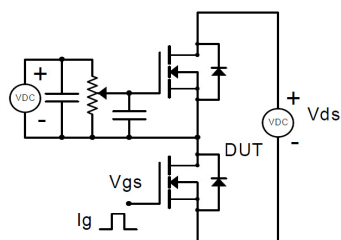


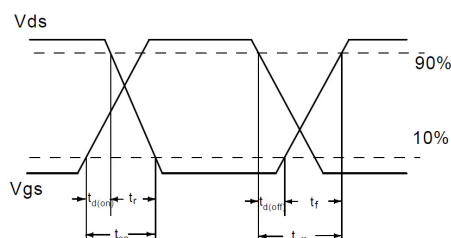
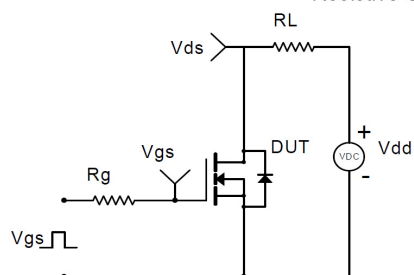
Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

测试电路和波形 / Test Circuit & Waveform

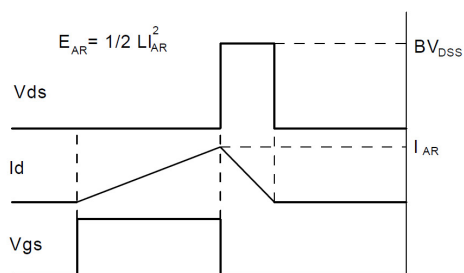
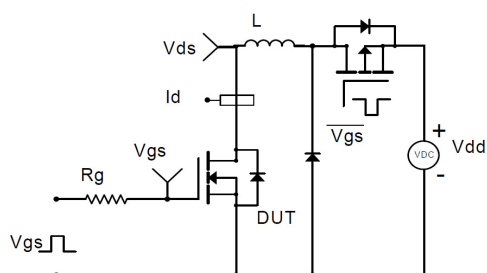
Gate Charge Test Circuit & Waveform



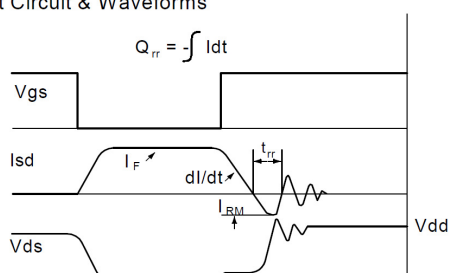
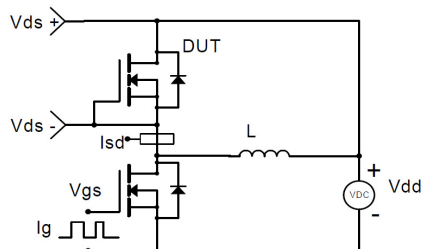
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



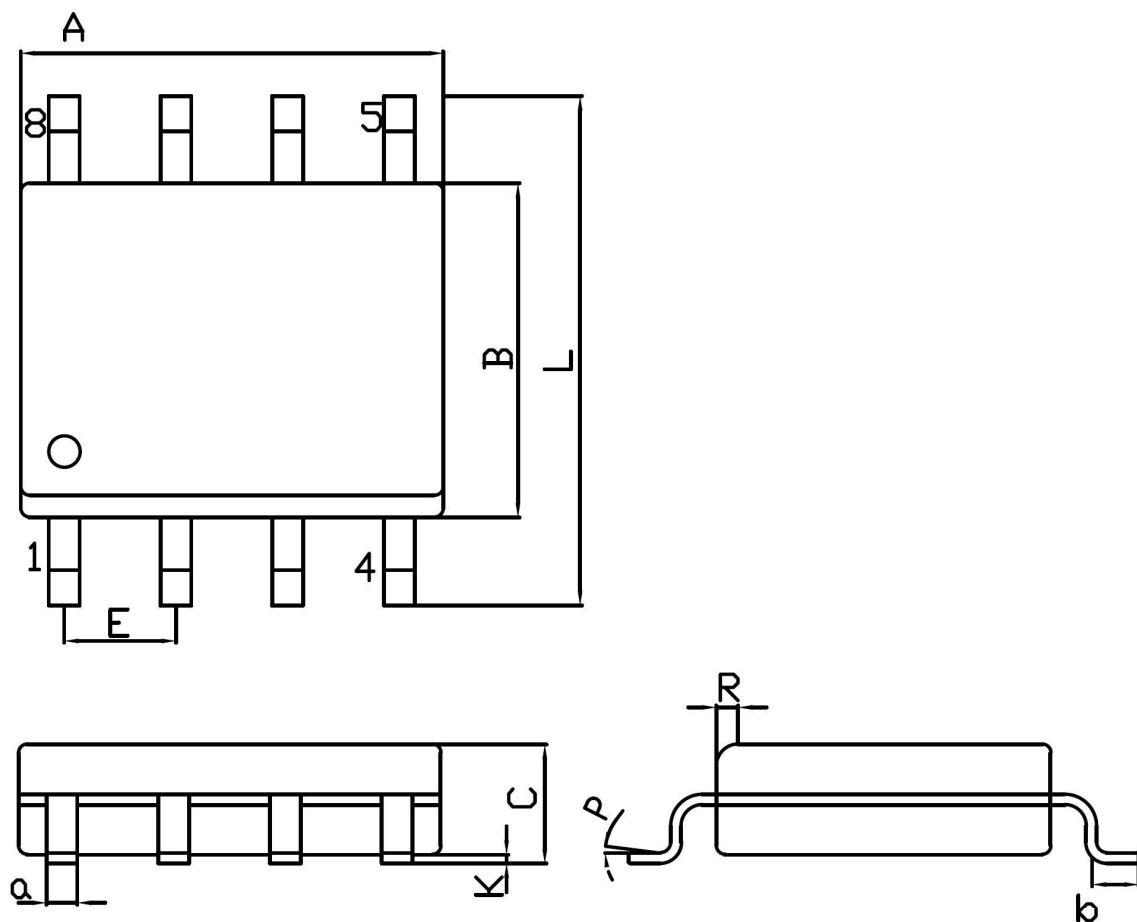
Diode Recovery Test Circuit & Waveforms



外形尺寸图 / Package Dimensions

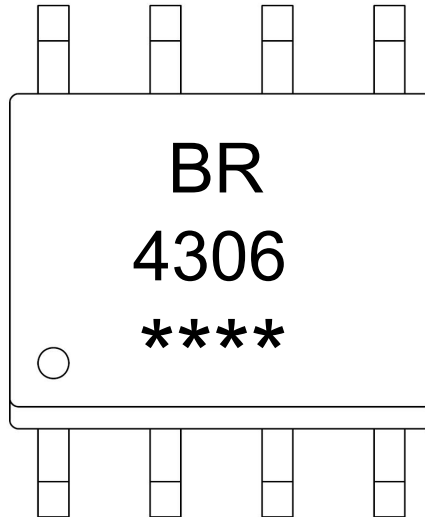
SOP-8

Unit:mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.70	5.10	C	1.35	1.75
B	3.70	4.10	a	0.35	0.49
L	5.80	6.20	R	0.30	0.60
E	1.27BSC		P	0°	7°
K	0.12	0.22	b	0.40	1.25

印章说明 / Marking Instructions



说明：

BR： 为公司代码

4306： 为型号代码

****： 为生产批号代码，随生产批号变化。

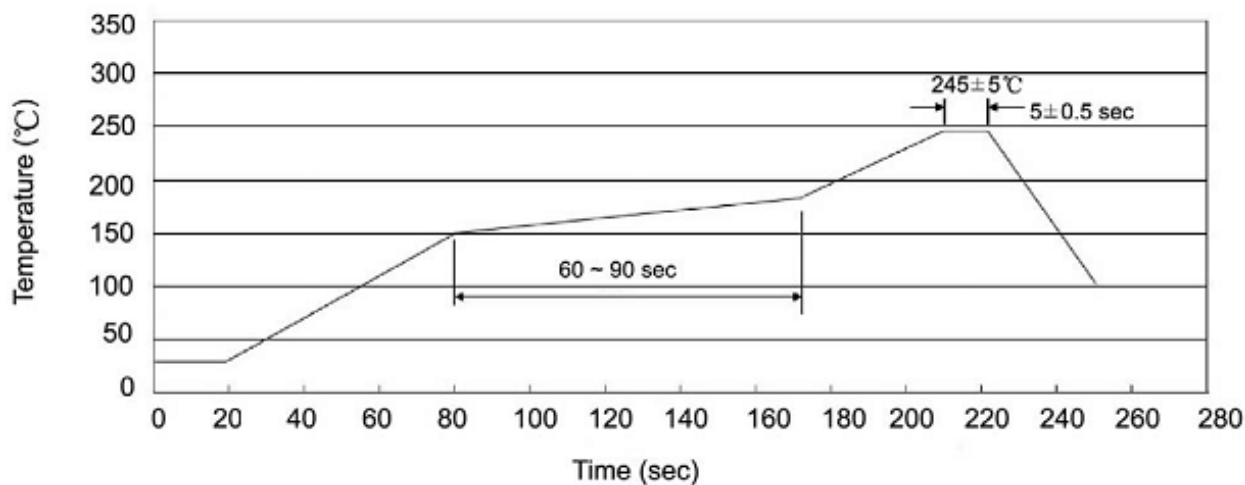
Note:

BR: Company Code.

4306: 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 150 ~ 180°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:150~180°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
SOP/ESOP-8	4,000	2	8,000	6	48,000	13" ×12	360×360×50	380×335×366

使用说明 / Notices