

# BR4407

## P-Channel Power MOSFET

### 描述 / Descriptions

SOP-8 塑封封装 P 沟道 MOS 场效应管。

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

### 特征 / Features

$V_{DS} (V) = -30V$

$I_D = -12 A (V_{GS} = -20V)$

$R_{DS(ON)} < 13m\Omega (V_{GS} = -20V)$

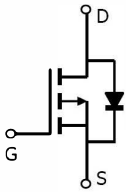
$R_{DS(ON)} < 14m\Omega (V_{GS} = -10V)$

### 用途 / Applications

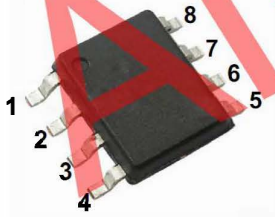
用于电源管理，便携式设备和电池供电系统。

Power Management in Notebook computer, Portable Equipment and Battery powered systems.

### 内部等效电路 / Equivalent Circuit



### 引脚排列 / Pinning



PIN 1 : S	PIN 2 : S	PIN 3 : S	PIN 4 : G
PIN 5 : D	PIN 6 : D	PIN 7 : D	PIN 8 : D

### 印章代码 / Marking

见印章说明 See Marking Instructions.

**P-Channel Power MOSFET**
**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 <sup>A</sup>	$I_D (T_a=25^\circ\text{C})$	-12	A
Continuous Drain Current <sup>A</sup>	$I_D (T_a=70^\circ\text{C})$	-10	A
Pulsed Drain Current <sup>B</sup>	$I_{DM}$	-60	A
Power Dissipation for Single Operation <sup>A</sup>	$P_D (T_a=25^\circ\text{C})$	3	W
Power Dissipation for Single Operation <sup>A</sup>	$P_D (T_a=100^\circ\text{C})$	2.1	W
Maximum Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55 ~ 150	°C
Thermal Resistance-Junction to Ambient <sup>A</sup>	$R_{\theta JA} (t \leq 10s)$	40	°C/W
Thermal Resistance-Junction to Ambient <sup>A</sup>	$R_{\theta JA}$	75	°C/W
Maximum Junction-to-Lead <sup>C</sup>	$R_{\theta JL}$	30	°C/W

**Note:**

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> 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. The current rating is based on the  $t \leq 10s$  thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

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

D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80 μs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ . The SOA curve provides a single pulse rating. Rev 1 : Sept 2005

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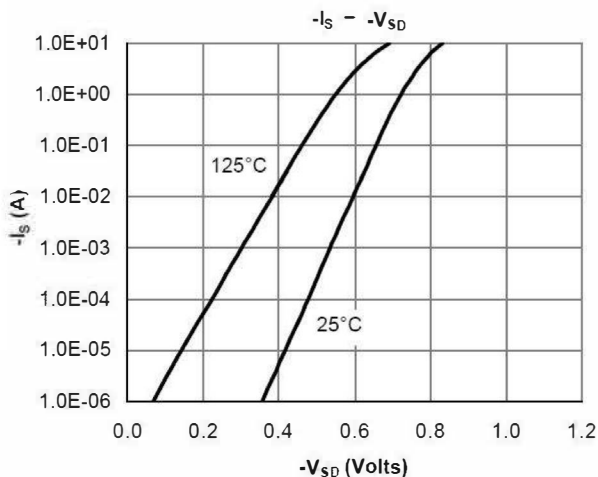
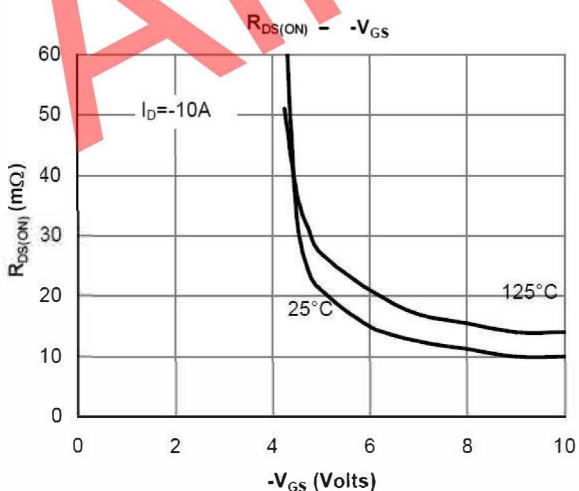
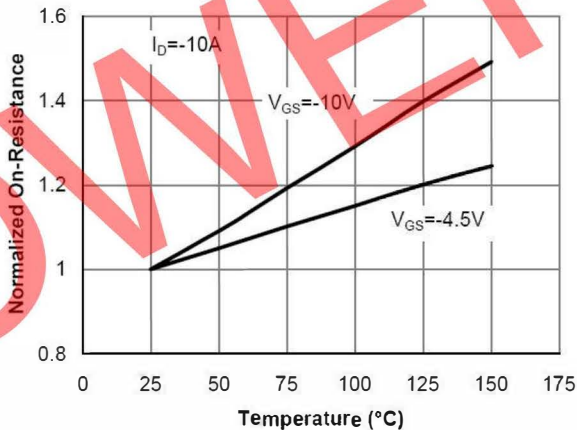
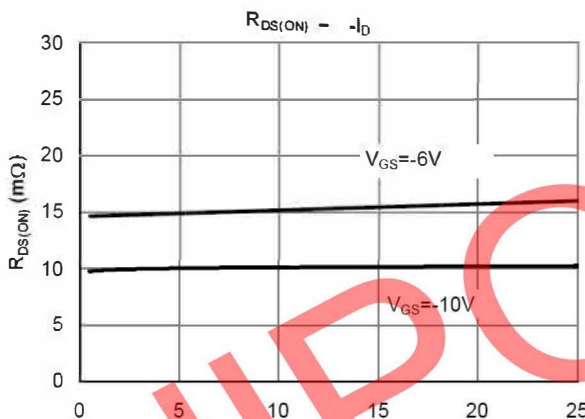
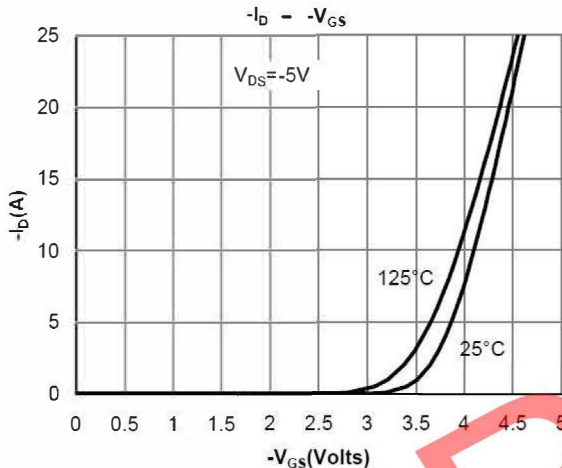
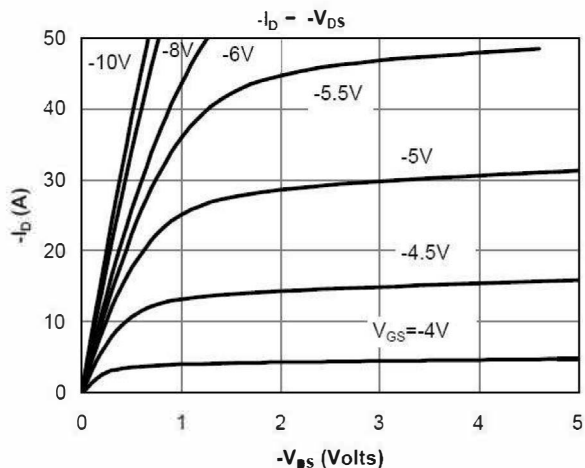
**电性能参数 / Electrical Characteristics(Ta=25°C)**

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	$BV_{DSS}$	$I_D=-250\mu A$ $V_{GS}=0V$	-30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-24V$ $V_{GS}=0V$			-1.0	$\mu A$
		$V_{DS}=-24V$ $V_{GS}=0V$ $T_J=55^\circ C$			-5.0	
Gate-Body leakage current	$I_{GSS}$	$V_{DS}=0V$ $V_{GS}=\pm 20V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.0	-1.5	-3.0	V
On state drain current	$I_{D(ON)}$	$V_{GS}=-10V$ $V_{DS}=-5V$	60			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V$ $I_D=-10A$		10	14	m $\Omega$
		$V_{GS}=-10V$ $I_D=-10A$ $T_J=125^\circ C$		13	19	
		$V_{GS}=-20V$ $I_D=-10A$		9.5	13	
		$V_{GS}=-4.5V$ $I_D=-10A$		22		
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V$ $I_D=-10A$		28		S
Diode Forward Voltage	$V_{SD}$	$I_S=-1A$ $V_{GS}=0V$		-0.72	-1.0	V
Maximum Body-Diode Continuous Current					-4.2	A
Total Gate Charge	$Q_g$			37.2	45	nC
Gate-Source Charge	$Q_{gs}$	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-12A$		7		
Gate-Drain Charge	$Q_{gd}$			10.4		
Gate Resistance	$R_g$	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$		2.0	3.0	$\Omega$
Input Capacitance	$C_{iss}$			2076	2500	pF
Output Capacitance	$C_{oss}$	$V_{GS}=0V$ $V_{DS}=-15V$ $f=1MHz$		503		
Reverse Transfer Capacitance	$C_{rss}$			302		
Turn-on Delay Time	$t_{d(ON)}$			12.4		ns
Turn-on Rise Time	$t_r$	$V_{GS}=-10V$ $V_{DS}=-15V$ $R_L=1.25\Omega$ $R_{GEN}=3\Omega$		8.2		
Turn-off Delay Time	$t_{d(OFF)}$			25.6		
Turn-off Fall Time	$t_f$			12		
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F=-12A$ $di/dt=100A/\mu s$		33	40	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F=-12A$ $di/dt=100A/\mu s$		23		nC

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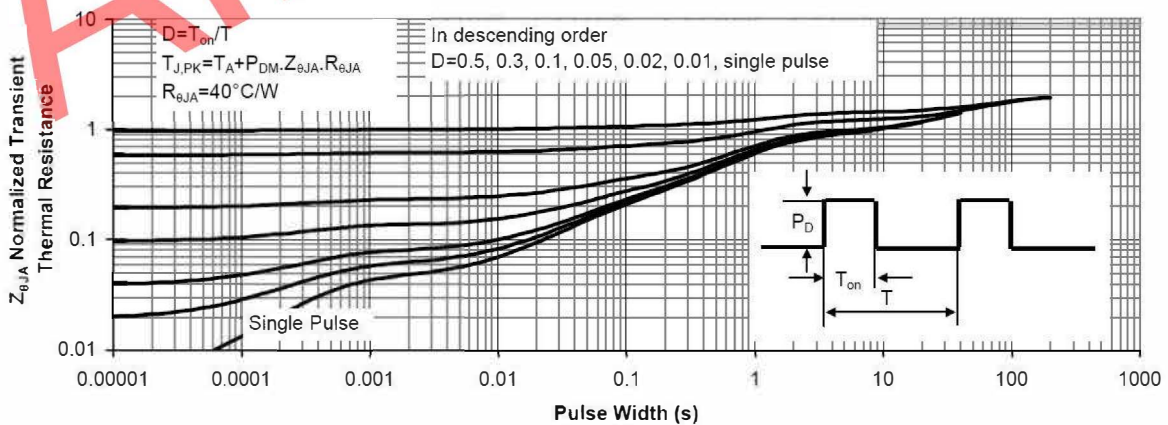
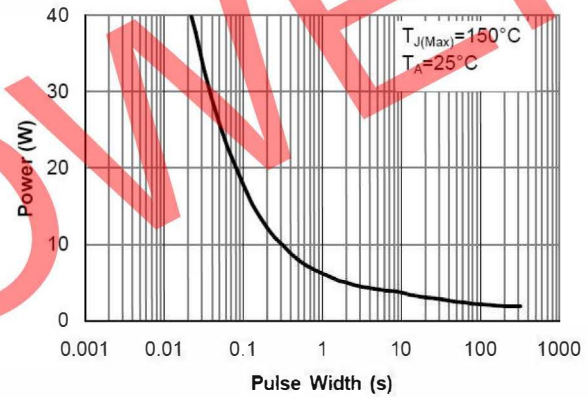
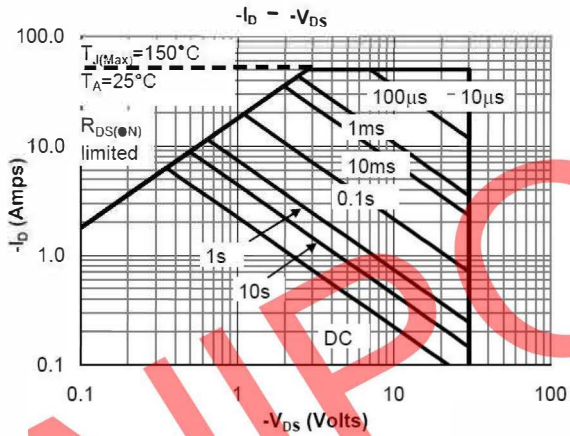
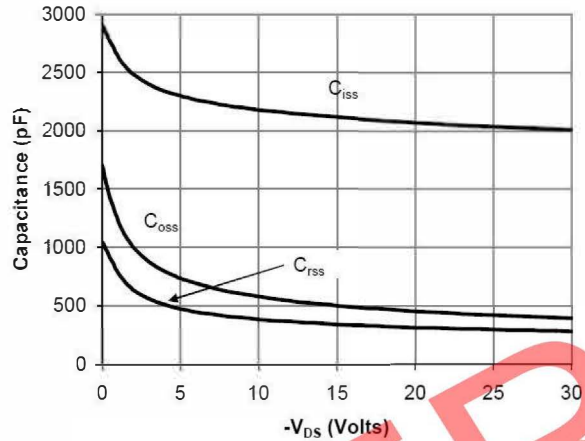
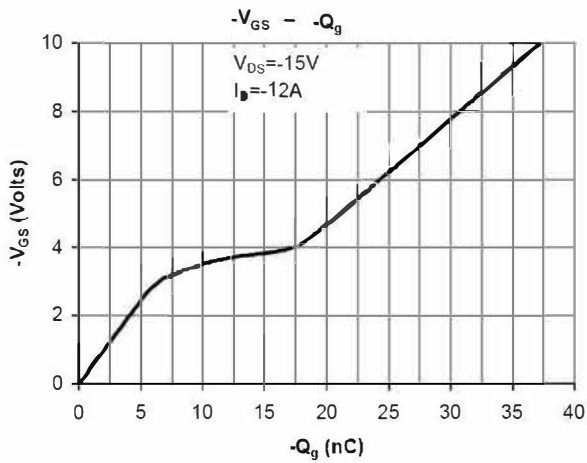
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**电参数曲线图 / Electrical Characteristic Curve**



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**电参数曲线图 / Electrical Characteristic Curve**



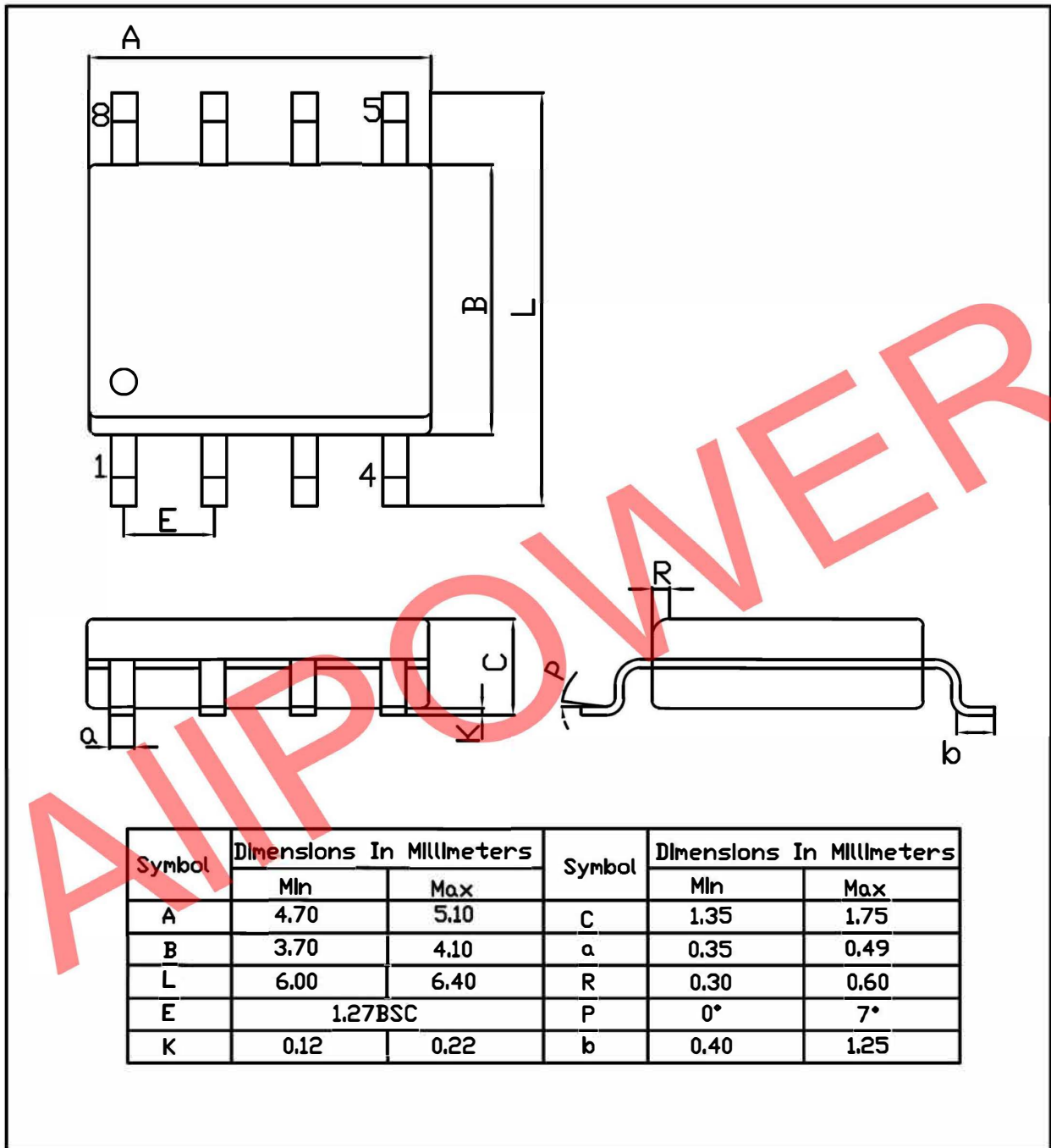


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外形尺寸图 / Package Dimensions

SOP-8

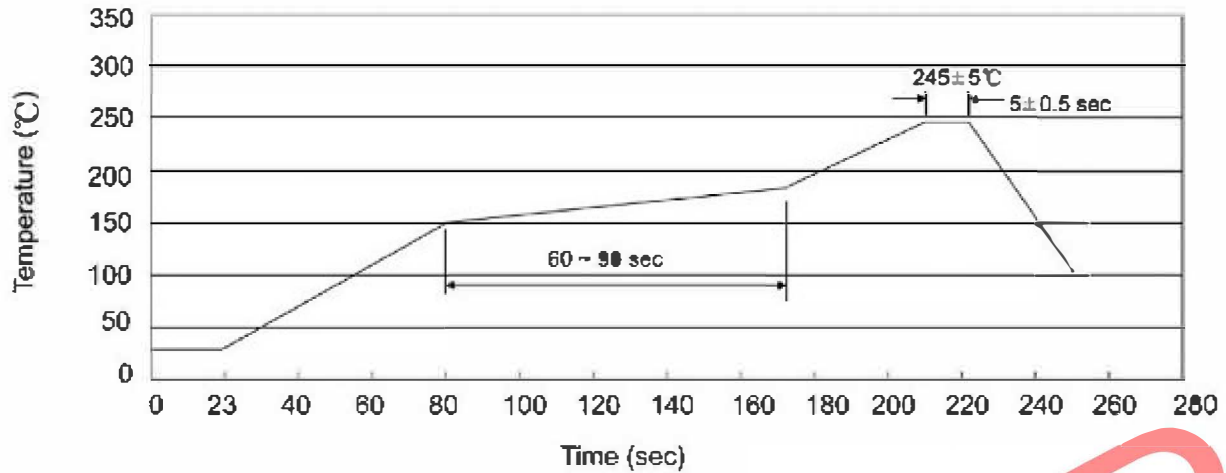
Unit:mm



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**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 <sup>3</sup> )		
	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	5	40,000	13" ×16	360×360×50	385×257×392

**使用说明 / Notices**

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