

AP4435

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

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

$I_D = -10.5 A (V_{GS} = -20V)$

$R_{DS(ON)} < 14m\Omega (V_{GS} = -20V)$

$R_{DS(ON)} < 18m\Omega (V_{GS} = -10V)$

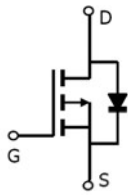
$R_{DS(ON)} < 36m\Omega (V_{GS} = -5.0V)$

用途 / Applications

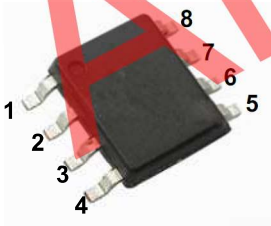
用于电源管理，便携式设备和电池供电系统。

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

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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}	±25	V
Continuous Drain Current ^A	$I_D (T_a=25^\circ\text{C})$	-10.5	A
Continuous Drain Current ^A	$I_D (T_a=70^\circ\text{C})$	-8.0	A
Pulsed Drain Current ^B	I_{DM}	-80	A
Power Dissipation for Single Operation ^A	$P_D (T_a=25^\circ\text{C})$	3.0	W
Power Dissipation for Single Operation ^A	$P_D (T_a=70^\circ\text{C})$	2.0	W
Avalanche Current	I_{AR}	-20	A
Repetitive avalanche energy 0.3mH ^B	E_{AR}	50	mJ
Maximum Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-55 ~ +150	°C
Thermal Resistance-Junction to Ambient ^A	$R_{\theta JA} (t \leq 10s)$	40	°C/W
Thermal Resistance-Junction to Ambient ^A	$R_{\theta JA}$	75	°C/W
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	24	°C/W

Note:

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² 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 are obtained using <300μs pulses, duty cycle 0.5% max.

E: These tests are performed with the device mounted on 1 in² 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.

F: The current rating is based on the $t \leq 10s$ thermal resistance rating.

G: E_{AR} and I_{AR} ratings are based on low frequency and duty cycles to keep $T_j=25^\circ\text{C}$.

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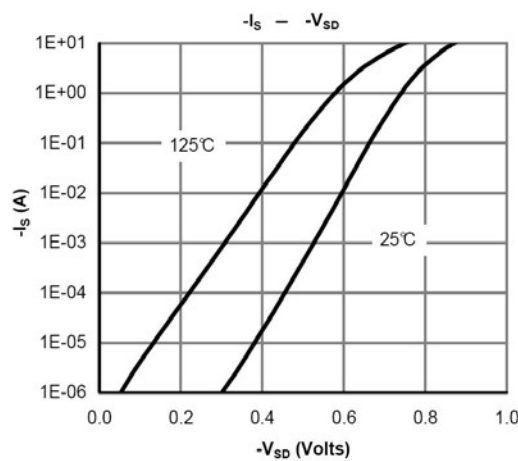
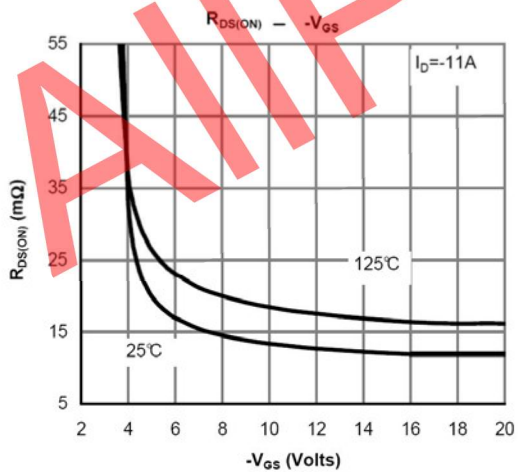
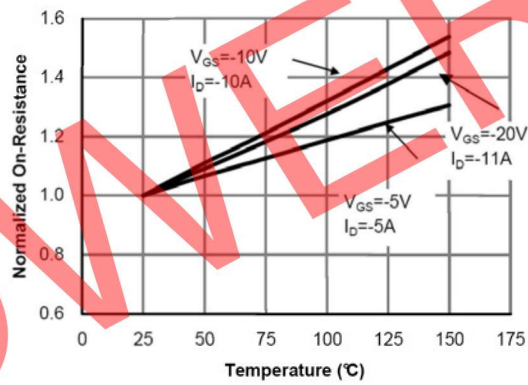
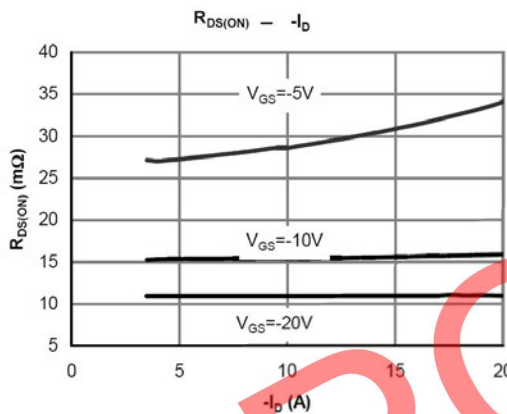
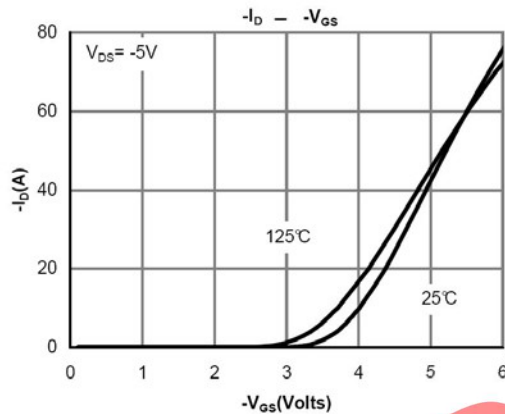
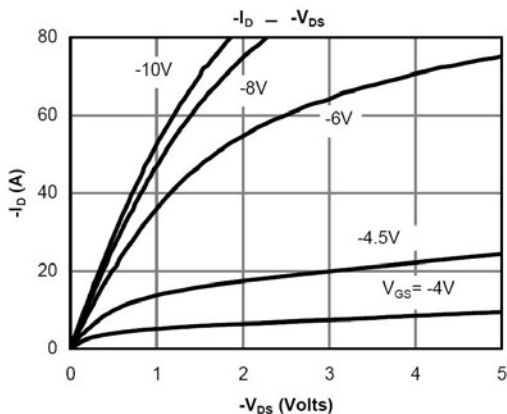
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电性能参数 / Electrical Characteristics(Ta=25°C)

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}	$V_{DS}=-30V$ $V_{GS}=0V$			-1.0	μA
		$V_{DS}=-30V$ $V_{GS}=0V$ $T_J=55^\circ C$			-5.0	
Gate-Body leakage current	I_{GSS}	$V_{DS}=0V$ $V_{GS}=\pm 25V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.7	-2.3	-3.0	V
On state drain current	$I_{D(ON)}$	$V_{GS}=-10V$ $V_{DS}=-5V$	-80			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-20V$ $I_D=-11A$		11	14	m Ω
		$V_{GS}=-20V$ $I_D=-11A$ $T_J=125^\circ C$		14	19	
		$V_{GS}=-10V$ $I_D=-10A$		16	24	
		$V_{GS}=-5.0V$ $I_D=-5.0A$		27	36	
Forward Transconductance	g_{FS}	$V_{DS}=-5V$ $I_D=-10A$		22		S
Diode Forward Voltage	V_{SD}	$I_S=-1A$ $V_{GS}=0V$		-0.74	-1.0	V
Maximum Body-Diode Continuous Current	I_S				-3.5	A
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-10A$		18	24	nC
	$Q_{g(4.5V)}$			9.5		
Gate-Source Charge	Q_{gs}			5.5		
Gate-Drain Charge	Q_{gd}			3.3		
Gate Resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$	1.0	5.8	8.0	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V$ $V_{DS}=-15V$ $f=1MHz$		1130	1400	pF
Output Capacitance	C_{oss}			240		
Reverse Transfer Capacitance	C_{rss}			155		
Turn-on Delay Time	$t_{d(ON)}$	$V_{GS}=-10V$ $V_{DS}=-15V$ $R_L=1.5\Omega$ $R_{GEN}=3\Omega$		8.7		ns
Turn-on Rise Time	t_r			8.5		
Turn-off Delay Time	$t_{d(OFF)}$			18		
Turn-off Fall Time	t_f			7.0		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-10A$ $dI/dt=100A/\mu s$		25	30	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=-10A$ $dI/dt=100A/\mu s$		12		nC

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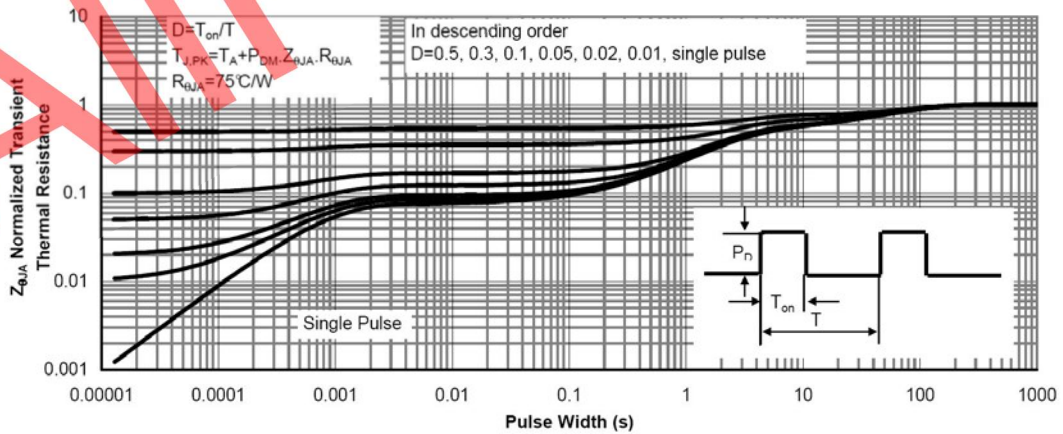
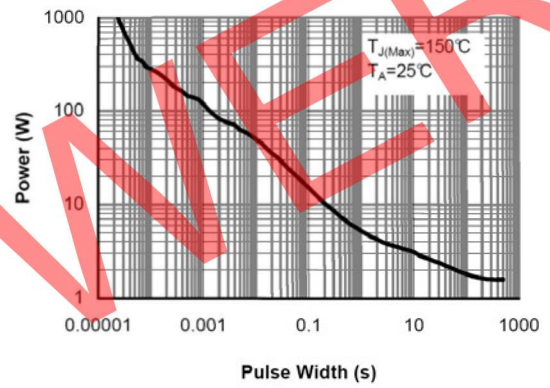
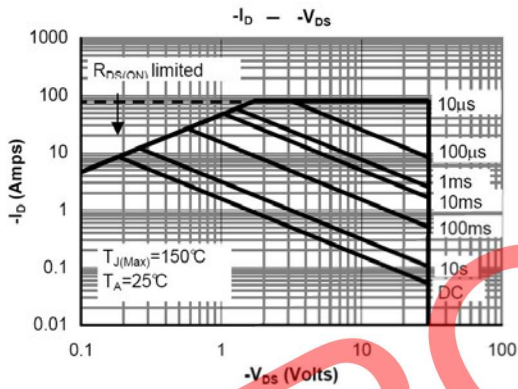
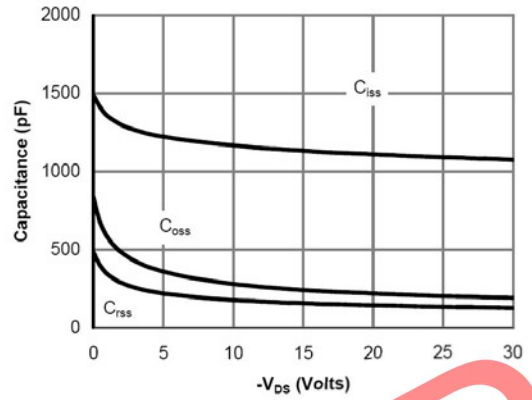
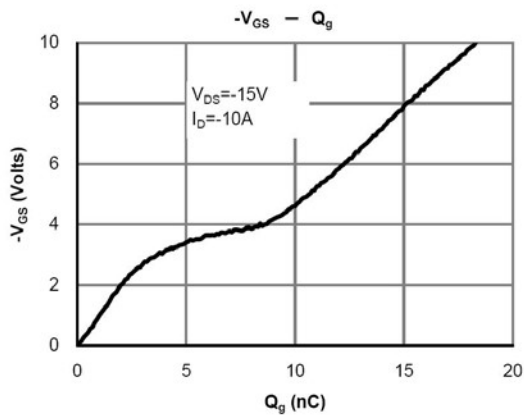
电参数曲线图 / Electrical Characteristic Curve



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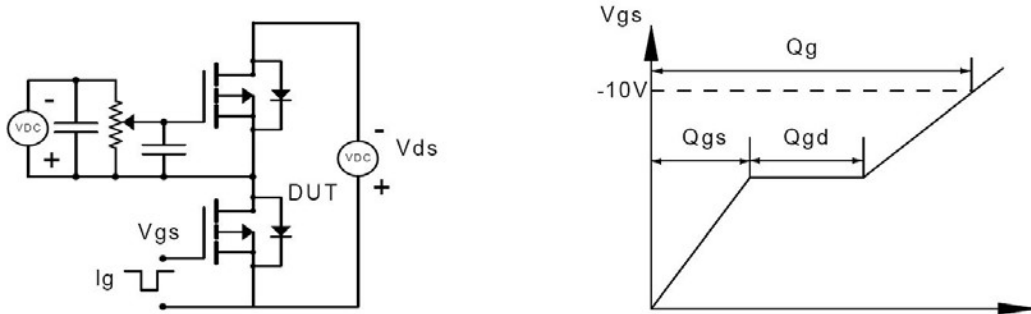
电参数曲线图 / Electrical Characteristic Curve



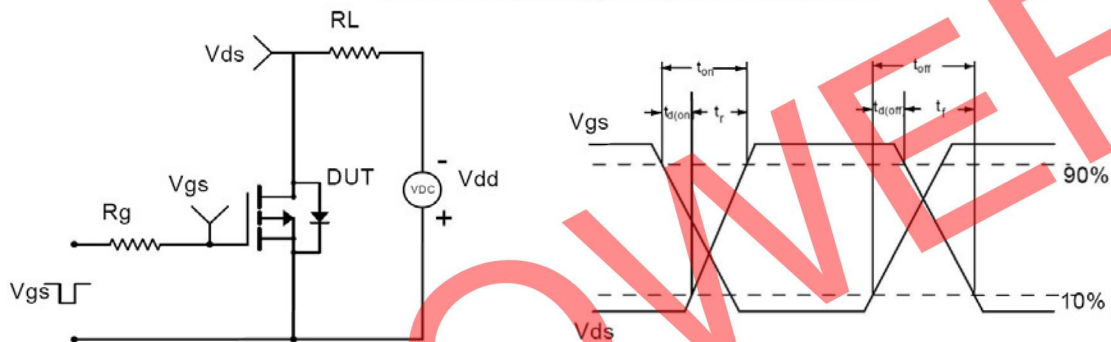
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测试波形图 / Test Waveform

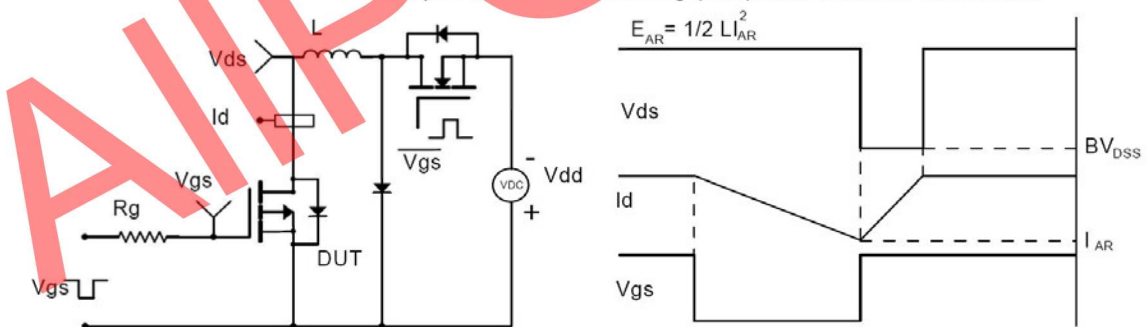
Gate Charge Test Circuit & Waveform



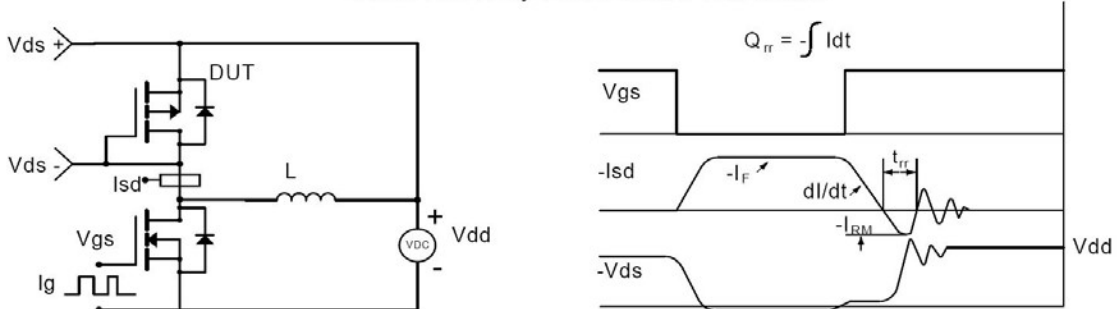
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



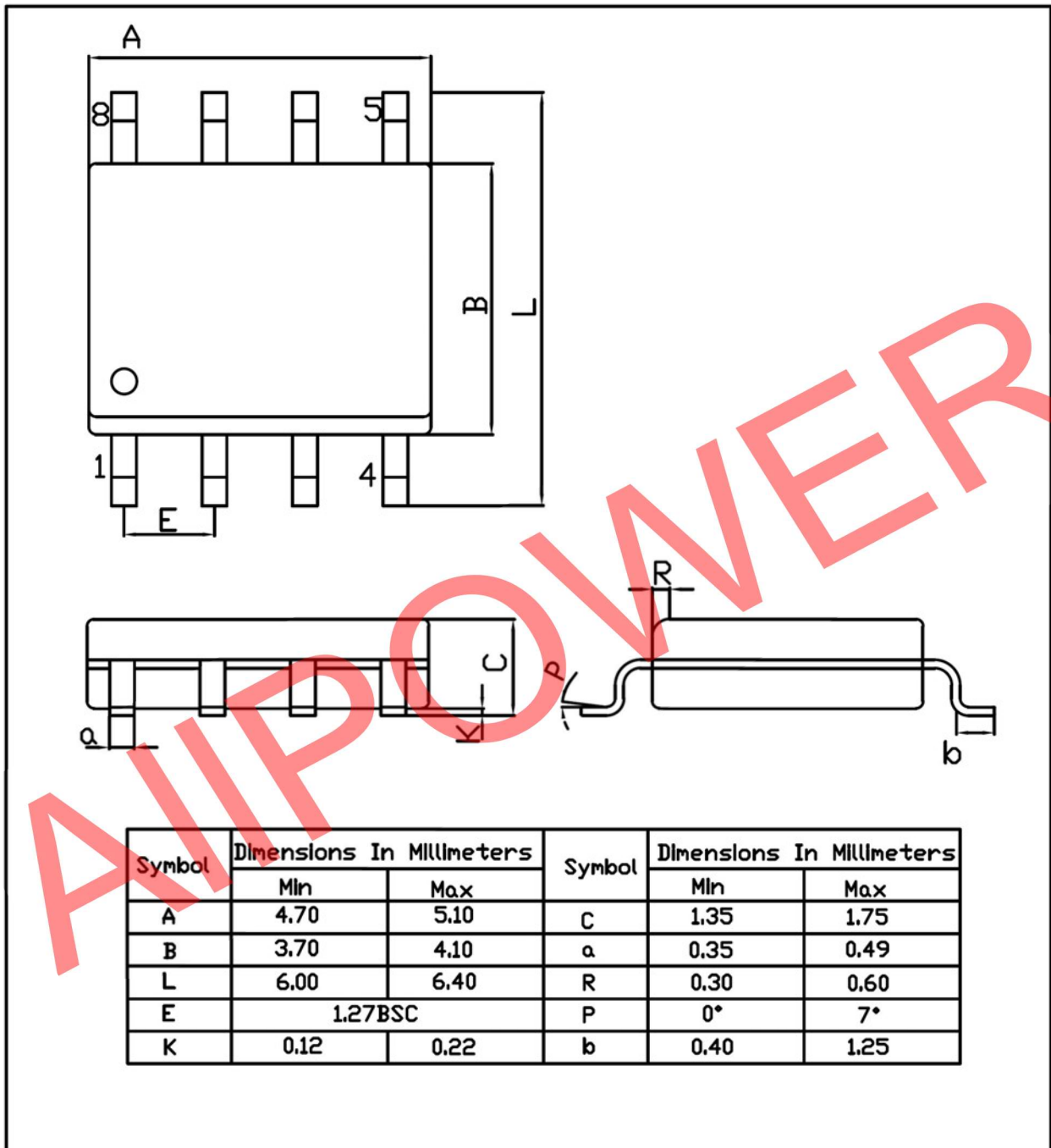
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外形尺寸图 / Package Dimensions

SOP-8

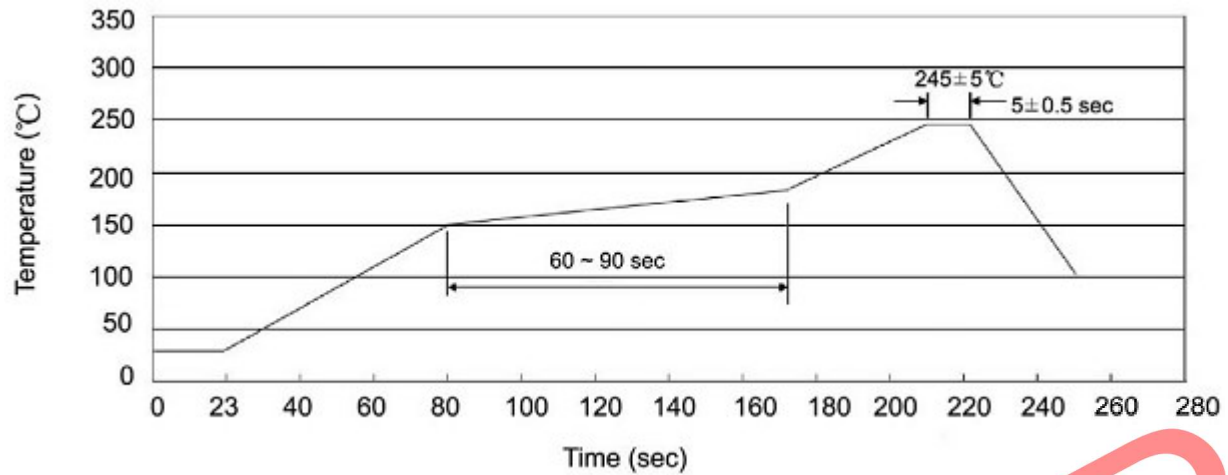
Unit:mm



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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 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	5	40,000	13" ×16	360×360×50	385×257×392

使用说明 / Notices