

AP8810

N-Channel Power MOSFET

描述 / Descriptions

SOT23-6 塑封封装 N 沟道双 MOS 管。有 ESD 保护功能。

N-channel Double MOSFET in a SOT23-6 Plastic Package. It is ESD protested.

特征 / Features

采用先进的沟槽技术，提供较小的导通电阻 $R_{DS(on)}$ ，低栅极电荷。

advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge.

$V_{DSS}=20V / V_{GSS}=\pm 12V \quad I_D=7A$

$R_{DS(ON)}=16m\Omega(\text{typ.})@V_{GS}=4.5V$

$R_{DS(ON)}=19m\Omega(\text{typ.})@V_{GS}=2.5V$

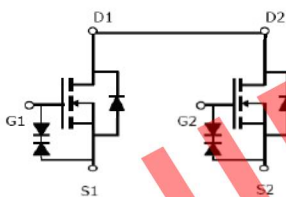
$R_{DS(ON)}=24m\Omega(\text{typ.})@V_{GS}=1.8V$

用途 / Applications

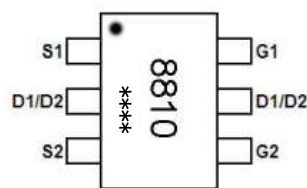
适用于开关电路，PWM 应用电路。

Use as Load Switch or PWM application.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



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极限参数 / Absolute Maximum Ratings($T_a=25^{\circ}\text{C}$)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Drain-Source Voltage	V_{DS}	20	V
Drain Current - Continuous	$I_D(T_a=25^{\circ}\text{C})$	7.0	A
Drain Current - Continuous	$I_D(T_a=70^{\circ}\text{C})$	5.7	
Drain Current – Pulsed	I_{DM}	25	A
Gate-Source Voltage	V_{GS}	± 8.0	V
Power Dissipation	$P_D(T_a=25^{\circ}\text{C})$	1.5	W
Power Dissipation	$P_D(T_a=70^{\circ}\text{C})$	1.0	
Junction-to-Ambient ^A	$t \leq 10\text{s}$	83	$^{\circ}\text{C/W}$
Junction-to-Ambient ^{AD}	Steady-State		
Junction-to-Lead	Steady-State	70	$^{\circ}\text{C/W}$
Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ 150	$^{\circ}\text{C}$

电性能参数 / Electrical Characteristics($T_a=25^{\circ}\text{C}$)

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}	$V_{GS}=0\text{V}$ $I_D=250\mu\text{A}$	20			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=16\text{V}$ $V_{GS}=0\text{V}$			1.0	μA
Drain-Source Leakage Current		$V_{DS}=16\text{V}$ $V_{GS}=0\text{V}$ $T_j=85^{\circ}\text{C}$			10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}$ $V_{DS}=0\text{V}$			± 10	μA
On state drain current	$I_{D(ON)}$	$V_{GS}=4.5\text{V}$ $V_{DS}=5\text{V}$	25			A
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu\text{A}$	0.45	0.6	1.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{V}$ $I_D=6.0\text{A}$		16	20	m Ω
		$V_{GS}=2.5\text{V}$ $I_D=6.0\text{A}$		19	25	
		$V_{GS}=1.8\text{V}$ $I_D=4.0\text{A}$		24	34	
Forward Transconductance	g_{FS}	$V_{DS}=5.0\text{V}$ $I_D=7.0\text{A}$		50		S
Forward On Voltage	V_{SD}	$V_{GS}=0\text{V}$ $I_S=1.0\text{A}$			1.3	V
Maximum Body-Diode Continuous Current	I_S				2	A
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}$ $V_{GS}=0\text{V}$ $f=1.0\text{MHz}$		1295		pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			87		

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电性能参数 / Electrical Characteristics(T_a=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
Gate resistance	R _g	V _{DS} =0V V _{GS} =0V f=1.0MHz		1.8		KΩ
Total Gate Charge	Q _g	V _{DS} =10V V _{GS} =4.5V I _D =7.0A		10	14	nC
Gate Source Charge	Q _{gs}			4.2		
Gate Drain Charge	Q _{gd}			2.6		
Turn-on Delay Time	t _{d(on)}	V _{DS} =10V V _{GS} =4.5V R _G =3.0Ω R _L =1.54Ω		280		ns
Rise Time	t _r			328		ns
Turn-off Delay Time	t _{d(off)}			3.76		μs
Fall Time	t _f			2.24		μs
Body Diode Reverse Recovery Time	t _{rr}	I _F =7A dl/dt=100A/ms V _{GS} =-9V		31		ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F =7A dl/dt=100A/ms V _{GS} =-9V		6.8		nC

Notes:

A. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°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°C, using ≤ 10s junction-to-ambient thermal resistance.

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

D. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

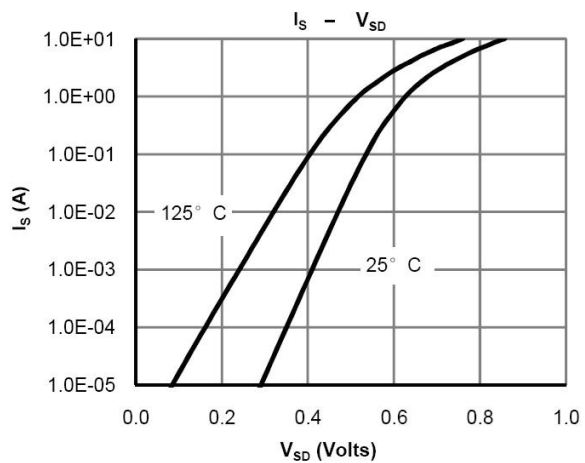
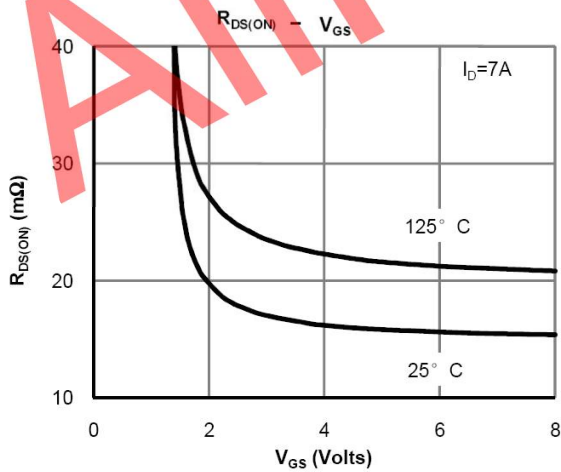
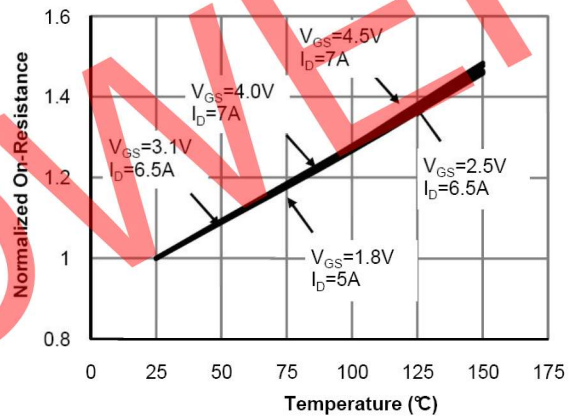
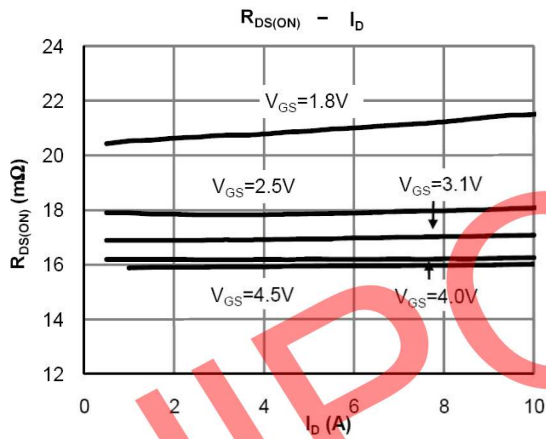
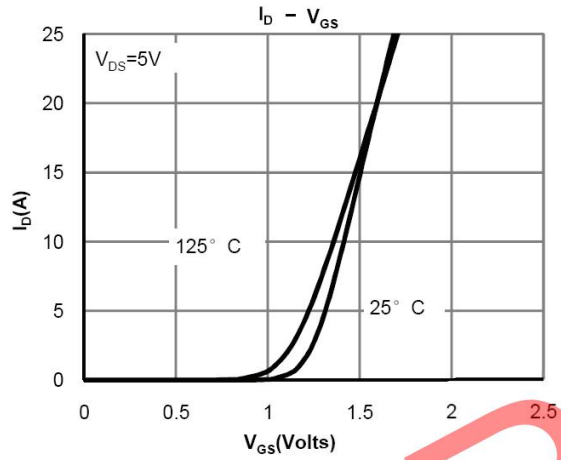
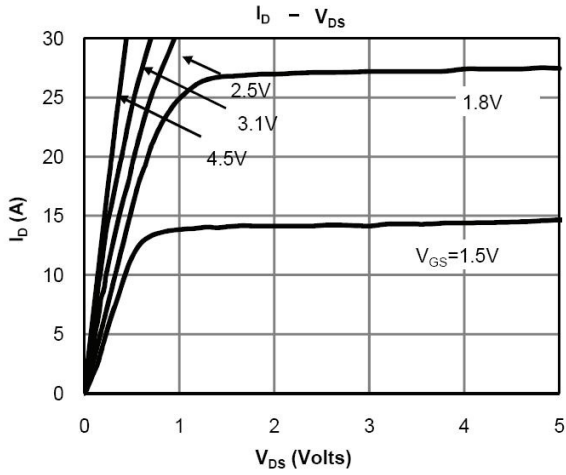
E. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.

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°C. The SOA curve provides a single pulse rating.

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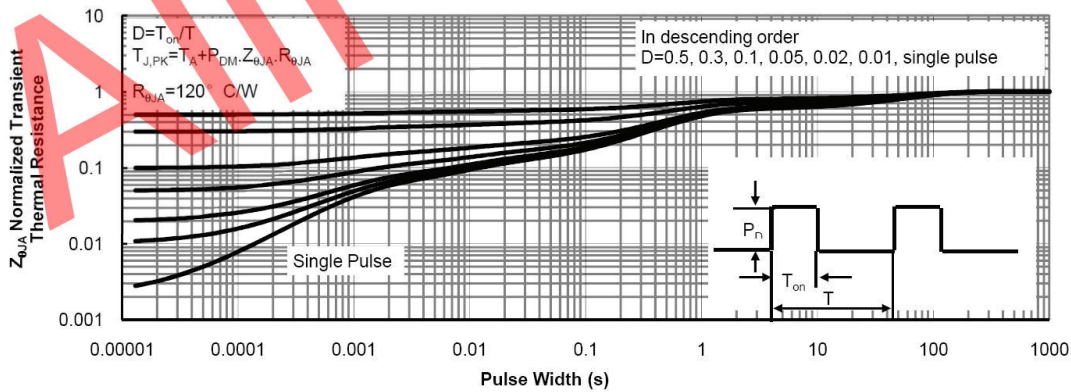
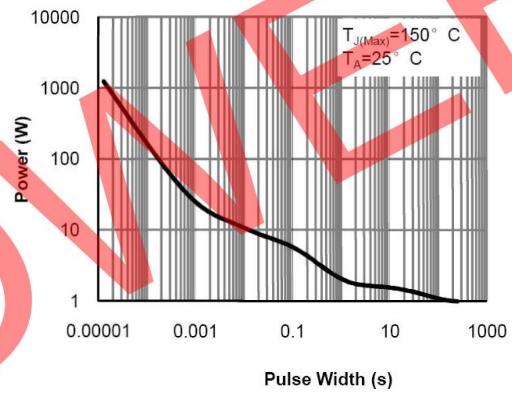
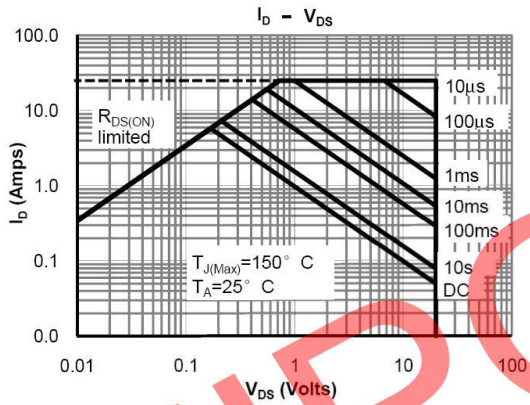
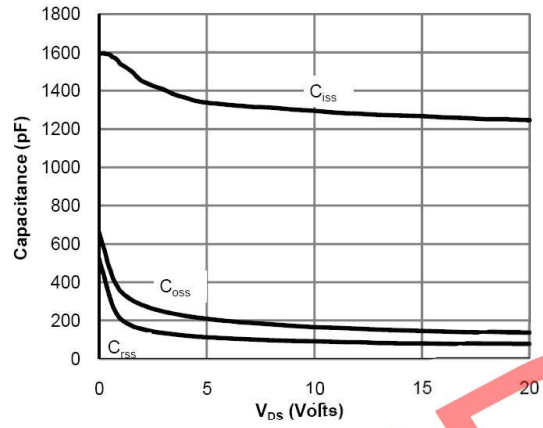
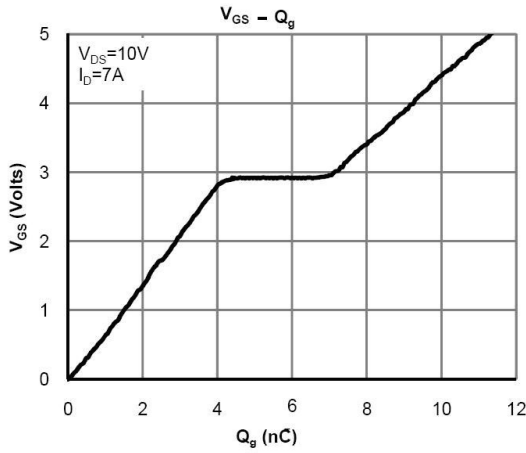
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电参数曲线图 / Electrical Characteristic Curve



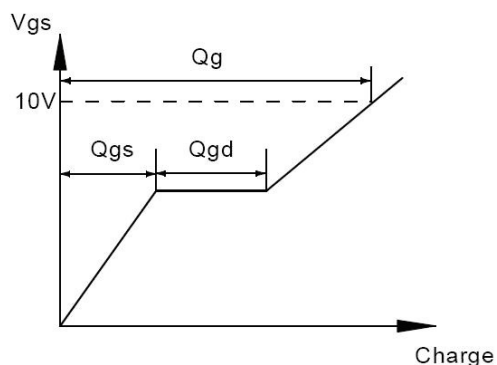
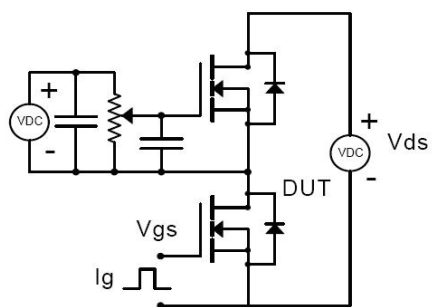
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电参数曲线图 / Electrical Characteristic Curve

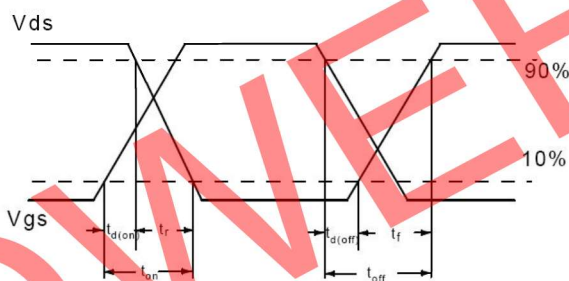
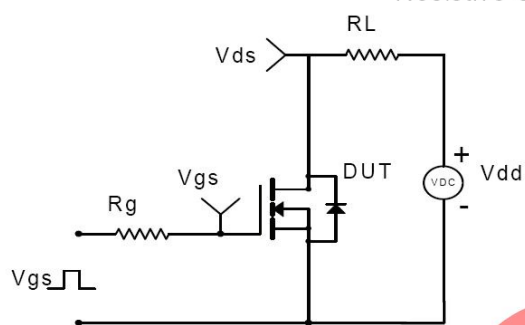


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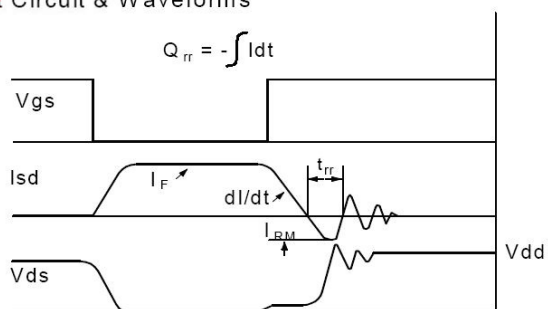
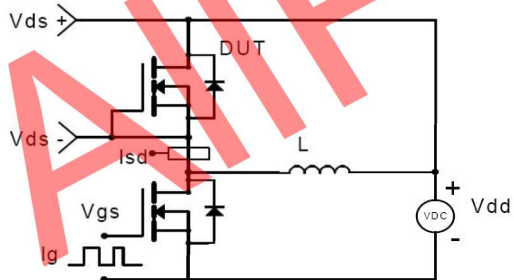
测试电路和波形 / Test circuit and waveform



Resistive Switching Test Circuit & Waveforms

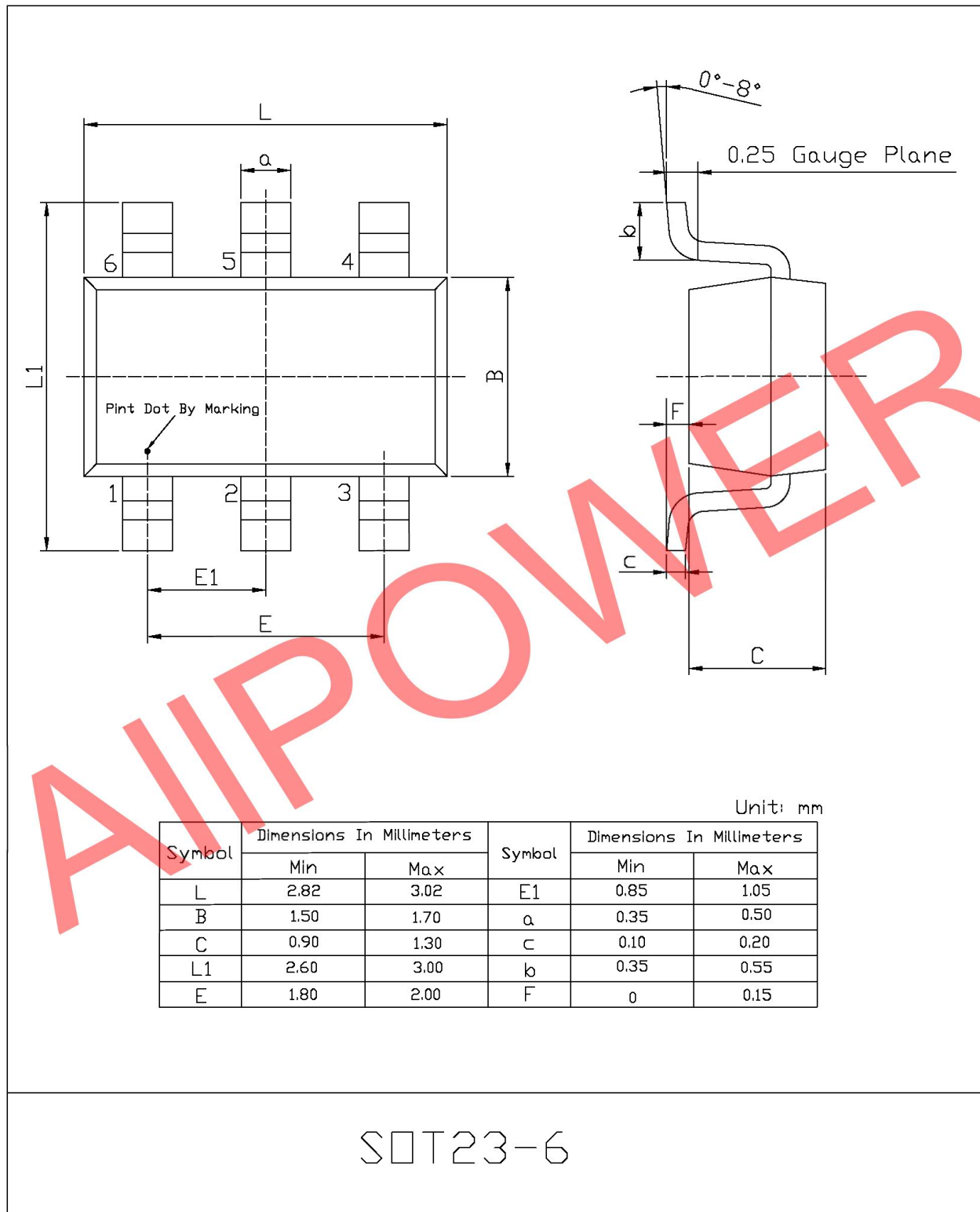


Diode Recovery Test Circuit & Waveforms



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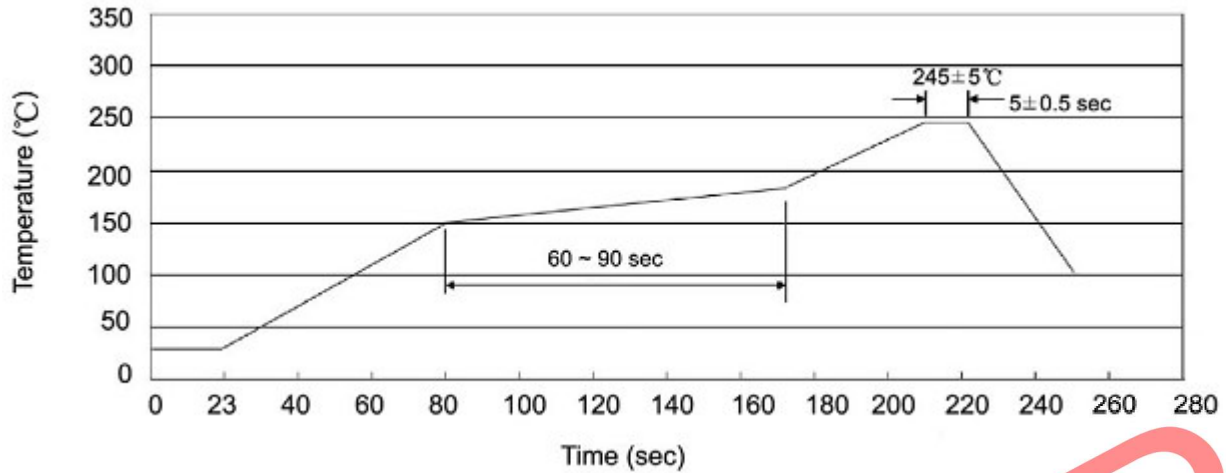
外形尺寸图 / Package Dimensions



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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
SOT23-5/6	3,000	10	30,000	4	120,000	7" ×8	210×205×205	445×230×435

使用说明 / Notices