

# AP9926

## N-Channel Power MOSFET

### 描述 / Descriptions

SOP-8 塑封封装 N 沟道 Power Trench MOS 双场效应管。  
Dual N-Channel Power Trench MOSFET in a SOP-8 Plastic Package.

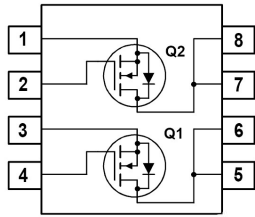
### 特征 / Features

优化电池保护电路，允许工作电压范围宽： $\pm 10 V_{GSS}$ ，低栅极电荷。内置双 MOSFET。  
Optimized for use in battery protection circuits,  $\pm 10 V_{GSS}$  allows for wide operating voltage range, Low gate charge. Built-in dual MOSFET.

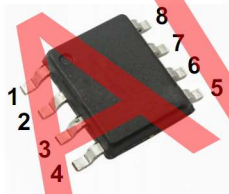
### 用途 / Applications

电池保护，负载开关，电源管理。  
Battery protection, Load Switch, Power management.

### 内部等效电路 / Equivalent Circuit



### 引脚排列 / Pinning



PIN1:S2    PIN 2:G2    PIN 3 : S1    PIN 4 : G1  
PIN5、PIN 6:D1    PIN 7、PIN 8 : D2

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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	$V_{DSS}$	20	V
Gate-Source Voltage	$V_{GS}$	±10	V
Drain Current– Continuous <sup>(note 1a)</sup>	$I_D$	6.5	A
Drain Current–Pulsed		20	A
Power Dissipation for Dual Operation	$P_D$	2.0	W
Power Dissipation for Single Operation <sup>(note 1a)</sup>		1.6	W
Power Dissipation for Dual Operation <sup>(note 1b)</sup>		1.0	W
Power Dissipation for Single Operation <sup>(note 1c)</sup>		0.9	W
Thermal Resistance, Junction-to-Ambient <sup>(note 1a)</sup>	$R_{\theta JA}$	78	°C/W
Thermal Resistance, Junction-to case <sup>(note 1)</sup>	$R_{\theta JC}$	40	°C/W
Operating and Junction Temperature Range	$T_j$ $T_{stg}$	-55~150	°C

**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	$BV_{DSS}$	$V_{GS}=0V$ $I_D=250\mu A$	20			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$ Referenced to 25°C		14		mV/°C
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=16V$ $V_{GS}=0V$			1.0	μA
Gate-Body Leakage Current Forward	$I_{GSS}$	$V_{GS}=\pm 8.0V$ $V_{DS}=0V$			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	0.5	1.0	1.5	V
Gate Threshold Voltage Temperature Coefficient	$\Delta V_{GS(th)}/\Delta T_J$	$I_D=250\mu A$ Referenced to 25°C		-3.0		mV/°C
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V$ $I_D=6.5A$		19	24	mΩ
		$V_{GS}=4.5V$ $I_D=6.5A$ $T_J=125^\circ C$		27	34	
		$V_{GS}=2.5V$ $I_D=5.4A$		23	30	
On-State Drain Current	$I_{D(on)}$	$V_{DS}=5.0V$ $V_{GS}=5.0V$	15			A
Forward Transconductance	$g_{FS}$	$V_{DS}=5.0V$ $I_D=3.0A$		11		S

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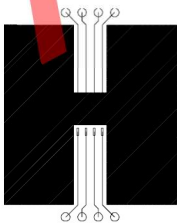
#### 电性能参数 / Electrical Characteristics(Ta=25°C)

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
Input Capacitance	$C_{iss}$	$V_{DS}=10V$ $V_{GS}=0V$ $f=1.0MHz$		700		pF
Output Capacitance	$C_{oss}$			175		
Reverse Transfer Capacitance	$C_{rss}$			85		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=10V$ $I_D=1.0A$ $R_{GEN}=6\Omega$ $V_{GS}=4.5V$		8	16	ns
Turn-On Rise Time	$t_r$			10	18	
Turn-Off Delay Time	$t_{d(off)}$			18	29	
Turn-Off Fall Time	$t_f$			5.0	10	
Total Gate Charge	$Q_g$	$V_{DD}=10V$ $I_D=3.0A$ $V_{GS}=4.5$		7.0	10	nC
Gate-Source Charge	$Q_{gs}$			1.2		
Gate-Drain Charge	$Q_{gd}$			1.9		
Maximum Continuous Drain-Source Diode Forward Current	$I_S$				1.3	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=1.3A$ (note2) $V_{GS}=0V$		0.65	1.2	V

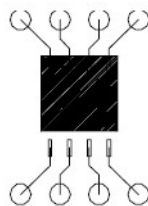
#### Notes:

1.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design while  $R_{\theta JA}$  is determined by the user's board design.

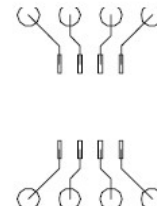
a) 78°C/W when mounted on a 0.5 in<sup>2</sup> pad of 2 oz. copper.



b) 125°C/W when mounted on a 0.02 in<sup>2</sup> pad of 2 oz. copper.



c) 135°C/W when mounted on a minimum pad.



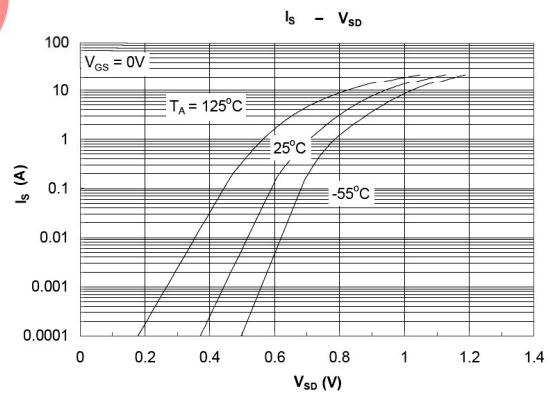
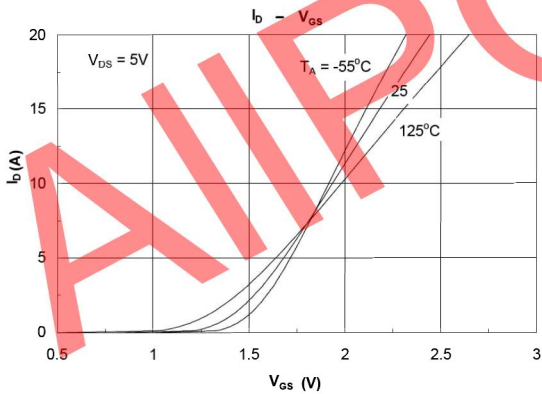
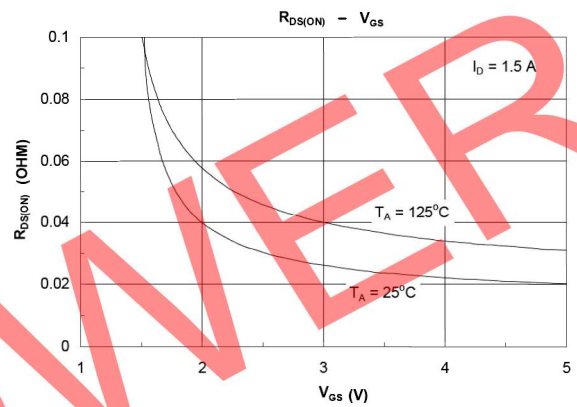
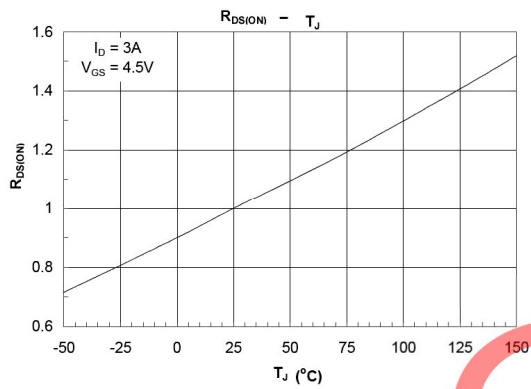
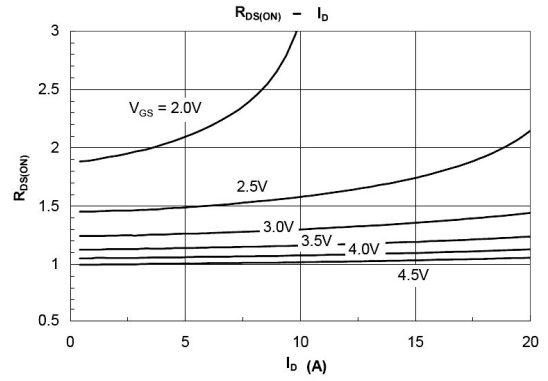
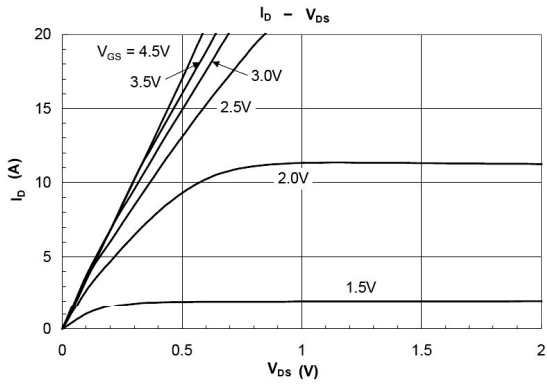
Scale 1 : 1 on letter size paper

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

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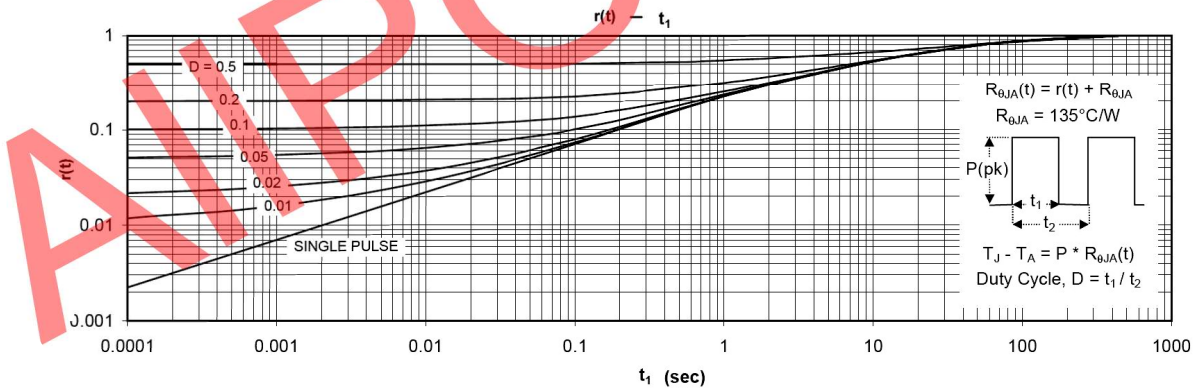
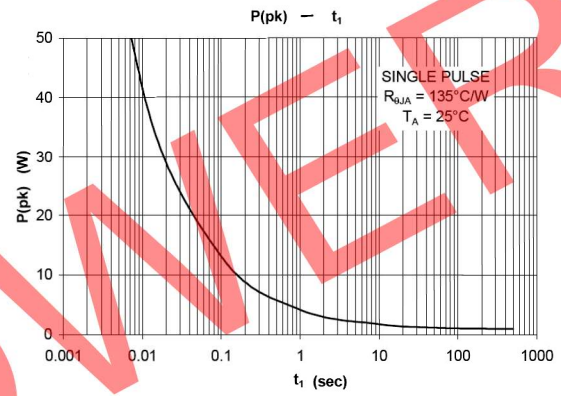
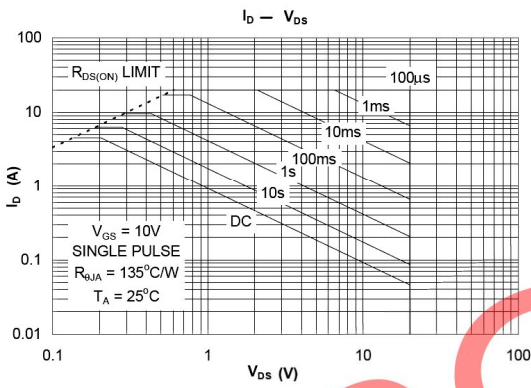
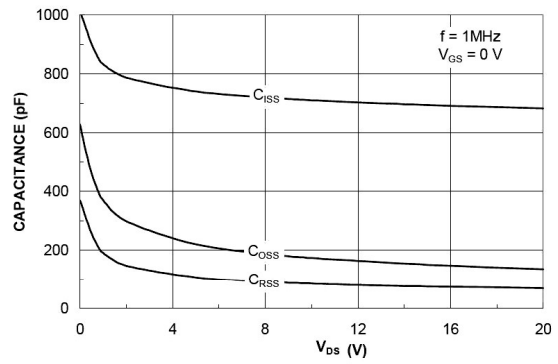
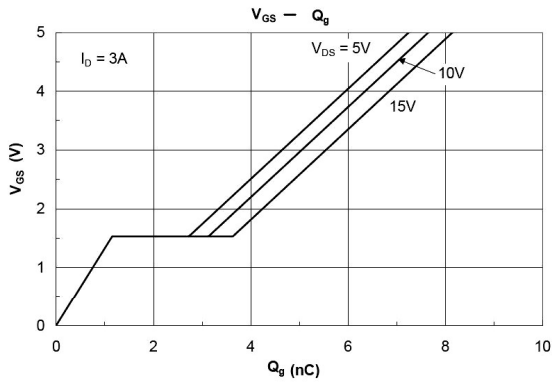
电参数曲线图 / Electrical Characteristic Curve



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电参数曲线图 / Electrical Characteristic Curve



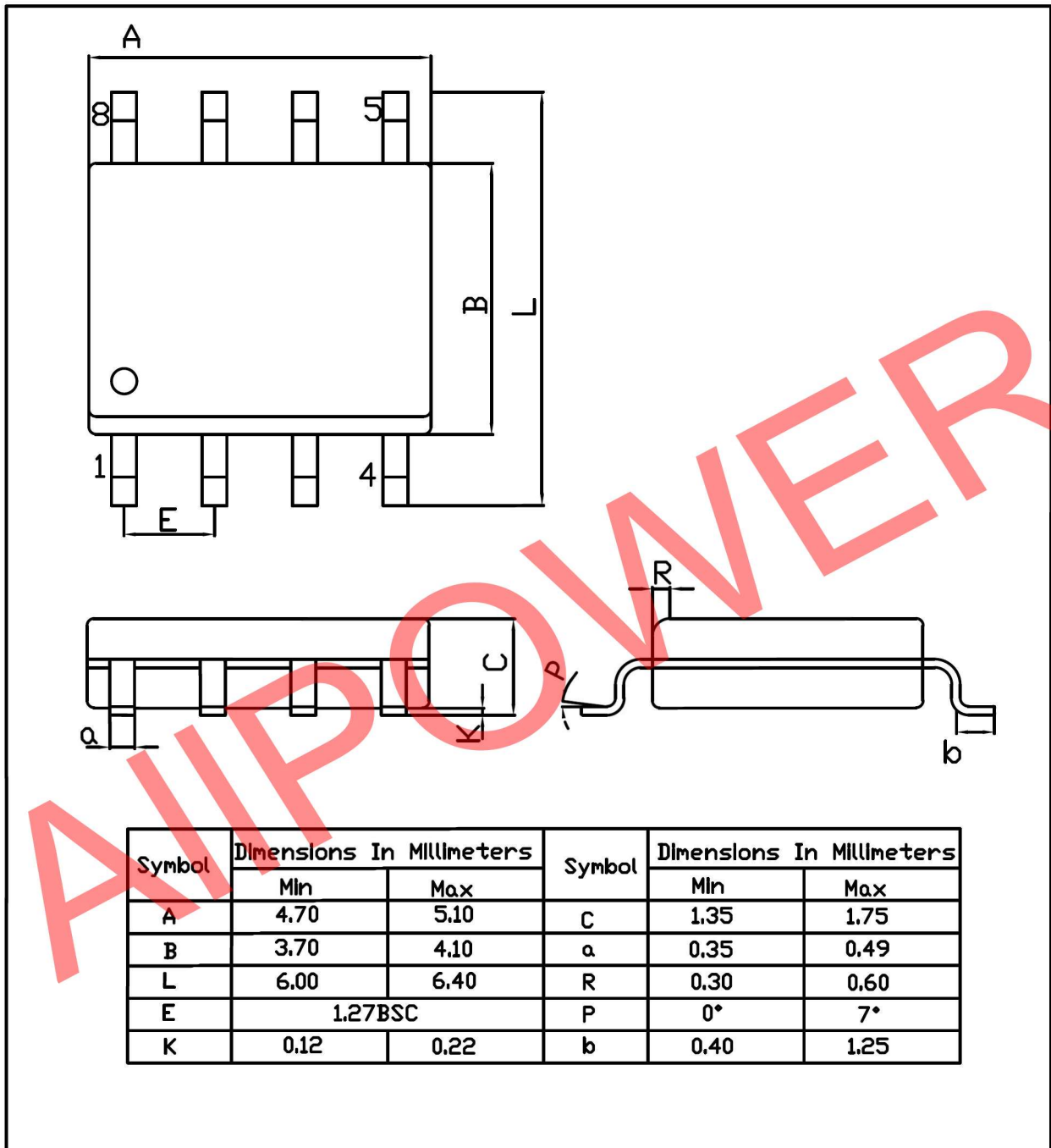
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外形尺寸图 / Package Dimensions

SOP-8

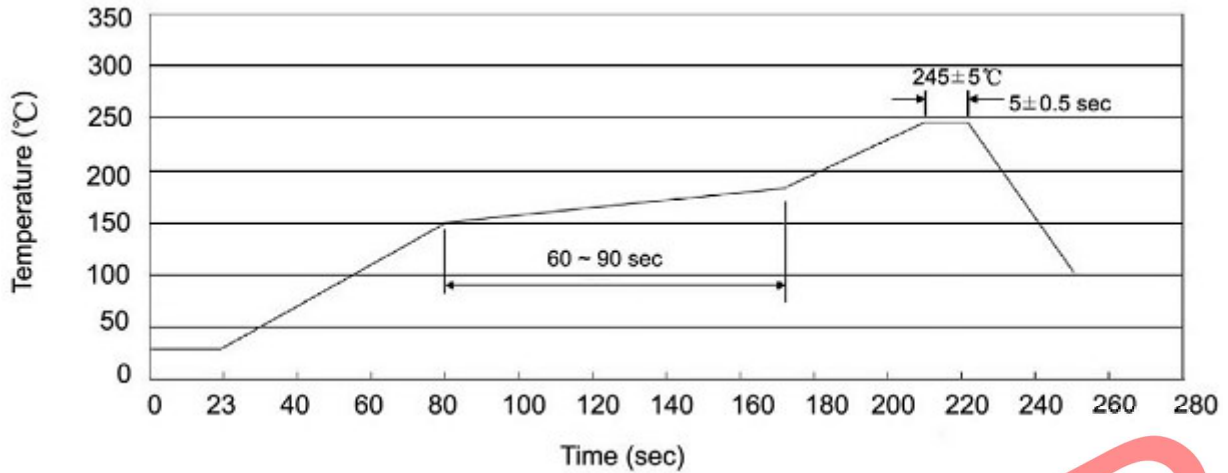
Unit:mm



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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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