



ZHEJIANG UNIÜ-NE Technology CO., LTD

浙江宇力微新能源科技有限公司



## AP6009S Data Sheet

V 1.1

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**Description**

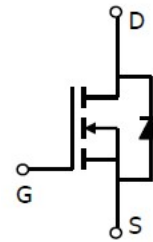
The AP6009S uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

**General Features**

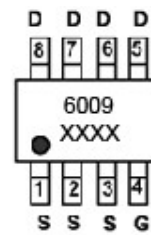
- $V_{DS} = 60V, I_D = 9A$   
 $R_{DS(ON)} < 18m\Omega @ V_{GS}=10V$  (Typ:14m $\Omega$ )  
 $R_{DS(ON)} < 21m\Omega @ V_{GS}=4.5V$  (Typ:17.5m $\Omega$ )
- High density cell design for ultra low  $R_{dson}$
- Fully characterized avalanche voltage and current
- Low gate to drain charge to reduce switching losses

**Application**

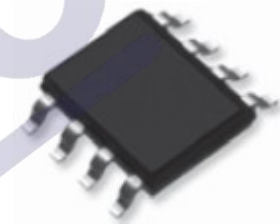
- Power switching application
- Load switch



Schematic diagram



Marking and pin assignment



SOP-8 top view

**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
6009	AP6009S	SOP-8	-	-	-

**Absolute Maximum Ratings ( $T_C=25^\circ C$  unless otherwise noted)**

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	9	A
Drain Current-Continuous( $T_C=100^\circ C$ )	$I_D(100^\circ C)$	6.4	A
Pulsed Drain Current	$I_{DM}$	36	A
Maximum Power Dissipation	$P_D$	2.6	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

**Thermal Characteristic**

Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	$R_{\theta JA}$	48	$^\circ C/W$
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**Electrical Characteristics (TC=25°C unless otherwise noted)**

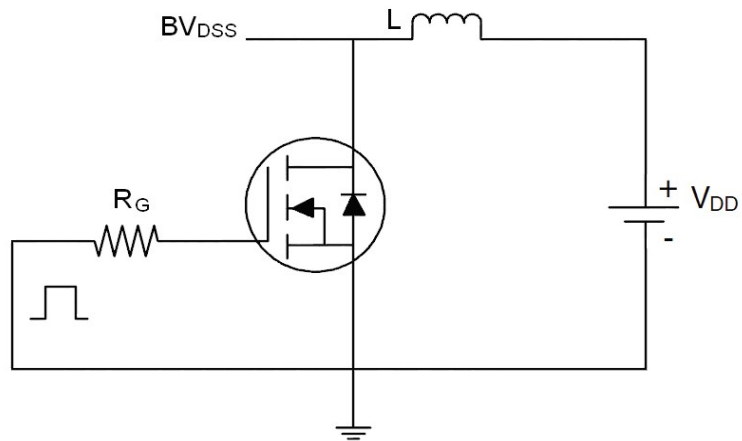
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60		-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.8	2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=9A$	-	14	18	m $\Omega$
		$V_{GS}=4.5V, I_D=9A$	-	17.5	21	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=9A$	25	-	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V,$ $F=1.0MHz$	-	2180	-	PF
Output Capacitance	$C_{oss}$		-	350	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	270	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V, R_L=1\Omega$ $V_{GS}=10V, R_{GEN}=3\Omega$	-	8.5	-	nS
Turn-on Rise Time	$t_r$		-	6	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	$t_f$		-	5	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=30V, I_D=8A,$ $V_{GS}=10V$	-	58	-	nC
Gate-Source Charge	$Q_{gs}$		-	8	-	nC
Gate-Drain Charge	$Q_{gd}$		-	17	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=9A$	-	-	1.2	V
Diode Forward Current (Note 2)	$I_S$	-	-	-	9	A
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ C, I_F=9A$	-	30	-	nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt = 100A/\mu s$ (Note 3)	-	44	-	nC

**Notes:**

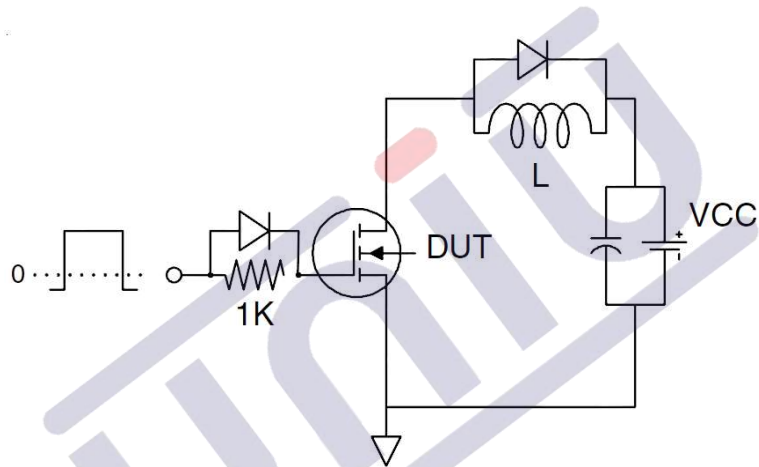
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

Test Circuit

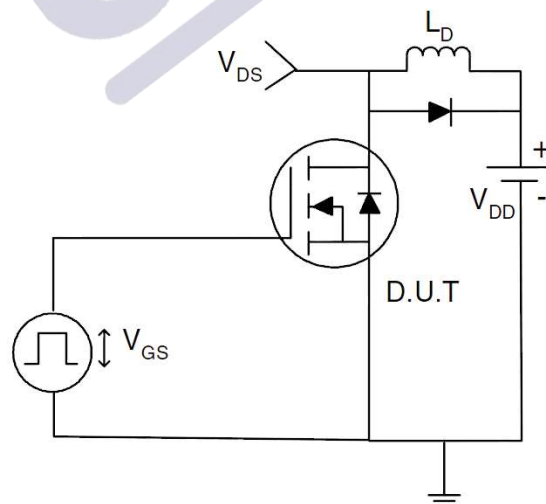
1)  $E_{AS}$  test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



## 1.版本记录

DATE	REV.	DESCRIPTION
2018/11/15	1.0	First Release
2020/09/18	1.1	Layout adjustment

## 2.免责声明

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## 3.联系我们

浙江宇力微新能源科技有限公司

总部地址：绍兴市越城区斗门街道袍渎路25号中节能科创园45幢4/5楼

电话：0575-85087896（研发部）

传真：0575-88125157

E-mail: htw@uni-semic.com

无锡地址：无锡市锡山区先锋中路6号中国电子（无锡）数字芯城1#综合楼503室

电话：0510-85297939

E-mail: zh@uni-semic.com

深圳地址：深圳市宝安区西乡街道南昌社区宝源路泳辉国际商务大厦410

电话：0755-84510976

E-mail: htw@uni-semic.com