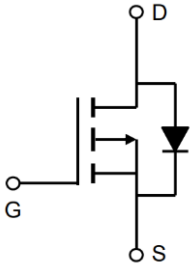
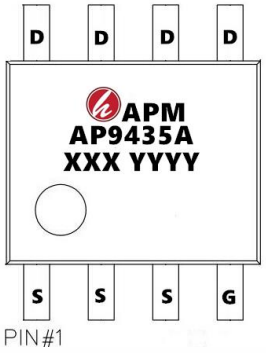
AP9435A

-30V P-Channel Enhancement Mode MOSFET

Description

The AP9435A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = -30V I_D =-6A

$R_{DS(ON)}$ < 55mΩ @ V_{GS}=10V

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP9435A	SOP-8	AP9435A XXXX YYYY	3000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-6.0	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-3.3	A
IDM	Pulsed Drain Current note1	-20.4	A
P_D	Power Dissipation T_A= 25℃	2.15	W
RθJA	Thermal Resistance, Junction to Ambient	58	℃/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +150	℃

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D= -250μA	-30	-33	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D= -250μA	-1.0	-1.6	-2.5	V
RDS(on)	Static Drain-Source on-Resistance note2	V_{GS} =-10V, I_D =-5A	-	43	55	mΩ
		V_{GS} =-4.5V, I_D =-4A	-	65	90	
C_{iss}	Input Capacitance	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz	-	596	-	pF
Coss	Output Capacitance		-	95	-	pF
Crss	Reverse Transfer Capacitance		-	68	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D = -5.1A, V_{GS} = -10V	-	6.8	-	nC
Q_{gs}	Gate-Source Charge		-	1	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	1.4	-	nC
td(on)	Turn-on Delay Time	V_{DD} = -15V, I_D = -1A, V_{GS}=-10V, R_{GEN}=2.5Ω	-	14	-	ns
t_r	Turn-on Rise Time		-	61	-	ns
td(off)	Turn-off Delay Time		-	19	-	ns
t_f	Turn-off Fall Time		-	10	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-5.1	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-20.4	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -5.1A	-	-0.8	-1.2	V

Note :
1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The EAS data shows Max. rating . The test condition is VDD=-25V,VGS=-10V,L=0.1mH,IAS=-5A
4、The power dissipation is limited by 150℃ junction temperature
5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

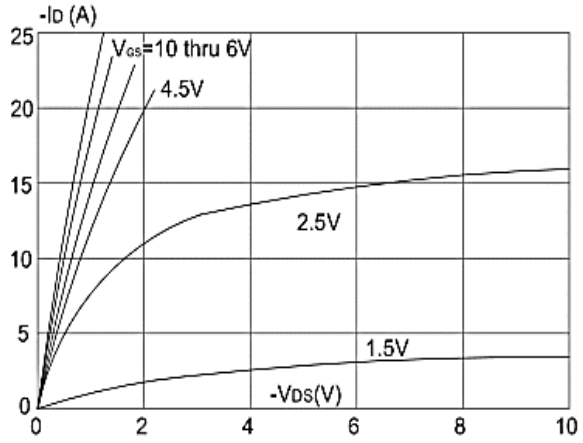


Figure1: Output Characteristics

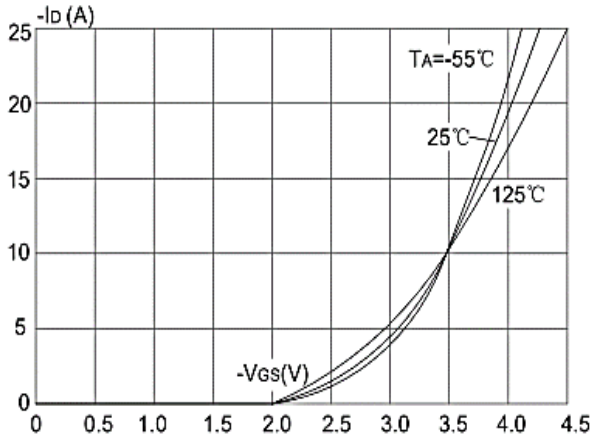


Figure 2: Typical Transfer Characteristics

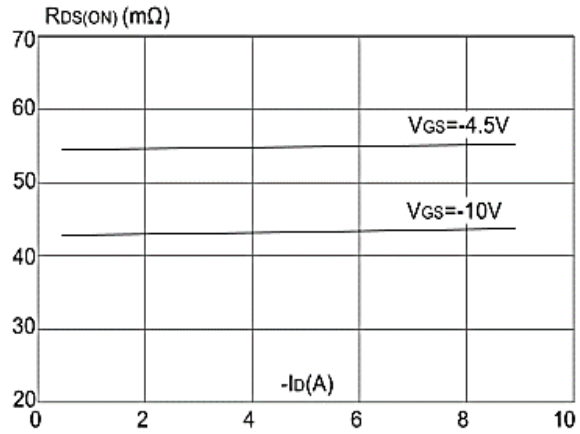


Figure 3:On-resistance vs. Drain Current

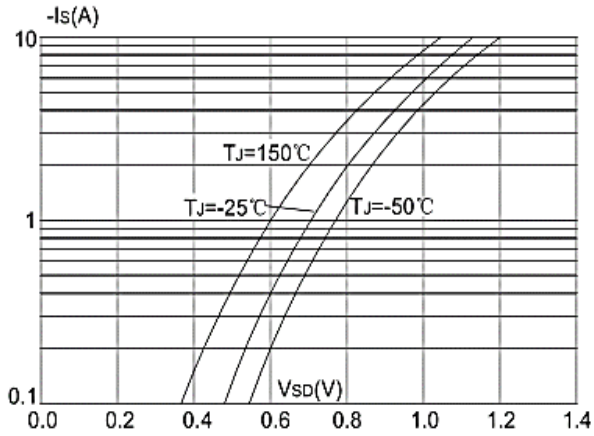


Figure 4: Body Diode Characteristics

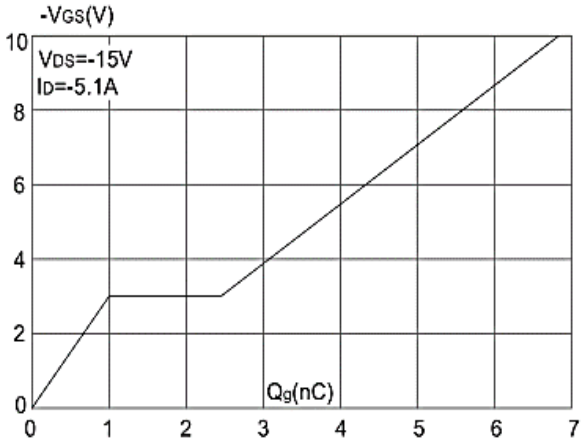


Figure 5: Gate Charge Characteristics

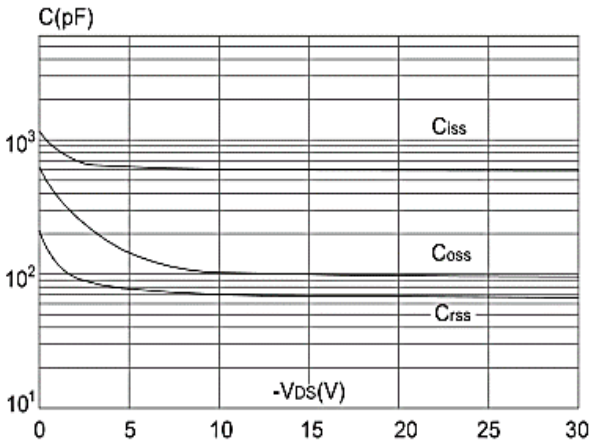


Figure 6: Capacitance Characteristics

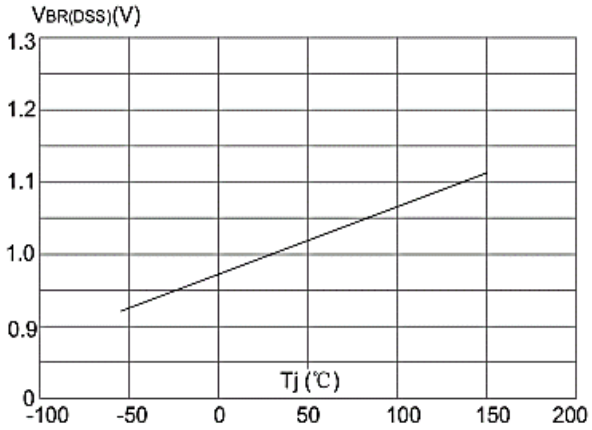


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

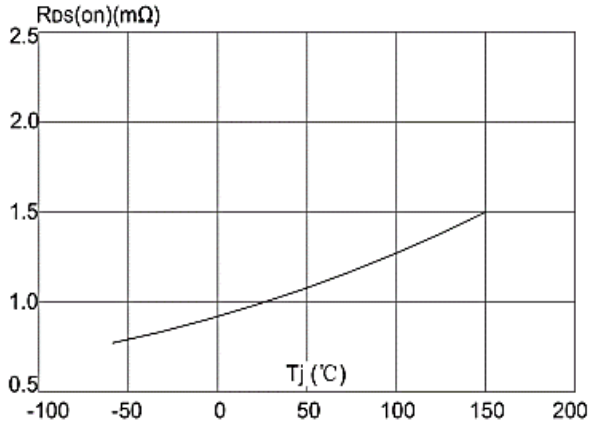


Figure 8: Normalized on Resistance vs Junction Temperature

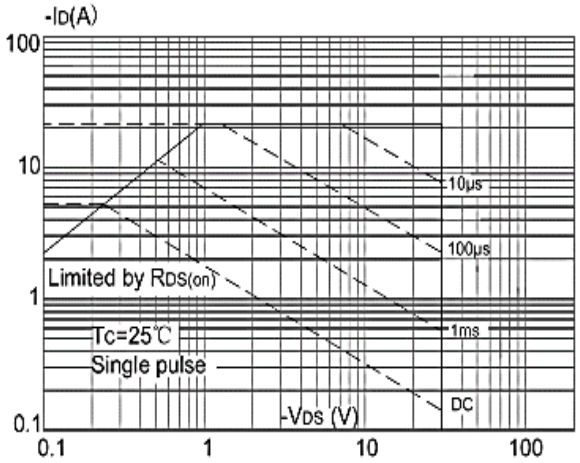


Figure 9: Maximum Safe Operating Area vs. Case Temperature

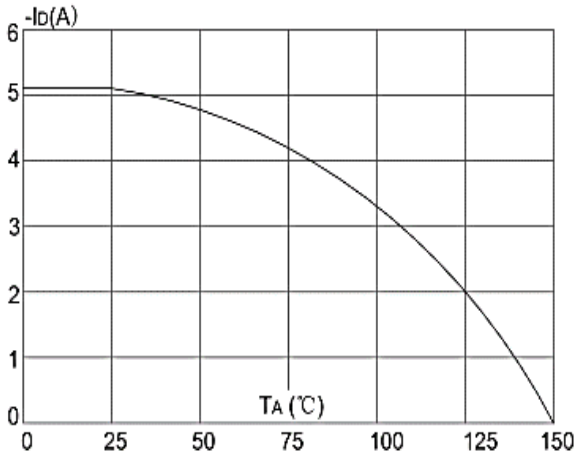


Figure 10: Maximum Continuous Drain Current

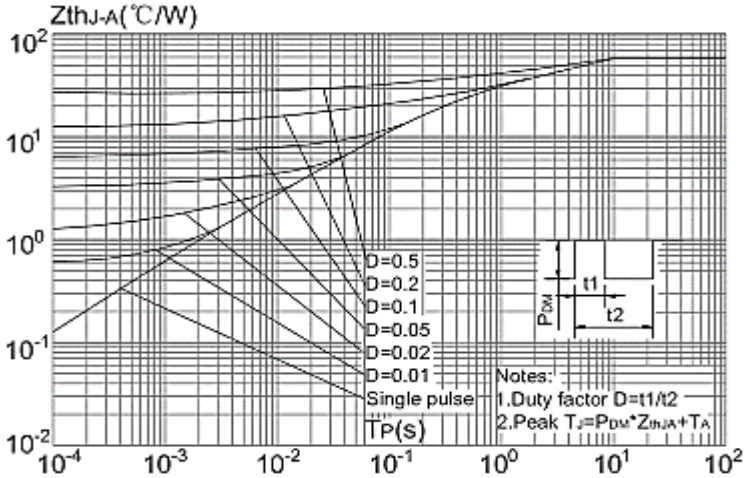
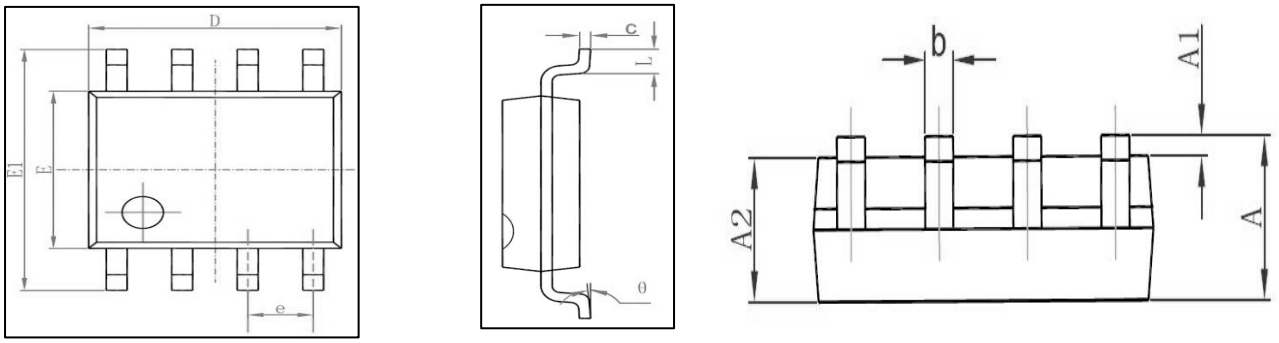


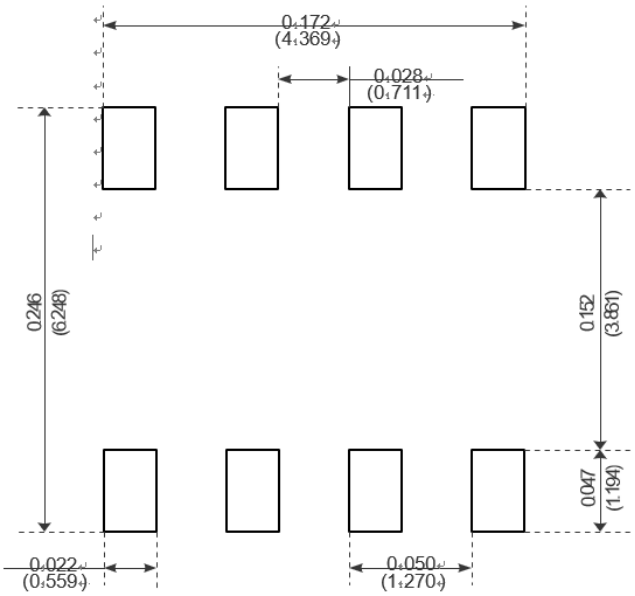
Figure.11: Maximum Effective

Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data-SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads

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Edition	Date	Change
Rve3.8	2018/11/31	Initial release
Rve3.9	2020/5/31	Reduce RDS(on)