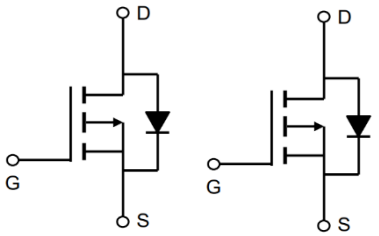
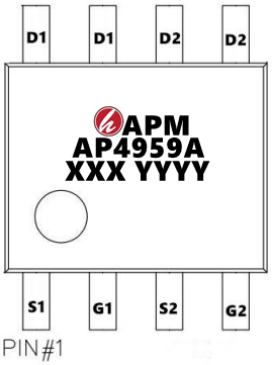
AP4959A

-30V P+P Channel Enhancement Mode MOSFET

Description

The AP4959A 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 =-18A

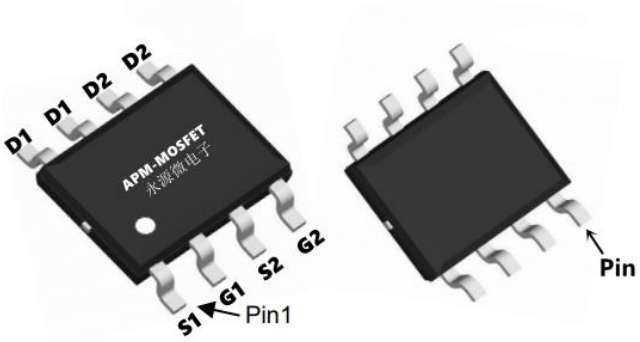
$R_{DS(ON)}$ <18mΩ @ V_{GS}=-10V （**Type：12.5mΩ**）

Application

Lithium battery protection

Wireless impact

Mobile phone fast charging



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP4959A	SOP-8L	AP4959A XXX YYYY	300

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-30	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-18	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -10V[1]	-11	A
IDM	Pulsed Drain Current[2]	-48	A
EAS	Single Pulse Avalanche Energy[3]	168	mJ
P_D@T_A=25℃	Total Power Dissipation[4]	310	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	85	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	4.5	℃/W

-30V P+P Channel Enhancement Mode MOSFET

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	-32.5	-	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	-1.2	-1.5	-2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS}= -10V, I_D= -10A	-	12	18	mΩ
		V_{GS}= -4.5V, I_D= -5A	-	18	25	
C_{iss}	Input Capacitance	V_{DS}= -24V, V_{GS}=10V, f=1.0MHz	-	2130	-	pF
Coss	Output Capacitance		-	280	-	pF
Crss	Reverse Transfer Capacitance		-	252	-	pF
Q_g	Total Gate Charge	V_{DS}= -24V, I_D= -1A, V_{GS}= -10V	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	4	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	5.8	-	nC
td(on)	Turn-on Delay Time	V_{DD}= -24V, I_D= -1A, V_{GS}= -10V, R_{GEN}=7.0Ω	-	9	-	ns
t_r	Turn-on Rise Time		-	13	-	ns
td(off)	Turn-off Delay Time		-	48	-	ns
t_f	Turn-off Fall Time		-	20	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-29.5	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-44	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= -1A	-	-0.74	-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 .The EAS data shows Max. rating .

3、The power dissipation is limited by 175℃ junction temperature

4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

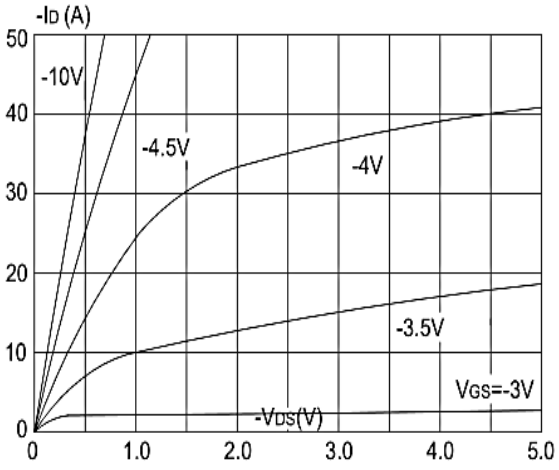


Figure1: Output Characteristics Figure

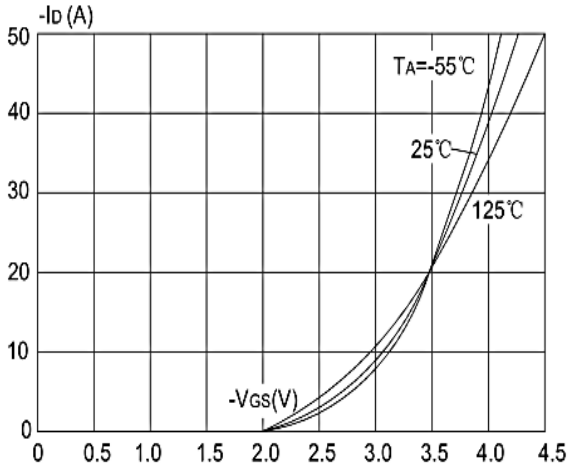


Figure2: Typical Transfer Characteristics

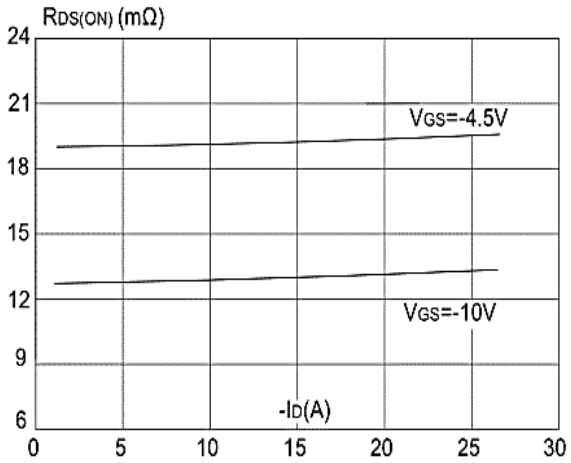


Figure 3:On-resistance vs. Drain Current

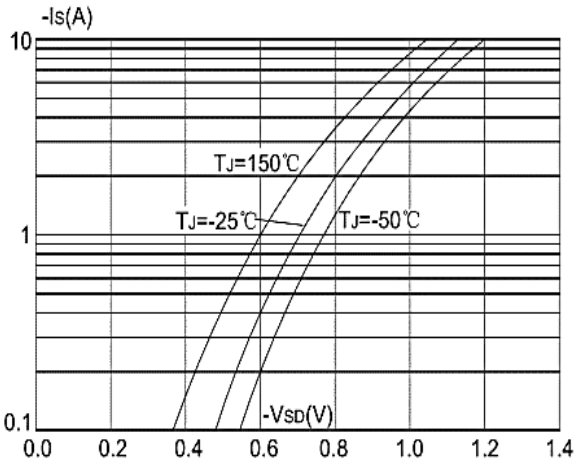


Figure 4: Body Diode Characteristics

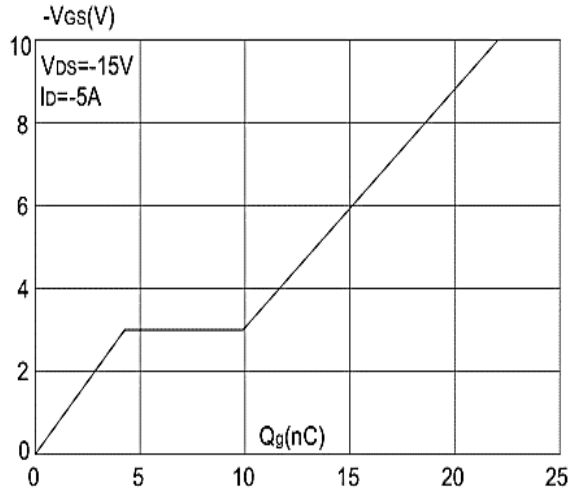


Figure 5: Gate Charge Characteristics

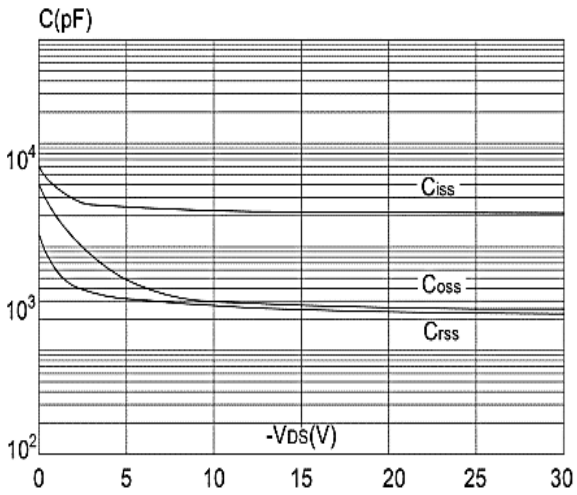


Figure 6: Capacitance Characteristics

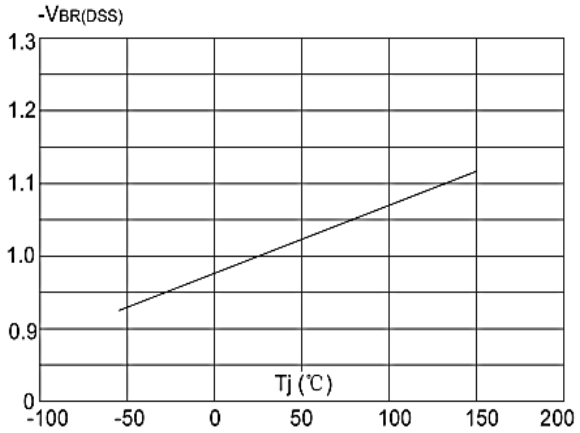


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

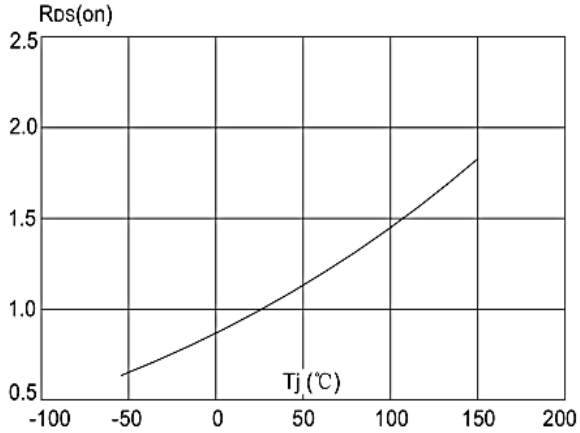


Figure 8: Normalized on Resistance vs. Junction Temperature

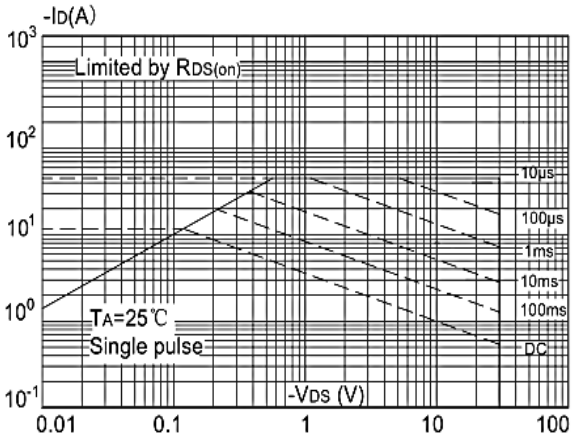


Figure 9: Maximum Safe Operating Area

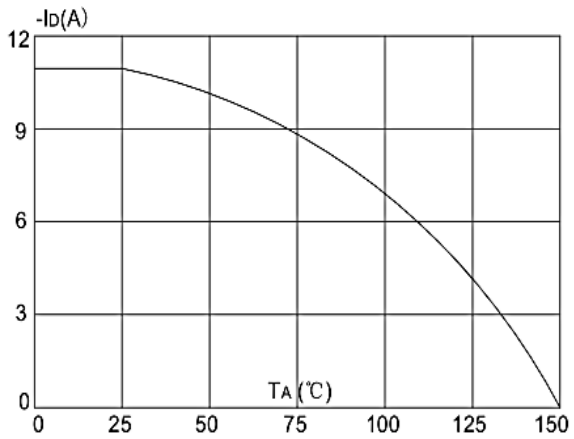


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

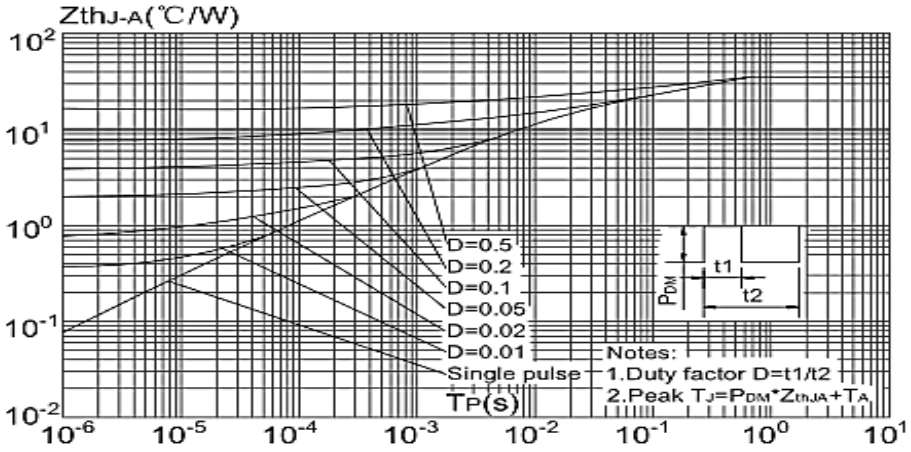
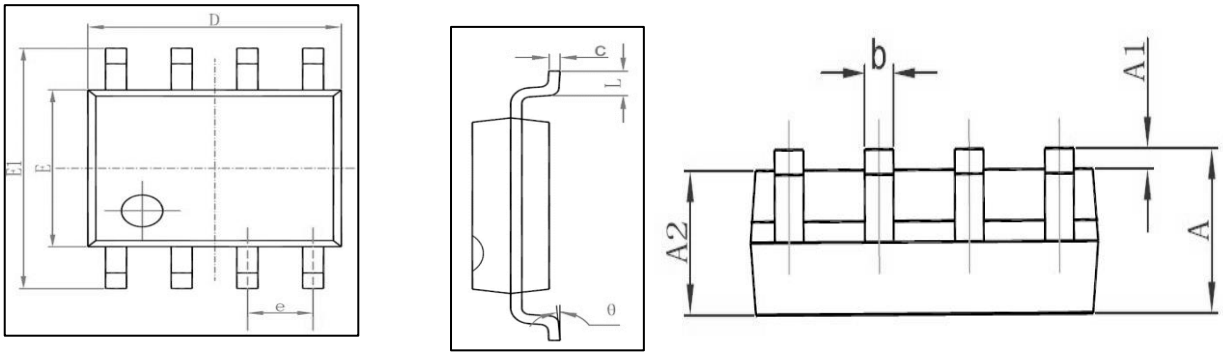
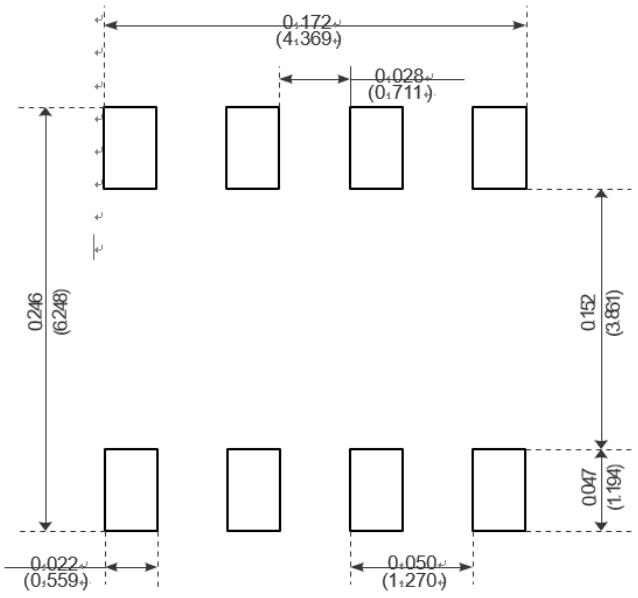


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Package Mechanical Data-SOP-8L



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
Rve1.0	2021/1/10	Initial release