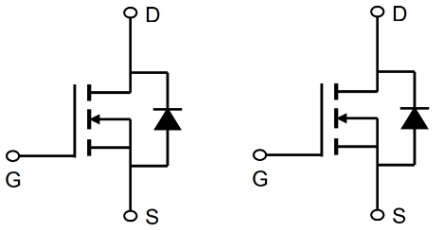
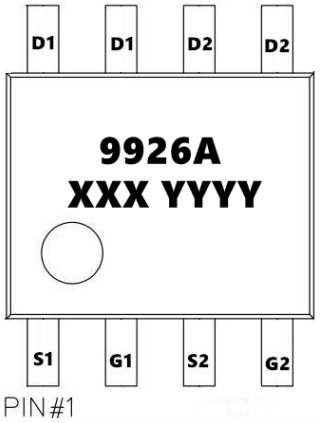
AP9926A

20V N+N-Channel Enhancement Mode MOSFET

Description

The AP9926A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = 20V I_D =6.5A

$R_{DS(ON)}$ < 25mΩ @ V_{GS}=10V (Type：20mΩ)

Application

Battery protection

Load switch

Wireless charging

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP9926A	SOP-8L	9926A	3000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	20	V
VGS	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	6.5	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	4	A
IDM	Pulsed Drain Current[2]	24	A
P_D@T_A=25℃	Total Power Dissipation[4]	1.2	W
TSTG	Storage Temperature Range	-55 to 150	℃
R_{θ}JA	Thermal Resistance Junction-Ambient [1]	78	℃/W

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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	20	22	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.5	0.7	1.2	V
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS}=4.5V, I_D=6A	-	20	28	mΩ
		V_{GS}=2.5V, I_D=5A	-	25.5	38	
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1.0MHz	-	358	-	pF
Coss	Output Capacitance		-	69.3	-	pF
Crss	Reverse Transfer Capacitance		-	58.5	-	pF
Q_g	Total Gate Charge	V_{DS}=10V, I_D=3A, V_{GS}=4.5V	-	5.6	-	nC
Q_{gs}	Gate-Source Charge		-	0.8	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	1.0	-	nC
td(on)	Turn-on Delay Time	V_{DS} =10V, I_D=6A, R_G=3Ω, V_{GS}=4.5V	-	16	-	ns
t_r	Turn-on Rise Time		-	51	-	ns
td(off)	Turn-off Delay Time		-	21	-	ns
t_f	Turn-off Fall Time		-	18	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	6	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	24	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=20A	-	-	1.2	V

Notes:

1、 Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2、 EAS condition : T J =25℃, V DD =30V, V G =10V, L=0.5mH, Rg=25Ω, IAS =3.5A

3、 Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

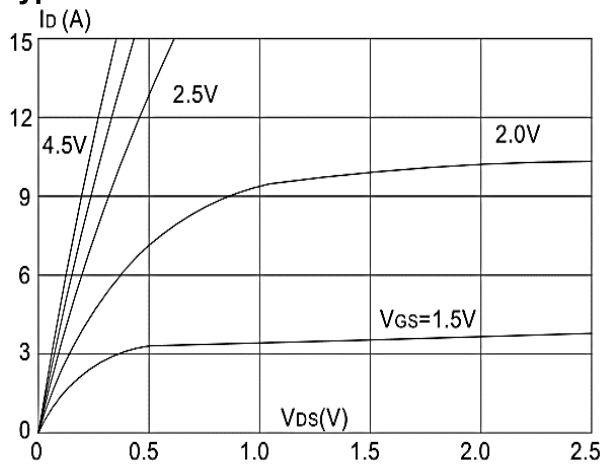


Figure1: Output Characteristics

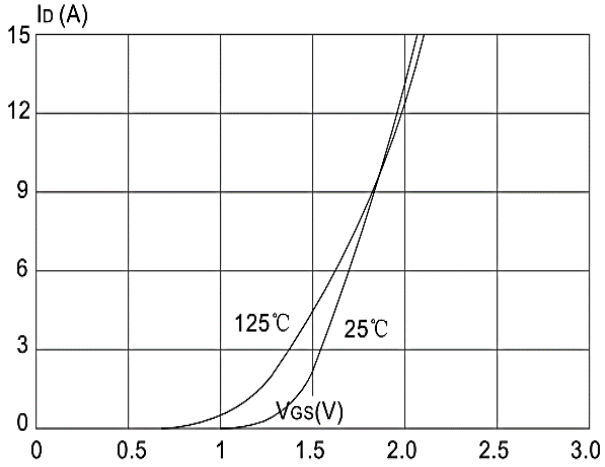


Figure 2: Typical Transfer Characteristics

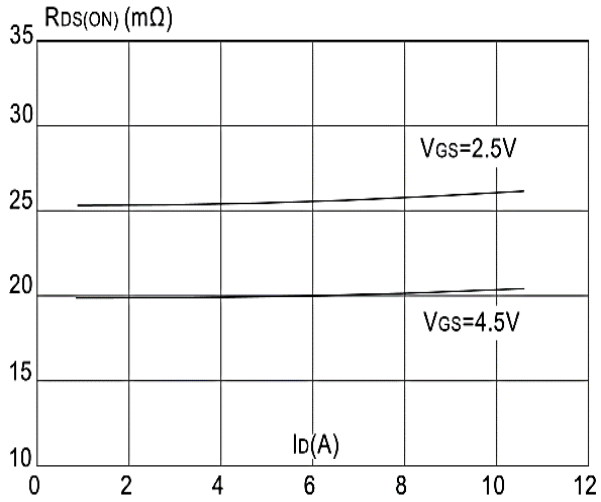


Figure 3:On-resistance vs. Drain Current

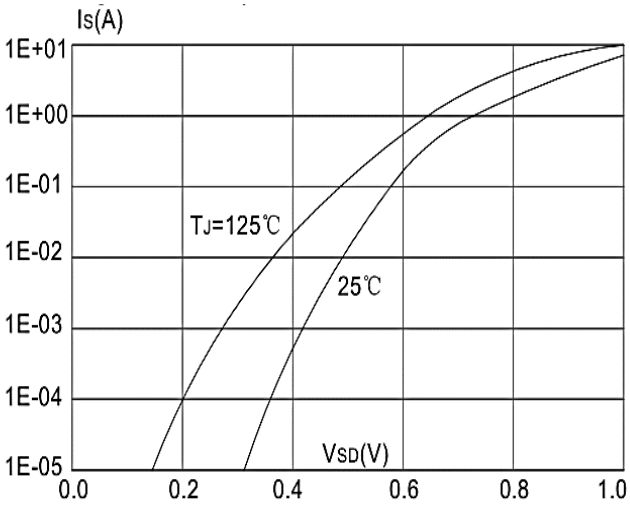


Figure 4: Body Diode Characteristics

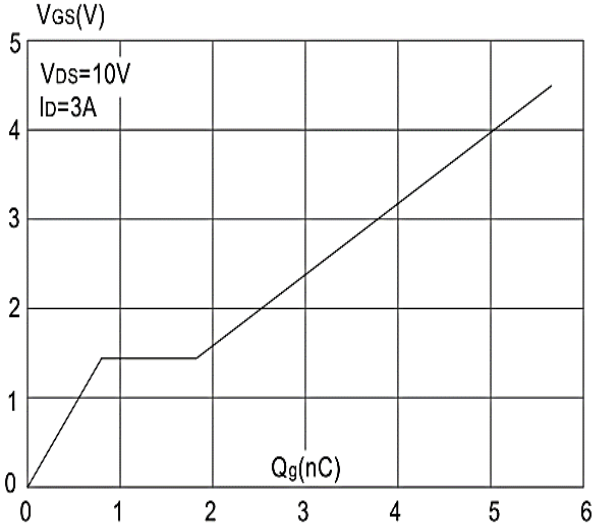


Figure 5: Gate Charge Characteristics

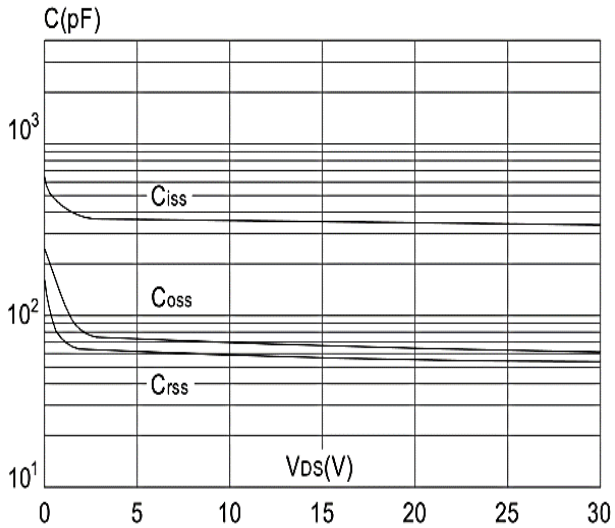


Figure 6: Capacitance Characteristics

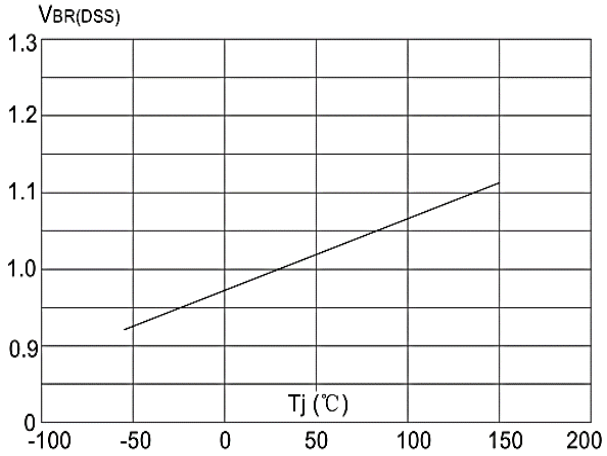


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

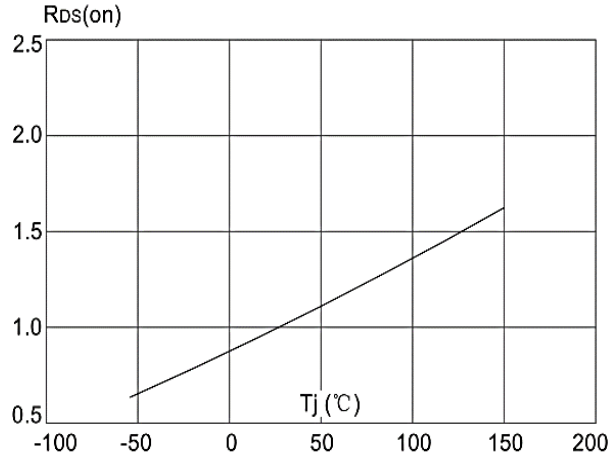


Figure 8: Normalized on Resistance vs Junction Temperature

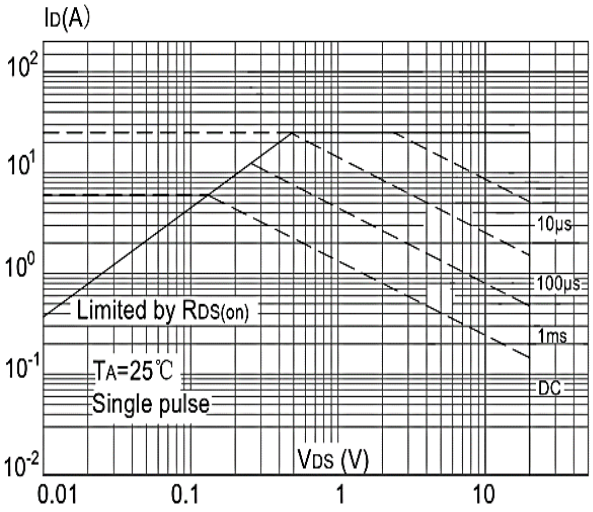


Figure 9: Maximum Safe Operating Area vs. Case Temperature

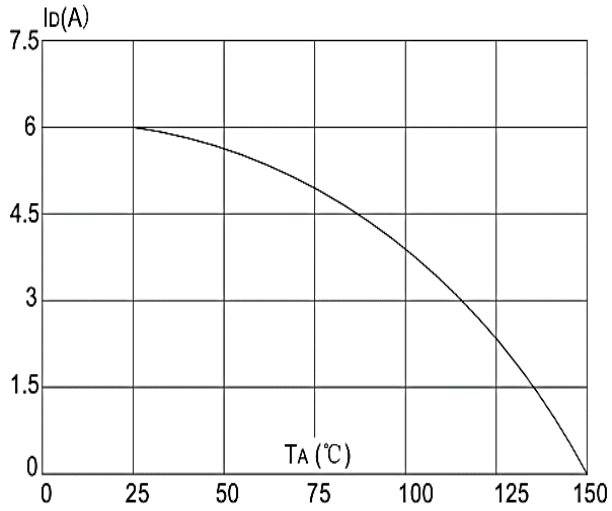


Figure 10: Maximum Continuous Drain Current

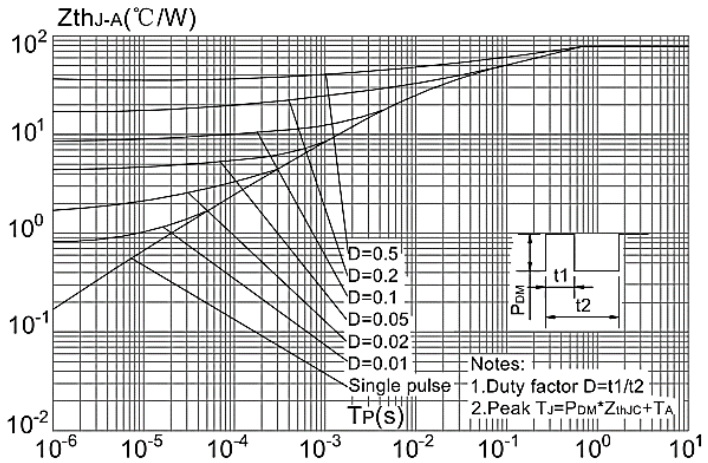
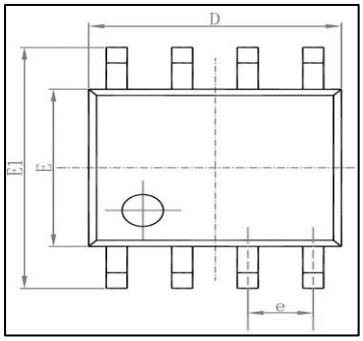
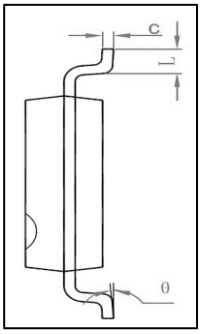
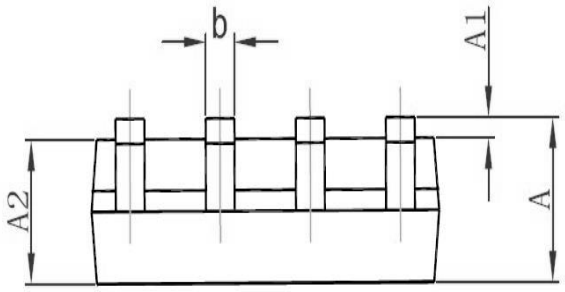


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

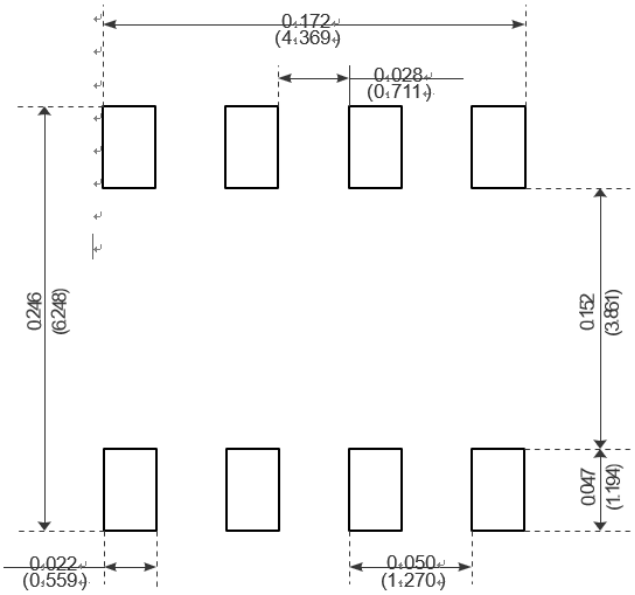
Package Mechanical Data-SOP-8/ESOP-8







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
Rve3.2	2018/12/1	Initial release
Rve3.3	2021/3/31	Change of specification format