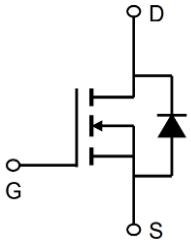
AP25N10D

100V N-Channel Enhancement Mode MOSFET

Description

The AP25N10D uses advanced **APM-SGT**$_{II}$ 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} = 100V I_D =25A

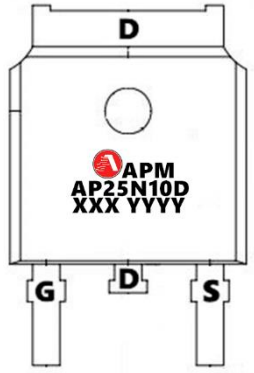
$R_{DS(ON)}$ < 53mΩ @ V_{GS}=10V **(Type：43mΩ)**

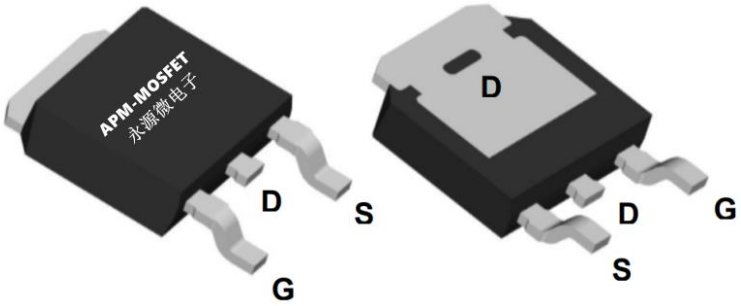
Application

DC/DC Converter

LED Backlighting

Power Management Switches





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP25N10D	TO-252-3L	AP25N10D XXX YYYY	2500

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	100	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	25	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	11.4	A
IDM	Pulsed Drain Current	72	A
EAS	Single Pulse Avalanche Energy	14.5	mJ
IAS	Avalanche Current	8.5	A
P_D@T_C=25℃	Total Power Dissipation[4]	35.7	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient	3.5	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case	62	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	108	-	V
IDSS	Drain-Source Leakage Current	V_{DS}=80V, 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	1.7	2.5	V
RDS(on)	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=15A	-	43	52	mΩ
		V_{GS}=4.5V, I_D=10A	-	60	80	mΩ
g_{fs}	Forward Threshold Voltage	V_{DS}=10V, I_D=20A	-	7.5	-	S
R_g	Gate Resistance	V_{DS} = V_{GS}=0V, f = 1.0MHz	-	1.75	-	Ω
Ciss	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f = 1.0MHz	-	390	-	pF
Coss	Output Capacitance		-	94	-	pF
Crss	Reverse Transfer Capacitance		-	3.3	-	pF
Q_g	Total Gate Charge	V_{DS}=50V, I_D=10A, V_{GS}=10V	-	8.2	-	nC
Q_{gs}	Gate-Source Charge		-	1.4	-	
Q_{gd}	Gate-Drain(“Miller”) Charge		-	2.1	-	
td(on)	Turn-On Delay Time	V_{DS} = 50V, I_D = 10A, R_G = 3Ω, V_{GS}=10V	-	4.2	-	ns
t_r	Turn-On Rise Time		-	4.9	-	
td(off)	Turn-Off Delay Time		-	13	-	
t_f	Turn-Off Fall Time		-	4.8	-	
I_S	Continuous Source Current		-	-	25	A
VSD	Diode Forward Voltage	I_S=10A . V_{GS} = 0V	-	0.75	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=10A, dI_{SD}/dt=100A/μs	-	2.2	-	ns
Q_{rr}	Reverse Recovery Charge		-	34.4	-	nC

Notes:

1、The data tested by surface mounted on a 1 inch2 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 V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_{AS}=8.5A

4、The power dissipation is limited by 150°C junction temperature

5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

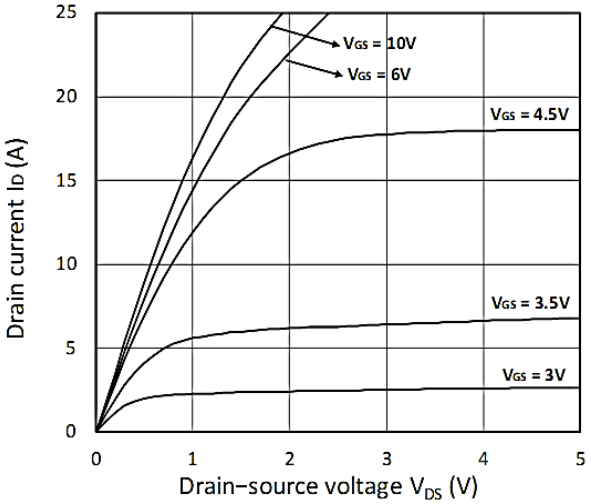


Figure 1. Output Characteristics

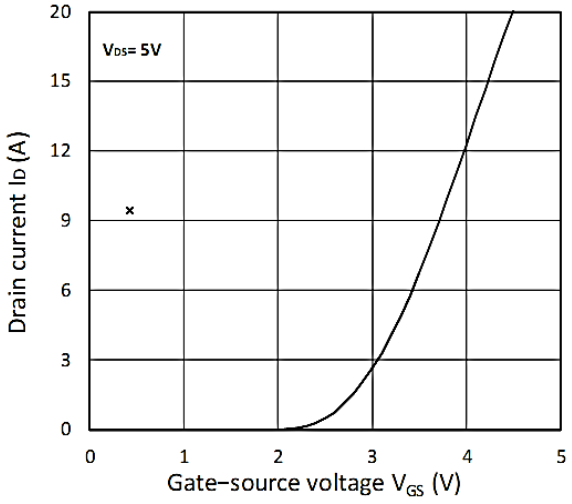


Figure 2. Transfer Characteristics

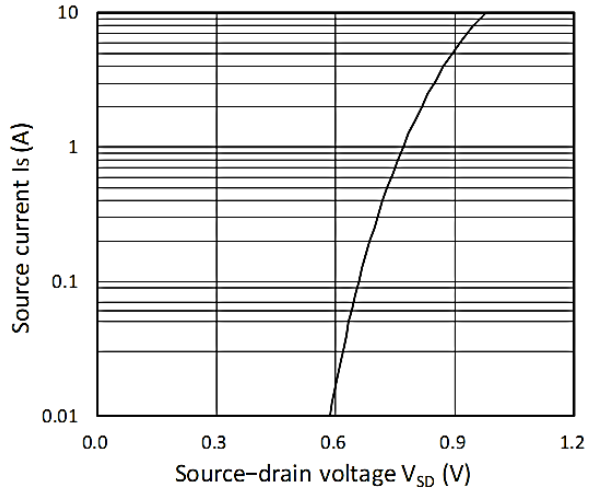


Figure 3. Forward Characteristics of Reverse

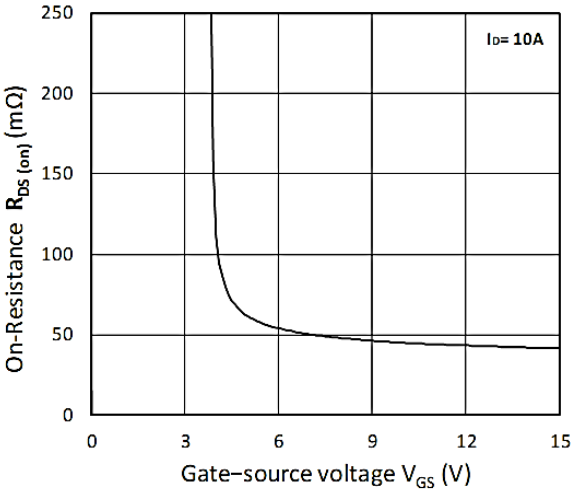


Figure 4. R DS(ON) vs. VGS

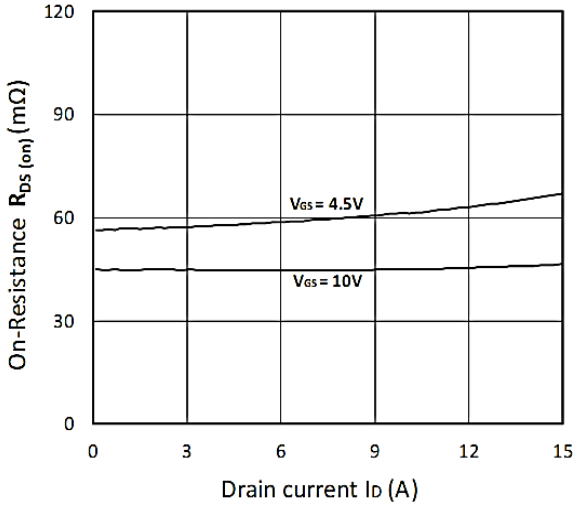


Figure 5. RDS(ON) vs. ID

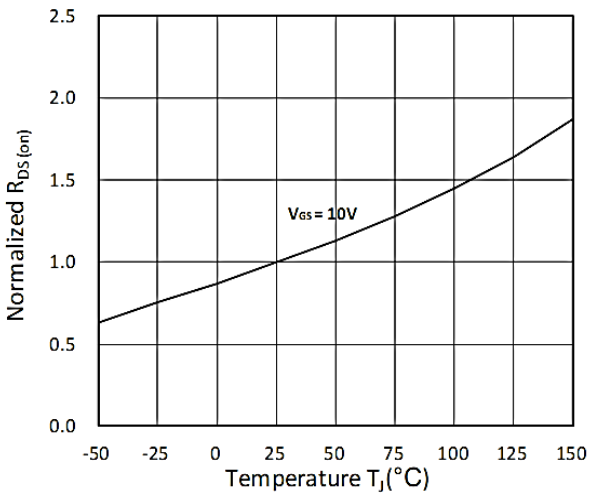


Figure 6. Normalized RDS(on) vs. Temperature

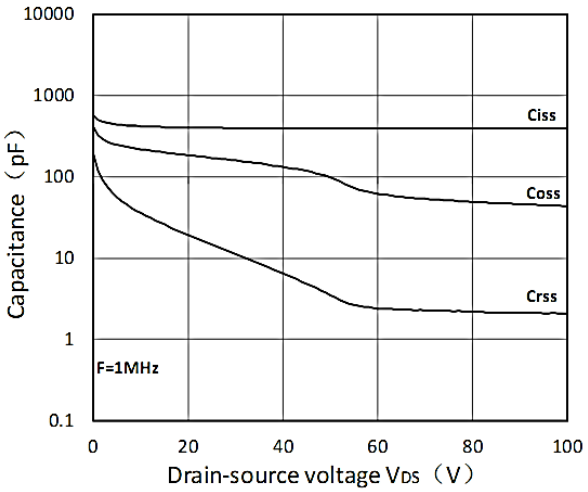


Figure 7. Capacitance Characteristics

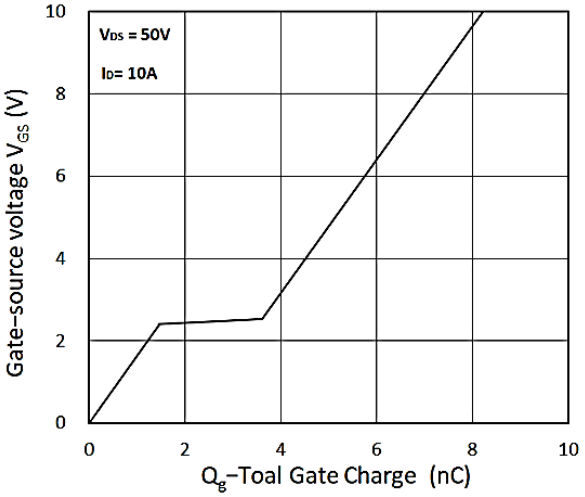


Figure 8. Gate Charge Characteristics

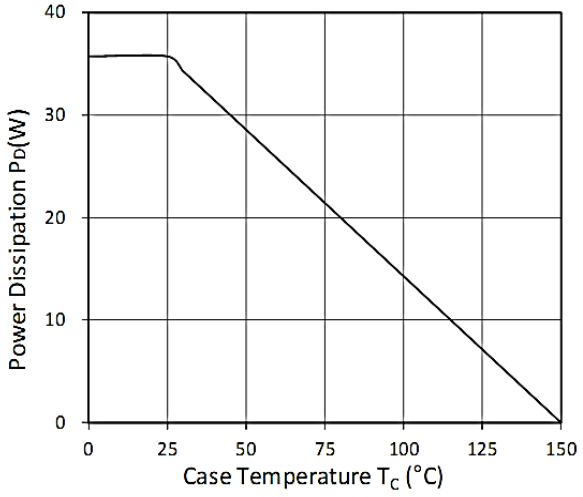


Figure 9. Power Dissipation

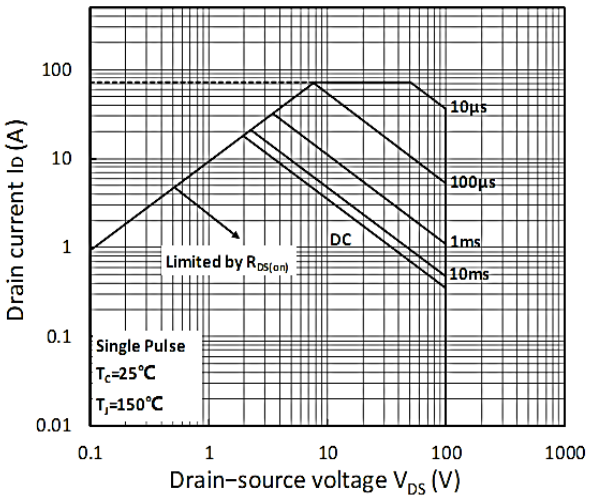


Figure10. Safe Operating Area

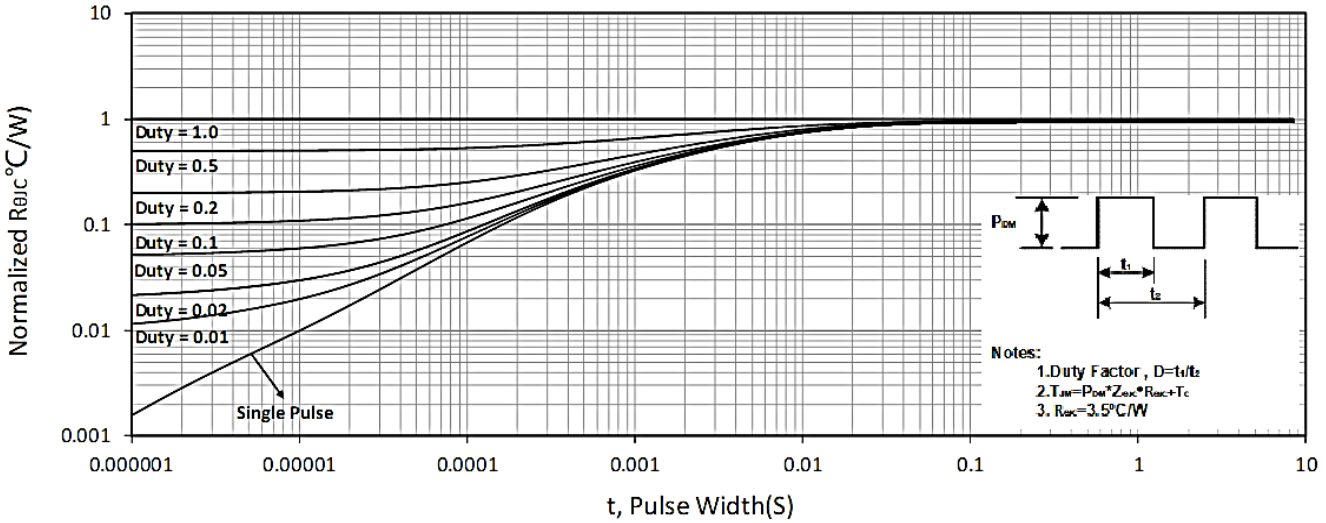
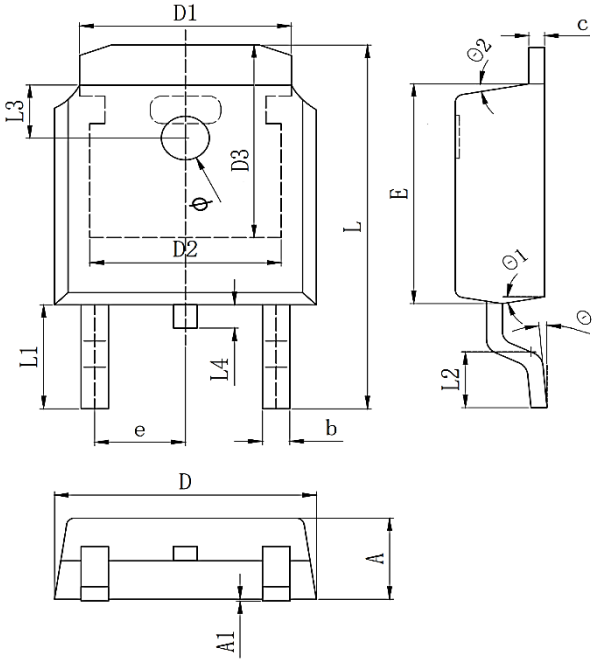


Figure 9 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TO-252-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	2.1	2.3	2.5
A1	0	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.6
D	6.4	6.6	6.8
D1	5.33REF		
D2	4.83REF		
D3	5.25REF		
E	5.9	6.1	6.3
e	2.286TYP		
L	9.8	10.1	10.4
L1	2.888REF		
L2	1.4	1.5	1.7
L3	1.65REF		
L4	0.6	0.8	1
ϕ	1.1	1.2	1.3
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

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100V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2023/11/10	Initial release