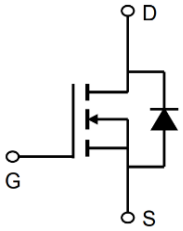
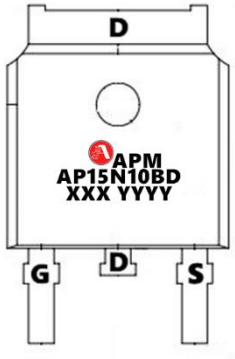
100V N-Channel Enhancement Mode MOSFET

Description

The AP15N10BD 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} = 100V I_D =15A

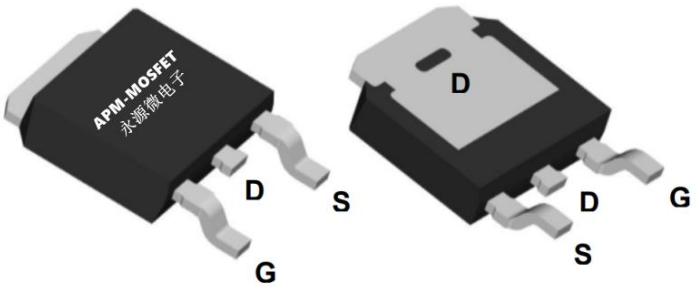
$R_{DS(ON)}$ < 100mΩ@ V_{GS}=10V **(Type：85mΩ)**

Application

Automative lighting

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP15N10D	TO-252-3L	AP15N10D-L XXX YYYY	3000

Absolute Maximum Ratings (TC=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℃	Drain Current, V_{GS} @ 10V	15	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	6.5	A
IDM	Pulsed Drain Current[1]	25	A
P_D@T_C=25℃	Total Power Dissipation	44	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Maximum Thermal Resistance, Junctionambient	62.5	℃/W
RθJC	Maximum Thermal Resistance, Junction-case	6	℃/W

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Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	100	-	-	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V, VGS=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	VDS=0V, VGS=±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1.0	1.5	2.5	V
RDS(on)	Static Drain-Source on-Resistancenote3	VGS=10V, ID=5A	-	85	100	mΩ
		VGS=4.5V, ID=3A	-	96	125	mΩ
Ciss	Input Capacitance	VDS=50V, VGS=0V, f=1.0MHz	-	547	-	pF
Coss	Output Capacitance		-	30	-	pF
Crss	Reverse Transfer Capacitance		-	8	-	pF
Qg	Total Gate Charge	VDS=50V, ID=2A, VGS=10V	-	20	-	nC
Qgs	Gate-Source Charge		-	2.8	-	nC
Qgd	Gate-Drain(“Miller”) Charge		-	4	-	nC
td(on)	Turn-on Delay Time	VDS=50V, ID=3A, RG=1.8Ω, VGS=10V	-	6	-	ns
tr	Turn-on Rise Time		-	7	-	ns
td(off)	Turn-off Delay Time		-	21	-	ns
tf	Turn-off Fall Time		-	3	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	15	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
VSD	Drain to Source Diode Forward Voltage	VGS=0V, IS=10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	IF=10A, dI/dt=100A/μs	-	22	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	29	-	nC

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 power dissipation is limited by 150℃ junction temperature

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

Typical Characteristics

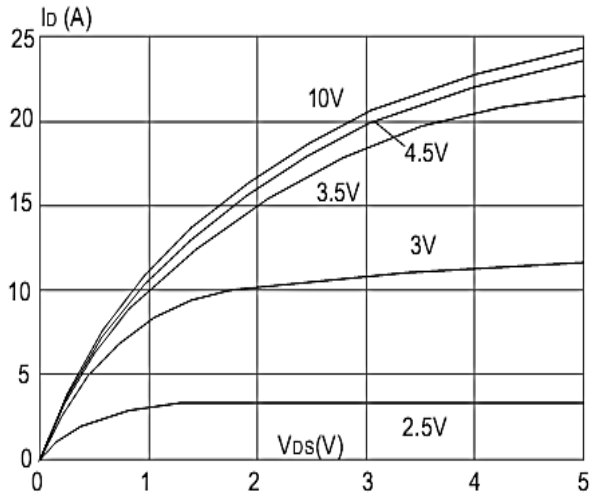


Figure1: Output Characteristics

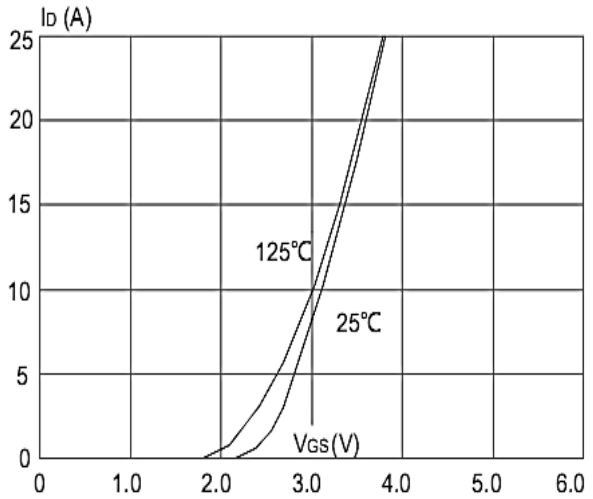


Figure 2: Typical Transfer Characteristics

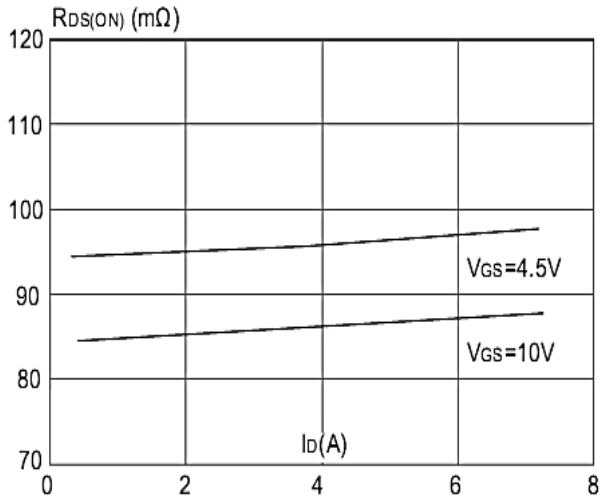


Figure 3:On-resistance vs. Drain Current

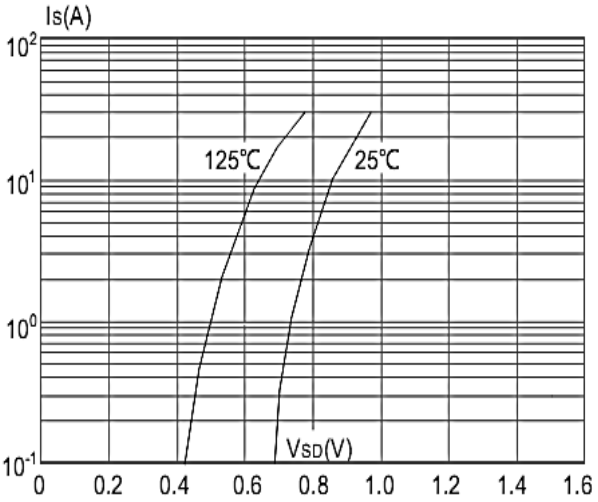


Figure 4: Body Diode Characteristics

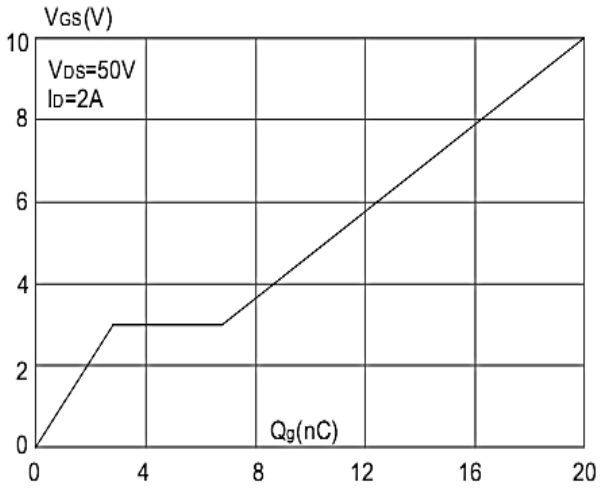


Figure 5: Gate Charge Characteristics

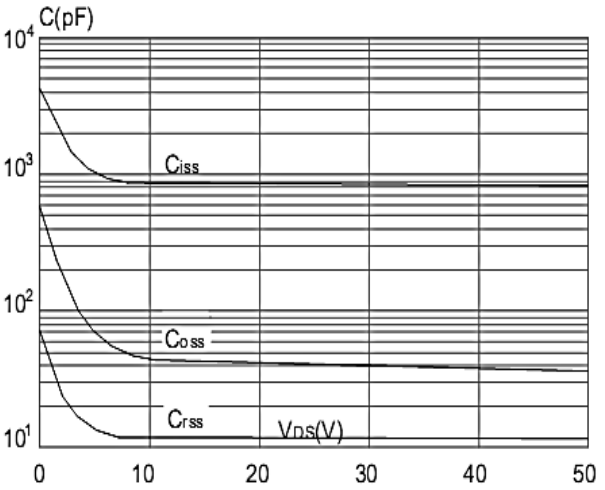


Figure 6: Capacitance Characteristics

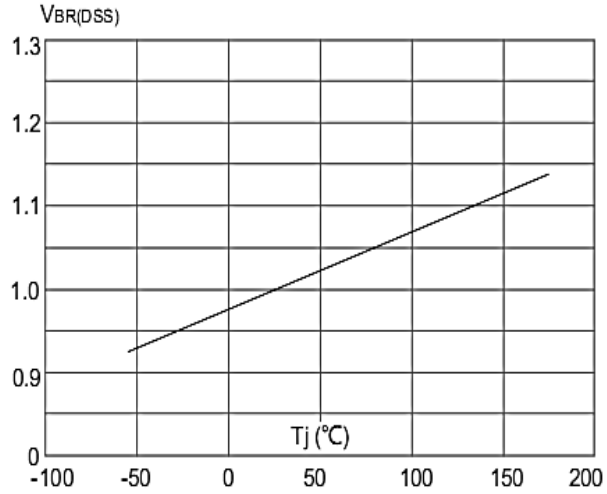


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

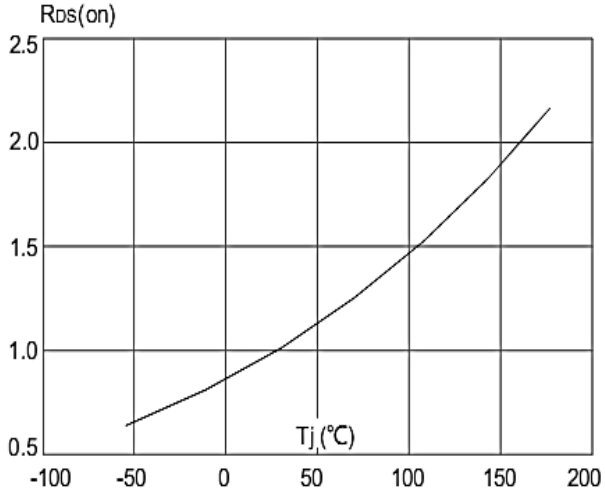


Figure 8: Normalized on Resistance vs. Junction Temperature

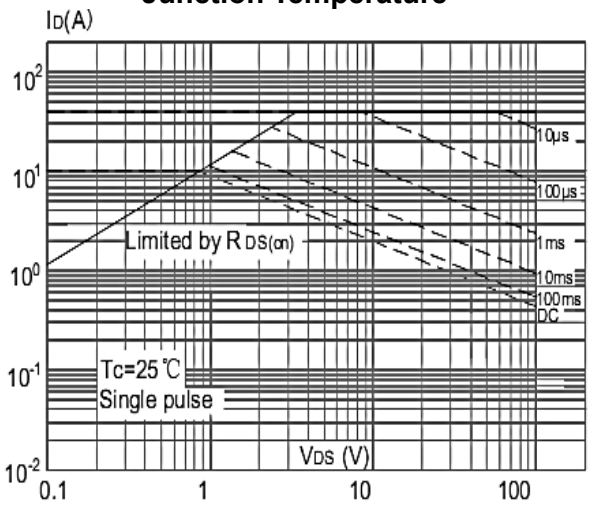


Figure 9: Maximum Safe Operating Area

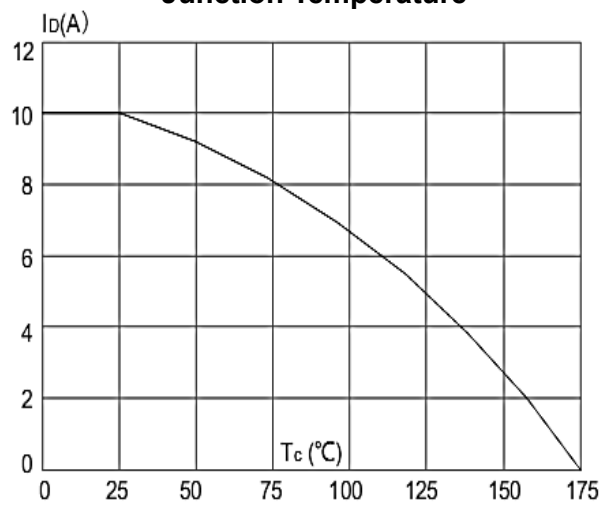


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

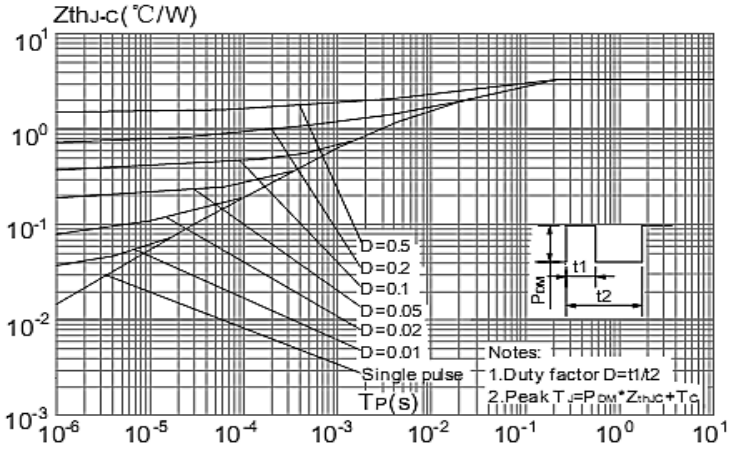
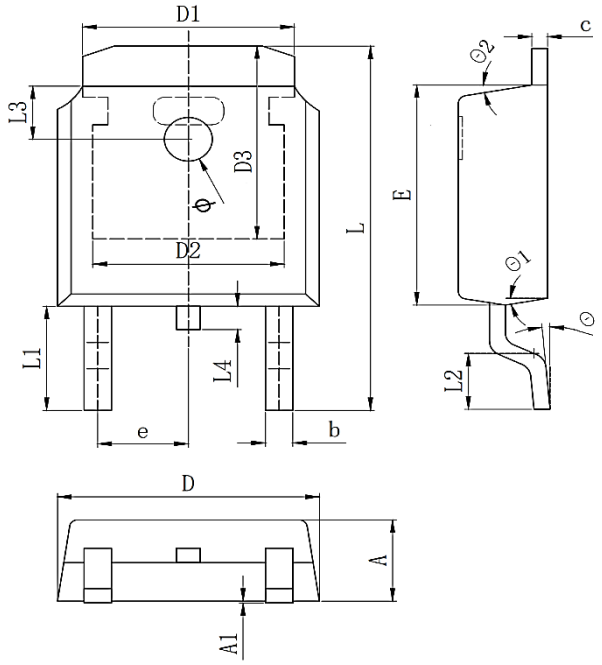


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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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Edition	Date	Change
REV1.0	2024/1/31	Initial release