AP180N08P/T

85V N-Channel Enhancement Mode MOSFET

Description

The AP180N08P/T uses advanced trench technology

to provide excellent $R_{DS(ON)}$, low gate charge and

operation with gate voltages as low as 10V.

This device is suitable for use as a Battery protection

or in other Switching application.
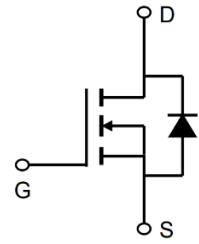
General Features

V_{DS} = 85V I_D =180A

$R_{DS(ON)}$ < 3.5mΩ V_{GS}=10V （Type：2.9mΩ）

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP180N08P	TO-220-3L	AP180N08P XXX YYYY	1000
AP180N08T	TO-263-3L	AP180N08T XXX YYYY	800

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	85	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	180	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	100	A
IDM	Pulsed Drain Current	480	A
EAS	Single Pulse Avalanche Energy	858	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	284	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_θJA$	Thermal Resistance Junction-Ambient	0.53	℃/W
$R_θJC$	Thermal Resistance Junction-Case	48	℃/W

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Electrical Characteristics (T$_J$=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V(BR)DSS	Drain-source breakdown voltage	V$_{GS}$=0V, I$_D$=250uA	85	92		V
VGS(th)	Gate threshold voltage	V$_{DS}$=V$_{GS}$,I$_D$=250uA T$_j$=25°C	2.0	3.0	4.0	V
IDSS	Zero gate voltage drain current	V$_{DS}$=80V,V$_{GS}$=0V T$_j$=25°C	-		1	µA
IDSS	Zero gate voltage drain current	V$_{DS}$=80V,V$_{GS}$=0V T$_j$=125°C		- 5		µA
IGSS	Gate-source leakage current	V$_{GS}$=20V,V$_{DS}$=0V	-	-	100	nA
RDS(on)	Drain-source on-state resistance	V$_{GS}$=10V, I$_D$=50A,T$_j$=25°C	-	2.9	3.5	mΩ
gfs	Transconductance	V$_{DS}$=5V,I$_D$=40A	-	106	-	S
Ciss	Input Capacitance		-	6813	-	pF
Coss	Output Capacitance	V$_{GS}$=0V, V$_{DS}$=40V, f=1MHz	-	808	-	pF
Crss	Reverse Transfer Capacitance		-	48	-	pF
Q$_G$	Gate Total Charge		-	91	-	nC
Qgs	Gate-Source charge	V$_{GS}$=10V, V$_{DS}$=40V,I$_D$=25A	-	37	-	nC
Qgd	Gate-Drain charge		-	25	-	nC
td(on)	Turn-on delay time		-	38	-	ns
t$_r$	Rise time	T$_j$=25°C, V$_{GS}$=10V,	-	58	-	ns
td(off)	Turn-off delay time	V$_{DS}$=40V, R$_L$=3Ω	-	63	-	ns
t$_f$	Fall time		-	32	-	ns
R$_G$	Gate resistance	V$_{GS}$=0V, V$_{DS}$=0V, f=1MHz	-	2	-	Ω
VSD	Body Diode Forward Voltage	V$_{GS}$=0V,I$_{SD}$=50A	-	0.85	1.2	V
trr	Body Diode Reverse Recovery Time	I$_F$=20A, dI/dt=500A/µs	-	85	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	313	-	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 .The EAS data shows Max. rating .

3、The test cond≦ 300us duty cycle ≦ 2%, duty cycle ition is V$_{DD}$=64V$_{GS}$=10V,L=0.1mH,I$_{AS}$=53.8A

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

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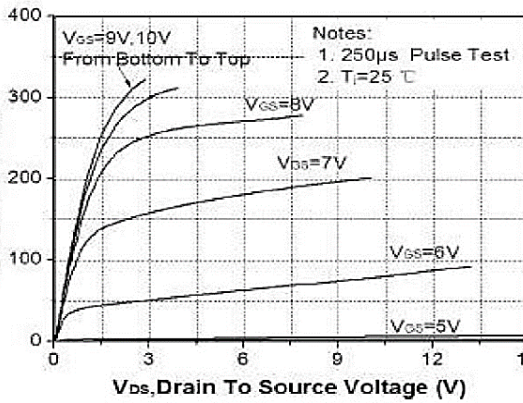
Typical Characteristics

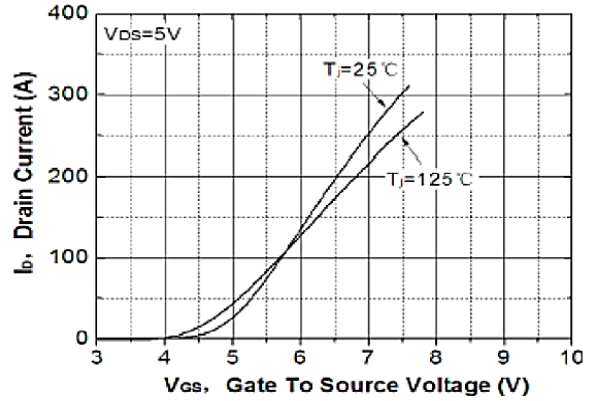Figure 1. Typ. Output Characteristics (Tj=25 ℃)

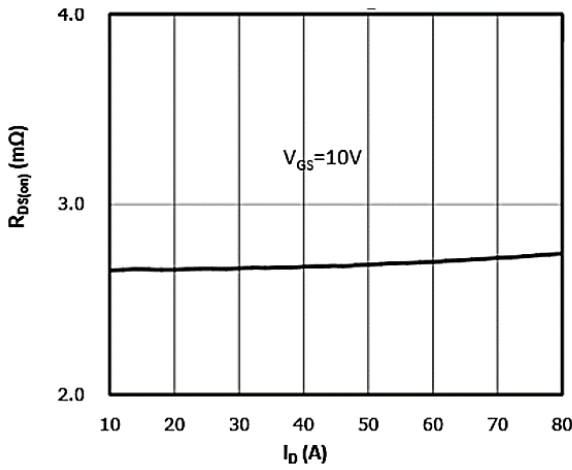Figure 2. Transfer Characteristics

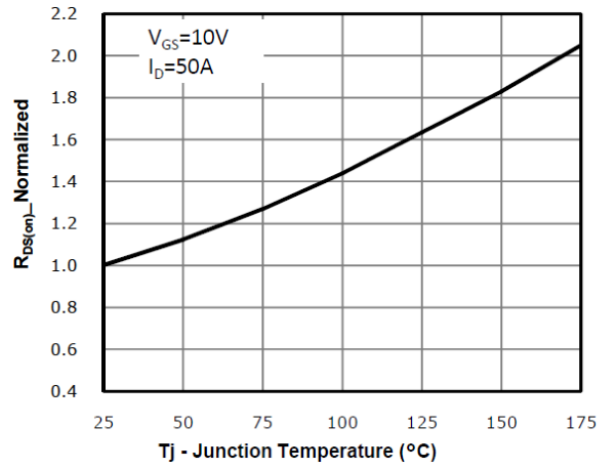Figure 3. On-Resistance vs. Drain Current and Gate Voltage Figure

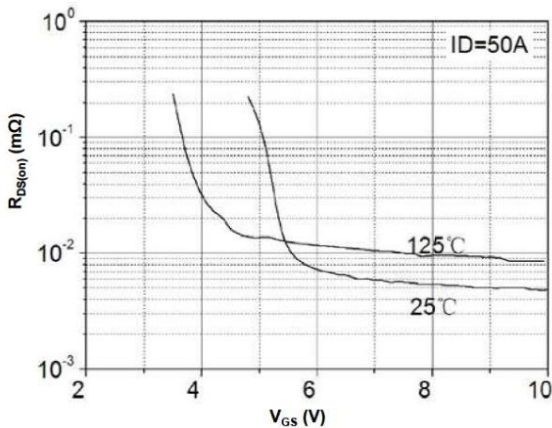Figure 4. On-Resistance vs. Junction Temperature
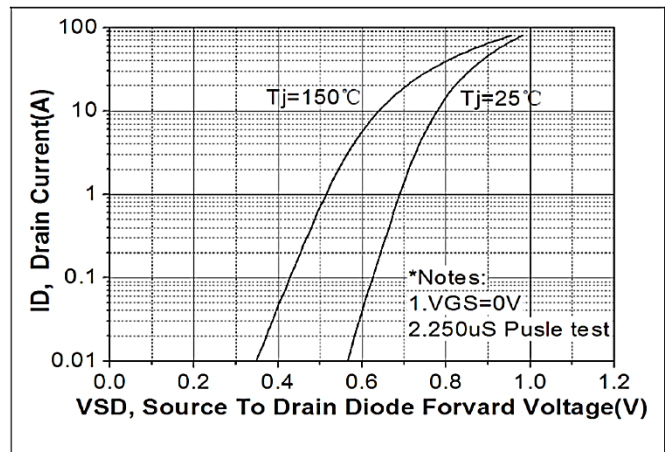

Figure 5. On-Resistance vs. Gate-Source Voltage

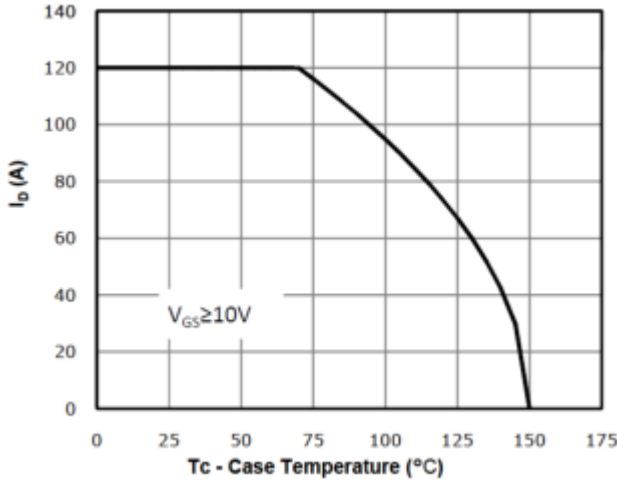

Figure 6．Body-Diode Characteristics

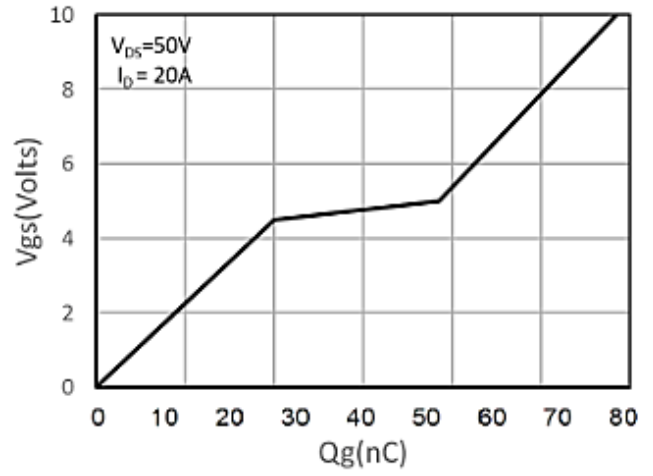**Figure 7. Gate-Charge Characteristics**

Figure 8. Drain Current Derating
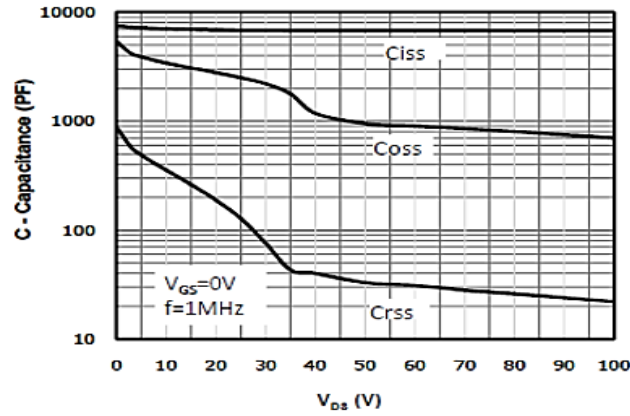
Figure 9: Normalized Maximum Transient Thermal Impedance

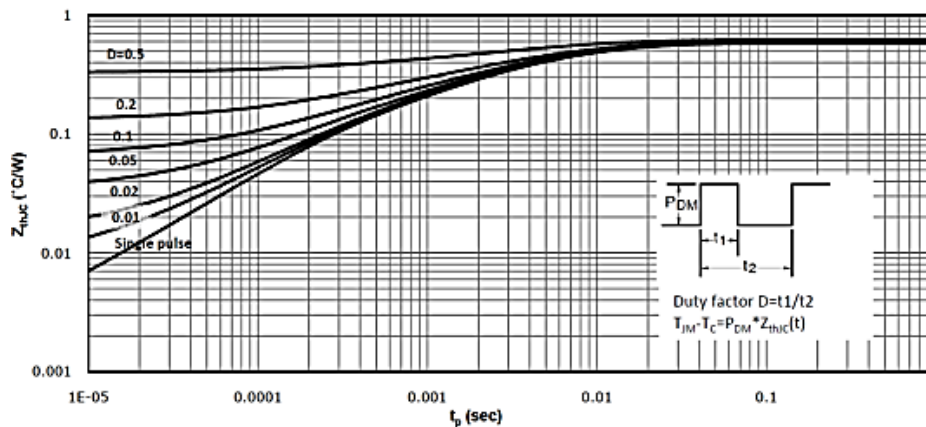Duty factor D=t1/t2
T_{JM}-T_C=P_{DM}*Z_{thJC}(t)

Figure 10. Capacitance Characteristics
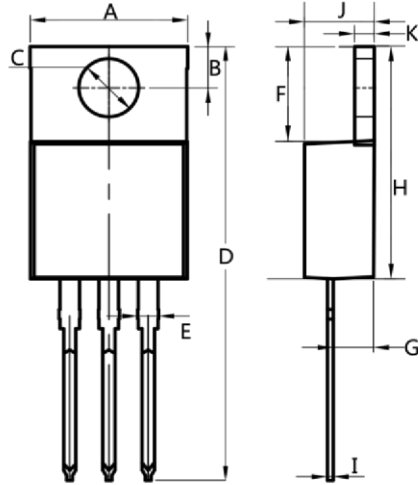
TO-220AB

Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

ITO-220AB
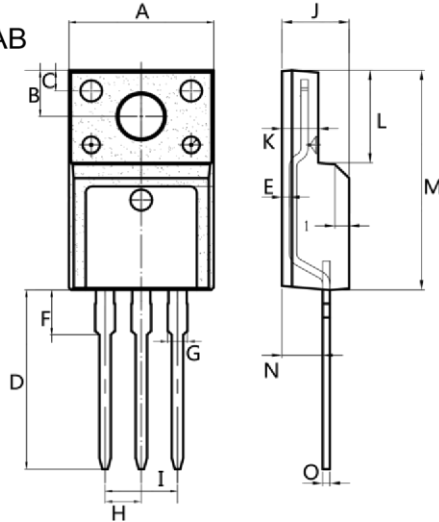
Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ	2.54
I	Typ	5.08
J	4.55	4.75
K	2.4	2.7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

TO-263
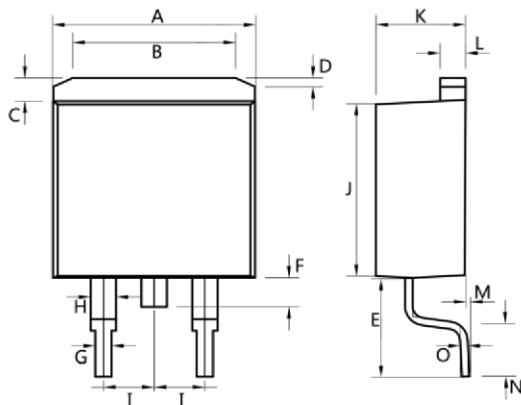
Dim.	Min.	Max.
A	10.0	10.5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ	2.54
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		

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Edition	Date	Change
Rve1.0	2020/10/31	Initial release
Rve1.1	2021/1/12	Modify BVDSS

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