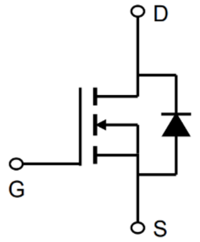
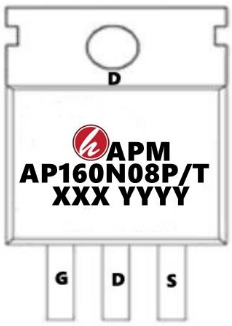
85V N-Channel Enhancement Mode MOSFET

Description

The AP160N08P/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 =160A

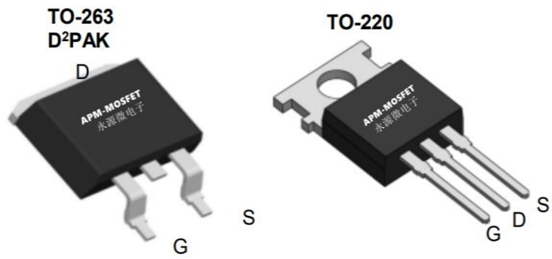
$R_{DS(ON)}$ < 4mΩ V_{GS}=10V （Type：3.2mΩ）

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP160N08P	TO-220-3L	AP160N08P XXX YYYY	1000
AP160N08T	TO-263-3L	AP160N08T 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	160	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	85	A
IDM	Pulsed Drain Current	480	A
EAS	Single Pulse Avalanche Energy	320	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	122.5	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient	62	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case	1.02	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	85	95	-	V
IGSS	Gate-body Leakage current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain CurrentT_J=25°C	V_{DS} =80V, V_{GS} = 0V	-	-	1	μA
	Zero Gate Voltage Drain CurrentT_J=100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
RDS(on)	Drain-Source on-Resistance[2]	V_{GS} = 10V, I_D = 20A	-	3.2	4	mΩ
gfs	Forward Transconductance[2]	V_{DS}=10V, I_D=20A	-	75	-	S
Ciss	Input Capacitance	V_{DS} = 40V, V_{GS} =0V, f =1MHz	-	5235	-	pF
Coss	Output Capacitance		-	985	-	
Crss	Reverse Transfer Capacitance		-	58	-	
R_g	Gate Resistance	V_{GS} = 0V, V_{DS} = 0V, f =1MHz	-	0.6	-	Ω
Q_g	Total Gate Charge	V_{GS} = 10V, V_{DS} = 40V, I_D=20A	-	78.5	-	nC
Qgs	Gate-Source Charge		-	19.6	-	
Qgd	Gate-Drain Charge		-	17	-	
td(on)	Turn-on Delay Time	V_{GS} =10V, V_{DS} =40V, R_G = 3Ω, I_D= 20A	-	15.4	-	ns
t_r	Rise Time		-	13	-	
td(off)	Turn-off Delay Time		-	34	-	
t_f	Fall Time		-	6.2	-	
VSD	Diode Forward Voltage[2]	I_F = 20A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	-	-	130	A
trr	Body Diode Reverse Recovery Time	I_F = 20A, dI/dt=100A/μs	-	57	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	114	-	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}=40A

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

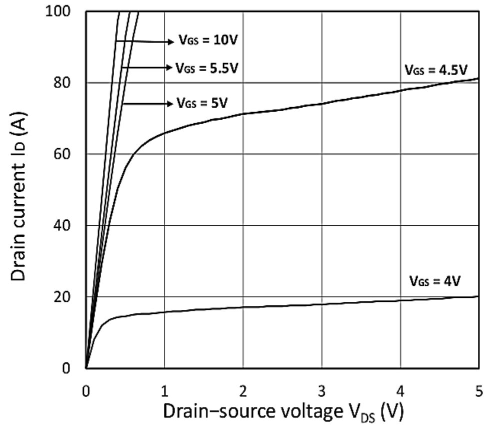


Figure 1. Output Characteristics

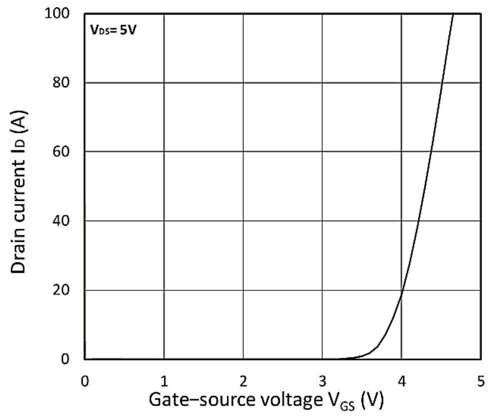


Figure 2. Transfer Characteristics

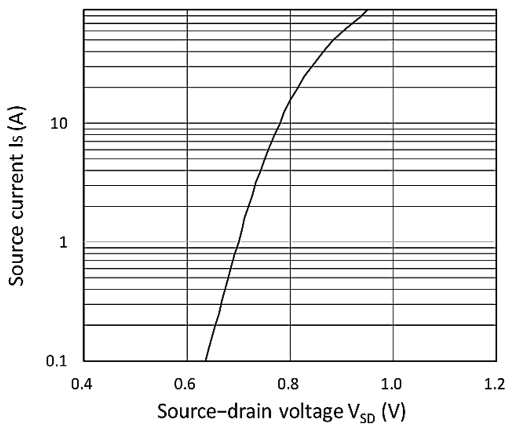


Figure 3. Forward Characteristics of Reverse

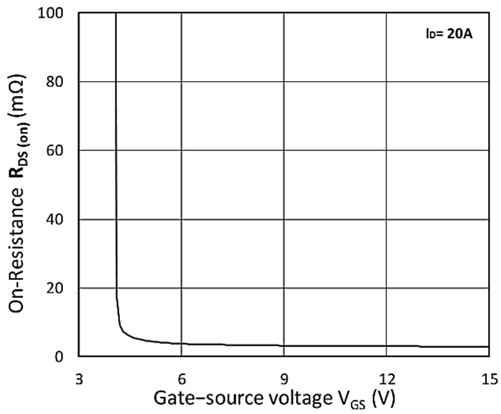


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

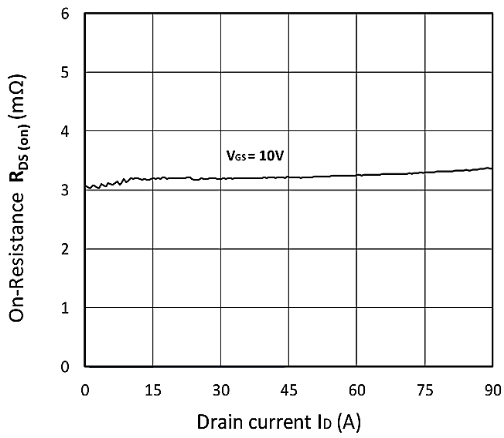


Figure 5. $R_{DS(ON)}$ vs. I_D

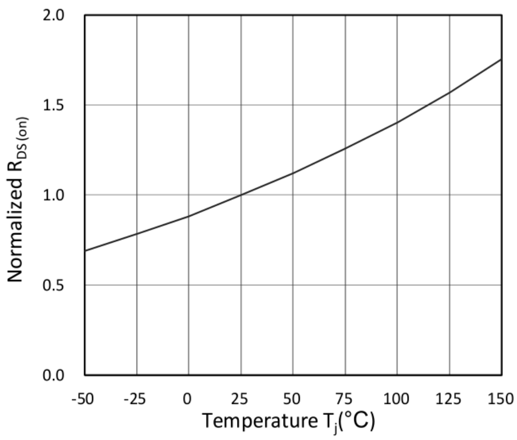


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

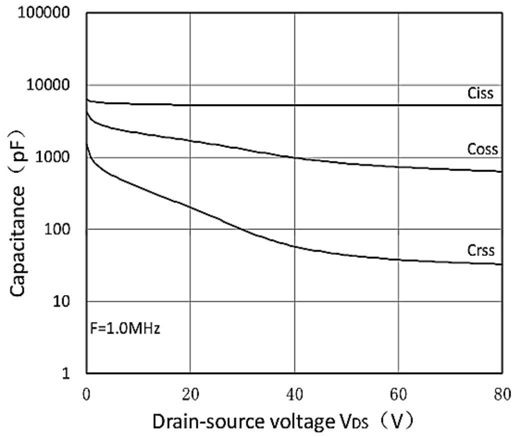


Figure 7. Capacitance Characteristics

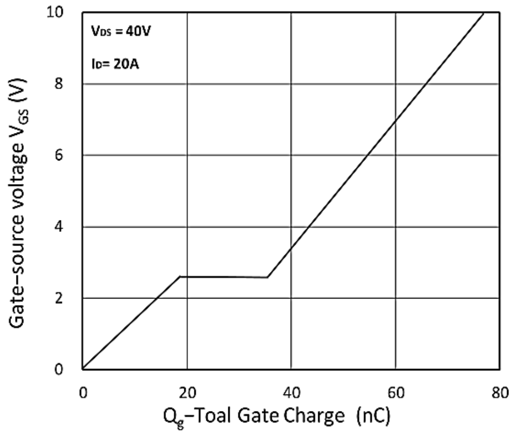


Figure 8. Gate Charge Characteristics

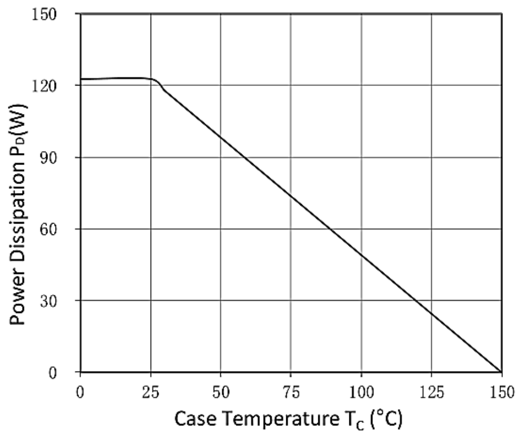


Figure 9. Power Dissipation

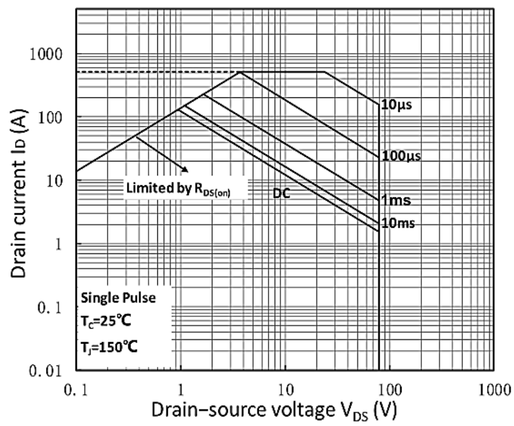


Figure10. Safe Operating Area

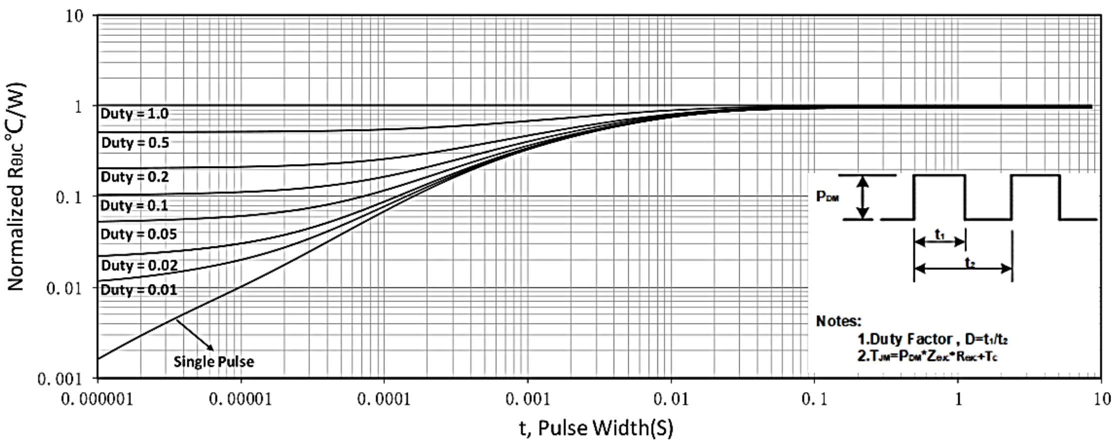
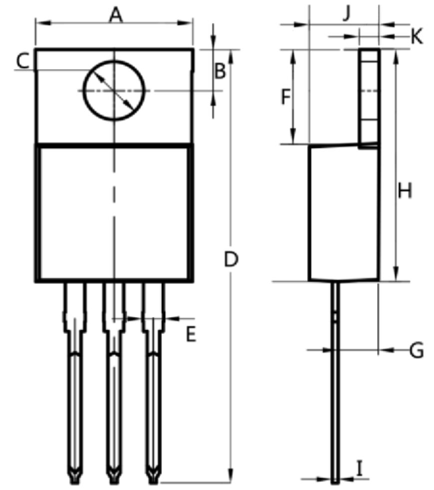


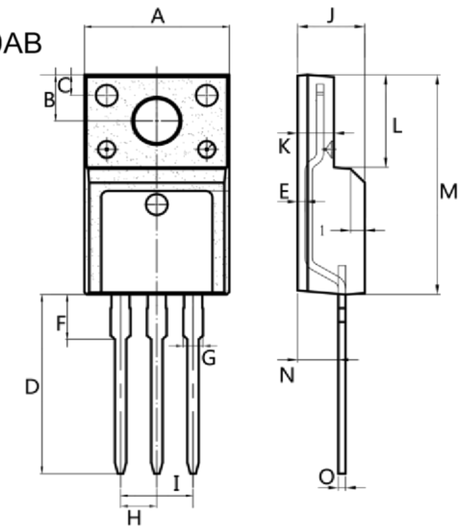
Figure 11. Normalized Maximum Transient Thermal Impedance

TO-220AB



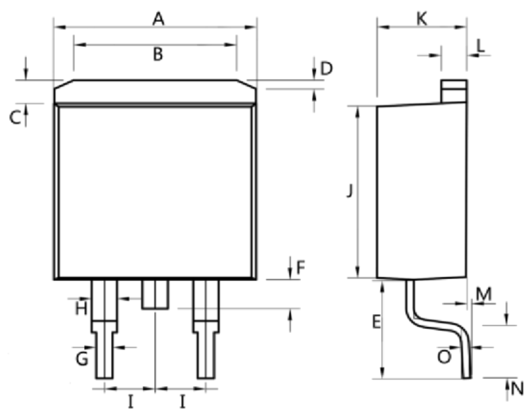
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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