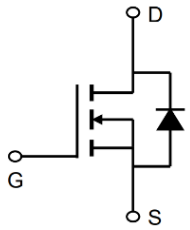
68V N-Channel Enhancement Mode MOSFET

Description

The AP80N07P/T uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with Hight EAS. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = 68V I_D =80A

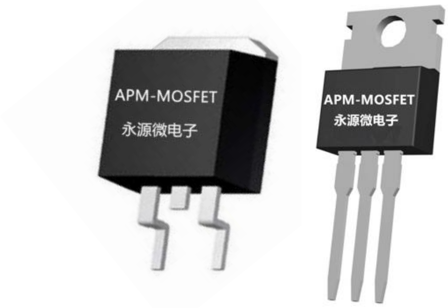
$R_{DS(ON)}$ < 9.0mΩ @ V_{GS}=10V (Type: 7.2mΩ)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80N07P	TO-220-3L	AP80N07P XXX YYYY	1000
AP80N07T	TO-263-3L	AP80N07T XXX YYYY	800

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	68	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	80	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	52	A
IDM	Pulsed Drain Current[2]	320	A
EAS	Single Pulse Avalanche Energy[3]	110	mJ
IAS	Avalanche Current	22	A
P_D@T_C=25℃	Total Power Dissipation[4]	103	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
R_{θ}JA	Thermal Resistance Junction-ambient [1]	63	℃/W
R_{θ}JC	Thermal Resistance Junction-Case[1]	1.46	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	68	72	---	V
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.023	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=10A	---	7.2	9.0	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.2	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=68V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=68V , V_{GS}=0V , T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge (4.5V)	VDS =30V, ID =30A, VGS =10V	---	35	---	nC
Qgs	Gate-Source Charge		---	11	---	
Qgd	Gate-Drain Charge		---	9	---	
Td(on)	Turn-On Delay Time	VDS =30V,ID =30A, RGEN =3Ω, V GS =10V	---	15	---	ns
T_r	Rise Time		---	90	---	
Td(off)	Turn-Off Delay Time		---	45	---	
T_f	Fall Time		---	30	---	
Ciss	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	400	---	pF
Coss	Output Capacitance		---	267	---	
Crss	Reverse Transfer Capacitance		---	250	---	
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	80	A
ISM	Pulsed Source Current[2,5]		---	---	320	A
VSD	Diode Forward Voltage[2]	V GS =0V, I S =80A	---	---	1.2	V
trr	Reverse Recovery Time	T J =25℃ I F =20A,dI/dt=100A/µs	---	78	---	nS
Q_{rr}	Reverse Recovery Charge		---	51	---	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 TJ =25℃, VDD =35V, VG =10V, R G =25Ω, L=0.5mH, IAS =21A
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

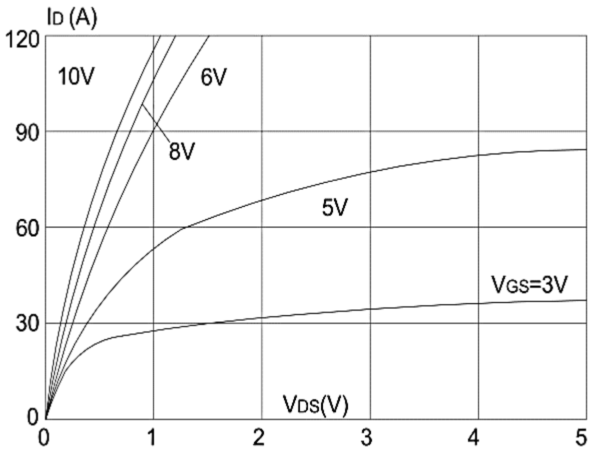


Figure1: Output Characteristics

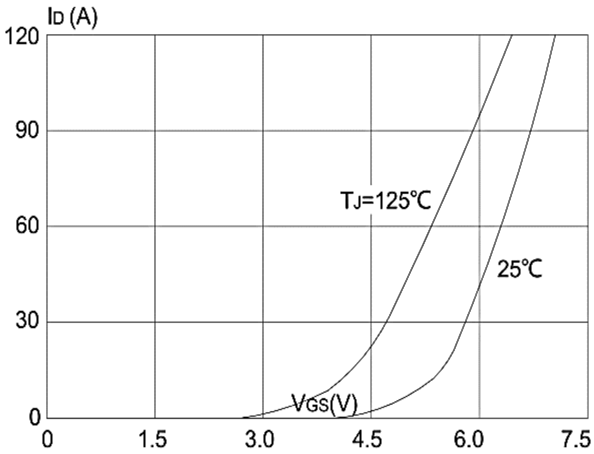


Figure 2: Typical Transfer Characteristics

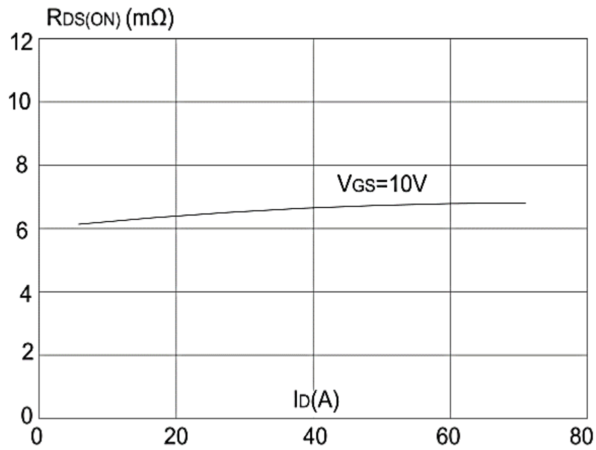


Figure 3:On-resistance vs. Drain Current

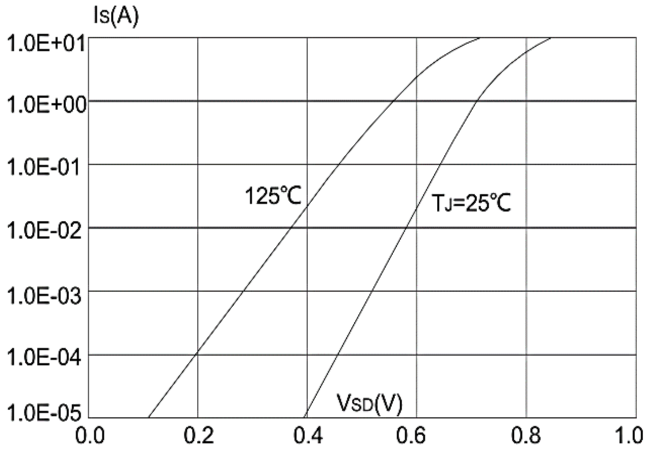


Figure 4: Body Diode Characteristics

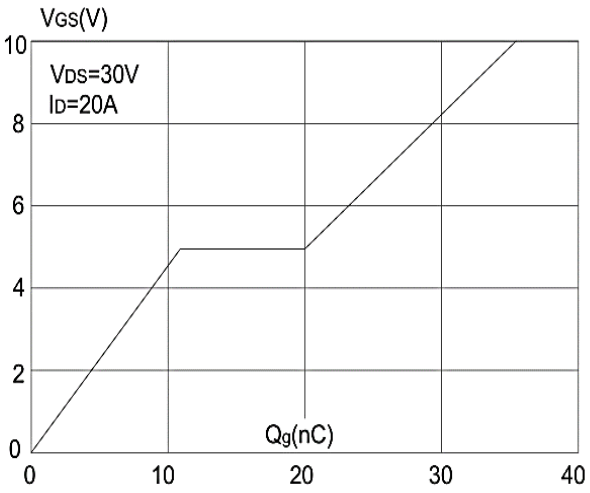


Figure 5: Gate Charge Characteristics

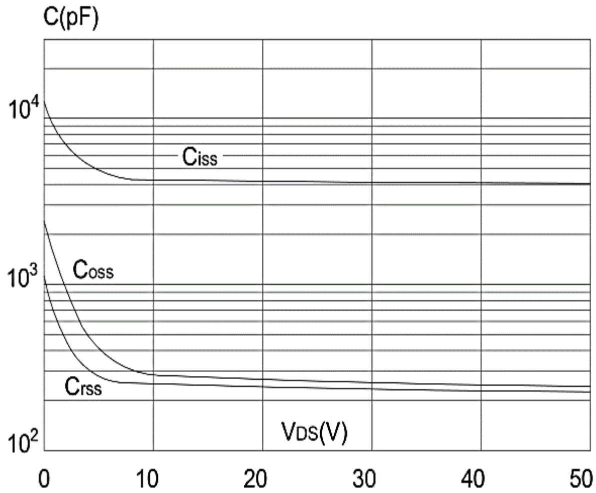


Figure 6: Capacitance Characteristics

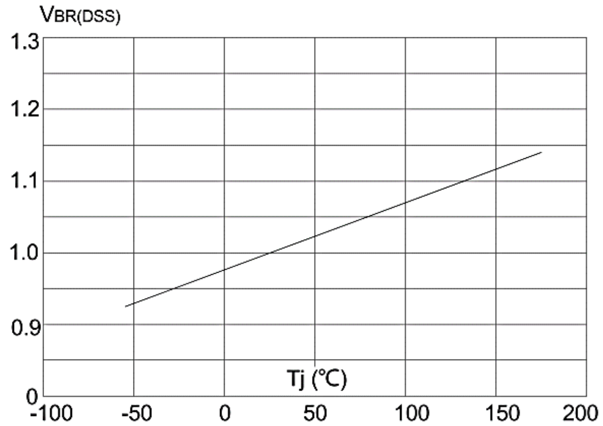


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

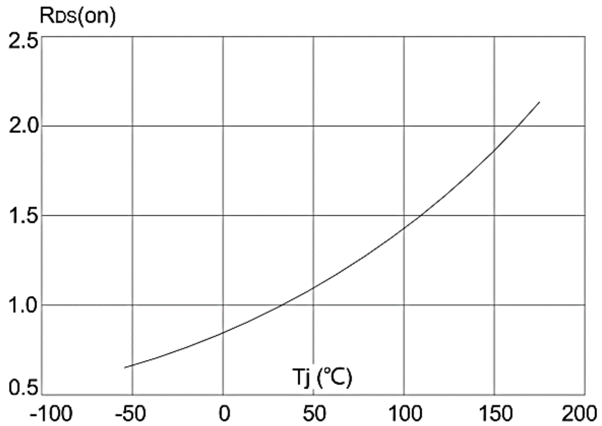


Figure 8: Normalized on Resistance vs. Junction Temperature

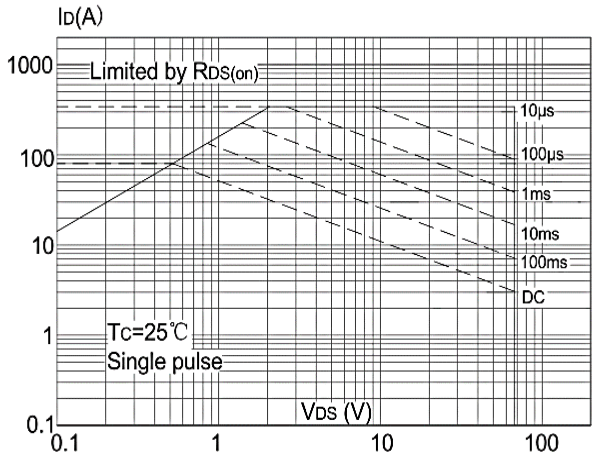


Figure 9: Maximum Safe Operating Area

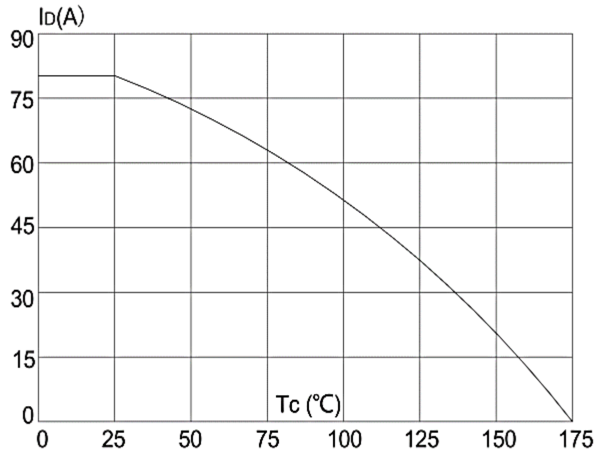


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

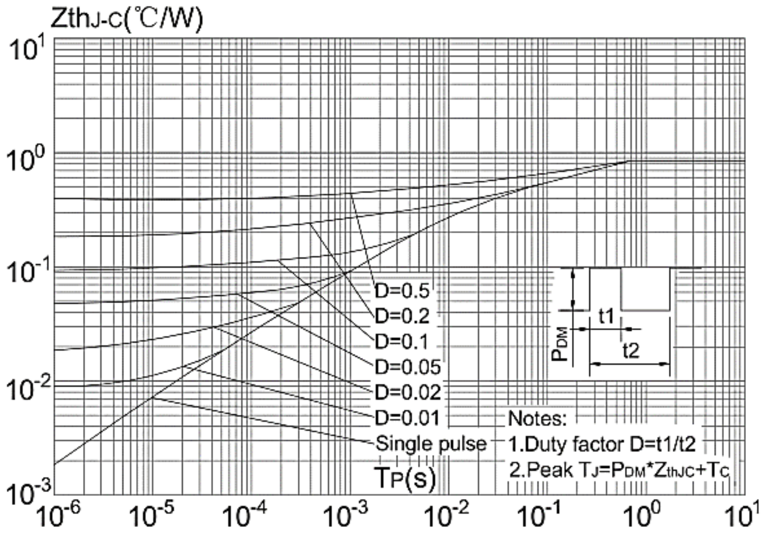
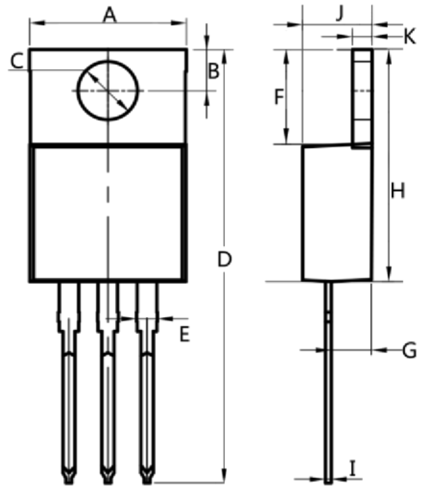


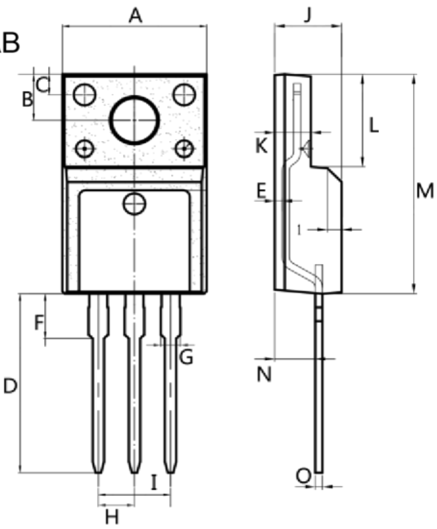
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

TO-220AB



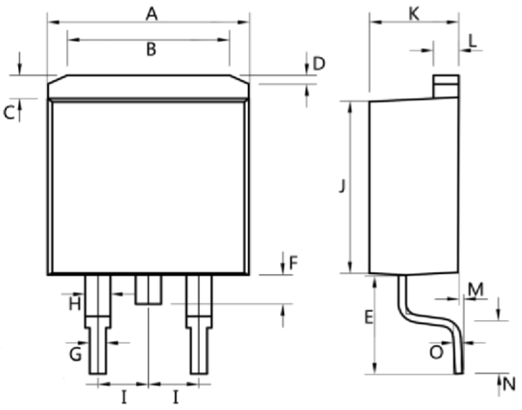
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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
RVE3.8	2018/12/21	Initial release
RVE3.9	2021/1/21	Reduce QG and CISS