

60V N-Channel Enhancement Mode MOSFET

Description

The AP80N06HP/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

$V_{DS} = 60V$ $I_D = 80A$

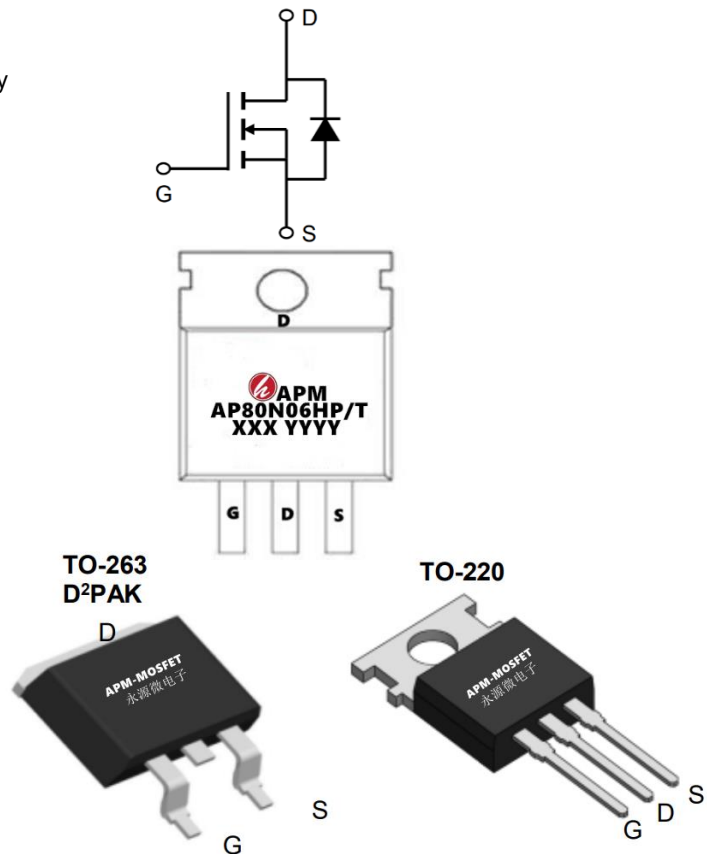
$R_{DS(ON)} < 8.5m\Omega$ @ $V_{GS}=10V$ (Type: 7.5m Ω)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80N06HP	TO-220-3L	AP80N06HP XXX YYYY	1000
AP80N06HT	TO-263-3L	AP80N06HT XXX YYYY	800

Absolute Maximum Ratings@ $T_j=25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain source voltage	60	V
V_{GS}	Gate source voltage	± 20	V
$I_D@T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	80	A
$I_D@T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	52	A
I_{DM}	Pulsed drain current ²⁾	250	A
I_S	Diode forward current	37	A
P_D	Power dissipation	70	W
EAS	Single pulsed avalanche energy ³⁾	100	mJ
T_{stg}, T_j	Operation and storage temperature	-55 to 150	$^\circ C$
$R_{\theta JC}$	Thermal resistance, junction-case	2.14	$^\circ C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient ⁴⁾	62.5	$^\circ C/W$



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Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	66	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V,	-	-	1.0	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	2.0	2.6	4.0	V
RDS(on)	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =30A	-	7.5	8.5	mΩ
Ciss	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	4018	-	pF
Coss	Output Capacitance		-	210	-	pF
Crss	Reverse Transfer Capacitance		-	116	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =30A, V _{GS} =10V	-	77	-	nC
Q _{gs}	Gate-Source Charge		-	14	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	15	-	nC
td(on)	Turn-on Delay Time	V _{DS} =30V, I _D =30A, R _G =1.8Ω, V _{GS} =10V	-	13	-	ns
t _r	Turn-on Rise Time		-	77	-	ns
td(off)	Turn-off Delay Time		-	50	-	ns
t _f	Turn-off Fall Time		-	106	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	80	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	250	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F =30A, dI/dt=100A/μs	-	25	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	30	-	nC

Note :

- 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 .The EAS data shows Max. rating .
- 3、 The test cond ≅ 300us duty cycle ≅ 2%, duty cycle ition is T_J =25°C , VDD =35V, VG =10V, R G =25Ω, L=0.5mH, IAS =20A
- 4、 The power dissipation is limited by 175°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

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Typical Characteristics

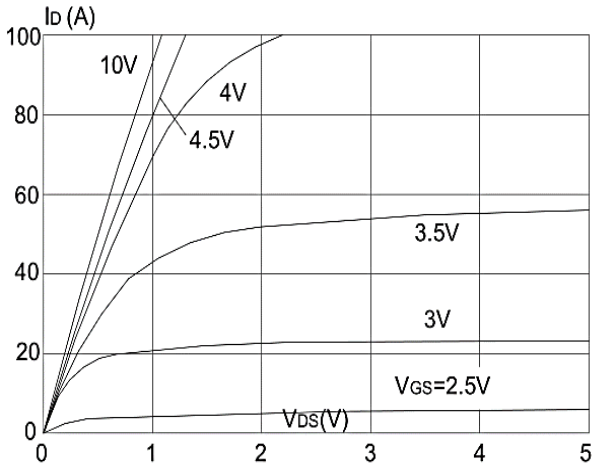


Figure 1: Output Characteristics

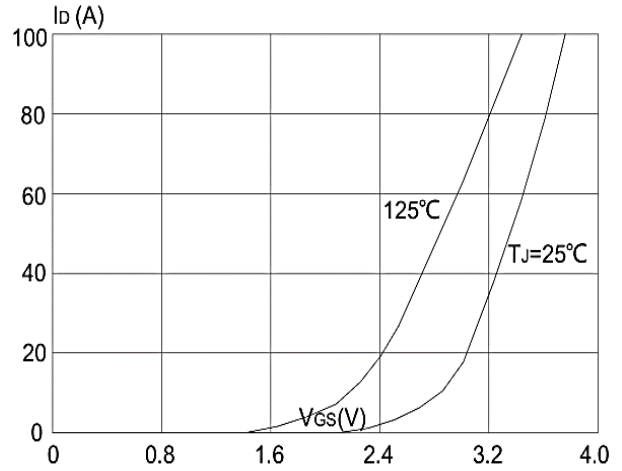


Figure 2: Typical Transfer Characteristics

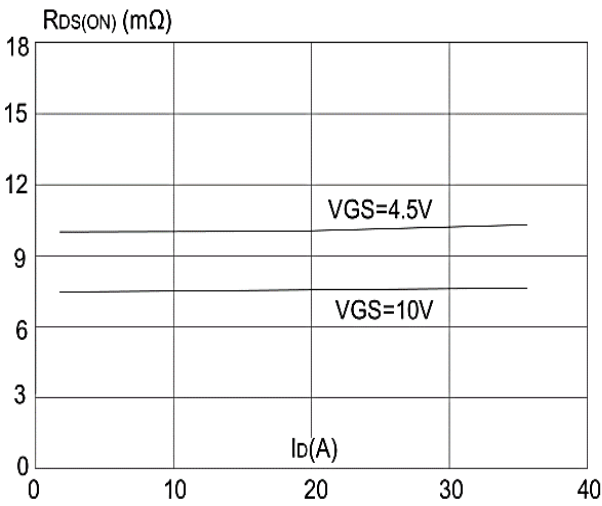


Figure 3: On-resistance vs. Drain Current

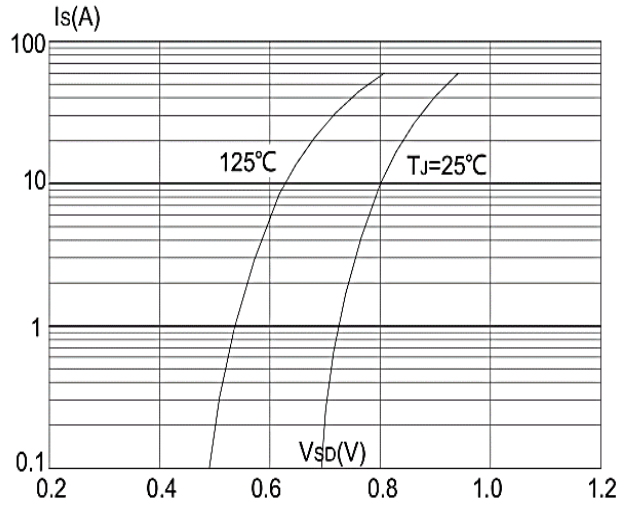


Figure 4: Body Diode Characteristics

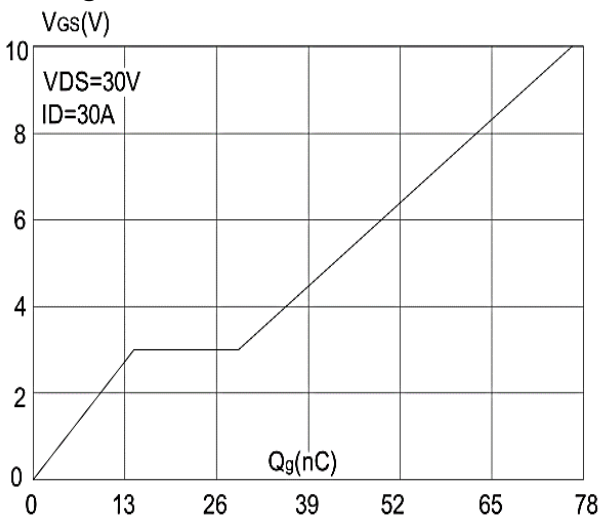


Figure 5: Gate Charge Characteristics

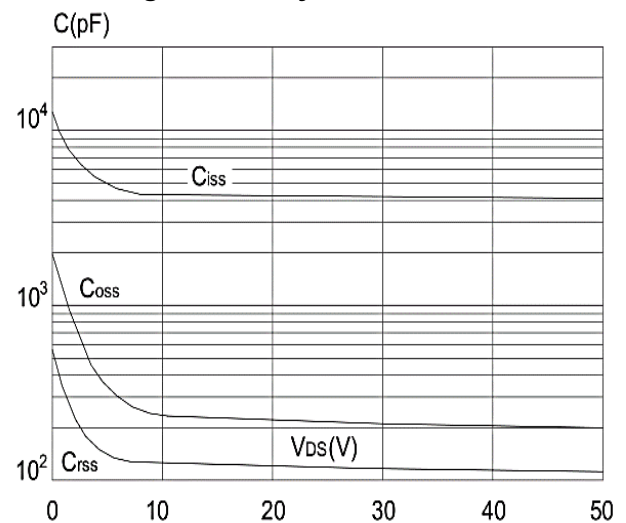


Figure 6: Capacitance Characteristics



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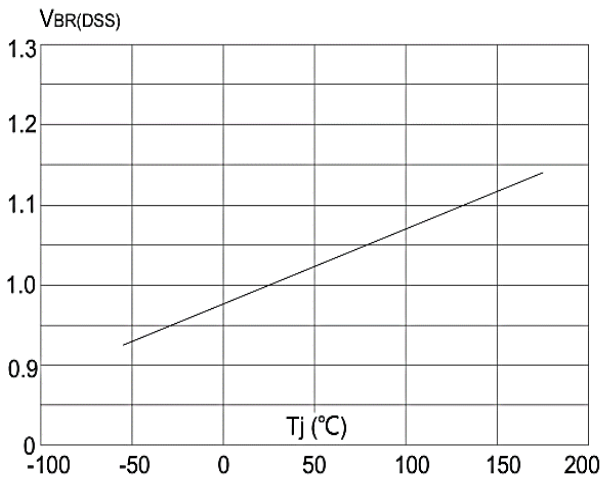


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

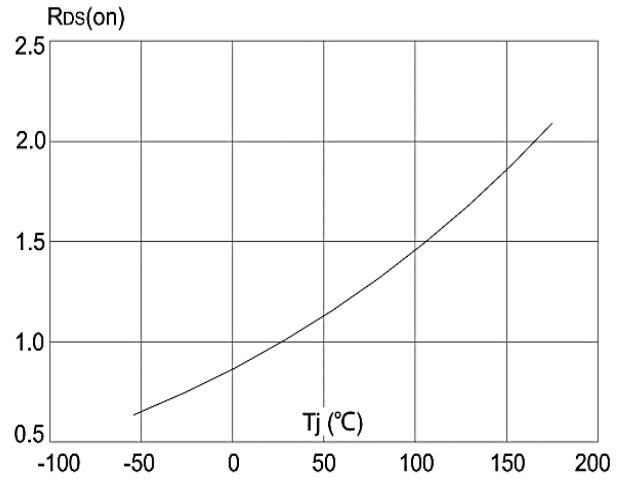


Figure 8: Normalized on Resistance vs. Junction Temperature

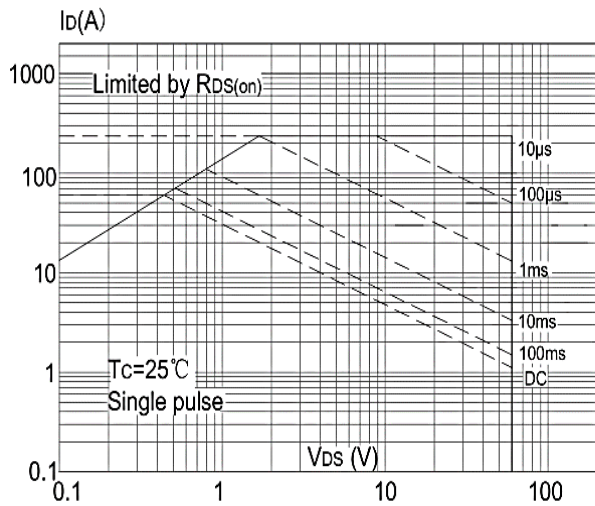


Figure 9: Maximum Safe Operating Area

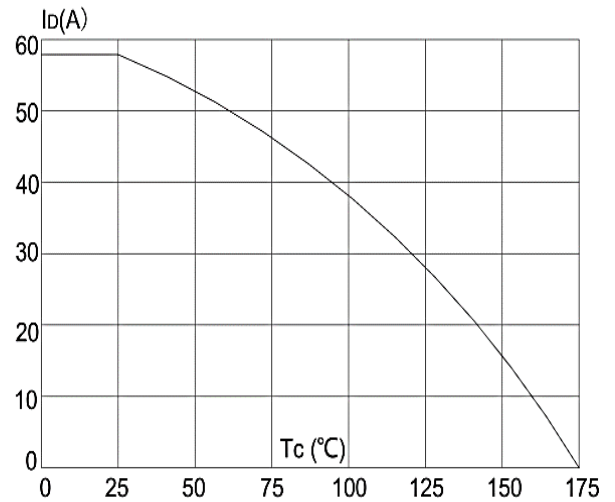


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

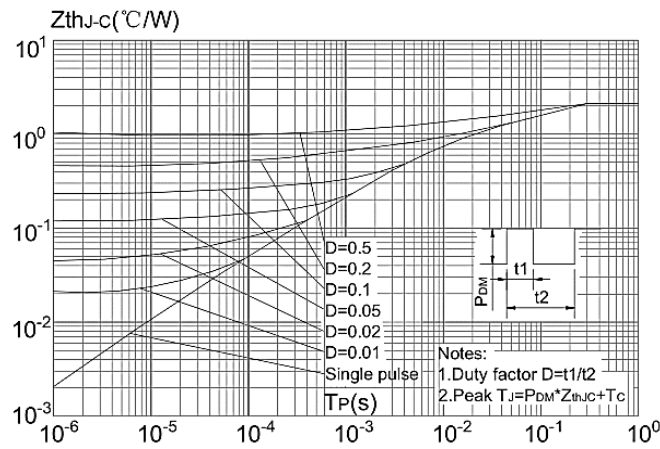
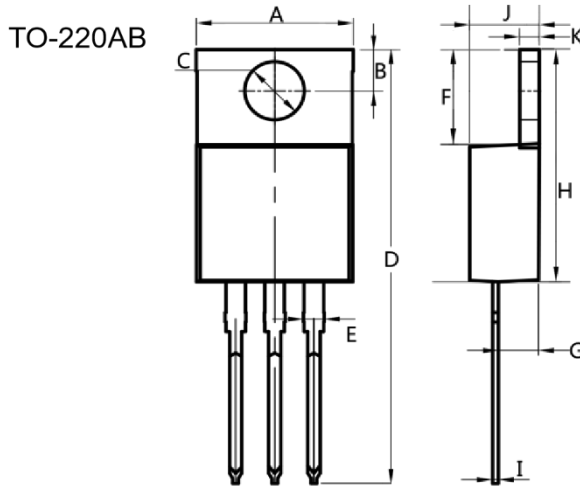
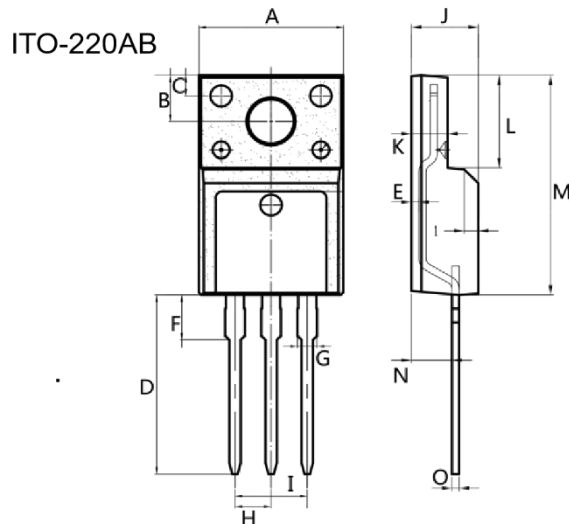


Figure.11: Maximum Effective Transient Thermal, Impedance, Junction-to-Ambien

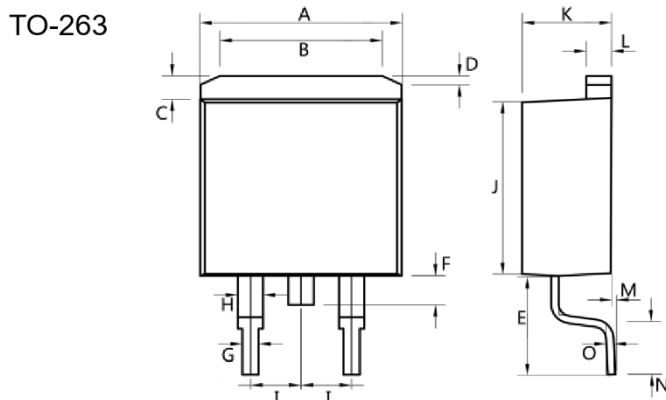
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Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		



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		



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		

60V N-Channel Enhancement Mode MOSFET**Attention**

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AP80N06P/T

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Edition	Date	Change
REV1.0	2022/7/15	Initial release

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