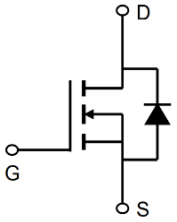
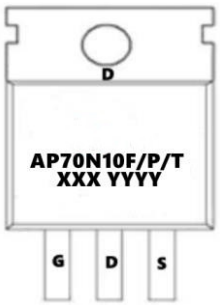
AP70N10F/P/T

100V N-Channel Enhancement Mode MOSFET

Description

The AP70N10F/P/T 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 =70A

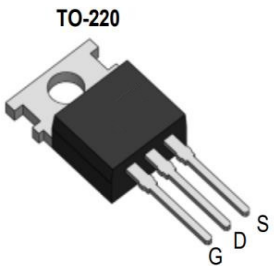
$R_{DS(ON)}$ < 22mΩ@ V_{GS}=10V （Type：16mΩ）

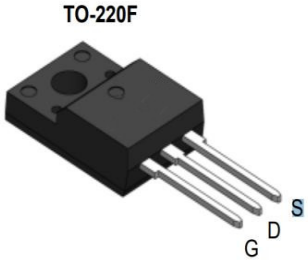
Application

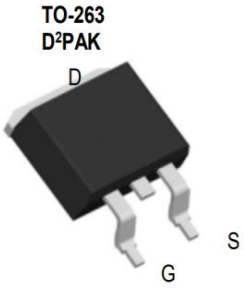
Automative lighting

Load switch

Uninterruptible power supply







Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP70N10F	TO-220F-3L	AP70N10F XXX YYYY	1000
AP70N10P	TO-220-3L	AP70N10P XXX YYYY	1000
AP70N10T	TO-263-3L	AP70N10T XXX YYYY	800

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	70	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	56	A
IDM	Pulsed Drain Current[1]	210	A
P_D@T_C=25℃	Total Power Dissipation	90	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	1.4	℃/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	110	---	V
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=30A	---	16	22	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
IDSS	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=30A	---	31	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.9	3.8	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=80V , V_{GS}=10V , I_D=30A	---	27.6	---	nC
Qgs	Gate-Source Charge		---	11.4	---	
Qgd	Gate-Drain Charge		---	7.9	---	
Td(on)	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3.3Ω, I_D=30A	---	16.5	---	ns
T_r	Rise Time		---	35	---	
Td(off)	Turn-Off Delay Time		---	17.5	---	
T_f	Fall Time		---	12	---	
Ciss	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	1890	---	pF
Coss	Output Capacitance		---	268	---	
Crss	Reverse Transfer Capacitance		---	67	---	
IS	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	58	A
ISM	Pulsed Source Current[2,5]		---	---	130	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V
trr	Reverse Recovery Time	IF=30A , dI/dt=100A/μs , T_J=25℃	---	22	---	nS
Q_{rr}	Reverse Recovery Charge		---	20	---	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 EAS data shows Max. rating . The test condition is VDD=72V,VGS=10V,L=0.1mH,IAS=40A

4、The power dissipation is limited by 150℃ junction temperature

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

Typical Characteristics

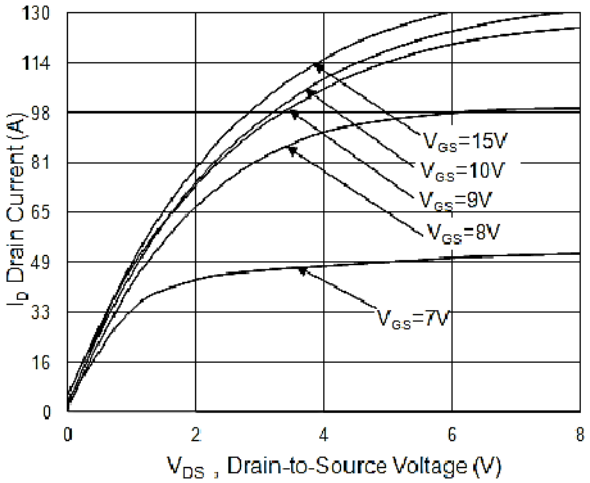

Fig.1 Typical Output Characteristics

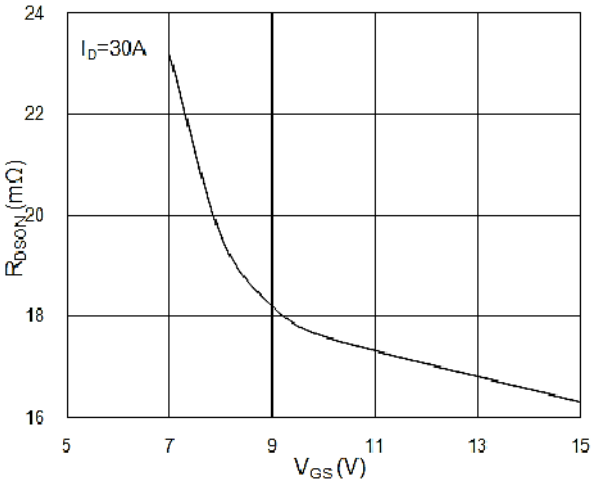

Fig.2 On-Resistance v.s Gate-Source

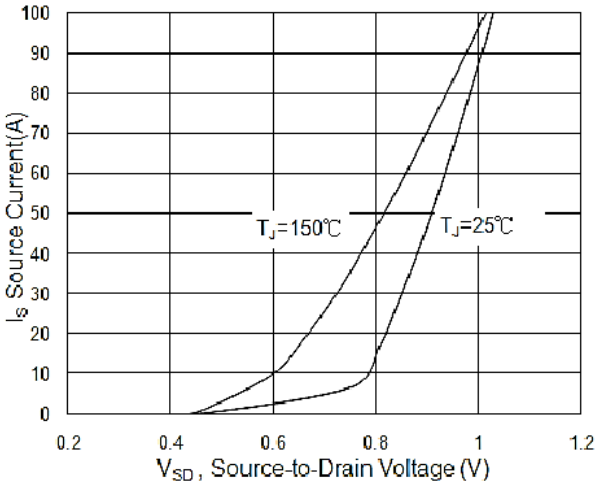

Fig.3 Forward Characteristics of Reverse

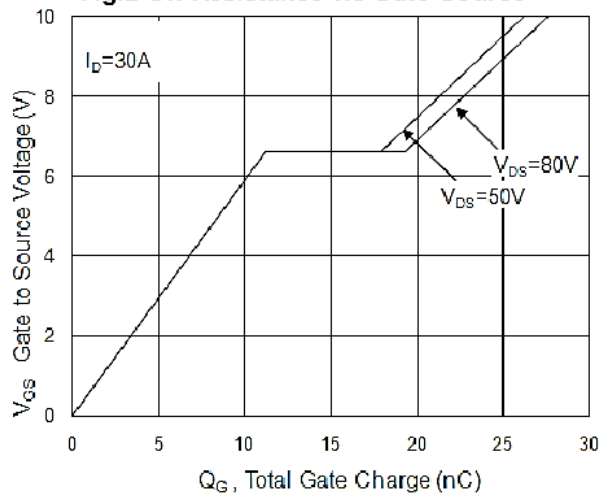

Fig.4 Gate-Charge Characteristics

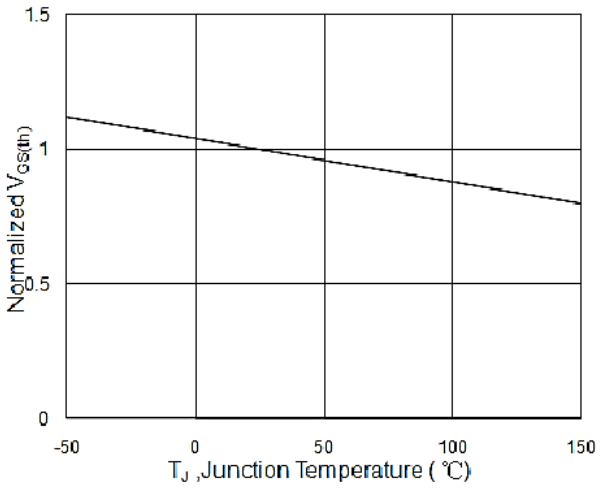

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

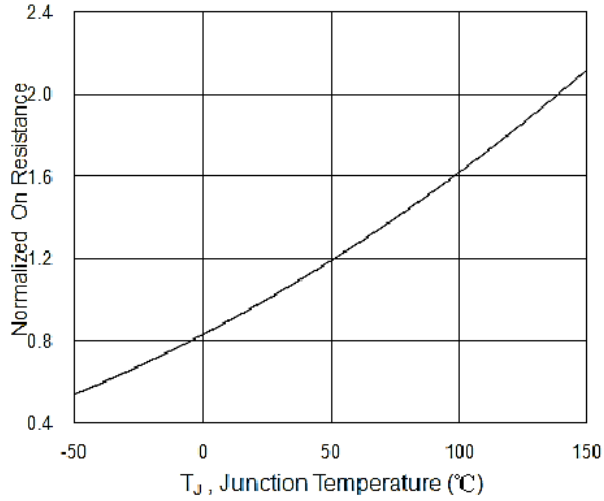

Fig.6 Normalized R_{DSON} vs. T_J

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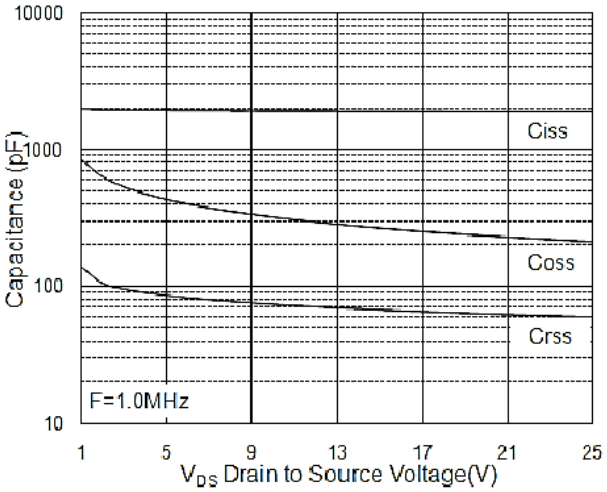

Fig.7 Capacitance

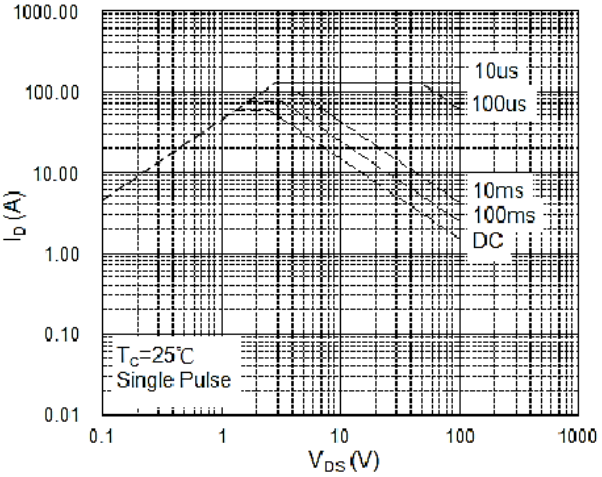

Fig.8 Safe Operating Area

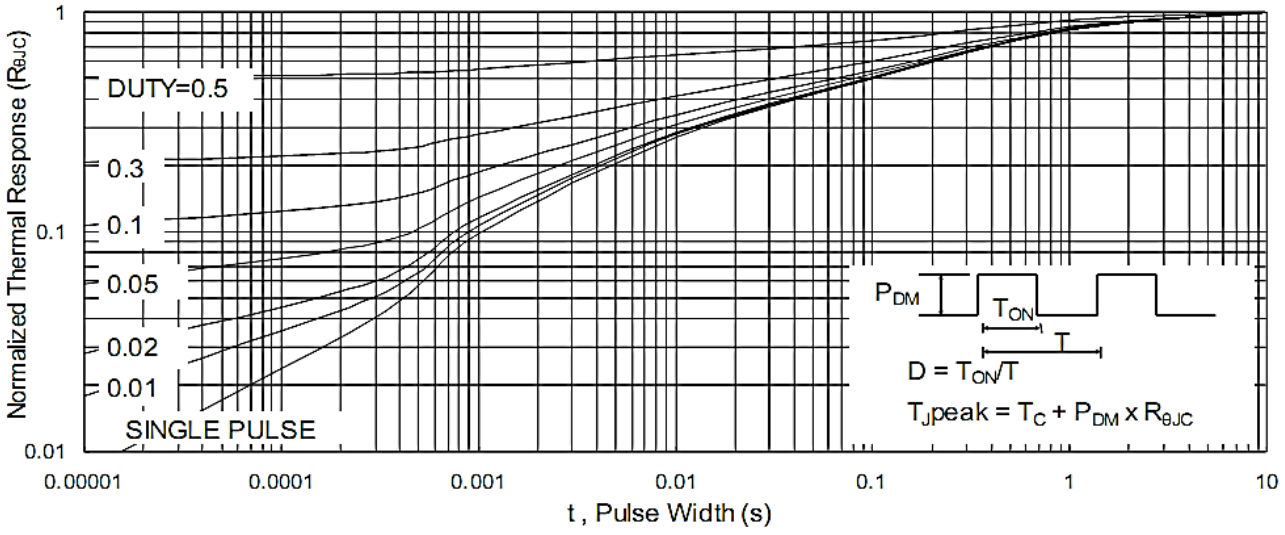

Fig.9 Normalized Maximum Transient Thermal Impedance

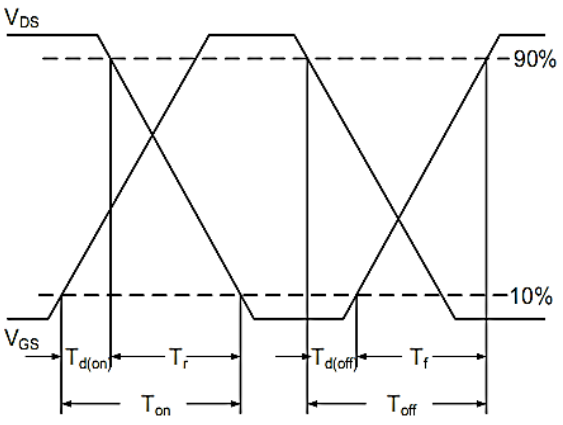

Fig.10 Switching Time Waveform

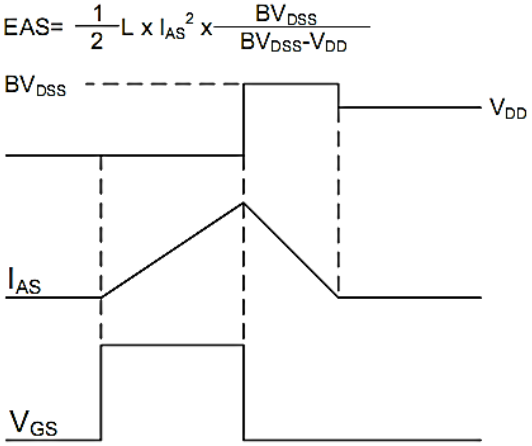

Fig.11 Unclamped Inductive Switching Waveform

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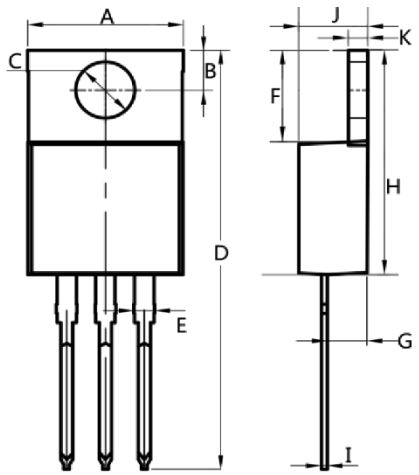
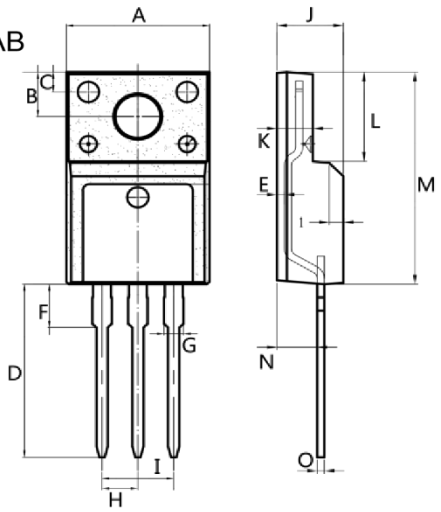
TO-220AB



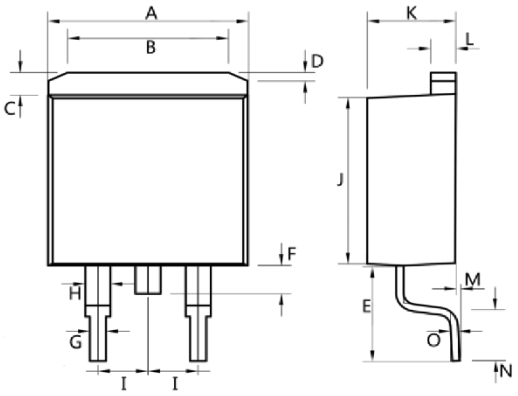
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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		