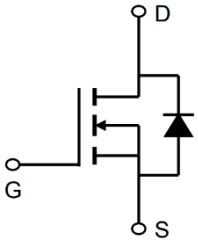
AP120N06P/T

65V N-Channel Enhancement Mode MOSFET

Description

The AP120N06P/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} = 65V I_D =125A

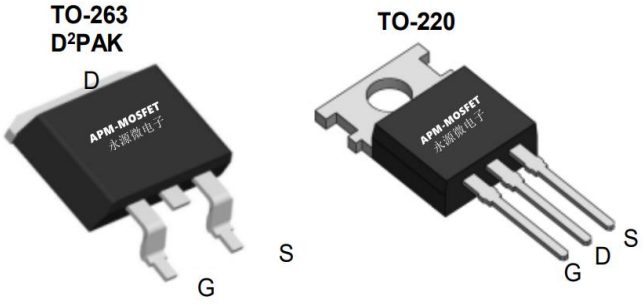
$R_{DS(ON)}$ < 5.6mΩ @ V_{GS}=10V （**Type：4.8mΩ**）

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP120N06P	TO-220-3L	AP120N06P XXX YYYY	1000
AP120N06T	TO-263-3L	AP120N06T XXX YYYY	800

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Value	Unit
VDS	Drain source voltage	65	V
VGS	Gate source voltage	±25	V
ID	Continuous drain current[1)]	125	A
IDM	Pulsed drain current[2)]	492	A
IAS	Diode forward current	55	A
P_D	Power dissipation	172	W
EAS	Single pulsed avalanche energy[)]	225	mJ
Tstg，Tj	Operation and storage temperature	-55 to 150	℃
RθJC	Thermal resistance, junction-case	1.4	℃/W
RθJA	Thermal resistance, junction-ambient[4)]	62.5	℃/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	65	72	-	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	2.8	4.0	V
RDS(on)	Static Drain-Source on-Resistance note	V_{GS}=10V, I_D=55A	-	4.8	5.6	mΩ
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1.0MHz	-	3135	-	pF
Coss	Output Capacitance		-	521	-	pF
Crss	Reverse Transfer Capacitance		-	306	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=55A, V_{GS}=10V	-	77	-	nC
Q_{gs}	Gate-Source Charge		-	18	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	30	-	nC
td(on)	Turn-on Delay Time	V_{DS}=30V, I_D=55A, R_G=1.8Ω, V_{GS}=10V	-	15	-	ns
t_r	Turn-on Rise Time		-	89	-	ns
td(off)	Turn-off Delay Time		-	36	-	ns
t_f	Turn-off Fall Time		-	91	-	ns
IS	Maximum Continuous Drain to Source Diode ForwardCurrent		-	-	123	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	492	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=550A, dI/dt=100A/μs	-	32	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	31	-	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 =55A
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.

Electrical Characteristics Diagrams

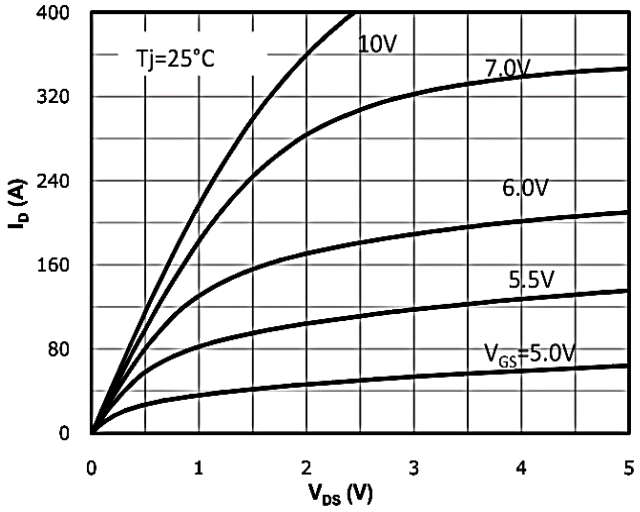

Figure1: Output Characteristics

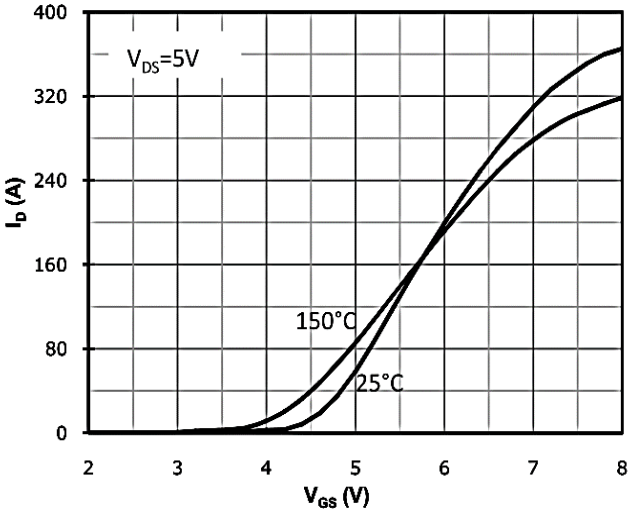

Figure 2: Typical Transfer Characteristics

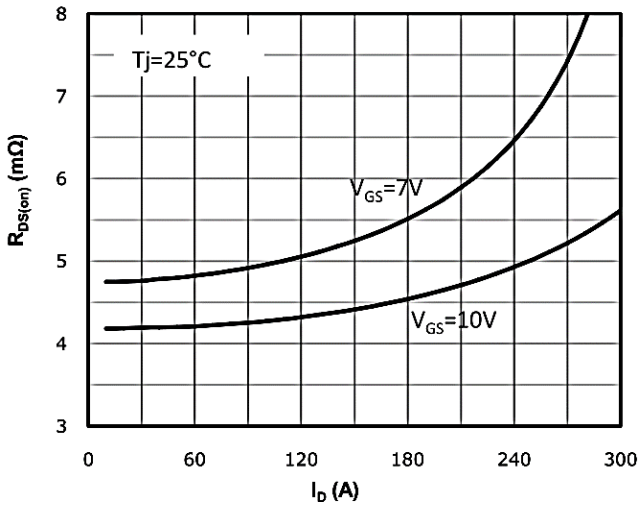

Figure 3: Rds(on) vs Drain Current and

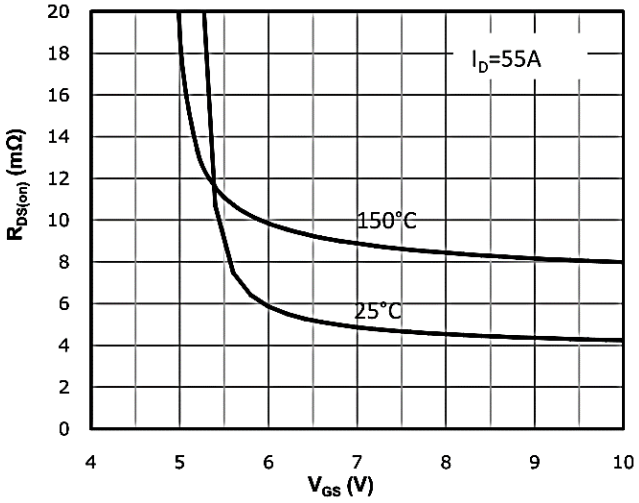

Figure 4: Rds(on) vs Gate Voltage

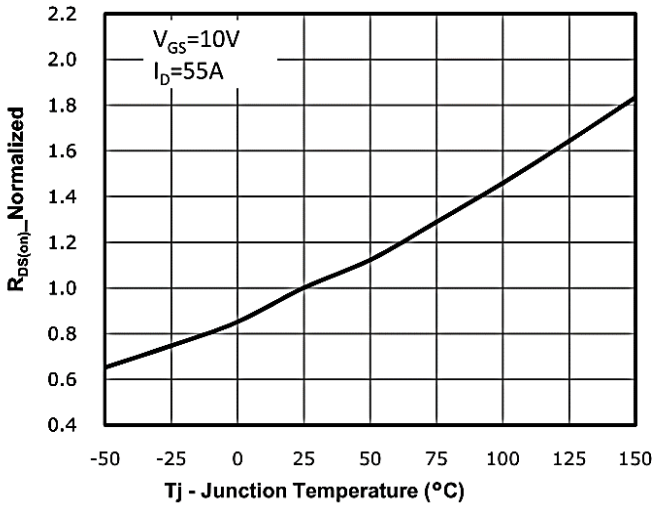

Figure 5: Rds(on) vs. Temperature

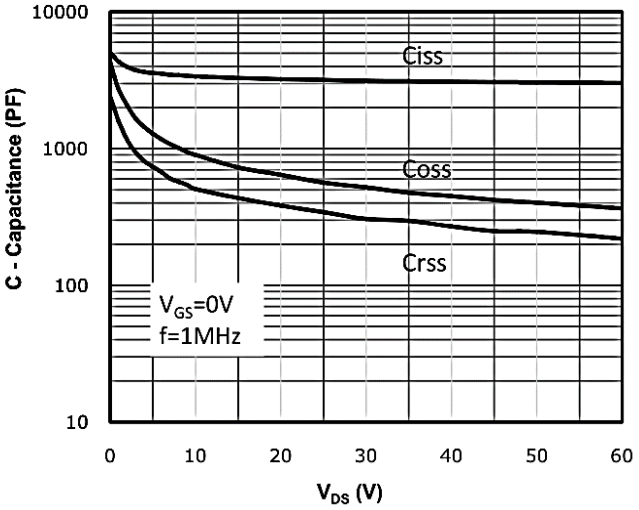

Figure 6: Capacitance Characteristics

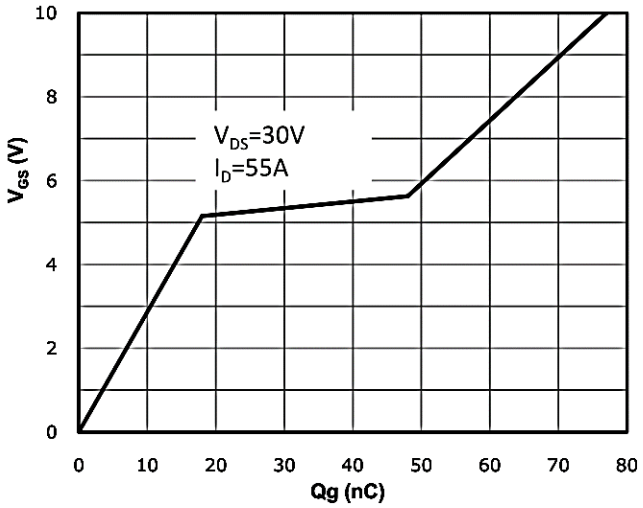

Figure 7: Gate Charge Characteristics

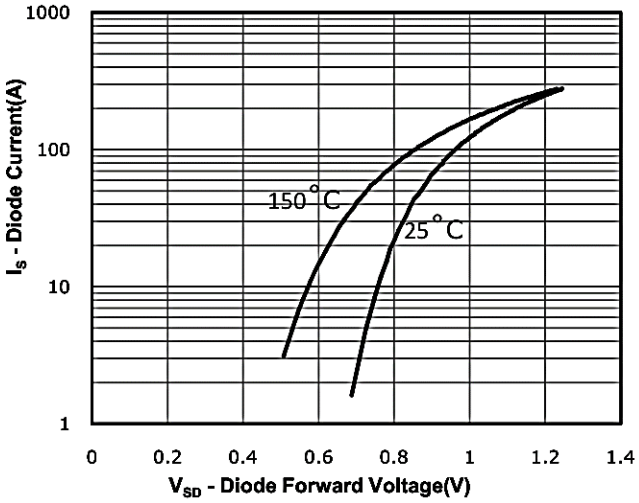

Figure 8: Body-diode Forward Characteristics

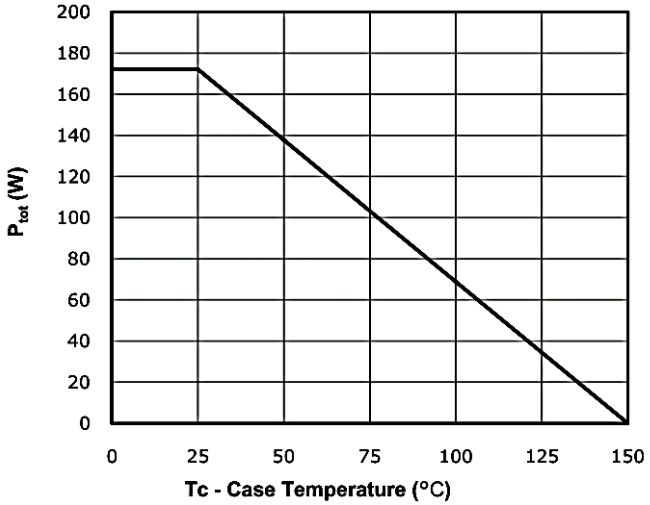

Figure 9: Power Dissipation

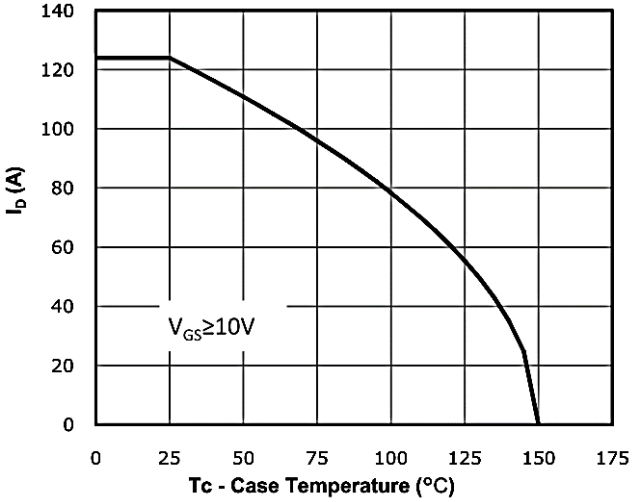

Figure 10: Drain Current Derating

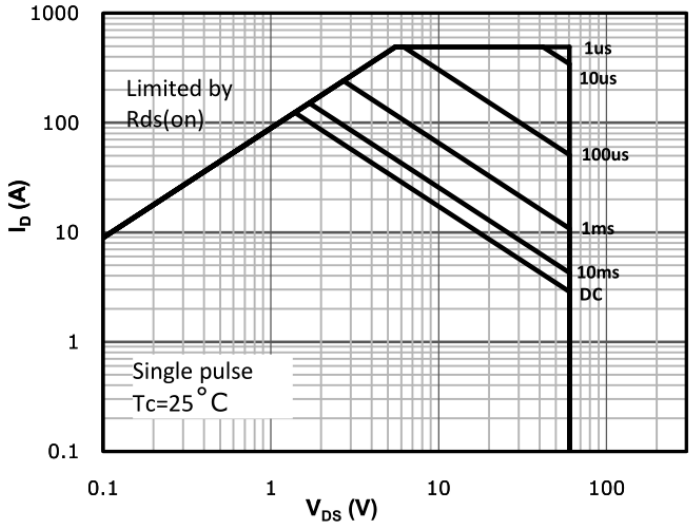

Figure.11: Safe Operating Area

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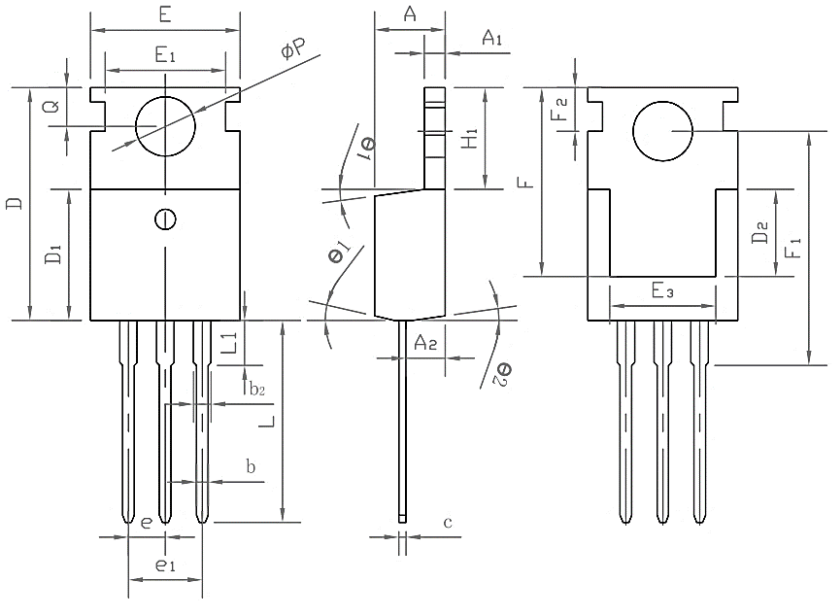
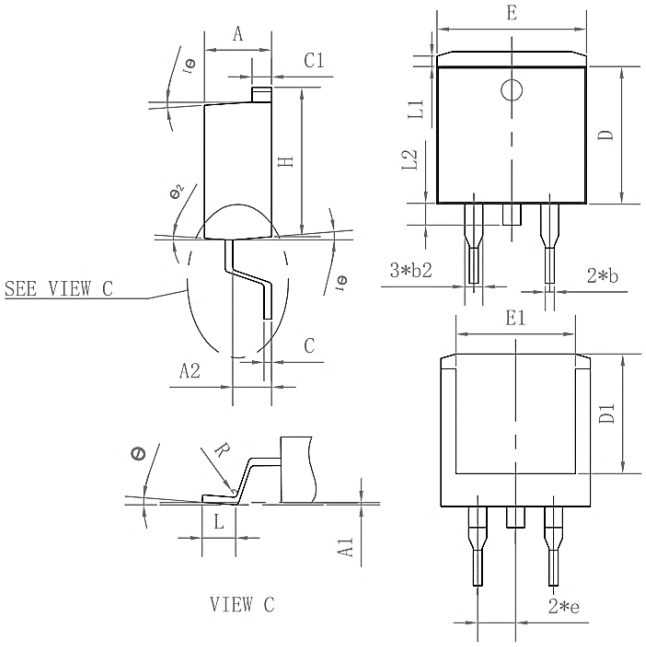
Package Mechanical Data-TO-220-3L-SLK



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.10	2.40	2.70
b	0.70	0.80	1.00
b2	1.17	1.27	1.50
D	0.40	0.50	0.65
D1	8.80	9.10	9.40
D2	5.70	6.70	7.00
E	9.70	10.00	10.30
E1	-	8.70	-
E2	9.63	10.00	10.35
E3	7.00	8.00	8.40
e	0.37		
e1	0.10		
H1	6.00	6.50	6.85
L	12.75	13.50	13.90
L1	-	3.10	3.40
Φp	3.45	3.60	3.75
Q	2.60	2.80	3.00
θ1	4°	7°	10°
θ2	0°	3°	6°
F	13.30	13.50	13.70
F1	15.50	15.90	16.30
F2	2.80	3.00	3.20

Package Mechanical Data-TO-263-3L-SLK



Symbol	Common		
	mm		
	Mim	Nom	Max
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.70
b	0.70	0.80	1.00
b2	1.25	1.36	1.50
C	0.45	0.50	0.65
C1	1.29	1.30	9.40
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
Θ1	4°	7°	10°
Θ2	0°	3°	6°

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Edition	Date	Change
Rve1.0	2021/12/14	Initial release

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