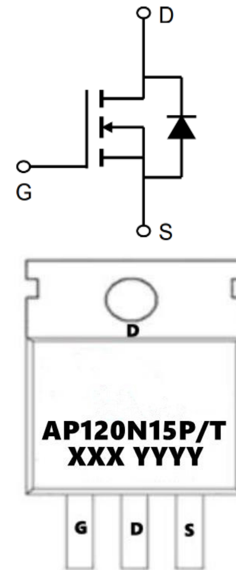
AP120N15P/T

150V N-Channel Enhancement Mode MOSFET

Description

The AP120N15P/T uses advanced SGTⅠtechnology 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} = 150V I_D =120A

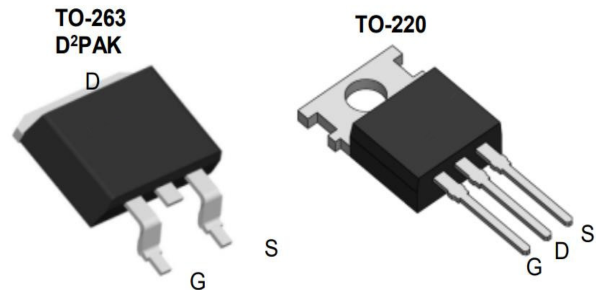
$R_{DS(ON)}$ < 12mΩ @ V_{GS}=10V **(Type：9.5mΩ)**

Application

DC/DC Converter

LED Backlighting

Power Management Switches



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP120N15P	TO-220-3L	AP120N15P XXX YYYY	1000
AP120N15T	TO-263-3L	AP120N15T XXX YYYY	800

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	150	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	120	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	80	A
IDM	Pulsed Drain Current	360	A
EAS	Single Pulse Avalanche Energy	406	mJ
IAS	Avalanche Current	43	A
P_D@T_C=25℃	Total Power Dissipation[4]	160	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient	0.78	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case	62	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VDSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	150	168	-	V
IGSS	Gate-body Leakage current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T_J=25°C	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
IDSS	Zero Gate Voltage Drain Current T_J=100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.5	3.5	4.5	V
RDS(on)	Drain-Source on-Resistance[2]	V_{GS} = 10V, I_D = 20A	-	9.5	12	mΩ
Ciss	Input Capacitance	V_{DS} = 25V, V_{GS} =0V, f =100KHz	-	5469	-	pF
Coss	Output Capacitance		-	1702	-	
Crss	Reverse Transfer Capacitance		-	186	-	
R_g	Gate Resistance	V_{GS} = 0V, V_{DS} = 0V, f =1MHz	-	1.7	-	Ω
Q_g	Total Gate Charge	VGS =10 V, VDS =80 V, ID =40 A	-	65.5	-	nC
Qgs	Gate-Source Charge		-	26	-	
Qgd	Gate-Drain Charge			17.2	-	
td(on)	Turn-on Delay Time	VGS =10 V, VDS =80 V, RG =2Ω, ID =40A	-	36	-	ns
t_r	Rise Time		-	95	-	
td(off)	Turn-off Delay Time		-	56	-	
t_f	Fall Time		-	11	-	
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	-	-	120	A
trr	Body Diode Reverse Recovery Time	VR =80 V, IS =40 A, di/dt=100 A/μs	-	76	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	285	-	nC

Notes:

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 ≤ 300us , duty cycle ≤ 2%

3、The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=35A

4、The power dissipation is limited by 150°C 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

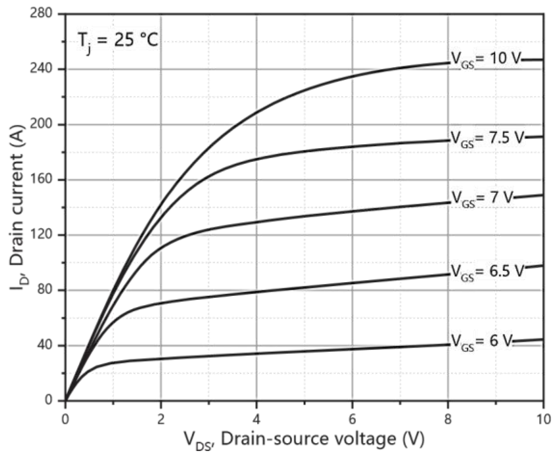


Figure 1. Type. output characteristics

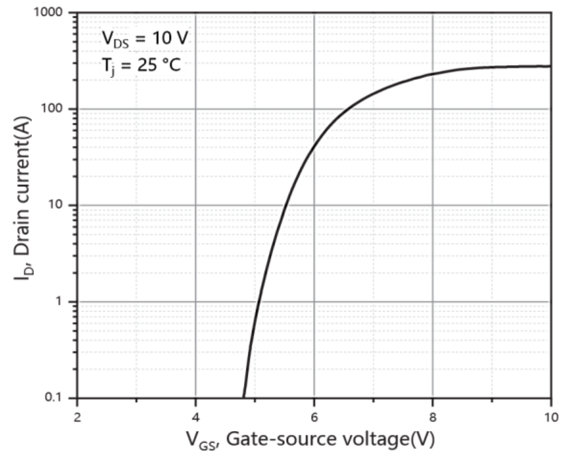


Figure 2. Type. transfer characteristics

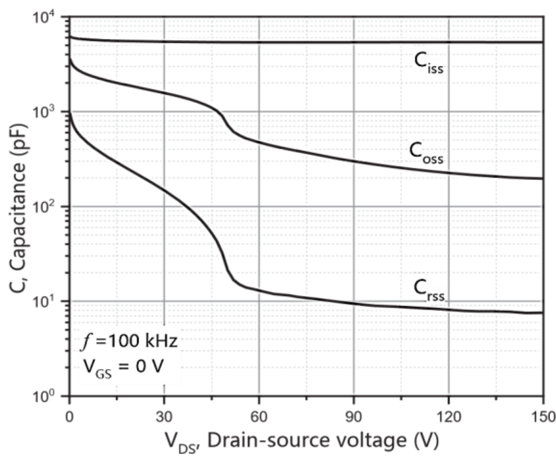


Figure 3. Type. capacitances

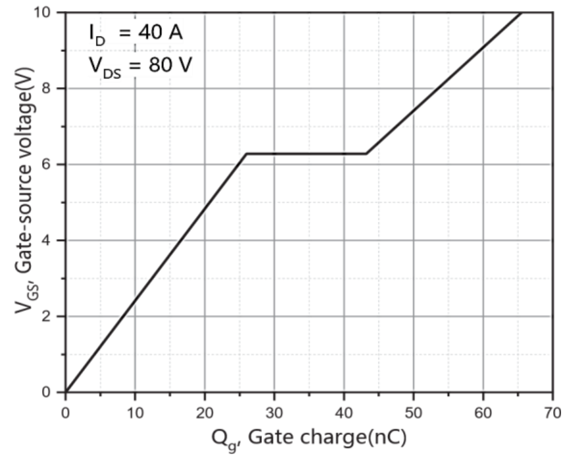


Figure 4. Type. gate charge

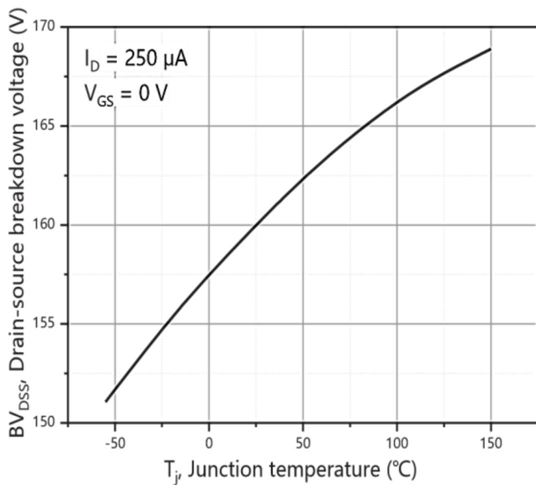


Figure 5. Drain-source breakdown voltage

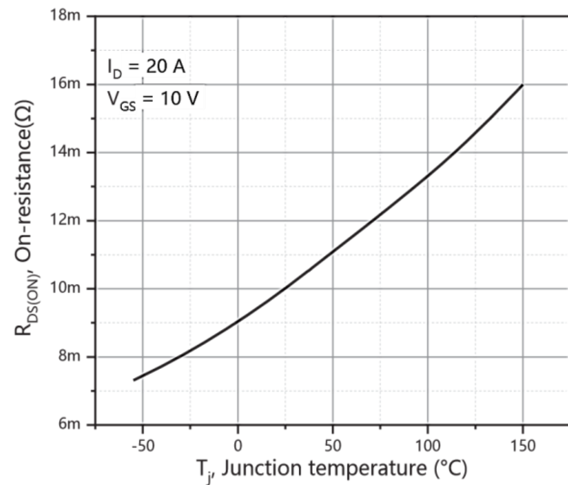


Figure 6. Drain-source on-state resistance

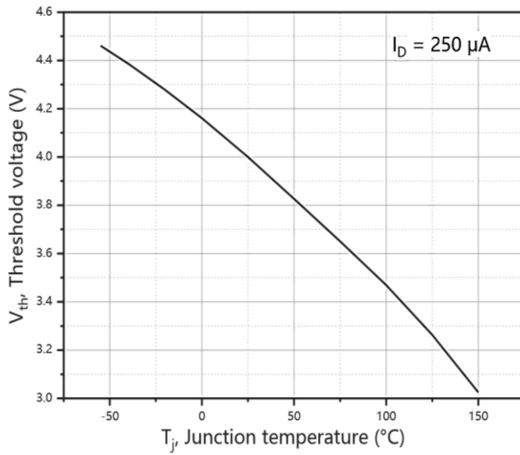


Figure 7. Threshold voltage

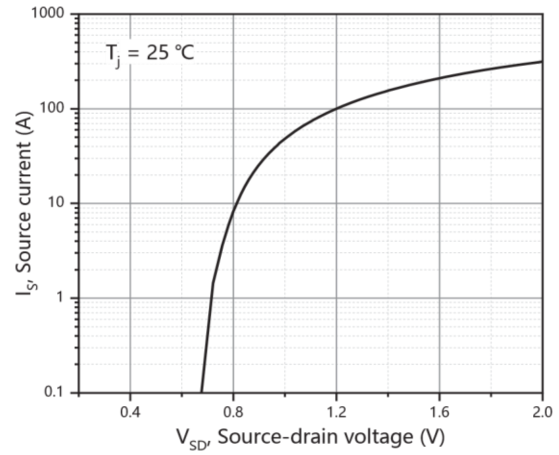


Figure 8. Forward characteristic of body diode

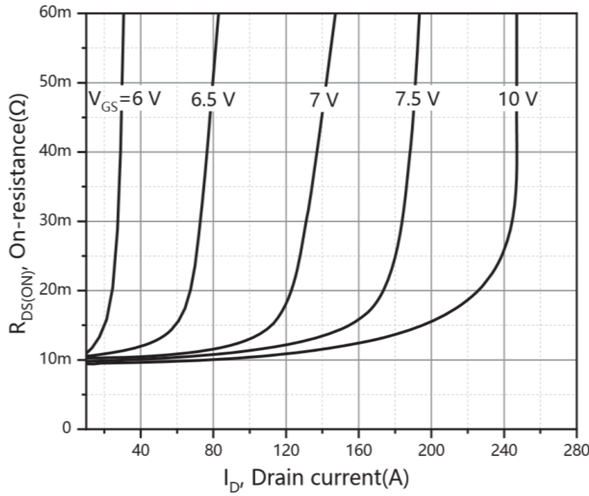


Figure 9. Drain-source on-state resistance

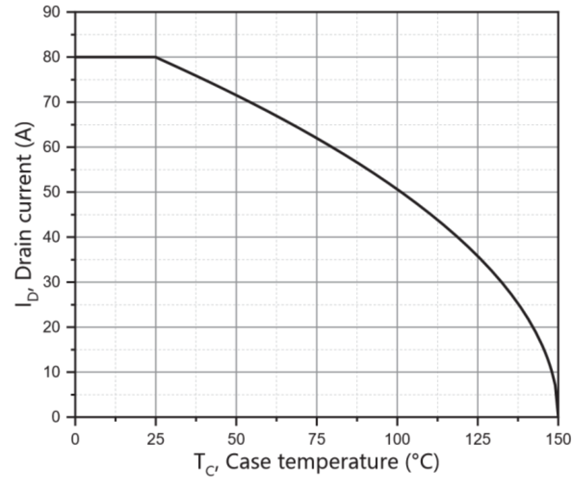


Figure 10. Drain current

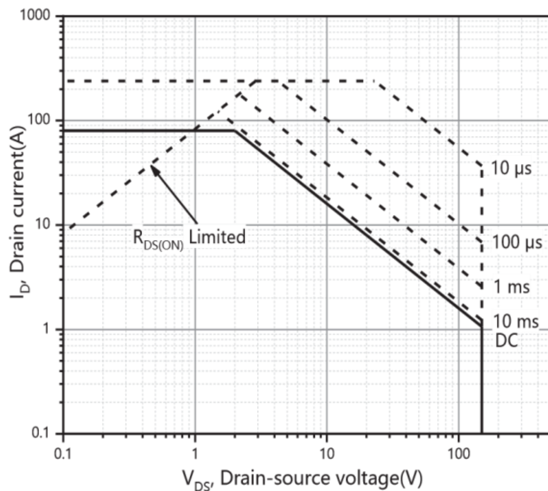


Figure 11. Safe operation area T_C=25₵

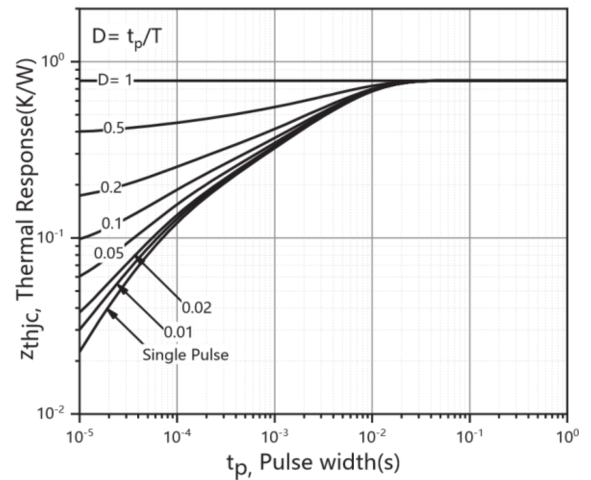
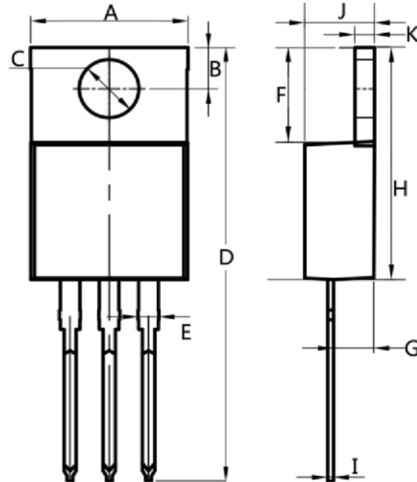


Figure 12. Max. transient thermal impedance

AP120N15P/T

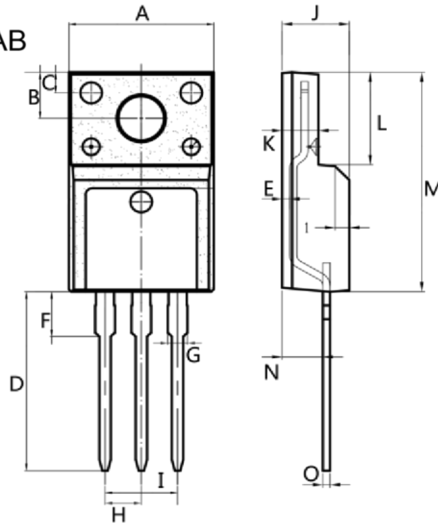
150V N-Channel Enhancement Mode MOSFET

TO-220AB



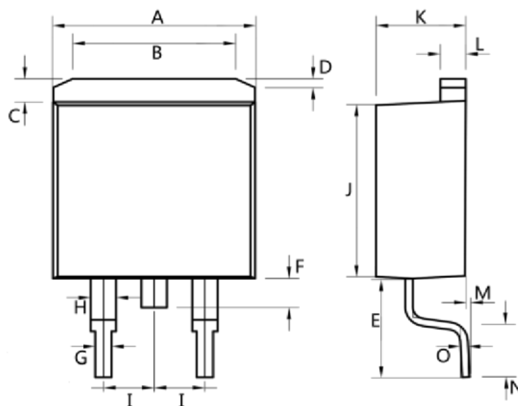
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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		