
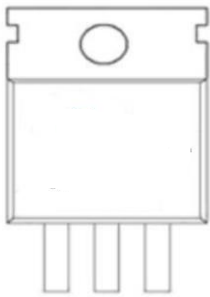


TM60120P

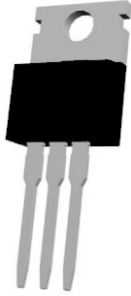
N-Channel Enhancement Mosfet

<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = 60V$ $I_D = 120A$ $R_{DS(ON)} = 4.5m\Omega$(typ.) @ $V_{GS} = 10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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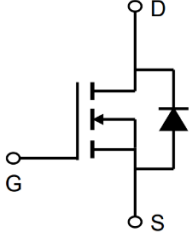


Marking: 120N06P

P:TO-220AB



G D S



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$	120	A
	Continuous Drain Current- $T_C=100^\circ C$	68	
I_{DM}	Pulsed Drain Current	340	
P_D	Power Dissipation	130	W
E_{AS}	Single pulse avalanche energy ^(Note 5)	380	$^\circ C$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ^(Note 2)	1.15	$^\circ C/W$

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N-Channel Enhancement Mosfet

Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	60		---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ^(Note 3)						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	2	3	4	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =30A	---	4.5	6	mΩ
Dynamic Characteristics ^(Note 4)						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	4000	---	pF
C _{oss}	Output Capacitance		---	350	--	
C _{rss}	Reverse Transfer Capacitance		---	300	---	
Switching Characteristics ^(Note 4)						
t _{d(on)}	Turn-On Delay Time	V _{DS} =30V, R _G =3 Ω V _{GS} =10V, R _L =1.5 Ω	---	12	---	ns
t _r	Rise Time		---	10	---	ns
t _{d(off)}	Turn-Off Delay Time		---	21	---	ns
t _f	Fall Time		---	7	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =20A	---	32	---	nC
Q _{gs}	Gate-Source Charge		---	11.2	---	nC
Q _{gd}	Gate-Drain "Miller" Charge		---	7.5	---	nC
Drain-Source Diode Characteristics						
I _S	Maximum Continuous Drain to Source Diode Forward Current ^(Note 2)		---	---	120	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		---	---	340	A
V _{SD}	Diode Forward Voltage ^(Note 3)	V _{GS} =0V, I _{SD} =30A	---	---	1.2	V
T _{rr}	Reverse Recovery Time	I _F =20A, dI/dt=100A/us	---	18	---	NS
Q _{rr}	Reverse Recovery Charge		---	58	---	NC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25Ω

Typical Operating Characteristics

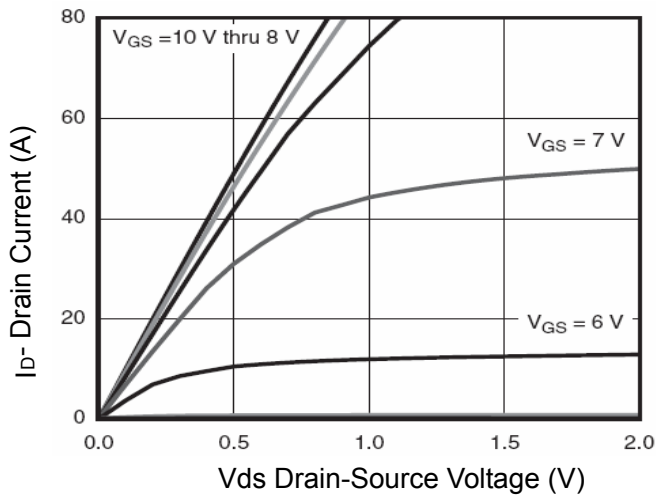


Figure 1 Output Characteristics

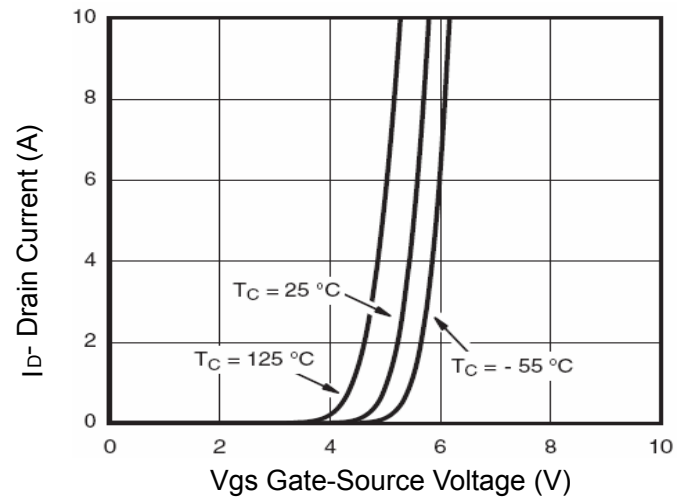


Figure 2 Transfer Characteristics

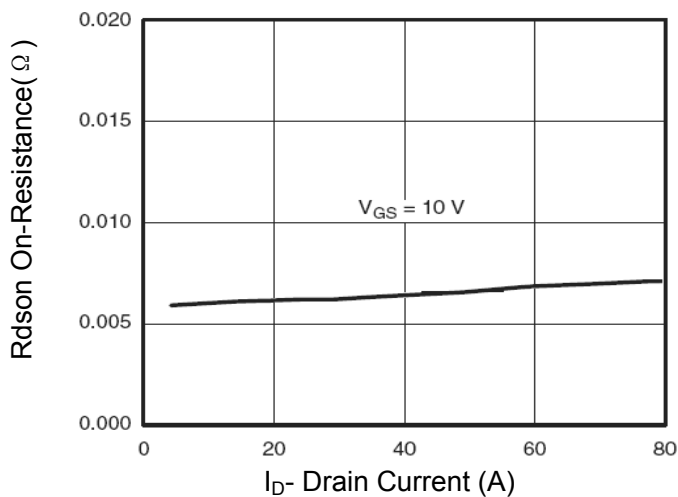


Figure 3 Rdson- Drain Current

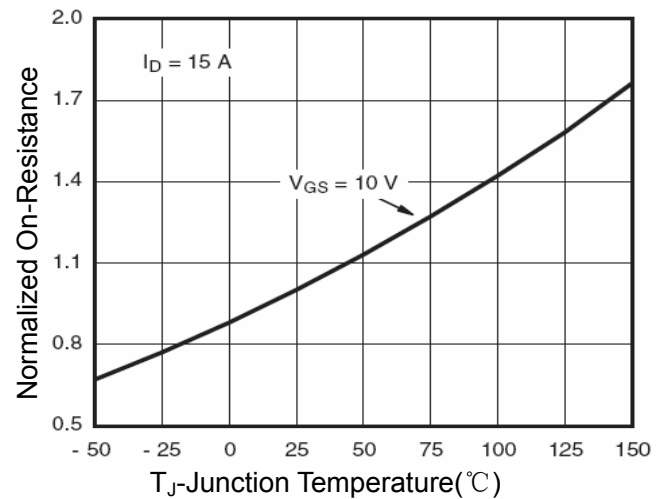


Figure 4 Rdson-Junction Temperature

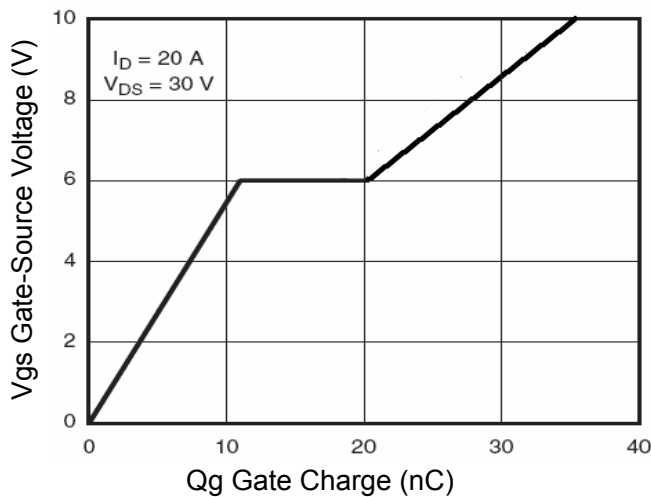


Figure 5 Gate Charge

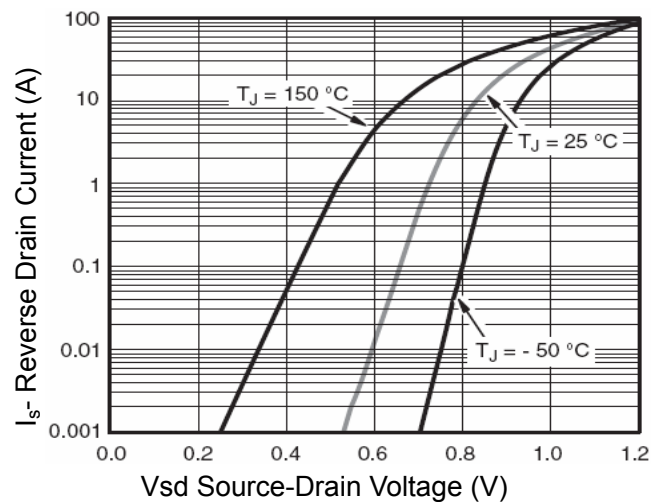


Figure 6 Source- Drain Diode Forward



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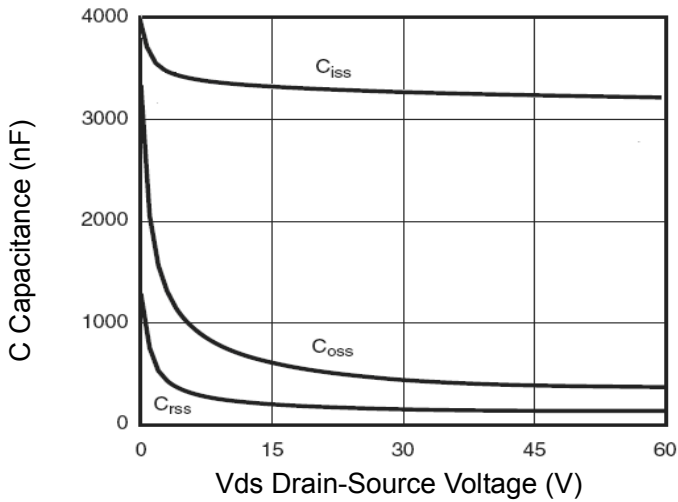


Figure 7 Capacitance vs Vds

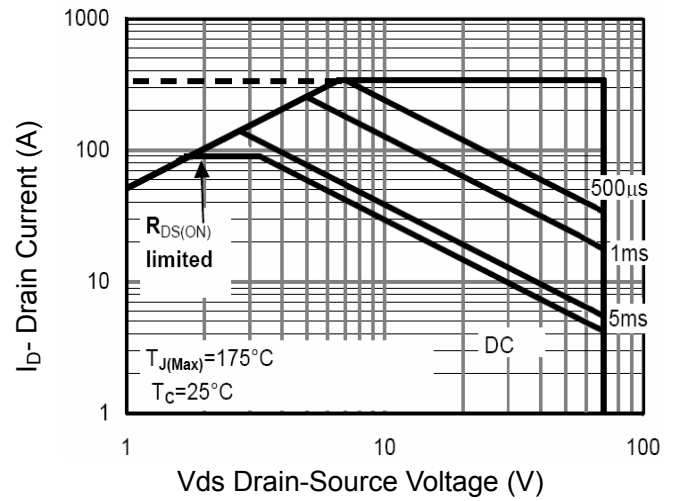


Figure 8 Safe Operation Area

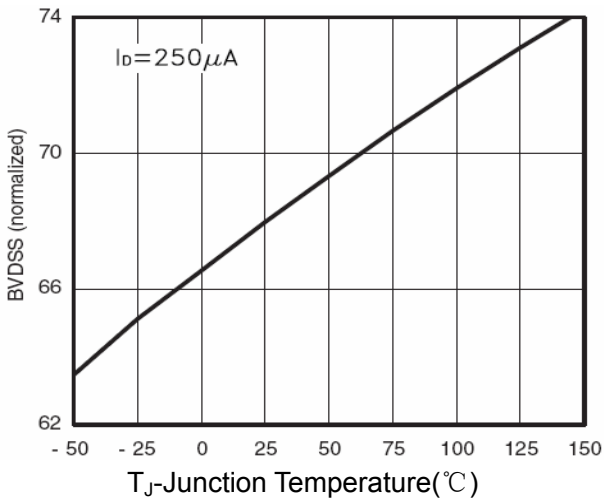


Figure 9 BV_{DSS} vs Junction Temperature

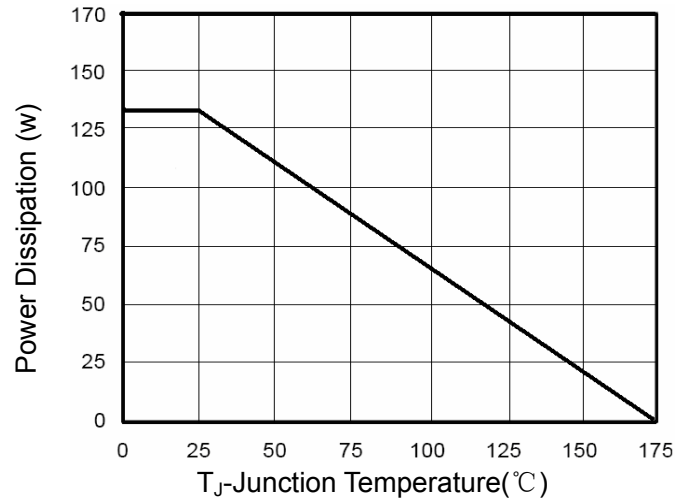


Figure 10 Power De-rating

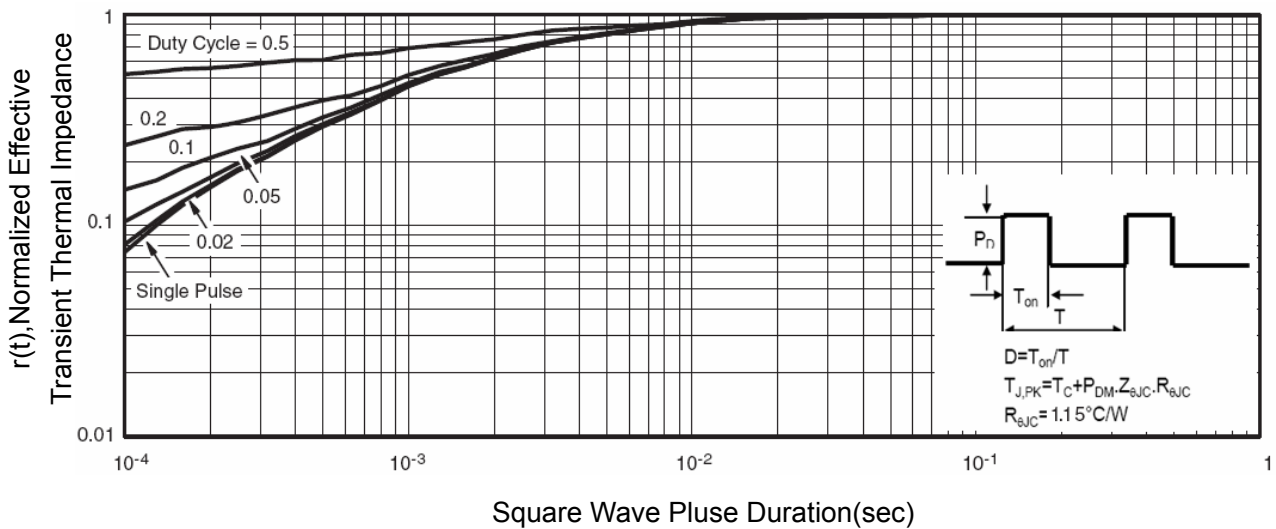
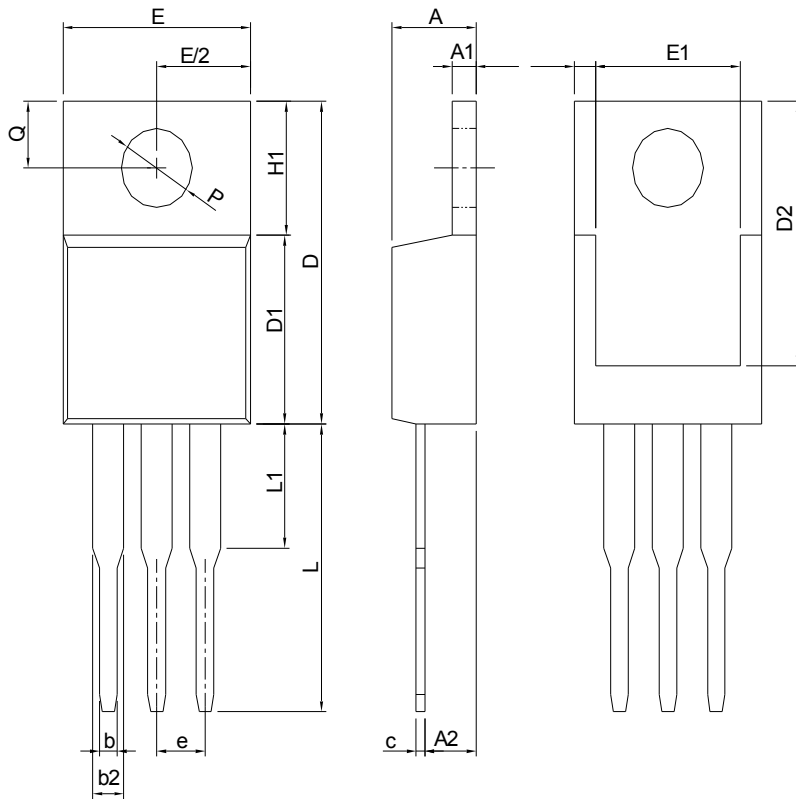


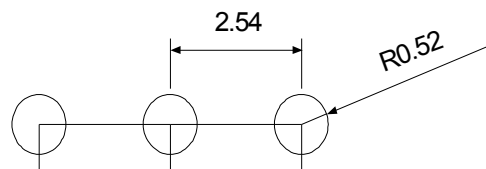
Figure 11 Normalized Maximum Transient Thermal Impedance

Package Information: TO-220AB



DIMENSIONS	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	8.89	0.270	0.350
e	2.54 BSC		0.100 BSC	
H1	5.84	6.86	0.230	0.270
L	12.70	14.73	0.500	0.580
L1	-	6.35	-	0.250
P	3.53	4.09	0.139	0.161
Q	2.54	3.43	0.100	0.135

RECOMMENDED LAND PATTERN



UNIT: mm

Note: Follow JEDEC TO-220 AB.

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