TMG120N20HP

N-Channel Enhancement Mosfet

General Description
- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications
- Load switch
- PWM

General Features

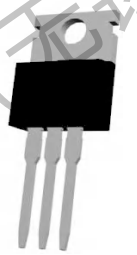
V_{DS} =200V I_D = 120A

$R_{DS(ON)}$=8.8mΩ(typ.) @ V_{GS}= 10V

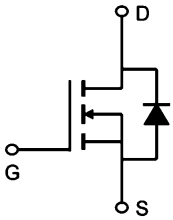
100% UIS Tested
100% R_g Tested

P:TO-220AB

Marking: G120N20



G D S



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Curren	120	A
	Continuous Drain Current-T_C=100℃	84	
I_{DM}	Pulsed Drain Current	517	
P_D	Power Dissipation	500	W
E_{AS}	Single pulse avalanche energy	841	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	℃

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	15	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	℃/W

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Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	200	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=160V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	3	4	5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=20A	---	8.8	10.6	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=100V, V_{GS}=0V, f=1MHz	---	3318	---	pF
C_{oss}	Output Capacitance		---	436	--	
C_{rss}	Reverse Transfer Capacitance		---	41	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=100V, R_L=5Ω R_G=6Ω,V_{GS}=10V	---	18.3	---	ns
t_r	Rise Time		---	27	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	38	---	ns
t_f	Fall Time		---	19.4	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=100V, I_D=20A	---	48	---	nc
Q_{gs}	Gate-Source Charge		---	18.3	---	nc
Q_{gd}	Gate-Drain “Miller” Charge		---	11.3	---	nc
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=1A	---	---	1.2	V
I_S	Continuous Drain Curren	VD=VG=0V	---	---	120	A
I_{SM}	Pulsed Drain Current		---	---	517	A
Trr	Reverse Recovery Time	I_{SD}=15 A, V_{GS}= 0 V, dIF / dt = 100 A/μs	---	130	---	ns
Qrr	Reverse Recovery Charge		---	667	---	nc

Typical Characteristics

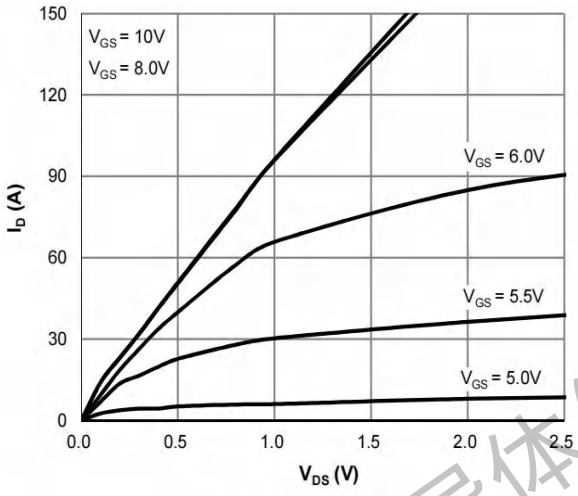

Figure 1: Saturation Characteristics

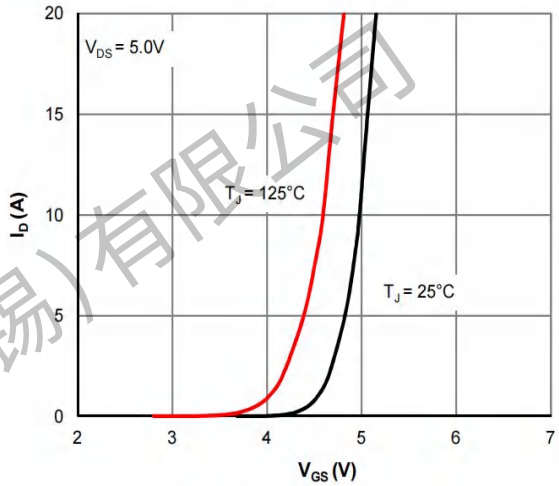

Figure 2: Transfer Characteristics

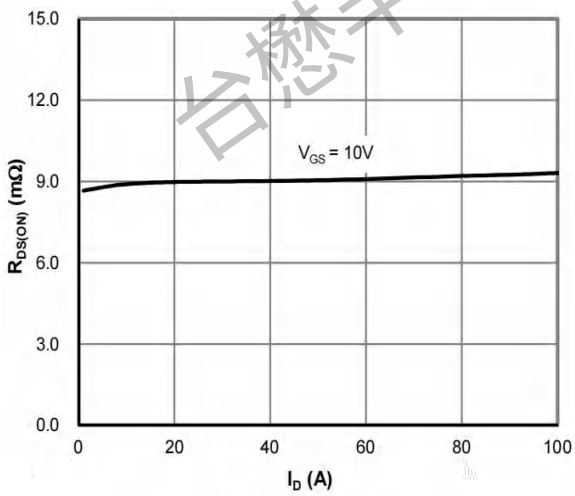

Figure 3: $R_{DS(ON)}$ vs. Drain Current

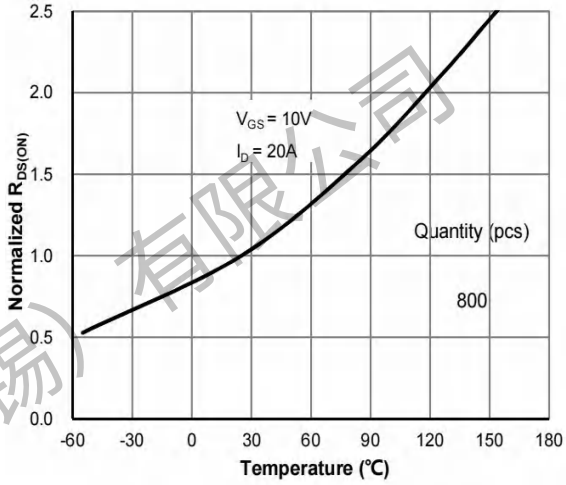

Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

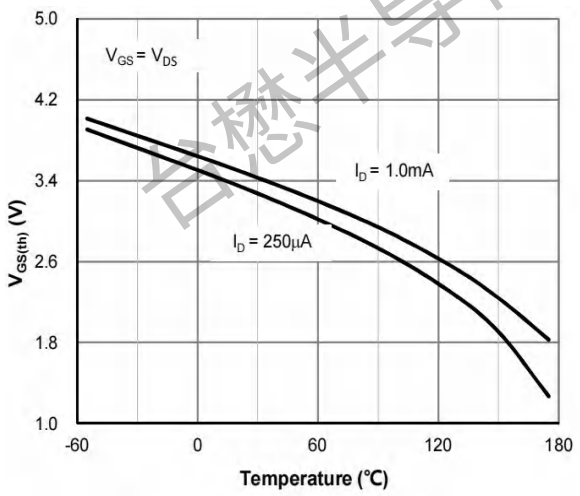

Figure 5: $V_{GS(th)}$ vs. Junction Temperature

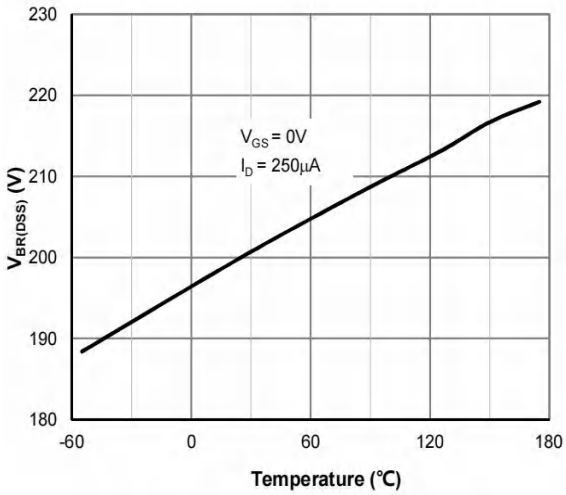

Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

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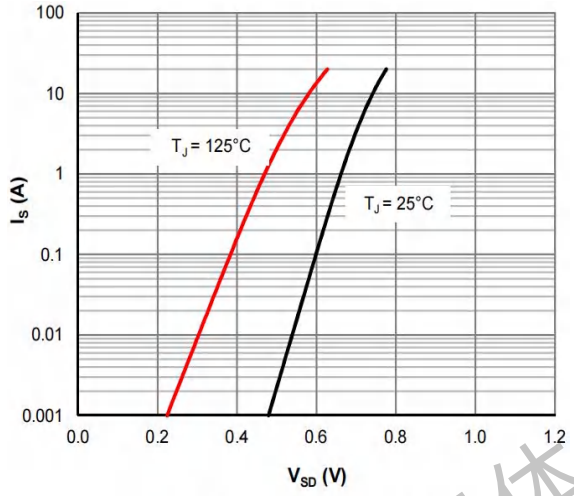


Figure 7: Body-Diode Characteristics

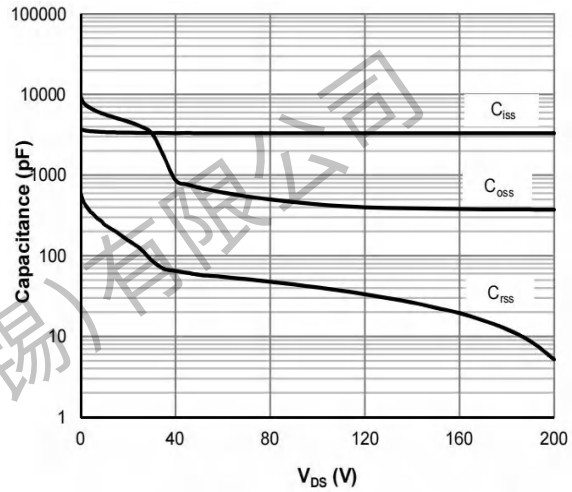


Figure 8: Capacitance Characteristics

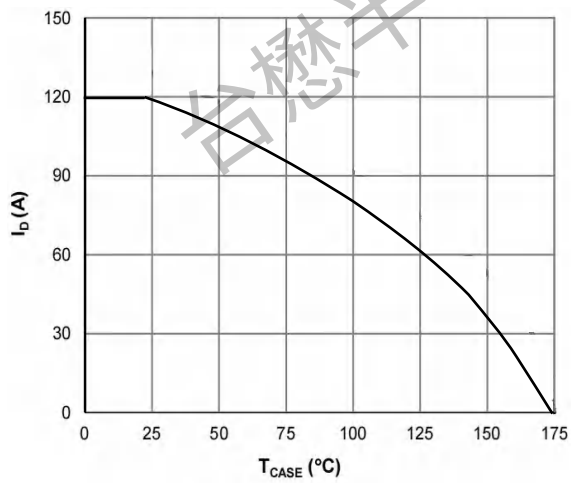


Figure 9: Current De-rating

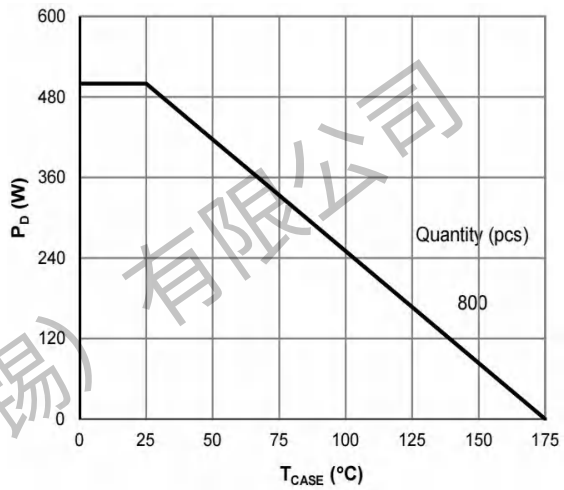


Figure 10: Power De-rating

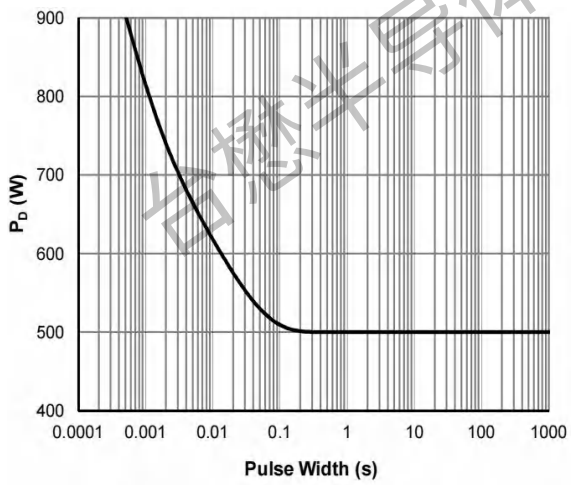


Figure 11: Single Pulse Power Rating, Junction-to-Case

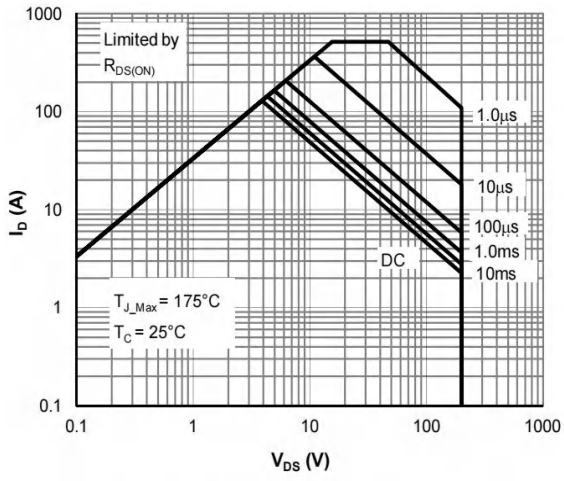
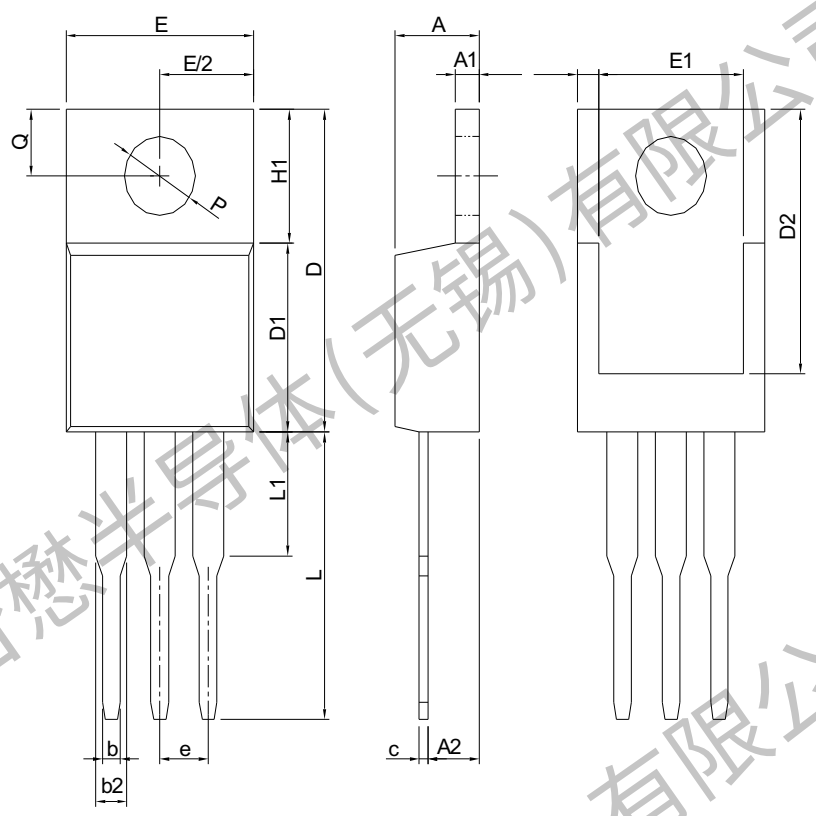


Figure 12: Maximum Safe Operating Area

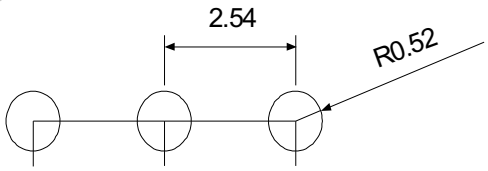
Package Mechanical Data: TO-220AB



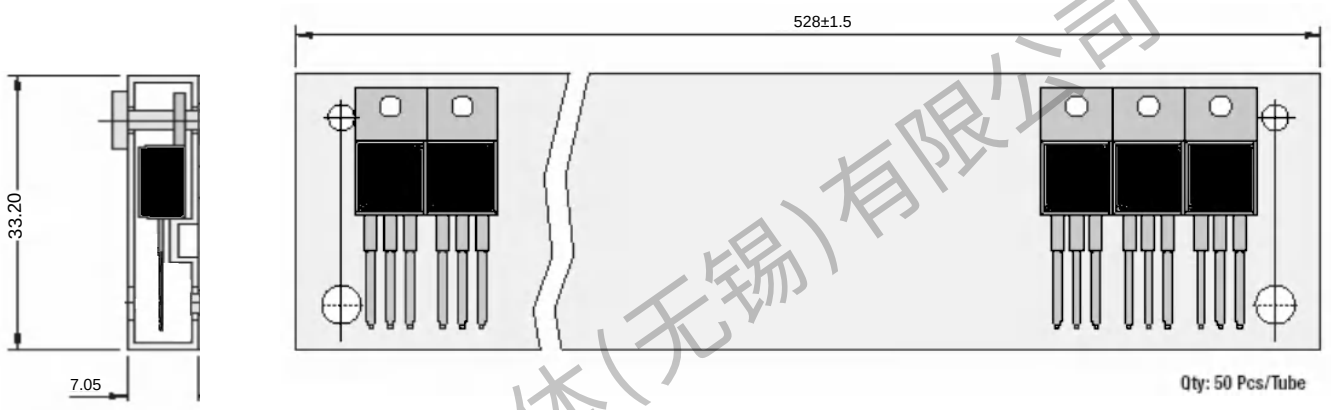
SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	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

Note: Follow JEDEC TO-220 AB.

RECOMMENDED LAND PATTERN



UNIT: mm

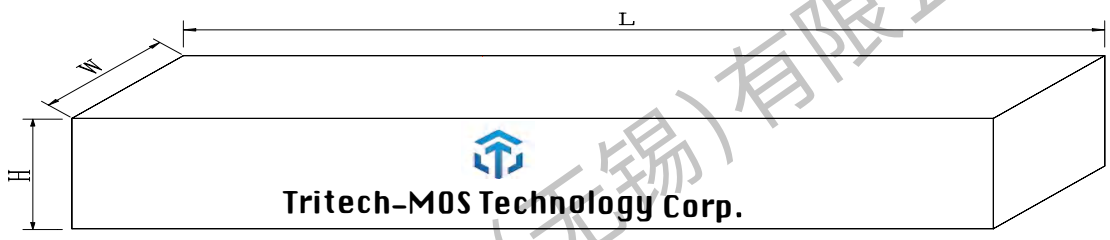


All Dimensions are in mm

1.TO-220AB Packaging

Package	Packing Form	Quantity		
		Tube	Inner Box [kpcs]	Outbox [kpcs]
TO-220AB	Tube Tape	50	5	1

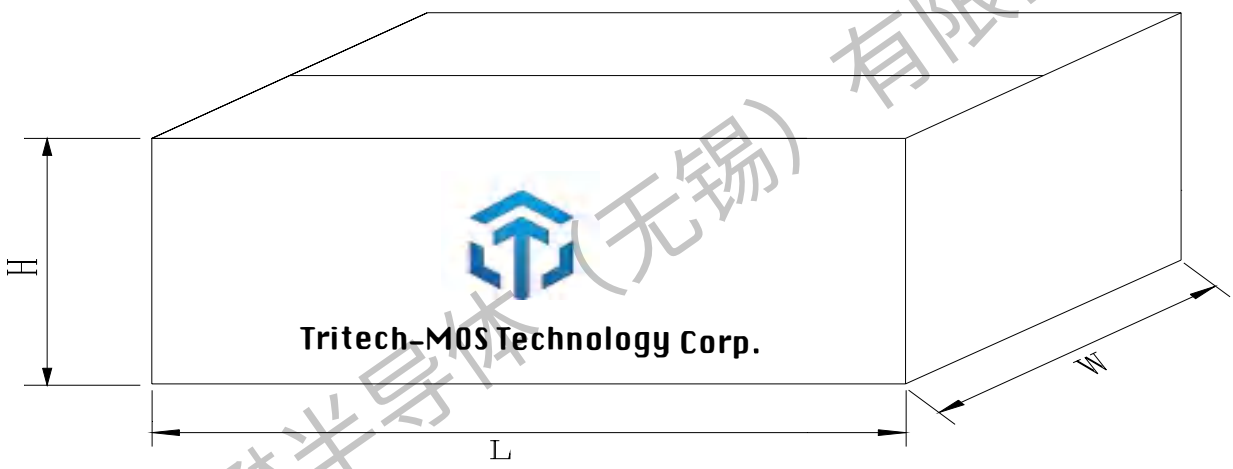
Inner Box



Dimension : 580 (L)×154(W) ×49(H) mm

Quantity : 50 ×20Ea = 1Kpcs

Outer Box



Dimension : 595(L)×285(W) ×185(H) mm

Quantity : 1K×5Ea = 5Kpcs

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Revision history:

Date	Rev	Description	Page
2023.07.07	23.07	Original	