TMG150P10HP

P-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

V_{DS} = -100V I_D= -150A

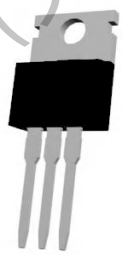
$R_{DS(ON)}$= 6 mΩ(typ.) @ V_{GS}=-10V

100% UIS Tested

100% R_g Tested

P:TO-220AB

Marking: G150P10H



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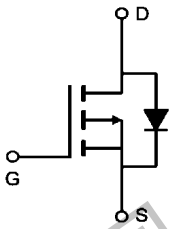

Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Curren	-150	A
	Continuous Drain Current-T_C=100℃	-94	
I_{DM}	Pulsed Drain Current	-600	
P_D	Power Dissipation	305	W
E_{AS}	Single pulse avalanche energy	1232	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	0.4	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	℃/W

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

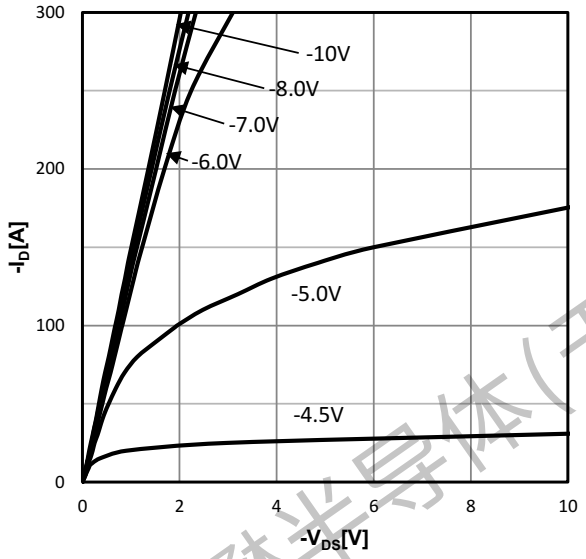
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-100	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	---	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-22A	---	6	8	mΩ
		V_{GS}=-4.5V , I_D=-22A	---	---	---	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=-250uA	-3	-3.5	-4	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=-100V, V_{GS}=0V , T_J=100℃	---	---	---	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-10V , I_D=-5A	---	---	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.7	---	Ω
Q_g	Total Gate Charge	V_{DS}=-50V , V_{GS}=-10V , I_D=-5A	---	170	---	nC
Q_{gs}	Gate-Source Charge		---	45	---	
Q_{gd}	Gate-Drain Charge		---	31	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=-10V, V_{DS}=-50V, I_D=-22A, R_G=1Ω	---	15	---	ns
T_r	Rise Time		---	35	---	
$T_{d(off)}$	Turn-Off Delay Time		---	100	---	
T_f	Fall Time		---	35	---	
C_{iss}	Input Capacitance	V_{DS}=-50V , V_{GS}=0V , f=1MHz	---	11687	---	pF
C_{oss}	Output Capacitance		---	998	---	
C_{rss}	Reverse Transfer Capacitance		---	139	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-150	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-22A , T_J=25℃	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	IF=-22A , di/dt=100A/μs , T_J=25℃	---	86	---	nS
Q_{rr}	Reverse Recovery Charge		---	271	---	nC

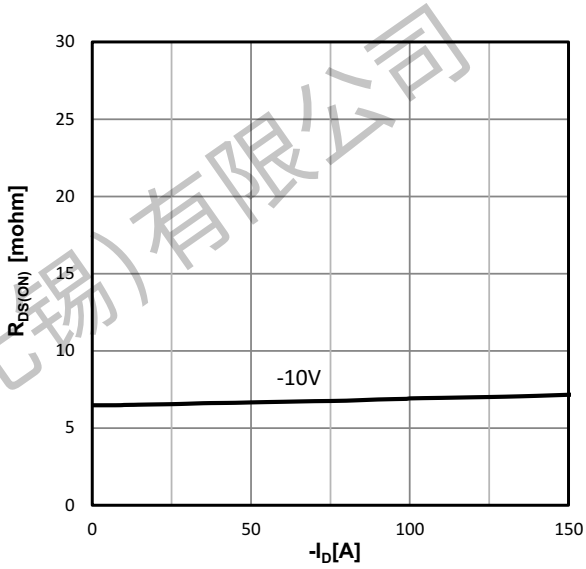
Characteristics Curve:

Figure 1: Typ. output characteristics



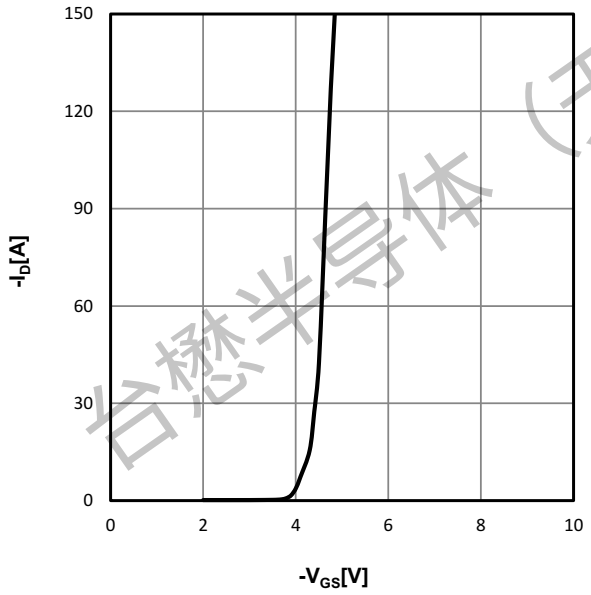
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}

Figure 2: Typ. drain-source on resistance



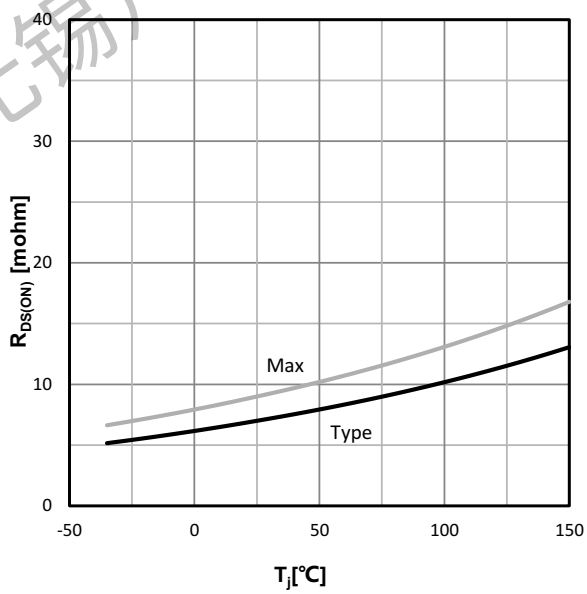
$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

Figure 3: Typ. transfer characteristics



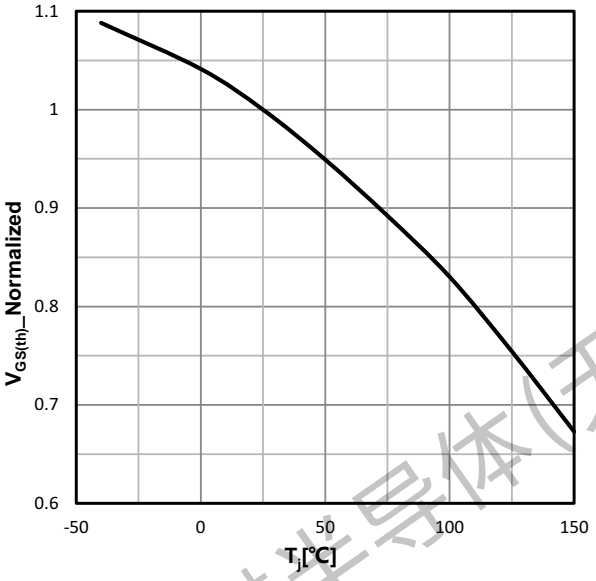
$I_D=f(V_{GS})$, $|V_{DS}|>2|I_D|R_{DS}(on)max$;

Figure 4: drain-source on resistance



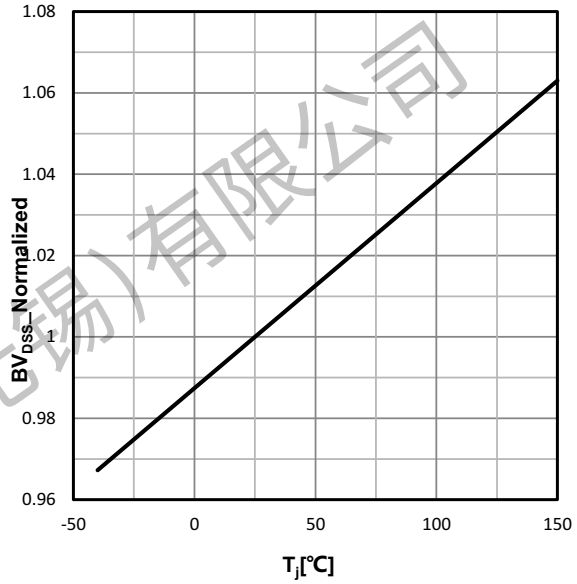
$R_{DS(on)}=f(T_j)$, I_D=-20A, V_{GS}=-10V;

Figure 5: Typ. gate threshold voltage



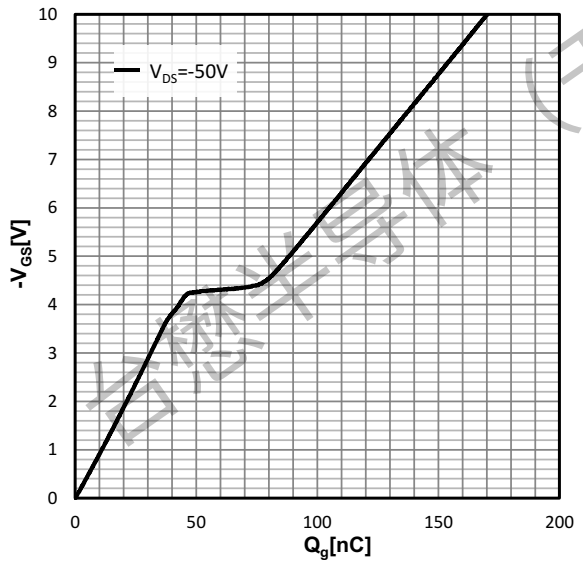
$V_{GS}=f(T_j)$, $V_{GS}=V_{DS}$, I_D=-250μA;

Figure 6: Drain-source breakdown voltage



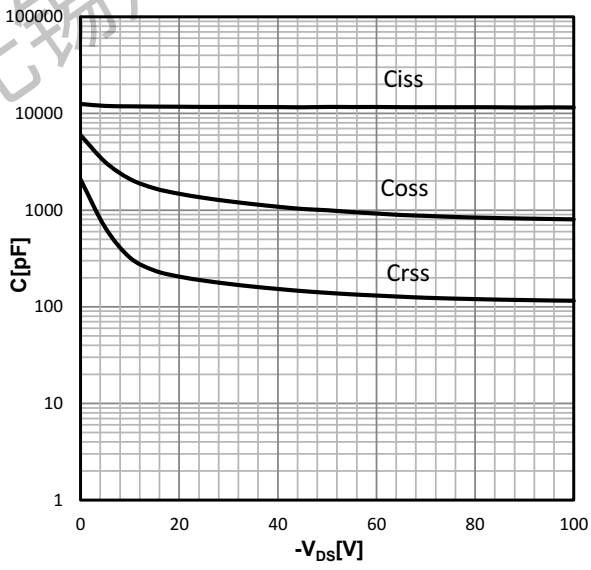
$V_{BR(DSS)}=f(T_j)$; I_D=-250μA;

Figure 7: Typ. gate charge



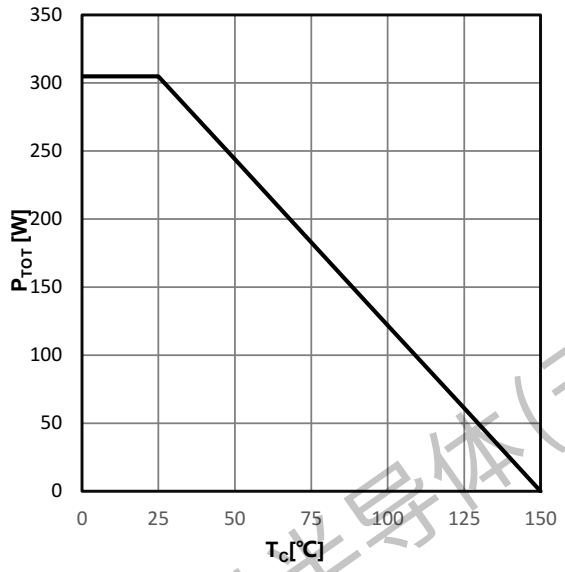
$V_{GS}=f(Q_g)$, I_D=-20A, T_j=25 °C; parameter: V_{DS}

Figure 8: Typ. Capacitances



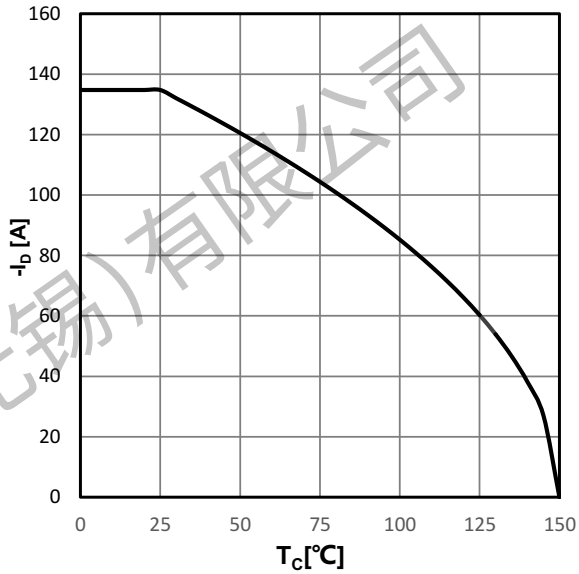
$C=f(V_{DS})$; V_{GS}=0V; f=1.0 MHz;

Figure 9: Power dissipation



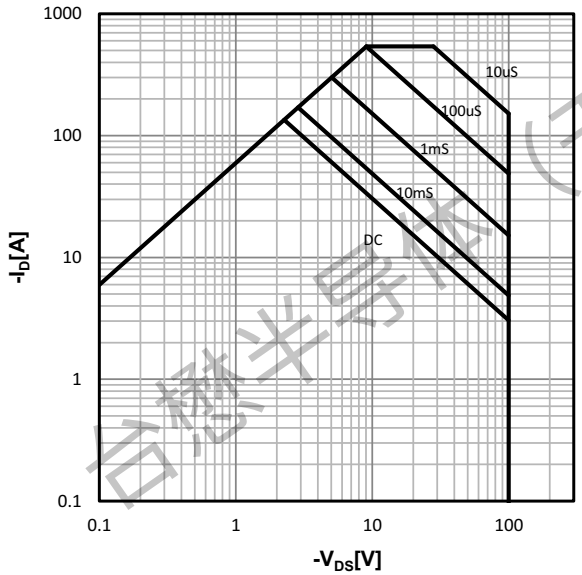
$P_{tot}=f(T_C)$;

Figure 10:Drain current



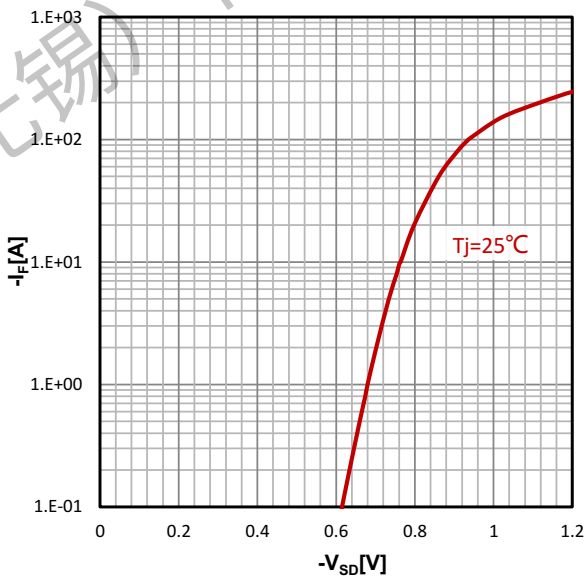
$I_D=f(T_C)$;

Figure 11: Safe operating area



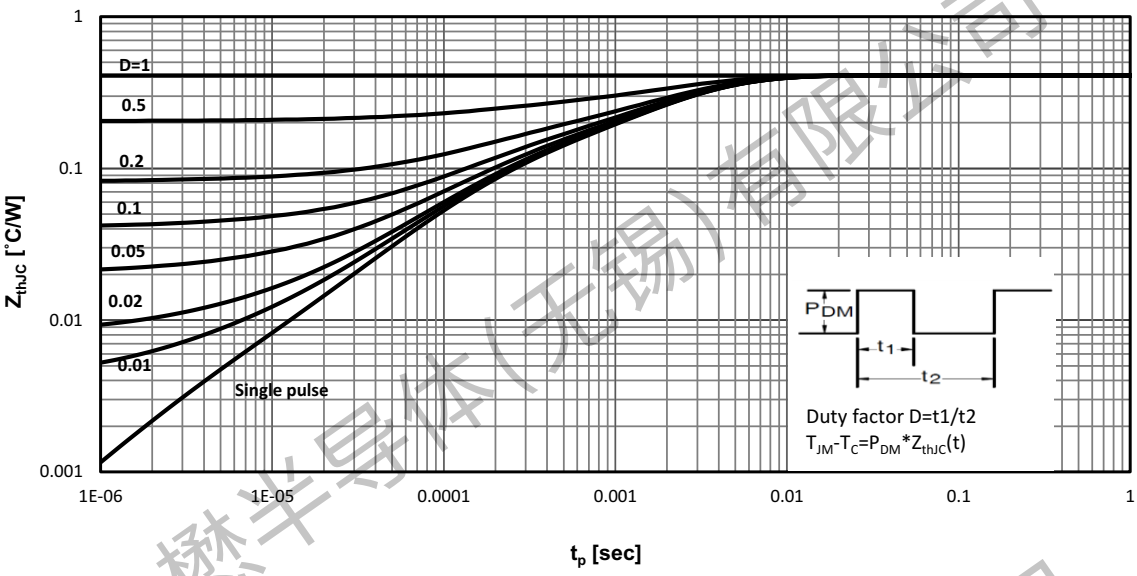
$I_D=f(V_{DS})$; T_C=25 °C; D=0; parameter: tp

Figure 12: Typ. forward characteristics



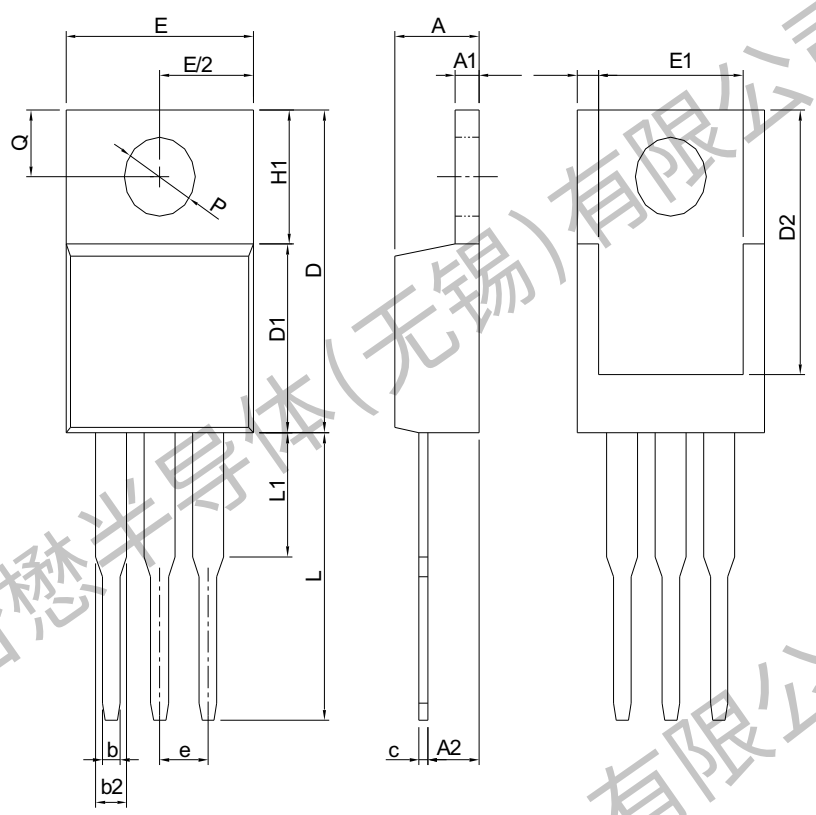
$I_F=f(V_{SD})$;

Figure 13: Max. Transient Thermal Impedance



$Z_{thJC}=f(t_p)$; parameter: D

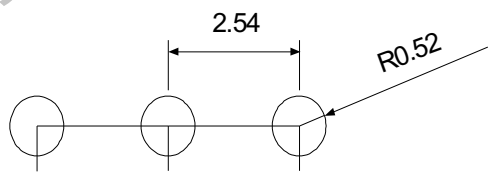
Package Mechanical Data: TO-220AB



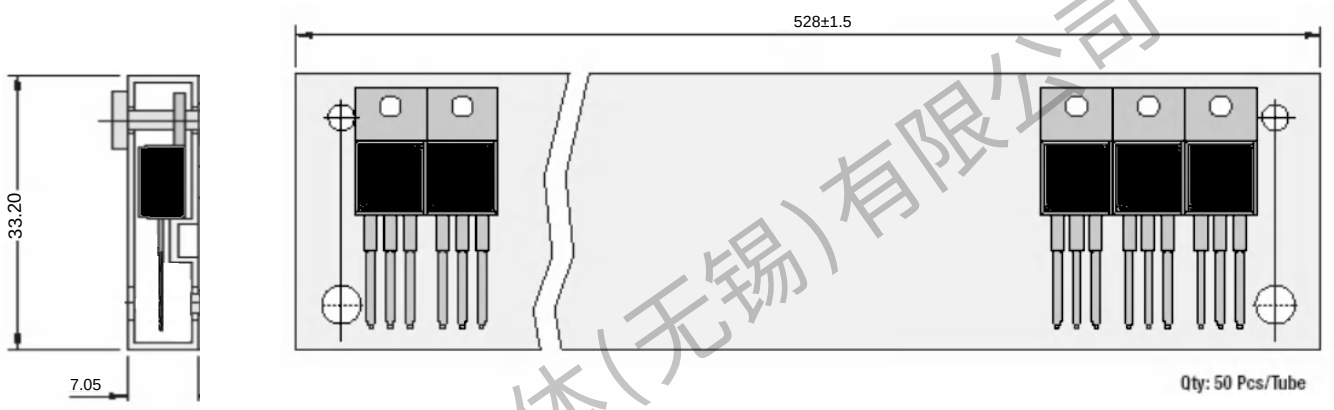
SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380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

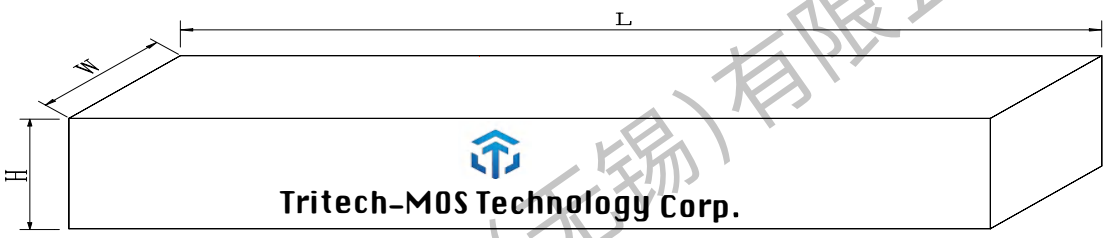


All Dimensions are in mm

1.TO-220AB Packaging

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

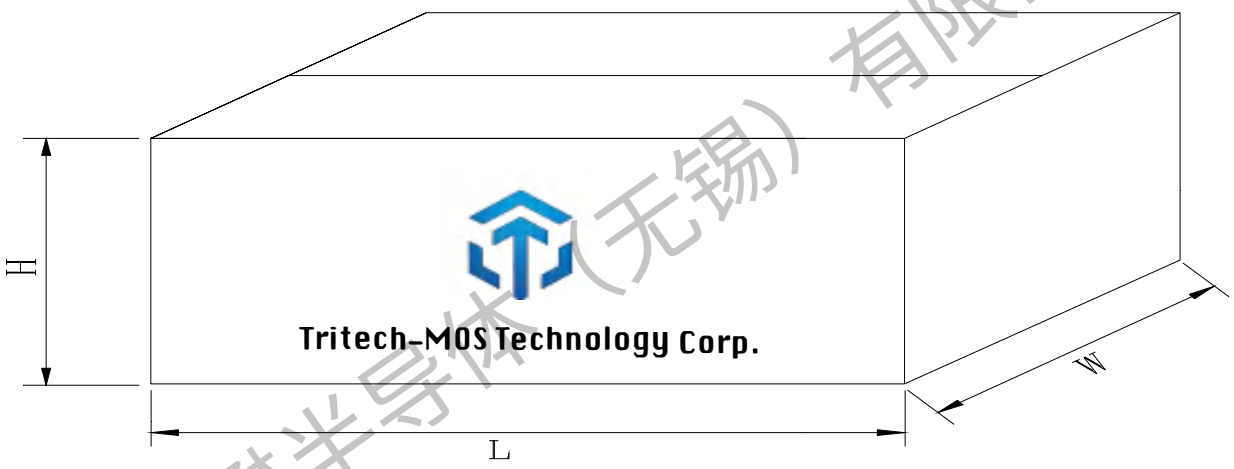
Inner Box



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
2023.09.28	23.09	Original	