TM150N12P

N -Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

V_{DS} =120V I_D =150A

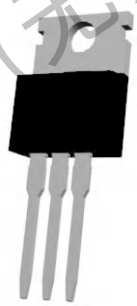
$R_{DS(ON)}$ =4.5mΩ(typ.)@ V_{GS}=10V

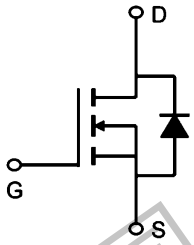
100% UIS Tested

100% R_g Tested

Green Product

P:TO-220AB





Marking:150N12

G D S

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

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		120	V
I_D	Continuous Drain Current	T_C = 25 °C	150	A
	Continuous Drain Current	T_C = 100 °C	95	A
I_{DM}	Pulsed Drain Current		1050	A
E_{AS}	Single pulse avalanche energy		729	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		208	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		175, –55 to 175	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.6	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	---	℃/W

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Electrical Characteristics (Tc= 25℃ unless otherwise specified):

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	120	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 105V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2	2.5	3	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance	V_{GS} = 10V, I_D = 30A	-	4.5	6.5	mΩ
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	-	11122	-	pF
C_{oss}	Output Capacitance		-	507	-	pF
C_{rss}	Reverse Transfer Capacitance		-	430	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 50V, I_D =70A	-	150	-	nC
Q_{gs}	Gate Source Charge		-	55	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	49	-	nC
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 50V, I_D= 70A, R_{GEN} = 3Ω	-	40	-	ns
t_r	Turn-On Rise Time		-	83	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	78	-	ns
t_f	Turn-Off Fall Time		-	51	-	ns
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	150	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	1050	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 70A, di/dt = 100A/us	-	60	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	110	-	nC

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Typical Electrical and Thermal Characteristics (Curves

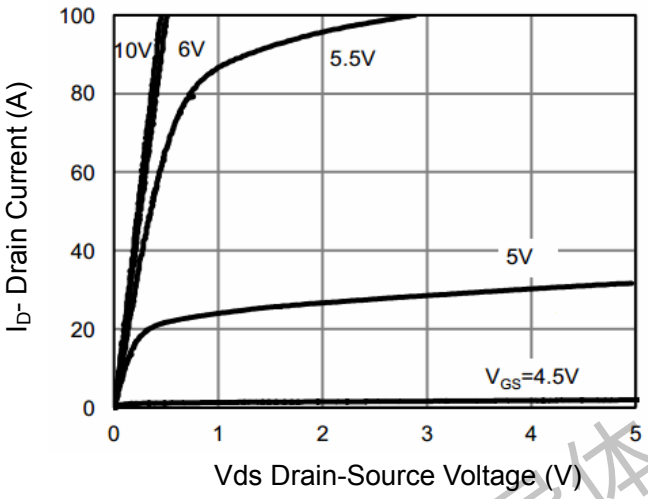

Figure 1 Output Characteristics

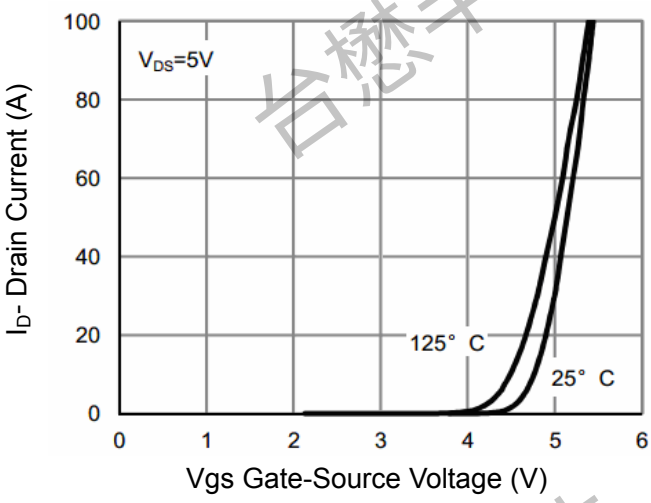

Figure 2 Transfer Characteristics

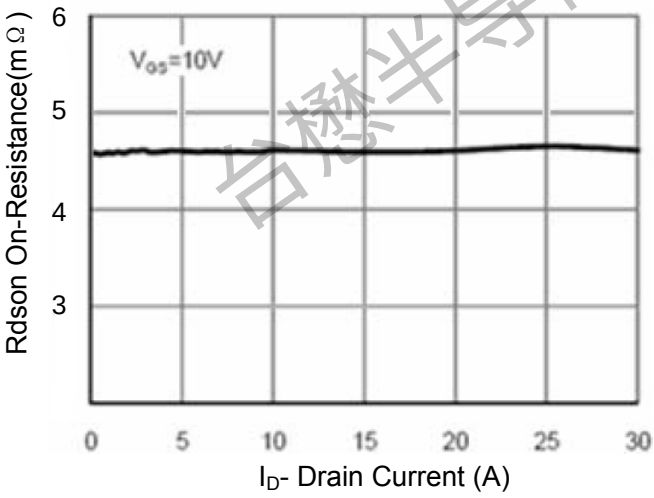

Figure 3 Rdson- Drain Current

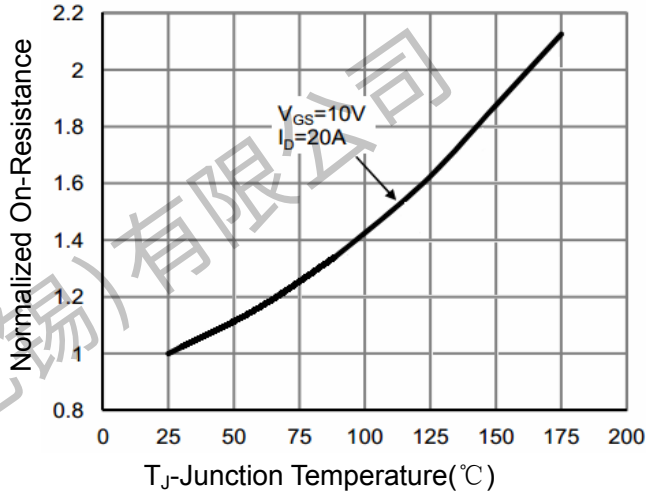

Figure 4 Rdson-JunctionTemperature

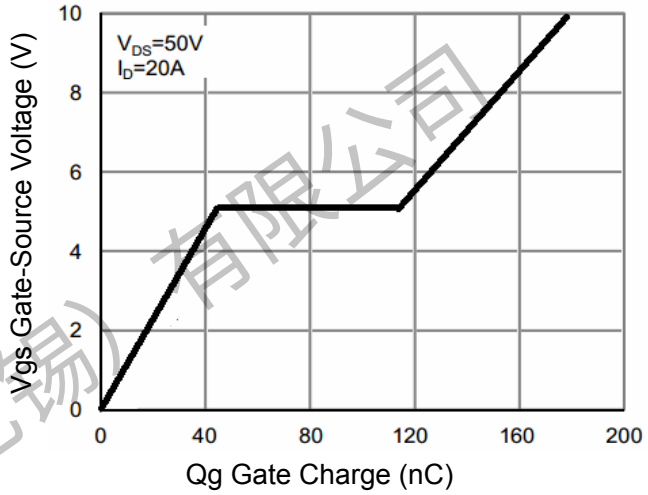

Figure 5 Gate Charge

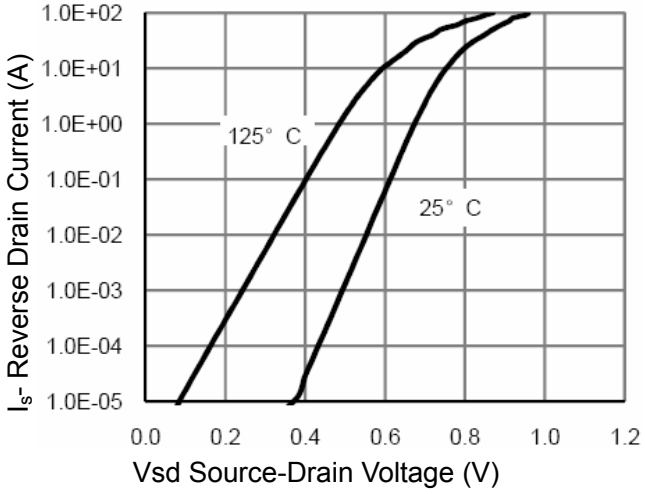

Figure 6 Source- Drain Diode Forward

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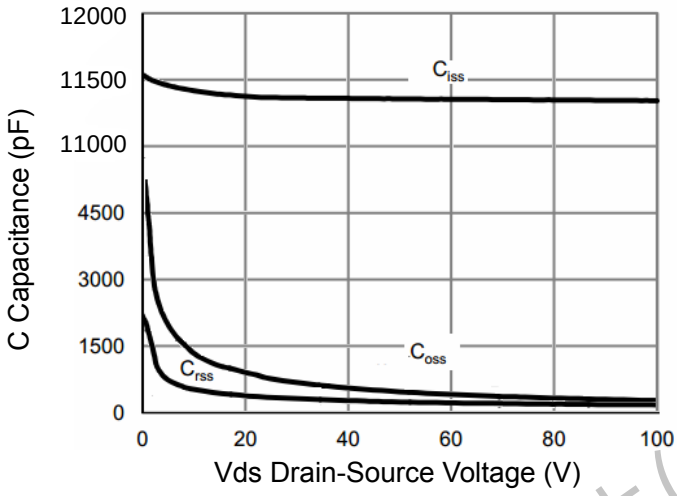

Figure 7 Capacitance vs Vds

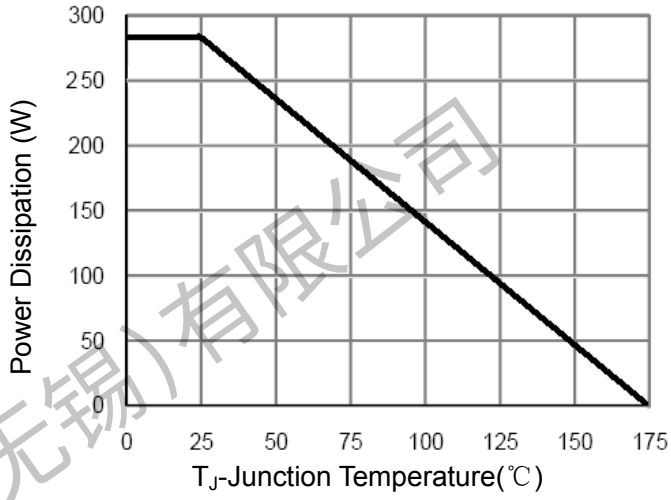

Figure 9 Power De-rating

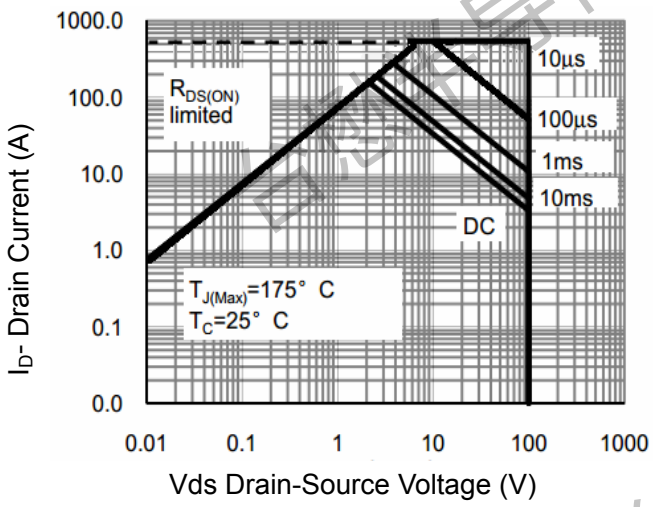

Figure 8 Safe Operation Area

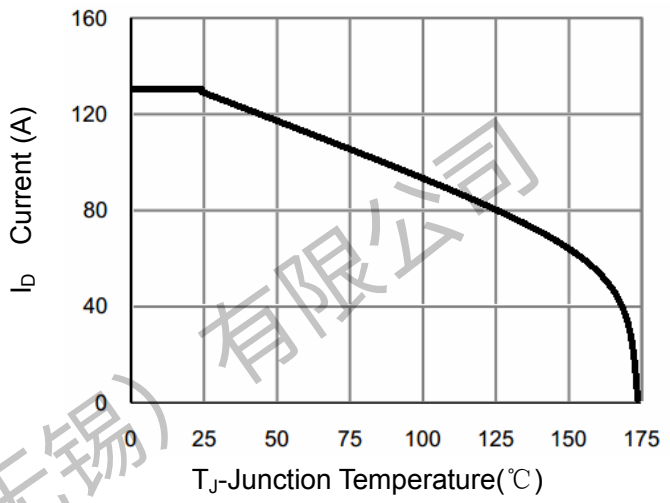

Figure 10 ID Current- JunctionTemperature

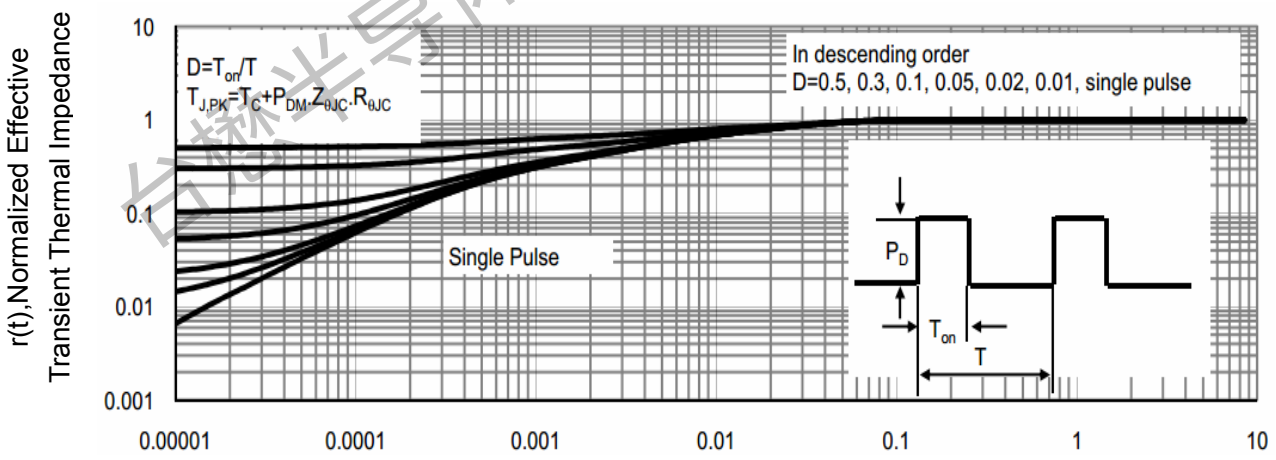

Figure 11 Normalized Maximum Transient Thermal Impedance

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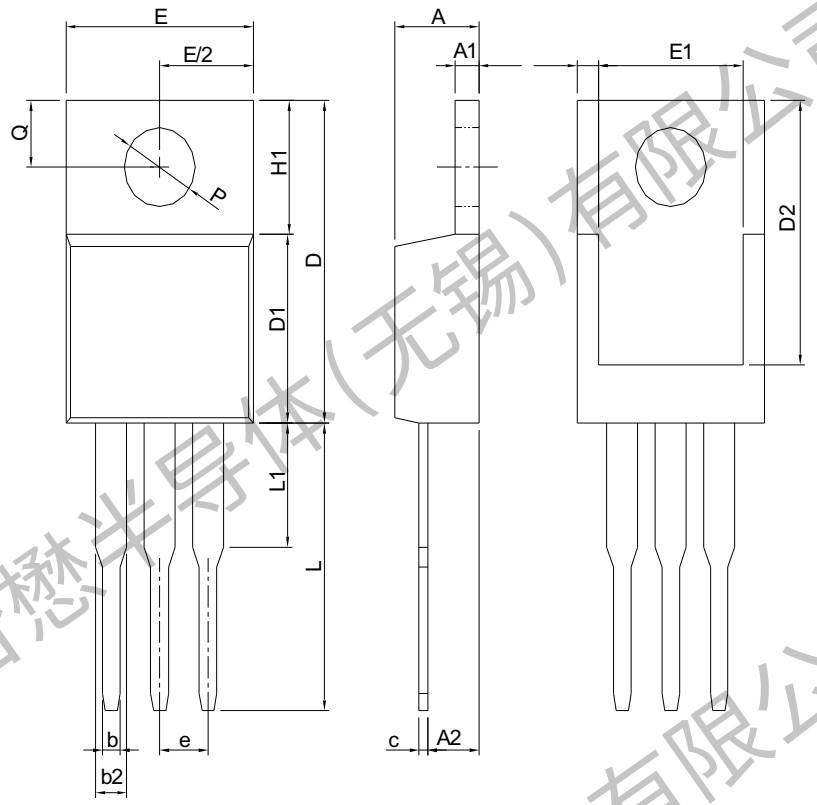
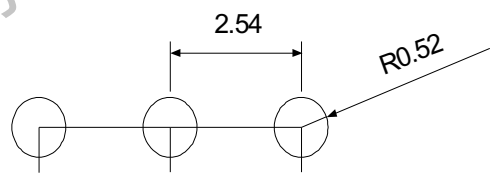
Package Mechanical Data: TO-220AB



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

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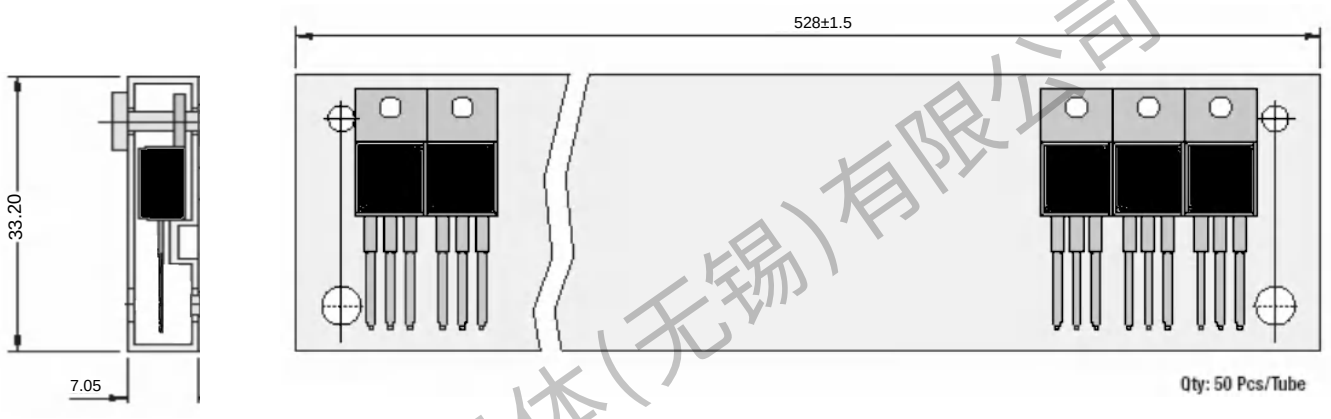

All Dimensions are in mm

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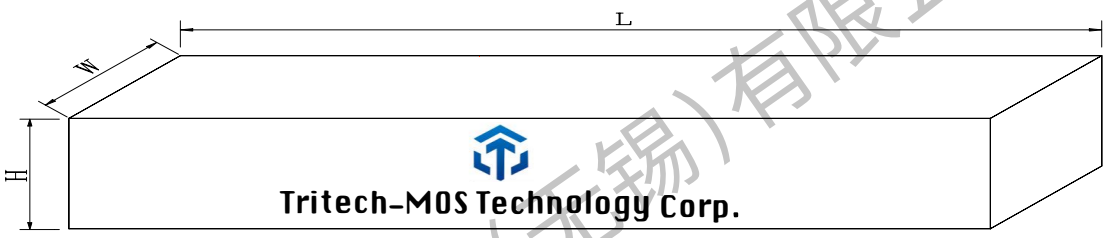
1.TO-220AB Packaging

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

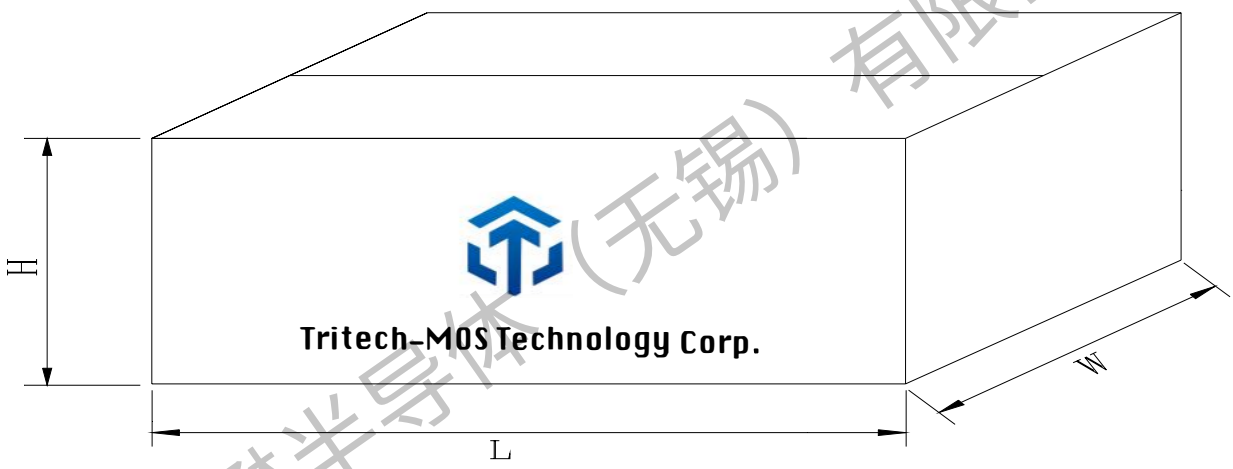
Inner Box



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
2023.08.08	23.08	Original	

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