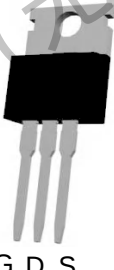
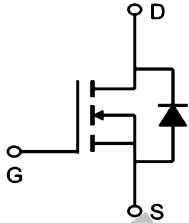


TMG130N06LP

N-Channel Enhancement Mosfet

General Description • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant Applications • Load switch • PWM General Features $V_{DS} = 60V$ $I_D = 130A$ $R_{DS(ON)} = 4.2m\Omega (typ.) @ V_{GS} = 10V$ 100% UIS Tested 100% R_g Tested 	P:TO-220AB  Marking:G130N06  																																									
Absolute Maximum Ratings ($T_c=25^{\circ}C$ unless otherwise noted) <table><tr><th>Symbol</th><th>Parameter</th><th>Ratings</th><th>Units</th></tr><tr><td>V_{DS}</td><td>Drain-Source Voltage</td><td>60</td><td>V</td></tr><tr><td>V_{GS}</td><td>Gate-Source Voltage</td><td>± 20</td><td>V</td></tr><tr><td rowspan="2">I_D</td><td>Continuous Drain Current</td><td>130</td><td rowspan="3">A</td></tr><tr><td>Continuous Drain Current-$T_c=100^{\circ}C$</td><td>84.5</td></tr><tr><td>I_{DM}</td><td>Pulsed Drain Current¹</td><td>481</td></tr><tr><td>P_D</td><td>Power Dissipation</td><td>71.4</td><td>W</td></tr><tr><td>E_{AS}</td><td>Single pulse avalanche energy²</td><td>135.2</td><td>mJ</td></tr><tr><td>T_J, T_{STG}</td><td>Operating and Storage Junction Temperature Range</td><td>-55-+150</td><td>$^{\circ}C$</td></tr></table> Thermal Characteristics <table><tr><th>Symbol</th><th>Parameter</th><th>Max</th><th>Units</th></tr><tr><td>$R_{\theta JC}$</td><td>Thermal Resistance,Junction to Case</td><td>1.67</td><td>$^{\circ}C/W$</td></tr></table>		Symbol	Parameter	Ratings	Units	V_{DS}	Drain-Source Voltage	60	V	V_{GS}	Gate-Source Voltage	± 20	V	I_D	Continuous Drain Current	130	A	Continuous Drain Current- $T_c=100^{\circ}C$	84.5	I_{DM}	Pulsed Drain Current ¹	481	P_D	Power Dissipation	71.4	W	E_{AS}	Single pulse avalanche energy ²	135.2	mJ	T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^{\circ}C$	Symbol	Parameter	Max	Units	$R_{\theta JC}$	Thermal Resistance,Junction to Case	1.67	$^{\circ}C/W$
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Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	-	-	V
Gate-body Leakage Current		I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	$T_J = 25^{\circ}C$	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$	-	-	1	μA
	$T_J = 100^{\circ}C$			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.5	2.0	V
Drain-Source On-Resistance ⁴		$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	4.2	5.4	m Ω
		$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 10A$	-	5.8	7.1	
Forward Transconductance ⁴		g_{fs}	$V_{DS} = 10V, I_D = 20A$	-	89	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$	-	1673	-	pF
Output Capacitance		C_{oss}		-	773	-	
Reverse Transfer Capacitance		C_{rss}		-	46.8	-	
Gate Resistance		R_g	$f = 1MHz$	-	1.8	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q_g	$V_{GS} = 10V, V_{DS} = 30V, I_D = 20A$	-	28.5	-	nC
Gate-Source Charge		Q_{gs}		-	7.8	-	
Gate-Drain Charge		Q_{gd}		-	8.4	-	
Turn-On Delay Time		$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 30V, R_G = 3\Omega, I_D = 20A$	-	11.2	-	ns
Rise Time		t_r		-	8.2	-	
Turn-Off Delay Time		$t_{d(off)}$		-	19.6	-	
Fall Time		t_f		-	6.2	-	
Body Diode Reverse Recovery Time		t_{rr}	$I_F = 20A, dI/dt = 100A/\mu s$	-	50	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}		-	20	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V_{SD}	$I_S = 20A, V_{GS} = 0V$	-	-	1.2	V
Continuous Source Current	$T_C = 25^{\circ}C$	I_S	-	-	-	130	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
2. The EAS data shows Max. rating. The test condition is $V_{DD} = 25V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 26A$.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. This value is guaranteed by design hence it is not included in the production test.

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Typical Characteristics

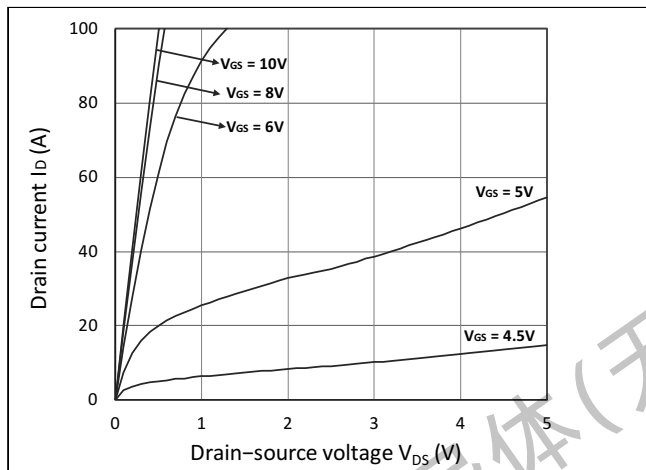


Figure 1. Output Characteristics

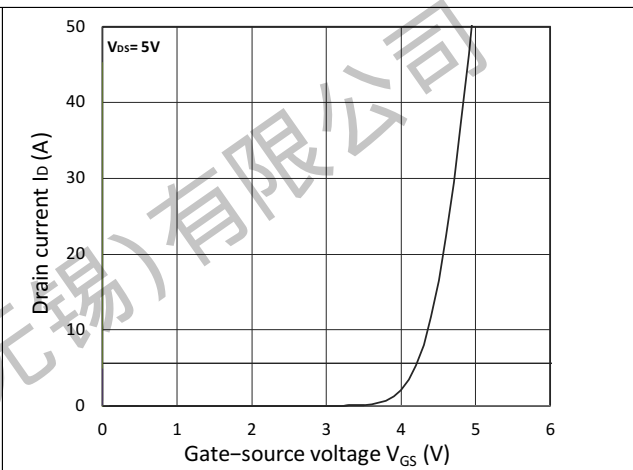


Figure 2. Transfer Characteristics

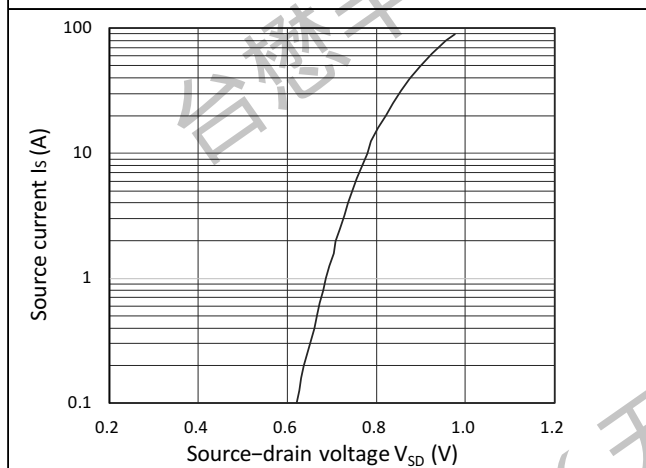


Figure 3. Forward Characteristics of Reverse

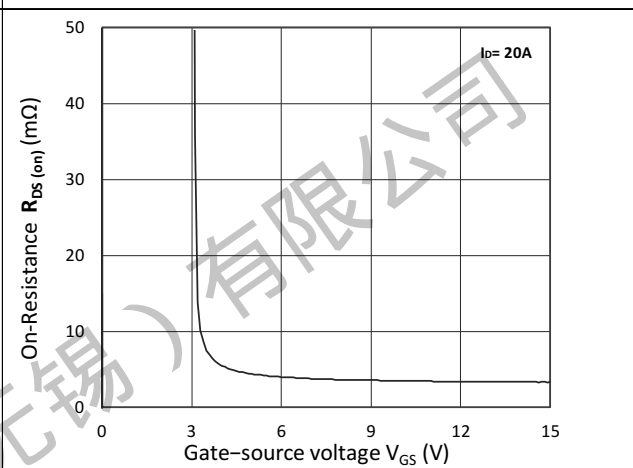


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

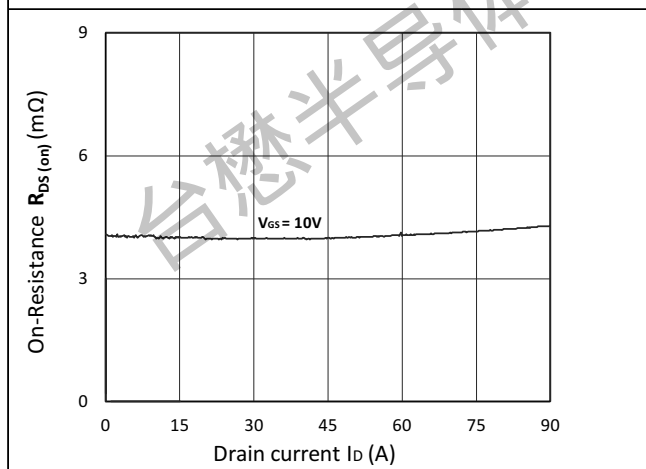


Figure 5. $R_{DS(ON)}$ vs. I_D

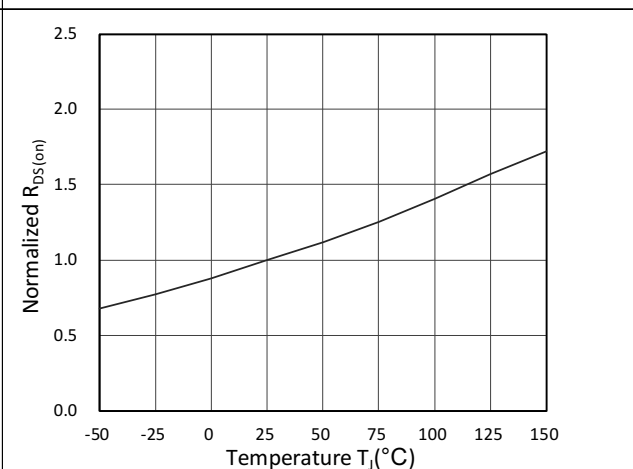


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

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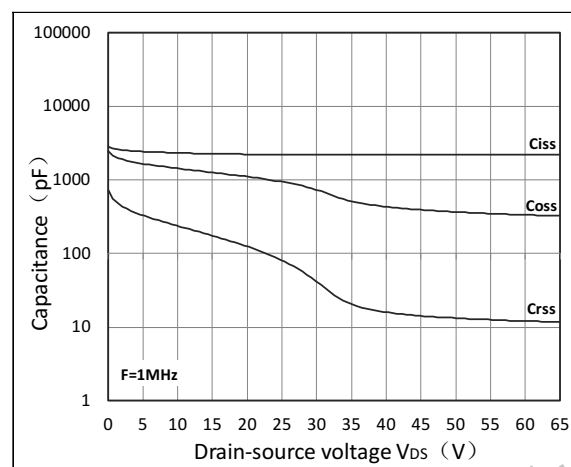


Figure 7. Capacitance Characteristics

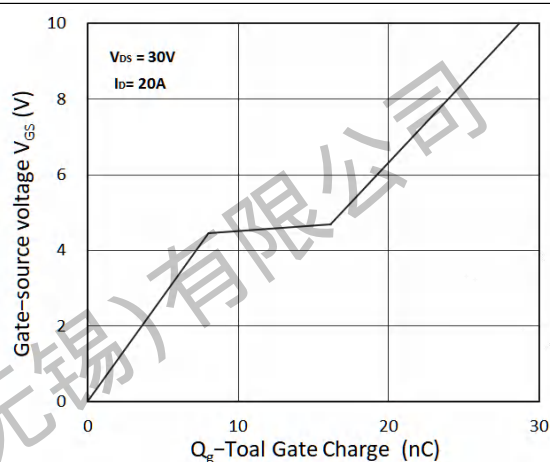


Figure 8. Gate Charge Characteristics

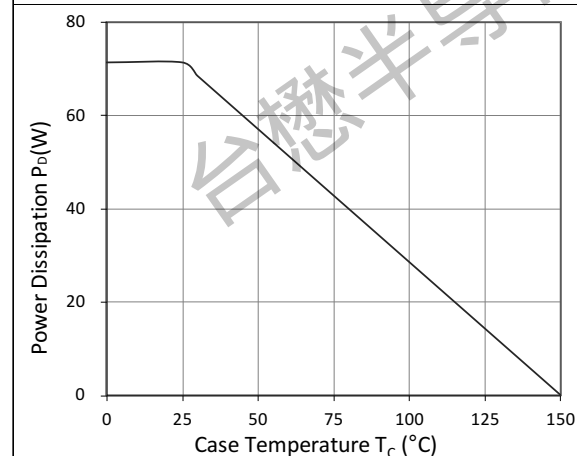


Figure 9. Power Dissipation

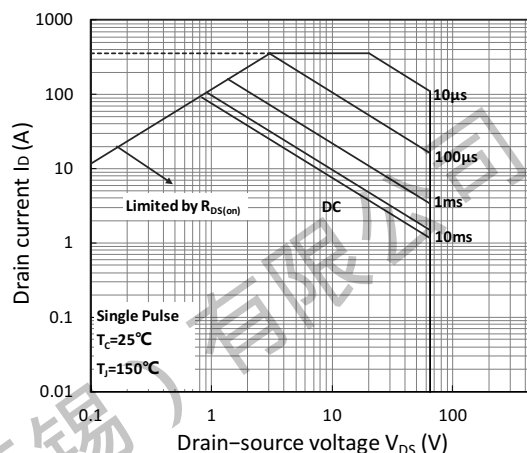


Figure 10. Safe Operating Area

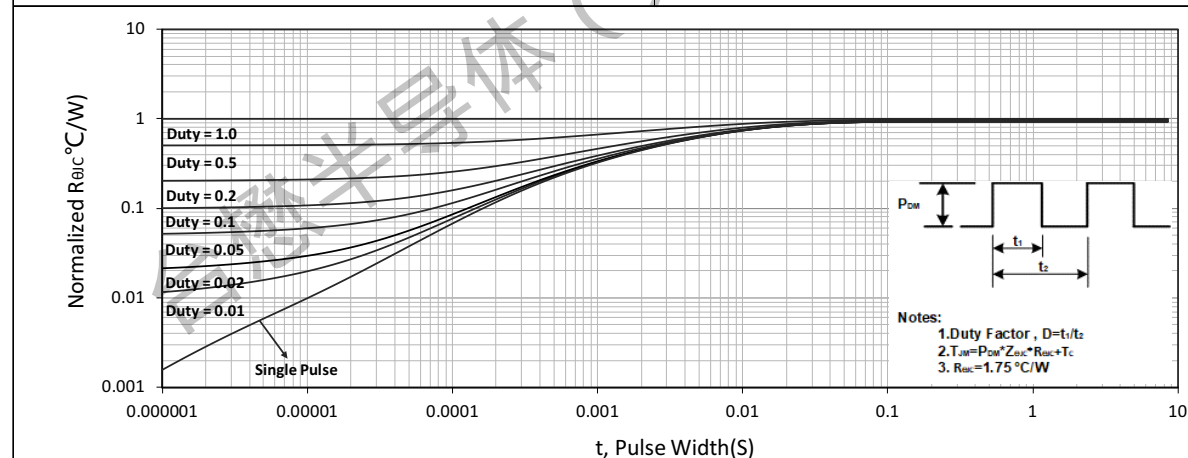
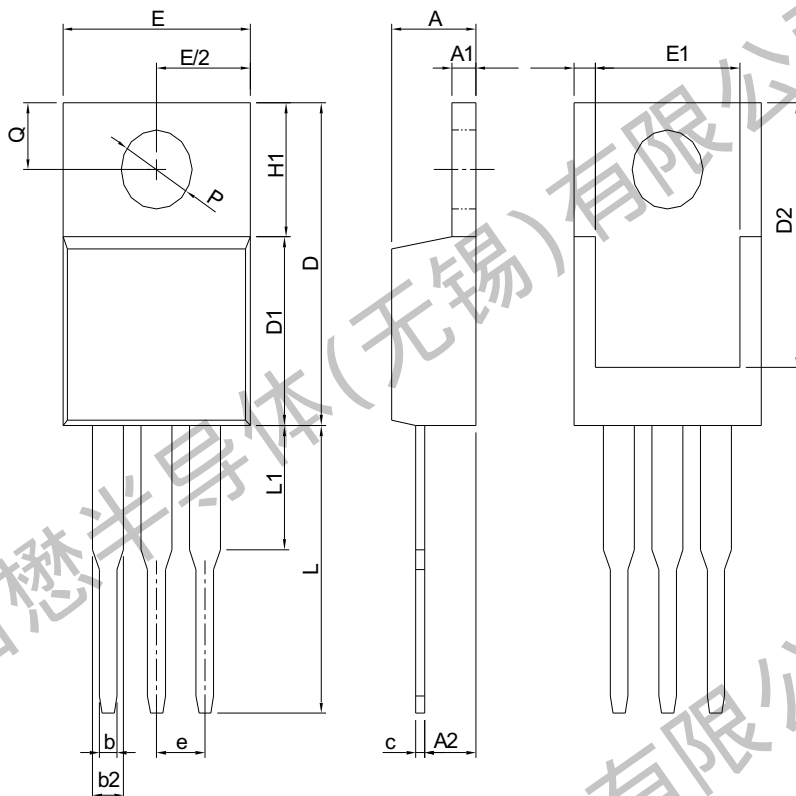


Figure 11. Normalized Maximum Transient Thermal Impedance

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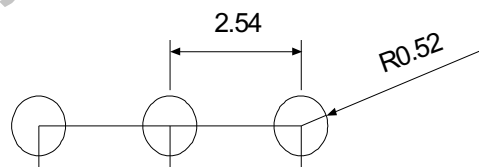
N-Channel Enhancement Mosfet

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

RECOMMENDED LAND PATTERN

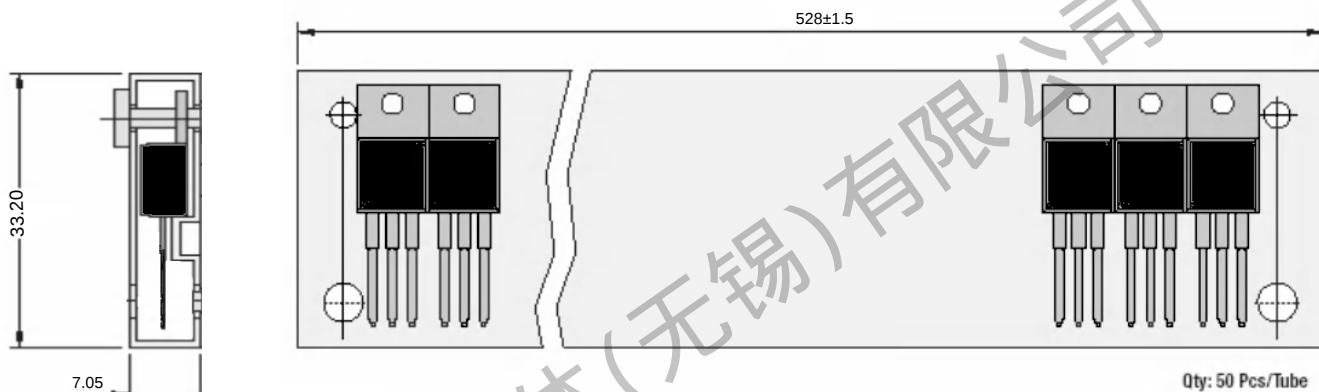


UNIT: mm

Note: Follow JEDEC TO-220 AB.

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All Dimensions are in mm

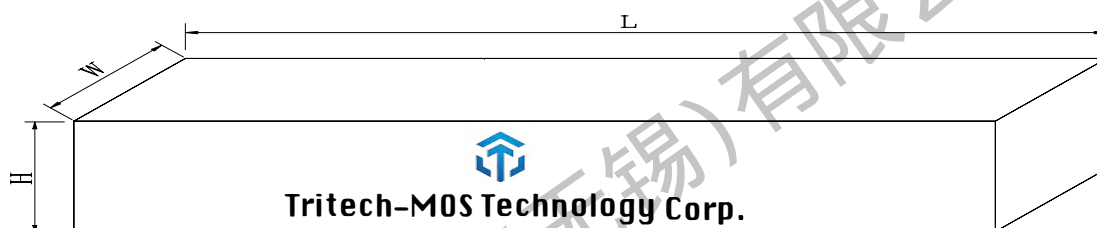
1.TO-220AB Packaging

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

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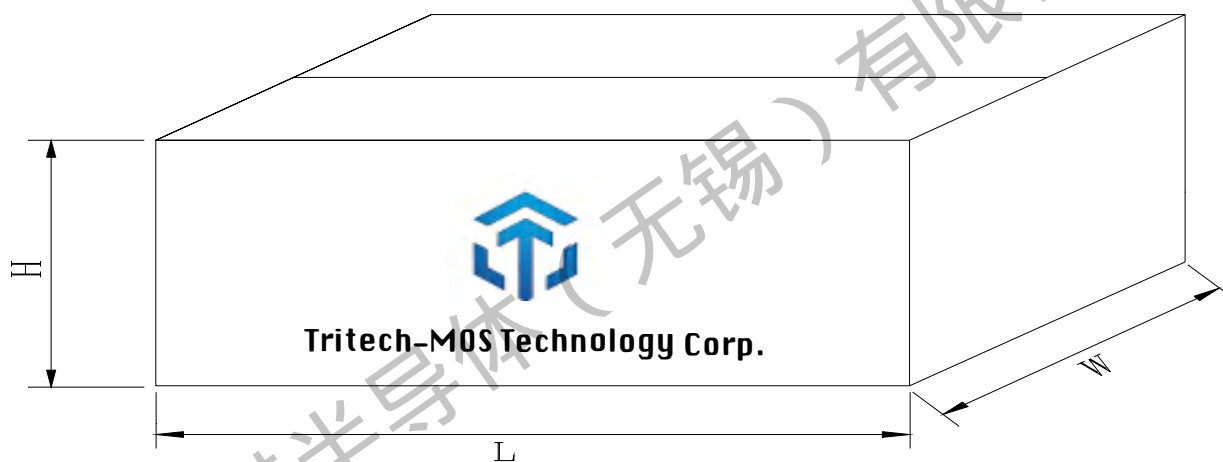
Inner Box



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
2023.07.31	23.07	Original	