

TMG120P10HP

P-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>$V_{DS} = -100V$ $I_D = -120A$ $R_{DS(ON)} = 12.5m\Omega (typ.) @ V_{GS} = -10V$</p> <p>100% UIS Tested 100% R_g Tested</p>
--	---



P:TO-220AB

Marking: G120P10H

G D S

Absolute Maximum Ratings ($T_c=25^\circ C$ 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 Current	-120	A
	Continuous Drain Current- $T_c=100^\circ C$	-64	
I_{DM}	Pulsed Drain Current	-600	
P_D	Power Dissipation	300	W
E_{AS}	Single pulse avalanche energy	1458	mJ
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	0.45	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	60	$^\circ C/W$

TMG120P10HP

P-Channel Enhancement Mosfet

Electrical Characteristics: ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-100	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to $25^\circ\text{C}, I_D=1\text{mA}$	---	---	---	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-22A$	---	12.5	15.6	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-3	-3.5	-4	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	$\text{mV}/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-100V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=-100V, V_{GS}=0V, T_J=100^\circ\text{C}$	---	---	---	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
gfs	Forward Transconductance	$V_{DS}=-10V, I_D=-5A$	---	---	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	---	---	Ω
Q_g	Total Gate Charge	$V_{DS}=-50V, V_{GS}=-10V, I_D=-5A$	---	136	---	nC
Q_{gs}	Gate-Source Charge		---	36	---	
Q_{gd}	Gate-Drain Charge		---	24.8	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{GS}=-10V,$ $V_{DS}=-50V, I_D=-22A,$ $R_G=1\Omega$	---	18	---	ns
T_r	Rise Time		---	43	---	
$T_{d(off)}$	Turn-Off Delay Time		---	125	---	
T_f	Fall Time		---	43	---	
C_{iss}	Input Capacitance	$V_{DS}=-50V, V_{GS}=0V, f=1\text{MHz}$	---	9349	---	pF
C_{oss}	Output Capacitance		---	798	---	
C_{rss}	Reverse Transfer Capacitance		---	111.2	---	

Diode Characteristics

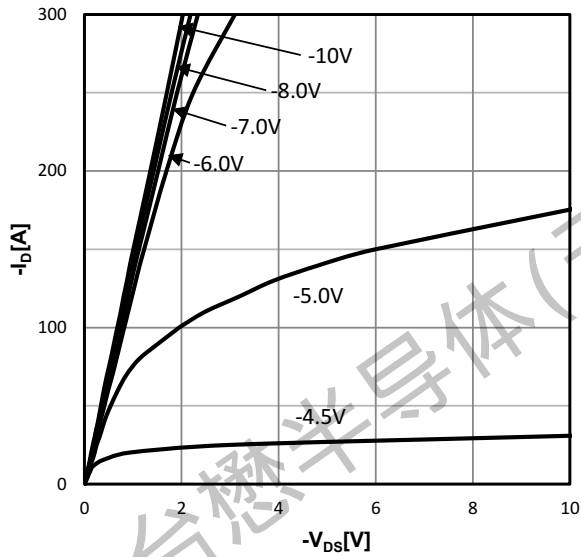
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	-120	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-20A, T_J=25^\circ\text{C}$	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	$I_F=-20A, di/dt=100A/\mu s$	---	107	---	ns
Q_{rr}	Reverse Recovery Charge	$\mu s, T_J=25^\circ\text{C}$	---	216.8	---	nC

TMG120P10HP

P-Channel Enhancement Mosfet

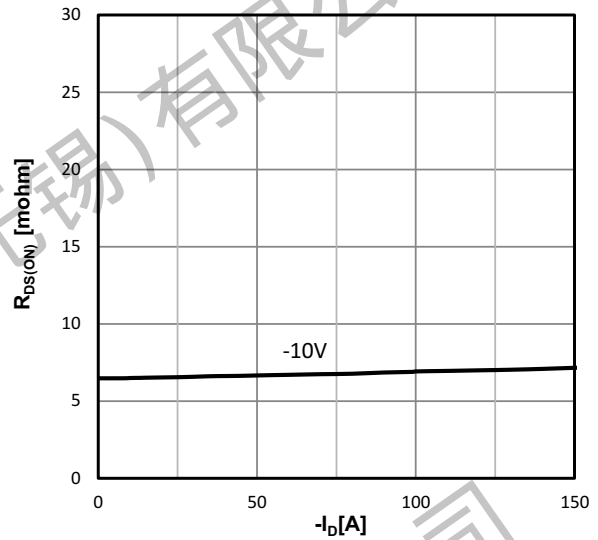
Characteristics Curve:

Figure 1: Typ. output characteristics



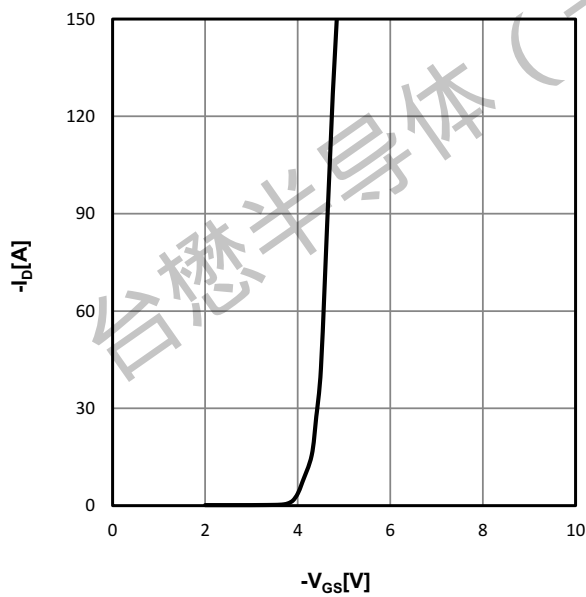
$I_D=f(V_{DS}), T_j=25\text{ }^\circ\text{C};$ parameter: V_{GS}

Figure 2: Typ. drain-source on resistance



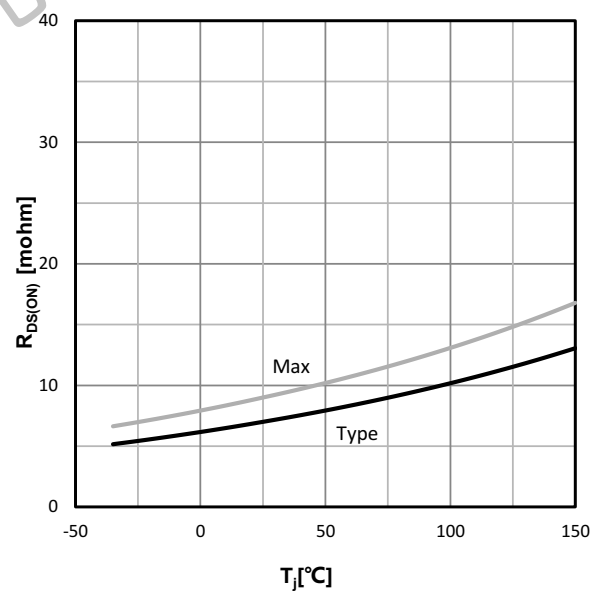
$R_{DS(on)}=f(I_D), T_j=25\text{ }^\circ\text{C};$ parameter: V_{GS}

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



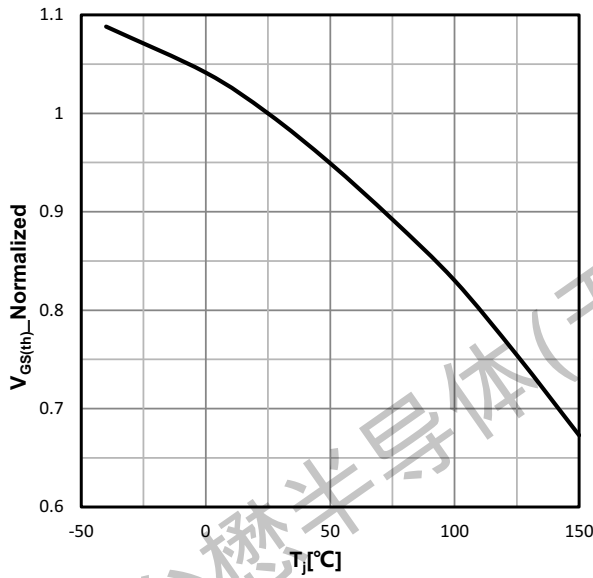
$R_{DS(on)}=f(T_j), I_D=-20A, V_{GS}=-10V;$



TMG120P10HP

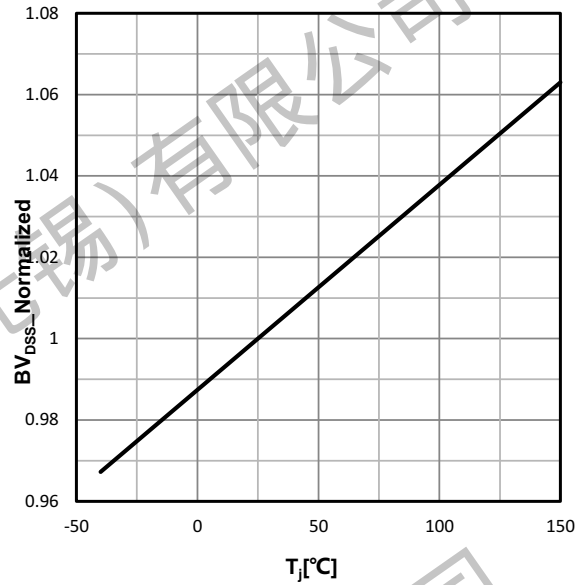
P-Channel Enhancement Mosfet

Figure 5: Typ. gate threshold voltage



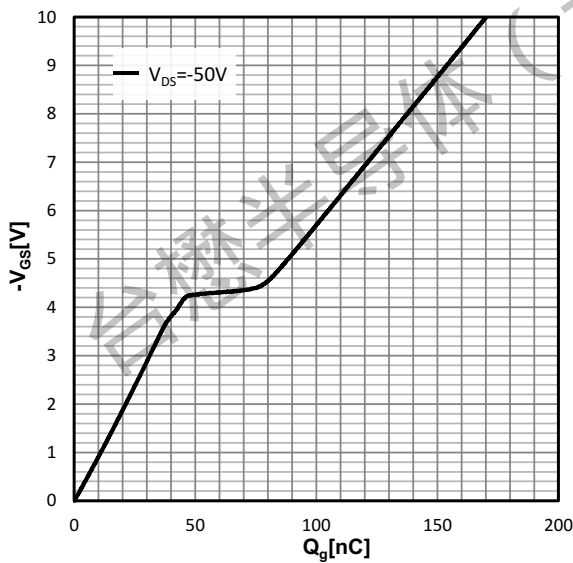
$V_{GS}=f(T_j), V_{GS}=V_{DS}, I_D=-250\mu A;$

Figure 6: Drain-source breakdown voltage



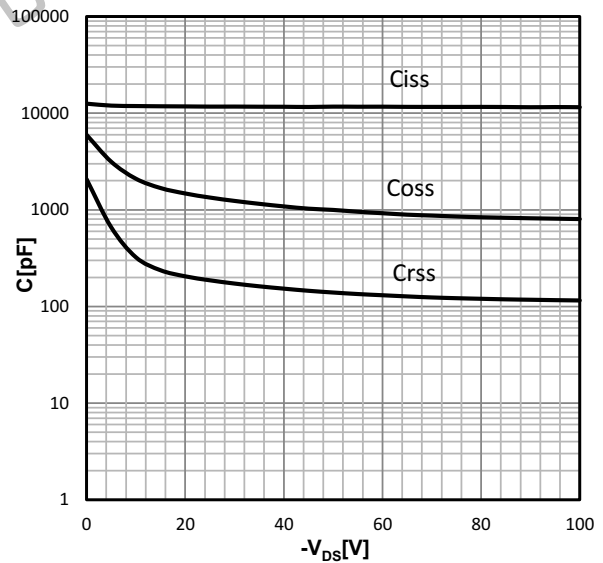
$V_{BR(DSS)}=f(T_j); I_D=-250\mu A;$

Figure 7: Typ. gate charge



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

Figure 8: Typ. Capacitances



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

TMG120P10HP

P-Channel Enhancement Mosfet

Figure 9: Power dissipation

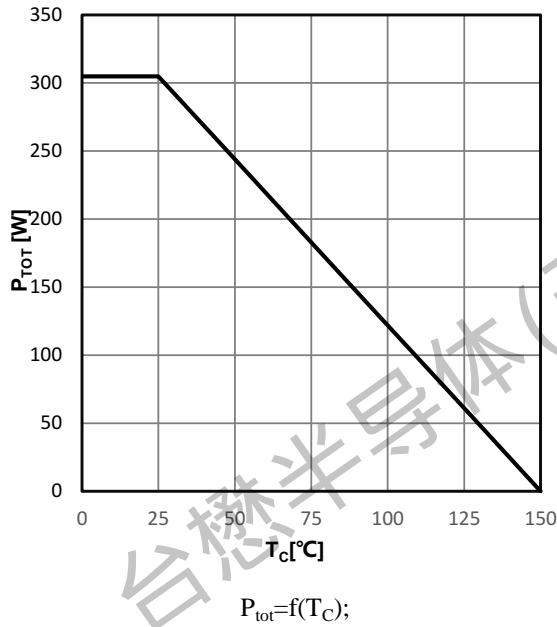


Figure 10: Drain current

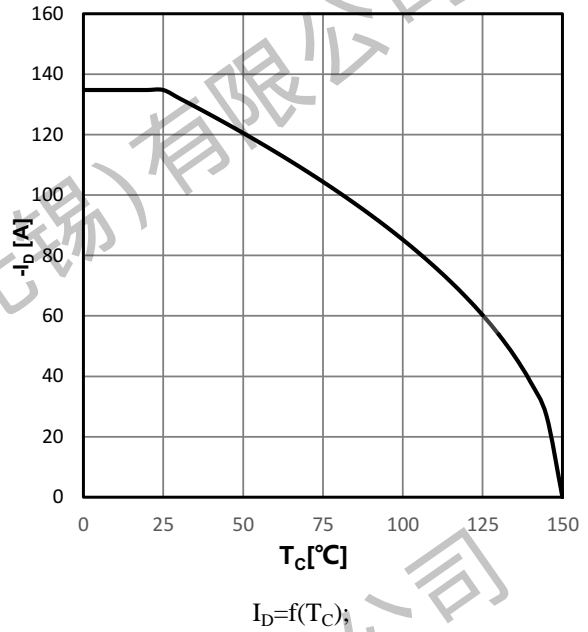


Figure 11: Safe operating area

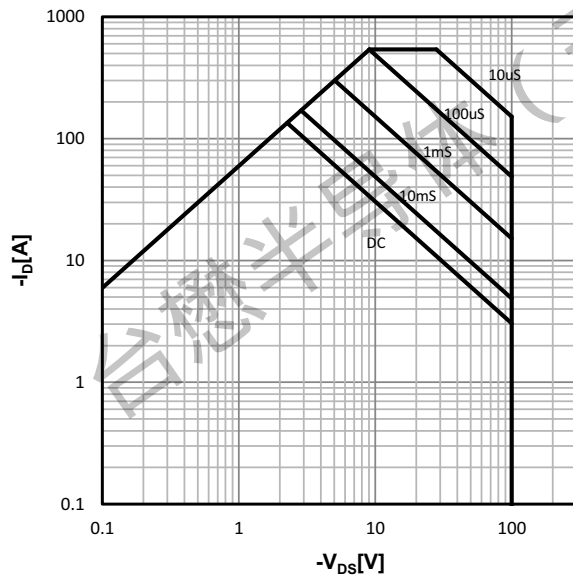
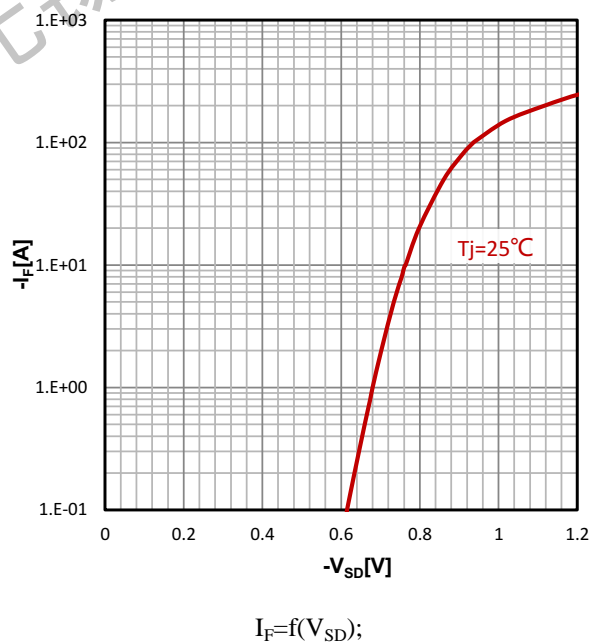


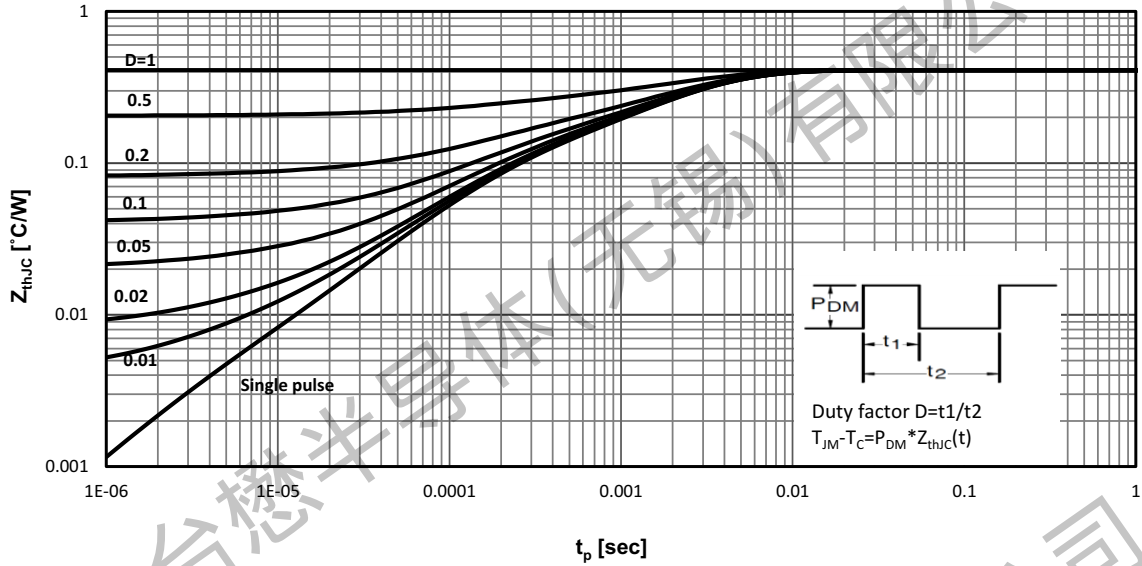
Figure 12: Typ. forward characteristics



TMG120P10HP

P-Channel Enhancement Mosfet

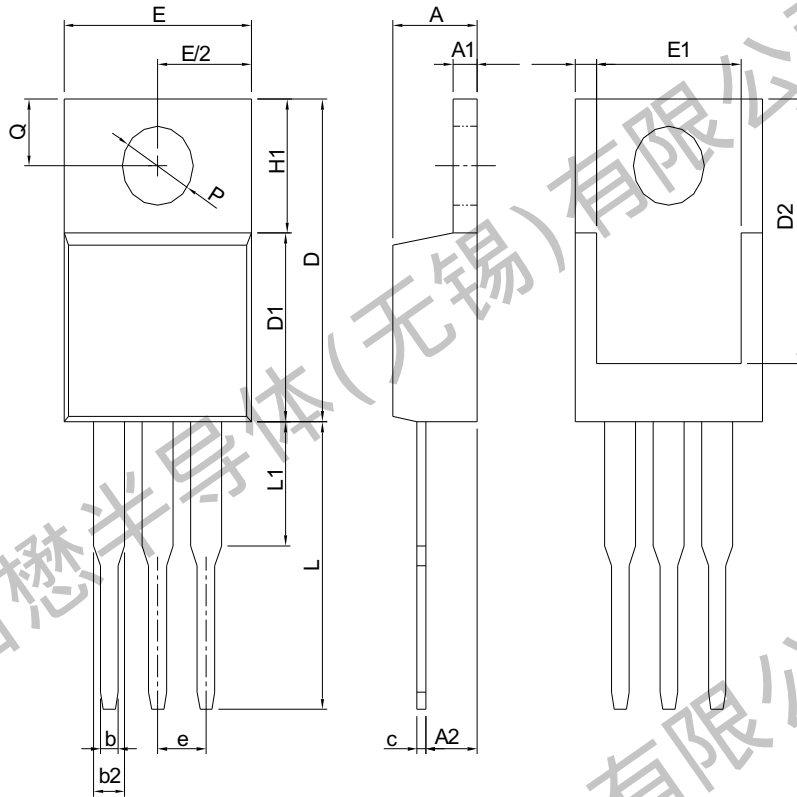
Figure 13: Max. Transient Thermal Impedance



TMG120P10HP

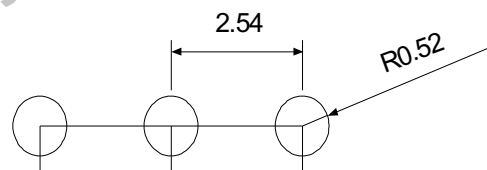
P-Channel Enhancement Mosfet

Package Mechanical Data: 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



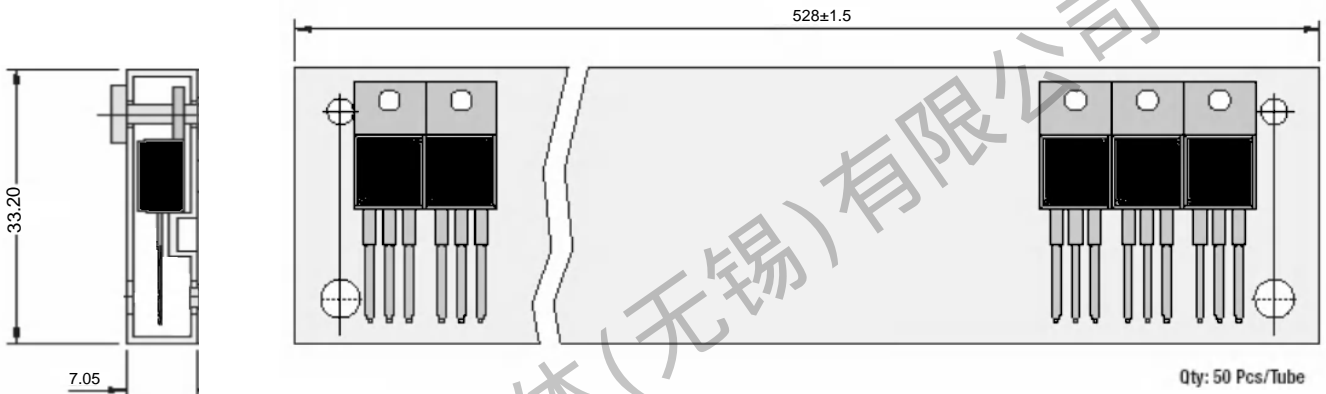
UNIT: mm

Note: Follow JEDEC TO-220 AB.



TMG120P10HP

P-Channel Enhancement Mosfet



All Dimensions are in mm

1.TO-220AB Packaging

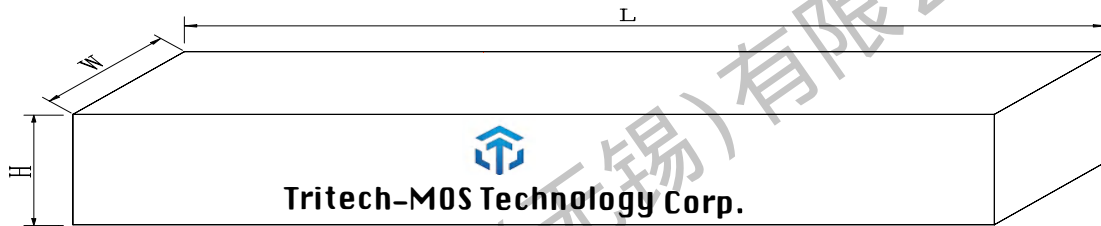
Package	Packing Form	Quantity		
		Tube	Inner Box [kpcs]	Outbox [kpcs]
TO-220AB	Tube Tape	50	5	1



TMG120P10HP

P-Channel Enhancement Mosfet

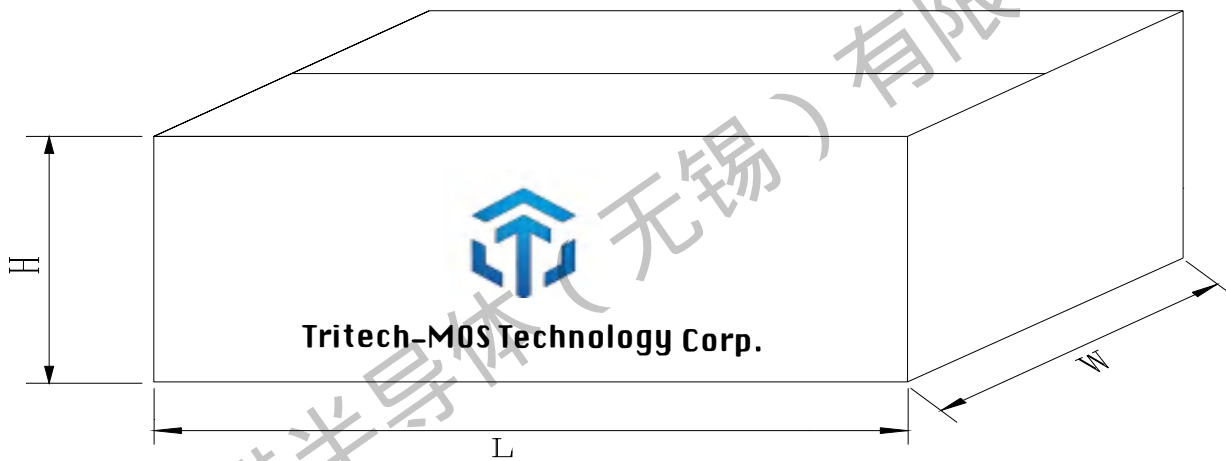
Inner Box



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



Important Notices and Disclaimers

- Tritech-MOS Technology Corp.reserves the right to change this document, its products, and specifications at any time without prior notice.
- Before final design, purchase, or use, customers should obtain and confirm the latest product information and specifications.
- Tritech-MOS Technology Corp. makes no warranties, representations or warranties regarding the suitability of its products for any specific purpose, and Tritech-MOS Technology Corp. does not assume any responsibility for application assistance or customer product design.
- Tritech-MOS Technology Corp. does not guarantee or assume any responsibility for the purchase or use of any unexpected or unauthorized products.
- Any intellectual property rights of Tritech-MOS Technology Corp. are not licensed through implicate or other means.
- Products of Tritech-MOS Technology Corp. are not included as critical components in life support equipment or systems without explicit written approval from Tritech-MOS Technology Corp.

Revision history:

Date	Rev	Description	Page
2023.09.28	23.09	Original	