TMG120P06HP

P-Channel Enhancement Mosfet

General Description

- Low R DS(ON)
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

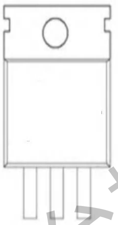
V_{DS} = - 60V I_D = -120A

$R_{DS(ON)}$= 5.5 mΩ(typ.) @ V_{GS}=-10V

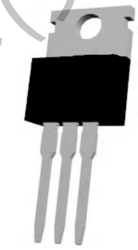
100% UIS Tested

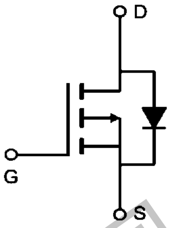
100% R_g Tested

P:TO-220AB



Marking: G120P06H





Absolute Maximum Ratings (T$_C$=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Curren	-120	A
	Continuous Drain Current-T$_C$=100℃	-70	
I_{DM}	Pulsed Drain Current	-440	
P_D	Power Dissipation	180	W
E_{AS}	Single pulse avalanche energy	960	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	℃

Thermal Characteristics

Symbol	Parameter	Max	Units
$R_{θJC}$	Thermal Resistance,Junction to Case	0.69	℃/W
$R_{θJA}$	Thermal Resistance,Junction to Ambient	60	℃/W

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

Static Characteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = -60V, V_{GS}= 0V	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =-20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =+20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-2.0	-3.0	-4.0	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-10V,I_D=-15A	--	5.5	7.0	mΩ

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=-30V f=1.0MHz	--	5403	--	pF
C_{oss}	Output Capacitance		--	941	--	
C_{rss}	Reverse Transfer Capacitance		--	48	--	
R_g	Gate resistance	V_{GS}=0V, V_{DS}Open	--	2.0	--	Ω

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=-15A, R_L=0.75Ω V_{DS}= -30V V_{GS}= -10V R_G= 3Ω	--	4.5	--	ns
tr	Rise Time		--	2.5	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	14.5	--	
t_f	Fall Time		--	3.5	--	
Q_g	Total Gate Charge	V_{GS}=-10V V_{DS}=-30V I_D=-15A	--	80.2	--	nC
Q_{gs}	Gate Source Charge		--	15.2	--	
Q_{gd}	Gate Drain Charge		--	11	--	

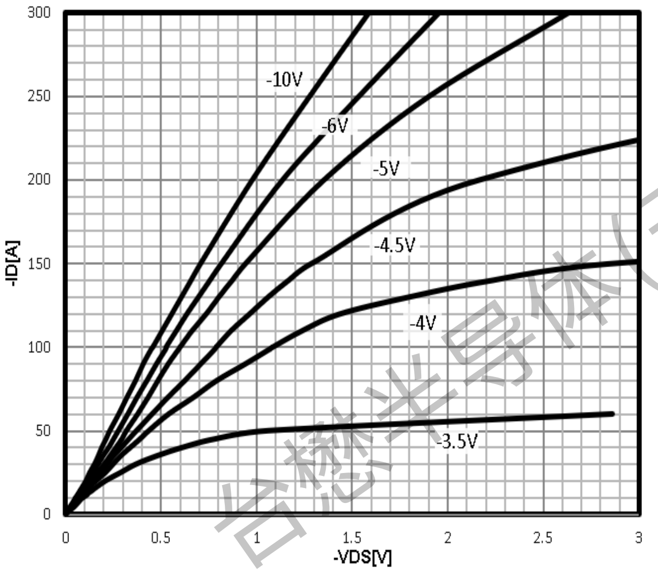
Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C=25 °C	--	-- -	120	A
V_{SD}	Diode Forward Voltage	I_S=-15A,V_{GS}=0V	--	--	-1.2	V
t_{rr}	Reverse Recovery time	I_S=-15A,V_{DD}=-30V dI/dt=100A/μs	--	60	--	ns
Q_{rr}	Reverse Recovery Charge		--	105	--	nC

Characteristics Curve：

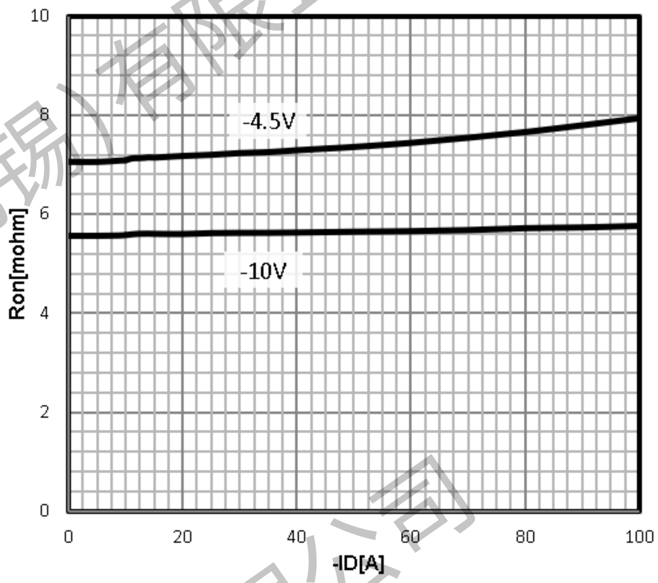
Typ. output characteristics

$I_D=f(V_{DS})$



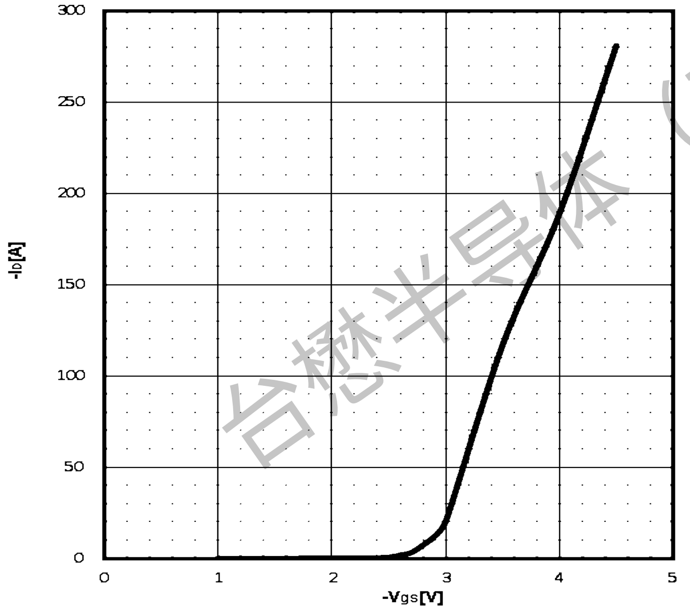
Typ. drain-source on resistance

$R_{DS(on)}=f(I_D)$



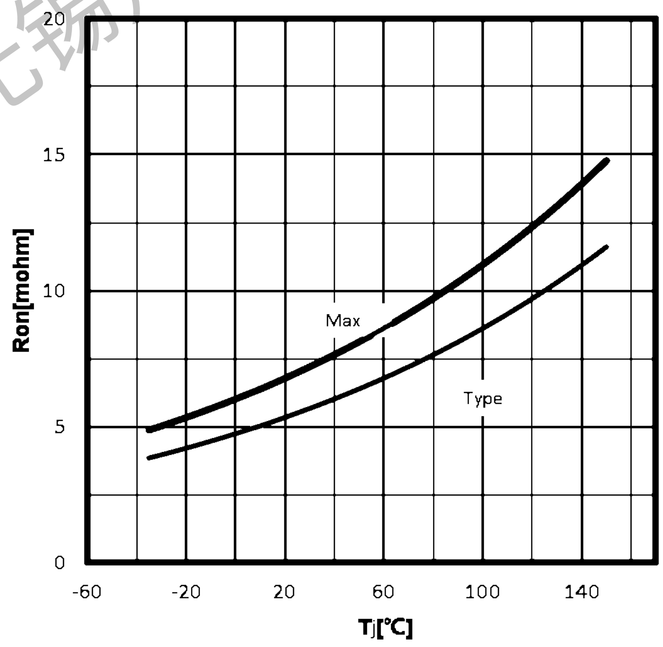
Typ. transfer characteristics

$I_D=f(V_{GS})$

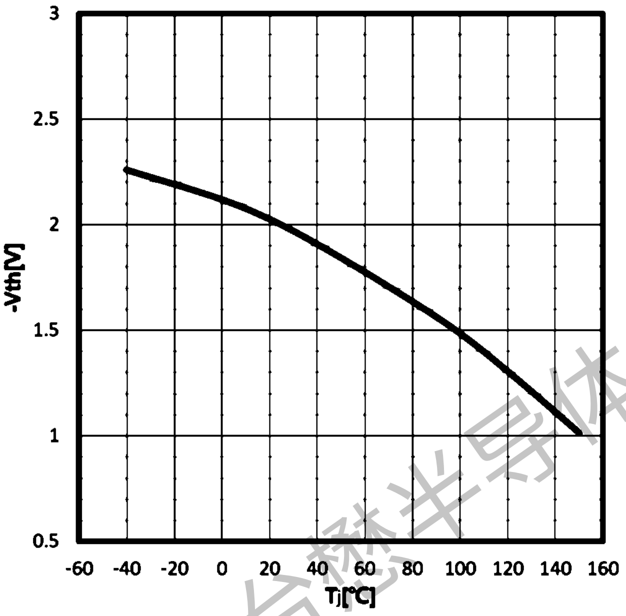


Drain-source on-state resistance

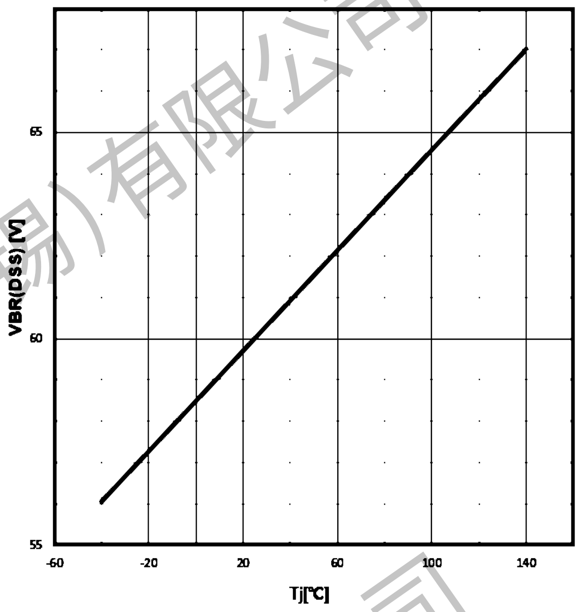
$R_{DS(on)}=f(T_j);I_D=-15A;\ V_{GS}=-10V$



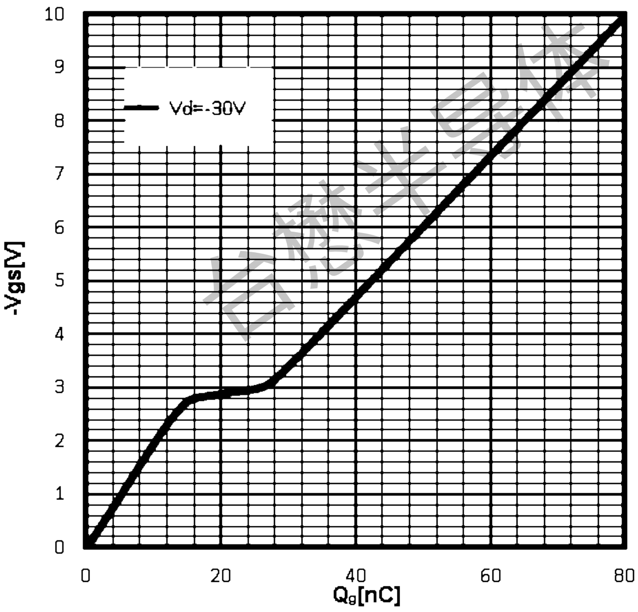
Gate Threshold Voltage
$-V_{TH}=f(T_j)$; $I_D=-250uA$



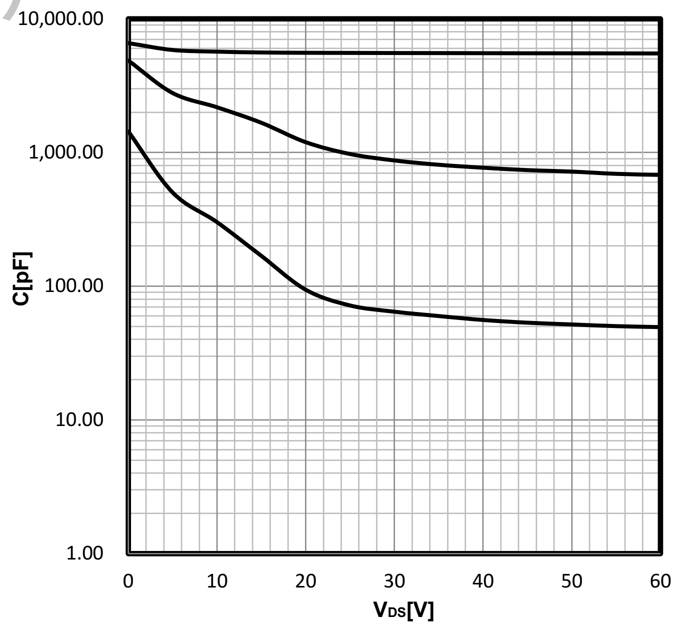
Drain-source breakdown voltage
$V_{BR(DSS)}=f(T_j)$; $I_D=-250uA$



Typ. gate charge
$V_{GS}=f(Q_{gate})$; $I_D=-15A$

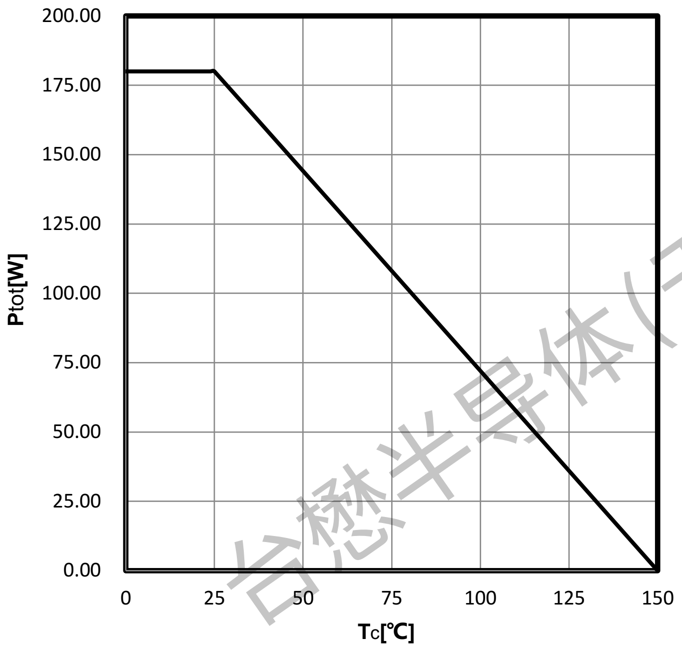


Typ. capacitances
$C=f(V_{DS})$; $V_{GS}=0V$; $f=1MHz$



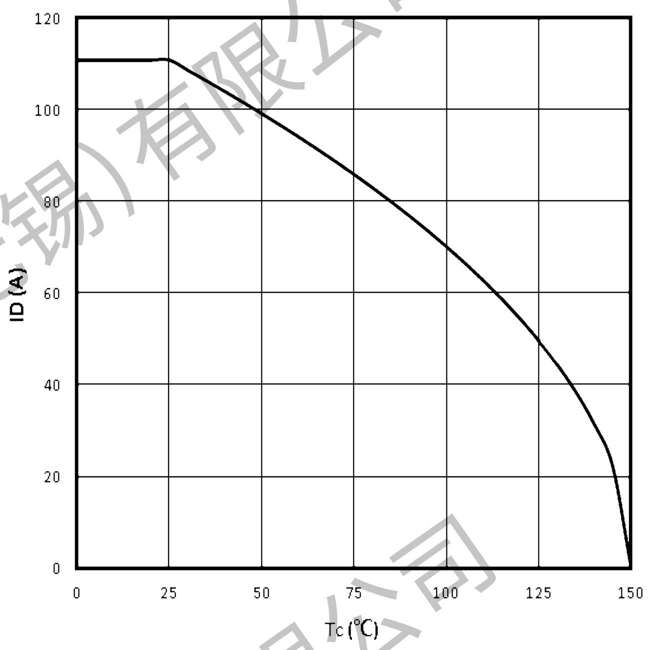
Power Dissipation

$P_{tot}=f(T_C)$



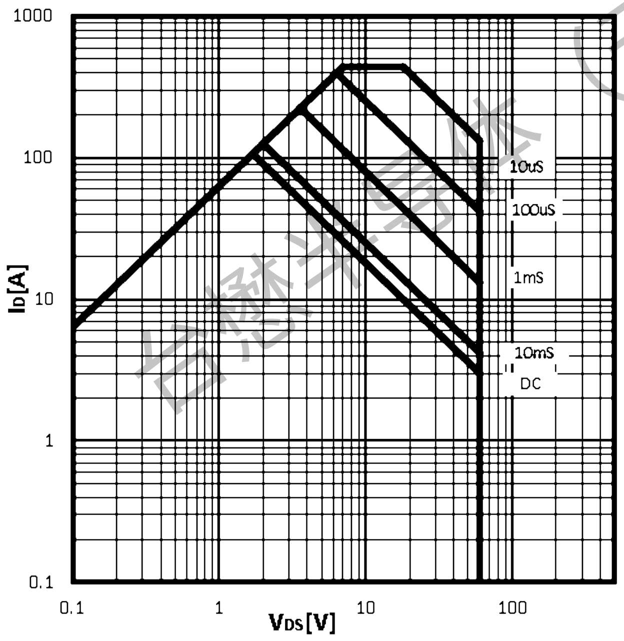
Maximum Drain Current

$-I_D=f(T_C)$



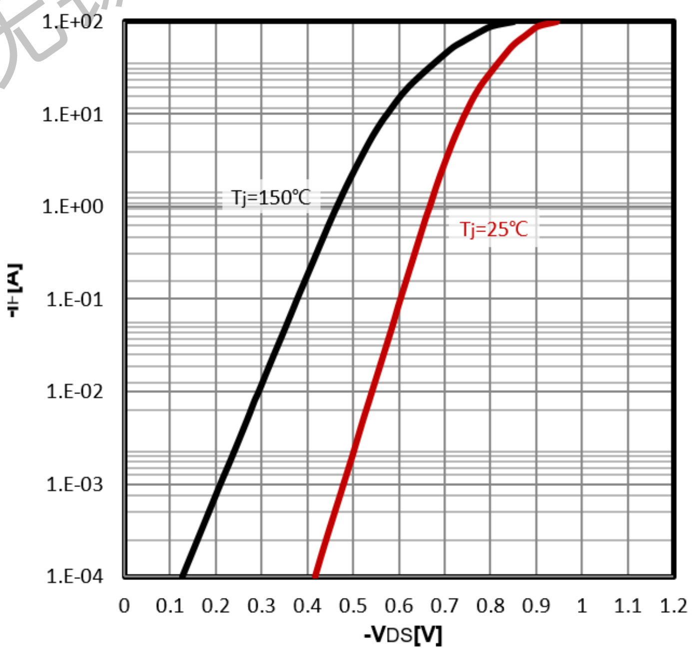
Safe operating area

$I_D=f(V_{DS})$



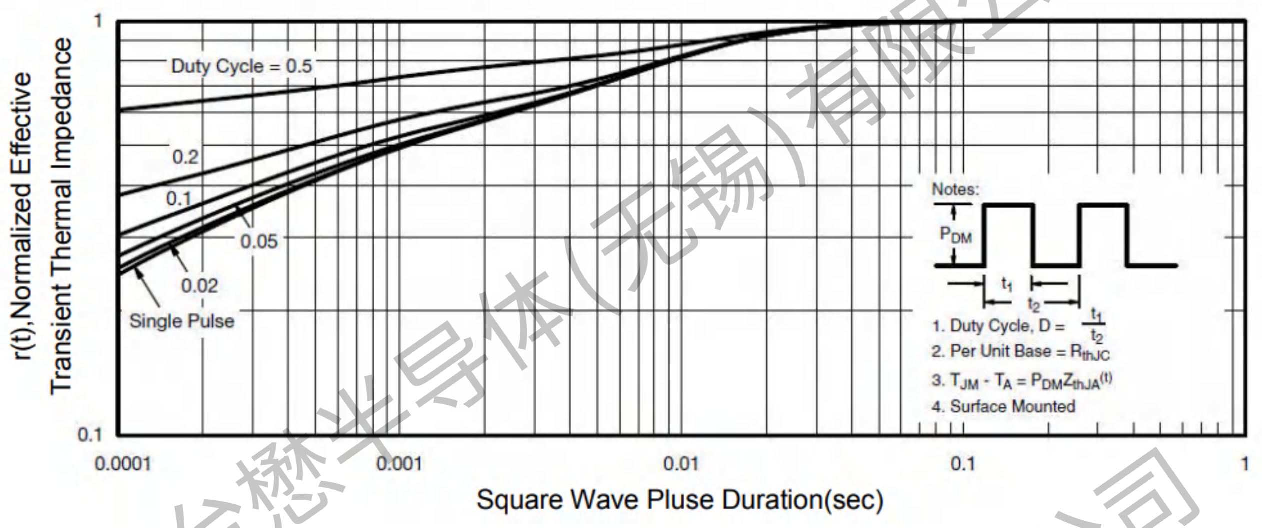
Body Diode Forward Voltage Variation

$-I_F=f(-V_{DS})$

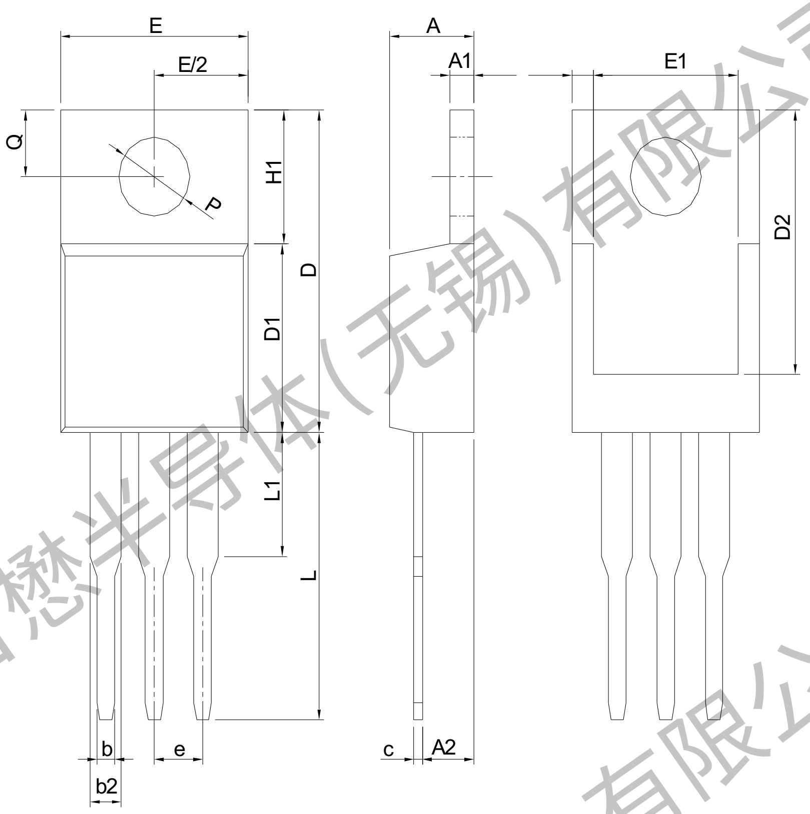


Max. transient thermal impedance

$Z_{thJC}=f(t_p)$



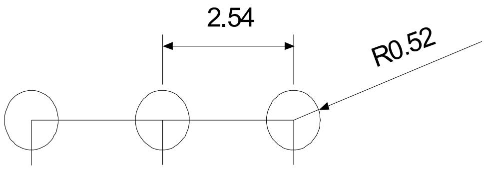
Package Mechanical Data: TO-220AB



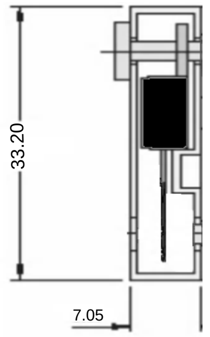
SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380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

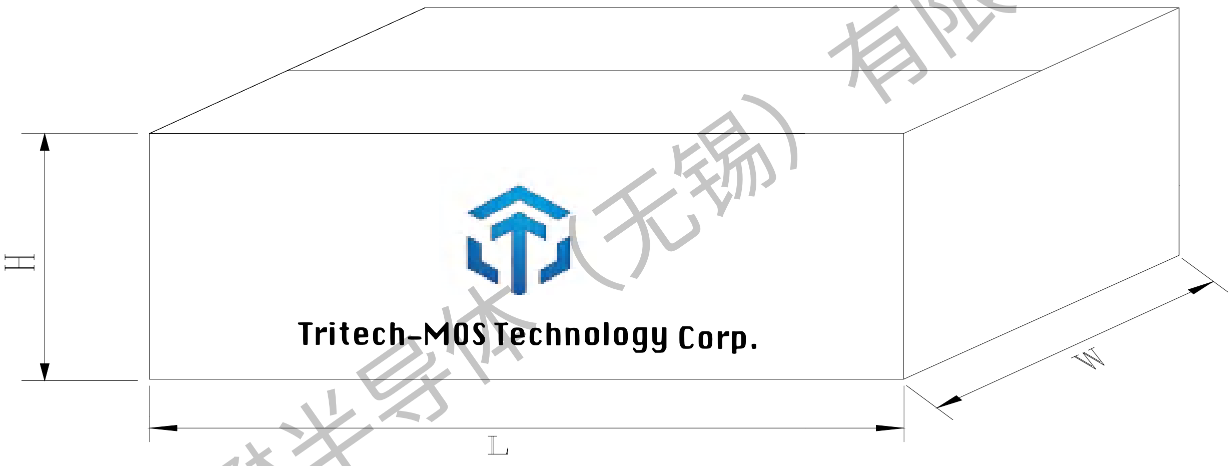
Package	Packing Form	Quantity		
		Tube	Inner Box [kpcs]	Outbox [kpcs]
TO-220AB	Tube Tape	50	5	1

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	