


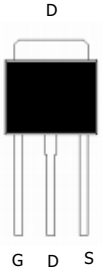


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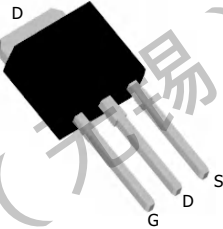
N-Channel Enhancement Mosfet

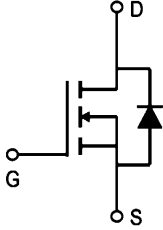
<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = 60V$ $I_D = 30A$ $R_{DS(ON)} = 26 m\Omega$ (typ.) @ $V_{GS} = 10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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Y:TO-251-3L



Marking: 30N06





Absolute Maximum Ratings ($T_A = 25^\circ C$ 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 Current $T_C = 25^\circ C$	30	A
	Continuous Drain Current $T_C = 100^\circ C$	20	A
I_{DM}	Pulsed Drain Current	120	A
P_D	Power Dissipation	55	W
EAS	Single pulse avalanche energy <small>note2</small>	23	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	$^\circ C$

Thermal Characteristic

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.7	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	$^\circ C/W$



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Electrical Characteristics: (T_c=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
On Characteristics						
V_{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μA	1	2	3	V
R_{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =10V, I _D =15A	---	26	31	mΩ
		V _{GS} =4.5V, I _D =10A	---	32	39	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1450	---	pF
C_{oss}	Output Capacitance		---	70	---	
C_{rss}	Reverse Transfer Capacitance		---	60	---	
Switching Characteristics						
t_{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D =15A R _G =1.8Ω, V _{GS} =10V	---	7.5	---	ns
t_r	Rise Time		---	21	---	ns
t_{d(off)}	Turn-Off Delay Time		---	16	---	ns
t_f	Fall Time		---	23.5	---	ns
Q_g	Total Gate Charge		---	25	---	nC
Q_{gs}	Gate-Source Charge	V _{GS} =10V, V _{DS} =30V, I _D =15A	---	4.5	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	6.5	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Source Current	---	---	---	30	A
I_{SM}	Pulsed Source Current	---	---	---	120	A
V_{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =30A	---	---	1.2	V
Trr	Reverse Recovery Time	I _F =30A, dI/dt=100A/μs	---	29	---	ns
Qrr	Reverse Recovery Charge		---	45	---	nC



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

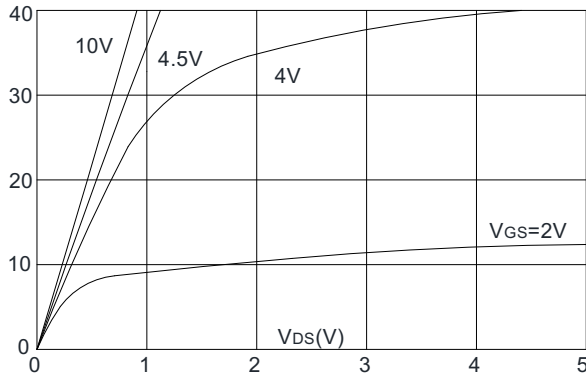


Figure1: Output Characteristics

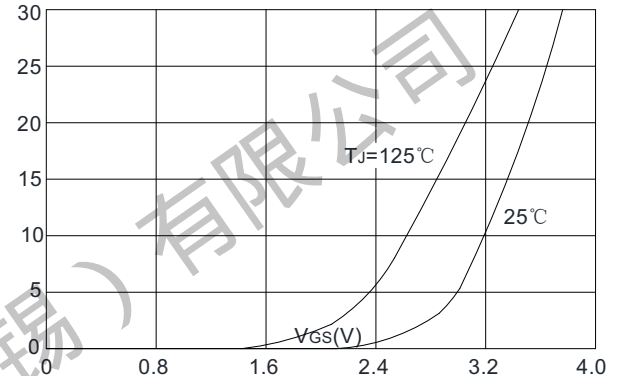


Figure 2: Typical Transfer Characteristics

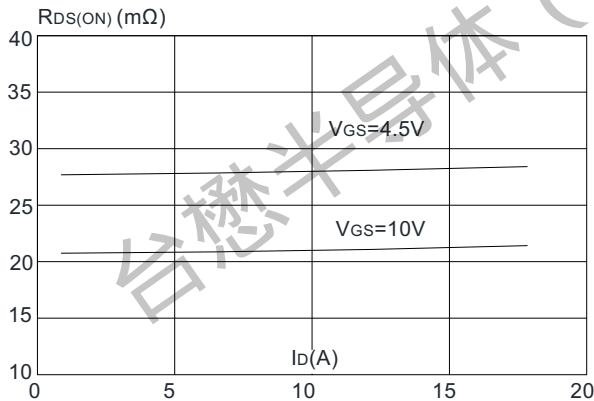


Figure 3: On-resistance vs. Drain Current

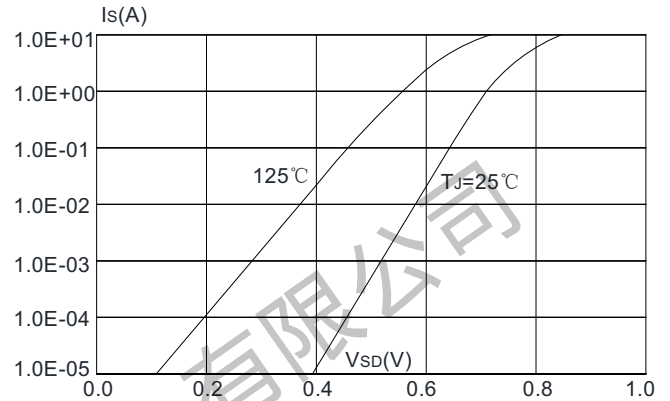


Figure 4: Body Diode Characteristics

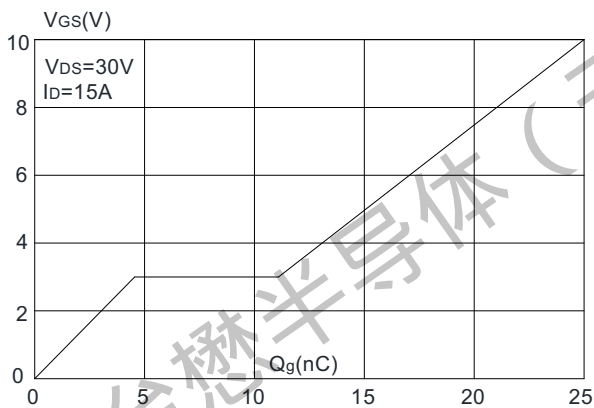


Figure 5: Gate Charge Characteristics

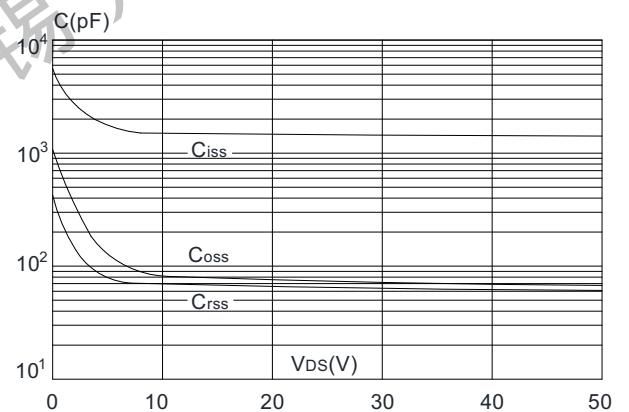


Figure 6: Capacitance Characteristics



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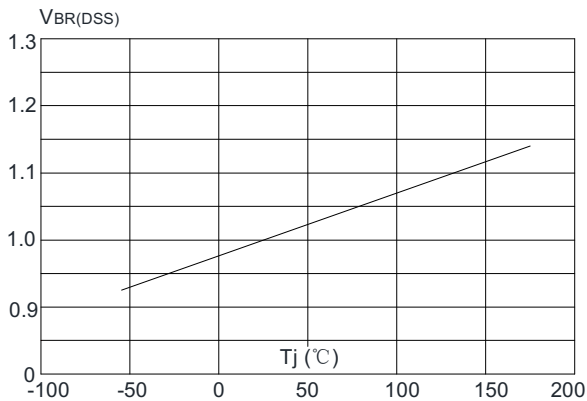


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

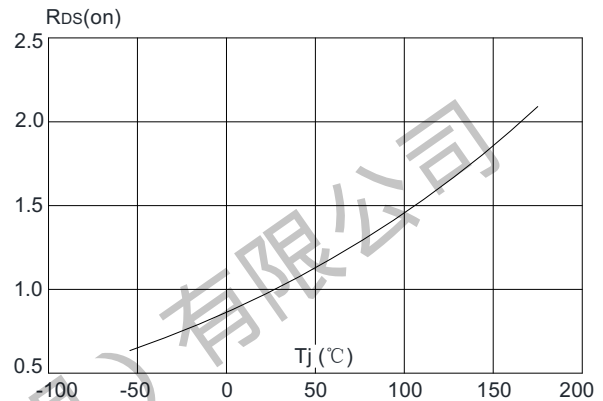


Figure 8: Normalized on Resistance vs. Junction Temperature

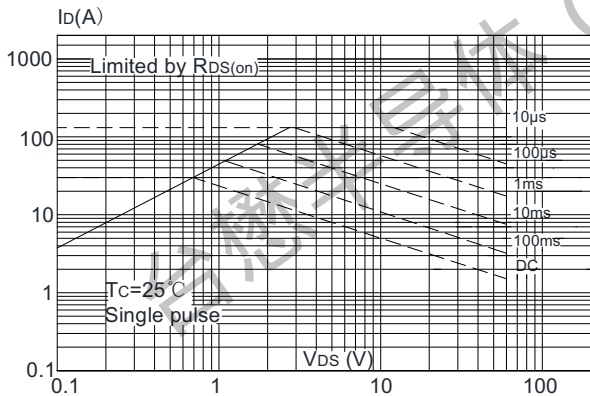


Figure 9: Maximum Safe Operating Area

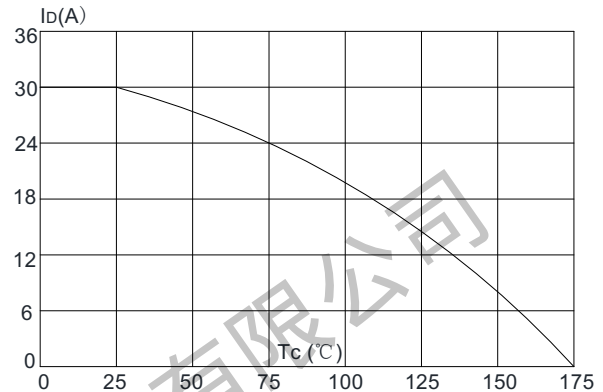


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

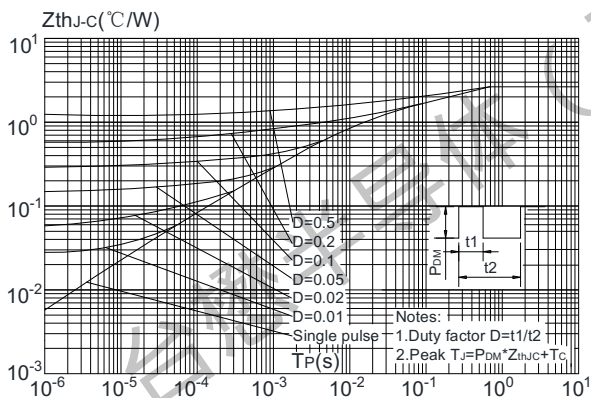


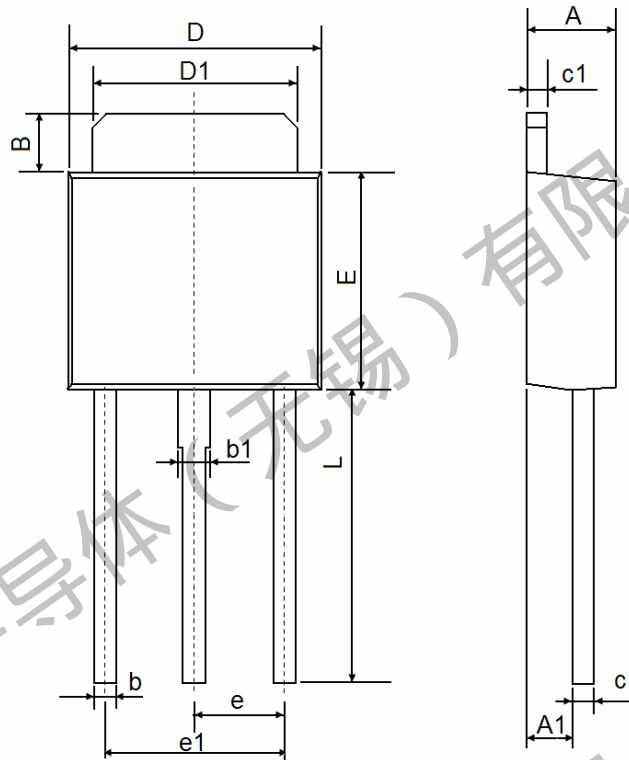
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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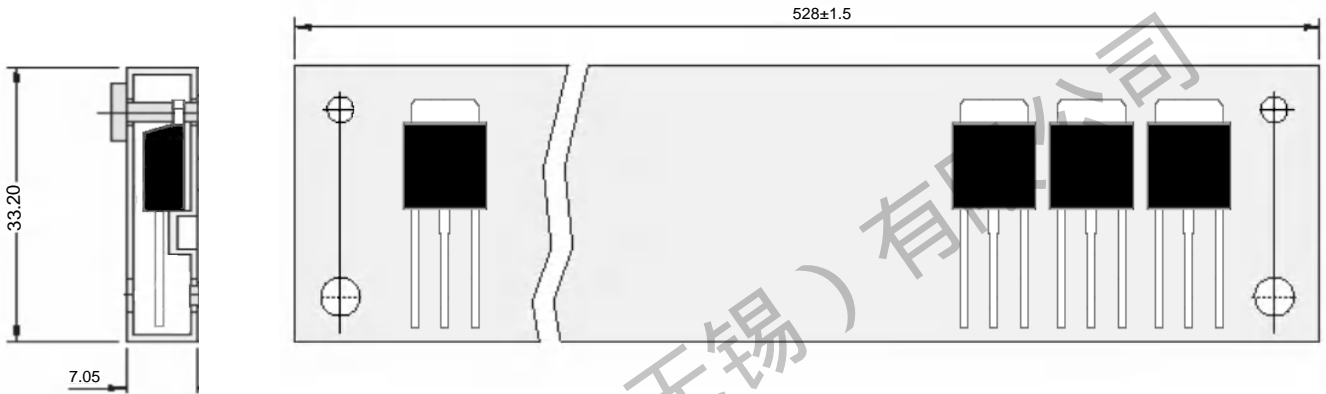
Package Mechanical Data: TO-251-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.000	1.150	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.480	0.205	0.213
E	5.900	6.100	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.200	9.400	0.295	0.311

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All Dimensions are in mm

1.TO-251-3L Packaging

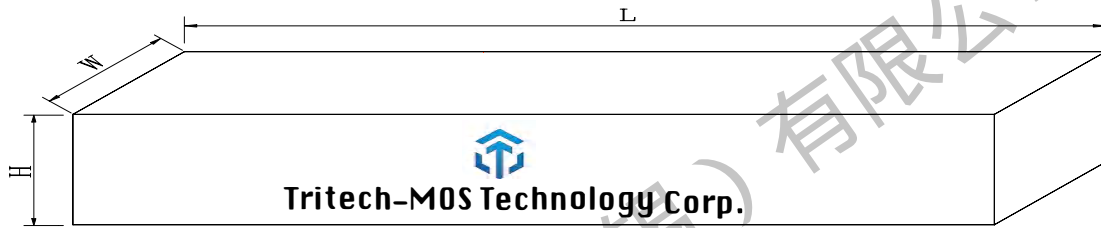
Package	Packing Form	Quantity		
		Tube	Inner Box [kpcs]	Outbox [kpcs]
TO-251-3L	Tube Tape	75	5	1



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Inner Box



Dimension : 580 (L)×154(W) ×49(H) mm

Quantity : 75 × 56Ea = 4200pcs

Outer Box



Dimension : 595(L)×285(W) ×185(H) mm

Quantity : 4200 × 5Ea = 21000pcs



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Revision history:

Date	Rev	Description	Page
2023.08.05	23.08	Original	