TM150N12T

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

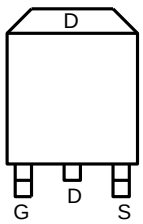
General Features

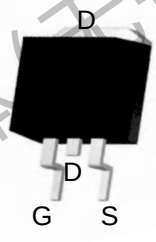
V_{DS} =120V I_D= 150A

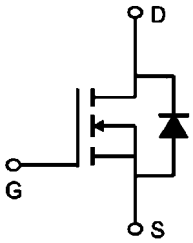
$R_{DS(ON)}$= 4.3 mΩ(typ.) @ V_{GS}= 10V

100% UIS Tested
100% R_g Tested

T:TO-263-3L







Marking:150N12

Absolute Maximum Ratings (T_C = 25°C Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	120	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V	150	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V	95	A
I_{DM}	Pulsed Drain Current	1050	A
EAS	Single Pulse Avalanche Energy	304	mJ
I_{AS}	Avalanche Current	36	A
P_D	Total Power Dissipation	156	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	---	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	0 8	°C/W

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

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} = 80V, 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	2.0	2.5	3.0	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance	V_{GS} = 10V, I_D = 20A	-	4.3	5.5	mΩ
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz	-	12148	-	pF
C_{oss}	Output Capacitance		-	518	-	pF
C_{rss}	Reverse Transfer Capacitance		-	441	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 50V, I_D = 15A	-	230	-	nC
Q_{gs}	Gate Source Charge		-	56	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	76	-	nC
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 50V I_D= 30A, R_{GEN} = 6Ω	-	40	-	ns
t_r	Turn-On Rise Time		-	68	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	99	-	ns
t_f	Turn-Off Fall Time		-	91	-	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 = 20A, di/dt = 100A/us	-	113	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	274	-	nC

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Typical Electrical and Thermal Characteristics (Curves

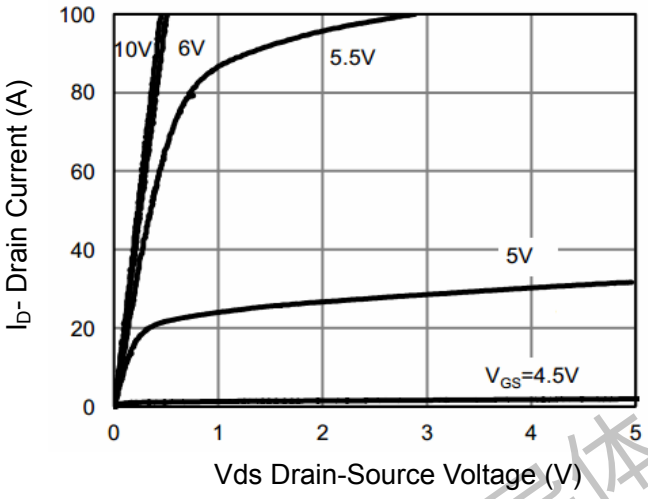

Figure 1 Output Characteristics

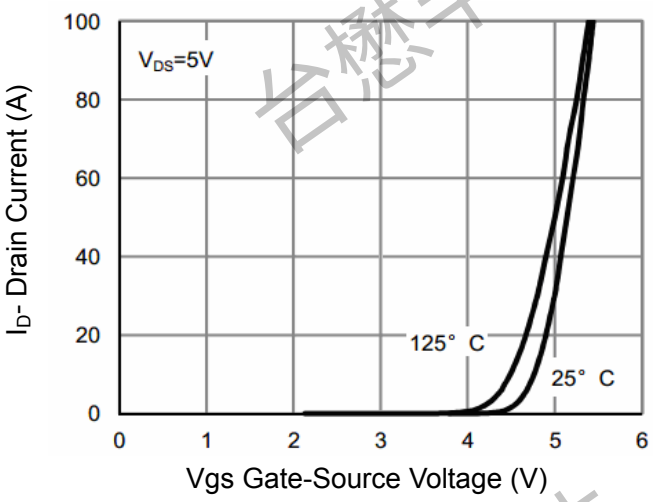

Figure 2 Transfer Characteristics

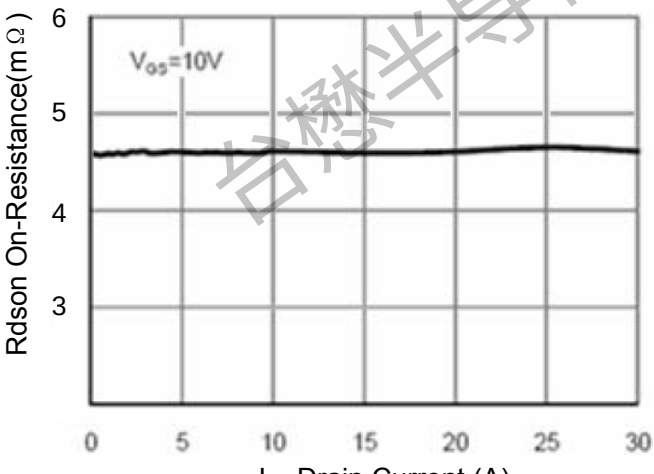

Figure 3 Rdson- Drain Current

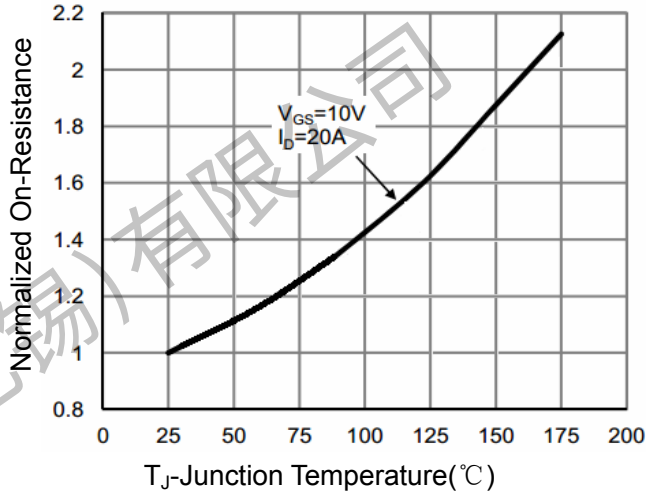

Figure 4 Rdson-JunctionTemperature

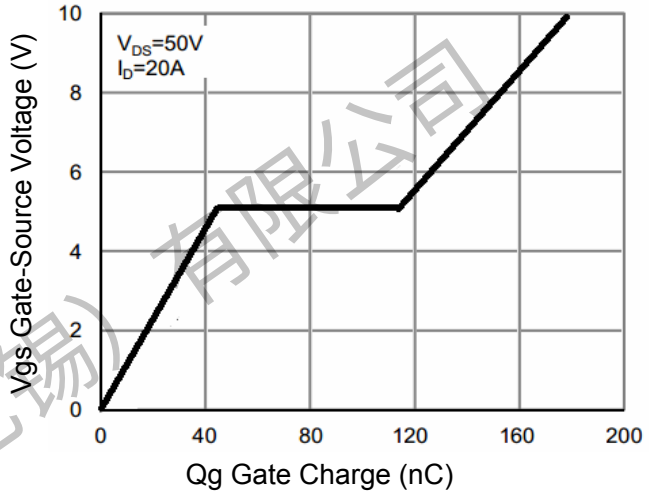

Figure 5 Gate Charge

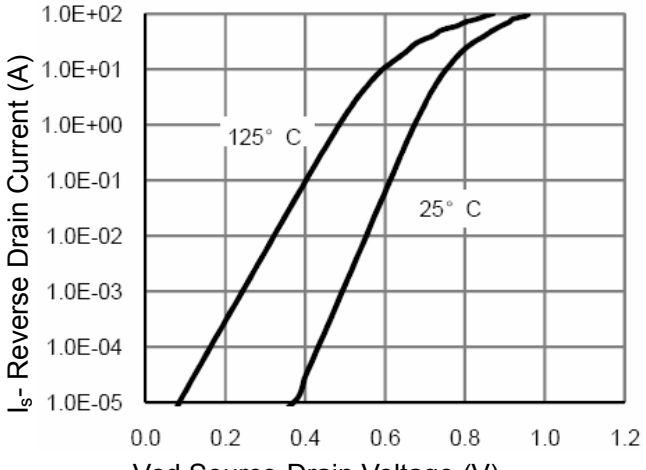

Figure 6 Source- Drain Diode Forward

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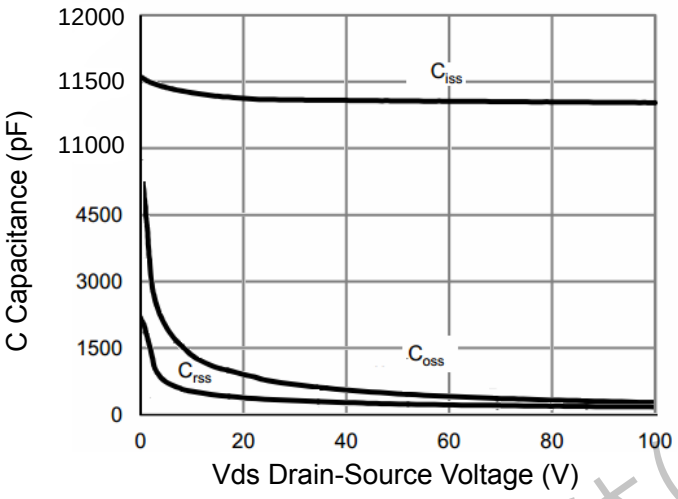

Figure 7 Capacitance vs Vds

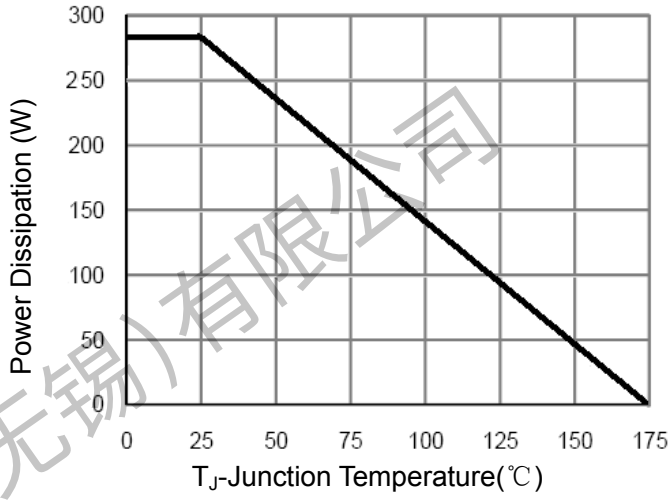

Figure 9 Power De-rating

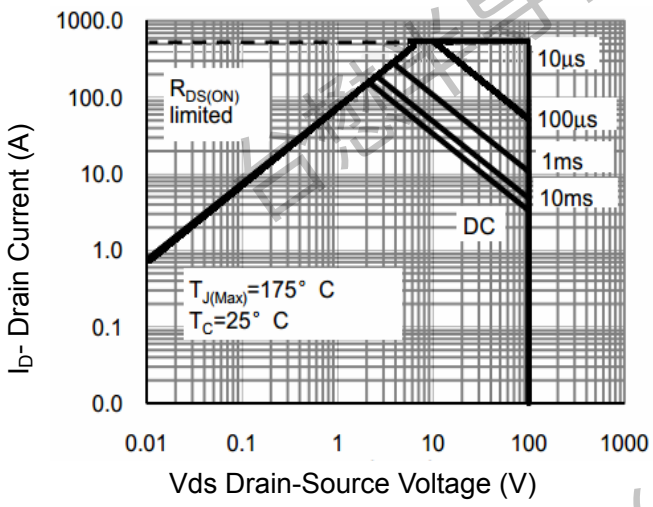

Figure 8 Safe Operation Area

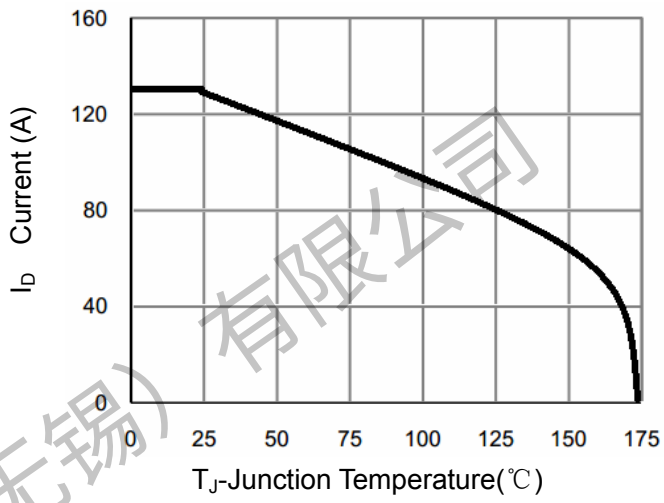

Figure 10 ID Current- JunctionTemperature

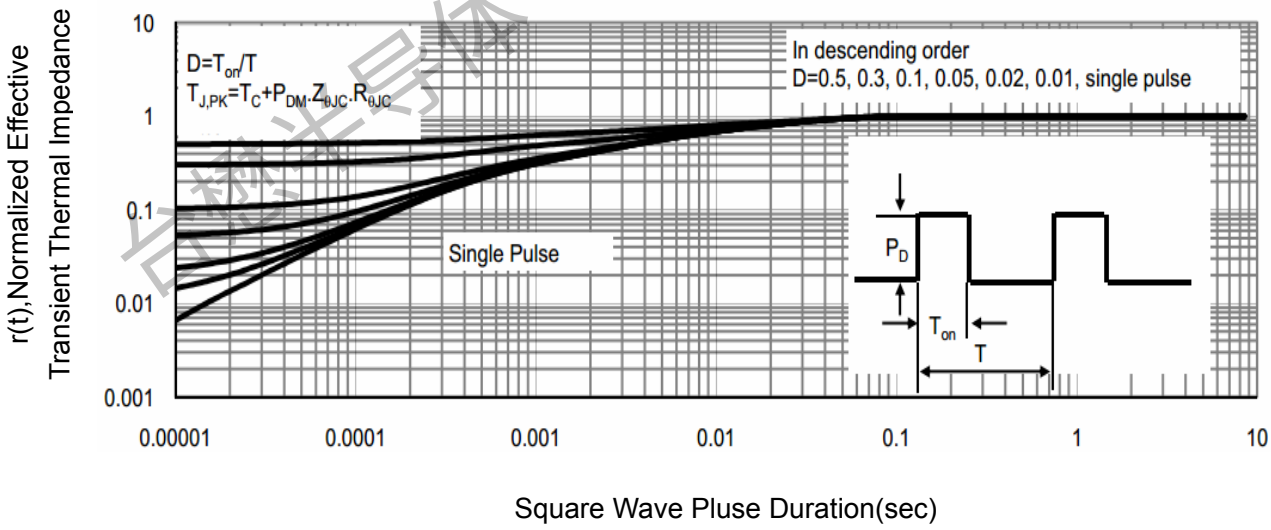

Figure 11 Normalized Maximum Transient Thermal Impedance

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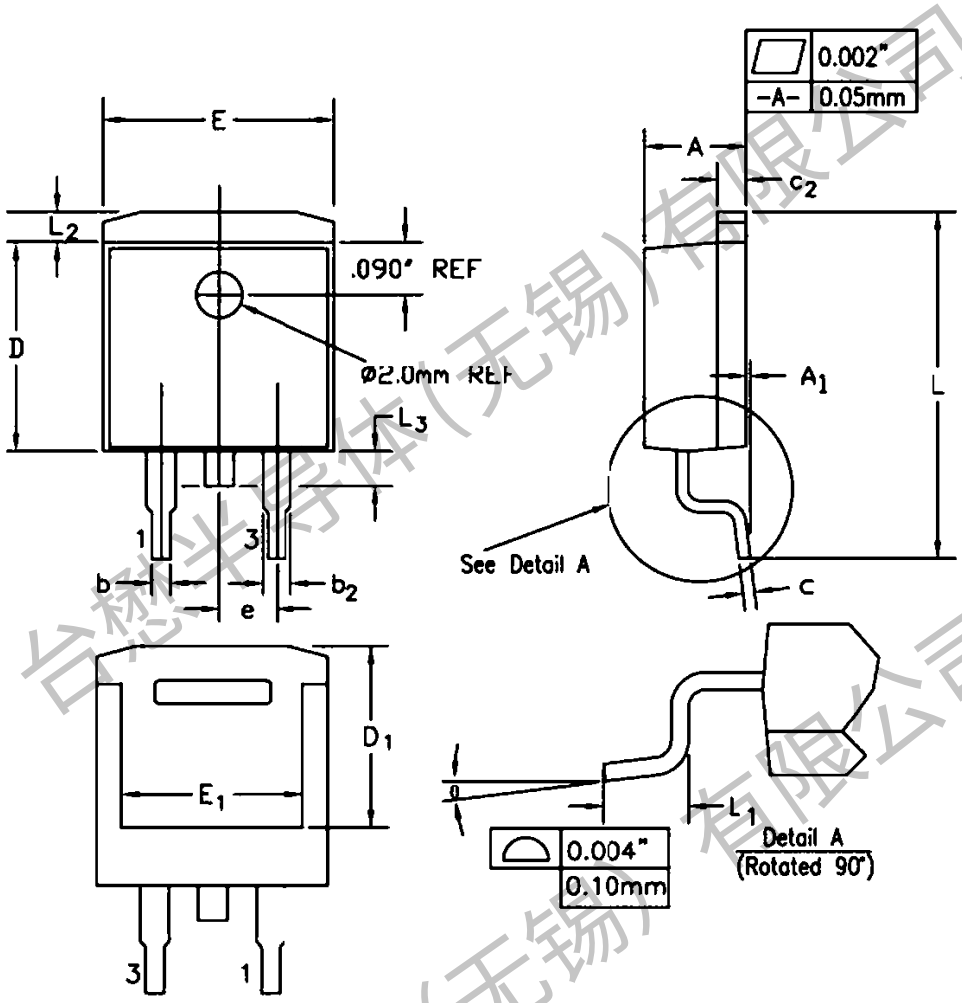
Package Mechanical Data: TO-263-3L



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	
A1	-	0.010	-	0.25	
b	0.028	0.037	0.71	0.94	
b2	0.045	0.055	1.15	1.40	
c	0.018	0.024	0.46	0.61	
c2	0.048	0.055	1.22	1.40	
D	0.350	0.370	8.89	9.40	
D1	0.315	0.324	8.01	8.23	
E	0.395	0.405	10.04	10.28	
E1	0.310	0.318	7.88	8.08	
e	0.100 BSC.		2.54 BSC.		
L	0.580	0.620	14.73	15.75	
L1	0.090	0.110	2.29	2.79	
L2	0.045	0.055	1.15	1.39	
L3	0.050	0.070	1.27	1.77	
θ	0°	8°	0°	8°	

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Revision history:

Date	Rev	Description	Page
2023.12.11	23.12	Original	