

TMG130N085T

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

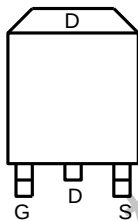
General Features

$V_{DS} = 85V$ $I_D = 130A$

$R_{DS(ON)} = 4.2m\Omega (typ.) @ V_{GS} = 10V$

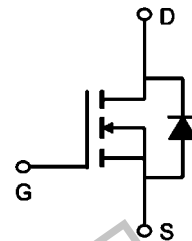
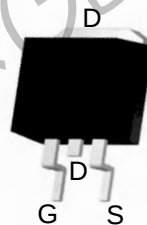
100% UIS Tested

100% R_g Tested



Marking: G130N085

T:TO-263-3L



Absolute Maximum Ratings: ($T_c = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	130	A
	Continuous Drain Current- $T_C = 100^\circ C$	91	
	Pulsed Drain Current ²	455	
E_{AS}	Single Pulse Avalanche Energy ³	338	mJ
P_D	Power Dissipation ⁴	208	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	2	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ¹	62	



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	85	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =80V	---	---	1	μ A
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 μ A	2	3	4	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =20A	---	4.2	5	m Ω
G _{FS}	Forward Transconductance	V _{DS} = 5 V, I _D =20A	---	31	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =40V, V _{GS} =0V, f=1MHz	---	3365	---	pF
C _{oss}	Output Capacitance		---	1264	---	
C _{rss}	Reverse Transfer Capacitance		---	46	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =40V, R _L =2 Ω R _{GEN} =3 Ω, V _{GS} =10V	---	17.6	---	ns
t _r	Rise Time		---	27	---	ns
t _{d(off)}	Turn-Off Delay Time		---	31	---	ns
t _f	Fall Time		---	10.8	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =40V, I _D =20A	---	56	---	nC
Q _{gs}	Gate-Source Charge		---	18.3	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	15	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ²	V _{GS} =0V, I _S = 1 A	---	0.7	1.0	V
I _S	Diode Forward Current (Note 2)	---	---	---	130	A
T _{rr}	Reverse Recovery Time	T _J = 25°C, I _F = 20A di/dt = 100A/μs ^(Note3)	---	58	---	NS
Q _{rr}	Reverse Recovery Charge		---	95	---	NC

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

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Typical Characteristics

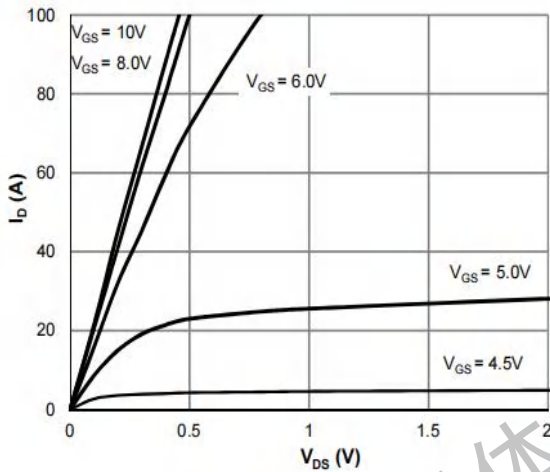


Figure 1: Saturation Characteristics

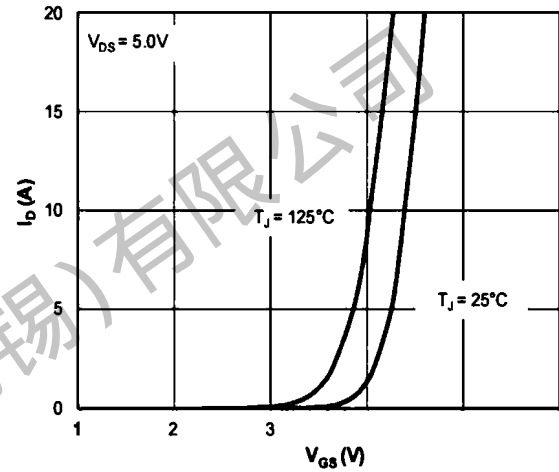


Figure 2: Transfer Characteristics

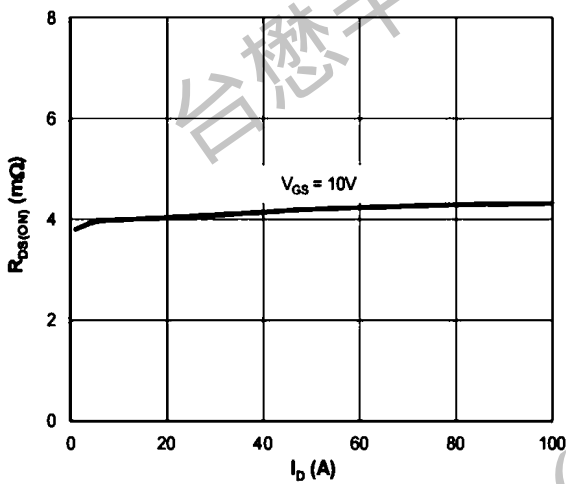


Figure 3: $R_{DS(ON)}$ vs. Drain Current

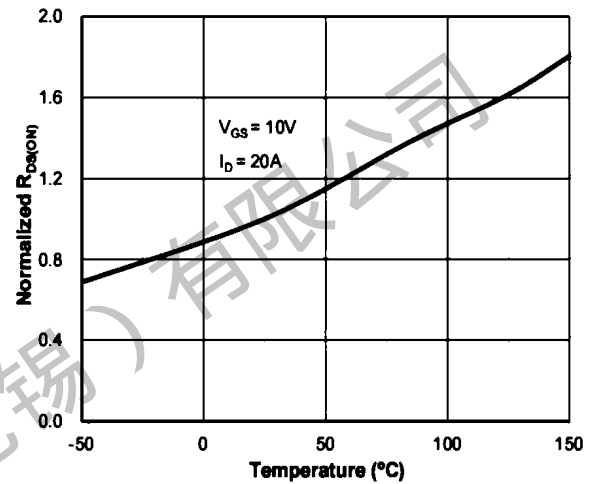


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

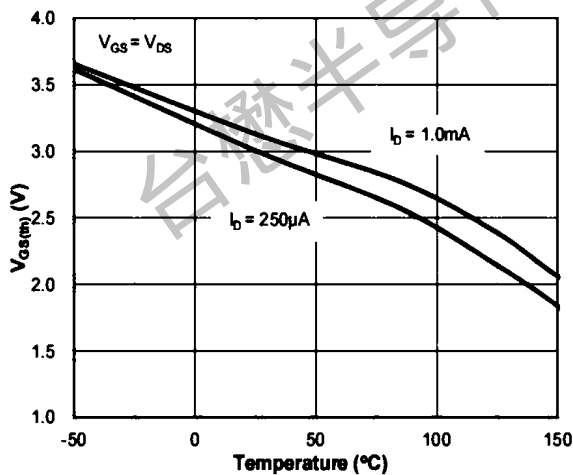


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

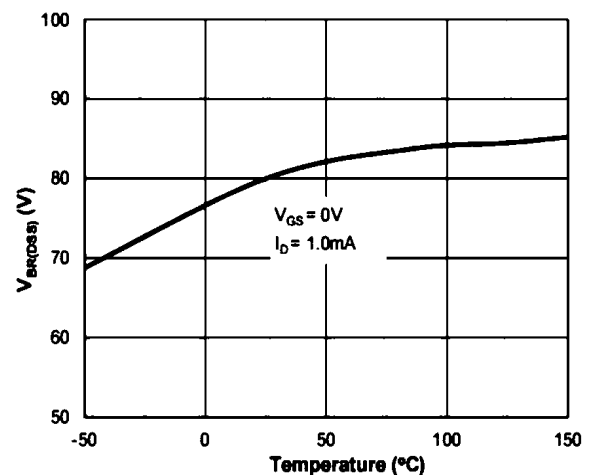


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

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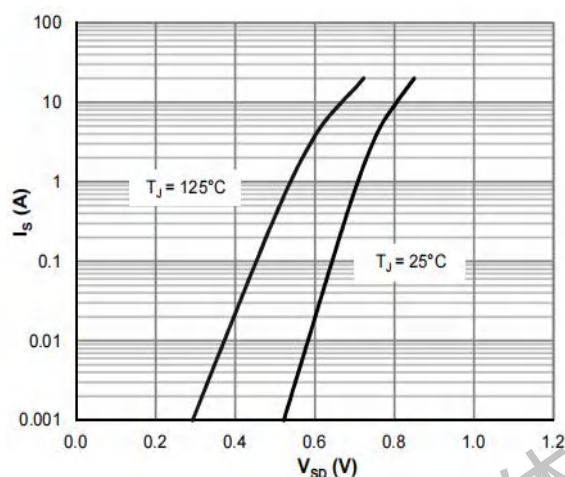


Figure 7: Body-Diode Characteristics

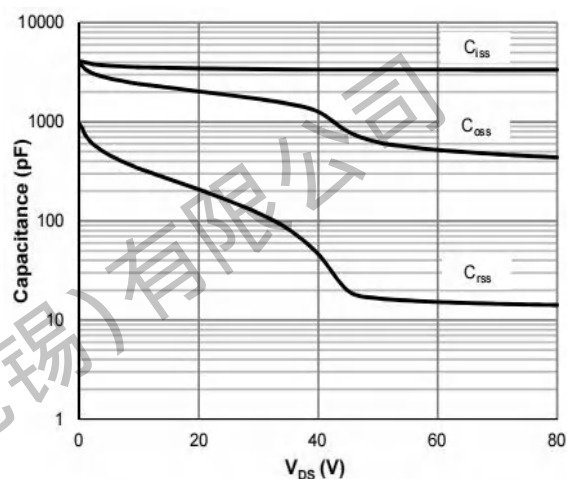


Figure 8: Capacitance Characteristics

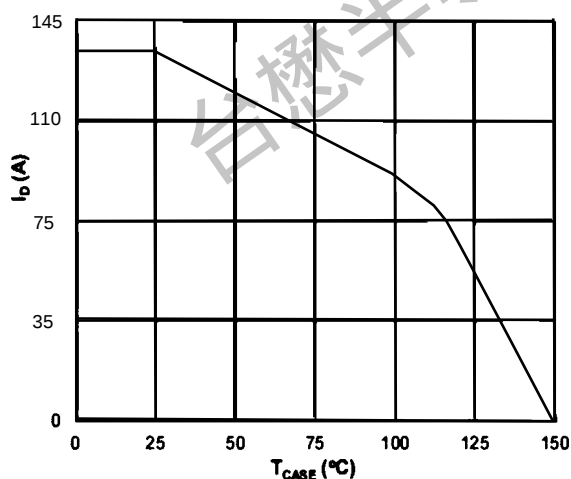


Figure 9: Current De-rating

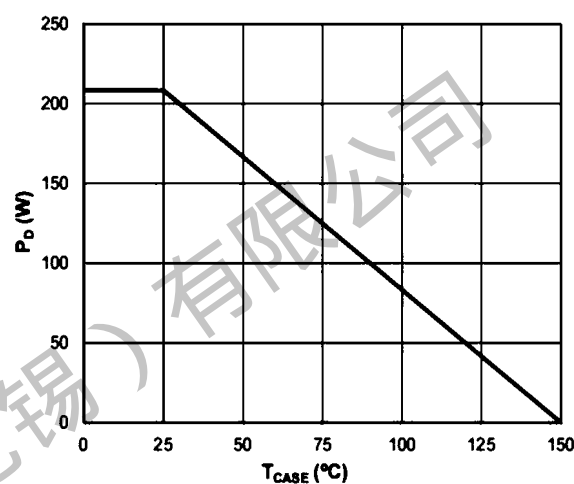


Figure 10: Power De-rating

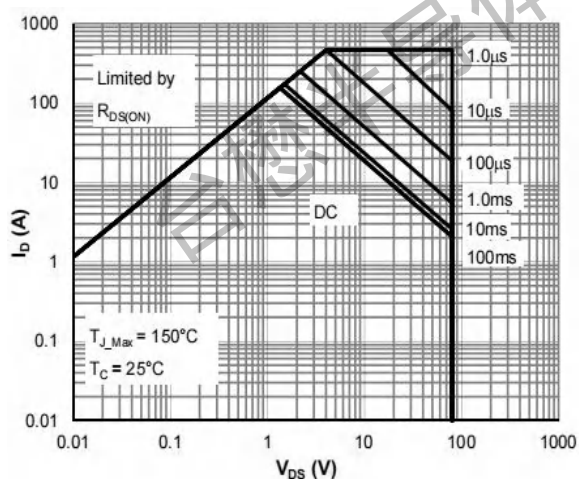


Figure 11: Maximum Safe Operating Area

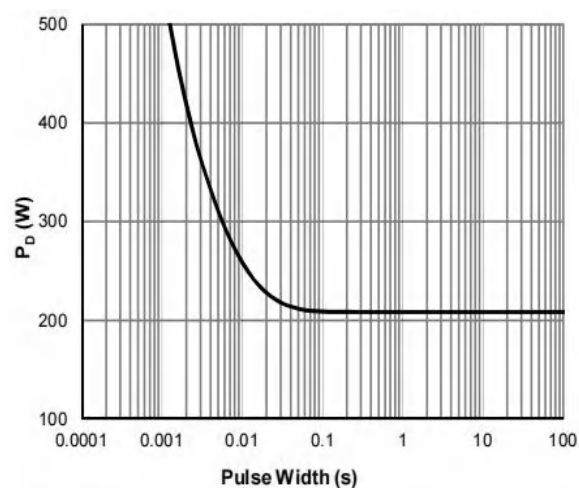
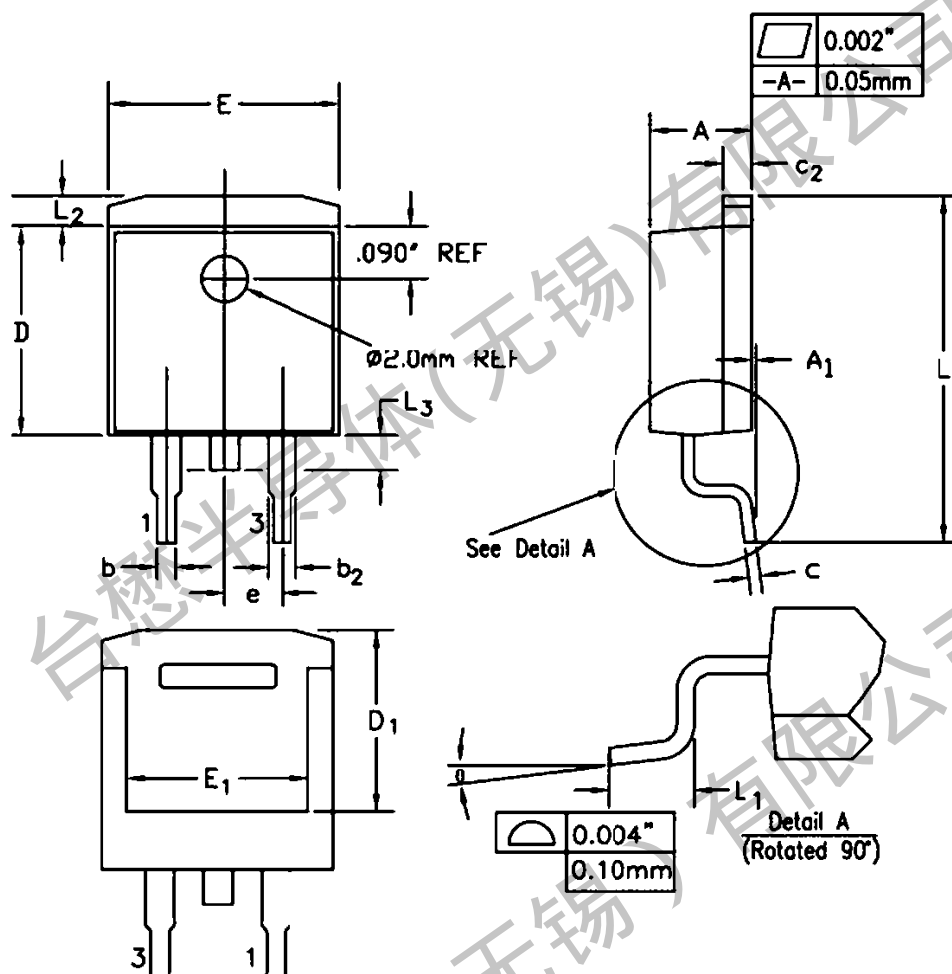


Figure 12: Single Pulse Power Rating, Junction-to-Case

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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	