TMG120N085D

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 = 120A

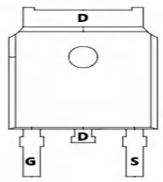
$R_{DS(ON)}$=4.5mΩ(typ.) @V_{GS}=10V

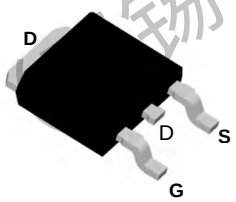
100% UIS Tested

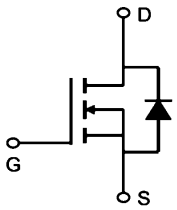
100% R_g Tested

Green Product

D:TO-252-3L







Marking: G120N085

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	120	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V[1]	84	A
I_{DM}	Pulsed Drain Current[2]	465	A
EAS	Single Pulse Avalanche Energy[3]	338	mJ
P_D	Total Power Dissipation[3]	208	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	6.6	°C/W

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 250 μA	BV_{DSS}	85	-	-	V
Drain-Source Leakage Current	V_{DS} = 80 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250 μA	$V_{GS(th)}$	2	3	4	V
Drain-Source On-State Resistance (Note 3)	V_{GS} = 10 V, I_D = 20 A	$R_{DS(on)}$	-	4.5	5.0	mΩ
Forward Transconductance	V_{DS} = 5 V, I_D = 20 A	gfs	-	31	-	S
Gate Resistance	VGS = 0V, VDS= 0V, f = 1MH	RG	-	1.9	-	Ω
Input Capacitance	VDS=40 V , VGS=0V , f=1MHz	C_{iss}	-	3365	-	pF
Output Capacitance		C_{oss}	-	1264	-	pF
Reverse Transfer Capacitance		C_{rss}	-	46	-	pF
Turn-on Delay Time(Note2)	VGS = 10V, VDS = 40V RL = 2.0Ω, RGEN = 3Ω	$t_{d(ON)}$	-	17.6	-	ns
Rise Time(Note2)		t_r	-	27	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	31	-	ns
Fall Time(Note2)		t_f	-	10.8	-	ns
Total Gate Charge(Note2)	VDS=40V , VGS=10V , ID=20A	Q_G	-	56	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	18.3	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	15	-	nC

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbo	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	120	A
Drain-Source Diode Forward Voltage	VGS=0V , IS=1A , TJ=25℃	V_{SD}	-	0.7	1.0	V
Reverse Recovery Time(Note2)	T_J = 25℃, I_F= 20A di / dt = 100 A/μs	trr	-	58	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	95	-	nC

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

RATINGS AND CHARACTERISTIC CURVES

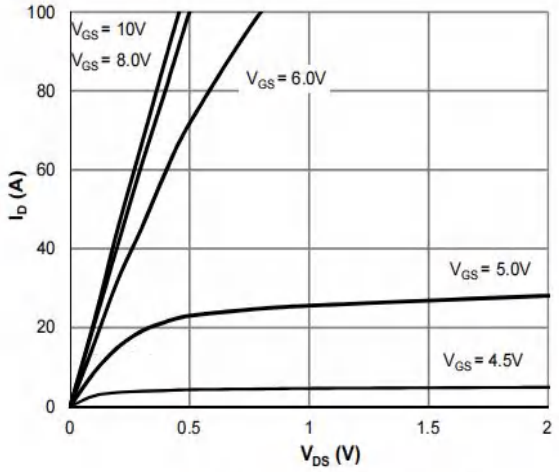


Figure 1: Saturation Characteristics

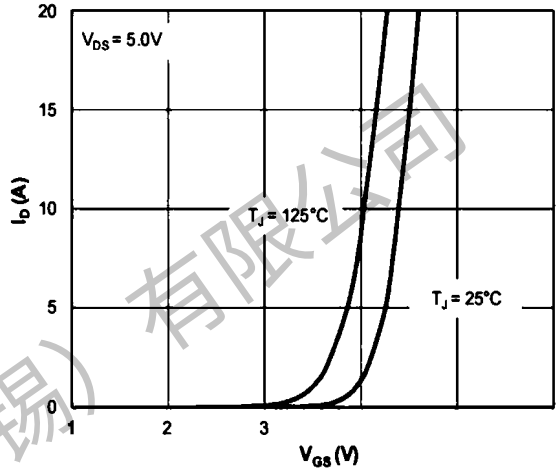


Figure 2: Transfer Characteristics

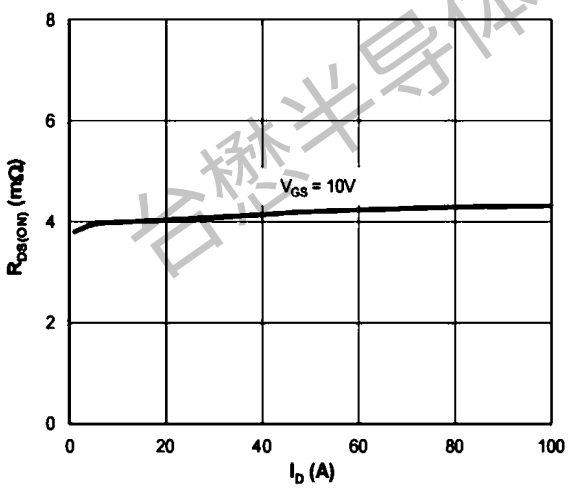


Figure 3: $R_{DS(ON)}$ vs. Drain Current

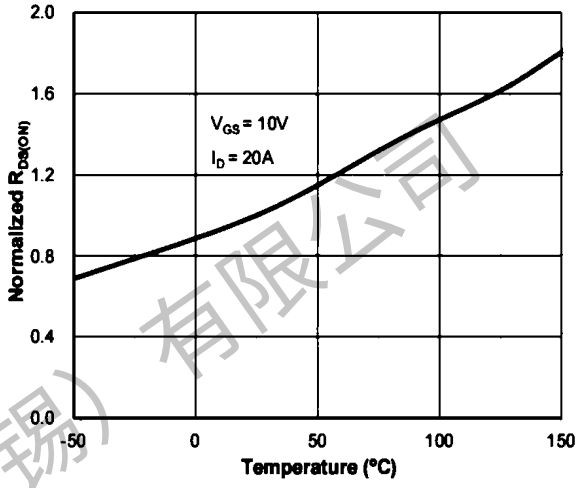


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

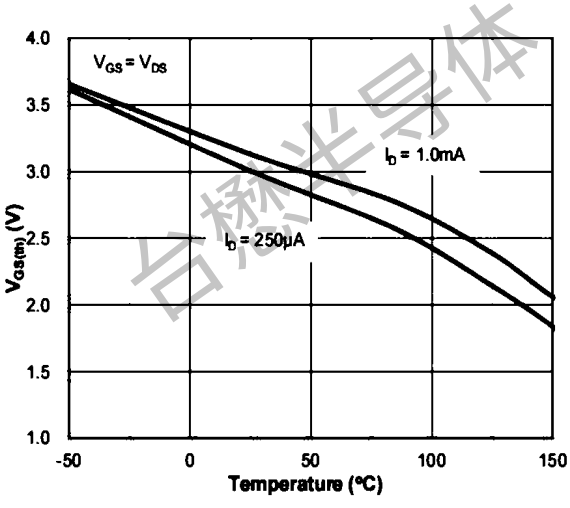


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

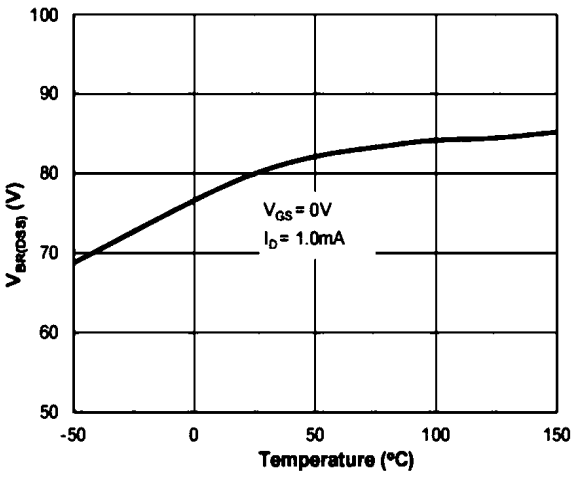


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

RATINGS AND CHARACTERISTIC CURVES

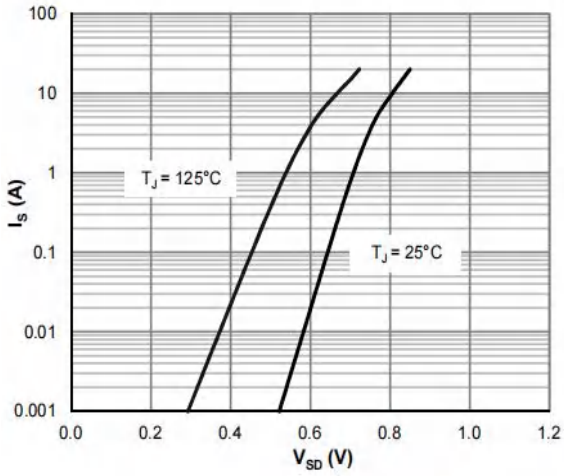


Figure 7: Body-Diode Characteristics

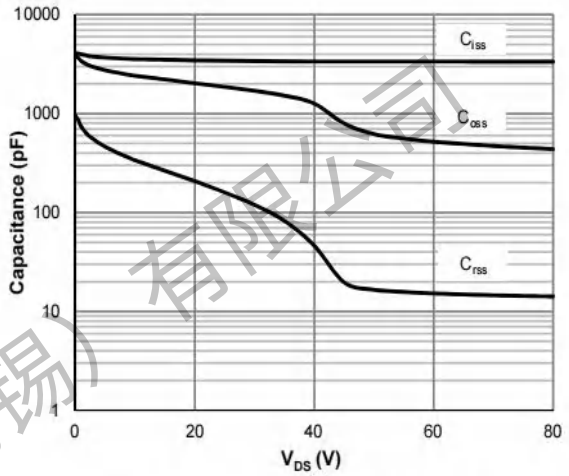


Figure 8: Capacitance Characteristics

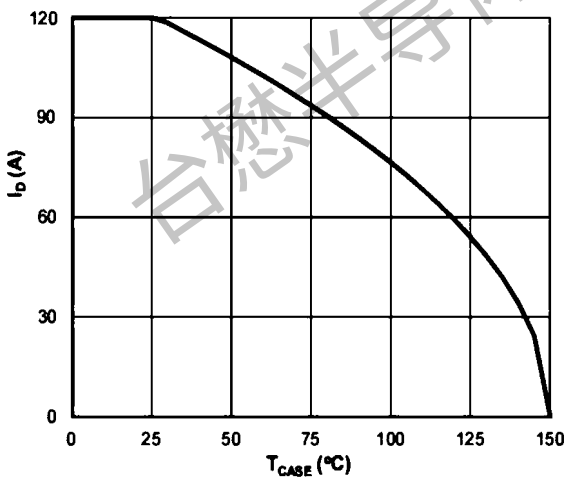


Figure 9: Current De-rating

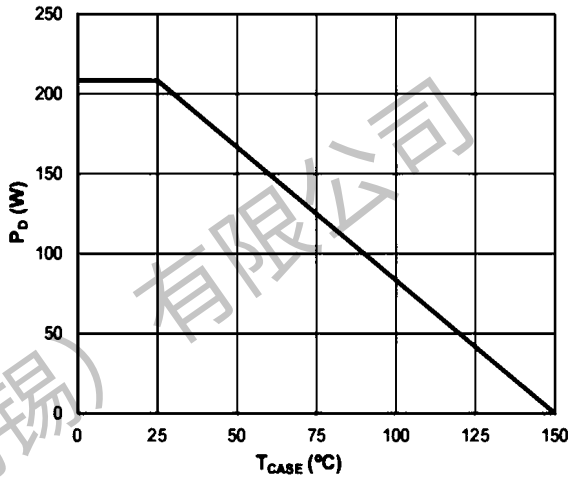


Figure 10: Power De-rating

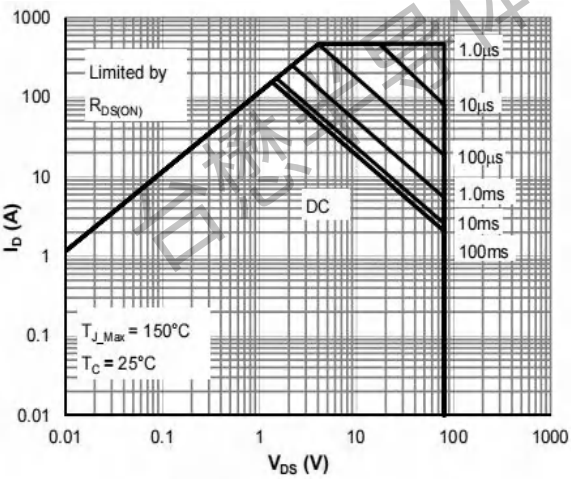


Figure 11: Maximum Safe Operating Area

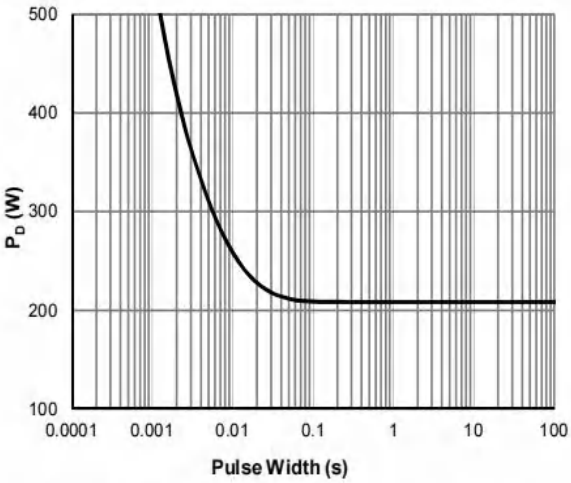
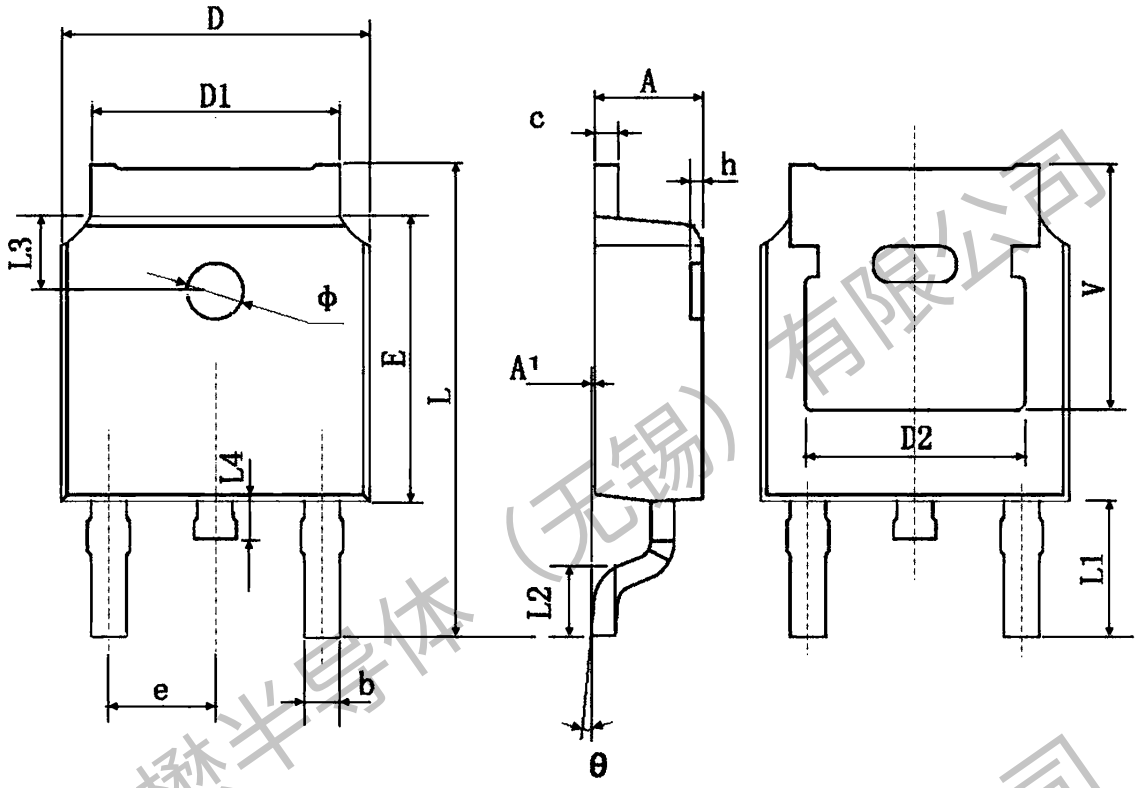


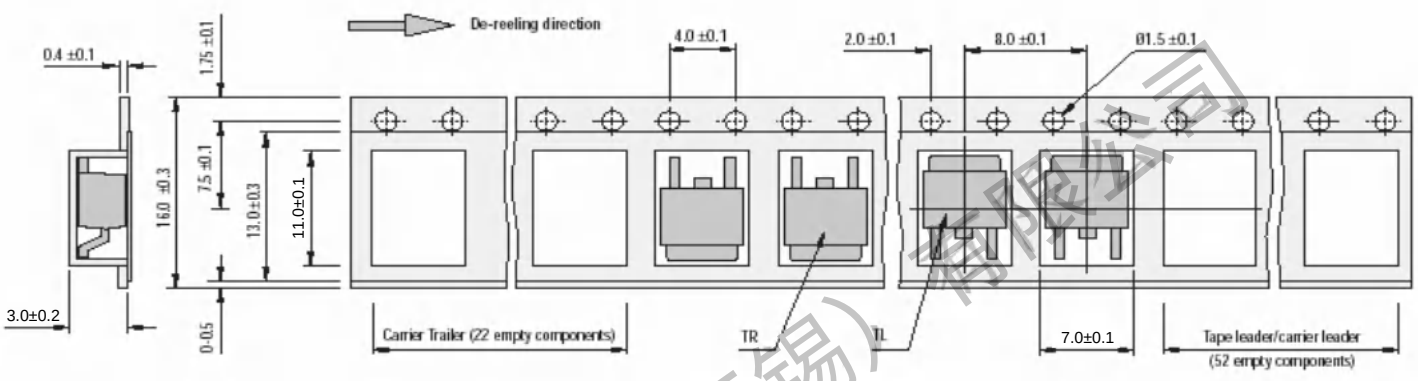
Figure 12: Single Pulse Power Rating, Junction-to-Case

Package Mechanical Data: TO-252-3L

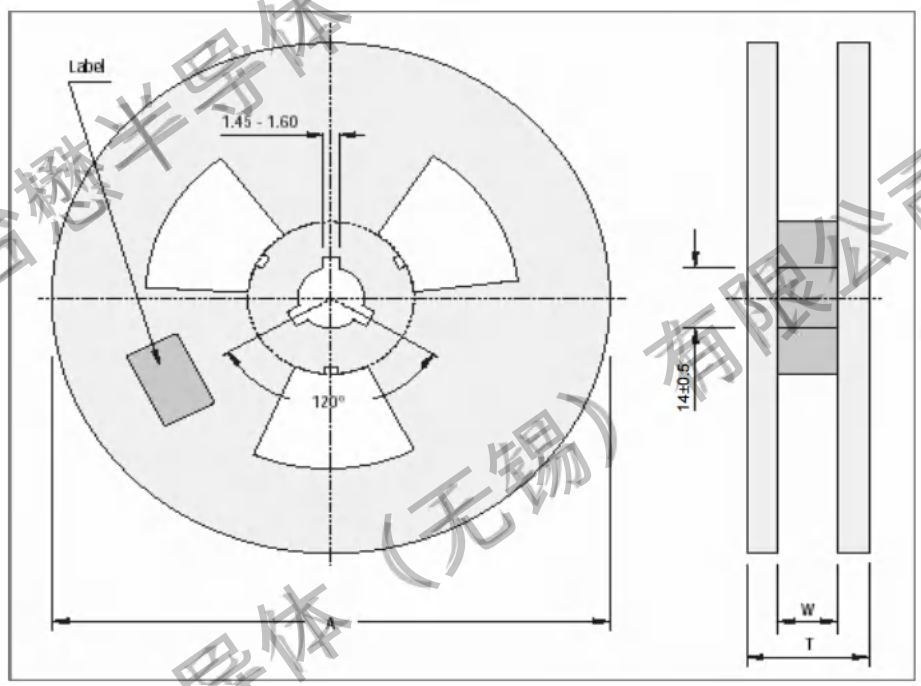


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

TO-252-3L Embossed Carrier Tape



TO-252-3L Reel



All Dimensions are in mm

Reel Specifications				
Package	Tape Width	Reel Dia. A - Max	Inside Thickness W	Reel Thickness T - max
TO-252-3L	16	330	18.0 ±1.5	20

Packaging Information

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
2,500 pcs	13 inch	5,000 pcs	355×370×50	25,000 pcs	380×275×380	

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Revision history:

Date	Rev	Description	Page
2024.06.14	24.06	Original	