TMG15P10D

P-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

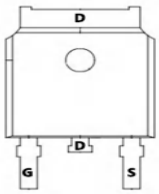
V_{DS} =-100V I_D=-15A

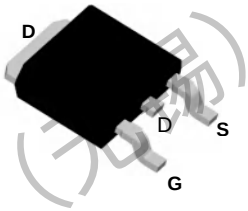
$R_{DS(ON)}$ = 115 mΩ(typ.) @ V_{GS} =-10V

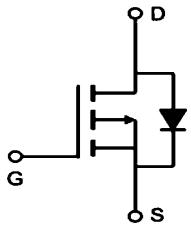
100% UIS Tested

100% R_g Tested

D:TO-252-3L







Marking:G15P10

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ - 10V	-15	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ - 10V	-9.2	A
I_{DM}	Pulsed Drain Current	-58	A
P_D@T_C=25°C	Total Power Dissipation	69	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	---	75	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	1.8	°C/W

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Electrical Characteristics (T_J = 25°C, 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	-100	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-100V, V_{GS}=0V	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=-20V, V_{DS}=0V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=+20V, V_{DS}=0V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-1	-2	3	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=-10V, I_D=-5A	--	115	150	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=-4.5V, I_D=-5A	--	---	---	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = -50V f = 1.0MHz	--	700	--	pF
C_{oss}	Output Capacitance		--	56	--	
C_{rss}	Reverse Transfer Capacitance		--	8.6	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =-5A V_{DS} = -50V V_{GS} = -10V R_G = 5Ω	--	5.9	--	ns
tr	Rise Time		--	3.7	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	39.5	--	
t_f	Fall Time		--	24.6	--	
Q_g	Total Gate Charge	V_{GS} =-10V V_{DS} = -50V I_D =-5A	--	12.7	--	nC
Q_{gs}	Gate Source Charge		--	2.1	--	
Q_{gd}	Gate Drain Charge		--	2.3	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{SD}	Diode Forward Voltage	I_S=-5A, V_{GS}=0V	--	--	-1.2	V
t_{rr}	Reverse Recovery time	I_S=-5A, V_{DD}=-50V dI/dt=100A/μs	--	66	--	ns
Q_{rr}	Reverse Recovery Charge		--	214	--	nC

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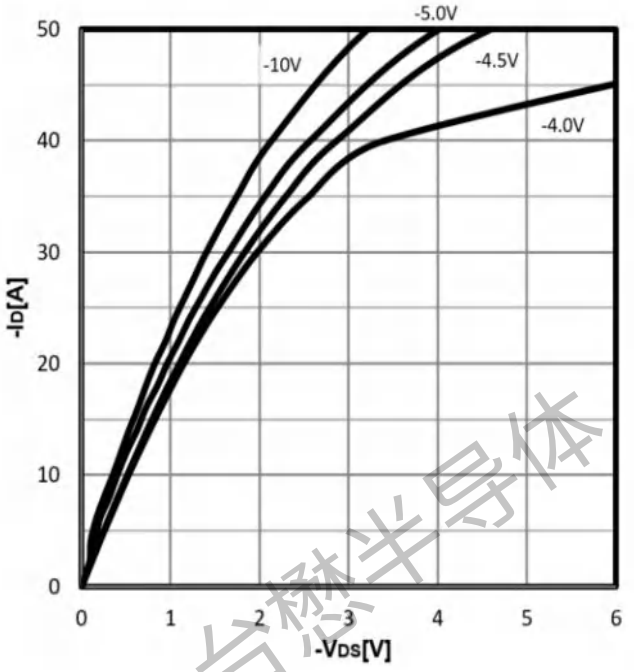
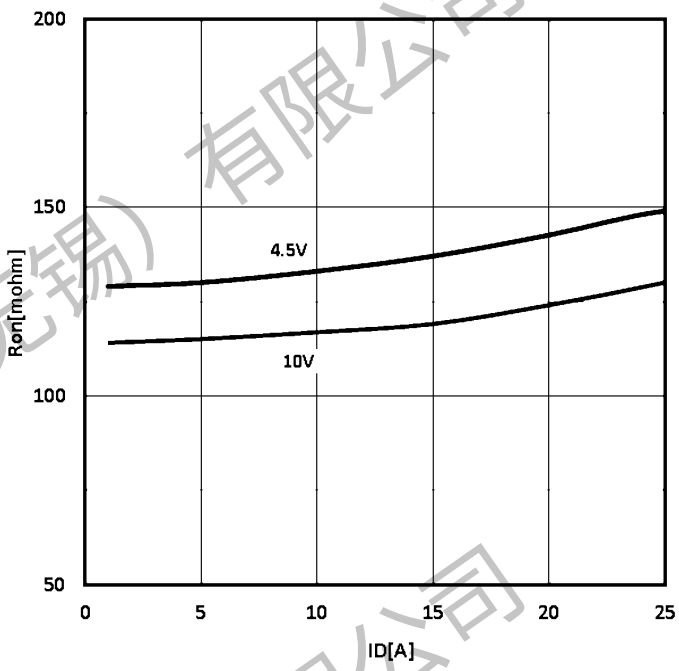
Characteristics Curve:

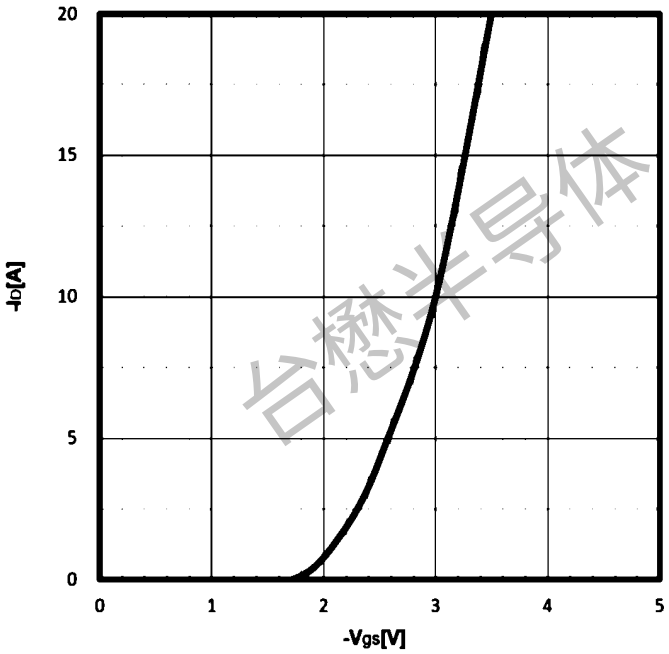
Typ. output characteristics
$-I_D=f(-V_{DS})$



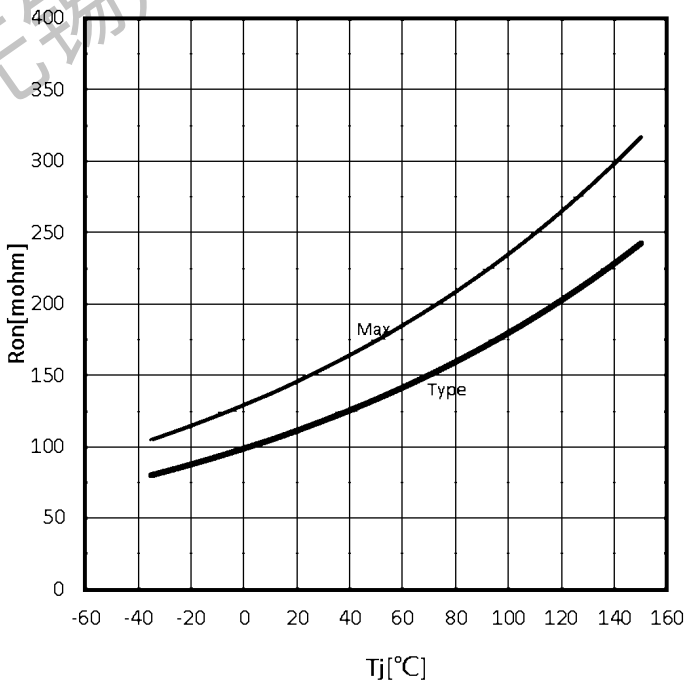
Typ. drain-source on resistance
$R_{DS(on)}=f(-I_D)$



Typ. transfer characteristics
$-I_D=f(-V_{GS})$



Drain-source on-state resistance
$R_{DS(on)}= f(T_j)$; I_D=-5A; V_{GS}=-10V



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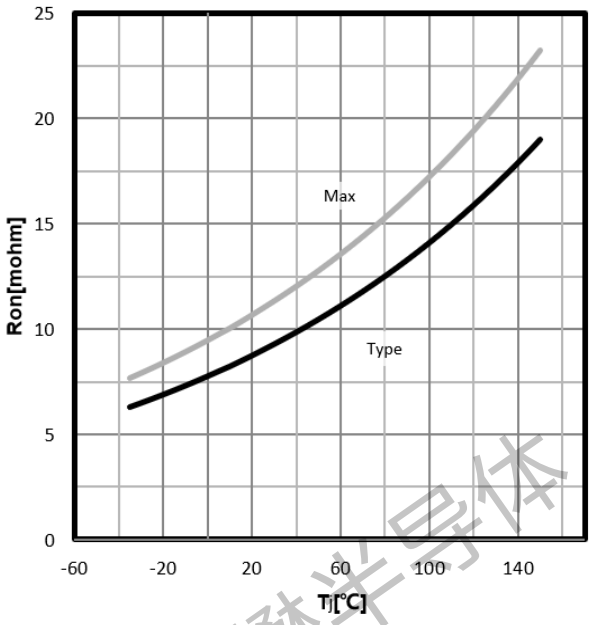
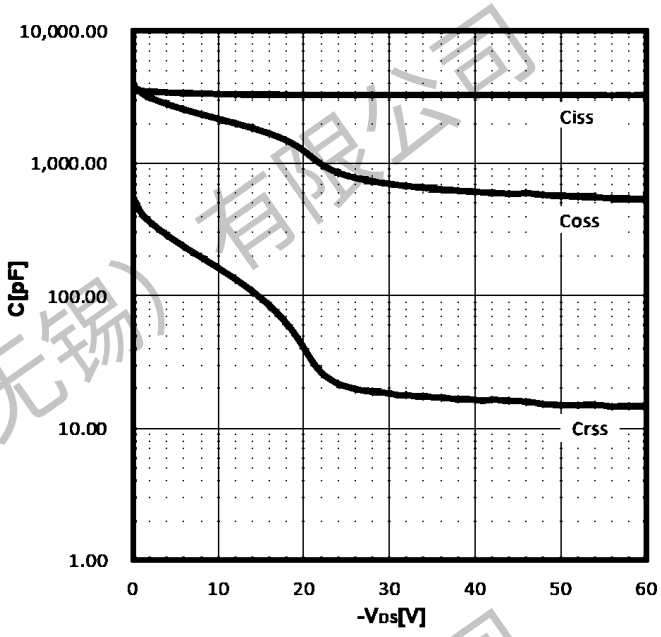
Drain-source on-state resistance

$R_{DS(on)}=f(T_j)$; I_D=-20A; V_{GS}=-10V



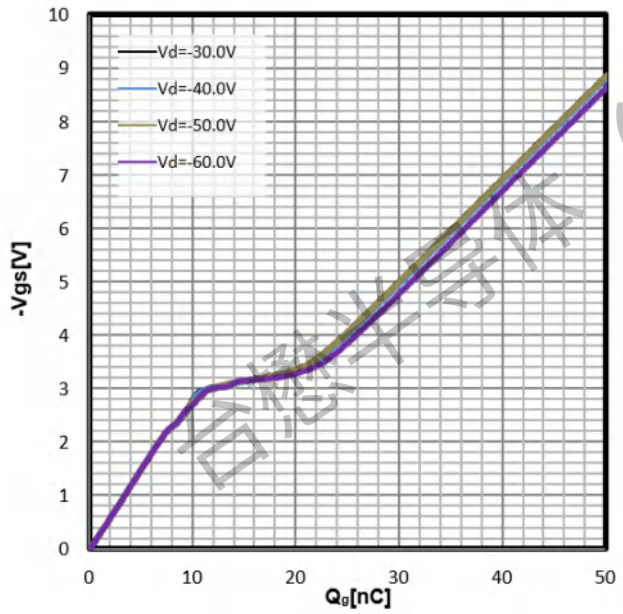
Typ. capacitances

C =f(V_{DS}); V_{GS}=0V; f =1MHz



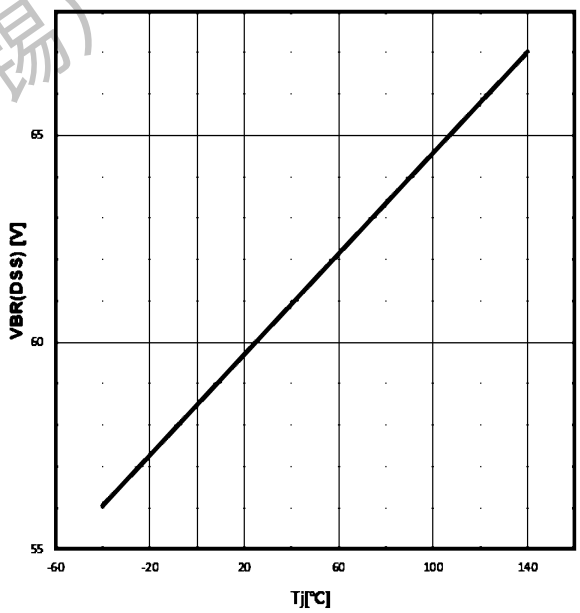
Typ. gate charge

$V_{GS}=f(Q_{gate})$; I_D=-20A



Drain-source breakdown voltage

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



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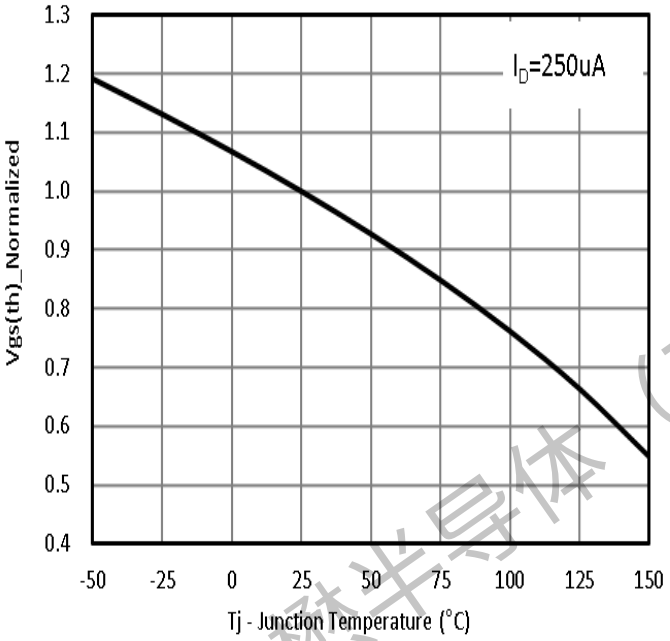
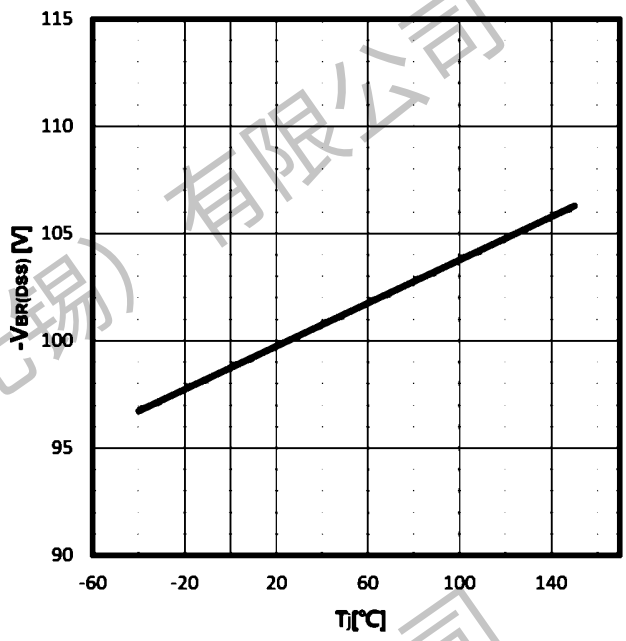
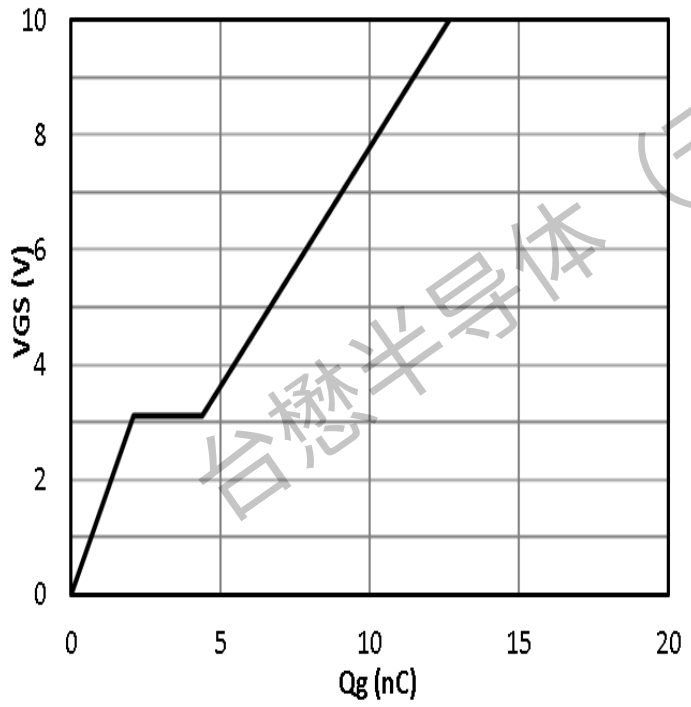
Gate Threshold Voltage
$-V_{TH}=f(T_j)$; I_D=-250uA



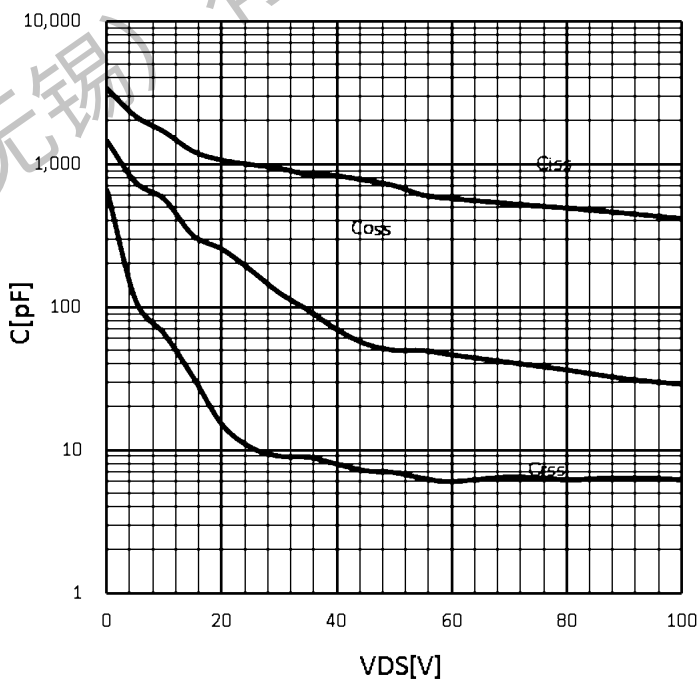
Drain-source breakdown voltage
$-V_{BR(DSS)}=f(T_j)$; I_D=-250uA



Typ. gate charge
$-V_{GS}=f(Q_g)$; I_D=-5A



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



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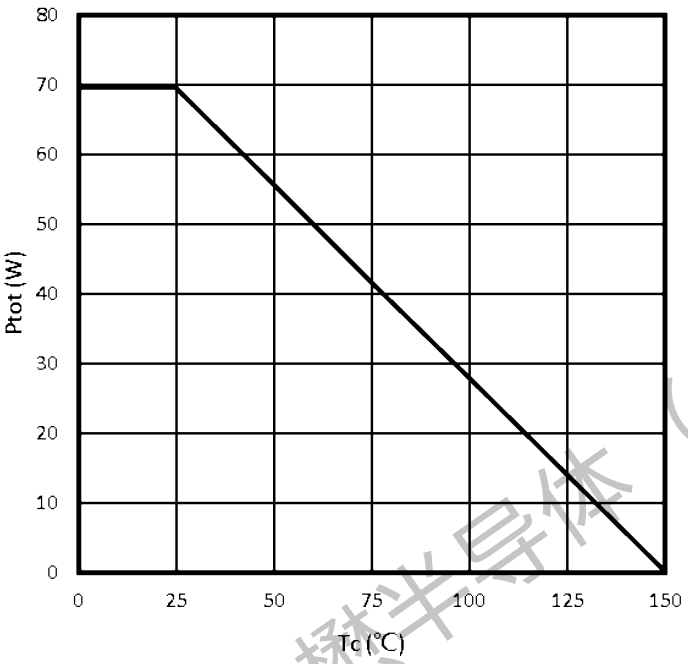
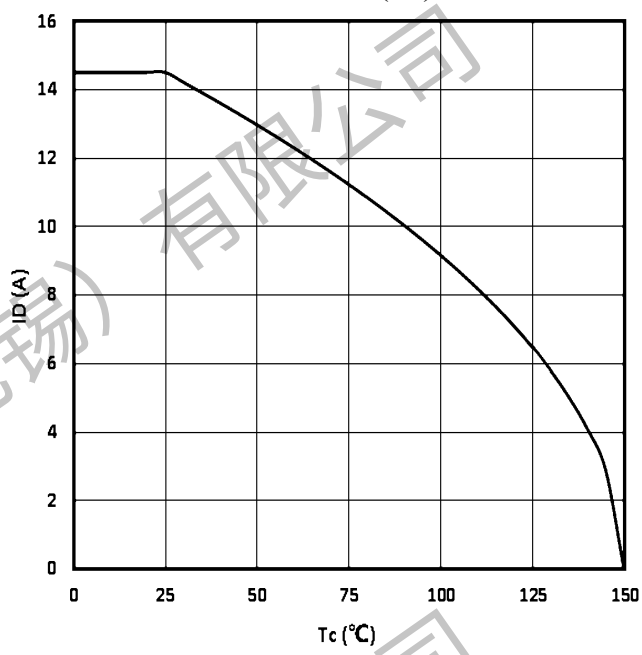
Power Dissipation

$P_{tot}=f(T_C)$



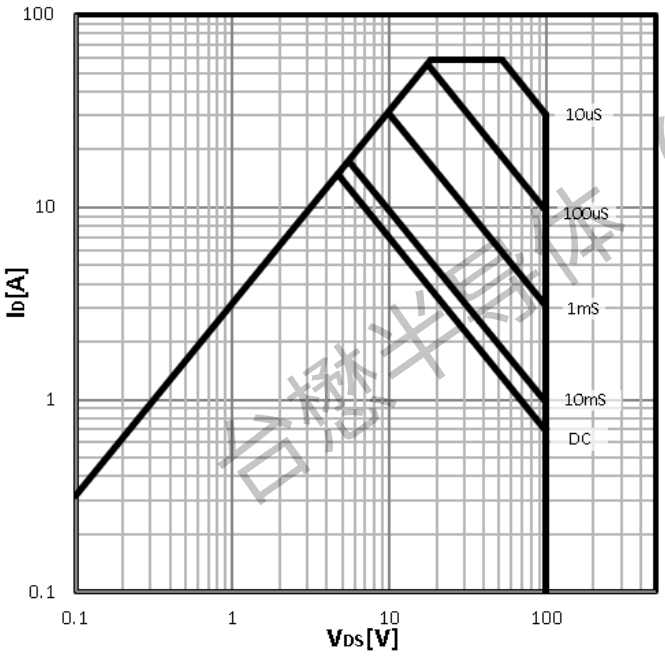
Maximum Drain Current

$-I_D=f(T_C)$



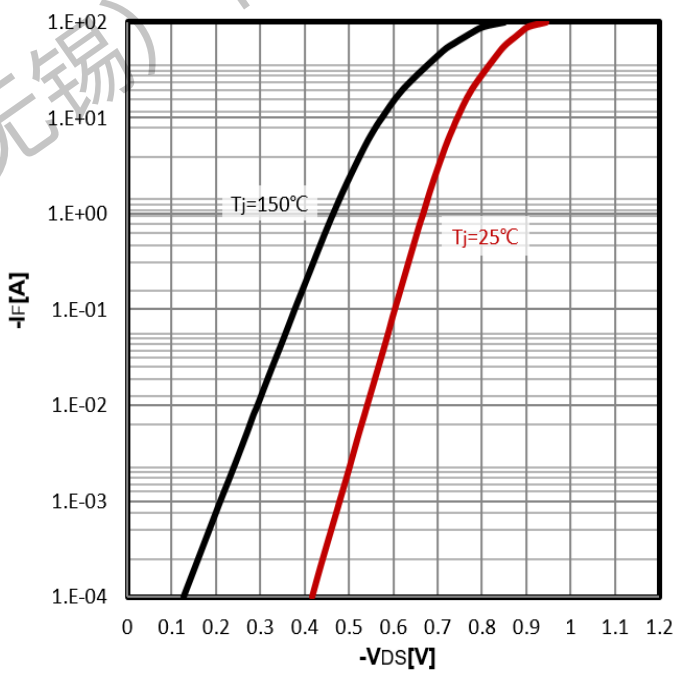
Safe operating area

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



Body Diode Forward Voltage Variation

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



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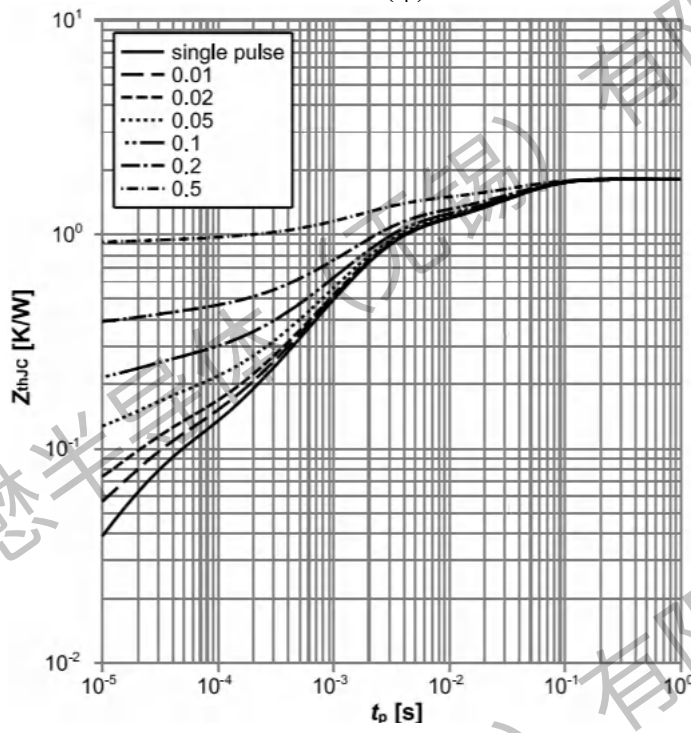
Max. transient thermal impedance

$Z_{thJC}=f(t_p)$



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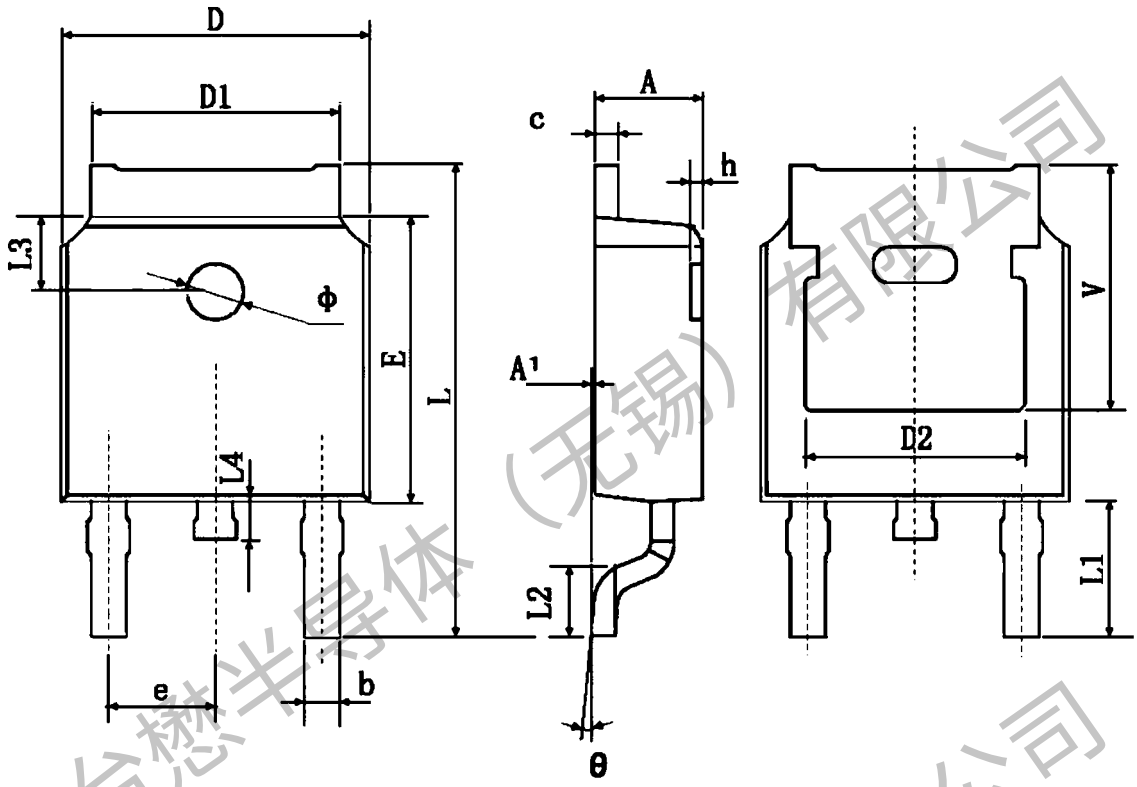
Package Mechanical Data: TO-252-3L



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.	

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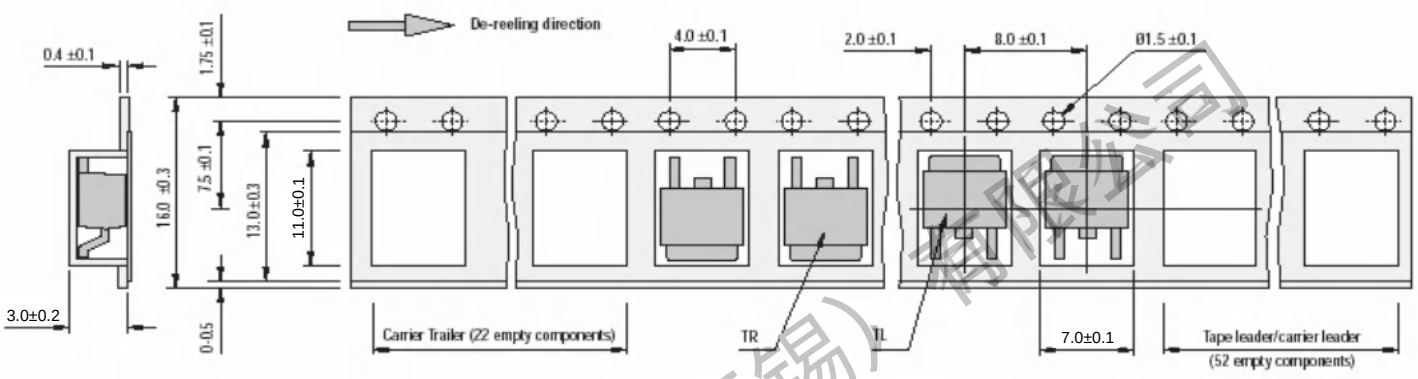
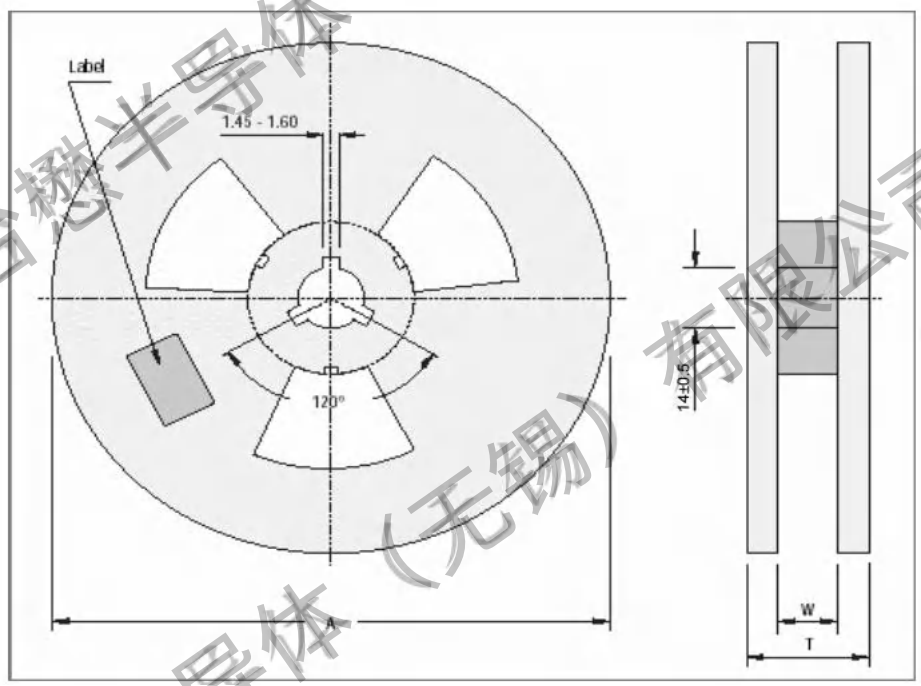
TO-252-3L Embossed Carrier Tape



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
2023.04.21	23.04	Original	