TM15P10D

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

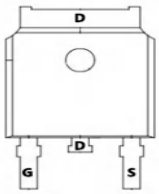
$R_{DS(ON)}$ = 135mΩ(typ.) @ V_{GS} =-10V

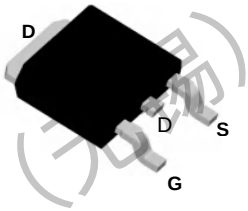
100% UIS Tested

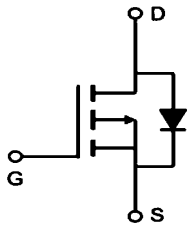
100% R_g Tested

Green Product

D:TO-252-3L







Marking:15P10

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	-6.5	A
I_{DM}	Pulsed Drain Current	-40	A
P_D@T_C=25°C	Total Power Dissipation	54	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	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	2.3	°C/W

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Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-100	---	---	V
	BV_{DSS} Temperature Coefficient	Reference to 25℃ ID=-1mA	---	---	---	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}0V, V_{DS}=-100V T_J=25℃	---	---	-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=-250μA	-1	-2	-3	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=-10V,I_D=-5A	---	135	150	mΩ
		V_{GS}=-4.5V,I_D=-2A	---	---	---	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-25V, V_{GS}=0V, f=1MHz	---	1419	2500	pF
C_{oss}	Output Capacitance		---	89	170	
C_{rss}	Reverse Transfer Capacitance		---	45	90	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=-50V, I_D=-5A, R_{GEN}=25Ω .V_{GS}=-10V	---	18	36	ns
t_r	Rise Time		---	8	16	ns
$t_{d(off)}$	Turn-Off Delay Time		---	100	200	ns
t_f	Fall Time		---	30	60	ns
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-80V, I_D=-5A	---	20	40	nC
Q_{gs}	Gate-Source Charge		---	3.5	7	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	4.6	9	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=-1A, T_J=25℃	---	---	-1.2	V
Ls	Diode Forward Current		---	---	-15	A
Trr	Reverse Recovery Time	VGS=0V,Is=-5A , dI/dt=100A/μs T =25℃	---	26.6	---	NS
Qrr	Reverse Recovery Charge		---	24.2	---	NC

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

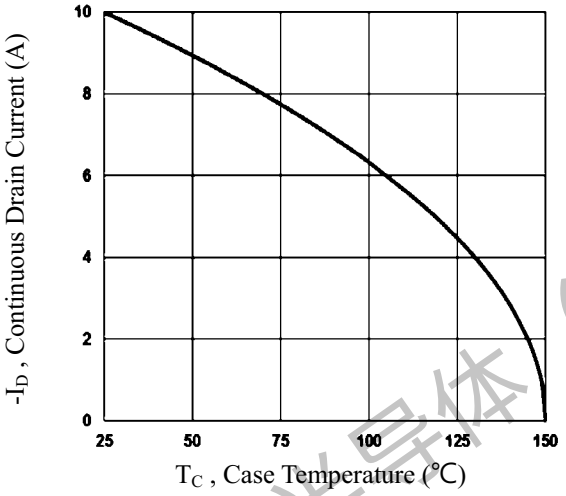


Fig.1 Continuous Drain Current vs. T_C

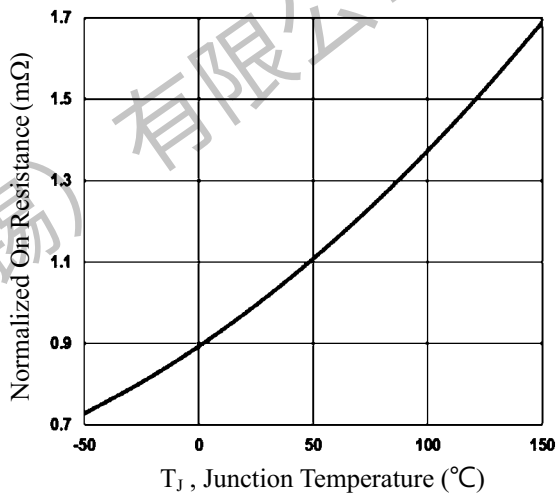


Fig.2 Normalized RDSON vs. T_J

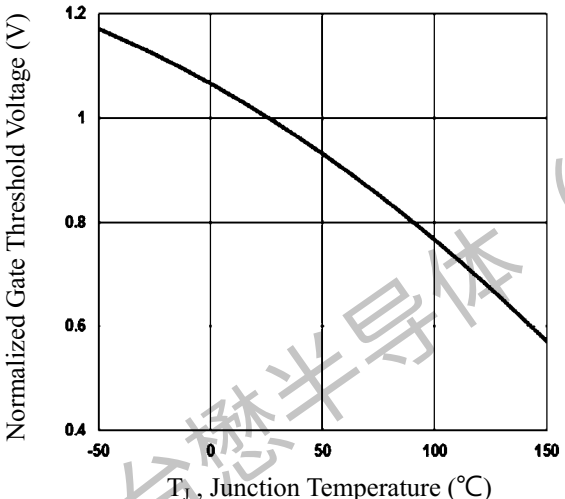


Fig.3 Normalized V_{th} vs. T_J

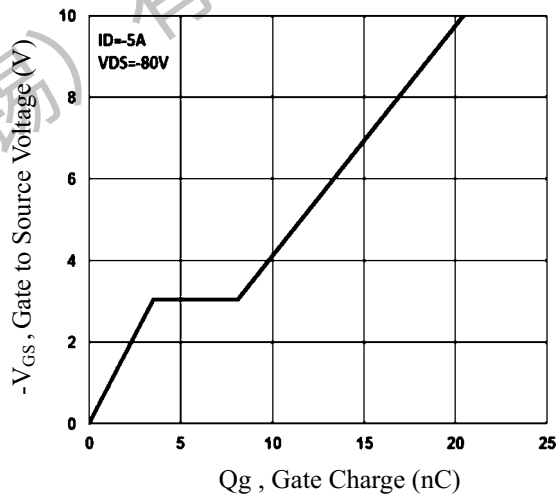


Fig.4 Gate Charge Waveform

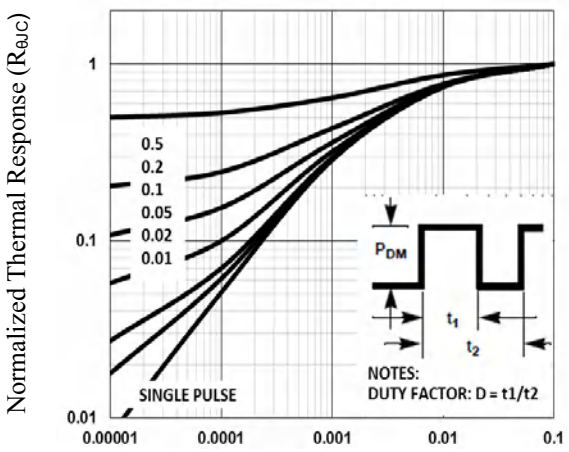


Fig.5 Normalized Transient Impedance

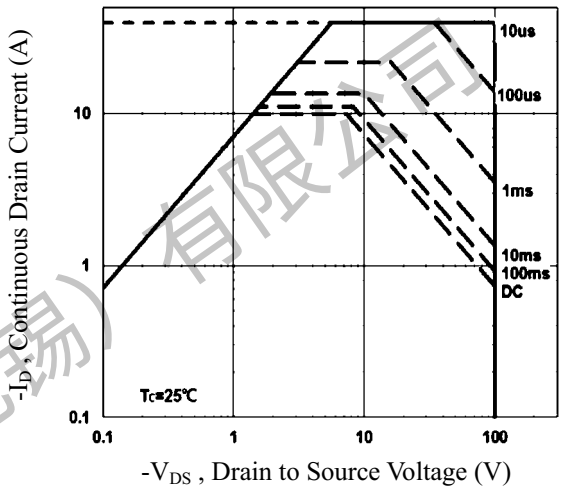
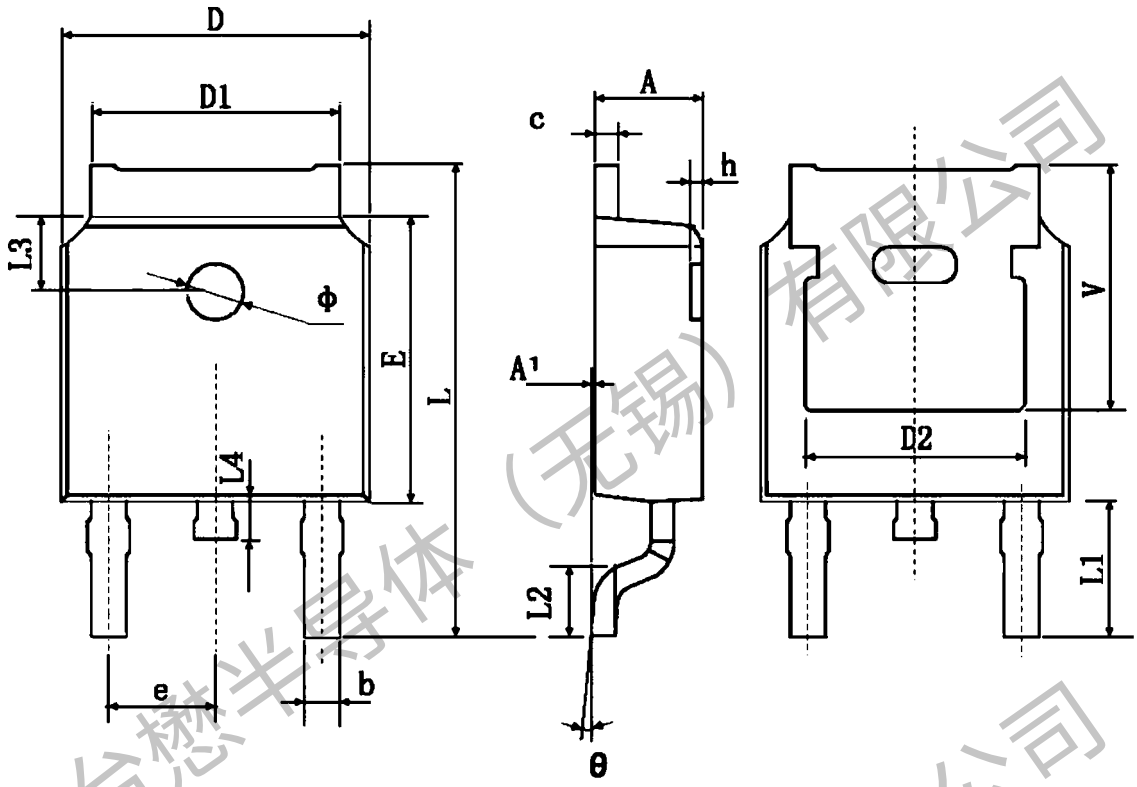


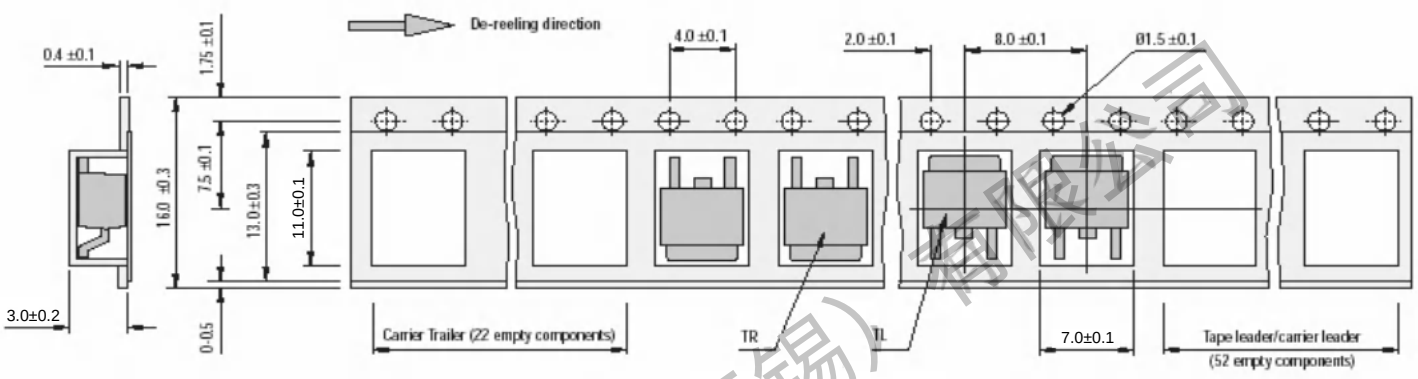
Fig.6 Maximum Safe Operation Area

Package Mechanical Data: TO-252-3L

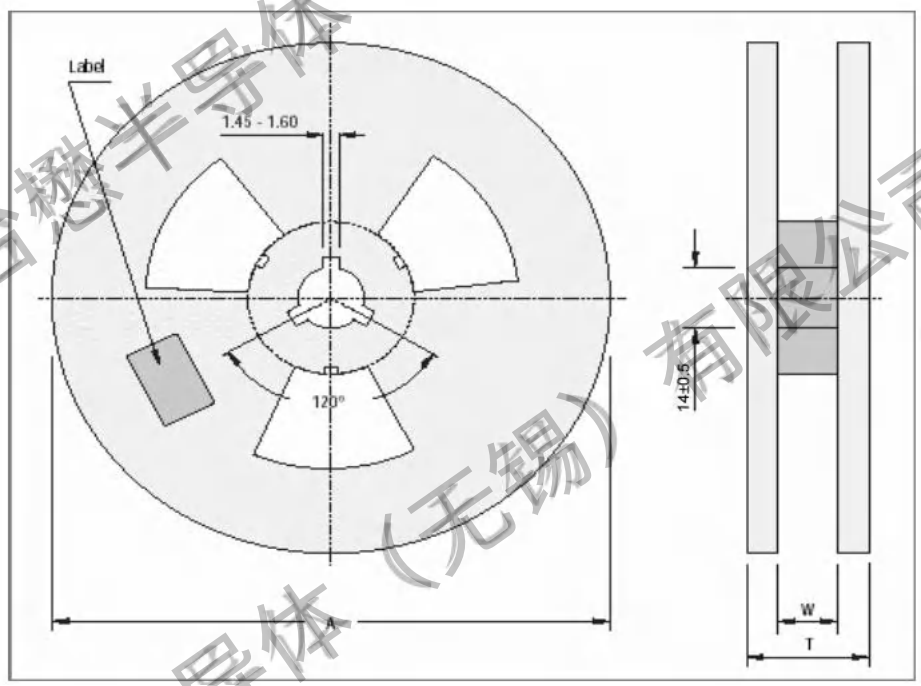


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	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
2023.04.21	23.04	Original	