TM30P06D

P-Channel Enhancement Mosfet

General Description

- Low R DS(ON)
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

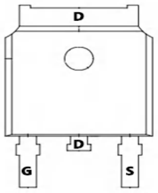
V_{DS} =-60V I_D =-30A

$R_{DS(ON)}$=24mΩ (typ.)@V_{GS}=-10V

100% UIS Tested
100% R_g Tested

Green Product

D:TO-252-3L



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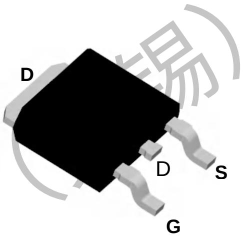
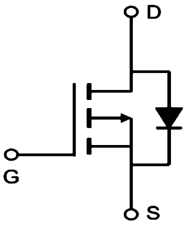




Absolute Maximum Ratings (T_C = 25°C Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25˚C	Continuous Drain Current, V_{GS} @ - 10V	-30	A
I_D@T_C=100˚C	Continuous Drain Current, V_{GS} @ - 10V	-21	A
I_{DM}	Pulsed Drain Current	-124	A
EAS	Single Pulse Avalanche Energy	196	mJ
P_D@T_C=25˚C	Total Power Dissipation	79	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	---	6.6	˚C/W

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-60V, V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1	-2.0	-3.0	V
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-15A		35		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-15A		24	29	mΩ
		V_{GS}=-4.5V, I_D=-10A		30	39	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-25V, V_{GS}=0V, f=1.0MHz		2026		pF
C_{oss}	Output Capacitance			134		pF
C_{rss}	Reverse Transfer Capacitance			98		pF
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=-10V, V_{DS}=-30V, R_L=1.5Ω, R_{GEN}=3Ω		12.2		nS
t_r	Turn-on Rise Time			10		nS
$t_{d(off)}$	Turn-Off Delay Time			64		nS
t_f	Turn-Off Fall Time			14		nS
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-30V, I_D=-20A		68		nC
Q_{gs}	Gate-Source Charge			10.5		nC
Q_{gd}	Gate-Drain Charge			13		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				-30	A
V_{SD}	Forward on Voltage (Note 3)	V_{GS}=0V, I_S=-15A			-1.2	V
t_{rr}	Reverse Recovery Time	I_F=-20A, di/dt=100A/μs		26		ns
Q_{rr}	Reverse Recovery Charge	I_F=-20A, di/dt=100A/μs		29		nC

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

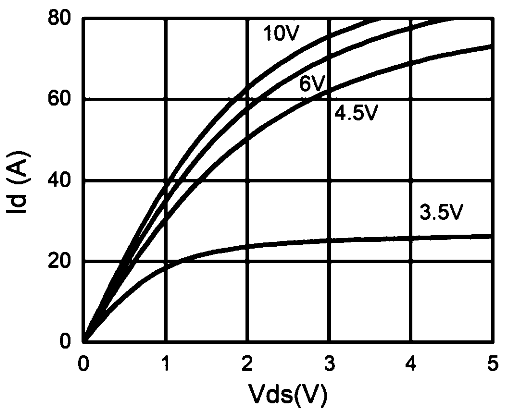


Figure 2. Transfer Characteristics

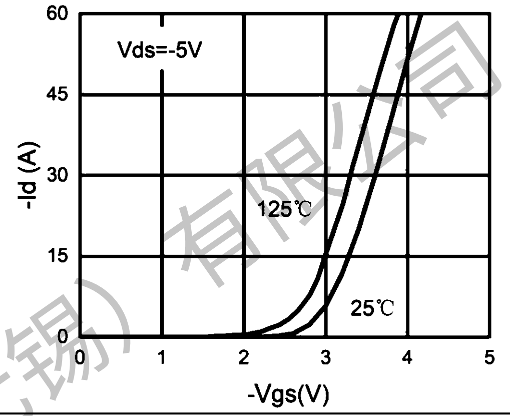


Figure 3. Power Dissipation

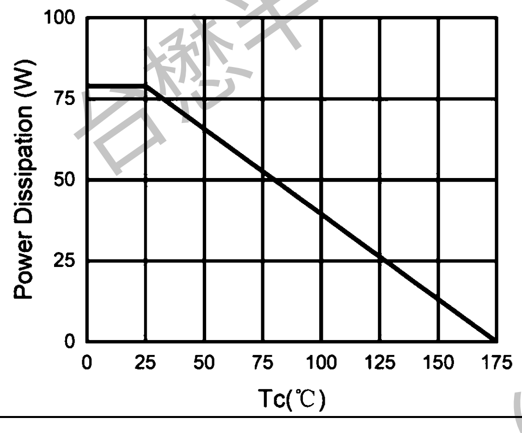


Figure 4. Drain Current

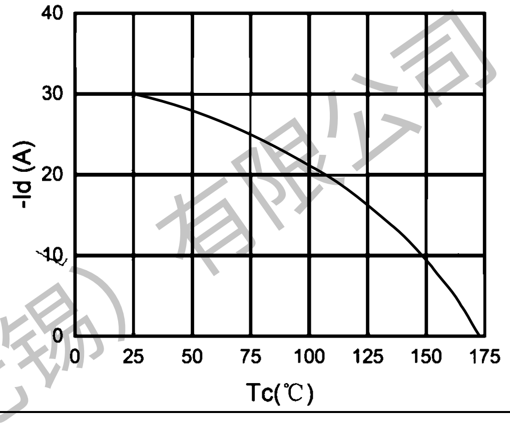


Figure 5. BV_{DSS} vs Junction Temperature

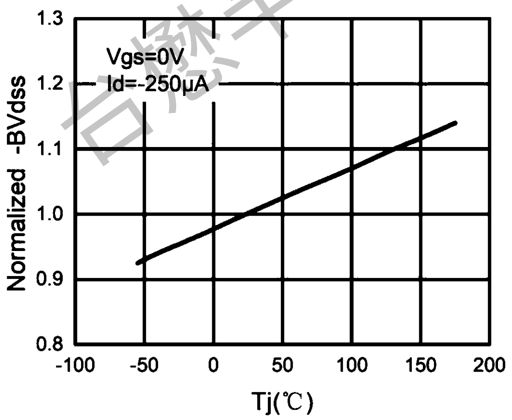


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

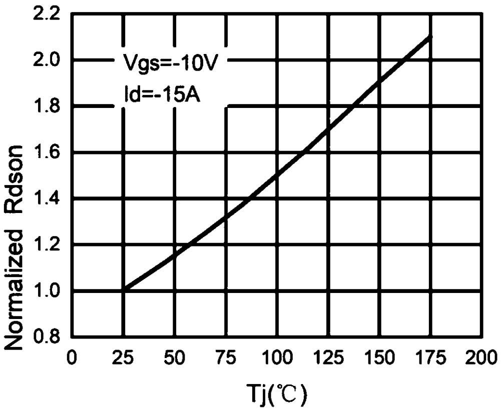


Figure 7. Gate Charge Waveforms

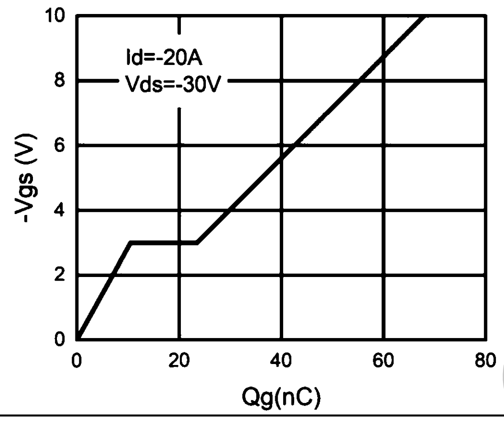


Figure 8. Capacitance

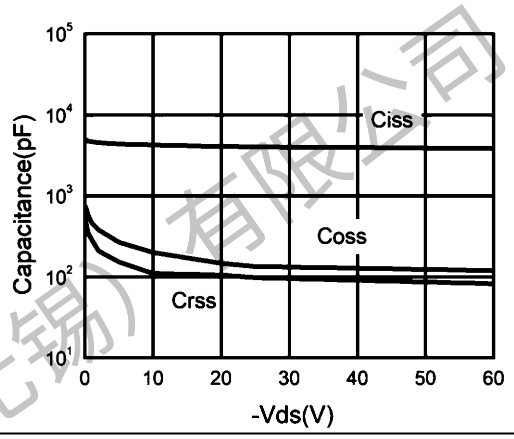


Figure 9. Body-Diode Characteristics

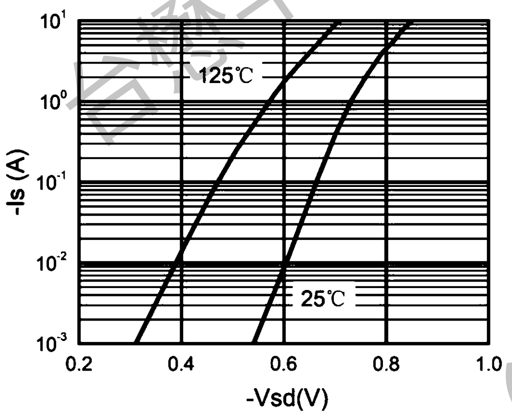
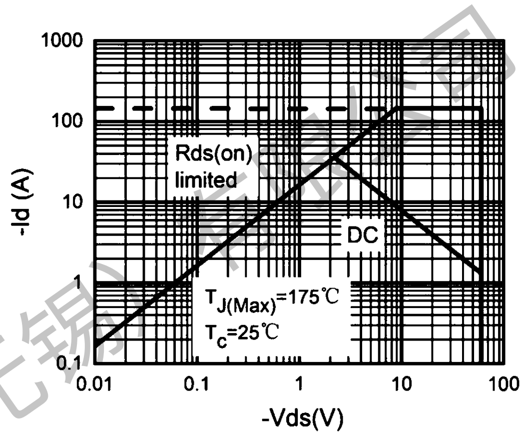
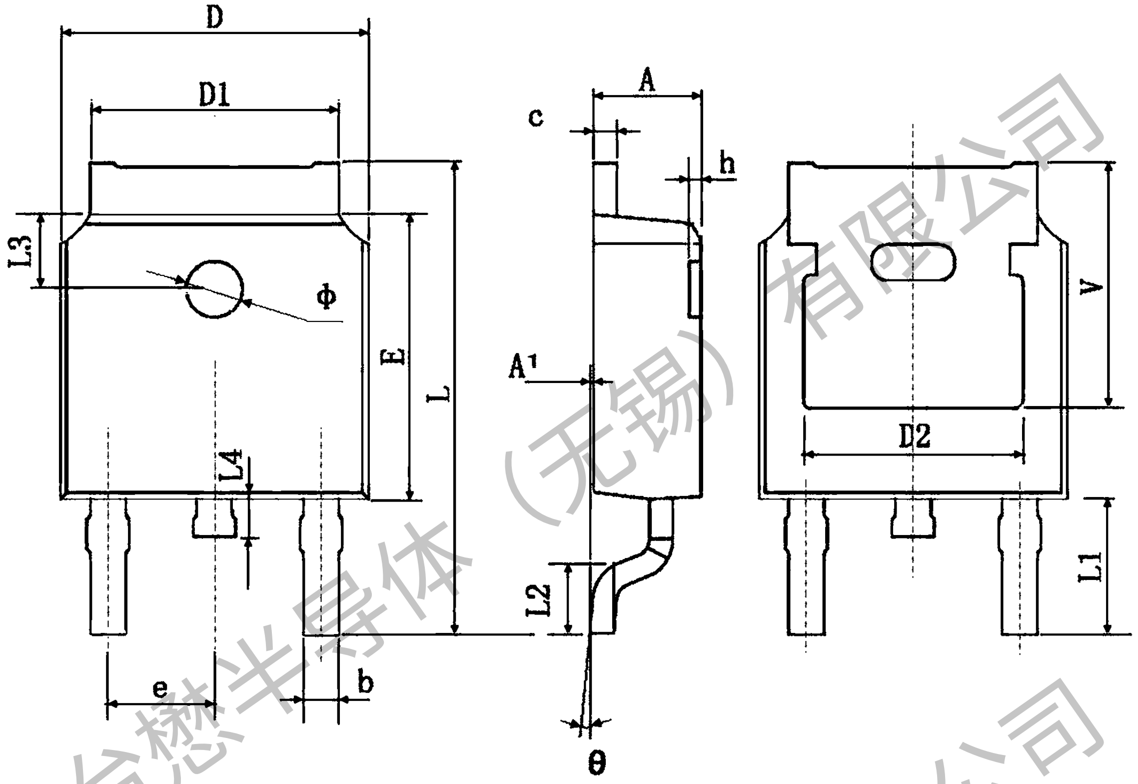


Figure 10. Maximum Safe Operating Area

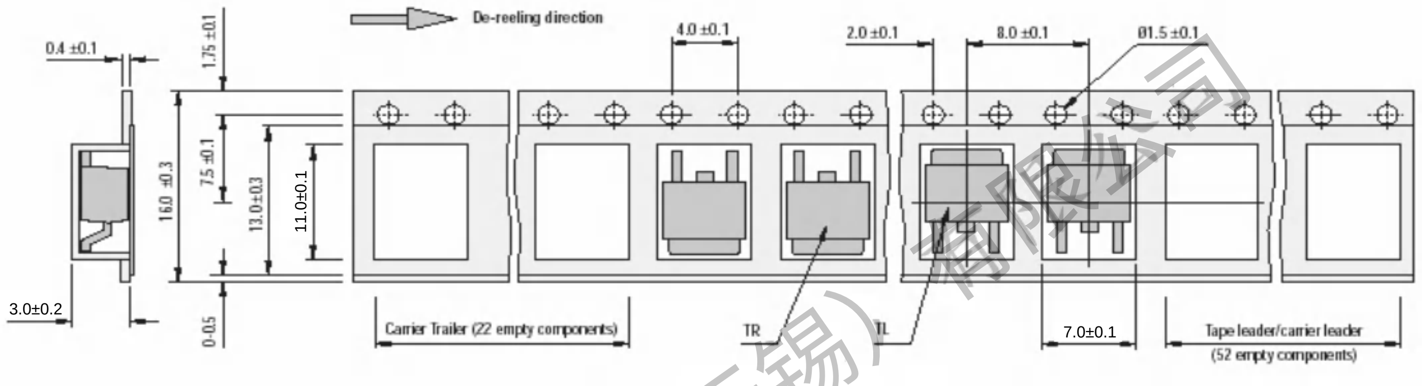


Package Mechanical Data: TO-252-3L

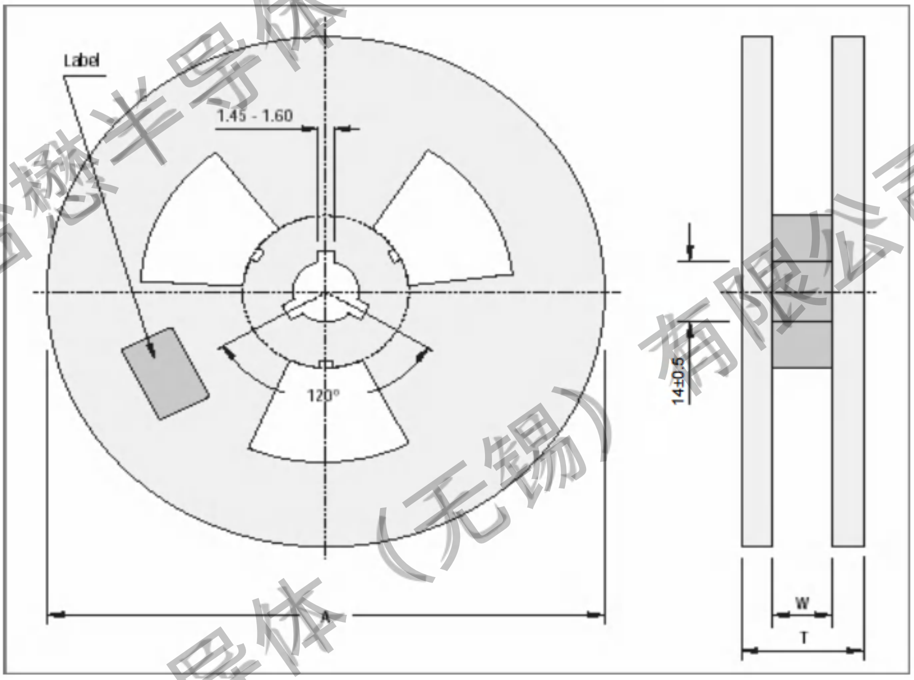


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	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
2023.06.15	23.06	Original	