



TM80N06D

N-Channel Enhancement Mosfet

General Description

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

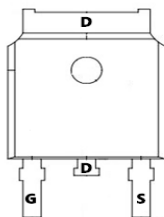
Applications

- Load switch
- PWM

General Features

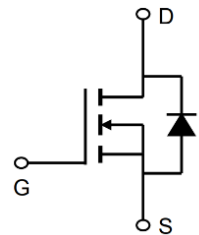
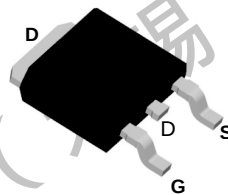
$V_{DS} = 60V$ $I_D = 80A$
 $R_{DS(ON)} = 6.8m\Omega$ (typ.) @ $V_{GS} = 10V$

100% UIS Tested
100% R_g Tested



Marking: 80N06

D:TO-252-3L



Absolute Maximum Ratings ($T_C = 25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	80	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	52	A
I_{DM}	Pulsed Drain Current ²	290	A
EAS	Single Pulse Avalanche Energy ³	300	mJ
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ³	75	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$

Thermal Data

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



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Electrical Characteristics (TA=25°C 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(Tc=25℃)	V _{DS} =64V,V _{GS} =0V	---	---	1	μA
I _{DSS}	Zero Gate Voltage Drain Current(Tc=125℃)	V _{DS} =64V,V _{GS} =0V	---	---	10	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	2	3	4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =40A	---	6.8	8.2	mΩ
Dynamic Characteristics						
g _{FS}	Forward Transconductance	V _{DS} =10V,I _D =15A	15	---	---	S
C _{iss}	Input Capacitance	V _{DS} =25V,V _{GS} =0V, f=1.0MHz	---	2873	---	pF
C _{oss}	Output Capacitance		---	252	---	pF
C _{rss}	Reverse Transfer Capacitance		---	205	---	pF
Q _g	Total Gate Charge	V _{DS} =50V,I _D =40A, V _{GS} =10V	---	56	---	nC
Q _{gs}	Gate-Source Charge		---	10	---	nC
Q _{gd}	Gate-Drain Charge		---	16	---	nC
Switching Times						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V,I _D =2A,R _L =15Ω V _{GS} =10V,R _G =2.5Ω	---	14.5	---	nS
t _r	Turn-on Rise Time		---	24	---	nS
t _{d(off)}	Turn-Off Delay Time		---	45	---	nS
t _f	Turn-Off Fall Time		---	22	---	nS
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)		---	80	---	A
I _{SDM}	Pulsed Source-Drain Current(Body Diode)		---	260	---	A
V _{SD}	Forward On Voltage ^(Note 1)	T _J =25℃,I _{SD} =40A,V _{GS} =0V	---	0.89	0.99	V
t _{rr}	Reverse Recovery Time ^(Note 1)	T _J =25℃,I _F =75A di/dt=100A/μs	---	22	---	nS
Q _{rr}	Reverse Recovery Charge ^(Note 1)		---	27	---	nC
t _{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by L _S +L _D)				

Notes 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1.5%, R_G=25Ω, Starting T_J=25°C



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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Output Characteristics

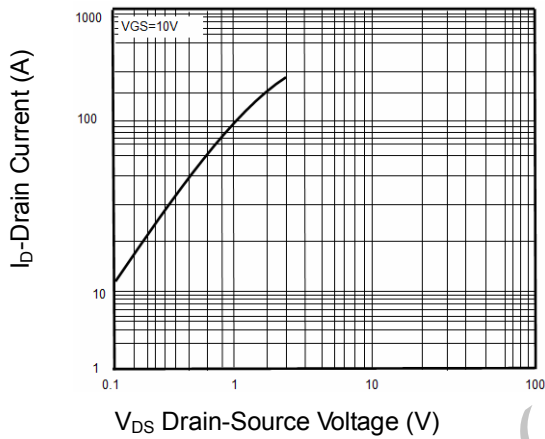


Figure2. Transfer Characteristics

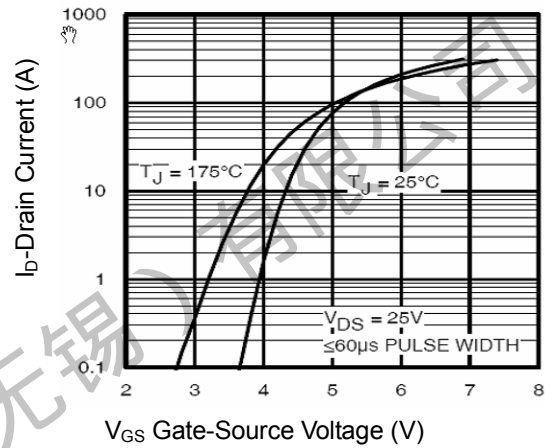


Figure3. BVDSS vs Junction Temperature

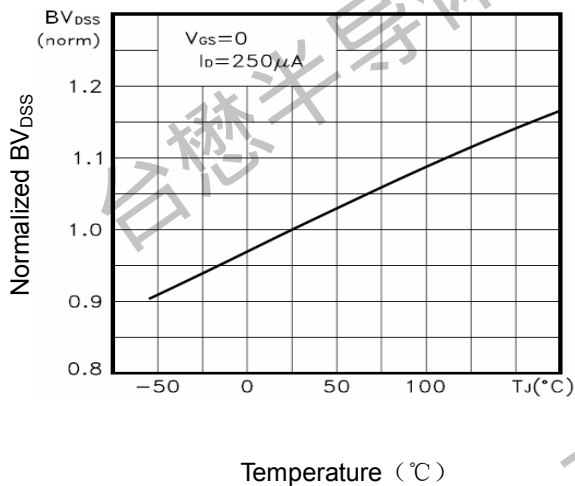


Figure4. ID vs Junction Temperature

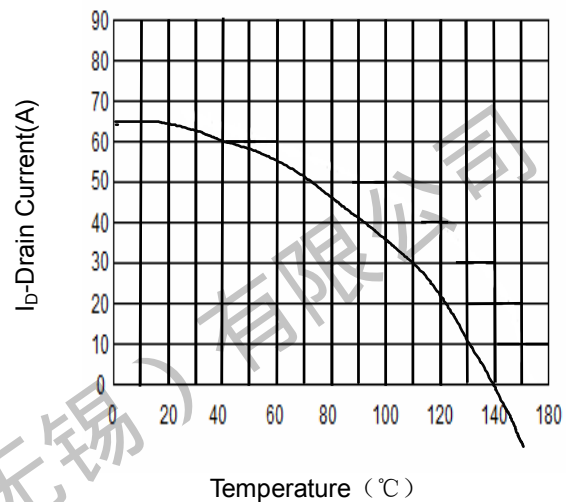


Figure5. VGS(th) vs Junction Temperature

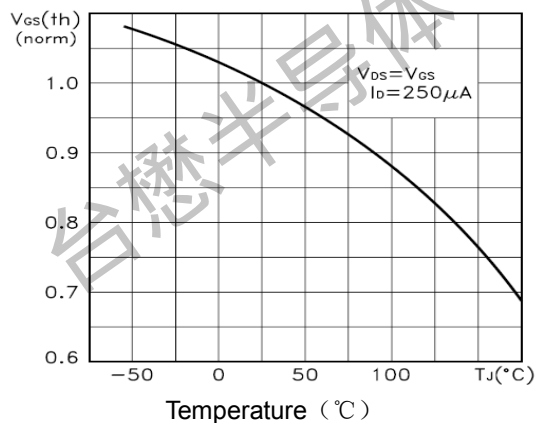
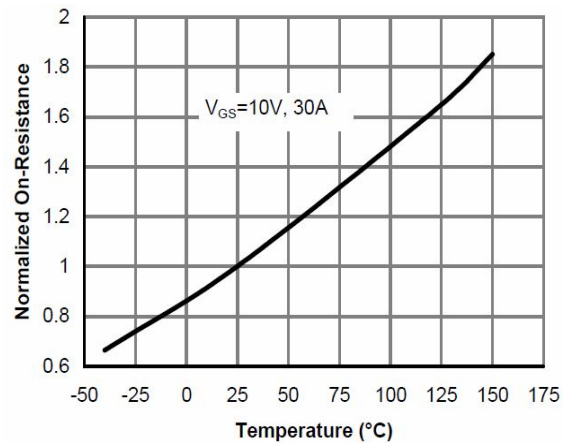


Figure6. Rdson Vs Junction Temperature





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Figure7. Gate Charge

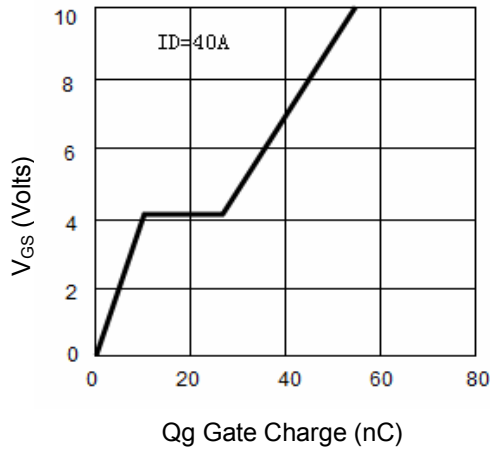


Figure8. Capacitance vs Vds

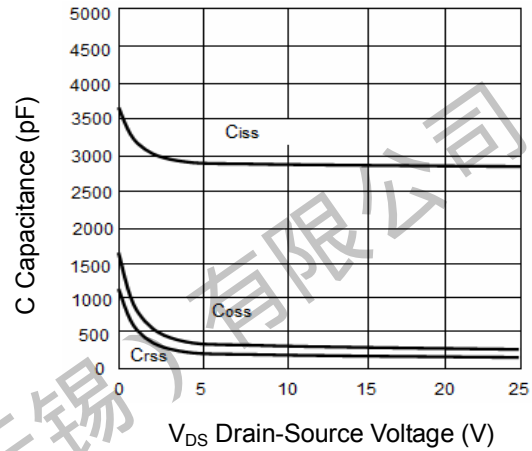


Figure9. Source- Drain Diode Forward

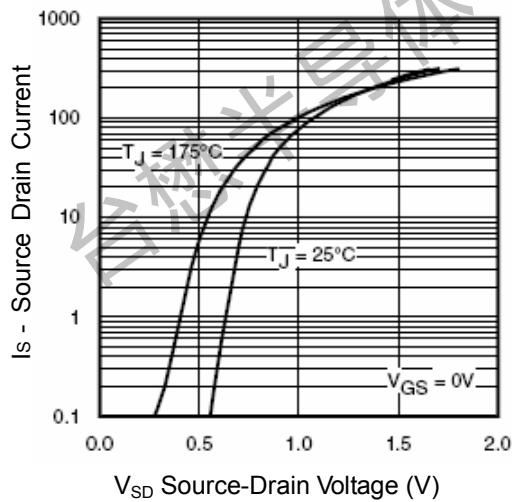


Figure10. Safe Operation Area

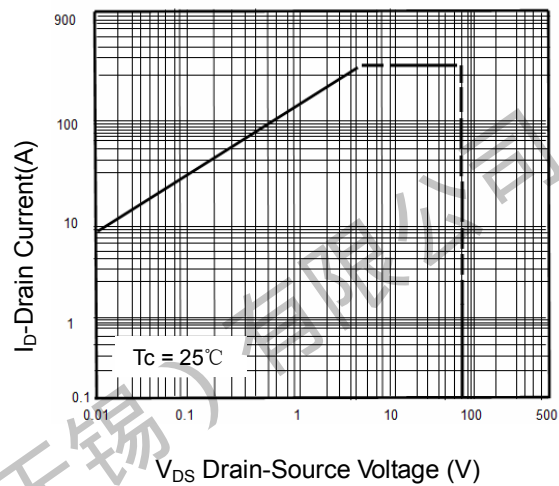
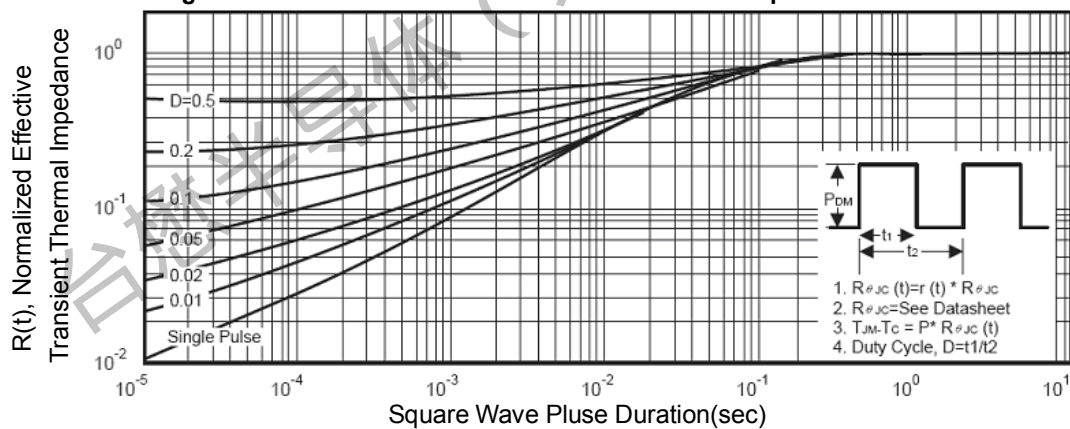
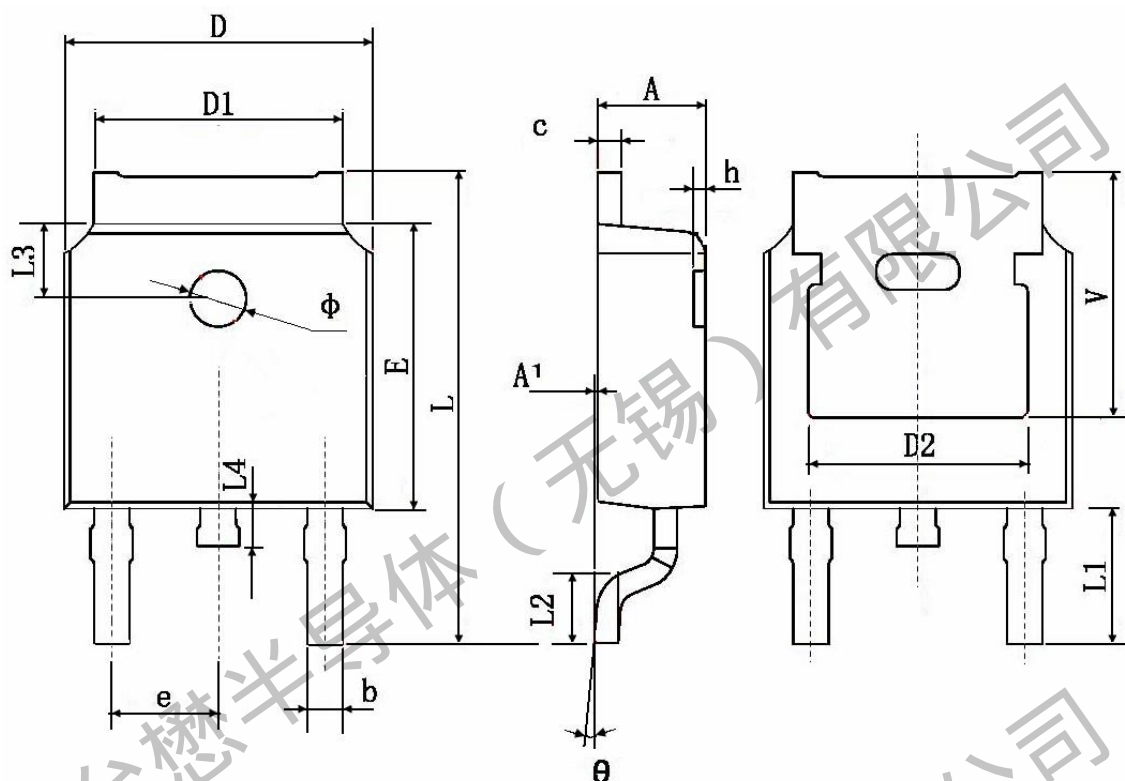


Figure11. Normalized Maximum Transient Thermal Impedance



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Package Mechanical Data: TO-252-3L



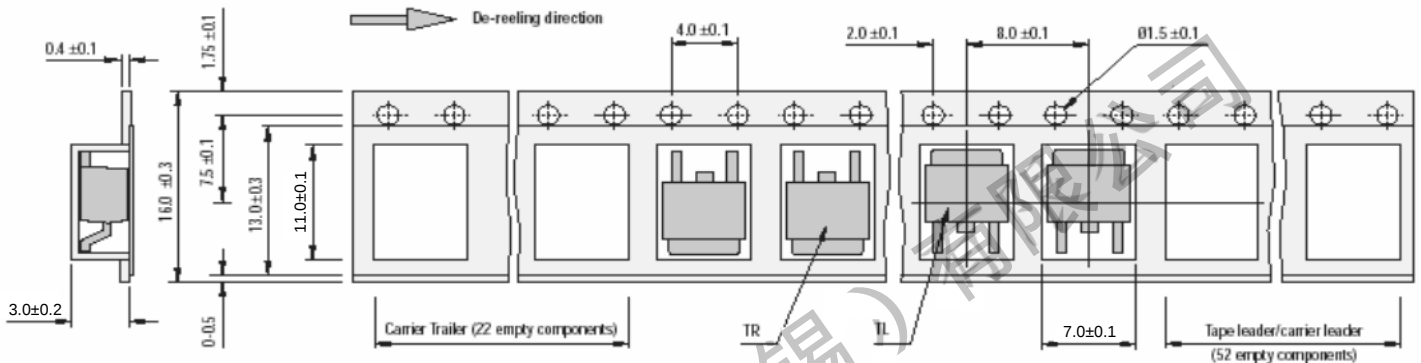
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386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



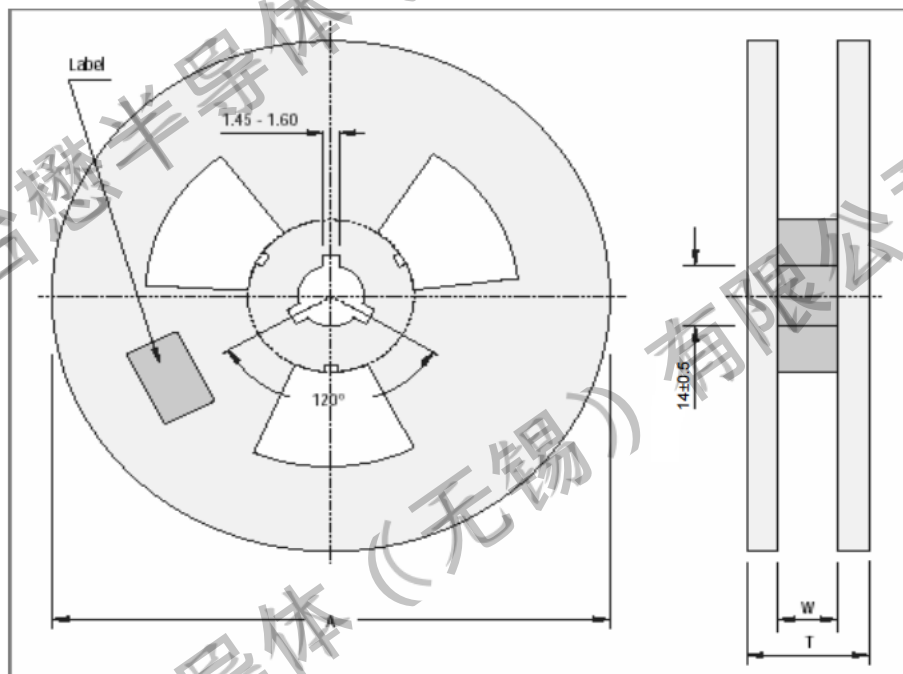
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TO-252-3L Embossed Carrier Tape



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
2023.06.05	23.06	Original	