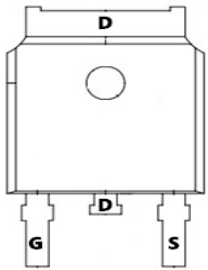# TMN6080D

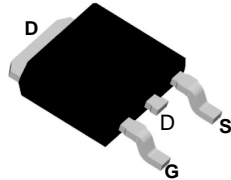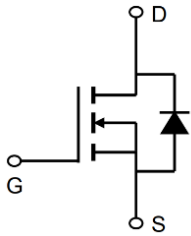## N-Channel Enhancement Mosfet

General Description
• Low R $_{DS(ON)}$
• RoHS and Halogen-Free Compliant

Applications
• Load switch
• PWM

General Features

V_{DS} = 60V I_D = 80A

$R_{DS(ON)}$= 6.8mΩ(typ.) @ V_{GS}= 10V

100% UIS Tested
100% R_g Tested

Green Product

D:TO-252-3L

Marking 80N06

Absolute Maximum Ratings (T$_C$=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain source voltage	VDS	60	V
Gate source voltage	VGS	±20	V
Continuous drain current[1]	ID	80	A
Pulsed drain current[2]	ID, pulse	180	A
Power dissipation[3]	P$_D$	125	W
Single pulsed avalanche energy[4]	EAS	30	mJ
Operation and storage temperature	Tstg，Tj	-55 to 150	℃
Thermal resistance, junction-case	RθJC	1	℃/W
Thermal resistance, junction-ambient[5]	RθJA	62	℃/W

TMN6080D

N-Channel Enhancement Mosfet

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 µA	60	71		V
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 µA	1.0	2.0	2.5	V
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=10 V, I_D=20 A		6.8	9.3	mΩ
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=4.5 V, I_D=10 A		9.2	11	mΩ
I_{GSS}	Gate-source leakage current	V_{GS}=20 V			100	nA
		V_{GS}=-20 V			-100	
I_{DSS}	Drain-source leakage current	V_{DS}=40 V, V_{GS}=0 V			1	µA
C_{iss}	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		1182.1		pF
C_{oss}	Output capacitance			199.5		pF
C_{rss}	Reverse transfer capacitance			4.1		pF
$t_{d(on)}$	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=2 Ω, I_D=10 A		17.9		ns
t_r	Rise time			4.0		ns
$t_{d(off)}$	Turn-off delay time			34.9		ns
t_f	Fall time			5.5		ns
Q_g	Total gate charge	I_D=10 A, V_{DS}=50 V, V_{GS}=10 V		18.4		nC
Q_{gs}	Gate-source charge			3.3		nC
Q_{gd}	Gate-drain charge			3.1		nC
$V_{plateau}$	Gate plateau voltage			2.8		V
I_S	Diode forward current	V_{GS}<V_{th}			80	A
I_{SP}	Pulsed source current				180	
V_{SD}	Diode forward voltage	I_S=20 A, V_{GS}=0 V			1.3	V
t_{rr}	Reverse recovery time	I_S=10 A, di/dt=100 A/µs		41.8		ns
Q_{rr}	Reverse recovery charge			36.1		nC
I_{rrm}	Peak reverse recovery current			1.4		A

Note

1) Calculated continuous current based on maximum allowable junction temperature.

2) Repetitive rating; pulse width limited by max. junction temperature.

3) Pd is based on max. junction temperature, using junction-case thermal resistance.

4) V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_j=25 ℃.

5) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 ℃.

https://www.tmc.com.tw

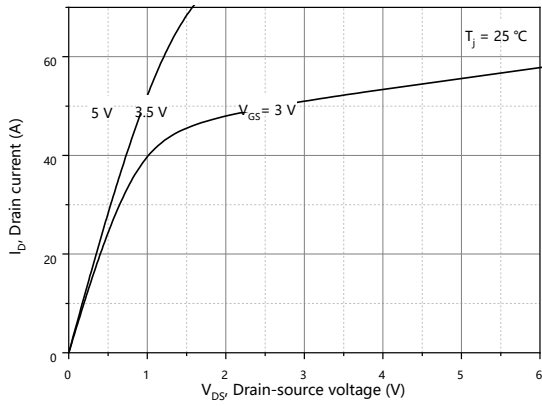## Electrical Characteristics Diagrams
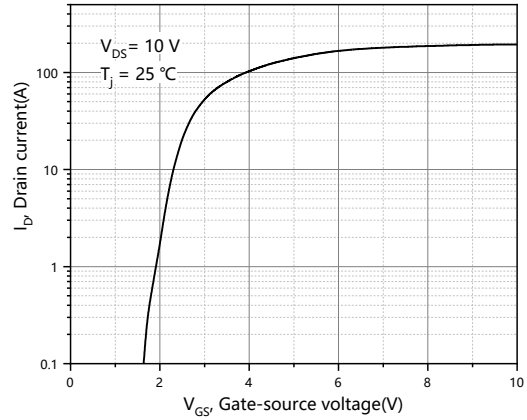

Figure 1, Typ. output characteristics

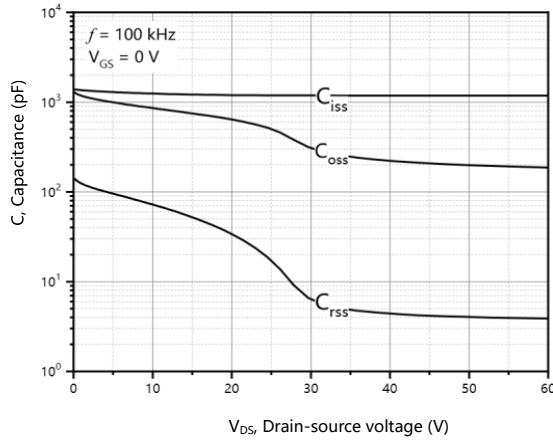Figure 2, Typ. transfer characteristics

Figure 3, Typ. capacitances
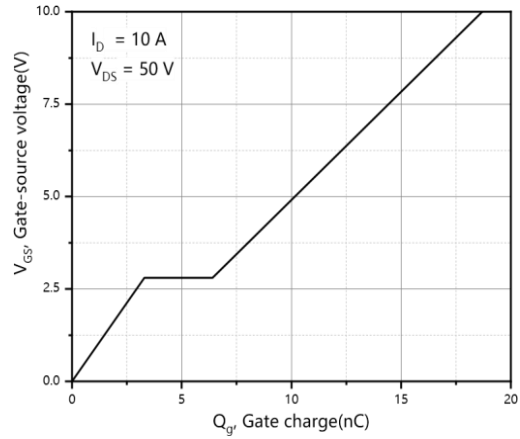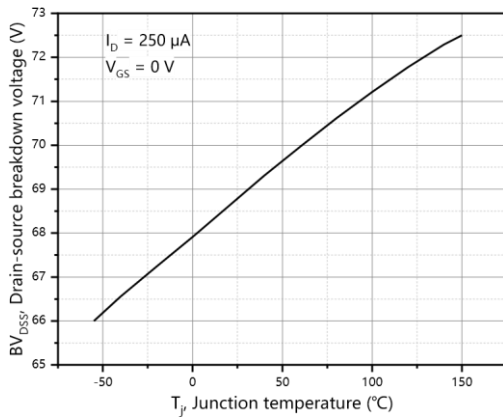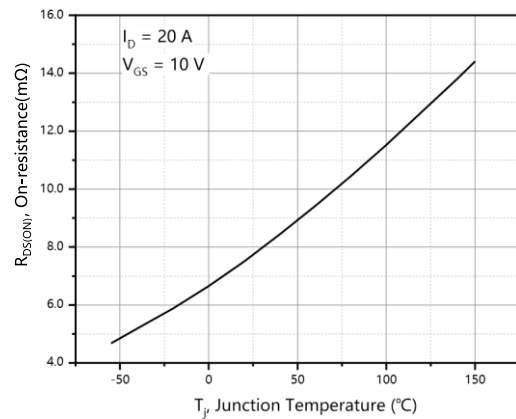

Figure 4, Typ. gate charge

Figure 5, Drain-source breakdown voltage

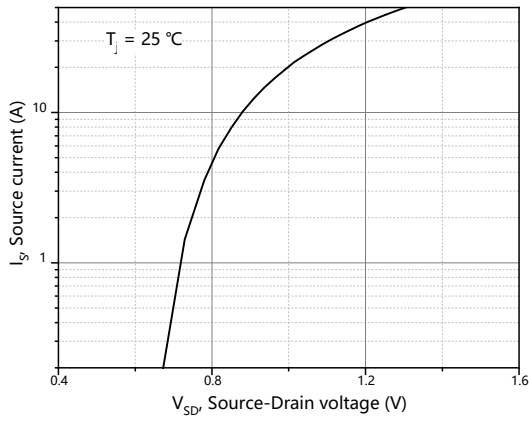Figure 6, Drain-source on-state resistance

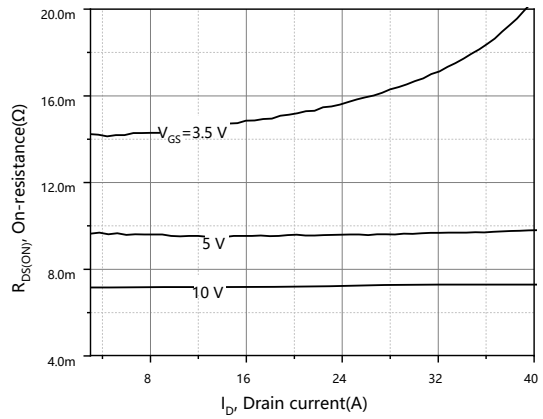Figure 7, Forward characteristic of body diode

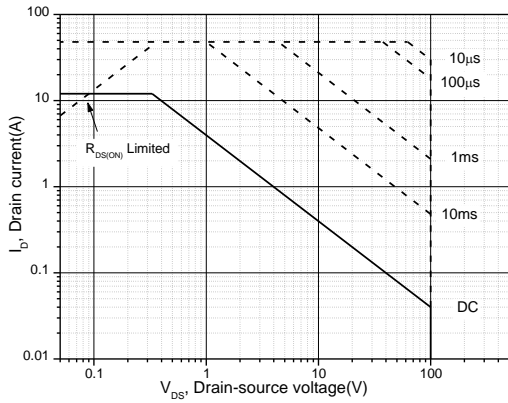Figure 8, Drain-source on-state resistance
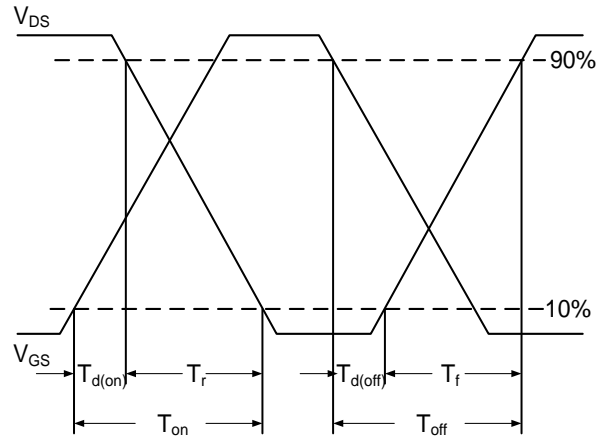

Figure 9, Safe operation area T_C=25 ℃

Fig.10 Switching Time Waveform

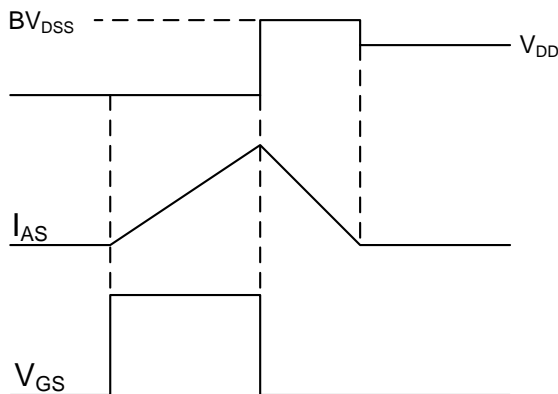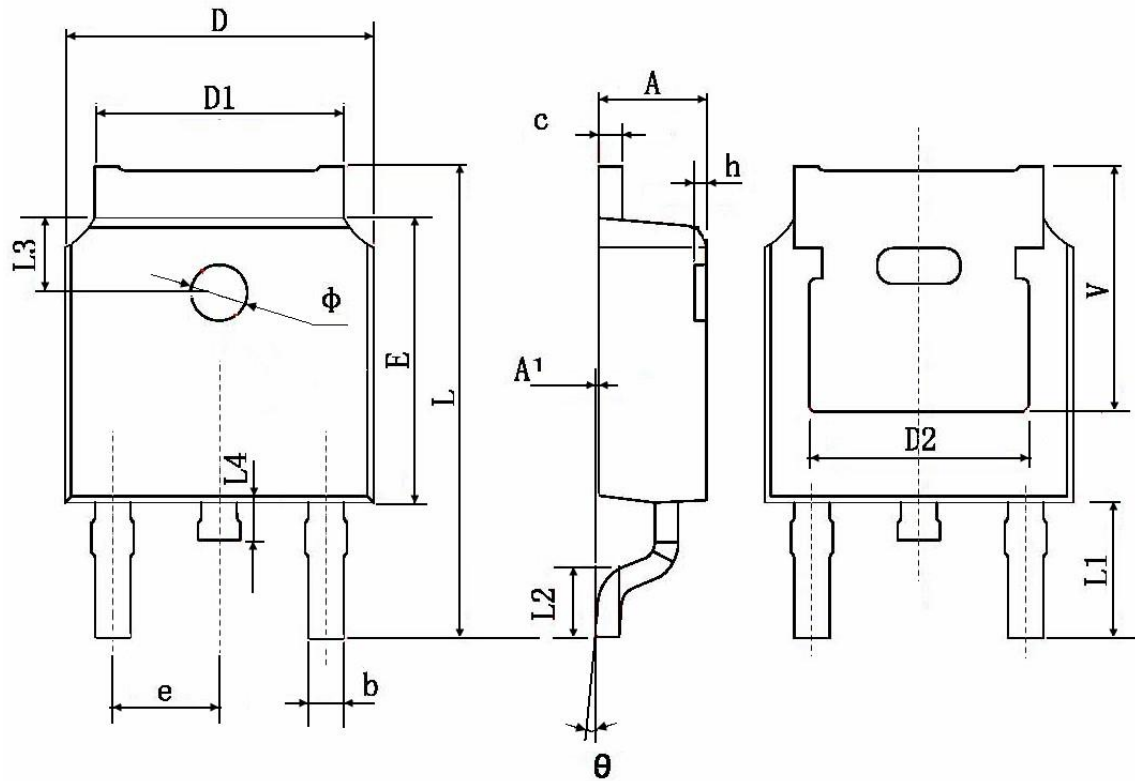$$EAS= \frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

Fig.11 Unclamped Inductive Switching Waveform

Package Information : 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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