


TM0068N06D

N-Channel Enhancement Mosfet

<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = 60V$ $I_D = 80A$</p> <p>$R_{DS(ON)} = 6.8m\Omega$(typ.) @ $V_{GS} = 10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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D:TO-252-3L

Marking 80N06

Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	60	V
Gate source voltage	V_{GS}	± 20	V
Continuous drain current ¹⁾	I_D	80	A
Pulsed drain current ²⁾	$I_D, pulse$	180	A
Power dissipation ³⁾	P_D	125	W
Single pulsed avalanche energy ⁴⁾	EAS	30	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	$^\circ C$
Thermal resistance, junction-case	$R_{\theta JC}$	1	$^\circ C/W$
Thermal resistance, junction-ambient ⁵⁾	$R_{\theta JA}$	62	$^\circ C/W$

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Electrical Characteristics (T_J=25 °C, 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 I _S =10 A, di/dt=100 A/μs			1.3	V
t _{rr}	Reverse recovery time			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 °C.
- 5) The value of R_{θJA} 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 °C.

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Electrical Characteristics Diagrams

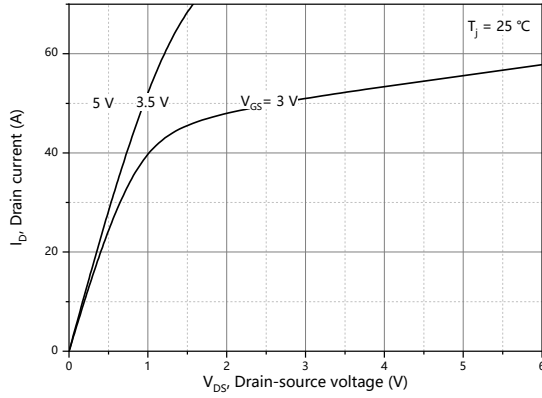


Figure 1, Typ. output characteristics

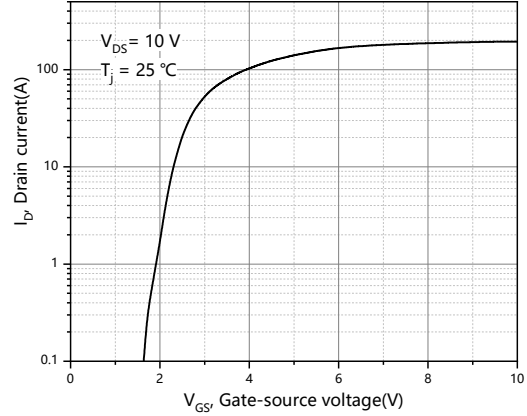


Figure 2, Typ. transfer characteristics

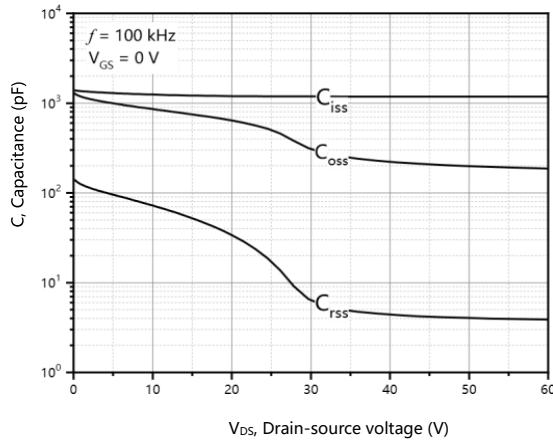


Figure 3, Typ. capacitances

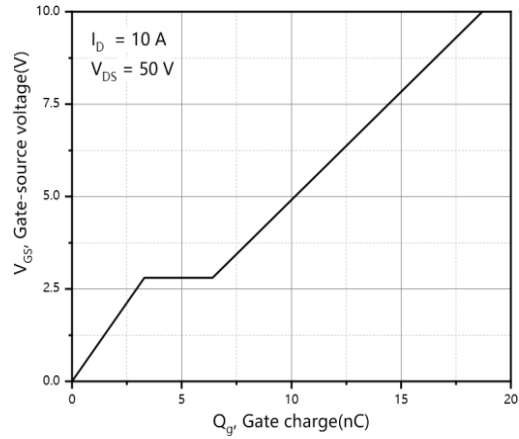


Figure 4, Typ. gate charge

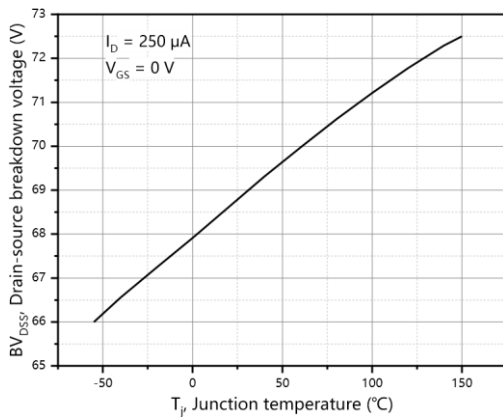


Figure 5, Drain-source breakdown voltage

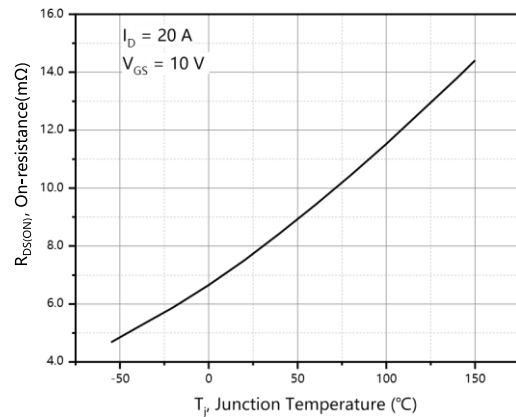


Figure 6, Drain-source on-state resistance



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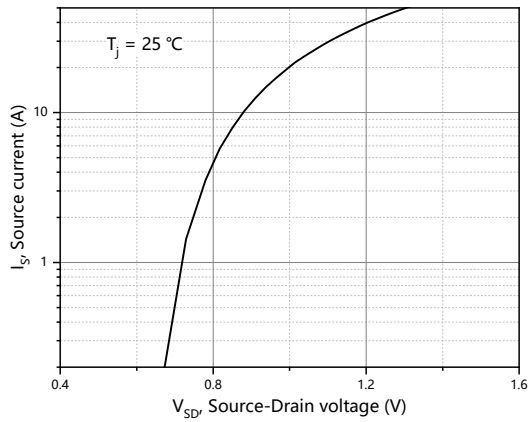


Figure 7, Forward characteristic of body diode

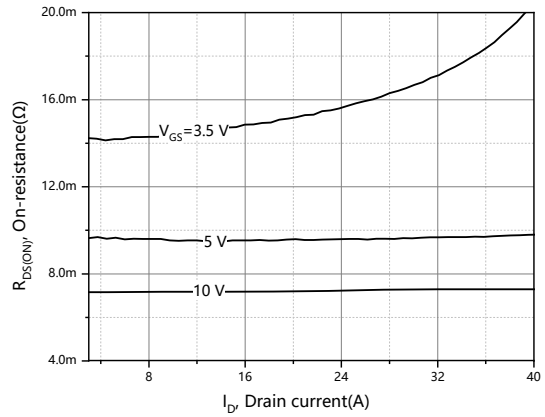


Figure 8, Drain-source on-state resistance

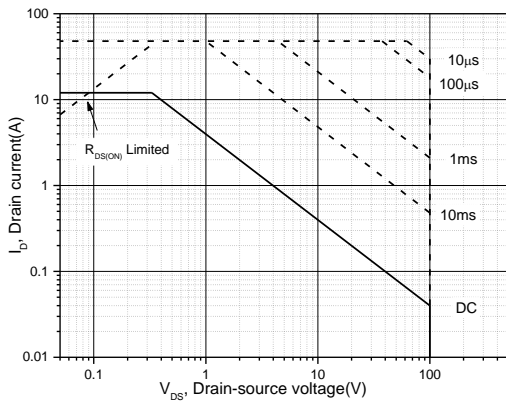


Figure 9, Safe operation area T_C=25 °C

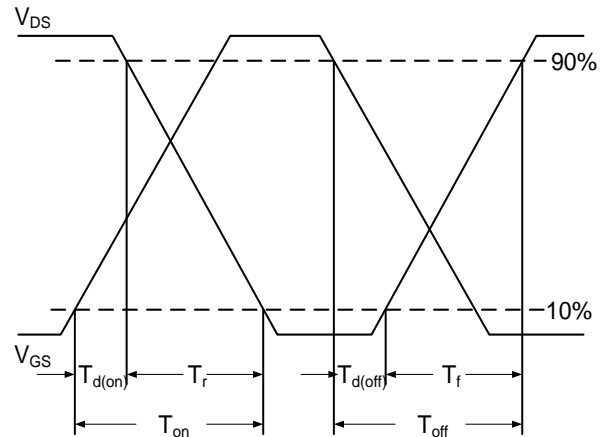


Fig.10 Switching Time Waveform

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

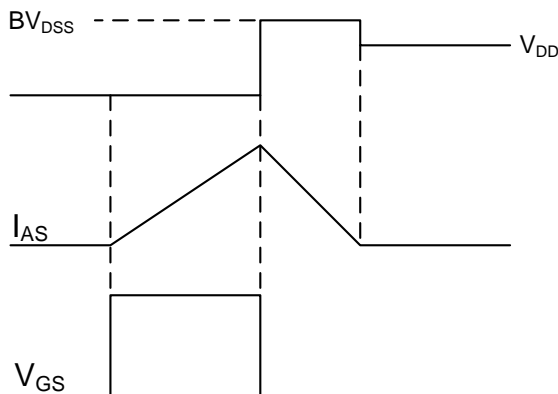
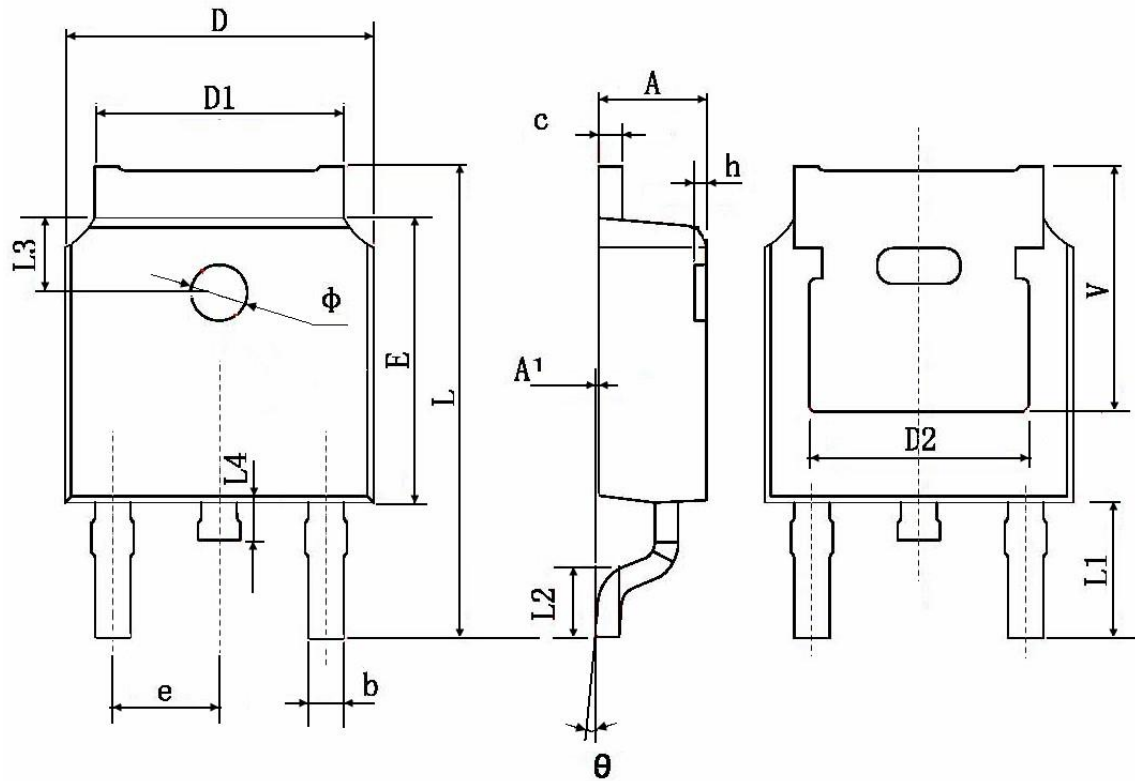


Fig.11 Unclamped Inductive Switching Waveform

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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