

60V/80 A N-Channel MOSFET

BVDSS	60	V
ID	80	A
RDSON@VGS=10V	6.3	mΩ

Features

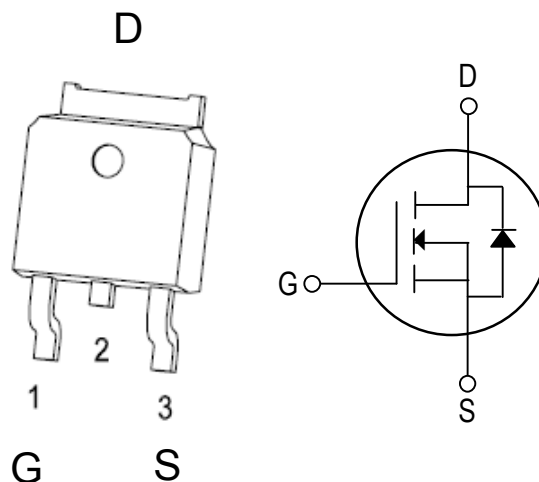
- Lead free and Green Device Available
- Low Rds-on to Minimize Conductive Loss
- High avalanche Current
- 100% Avalanche Tested

Application

- Power Supply
- DC-DC Converters
- UPS
- Battery Management System

Order Information

Product	Package	Marking	Reel
M06N80L	TO-252	PTD80N06	2500PCS

TO-252

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter		Maximum	Unit
V_{DSS}	Drain-to-Source Voltage		60	V
V_{GSS}	Gate-to-Source Voltage		± 25	V
I_D^3	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	80	A
		$T_C=100^{\circ}\text{C}$	66	
I_{DP}^4	Pulsed Drain Current	$T_C=25^{\circ}\text{C}$	320	
EAS^5	Avalanche energy		246	mJ
PD	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	100	W
T_J, T_{STG}	Junction & Storage Temperature Range		-55~150	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta jc}$	Thermal Resistance-Junction to Case	1.3	$^{\circ}\text{C/W}$
$R_{\theta ja}$	Thermal Resistance-Junction to Ambient	62.5	

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Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	—	—	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	—	—	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V	—	—	±100	nA
R _{DS(on)} ¹	Drain-Source On-Resistance	V _{GS} =10V, I _D =40A	—	6.3	8	mΩ
			—	—	—	
Diode Characteristics						
V _{SD} ¹	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V	—	—	1.3	V
I _S ³	Diode Continuous Forward Current		—	—	100	A
t _{rr}	Reverse Recovery Time	I _S =40A,	—	70	—	nS
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/us	—	100	—	nC
Dynamic Characteristics ²						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V Frequency=1MHz	—	4100	—	pF
C _{oss}	Output Capacitance		—	370	—	
C _{rss}	Reverse Transfer Capacitance		—	260	—	
t _{d(on)}	Turn-On Delay Time	V _{DD} =34V, I _D =40A, V _{GS} =10V, (Note1, 4)	—	55	—	nS
t _r	Rise Time		—	65	—	
t _{d(off)}	Turn-Off Delay Time		—	140	—	
t _f	Fall Time		—	50	—	
Gate Charge Characteristics ²						
Q _g	Total Gate Charge	V _{DD} =48V, I _D =40A, V _{GS} =10V, (Note1, 4)	—	90	—	nC
Q _{gs}	Gate-to-Source Charge		—	20	—	
Q _{gd}	Gate-to-Drain Charge		—	31	—	

Note: 1: Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

2: Guaranteed by design, not subject to production testing.

3: Package limitation current is 100A. Calculated continuous current based on maximum allowable junction temperature.

4: Repetitive rating, pulse width limited by max junction temperature.

5: Starting $T_J = 25^\circ C, L = 1mH, I_{AS} = 22A$.

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Typical Characteristics

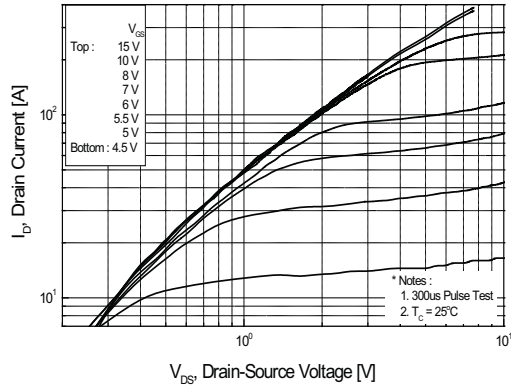


Figure 1. On Region Characteristics

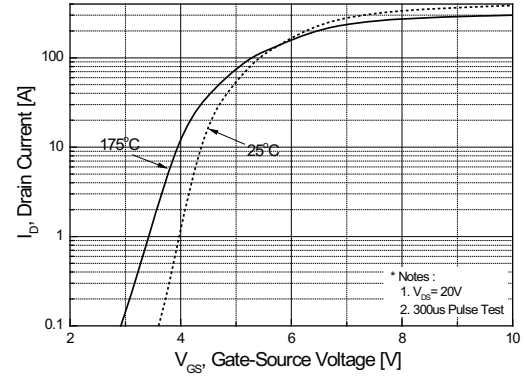


Figure 2. Transfer Characteristics

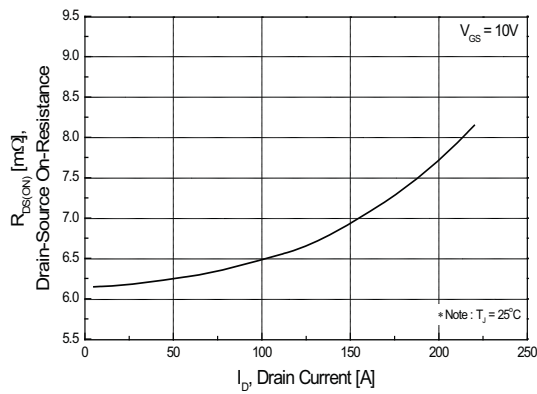


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

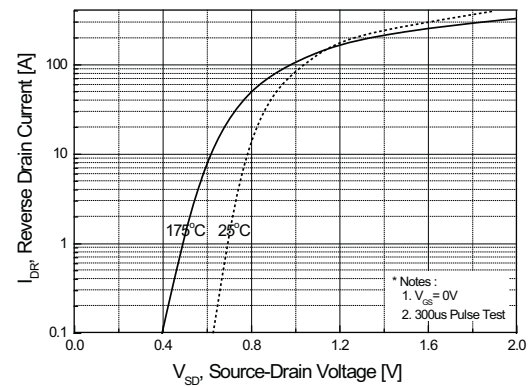


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

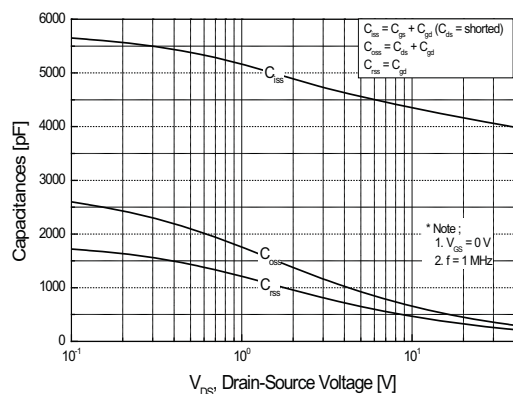


Figure 5. Capacitance Characteristics

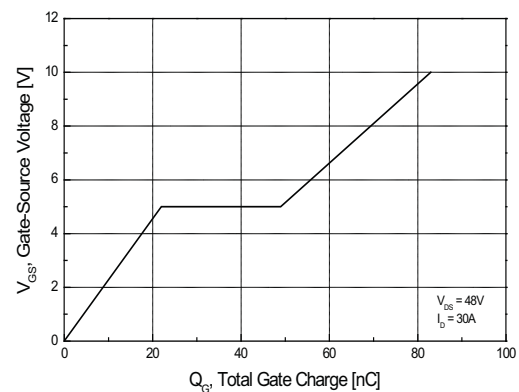


Figure 6. Gate Charge Characteristics

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Typical Characteristics (continued)

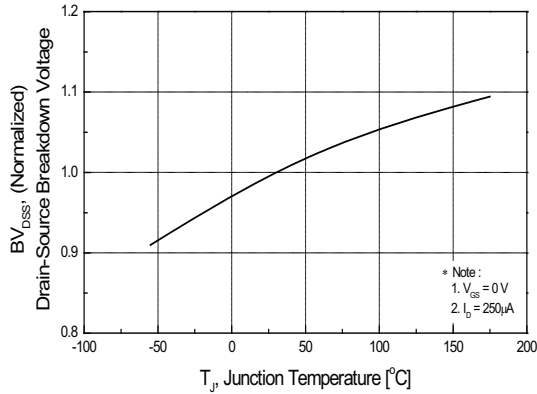


Figure 7. Breakdown Voltage Variation vs Temperature

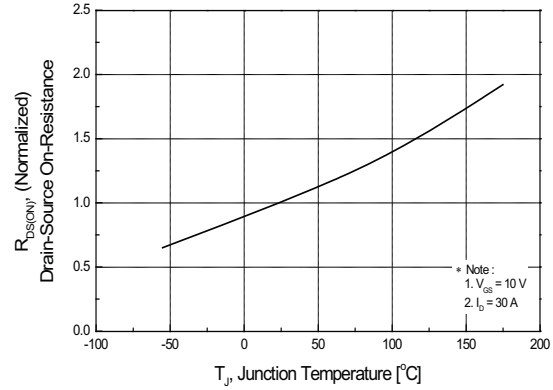


Figure 8. On-Resistance Variation vs Temperature

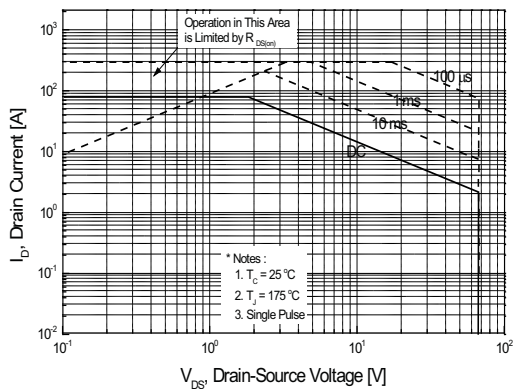


Figure 9. Maximum Safe Operating Area

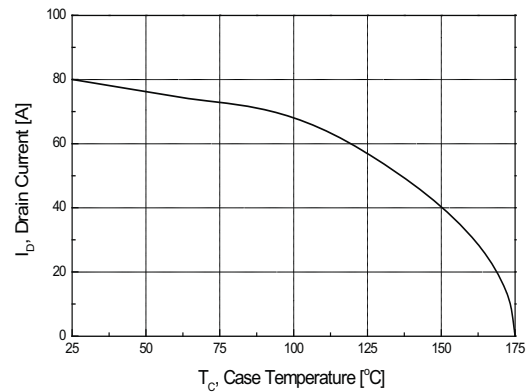


Figure 10. Maximum Drain Current vs Case Temperature

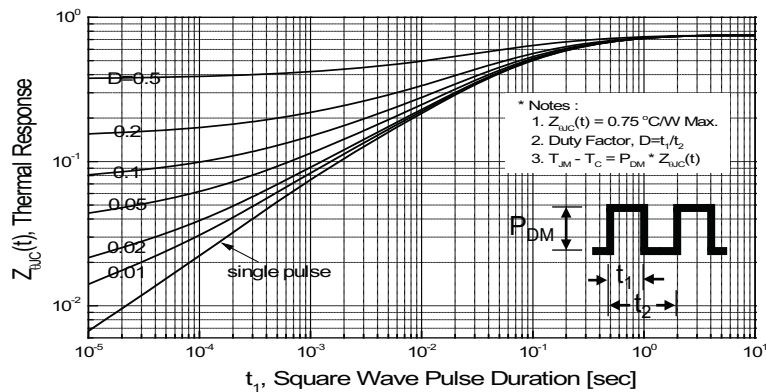
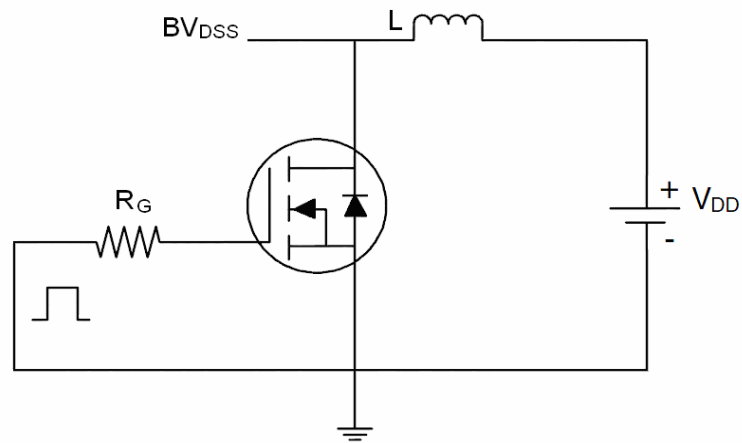
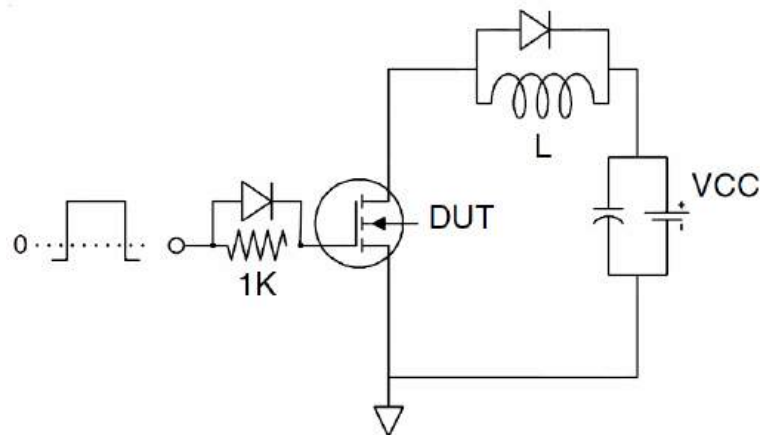
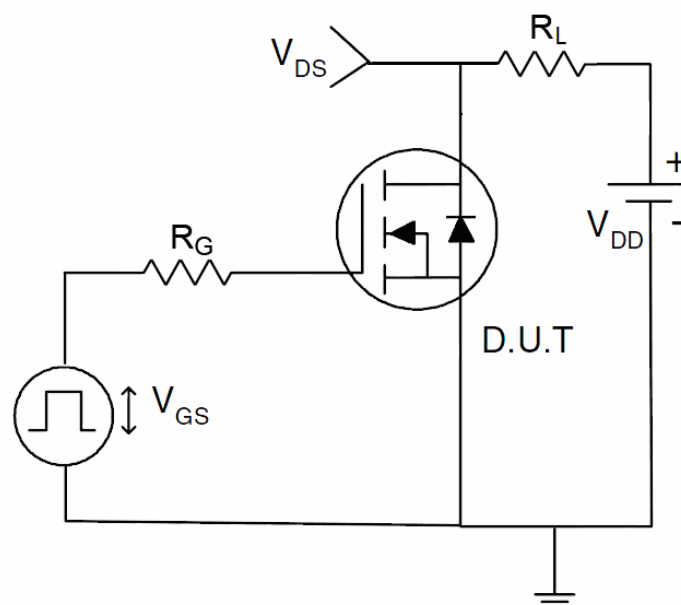
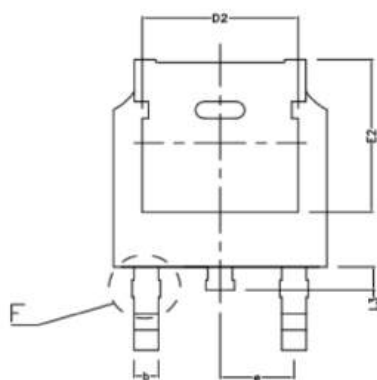
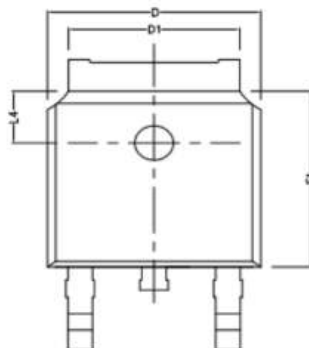
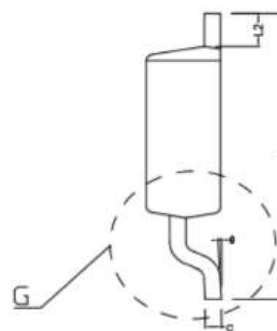
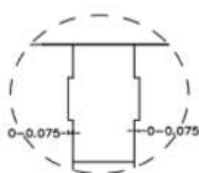
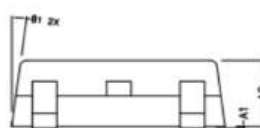
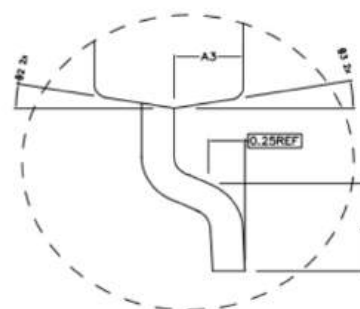


Figure 11. Transient Thermal Response Curve

60V/80 A N-Channel MOSFET
Test Circuit
1) E_{AS} test Circuit

2) Gate charge test Circuit

3) Switch Time Test Circuit


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TO-252 Package Outline Dimensions (Units: mm)

BOTTOM VIEW

TOP VIEW

SIDE VIEW

DETAIL F

SIDE VIEW

DETAIL G

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.000	0.100	0.150
A2	2.200	2.300	2.400
A3	1.020	1.070	1.120
b	0.710	0.760	0.810
c	0.460	0.508	0.550
D	6.500	6.600	6.700
D1	5.330REF		
D2	4.830REF		
E	9.900	10.100	10.300
E1	6.000	6.100	6.200
E2	5.600REF		
e	2.286TYPE		
L	1.400	1.550	1.700
L2	1.10REF		
L3	0.80REF		
L4	1.80REF		
θ	0~8°		
θ1	7° TYPE		
θ2	10° TYPE		
θ3	10° TYPE		