

60V N-Channel Enhancement Mode Power MOSFET

Description

WMO80N06T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Features

- $V_{DS} = 60V$, $I_D = 80A$
 $R_{DS(on)} < 7.2m\Omega$ @ $V_{GS} = 10V$
- Green Device Available
- Low Gate Charge
- Low $R_{DS(on)}$
- 100% EAS Guaranteed

Applications

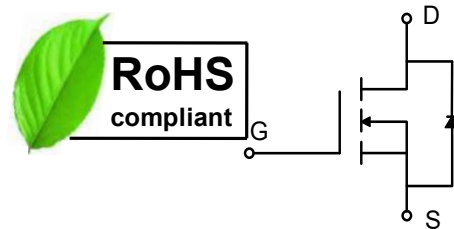
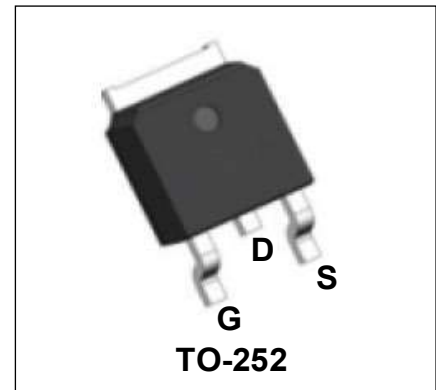
- Synchronous Rectification
- DC/DC Converter
- Moto Control

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C = 25^\circ C$	I_D	80	A
	$T_C = 100^\circ C$		50.6	
Pulsed Drain Current ²		I_{DM}	320	A
Single Pulse Avalanche Energy ³		EAS	80	mJ
Total Power Dissipation ⁴	$T_C = 25^\circ C$	P_D	96.1	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Case ¹	$R_{\theta JC}$	1.3	$^\circ C/W$



Electrical Characteristics

$T_c = 25^\circ\text{C}$, unless otherwise noted

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	-	-	V
Gate-body Leakage current		I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	$T_J=25^{\circ}C$	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$	-	-	1	μA
Gate-Threshold Voltage		$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-Source on-Resistance ²		$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	5.5	7.2	m Ω
Forward Transconductance ²		g_{fs}	$V_{DS} = 5V, I_D = 20A$	-	25	-	S
Dynamic Characteristics							
Input Capacitance		C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$	-	3692	-	pF
Output Capacitance		C_{oss}		-	263.2	-	
Reverse Transfer Capacitance		C_{rss}		-	218	-	
Switching Characteristics							
Gate Resistance		R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$	-	0.7	-	Ω
Total Gate Charge		Q_g	$V_{GS} = 10, V_{DS} = 30V, I_D=20A$	-	80	-	nC
Gate-Source Charge		Q_{gs}		-	7.2	-	
Gate-Drain Charge		Q_{gd}		-	15.5	-	
Turn-on Delay Time		$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 30V, R_G = 3\Omega, R_L = 1\Omega, I_D=20A$	-	7.5	-	ns
Rise Time		t_r		-	6.2	-	
Turn-off Delay Time		$t_{d(off)}$		-	34	-	
Fall Time		t_f		-	12.8	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²		V_{SD}	$I_S = 1A, V_{GS} = 0V$	-	-	1	V
Continuous Source Current ^{1,5}		I_S	$V_G=V_D=0V, Force\ Current$	-	-	80	A
Body Diode Reverse Recovery Time		t_{rr}	$I_F = 20A, dI/dt = 100A/\mu s$	-	38	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}		-	53	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD} = 30V, L = 0.1mH, I_{AS} = 40A$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

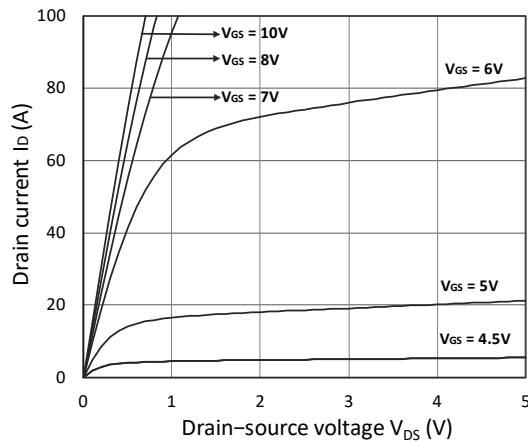


Figure 1. Output Characteristics

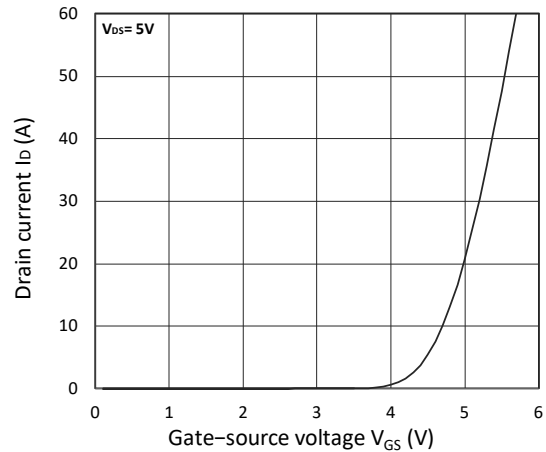


Figure 2. Transfer Characteristics

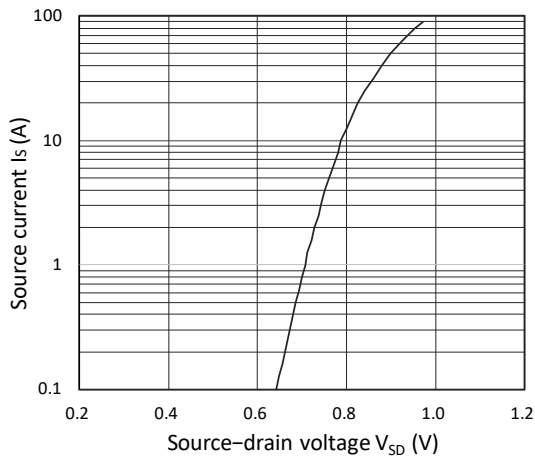
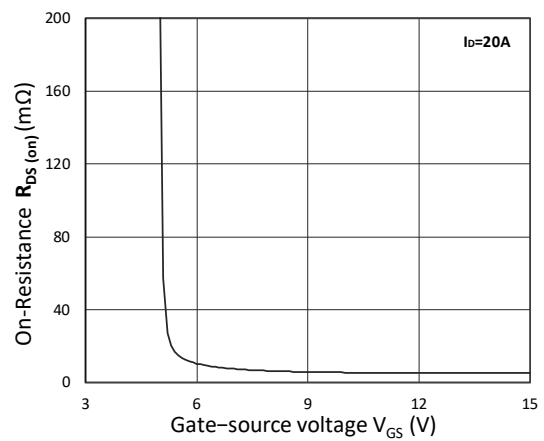
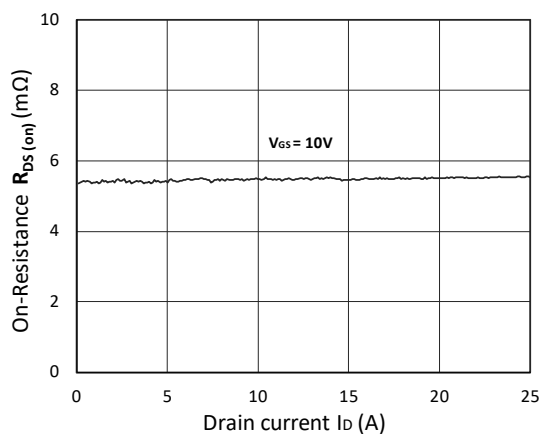
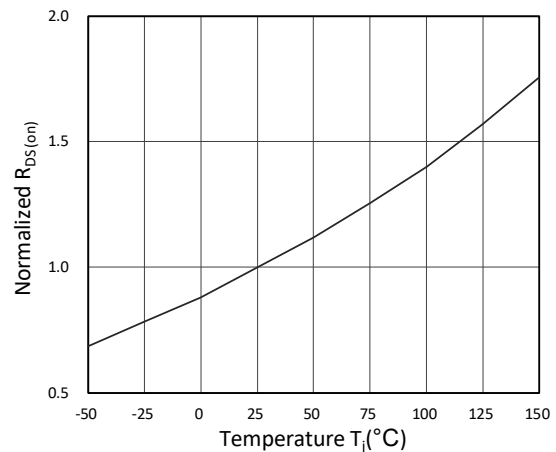


Figure 3. Forward Characteristics of Reverse

Figure 4. $R_{DS(on)}$ vs. V_{GS} Figure 5. $R_{DS(on)}$ vs. I_D Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

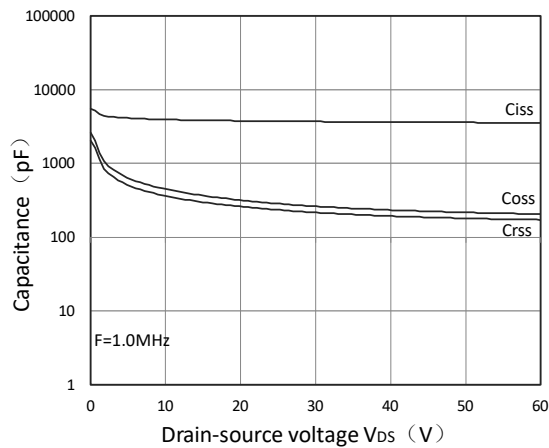


Figure 7. Capacitance Characteristics

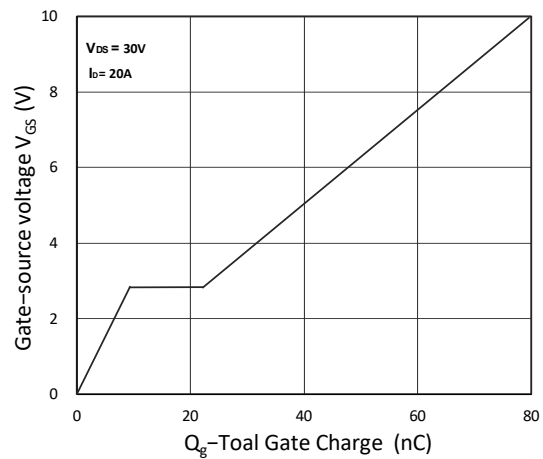


Figure 8. Gate Charge Characteristics

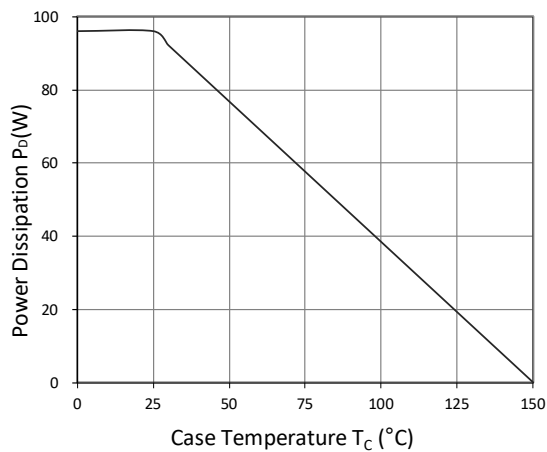


Figure 9. Power Dissipation

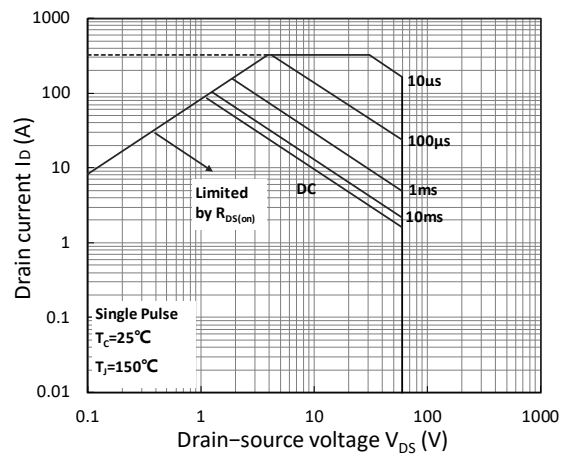


Figure 10. Safe Operating Area

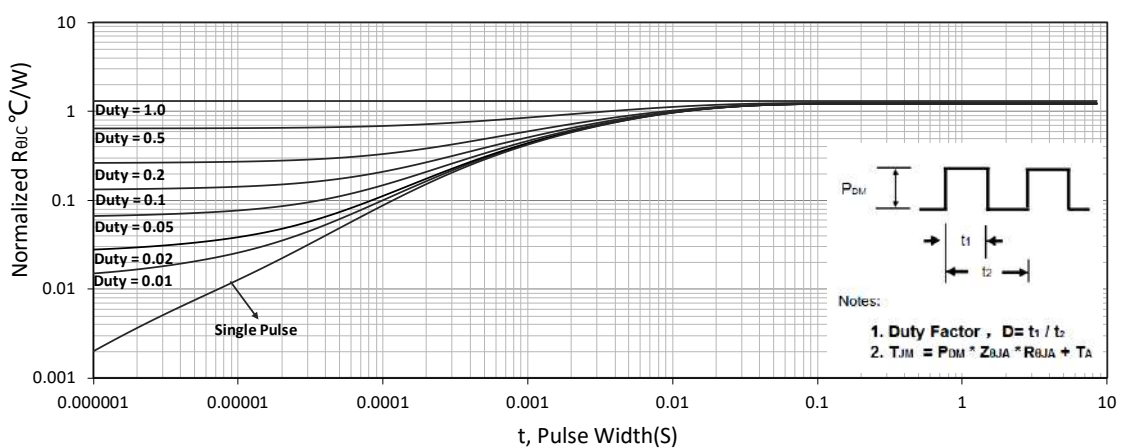


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

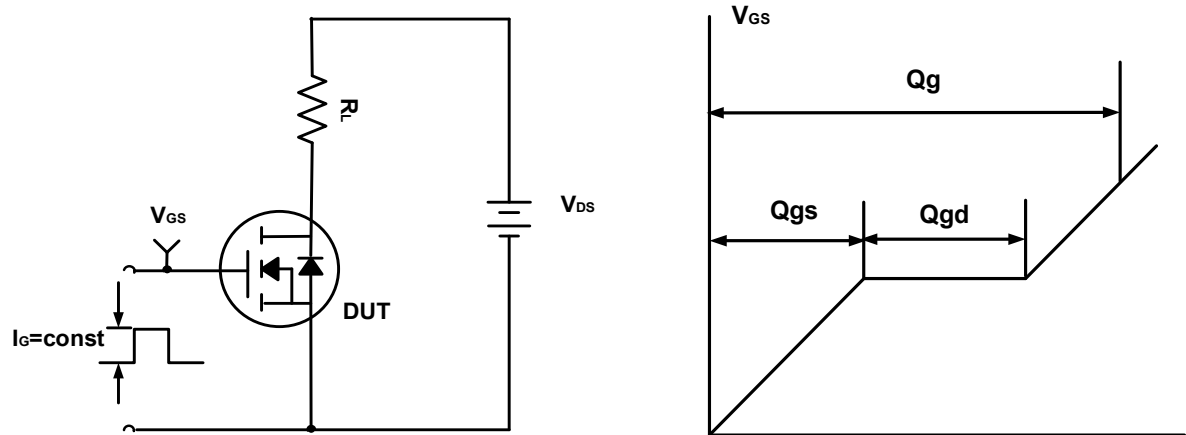


Figure A. Gate Charge Test Circuit & Waveforms

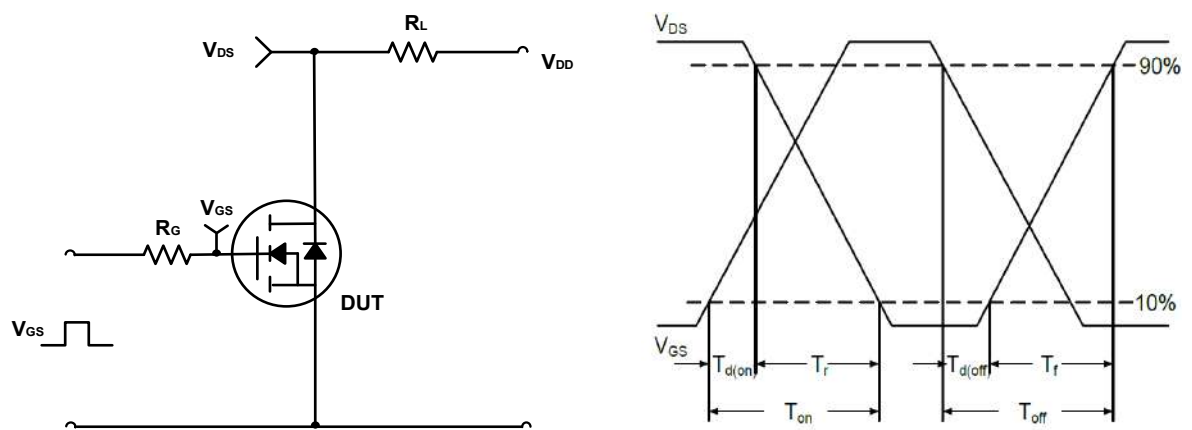


Figure B. Switching Test Circuit & Waveforms

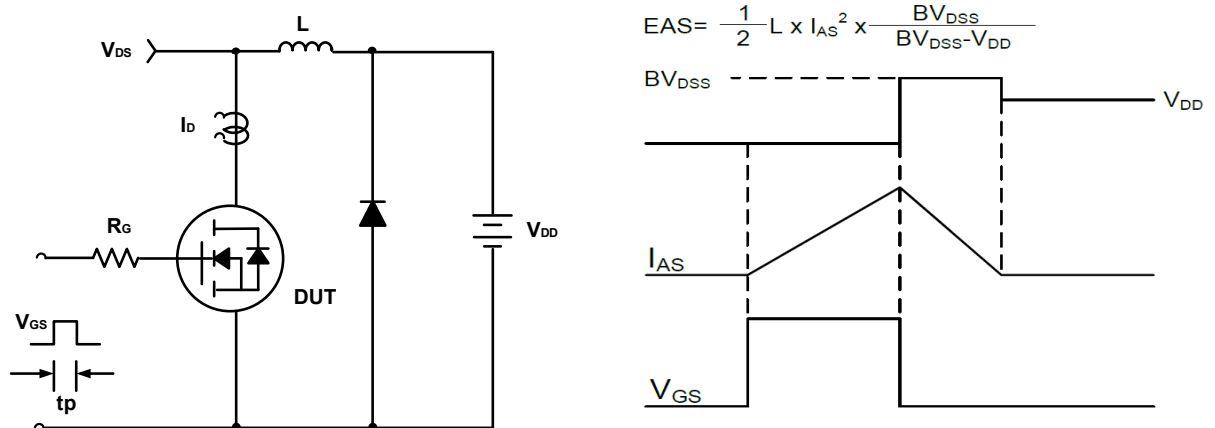
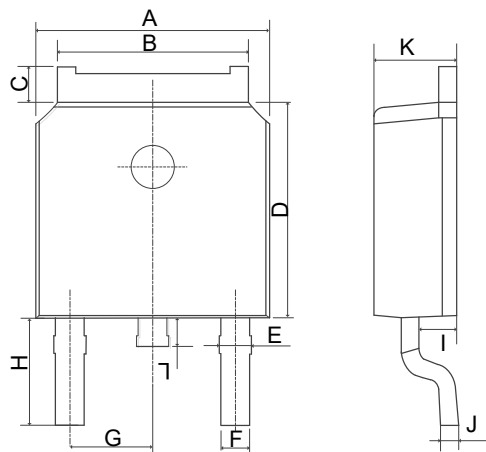


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TO-252



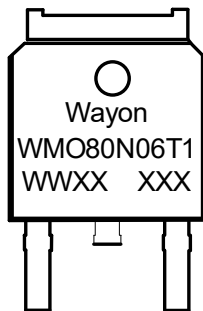
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	6.40	6.80
B	5.13	5.50
C	0.88	1.28
D	5.90	6.22
E	0.68	1.10
F	0.68	0.91
G	2.29REF	
H	2.90REF	
I	0.85	1.17
J	0.51REF	
K	2.10	2.50
L	0.40	1.00

Ordering Information

Part	Package	Marking	Packing method
WMO80N06T1	TO-252	WMO80N06T1	Tape and Reel

Marking Information



WMO80N06T1 = Device code

WWXX XXX= Date code

Contact Information

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