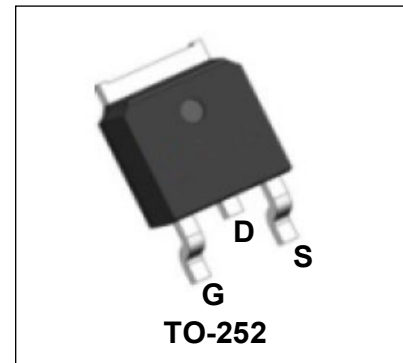


100V N-Channel Enhancement Mode Power MOSFET

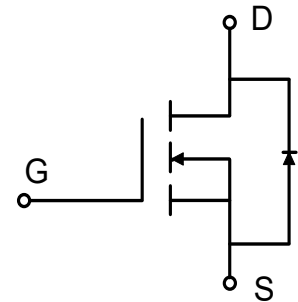
Description

WMO15N10T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.



Features

- $V_{DS} = 100V$, $I_D = 14.6A$
 $R_{DS(on)} < 90m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(on)} < 105m\Omega$ @ $V_{GS} = 4.5V$
- Green Device Available
- Low Gate Charge
- Advanced High Cell Density Trench Technology
- 100% EAS Guaranteed



Applications

- Power Management Switches
- DC/DC Converters

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ C$	I_D	14.6	A
	$T_C = 100^\circ C$		10	
Pulsed Drain Current ¹		I_{DM}	58	A
Single Pulse Avalanche Energy ²		EAS	3.2	mJ
Total Power Dissipation	$T_C = 25^\circ C$	P_D	41.7	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-Ambient ³	$R_{\theta JA}$	50	$^\circ C/W$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	3	$^\circ C/W$

Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V	
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA	
Zero Gate Voltage Drain Current	$T_J=25^\circ\text{C}$	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
	$T_J=100^\circ\text{C}$			-	-	100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	-	2.5	V	
Drain-Source on-Resistance ⁴	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5A$	-	65	90	m Ω	
		$V_{GS} = 4.5V, I_D = 3A$	-	75	105		
Forward Transconductance ⁴	g_{fs}	$V_{DS}=5V, I_D=5A$	-	12	-	S	
Dynamic Characteristics⁵							
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1\text{MHz}$	-	1220	-	μF	
Output Capacitance	C_{oss}		-	53	-		
Reverse Transfer Capacitance	C_{rss}		-	42	-		
Gate Resistance	R_g	$f = 1\text{MHz}$	-	1.3	-	Ω	
Switching Characteristics⁵							
Total Gate Charge	Q_g	$V_{GS} = 10V, V_{DS} = 50V,$ $I_D=5A$	-	20.6	-	nC	
Gate-Source Charge	Q_{gs}		-	4	-		
Gate-Drain Charge	Q_{gd}		-	3.7	-		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 50V,$ $R_G = 3\Omega, I_D = 5A$	-	4.7	-	ns	
Rise Time	t_r		-	21	-		
Turn-Off Delay Time	$t_{d(off)}$		-	20	-		
Fall Time	t_f		-	16	-		
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴	V_{SD}	$I_S = 1A, V_{GS} = 0V$	-	-	1.2	V	
Continuous Source Current	$T_C=25^\circ\text{C}$	I_S	-	-	14.6	A	

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.
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 $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=8A$
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

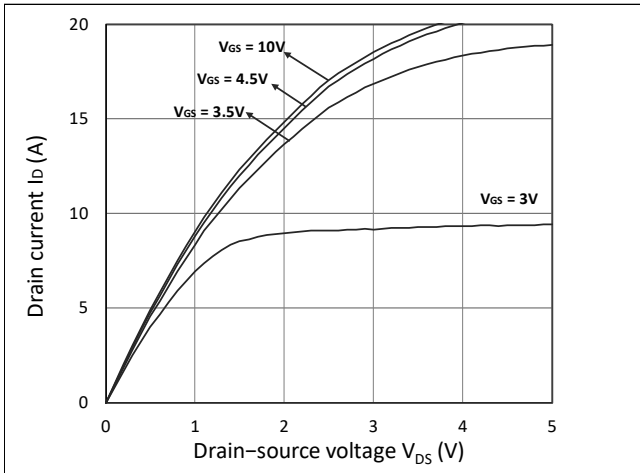


Figure 1. Output Characteristics

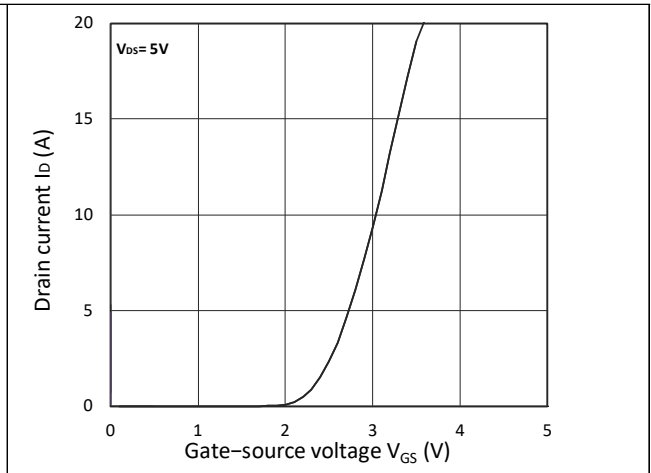


Figure 2. Transfer Characteristics

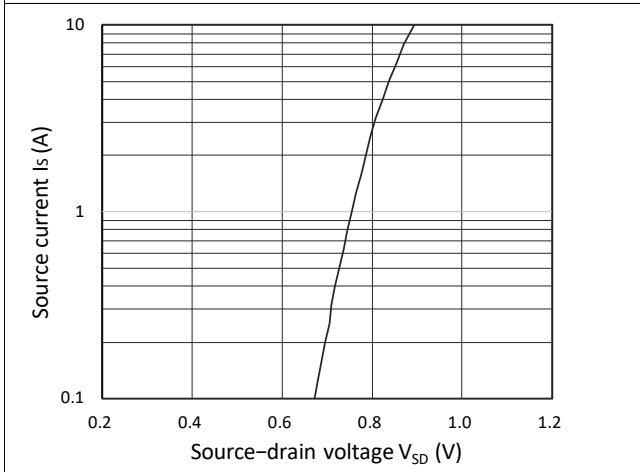


Figure 3. Forward Characteristics of Reverse

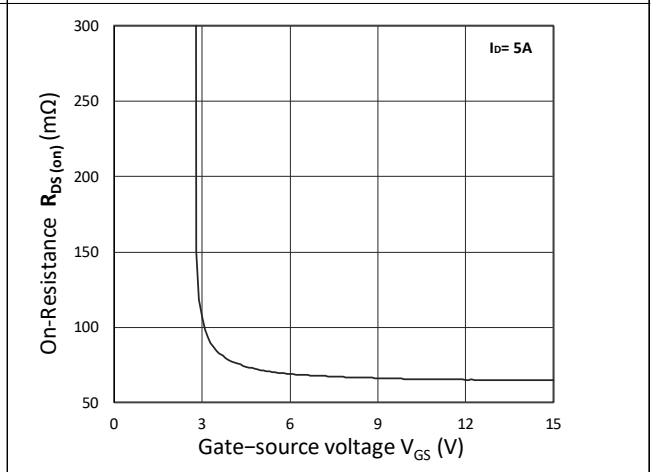


Figure 4. $R_{DS(on)}$ vs. V_{GS}

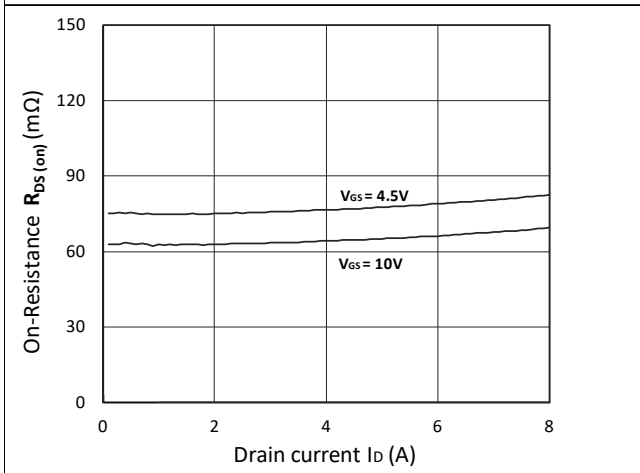


Figure 5. $R_{DS(on)}$ vs. I_D

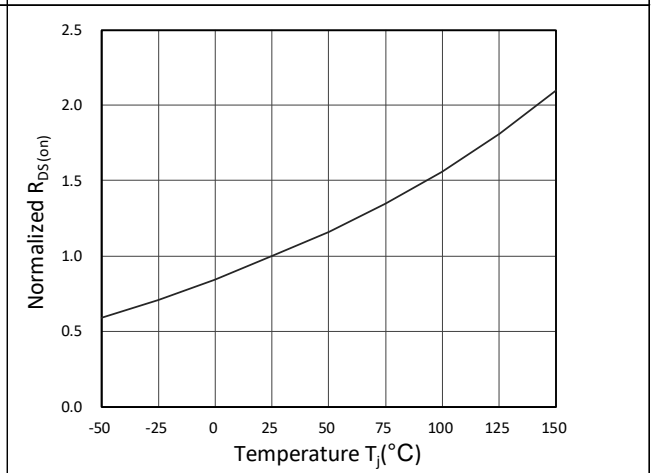


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

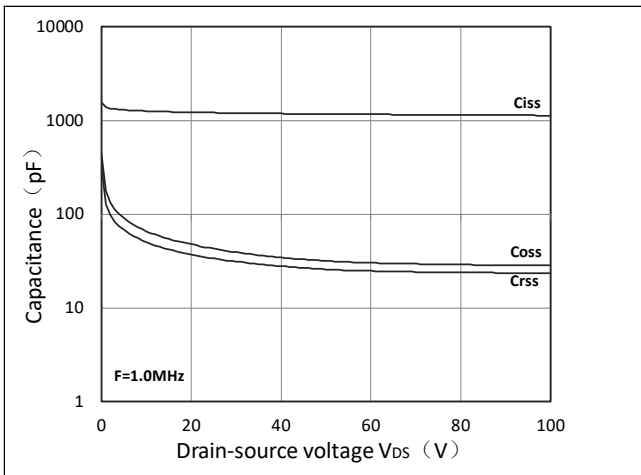


Figure 7. Capacitance Characteristics

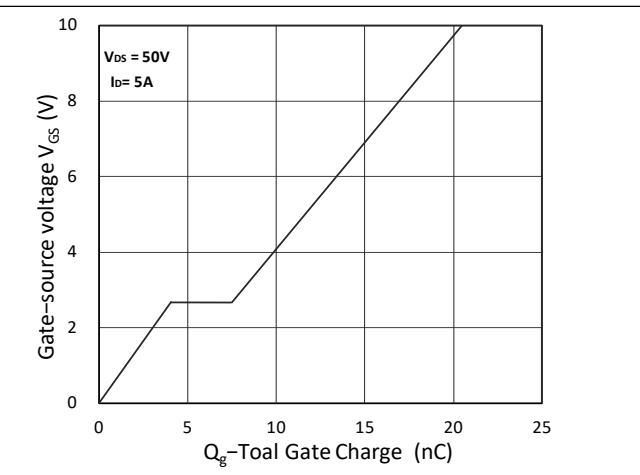


Figure 8. Gate Charge Characteristics

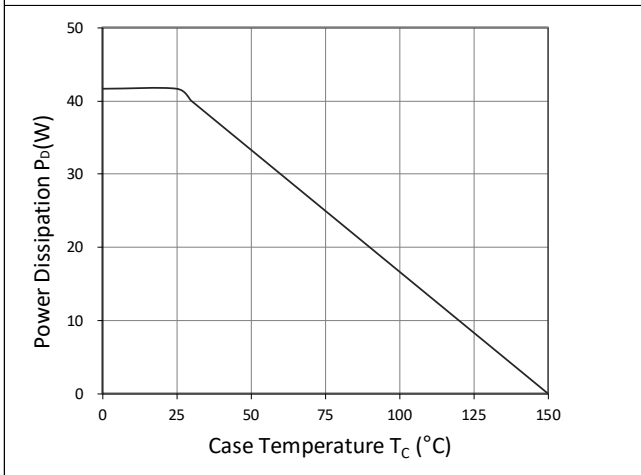


Figure 9. Power Dissipation

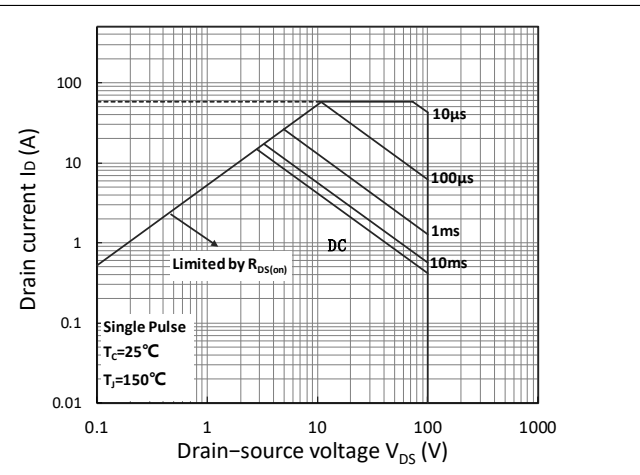


Figure 10. Safe Operating Area

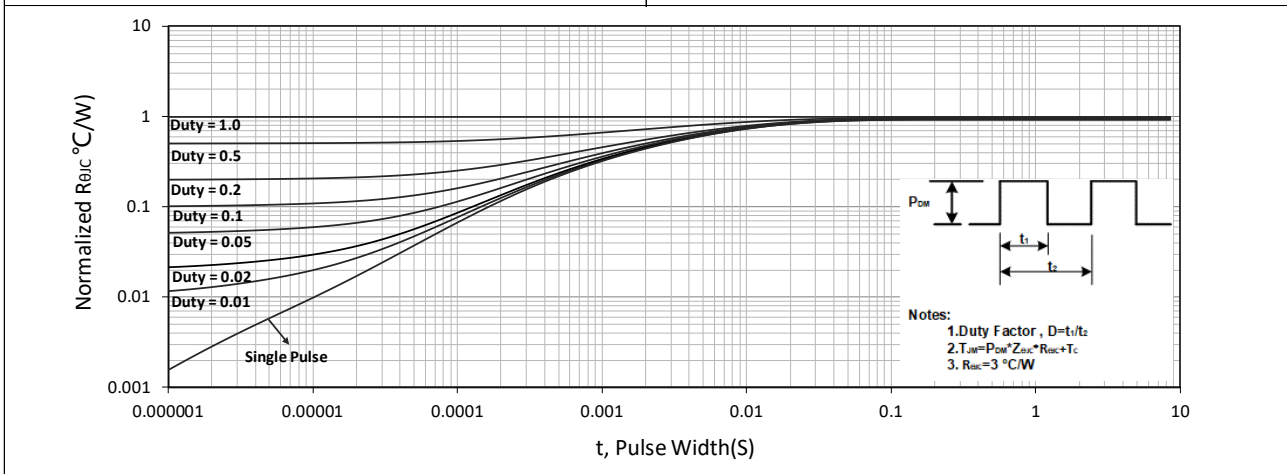


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

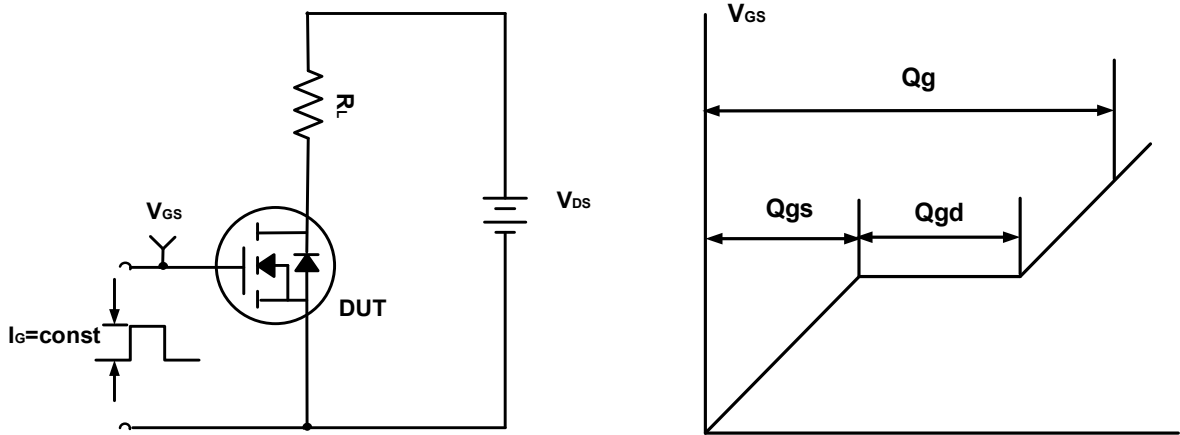


Figure A. Gate Charge Test Circuit & Waveforms

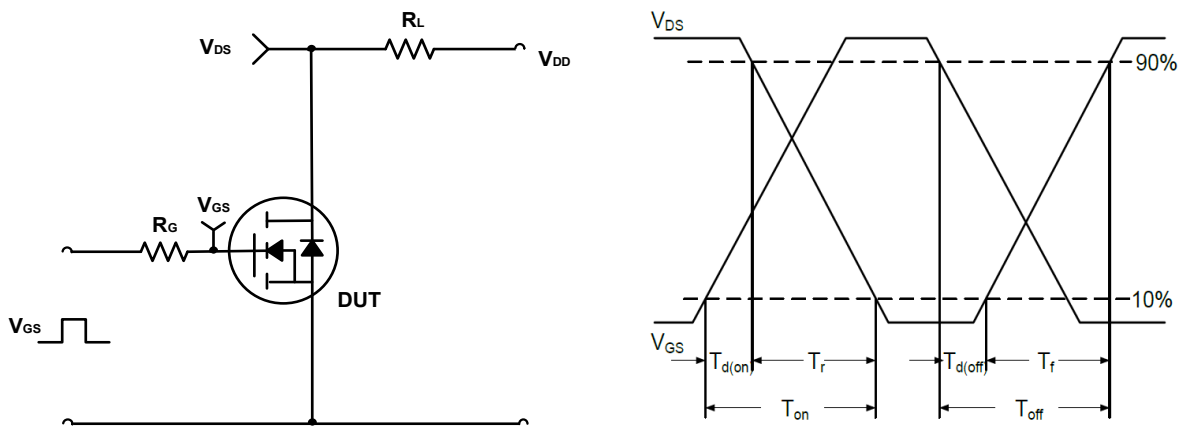


Figure B. Switching Test Circuit & Waveforms

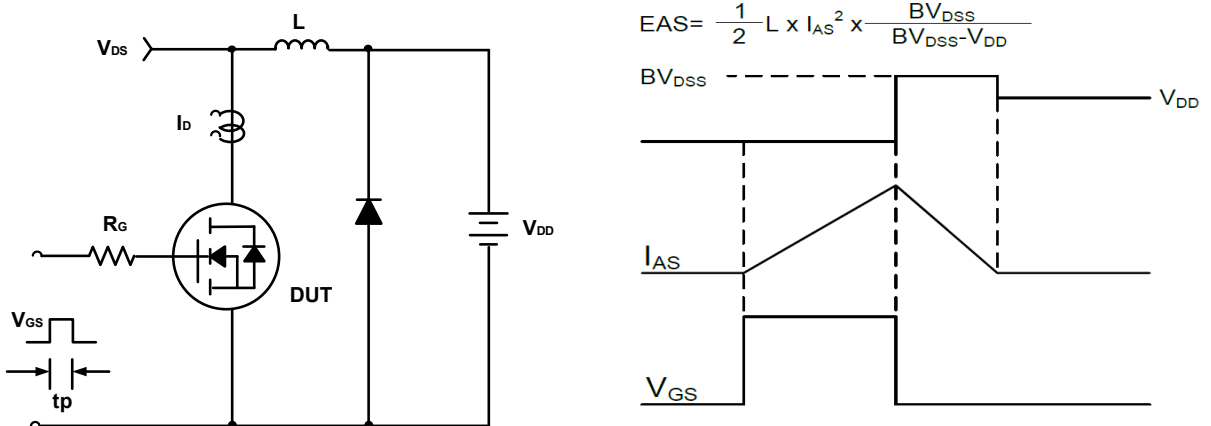
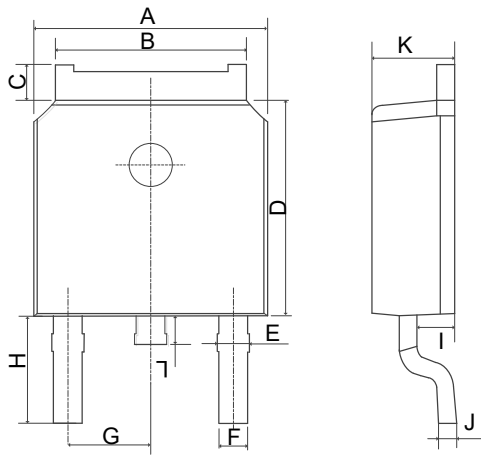


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TO-252



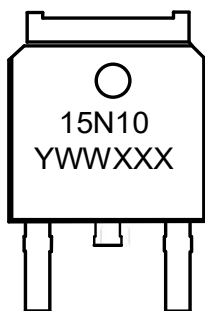
COMMON DIMENSIONS

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
WMO15N10T1	TO-252	15N10	Tape and Reel

Marking Information



15N10 = Device code

YWWXXX= Date code


Contact Information

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WAYON website: <http://www.way-on.com>

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