

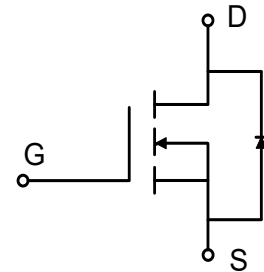
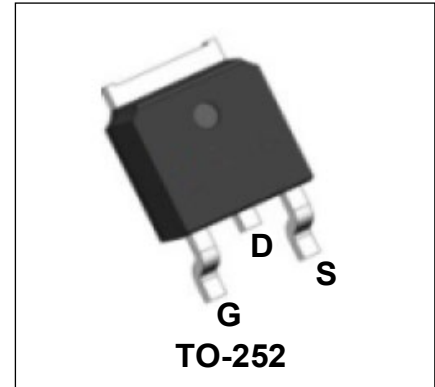
150V N-Channel Enhancement Mode Power MOSFET

Description

WMO20N15T2 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Features

- $V_{DS} = 150V$, $I_D = 20A$
 $R_{DS(on)} < 70m\Omega @ V_{GS} = 10V$
 $R_{DS(on)} < 88m\Omega @ V_{GS} = 4.5V$
- High Speed Power Switching, Logic Level
- Low Gate Charge
- 100% EAS Guaranteed
- Lead Free



Applications

- Synchronous Rectification in SMPS
- DC/DC Converters

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C = 25^\circ C$	I_D	20	A
	$T_C = 100^\circ C$		12.6	
Pulsed Drain Current ²		I_{DM}	80	A
Single Pulse Avalanche Energy ³		EAS	3.75	mJ
Total Power Dissipation ⁴	$T_C = 25^\circ C$	P_D	56.8	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 ¹	$R_{\theta JA}$	52	$^\circ C/W$
Thermal Resistance from Junction-to-Case ¹	$R_{\theta JC}$	2.2	$^\circ C/W$

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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	150	-	-	V	
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 150V, V_{GS} = 0V$	$T_J = 25^\circ\text{C}$	-	-	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	3	V	
Drain-Source on-Resistance ²	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$	-	55	70	m Ω	
		$V_{GS} = 4.5V, I_D = 8A$	-	63	88		
Transconductance ²	g_{fs}	$V_{DS} = 5V, I_D = 10A$	-	24	-	S	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS} = 75V, V_{GS} = 0V, f = 1MHz$	-	605	-	pF	
Output Capacitance	C_{oss}		-	45.5	-		
Reverse Transfer Capacitance	C_{rss}		-	3	-		
Switching Characteristics							
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} \text{ Open}, f = 1MHz$	-	3	-	Ω	
Total Gate Charge	Q_g	$V_{GS} = 10V, V_{DS} = 75V, I_D = 10A$	-	7.8	-	nC	
Gate-Source Charge	Q_{gs}		-	2.1	-		
Gate-Drain Charge	Q_{gd}		-	0.6	-		
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 75V, R_G = 10\Omega, I_D = 10A$	-	7.5	-	ns	
Rise Time	t_r		-	3.8	-		
Turn-off Delay Time	$t_{d(off)}$		-	10.5	-		
Fall Time	t_f		-	2.6	-		
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²	V_{SD}	$I_S = 1A, V_{GS} = 0V$	-	-	1.2	V	
Continuous Source Current ^{1,5}	I_S	$V_G = V_D = 0V, \text{ Force Current}$	-	-	20	A	
Body Diode Reverse Recovery Time	t_{rr}	$V_R = 75V, I_F = 10A, di/dt = 100A/\mu s$	-	46	-	ns	
Body Diode Reverse Recovery Charge	Q_{rr}		-	50	-	nC	

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ 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 $V_{DD} = 30V, V_{GS} = 10V, L = 0.3mH, I_{AS} = 5A$
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

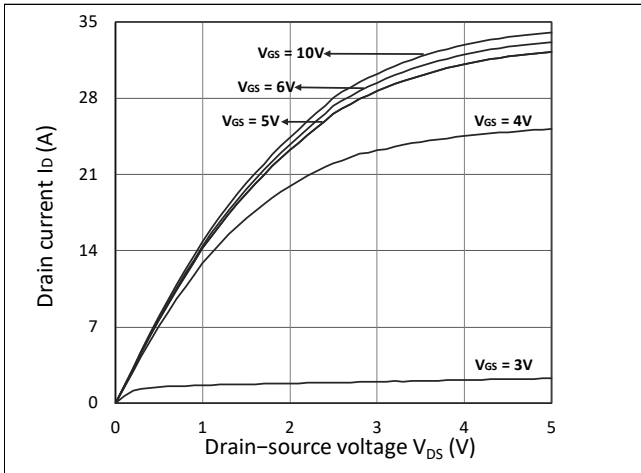


Figure 1. Output Characteristics

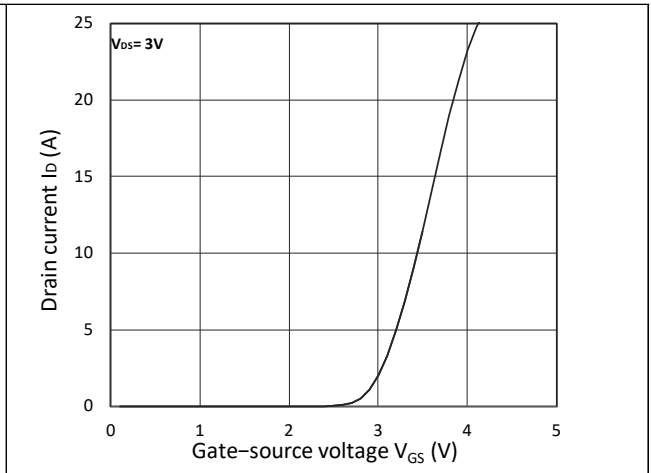


Figure 2. Transfer Characteristics

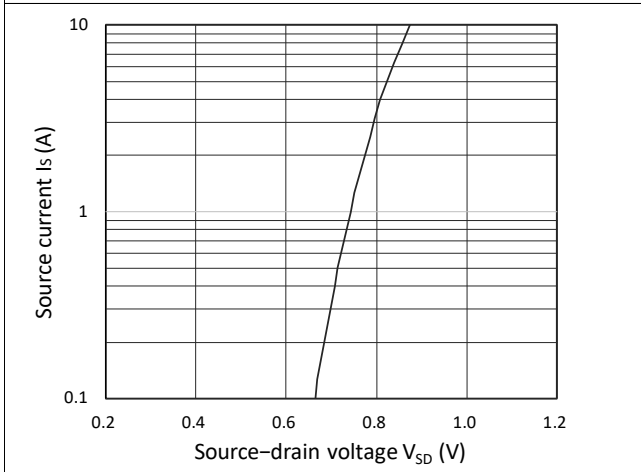


Figure 3. Forward Characteristics of Reverse

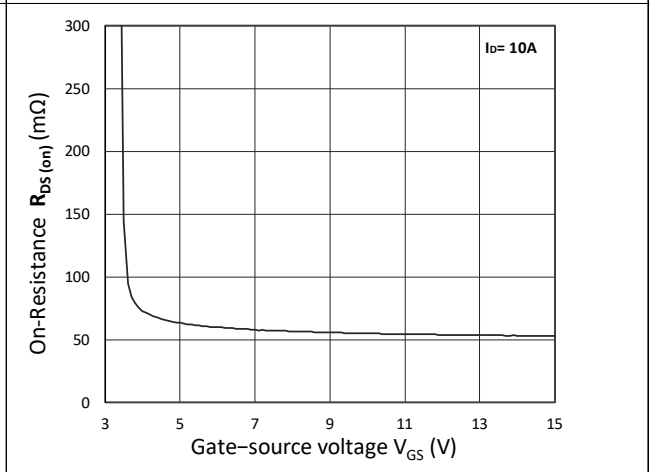


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

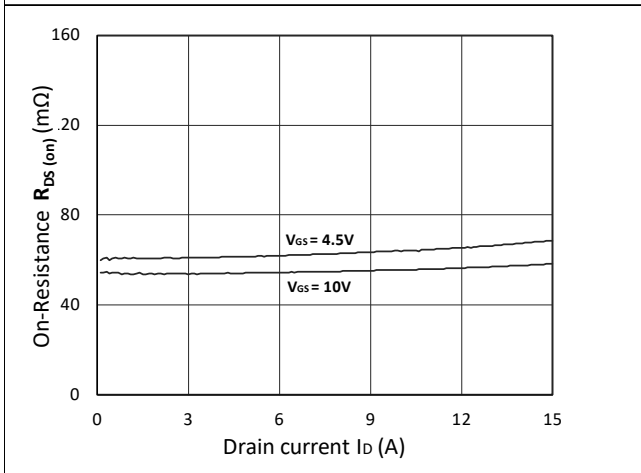


Figure 5. $R_{DS(ON)}$ vs. I_D

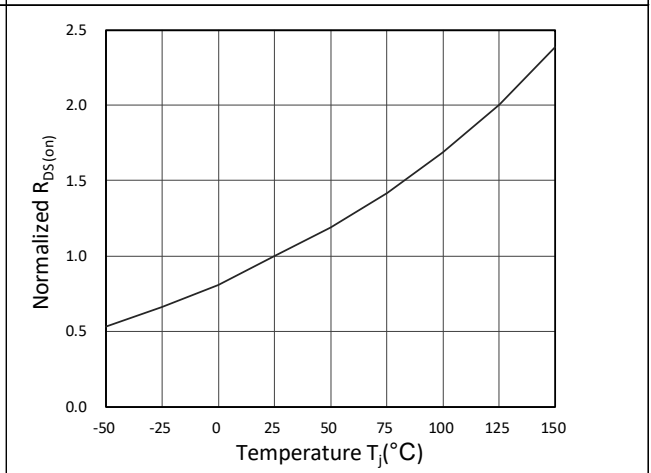


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

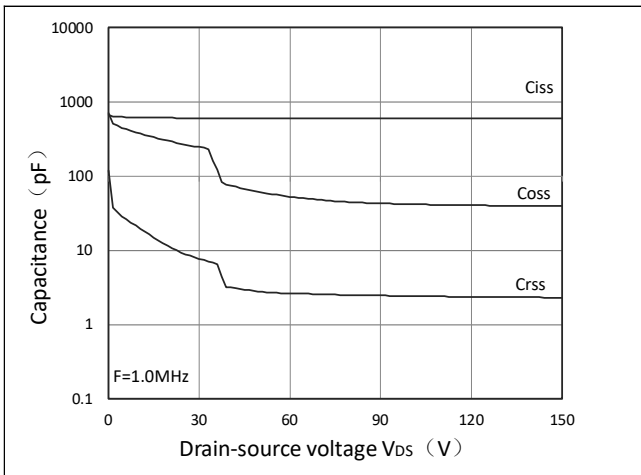


Figure 7. Capacitance Characteristics

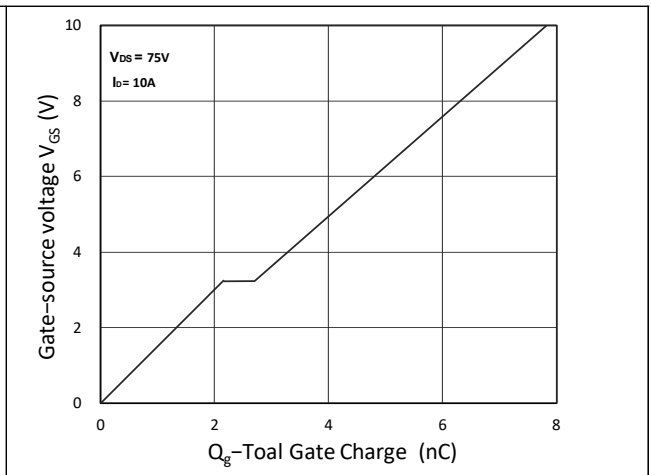


Figure 8. Gate Charge Characteristics

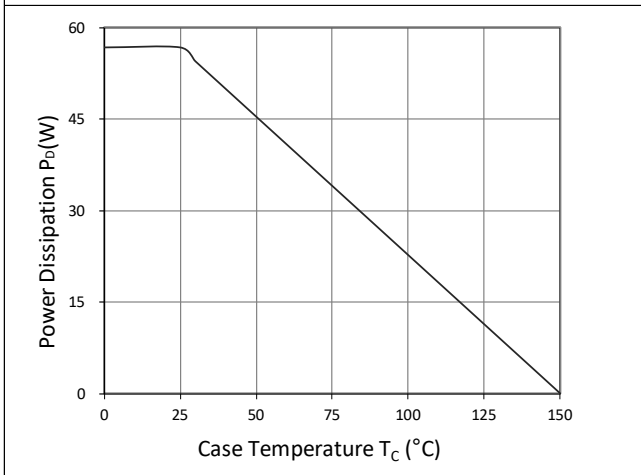


Figure 9. Power Dissipation

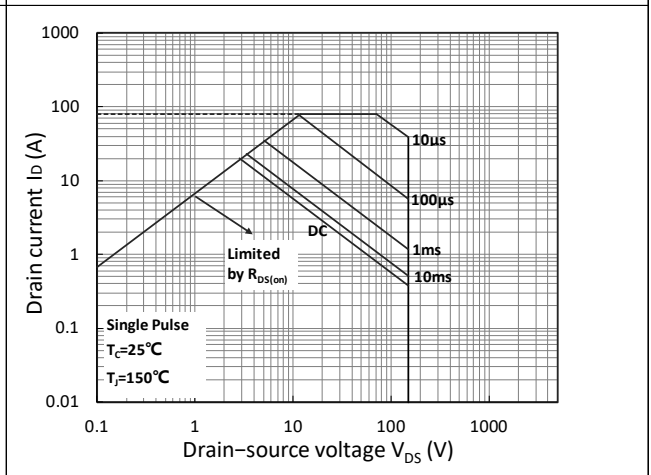


Figure 10. Safe Operating Area

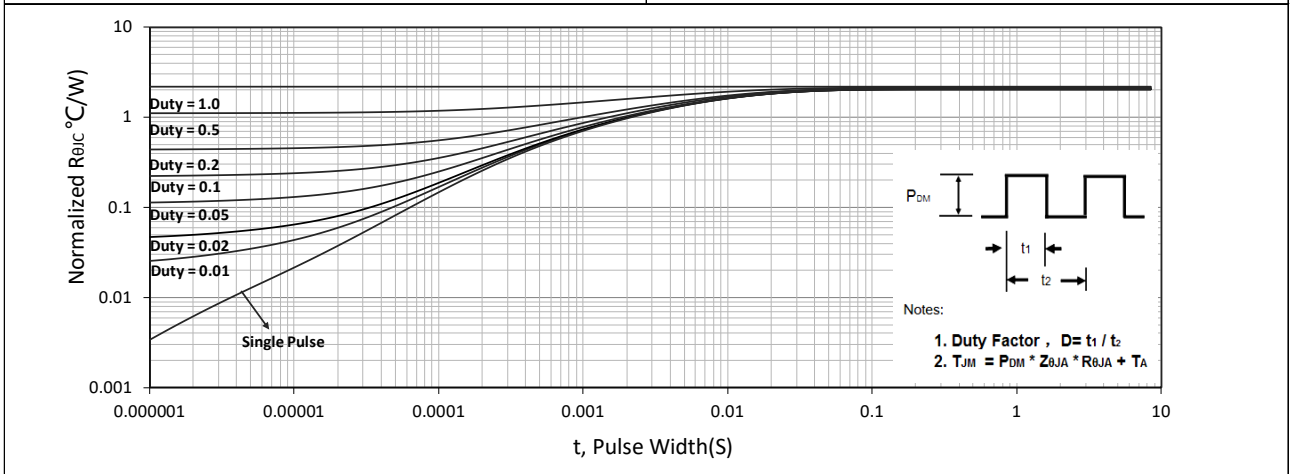
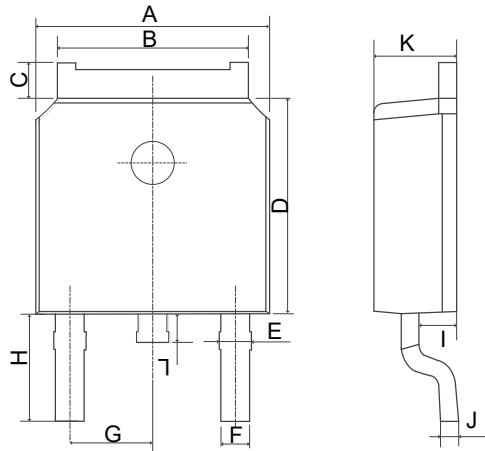


Figure 11. Normalized Maximum Transient Thermal Impedance

Mechanical Dimensions for TO-252



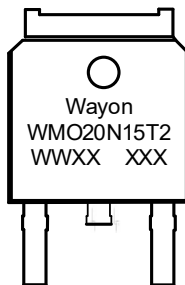
COMMON DIMENSIONS

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
WMO20N15T2	TO-252	WMO20N15T2	Tape and Reel

Marking Information



WMO20N15T2 = Device code

WWXX XXX= Date code

Contact Information

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