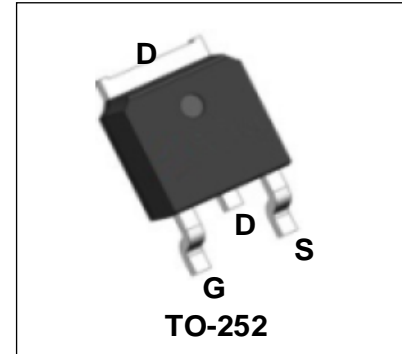


## 30V N-Channel Enhancement Mode Power MOSFET

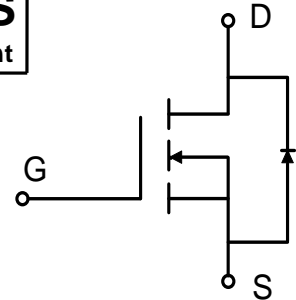
### Description

WMO55N03T1 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.



### Features

- $V_{DS} = 30V$ ,  $I_D = 55A$   
 $R_{DS(on)} < 8.5m\Omega @ V_{GS} = 10V$   
 $R_{DS(on)} < 12.5m\Omega @ V_{GS} = 4.5V$
- Green Device Available
- Low Gate Charge
- Advanced High Cell Density Trench Technology
- 100% EAS Guaranteed



### Applications

- Power Management Switches
- Synchronous Buck Converter

### Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current@10V <sup>1</sup>	$I_D$	$T_C = 25^\circ C$	55
		$T_C = 100^\circ C$	40
		$T_A = 25^\circ C$	13.6
		$T_A = 70^\circ C$	11.4
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	110	A
Single Pulse Avalanche Energy <sup>3</sup>	<b>EAS</b>	57.8	mJ
Avalanche Current	$I_{AS}$	34	A
Total Power Dissipation <sup>4</sup>	$P_D$	$T_C = 25^\circ C$	41
		$T_A = 25^\circ C$	2.42
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +175	$^\circ C$

### Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient <sup>1</sup>	$R_{\theta JA}$	62	$^\circ C/W$
Thermal Resistance from Junction-to-Case <sup>1</sup>	$R_{\theta JC}$	3.6	$^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
<b>Static Characteristics</b>							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V	
Gate-body Leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24V, V_{GS} = 0V$	$T_J = 25^\circ\text{C}$	-	-	1	$\mu A$
			$T_J = 55^\circ\text{C}$	-	-	5	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.6	2.5	V	
Drain-Source On-Resistance <sup>2</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$	-	7	8.5	m $\Omega$	
		$V_{GS} = 4.5V, I_D = 15A$	-	9.1	12.5		
Forward Trans conductance	$g_{fs}$	$V_{DS} = 5V, I_D = 30A$	-	37	-	S	
<b>Dynamic Characteristics</b>							
Input Capacitance	$C_{iss}$	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$	-	1107	-	pF	
Output Capacitance	$C_{oss}$		-	163	-		
Reverse Transfer Capacitance	$C_{rss}$		-	115	-		
<b>Switching Characteristics</b>							
Gate Resistance	$R_g$	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$	-	2.2	-	$\Omega$	
Total Gate Charge	$Q_g$	$V_{GS} = 4.5V, V_{DS} = 15V, I_D = 15A$	-	12.6	-	nC	
Gate-Source Charge	$Q_{gs}$		-	4.2	-		
Gate-Drain Charge	$Q_{gd}$		-	5.1	-		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 15V, R_G = 3.3\Omega, I_D = 15A$	-	4.6	-	nS	
Rise Time	$t_r$		-	12.2	-		
Turn-Off Delay Time	$t_{d(off)}$		-	26.6	-		
Fall Time	$t_f$		-	8	-		
<b>Drain-Source Body Diode Characteristics</b>							
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$	-	-	1.0	V	
Continuous Source Current <sup>1,5</sup>	$I_S$	$V_G = V_D = 0V, \text{Force Current}$	-	-	55	A	
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 30A, di/dt = 100A/\mu s$	-	9.2	-	nS	
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	2	-	nC	

## Notes:

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- The EAS data shows Max. rating . The test condition is  $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=34A$
- The power dissipation is limited by 175 $^\circ\text{C}$  junction temperature
- The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

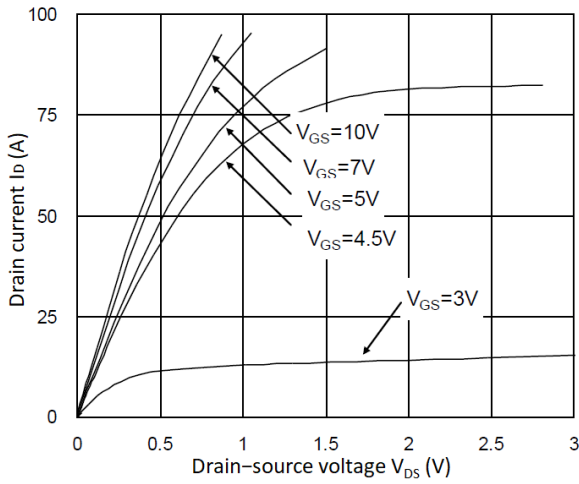


Figure 1. Output Characteristics

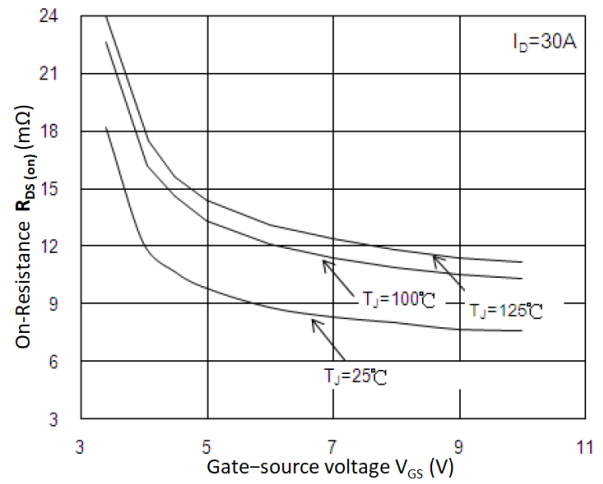


Figure 2.  $R_{DS(on)}$  vs.  $V_{GS}$

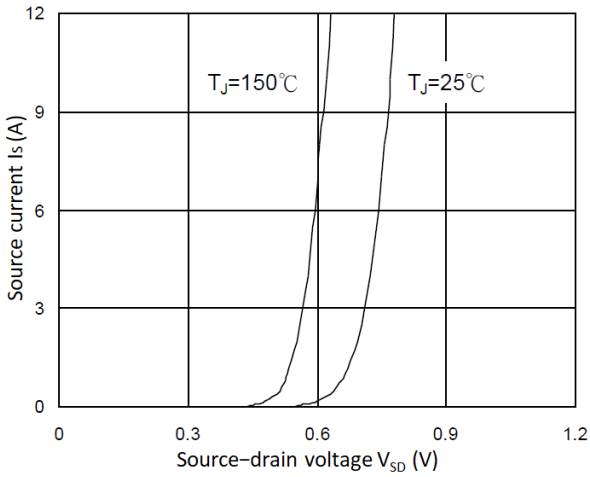


Figure 3. Forward Characteristics of Reverse

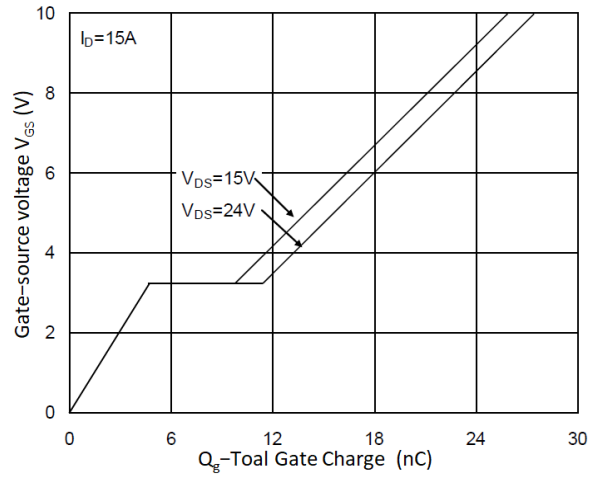


Figure 4. Gate Charge Characteristics

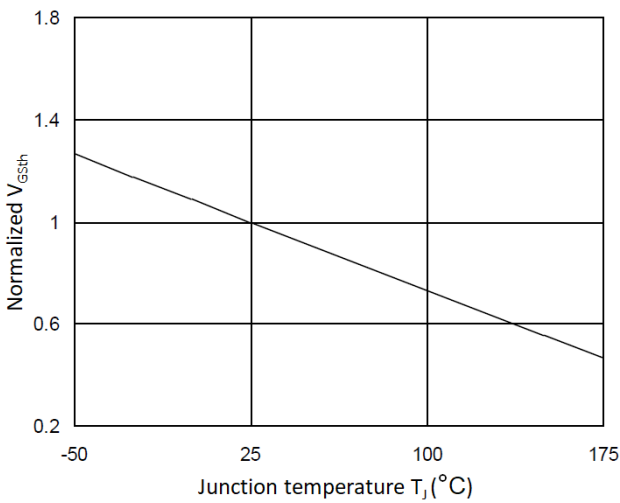


Figure 5. Normalized  $V_{GSth}$  vs.  $T_J$

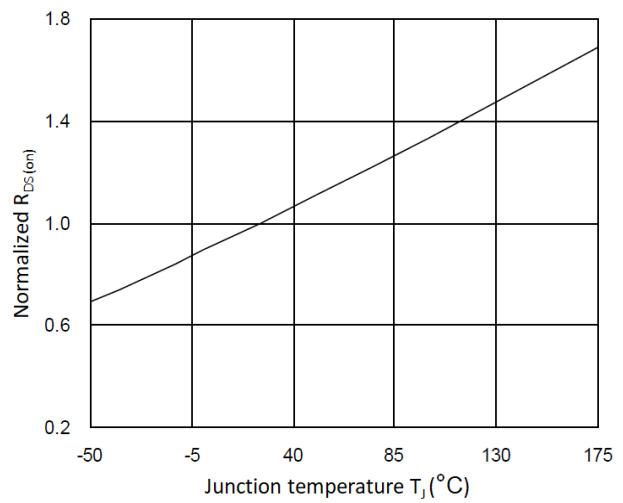


Figure 6. Normalized  $R_{DS(on)}$  vs.  $T_J$

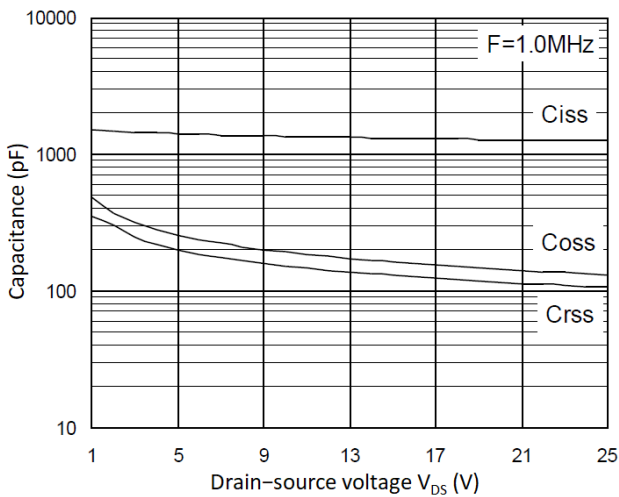


Figure 7. Capacitance Characteristics

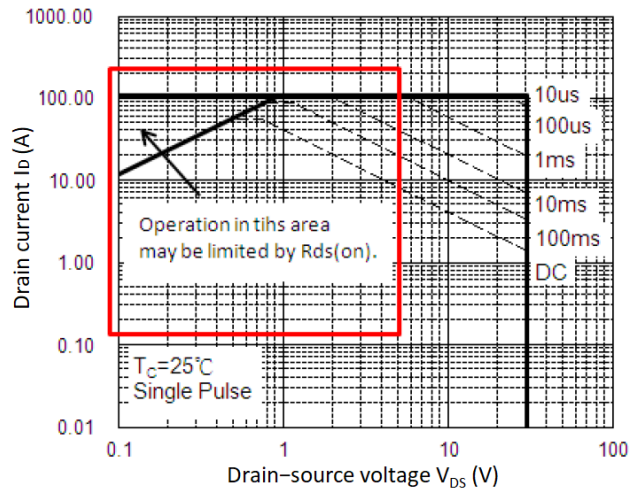


Figure 8. Safe Operating Area

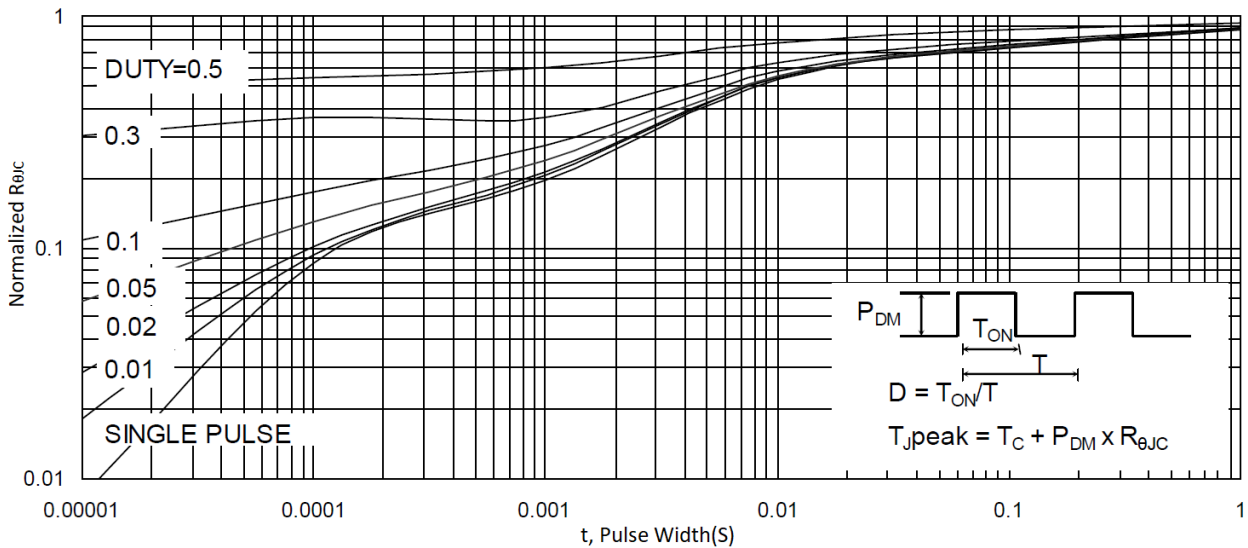


Figure 9. Normalized Maximum Transient Thermal Impedance

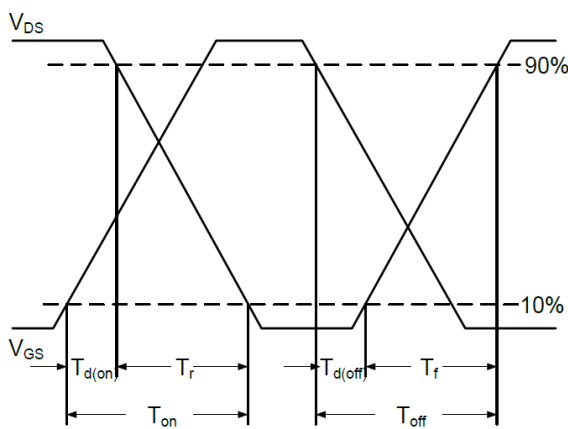


Figure 10. Switching Time Waveform

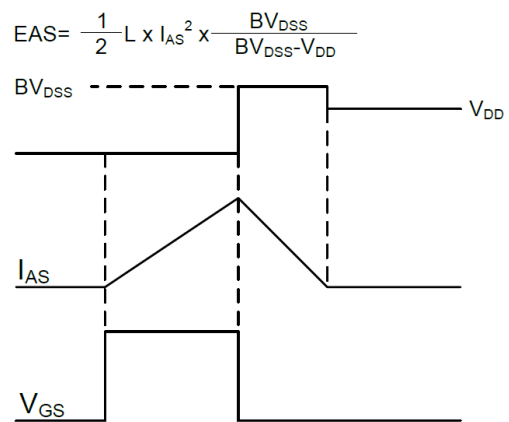
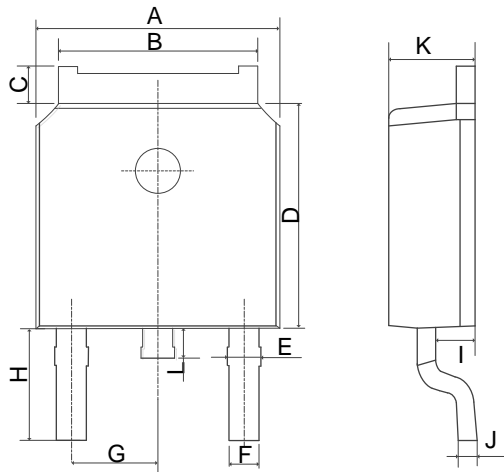


Figure 11. Unclamped Inductive Switching Waveform

## Mechanical Dimensions for TO-252



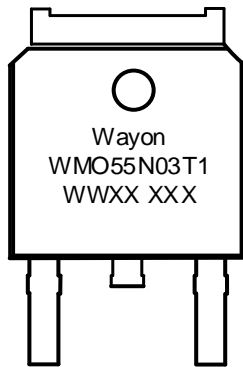
## COMMON DIMENSIONS

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
WMO55N03T1	TO-252	WMO55N03T1	Tape and Reel

## Marking Information



WMO55N03T1 = Device code

WWXX XXX= Manufacturing code

## Contact Information

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

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