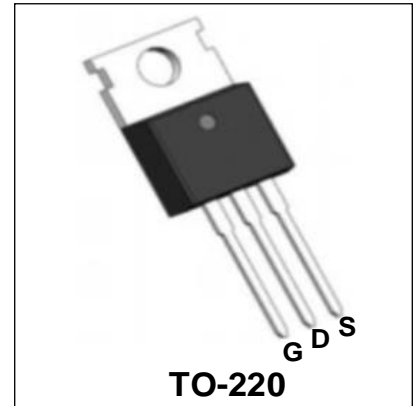


150V N-Channel Enhancement Mode Power MOSFET

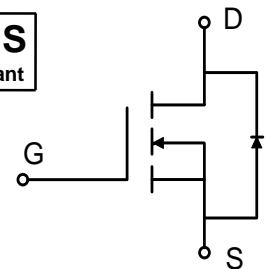
Description

WMK115N15HG2 uses Wayon's 2nd generation power trench MOSFET technology that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance. This device is well suited for high efficiency fast switching applications.



Features

- $V_{DS} = 150V$, $I_D = 91A$ (Silicon Limited)
 $R_{DS(on)} < 11.5m\Omega @ V_{GS} = 10V$
- Low $R_{DS(ON)}$
- 100% EAS Guaranteed
- High Speed Power Switching



Applications

- Hard Switching and High Speed Circuit
- DC/DC Converter
- Synchronous Rectification in SMPS

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 (Silicon Limited)	I_D	$T_C=25^\circ C$	91
		$T_C=100^\circ C$	64
Pulsed Drain Current ²	I_{DM}	301	A
Single Pulse Avalanche Energy ³	EAS	115	mJ
Avalanche Current	I_{AS}	24	A
Total Power Dissipation ⁴	P_D	213	W
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 ¹	$R_{\theta JA}$	58	$^\circ C/W$
Thermal Resistance from Junction-to-Case ¹	$R_{\theta JC}$	0.72	$^\circ C/W$

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	$T_J=25^\circ\text{C}$	I_{DSS}	$V_{DS} = 150V, V_{GS} = 0V$	-	-	1	μA
	$T_J=100^\circ\text{C}$			-	-	100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V	
Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	-	9.6	11.5	m Ω	
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 20A$	-	66	-	S	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS} = 75V, V_{GS} = 0V, f = 1\text{MHz}$	-	3320	-	μF	
Output Capacitance	C_{oss}		-	230	-		
Reverse Transfer Capacitance	C_{rss}		-	6.8	-		
Switching Characteristics							
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$	-	2.7	-	Ω	
Total Gate Charge	Q_g	$V_{GS} = 10V, V_{DD} = 75V, I_D = 20A$	-	43	-	nC	
Gate-Source Charge	Q_{gs}		-	13.5	-		
Gate-Drain Charge	Q_{gd}		-	7.1	-		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 75V, R_g = 10\Omega, I_D = 20A$	-	17.5	-	nS	
Rise Time	t_r		-	7.9	-		
Turn-Off Delay Time	$t_{d(off)}$		-	25.6	-		
Fall Time	t_f		-	10.3	-		
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ²	V_{SD}	$I_F = 20A, V_{GS} = 0V$	-	-	1.2	V	
Reverse Recovery Time	t_{rr}	$V_R = 75V, I_F = 20A, di_F/dt = 100A/\mu s$	-	81.6	-	ns	
Reverse Recovery Charge	Q_{rr}		-	162	-	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 $V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=24A$
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.

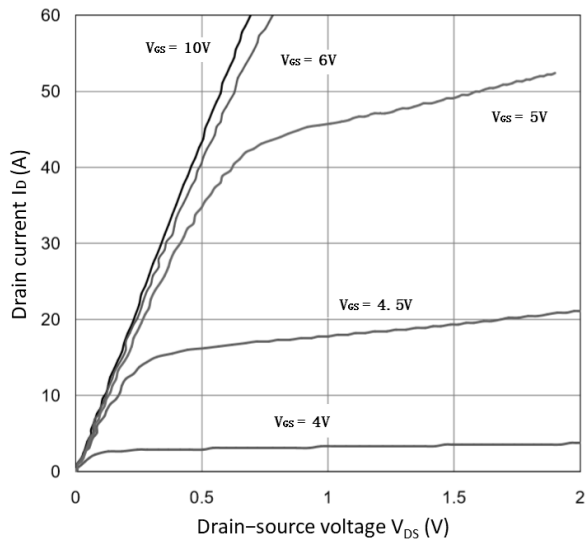


Figure 1. Output Characteristics

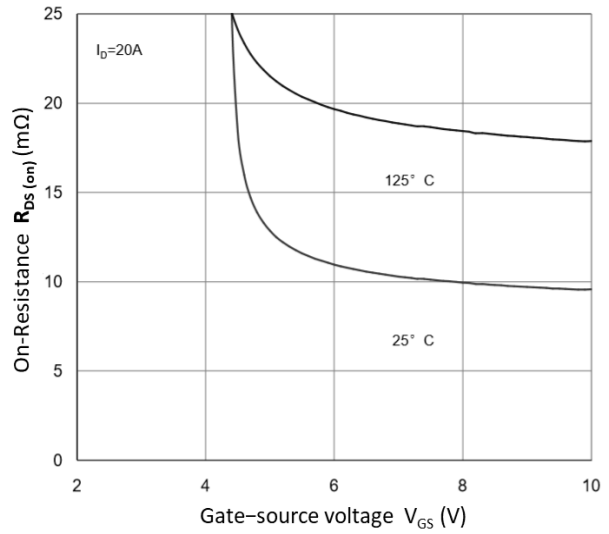


Figure 2. $R_{DS(on)}$ vs. V_{GS}

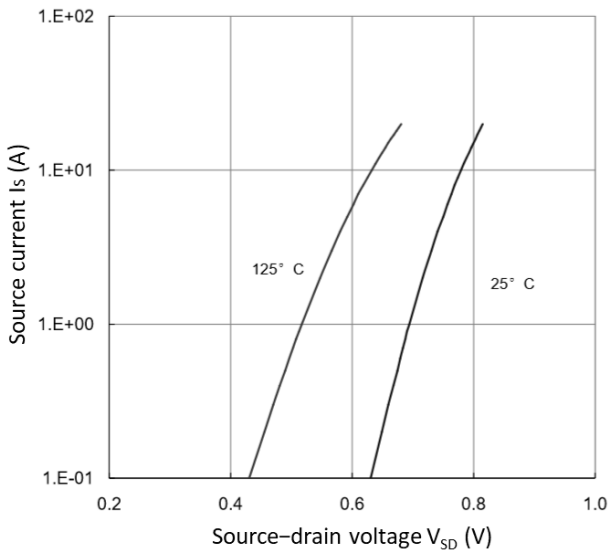


Figure 3. Forward Characteristics of Reverse

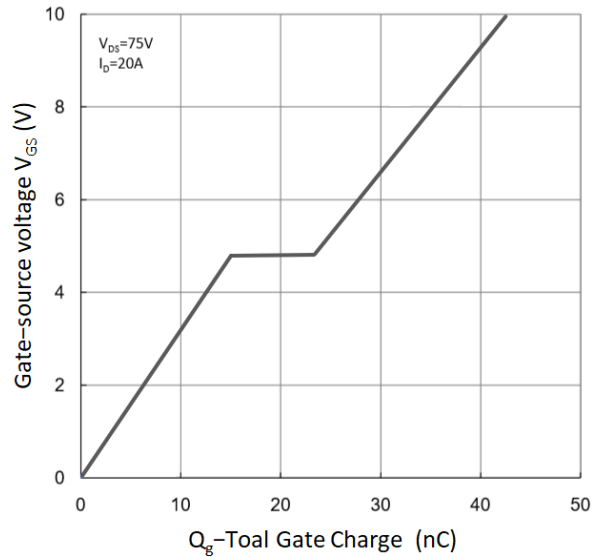


Figure 4. Gate Charge Characteristics

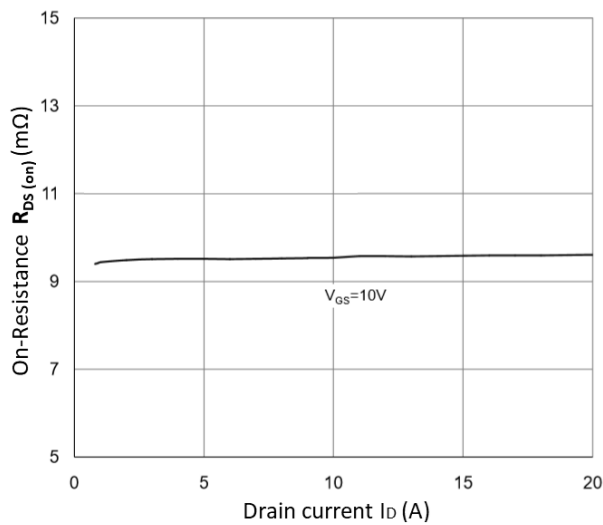


Figure 5. $R_{DS(on)}$ vs. I_D

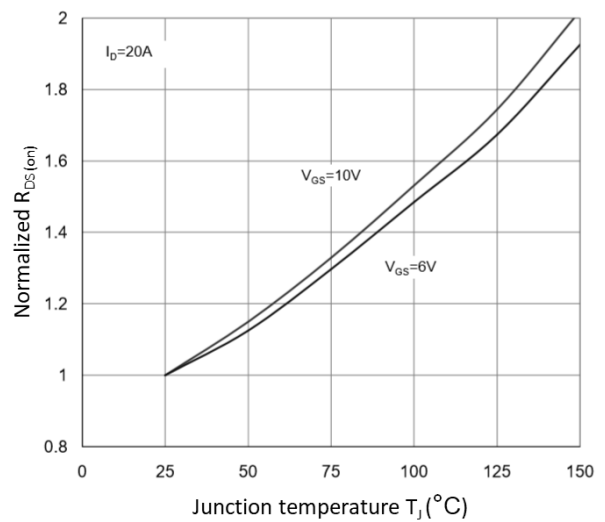


Figure 6. Normalized $R_{DS(on)}$ vs. T_J

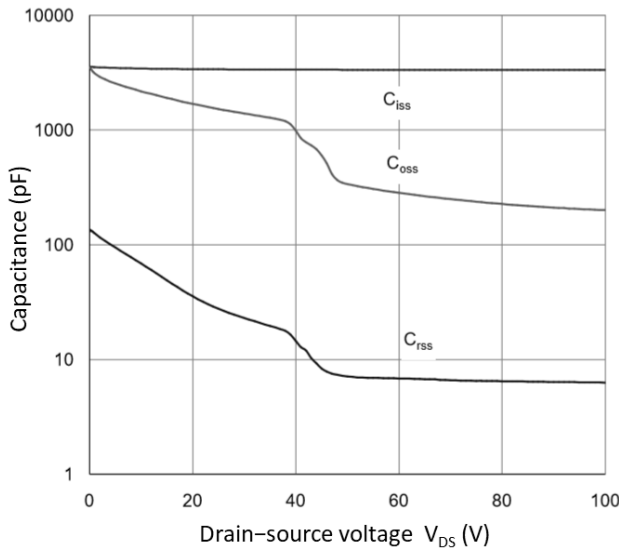


Figure 7. Capacitance Characteristics

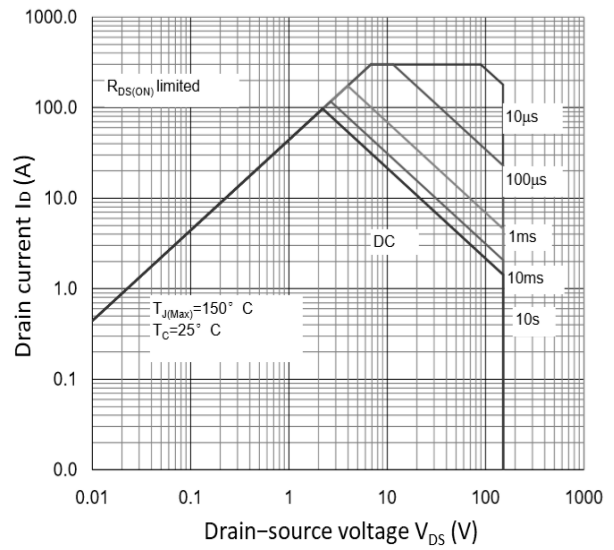


Figure 8. Safe Operating Area

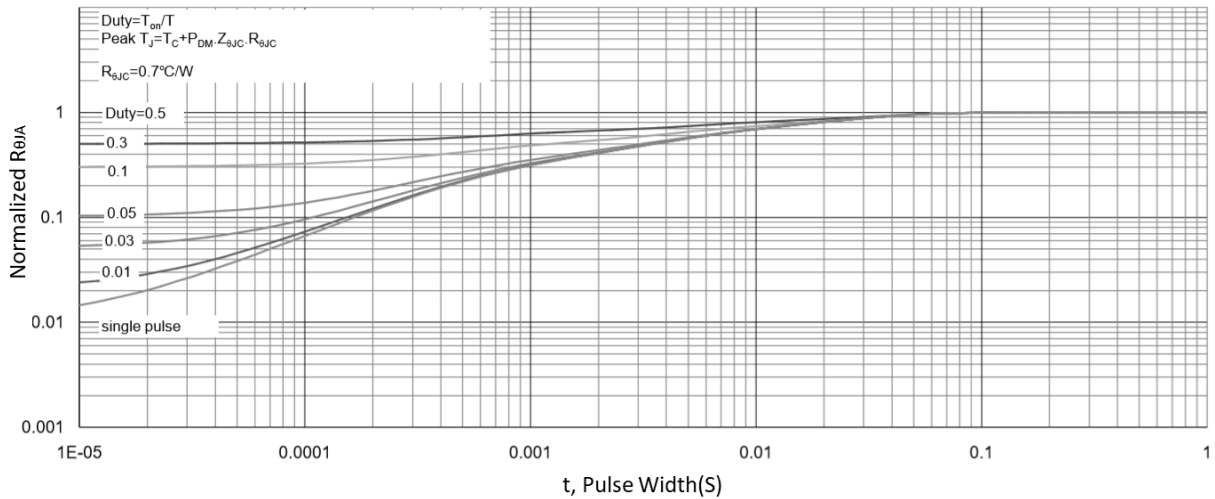


Figure 9. Normalized Maximum Transient Thermal Impedance

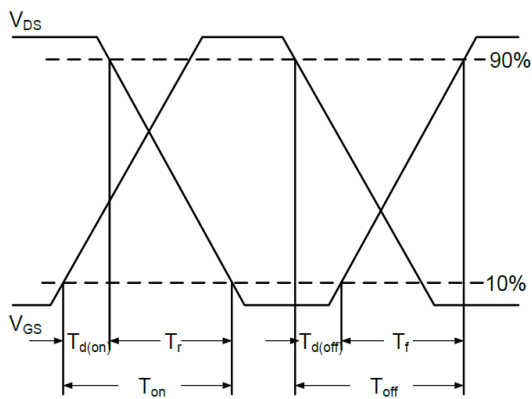


Figure 10. Switching Time Waveform

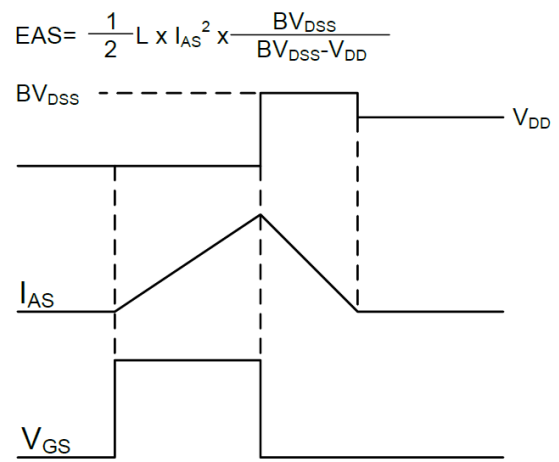
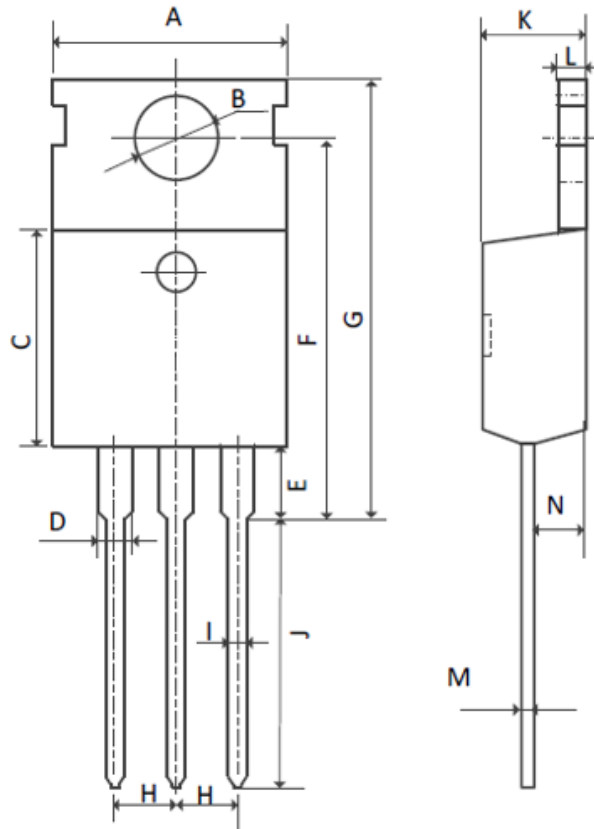


Figure 11. Unclamped Inductive Switching Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

Mechanical Dimensions for TO-220



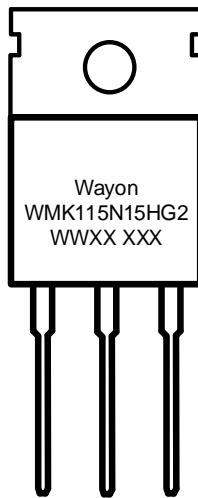
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.40
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60

Ordering Information

Part	Package	Marking	Packing method
WMK115N15HG2	TO-220	K115N15HG2	Tube

Marking Information



WMK115N15HG2= Device code

WWXX XXX= Date code


Contact Information.

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201207

Tel: 86-21-50310888 Fax: 86-21-50757680 Email: market@way-on.com

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

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