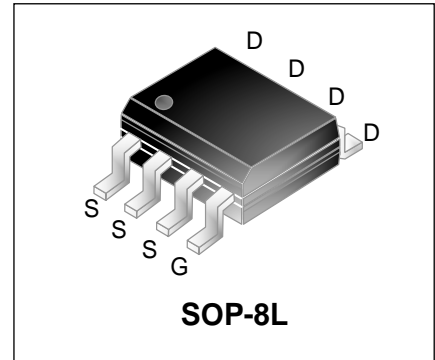


150V N-Channel Enhancement Mode Power MOSFET

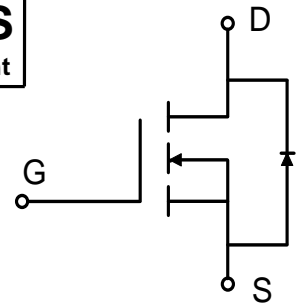
Description

WMS690N15HG2 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

- $V_{DS} = 150V$, $I_D = 5A$
 $R_{DS(on)} < 69m\Omega @ V_{GS} = 10V$
- Green Device Available
- Low Gate Charge
- Advanced High Cell Density Trench Technology
- 100% EAS Guaranteed



Applications

- High Voltage Synchronous Rectification
- Hard Switching and High Frequency Circuit
- Power Tools

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_A = 25^\circ C$	5
		$T_A = 100^\circ C$	3.1
Pulsed Drain Current ⁴	I_{DM}	20	A
Single Pulse Avalanche Energy ³	EAS	12.8	mJ
Total Power Dissipation	P_D	3.1	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-Ambient ¹	$R_{\theta JA}$	40.3	$^\circ C/W$

Electrical Characteristics ($T_A = 25^\circ\text{C}$, 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	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V	
Drain-Source on-Resistance ²	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4A$	-	56	69	m Ω	
Forward Transconductance ²	g_{fs}	$V_{DS} = 5V, I_D = 10A$	-	18.5	-	S	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS} = 75V, V_{GS} = 0V, f = 1MHz$	-	585	-	μF	
Output Capacitance	C_{oss}		-	48	-		
Reverse Transfer Capacitance	C_{rss}		-	2.5	-		
Switching Characteristics							
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$	-	2.5	-	Ω	
Total Gate Charge(10V)	Q_g	$V_{GS} = 10V, V_{DS} = 75V, I_D = 5A$	-	7.5	-	nC	
Gate-Source Charge	Q_{gs}		-	2.8	-		
Gate-Drain Charge	Q_{gd}		-	0.5	-		
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 75V, R_G = 3\Omega, I_D = 5A$	-	10.5	-	ns	
Rise Time	t_r		-	4.6	-		
Turn-off Delay Time	$t_{d(off)}$		-	13	-		
Fall Time	t_f		-	4	-		
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	$V_G = V_D = 0V, \text{Force Current}$	-	-	5	A	
Body Diode Reverse Recovery Time	t_{rr}	$V_R = 75V, I_F = 5A, di/dt = 100A/\mu s$	-	62	-	ns	
Body Diode Reverse Recovery Charge	Q_{rr}		-	75	-	nC	

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 20Z 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 $V_{DD} = 25V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 8A$
- Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
- The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

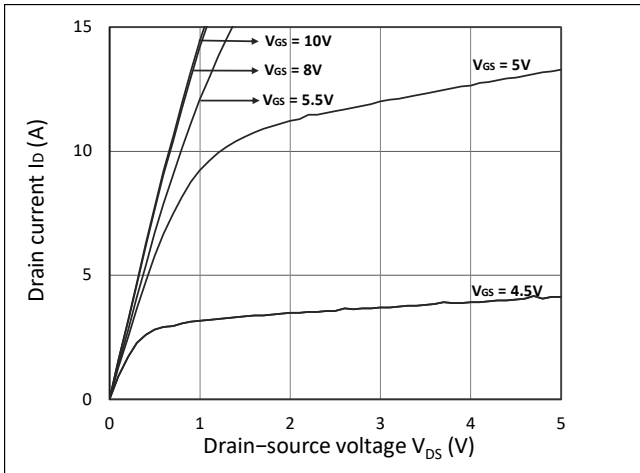


Figure 1. Output Characteristics

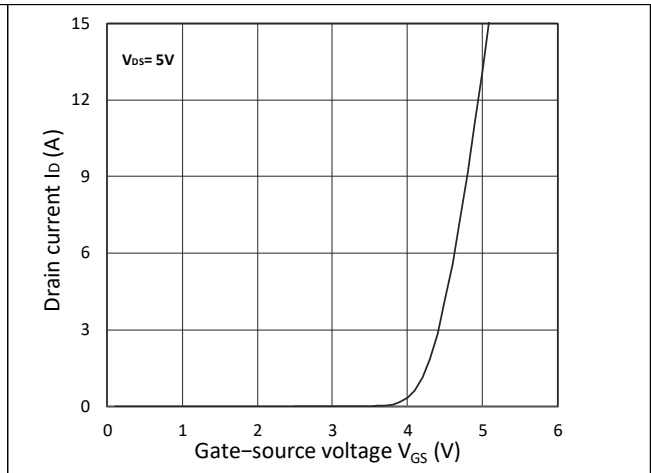


Figure 2. Transfer Characteristics

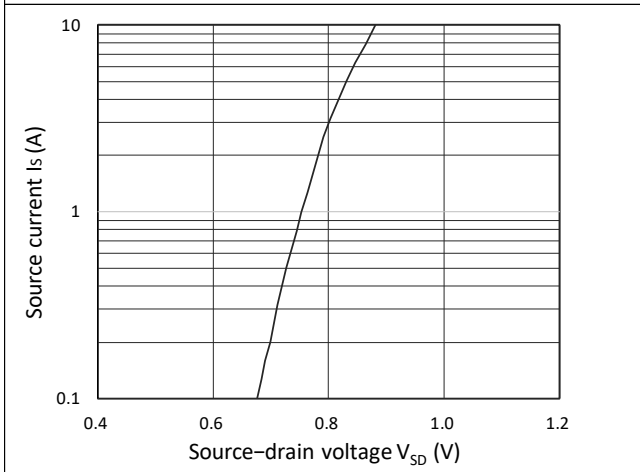


Figure 3. Forward Characteristics of Reverse

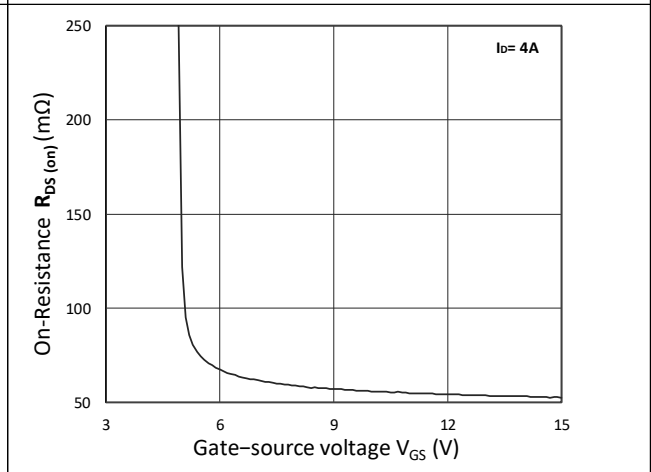


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

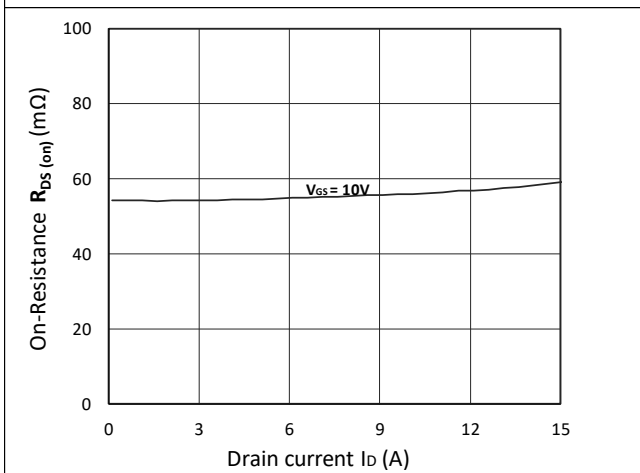


Figure 5. $R_{DS(ON)}$ vs. I_D

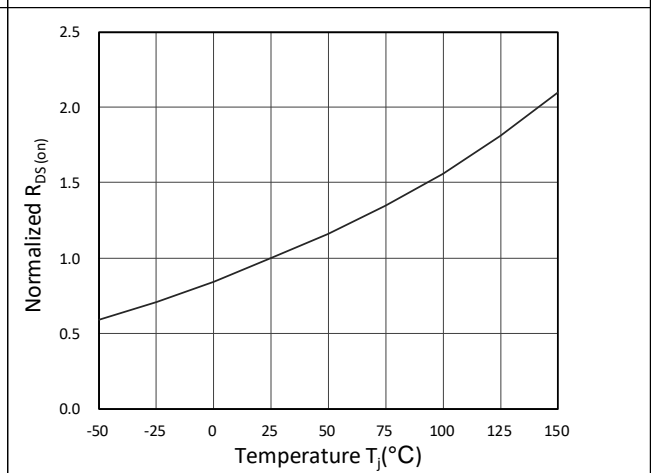


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

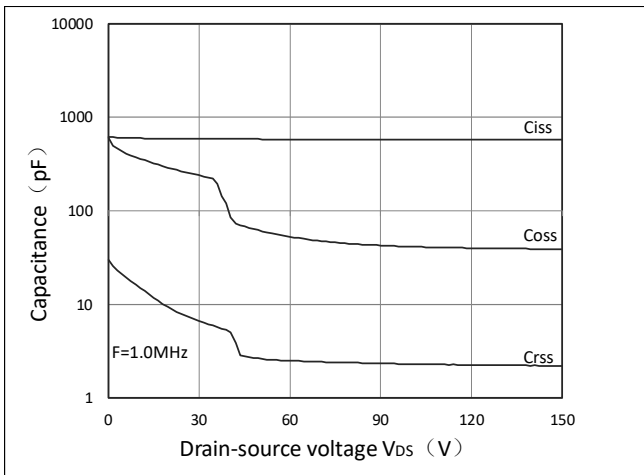


Figure 7. Capacitance Characteristics

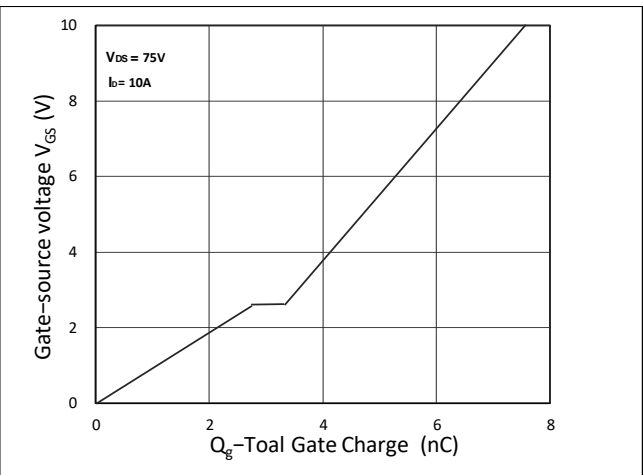


Figure 8. Gate Charge Characteristics

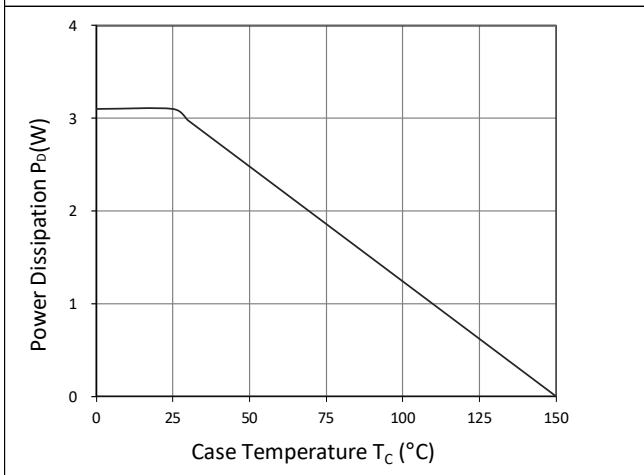


Figure 9. Power Dissipation

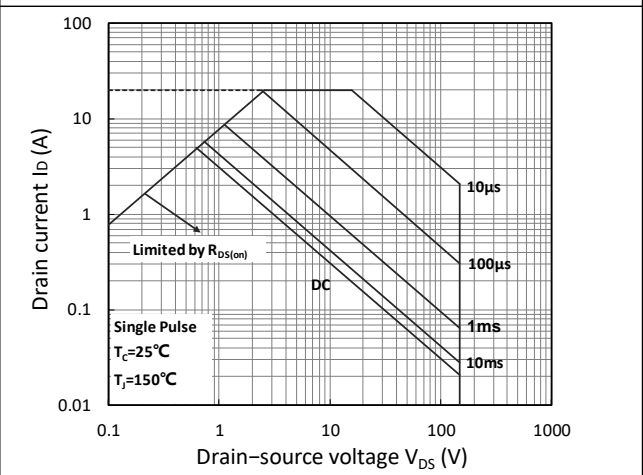


Figure 10. Safe Operating Area

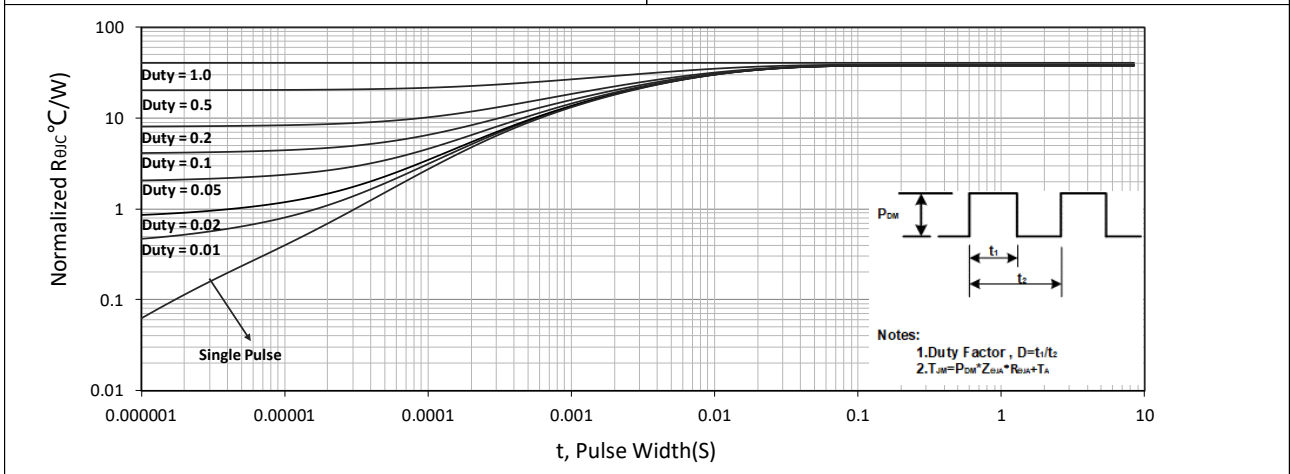
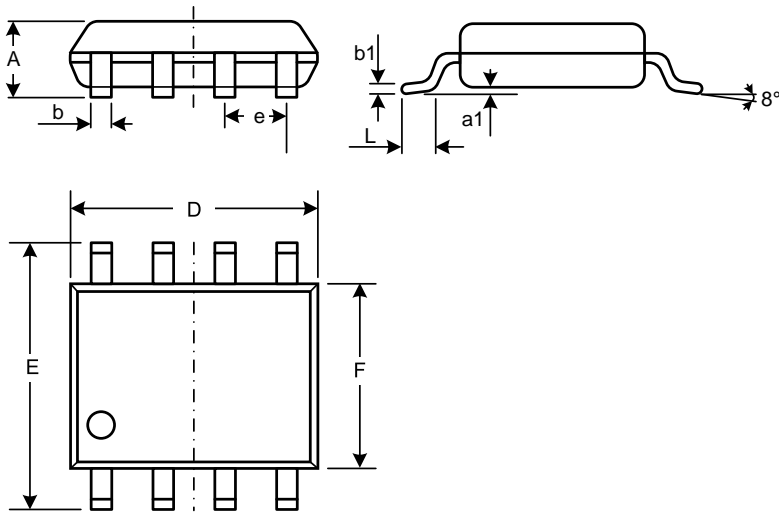


Figure 11. Normalized Maximum Transient Thermal Impedance

Mechanical Dimensions for SOP-8L



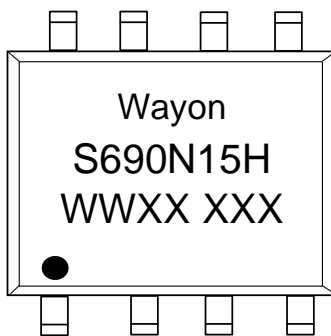
COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	1.23	1.75
a1	0.05	0.25
b	0.31	0.51
b1	0.16	0.25
D	4.70	5.15
E	5.75	6.25
e	1.07	1.47
F	3.70	4.10
L	0.4	1.27

Ordering Information

Part	Package	Marking	Packing method
WMS690N15HG2	SOP-8L	S690N15H	Tape and Reel

Marking Information



S690N15H = Device code

WWXX XXX= Date code


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

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