



**WANSEMI**  
万芯半导体

**WX015N12LL**

# **N-channel Enhancement Mode Power MOSFET**

TOLL/NMOS/120V/±20V/3.0V/330A/1.5mΩ

Rev0.1

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## 120V, 1.5mΩ, 330A, N-channel MOSFET

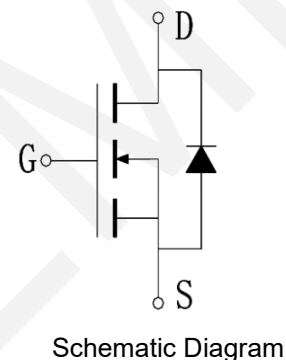
### 1.Features

- ◆ Excellent RDS(ON) and Low Gate Charge
- ◆ 100% UIS Tested
- ◆ 100% ΔVds Tested
- ◆ 100% RG Tested
- ◆ Halogen-free; RoHS-compliant

V <sub>DS</sub>	R <sub>DS(on)</sub> Typ.	I <sub>D</sub> Max.
120V	1.5mΩ @10V	330A

### 2.Applications

- ◆ Load Switch
- ◆ PWM Application
- ◆ Power Management



### 3.Package Marking and Ordering Information

Part no.	Package	Marking	PCS/Reel	PCS/CTN.
WX015N12LL	TOLL	015N12	2,000	16,000

### 4.Absolute Max Ratings at Ta=25°C (Note1)

Parameter	Symbol	Maximum	Units	
Drain to Source Voltage	V <sub>DSS</sub>	120	V	
Gate to Source Voltage	V <sub>GSS</sub>	±20	V	
Drain Current (DC)	T C = 25°C	I <sub>D</sub>	330	A
	T C = 100°C	I <sub>D</sub>	197	A
Drain Current (Pulse), PW ≤ 300μs	I <sub>DM</sub>	1320	A	
Avalanche Energy, Single Pulsed	E <sub>AS</sub>	1765	mJ	
Total Dissipation	T C = 25°C	P <sub>D</sub>	500	W
	T C = 100°C	P <sub>D</sub>	200	W
Junction Temperature	T <sub>J</sub>	150	°C	
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C	

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

**5. Thermal Resistance Ratings (Note 2)**

Parameter	Symbol	Value	Unit
Junction to Ambient	$R_{\theta JA}$	35	$^{\circ}C/W$
Junction to case	$R_{\theta JC}$	0.25	$^{\circ}C/W$

Note 2: When mounted on 1 inch square copper board  $t \leq 10$ sec The value in any given application depends on the user's specific board design.

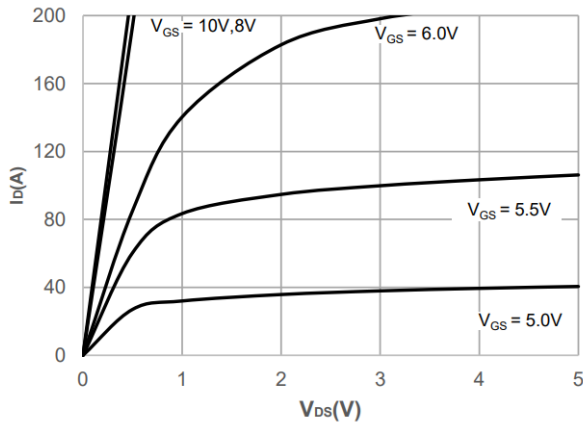
**6. Electrical Characteristics at  $T_a=25^{\circ}C$  (Note 2)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	120	-	-	V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 120V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_{DS} = 250\mu A$	1.8	3.0	3.8	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 20A, V_{GS} = 10V$	-	1.5	1.75	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = 60V,$ Frequency=1.0MHz	-	12121	-	nF
Output Capacitance	$C_{oss}$		-	1150	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	36	-	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 60V, I_D = 20A,$ $V_{GS} = 10V,$ $R_{GEN} = 3\Omega$	-	36	-	ns
Rise Time	$t_r$		-	66	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	165	-	ns
Fall Time	$t_f$		-	69	-	ns
Total Gate Charge	$Q_g$	$V_{DS} = 60V,$ $V_{GS} = 0$ to 10V, $I_D = 20A$	-	181	-	nC
	$Q_{gs}$		-	61	-	nC
	$Q_{gd}$		-	42	-	nC
Diode Forward Voltage	$V_{FSD}$	$I_S = 20A, V_{GS} = 0$	0.5	-	1.2	V

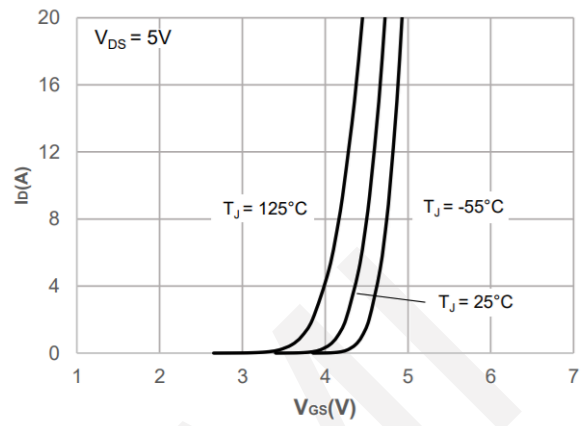
Note 2: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



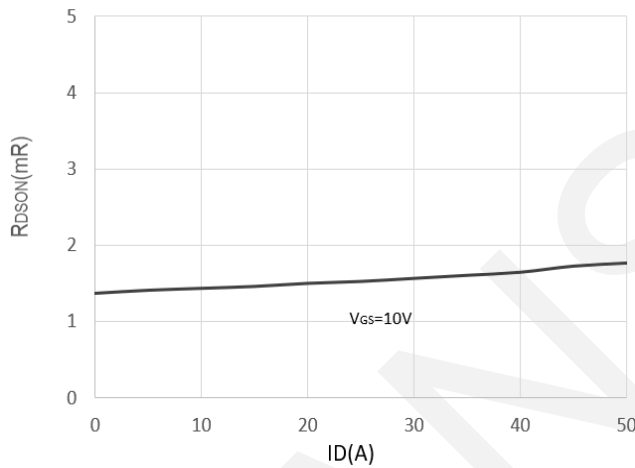
### 7. Typical electrical and thermal characteristics



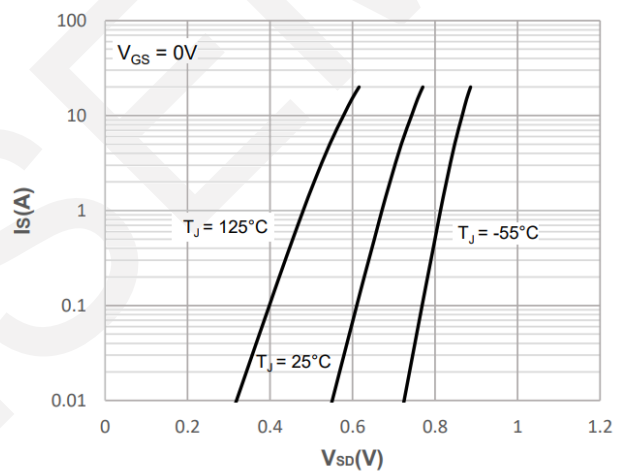
**Saturation Characteristics**



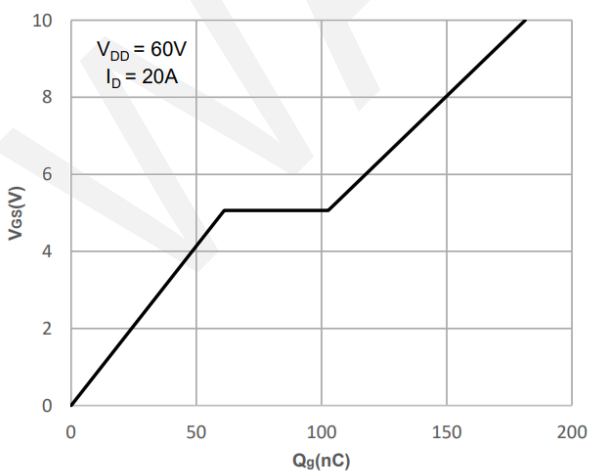
**Transfer Characteristics**



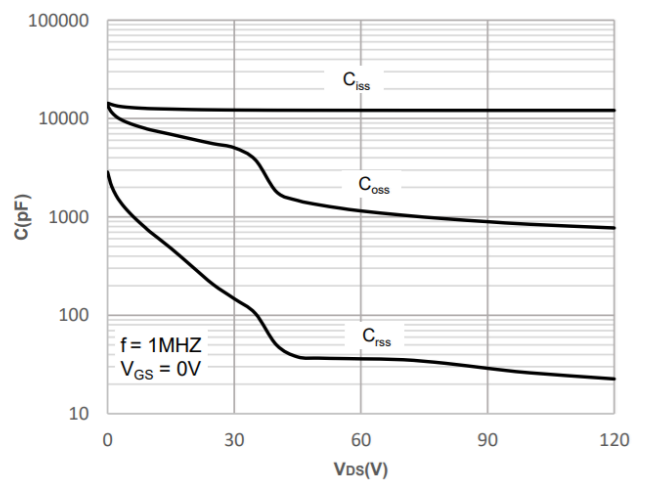
**$R_{DS(on)}$  vs. Drain Current**



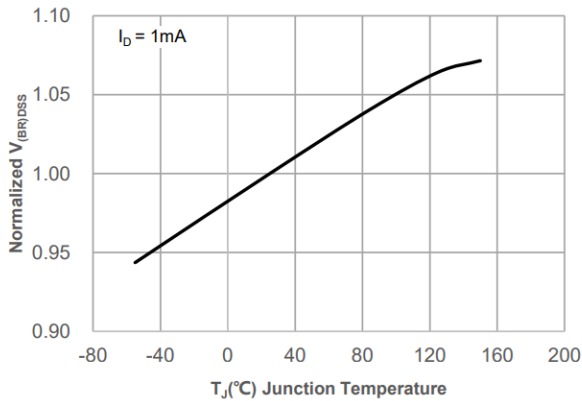
**Body-Diode Characteristics**



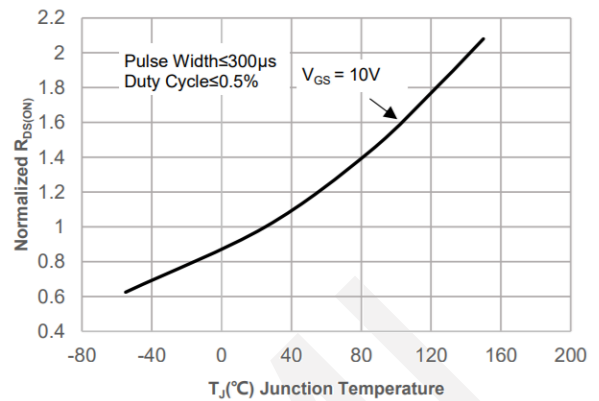
**Gate Charge Characteristics**



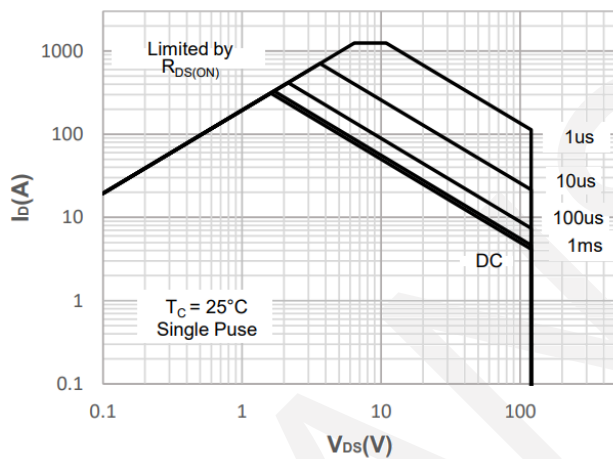
**Capacitance Characteristics**



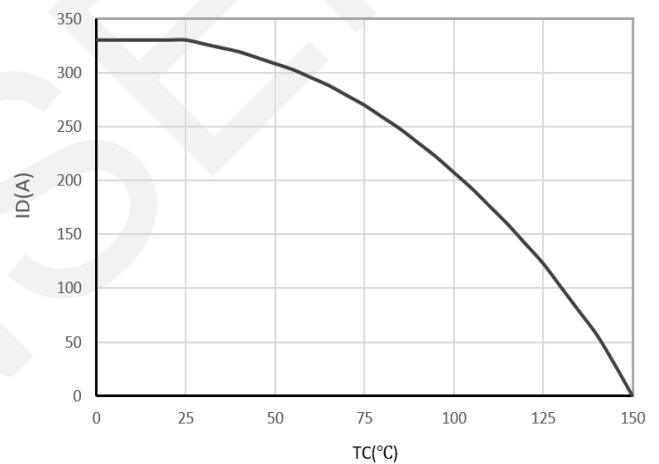
**Normalized Breakdown voltage vs. Junction Temperature**



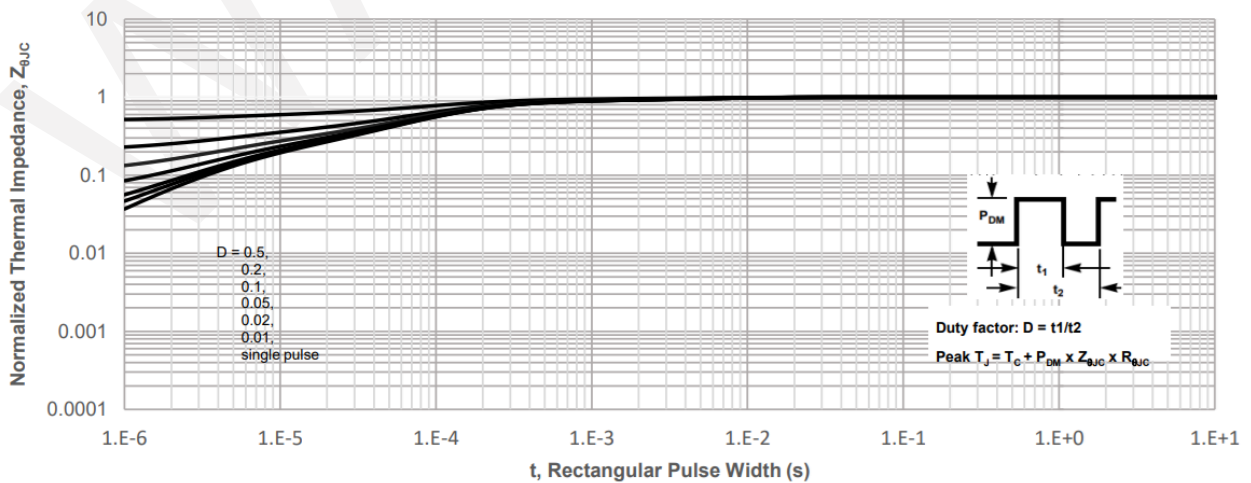
**Normalized on Resistance vs. Junction Temperature**



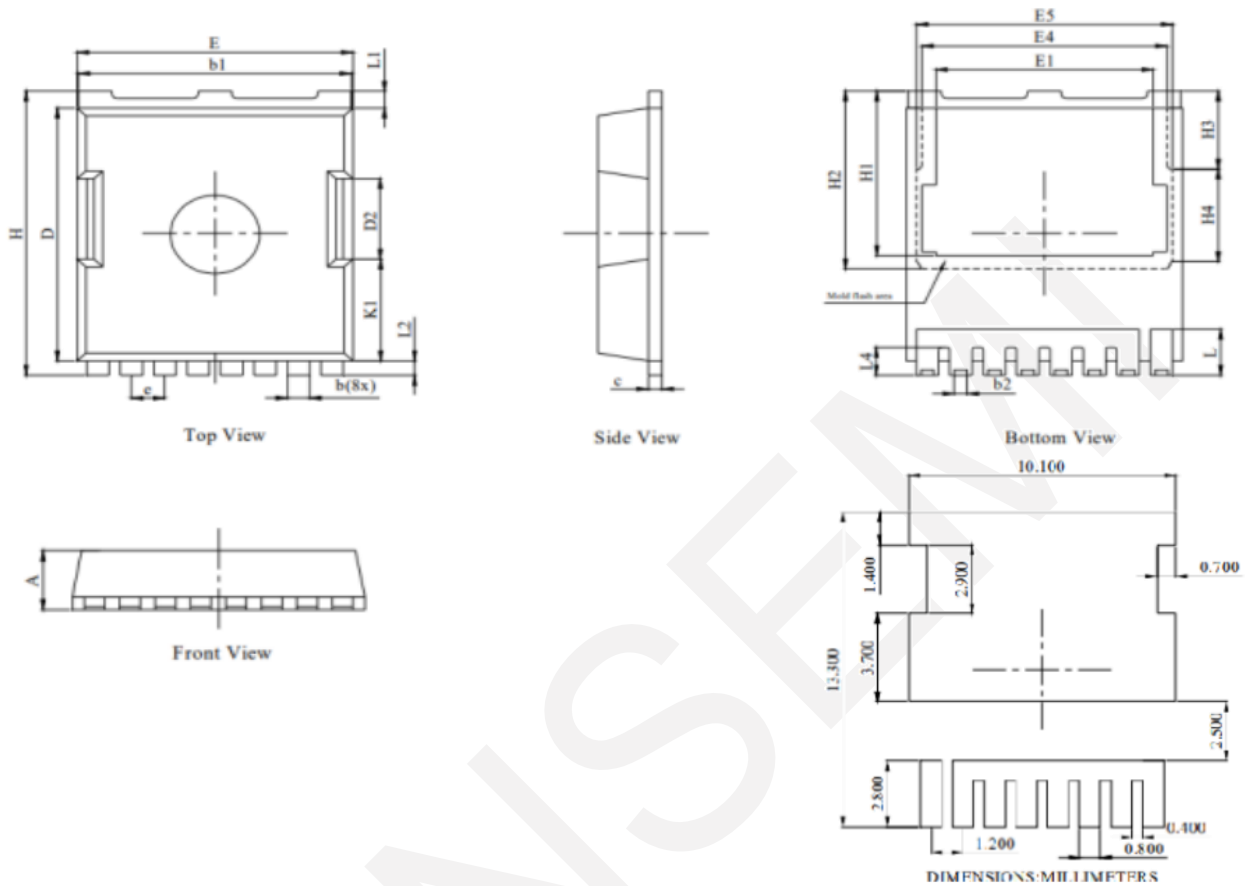
**Maximum Safe Operating Area**



**Current De-rating**



**Normalized Maximum Transient Thermal Impedance**

**8.Package Dimensions**


DIM.	MILLIMETER		
	MIN	NOM	MAX
A	2.20	2.30	2.50
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.42	0.46	0.50
C	0.40	0.50	0.65
D	10.28	10.38	10.58
D2	3.30		
E	9.70	9.90	10.10
E1	7.80		
E4	8.80		
E5	9.20		
e	1.20(BSC)		
H	11.48	11.68	11.88
H1	6.55	6.75	6.85
H2	7.30		
H3	3.20		
H4	3.80		
K1	4.18		
L	1.70	1.90	2.10
L1	0.70		
L2	0.60		
L4	1.00	1.15	1.30

## 9. Important Notice

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