



**WANSEMI**  
万芯半导体

**WX012BN10LL**

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

**TOLL/NMOS/100V/±20V/3.0V/325A/1.25mΩ**

**Rev0.7**

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## 100V, 1.25mΩ, 325A, N-channel MOSFET

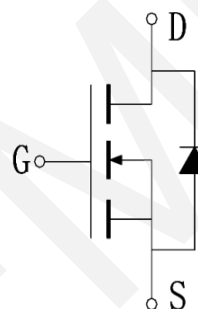
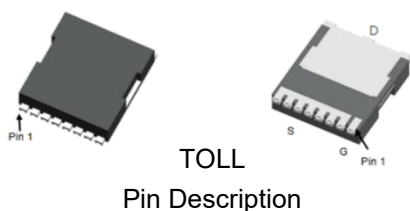
### 1.Features

- ◆ Excellent  $R_{DS(ON)}$  and Low Gate Charge
- ◆ 100% UIS Tested
- ◆ 100%  $\Delta V_{DS}$  Tested
- ◆ 100% DVDS Tested
- ◆ 100%  $R_g$  Tested
- ◆ Halogen-free; RoHS-compliant

$V_{DS}$	$R_{DS(on)}$ Typ.	$I_D$ Max.
100V	1.25mΩ @10V	325A

### 2.Applications

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



Schematic Diagram

### 3.Package Marking and Ordering Information

Part no.	Package	Marking	PCS/Reel	PCS/CTN.
WX012BN10LL	TOLL	012N10	2,000	16,000

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

Parameter		Symbol	Maximum	Units
Drain to Source Voltage		$V_{DSS}$	100	V
Gate to Source Voltage		$V_{GSS}$	±20	V
Drain Current (DC)	T C = 25°C	$I_D$	325	A
	T C = 100°C	$I_D$	205	A
Drain Current (Pulse), $PW \leq 300\mu s$		$I_{DM}$	1300	A
Avalanche Energy, Single Pulsed		$E_{AS}$	2401	mJ
Total Dissipation	T C = 25°C	$P_D$	313	W
Junction Temperature		$T_j$	150	°C
Storage Temperature		$T_{stg}$	-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 case	$R_{\theta JC}$	0.2	$^{\circ}\text{C/W}$
Junction to ambient	$R_{\theta JA}$	35	$^{\circ}\text{C/W}$

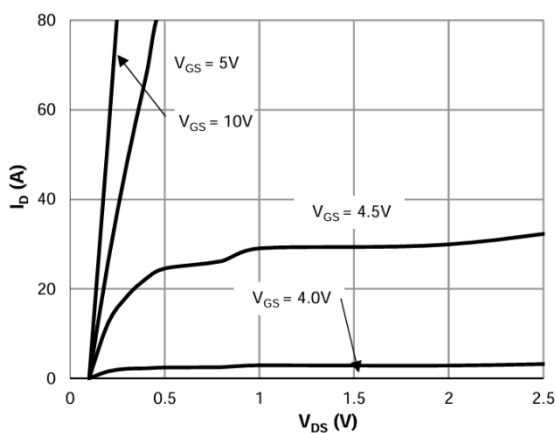
Note 2: When mounted on 1 inch square copper board  $t \leq 10\text{sec}$  The value in any given application depends on the user's specific board design.

### 6. Electrical Characteristics at $T_a=25^{\circ}\text{C}$ (Note 3)

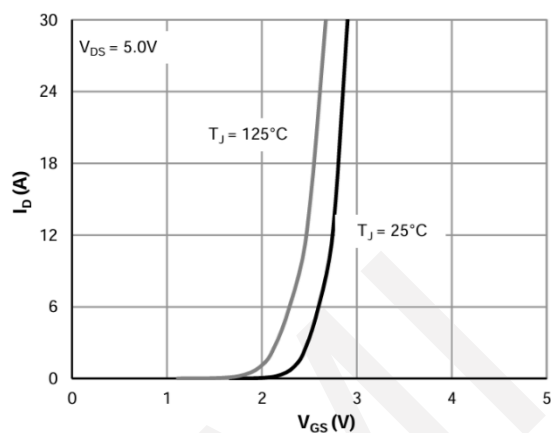
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$ , $V_{GS} = 0\text{V}$	100	-	-	V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 100\text{V}$ , $V_{GS} = 0\text{V}$	-	-	1	$\mu\text{A}$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ , $I_{DS}=250\mu\text{A}$	2.0	3.0	4.0	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 20\text{A}$ , $V_{GS} = 10\text{V}$	-	1.25	1.6	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{GS}=0\text{V}$ , $V_{DS}=20\text{V}$ , Frequency=1.0MHz	-	10087	-	pF
Output Capacitance	$C_{oss}$		-	5896	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	295	-	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 20\text{V}$ , $V_{GS} = 10\text{V}$ , $I_D = 20\text{A}$	-	40	-	ns
Rise Time	$t_r$		-	67	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	131	-	ns
Fall Time	$t_f$		-	91	-	ns
Total Gate Charge	$Q_g$	$V_{DS} = 20\text{V}$ , $V_{GS} = 10\text{V}$ , $I_D = 20\text{A}$	-	230	-	nC
	$Q_{gs}$		-	56	-	nC
	$Q_{gd}$		-	76	-	nC
Diode Forward Voltage	$V_{FSD}$	$I_S = 1\text{A}$ , $V_{GS} = 0$	0.5	0.65	0.9	V

Note 3: 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.

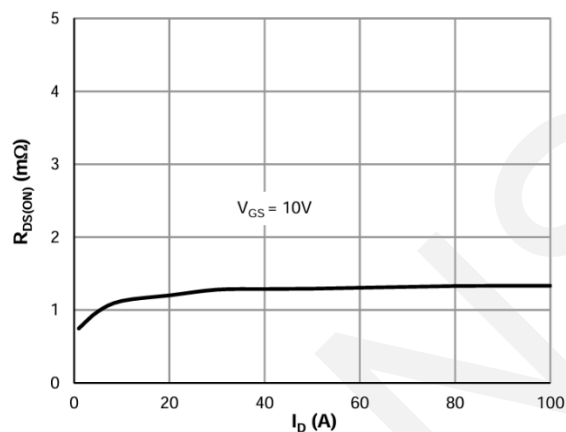
## 7. Typical electrical and thermal characteristics



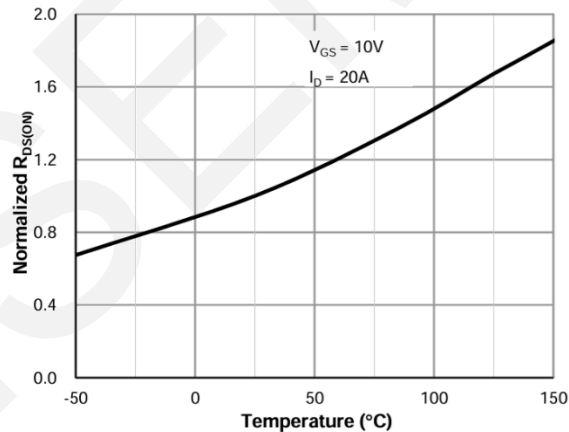
**Saturation Characteristics**



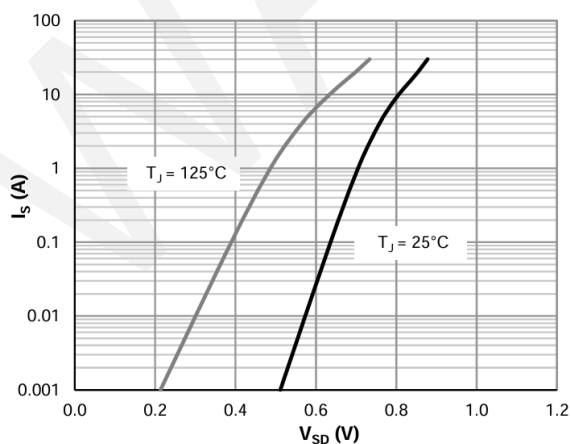
**Transfer Characteristics**



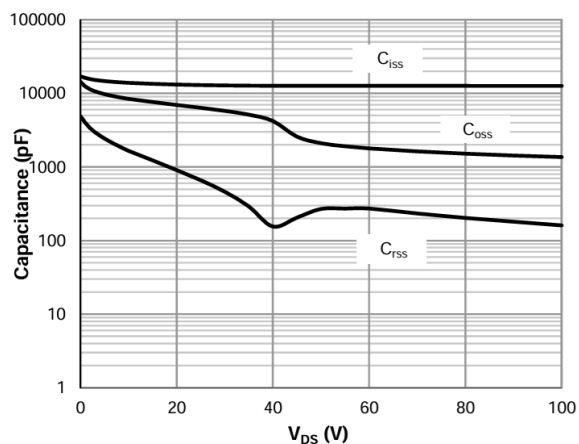
**$R_{DS(on)}$  vs. Drain Current**



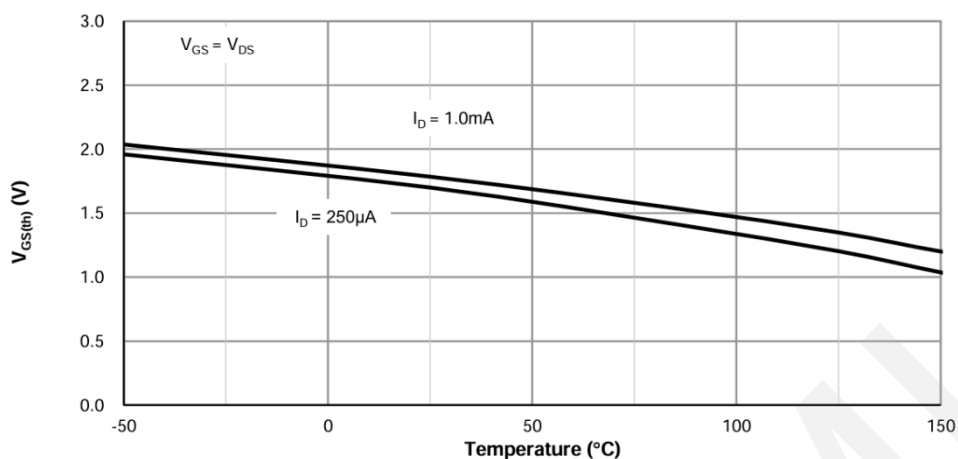
**$R_{DS(on)}$  vs. Junction Temperature**



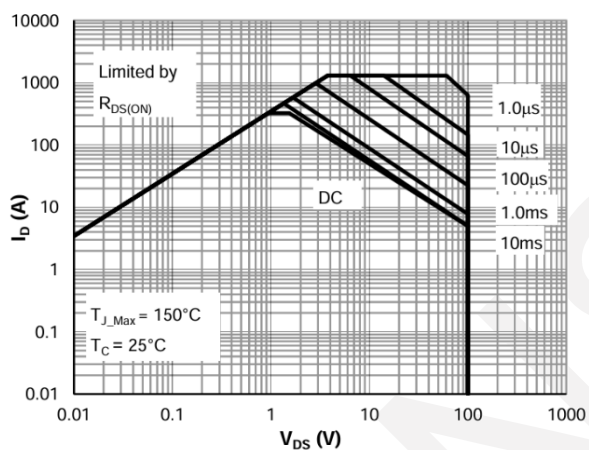
**Body-Diode Characteristics**



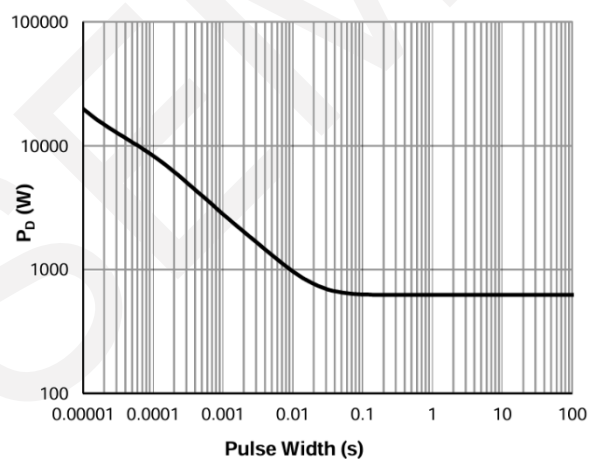
**Capacitance Characteristics**



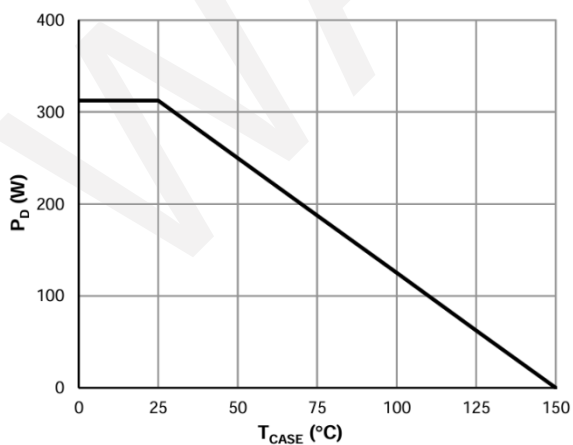
$V_{GS(th)}$  vs. Junction Temperature



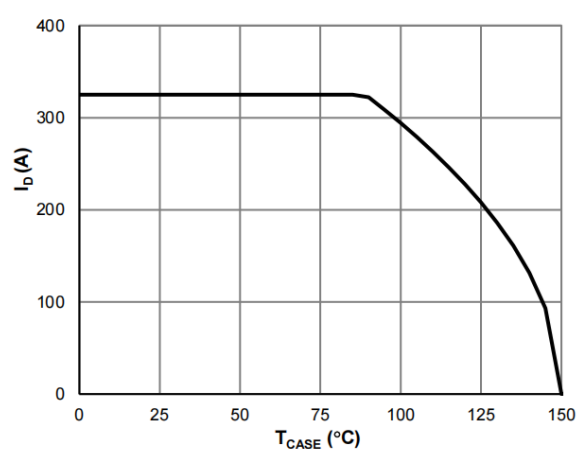
Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case

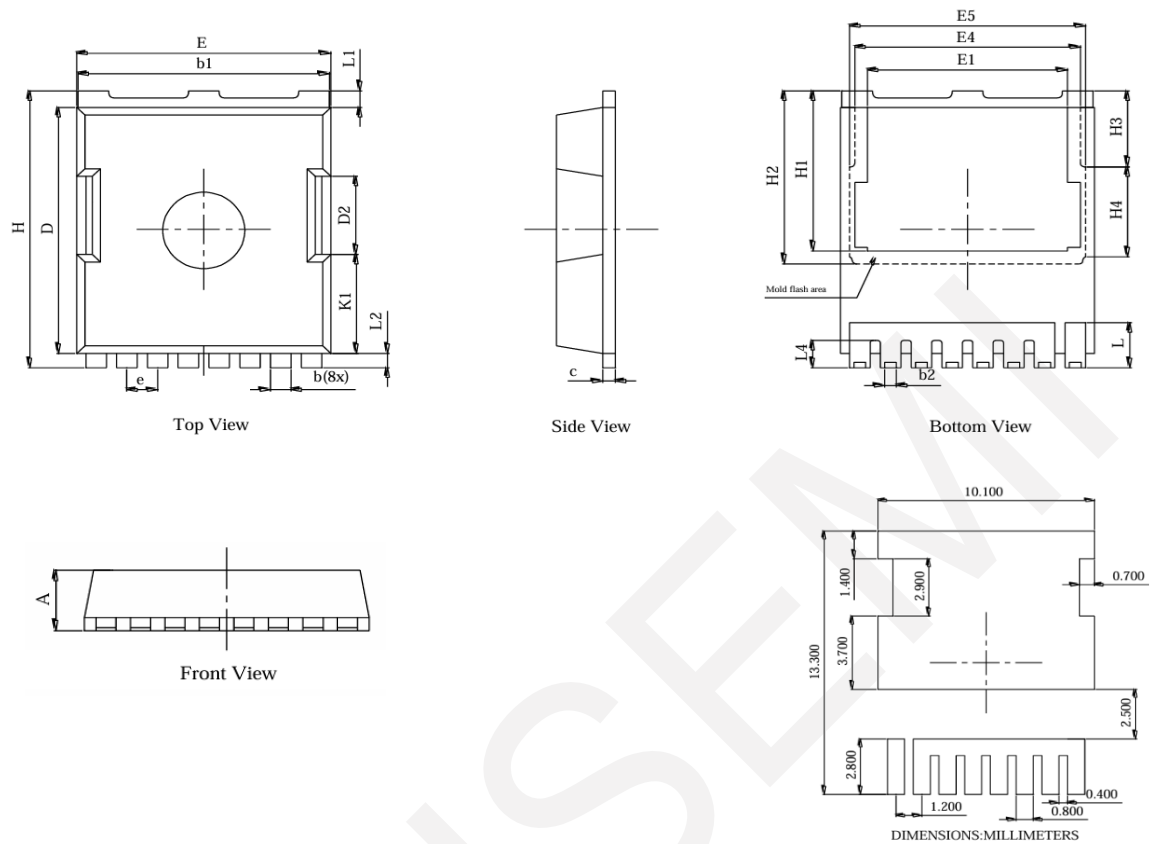


Power De-rating



Current De-rating

## 8.Package Dimensions



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
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	0.60
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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