



**WANSEMI**  
万芯半导体

**WX025BN03KD**

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

TO-252/NMOS/30V/ $\pm 20$ V/1.7V/90A/3.2m $\Omega$

Rev0.6

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## 30V, 3.2mΩ, 90A, Single N-Channel

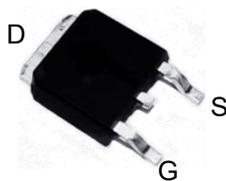
### 1.Features

- ◆ Super Low Gate Charge
- ◆ Green Device Available
- ◆ Excellent Cdv/dt effect decline
- ◆ Advanced high cell density Trench technology
- ◆ 100% RG Tested
- ◆ 100% UIS Tested

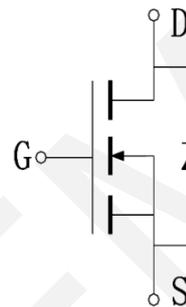
$V_{DS}$	$R_{DS(on)}$ Typ.	$I_D$ Max.
30V	3.2mΩ @ 10V	90A
	4.6mΩ @ 4.5V	

### 2.Applications

- ◆ Primary Side Switch
- ◆ Load Switch



TO-252  
Pin Description



Schematic Diagram

### 3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WX025BN03KD	025N03	TO-252	2,500	25,000

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

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	$V_{DSS}$	30	V
Gate to Source Voltage	$V_{GSS}$	±20	V
Drain Current (DC)	$I_D$	90	A
Drain Current (Pulse), $PW \leq 300\mu s$	$I_{DP}$	360	A
Total Dissipation	$P_D$	74	W
Avalanche Energy, Single Pulsed	$E_{AS}$	56.25	mJ
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	$R_{\theta JC}$	42	$^{\circ}C/W$
Junction to ambient	$R_{\theta JA}$	1.7	$^{\circ}C/W$

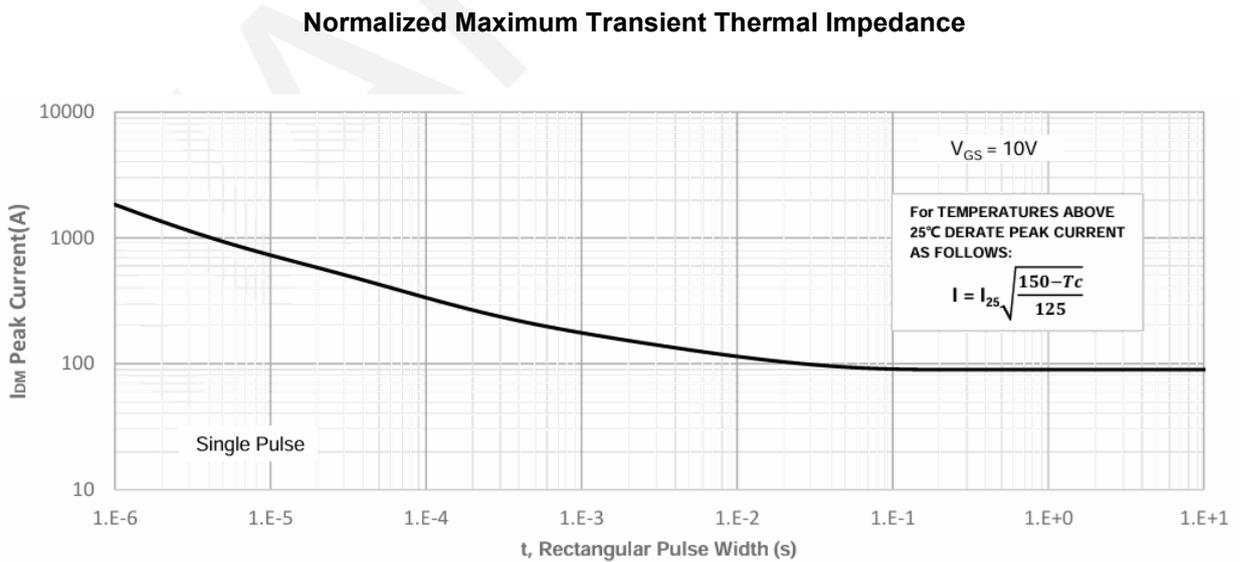
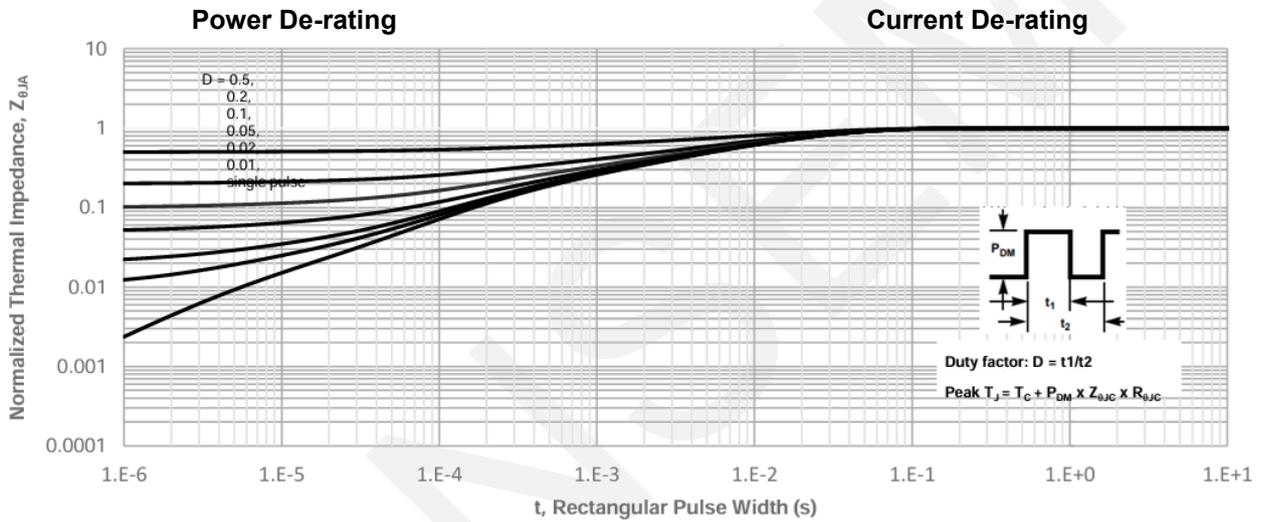
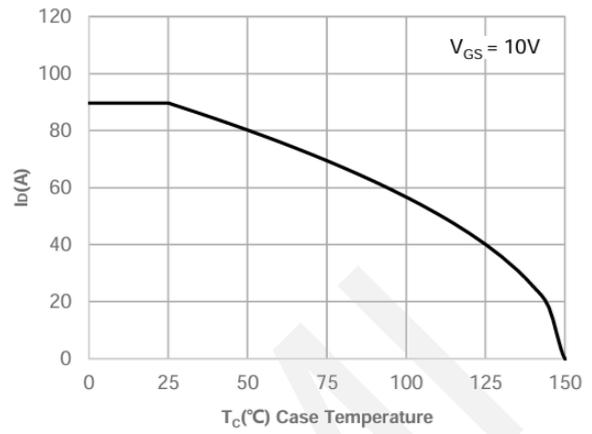
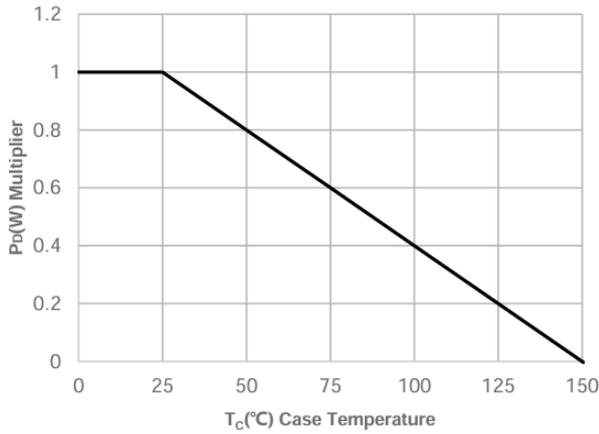
Note 2: When mounted on 1 inch square copper board  $t \leq 10\text{sec}$  The value in any given application depends on the user's specific board design.

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

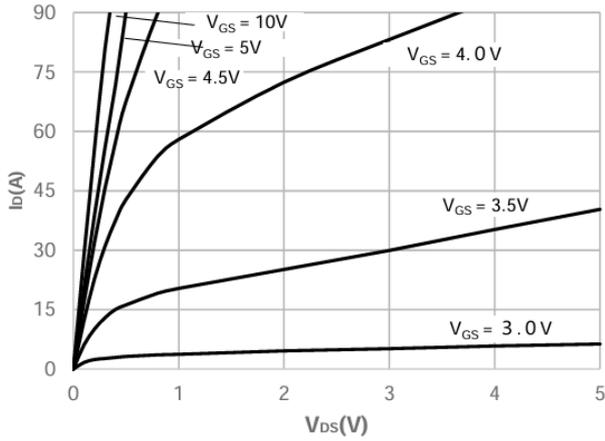
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	30	-	-	V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{SS} = 0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.0	1.7	2.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 30A, V_{GS} = 10V$	-	3.2	3.6	m $\Omega$
		$I_D = 20A, V_{GS} = 4.5V$	-	4.6	7.0	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz	-	2264	-	pF
Output Capacitance	$C_{oss}$		-	302	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	246	-	pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD} = 15V, R_{GEN}= 3\Omega$ $V_{GS} = 10V, I_D=30A$	-	9	-	ns
Rise Time	$t_r$		-	19	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	37	-	ns
Fall Time	$t_f$		-	13	-	ns
Total Gate Charge	$Q_g$	$V_{DS} = 15V,$ $V_{GS} = 0 \text{ to } 10V,$ $I_D = 30A$	-	44	-	nC
	$Q_{gs}$		-	9	-	nC
	$Q_{gd}$		-	11	-	nC
Diode Forward Voltage	$V_{FSD}$	$I_S=10A, V_{GS} = 0$	-	-	1.2	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.

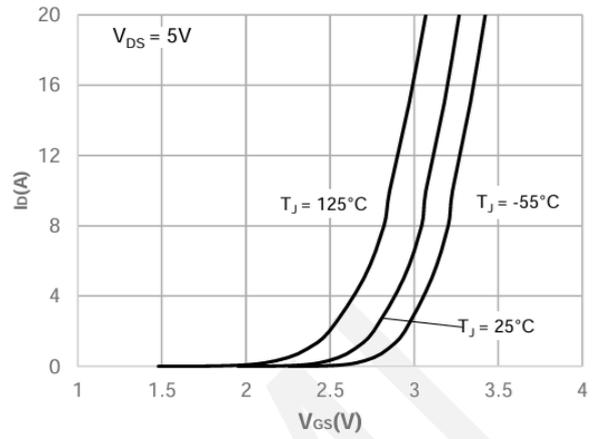
**7. Typical electrical and thermal characteristics**



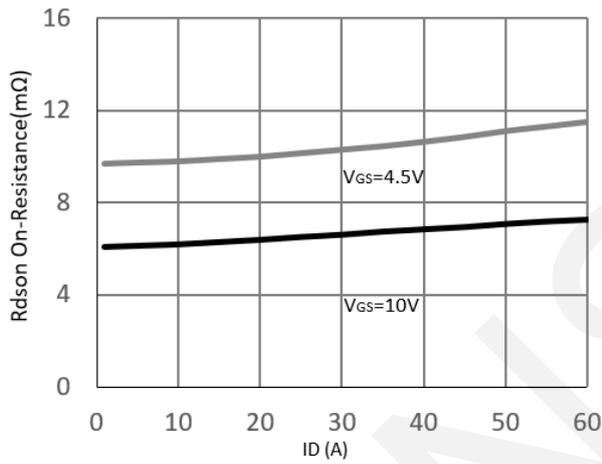
**Peak Current Capacity**



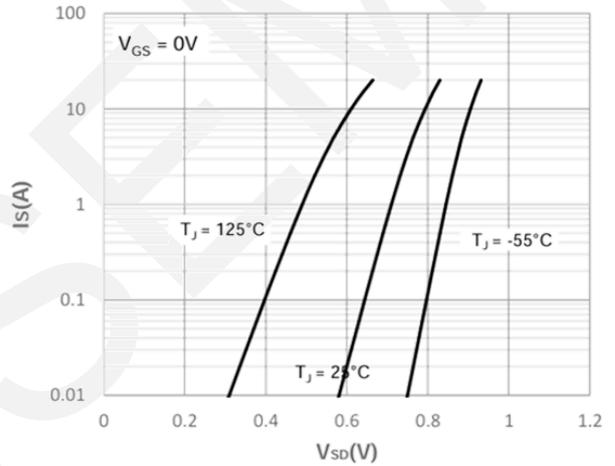
**Output Characteristics**



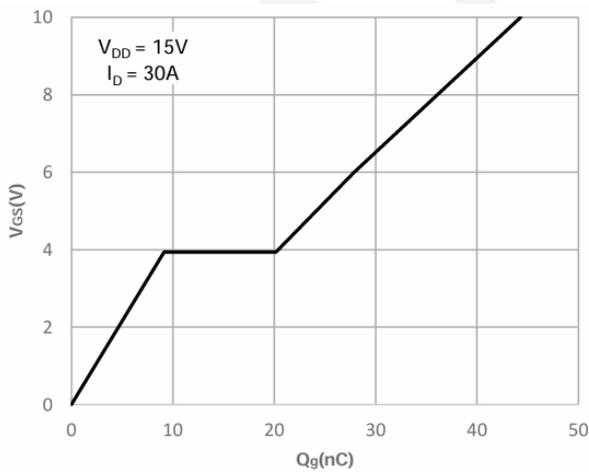
**Typical Transfer Characteristics**



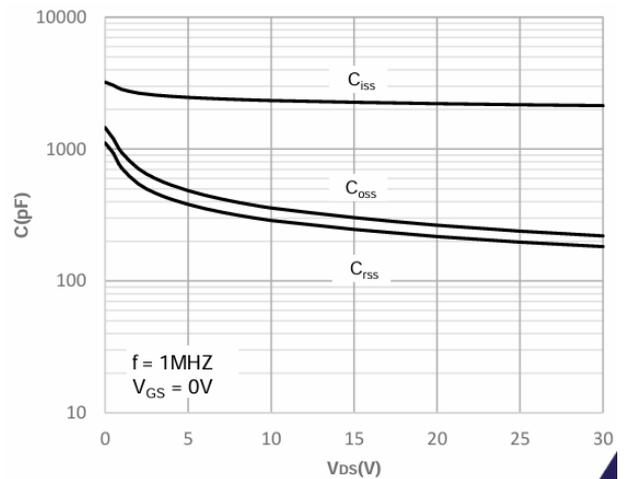
**On-resistance vs. Drain Current**



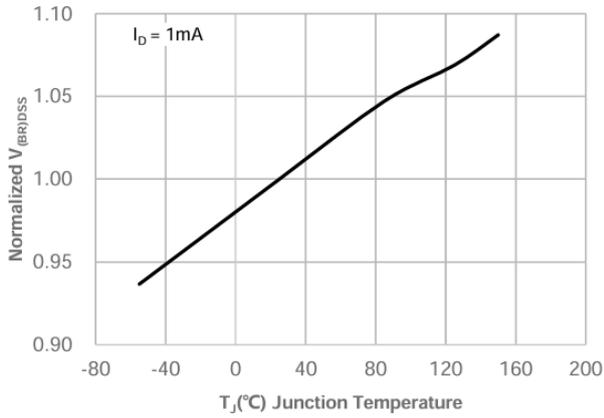
**Body Diode Characteristics**



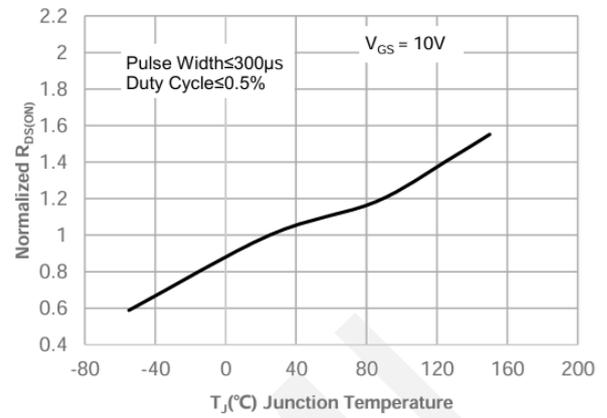
**Gate Charge Characteristics**



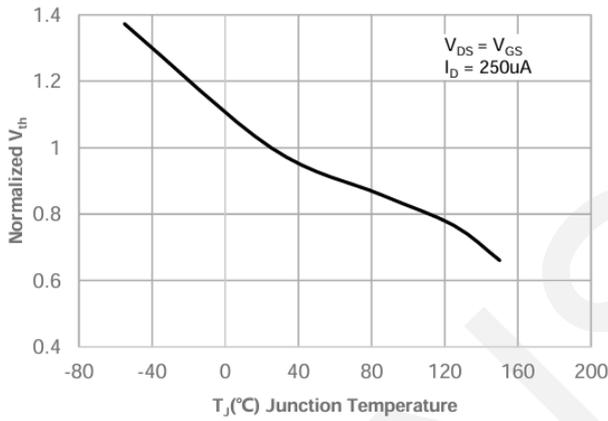
**Capacitance Characteristics**



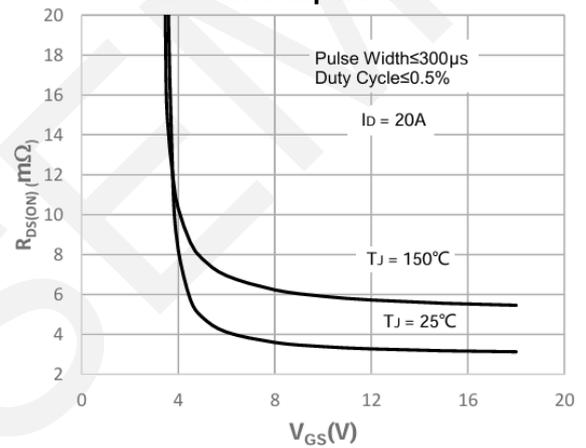
**Normalized Breakdown voltage vs. Junction Temperature**



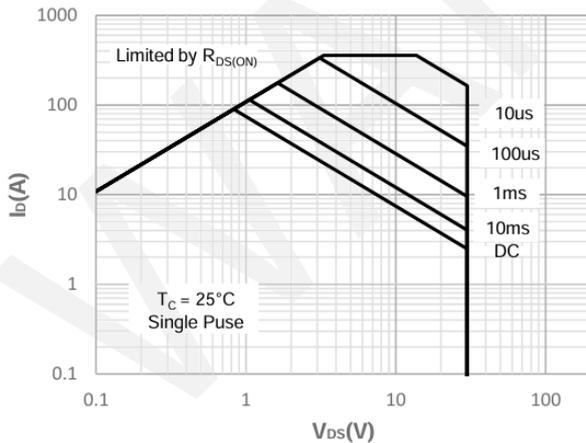
**Normalized on Resistance vs. Junction Temperature**



**Normalized Threshold Voltage vs. Junction Temperature**



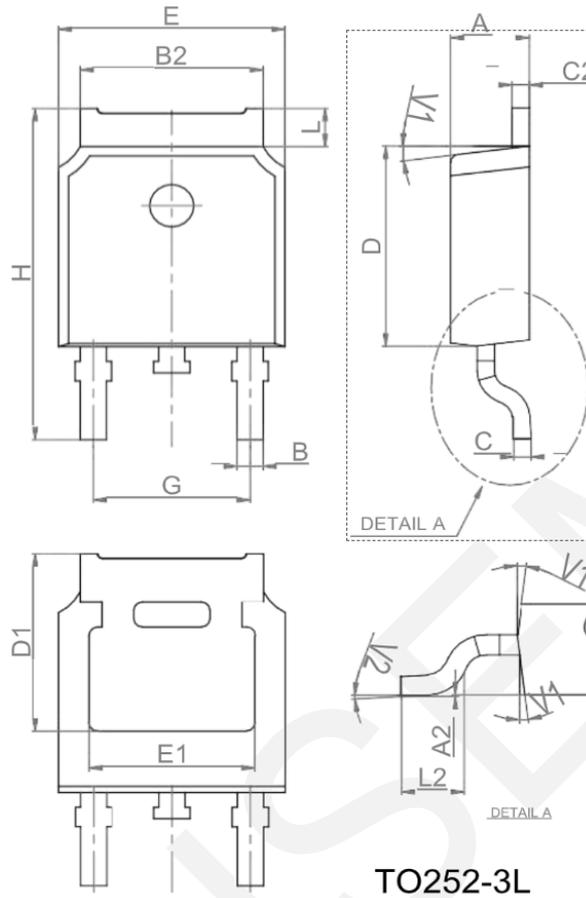
**RDS(ON) vs. VGS**



**Maximum Safe Operating Area**



**8.Package Dimensions**



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

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