



**WANSEMI**  
万芯半导体

**WX042N02SM**

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

**SOT323/NMOS/20V/ $\pm 12$ V/0.6V/2.2A/42m $\Omega$**

**Rev0.1**

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## 20V, 42mΩ, 2.2A, N-Channel MOSFET

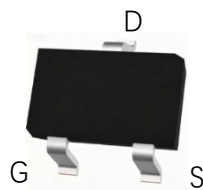
### 1.Features

- ◆ Advanced Trench Technology
- ◆ Surface mount package

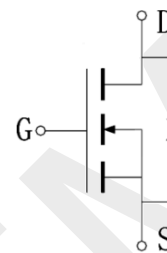
### 2.Applications

- ◆ Power Management
- ◆ Load Switching

$V_{DS}$	$R_{DS(on)}$ Typ.	$I_D$
20V	42mΩ @ 4.5V	2.2A
	53mΩ @ 2.5V	



SOT323  
Pin Description



Schematic Diagram

### 3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WX042N02SM	042N02	SOT323	3,000	180,000

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

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	$V_{DSS}$	20	V
Gate to Source Voltage	$V_{GSS}$	±12	V
Drain Current (DC)	$I_D$	2.2	A
Drain Current (Pulse), $PW \leq 300\mu s$	$I_{DP}$	8.8	A
Total Dissipation	$P_D$	1.2	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.

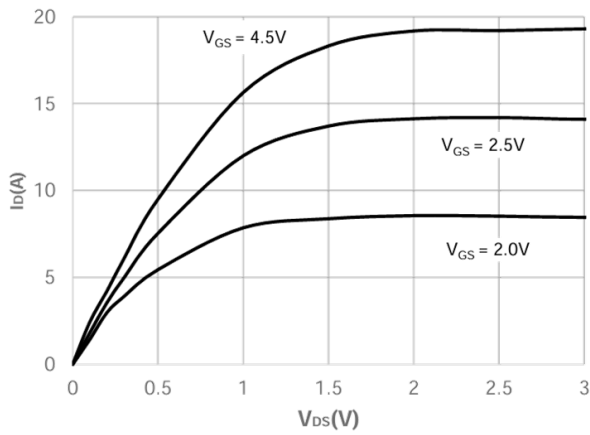
**5. Electrical Characteristics at Ta=25°C (Note 2)**

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	20	-	-	V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.3	0.6	1.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 2A, V_{GS} = 4.5V$	-	42	55	m $\Omega$
		$I_D = 1A, V_{GS} = 2.5V$	-	53	73	m $\Omega$
Input Capacitance	$C_{iss}$	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz	-	200	-	pF
Output Capacitance	$C_{oss}$		-	35	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	28	-	pF
Turn-ON Delay Time	$t_{d(on)}$		-	3	-	ns
Rise Time	$t_r$	$V_{DD} = 10V, I_D = 2A,$ $R_G = 3\Omega, V_{GS} = 4.5V$	-	11	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	20	-	ns
Fall Time	$t_f$		-	8	-	ns
Total Gate Charge	$Q_g$		$V_{DS} = 10V,$ $V_{GS} = 0$ to 4.5V, $I_D = 2A$	-	3	-
	$Q_{gs}$	-		0.5	-	nC
	$Q_{gd}$	-		0.7	-	nC
Diode Forward Voltage	$V_{FSD}$	$I_{SD} = 2A, V_{GS} = 0$	0.5	-	1.2	V

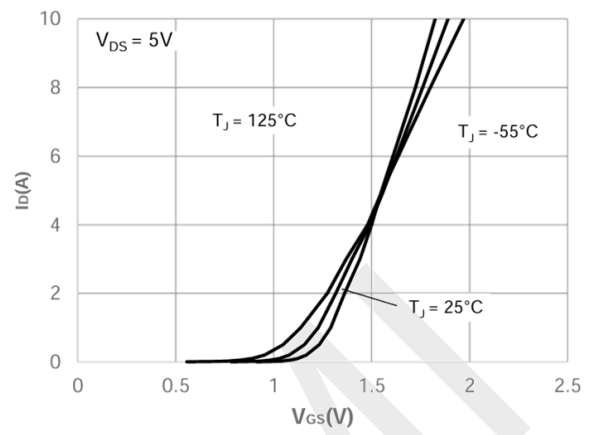
Note 2: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



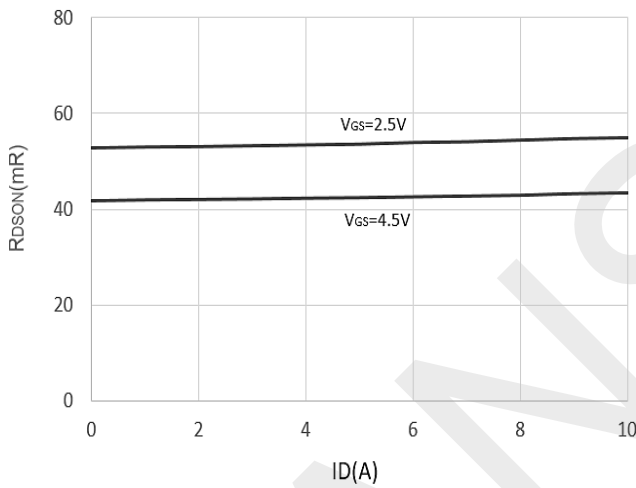
## 6. Typical Electrical and Thermal Characteristics



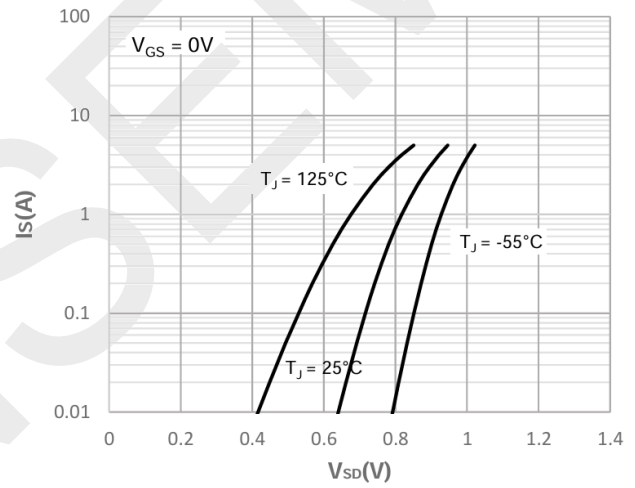
Output Characteristics



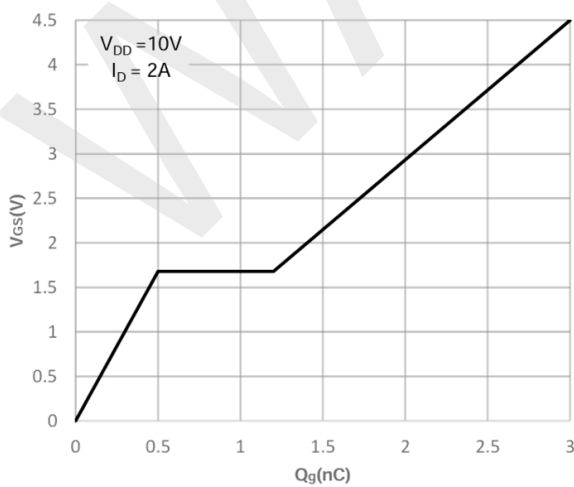
Typical Transfer Characteristics



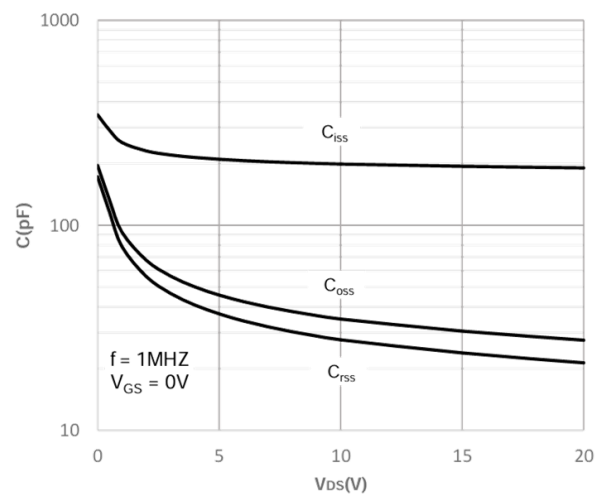
On-resistance vs. Drain Current



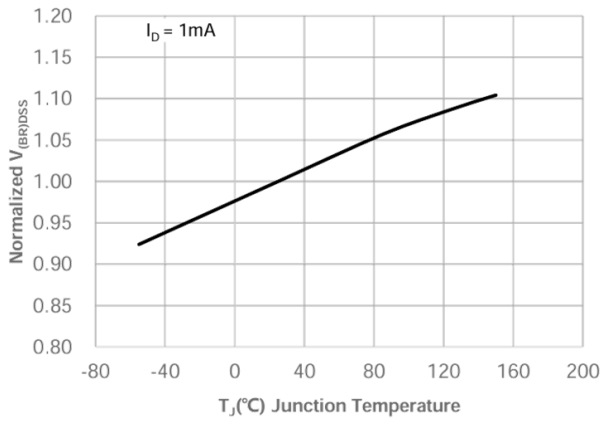
Body Diode Characteristics



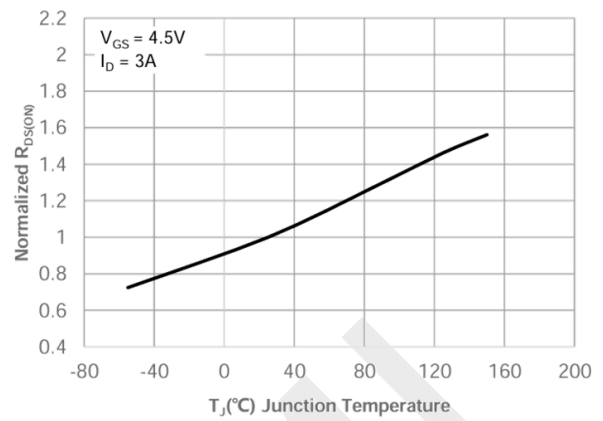
Gate Charge Characteristics



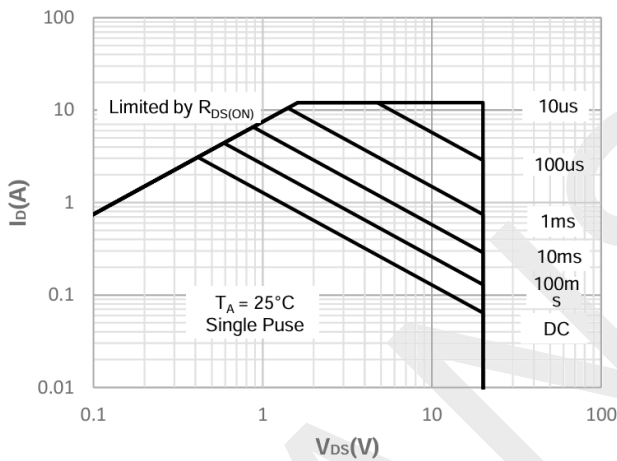
Capacitance Characteristics



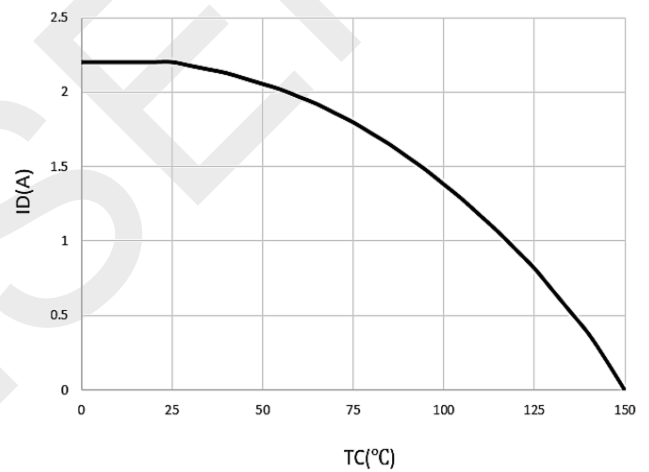
Normalized Breakdown Voltage vs. Junction Temperature



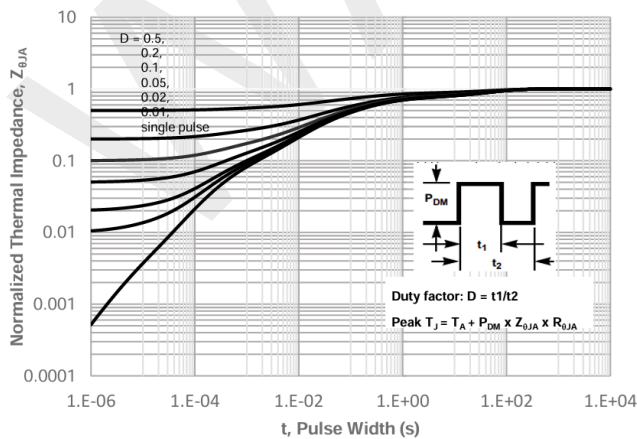
Normalized on Resistance vs. Junction Temperature



Maximum Safe Operating Area



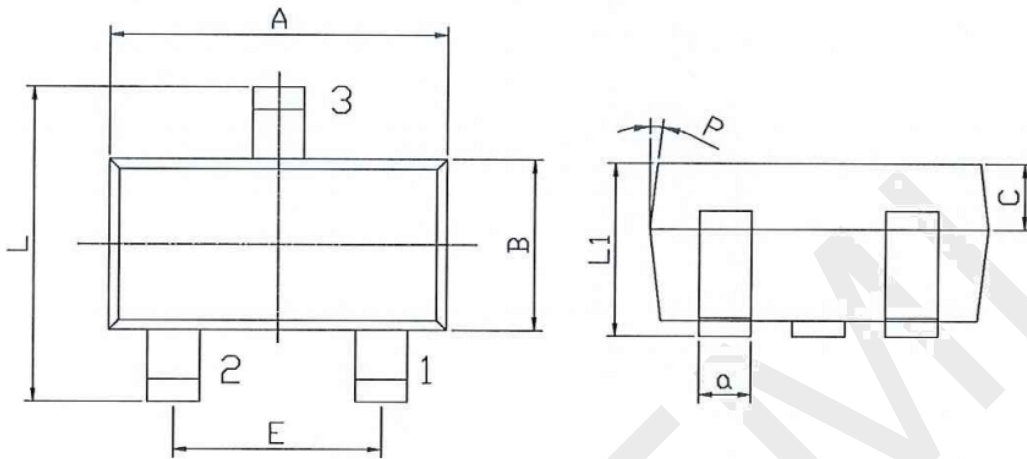
Maximum Continuous Drain Current vs. Case Temperature



Normalized Maximum Transient Thermal Impedance



### 7.Package Dimensions



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	1.95	2.35	C	0.30	0.50
L	2.00	2.2	L1	0.85	1.15
E	1.20	1.40	a	0.20	0.40
B	1.15	1.35	P	7°	

## 8. Important Notice

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