



WANSEMI
万芯半导体

WX013P02N2

Enhancement Mode N-Channel Power MOSFET

DFN2X2/PMOS/-16V/ $\pm 12V$ /-0.65V/-12A/13m Ω

Rev0.1

-16V, 13mΩ, -12A, P-Channel MOSFET

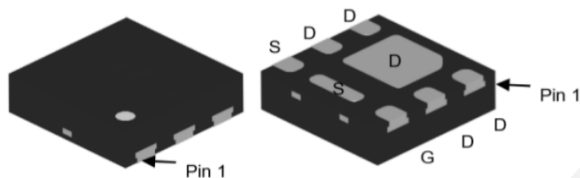
1.Features

- ◆ High Power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface Mount Package

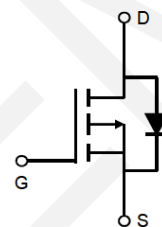
V _{DS} Typ.	R _{DS(on)} Typ.	I _D Max.
-16V	13mΩ @ -4.5V	-12A
	18mΩ @ -2.5V	

2.Applications

- ◆ Battery Protection
- ◆ Battery Powered Systems
- ◆ Power Management in Notebook Computer
- ◆ Portable Equipment



Pin Description
DFN2X2-6L



Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WX013P02N2	013P02	DFN2X2	3,000	180,000

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

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	V _{DSS}	-16	V
Gate to Source Voltage	V _{GSS}	±12	V
Drain Current-Continuous	I _D	-12	A
Drain Current (Pulse)	I _{DM}	-48	A
Maximum Power Dissipation	P _D	1.9	W
Operating Junction and Storage Temperature Range	T _j , 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
Maximum Junction-to-Ambien	$R_{\theta JA}$	64	$^{\circ}\text{C/W}$

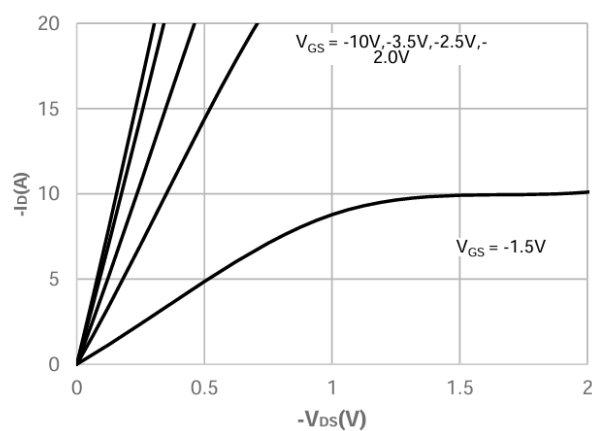
Note 2: When mounted on 1 inch square copper board $t \leq 10\text{sec}$ The value in any given application depends on the user's specific board design.

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

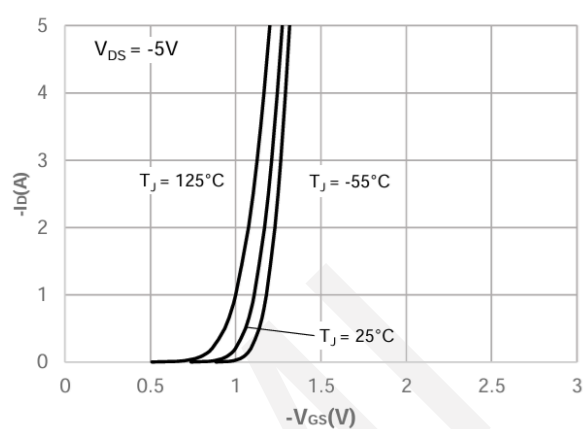
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$	-16	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16\text{V}$, $V_{GS} = 0\text{V}$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 12\text{V}$, $V_{DS} = 0\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=-250\mu\text{A}$	-0.3	-0.65	-1.5	V
Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = -5\text{A}$, $V_{GS} = -4.5\text{V}$	-	13	17	$\text{m}\Omega$
		$I_D = -3\text{A}$, $V_{GS} = -2.5\text{V}$	-	18	25	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=-8\text{V}$, Frequency=1.0MHz	-	1352	-	pF
Output Capacitance	C_{oss}		-	190	-	pF
Reverse Transfer Capacitance	C_{rss}		-	167	-	pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{V}$, $I_D = -3\text{A}$, $R_G = 3\Omega$, $V_{GS} = -4.5\text{V}$	-	7.2	-	ns
Turn-ON Rise Time	t_r		-	17.5	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	62	-	ns
Turn-ON Fall Time	t_f		-	45	-	ns
Total Gate Charge	Q_g	$V_{DS} = -8\text{V}$, $V_{GS} = 0$ to -4.5V , $I_D = -3\text{A}$	-	14	-	nC
Gate-Source Charge	Q_{gs}		-	2.2	-	nC
Gate-Drain Charge	Q_{gd}		-	2.9	-	nC
Diode Forward Voltage	V_{SD}	$I_{SD} = -5\text{A}$, $V_{GS} = 0$	-0.5	-	-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.

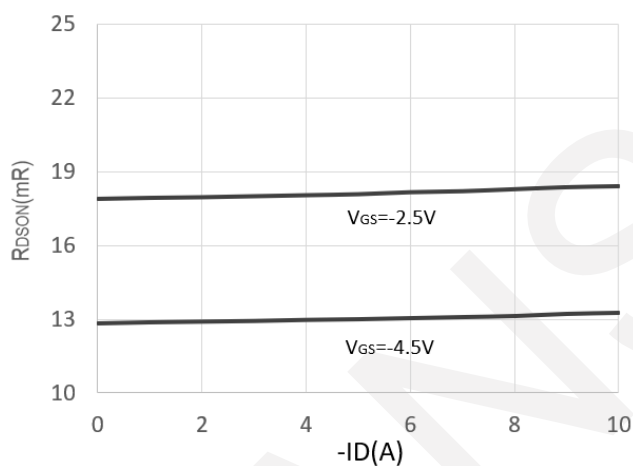
7. Typical electrical and thermal characteristics



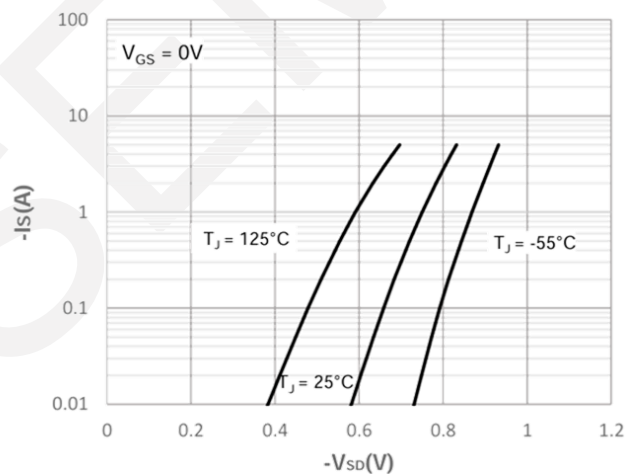
Typical Output Characteristics



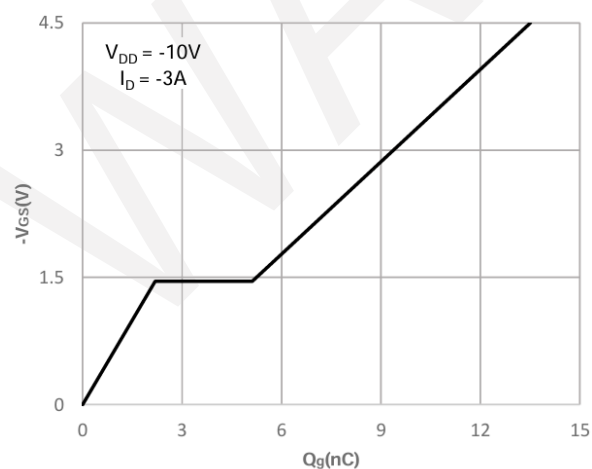
Typical Transfer Characteristics



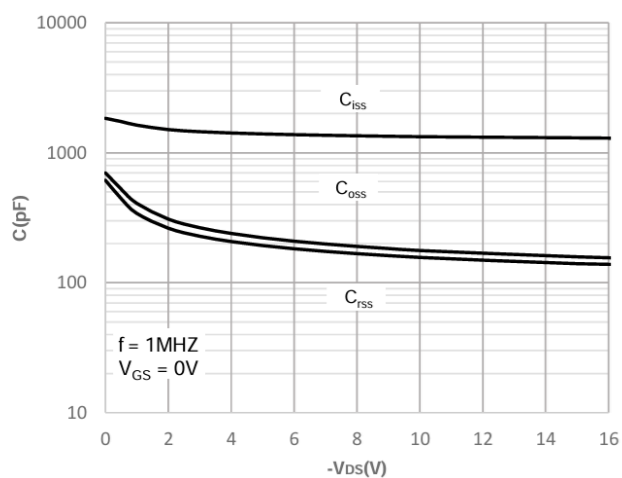
On-resistance vs. Drain Current



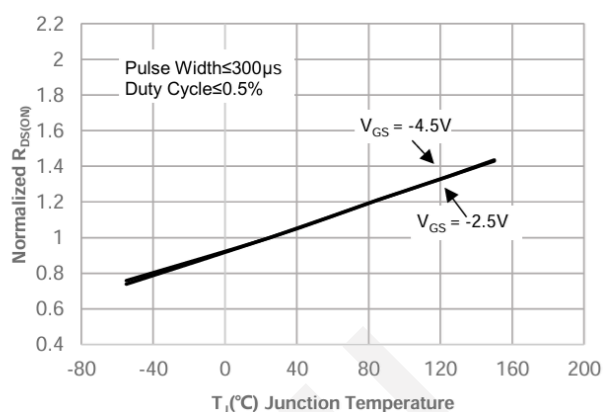
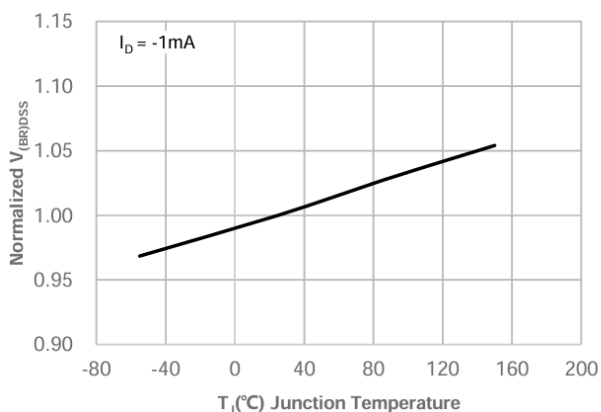
Body Diode Characteristics



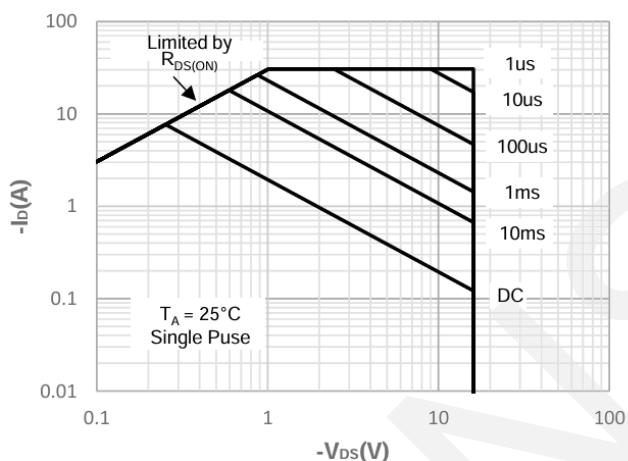
Gate Charge Characteristics



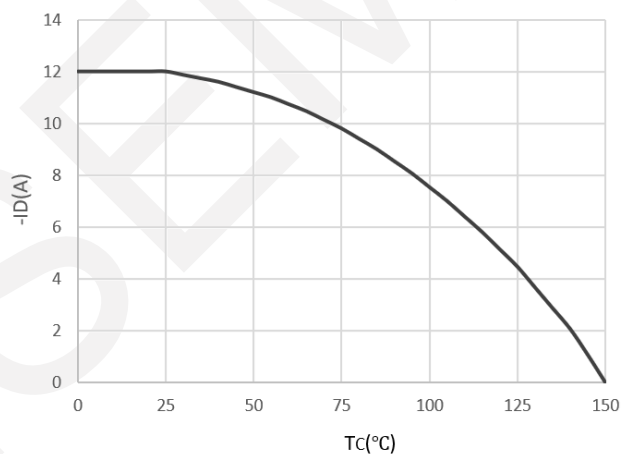
Capacitance Characteristics



Normalized Breakdown voltage vs. Junction Temperature

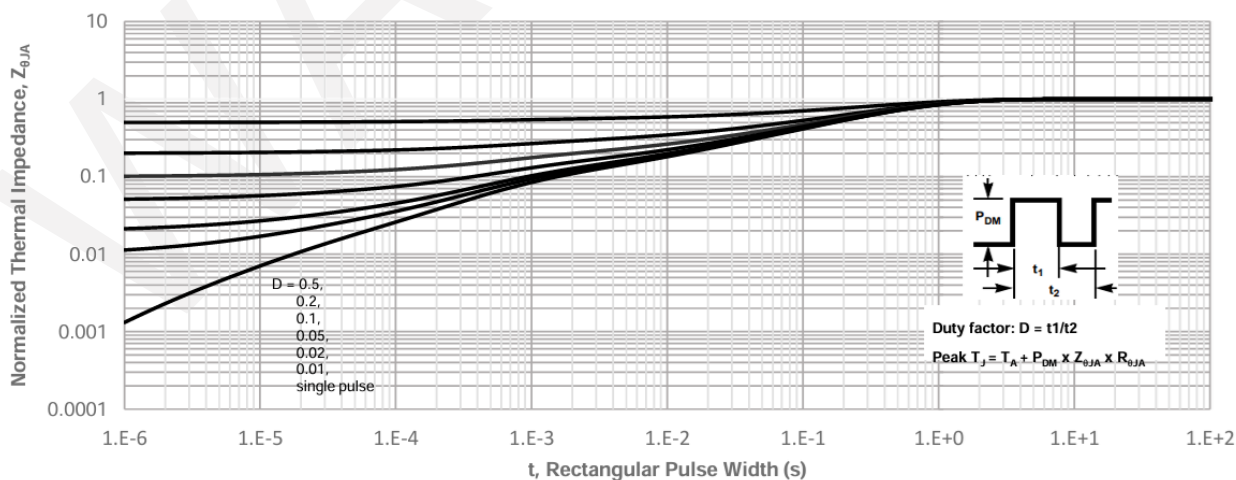


Normalized on Resistance vs. Junction Temperature



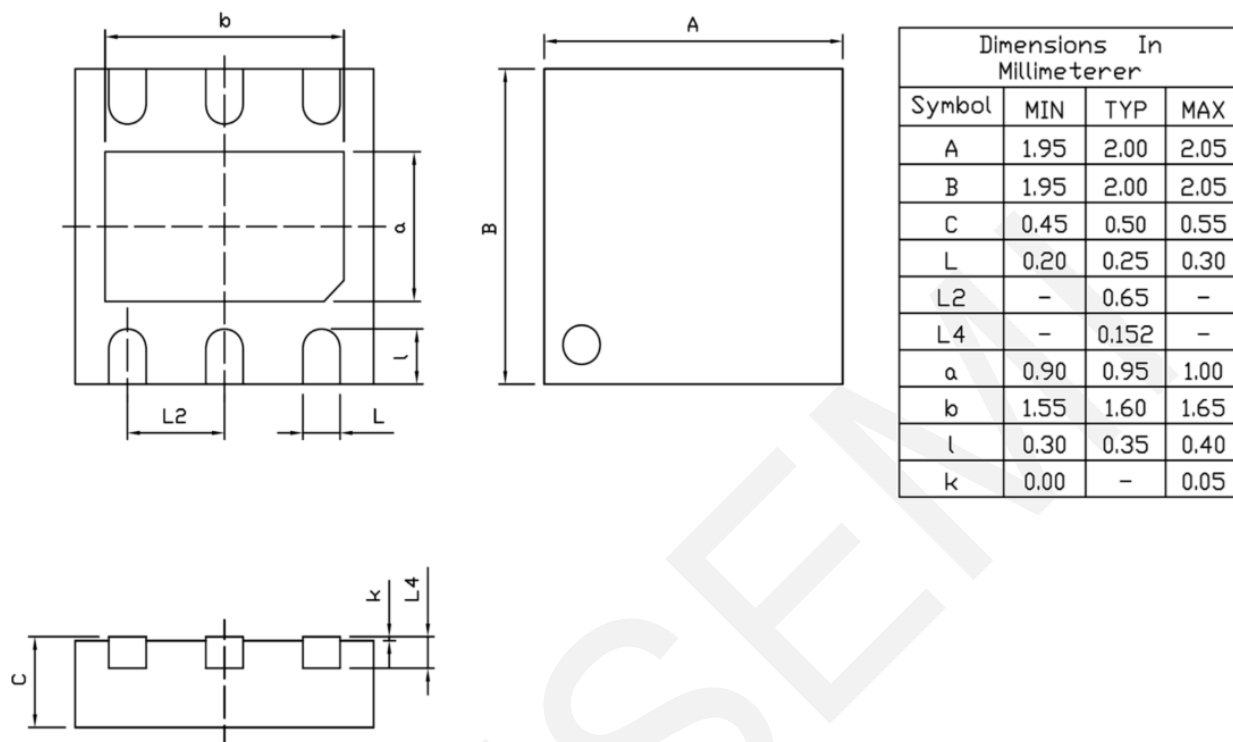
Normalized Breakdown voltage vs. Junction Temperature

Current De-rating



Normalized Maximum Transient Thermal Impedance

8.Package Dimensions



9.Important Notice

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