



WANSEMI
万芯半导体

WX029P04KD

Enhancement Mode P-Channel Power MOSFET

TO-252/PMOS/-40V/ $\pm 20V$ /-1.5V/-15A/30m Ω

Rev1.0

-40V, 30mΩ, -15A, Single P-Channel

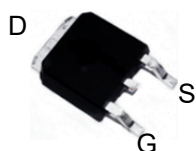
1.Features

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

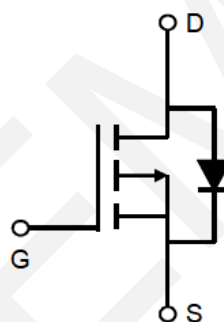
V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
-40V	30mΩ @ -10V	-15A
	36mΩ @ -4.5V	

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.
WX029P04KD	029P04	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}	-40	V
Gate to Source Voltage	V_{GSS}	±20	V
Drain Current (DC)	I_D	-15	A
Drain Current (Pulse), $PW \leq 300\mu s$	I_{DP}	-60	A
Total Dissipation	P_D	37	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	$R_{\theta JC}$	3.4	$^{\circ}\text{C/W}$
Junction to ambient	$R_{\theta JA}$	34	$^{\circ}\text{C/W}$

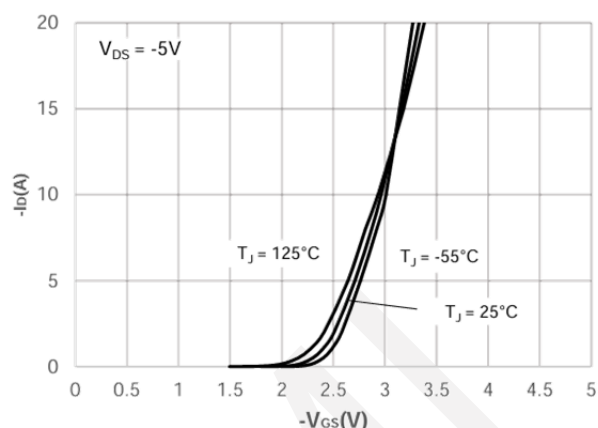
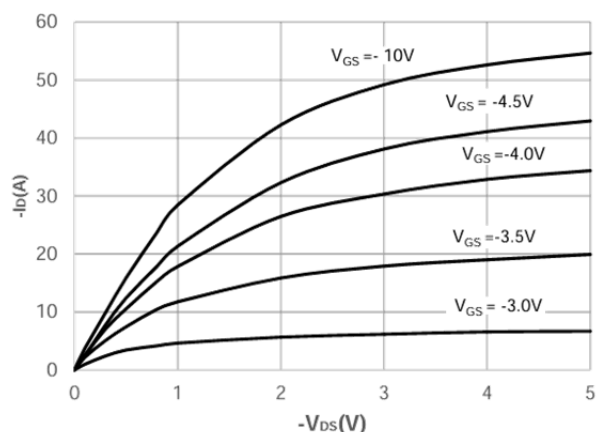
Note 2: When mounted on 1 inch square copper board $t \leq 10\text{sec}$ The value in any given application depends on the user's specific board design.

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	$V_{(BR)DSS}$	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$	-40	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40\text{V}$, $V_{GS} = 0\text{V}$	-	-	-1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{SS} = 0\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=-250\mu\text{A}$	-1.2	-1.5	-2.3	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = -15\text{A}$, $V_{GS} = -10\text{V}$	-	30	39	$\text{m}\Omega$
		$I_D = -10\text{A}$, $V_{GS} = -4.5\text{V}$	-	36	50	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=-20\text{V}$, Frequency=1.0MHz	-	1244	-	pF
Output Capacitance	C_{oss}		-	97	-	pF
Reverse Transfer Capacitance	C_{rss}		-	80	-	pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD} = -20\text{V}$, $R_{GEN} = 3\Omega$ $V_{GS} = -10\text{V}$, $I_D = -15\text{A}$	-	5	-	ns
Rise Time	t_r		-	2	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	51	-	ns
Fall Time	t_f		-	29	-	ns
Total Gate Charge	Q_g	$V_{DS} = -20\text{V}$, $V_{GS} = 0$ to -10V , $I_D = -15\text{A}$	-	23	-	nC
	Q_{gs}		-	4	-	nC
	Q_{gd}		-	4	-	nC
Diode Forward Voltage	V_{FSD}	$I_S = -15\text{A}$, $V_{GS} = 0$	-	-	-1.2	V

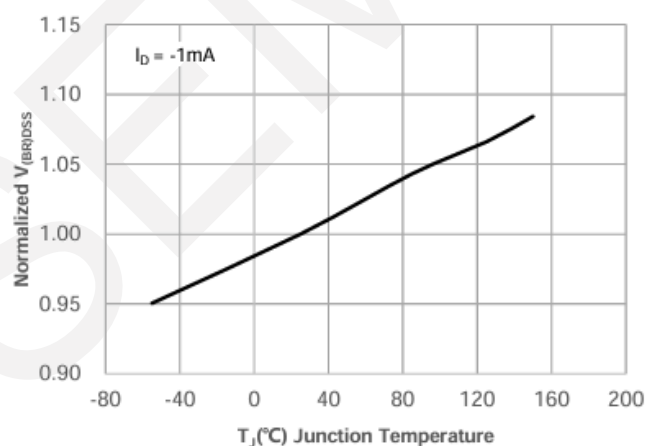
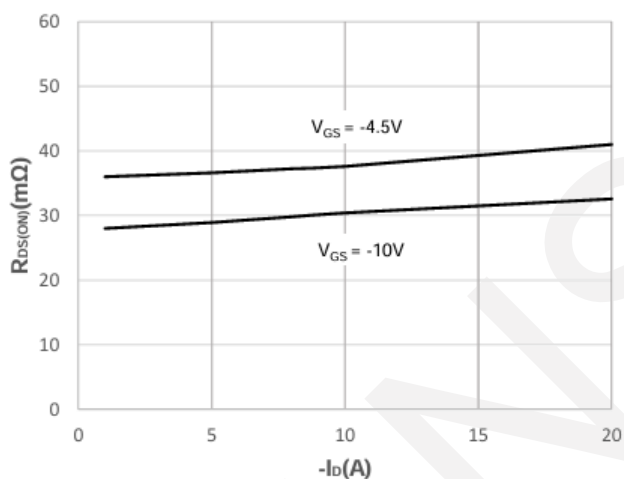
Note 3: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

7. Typical electrical and thermal characteristics



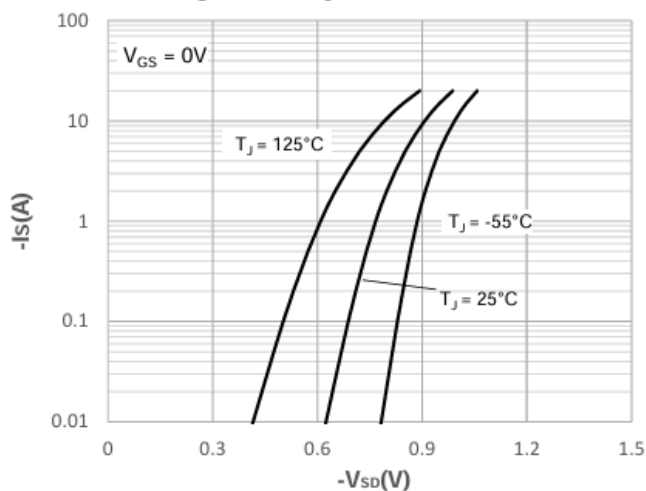
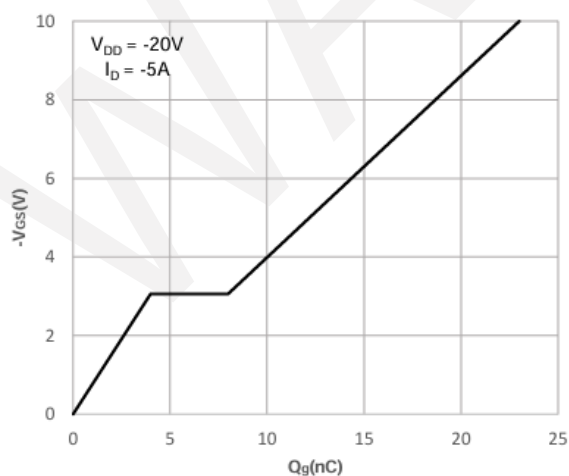
Output Characteristics

Transfer Characteristics



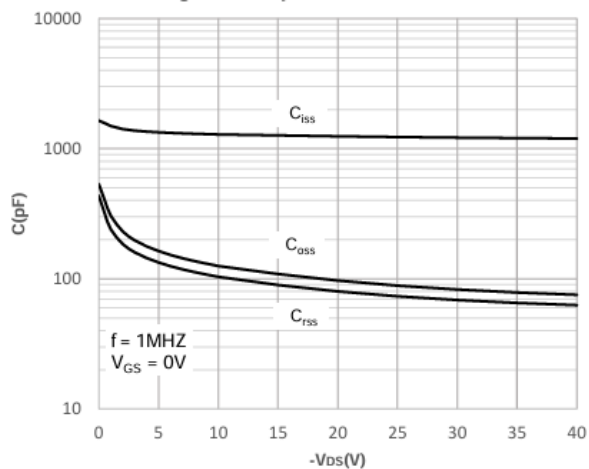
On-resistance vs. Drain Current

Normalized Breakdown Voltage-Junction Temperature

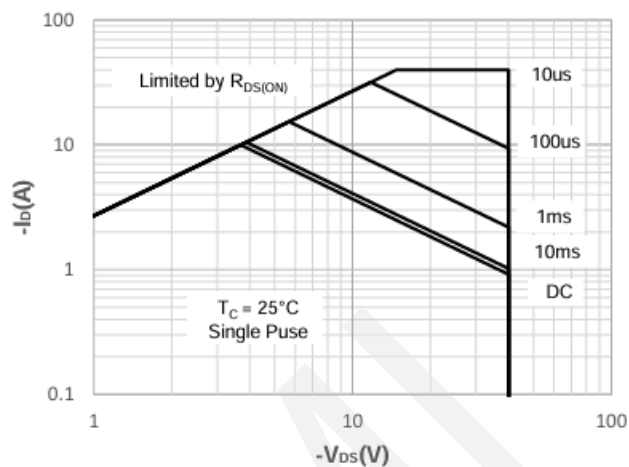


Gate Charge

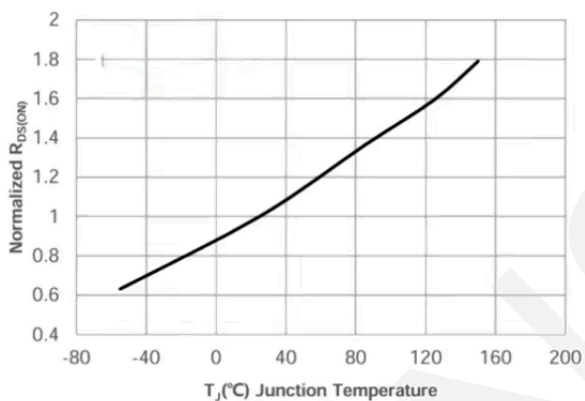
Body Diode Characteristics



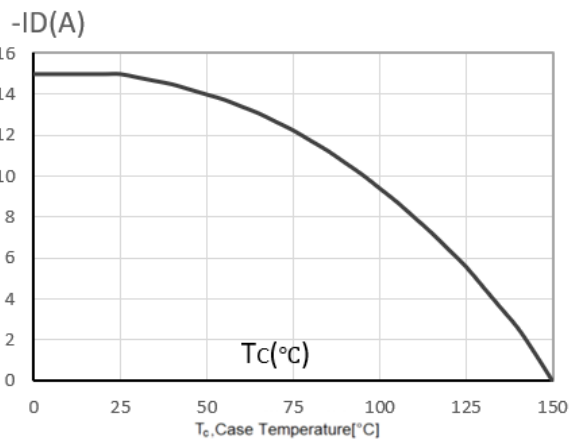
Capacitance - Vds



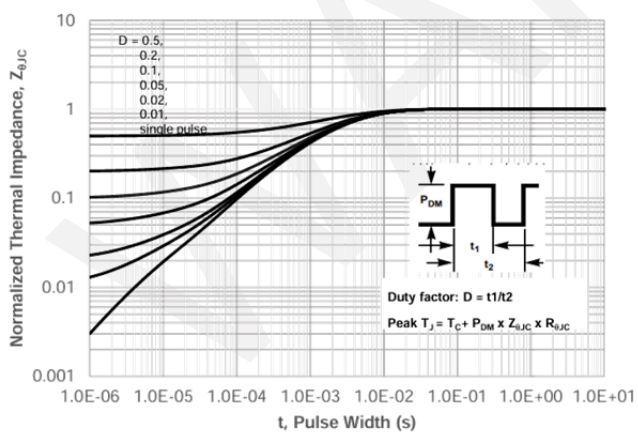
Safe Operation Area



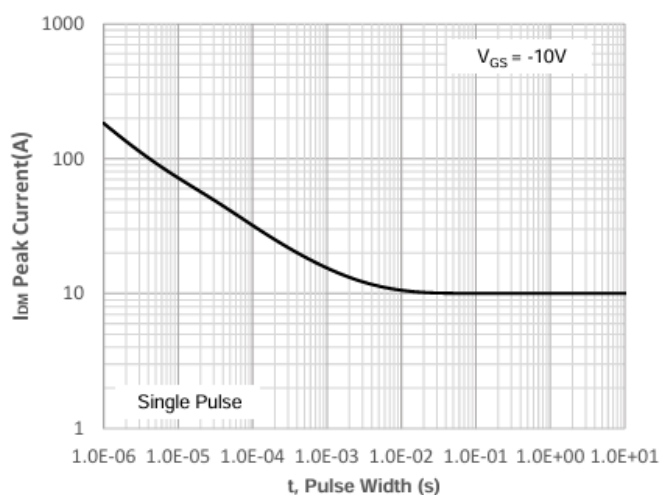
Normalized on Resistance - Junction Temperature



Maximum Continuous Drain Current - Case Temperature

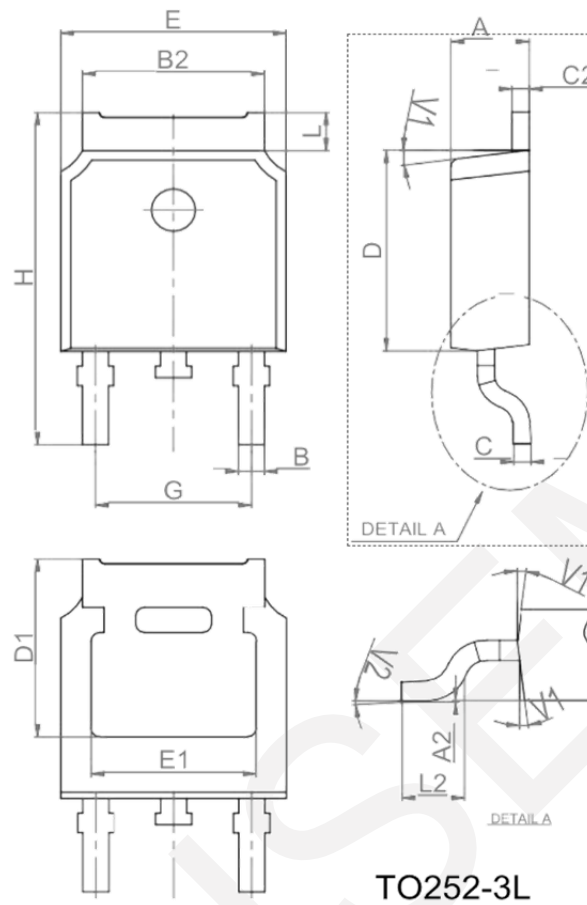


Maximum Effective Transient Thermal Impedance , Junction-to-Case



Peak Current Capacity

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°

9. Important Notice

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