WANSEMI
万代半导体

WP3020KP3

Enhancement Mode N-Channel Power MOSFET

PDFN3X3/NMOS/30V/±20V/1.6V/20A/14.2mΩ

Rev0.6

30V, 14.2mΩ, 20A, Single N-Channel

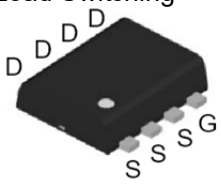
1.Features

- 30V MOSFET technology
- Low on-state resistance
- Fast switching
- Vgs±20V
- 100% RG Tested
- 100% UIS Tested

V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
30V	14.2mΩ @ 10V	20A
	23.2mΩ @ 4.5V	

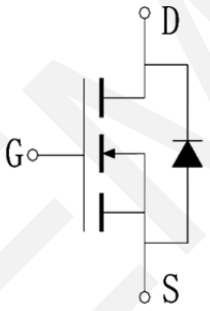
2.Applications

- Power Switching Application
- Load Switching



PDFN3X3

Pin Description



Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP3020KP3	3020K	PDFN3X3	5,000	50,000

4.Absolute Max Ratings at Ta=25℃ (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	20	A
Drain Current (Pulse), PW≤300μs	I_{DP}	80	A
Total Dissipation	P_D	40	W
Avalanche Energy, Single Pulsed	E_{AS}	27.56	mJ
Junction Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-55 to +150	℃

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	$R_{\theta JC}$	3.8	℃/W

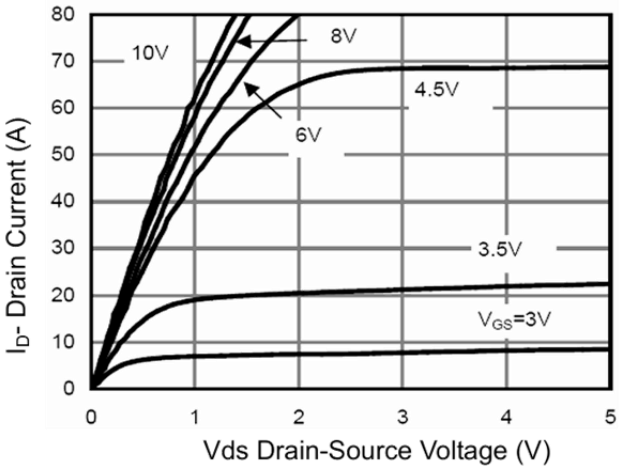
Note 2：When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

6.Electrical Characteristics at Ta=25℃ (Note 3)

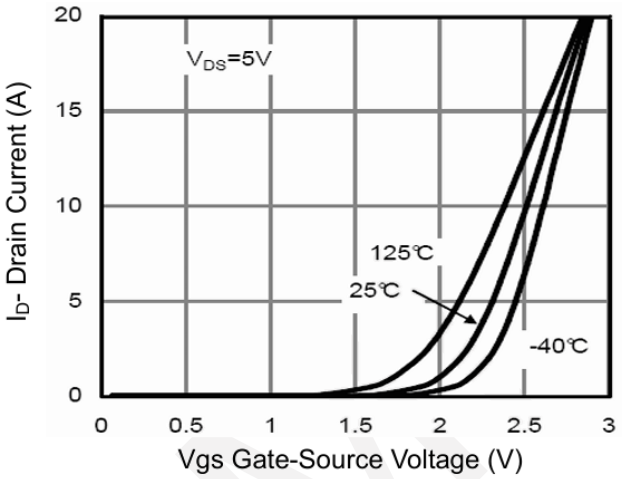
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0V	30	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V	-	-	100	nA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1.0	1.6	2.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D = 20A, V_{GS} = 10V	-	14.2	20	mΩ
		I_D = 15A, V_{GS} = 4.5V	-	23.2	35	mΩ
Forward Transconductance	G_{FS}	I_D = 20A, V_{DS} = 5V	20	-	-	S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	669	-	pF
Output Capacitance	C_{oss}		-	82	-	pF
Reverse Transfer Capacitance	C_{rss}		-	65	-	pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DS} = 15V, R_L=0.75Ω, V_{GS} = 10V, R_G = 3Ω	-	5	-	ns
Rise Time	t_r		-	12	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	19	-	ns
Fall Time	t_f		-	6	-	ns
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 10V, I_D = 20A	-	17.5	-	nC
	Q_{gs}		-	3	-	nC
	Q_{gd}		-	4.1	-	nC
Diode Forward Voltage	V_{FSD}	I_S = 30A, V_{GS} = 0	0.5	0.85	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.

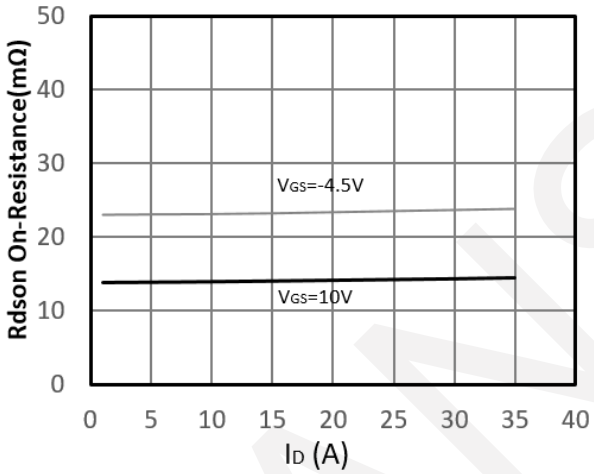
7.Typical electrical and thermal characteristics



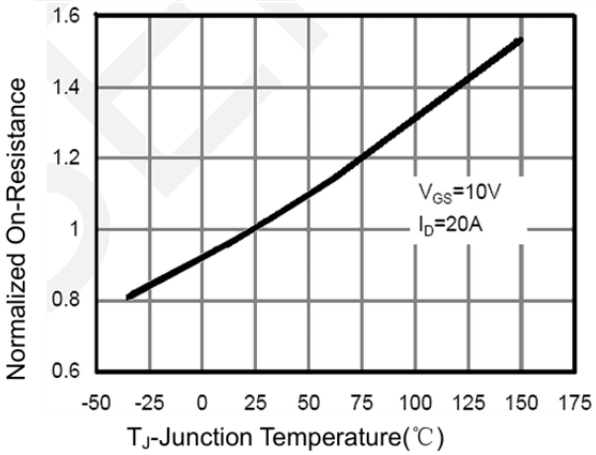
Output Characteristics



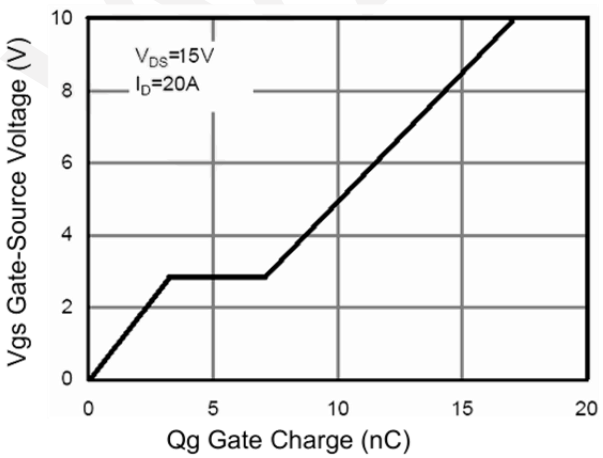
Transfer Characteristics



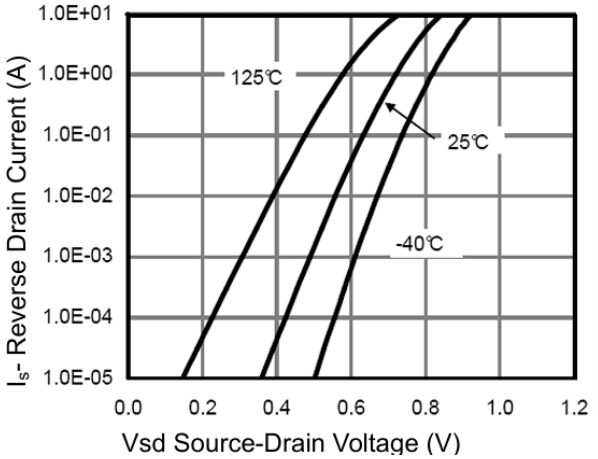
Rdson-Drain Current



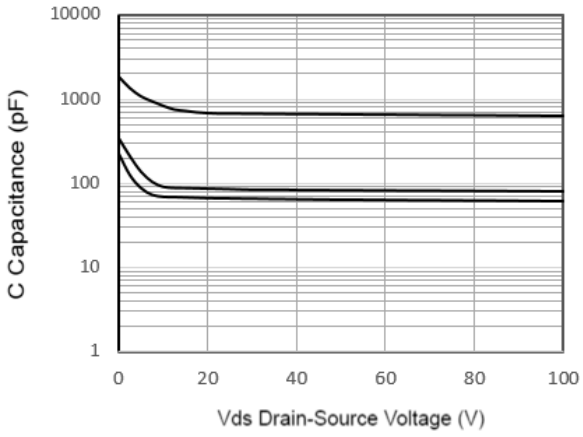
Rdson-Junction Temperature



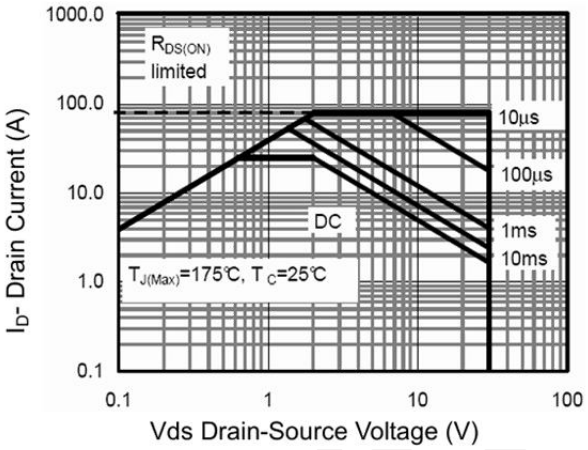
Gate Charge



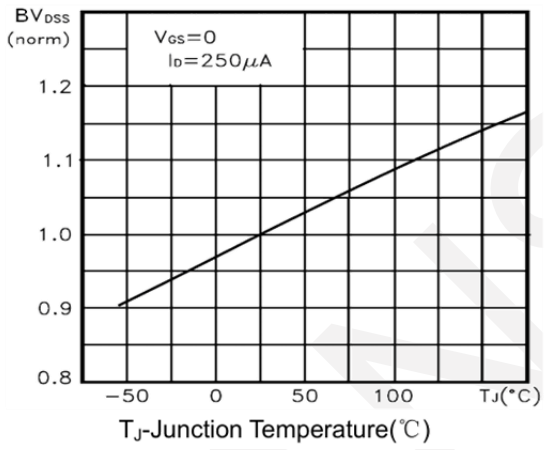
Source-Drain Diode Forward



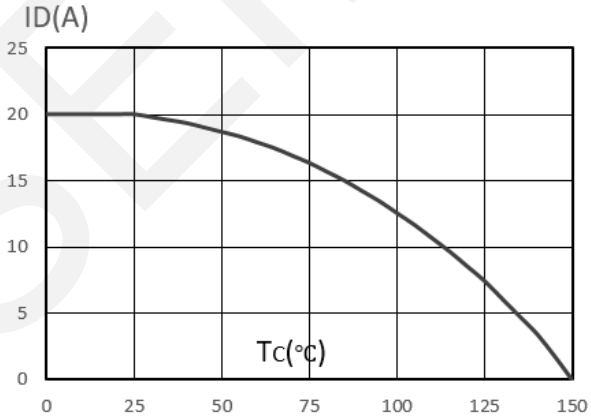
Capacitance vs Vds



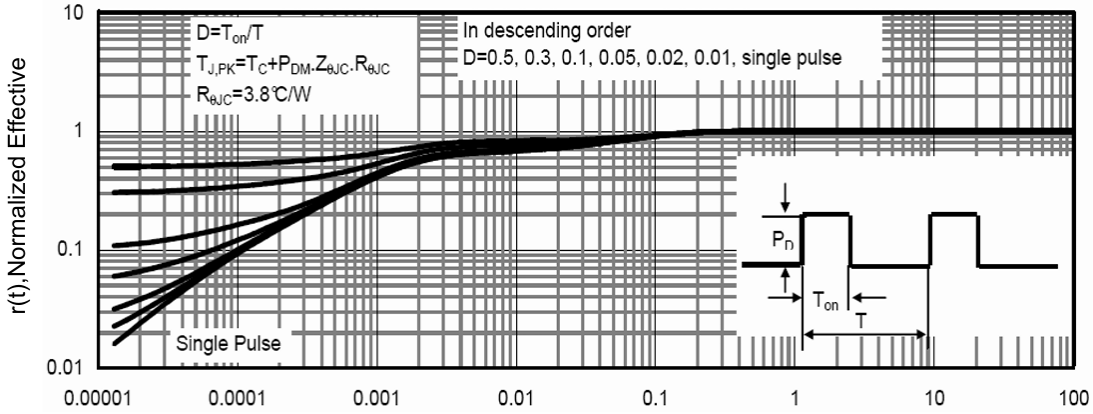
Safe Operation Area



BV_{DSS} vs Junction Temperature

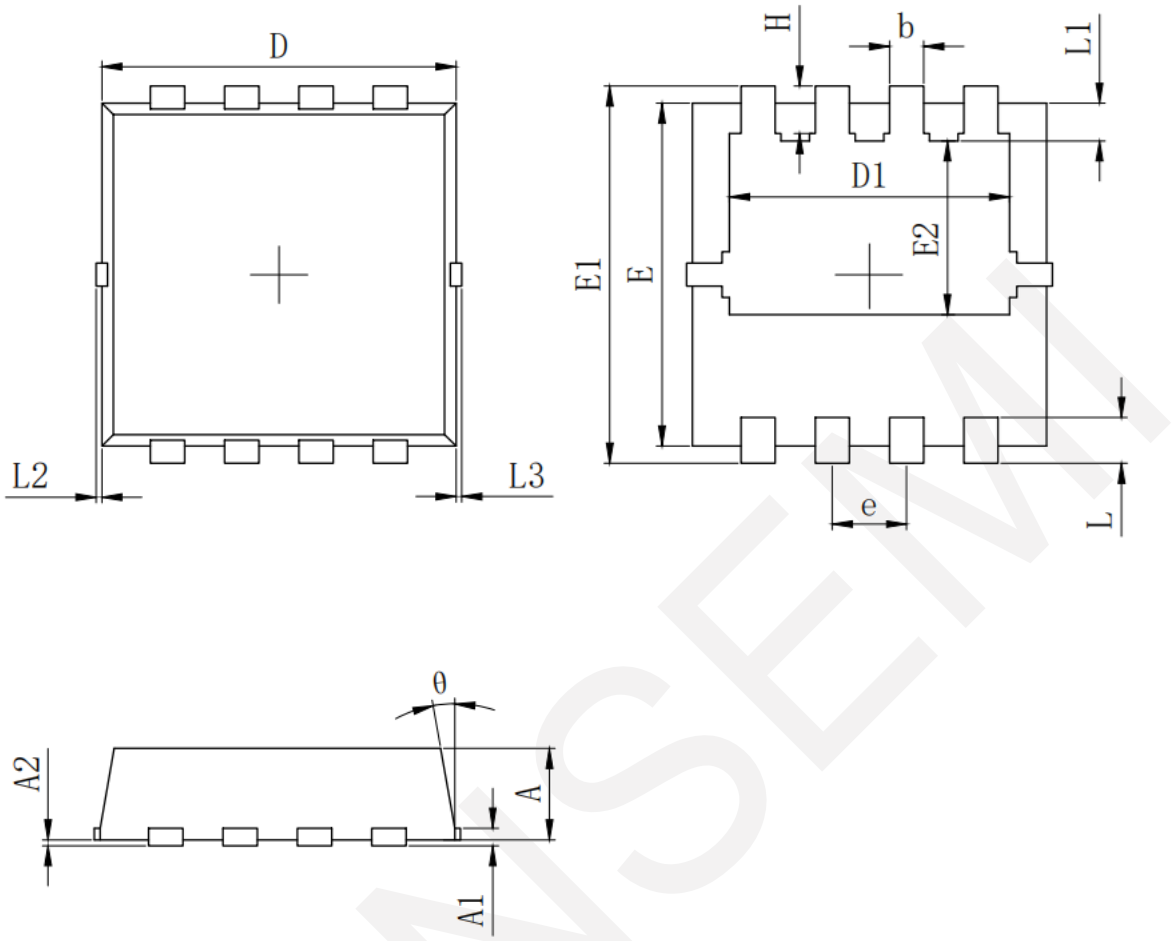


Maximum Continuous Drain Current vs. Case Temperature



Normalized Maximum Transient Thermal Impedance

8.Package Dimensions



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152 REF.		
A2	0~0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.320	1.520	1.720
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0~0.100		
L3	0~0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°

9. Important Notice

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