



WANSEMI
万芯半导体

WP3020DPA

Enhancement Mode N-Channel Power MOSFET

PDFN5X6/NMOS/30V/ ± 20 V/1.7V/20A/9.5m Ω

Rev0.8

30V, 9.5mΩ, 20A, Dual N-Channel

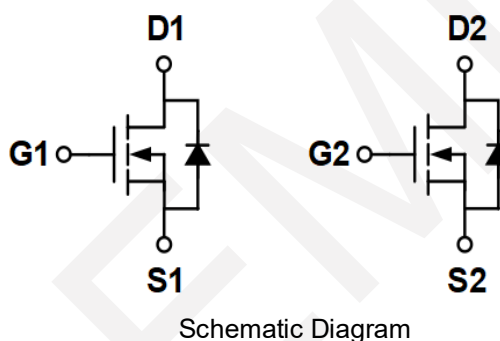
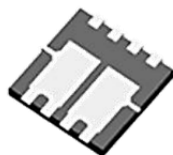
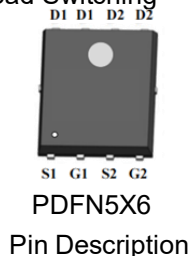
1.Features

- ◆ 30V MOSFET technology
- ◆ Low on-state resistance
- ◆ Fast switching
- ◆ $V_{GS} \pm 20V$

V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
30V	9.5mΩ @ 10V	20A
	14.5mΩ @ 4.5V	

2.Applications

- ◆ Power Switching Application
- ◆ Load Switching



3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP3020DPA	WP3020DPA	PDFN5x6	5,000	50,000

4.Absolute Max Ratings at $T_a = 25^\circ C$ (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	20	A
Drain Current (Pulse), $PW \leq 300\mu s$	I_{DP}	80	A
Total Dissipation	P_D	31	W
Avalanche Energy, Single Pulsed	E_{AS}	64	mJ
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature	T_{stg}	-55 to +150	$^\circ C$

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	$R_{\theta JC}$	4	$^{\circ}\text{C/W}$

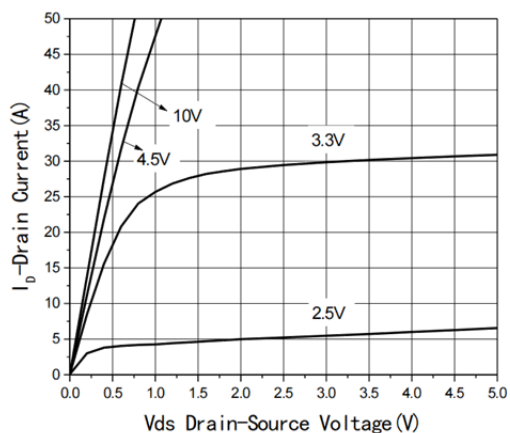
Note 2: When mounted on 1 inch square copper board $t \leq 10\text{sec}$ The value in any given application depends on the user's specific board design.

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

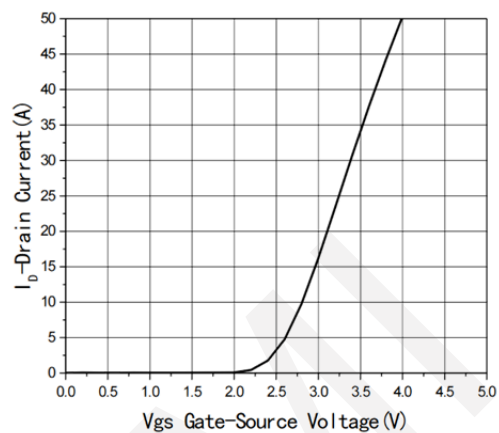
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{V}$, $V_{GS} = 0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=250\mu\text{A}$	1.0	1.7	3.0	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 20\text{A}$, $V_{GS} = 10\text{V}$		9.5	15	$\text{m}\Omega$
		$I_D = 10\text{A}$, $V_{GS} = 4.5\text{V}$		14.5	20	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=15\text{V}$, Frequency=1.0MHz		1021		pF
Output Capacitance	C_{oss}			273		pF
Reverse Transfer Capacitance	C_{rss}			166		pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DS} = 15\text{V}$, $R_L = 1.5\Omega$ $V_{GS} = 10\text{V}$, $R_G = 3\Omega$		4.4		ns
Rise Time	t_r			9		ns
Turn-OFF Delay Time	$t_{d(off)}$			17		ns
Fall Time	t_f			6		ns
Total Gate Charge	Q_g	$V_{DS} = 15\text{V}$, $V_{GS} = 10\text{V}$, $I_{DS} = 10\text{A}$		19.5		nC
	Q_{gs}			2.45		nC
	Q_{gd}			3.9		nC
Diode Forward Voltage	V_{FSD}	$I_S = 20\text{A}$, $V_{GS} = 0$		0.9	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.

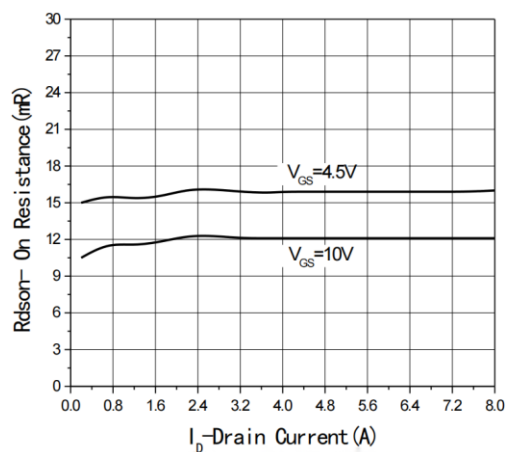
7. Typical electrical and thermal characteristics



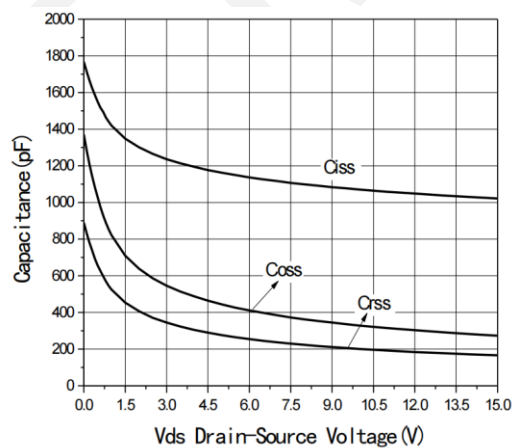
Output Characteristics



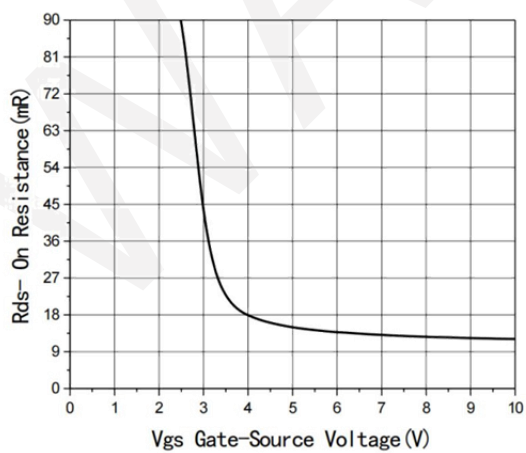
Typical Transfer Characteristics



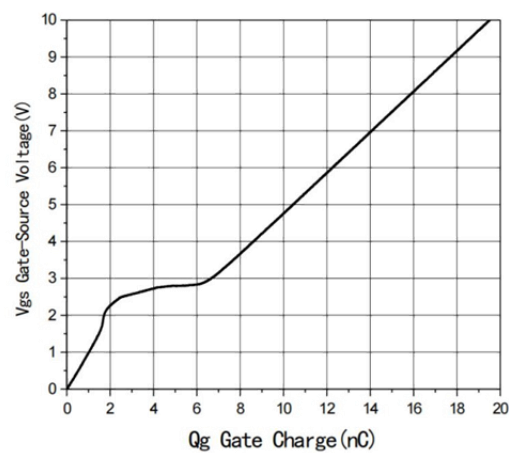
$R_{DS(on)}$ -Drain current



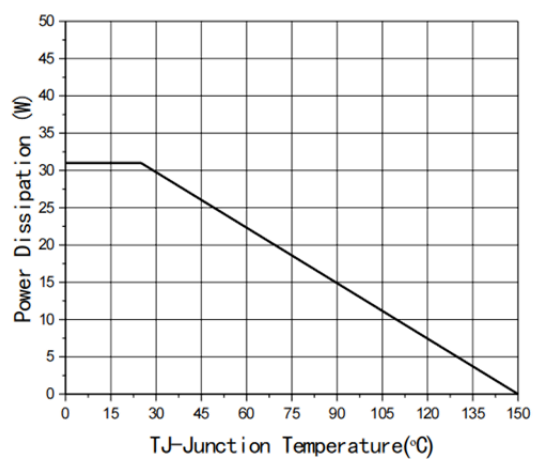
Capacitance vs V_{DS}



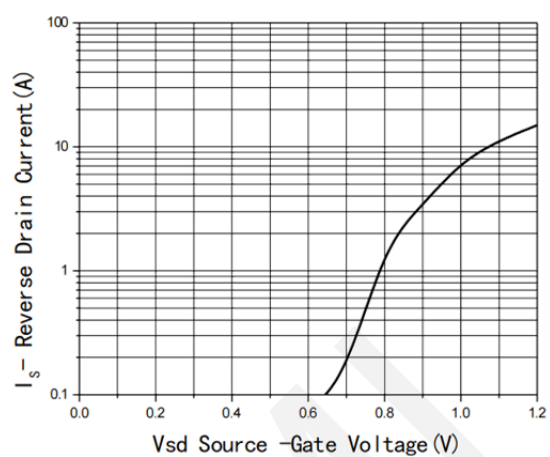
$R_{DS(on)}$ -Gate Drain voltage



Gate Charge



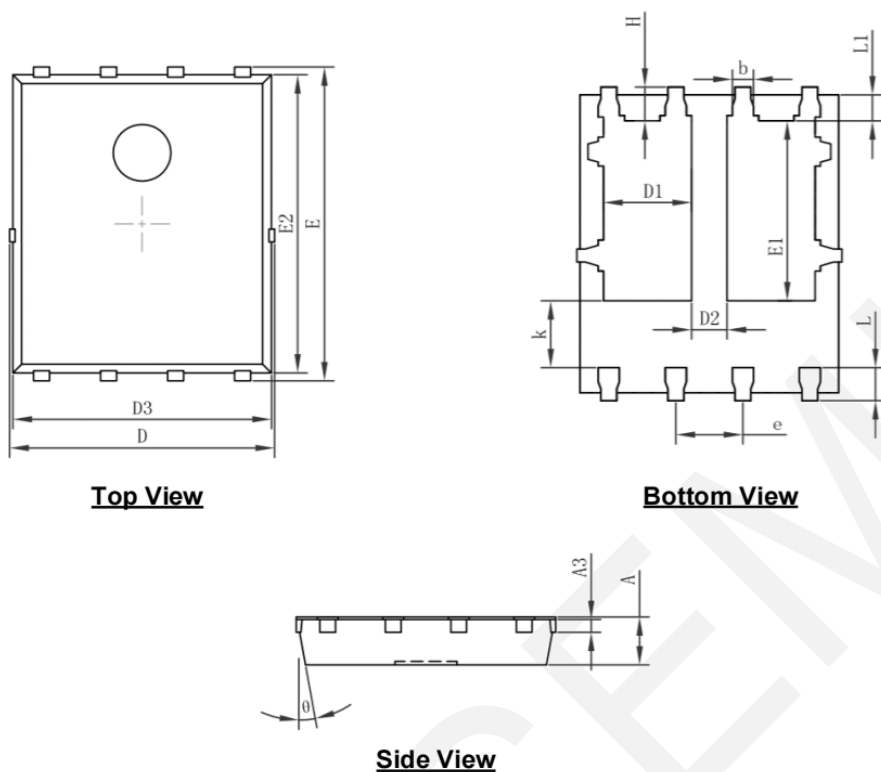
Power De-rating



Source-Drain Diode Forward



8.Package Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.154REF.		0.006REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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