



WANSEMI
万芯半导体

WP6070DPA

Enhancement Mode N-Channel Power MOSFET

PDFN5X6/NMOS/60V/ ± 20 V/1.85V/70A/7.2m Ω

Rev0.5

60V, 7.2mΩ, 70A, N-Channel MOSFET

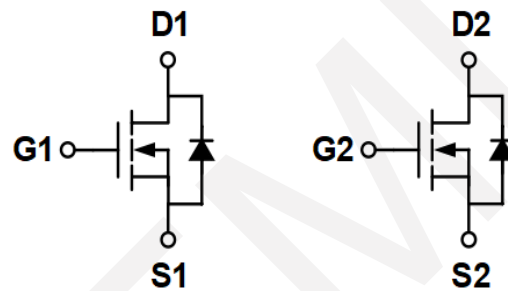
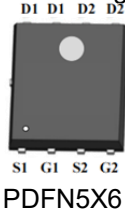
1.Features

- ◆ 60V MOSFET technology
- ◆ Low on-state resistance
- ◆ Fast switching
- ◆ $V_{GS} \pm 20V$
- ◆ 100% RG Tested
- ◆ 100% UIS Tested

V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
60V	7.2mΩ @ 10V	70A
	9.6mΩ @ 4.5V	

2.Applications

- ◆ Power Switching Application
- ◆ Load Switching



Schematic Diagram

Pin Description

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP6070DPA	6070D	PDFN5x6	5,000	50,000

4.Absolute Max Ratings at $T_a=25^\circ\text{C}$ (Note1)

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GSS}	± 20	V
Drain Current (DC)	I_D	70	A
Drain Current (Pulse), $PW \leq 300\mu s$	I_{DP}	280	A
Total Dissipation	P_D	60	W
Avalanche Energy, Single Pulsed	E_{AS}	121	mJ
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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	$R_{\theta JC}$	2.1	$^{\circ}\text{C/W}$

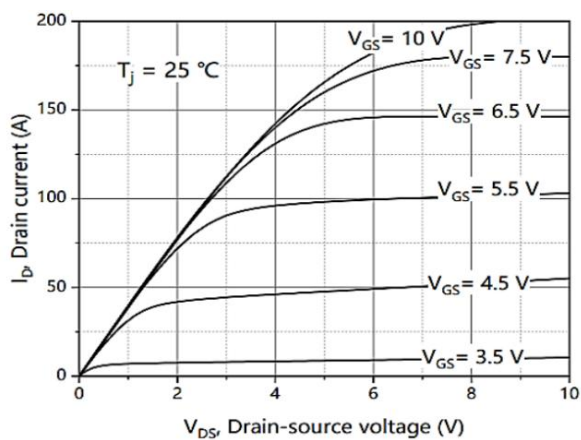
Note 2: When mounted on 1 inch square copper board $t \leq 10\text{sec}$ The value in any given application depends on the user's specific board design.

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

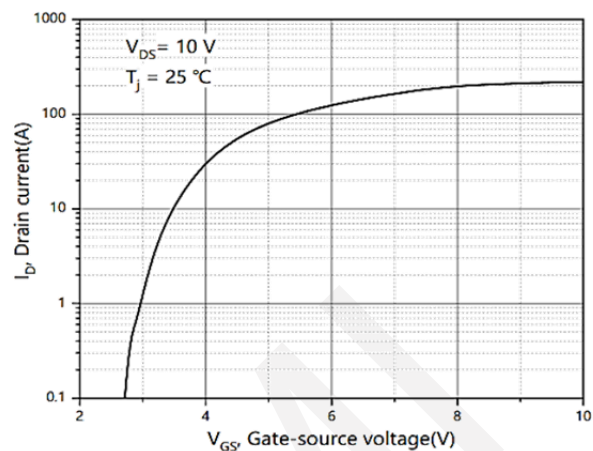
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	60	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$	-	-	1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=250\mu\text{A}$	1.2	1.85	2.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 20\text{A}$, $V_{GS} = 10\text{V}$	-	7.2	9.0	$\text{m}\Omega$
	$R_{DS(on)}$	$I_D = 10\text{A}$, $V_{GS} = 4.5\text{V}$	-	9.6	12	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=35\text{V}$, Frequency=1.0MHz	-	1182	-	pF
Output Capacitance	C_{oss}		-	199	-	pF
Reverse Transfer Capacitance	C_{rss}		-	4.1	-	pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DS} = 50\text{V}$, $I_D = 10\text{A}$ $V_{GS} = 10\text{V}$, $R_G = 2\Omega$	-	17.9	-	ns
Rise Time	t_r		-	4	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	34.9	-	ns
Fall Time	t_f		-	5.5	-	ns
Total Gate Charge	Q_g	$V_{DS} = 50\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 10\text{A}$	-	18.4	-	nC
	Q_{gs}		-	3.3	-	nC
	Q_{gd}		-	3.1	-	nC
Diode Forward Voltage	V_{FSD}	$I_S = 20\text{A}$, $V_{GS} = 0\text{V}$	-	-	1.3	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.

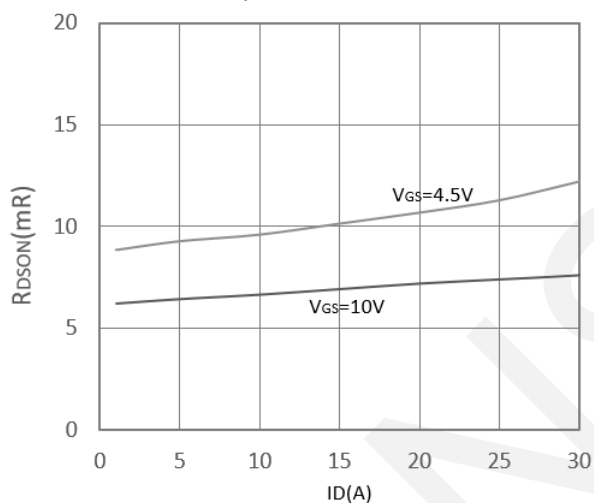
7. Typical electrical and thermal characteristics



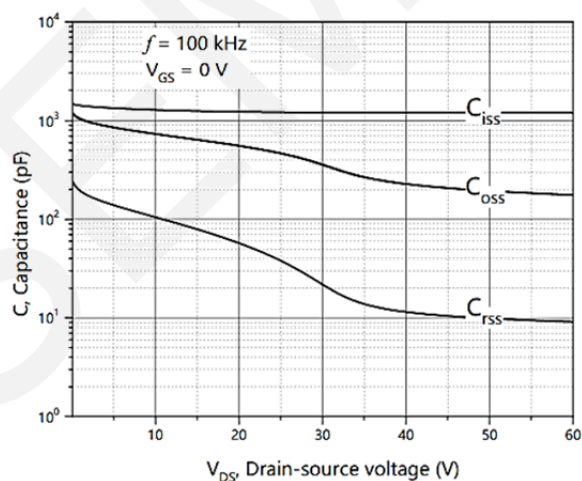
Output Characteristics



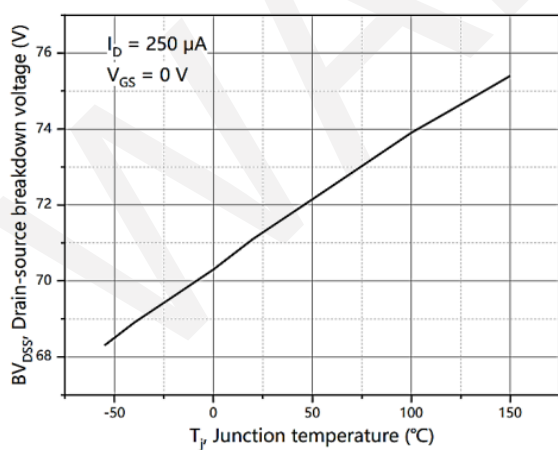
Typical Transfer Characteristics



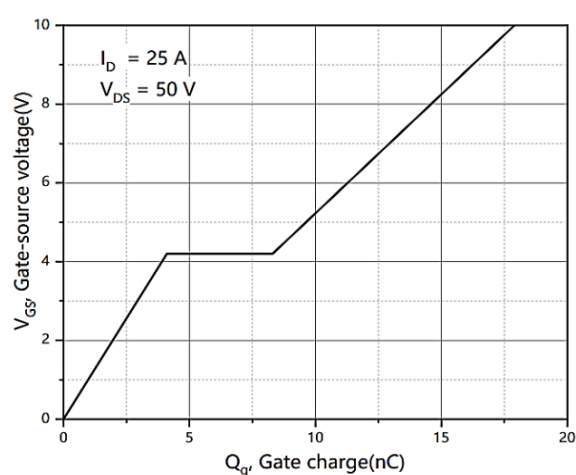
Rdson-Drain current



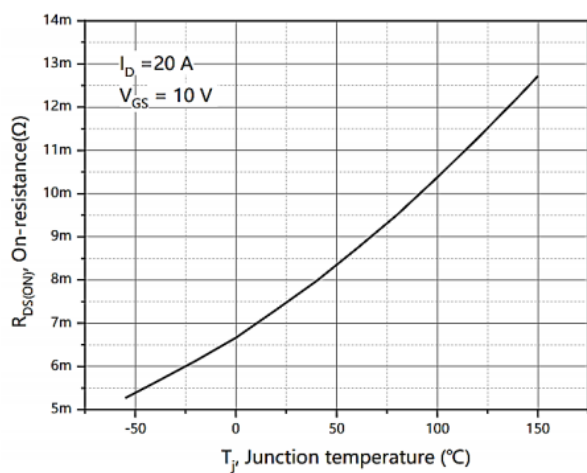
Capacitance vs Vds



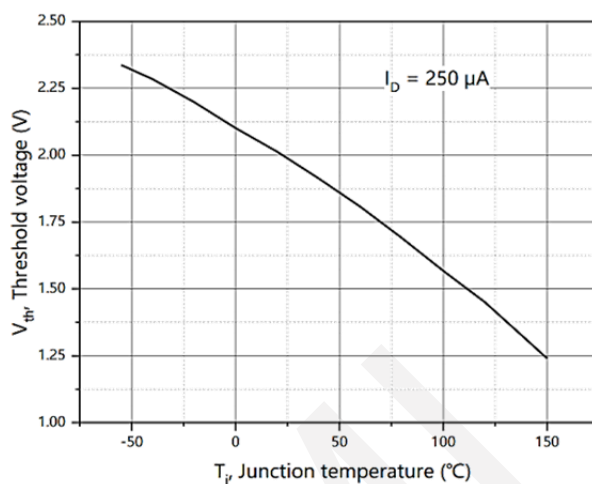
Drain-source breakdown voltage



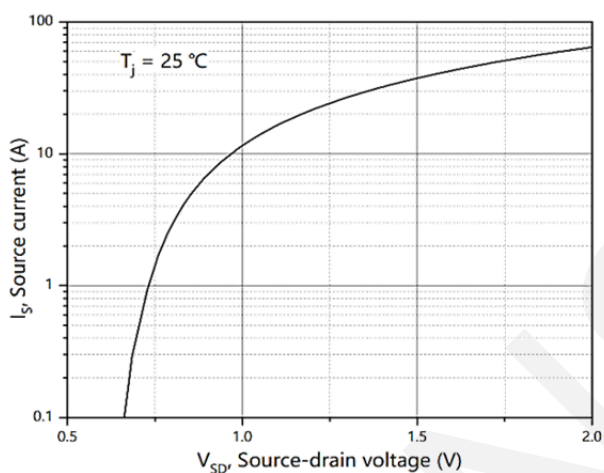
Gate Charge



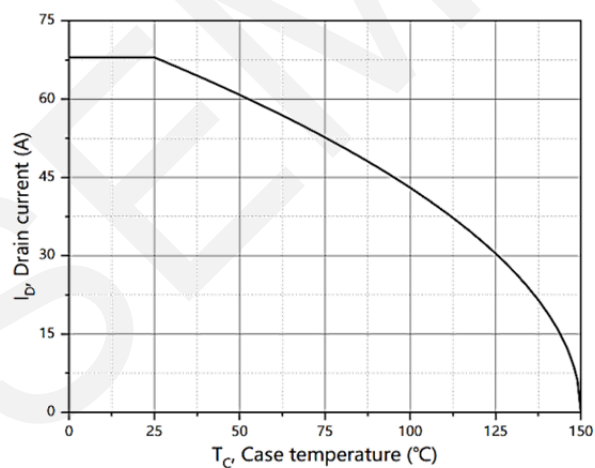
Drain-Rdson



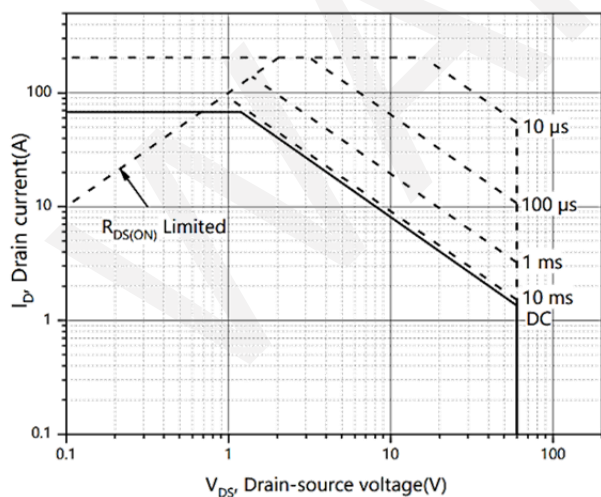
Threshold voltage



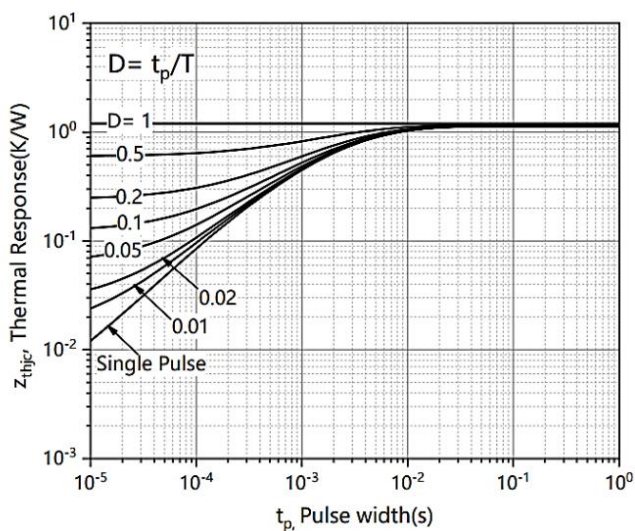
Forward characteristic of body diode



Drain current



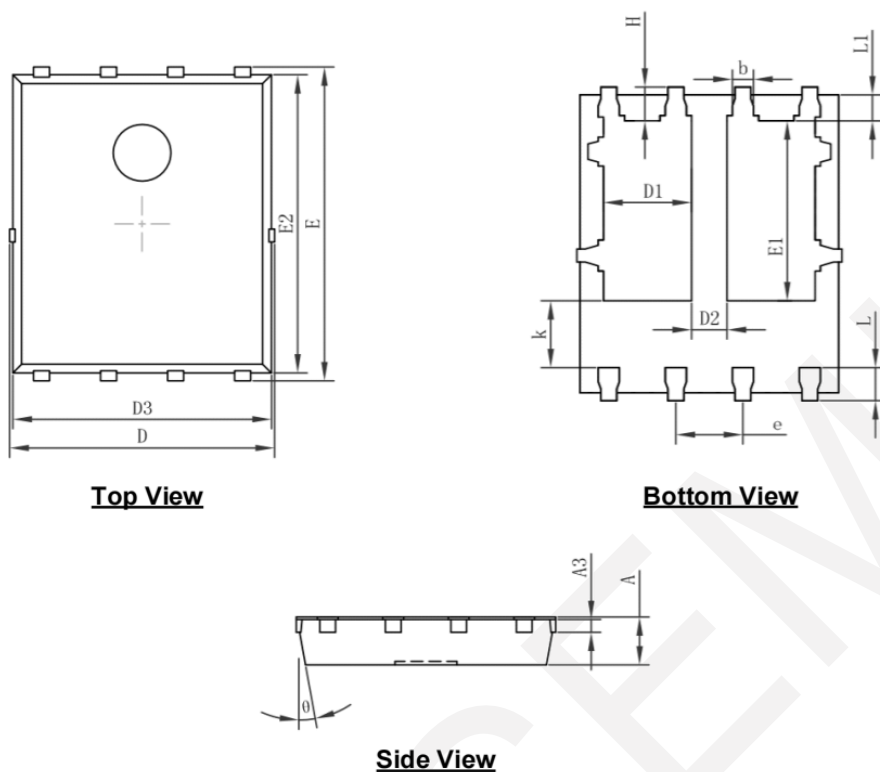
Safe operation area



Max.transient thermal impedance



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°

9. Important Notice

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