Enhancement Mode N-Channel Power MOSFET

PDFN5x6/NMOS/40V/±20V/1.95V/120A/4.3mΩ

Rev0.6

40V, 4.3mΩ, 120A, N-Channel Enhancement MOSFET

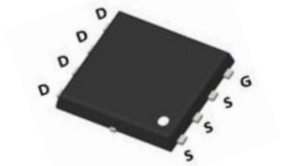
1.Features

- 40V MOSFET technology
- Low on-state resistance
- Fast switching
- Vgs±20V

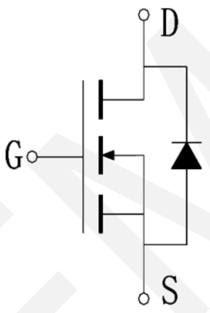
V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
40V	4.3mΩ @ 10V	120A
	6.5mΩ @ 4.5V	

2.Applications

- Power Switching Application
- Load Switching



PDFN5x6
Pin Description



Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP40H20APA	WP40H20APA	PDFN5X6	5,000	50,000

4.Absolute Max Ratings at Ta=25℃ (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	120	A
Drain Current (Pulse), PW≤300μs	I_{DP}	320	A
Total Dissipation	P_D	77	W
Avalanche Energy, Single Pulsed	E_{AS}	104	mJ
Junction Temperature	T_j	175	℃
Storage Temperature	T_{stg}	-55 to +175	℃

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

Parameter	Symbol	Value	Unit
Junction to Case	$R_{\theta JC}$	1.95	℃/W

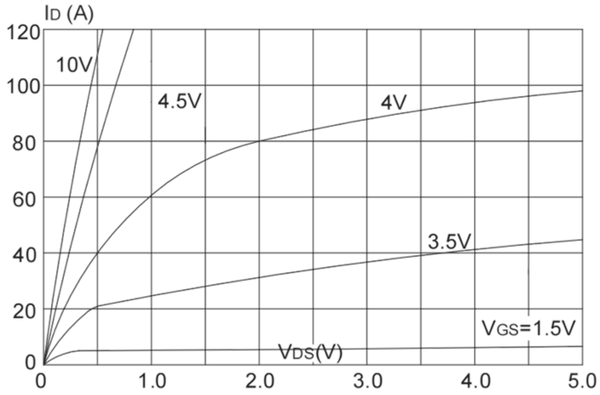
Note 2：When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

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

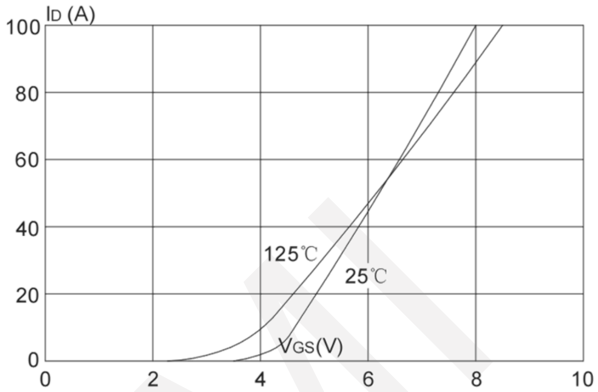
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0V	40			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} =40V, V_{GS} = 0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1.0	1.95	2.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D =30A, V_{GS} = 10V	-	4.3	5.5	mΩ
		I_D = 20A, V_{GS} = 4.5V	-	6.5	10	mΩ
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, Frequency=1.0MHz		3800		pF
Output Capacitance	C_{oss}			280		pF
Reverse Transfer Capacitance	C_{rss}			230		pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} = 20V,R_L =1Ω, V_{GS} = 10V, I_D = 30A, R_{GEN} =3Ω		8		ns
Rise Time	t_r			18		ns
Turn-OFF Delay Time	$t_{d(off)}$			24		ns
Fall Time	t_f			14		ns
Total Gate Charge	Q_g	V_{DS} =20V, V_{GS} = 10V, I_D =30A		57		nC
	Q_{gs}			9		nC
	Q_{gd}			11		nC
Diode Forward Voltage	V_{FSD}	I_S =30A, V_{GS} = 0		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.

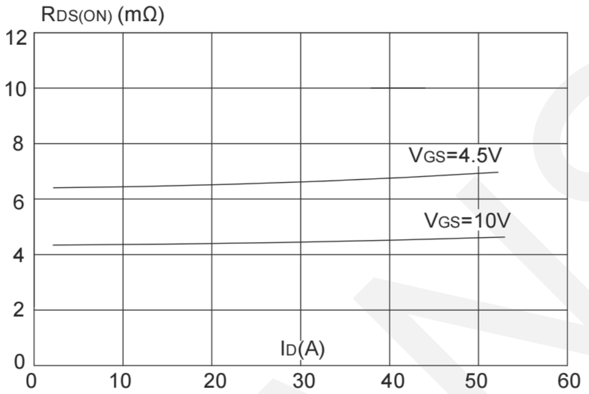
7.Typical electrical and thermal characteristics



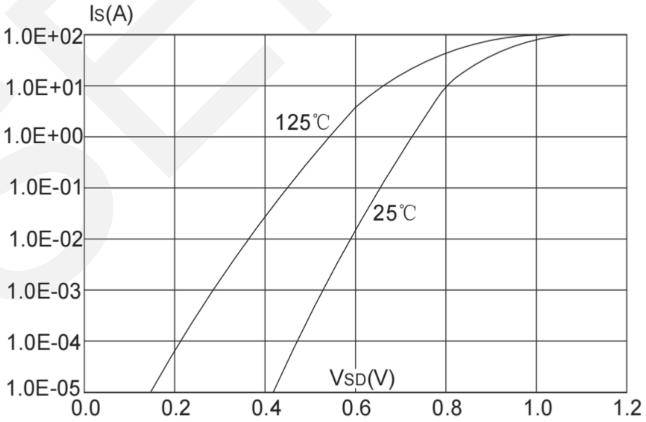
Output Characteristics



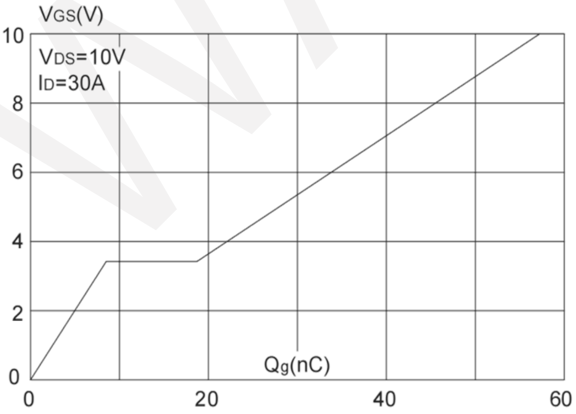
Typical Transfer Characteristics



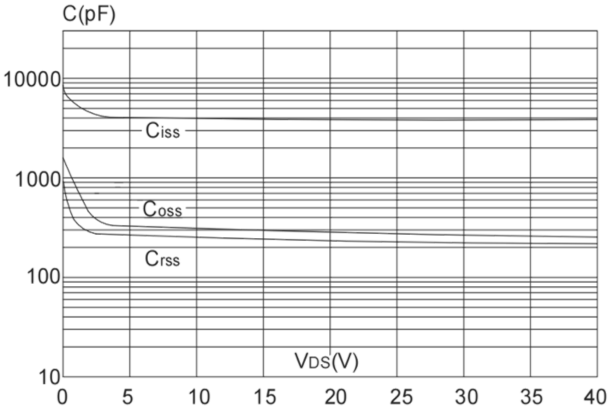
On-resistance vs. Drain Current



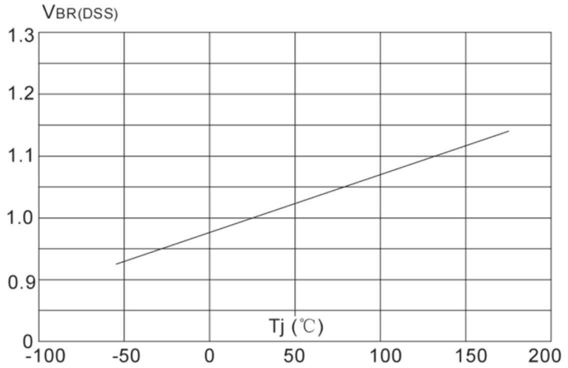
Body Diode Characteristics



Gate Charge Characteristics

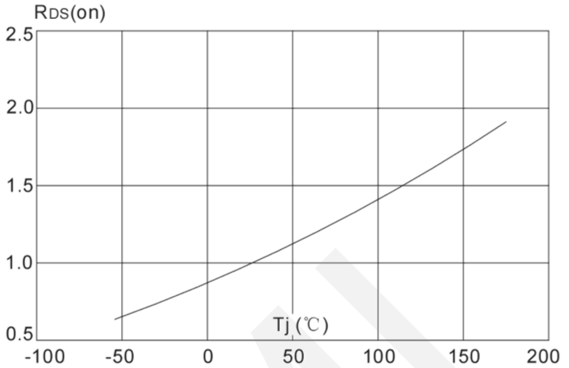


Capacitance Characteristics



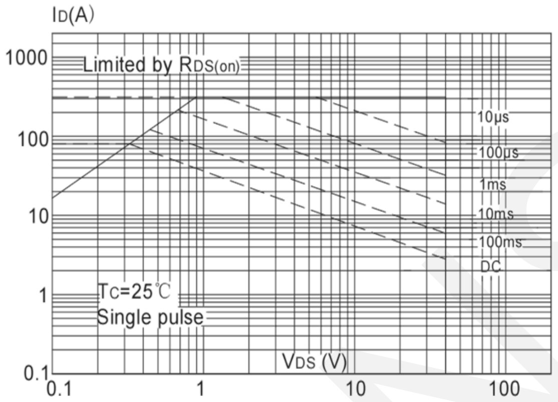
Normalized Breakdown Voltage vs.

Junction Temperature

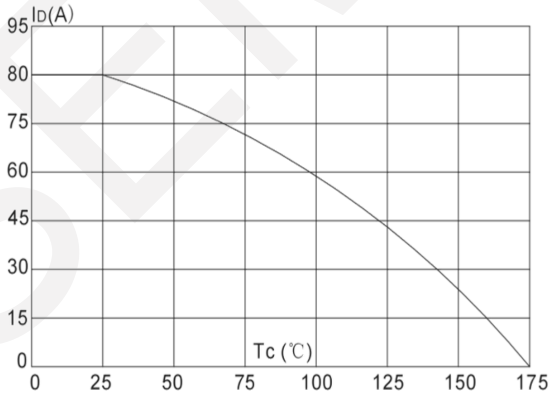


Normalized on Resistance vs.

Junction Temperature

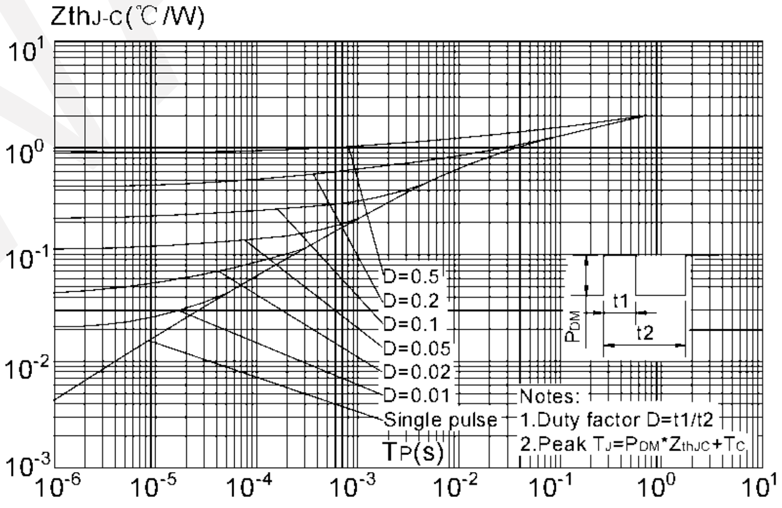


Maximum Safe Operating Area



Maximum Continuous Drain Current vs.

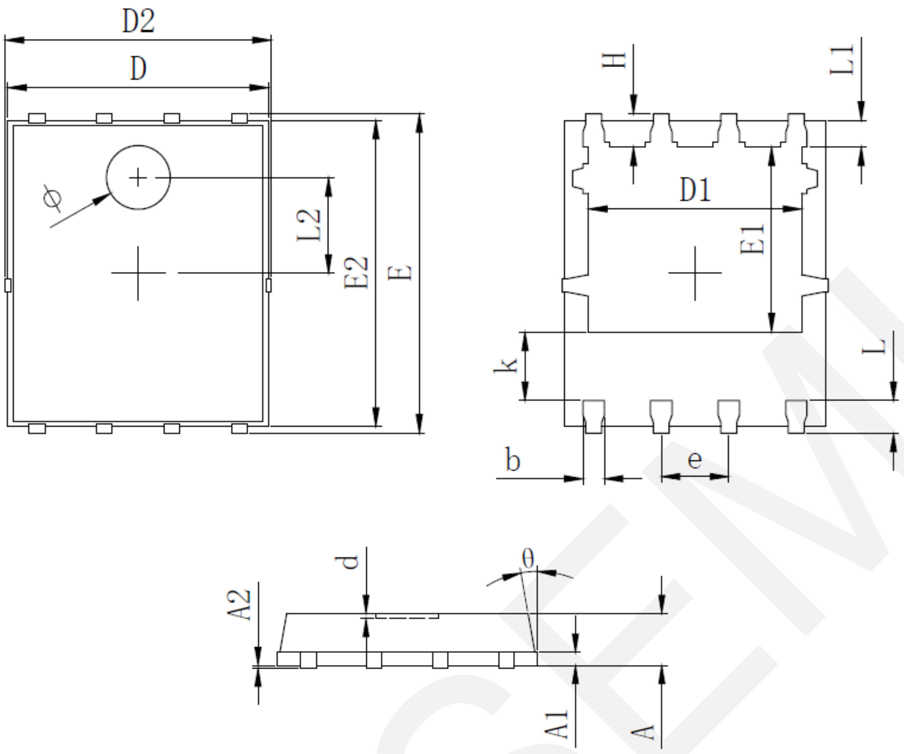
Case Temperature



Maximum Effective Transient

Thermal Impedance, Junction-to-Case

8.Package Dimensions



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0~0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100

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