

30V_{DS}/±20V_{GS} N-Channel Enhancement Mode MOSFET

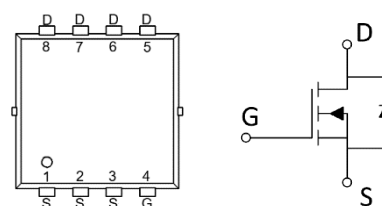
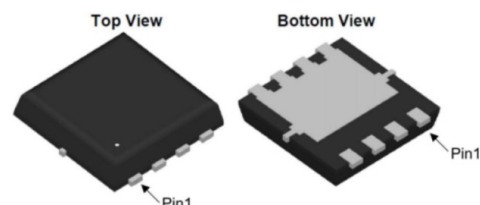
Features

- $V_{DS}=30V, I_D=50A$
- $R_{DS(ON)}=10m\Omega$ (TYP.) $V_{GS}=10V$
- $R_{DS(ON)}=16m\Omega$ (TYP.) $V_{GS}=4.5V$
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

PDFN5060



Ordering Information

Temperature Range	Package		Orderable Device	Package Qty.
-55℃~+125℃	PDFN5060	Pb-Free	HAN3050	5000pcs/Reel

Absolute Maximum Ratings ($T_C=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS}=0V$)	V_{DS}	30	V
Gate-Source Voltage ($V_{GS}=0V$, static)	V_{GS}	±20	V
Continuous Drain Current ($T_C=25^{\circ}C$)	I_D	50	A
Continuous Drain Current ($T_C=100^{\circ}C$)		32	A
Pulsed Drain Current	I_{DM}	150	A
Continuous Drain Current ($T_A=25^{\circ}C$)	I_{DSM}	32	A
Continuous Drain Current ($T_A=70^{\circ}C$)		22	A
Avalanche Current	I_{AS}	31	A
Single Pulsed Avalanche Energy	E_{AS}	24	mJ
V_{DS} Spike 100ns	V_{SPIKE}	34	V
Maximum Power Dissipation ($T_C=25^{\circ}C$)	P_D	54	W
Maximum Power Dissipation ($T_C=100^{\circ}C$)		22	W
Maximum Power Dissipation ($T_A=25^{\circ}C$)	P_{DSM}	4.1	W
Maximum Power Dissipation ($T_A=70^{\circ}C$)		2.6	W
Operating, Storage Temperature Range	T_J, T_{STG}	-55~150	℃

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	-	2.3	-	$^{\circ}\text{C}/\text{W}$
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	-	30	-	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.8	2.2	V
Drain-Source On-stage Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	10	15	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	16	21	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{DS}=15V$ $V_{GS}=0V$ $f=1\text{MHz}$	-	1856	-	pF
Output capacitance	C_{oss}		-	577	-	
Reverse transfer capacitance	C_{rss}		-	165	-	
Gate Resistance	R_g	$f=1\text{MHz}$	-	1.5	-	Ω
Total Gate Charge	Q_g	$V_{DS}=15V$ $V_{GS}=10V$ $I_D=20A$	-	15.9	-	nC
Gate Source Charge	Q_{gs}		-	2.9	-	
Gate Drain Charge	Q_{gd}		-	3.3	-	
Turn-on delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=15V$ $R_L=0.75\Omega$ $R_G=3\Omega$	-	6.3	-	ns
Rise time	t_r		-	2.7	-	
Turn-off delay Time	$t_{d(off)}$		-	18.6	-	
Fall time	t_f		-	4.2	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=1A$	-	0.7	1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{SD}=20A$ $dI/dt=500A/\mu s$	-	10.4	-	ns
Reverse Recovery Charge	Q_{rr}		-	13.5	-	nC

Electrical Characteristics Diagrames

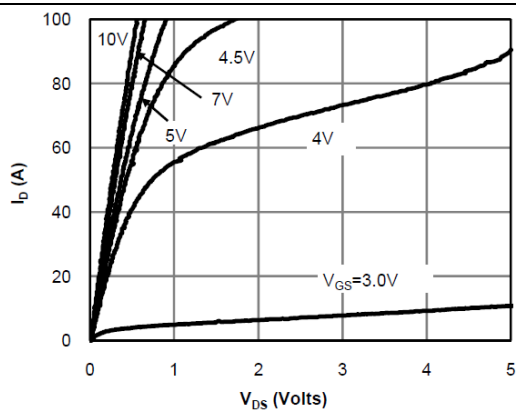
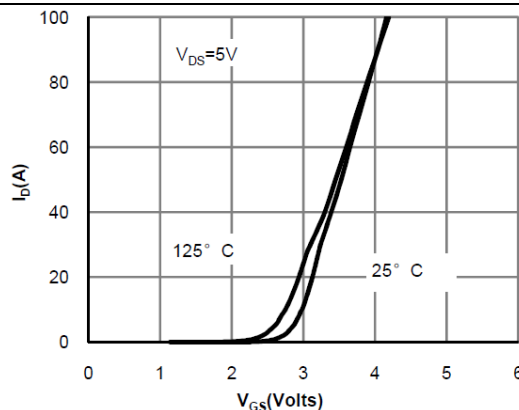
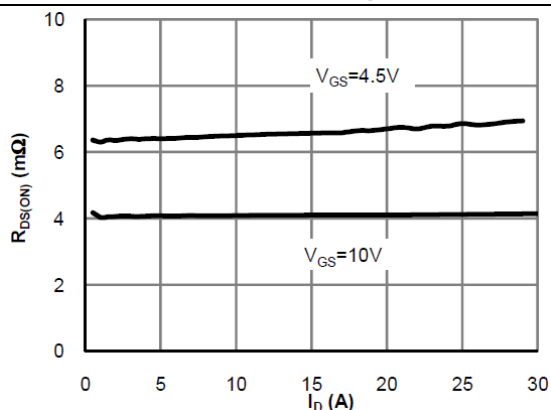
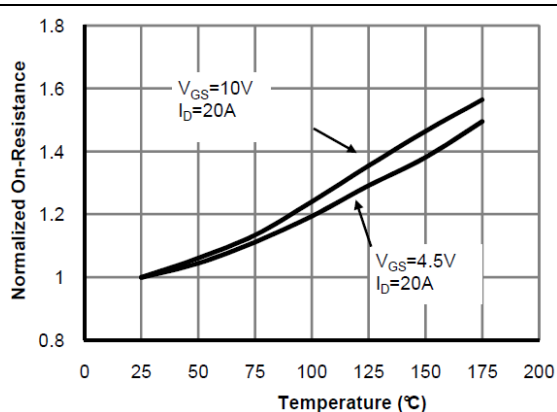
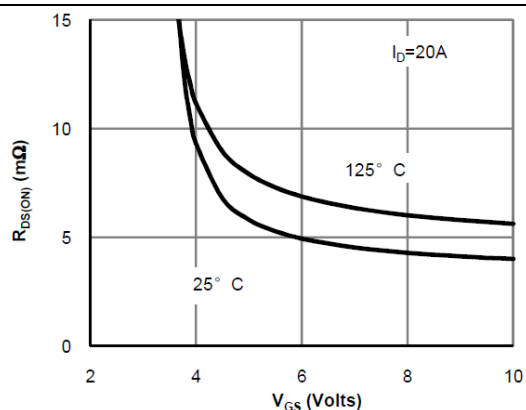
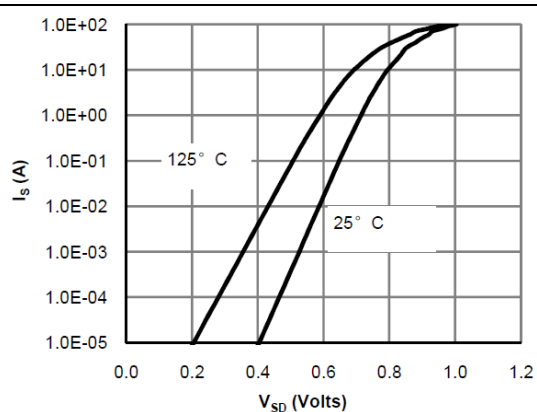
Figure 1. On-Regin Characteristics

Figure 2. Transfer Characteristics

Figure 3. On-Resistance vs. Drain Current and Gate Voltage

Figure 4. On-Resistance vs. Junction Temperature

Figure 5. On-Resistance vs. Gate-Source Voltage

Figure 6. Body-Diode Characteristics


Figure 7. Gate-Charge Characteristics

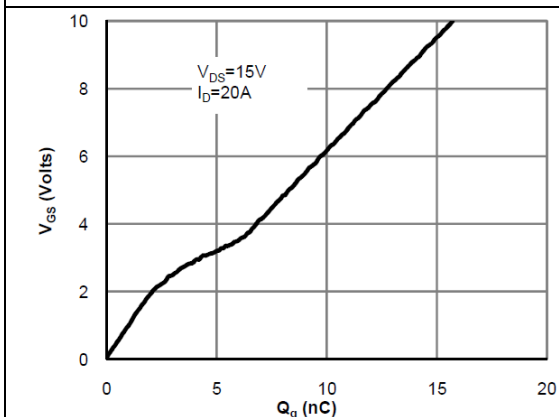


Figure 8. Capacitance Characteristics

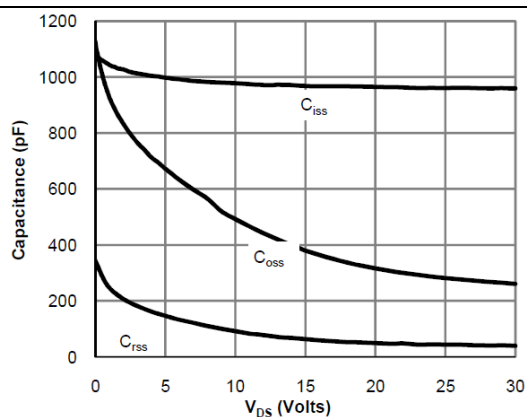


Figure 9. Maximum Forward Biased Safe Operating Area

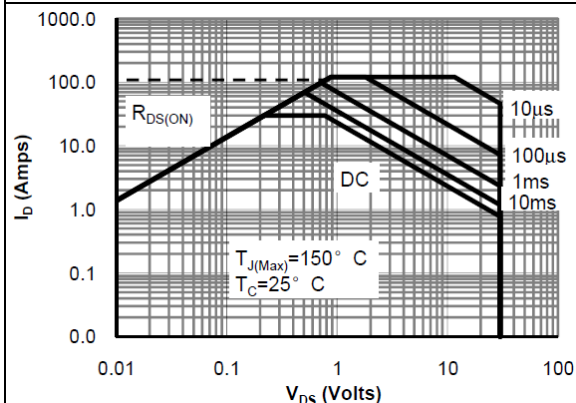


Figure 10. Single Pulse Power Rating Junction-to-Case

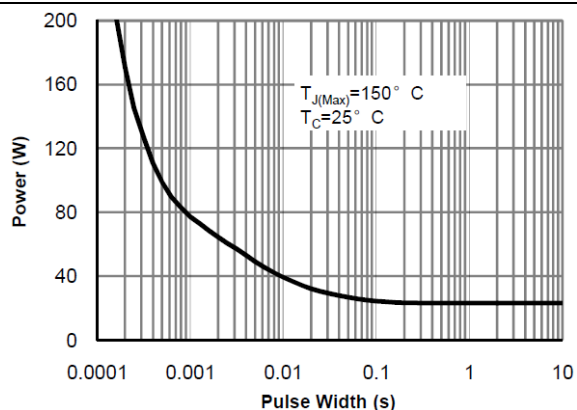


Figure 11. Normalized Maximum Transient Thermal Impedance

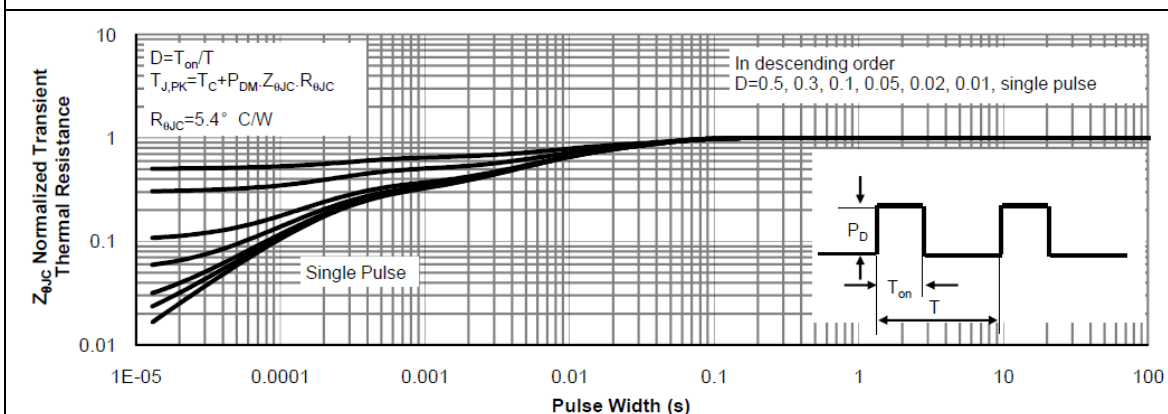
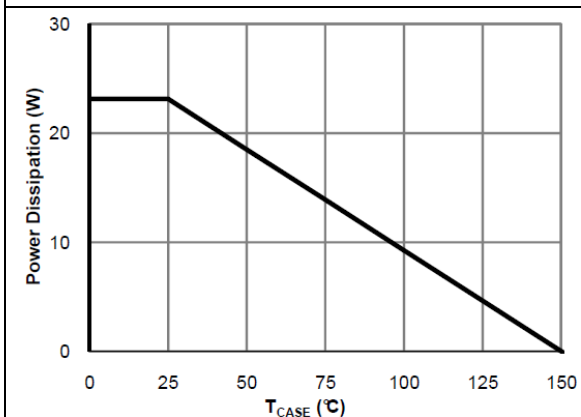
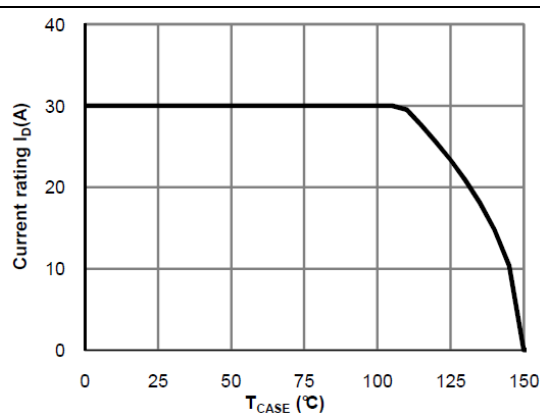
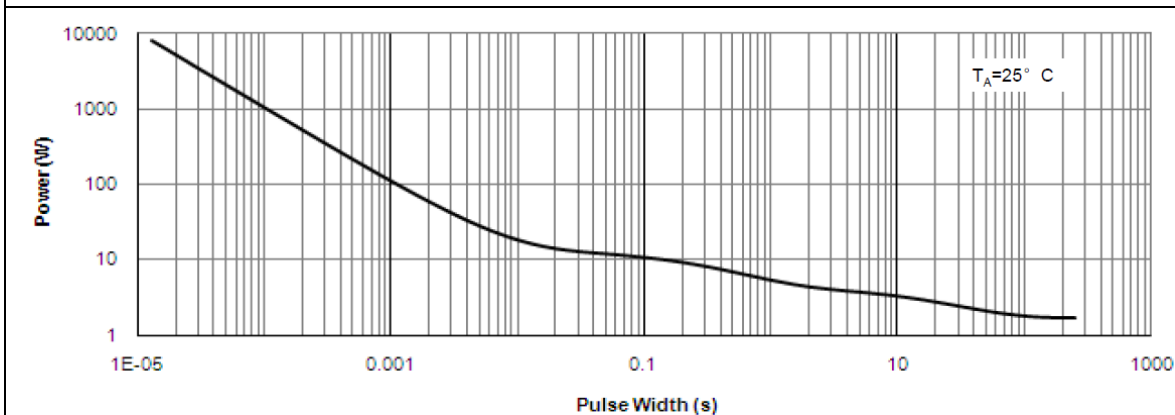
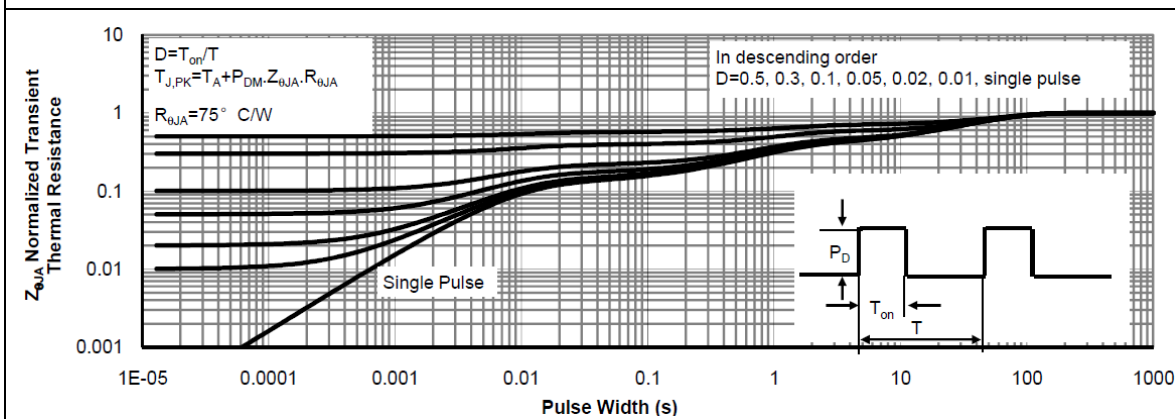
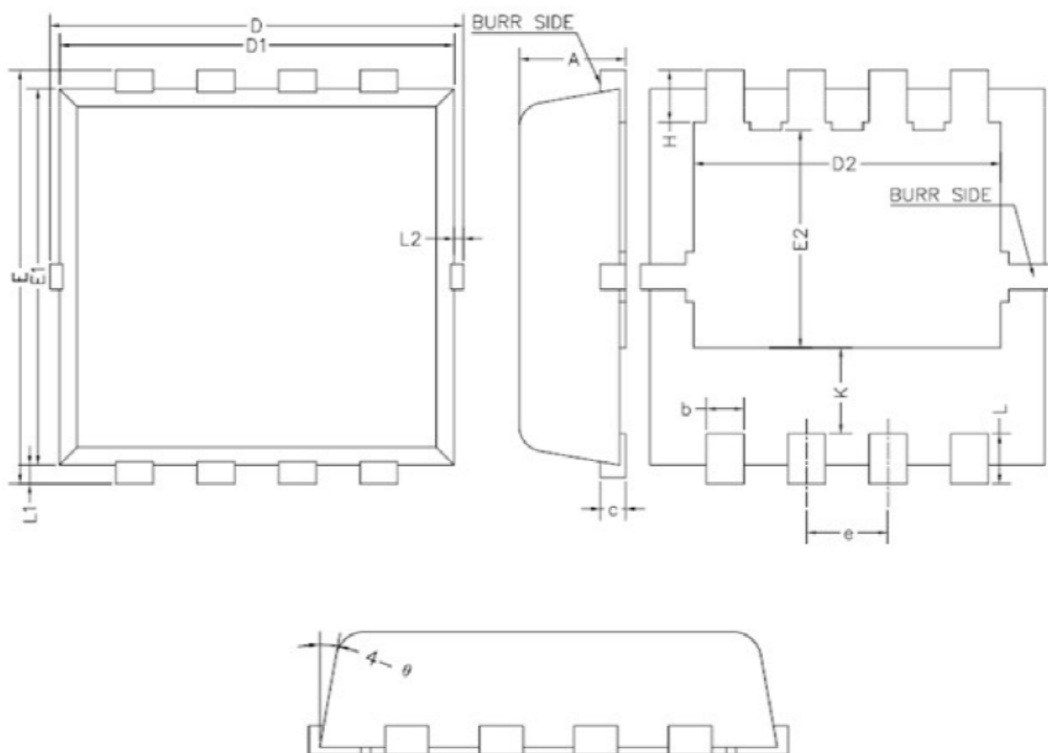


Figure 12. Power De-rating

Figure 13. Current De-rating

Figure 14. Single Pulse Power Rating Junction-to-Ambient

Figure 15. Normalized Maximum Transient Thermal Impedance


Physical Dimensions

PDFN5060



符号	尺寸 (mm)			符号	尺寸 (mm)		
	最小值	典型值	最大值		最小值	典型值	最大值
A	0.90	1.00	1.10	E1	5.70	5.75	5.80
b	0.33	0.41	0.51	E2	3.38	3.58	3.78
c	0.20	0.25	0.30	H	0.41	0.51	0.61
D	4.80	4.90	5.00	K	1.10	-	-
D1	3.61	3.81	3.96	L	0.51	0.61	0.71
e	1.27BSC			L1	0.06	0.13	0.20
E	5.90	6.00	6.10	θ	0°	-	12°

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