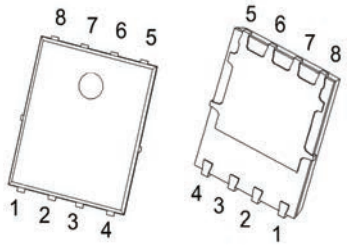
N-Channel MOSFET

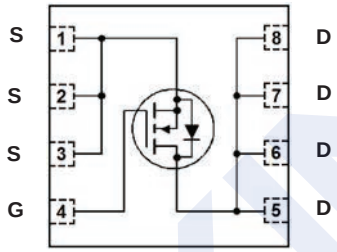
2KK5087DFN

PDFN5x6-8



■ Features

- V_{DS} = 120 V
- I_D (at V_{GS}=10V) = 60 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) < 7.0 mΩ



■ Absolute Maximum Ratings (T_J = 25℃ unless otherwise noted)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	120	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (Note 1)	T_C = 25℃	I_D	60	A
	T_C = 100℃		38	
Pulsed Drain Current (Note 2)		I_{DM}	240	
Avalanche Energy (Note 3)		E_{AS}	350	mJ
Thermal Resistance, Junction- to-Ambient		$R_{\theta JA}$	48	℃/W
Thermal Resistance, Junction- to-Case		$R_{\theta JC}$	2.4	
Power Dissipation	T_C = 25℃	P_D	51.6	W
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Notes:

1. Drain current limited by maximum junction temperature
2. Repetitive Rating : Pulse width limited by maximum junction temperature
3. L = 0.4 mH, V_{DD} = 50 V, R_G = 25 Ω, Starting T_j = 25 °C

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■ Electrical Characteristics (Tc = 25℃ unless othewise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	120			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 120 V, V_{GS} = 0 V			1	μA
		V_{DS} = 120 V, V_{GS} = 0 V, T_J=55℃			5	
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	1.0		3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 20 A		6.0	7.0	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 20 A		80		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 60 V, f = 1 MHz		4913		pF
Output Capacitance	C_{oss}			404		
Reverse Transfer Capacitance	C_{rss}			14		
Switching Characteristics						
Total Gate Charge	Q_g	V_{GS} = 10V, V_{DS} = 60 V, I_D = 20 A (Note 4,5)		67		nC
Gate Source Charge	Q_{gs}			13		
Gate Drain Charge	Q_{gd}			10		
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 60 V, I_D = 20 A, R_G = 10 Ω (Note 4,5)		23		ns
Turn-On Rise Time	t_r			42		
Turn-Off DelayTime	$t_{d(off)}$			110		
Turn-Off Fall Time	t_f			51		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t_{rr}	I_F = 20A, dI/dt = 380 A/μs		60		ns
Body Diode Reverse Recovery Charge	Q_{rr}			393		nC
Maximum Body-Diode Continuous Current	I_S			60		A
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 20 A		0.81		V

Notes:

4. I_{SD} ⩽ 100 A, di/dt = 100 A/μs, V_{DD} ⩽ BV_{DSS}, Staring T_j =25 °C
5. Pulse Test : Pulse width ⩽ 300 μs, Duty cycle ⩽ 2%
6. Essentially independent of operating temperature

■ Marking

Marking	K5087 KC***

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■ Typical Characterisitics

Fig.1 Power Dissipation Derating Curve

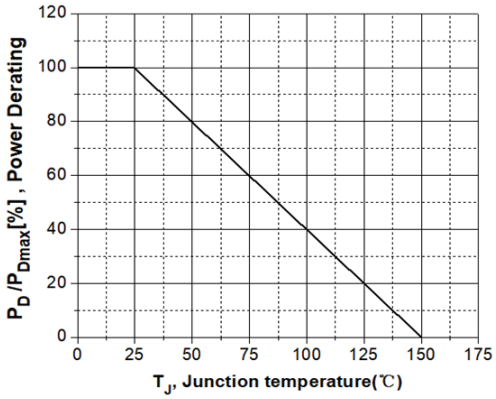

Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

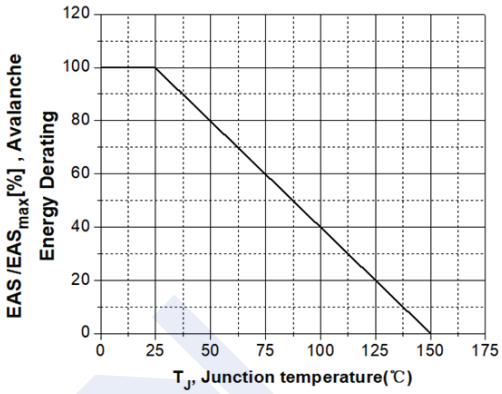

Fig.3 Typical Output Characteristics

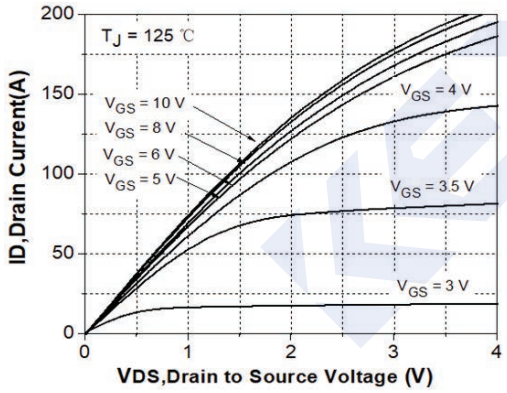

Fig. 4 Transconductance vs. Drain Current

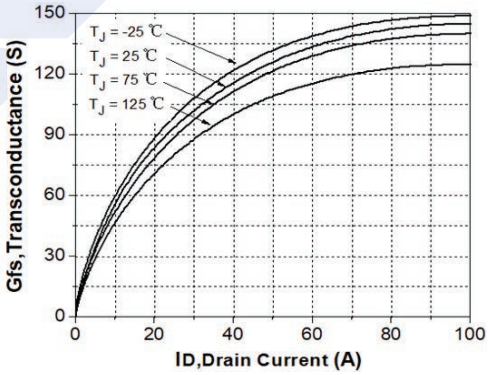

Fig.5 Typical Transfer Characteristics

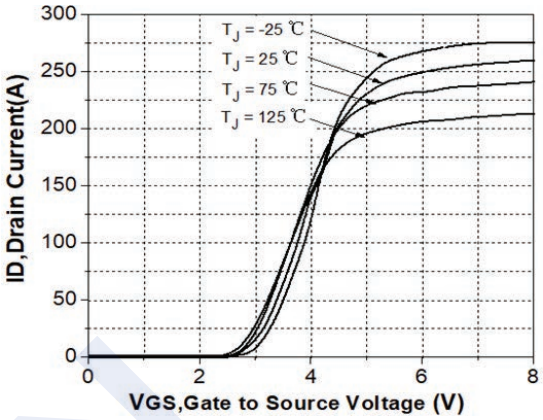

Fig. 6 State Resistance vs. Drain Current @-25℃

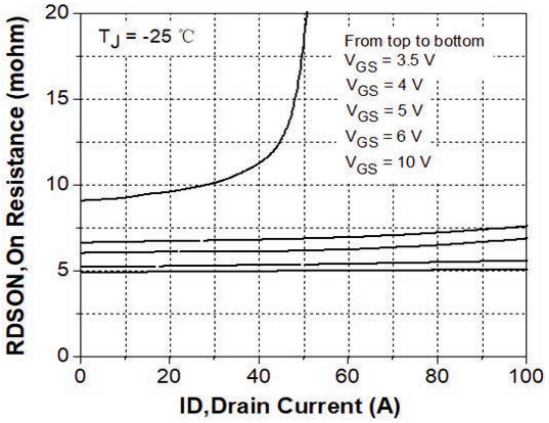

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Fig.7 State Resistance vs. Drain Current @25℃

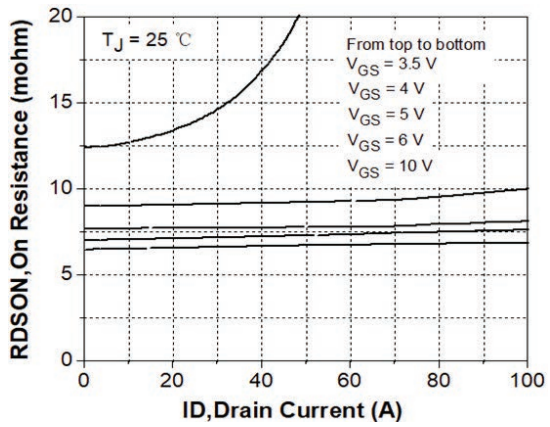

Fig. 8 State Resistance vs. Drain Current @125℃

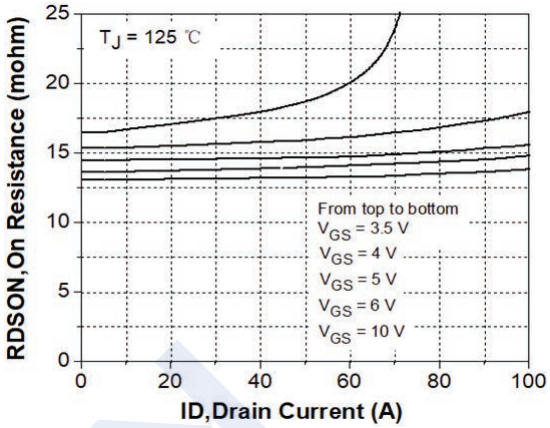

Fig.9 Typical Capacitance vs. Drain Source Voltage

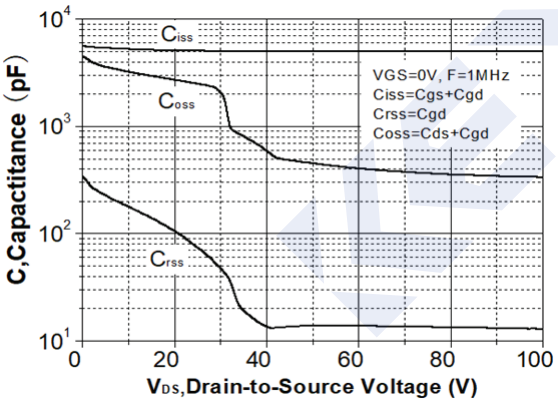

Fig.10 Dynamic Input Characteristics

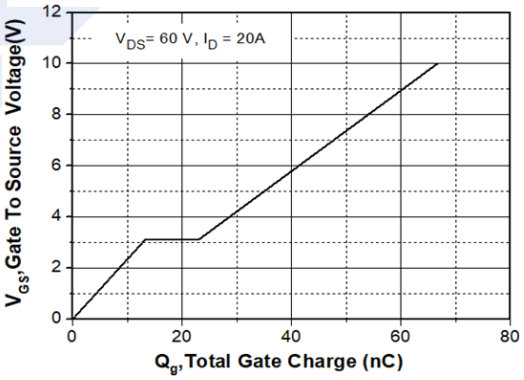

Fig.11 Breakdown Voltage vs. Junction Temperature

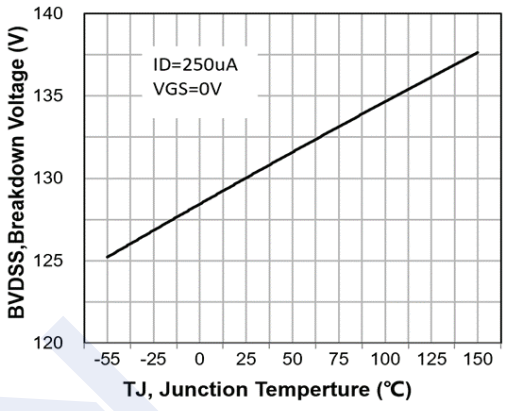

Fig. 12 Gate Threshold Voltage vs. Junction Temperature

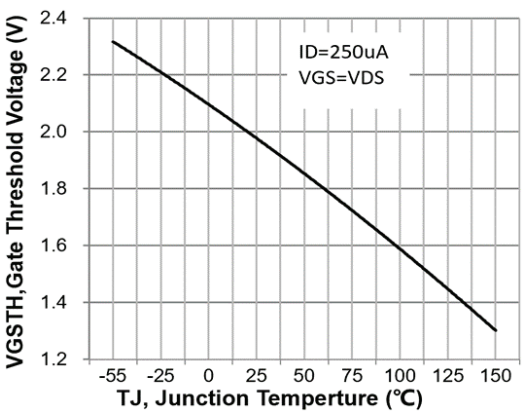

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Fig.13 On-Resistance Variation vs. Junction

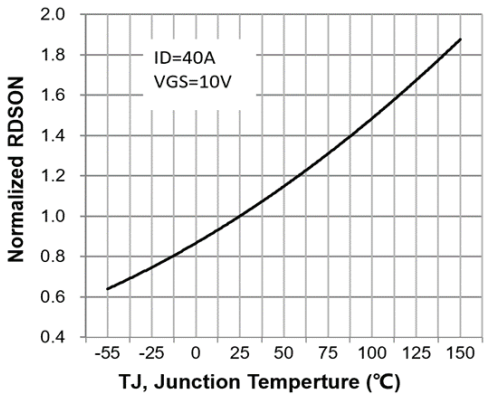


Fig.14 Maximum Drain Current vs.Case Temperature

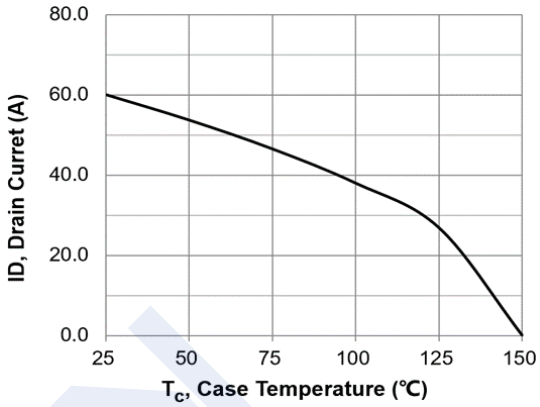


Fig.15 Body Diode Forward Voltage vs. Reverse Drain Current

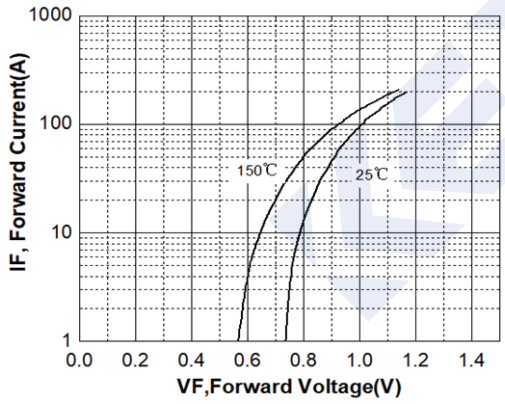


Fig.16 Safe Operating Area

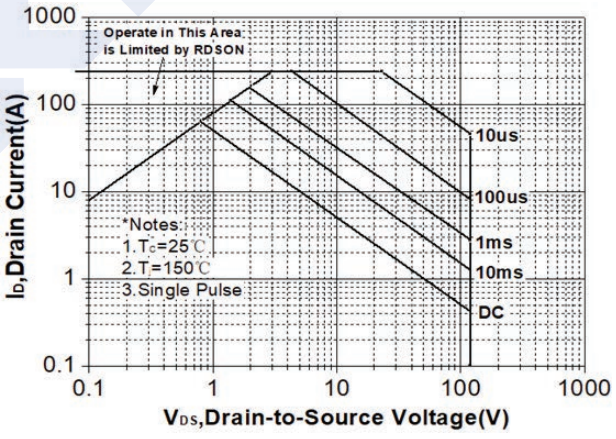
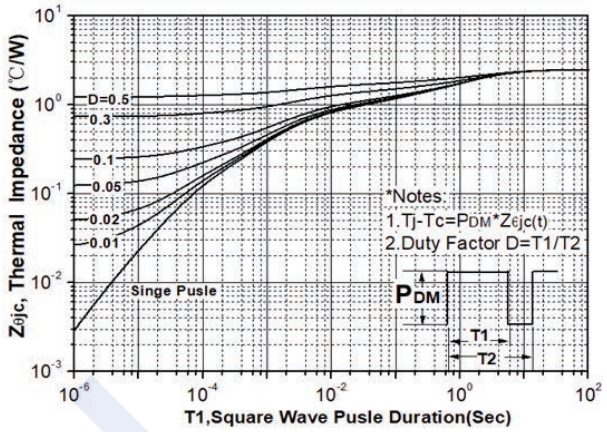


Fig. 17 Transient Thermal Response Curve



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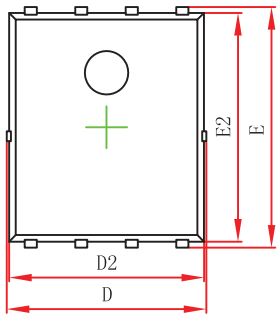
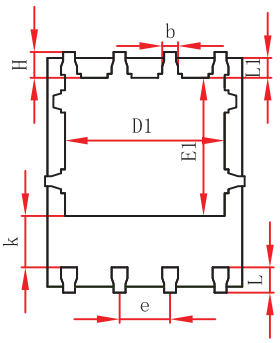
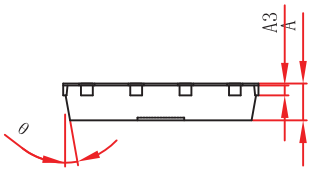
■ PDFN5x6-8 Package Outline Dimensions



Top View



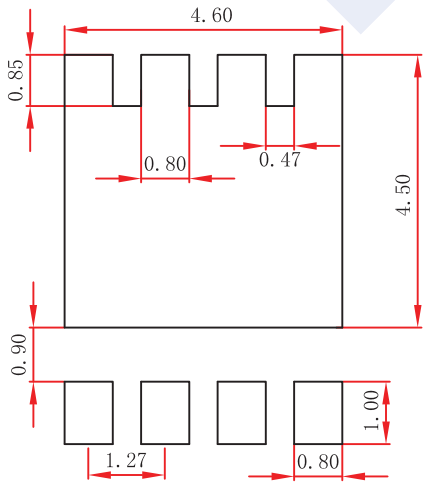
Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	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°

■ PDFN5x6-8 Suggested Pad Layout



Note:
1.Controlling dimension: in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.