

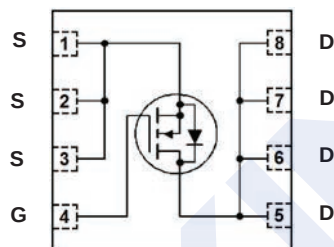
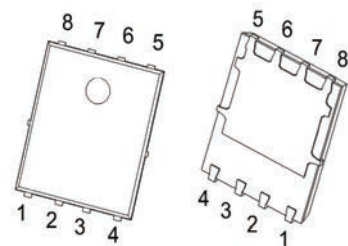
N-Channel MOSFET

2KK5087DFN

■ Features

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

PDFN5x6-8

■ Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ 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)	I_D	60	A
		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	$^\circ\text{C/W}$
Thermal Resistance, Junction- to-Case	$R_{\theta JC}$	2.4	
Power Dissipation	P_D	51.6	W
Junction Temperature	T_J	150	$^\circ\text{C}$
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. $L = 0.4\text{ mH}$, $V_{DD} = 50\text{ V}$, $R_G = 25\text{ }\Omega$, Starting $T_J = 25\text{ }^\circ\text{C}$

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■ Electrical Characteristics (Tc = 25°C unless otherwise 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 Characteristics

Fig.1 Power Dissipation Derating Curve

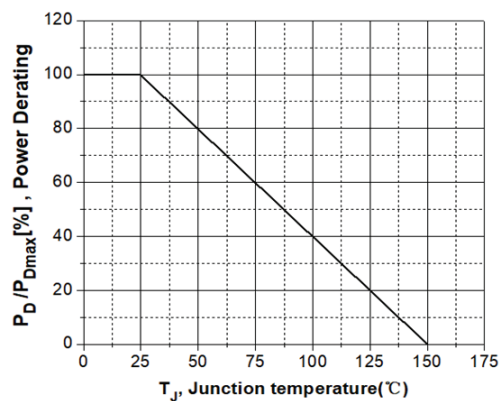


Fig.2 Avalanche Energy Derating Curve vs. Junction Temperature

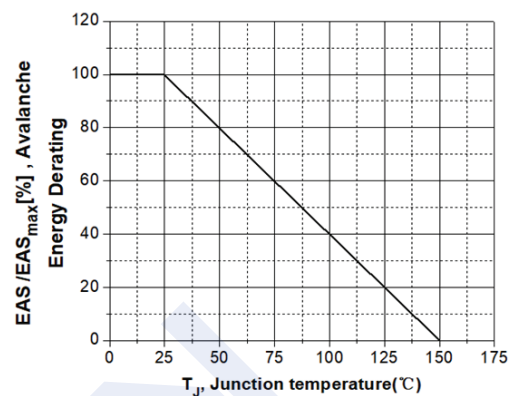


Fig.3 Typical Output Characteristics

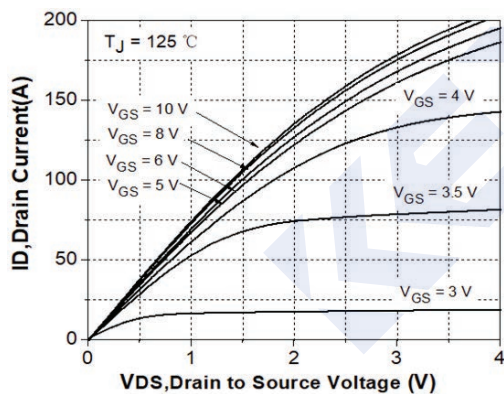


Fig. 4 Transconductance vs. Drain Current

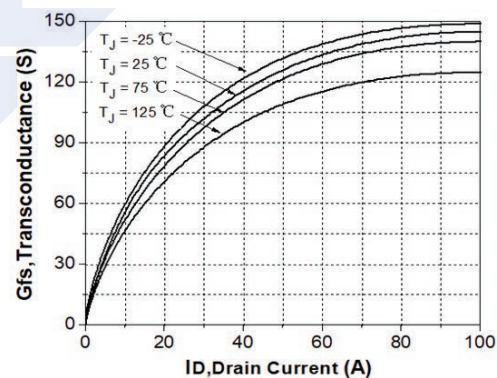
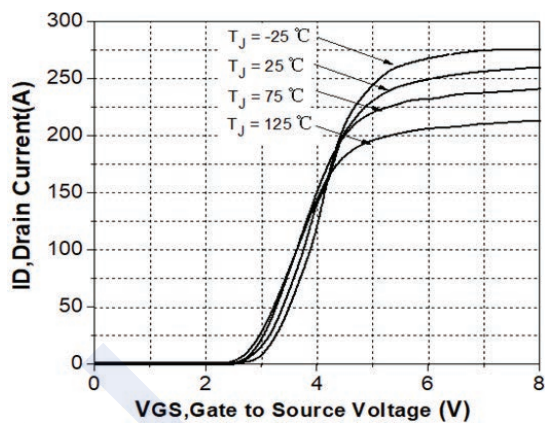
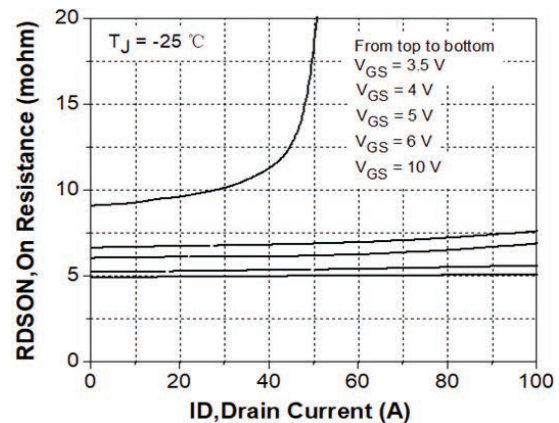


Fig.5 Typical Transfer Characteristics

Fig. 6 State Resistance vs. Drain Current @ -25°C 

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Fig.7 State Resistance vs. Drain Current @25°C

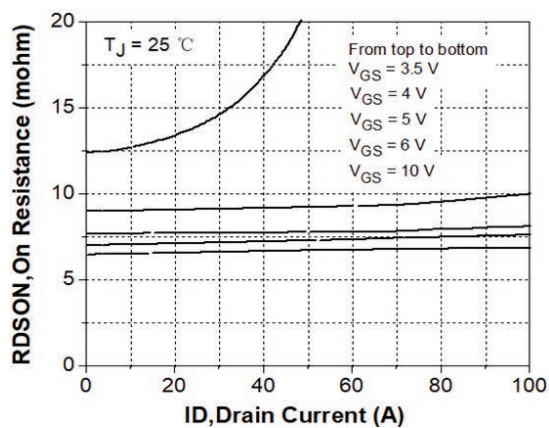


Fig. 8 State Resistance vs. Drain Current @125°C

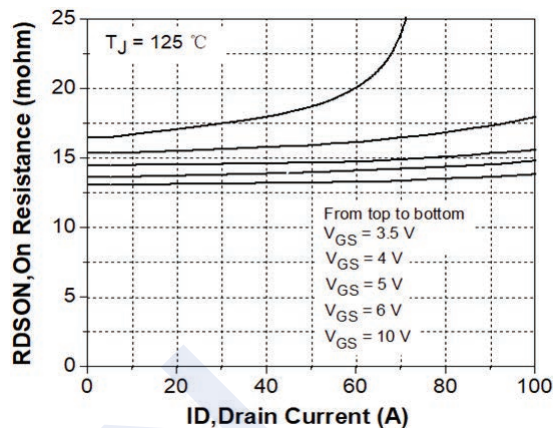


Fig.9 Typical Capacitance vs. Drain Source Voltage

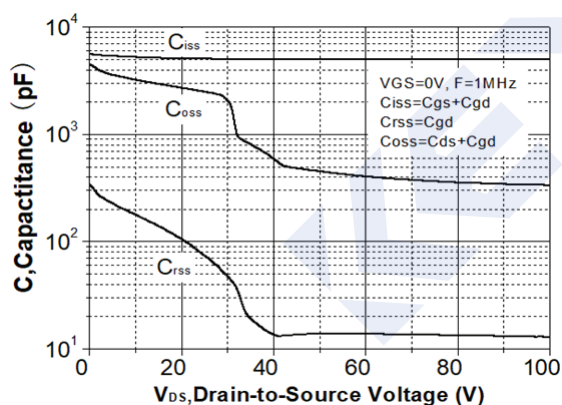


Fig.10 Dynamic Input Characteristics

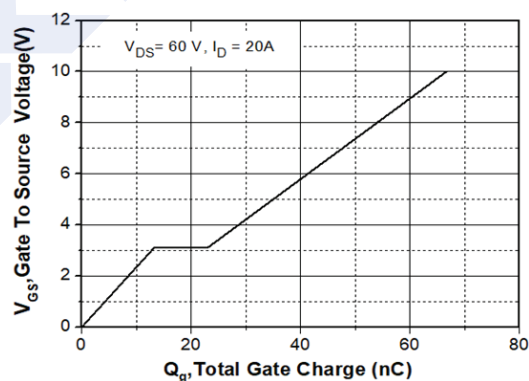


Fig.11 Breakdown Voltage vs. Junction Temperature

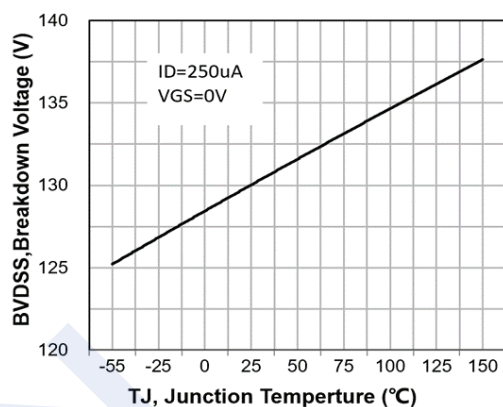
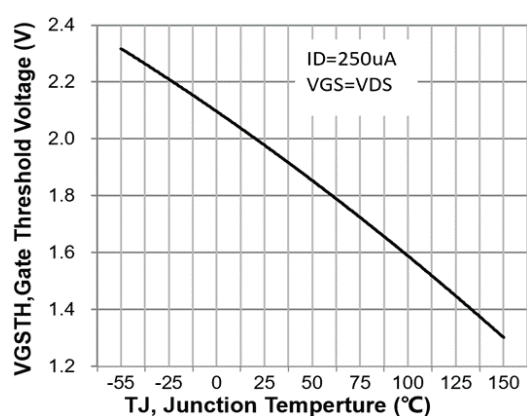


Fig. 12 Gate Threshold Voltage vs. Junction Temperature



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Fig.13 On-Resistance Variation vs. Junction

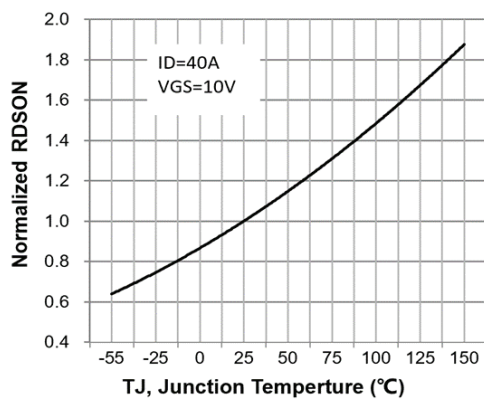


Fig.14 Maximum Drain Current vs. Case Temperature

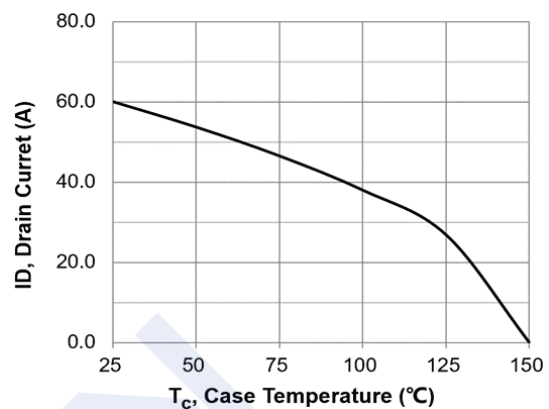


Fig.15 Body Diode Forward Voltage vs. Reverse Drain Current

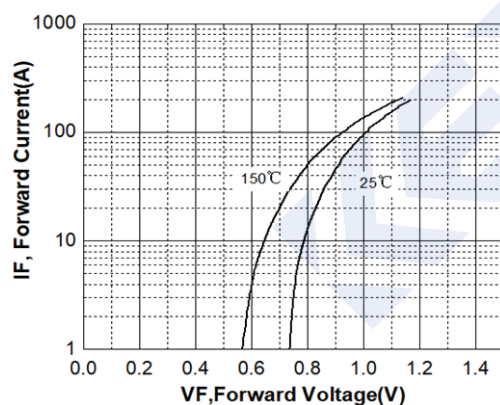


Fig.16 Safe Operating Area

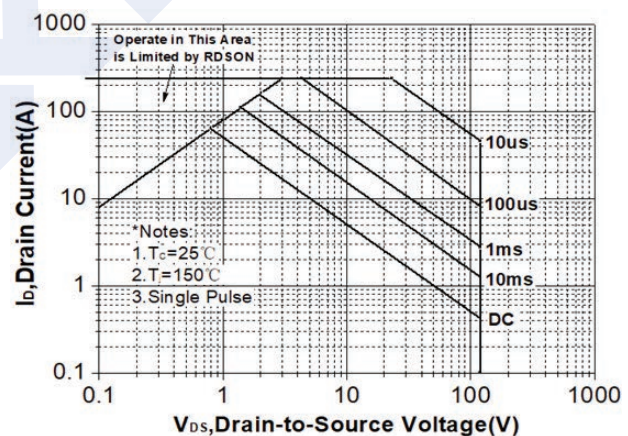
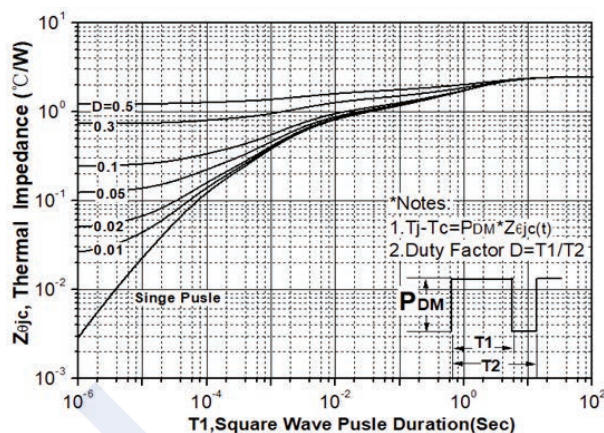


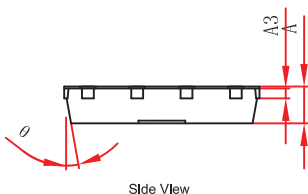
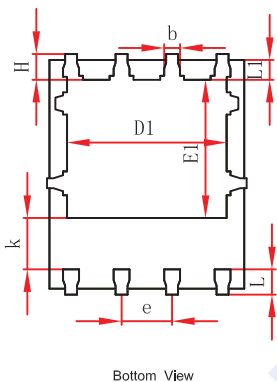
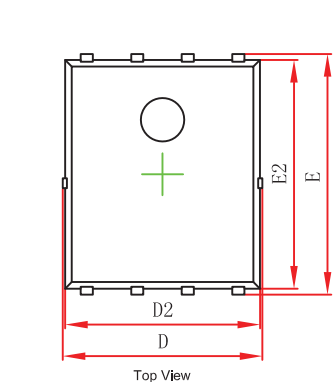
Fig. 17 Transient Thermal Response Curve



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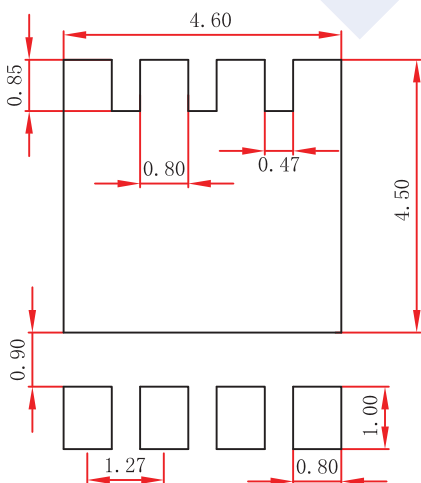
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PDFN5x6-8 Package Outline Dimensions



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.