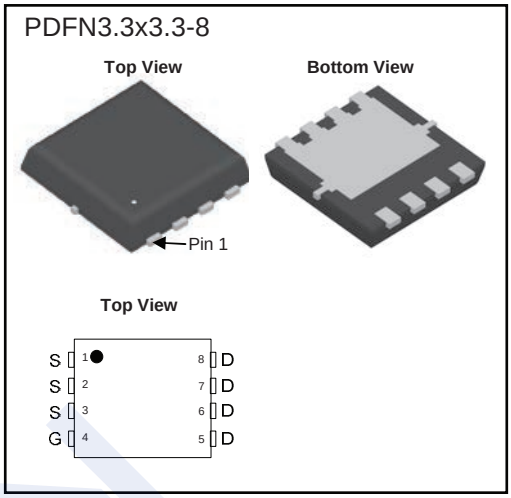
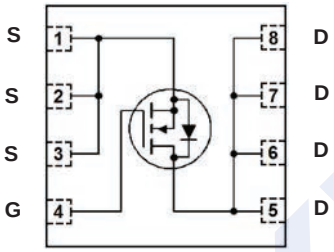
N-Channel MOSFET

2KK5097DFN



■ Features

- $V_{DS\ (V)}$ = 150V
- I_D = 17 A
- $R_{DS(ON)}$ = 54mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ = 66mΩ (V_{GS} = 6V)



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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C=25℃	I_D	17	A
	T_C=100℃		11	
Pulsed Drain Current (Note 3)		I_{DM}	30	
Continuous Drain Current	T_A=25℃	I_{DSM}	5.5	
	T_A=70℃		4.5	
Single Pulse Avalanche Current (Note 3)		I_{AS}	15	
Single Pulse Avalanche Energy (Note 3)	L=0.3mH	E_{AS}	34	mJ
Power Dissipation (Note 2)	T_C=25℃	P_D	38	W
	T_C=100℃		15.5	
Power Dissipation (Note 1)	T_A=25℃	P_{DSM}	4.1	
	T_A=70℃		2.6	
Thermal Resistance.Junction- to-Ambient (Note 1)	t≤10s	$R_{\theta JA}$	30	℃/W
Thermal Resistance.Junction- to-Case	Steady state	$R_{\theta JC}$	3.2	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

Notes:

1.The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.The Power dissipation P_{DSM} is based on $R_{\theta JA}$ (t≤ 10s) and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

2.The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

3.Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	150			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=150V, V_{GS}=0V			1	μA
		V_{DS}=150V, V_{GS}=0V, T_J=55℃			5	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=250μA	2		4	V
Static Drain-Source On-Resistanc (Note 4)	$R_{DS(on)}$	V_{GS}=10V, I_D=5A		54	80	mΩ
		V_{GS}=10V, I_D=5A , T_J=125℃		107		
		V_{GS}=6V, I_D=2A		66	95	
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=5A		17		S
Maximum Body-Diode Continuous Current	I_S	T_C=25℃			17	A
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1.0	V
DYNAMIC PARAMETERS (Note 5)						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=75V, f=1MHz		675		pF
Output Capacitance	C_{oss}			78		
Reverse Transfer Capacitance	C_{rss}			4		
Gate resistance	R_g	f=1MHz	1.4		4.4	Ω
SWITCHING PARAMETERS (Note 5)						
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=10V, V_{DS}=75V, R_L=15Ω, R_{GEN}=3Ω		6		ns
Turn-On Rise Time	t_r			3		
Turn-Off DelayTime	$t_{d(off)}$			20		
Turn-Off Fall Time	t_f			5		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 5A, dI/dt = 500A/μs		37		ns
Body Diode Reverse Recovery Charge	Q_{rr}			210		nC

Notes:

4. Pulse test; pulse width≤300 μs, duty cycle≤2%
5. Guaranteed by design, not subject to production testing.

■ Marking

Marking	K5097 KC****

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■ Typical Electrical And Thermal Characteristics

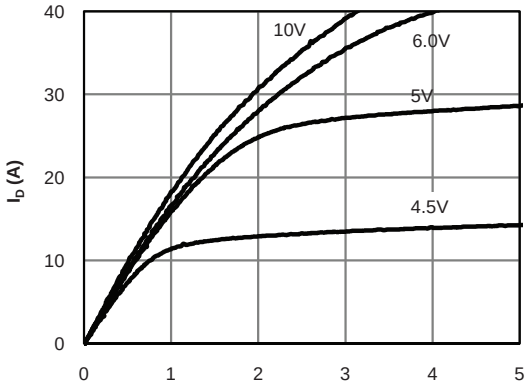

Figure 1: On-Region Characteristics

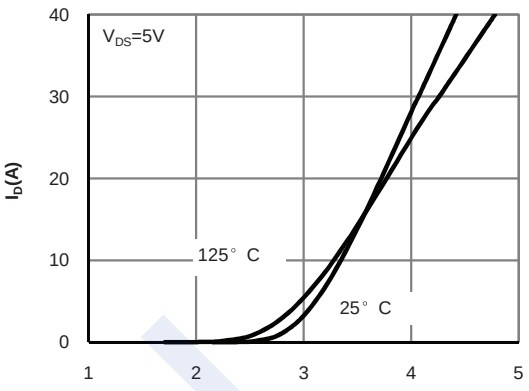

Figure 2: Transfer Characteristics

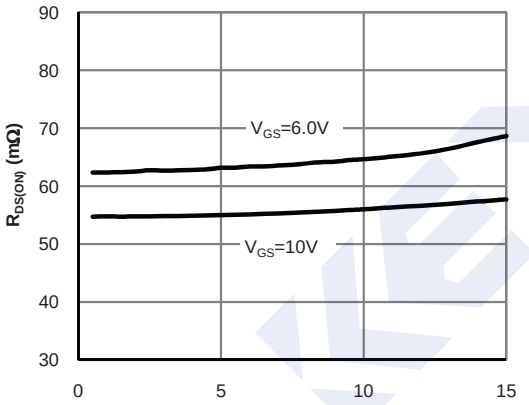

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

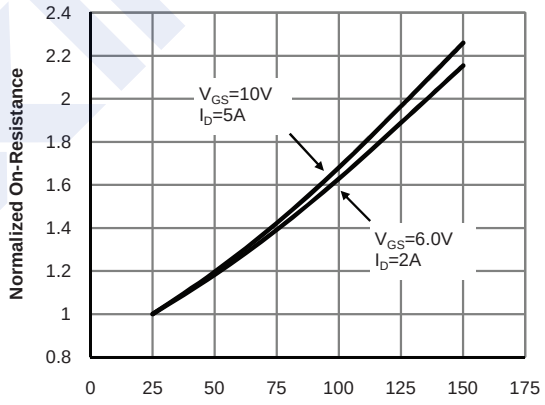

Figure 4: On-Resistance vs. Junction Temperature

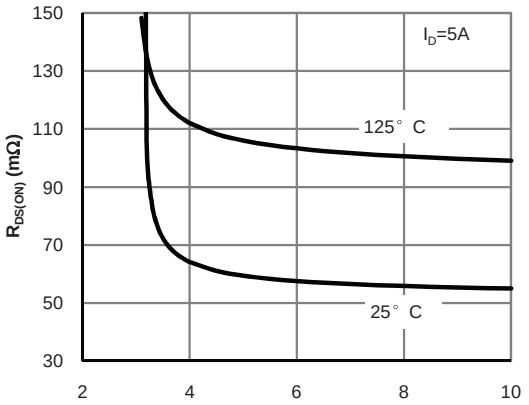

Figure 5: On-Resistance vs. Gate-Source Voltage

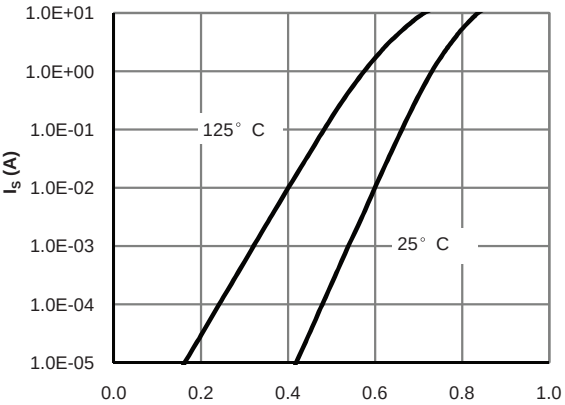

Figure 6: Body-Diode Characteristics

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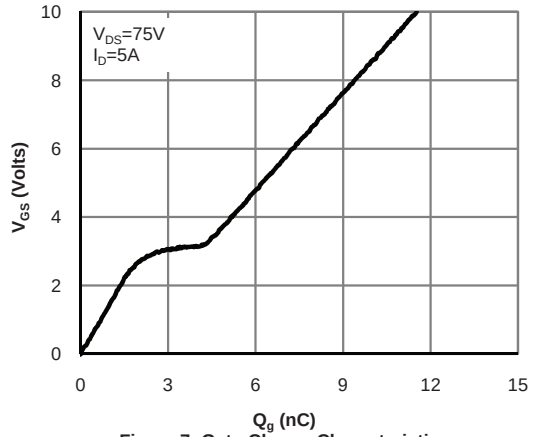


Figure 7: Gate-Charge Characteristics

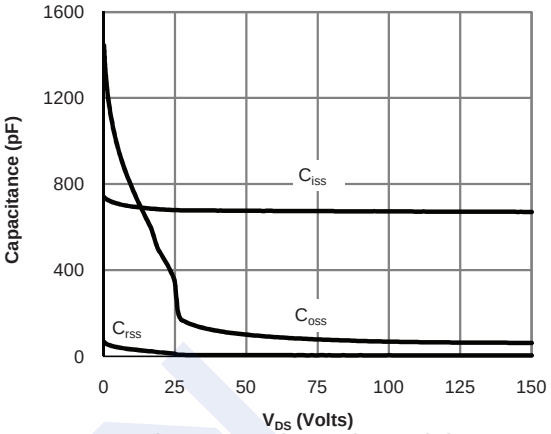
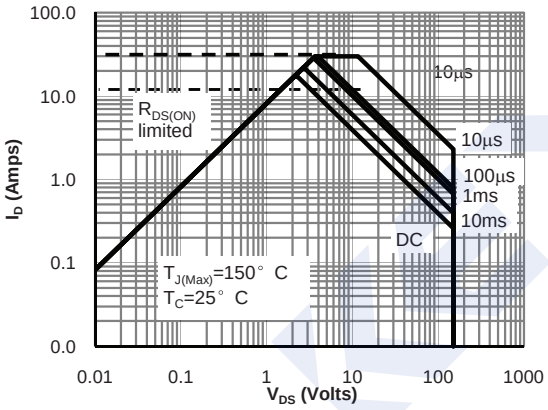


Figure 8: Capacitance Characteristics



V_{GS}> or equal to 4.5V

Figure 9: Maximum Forward Biased Safe Operating Area

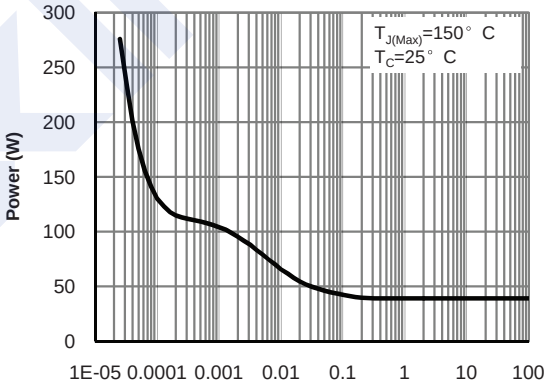


Figure 10: Single Pulse Power Rating Junction-to-Case

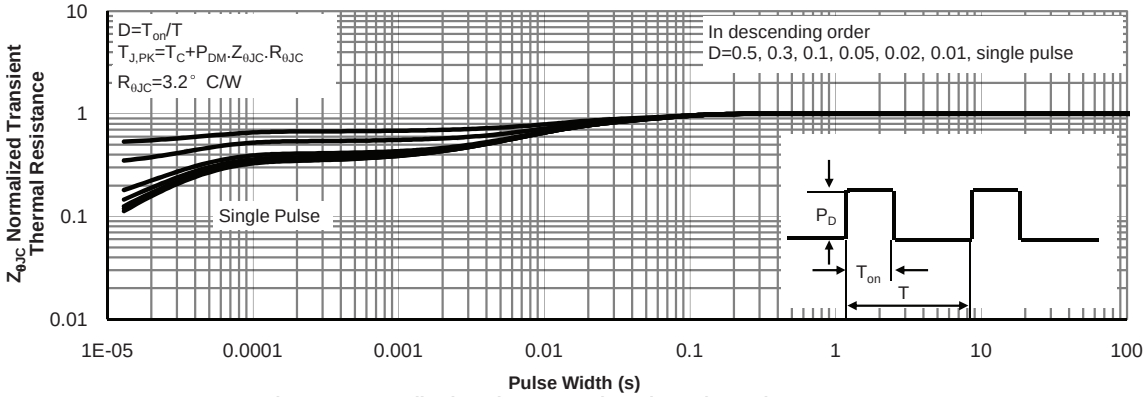


Figure 11: Normalized Maximum Transient Thermal Impedance

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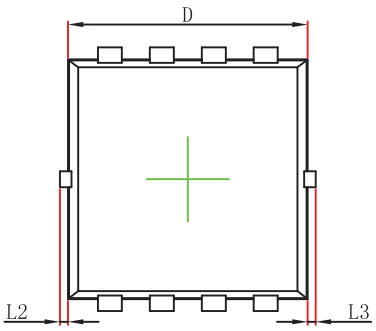
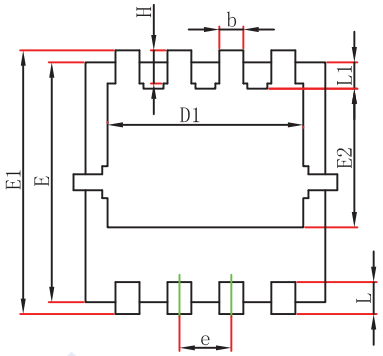
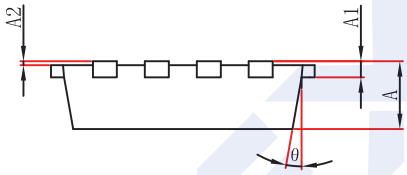
■ **PDFN3.3x3.3-8 Package Outline Dimensions**



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	3.050	3.250	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°