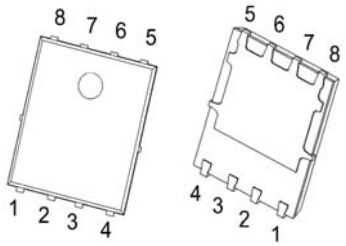
N-Channel MOSFET

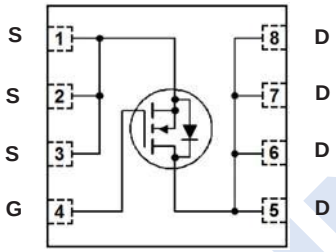
2KK5049DFN

PDFN5x6-8



■ Features

- $V_{DS\ (V)}$ = 40 V
- I_D = 50 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) < 8 mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5 V) < 11 mΩ



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current	I_D	50	A
Pulsed Drain Current (Note 1)	I_{DM}	200	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	142	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	7	V/ns
Power Dissipation	P_D	50	W
Thermal Resistance, Junction- to-Ambient	$R_{\theta JA}$	110	℃/W
Thermal Resistance, Junction- to-Case	$R_{\theta JC}$	2.5	
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 to 150	

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. V_{DD}=25V,L=0.1mH, I_{AS}=53.2A, R_G=25Ω, Starting T_J = 25℃.
3. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25℃.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40 V, V_{GS} = 0 V			1	μA
		V_{DS} = 32 V, V_{GS} = 0 V, T_J=125℃			10	
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
On Characteristics (Note 1)						
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	1.0		2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 25 A			8	mΩ
		V_{GS} = 4.5 V, I_D = 20 A			11	
Dynamic Characteristics (Note 1)						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 20 V, f = 1 MHz		4500		pF
Output Capacitance	C_{oss}			800		
Reverse Transfer Capacitance	C_{rss}			350		
Switching Characteristics (Note 1)						
Total Gate Charge	Q_g	V_{GS} = 10V, V_{DS} = 32 V, I_D = 50 A (Note 2)		82		nC
Gate Source Charge	Q_{gs}			24		
Gate Drain Charge	Q_{gd}			18		
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 20 V, I_D = 50A, R_G = 25 Ω (Note 2)		40		ns
Turn-On Rise Time	t_r			50		
Turn-Off DelayTime	$t_{d(off)}$			204		
Turn-Off Fall Time	t_f			120		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t_{rr}	I_S = 30A, dI/dt = 100 A/μs		53		ns
Body Diode Reverse Recovery Charge	Q_{rr}			80		nC
Maximum Body-Diode Continuous Current	I_S	V_G=V_D=0V , Force Current			50	A
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 1 A			1	V

Notes:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

■ Marking

Marking	K5049 KC***

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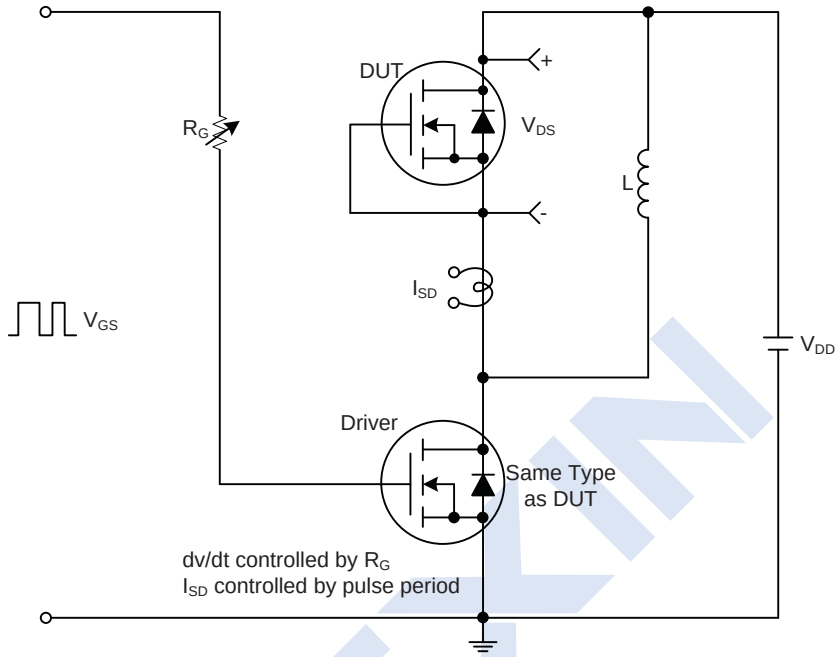
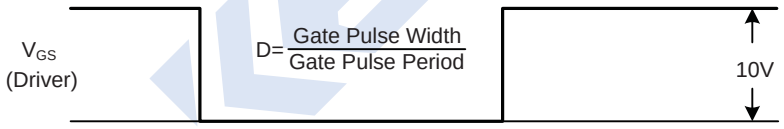
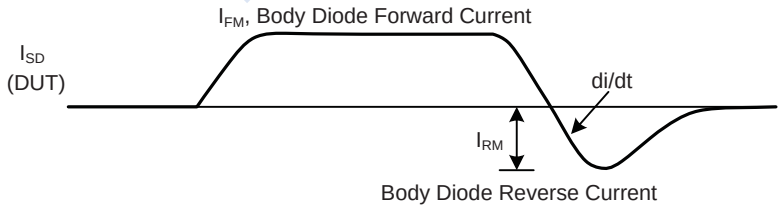
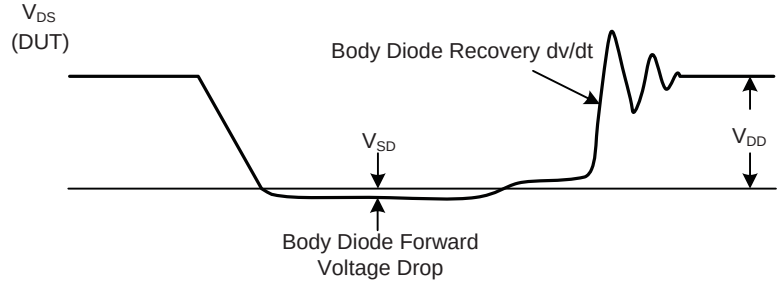
■ Test Circuits And Waveforms









Peak Diode Recovery dv/dt Test Circuit and Waveforms

N-Channel MOSFET

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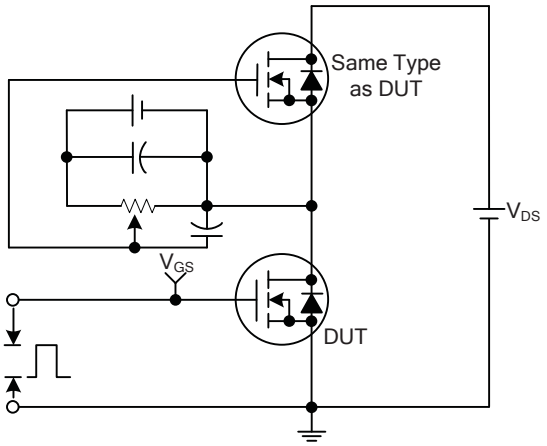
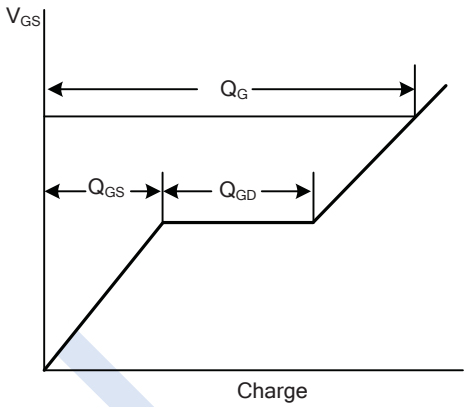
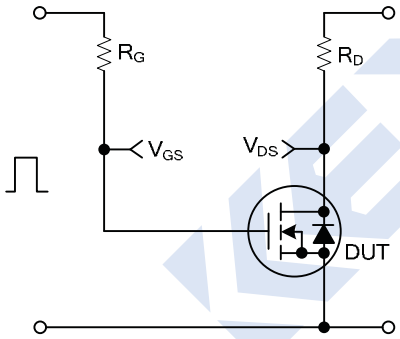


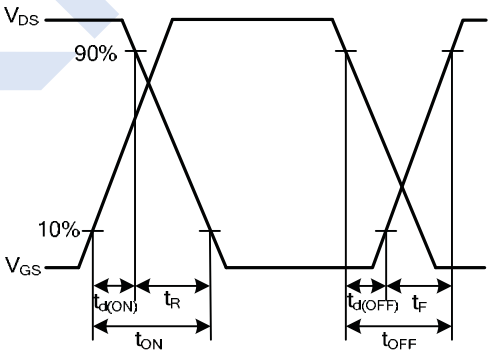
Gate Charge Test Circuit



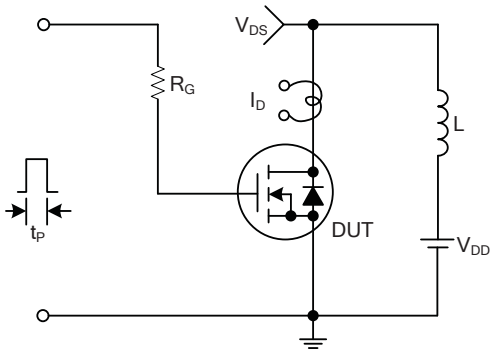
Gate Charge Waveforms



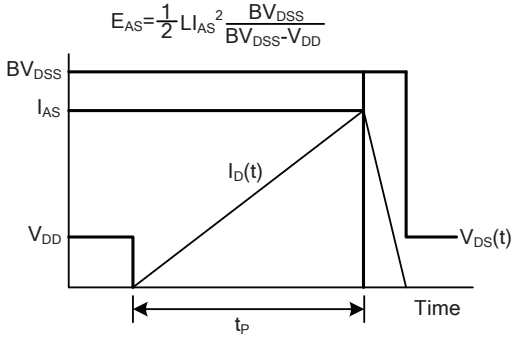
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit

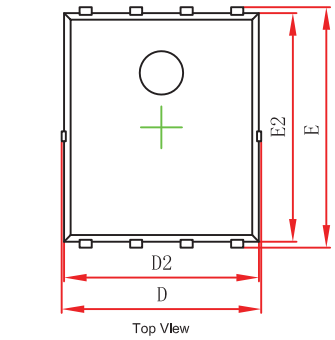


Unclamped Inductive Switching Waveforms

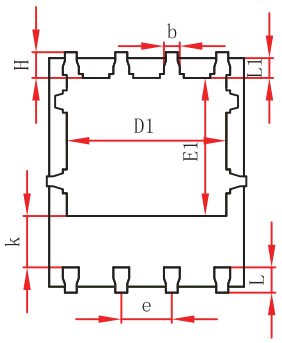
N-Channel MOSFET

2KK5049DFN

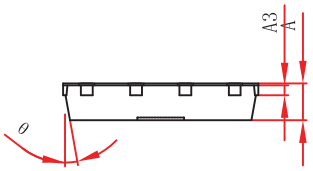
■ PDFN5x6-8 Package Outline Dimensions



Top View



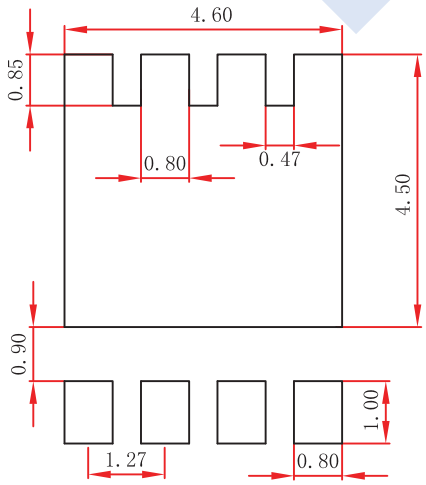
Bottom View



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.