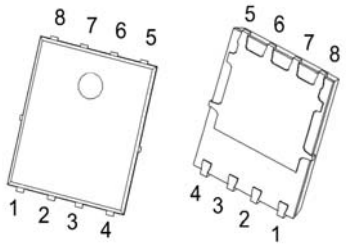
N-Channel MOSFET

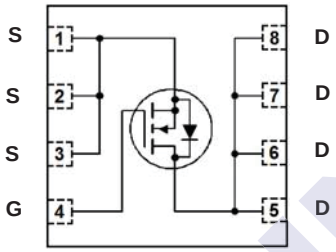
2KK5042DFN

DFN5x6-8(PDFNWB5x6-8L)



■ Features

- $V_{DS\ (V)}$ = 100 V
- I_D = 50 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) < 14 mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5 V) < 16 mΩ



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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	Package Limited	I_D	50	A
	T_C = 100℃		35	
Pulsed Drain Current (Note 1)		I_{DM}	150	
Power Dissipation		P_D	105	W
Derating factor			0.84	W/℃
Single Pulse Avalanche Energy (Note 2)		E_{AS}	250	mJ
Thermal Resistance.Junction- to-Case (Note 3)		$R_{\theta JC}$	1.2	℃/W
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. EAS condition : T_j=25℃,V_{DD}=50V,V_G=10V,L=0.5mH,R_g=25Ω
3. Surface Mounted on FR4 Board, t ≤ 10 sec.

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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	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V			1	μA
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	1.7	2.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 12 A		11.5	14	mΩ
		V_{GS} = 4.5 V, I_D = 12 A		12.6	16	
Forward Transconductance	g_{FS}	V_{DS} = 10 V, I_D = 30 A	40			S
Dynamic Characteristics (Note 1)						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz		4200		pF
Output Capacitance	C_{oss}			354		
Reverse Transfer Capacitance	C_{rss}			23		
Switching Characteristics (Note 1)						
Total Gate Charge	Q_g	V_{GS} = 10V, V_{DS} = 50 V, I_D = 30 A		58		nC
Gate Source Charge	Q_{gs}			12		
Gate Drain Charge	Q_{gd}			7.8		
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 50 V, I_D = 30A, R_G = 4.7 Ω		14		ns
Turn-On Rise Time	t_r			9		
Turn-Off DelayTime	$t_{d(off)}$			39		
Turn-Off Fall Time	t_f			5		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t_{rr}	I_F = I_S, dI/dt = 100 A/μs, T_J = 25℃		58		ns
Body Diode Reverse Recovery Charge	Q_{rr}			110		nC
Maximum Body-Diode Continuous Current	I_S				50	A
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 50 A			1.2	V

Notes:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

■ Marking

Marking	K5042 KC****

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■ Typical Electrical and Thermal Characteristics

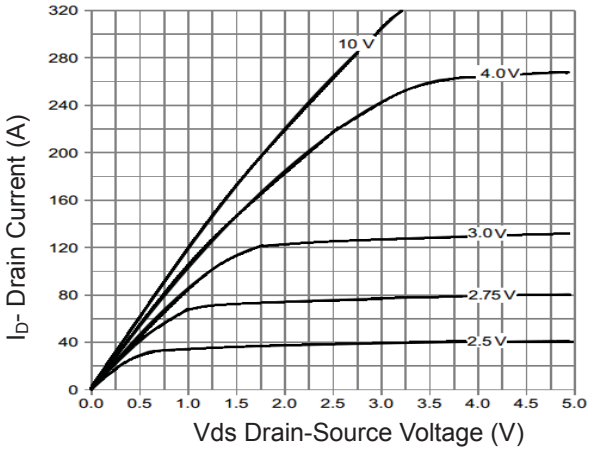

Figure 1 Output Characteristics

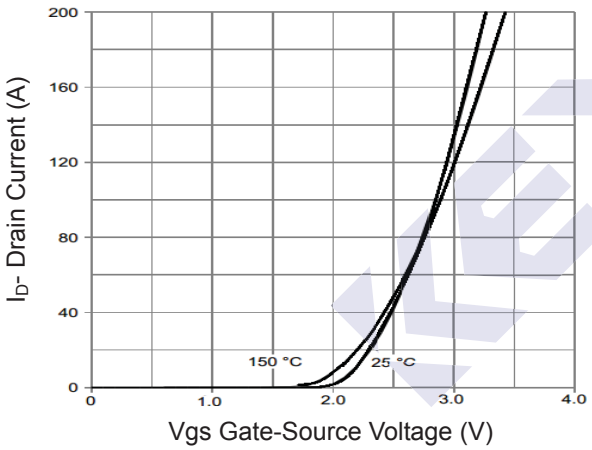

Figure 2 Transfer Characteristics

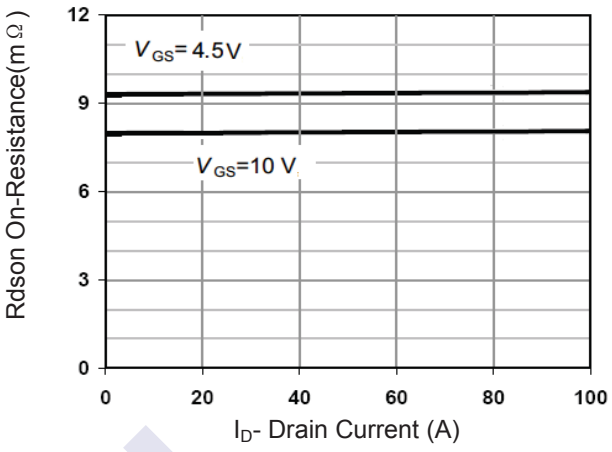

Figure 3 Rdson- Drain Current

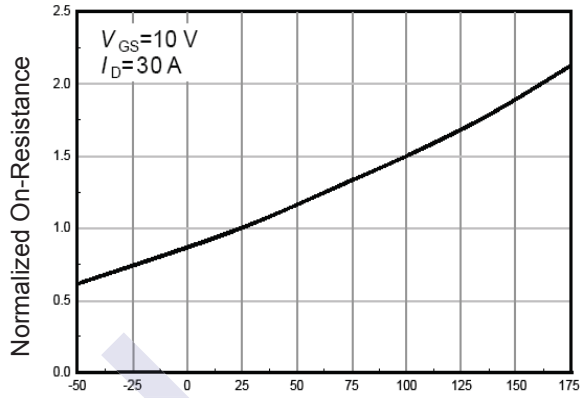

Figure 4 Rdson-JunctionTemperature

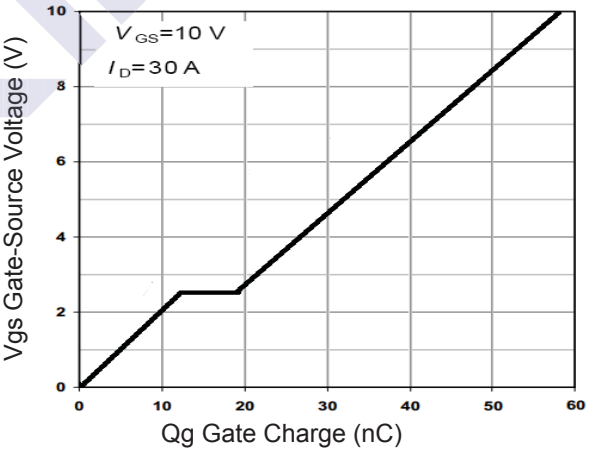

Figure 5 Gate Charge

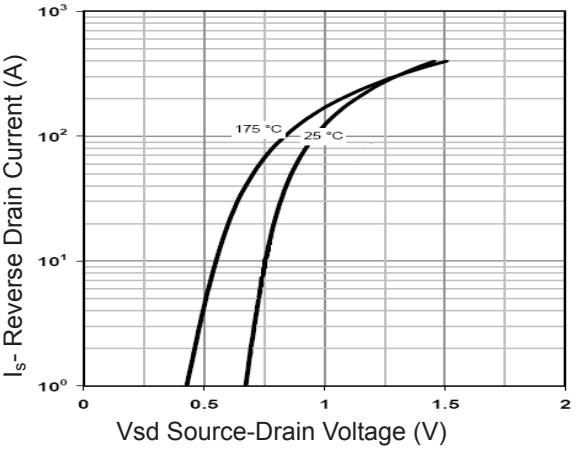

Figure 6 Source- Drain Diode Forward

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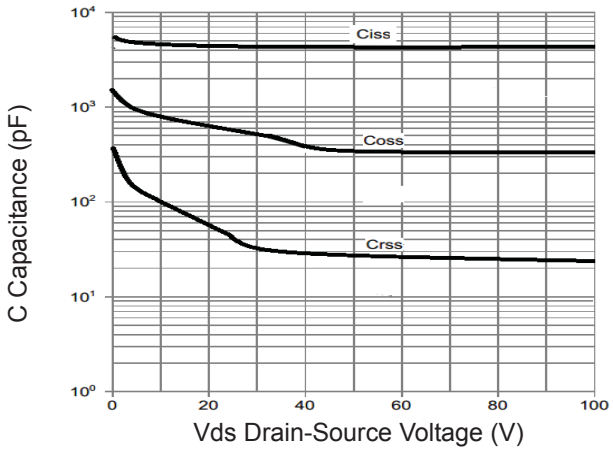

Figure 7 Capacitance vs Vds

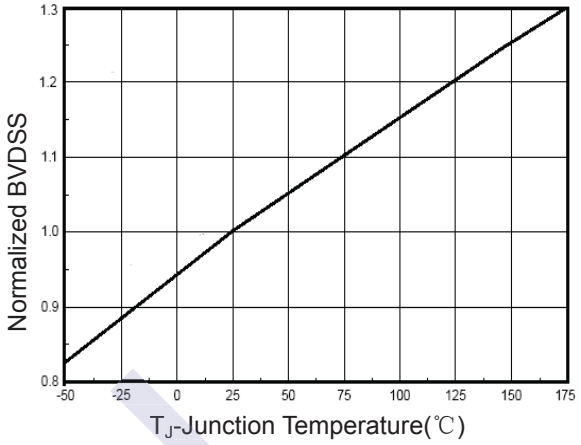

Figure 9 BV_{DSS} vs Junction Temperature

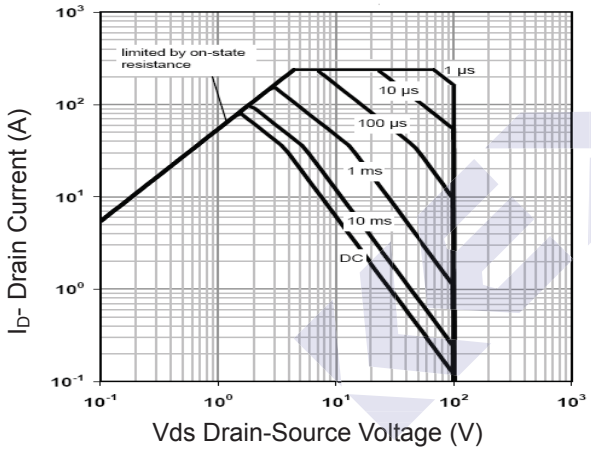

Figure 8 Safe Operation Area

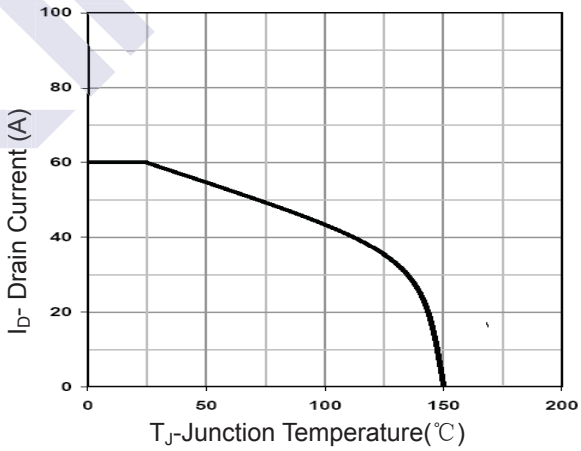

Figure 10 Current De-rating

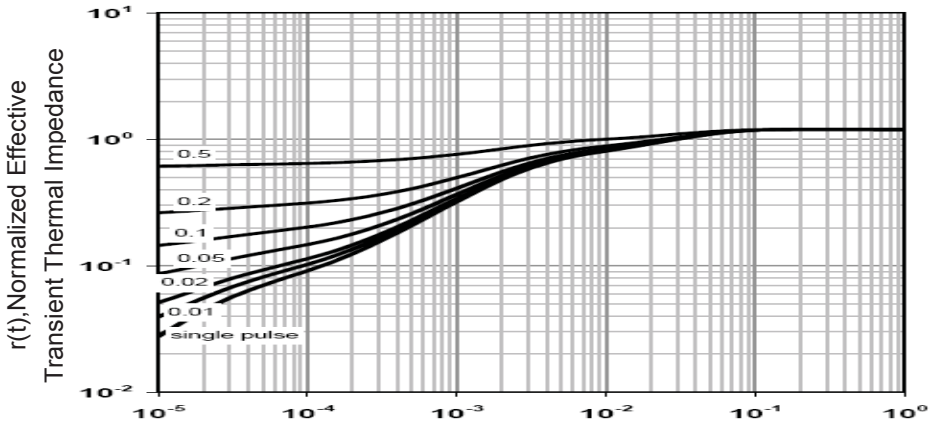

Figure 11 Normalized Maximum Transient Thermal Impedance

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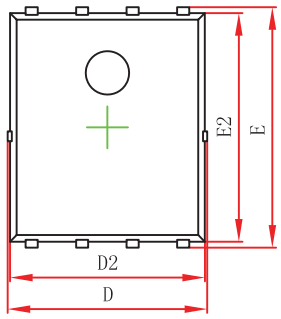
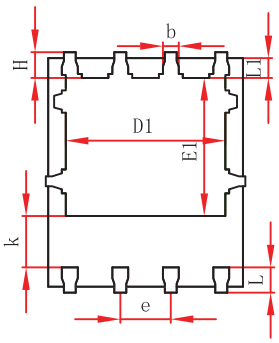
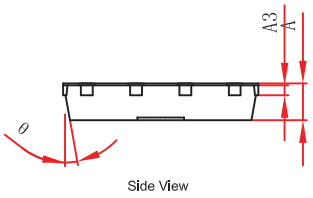
■ DFN5x6-8(PDFNWB5x6-8L) Package Outline Dimensions



Top View



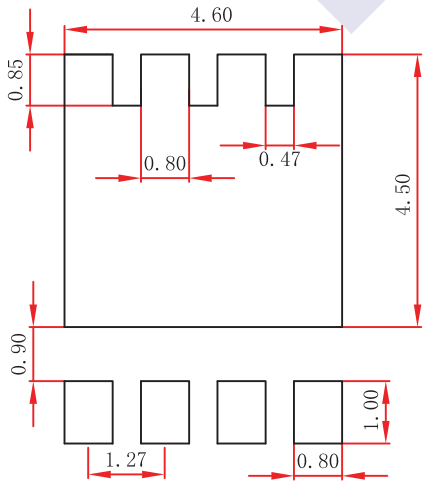
Bottom View



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°

■ DFN5x6-8(PDFNWB5x6-8L) Suggested Pad Layout



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