

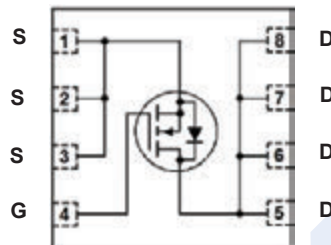
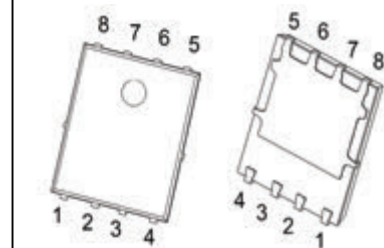
## N-Channel MOSFET

## 2KK5401DFN

## ■ Features

- $V_{DS(V)} = 100\text{ V}$
- $I_D = 100\text{ A}$
- $R_{DS(ON)}$  (at  $V_{GS} = 10\text{ V}$ ) =  $3.8\text{ m}\Omega$  (Typ.)
- 100% EAS Guaranteed
- Super Low Gate Charge
- Excellent  $Cdv/dt$  effect decline
- Advanced high cell density Trench technology

PDFN5x6-8

■ Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	100	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current	Package Limited	100	A	
	$T_C = 100^\circ\text{C}$	63		
Pulsed Drain Current (Note 1)	$I_{DM}$	400		
Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	132	W
		$T_C = 100^\circ\text{C}$	100	
Single Pulse Avalanche Energy (Note 2)	EAS	231	mJ	
Thermal Resistance.Junction- to-Ambient	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$	
Thermal Resistance.Junction- to-Case	$R_{\theta JC}$	0.95		
Junction Temperature	$T_J$	150	$^\circ\text{C}$	
Storage Temperature Range	$T_{stg}$	-55 to 150		

## Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.  $V_{DD}=50\text{V}, V_{GS}=10\text{V}, L=0.1\text{mH}, I_{AS}=48\text{A}, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$ .

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## ■ Electrical Characteristics (TA = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BVDSS	ID = 250 μA, VGS = 0V	100			V
Zero Gate Voltage Drain Current	IDSS	VDS = 68 V, VGS = 0 V			1	μA
Gate to Source Leakage Current	IGSS	VDS = 0 V, VGS = ±20 V			±100	nA
On Characteristics (Note 3)						
Gate to Source Threshold Voltage	VGS(th)	VDS = VGS, ID = 250μA	1.4		2.4	V
Static Drain-Source On-Resistance	RDS(on)	VGS = 10 V, ID = 40 A		3.8	5.0	mΩ
		VGS = 4.5 V, ID = 30 A		5.7	7.5	
Forward Transconductance	gFS	VDS = 10 V, ID = 15 A		10		S
Dynamic Characteristics (Note 3)						
Input Capacitance	Ciss	VGS = 0 V, VDS = 50 V, f = 1 MHz		4739		pF
Output Capacitance	Coss			622		
Reverse Transfer Capacitance	Crss			16		
Gate Resistance	Rg	f = 1 MHz		3.3		Ω
Switching Characteristics (Note 3)						
Total Gate Charge	Qg	VGS = 10V, VDS = 50 V, ID = 30 A		67		nC
Gate Source Charge	Qgs			24		
Gate Drain Charge	Qgd			11		
Turn-On DelayTime	td(on)	VGS = 10V, VDD = 50 V, ID = 30A, RG = 3 Ω		21		ns
Turn-On Rise Time	tr			80		
Turn-Off DelayTime	td(off)			69		
Turn-Off Fall Time	tf			30		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	trr	VR=100V, Is=20A, di/dt=100A/μs, TJ=25°C		60		ns
Body Diode Reverse Recovery Charge	Qrr			89		nC
Maximum Body-Diode Continuous Current	IS				100	A
Diode Forward Voltage	VSD	VGS = 0 V, IS = 20 A			1.4	V

Notes:

- The data tested by pulsed , pulse width  $\cong$  300us , duty cycle  $\cong$  2%.
- Essentially independent of operating temperature.

## ■ Marking

Marking	K5401 KC***
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### Typical Electrical and Thermal Characteristics

Fig1. On-Region Characteristics

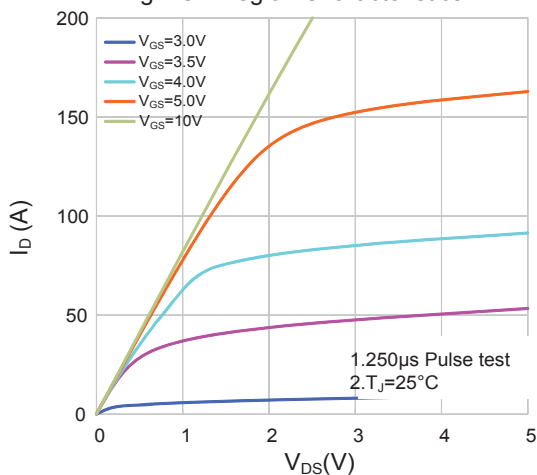


Fig2. Transfer Characteristics

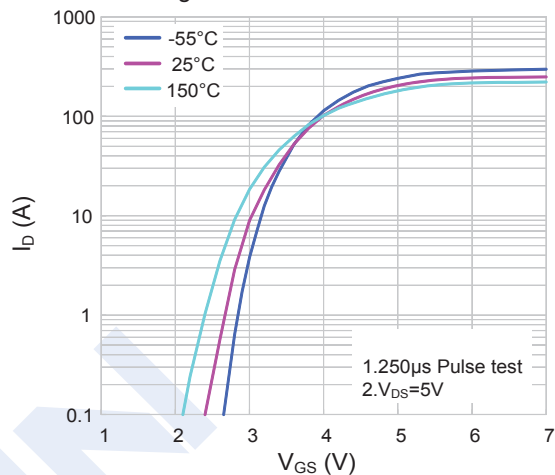


Fig3. R<sub>DS(on)</sub> vs. Id

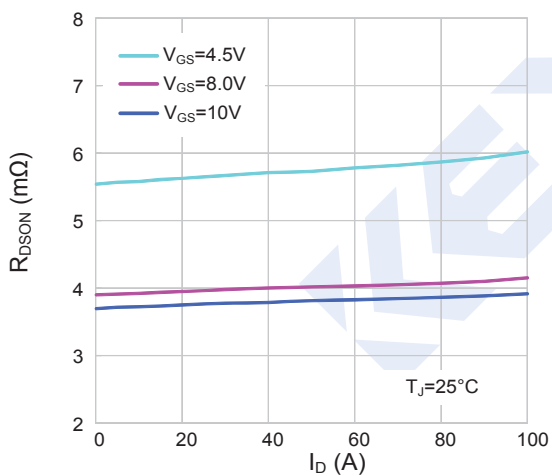


Fig4. R<sub>DS(on)</sub> vs. VGS

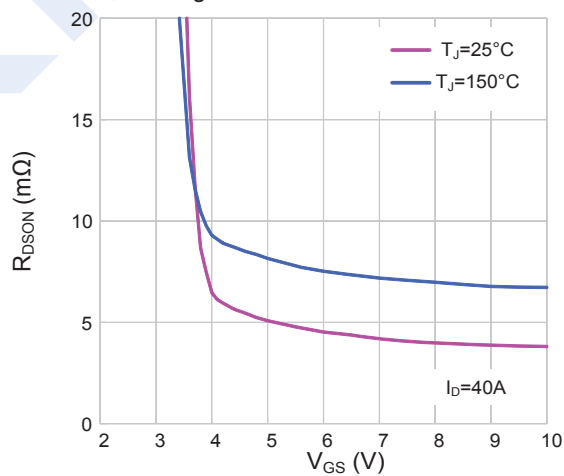


Fig5. V<sub>GS(th)</sub> vs. T<sub>J</sub>

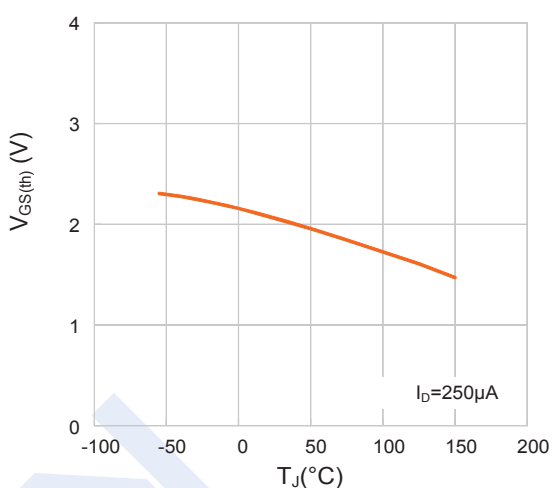
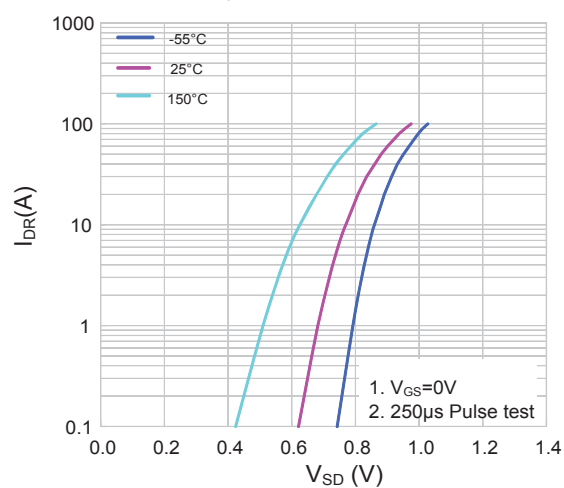
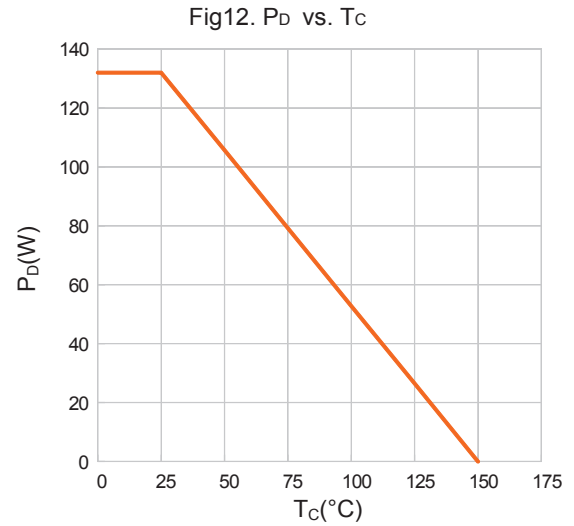
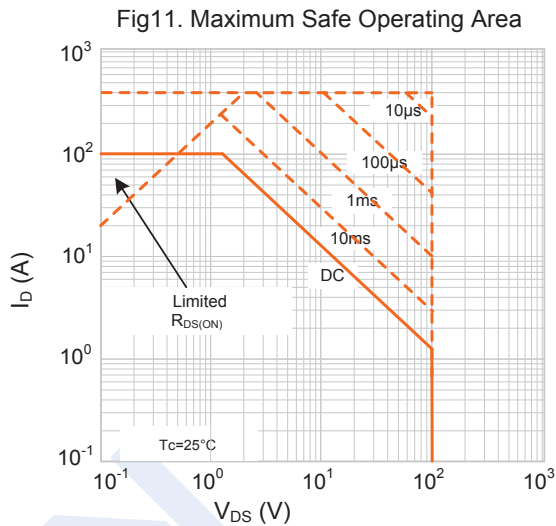
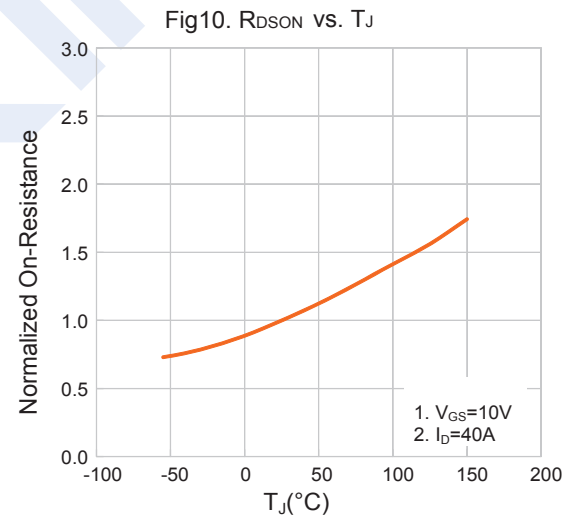
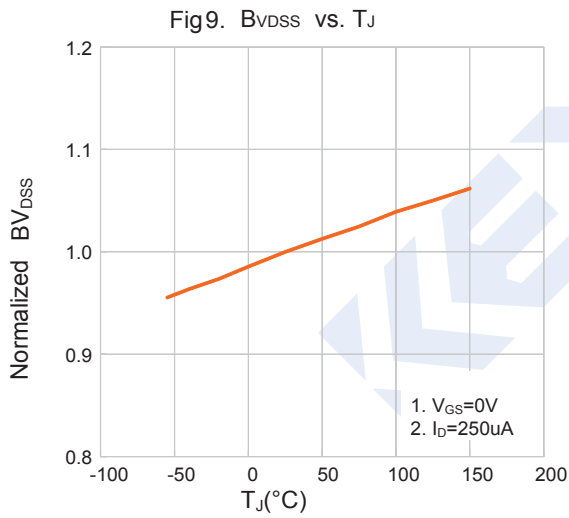
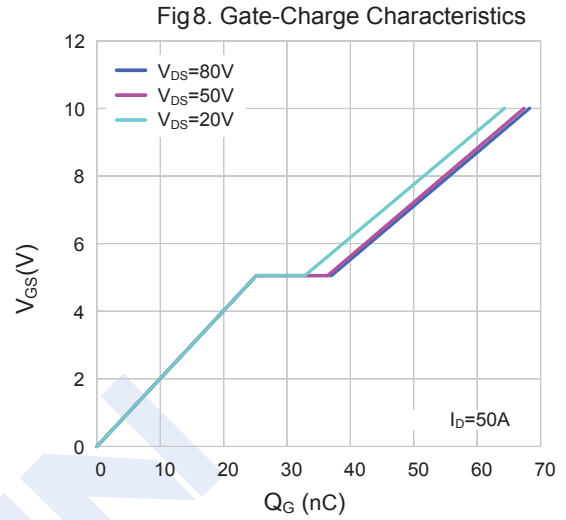
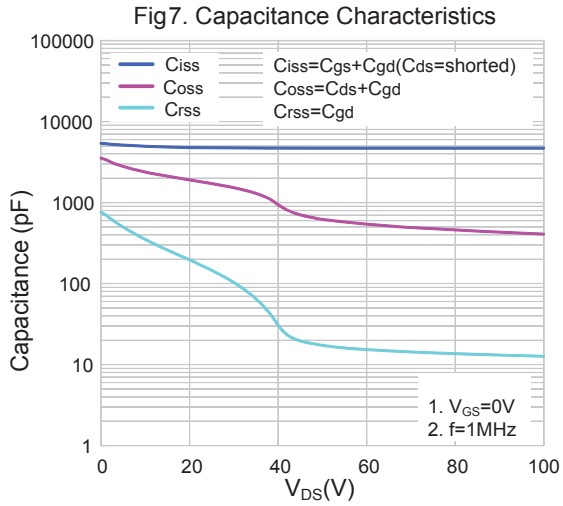


Fig6. V<sub>SD</sub> vs. IdR



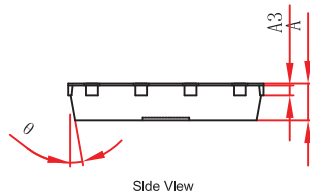
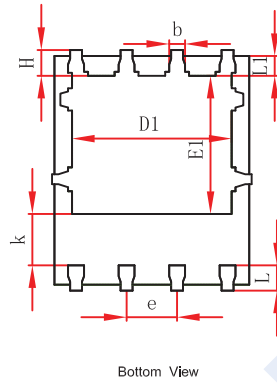
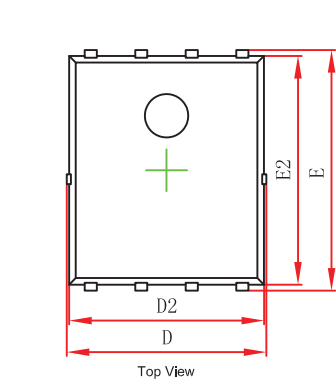
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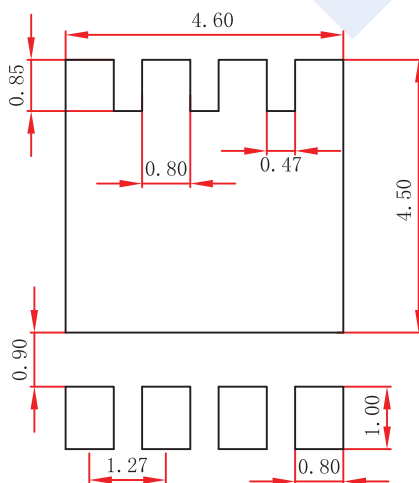
### 2KK5401DFN

#### 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:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.