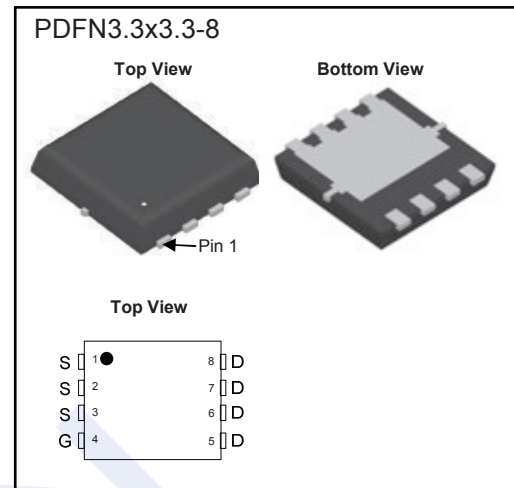
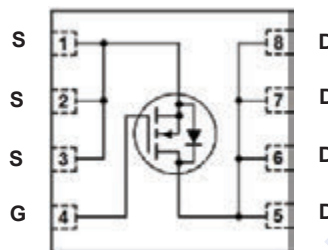


N-Channel MOSFET

2KK5100DFN

■ Features

- $V_{DS} = 40\text{ V}$
- I_D (at $V_{GS}=10\text{V}$) = 40 A
- $R_{DS(ON)}$ (at $V_{GS} = 10\text{ V}$) < 8.5 m Ω
- $R_{DS(ON)}$ (at $V_{GS} = 4.5\text{ V}$) < 14.5 m Ω

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current (Note 1)	I_D	$T_C = 25^\circ\text{C}$	40
		$T_C = 100^\circ\text{C}$	31
Pulsed Drain Current (Note 2)	I_{DM}	100	A
Single Pulse Avalanche Current (Note 2)	I_{AS}	40	A
Single Pulse Avalanche Energy $L = 0.1\text{mH}$ (Note 2)	E_{AS}	80	mJ
Thermal Resistance, Junction- to-Ambient (Note3, 4)	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction- to-Case	$R_{\theta JC}$	3.4	
Power Dissipation (Note 4)	P_D	$T_C = 25^\circ\text{C}$	36.7
		$T_C = 100^\circ\text{C}$	14
Power Dissipation (Note 5)	P_{DSM}	$T_A = 25^\circ\text{C}$	3.1
		$T_A = 70^\circ\text{C}$	2
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	

Notes:

1. The maximum current rating is package limited.
2. Single pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.
3. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
4. The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
5. 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 $T_A = 25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} t \leq 10\text{s}$ and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.

N-Channel MOSFET

2KK5100DFN

■ Electrical Characteristics (T_J = 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	40			V	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40 V, V _{GS} = 0 V			1	μA	
		V _{DS} = 40 V, V _{GS} = 0 V, T _J =55°C			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	1.1		2.1	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A			8.5	mΩ	
		V _{GS} = 10 V, I _D = 20 A, T _J =125°C			15		
		V _{GS} = 4.5 V, I _D = 15 A			14.5		
Forward Transconductance	g _{FS}	V _{DS} = 5 V, I _D = 20 A		50		S	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 20 V, f = 1 MHz		1830		pF	
Output Capacitance	C _{oss}			521			
Reverse Transfer Capacitance	C _{rss}			43			
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz		1		Ω	
Switching Characteristics							
Total Gate Charge (10V)	Q _g	V _{GS} = 10V, V _{DS} = 20 V, I _D = 20 A		27.8	35	nC	
Total Gate Charge (4.5V)				12.8	15		
Gate Source Charge			Q _{gs}		3.9		
Gate Drain Charge			Q _{gd}		6		
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 15 V, R _L = 0.75 Ω, R _{GEN} = 3 Ω		7.2		ns	
Turn-On Rise Time	t _r			3			
Turn-Off Delay Time	t _{d(off)}			23			
Turn-Off Fall Time	t _f			3.5			
Drain-Source Diode Characteristics							
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, di/dt = 500 A/μs		16.5		ns	
Body Diode Reverse Recovery Charge	Q _{rr}			40		nC	
Maximum Body-Diode Continuous Current	I _S	(Note 1)			40	A	
Diode Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 1 A		0.7	1	V	

Notes:

- The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.
- These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=150°C. The SOA curve provides a single pulse rating.
- These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

■ Marking

Marking	K5100 KC***
---------	----------------

N-Channel MOSFET

2KK5100DFN

Typical Electrical And Thermal Characteristics

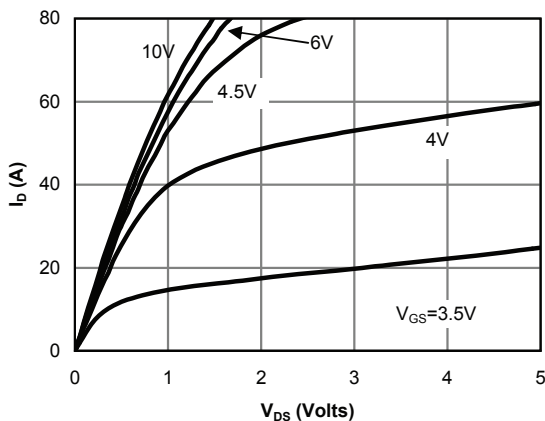


Fig 1: On-Region Characteristics

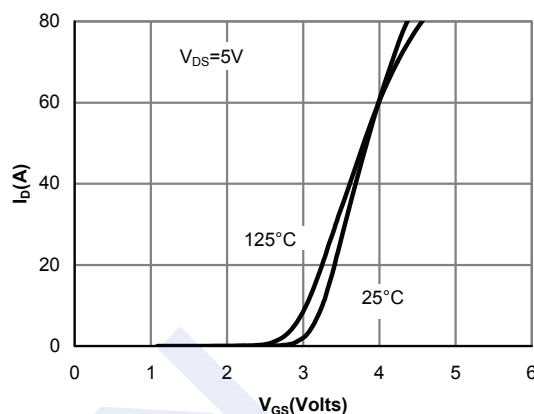


Figure 2: Transfer Characteristics

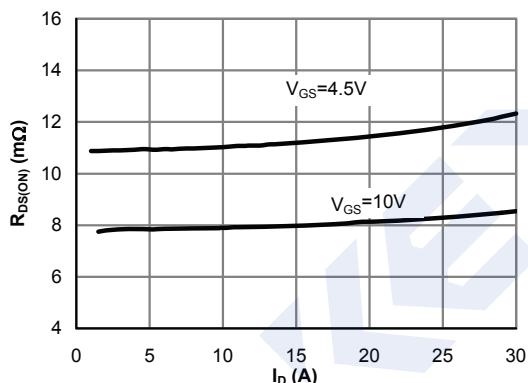


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

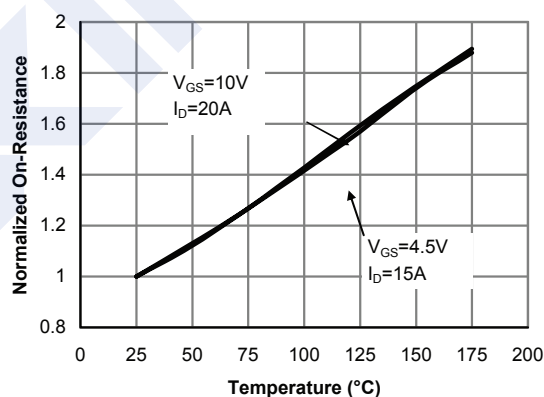


Figure 4: On-Resistance vs. Junction Temperature

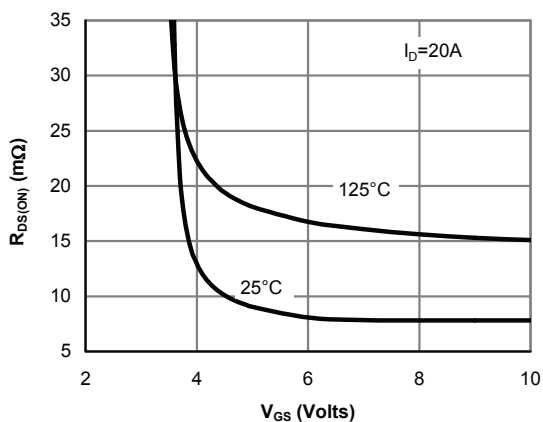


Figure 5: On-Resistance vs. Gate-Source Voltage

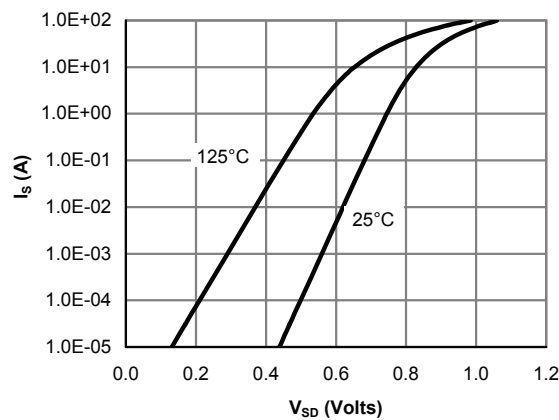


Figure 6: Body-Diode Characteristics

N-Channel MOSFET

2KK5100DFN

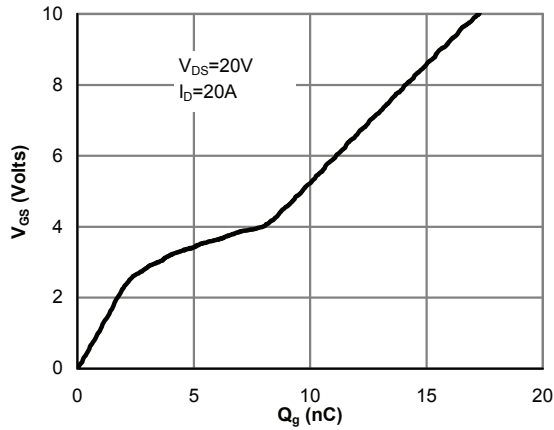


Figure 7: Gate-Charge Characteristics

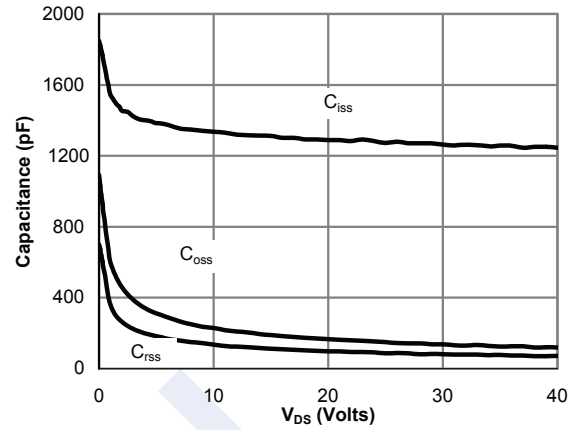


Figure 8: Capacitance Characteristics

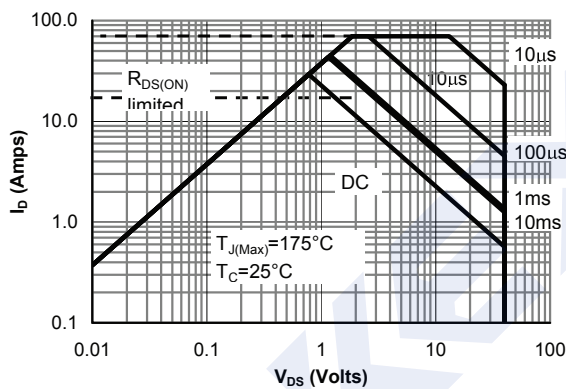


Figure 9: Maximum Forward Biased Safe Operating Area

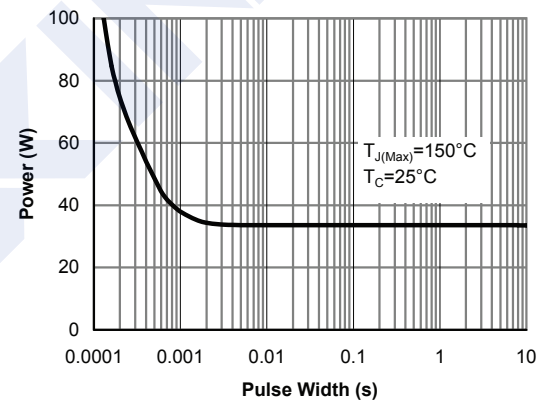


Figure 10: Single Pulse Power Rating Junction-to-Case

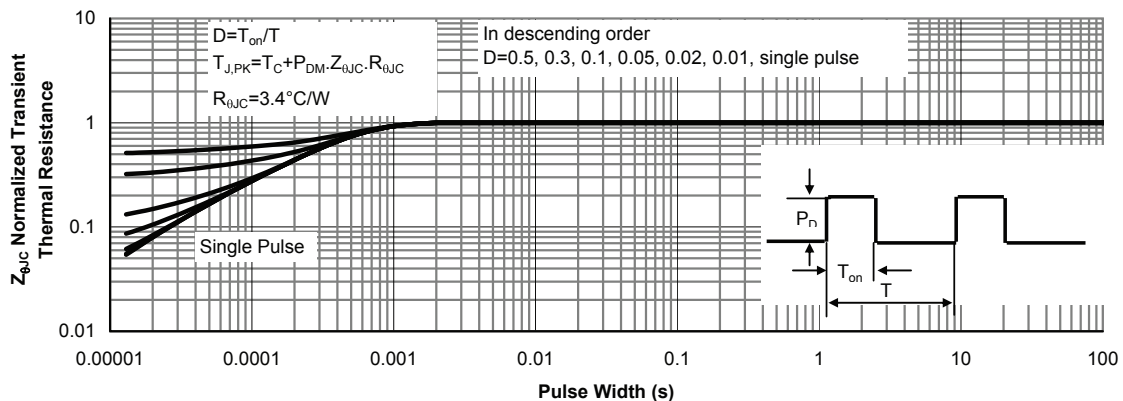
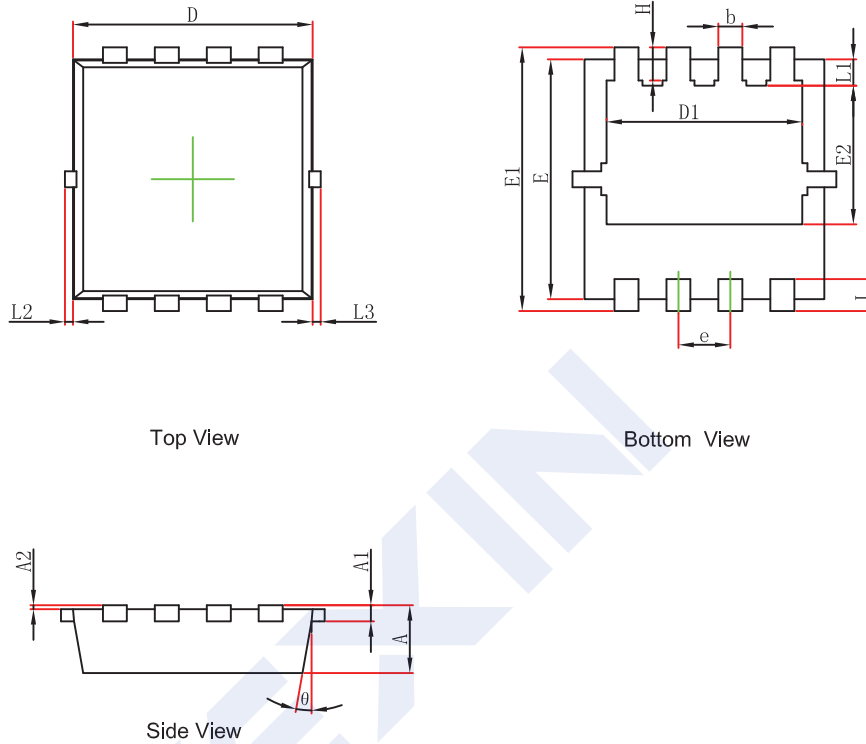


Figure 11: Normalized Maximum Transient Thermal Impedance

N-Channel MOSFET

2KK5100DFN

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



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°