

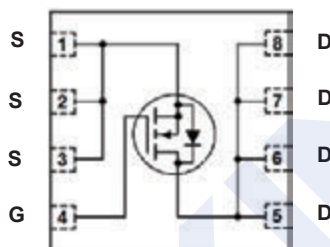
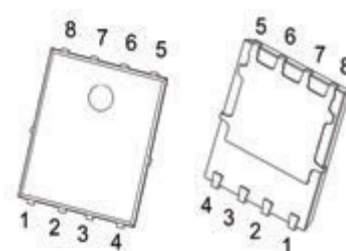
N-Channel MOSFET

2KK5777DFN

■ Features

- $V_{DS} = 30\text{ V}$
- I_D (at $V_{GS}=10\text{V}$) = 100 A
- $R_{DS(ON)}$ (at $V_{GS} = 10\text{ V}$) < 3.6 m Ω
- $R_{DS(ON)}$ (at $V_{GS} = 4.5\text{ V}$) < 4.7 m Ω

PDFN5x6-8

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

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	V_{DS}	30	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current (Note 1)	I_D	$T_C = 25^\circ\text{C}$	100	A
Pulsed Drain Current (Note 2)		I_{DM}	390	
Single Pulse Avalanche Current (Note 2)	I_{AS}	50	A	
Single Pulse Avalanche Energy $L = 0.1\text{mH}$ (Note 2)	E_{AS}	125	mJ	
Thermal Resistance, Junction- to-Ambient (Note3, 4)	$R_{\theta JA}$	55	$^\circ\text{C}/\text{W}$	
Thermal Resistance, Junction- to-Case	$R_{\theta JC}$	2.5		
Power Dissipation (Note 4)	P_D	$T_C = 25^\circ\text{C}$	50	W
		$T_C = 100^\circ\text{C}$	20	
Power Dissipation (Note 5)	P_{DSM}	$T_A = 25^\circ\text{C}$	6.2	
		$T_A = 70^\circ\text{C}$	4	
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 1in² 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.

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■ 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	30			V	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			1	μA	
		V _{DS} = 30 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		1.9	V	
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A			3.6	mΩ	
		V _{GS} = 10 V, I _D = 20 A, T _J =125°C			5.4		
		V _{GS} = 4.5 V, I _D = 20 A			4.7		
Forward Transconductance	g _{FS}	V _{DS} = 5 V, I _D = 20 A		100		S	
Dynamic Characteristics							
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 15 V, f = 1 MHz		4080		pF	
Output Capacitance	C _{oss}			410			
Reverse Transfer Capacitance	C _{rss}			265			
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	1		3	Ω	
Switching Characteristics							
Total Gate Charge (10V)	Q _g	V _{GS} = 10V, V _{DS} = 15 V, I _D = 20 A		63	90	nC	
Total Gate Charge (4.5V)				29	40		
Gate Source Charge			Q _{gs}		9		
Gate Drain Charge			Q _{gd}		9.5		
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 15 V, R _L = 0.75 Ω, R _{GEN} = 3 Ω		9		ns	
Turn-On Rise Time	t _r			6			
Turn-Off Delay Time	t _{d(off)}			52			
Turn-Off Fall Time	t _f			11.5			
Drain-Source Diode Characteristics							
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, di/dt = 500 A/μs		11		ns	
Body Diode Reverse Recovery Charge	Q _{rr}			19		nC	
Maximum Body-Diode Continuous Current	I _S	(Note 1)			100	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.

■ Marking

Marking	K5777 KC****
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Typical Characteristics

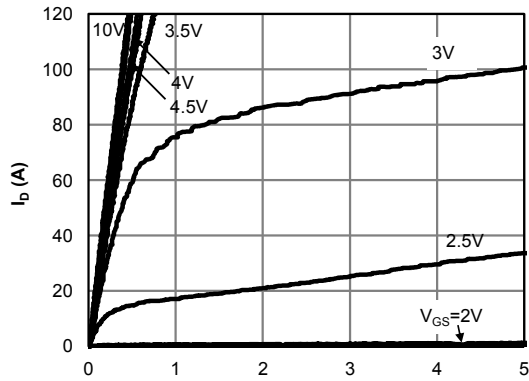


Figure 1: On-Region Characteristics (Note 6)

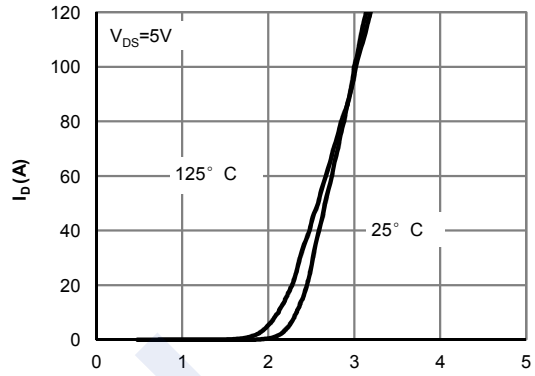


Figure 2: Transfer Characteristics (Note 6)

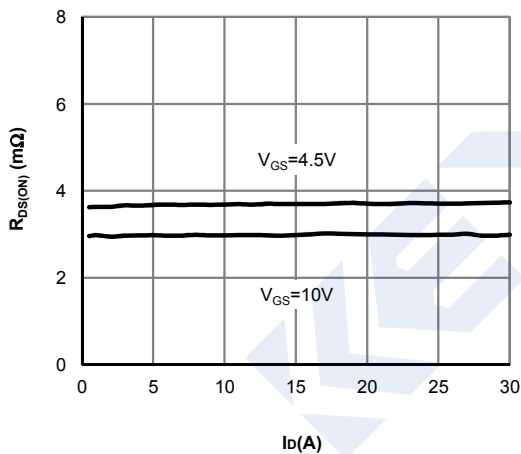


Figure 3: On-Resistance and Gate Voltage (Note 6)

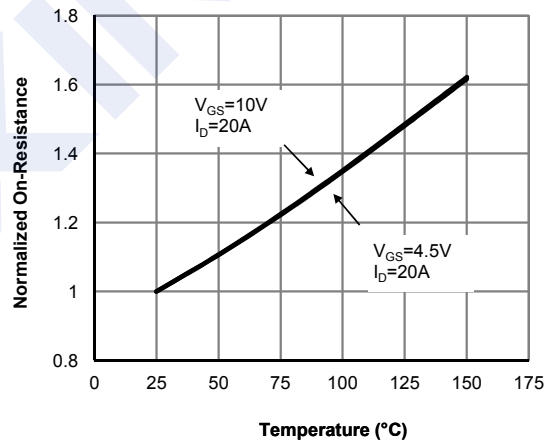


Figure 4: On-Resistance vs. Junction Temperature (Note 6)

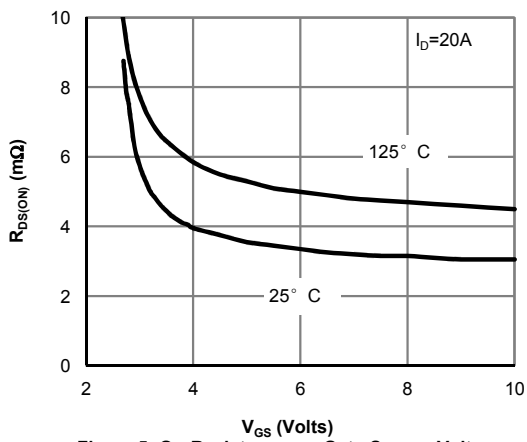


Figure 5: On-Resistance vs. Gate-Source Voltage (Note 6)

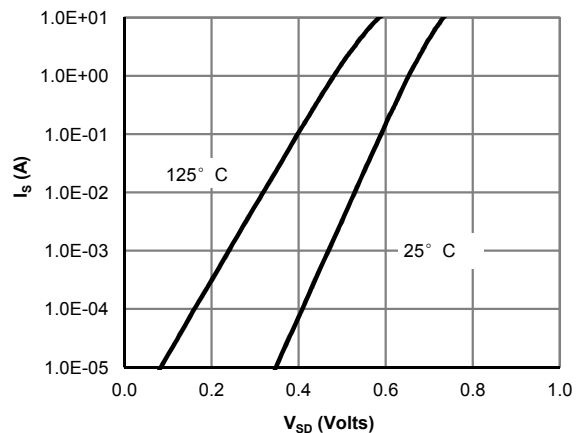


Figure 6: Body-Diode Characteristics (Note 6)

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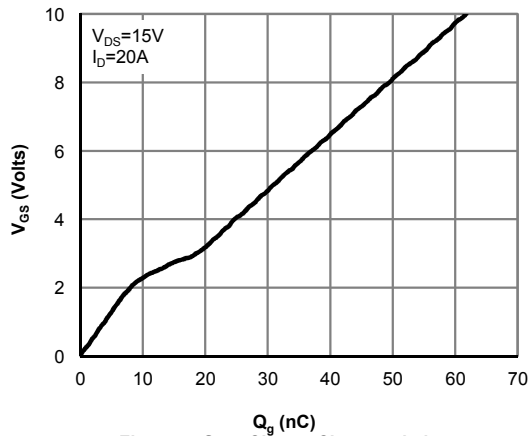


Figure 7: Gate-Charge Characteristics

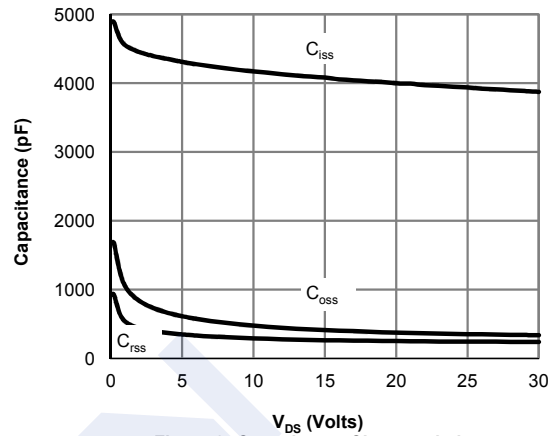


Figure 8: Capacitance Characteristics

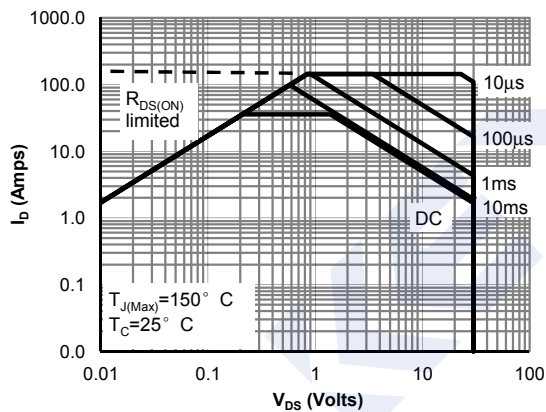


Figure 9: Maximum Forward Biased Safe Operating Area (Note 7)

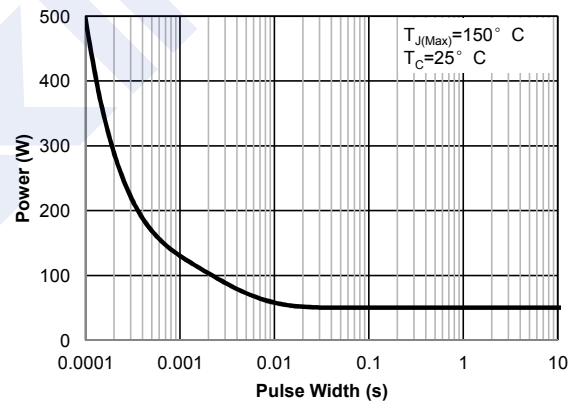


Figure 10: Single Pulse Power Rating Junction-to-Case (Note 7)

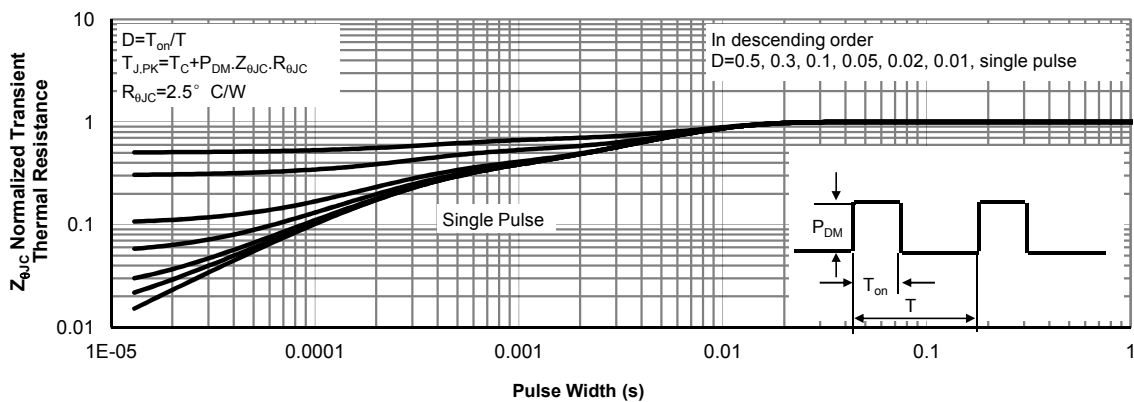
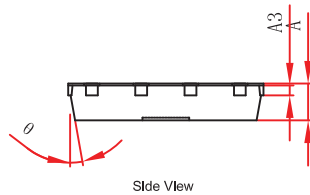
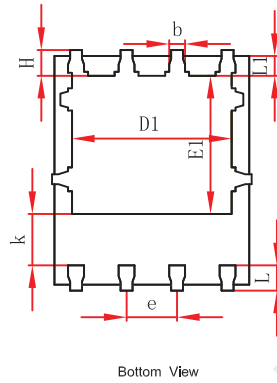
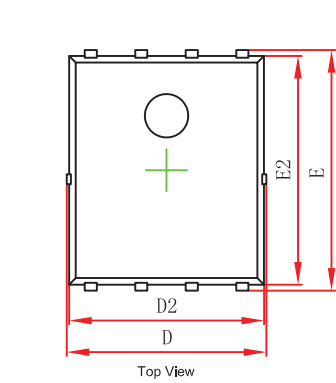


Figure 11: Normalized Maximum Transient Thermal Impedance (Note 7)

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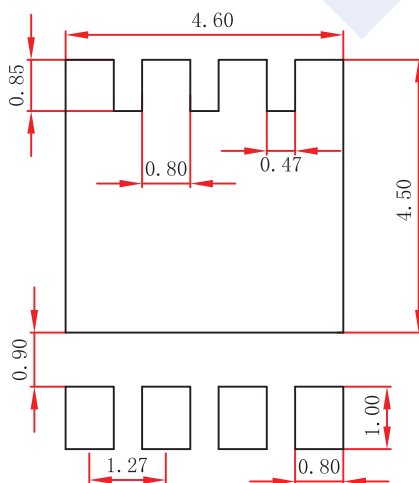
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PDFN5x6-8 Package Outline Dimensions



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: ±0.05mm.
 3. The pad layout is for reference purposes only.