

RoHS  
Compliant



## Features

- $V_{DS(V)} = 80V$
- $I_D = 23A$
- $R_{DS(on)}$  (at  $V_{GS} = 10V$ )  $< 34m\Omega$
- Packaging-PDFN5x6-8

## Absolute Maximum Ratings ( $T_J = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	80	V
Gate-Source Voltage	$V_{GS}$	+20	
Continuous Drain Current	$I_D$	$T_C = 25^\circ C$	23
		$T_C = 100^\circ C$	15
Pulsed Drain Current (Note 1)	$I_{DM}$	92	A
Power Dissipation	$P_D$	32	W
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	20	mJ
Thermal Resistance.Junction- to-Ambient (Note 3)	$R_{\theta JA}$	50	$^\circ C/W$
Thermal Resistance.Junction- to-Case (Note 3)	$R_{\theta JC}$	3.9	
Junction Temperature	$T_J$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to 150	

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.  $E_{AS}$  condition :  $I_D=12A$ ,  $R_{\theta g}=25\Omega$
3. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

## Electrical Characteristics ( $T_C = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=-250\mu A$ , $V_{GS}=0V$	80			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-80V$ , $V_{GS}=0V$			1	$\mu A$
Gate to Source Leakage Current	$I_{GSS}$	$V_{DS}=0V$ , $V_{GS}=\pm 20V$			$\pm 100$	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu A$	2		3.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ , $I_D=12A$			34	m $\Omega$
		$V_{GS}=-6V$ , $I_D=6A$			66	
Forward Transconductance	$g_{FS}$	$V_{DS}=-10V$ , $I_D=-12A$	8			S
<b>Dynamic Characteristics (Note 1)</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V$ , $V_{DS}=-40V$ , $f=1MHz$		564		pF
Output Capacitance	$C_{oss}$			156		
Reverse Transfer Capacitance	$C_{rss}$			7		

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Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Gate Resistance	R <sub>g</sub>	f = 1 MHz		1		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 40 V, I <sub>D</sub> = 12A, R <sub>G</sub> = 1.6Ω		8		nS
Turn-On Rise Time	t <sub>r</sub>			3		
Turn-Off Delay Time	t <sub>d(off)</sub>			11		
Turn-Off Fall Time	t <sub>f</sub>			2		
Total Gate Charge	Q <sub>g</sub>			6.8		
Gate Source Charge	Q <sub>gs</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =-40V, I <sub>D</sub> =-12A		2.4		nC
Gate Drain Charge	Q <sub>gd</sub>			1.5		
<b>Drain-Source Diode Characteristics</b>						
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 12A, dI/dt = 100 A/μs, T <sub>J</sub> = 25°C		43		nS
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			41		nC
Maximum Body-Diode Continuous Current	I <sub>s</sub>				23	
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>s</sub> = 12 A		0.9	1.2	

Notes:

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

## Typical Electrical and Thermal Characteristics

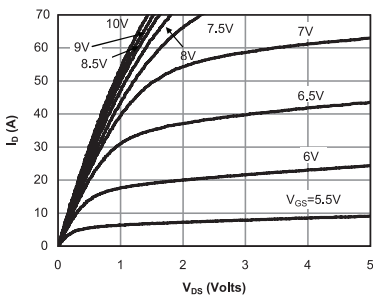


Fig 1: On-Region Characteristics

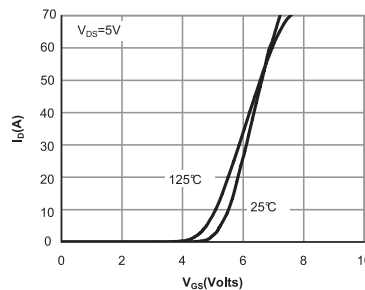


Figure 2: Transfer Characteristics

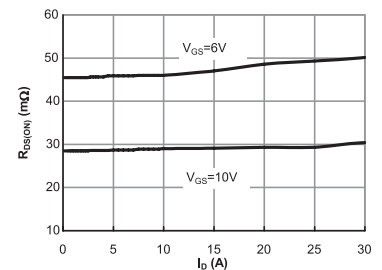


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

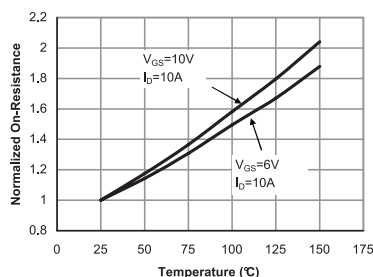


Figure 4: On-Resistance vs. Junction Temperature

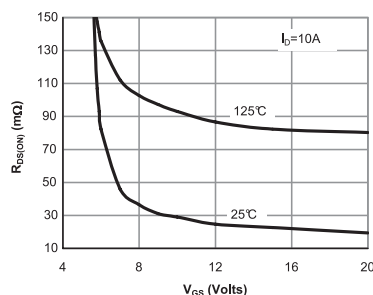


Figure 5: On-Resistance vs. Gate-Source Voltage

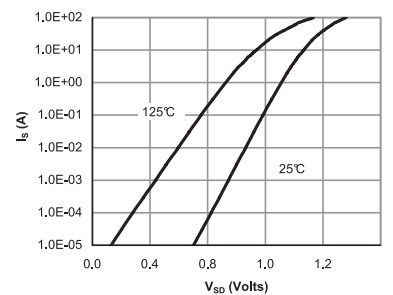


Figure 6: Body-Diode Characteristics

## Typical Characteristics

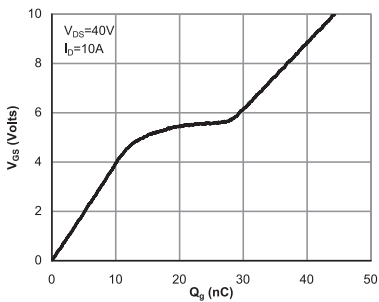


Figure 7: Gate-Charge Characteristics

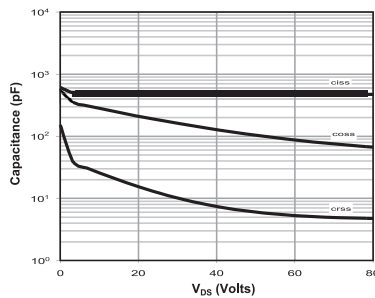


Figure 8: Capacitance Characteristics

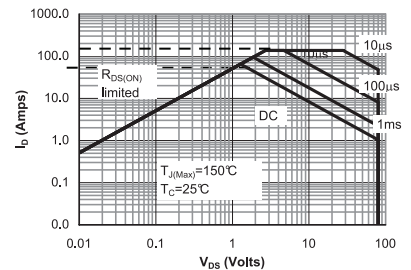


Figure 9: Maximum Forward Biased Safe Operating Area

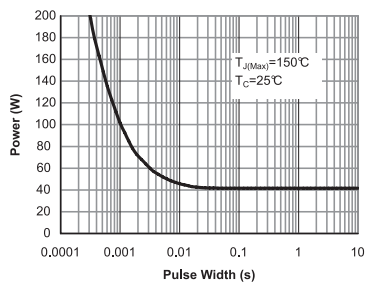


Figure 10: Single Pulse Power Rating Junction-to-Case

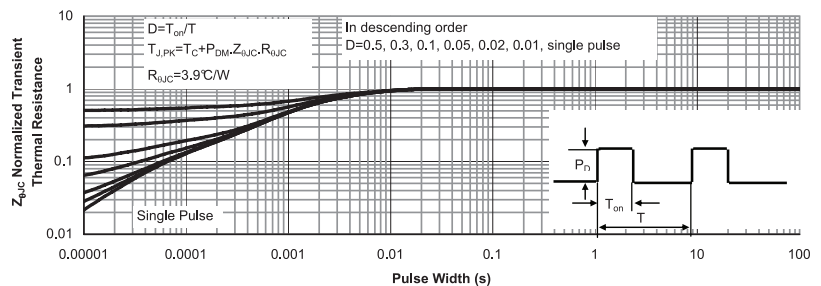
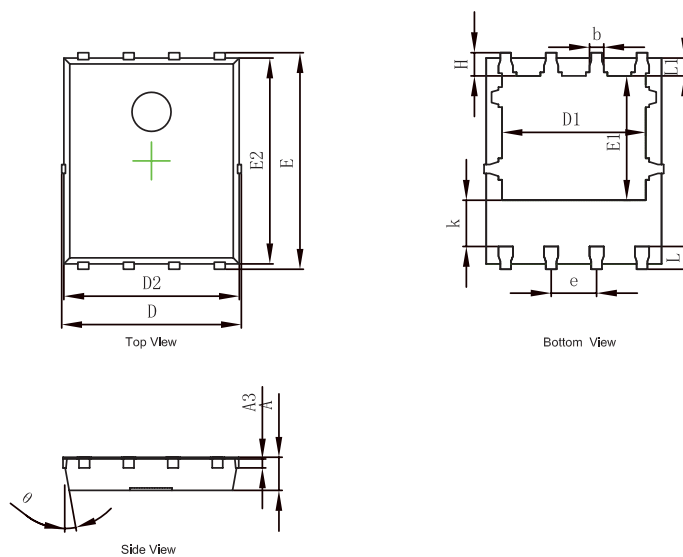


Figure 11: Normalized Maximum Transient Thermal Impedance

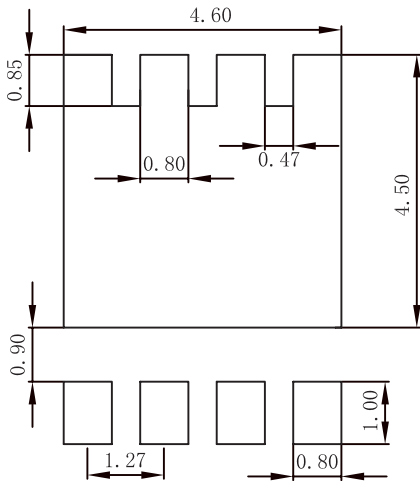
## Package Outline Dimensions



Dimensions : Millimetres

# N Channel MOSFET

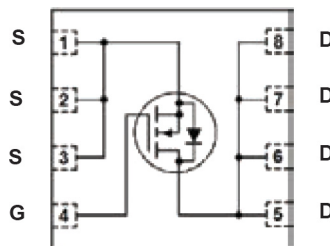
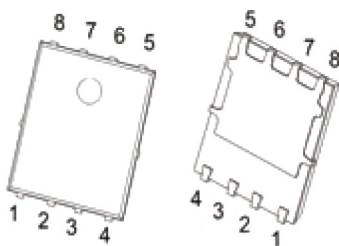
## Suggested Pad Layout



### Notes

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only.

## Diagram



Dimensions : Millimetres

## Part Number Table

Description	Part Number
N Channel MOSFET, 23A, 80V	2KK5098DFN

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