

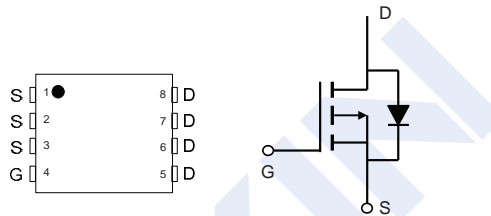
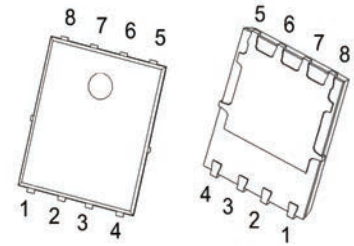
P-Channel MOSFET

2KJ6059DFN

■ Features

- V_{DS} -40 V
- I_D (at $V_{GS}=-10V$) -35 A
- $R_{DS(ON)}$ (at $V_{GS} = -10V$) < 12.5 m Ω
- $R_{DS(ON)}$ (at $V_{GS} = -4.5V$) < 18.5 m Ω
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

PDFN5x6-8



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	$T_c=25^\circ\text{C}$	-35
		$T_c=100^\circ\text{C}$	-23
Pulsed Drain Current (Note 1)	I_{DM}	-140	A
Single Pulsed Avalanche Energy (Note2)	EAS	132	
Power Dissipation	P_D	26	
Thermal Resistance, Junction- to-Case	$R_{\theta JC}$	4.8	$^\circ\text{C}/\text{W}$
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. EAS condition: $T_J= 25^\circ\text{C}$, $V_{DD}= -20V$, $V_G= -10V$, $L= 0.5mH$, $R_G= 25\Omega$, $I_{AS}= -23A$

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■ Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = -250μA, V _{GS} = 0V	-40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -40V, V _{GS} = 0V			-1	μA
		V _{DS} = -40V, V _{GS} = 0V, T _J = 55°C			-25	
Gate-Body Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0		-2.5	V
Static Drain-Source On-Resistance (Note 3)	R _{DS(on)}	V _{GS} = -10V, I _D = -20A			12.5	mΩ
		V _{GS} = -4.5V, I _D = -10A			18.5	
DYNAMIC CHARACTERISTICS (Note 4)						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = -20V, f = 1MHz		3800		pF
Output Capacitance	C _{oss}			329		
Reverse Transfer Capacitance	C _{rss}			289		
Total Gate Charge	Q _g	V _{DS} = -20V, V _{GS} = -10V, I _D = -20A		42		nC
Gate Source Charge	Q _{gs}			7.3		
Gate Drain Charge	Q _{gd}			8.5		
SWITCHING CHARACTERISTICS (Note 5)						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -20 V, R _{GEN} = 2.5 Ω, I _D = -20 A, V _{GS} = -10 V,		10		ns
Turn-On Rise Time	t _r			21		
Turn-Off Delay Time	t _{d(off)}			53		
Turn-Off Fall Time	t _f			29		
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Maximum Body-Diode Continuous Current	I _S				-35	A
Maximum Body-Diode Pulsed Current	I _{SM}				-140	
Reverse Recovery Time	t _{rr}	V _{GS} = 0V, I _S = -30A, di/dt = 100A/μs		39		ns
Reverse Recovery Charge	Q _{rr}			42		μC
Diode Forward Voltage	V _{SD}	I _S = -35 A, V _{GS} = 0V		-0.8	-1.2	V

Notes:

3. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
4. For design aid only, not subject to production testing.
5. Switching characteristics are independent of operating junction temperatures.

■ Marking

Marking	J6059 KC****
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Typical Characteristics

Figure 1: Output Characteristics

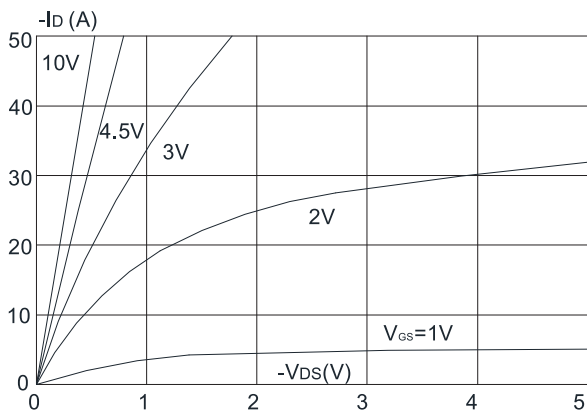


Figure 2: Typical Transfer Characteristics

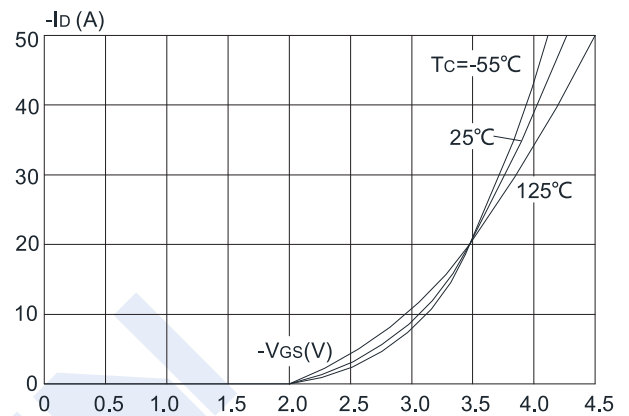


Figure 3: On-resistance vs. Drain Current

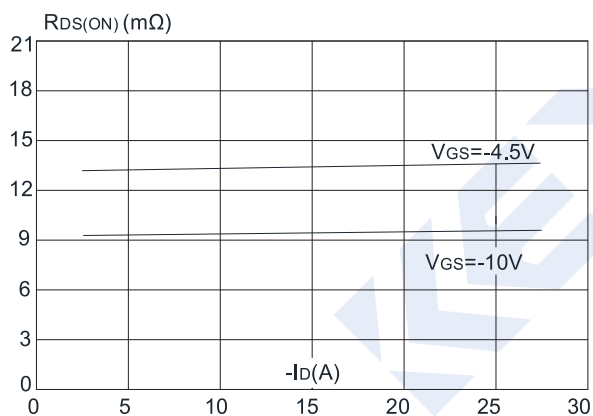


Figure 4: Body Diode Characteristics

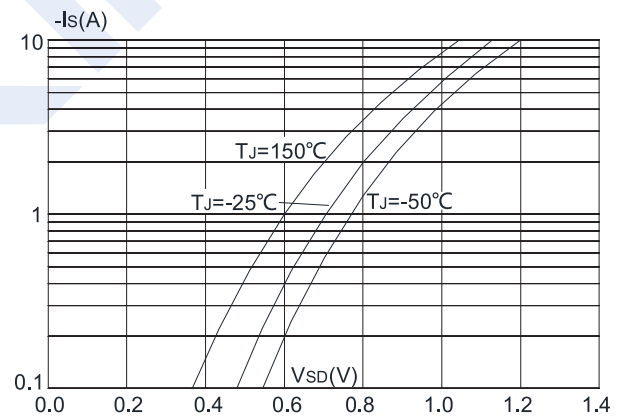


Figure 5: Gate Charge Characteristics

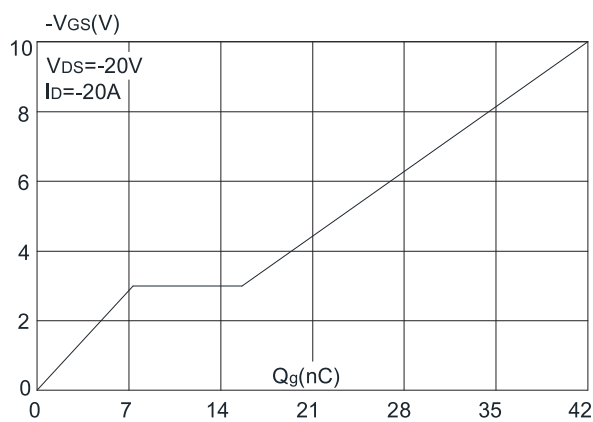
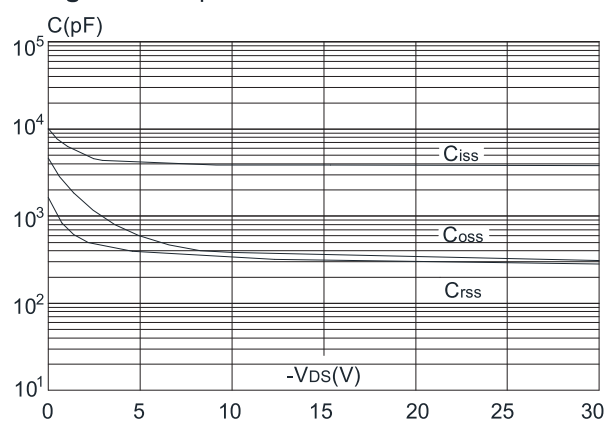


Figure 6: Capacitance Characteristics



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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

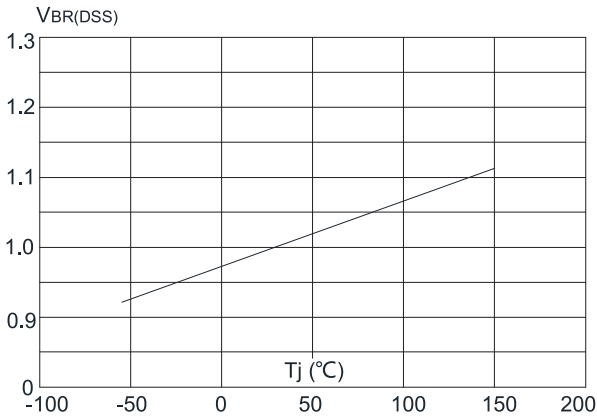


Figure 8: Normalized on Resistance vs. Junction Temperature

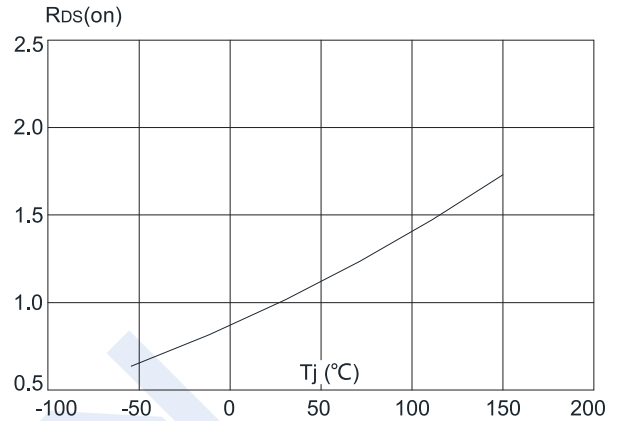


Figure 9: Maximum Safe Operating Area

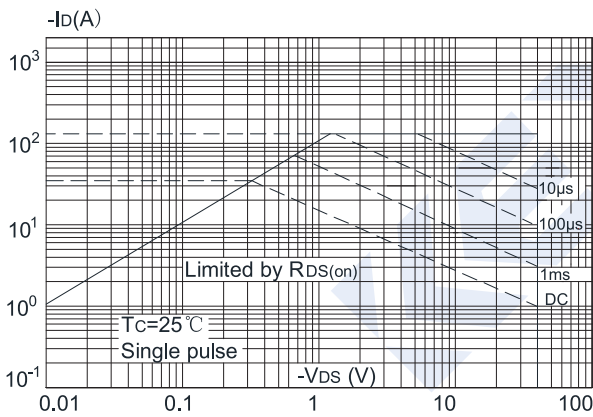


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

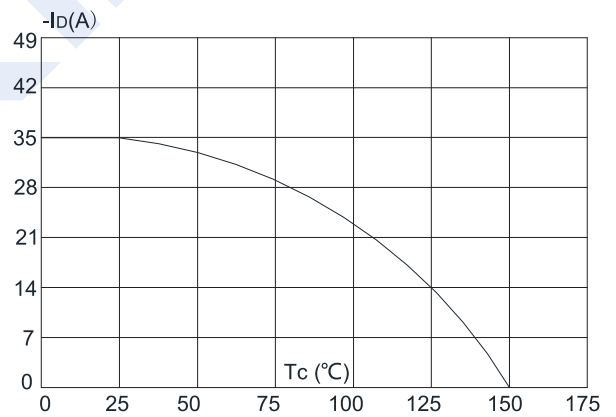
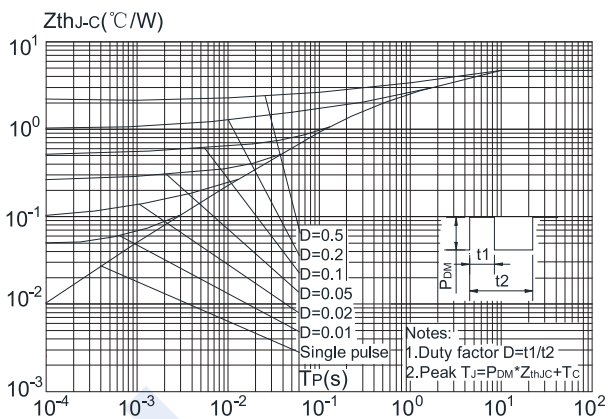
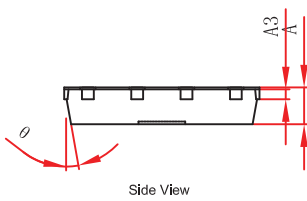
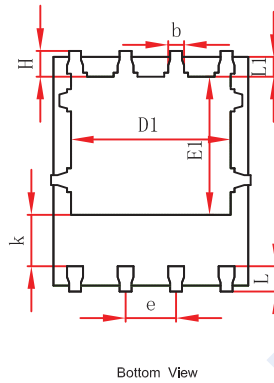
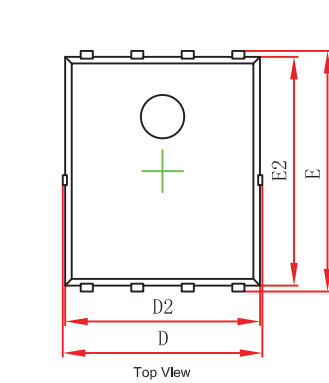


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



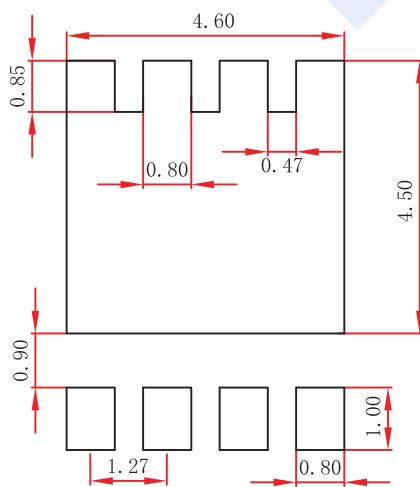
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PDFN5x6-8 Package Outline Dimensions



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.