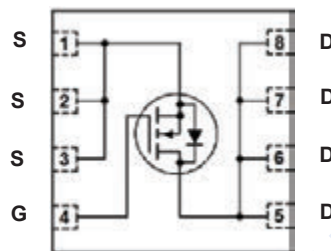


N-Channel MOSFET

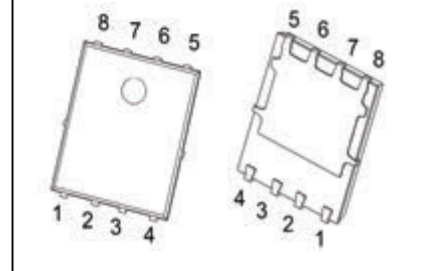
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■ Features

- $V_{DS(V)} = 80\text{ V}$
- $I_D = 160\text{ A}$
- $R_{DS(ON)}$ (at $V_{GS} = 10\text{ V}$) $< 2.7\text{ m}\Omega$
- $R_{DS(ON)}$ (at $V_{GS} = 4.5\text{ V}$) $< 3.3\text{ m}\Omega$



PDFN5x6-8

■ Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ 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	$T_C = 25^\circ\text{C}$	160
		$T_C = 100^\circ\text{C}$	113
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	167
		$T_C = 100^\circ\text{C}$	83
Continuous Drain Current	I_D	$T_A = 25^\circ\text{C}$	24
		$T_A = 100^\circ\text{C}$	17
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	3.8
		$T_A = 100^\circ\text{C}$	1.9
Pulsed Drain Current (Note 1)	I_{DM}	900	A
Source Current (Body Diode)	I_S	139	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	706	mJ
Thermal Resistance.Junction- to-Ambient (Note 3)	$R_{\theta JA}$	39	$^\circ\text{C}/\text{W}$
Thermal Resistance.Junction- to-Case	$R_{\theta JC}$	0.9	$^\circ\text{C}/\text{W}$
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. E_{AS} condition : $I_{L(pk)}=12.2\text{ A}$
3. Surface-mounted on FR4 board using a 650 mm^2 , 2 oz. Cu pad.

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■ Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = 250\ \mu\text{A}$, $V_{GS} = 0\text{V}$	80			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{V}$, $V_{GS} = 0\text{V}$			10	μA
		$V_{DS} = 80\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 125^\circ\text{C}$			100	
Gate to Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$			± 100	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	1.2		2	V
Static Drain-Source On-Resistance (Note 4)	$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 50\text{A}$			2.7	m Ω
		$V_{GS} = 4.5\text{V}$, $I_D = 50\text{A}$			3.3	
Forward Transconductance (Note 4)	g_{FS}	$V_{DS} = 8\text{V}$, $I_D = 50\text{A}$		240		S
Dynamic Characteristics (Note 5)						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 40\text{V}$, $f = 1\text{MHz}$		5126		pF
Output Capacitance	C_{oss}			657		
Reverse Transfer Capacitance	C_{rss}			30		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 4.5\text{V}$, $V_{DS} = 64\text{V}$, $I_D = 50\text{A}$, $R_G = 2.5\ \Omega$		25		ns
Turn-On Rise Time	t_r			99		
Turn-Off Delay Time	$t_{d(off)}$			50		
Turn-Off Fall Time	t_f			20		
Gate Charge Characteristics						
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	$V_{DD} = 40\text{V}$, $I_D = 50\text{A}$		90		nC
Total Gate Charge ($V_{GS} = 4.5\text{V}$)				8		
Gate Source Charge	Q_{gs}			14		
Gate Drain Charge	Q_{gd}			16		
Drain-Source Diode Characteristics						
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 50\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$		66		ns
Body Diode Reverse Recovery Charge	Q_{rr}			92		nC
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}$, $I_S = 50\text{A}$	0.76	1.2		V

Notes:

- Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.
- Switching characteristics are independent of operating junction temperatures.

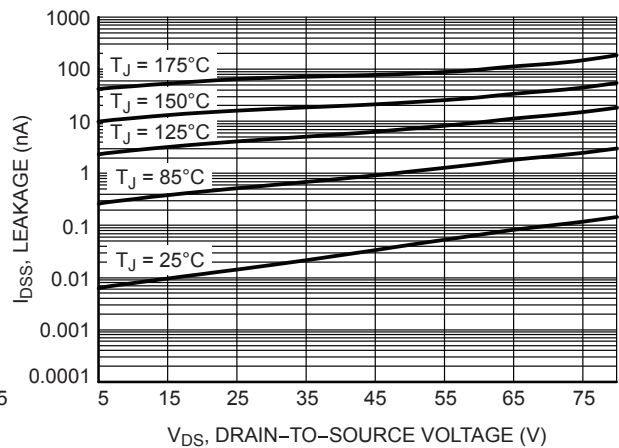
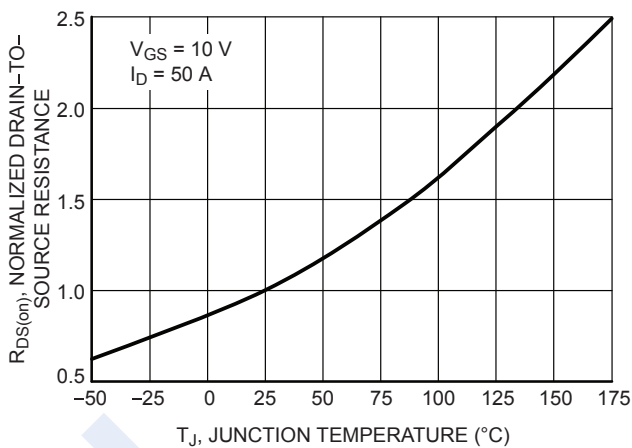
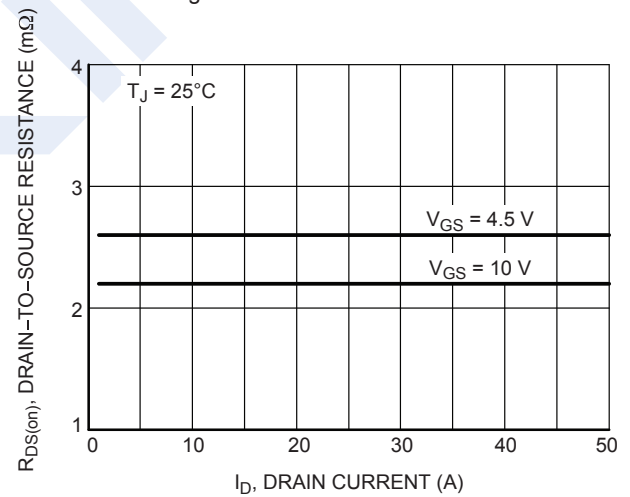
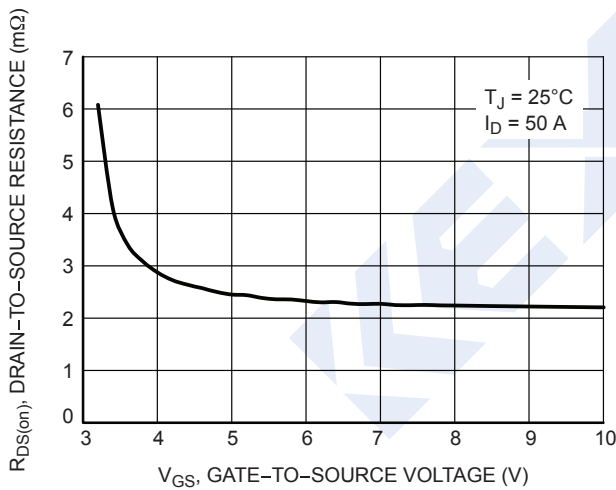
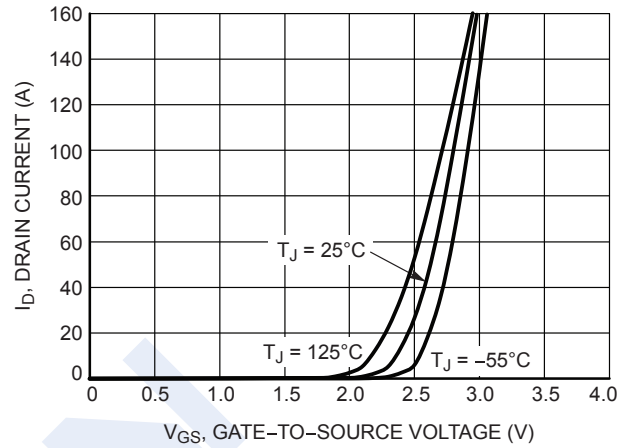
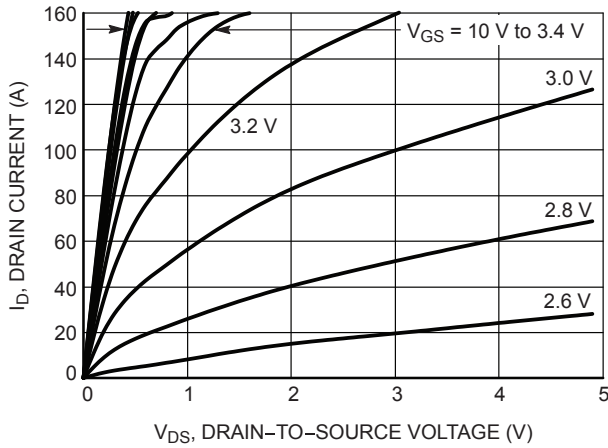
■ Marking

Marking	K5102 KC****
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Typical Electrical and Thermal Characteristics



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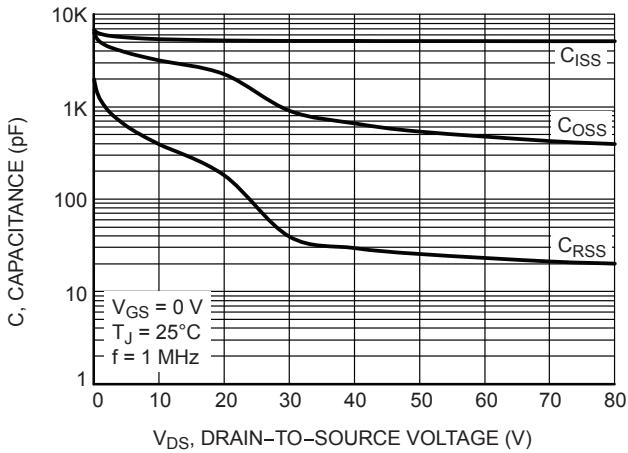


Figure 7. Capacitance Variation

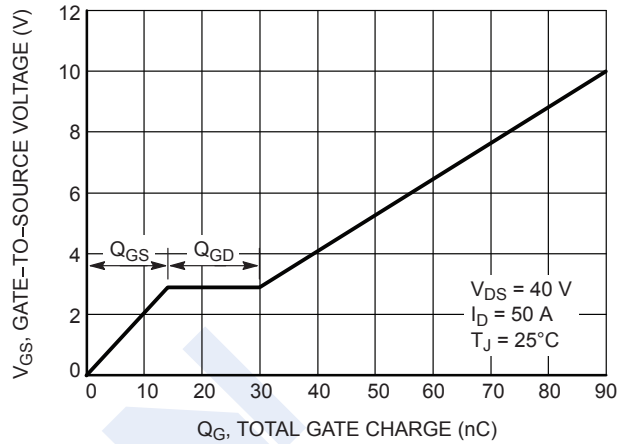


Figure 8. Gate-to-Source Voltage vs. Total Gate Charge

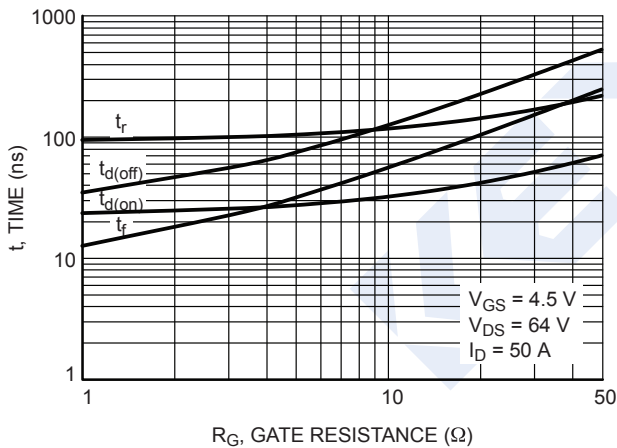


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

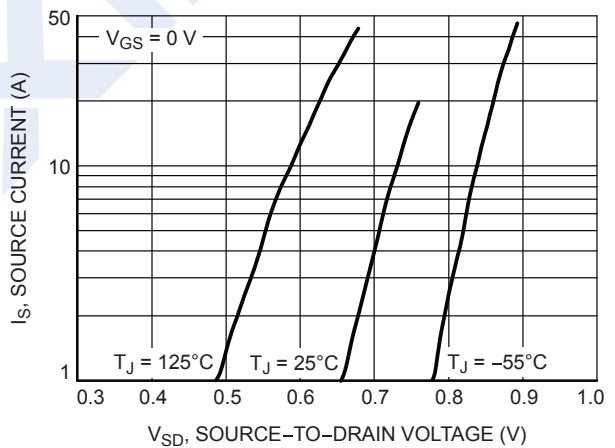


Figure 10. Diode Forward Voltage vs. Current

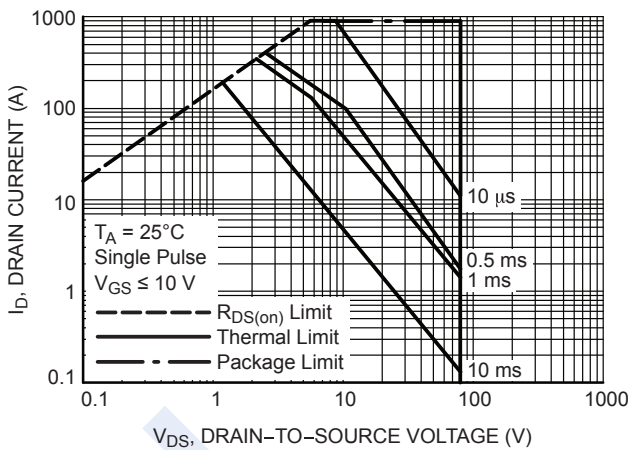


Figure 11. Safe Operating Area

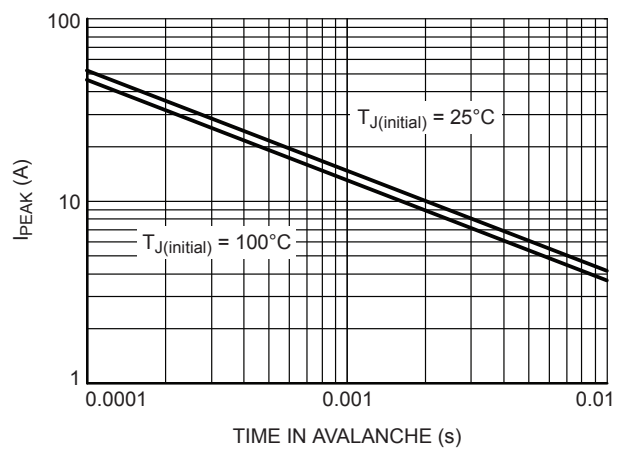
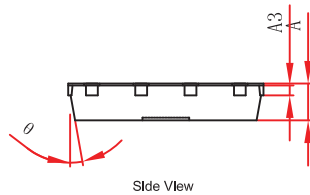
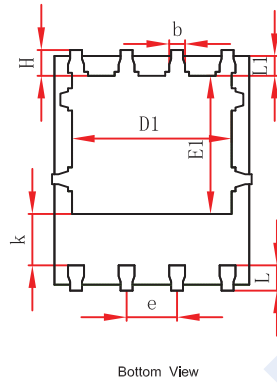
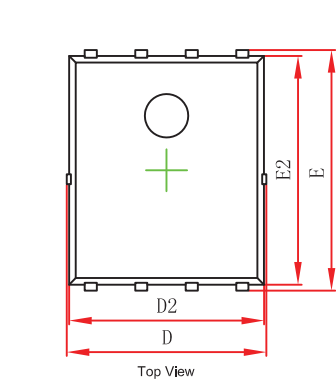


Figure 12. Maximum Drain Current vs. Time in Avalanche

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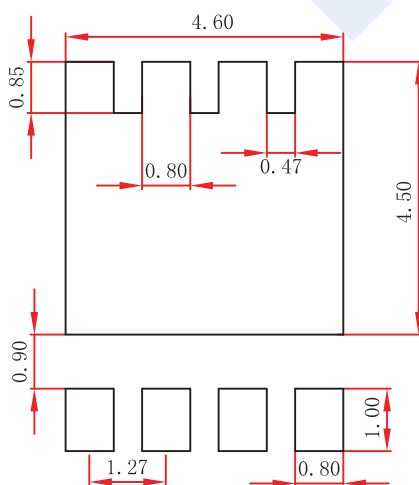
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PDFN5x6-8 Package Outline Dimensions



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