KJ0510GA

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Low $R_{DS(on)}$ Trench Technology
Fast Switching Speed
100% Avalanche Tested

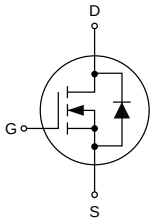
Applications

DC/DC Conversion
Power Switch
Motor Drives

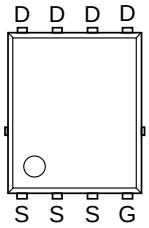
Quick reference

V_{DS} = 100 V
I_D = 105 A
P_D = 125 W
$R_{DS(ON)}$ ≦ 5.2 mΩ @ V_{GS}=10 V（Type: 4.8 mΩ）
$R_{DS(ON)}$ ≦ 8.6 mΩ @ V_{GS}=5 V（Type: 7 mΩ）

Schematic Diagram



Pin Assignment



Top View
PDFN 5×6-8L

Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ0510GA	PDFN 5×6-8L	KJ0510A	13 inches	12 mm	5000

2. Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current, T_c=25℃ [1, 2]	105	A
	Continuous Drain Current, T_c=100℃	66	A
	Continuous Drain Current, T_A=25℃ [3]	16	A
I_{DM}	Pulsed Drain Current [1, 2]	430	A
P_D	Power Dissipation, T_c=25℃	125	W
	Power Dissipation, T_A=25℃ [3]	2.7	W
E_{AS}	Single Pulse Avalanche Energy, V_{DS}=50 V, L=0.3 mH	194	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient [3]	45	℃/W
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1.0	℃/W

3. Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Parameter						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0 V, I_D=250 μA	100	-	-	V
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=250 μA	1.2	1.8	2.6	V
I_{GSS}	Gate-Source Leakage	V_{DS}=0 V, V_{GS}=±20 V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=250 V, V_{GS}=0 V	-	-	1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=10 V, I_D=40 A	-	4.8	5.2	mΩ
		V_{GS}=5 V, I_D=20 A	-	7	8.6	
G_{FS}	Forward transconductance [4]	V_{GS}=5 V, I_D=40 A	-	85	-	S
R_g	Gate resistance	f=1 MHz	-	1	-	Ω
Dynamic Characteristics [4]						
Q_g	Total Gate Charge	V_{DS}=50 V, V_{GS}=10 V, I_D=40 A	-	60	-	nC
Q_{gs}	Gate-Source Charge		-	10	-	
Q_{gd}	Gate-Drain Charge		-	17	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50 V, V_{GS}=10 V, I_D=40 A, R_{GEN}=6 Ω	-	55	-	ns
t_r	Turn-on Rise Time		-	71	-	
$t_{d(off)}$	Turn-off Delay Time		-	125	-	
t_f	Turn-off Fall Time		-	32	-	
C_{iss}	Input Capacitance	V_{DS}=50 V, V_{GS}=0 V, f=1.0 MHz	-	3110	-	pF
C_{oss}	Output Capacitance		-	425	-	
C_{rss}	Reverse Transfer Capacitance		-	20	-	
Reverse Diode Characteristics [4]						
V_{SD}	Diode Forward Voltage	V_{GS}=0 V, I_{SD}=40 A, V_{GS}=0 V	-	0.88	1.1	V
trr	Reverse Recovery Time	V_{DD}=50 V, V_{GS}=0 V, I_{SD}=40 A, diF/dt=100 A/μs	-	40	-	ns
Qrr	Reverse Recovery Charge		-	66	-	μC

Notes:
1. Package limited.
2. Pulse width limited by maximum junction temperature.
3. $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 pad 2 oz copper pad on a 1.5×1.5 in. board of FR-4 material.
4. Guaranteed by design, not subject to production testing.

4. Typical Characteristics

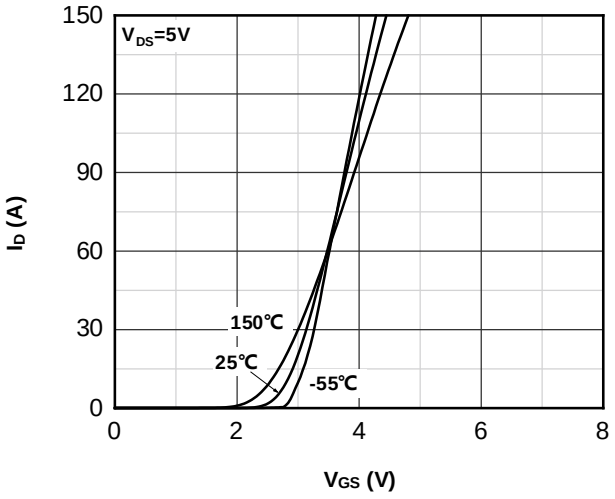


Fig.1 Typ. transfer characteristics

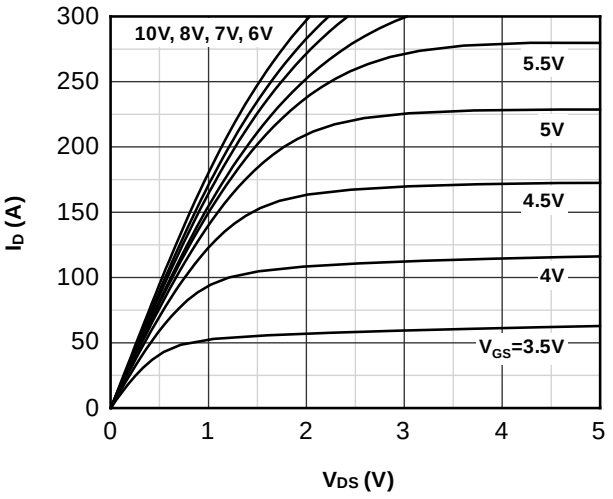


Fig.2 Typ. output characteristics

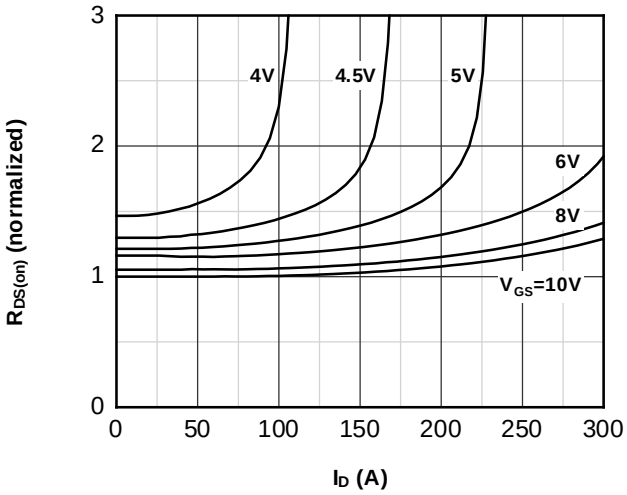


Fig.3 Normalized on-resistance vs drain current

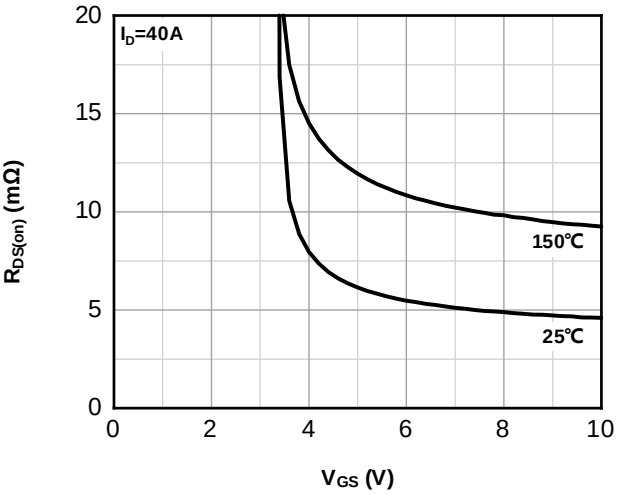


Fig.4 Typ. on-resistance vs gate-source voltage

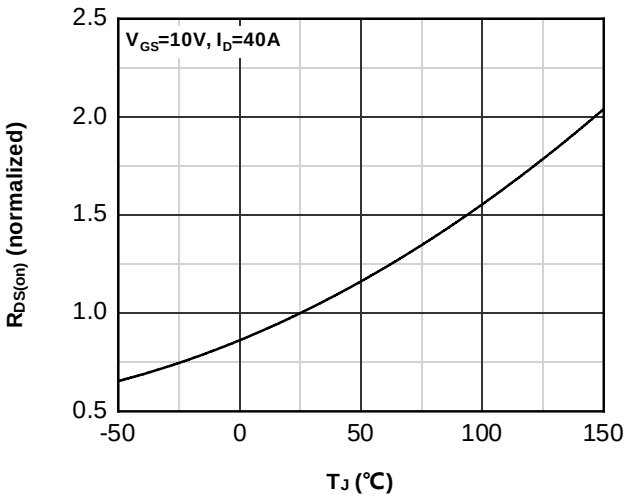


Fig.5 Normalized on-resistance vs junction temperature

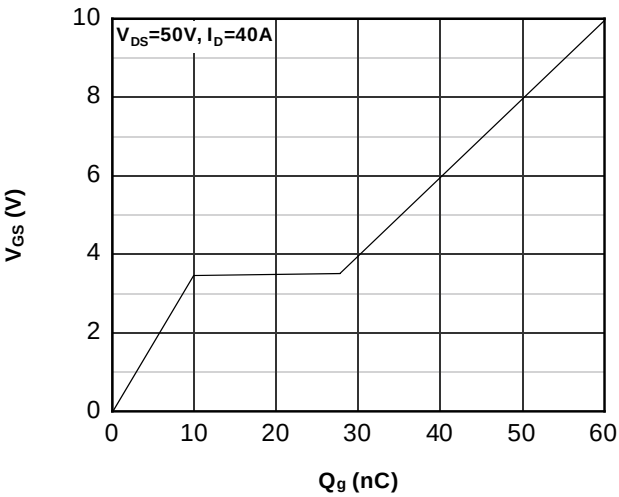


Fig.6 Typ. gate charge

4. Typical Characteristics (Cont.)

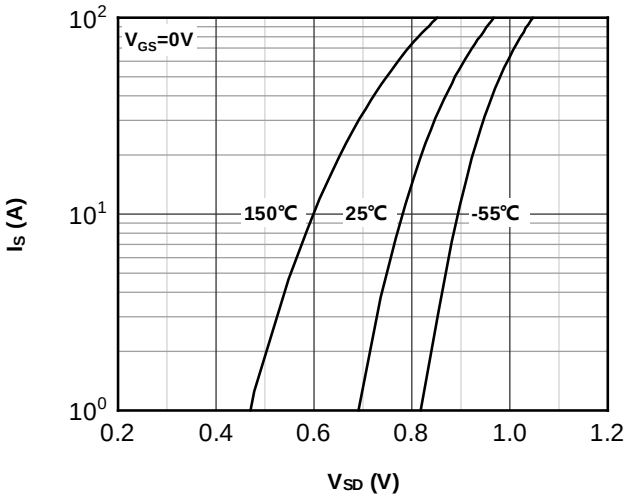


Fig.7 Typ. forward characteristics of body diode

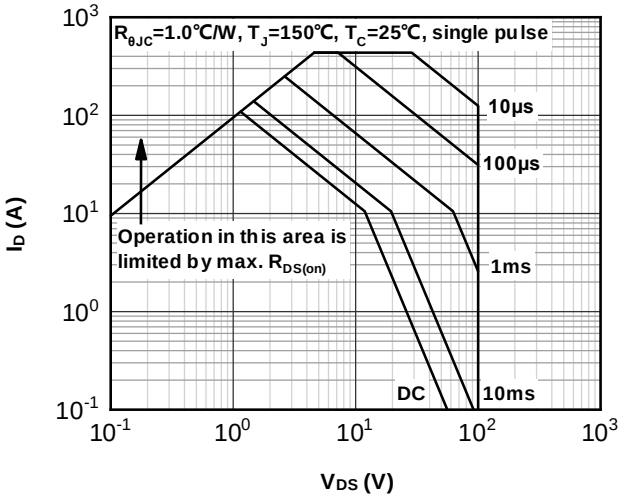


Fig.8 Safe operating area

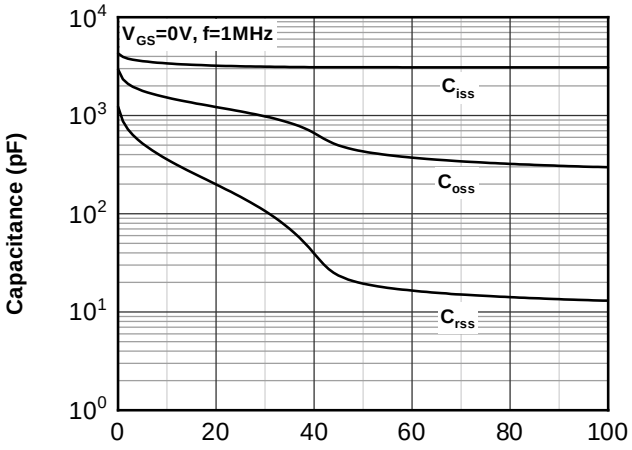


Fig.9 Typ. Capacitance

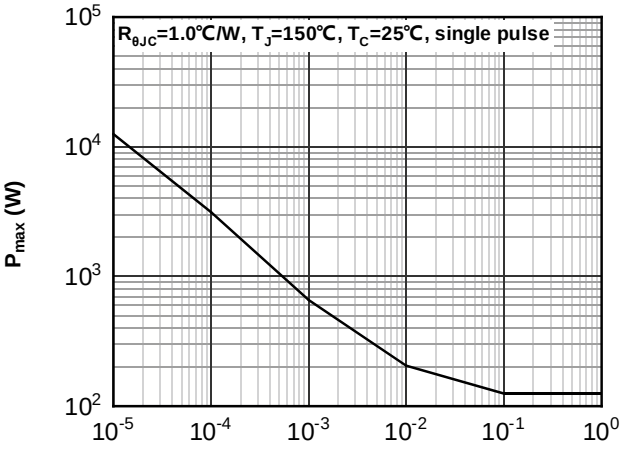


Fig.10 Single pulse maximum power dissipation

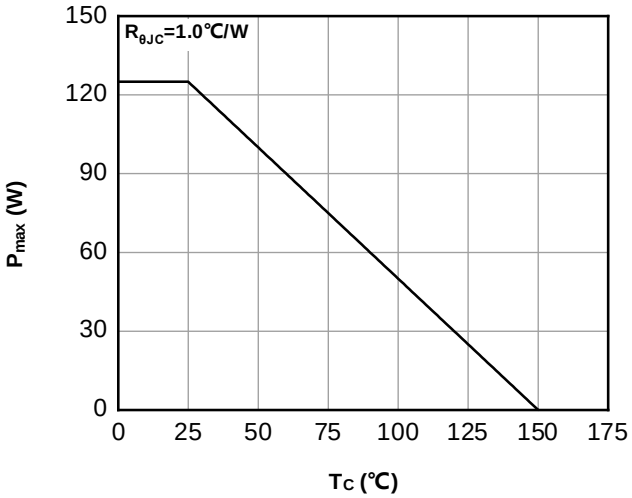


Fig.11 Max. power dissipation vs case temperature

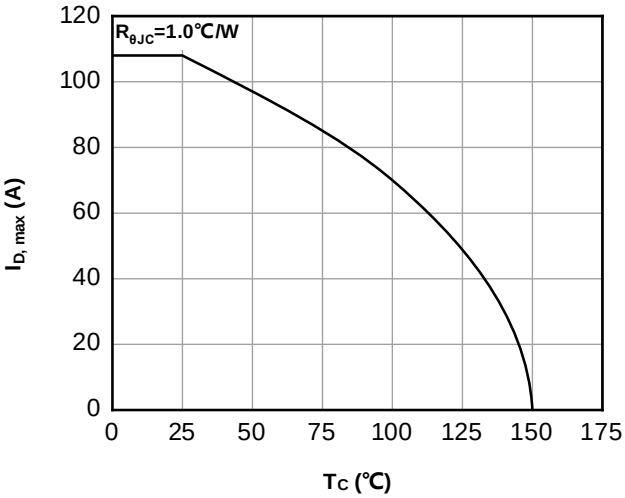


Fig.12 Max. continuous drain current vs case temperature

4. Typical Characteristics (Cont.)

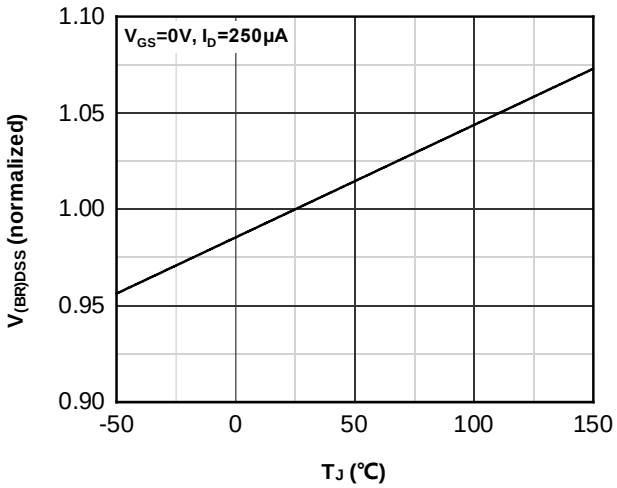


Fig.13 Normalized $V_{(BR)DSS}$ vs junction temperature

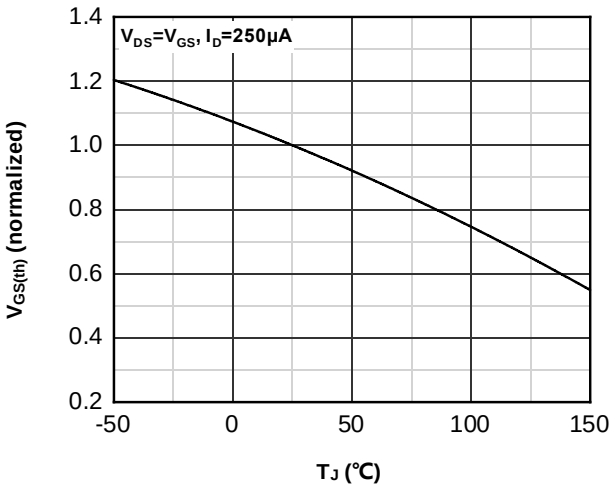


Fig.14 Normalized $V_{GS(th)}$ vs junction temperature

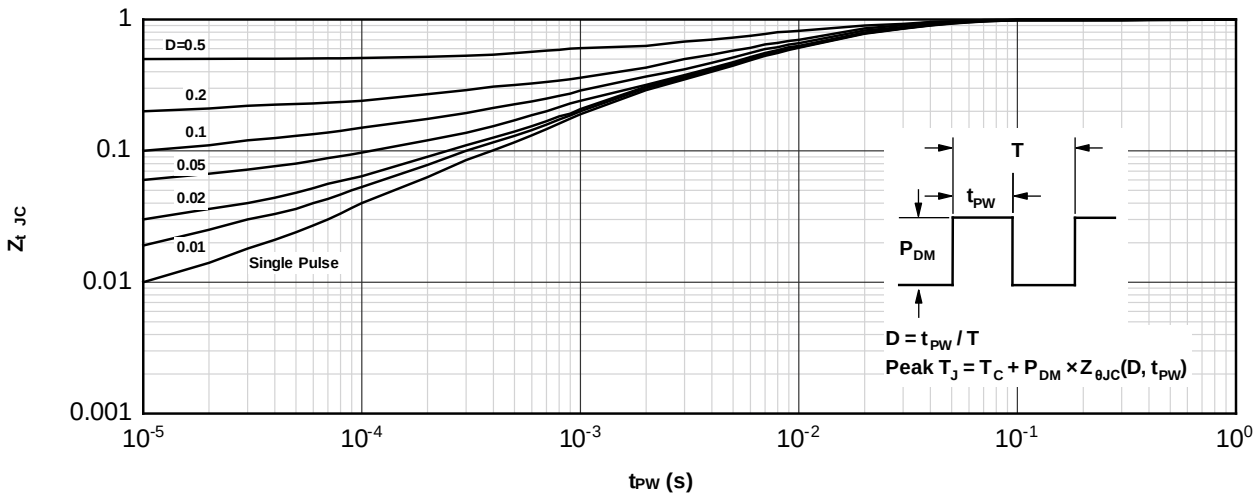
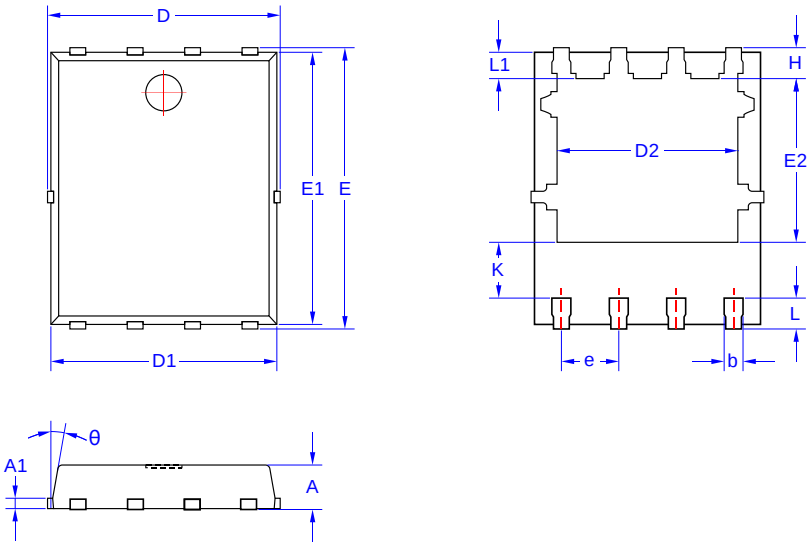


Fig.15 Transient thermal impedance from junction to case

5. Package Mechanical Data

PDFN 5×6-8L Package



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	0.900	-	1.000
A1	0.254 REF		
b	0.350	-	0.450
D	4.944	-	5.096
D1	4.824	-	4.976
D2	3.910	-	4.110
E	5.974	-	6.126
E1	5.674	-	5.826
E2	3.375	-	3.575
e	1.270 TYP		
H	0.574	-	0.726
K	1.190	-	1.390
L	0.559	-	0.711
L1	0.424	-	0.576
θ	10°	-	12°