

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Advanced trench cell design
- Super Trench
- T<sub>J</sub> max 175°C
- Low Thermal Resistance
- MSL1

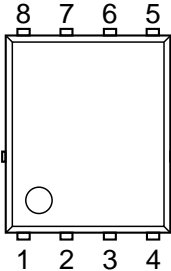
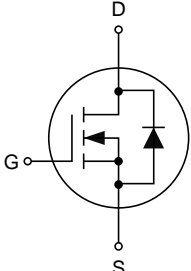
#### 1.2 Applications

- Motor drivers
- DC/DC Converter

#### 1.3 Quick reference

- BV ≥ 30 V
- P<sub>tot</sub> ≤ 113 W
- I<sub>D</sub> ≤ 271 A
- R<sub>DS(ON)</sub> ≤ 0.85 mΩ @ V<sub>GS</sub> = 10 V
- R<sub>DS(ON)</sub> ≤ 1.45 mΩ @ V<sub>GS</sub> = 4.5 V

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 <p>Top View PDFN5x6-8L</p>	
4	Gate		
5,6,7,8	Drain		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>C</sub> =25°C	30	-	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>C</sub> =25°C	-	± 20	V
I <sub>D</sub> *	Drain Current	T <sub>C</sub> =25°C, V <sub>GS</sub> =10 V	-	271	A
		T <sub>C</sub> =100°C, V <sub>GS</sub> =10 V	-	171	A
I <sub>DM</sub> **,***	Pulsed Source Current	T <sub>C</sub> =25°C, V <sub>GS</sub> =10 V	-	1084	A
P <sub>tot</sub> *	Total Power Dissipation	T <sub>C</sub> =25°C	-	113	W
T <sub>J</sub> , T <sub>stg</sub>	Operating Junction and Storage Temperature		-55	175	°C
I <sub>S</sub>	Diode Forward Current	T <sub>C</sub> =25°C	-	271	A
E <sub>AS</sub> *	Single Pulsed Avalanche Energy	V <sub>DD</sub> =30 V, L=1.0 mH	-	1058	mJ
R <sub>θJA</sub> *	Thermal Resistance-Junction to Ambient		-	41.4	°C / W
R <sub>θJC</sub> *	Thermal Resistance-Junction to Case		-	1.1	

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 300 μs, duty cycle ≤ 2%
- \*\*\* Limited by bonding wire

## 4. Marking Information

Product Name	Marking
KJ009N03G	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>KJ009N03G</b>  <b>YWWXXX</b> </div> <b>YWWXXX:</b> <b>Date Code</b>

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ009N03G	PDFN5x6-8L	-	-	5000	

Note: KUIJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

## 6. Electrical Characteristics (T<sub>A</sub>=25°C Unless Otherwise Noted)

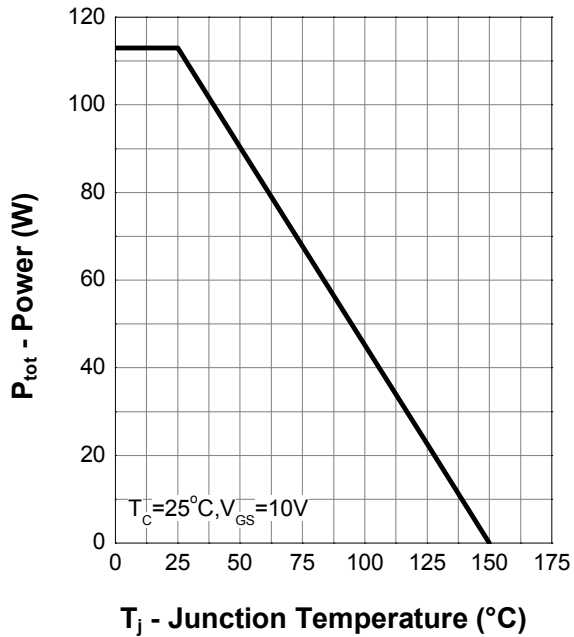
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA	30	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	1.2	-	2.0	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> =24 V, V <sub>GS</sub> =0 V	-	-	1	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20 V, V <sub>DS</sub> =0 V	-	-	±100	nA
R <sub>DS(on)</sub> <sup>a</sup>	On-State Resistance	V <sub>GS</sub> =10 V, I <sub>D</sub> =50 A	-	0.75	0.85	mΩ
		V <sub>GS</sub> =4.5 V, I <sub>D</sub> =30 A	-	1.25	1.45	
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> =50 A, V <sub>GS</sub> =0 V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =40 A, dI <sub>SD</sub> /dt=100 A/μs	-	34	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	22	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0 V, V <sub>DS</sub> =15 V Frequency=1 MHz	-	11055	-	pF
C <sub>oss</sub>	Output Capacitance		-	1276	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	476	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =15 V, V <sub>GEN</sub> =10 V, R <sub>G</sub> =4.5 Ω, R <sub>L</sub> =0.3 Ω, I <sub>DS</sub> =50 A	-	27	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	97	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	155	-	
t <sub>f</sub>	Turn-off Fall Time		-	106	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15 V, V <sub>GS</sub> =10 V, I <sub>DS</sub> =50 A	-	194	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	42	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	33	-	

Notes:

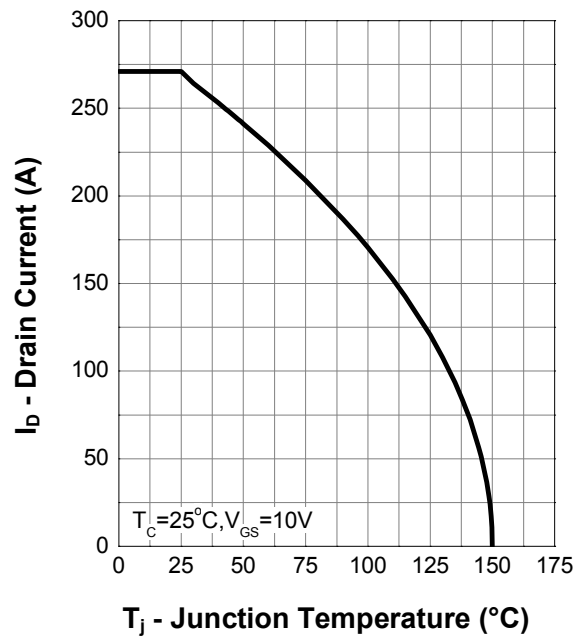
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%
- Guaranteed by design, not subject to production testing

## 7. Typical Characteristics

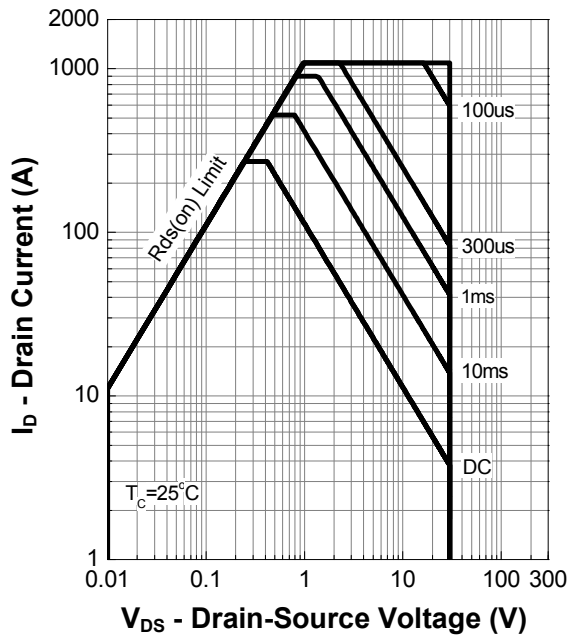
### Power Capability



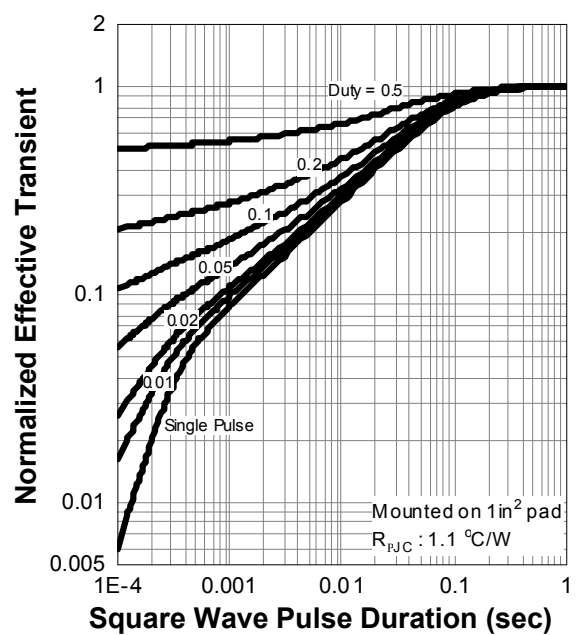
### Current Capability



### Safe Operation Area

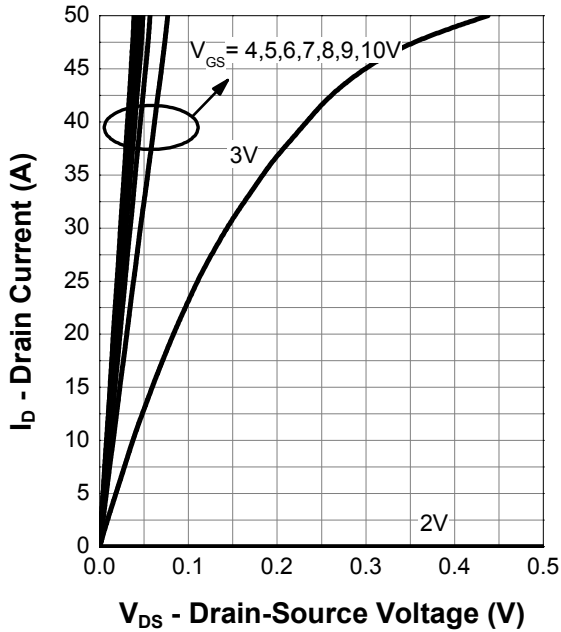


### Transient Thermal Impedance

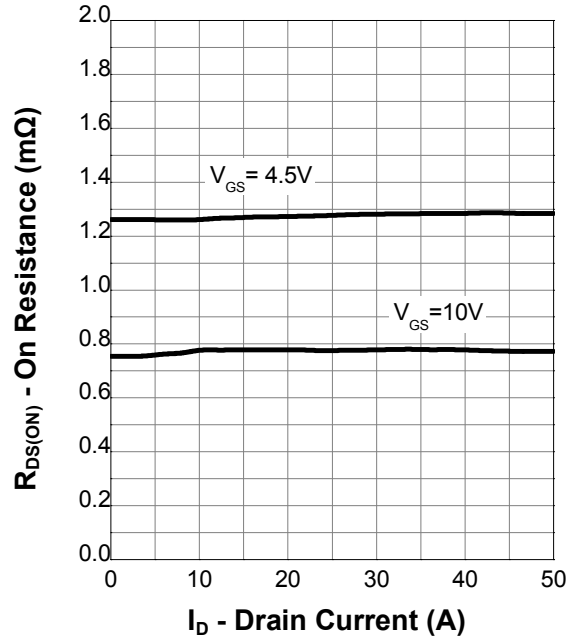


## 7. Typical Characteristics (Cont.)

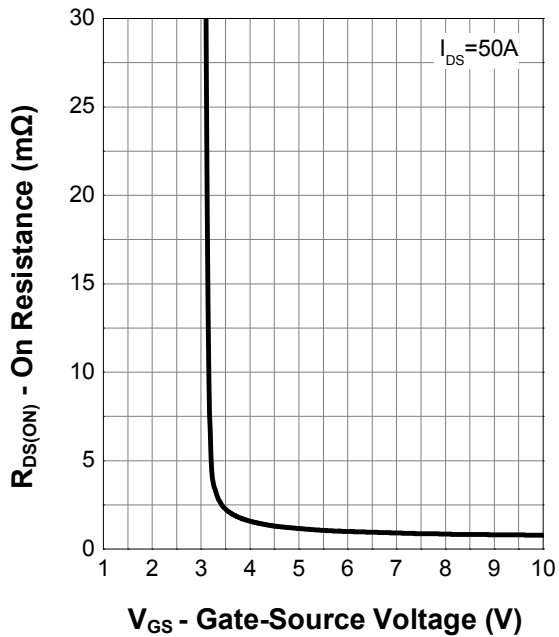
**Output Characteristics**



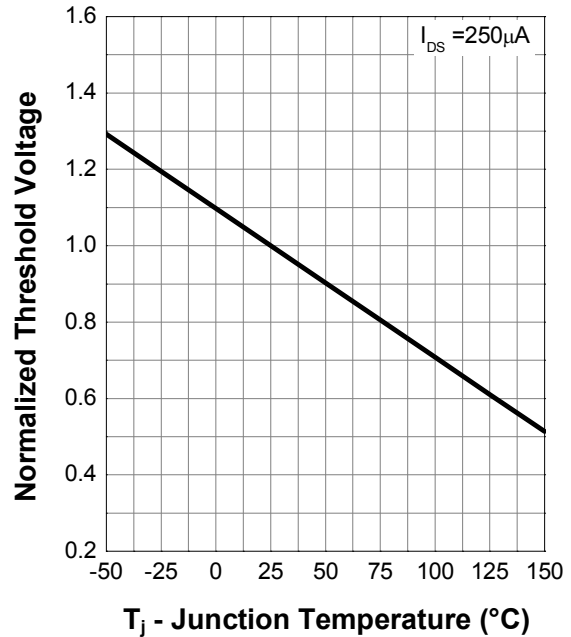
**On Resistance**



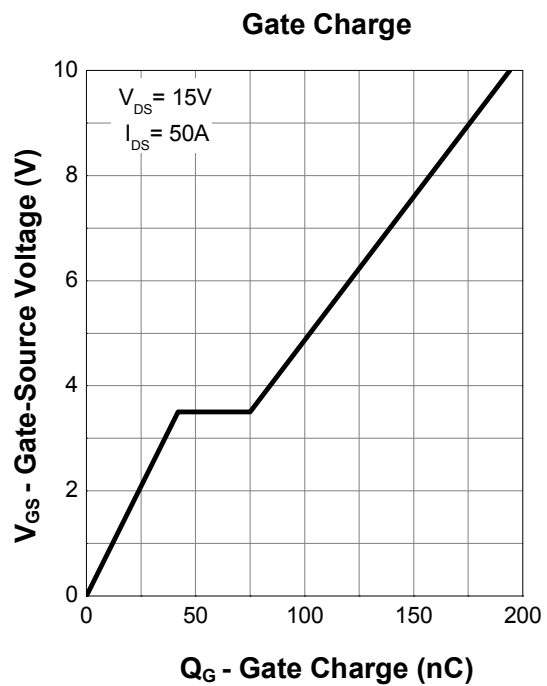
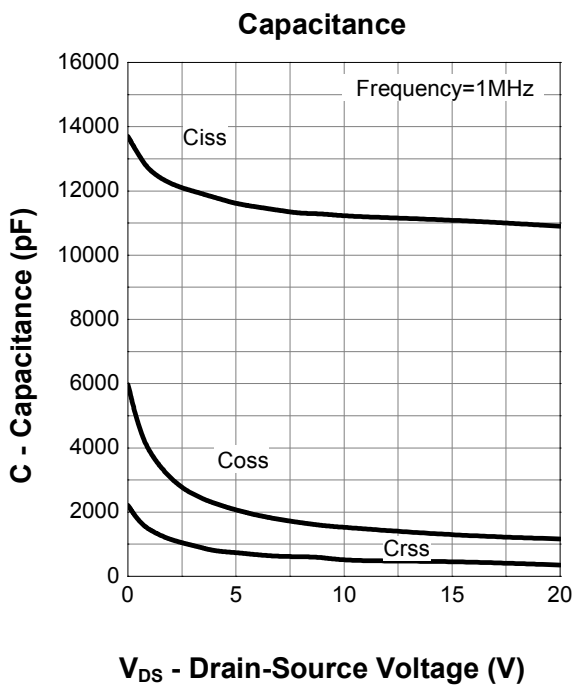
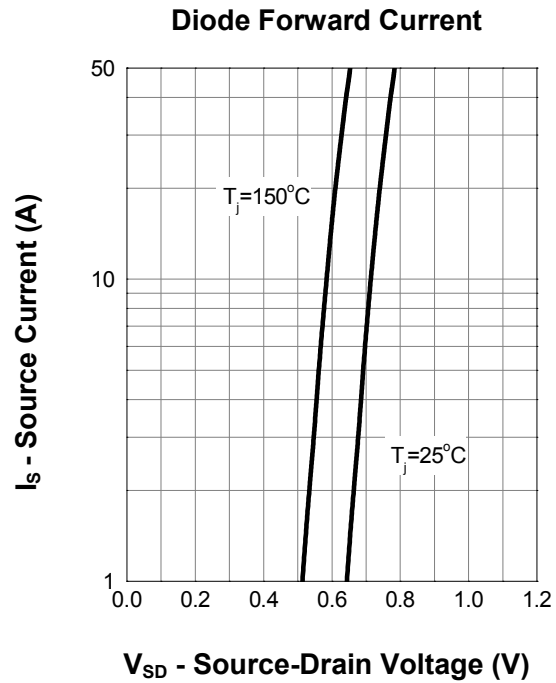
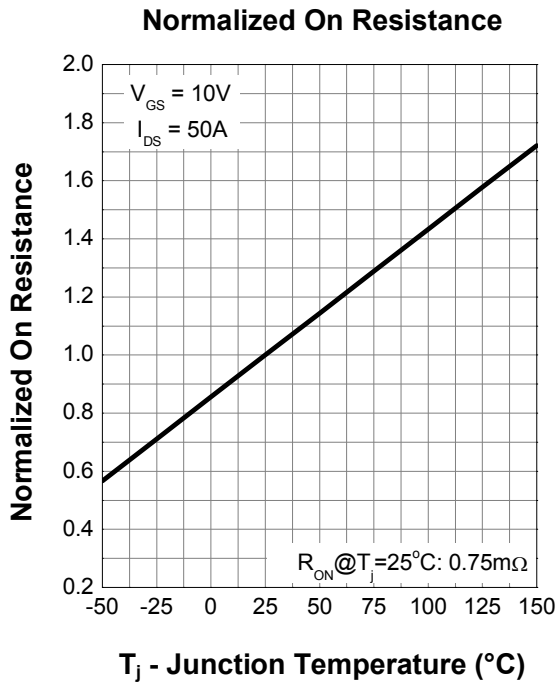
**Transfer Characteristics**



**Normalized Threshold Voltage**

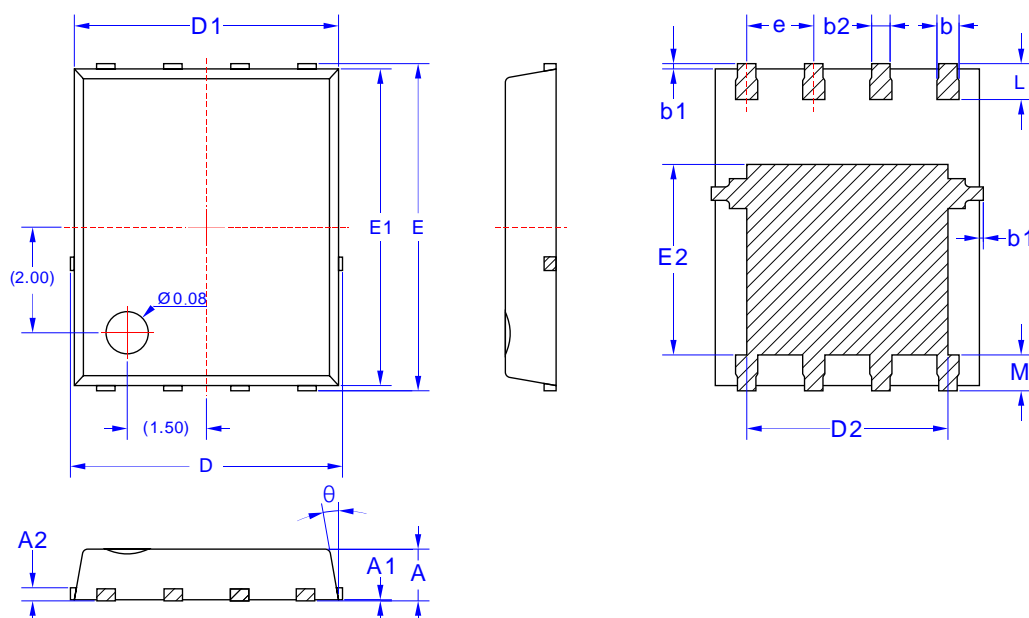


## 7. Typical Characteristics (Cont.)



## 8. Package Dimensions

PDFN5x6-8L Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.95	1.05
A1	0	0.05
A2	0.25 REF	
b	0.31	0.51
b1	0.03	0.13
b2	0.21	0.41
D	5.15 BSC	
D1	5.00 BSC	
D2	3.70	3.90
E	6.15 BSC	
E1	6.00 BSC	
E2	3.56	3.76
e	1.27 BSC	
L	2.04	2.84
M	2.04	2.84
$\theta$	10°	12°