

# N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- Advanced trench cell design
- Low Thermal Resistance

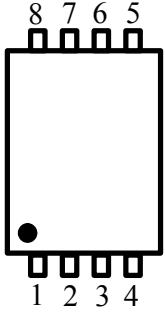
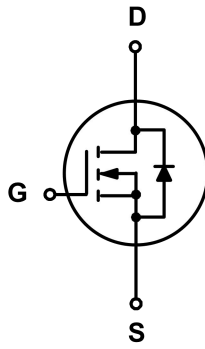
### 1.2 Applications

- Motor drivers
- DC - DC Converter

### 1.3 Quick reference

- $BV \geq 40\text{ V}$
- $R_{DS(ON)} \leq 2.0\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- $P_{tot} \leq 166\text{ W}$
- $R_{DS(ON)} \leq 3.5\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$
- $I_D \leq 100\text{ A}$

## 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1, 2, 3	Source	 Top View PQFN5x6-8L	
4	Gate		
5, 6, 7, 8	Drain		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	40	-	V
$V_{GS}$	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	$\pm 20$	V
$I_D^{*,**}$	Drain Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	100	A
$I_{DM}^{*,**,***}$	Pulsed Source Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	300	A
$P_{tot}^*$	Total Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	166	W
$T_{stg}$	Storage Temperature		-55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-	150	$^\circ\text{C}$
$I_S$	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	-	100	A
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	62.5	$^\circ\text{C} / \text{W}$
$R_{\theta JC}^*$	Thermal Resistance- Junction to Case		-	0.75	

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec}$
- \*\* Pulse width  $\leq 10\text{ }\mu\text{s}$ , duty cycle  $\leq 1\%$
- \*\*\* Limited by bonding wire

## 4. Marking Information

Product Name	Marking
KJ40H100G	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>40H100</b>  <b>YWWXXX</b> </div> <b>YWW:</b> <b>Date Code</b>

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ40H100G	PQFN5*6			4000	

Note: KUAJIEXIN 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)

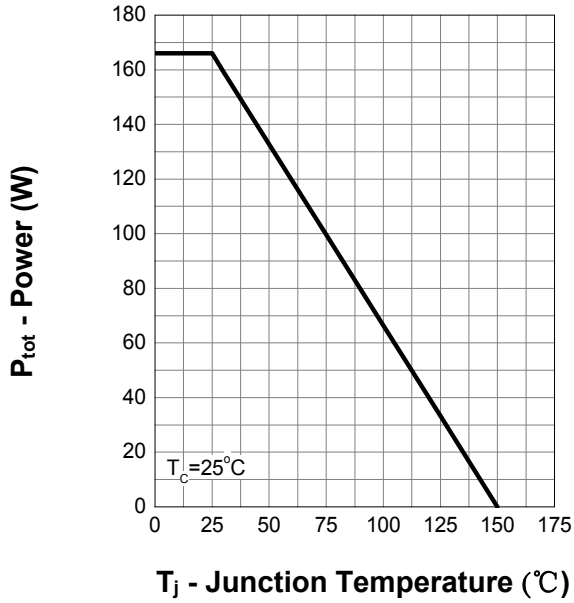
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	40	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 250 μA	1.5	2.0	2.5	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> = 32 V, V <sub>GS</sub> = 0 V	-	-	1	μA
		T <sub>J</sub> = 85 °C	-	-	30	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>	Drain-Source On-State Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A	-	1.5	2.0	mΩ
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 10 A	-	2.9	3.5	
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> = 20 A, V <sub>GS</sub> = 0 V	-	0.7	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> = 20 A, dI <sub>SD</sub> /dt = 100 A/μs	-	42	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	39	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 20 V Frequency = 1 MHz	-	10861	-	pF
C <sub>oss</sub>	Output Capacitance		-	757	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	165	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = 20 V, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 1 Ω, I <sub>D</sub> = 20 A	-	32	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	73	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	119	-	
t <sub>f</sub>	Turn-off Fall Time		-	84	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 20 V, I <sub>DS</sub> = 20 A	-	163	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	48.2	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	25.6	-	

Notes :

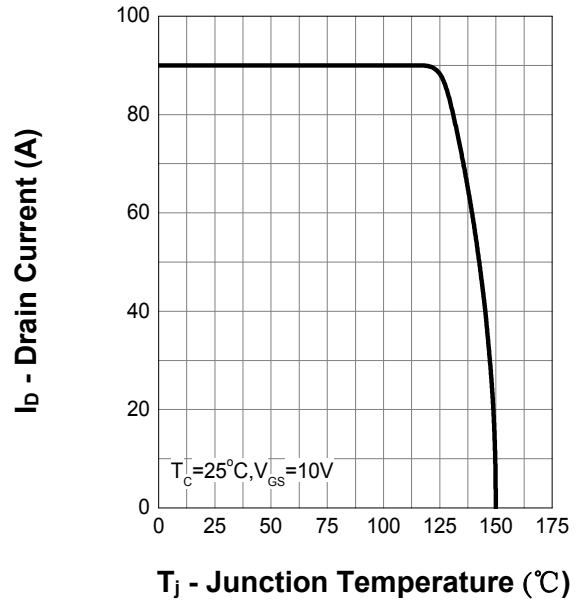
- a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics

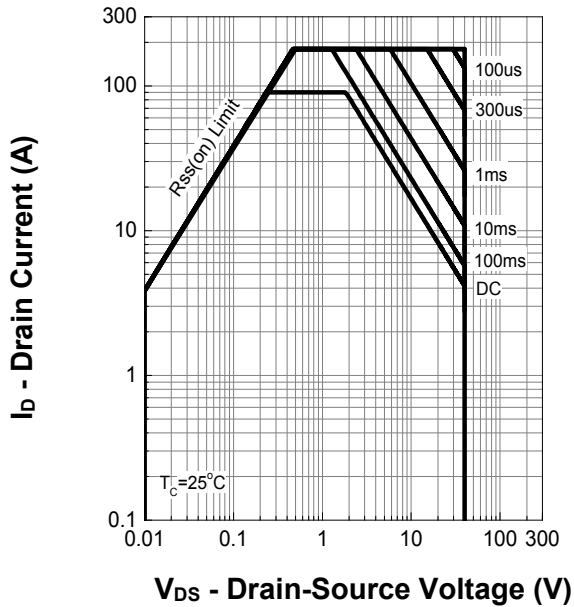
### Power Capability



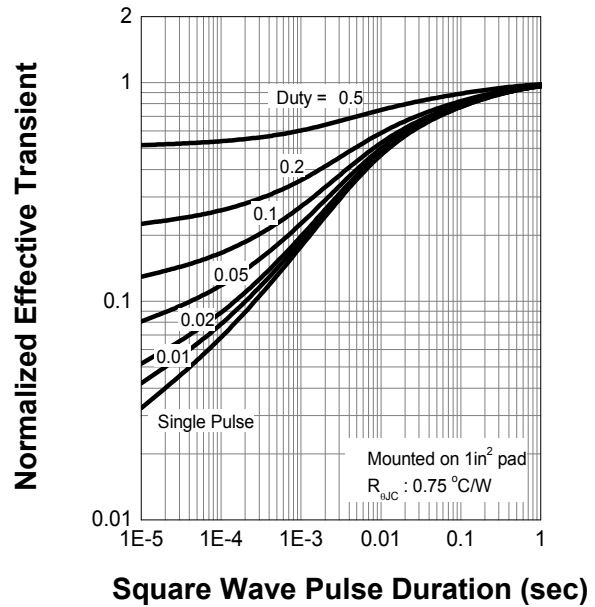
### Current Capability



### Safe Operation Area

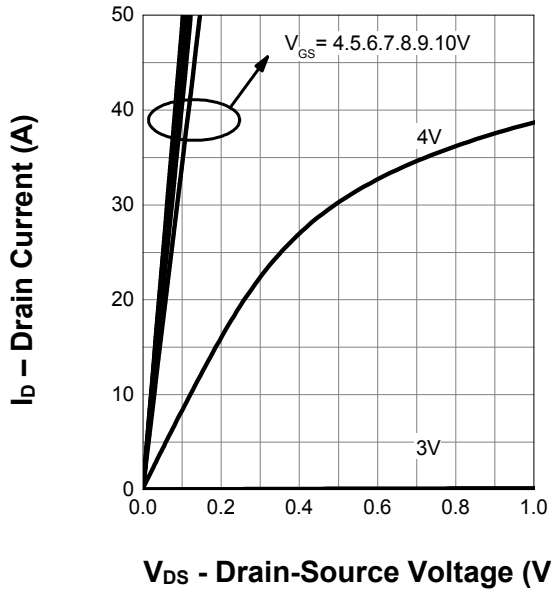


### Thermal Transient Impedance

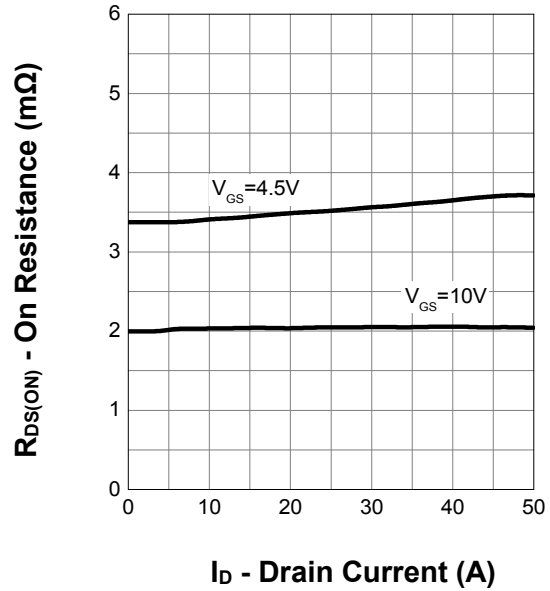


## 7. Typical Characteristics (cont.)

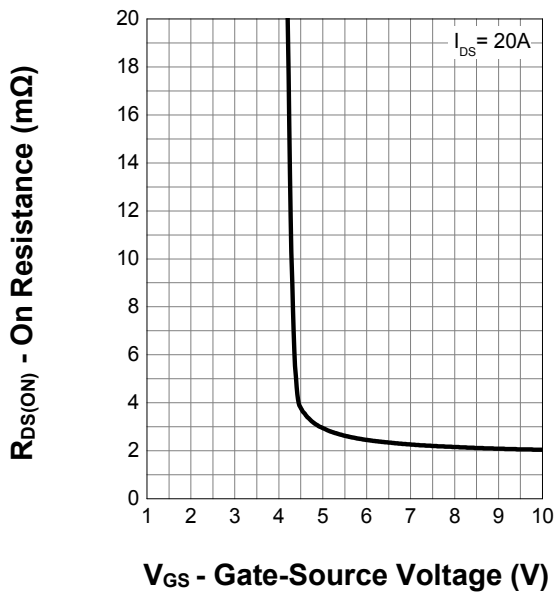
### Output Characteristics



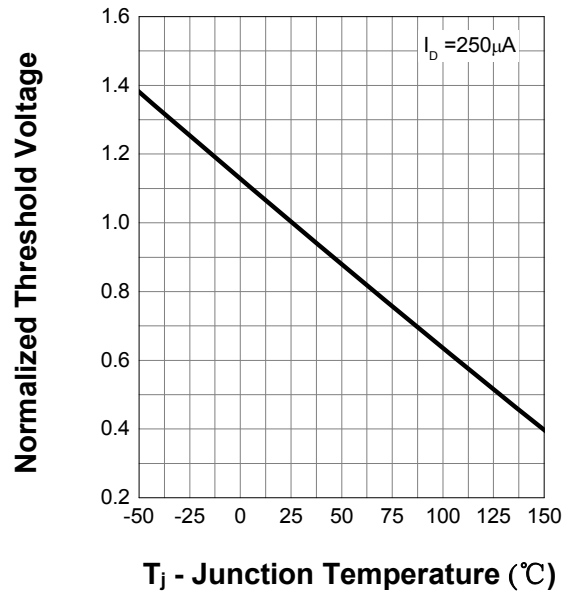
### Drain-Source On Resistance



### Transfer Characteristics

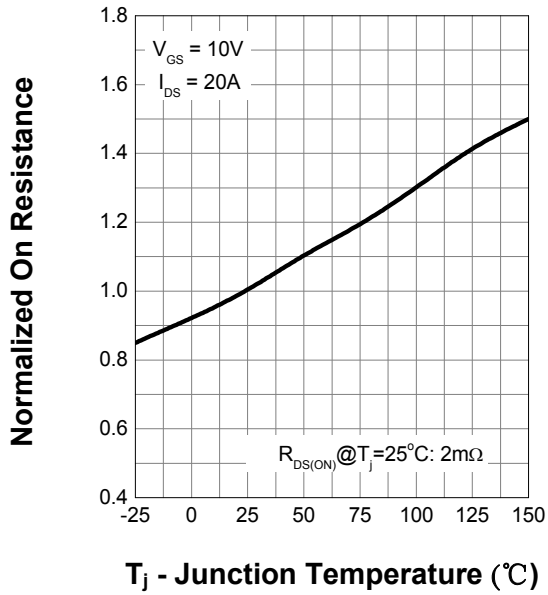


### Gate Threshold Voltage

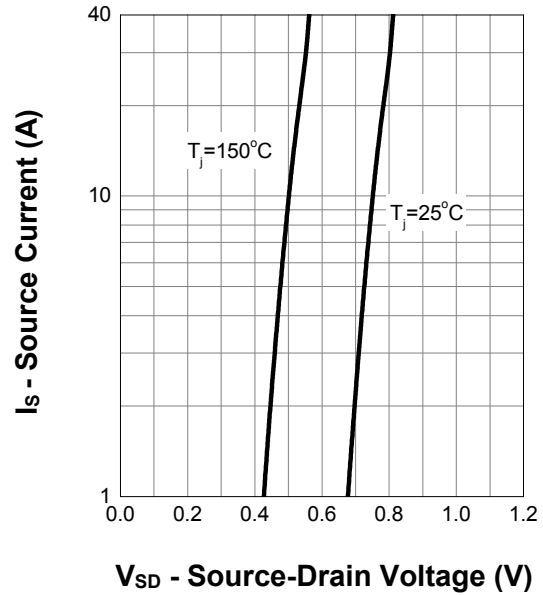


## 7. Typical Characteristics (cont.)

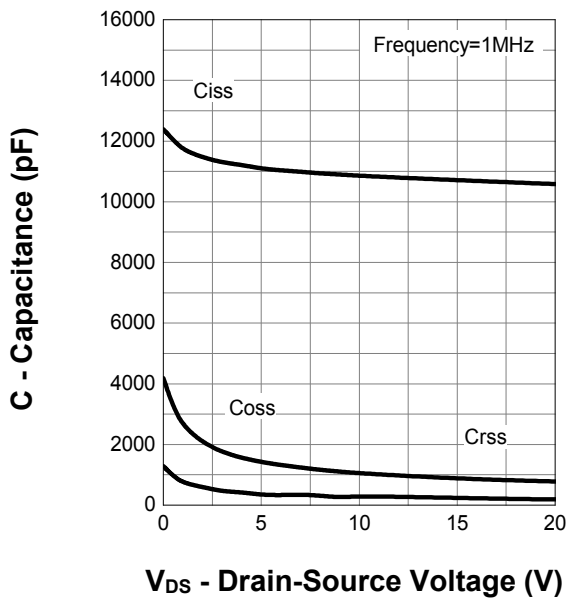
### Drain-Source On Resistance



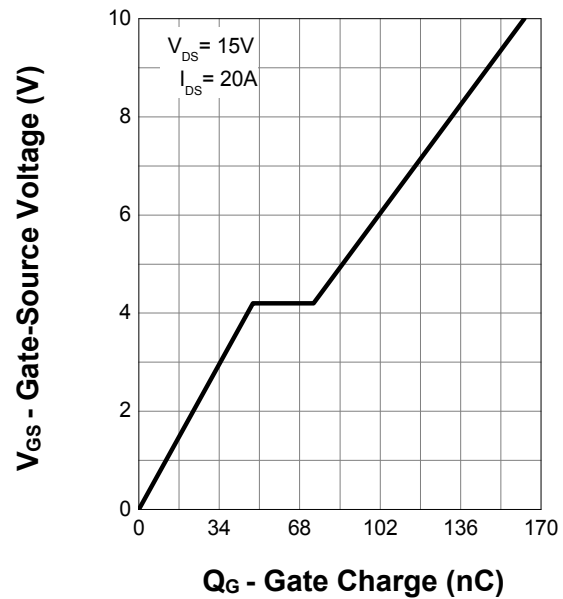
### Body Diode Characteristics



### Capacitance

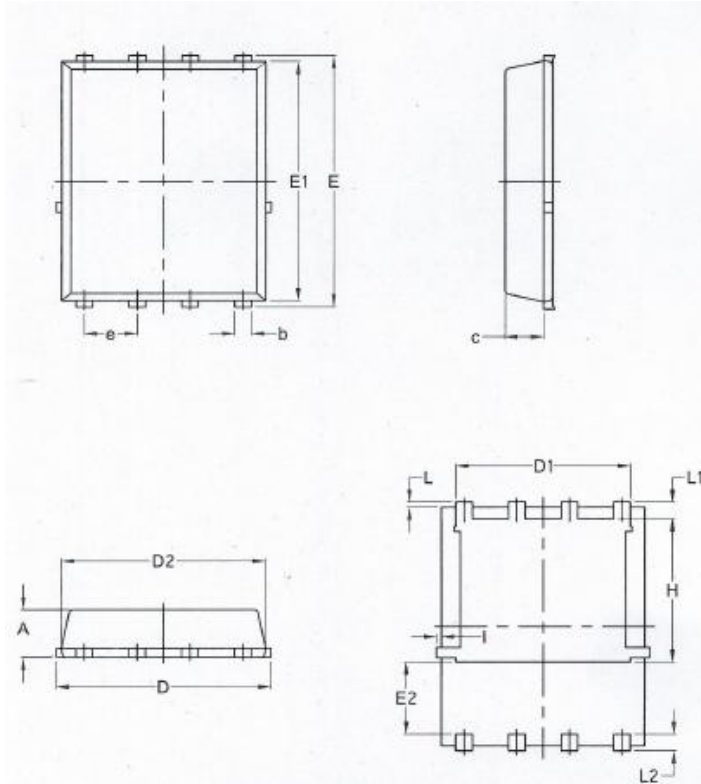


### Gate Charge



## 8.Package Dimensions

PQFN5\*6



SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
△ D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
△ D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	—	0.0630	—
e	1.27 BSC		0.05 BSC	
△ L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
△ H	3.30	3.50	0.1299	0.1378
I	—	0.18	—	0.0070