

# N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- Advanced trench cell design
- Low Thermal Resistance

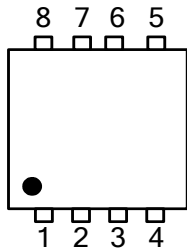
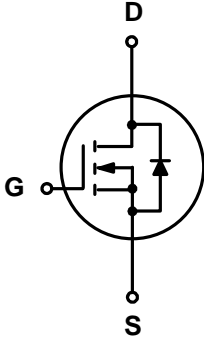
### 1.2 Applications

- Motor drivers
- DC - DC Converter

### 1.3 Quick reference

- $BV \geq 100\text{ V}$
- $R_{DS(ON)} \leq 88\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- $P_{tot} \cong 55\text{ W}$
- $R_{DS(ON)} \leq 95\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$
- $I_D \cong 15\text{ A}$

## 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 <p style="text-align: center;">Top View PDFN3x3-8L</p>	
4	Gate		
5,6,7,8	Drain		

### 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	100	V
$V_{GS}$	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	$\pm 20$	V
$I_D^{***}$	Drain Current ( DC )	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	15	A
		$T_C = 100\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	11	A
$I_{DM}^{****}$	Drain Current ( Pulsed )	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	60	A
$P_{tot}$	Drain power dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	50	W
$T_{stg}$	Storage Temperature		-55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-	150	$^\circ\text{C}$
$I_S$	Continuous-Source Current	$T_C = 25\text{ }^\circ\text{C}$	-	15	A
$R_{\theta JA}^{**}$	Thermal Resistance- Junction to Ambient		-	50	$^\circ\text{C/W}$
$R_{\theta JC}^{**}$	Thermal Resistance- Junction to Case		-	2.5	

Notes :

- \* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$
- \*\* Mounted on Large Heat Sink
- \*\*\* limited by bonding wire

### 4. Marking Information

Product Name	Marking
KJ15N10Q	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>15N10</b>  <b>YWWXXX</b> </div> YWW: Date Code

### 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ15N10Q	DFN3*3			5000	

Note: KUAIJIEIXIN 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** ( $T_A = 25\text{ }^\circ\text{C}$  Unless Otherwise Noted)

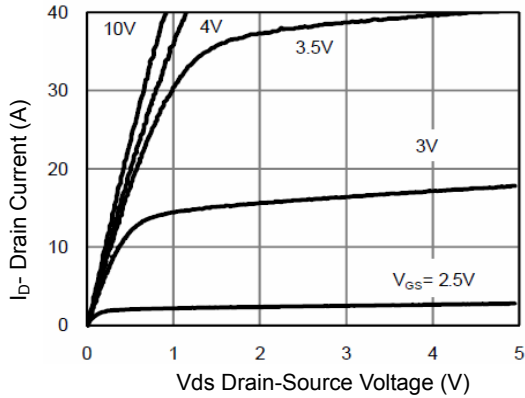
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	1	1.6	2.5	V
$I_{DSS}$	Zero Gate Voltage Source Current	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
		$T_J = 85\text{ }^\circ\text{C}$	-	-	30	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	-	-	$\pm 100$	nA
$R_{DS(ON)}^a$	Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	-	80	88	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$	-	88	95	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 15\text{ A}, V_{GS} = 0\text{ V}$	-	0.7	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 10\text{ A}, dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	61	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	105	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 50\text{ V}$ Frequency = 1 MHz	-	830	-	pF
$C_{oss}$	Output Capacitance		-	44.2	-	
$C_{rss}$	Reverse Transfer Capacitance		-	30.1	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 50\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 3\text{ }\Omega, R_L = 6.44\text{ }\Omega,$ $I_D = 10\text{ A}$	-	15	-	ns
$t_r$	Turn-on Rise Time		-	5	-	
$t_d(off)$	Turn-off Delay Time		-	25	-	
$t_f$	Turn-off Fall Time		-	7	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{GS} = 50\text{ V}, V_{DS} = 10\text{ V},$ $I_{DS} = 10\text{ A}$	-	22.3	-	nC
$Q_{gs}$	Gate-Source Charge		-	2.87	-	
$Q_{gd}$	Gate-Drain Charge		-	6.14	-	

Notes :

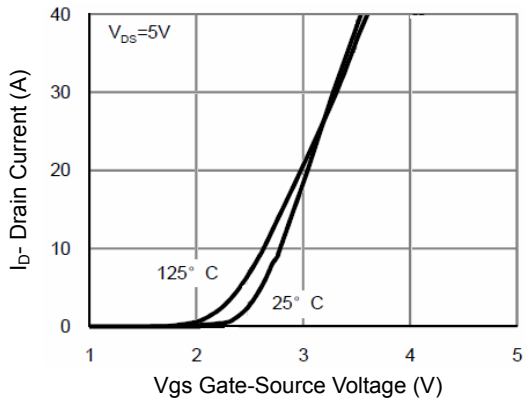
- a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$   
 b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics

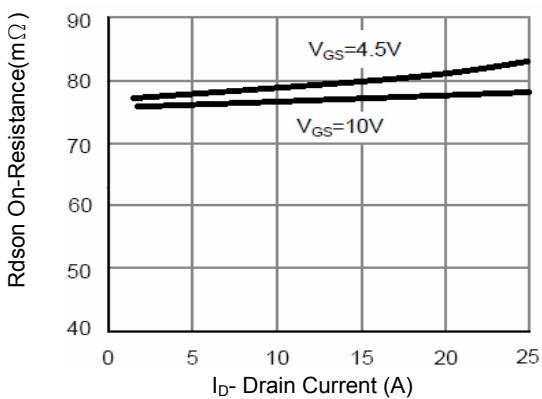
### Typical Electrical and Thermal Characteristics (Curves)



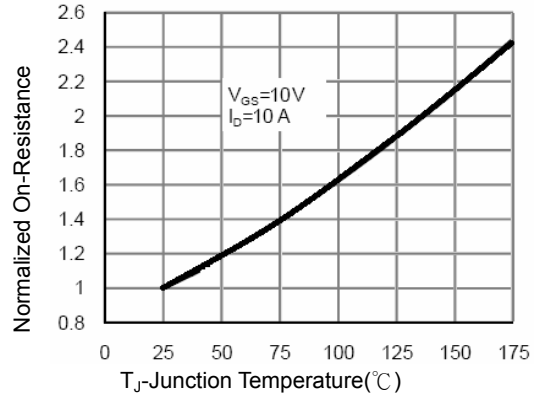
**Figure 1 Output Characteristics**



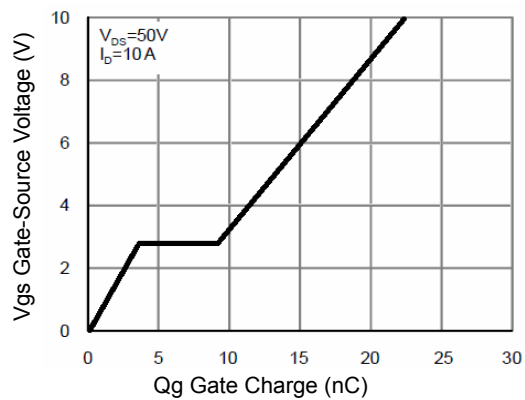
**Figure 2 Transfer Characteristics**



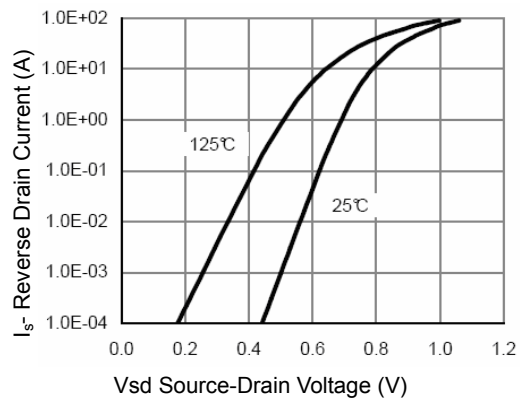
**Figure 3 Rdson- Drain Current**



**Figure 4 Rdson-Junction Temperature**



**Figure 5 Gate Charge**



**Figure 6 Source- Drain Diode Forward**

## 7. Typical Characteristics (cont.)

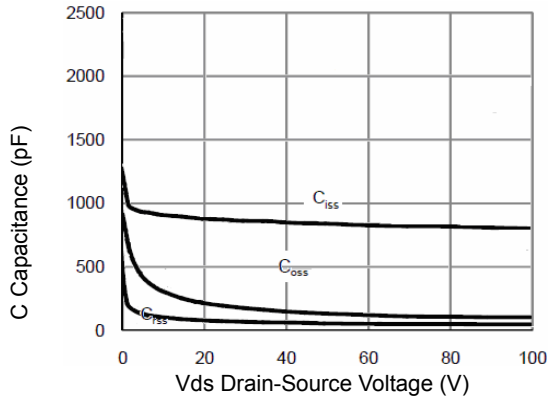


Figure 7 Capacitance vs Vds

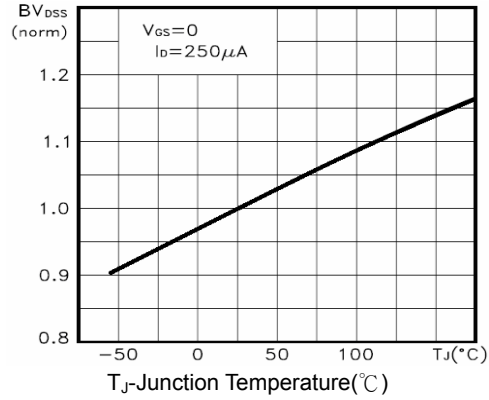


Figure 9  $BV_{DSS}$  vs Junction Temperature

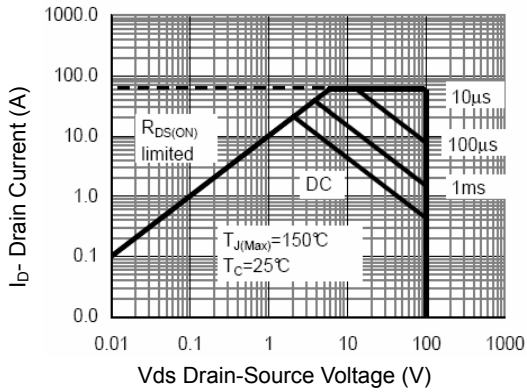


Figure 8 Safe Operation Area

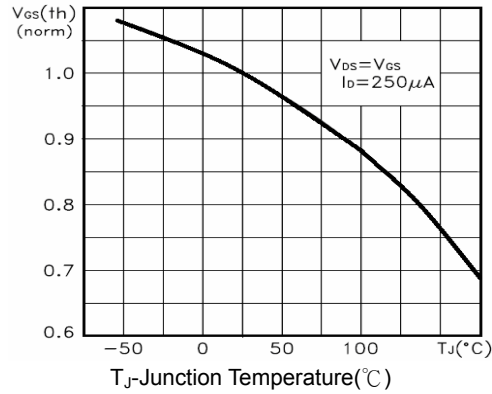


Figure 10  $V_{GS(th)}$  vs Junction Temperature

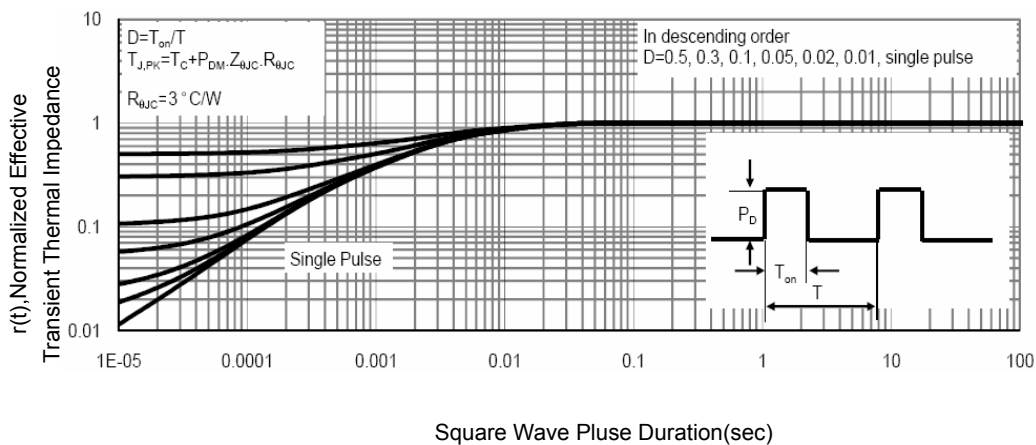
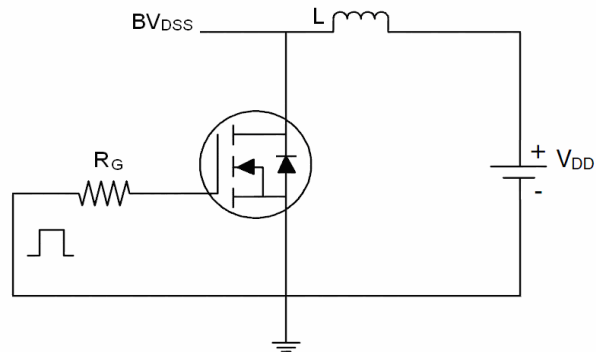


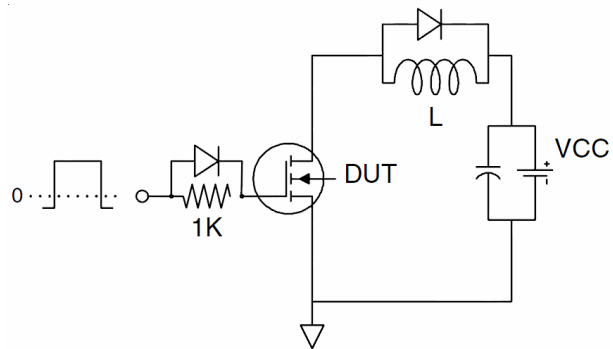
Figure 11 Normalized Maximum Transient Thermal Impedance

## Test Circuit

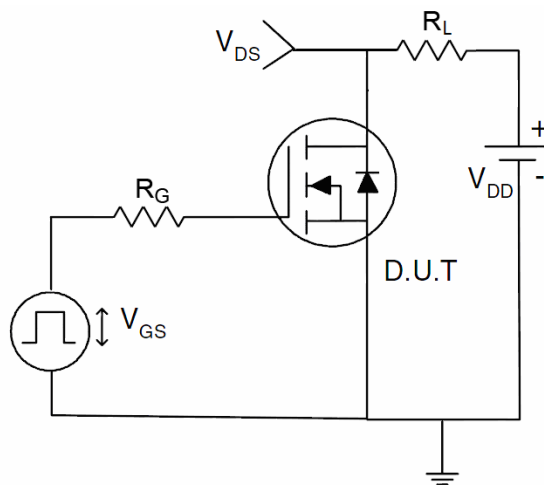
### 1) $E_{AS}$ test Circuit



### 2) Gate charge test Circuit



### 3) Switch Time Test Circuit



## 8.Package Dimensions

PDFN3.3\*3.3

