

# Dual N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- Surface-mounted package  
 Advanced trench cell design
- Extremely low threshold voltage  
 ESD:2KV

### 1.2 Applications

- Portable appliances
- Battery management

### 1.3 Quick reference

- $BV \geq 20\text{ V}$   
  $P_{tot} \leq 1.25\text{ W}$   
  $I_D \leq 10\text{ A}$
- $R_{DS(ON)} \leq 11\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$   
  $R_{DS(ON)} \leq 12\text{ m}\Omega @ V_{GS} = 3.9\text{ V}$   
  $R_{DS(ON)} \leq 14\text{ m}\Omega @ V_{GS} = 2.5\text{ V}$

## 2. Pin Description

Pin	Description	Simplified Outline	Symbol
 <p style="text-align: center;">Schematic diagram</p>	 <p style="text-align: center;">DFN2x3-6L Pin definition and Top / Bottom View</p>	 <p style="text-align: center;">Bottom (D1/D2)</p>	

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	20	-	V
$V_{GS}$	Gate-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	-	$\pm 12$	V
$I_D^*$	Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 4.5\text{ V}$	-	10	A
$I_{DM}^{*,**}$	Pulsed Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 4.5\text{ V}$	-	30	A
$P_{tot}^*$	Total Power Dissipation	$T_A = 25\text{ }^{\circ}\text{C}$	-	1.25	W
$T_{stg}$	Storage Temperature		- 55	150	$^{\circ}\text{C}$
$T_J$	Junction Temperature		-	150	$^{\circ}\text{C}$
$I_S^*$	Diode Forward Current	$T_A = 25\text{ }^{\circ}\text{C}$	-	10	A
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	100	$^{\circ}\text{C} / \text{W}$

Notes :

\* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec}$

\*\* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

## 4. Marking Information

Product Name	Marking
KJ3R09A	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>3R09A</b>  <b>YWWXXX</b> </div> <b>YWW:</b> <b>Date Code</b>

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ3R09A	DFN2*3				

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 250\text{ }\mu\text{A}$	20	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	0.5	-	1.0	V
$I_{DSS}$	Drain Leakage Current	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
		$T_J = 85\text{ }^\circ\text{C}$	-	-	30	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 10\text{ V}, V_{DS} = 0\text{ V}$	-	-	$\pm 10$	$\mu\text{A}$
$R_{DS(ON)}^a$	On-State Resistance	$V_{GS} = 4.5\text{ V}, I_{DS} = 7\text{ A}$	-	10	11	m $\Omega$
		$V_{GS} = 3.9\text{ V}, I_{DS} = 5\text{ A}$	-	11	12	
		$V_{GS} = 2.5\text{ V}, I_{DS} = 4\text{ A}$	-	12	14	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 7\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.2	V
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 10\text{ V}$ Frequency = 10 KHz	-	938	-	pF
$C_{oss}$	Output Capacitance		-	139	-	
$C_{rss}$	Reverse Transfer Capacitance		-	122	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 10\text{ V}, V_{GEN} = 4.5\text{ V},$ $R_G = 4.5\text{ }\Omega, R_L = 1.42\text{ }\Omega,$ $I_{DS} = 7\text{ A}$	-	0.1	-	uS
$t_r$	Turn-on Rise Time		-	0.3	-	
$t_d(off)$	Turn-off Delay Time		-	3.4	-	
$t_f$	Turn-off Fall Time		-	2.8	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{GS} = 4.5\text{ V}, V_{DS} = 10\text{ V},$ $I_{DS} = 7\text{ A}$	-	15	-	nC
$Q_{gs}$	Gate-Source Charge		-	3	-	
$Q_{gd}$	Gate-Drain Charge		-	4	-	

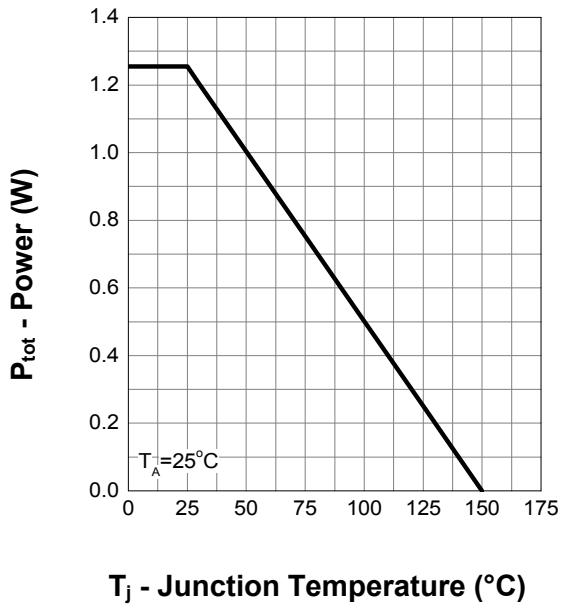
Notes :

 a : Pulse test ; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ 

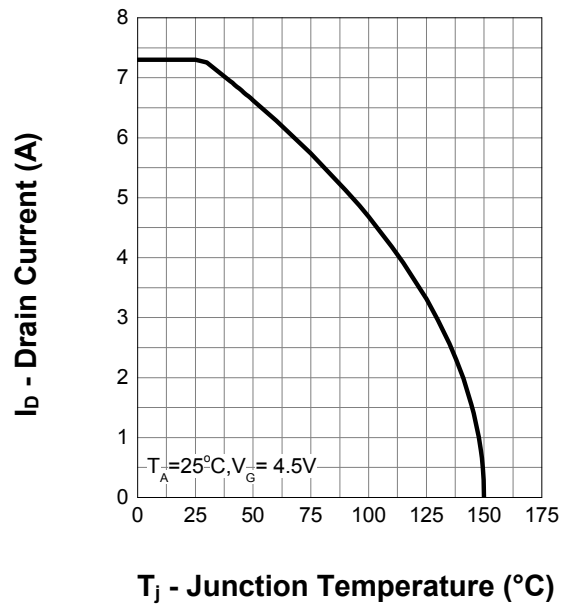
b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics

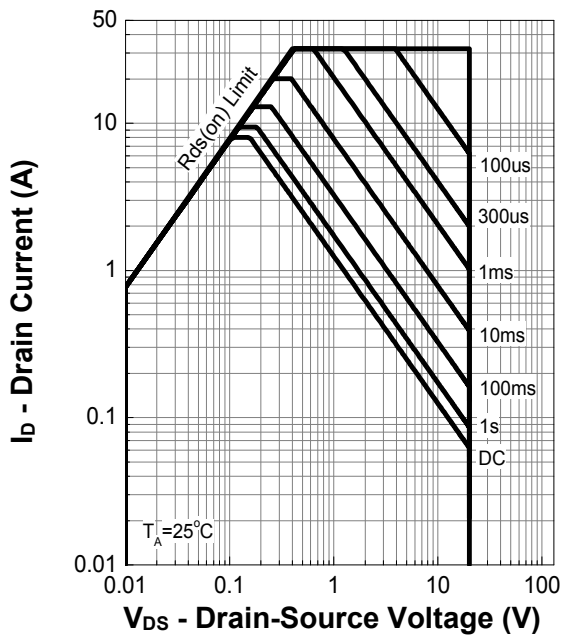
### Power Capability



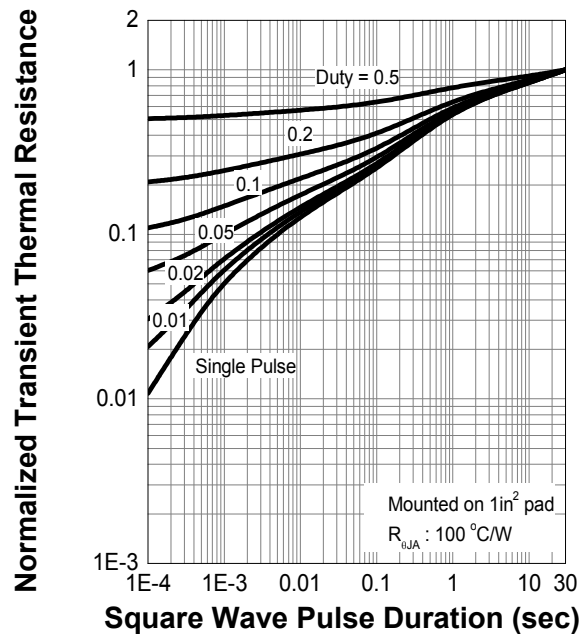
### Current Capability



### Safe Operation Area

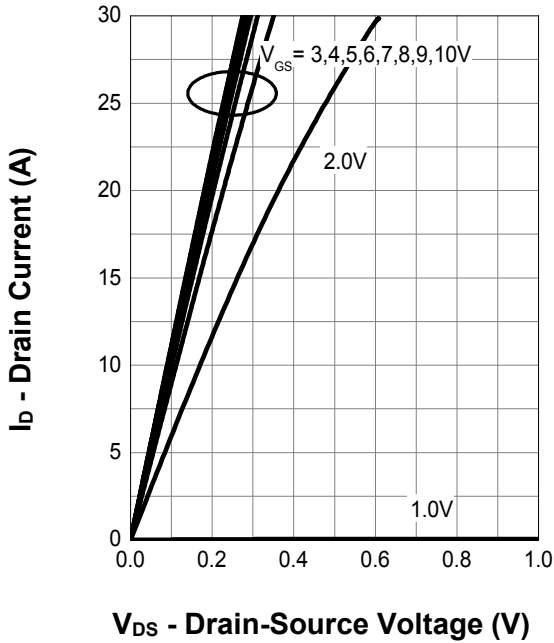


### Transient Thermal Impedance

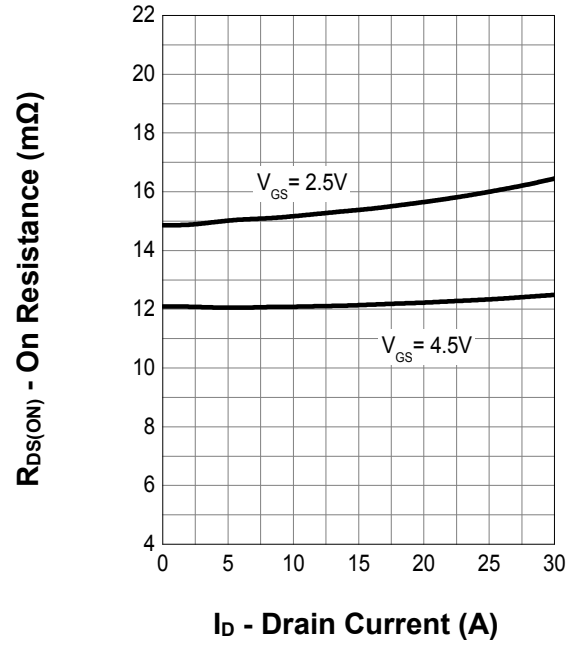


## 7. Typical Characteristics (cont.)

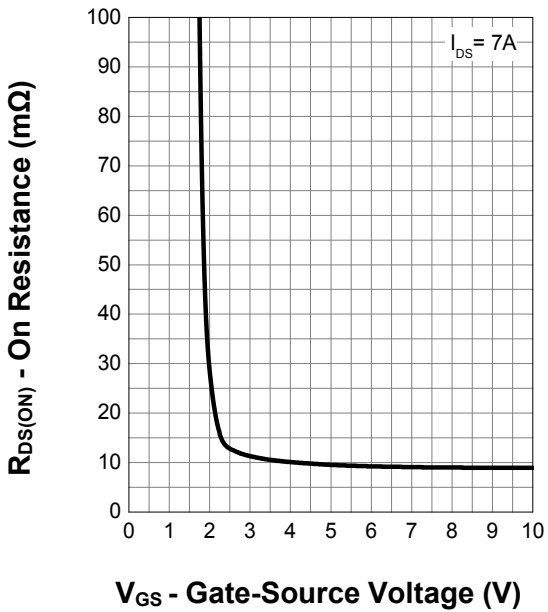
Output Characteristics



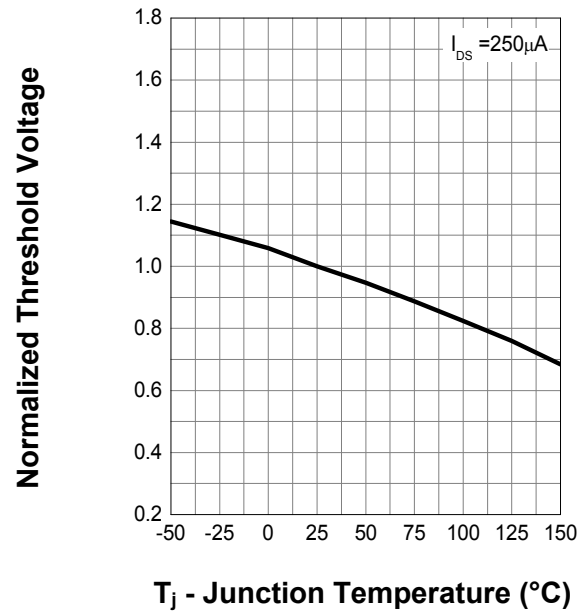
On Resistance



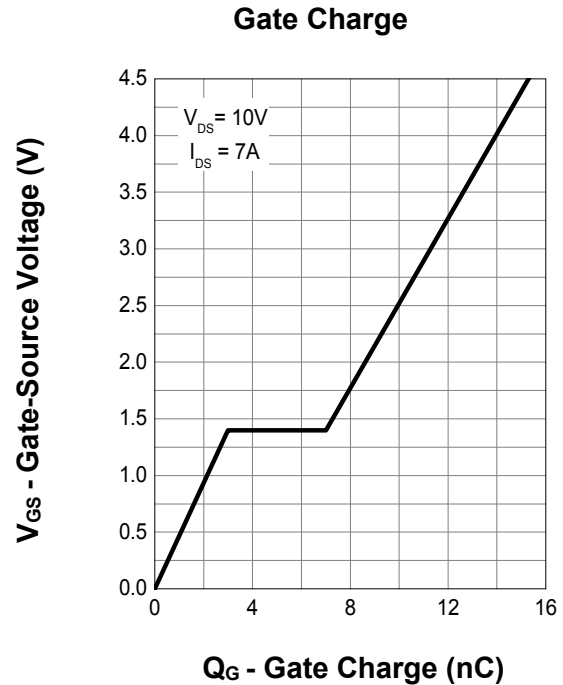
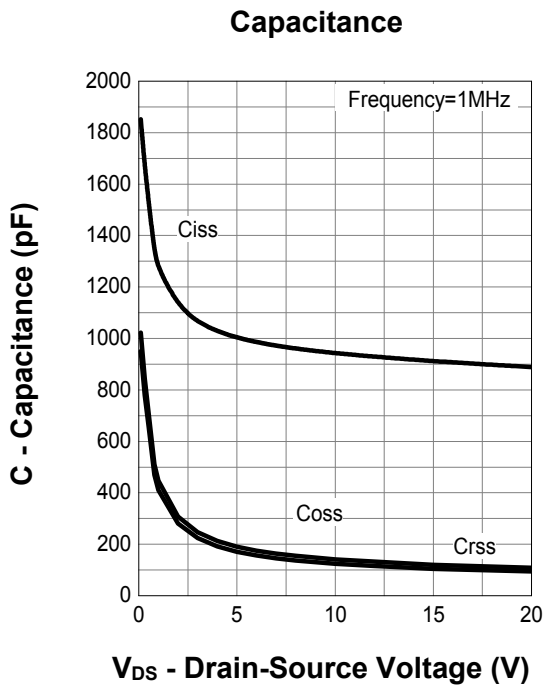
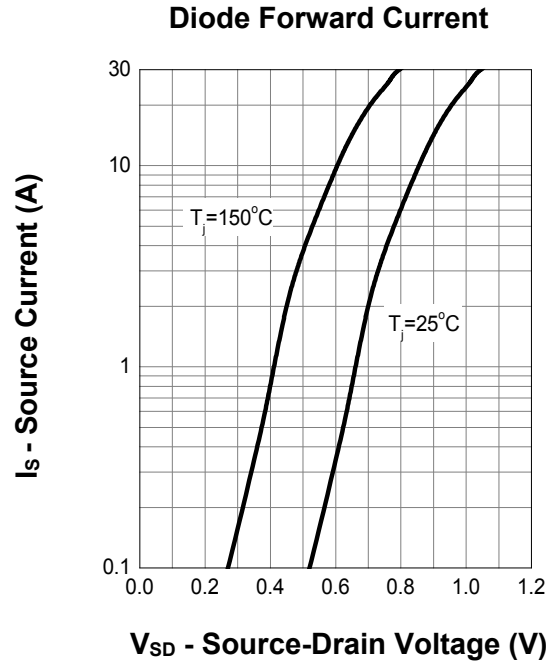
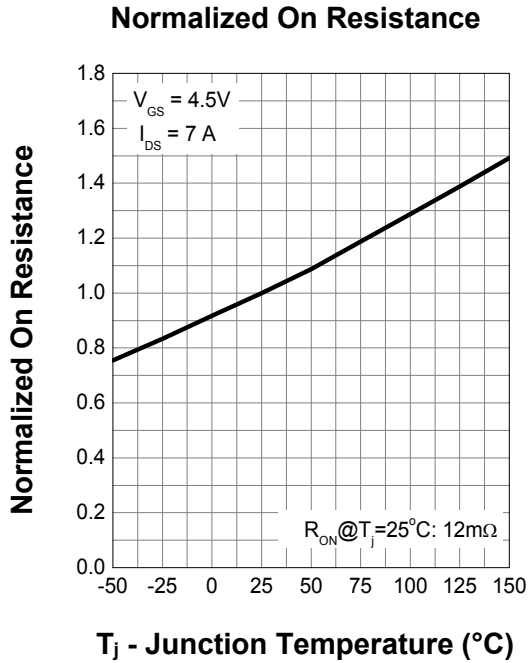
Transfer Characteristics



Normalized Threshold Voltage



## 7. Typical Characteristics (cont.)



## 8. Package Dimensions DFN2\*3-6L

