

# Dual N-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- Surface-mounted package
- Advanced trench cell design

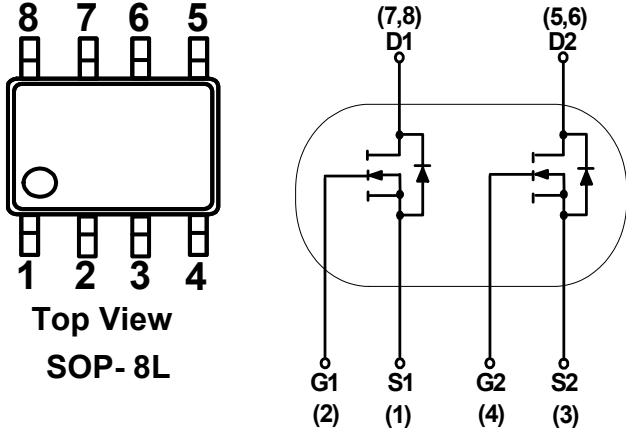
### 1.2 Applications

- Motor appliances
- High power inverter system

### 1.3 Quick reference

- $BV \geq 30\text{ V}$
- $R_{DS(ON)} \leq 13\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- $P_{tot} \cong 2\text{ W}$
- $R_{DS(ON)} \leq 16\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$
- $I_D \cong 10\text{ A}$

## 2. Pin Description

Pin	Description	Simplified Outline	Symbol	
1	Source(S1)			
2	Gate(G1)			
3	Source(S2)			
4	Gate(G2)			
5,6	Drain(D2)			
7,8	Drain(D1)			
				<b>Top View</b> <b>SOP- 8L</b>

### 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	-	30	V
$V_{GS}$	Gate-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	-	$\pm 20$	V
$I_D^*$	Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	10	A
		$T_A = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	5.7	A
$I_{DM}^{**}$	Pulsed Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	36.4	A
$P_{tot}$	Total Power Dissipation	$T_A = 25\text{ }^{\circ}\text{C}$	-	2	W
$T_{stg}$	Storage Temperature		- 55	150	$^{\circ}\text{C}$
$T_J$	Junction Temperature		- 55	150	$^{\circ}\text{C}$
$I_S$	Diode Forward Current	$T_A = 25\text{ }^{\circ}\text{C}$	-	9.1	A
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	62.5	$^{\circ}\text{C} / \text{W}$

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
KJ3020SI	<div style="display: flex; align-items: center;"> <div style="background-color: black; color: white; padding: 5px; margin-right: 10px;"> <b>3020</b>  <b>YWWXXX</b> </div> <div> <b>YWW:</b>  <b>Date Code</b> </div> </div>

### 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ3020SI	SOP8			3000	

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	$V_{GS} = 0\text{ V}, I_{DS} = 250\text{ }\mu\text{A}$	30	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\text{ }\mu\text{A}$	1.0	-	2.0	V
$I_{DSS}$	Drain Leakage Current	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$	-	-	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
$R_{DS(on)}^a$	On-State Resistance	$V_{GS} = 10\text{ V}, I_{DS} = 9\text{ A}$	-	11	13	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_{DS} = 5\text{ A}$	-	14	16	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 9\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 9\text{ A}, di_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	34	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	7.1	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}$ Frequency = 1 MHz	-	1147	-	pF
$C_{oss}$	Output Capacitance		-	106	-	
$C_{rss}$	Reverse Transfer Capacitance		-	90	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 15\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 4.5\text{ }\Omega, R_L = 1.6\text{ }\Omega,$ $I_{DS} = 9\text{ A}$	-	7	-	ns
$t_r$	Turn-on Rise Time		-	30	-	
$t_d(off)$	Turn-off Delay Time		-	19	-	
$t_f$	Turn-off Fall Time		-	18	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{GS} = 10\text{ V}, V_{DS} = 15\text{ V},$ $I_{DS} = 9\text{ A}$	-	22	-	nC
$Q_{gs}$	Gate-Source Charge		-	5	-	
$Q_{gd}$	Gate-Drain Charge		-	3.3	-	

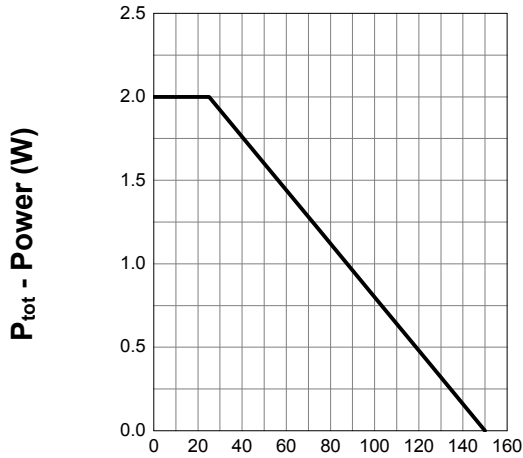
Notes :

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

b : Guaranteed by design, not subject to production testing

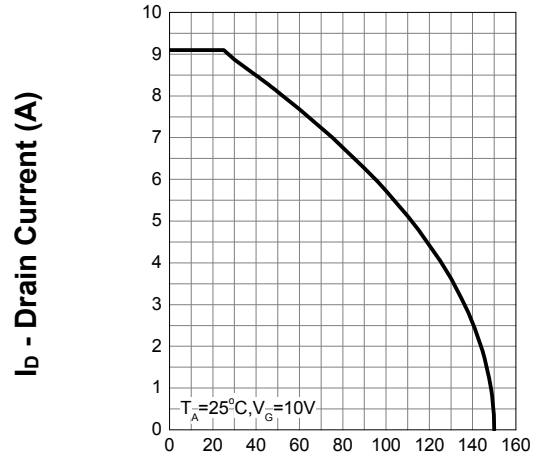
## 7. Typical Characteristics

### Power Capability



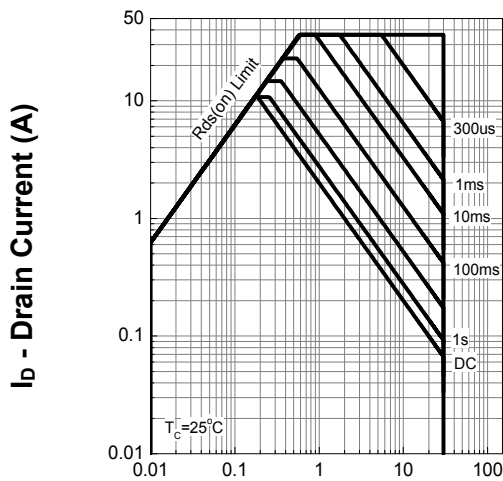
T<sub>mp</sub> - Mounting Point Temp. (°C)

### Current Capability



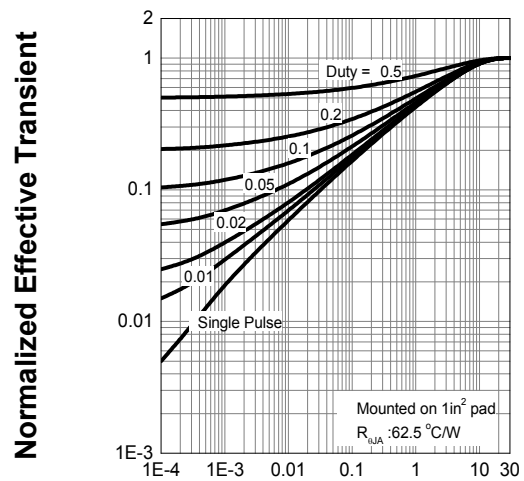
T<sub>mp</sub> - Mounting Point Temp. (°C)

### Operating



V<sub>DS</sub> - Drain-Source Voltage (V)

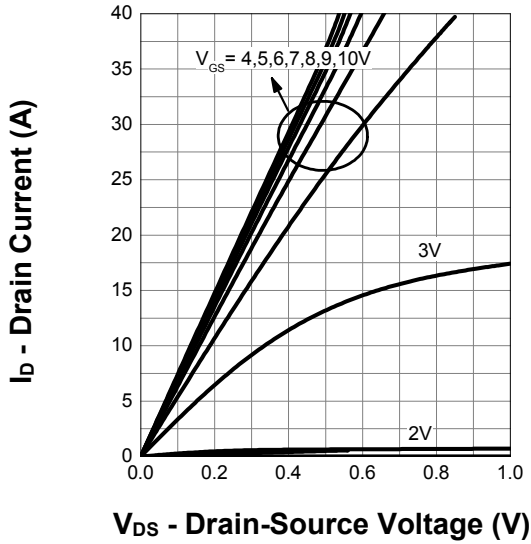
### Transient Thermal Impedance



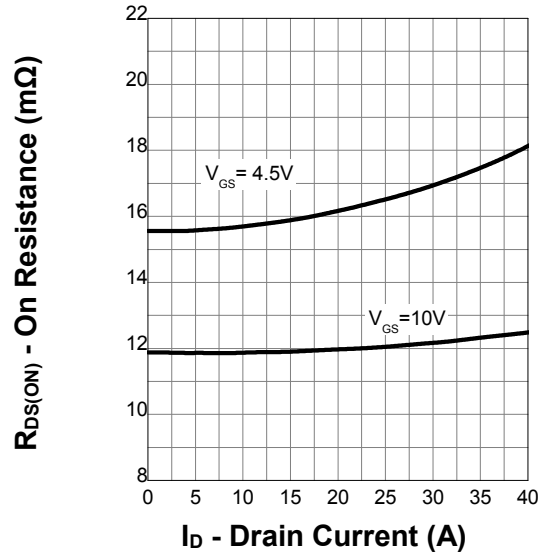
Square Wave Pulse Duration (sec)

## 7. Typical Characteristics (cont.)

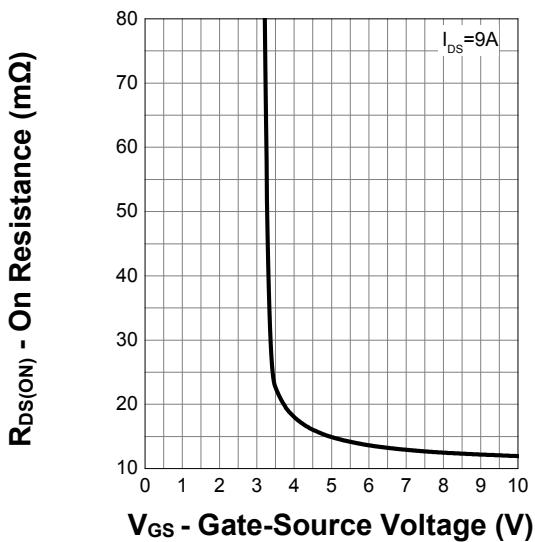
**Output Characteristics**



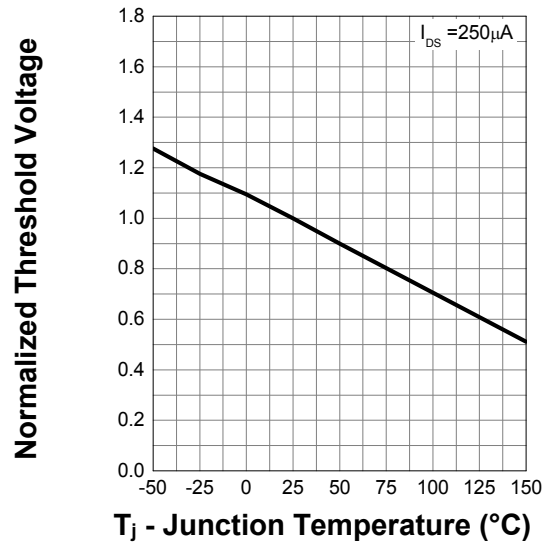
**On Resistance**



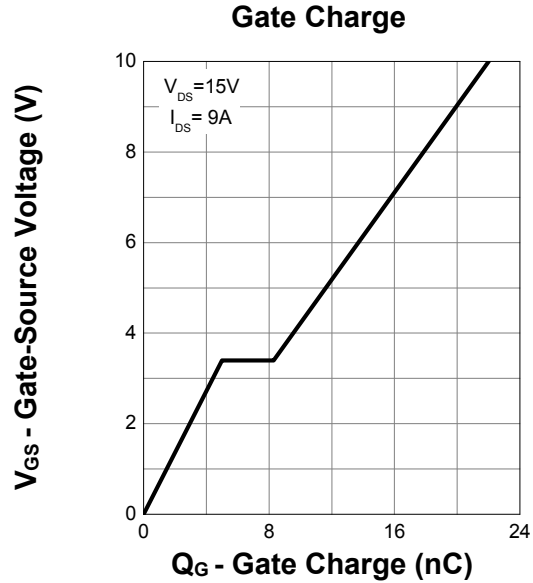
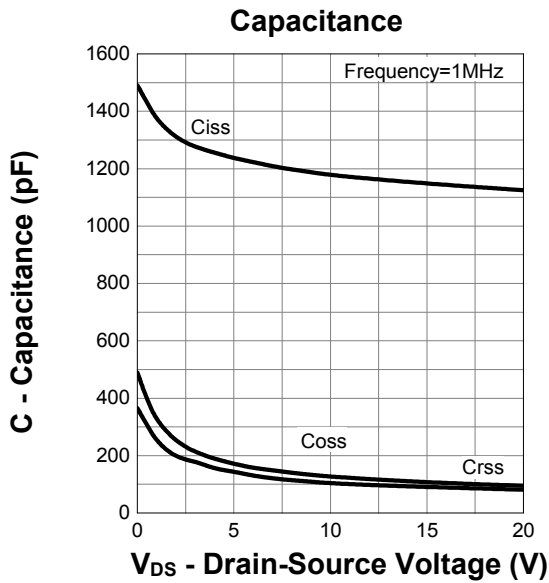
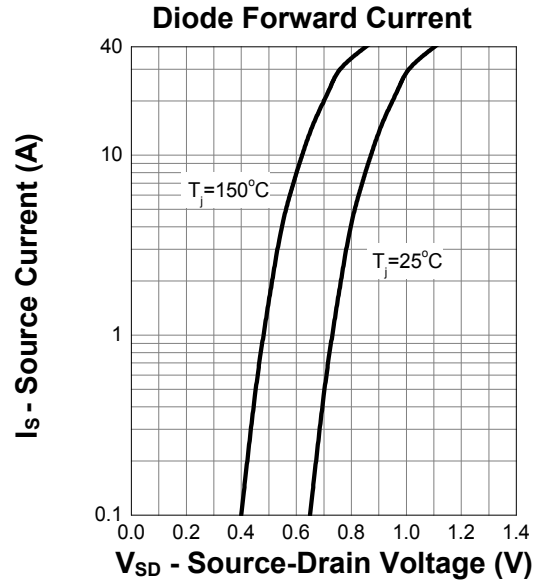
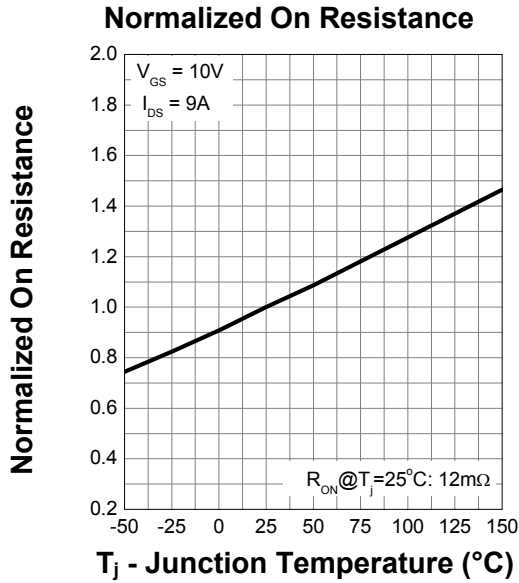
**Transfer Characteristics**



**Normalized Threshold Voltage**

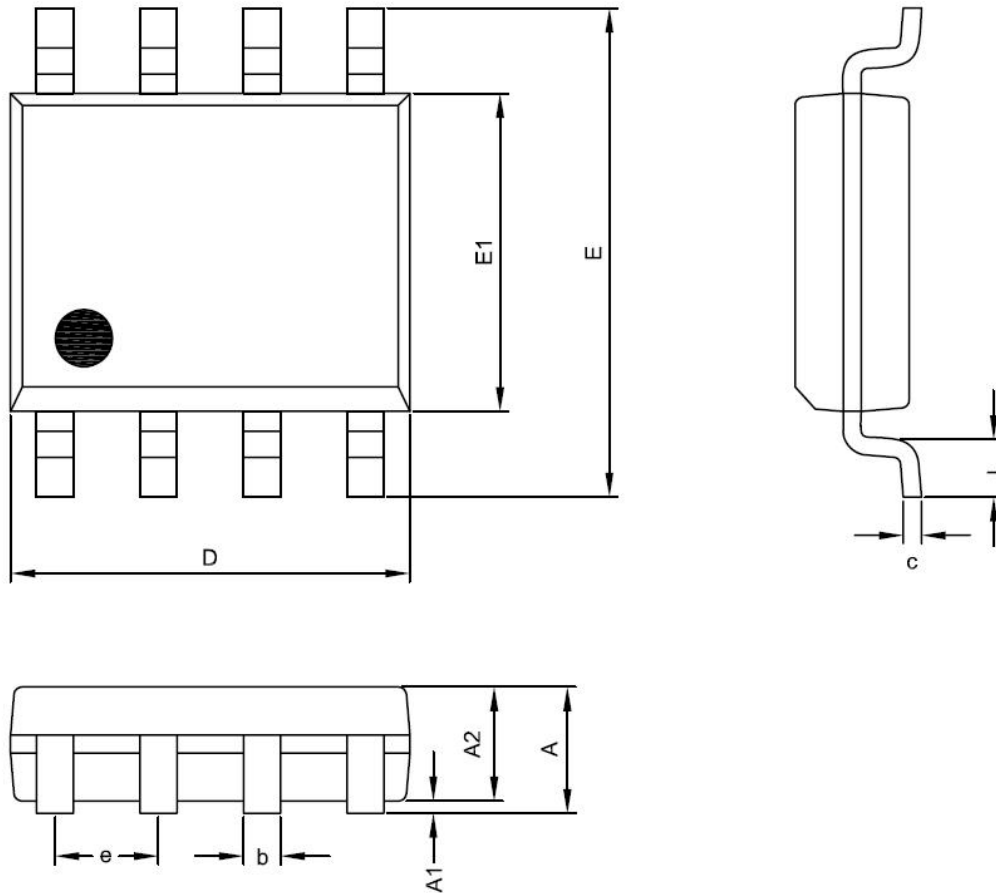


## 7. Typical Characteristics (cont.)



## 8. Package Dimensions

SOP- 8L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	1.35	1.75
A1	0.00	0.25
A2	1.15	1.50
D	4.80	5.00
E	5.80	6.20
E1	3.80	4.00
c	0.19	0.27
b	0.33	0.53
e	1.27 BSC	
L	0.40	1.27

**Notes :**

1. Jedec outline : MS-012AA
2. Dimensions " D " does not include mold flash, protrusions and gate burrs shall not exceed .15 mm (.006 in) per side .
3. Dimensions " E1 " does not include inter-lead flash, or protrusions. Inter-lead flash and protrusions shall not exceed .25 mm (.010 in) per side.