

## P-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Advanced trench cell design
- Low Thermal Resistance

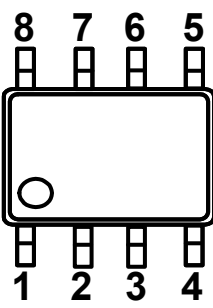
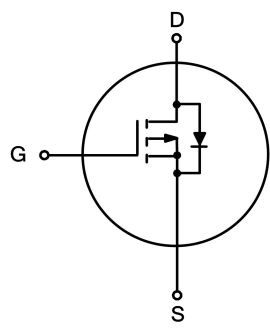
#### 1.2 Applications

- Motor drivers
- DC - DC Converter

#### 1.3 Quick reference

- $BV \geq -20\text{ V}$
- $R_{DS(ON)} \leq 8\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- $P_{tot} \leq 20\text{ W}$
- $R_{DS(ON)} \leq 9\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
- $I_D \leq -15\text{ A}$
- $R_{DS(ON)} \leq 11\text{ m}\Omega @ V_{GS} = -2.5\text{ V}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source(S)		
4	Gate(G)		
5,6,7,8	Drain(D)		

Top View  
SOP8-8L

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	-20	V
$V_{GS}$	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	$\pm 12$	V
$I_D^*$	Drain Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = -4.5\text{ V}$	-	-15	A
$I_{DM}^{*,**,***}$	Pulsed Source Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = -4.5\text{ V}$	-	-56	A
$P_{tot}^*$	Total Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	20	W
$T_{stg}$	Storage Temperature		-55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-	150	$^\circ\text{C}$
$I_S$	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	-	-15	A
$R_{\theta JC}^*$	Thermal Resistance- Junction to Ambient		-	6	$^\circ\text{C} / \text{W}$

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
KJ12P02S	<div style="display: flex; align-items: center;"> <div style="background-color: black; color: white; padding: 2px 5px; margin-right: 10px;"> <b>12P02</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
KJ12P02S	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<sub>C</sub> = 25 °C Unless Otherwise Noted)

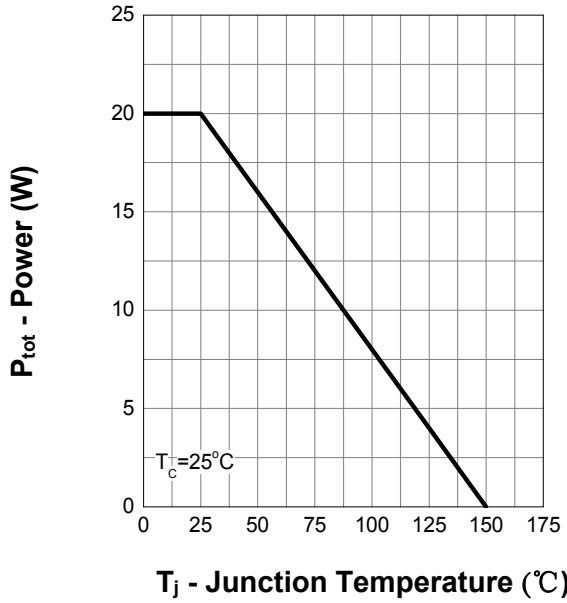
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA	-20	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = -250 μA	-0.3	-	-1.2	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0 V	-	-	-10	μA
		T <sub>J</sub> = 85 °C	-	-	-30	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ± 12 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> = -13A	-	7	8	mΩ
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -10 A	-	8	9	mΩ
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -6 A	-	10	11	mΩ
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> = -2.6 A, V <sub>GS</sub> = 0 V	-	-	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> = -10 A, dI <sub>SD</sub> /dt = 100 A/μs	-	36	-	nS
Q <sub>rr</sub>	Reverse Recovery Charge		-	20	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = -10 V Frequency = 1 MHz	-	6200	-	pF
C <sub>oss</sub>	Output Capacitance		-	700	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	380	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = -10 V, V <sub>GEN</sub> = -5 V, R <sub>G</sub> = 3.3 Ω, I <sub>D</sub> = -1 A	-	27	-	nS
t <sub>r</sub>	Turn-on Rise Time		-	21	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	240	-	
t <sub>f</sub>	Turn-off Fall Time		-	110	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = -4.5 V, V <sub>DS</sub> = -10 V, I <sub>DS</sub> = -10 A	-	60	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	10	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	13.5	-	

Notes :

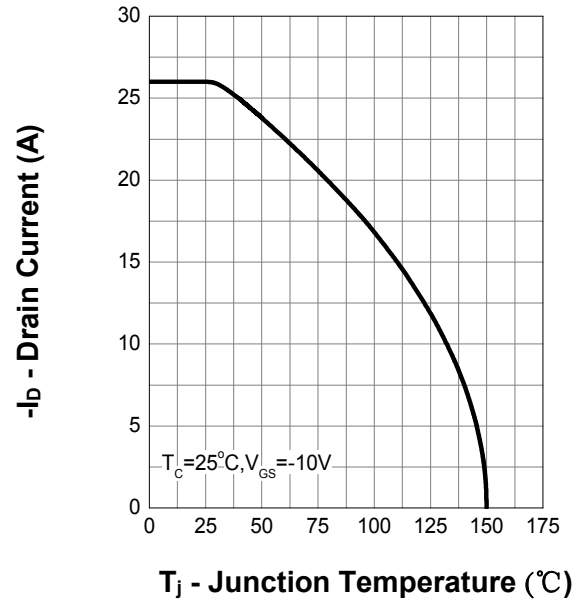
- a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics

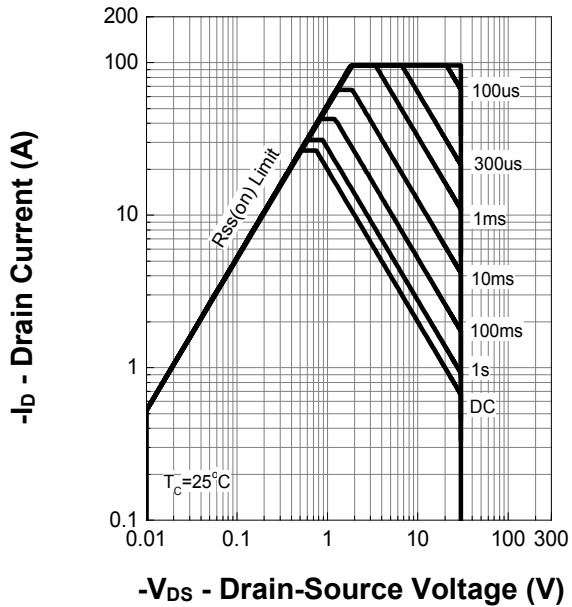
### Power Capability



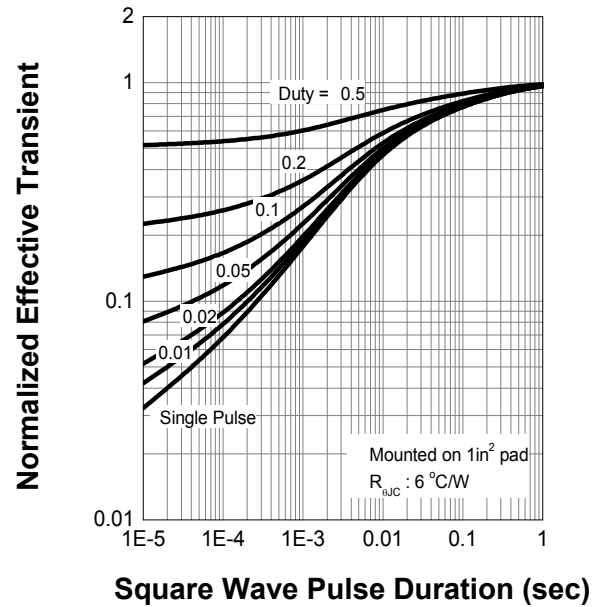
### Current Capability



### Safe Operation Area

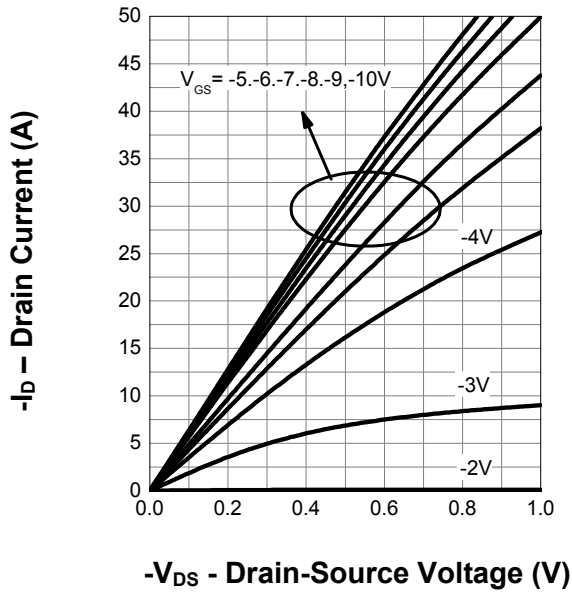


### Thermal Transient Impedance

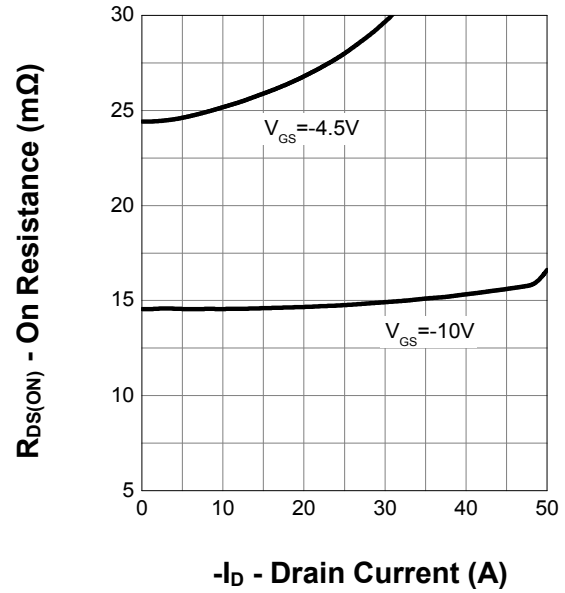


## 7. Typical Characteristics (cont.)

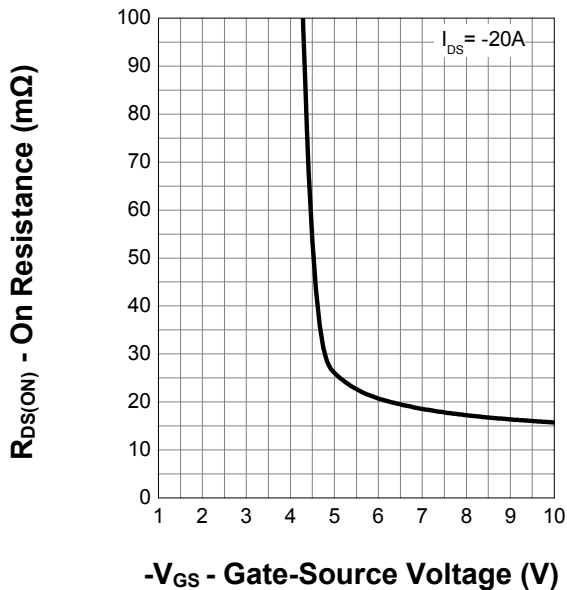
### Output Characteristics



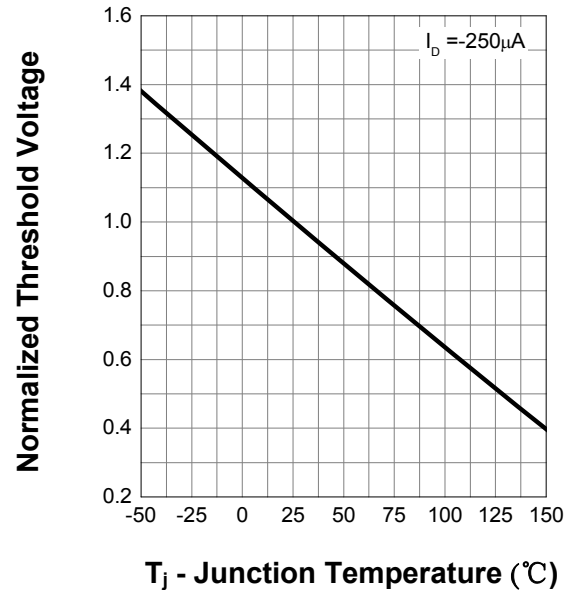
### Drain-Source On Resistance



### Transfer Characteristics

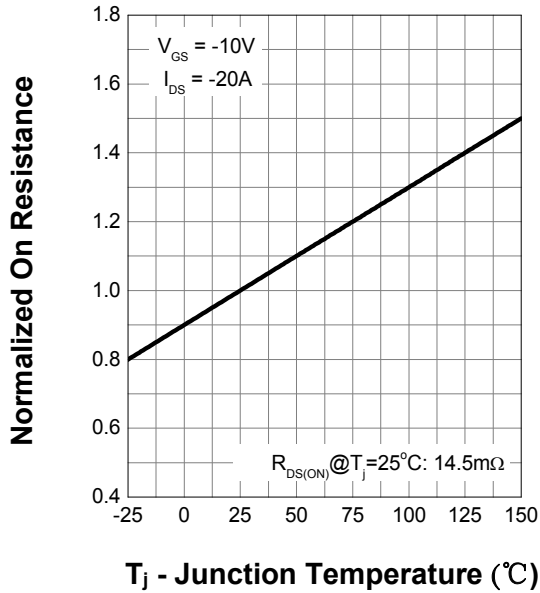


### Gate Threshold Voltage

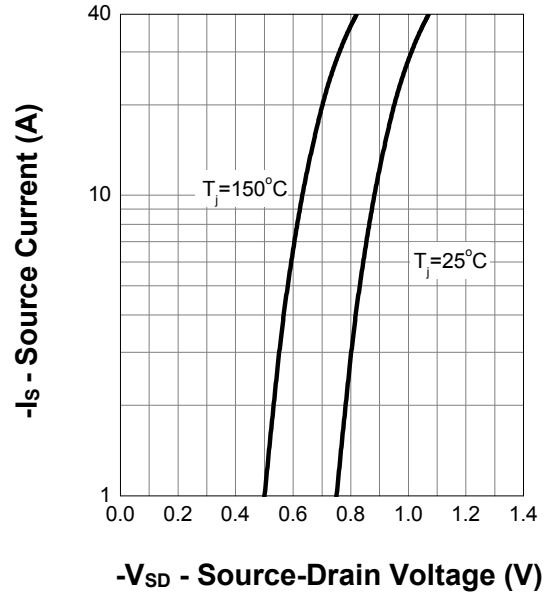


## 7. Typical Characteristics (cont.)

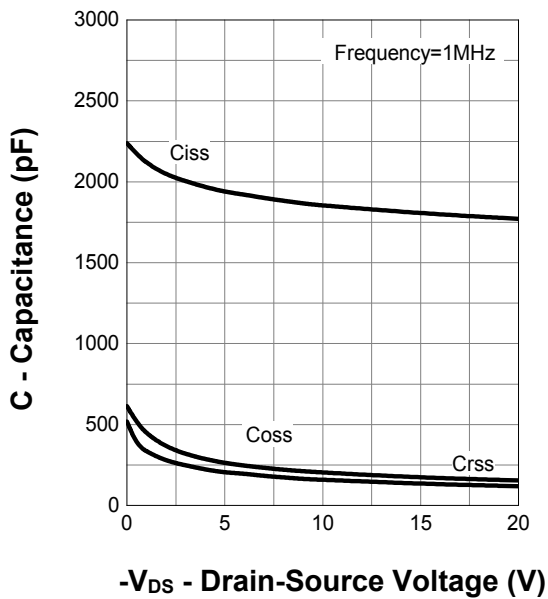
### Drain-Source On Resistance



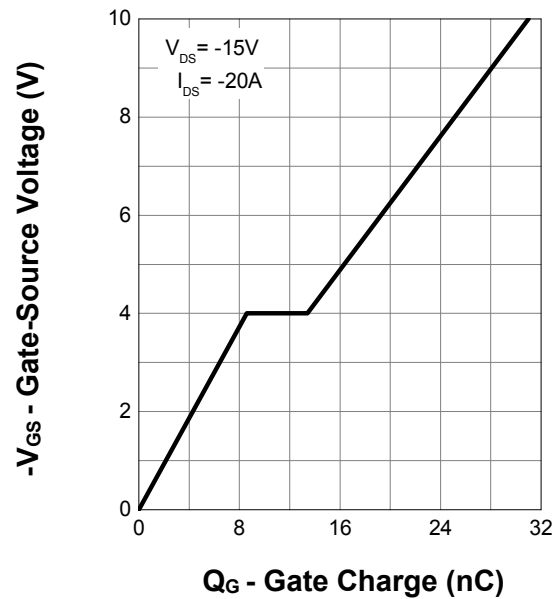
### Body Diode Characteristics



### Capacitance

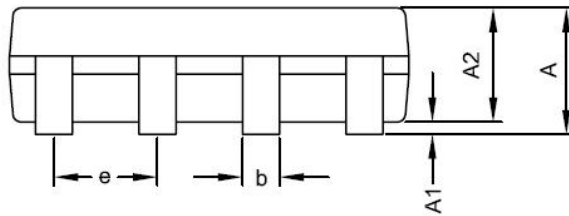
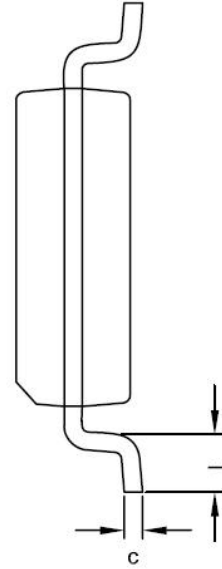
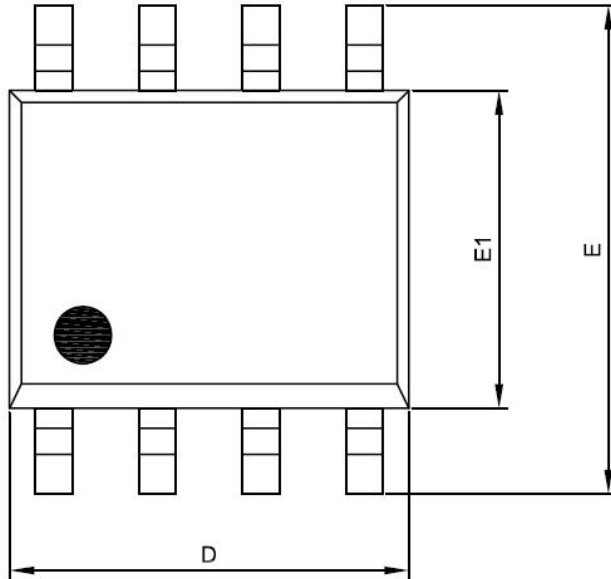


### Gate Charge



## 8. Package Dimensions

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.