

## P-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package
- Low gate charge

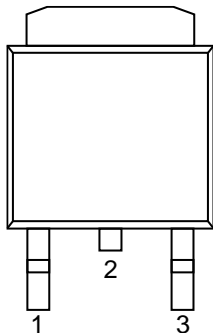
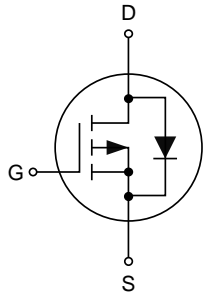
#### 1.2 Applications

- Motor driver appliances
- High power inverter system
- Adapter appliances

#### 1.3 Quick reference

- $BV \geq -100\text{ V}$
- $R_{DS(ON)} \leq 180\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- $P_{tot} \leq 50\text{ W}$
- $R_{DS(ON)} \leq 190\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
- $I_D \leq -20\text{ A}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate		
2	Drain		
3	Source		

Top View  
TO-252

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C=25^{\circ}C$	-	-100	V
$V_{GS}$	Gate-Source Voltage	$T_C=25^{\circ}C$	-	$\pm 20$	V
$I_D^*$	Drain Current	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	-20	A
$I_{DM}^{*,**,***}$	Pulsed Drain Current	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	-44	A
$P_{tot}^*$	Total Power Dissipation	$T_C=25^{\circ}C$	-	50	W
$T_J, T_{stg}$	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}C$
$I_S$	Diode Forward Current	$T_C=25^{\circ}C$	-	-20	A
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	62.5	$^{\circ}C/W$
$R_{\theta JC}^*$	Thermal Resistance-Junction to Case		-	2.5	$^{\circ}C/W$

Notes:

- \* Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
- \*\* Mounted on PCB of 1 in<sup>2</sup> pad area
- \*\*\* Mounted on Large Heat Sink

## 4. Marking Information

Product Name	Marking
KJ20P10K	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>20P10</b>  <b>YWWXXX</b> </div> <b>YWW:</b> Date Code

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ20P10K	TO-252	13"	16 mm	2500	

Note: KUIJIEXIN 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)

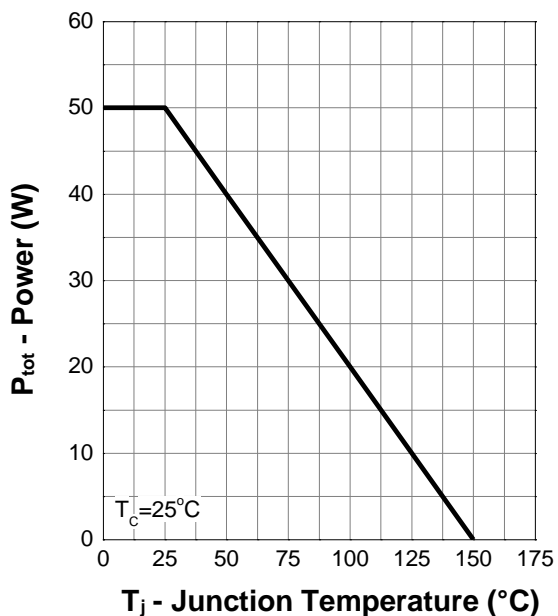
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0 V, I <sub>DS</sub> =-250 μA	-100	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250 μA	-1.0	-	-2.5	V
I <sub>DSS</sub>	Drain Leakage Current	V <sub>DS</sub> =-80 V, V <sub>GS</sub> =0 V	-	-	-1.0	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =0 V, V <sub>GS</sub> =±20 V	-	-	±100	nA
R <sub>DS(ON)</sub> <sup>a</sup>	On-State Resistance	V <sub>GS</sub> =-10 V, I <sub>DS</sub> =-2 A	-	165	180	mΩ
		V <sub>GS</sub> =-4.5 V, I <sub>DS</sub> =-1 A	-	175	190	
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> =-2 A, V <sub>GS</sub> =0 V	-	-	-1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =-6 A, dI <sub>SD</sub> /dt=100 A/μs	-	40	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	28	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0 V, V <sub>DS</sub> =-50 V, Frequency=1 MHz	-	1545	-	pF
C <sub>oss</sub>	Output Capacitance		-	37	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	25	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =-50 V, V <sub>GEN</sub> =-10 V, R <sub>G</sub> =4.5 Ω, R <sub>L</sub> =25 Ω, I <sub>DS</sub> =-2 A	-	10	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	27	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	288	-	
t <sub>f</sub>	Turn-off Fall Time		-	88	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-50 V, V <sub>GS</sub> =-10 V, I <sub>DS</sub> =-2 A	-	27	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	5.3	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	3.2	-	

Notes:

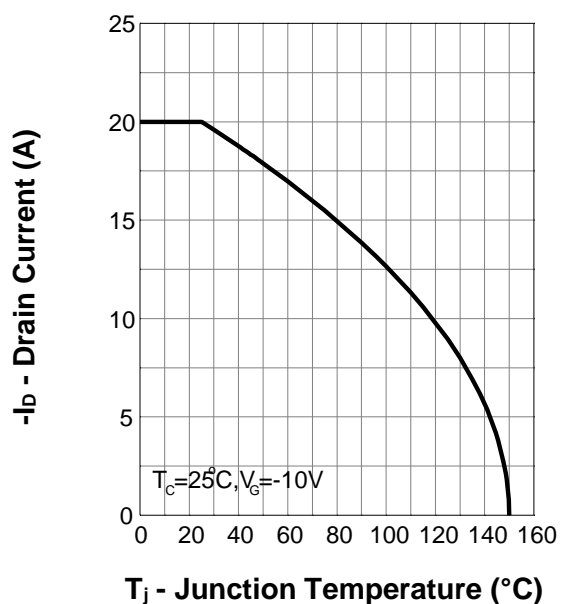
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

## 7. Typical Characteristics

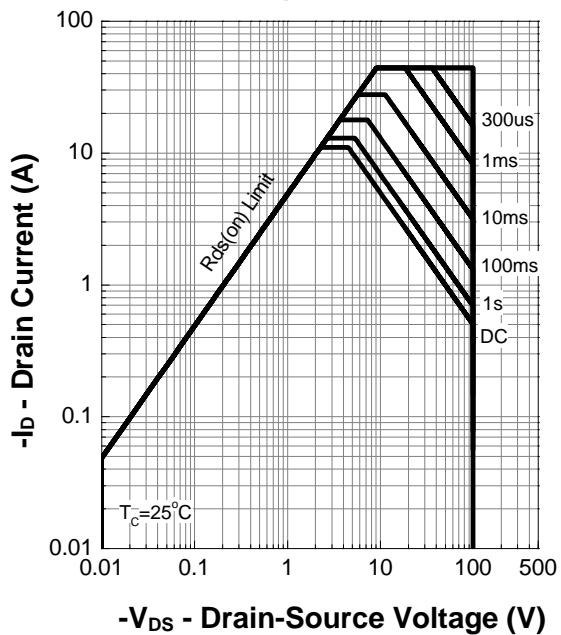
**Power Capability**



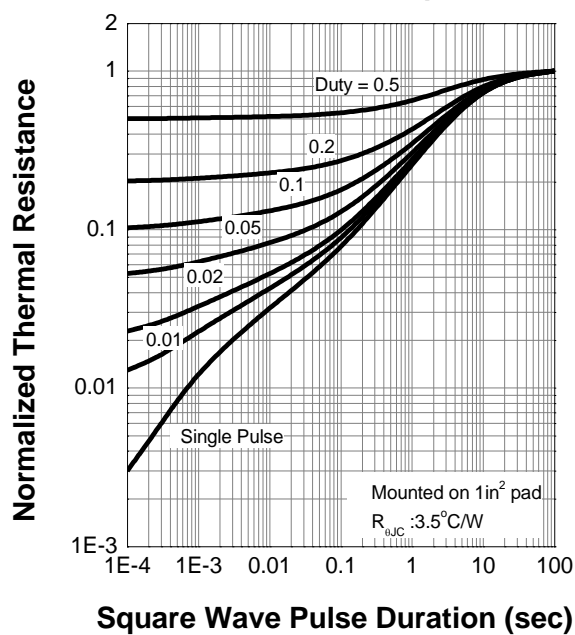
**Current Capability**



**Safe Operation Area**

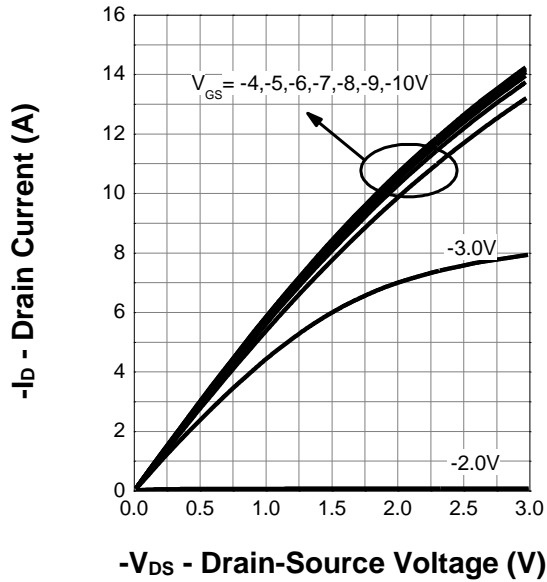


**Transient Thermal Impedance**

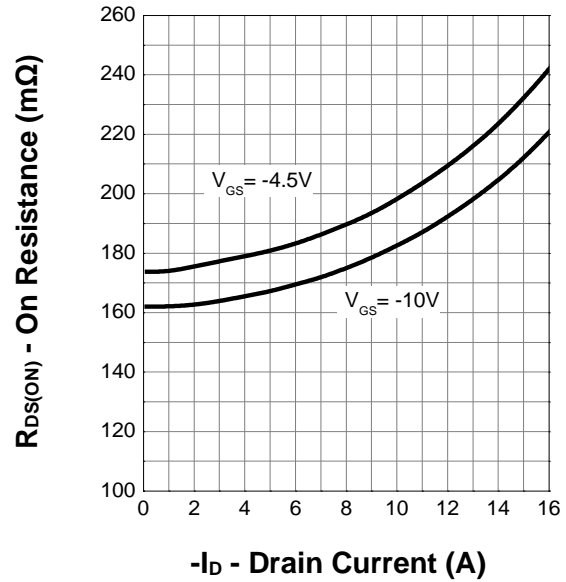


## 7. Typical Characteristics (cont.)

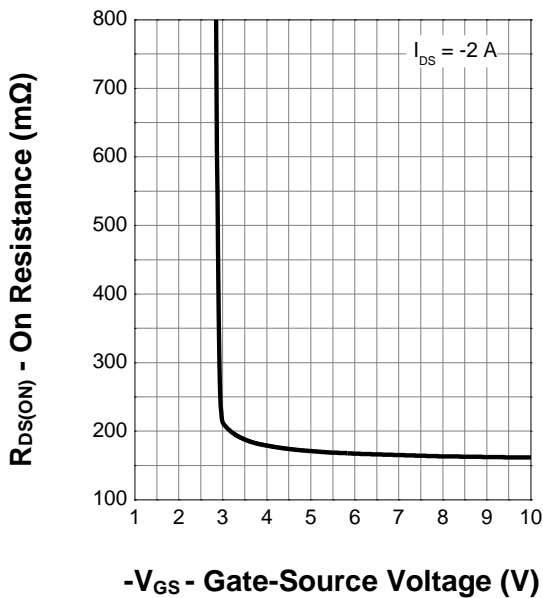
**Output Characteristics**



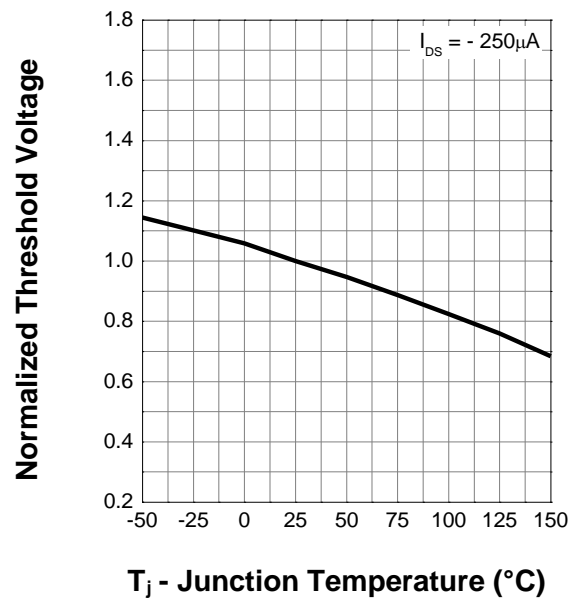
**Drain-Source On Resistance**



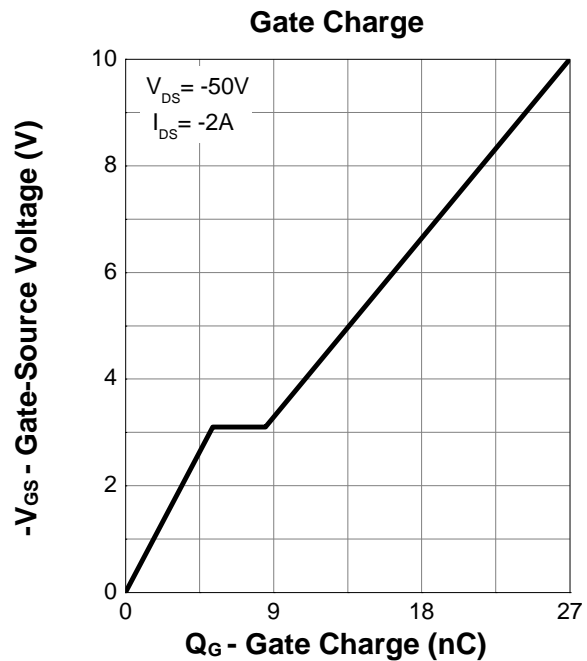
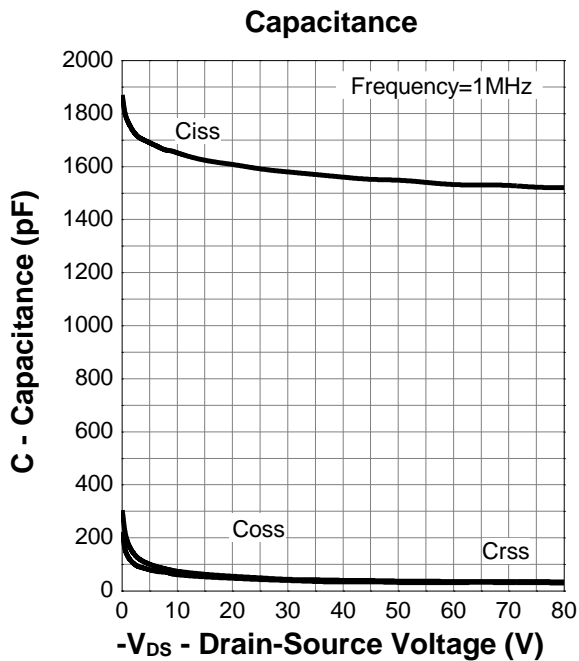
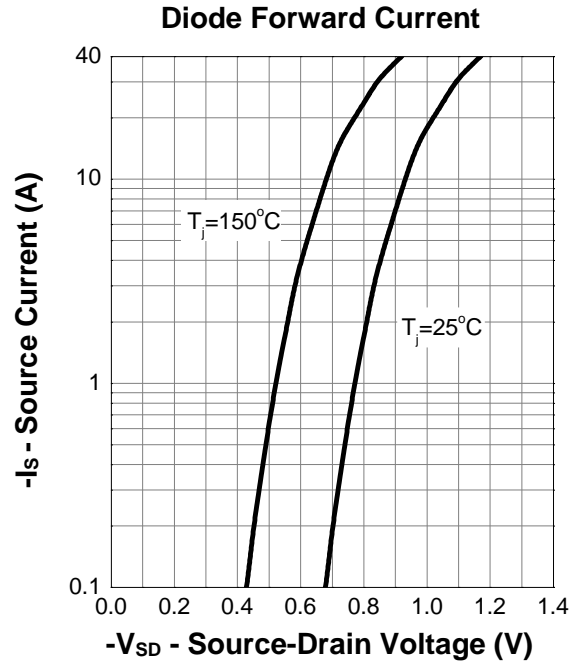
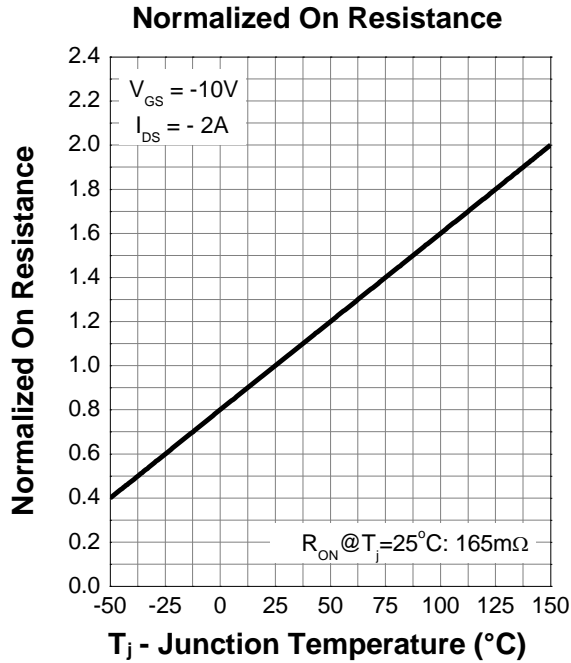
**Transfer Characteristics**



**Normalized Threshold Voltage**

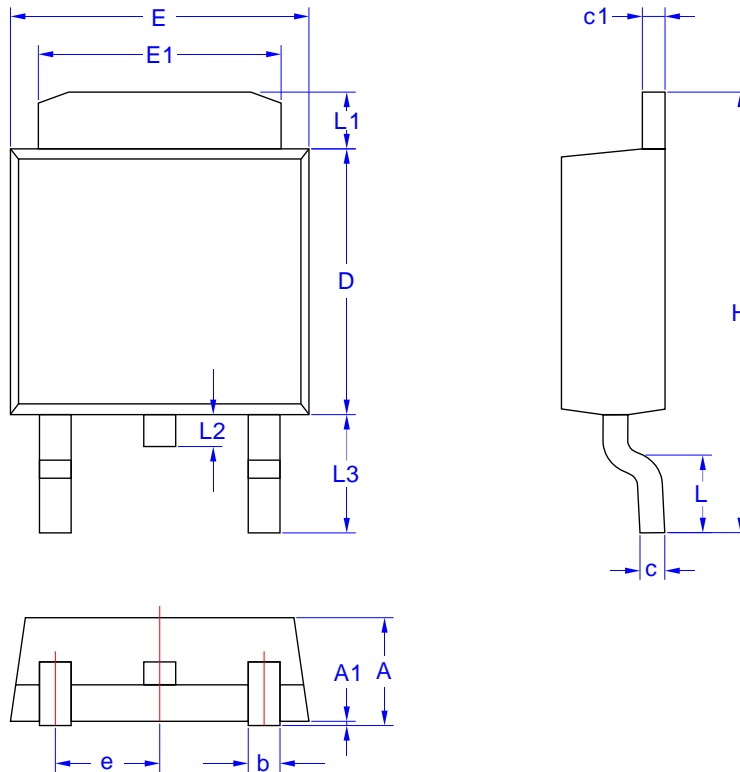


## 7. Typical Characteristics (cont.)



## 8. Package Dimensions

### TO-252 Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.19	2.38
A1	0.02	0.13
b	0.55	0.85
c	0.40	0.60
c1	0.40	0.60
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
e	2.30 BCS	
L	1.00	1.80
L1	0.70	1.80
L2	0.70 BCS	
L3	2.40	2.80
H	9.20	10.40