

## P-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Advanced trench cell design
- Low Thermal Resistance

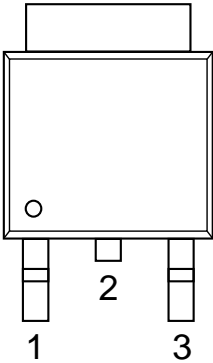
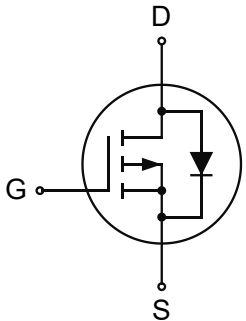
#### 1.2 Applications

- Motor drivers
- DC/DC Converter

#### 1.3 Quick reference

- $BV \geq -30V$
- $R_{DS(ON)} \leq 9m\Omega @ V_{GS} = -10V$
- $P_{tot} \leq 20W$
- $R_{DS(ON)} \leq 14m\Omega @ V_{GS} = -4.5V$
- $I_D \leq -60A$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 <p>Top View TO-252</p>	
2	Drain(D)		
3	Source(S)		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C=25^{\circ}C$	-30	-	V
$V_{GS}$	Gate-Source Voltage	$T_C=25^{\circ}C$	-	$\pm 20$	V
$I_D^*$	Drain Current	$T_C=25^{\circ}C, V_{GS}=-10V$	-	-60	A
$I_{DM}^{**,**}$	Pulsed Source Current	$T_C=25^{\circ}C, V_{GS}=-10V$	-	-144	A
$P_{tot}^*$	Total Power Dissipation	$T_C=25^{\circ}C$	-	20	W
$T_{stg}$	Storage Temperature		-55	150	$^{\circ}C$
$T_J$	Junction Temperature		-	150	$^{\circ}C$
$I_S$	Diode Forward Current	$T_C=25^{\circ}C$	-	-60	A
$R_{\theta JC}^*$	Thermal Resistance-Junction to Case		-	6	$^{\circ}C/W$

Notes:

- \* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10$  sec
- \*\* Pulse width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$
- \*\*\* Limited by bonding wire

## 4. Marking Information

Product Name	Marking
KJ10P03K	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>10P03</b>  <b>YWWXXX</b> </div> <b>YWW:</b> <b>Date Code</b>

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ10P03K	TO-252			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)

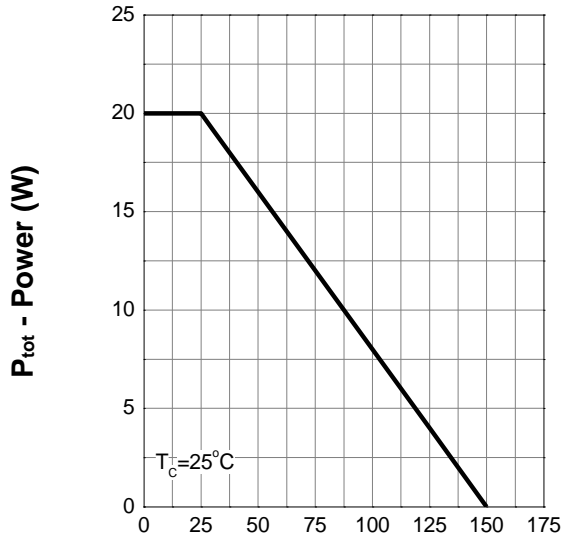
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250μA	-1.0	-	-2.4	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V	-	-	-1	μA
		T <sub>J</sub> =85°C	-	-	-30	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
R <sub>DS(ON)</sub> <sup>a</sup>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	-	7.5	9	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A	-	11	14	mΩ
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> =-20A, V <sub>GS</sub> =0V	-	-	-1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =-20A, dI <sub>SD</sub> /dt=100A/μs	-	21	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	14	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V Frequency=1MHz	-	2000	-	pF
C <sub>oss</sub>	Output Capacitance		-	290	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	270	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =-15V, V <sub>GEN</sub> =-10V, R <sub>G</sub> =4.5Ω, R <sub>L</sub> =0.75Ω, I <sub>D</sub> =-20A	-	10	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	8	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	43	-	
t <sub>f</sub>	Turn-off Fall Time		-	18	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>DS</sub> =-20A	-	36	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	5.3	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	8.8	-	

Notes:

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

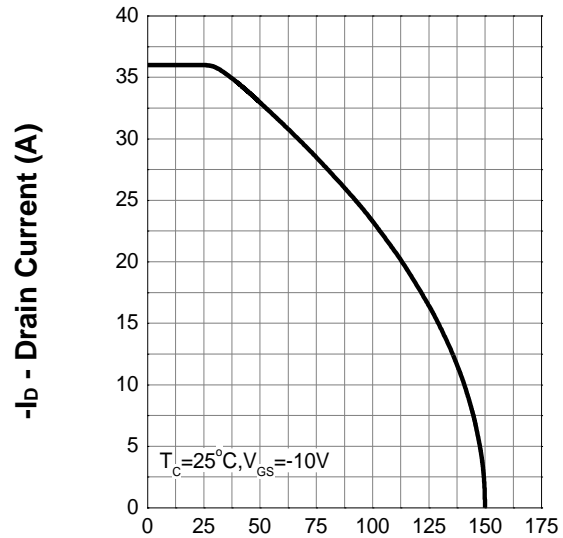
## 7. Typical Characteristics

**Power Capability**



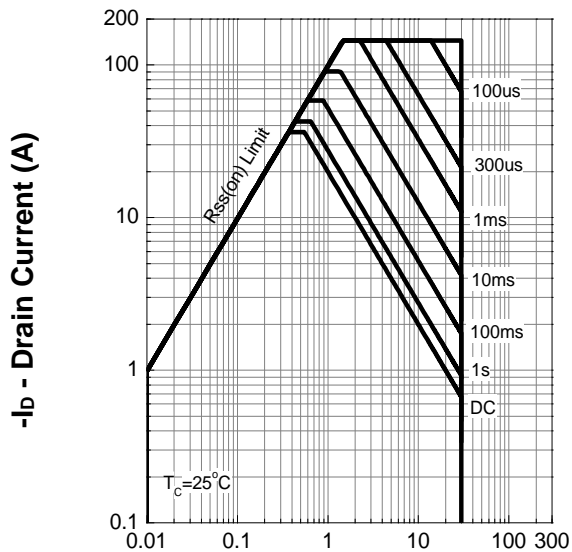
$T_j$  - Junction Temperature ( $^\circ\text{C}$ )

**Current Capability**



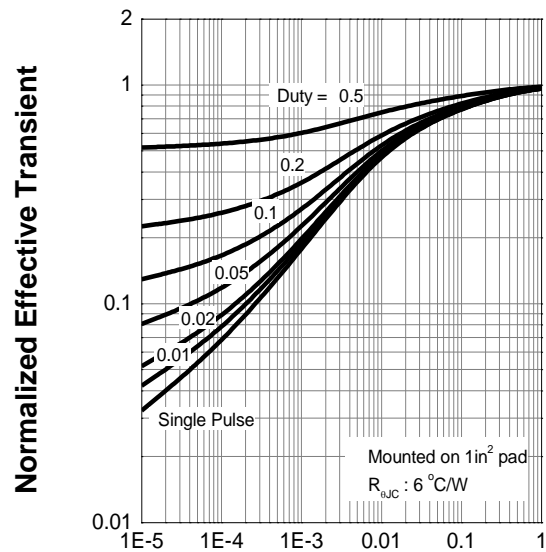
$T_j$  - Junction Temperature ( $^\circ\text{C}$ )

**Safe Operation Area**



$-V_{DS}$  - Drain-Source Voltage (V)

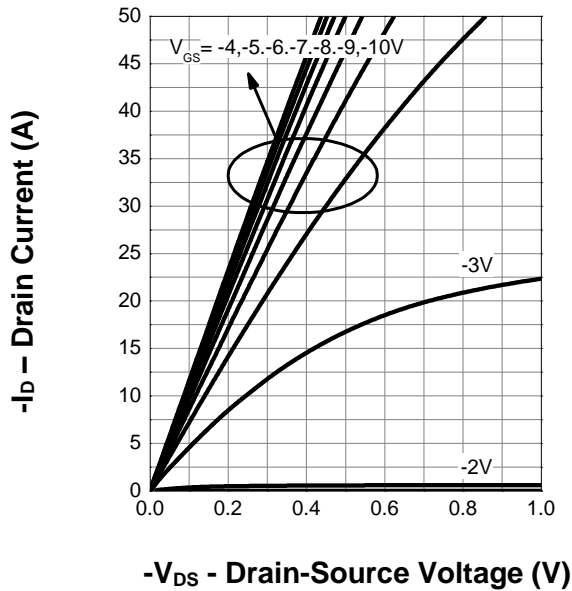
**Thermal Transient Impedance**



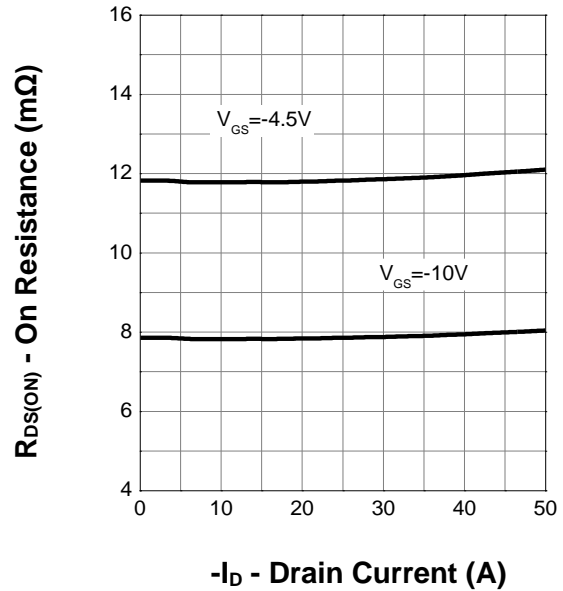
Square Wave Pulse Duration (sec)

## 7. Typical Characteristics (cont.)

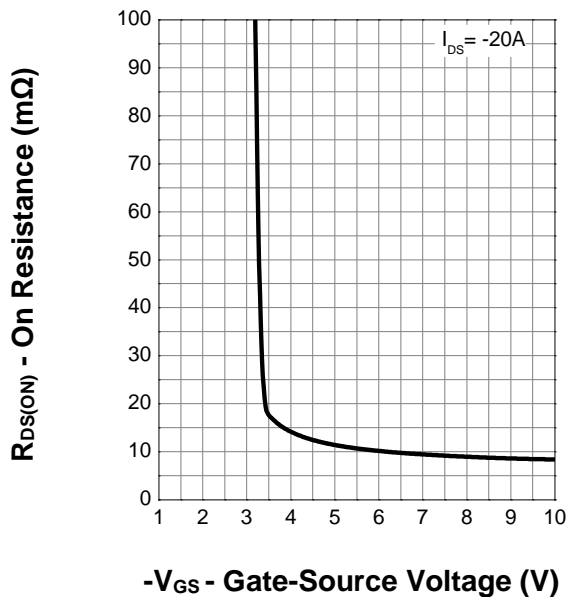
Output Characteristics



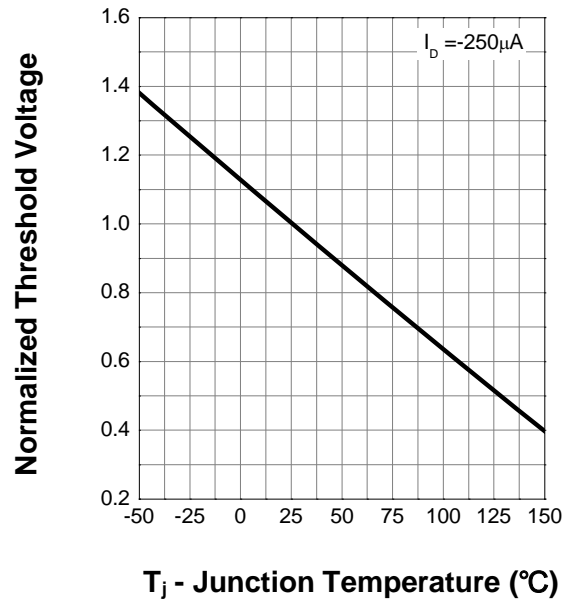
Drain-Source On Resistance



Transfer Characteristics

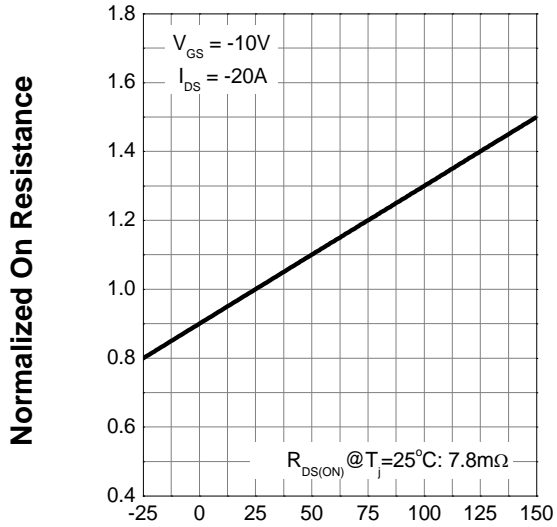


Gate Threshold Voltage



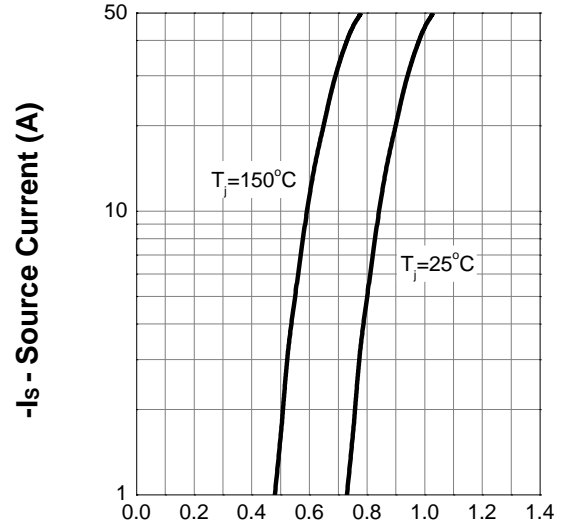
## 7. Typical Characteristics (cont.)

### Drain-Source On Resistance



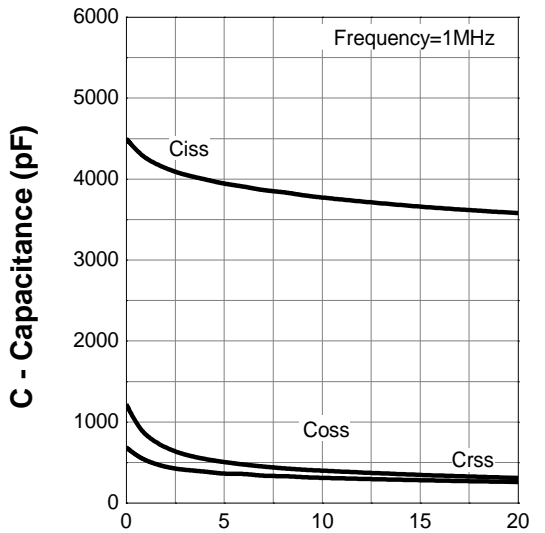
$T_j$  - Junction Temperature ( $^{\circ}\text{C}$ )

### Body Diode Characteristics



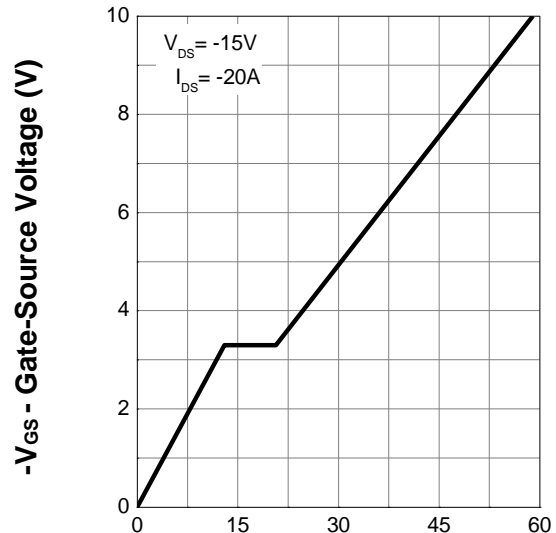
$-V_{SD}$  - Source-Drain Voltage (V)

### Capacitance



$-V_{DS}$  - Drain-Source Voltage (V)

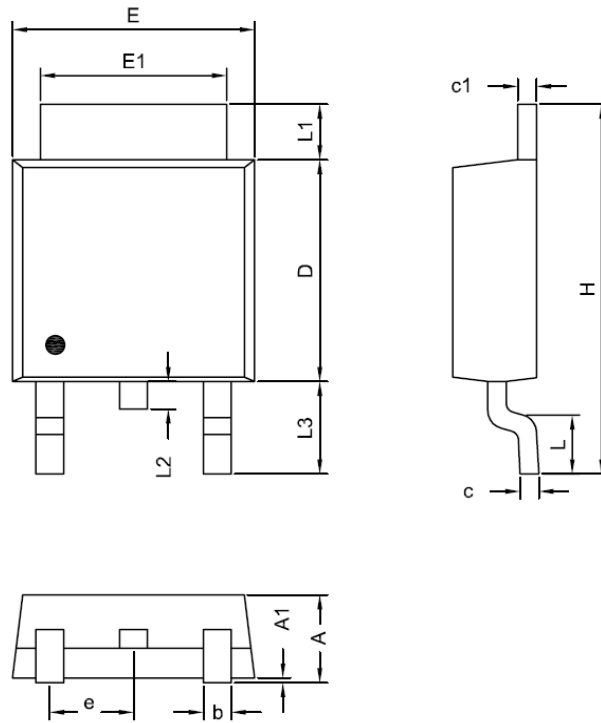
### Gate Charge



$Q_G$  - Gate Charge (nC)

## 8. Package Dimensions

### TO-252 Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.19	2.38
A1	0.02	0.13
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
c	0.40	0.60
c1	0.40	0.60
b	0.55	0.85
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