

# P-Channel Enhancement Mode MOSFET

## 1. Product Information

### 1.1 Features

- Advanced trench cell design
- Low Thermal Resistance

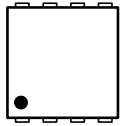
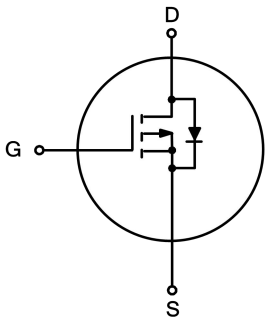
### 1.2 Applications

- Motor drivers
- DC - DC Converter

### 1.3 Quick reference

- $BV \geq -30\text{ V}$
- $R_{DS(ON)} \leq 8.8\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- $P_{tot} \leq 20\text{ W}$
- $R_{DS(ON)} \leq 13\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
- $I_D \leq -40\text{ A}$

## 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View PDFN3x3-8L	
4	Gate		
5,6,7,8	Drain		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-30	-	V
$V_{GS}$	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	$\pm 20$	V
$I_D^*$	Drain Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = -10\text{ V}$	-	-40	A
$I_{DM}^{*,**,***}$	Pulsed Source Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = -10\text{ V}$	-	-144	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	$T_C = 25\text{ }^\circ\text{C}$	-	-40	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
KJ30P03Q	<div style="display: inline-block; border: 1px solid black; padding: 2px;"> <b>30P03</b>  <b>YWWXXX</b> </div> <b>YWW:</b> <b>Date Code</b>

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ30P03Q	DFN3*3			5000	

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>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA	-30	-	-	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	-	-2.0	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V	-	-	-1	μA
		T <sub>J</sub> = 85 °C	-	-	-30	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ± 20 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> = -20 A	-	7.8	8.8	mΩ
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -10 A	-	11.8	13	mΩ
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> = -20 A, V <sub>GS</sub> = 0 V	-	-	-1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> = -20 A, dI <sub>SD</sub> /dt = 100 A/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> = 0 V, V <sub>DS</sub> = -15 V Frequency = 1 MHz	-	3651	-	pF
C <sub>oss</sub>	Output Capacitance		-	341	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	278	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = -15 V, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 0.75 Ω, I <sub>D</sub> = -20 A	-	42.8	-	nS
t <sub>r</sub>	Turn-on Rise Time		-	89	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	409	-	
t <sub>f</sub>	Turn-off Fall Time		-	193	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = -10 V, V <sub>DS</sub> = -15 V, I <sub>DS</sub> = -20 A	-	59	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	13	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	7.7	-	

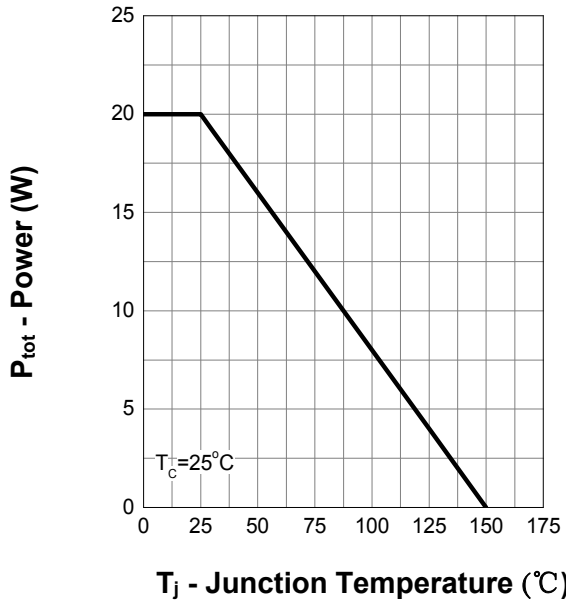
Notes :

a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

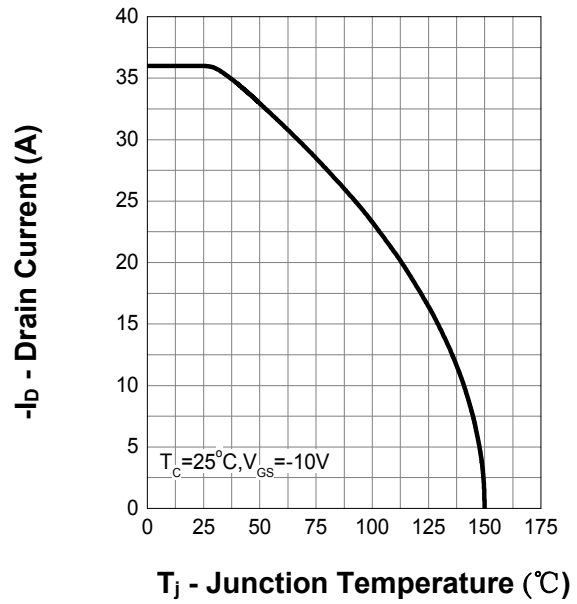
b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics

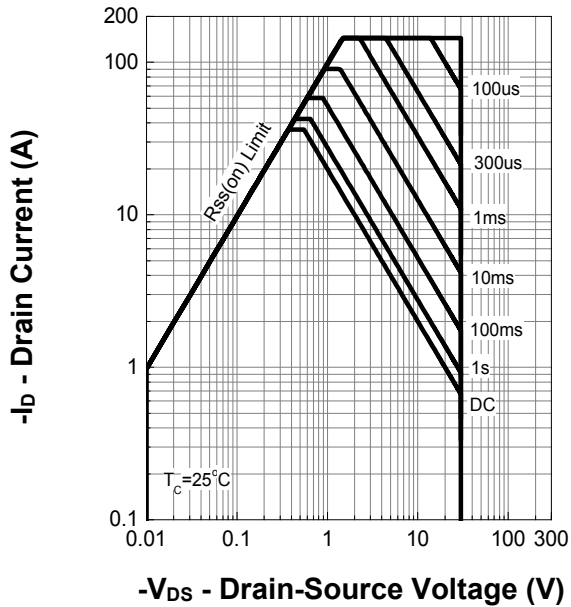
### Power Capability



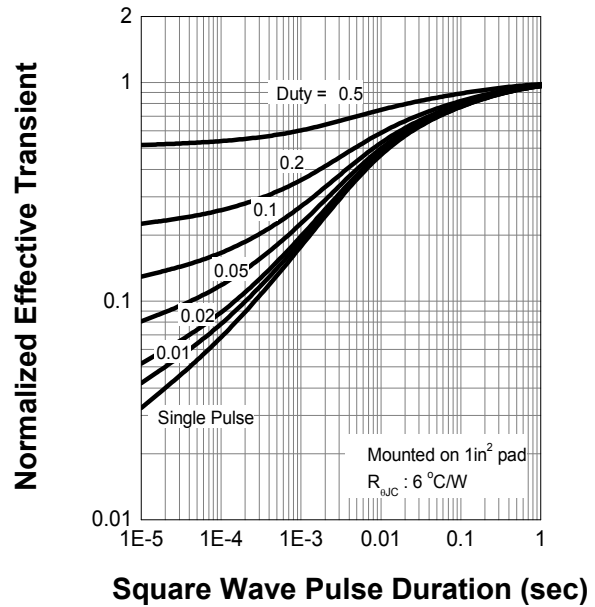
### Current Capability



### Safe Operation Area

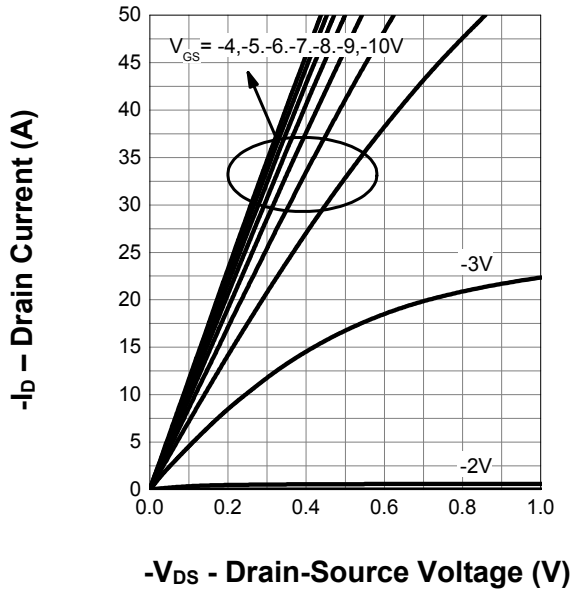


### Thermal Transient Impedance

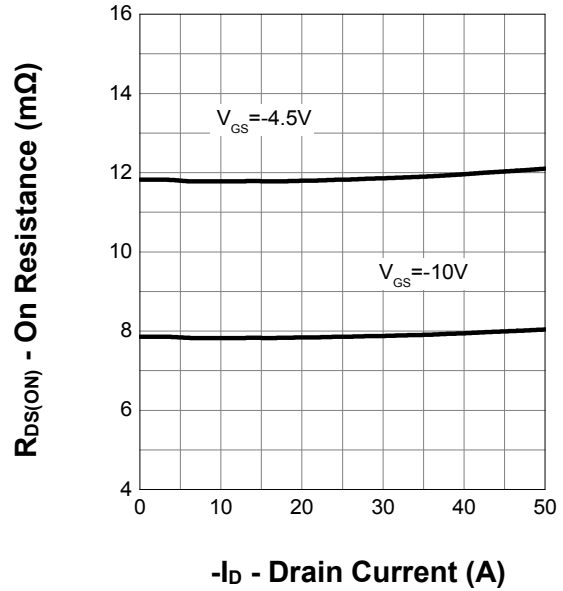


## 7. Typical Characteristics (cont.)

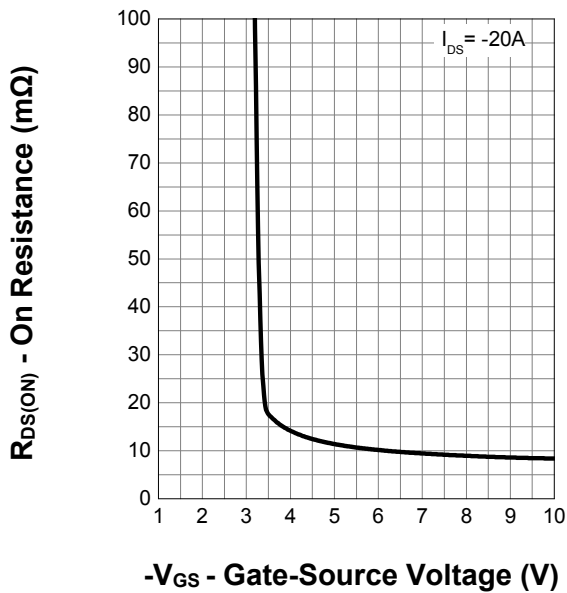
### Output Characteristics



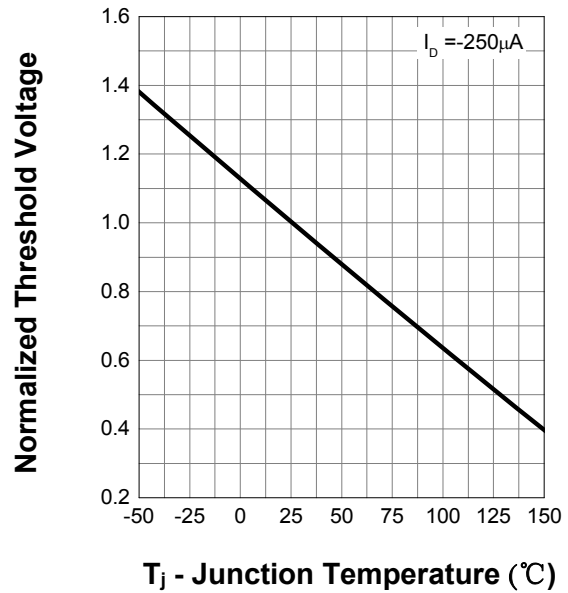
### Drain-Source On Resistance



### Transfer Characteristics

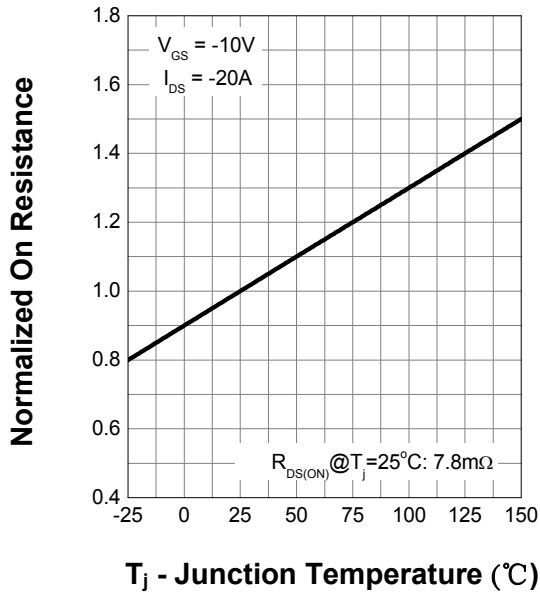


### Gate Threshold Voltage

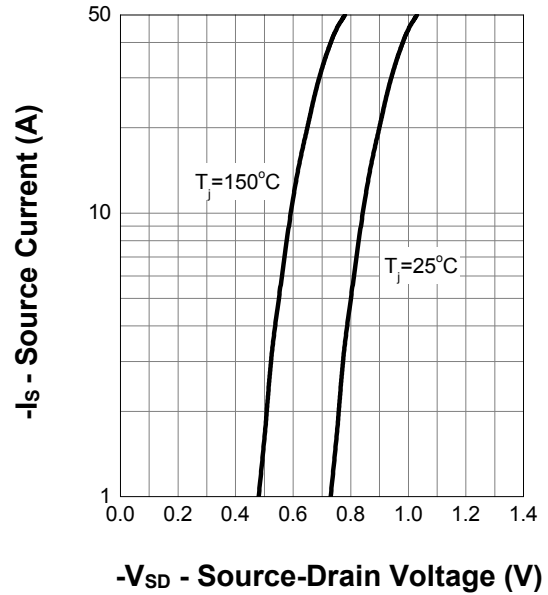


## 7. Typical Characteristics (cont.)

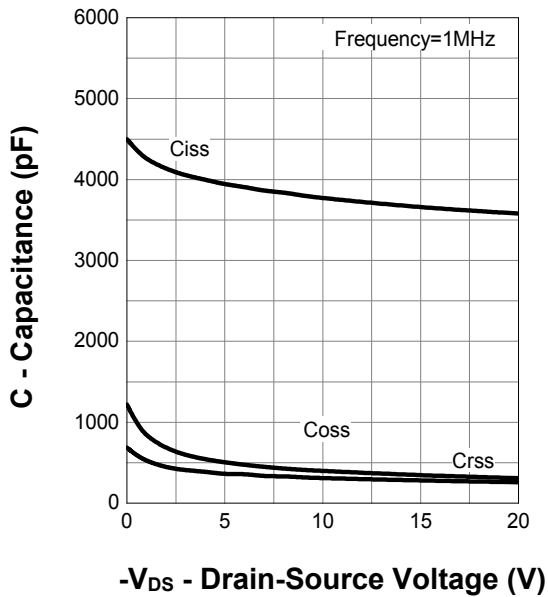
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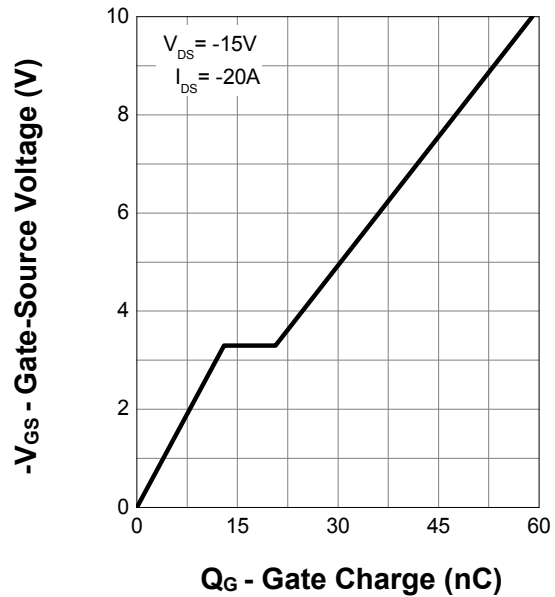
### Body Diode Characteristics



### Capacitance

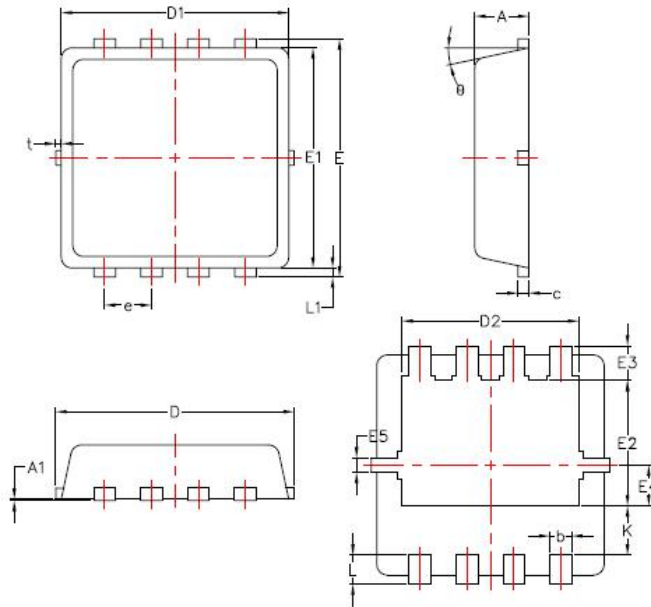


### Gate Charge



## 8. Package Dimensions

PDFN3x3 - 8L Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	0.7	0.85
A1	/	0.05
b	0.20	0.40
c	0.10	0.25
D	3.15	3.45
D1	3.00	3.25
D2	2.29	2.65
E	3.15	3.45
E1	2.90	3.20
E2	1.54	1.94
E3	0.28	0.68
E4	0.37	0.77
E5	0.10	0.30
e	0.60	0.70
K	0.59	0.89
L	0.30	0.50
L1	0.06	0.20
T	0	0.13
$\theta$	/	12°