

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package
- Low Thermal Resistance

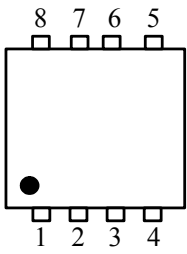
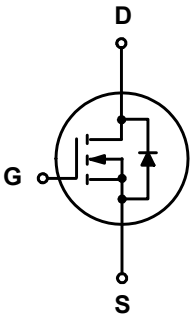
#### 1.2 Applications

- Motor drivers
- DC - DC Converter

#### 1.3 Quick reference

- $BV \leq 60\text{ V}$
- $R_{DS(ON)} \leq 13.5\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- $P_{tot} \leq 20.8\text{ W}$
- $R_{DS(ON)} \leq 22.5\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$
- $I_D \leq 50\text{ A}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
4	Gate(G)	 <p>Top View</p> <p>PDFN3.3x3.3-8L</p>	
5,6,7,8	Drain(D)		
1,2,3	Source(S)		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	60	-	V
$V_{GS}$	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	$\pm 20$	V
$I_D^*$	Drain Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	50	A
$I_{DM}^{*,**,***}$	Pulsed Source Current	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	112	A
$P_{tot}^*$	Total Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	20.8	W
$T_{stg}$	Storage Temperature		-55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-	150	$^\circ\text{C}$
$I_S$	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	-	50	A
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	62.5	$^\circ\text{C} / \text{W}$
$R_{\theta JC}^*$	Thermal Resistance- Junction to Case		-	6	

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
KJ1206QM	<div style="display: flex; align-items: center;"> <div style="background-color: black; color: white; padding: 2px 5px; margin-right: 10px;">1206 YWWXXX</div> <span>YWWXXXX : Date Code</span> </div>

## 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ1206QM	PDFN3.3*3.3			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>A</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	60	-	-	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	3.0	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> = 48, 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> = 20A	-	11.2	13.5	mΩ
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 10A	-	19	22.5	
<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	-	53	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	24	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 30 V Frequency = 1 MHz	-	789	-	pF
C <sub>oss</sub>	Output Capacitance		-	376	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	32	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = 30 V, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 4.5 Ω, R <sub>L</sub> = 1.5Ω, I <sub>D</sub> = 20 A	-	6.5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	29	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	12.6	-	
t <sub>f</sub>	Turn-off Fall Time		-	18.8	-	
<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> = 30 V, I <sub>DS</sub> = 20 A	-	16	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	4	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	3.5	-	

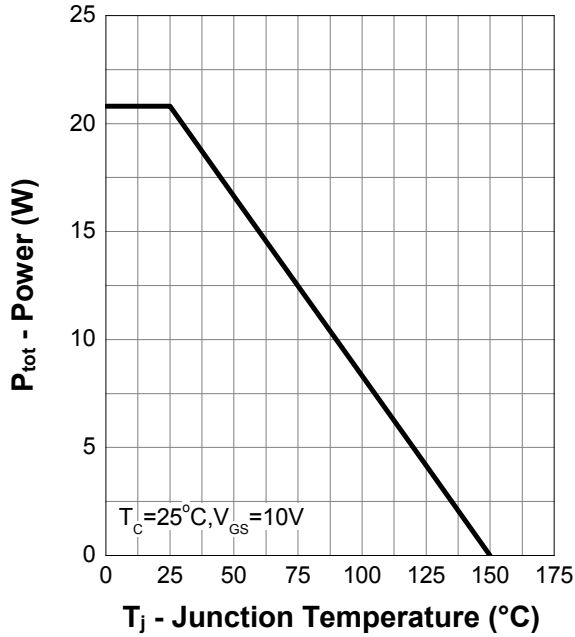
Notes :

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

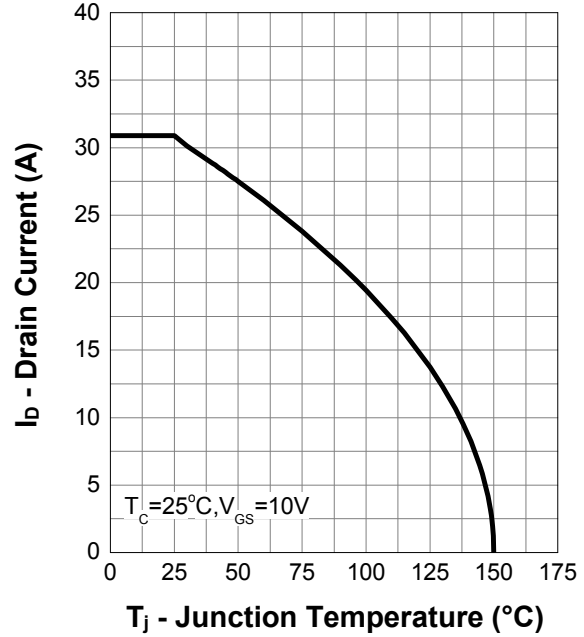
b : Guaranteed by design, not subject to production testing

## 7. Typical Characteristics (Cont.)

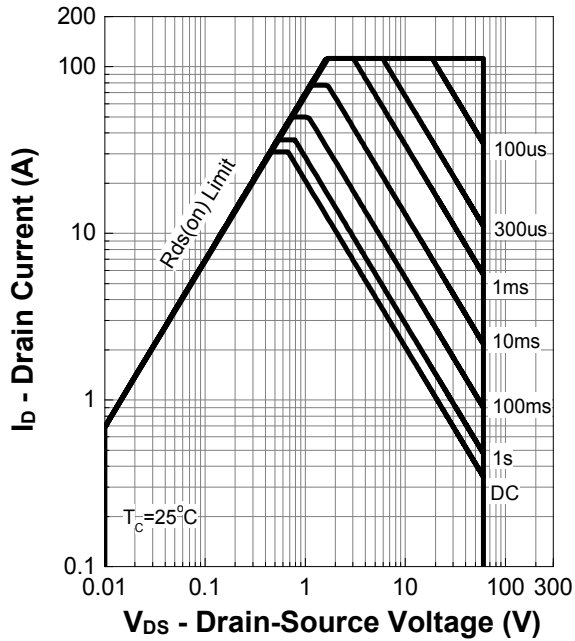
Power Capability



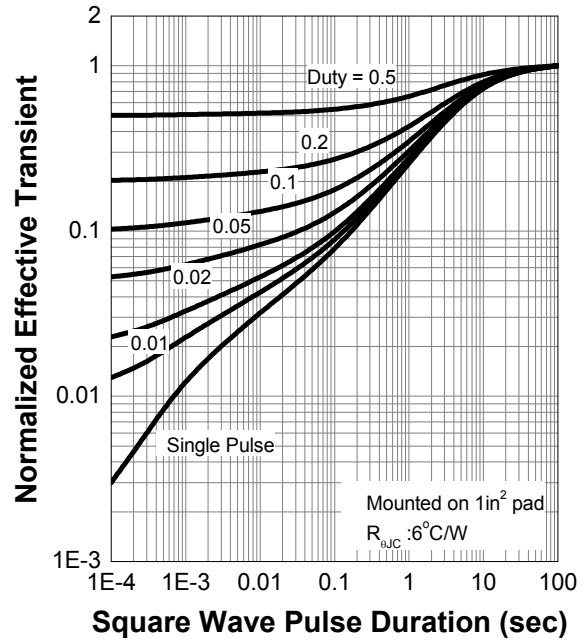
Current Capability



Safe Operation Area

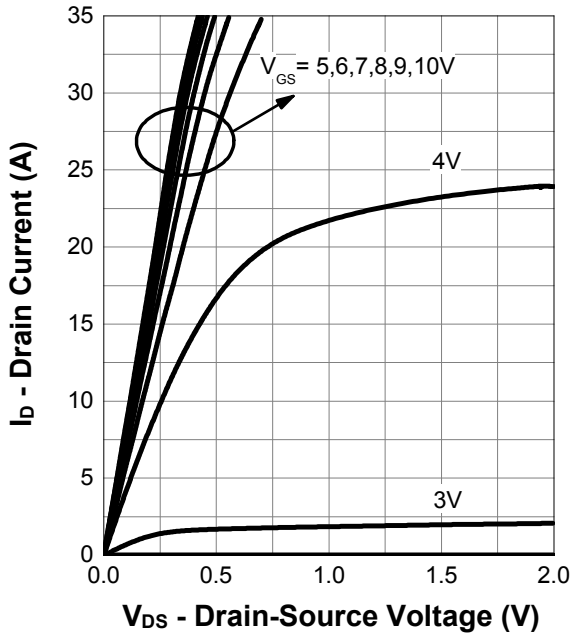


Transient Thermal Impedance

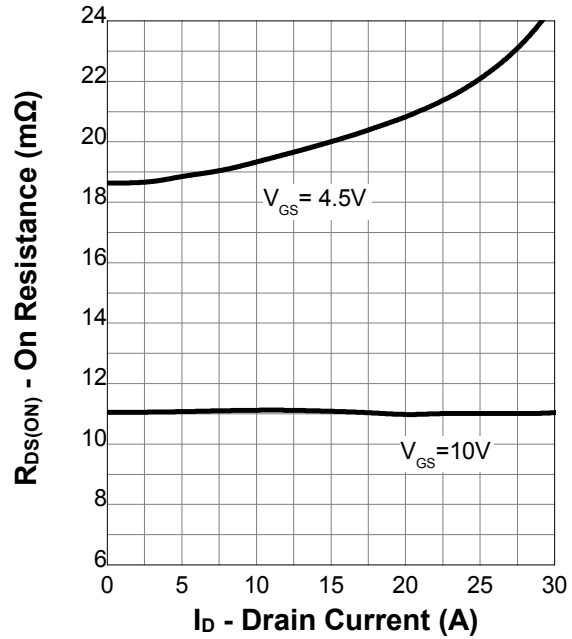


## 7. Typical Characteristics (Cont.)

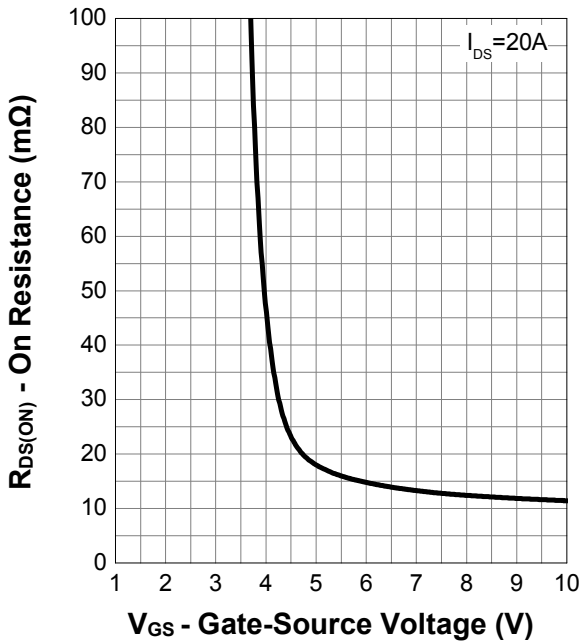
Output Characteristics



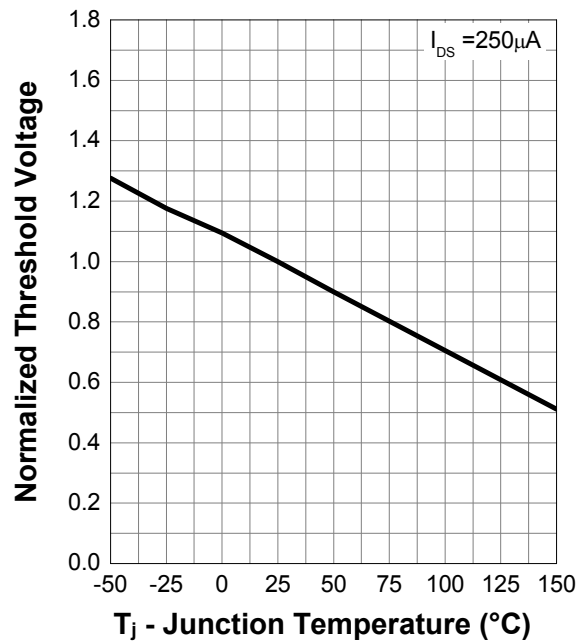
On Resistance



Transfer Characteristics

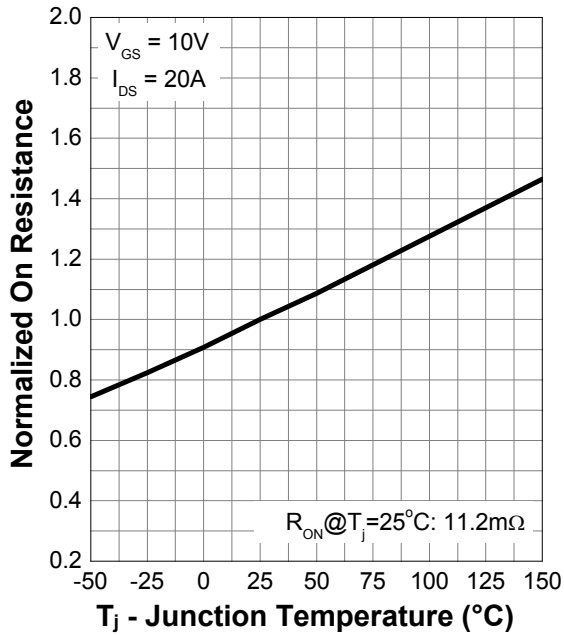


Normalized Threshold Voltage

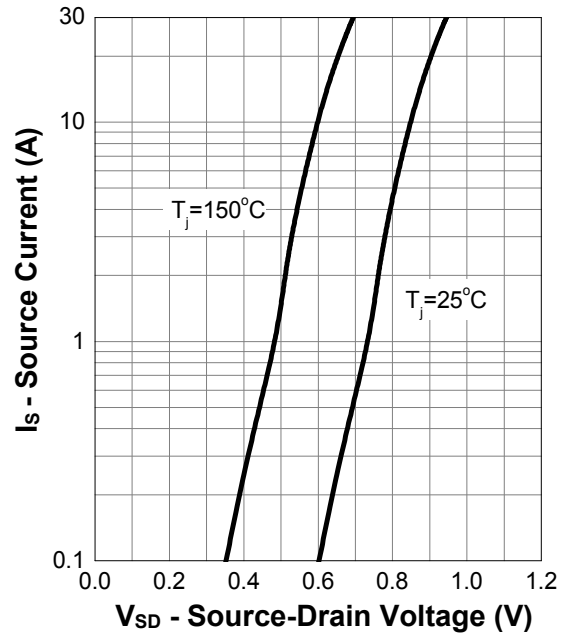


## 7. Typical Characteristics (Cont.)

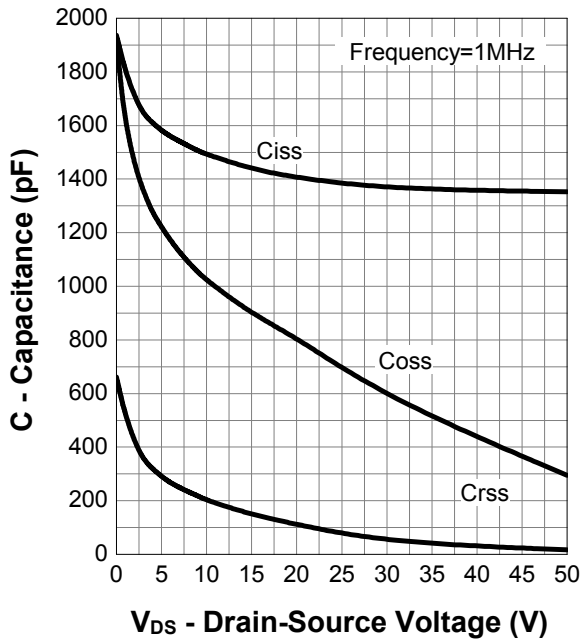
Normalized On Resistance



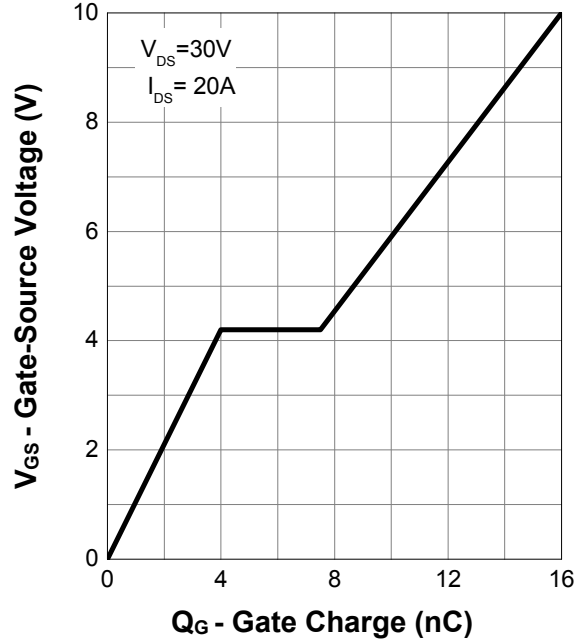
Diode Forward Current



Capacitance

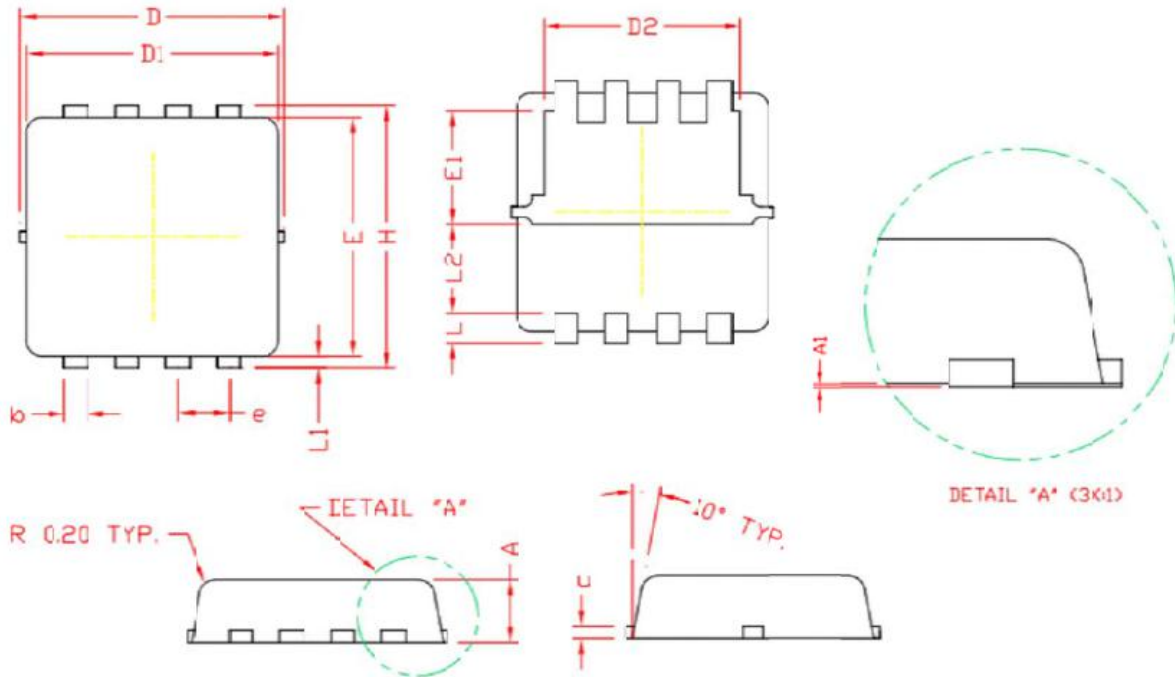


Gate Charge



## 8. Package Dimensions

PDFN 3.3x3.3-8L Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	0.70	0.90
A1	0.00	0.05
b	0.24	0.35
c	0.10	0.20
D	3.25	3.40
D1	3.05	3.25
D2	2.40	2.60
E	3.00	3.20
E1	1.35	1.55
e	0.65 BSC.	
H	3.20	3.40
L	0.30	0.50
L1	0.10	0.20
L2	1.13 REF.	