

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Surface-mounted package
- Low  $R_{DS(on)}$  trench technology
- $T_J$  175°C
- MSL1

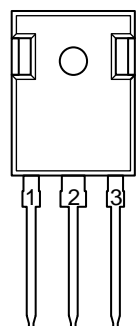
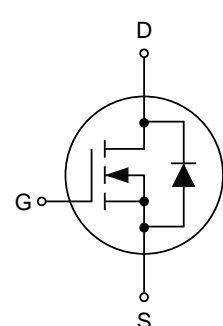
#### 1.2 Applications

- BMS appliances
- High power inverter system
- Motor drives
- Light electric vehicles

#### 1.3 Quick reference

- $BV \geq 100\text{ V}$
- $R_{DS(ON)} \leq 1.2\text{ m}\Omega @V_{GS} = 10\text{ V}$
- $P_D \leq 430\text{ W}$
- $R_{DS(ON)} \leq 1.65\text{ m}\Omega @V_{GS} = 6\text{ V}$
- $I_D \leq 420\text{ A}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate	 <p>Top View TO-247</p>	
2	Drain		
3	Source		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>C</sub> =25°C	-	100	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>C</sub> =25°C	-	±20	V
I <sub>D</sub> *	Drain Current (DC)	T <sub>C</sub> =25°C, V <sub>GS</sub> =10 V	-	420	A
		T <sub>C</sub> =100°C, V <sub>GS</sub> =10 V	-	290	A
I <sub>DM</sub> *, **	Drain Current (Pulsed)	T <sub>C</sub> =25°C, V <sub>GS</sub> =10 V	-	1840	A
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> =25°C	-	430	W
I <sub>S</sub>	Continuous-Source Current	T <sub>C</sub> =25°C	-	420	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy	V <sub>DD</sub> =75 V, L=0.3 mH	-	1750	mJ
T <sub>J</sub> , T <sub>stg</sub>	Operating Junction and Storage Temperature Range		-55	175	°C
R <sub>θJA</sub> **	Thermal Resistance- Junction to Ambient		-	40	°C/W
R <sub>θJC</sub>	Thermal Resistance- Junction to Case		-	0.35	°C/W


Notes:

\* Pulse width ≤ 300 μs, duty cycle ≤ 2%.

\*\* Surface mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec.

\*\*\* Limited by bonding wire.

## 4. Marking Information

Product Name	Marking
KJ011N10P	

## 4. Ordering Code

Product Name	Package	Form	Quantity (pcs)
KJ011N10P	TO-247	Tube	30

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)

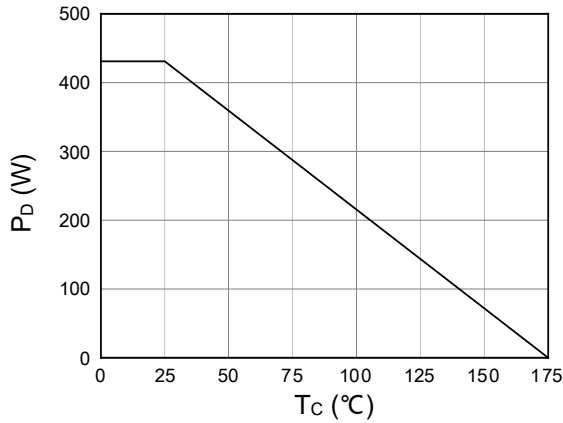
## 6. Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

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>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	2.2	-	3.5	V
I <sub>DSS</sub>	Drain Leakage Current	V <sub>DS</sub> =100 V, V <sub>GS</sub> =0 V	-	-	1	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</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> =50 A	-	1.0	1.2	mΩ
		V <sub>GS</sub> =6 V, I <sub>DS</sub> =50 A	-	1.2	1.65	mΩ
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5 V, I <sub>DS</sub> =30 A	-	49	-	S
R <sub>g</sub>	Gate Resistance		-	1	2	Ω
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	V <sub>GS</sub> =0 V, I <sub>SD</sub> =30 A	-	0.8	1.1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>DS</sub> =50 V, V <sub>GS</sub> =0 V, I <sub>DS</sub> =30 A, di/dt=100 A/μs	-	113	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	400	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50 V, V <sub>GS</sub> =0 V, f=1 MHz	-	18000	-	pF
C <sub>oss</sub>	Output Capacitance		-	2211	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	660	-	
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> =6 Ω, I <sub>DS</sub> =30 A	-	65	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	60	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	223	-	
t <sub>f</sub>	Turn-off Fall Time		-	104	-	
<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> =30 A	-	275	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	62	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	72	-	

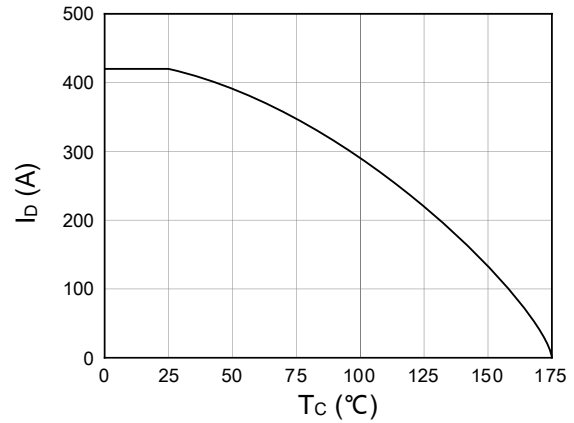
Notes:

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

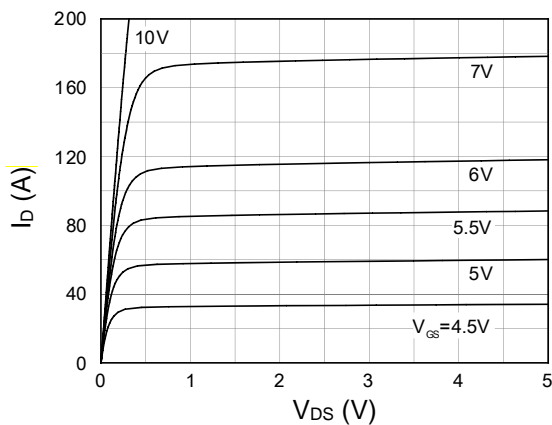
## 7. Typical Characteristics



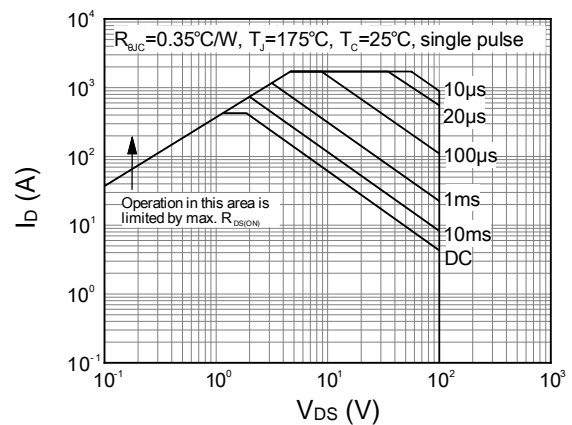
**Figure 1. Power Capability**



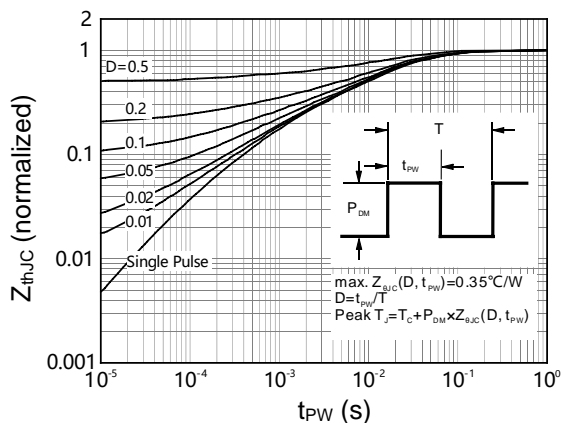
**Figure 2. Current Capability**



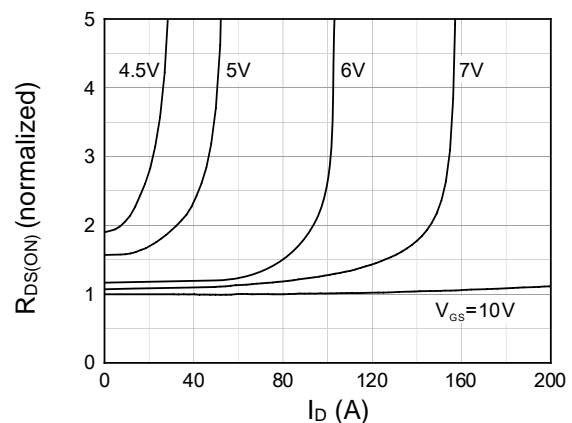
**Figure 3. Output characteristics**



**Figure 4. Safe operating area**

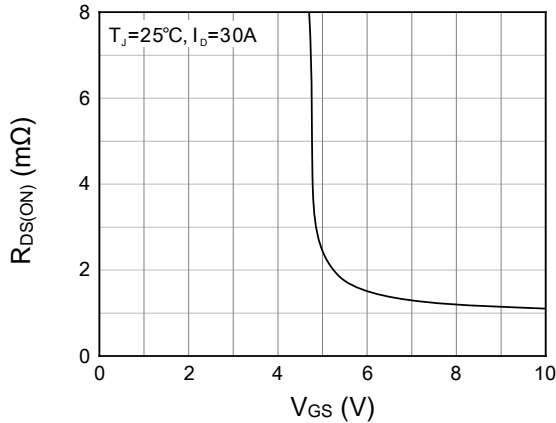


**Figure 5. Normalized transient thermal impedance from junction to case**

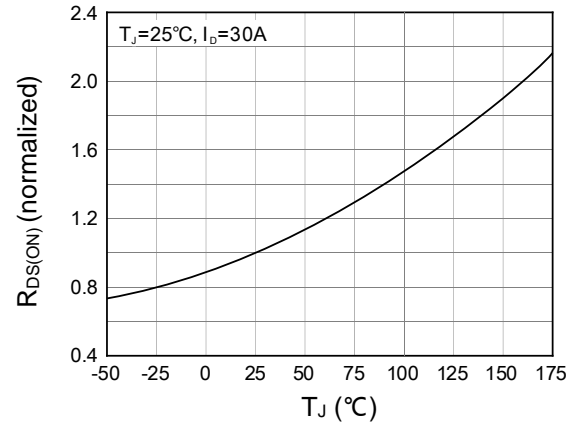


**Figure 6. Normalized on-resistance vs drain current**

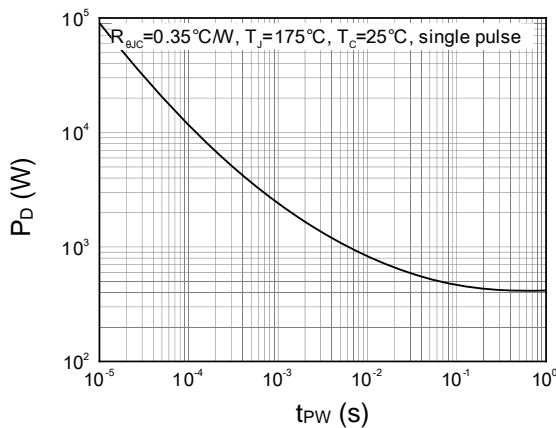
## 7. Typical Characteristics (cont.)



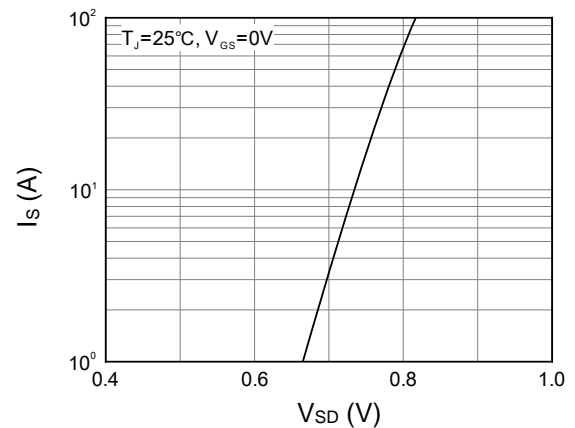
**Figure 7. On-resistance vs gate-source voltage**



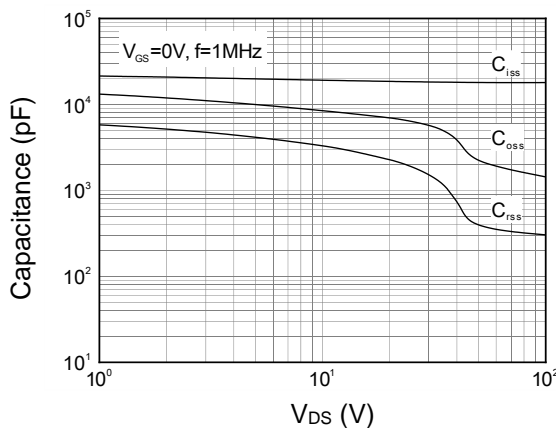
**Figure 8. Normalized on-resistance vs junction temperature**



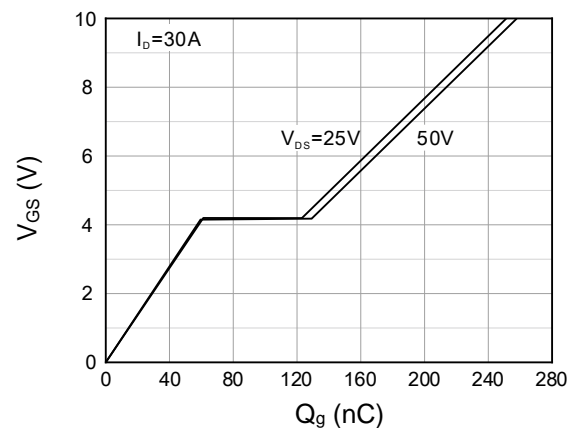
**Figure 9. Single pulse maximum power dissipation**



**Figure 10. Forward characteristics of body diode**



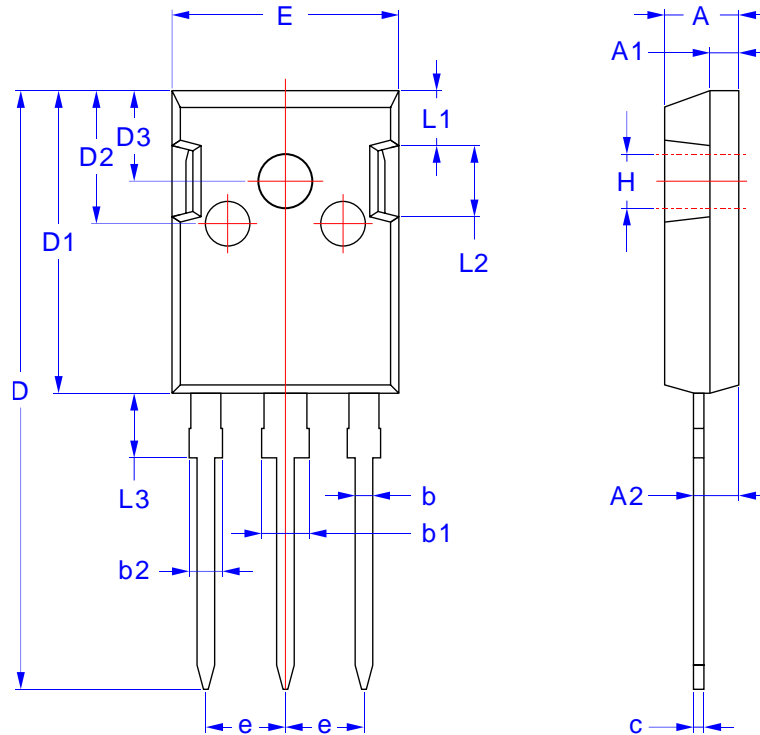
**Figure 11. Capacitance**



**Figure 12. Gate charge**

## 8. Package Dimensions

### TO-247 Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	4.90	5.10
A1	1.90	2.10
A2	2.00	3.00
b	1.20	1.30
b1	2.50	3.50
b2	1.75	2.50
c	0.55	0.75
D	41.00	42.00
D1	20.00	21.00
D2	8.00	10.00
D3	5.00	6.00
E	15.00	16.00
e	TYP 5.08	
H	3.00	3.50
L1	3.50	4.00
L2	4.75	5.25
L3	4.00	5.00