

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ✓ Advanced trench cell design
- ✓ Low thermal resistance
- ✓ T_J 175°C
- ✓ MSL1

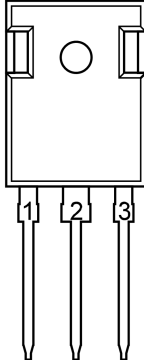
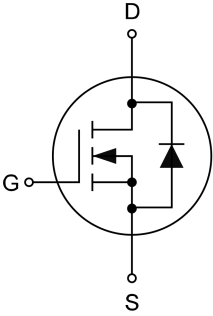
1.2 Applications

- ✓ Motor drivers
- ✓ Battery management

1.3 Quick reference

- ✓ $BV \geq 200\text{ V}$
- ✓ $P_D \leq 333\text{ W}$
- ✓ $I_D \leq 119\text{ A}$
- ✓ $R_{DS(ON)} \leq 10.2\text{ m}\Omega @ V_{GS} = 10\text{ V}$

2. Pin Description

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

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{DS}	Drain-Source Voltage	T _C =25℃	200	-	V
V _{GS}	Gate-Source Voltage	T _C =25℃	-	±20	V
I _D	Drain Current (DC)	T _C =25℃, V _{GS} =10 V	-	119	A
		T _C =100℃, V _{GS} =10 V	-	84	A
I _{DM} *	Drain Current (Pulsed)	T _C =25℃, V _{GS} =10 V	-	476	A
P _D	Drain Power Dissipation	T _C =25℃	-	333	W
I _S	Diode Forward Current	T _C =25℃	-	119	A
E _{AS}	Single Pulsed Avalanche Energy	V _{DD} =100 V, L=0.3 mH	-	972	mJ
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55	175	℃
R _{θJA}	Thermal Resistance-Junction to Ambient		-	62.5	℃/W
R _{θJC}	Thermal Resistance-Junction to Case		-	0.45	℃/W

Notes:

- * Pulse width ≤ 300 μs, duty cycle ≤ 2%.
- ** Surface mounted on 1 in² pad area, t ≤ 10 sec.
- *** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ10N20P	KJ10N20P XXXXXX-X

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ10N20P	TO-247	N/A	N/A	600

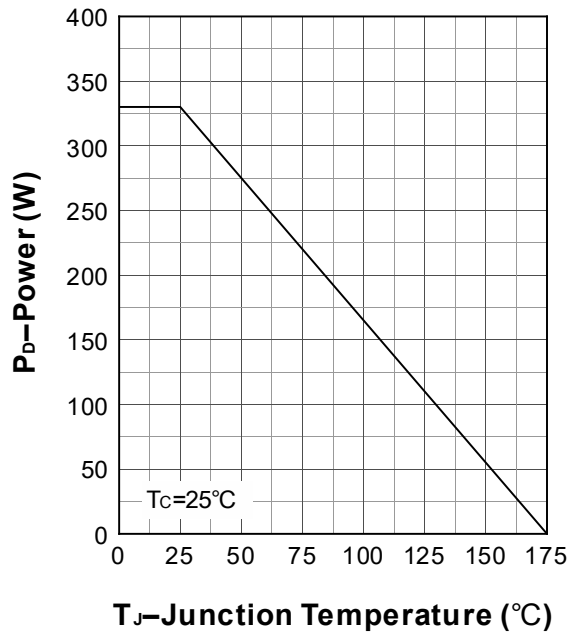
Note: KUAIJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C).

6. Electrical Characteristics (T_A=25°C unless otherwise noted)

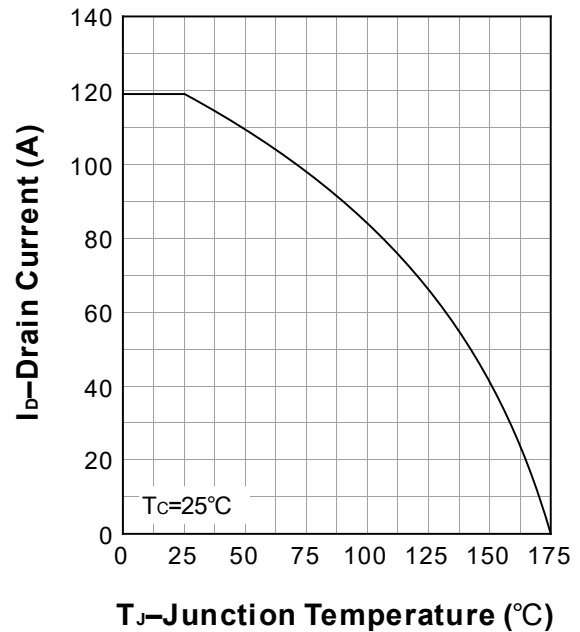
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =250 μA	200	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2	-	4	V
I _{DSS}	Drain Leakage Current	V _{DS} =200 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
R _{DS(ON)}	On-State Resistance	V _{GS} =10 V, I _{DS} =50 A	-	8.3	10.2	mΩ
R _G	Gate Resistance	V _{GS} =V _{DS} =0 V, f=1 MHz	-	3.5	-	Ω
g _{FS}	Forward Transconductance	V _{DS} =5 V, I _D =50 A	-	90	-	S
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =1 A, V _{GS} =0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =50 A, V _{GS} =0 V dI _{SD} /dt=100 A/μs	-	128	-	ns
Q _{rr}	Reverse Recovery Charge		-	755	-	nC
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =100 V, f=1 MHz	-	4822	-	pF
C _{oss}	Output Capacitance		-	410	-	
C _{rss}	Reverse Transfer Capacitance		-	26	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =100 V, V _{GEN} =10 V, R _G =2.7 Ω, I _{DS} =50 A	-	16	-	ns
t _r	Turn-on Rise Time		-	88	-	
t _{d(off)}	Turn-off Delay Time		-	53	-	
t _f	Turn-off Fall Time		-	82	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =100 V, V _{GS} =10 V, I _{DS} =50 A	-	70	-	nC
Q _{gs}	Gate-Source Charge		-	25	-	
Q _{gd}	Gate-Drain Charge		-	17	-	

7. Typical Characteristics

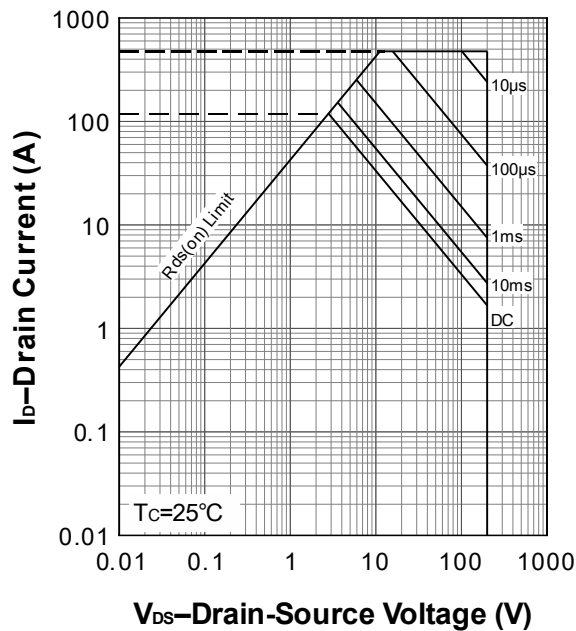
Power Capability



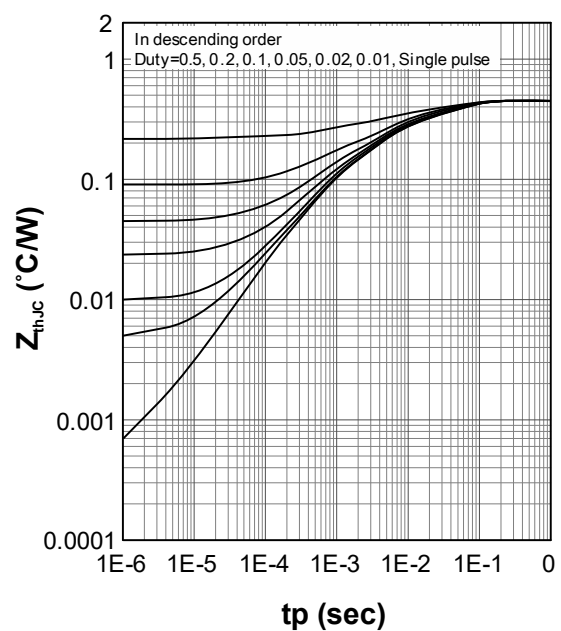
Current Capability



Safe Operating Area

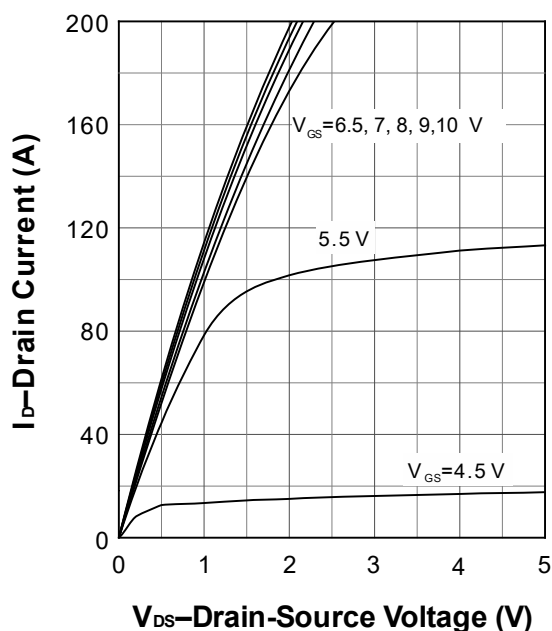


Transient Thermal Impedance

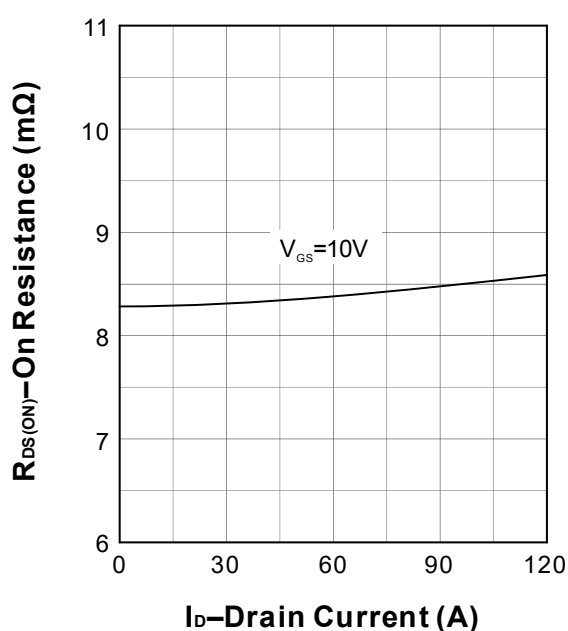


7. Typical Characteristics (cont.)

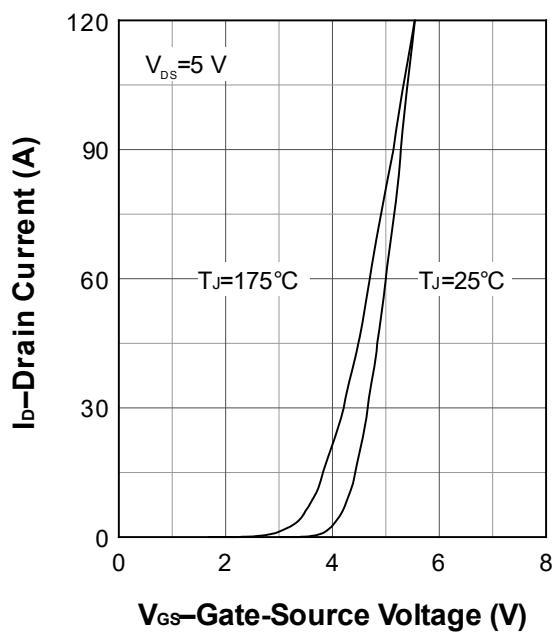
Output Characteristics



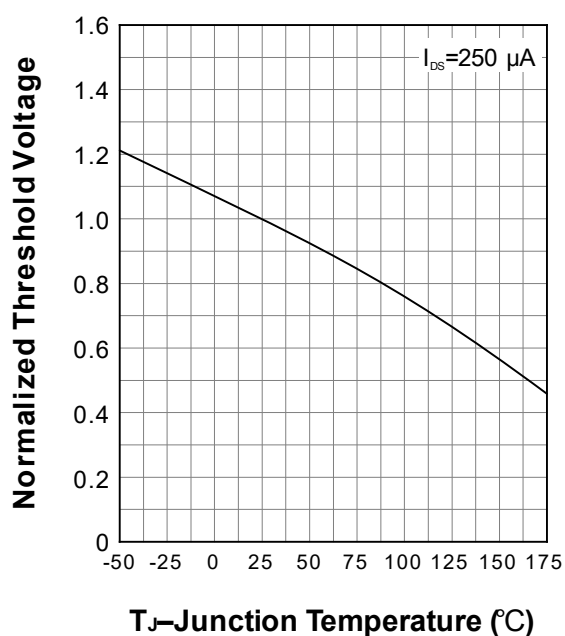
On Resistance



Transfer Characteristics

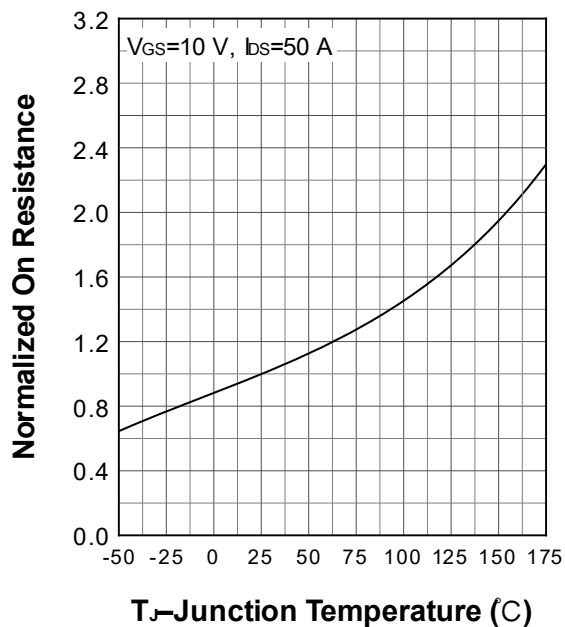


Normalized Threshold Voltage

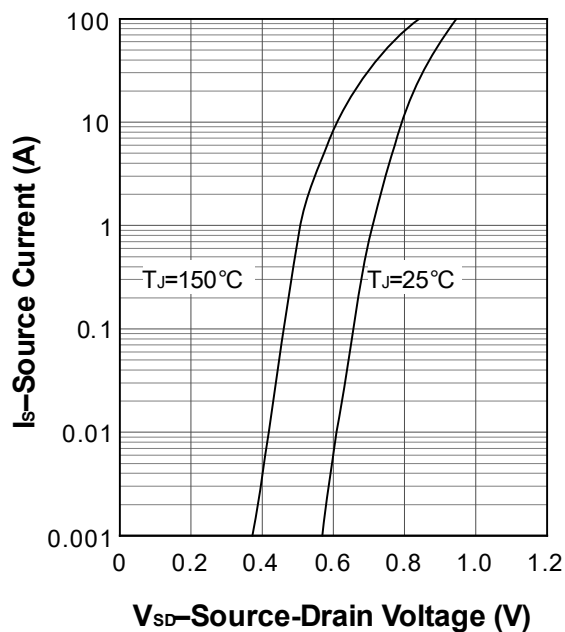


7. Typical Characteristics (cont.)

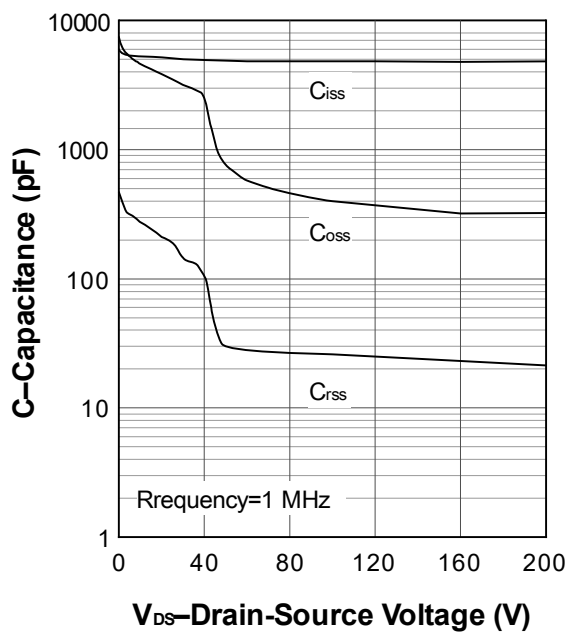
Normalized On Resistance



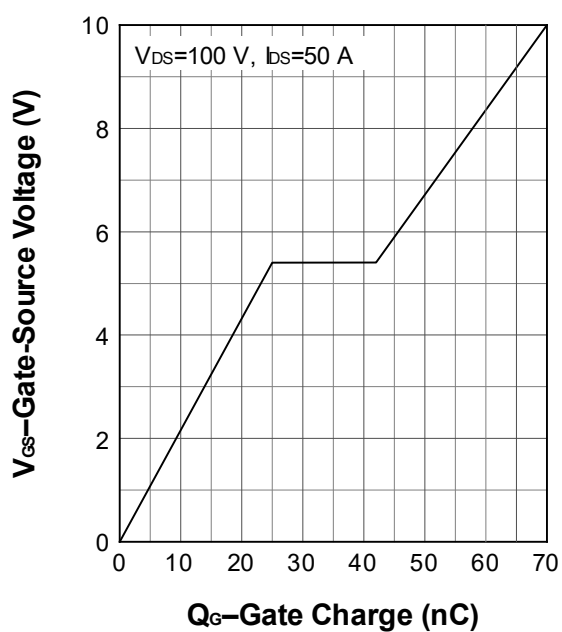
Diode Forward Current



Capacitance

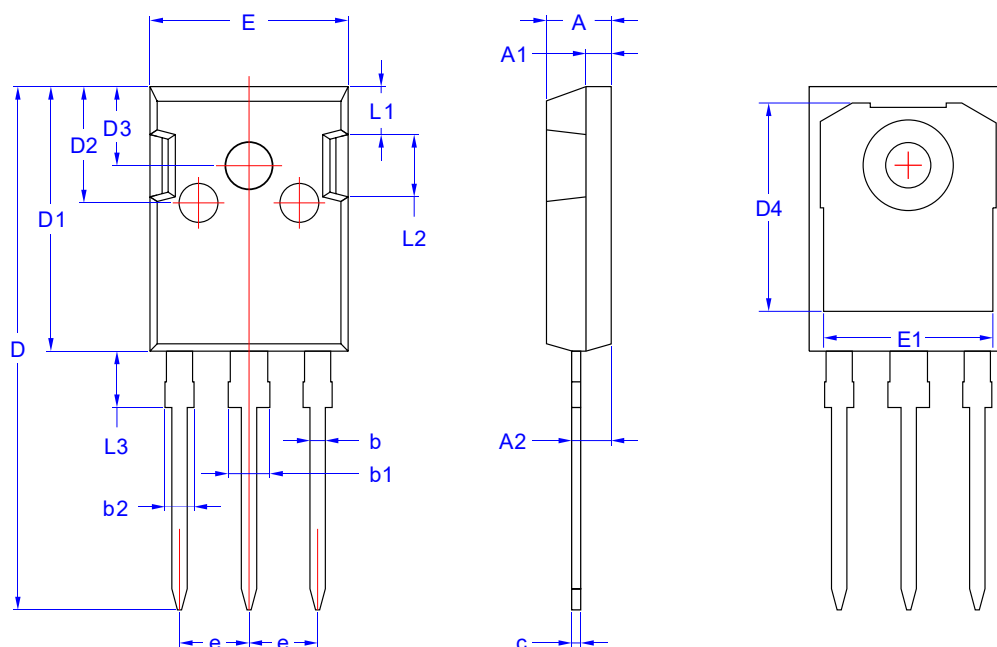


Gate Charge



8. Package Dimensions

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	1.16	1.26
b1	2.50	3.50
b2	1.75	2.50
c	0.55	0.75
D	40.0	42.0
D1	20.00	21.00
D2	8.00	10.00
D3	6.00	6.30
D4	16.10	17.00
E	15.00	16.00
E1	13.00	13.50
e	TYP 5.44	
L1	3.50	4.00
L2	4.75	5.25
L3	4.00	5.00