

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Advanced trench cell design

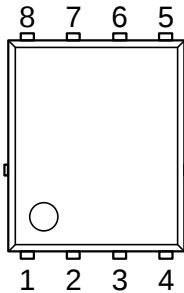
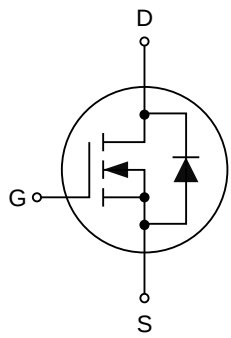
1.2 Applications

- ☒ Motor drivers
- ☒ DC/DC converter

1.3 Quick reference

- ☒ $BV \geq 200\text{ V}$
- ☒ $P_D \leq 147\text{ W}$
- ☒ $I_D \leq 85\text{ A}$
- ☒ $R_{DS(ON)} \leq 22\text{ m}\Omega @V_{GS} = 10\text{ V}$
- ☒ $R_{DS(ON)} \leq 25\text{ m}\Omega @V_{GS} = 6\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View PDFN5x6-8L	
4	Gate		
5,6,7,8	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	200	-	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 25	V
I_D^*	Drain Current (DC)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	85	A
		$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	43	A
$I_{DM}^{*,**}$	Drain Current (Pulsed)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	240	A
P_D	Drain Power Dissipation	$T_C=25^{\circ}\text{C}$	-	147	W
I_S	Continuous-Source Current	$T_C=25^{\circ}\text{C}$	-	85	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD}=50\text{ V}, L=1.0\text{ mH}$	-	648	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}\text{C}$
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	59	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.6	$^{\circ}\text{C/W}$

Notes:

* Surface mounted on 1 in² pad area, $t \leq 10\text{ sec.}$

** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

*** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ220N20G	220N20 YWWXXX YWW: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity (pcs)
KJ220N20G	PDFN 5×6-8L	13"	12 mm	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).

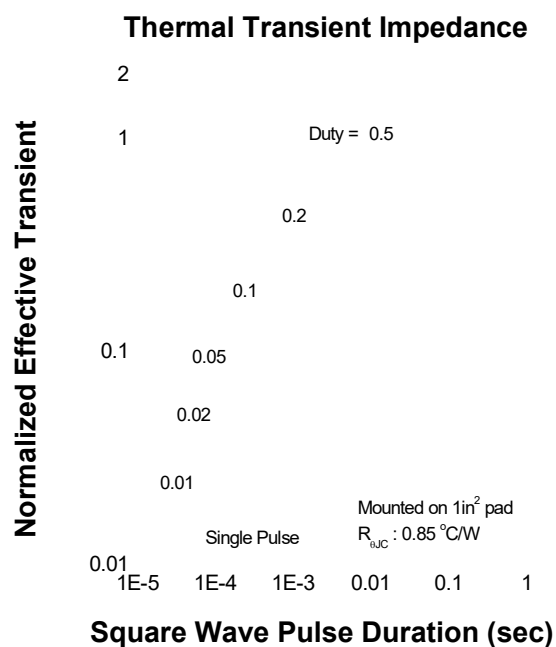
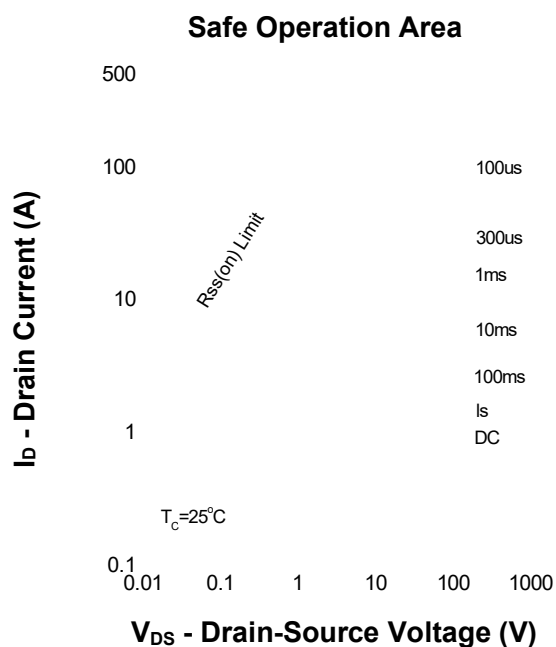
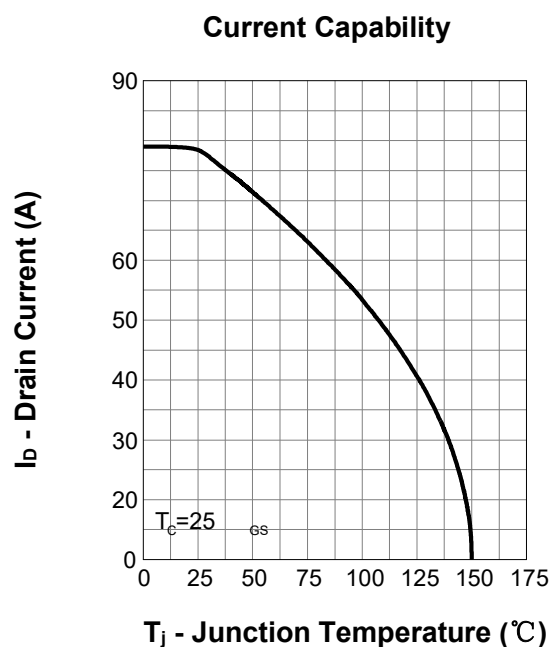
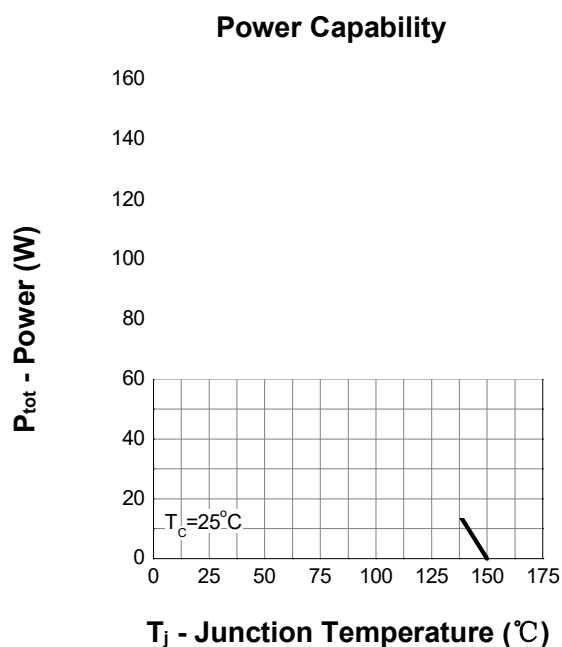
6. Electrical Characteristics (T_A=25°C unless otherwise noted)

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}	Zero gate voltage drain current	V _{DS} =200 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±25 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =10 V, I _{DS} =30 A	-	18	22	mΩ
		V _{GS} =6 V, I _{DS} =20 A	-	22	25	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	V _{GS} =0 V, I _{SD} =30 A	-	-	1.3	V
t _{rr}	Reverse Recovery Time	V _{GS} =0 V, I _{SD} = .0 A, dI _{SD} /dt=100 A/μs	-	TBD	-	ns
Q _{rr}	Reverse Recovery Charge		-	TBD	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{DS} =750 V, V _{GS} =0 V, f=1 MHz	-	3848	-	pF
C _{oss}	Output Capacitance		-	326	-	
C _{rss}	Reverse Transfer Capacitance		-	26	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =75 V, V _{GEN} =10 V, R _G =3.9 Ω, R _L =2.5 Ω, I _{DS} =30 A	-	16	-	ns
t _r	Turn-on Rise Time		-	53	-	
t _{d(off)}	Turn-off Delay Time		-	51	-	
t _f	Turn-off Fall Time		-	61	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =75 V, V _{GS} =10 V, I _{DS} =30 A	-	79	-	nC
Q _{gs}	Gate-Source Charge		-	25	-	
Q _{gd}	Gate-Drain Charge		-	17	-	

Notes:

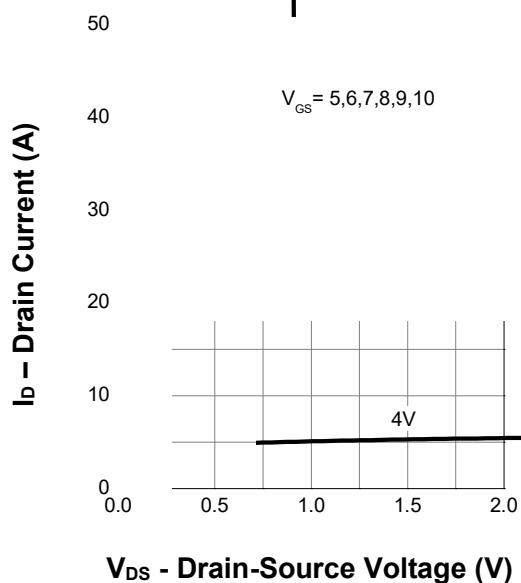
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

7. Typical Characteristics

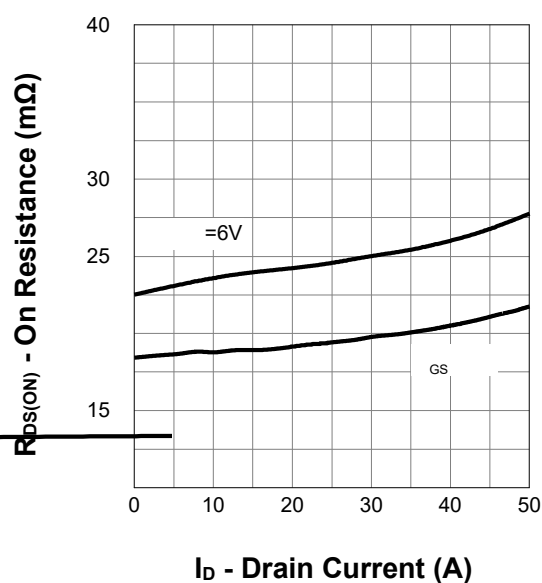


7. Typical Characteristics (cont.)

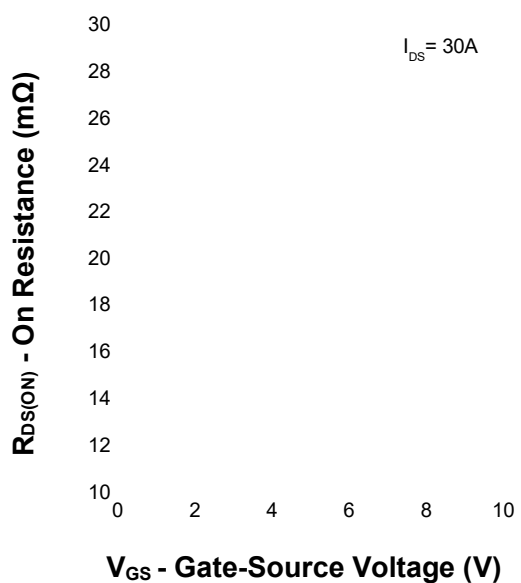
Output Characteristics



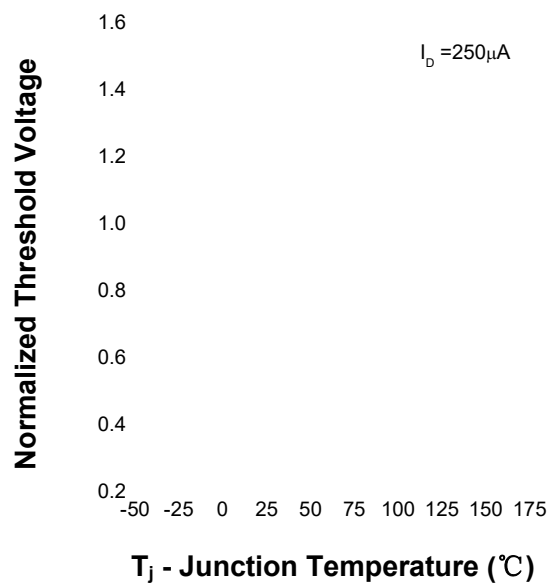
Drain-Source On Resistance



Transfer Characteristics

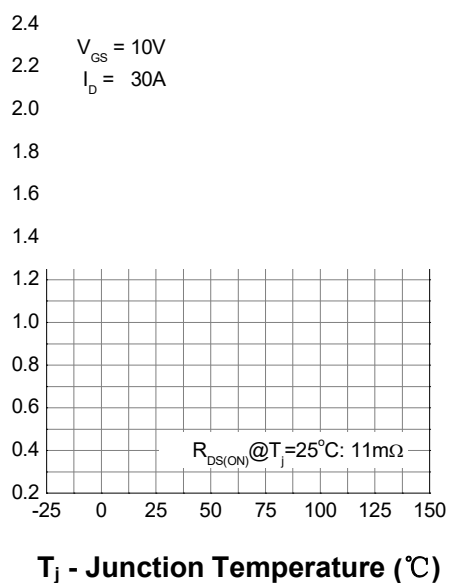


Gate Threshold Voltage

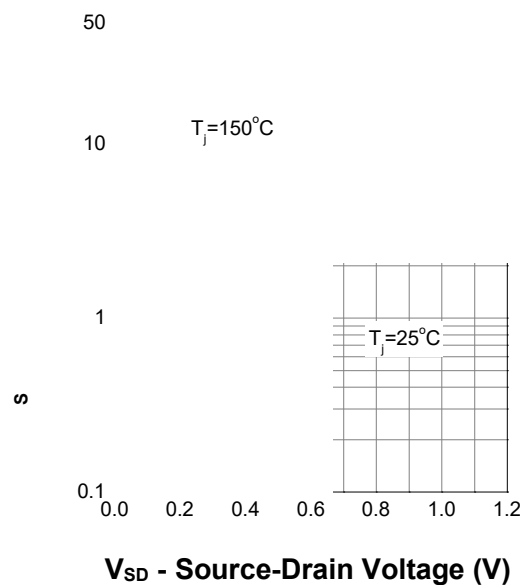


7. Typical Characteristics (cont.)

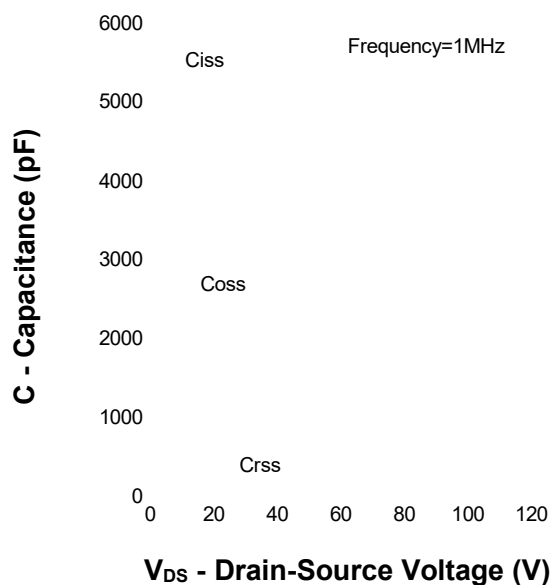
Drain-Source On Resistance



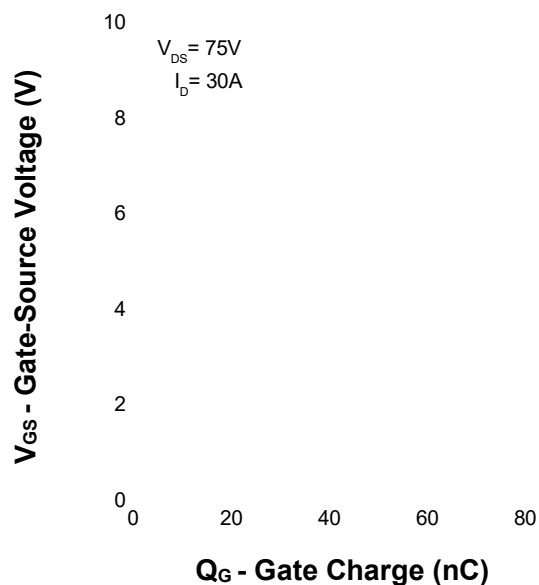
Body Diode Characteristics



Capacitance

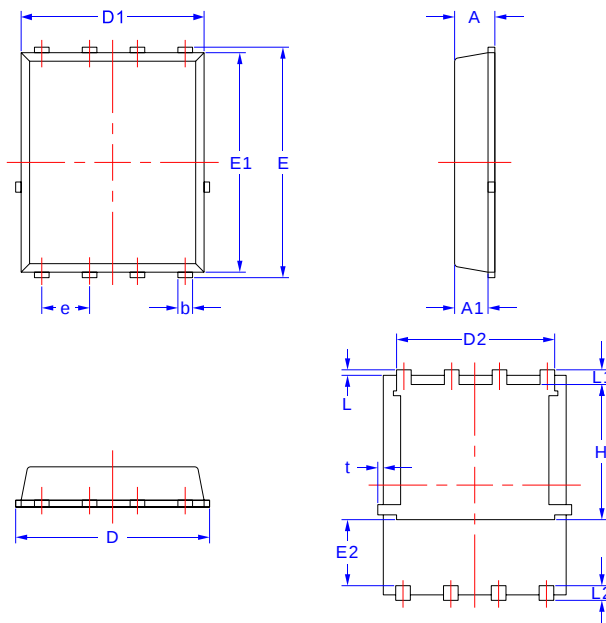


Gate Charge



8. Package Dimensions

PDFN 5×6-8L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	1.03	1.17
A1	0.824	0.97
b	0.34	0.48
D	4.80	5.40
D1	4.80	5.00
D2	4.11	4.31
E	5.95	6.15
E1	5.65	5.85
E2	1.40	-
e	1.27 BSC	
L	0.05	0.25
L1	0.38	0.50
L2	0.38	0.71
H	3.30	3.50
t	-	0.18