

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ✓ Advanced Trench Technology
- ✓ Surface-mounted package
- ✓ ESD $\geq$ 2KV

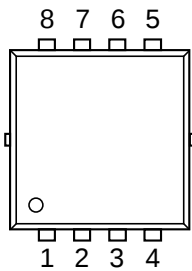
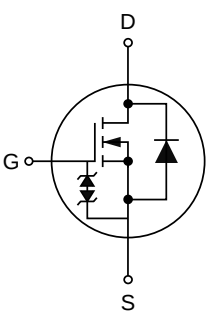
1.2 Applications

- ✓ MB and NB
- ✓ Battery Protection Charge/Discharge
- ✓ Load Switch

1.3 Quick reference

- ✓ BV $\geq$ 18 V
- ✓ $R_{DS(ON)} \leq 3.8 \text{ m}\Omega$ @V_{GS} = 4.5 V
- ✓ P_{tot} $\leq$ 20 W
- ✓ $R_{DS(ON)} \leq 5.5 \text{ m}\Omega$ @V_{GS} = 2.5 V
- ✓ I_D $\leq$ 50 A

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View PDFN3.3x3.3-8L	
4	Gate		
5,6,7,8	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}C$	18	-	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}C$	-	± 10	V
$I_D^{*,***}$	Drain Current (DC)	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	50	A
I_{DM}^*	Pulsed Source Current	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	100	A
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C$	-	20	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}C$
$R_{\theta JA}^{**}$	Thermal Resistance-Junction to Ambient		-	62.5	$^{\circ}C/W$
$R_{\theta JC}^{**}$	Thermal Resistance-Junction to Case		-	1.2	

Notes:

- * Pulse width $\leq 300\text{ }\mu s$, duty cycle $\leq 2\%$.
- ** Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$.
- *** Limited by maximum junction temperature.

4. Marking Information

Product Name	Marking
KJ3R5N02Q	KJ3R5N02Q XXXXXX

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ3R5N02Q	PDFN 3.3×3.3-8L	13"	12 mm	5000

Note: KUAJIE XIN 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_J=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	18	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	0.5	-	1.0	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =10 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{DS} =0 V, V _{GS} =±10 V	-	-	±10	μA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} =4.5 V, I _{DS} =20 A	-	3.2	3.8	mΩ
		V _{GS} =2.5 V, I _{DS} =10 A	-	4.5	5.5	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =20 A, V _{GS} =0 V	-	-	1.2	V
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =6 V, Frequency=1.0 MHz	-	2468	-	pF
C _{oss}	Output Capacitance		-	580	-	
C _{rss}	Reverse Transfer Capacitance		-	528	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =6 V, V _{GEN} =4.5 V, R _G =4.5 Ω, R _L =0.3 Ω, I _D =20 A	-	9	-	ns
t _r	Turn-on Rise Time		-	20	-	
t _{d(off)}	Turn-off Delay Time		-	33	-	
t _f	Turn-off Fall Time		-	57	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{GS} =4.5 V, V _{DS} =6 V, I _{DS} =20 A	-	40	-	nC
Q _{gs}	Gate-Source Charge		-	4.5	-	
Q _{gd}	Gate-Drain Charge		-	6.9	-	

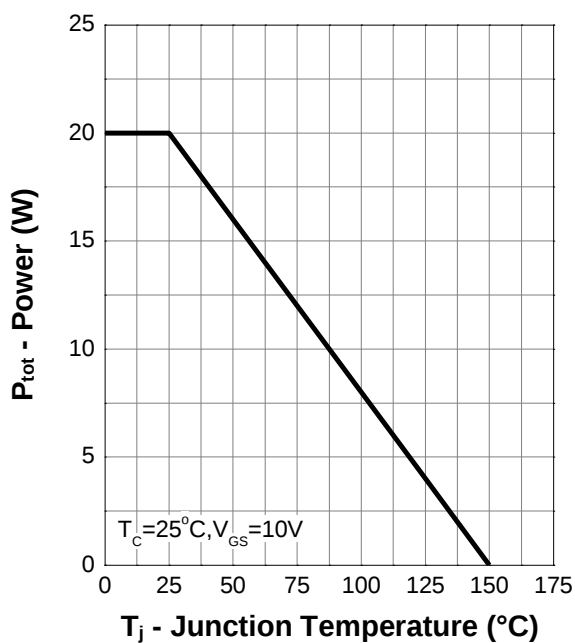
Notes:

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

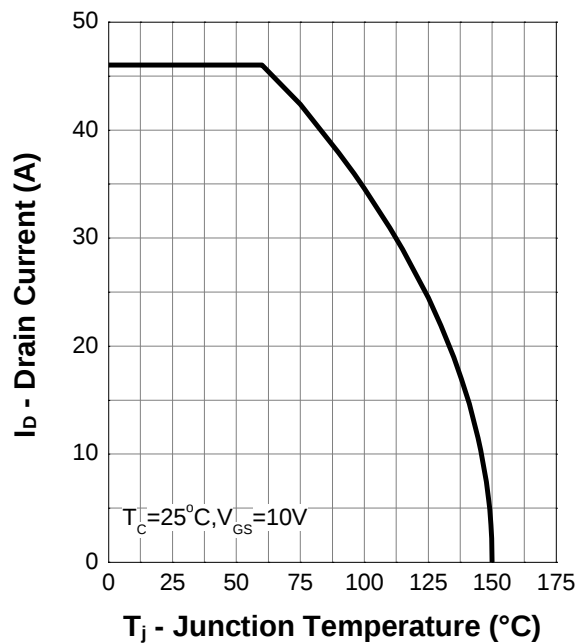
b. Guaranteed by design, not subject to production testing.

7. Typical Characteristics

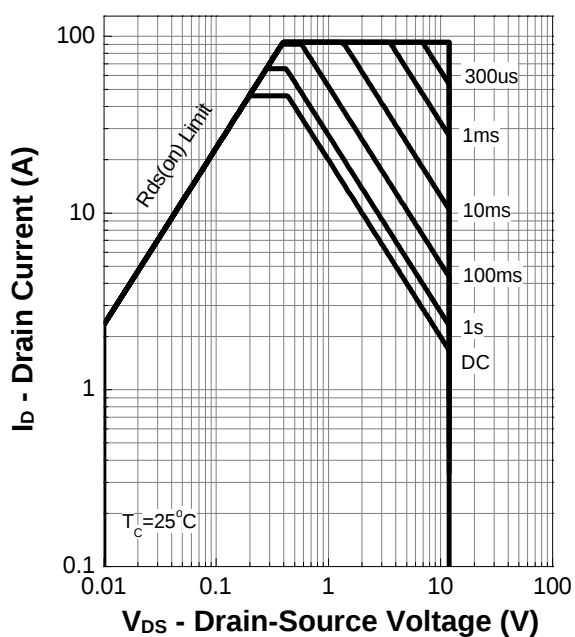
Power Capability



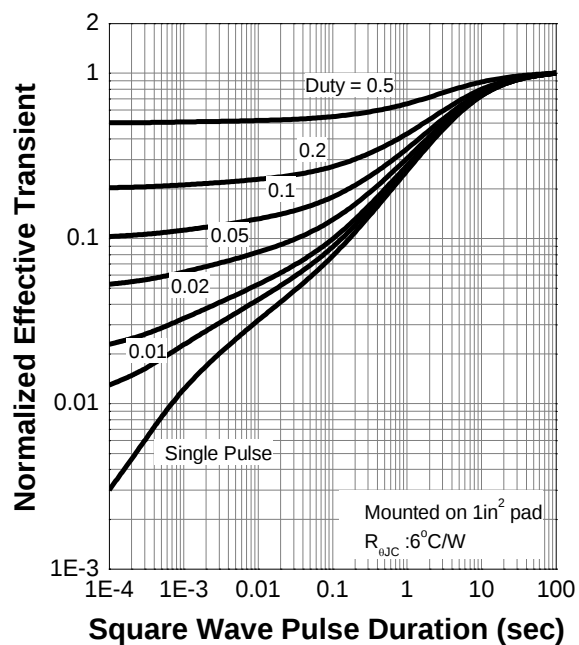
Current Capability



Safe Operation Area

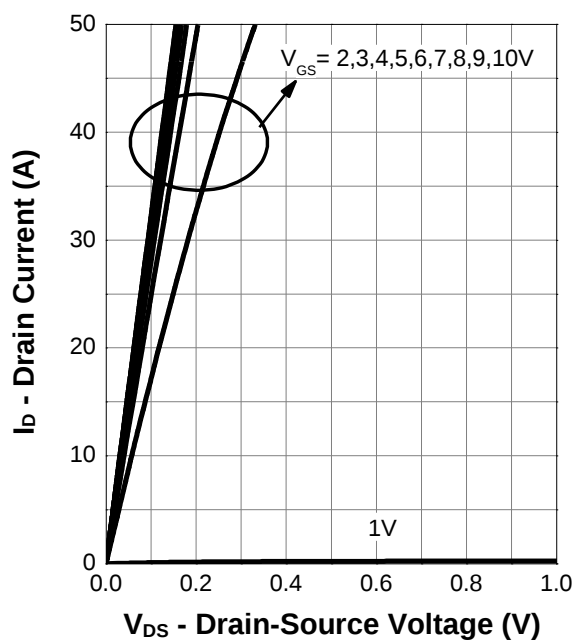


Transient Thermal Impedance

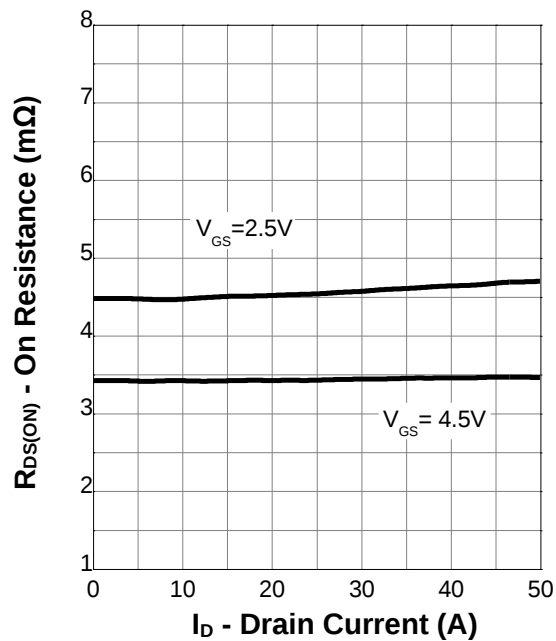


7. Typical Characteristics (cont.)

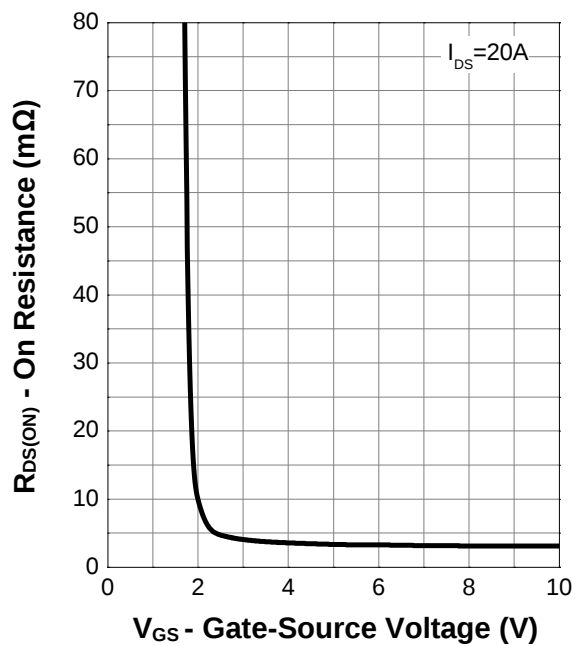
Output Characteristics



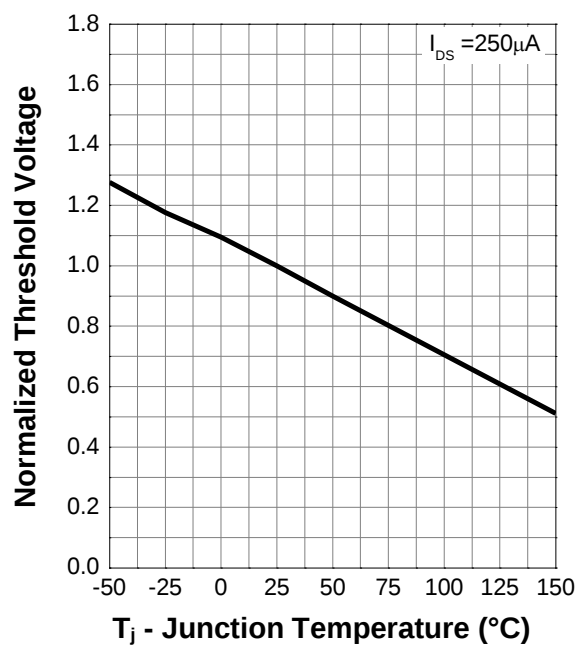
On Resistance



Transfer Characteristics

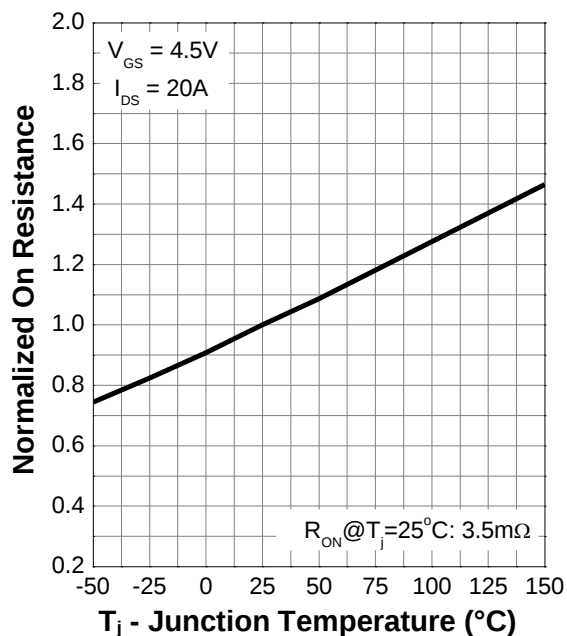


Normalized Threshold Voltage

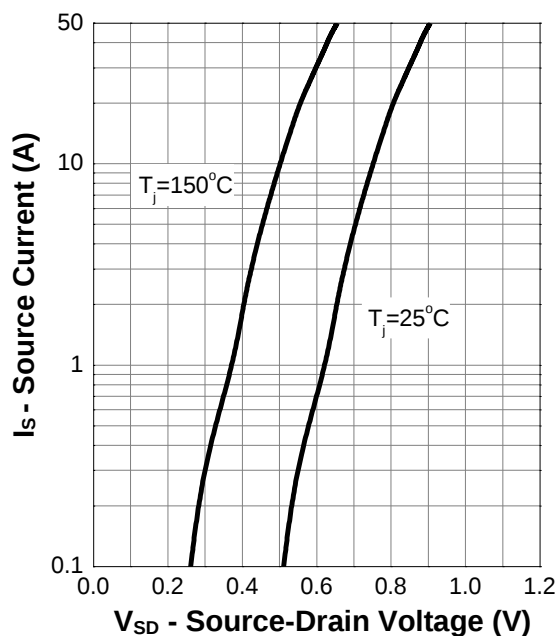


7. Typical Characteristics (cont.)

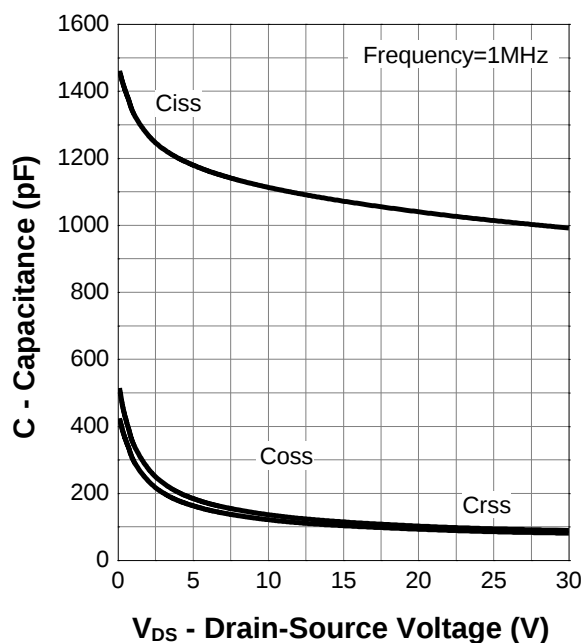
Normalized On Resistance



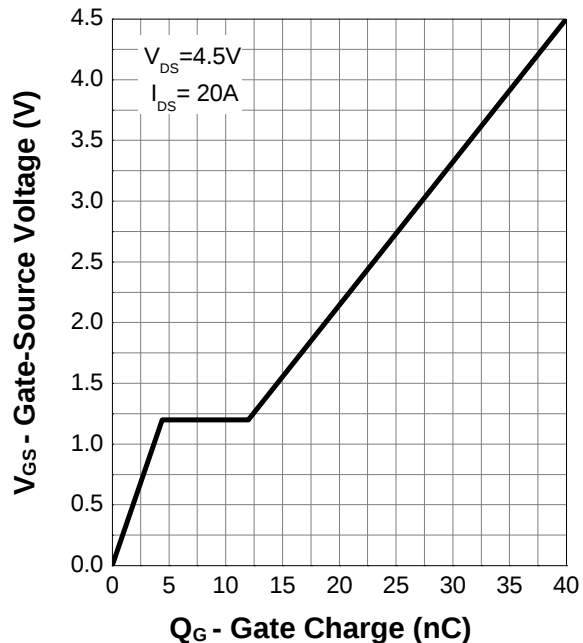
Diode Forward Current



Capacitance

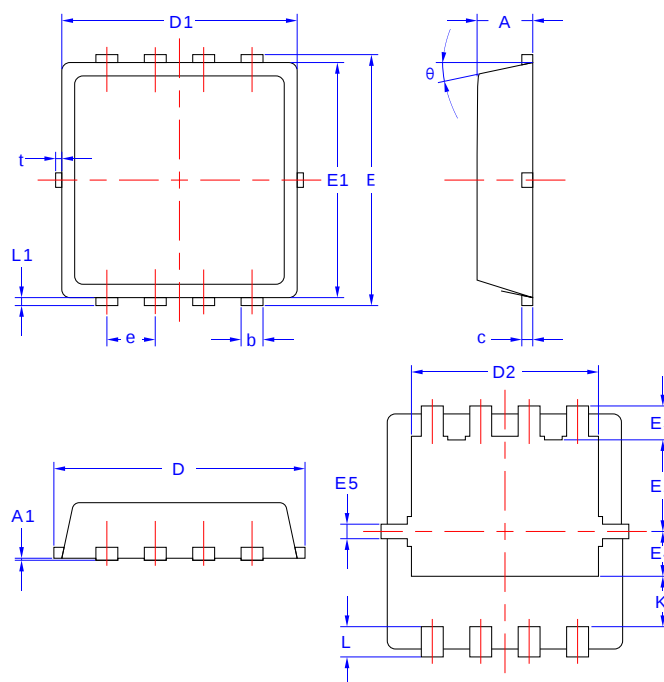


Gate Charge



8. Package Dimensions

PDFN 3.3x3.3-8L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	0.70	0.85
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	0.00	0.13
θ	/	12°