

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low Thermal Resistance

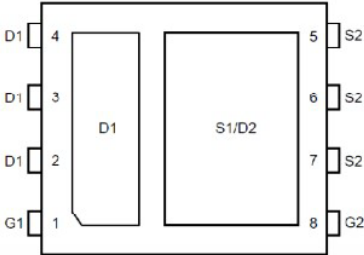
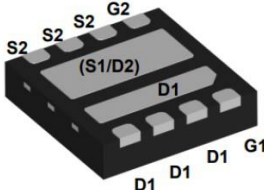
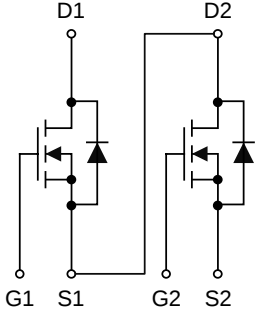
1.2 Applications

- ☒ Motor drivers
- ☒ DC - DC Converter

1.3 Quick reference

- ☒ $BV \geq 30\text{ V}$
- ☒ $R_{DS(ON)} \leq 6.5\text{ m}\Omega @V_{GS} = 10\text{ V}$
- ☒ $P_D \leq 20.8\text{ W}$
- ☒ $R_{DS(ON)} \leq 11\text{ m}\Omega @V_{GS} = 4.5\text{ V}$
- ☒ $I_D \leq 42\text{ A}$

2. Pin Description

Pin Description	Simplified Outline	Symbol
	 DFN3x3	

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{DS}	Drain-Source Voltage	T _C =25°C	30	-	V
V _{GS}	Gate-Source Voltage	T _C =25°C	-	±20	V
I _D *, **	Drain Current (DC)	T _C =25°C, V _{GS} =10 V	-	42	A
		T _C =100°C, V _{GS} =10 V	-	27	A
I _{DM} *	Pulsed Source Current	T _C =25°C, V _{GS} =10 V	-	168	A
P _D	Power Dissipation	T _C =25°C	-	20.8	W
E _{AS} *	Single Pulsed Avalanche Energy	V _{DD} =15 V, L=0.3 mH	-	60	mJ
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55	150	°C
R _{θJA} **	Thermal Resistance-Junction to Ambient		-	50	°C/W
R _{θJC} **	Thermal Resistance-Junction to Case		-	6	

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
KJ0603CQ	0603CQ XXXXXX

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ0603CQ	DFN 3x3-8L	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_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	30	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	1.0	-	2.2	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30 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)} ^a	On-State Resistance	V _{GS} =10 V, I _{DS} =10 A	-	5	6	mΩ
		V _{GS} =4.5 V, I _{DS} =5 A	-	8	11	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =10 A, V _{GS} =0 V	-	0.8	1.2	V
t _{rr}	Reverse Recovery Time	I _{DS} =10 A, V _{GS} =0V, dI _{SD} /dt=100 A/μs	-	21	-	ns
Q _{rr}	Reverse Recovery Charge		-	7	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =15 V, Frequency=1.0 MHz	-	600	-	pF
C _{oss}	Output Capacitance		-	260	-	
C _{rss}	Reverse Transfer Capacitance		-	15	-	
R _g	Gate resistance		-	1.3	-	Ω
t _{d(on)}	Turn-on Delay Time	V _{DS} =15 V, V _{GEN} =10 V, R _G =3 Ω, I _{DS} =10 A	-	8	-	ns
t _r	Turn-on Rise Time		-	29	-	
t _{d(off)}	Turn-off Delay Time		-	22	-	
t _f	Turn-off Fall Time		-	14	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =15 V, V _{GS} =10 V, I _{DS} =10 A	-	7	-	nC
Q _{gs}	Gate-Source Charge		-	2.5	-	
Q _{gd}	Gate-Drain Charge		-	2	-	

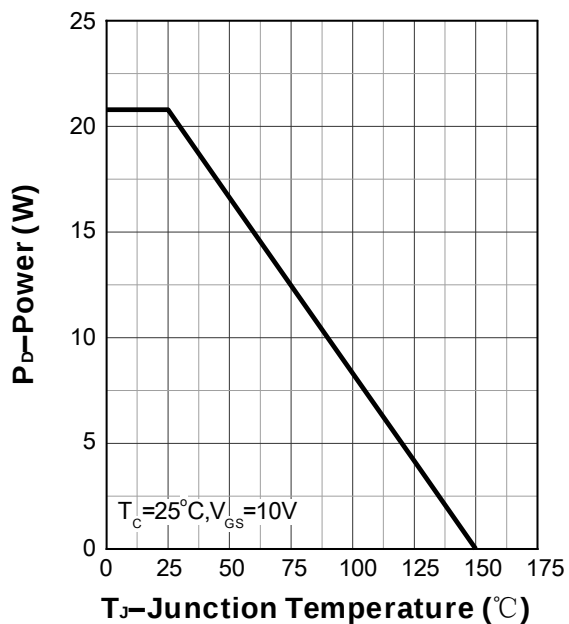
Notes:

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

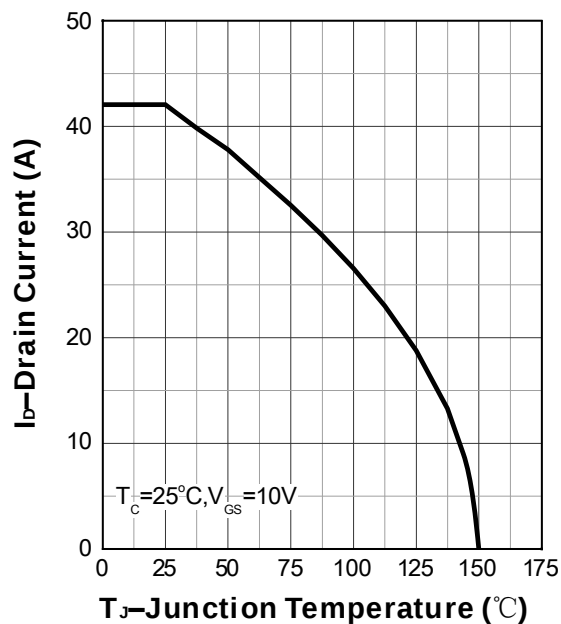
b. Guaranteed by design, not subject to production testing.

7. Typical Characteristics

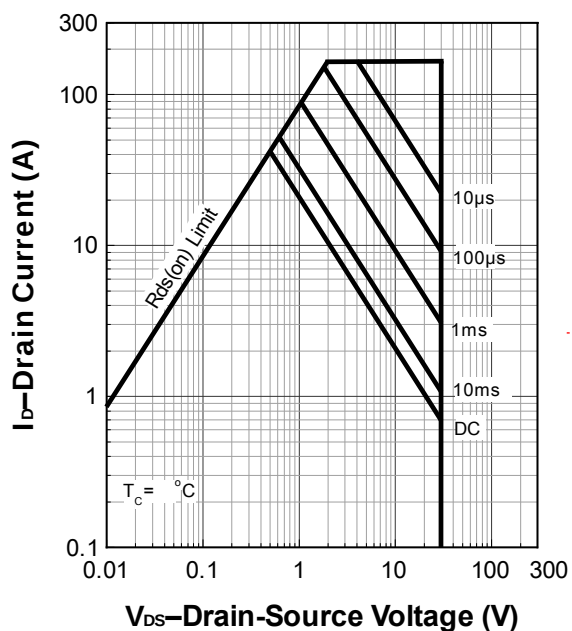
Power Capability



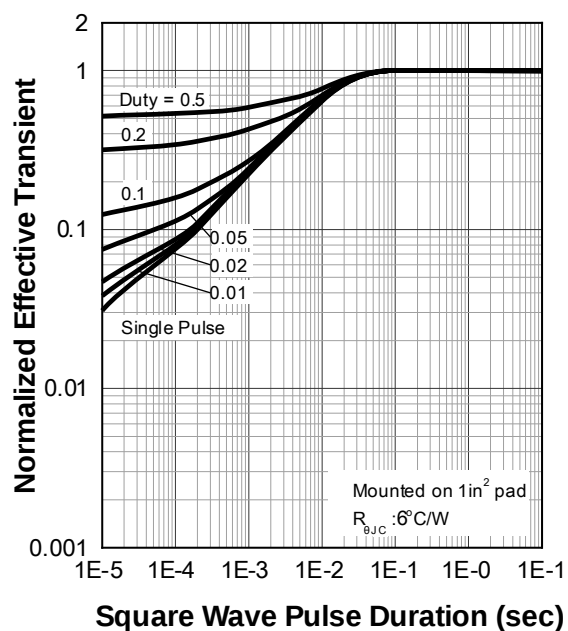
Current Capability



Safe Operating Area

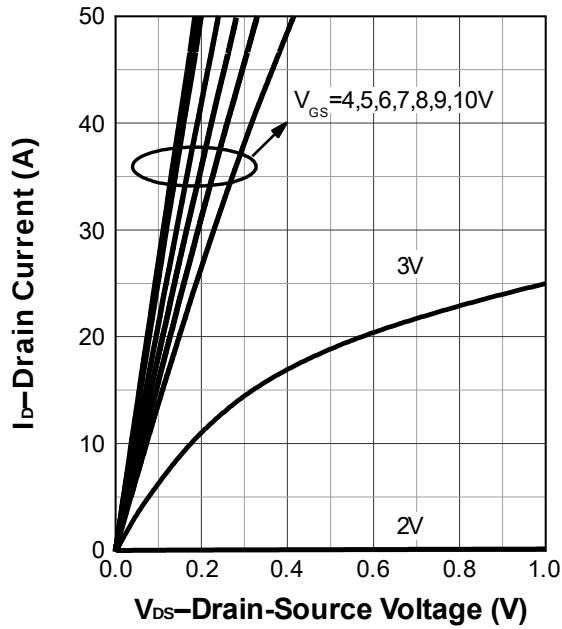


Transient Thermal Impedance

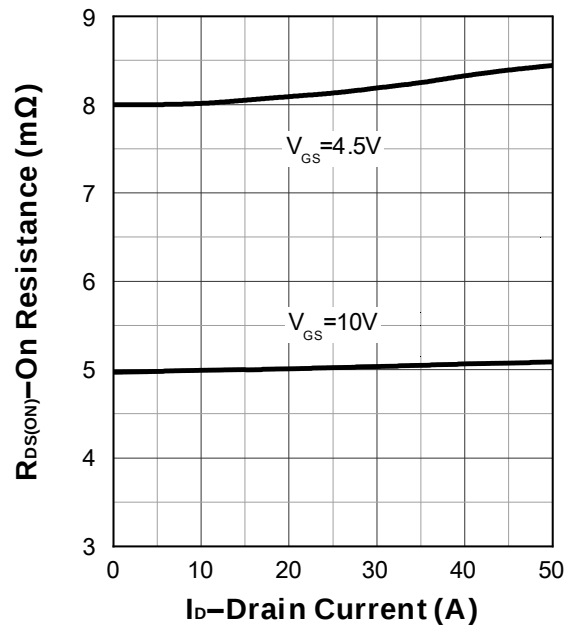


7. Typical Characteristics (cont.)

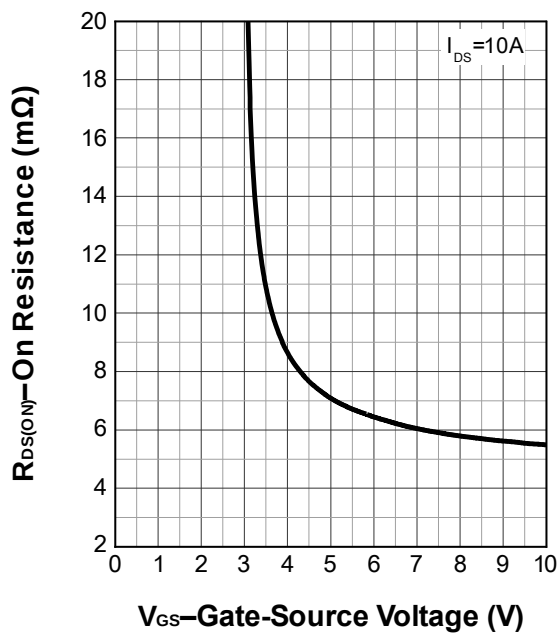
Output Characteristics



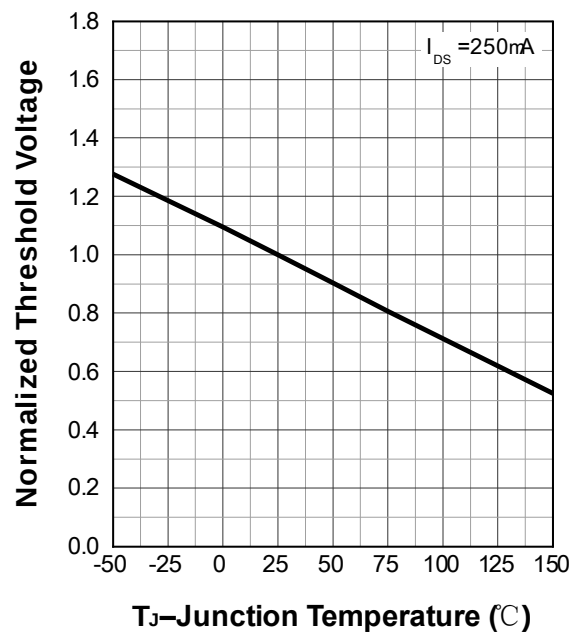
On Resistance



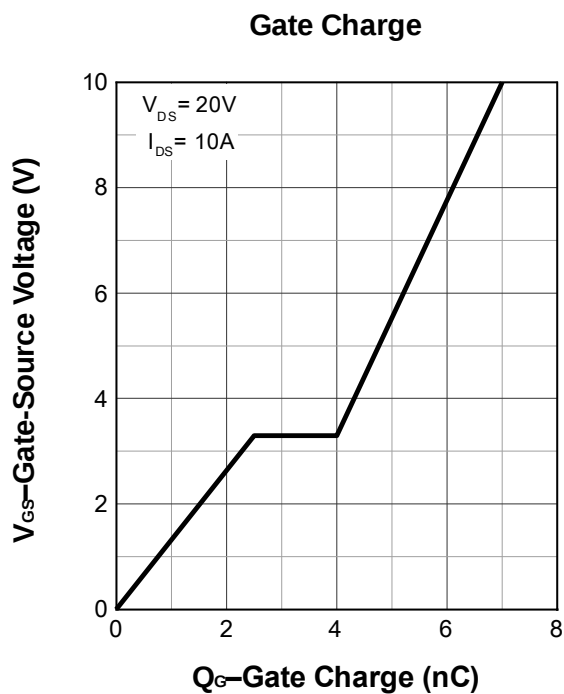
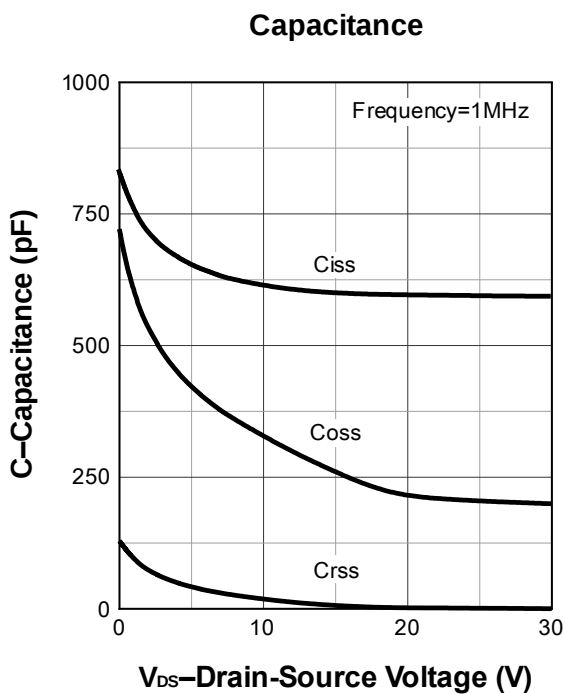
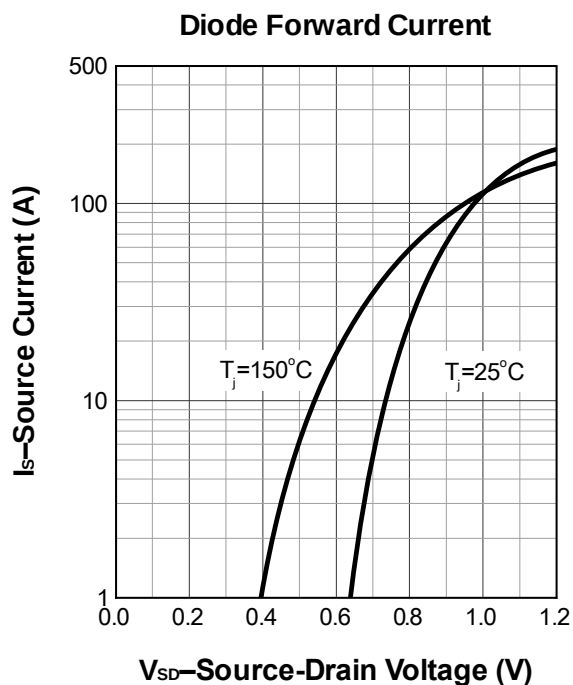
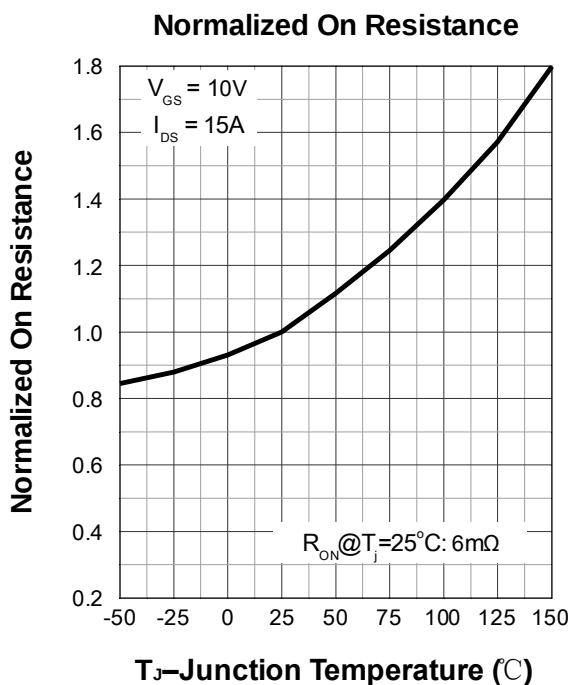
Transfer Characteristics



Normalized Threshold Voltage

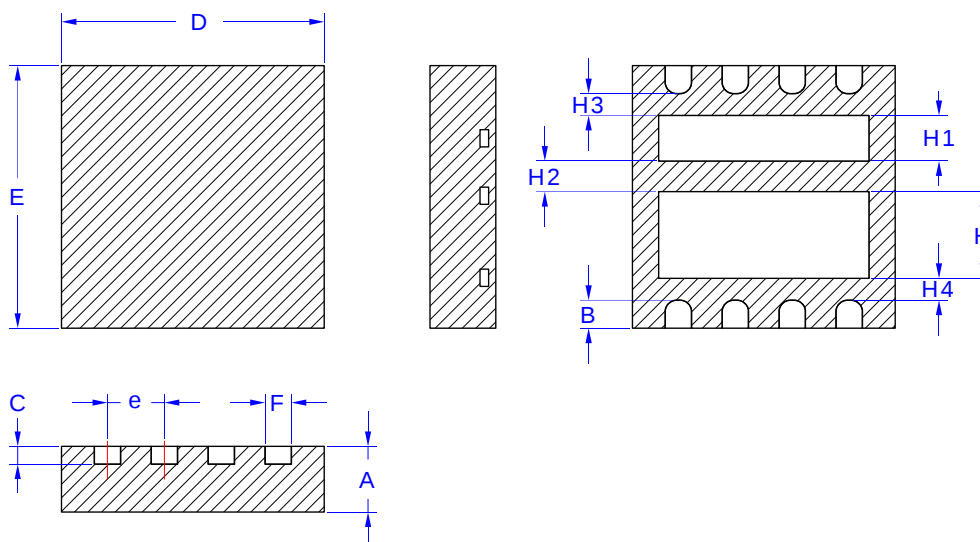


7. Typical Characteristics (cont.)



8. Package Dimensions

DFN3x3 Package



Symbol	Dimensions in Millimeters		
	MIN	TYP	MAX
A	0.7	0.75	0.80
B	0.27	0.32	0.37
C	0.153	0.203	0.253
D	2.90	3.00	3.10
E	2.90	3.00	3.10
e	0.60	0.65	0.70
F	0.25	0.30	0.35
H	0.89	0.99	1.09
H1	0.42	0.52	0.62
H2	0.25	0.35	0.45
H3	0.15	0.25	0.35
H4	0.15	0.25	0.35
L	2.30	2.40	2.50