

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Advanced trench cell design
- ☒ Low thermal resistance
- ☒ Super trench

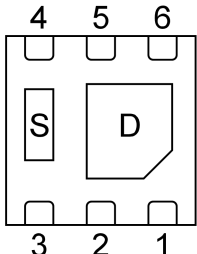
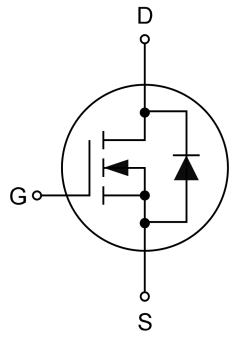
1.2 Applications

- ☒ Motor drivers
- ☒ DC/DC converter

1.3 Quick reference

- ☒ $BV \geq 30\text{ V}$
- ☒ $R_{DS(ON)} \leq 6.3\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ☒ $P_{tot} \leq 2.8\text{ W}$
- ☒ $R_{DS(ON)} \leq 9.0\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$
- ☒ $I_D \leq 16\text{ A}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,5,6	Drain	 Bottom View DFN 2x2-6L	
3	Gate		
4	Source		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	30	-	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	16	A
I_D^*	Drain Current	$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	10	A
$I_{DM}^{*, **, ***}$	Pulsed Drain Current	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	64	A
P_{tot}^*	Total Power Dissipation	$T_C=25^{\circ}\text{C}$	-	2.8	W
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD}=30\text{ V}, L=0.5\text{ mH}$	-	42	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}\text{C}$
$R_{\theta JA}^*$	Thermal Resistance, Junction to Ambient		-	62.5	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case		-	45	

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
KJ0503N2	0503 XXXXXX

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ0503N2	PDFN 2x2-6L	7"	8 mm	3000

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)

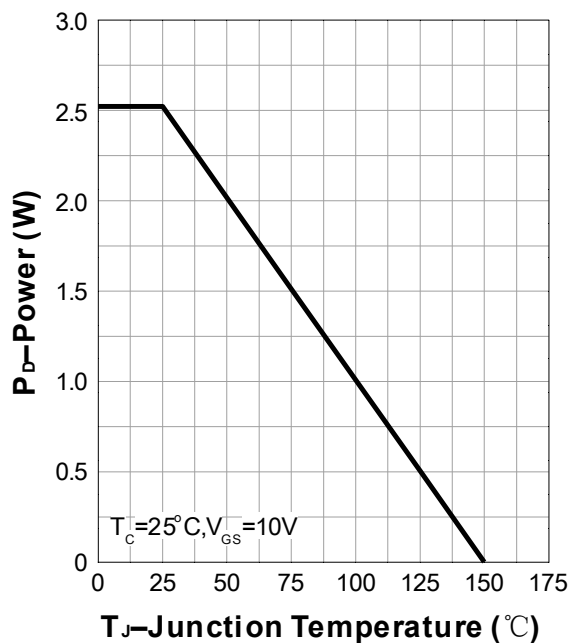
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	30	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	1	-	2.5	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±20 V, V _{DS} =0 V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =10 V, I _D =15 A	-	5.5	6.3	mΩ
		V _{GS} =4.5 V, I _D =10 A	-	8.3	9.0	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =10 A, V _{GS} =0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =15 A, dI _{SD} /dt=100 A/μs	-	22	-	ns
Q _{rr}	Reverse Recovery Charge		-	10	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =15 V, f=1MHz	-	770	-	pF
C _{oss}	Output Capacitance		-	350	-	
C _{rss}	Reverse Transfer Capacitance		-	30	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =15 V, V _{GEN} =10 V, R _G =1 Ω, I _{DS} =1 A	-	7	-	ns
t _r	Turn-on Rise Time		-	12	-	
t _{d(off)}	Turn-off Delay Time		-	16	-	
t _f	Turn-off Fall Time		-	21	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =15 V, V _{GS} =10 V, I _{DS} =15 A	-	11	-	nC
Q _{gs}	Gate-Source Charge		-	2.5	-	
Q _{gd}	Gate-Drain Charge		-	1.5	-	

Notes:

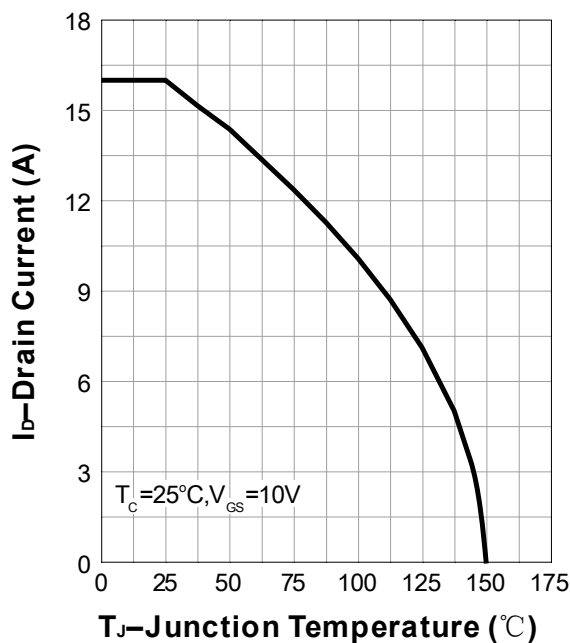
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

7. Typical Characteristics

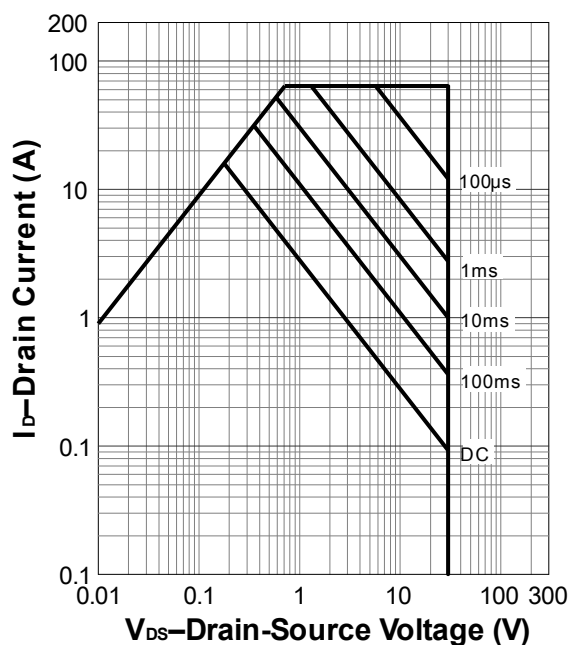
Power Capability



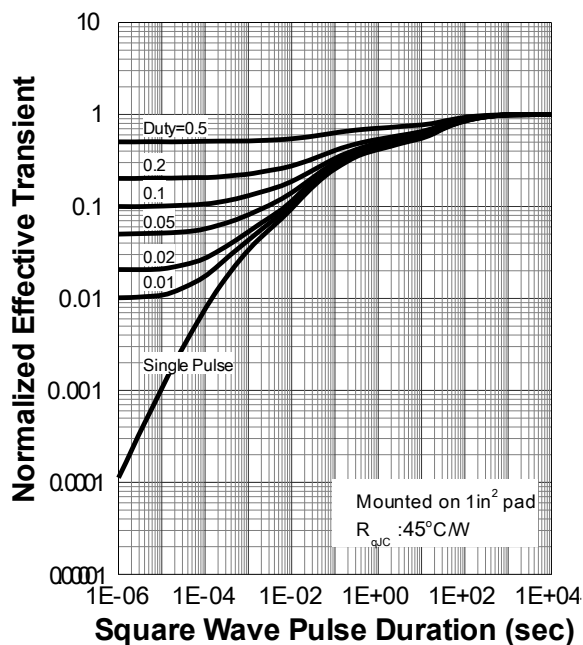
Current Capability



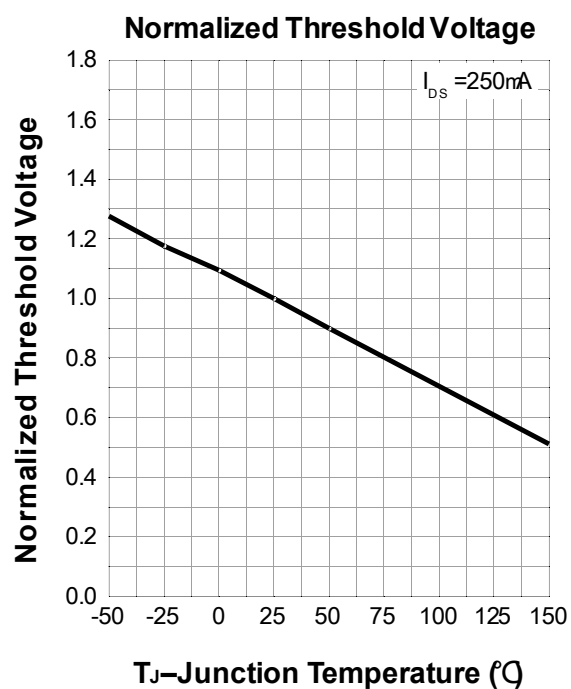
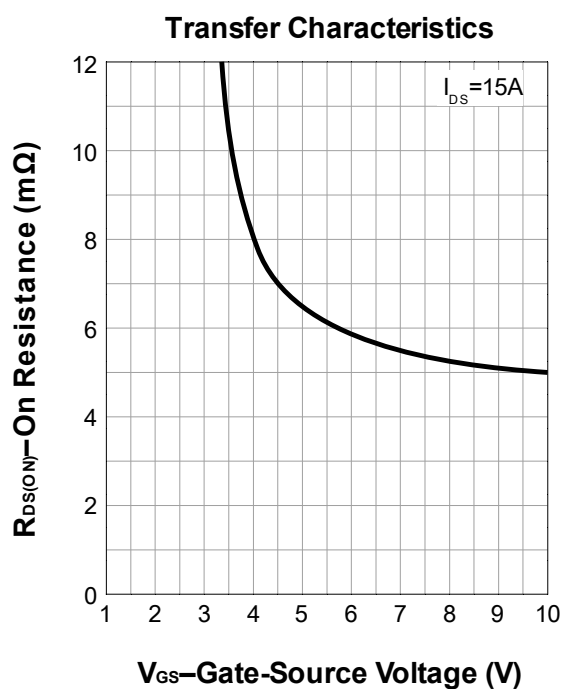
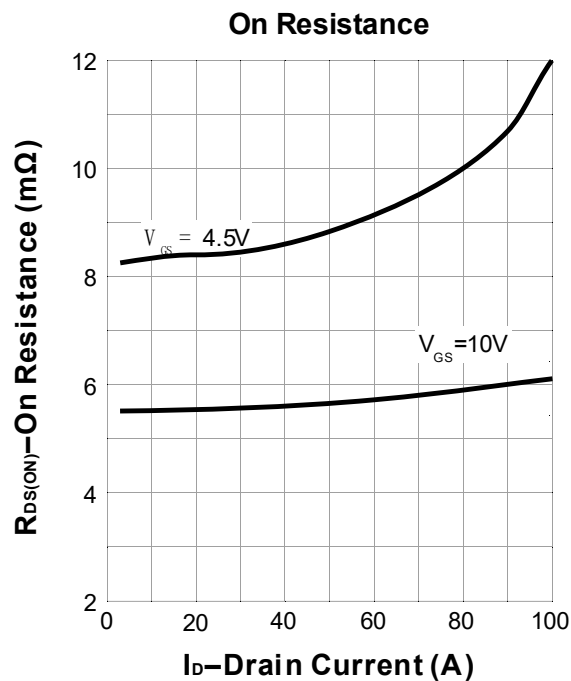
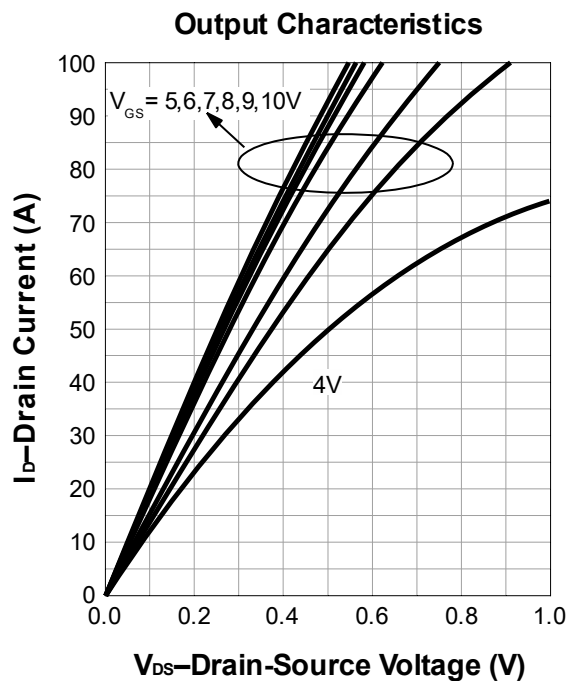
Safe Operating Area



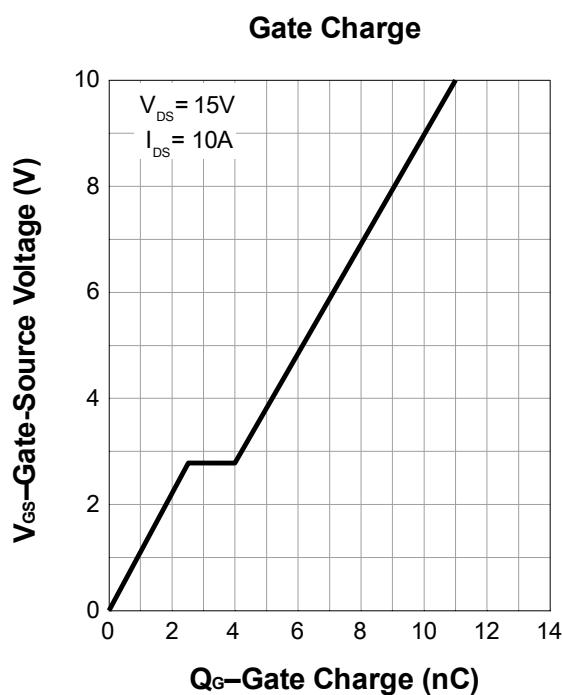
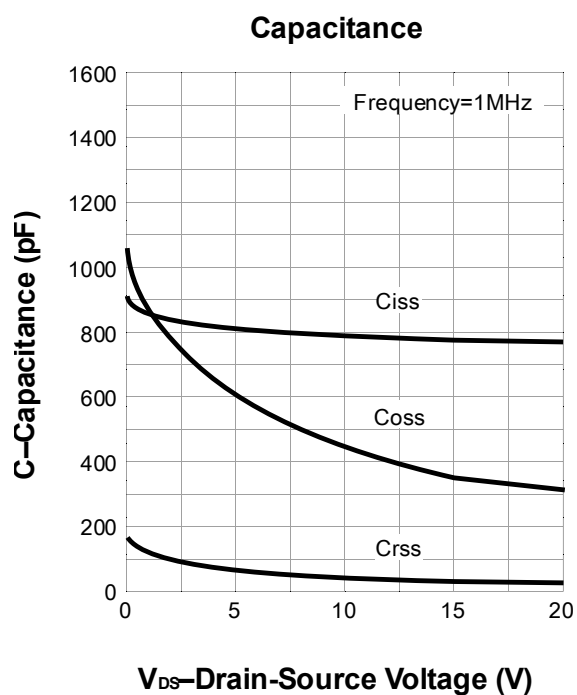
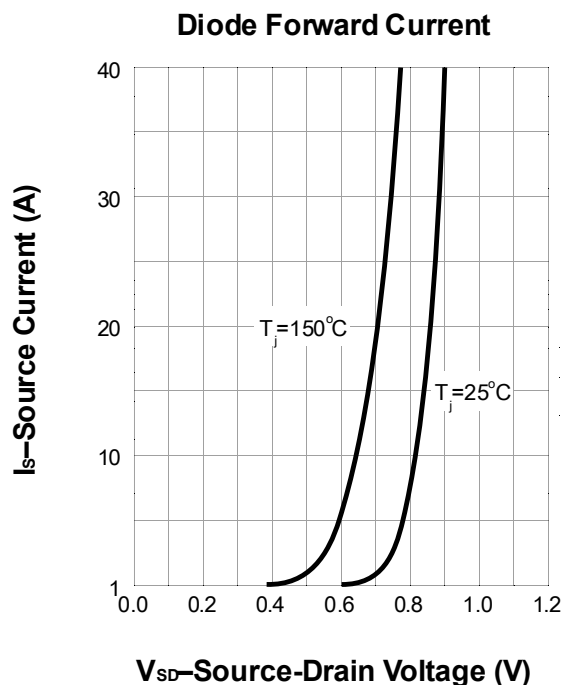
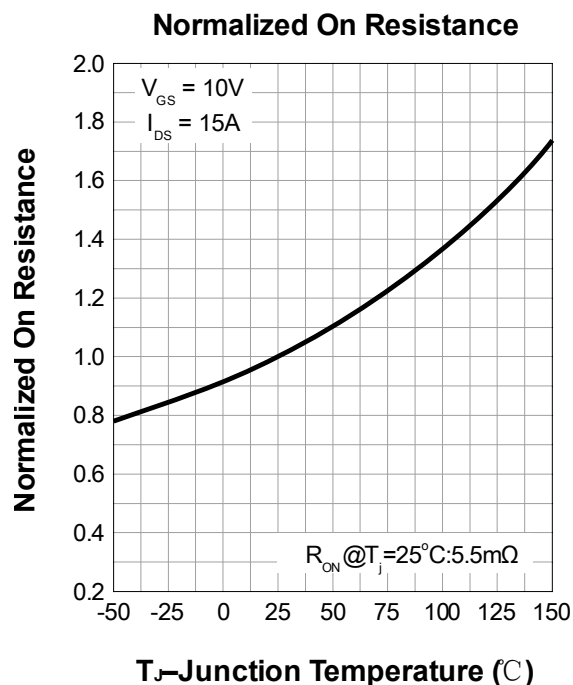
Transient Thermal Impedance



7. Typical Characteristics (cont.)

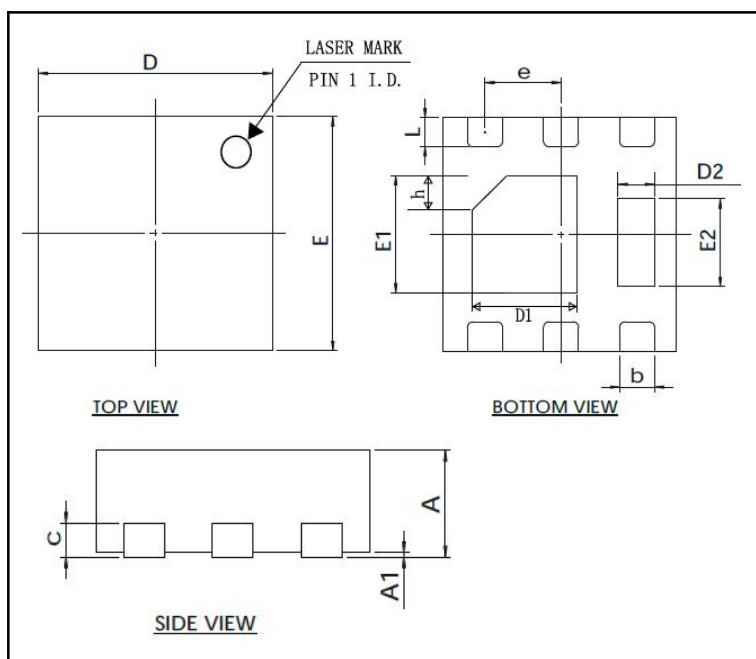


7. Typical Characteristics (cont.)



8. Package Dimensions

DFN 2x2-6L Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	NA	0.02	0.05
b	0.20	0.27	0.34
c	0.18	0.20	0.25
D	1.95	2.00	2.07
E	1.95	2.00	2.07
D1	0.80	0.90	1.00
E1	0.90	1.00	1.10
D2	0.20	0.30	0.40
E2	0.65	0.75	0.85
L	0.20	0.25	0.35
h	0.20	0.25	0.30
e	0.65 BSC		