KJ009N04TH

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Surface-mounted package
- ☑ Low $R_{DS(ON)}$
- ☑ T_J max 175℃
- ☑ Low thermal impedance
- ☑ 100% avalanche tested
- ☑ MSL 1

1.2 Applications

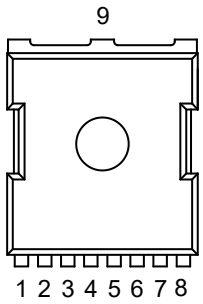
- ☑ BMS appliances
- ☑ Power switch
- ☑ DC/DC conversion
- ☑ Light electric vehicles

1.3 Quick reference

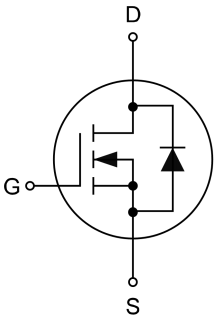
- ☑ BV ≥ 40 V
- ☑ P_D ≤ 395 W
- ☑ I_D ≤ 430 A
- ☑ $R_{DS(ON)}$ ≤ 0.95 mΩ @V_{GS} = 10 V

2. Pin Description

Pin	Description
1	Gate
2,3,4,5,6,7,8	Source
9	Drain



Top View
TOLL-8L



3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C=25℃	40	-	V
V_{GS}	Gate-Source Voltage	T_C=25℃	-	±20	V
I_D	Drain Current (DC)	T_C=25℃, V_{GS}=10 V	-	430	A
		T_C=100℃, V_{GS}=10 V	-	304	A
I_{DM} *	Drain Current (Pulsed)	T_C=25℃, V_{GS}=10 V	-	1720	A
P_D	Drain Power Dissipation	T_C=25℃	-	395	W
I_S	Continuous-Source Current	T_C=25℃	-	430	A
E_{AS}	Single Pulsed Avalanche Energy	V_{DD}=35 V, L=0.3 mH	-	1038	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature		-55	175	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		-	46	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.38	℃/W

Notes:

* Pulse width ≤ 300 μs, duty cycle ≤ 2%.

** Surface mounted on minimum footprint pad area.

*** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ009N04TH	

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ009N04TH	**TOLL-8L**	**13"**	**24 mm**	**2000**

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_C=25℃ 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	40	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250 μA	2.0	-	3.5	V
I_{DSS}	Drain Leakage Current	V_{DS}=40 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}=75 A	-	0.80	0.95	mΩ
R_g	Gate resistance	f=1 MHz, open drain	-	2.8	-	Ω
Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0 V, I_{SD}=1 A	-	-	1.1	V
t_{rr}	Reverse Recovery Time	V_{DS}=20 V, I_{SD}=75 A, dI_{SD}/dt=100 A/μs	-	87	-	ns
Q_{rr}	Reverse Recovery Charge		-	67	-	nC
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS}=0 V, V_{DS}=25 V, f=1 MHz	-	7250	-	pF
C_{oss}	Output Capacitance		-	3722	-	
C_{rss}	Reverse Transfer Capacitance		-	636	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=20 V, V_{GEN}=10 V, R_G=6 Ω, I_{DS}=75 A	-	33	-	ns
t_r	Turn-on Rise Time		-	47	-	
$t_{d(off)}$	Turn-off Delay Time		-	81	-	
t_f	Turn-off Fall Time		-	35	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=20 V, V_{GS}=10 V, I_{DS}=75 A	-	125	-	nC
Q_{gs}	Gate-Source Charge		-	33	-	
Q_{gd}	Gate-Drain Charge		-	35	-	

7. Typical Characteristics

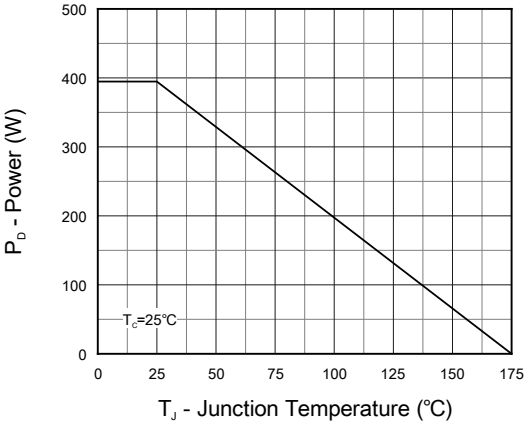


Figure 1. Power Capability

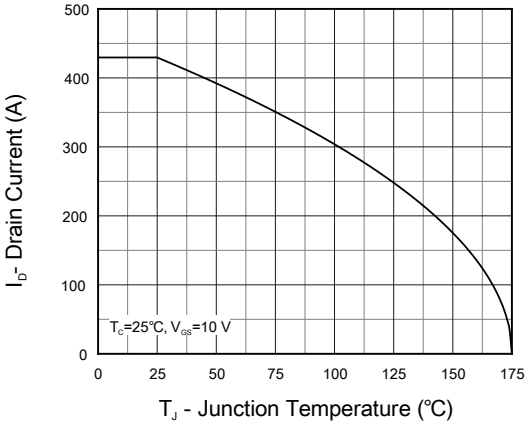


Figure 2. Current Capability

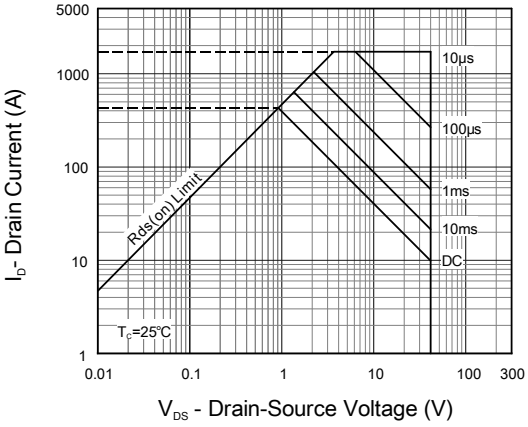


Figure 3. Safe Operation Area

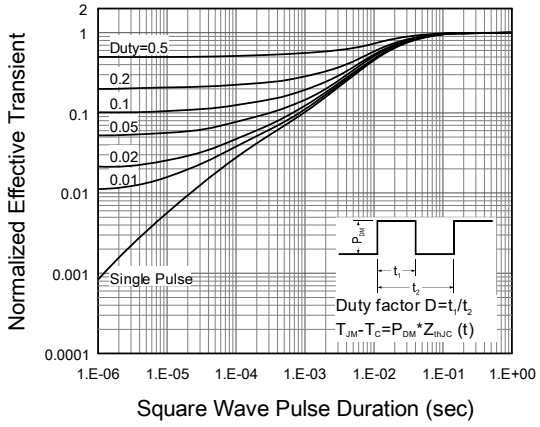


Figure 4. Transient Thermal Impedance

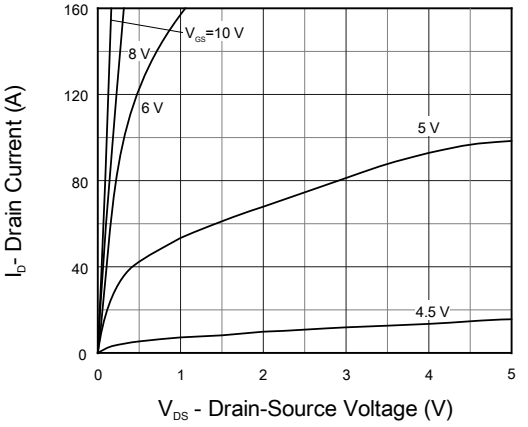


Figure 5. Output Characteristics

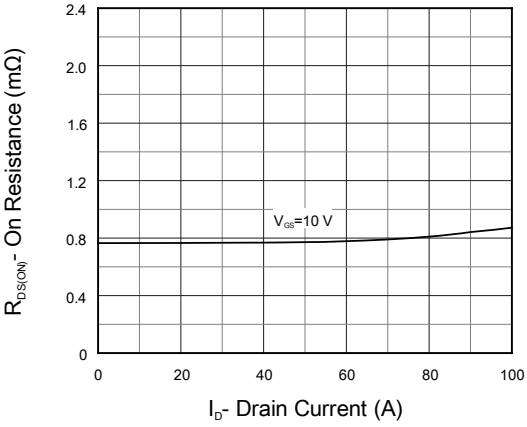
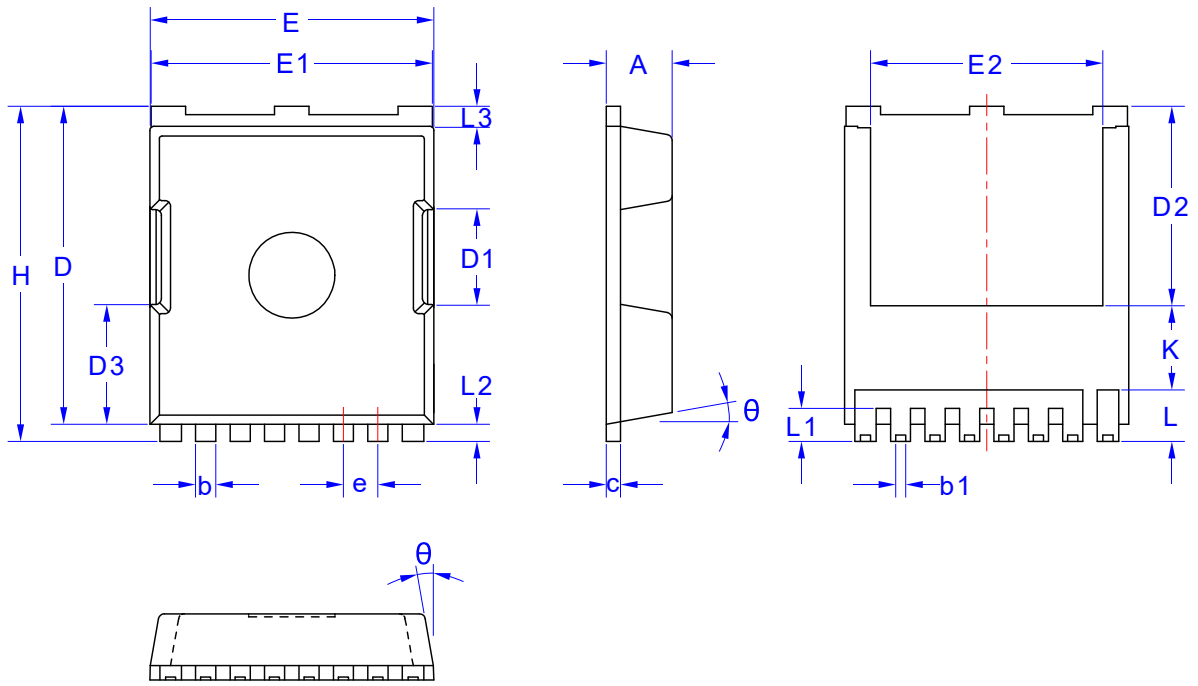


Figure 6. On Resistance

7. Typical Characteristics (cont.)

8. Package Dimensions

TOLL-8L Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	2.20	2.30	2.40
b	0.60	0.70	0.90
b1	0.30		0.50
c	0.40	0.50	0.60
D	10.28	10.38	10.48
D1	3.20	3.30	3.40
D2	6.85	6.95	7.05
D3		4.18 REF	
E	9.80	9.90	10.0
E1	9.70	9.80	9.90

Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
E2	8.00	8.10	8.20
e		1.20 BSC	
H	11.48	11.68	11.88
L	1.60	1.80	2.10
L1	1.00	1.15	1.30
L2		0.60 TYPE	
L3		0.60 TYPE	
K		2.90 TYPE	
θ	8°	10°	12°