KJ012N09LT1

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Surface-mounted package
- ☑ T_J 175℃
- ☑ Low $R_{DS(ON)}$ trench technology
- ☑ MSL1

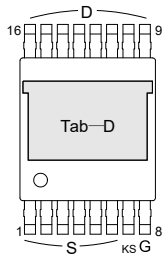
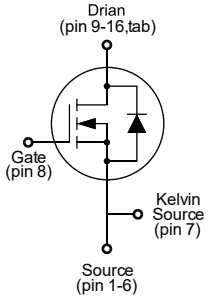
1.2 Applications

- ☑ BMS appliances
- ☑ Motor drives
- ☑ High power inverter system
- ☑ Light electric vehicles

1.3 Quick reference

- ☑ BV ≥ 90 V
- ☑ P_D ≤ 300 W
- ☑ I_D ≤ 333 A
- ☑ $R_{DS(ON)}$ ≤ 1.2 mΩ @V_{GS} = 10 V

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1~6	Source	 TOLT-16L	
7	Kelvin Source		
8	Gate		
9~16, Tab	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C=25℃	90	-	V
V_{GS}	Gate-Source Voltage	T_C=25℃	-	±20	V
I_D	Drain Current (DC)	T_C=25℃, V_{GS}=10 V	-	333	A
		T_C=100℃, V_{GS}=10 V	-	236	A
I_{DM} *	Drain Current (Pulsed)	T_C=25℃, V_{GS}=10 V	-	1332	A
P_D	Power Dissipation	T_C=25℃	-	300	W
I_S	Continuous-Source Current	T_C=25℃	-	333	A
E_{AS}	Single Pulsed Avalanche Energy	V_{DD}=40 V, L=0.3 mH	-	1500	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	175	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		-	64	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	0.5	℃/W

Notes:

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

** Surface mounted on 1 in^2 pad area, t ≤ 10 sec.

*** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ012N09LT1	**KJ012N09LT1 XXXXXX-X**

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ012N09LT1	**TOLT-16L**	**13"**	**24 mm**	**1000**

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_A=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	90	-	-	V
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250 μA	2.5	-	4.0	V
I_{DSS}	Drain Leakage Current	V_{DS}=90 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}=100 A	-	1.0	1.2	mΩ
g_{fs}	Forward Transconductance	V_{DS}=5 V, I_{DS}=50 A	-	156	-	S
R_g	Gate Resistance		-	2.3	-	Ω
Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0 V, I_{SD}=100 A	-	0.9	1.2	V
t_{rr}	Reverse Recovery Time	V_{DS}=45 V, V_{GS}=0 V, I_{DS}=50 A, di/dt=100 A/μs	-	88	-	ns
Q_{rr}	Reverse Recovery Charge		-	180	-	nC
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=45 V, V_{GS}=0 V, f=1 MHz	-	10580	-	pF
C_{oss}	Output Capacitance		-	3120	-	
C_{rss}	Reverse Transfer Capacitance		-	55	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=45 V, V_{GEN}=10 V, R_G=6 Ω, I_{DS}=100 A	-	118	-	ns
t_r	Turn-on Rise Time		-	72	-	
$t_{d(off)}$	Turn-off Delay Time		-	75	-	
t_f	Turn-off Fall Time		-	51	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=50 V, V_{GS}=10 V, I_{DS}=30 A	-	142	-	nC
Q_{gs}	Gate-Source Charge		-	53	-	
Q_{gd}	Gate-Drain Charge		-	29	-	

7. Typical Characteristics

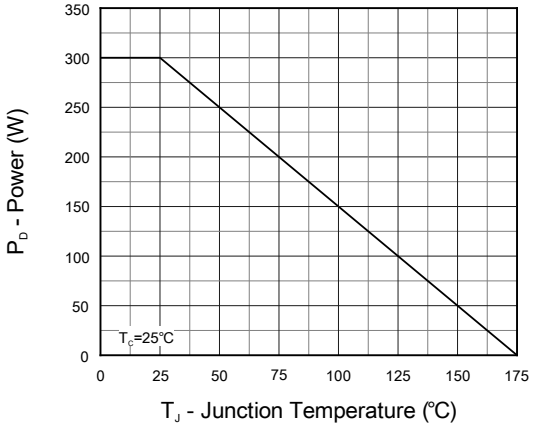


Figure 1. Power Capability

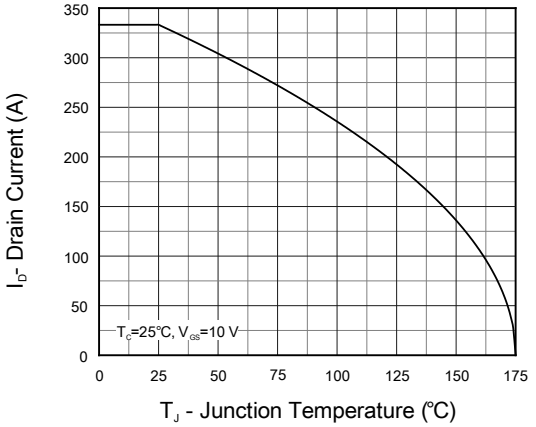


Figure 2. Current Capability

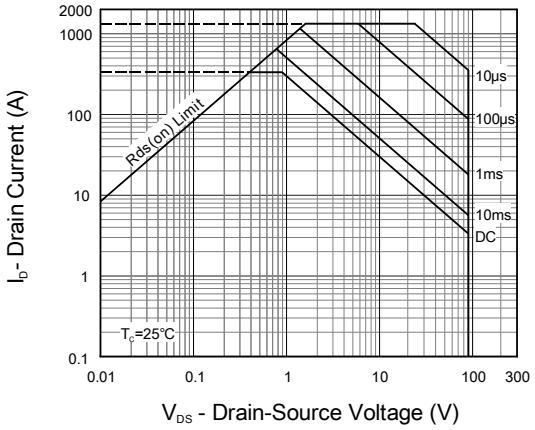


Figure 3. Safe Operation Area

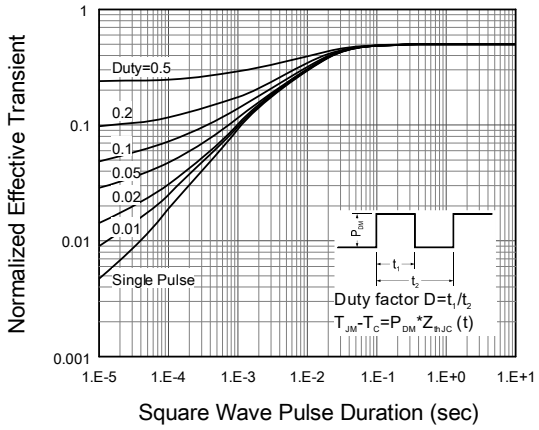


Figure 4. Transient Thermal Impedance

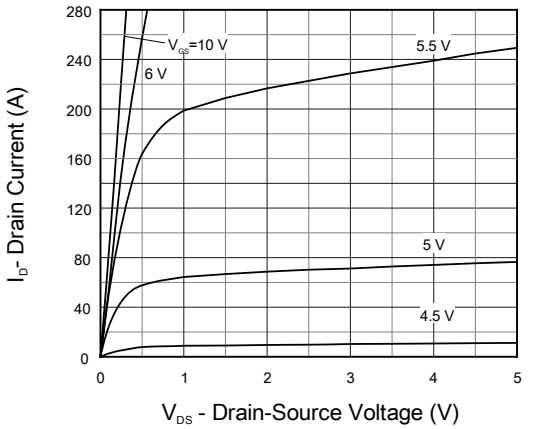


Figure 5. Output Characteristics

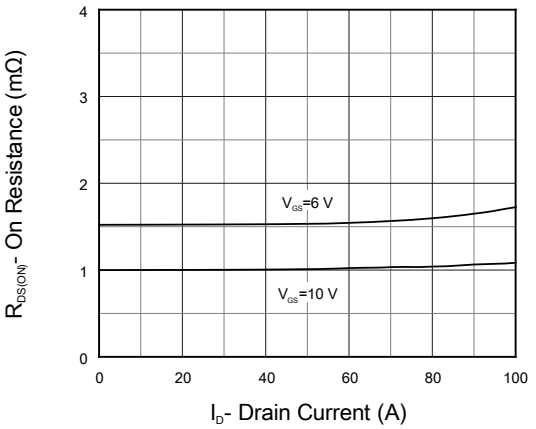


Figure 6. On Resistance

7. Typical Characteristics (cont.)

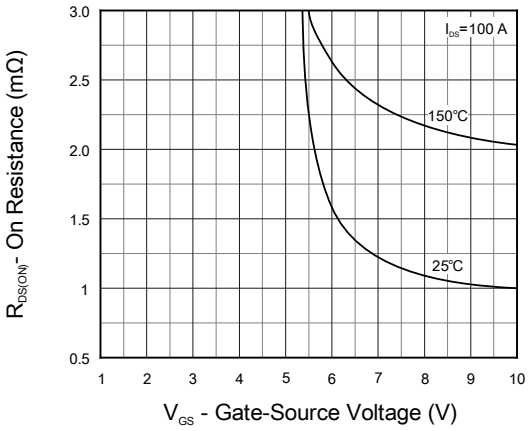


Figure 7. Transfer Characteristics

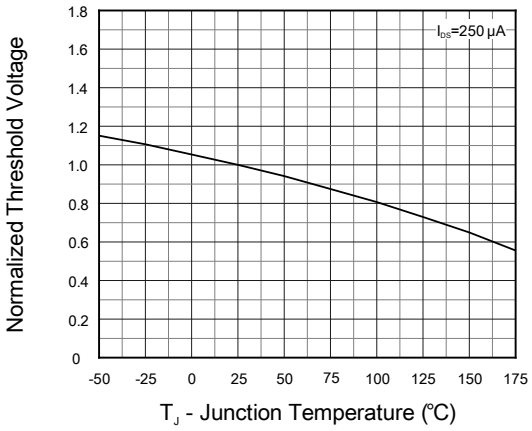


Figure 8. Normalized Threshold Voltage

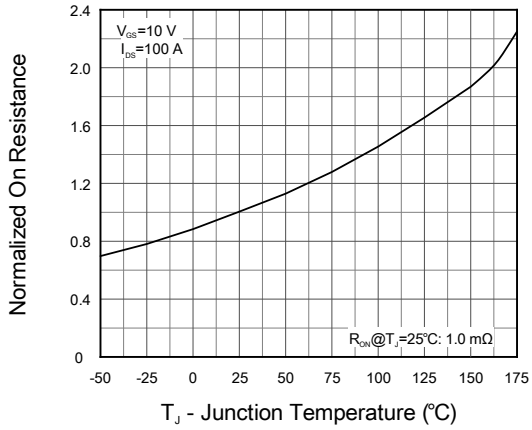


Figure 9. Normalized On Resistance

10000

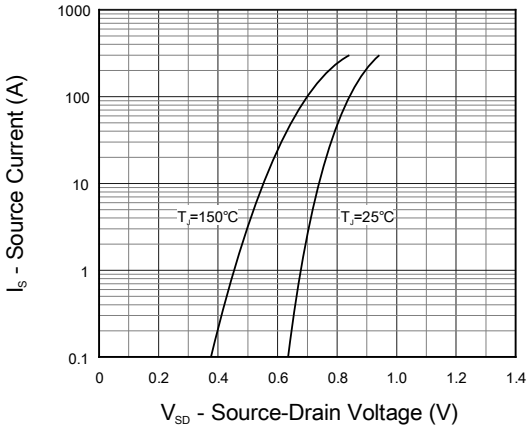


Figure 10. Diode Forward Current

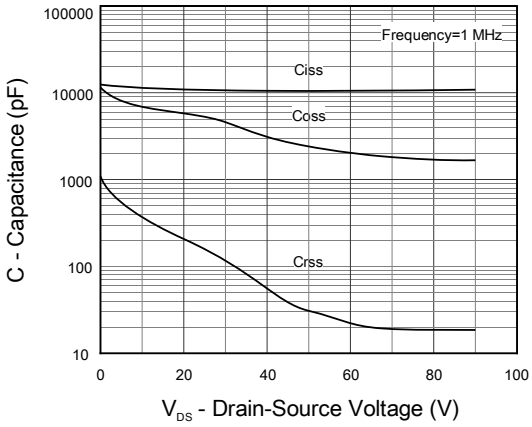


Figure 11. Capacitance

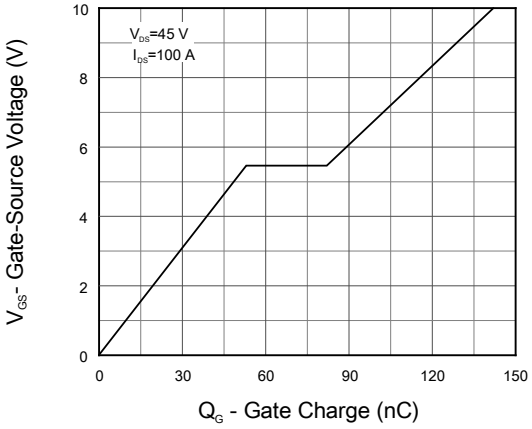
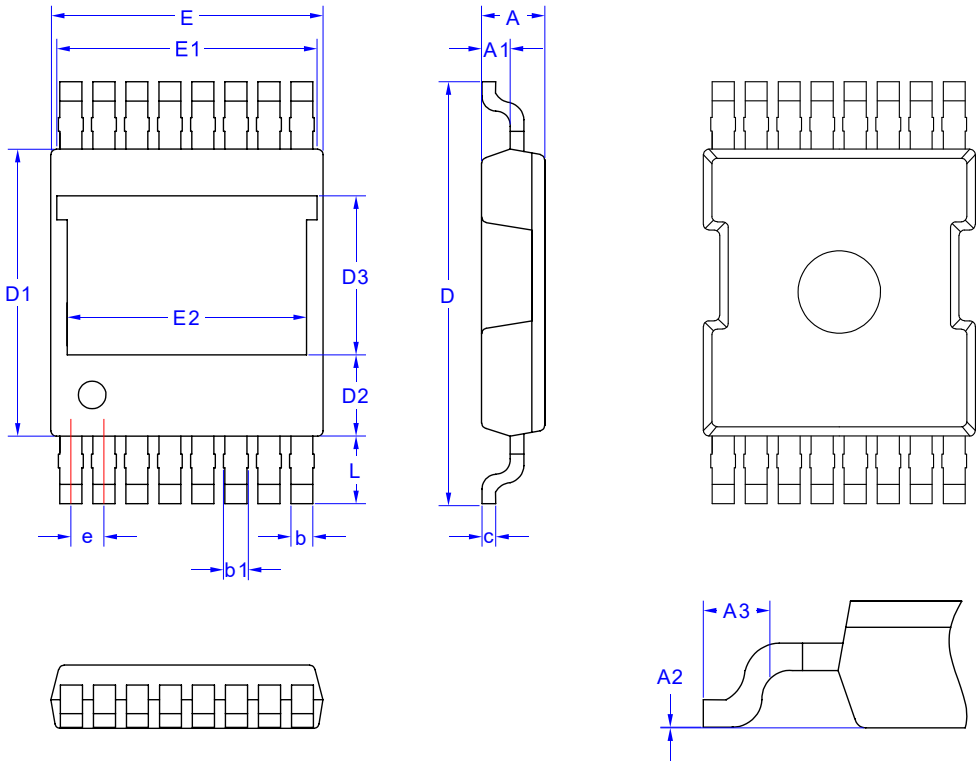


Figure 12. Gate Charge

8. Package Dimensions

TOLT-16L Package



Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.99	1.04	1.09
A2	0.00	0.06	0.12
A3	1.30 REF		
b	0.58	0.65	0.72
c	0.45	0.50	0.55
D	14.70	15.20	15.70
D1	9.60	10.10	10.60

Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
D2	2.30	2.80	3.30
D3	6.20 REF		
E	9.50	9.90	10.30
E1	9.00 REF		
E2	8.20 REF		
e	1.15	1.20	1.25
L	2.40	2.55	2.70