

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Very low on-resistance $R_{DS(ON)}$
- ☒ T_J max 175°C
- ☒ Advanced trench cell design
- ☒ MSL1

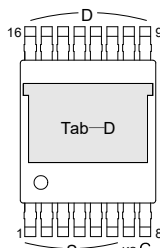
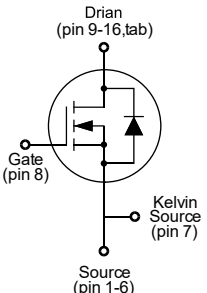
1.2 Applications

- ☒ Motor drivers
- ☒ BMS appliances
- ☒ DC/DC converter

1.3 Quick reference

- ☒ $BV \geq 40\text{ V}$
- ☒ $P_D \leq 230\text{ W}$
- ☒ $I_D \leq 300\text{ A}$
- ☒ $R_{DS(ON)} \leq 1.3\text{ m}\Omega @ V_{GS} = 10\text{ V}$

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℃	40	-	V
V _{GS}	Gate-Source Voltage	T _c =25℃	-	±20	V
I _D	Continuous Drain Current	T _C =25℃, V _{GS} =10 V	-	300	A
		T _C =100℃, V _{GS} =10 V	-	212	A
I _{DM} *	Pulsed Drain Current	T _c =25℃, V _{GS} =10 V	-	1200	A
E _{AS}	Single Pulsed Avalanche Energy	V _{DD} =35 V, L=0.5 mH	-	462	mJ
P _D	Drain Power Dissipation	T _C =25℃	-	230	W
T _J , T _{stg}	Operating Junction and Storage Temperature Range		-55	175	℃
R _{θJA}	Thermal Resistance-Junction to Ambient, Steady-State		-	50	℃/W
R _{θJC}	Thermal Resistance-Junction to Case, Steady-State		-	0.65	

Notes:

- * Pulse width ≤ 300 μs, duty cycle ≤ 2%.
- ** Limited by bonding wire.
- *** Surface mounted on minimum footprint pad area.

4. Marking Information

Product Name	Marking
KJ012N04LT1	KJ012N04LT1 XXXXXX-X

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ012N04LT1	TOLT-16L	13"	24 mm	1200

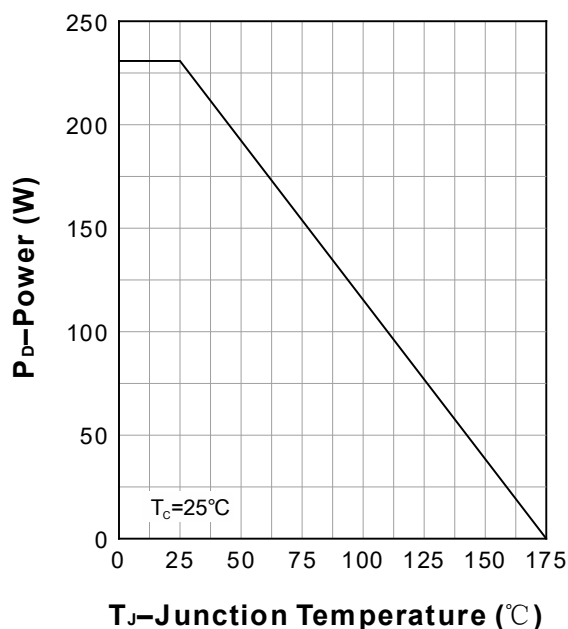
Note: KUAIJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C).

6. Electrical Characteristics (T_J=25°C unless otherwise noted)

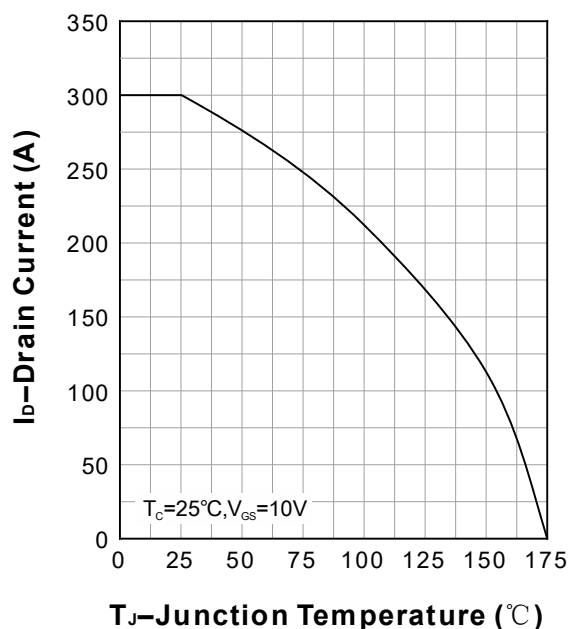
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =250 μA	40	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	1.0	1.7	2.5	V
I _{DSS}	Zero Gate Voltage Source Current	V _{DS} =40 V, V _{GS} =0 V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} =0 V, V _{GS} =±20 V	-	-	±100	nA
R _{DS(ON)}	Drain-Source On-Resistance	V _{GS} =10 V, I _{DS} =30 A	-	1.1	1.3	mΩ
		V _{GS} =4.5 V, I _{DS} =20 A	-	2.0	2.8	mΩ
V _{SD}	Diode Forward Voltage	I _{SD} =30 A, V _{GS} =0 V	-	-	1.2	V
I _S	Maximum Body-Diode Continuous Current		-	-	300	A
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20 V, V _{GS} =0 V, Frequency=1 MHz	-	14650	-	pF
C _{oss}	Output Capacitance		-	850	-	
C _{rss}	Reverse Transfer Capacitance		-	112	-	
Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =20 V, V _{GS} =10 V, I _{DS} =30 A	-	94	-	nC
Q _{gs}	Gate-Source Charge		-	16	-	
Q _{gd}	Gate-Drain Charge		-	18	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =20 V, V _{GS} =10 V, R _G =3 Ω, I _D =30 A	-	14	-	ns
t _r	Turn-on Rise Time		-	10	-	
t _{d(off)}	Turn-off Delay Time		-	100	-	
t _f	Turn-off Fall Time		-	17	-	
t _{rr}	Body Diode Reverse Recovery Time	V _{GS} =0 V, I _{SD} =30 A, dI _{SD} /dt=100 A/μs	-	30	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	23	-	nC

7. Typical Electrical and Thermal Characteristics

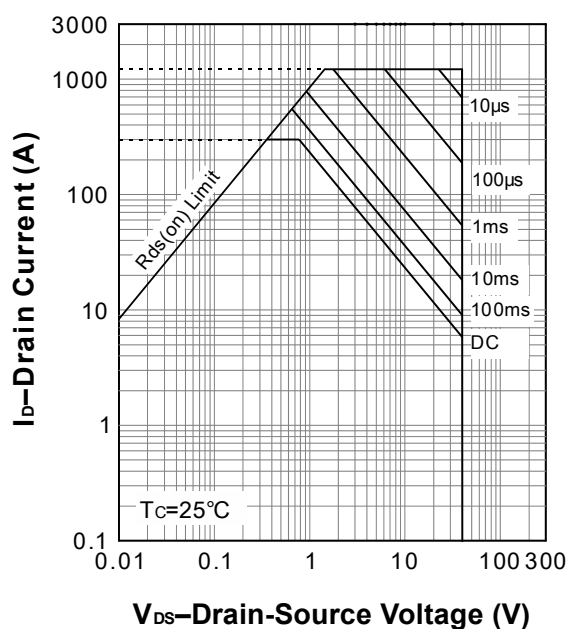
Power Capability



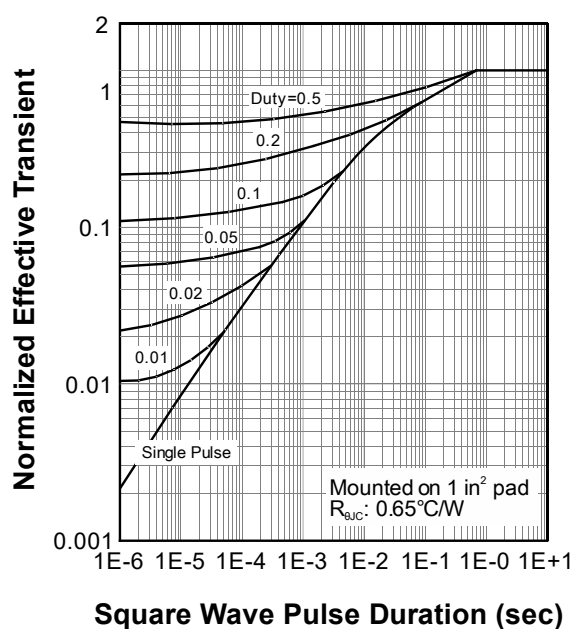
Current Capability



Safe Operating Area

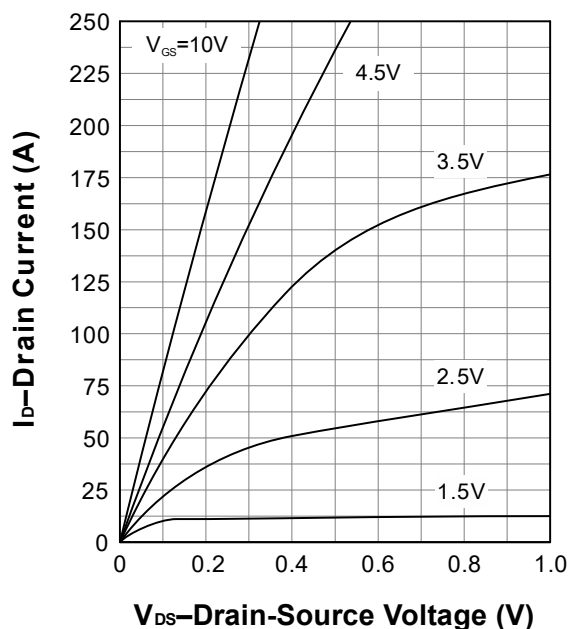


Transient Thermal Impedance

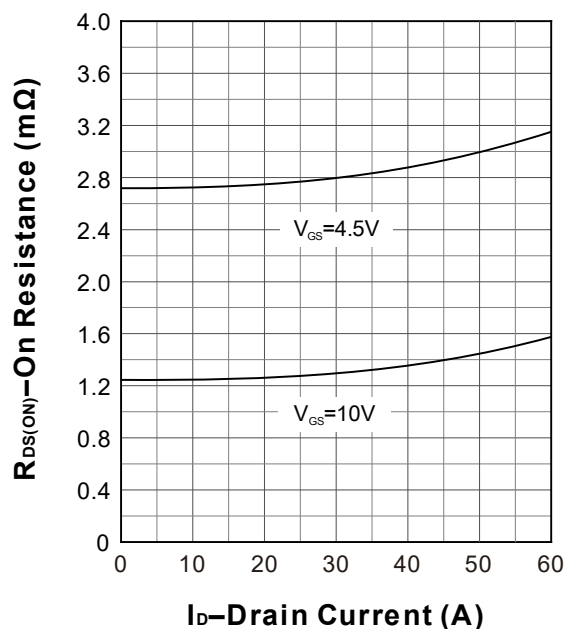


7. Typical Characteristics(cont.)

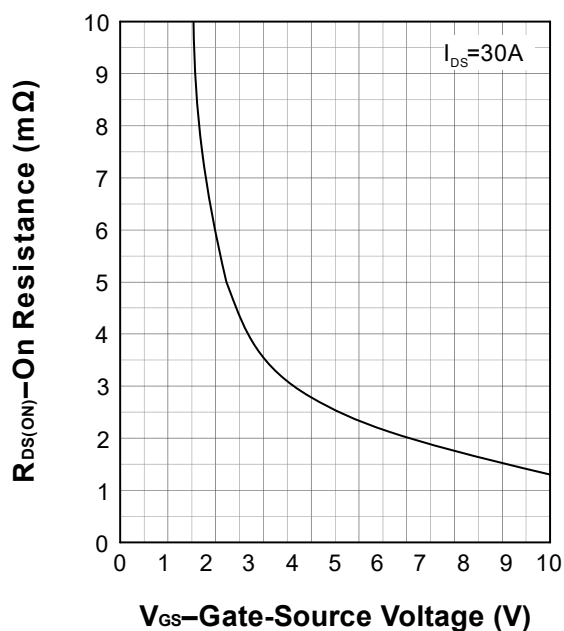
Output Characteristics



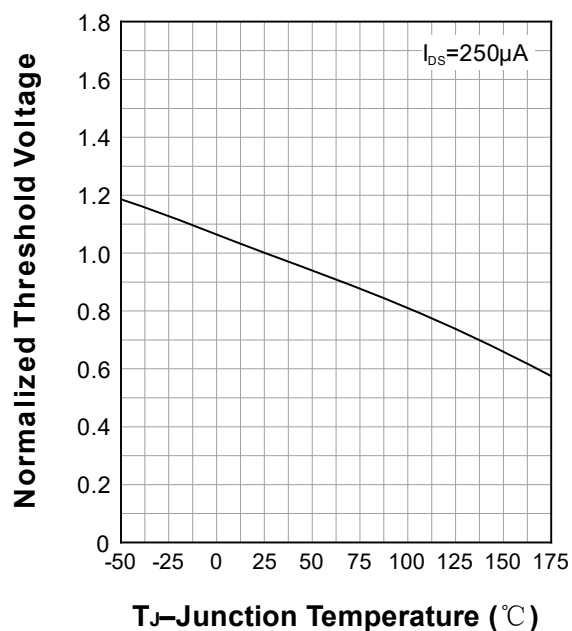
On Resistance



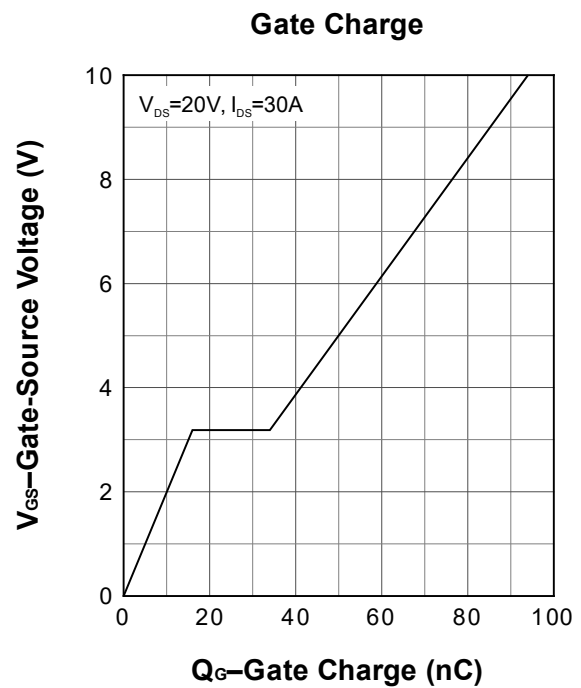
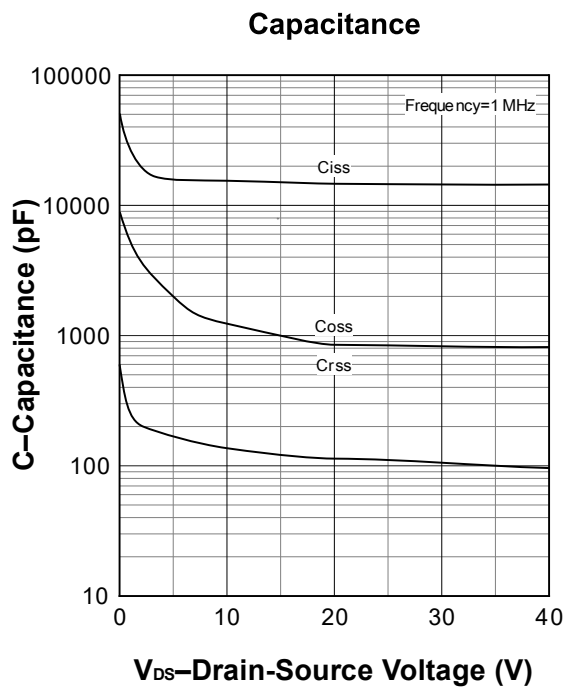
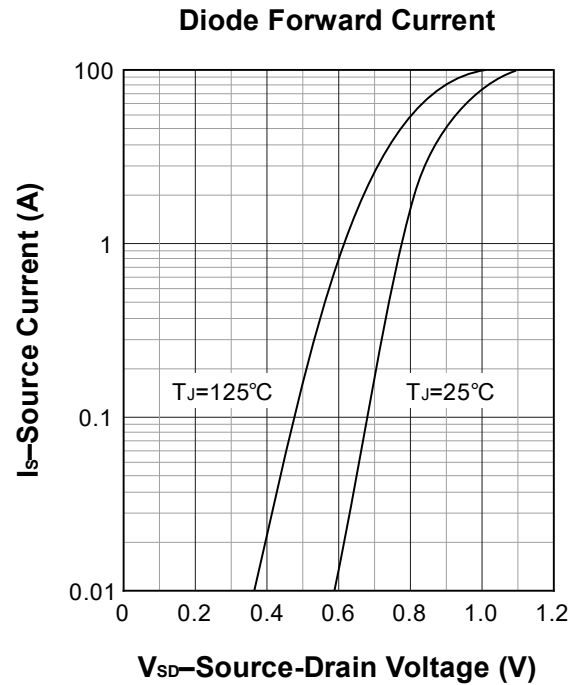
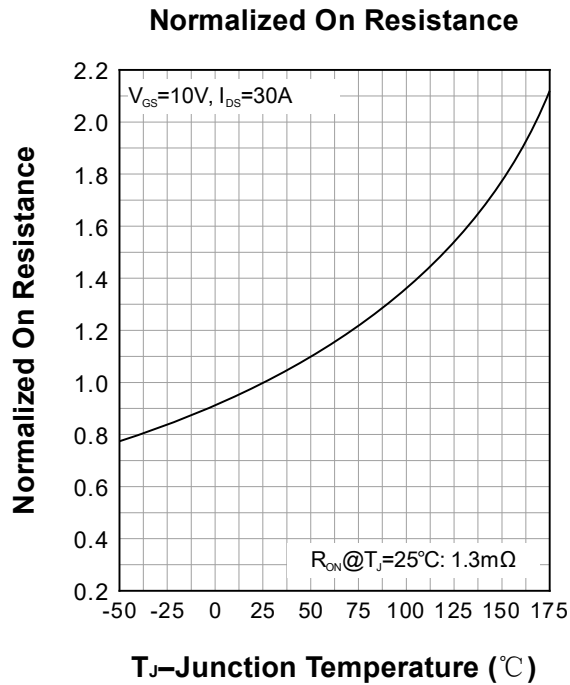
Transfer Characteristics



Normalized Threshold Voltage

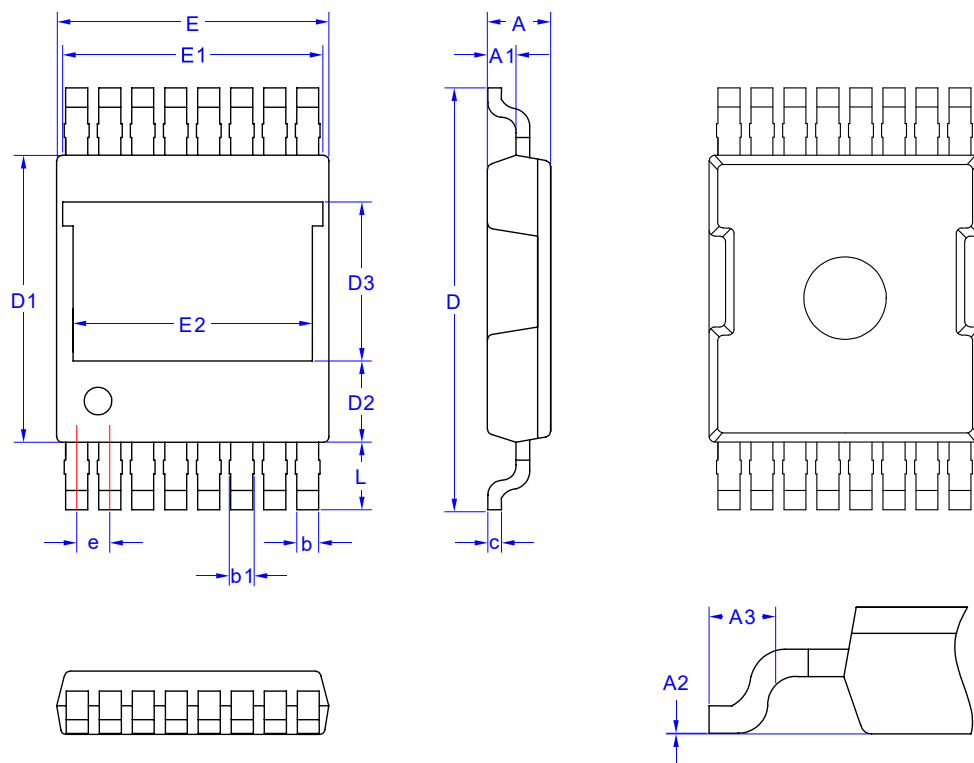


7. Typical Characteristics(cont.)



8. Package Dimensions

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	0.08	0.16
A3	1.50 REF		
b	0.70	0.75	0.80
b1	0.65	0.70	0.75
c	0.45	0.50	0.55
D	14.50	15.00	15.50

Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX
D1	9.60	10.10	10.60
D2	2.30	2.80	3.30
D3	5.77 REF		
E	9.40	9.90	10.40
E1	9.46 REF		
E2	8.70 REF		
e	1.15	1.20	1.25
L	2.40	2.45	2.50