

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Advanced trench cell design

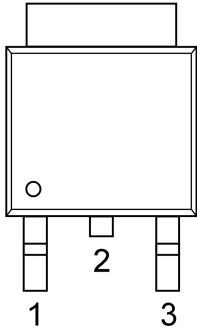
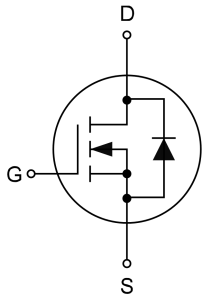
1.2 Applications

- ☒ Motor drivers
- ☒ High power inverter system
- ☒ DC-DC Converter

1.3 Quick reference

- ☒ $BV \geq 150\text{ V}$
- ☒ $R_{DS(ON)} \leq 23\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ☒ $P_D \leq 83\text{ W}$
- ☒ $R_{DS(ON)} \leq 28\text{ m}\Omega @ V_{GS} = 6\text{ V}$
- ☒ $I_D \leq 40\text{ A}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View TO-252	
2	Drain(D)		
3	Source(S)		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C=25^{\circ}\text{C}$	150	-	V
V_{GS}	Gate-Source Voltage	$T_C=25^{\circ}\text{C}$	-	± 20	V
I_D	Drain Current (DC)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	40	A
I_D	Drain Current (DC)	$T_C=100^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	25	A
I_{DM}^*	Drain Current (Pulsed)	$T_C=25^{\circ}\text{C}, V_{GS}=10\text{ V}$	-	120	A
P_D	Drain power dissipation	$T_C=25^{\circ}\text{C}$	-	83	W
I_S	Continuous-Source Current	$T_C=25^{\circ}\text{C}$	-	40	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD}=50\text{ V}, L=1.0\text{ mH}$	-	50	mJ
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		-	50	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	1.5	

Notes:

- * Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- ** Surface mounted on 1 in² pad area, $t \leq 10\text{ sec}$.
- *** Limited by bonding wire.

4. Marking Information

Product Name	Marking
KJ40N15K	40N15 XXXXXX

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ40N15K	TO-252	13"	16 mm	2500

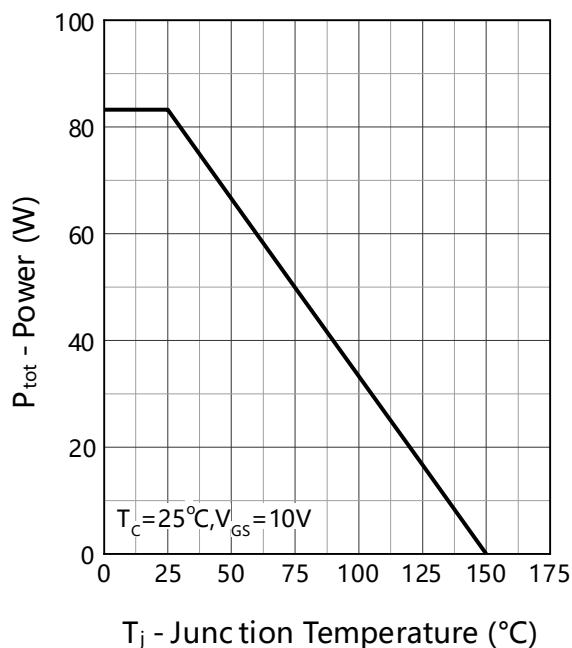
Note: KUAJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C)

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

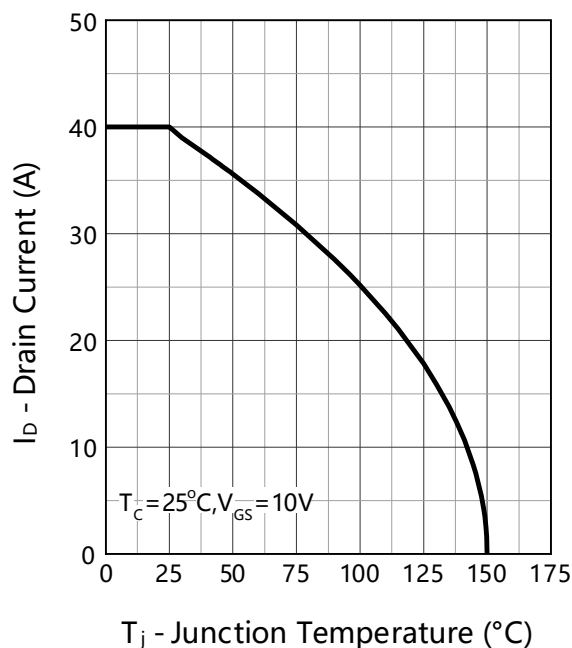
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _{DS} =250 μA	150	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	2	-	4	V
I _{DSS}	Drain Leakage Current	V _{DS} =120 V, V _{GS} =0 V	-	-	1	μA
		T _J =85 °C	-	-	30	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} =15 A	-	20	23	mΩ
		V _{GS} =6 V, I _{DS} =10 A	-	22	28	
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} =15 A, V _{GS} =0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{DS} =15 A, V _{GS} =0 V, dI _{SD} /dt=100 A/μs	-	72	-	ns
Q _{rr}	Reverse Recovery Charge		-	240	-	nC
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0 V, V _{DS} =75 V, Frequency=1 MHz	-	2400	-	pF
C _{oss}	Output Capacitance		-	675	-	
C _{rss}	Reverse Transfer Capacitance		-	30	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =75 V, V _{GEN} =10 V, R _G =4.5 Ω, R _L =5 Ω, I _{DS} =15 A	-	11	-	ns
t _r	Turn-on Rise Time		-	28	-	
t _{d(off)}	Turn-off Delay Time		-	27	-	
t _f	Turn-off Fall Time		-	35	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =75 V, V _{GS} =10 V, I _{DS} =15 A	-	34	-	nC
Q _{gs}	Gate-Source Charge		-	10	-	
Q _{gd}	Gate-Drain Charge		-	7.3	-	

7. Typical Characteristics

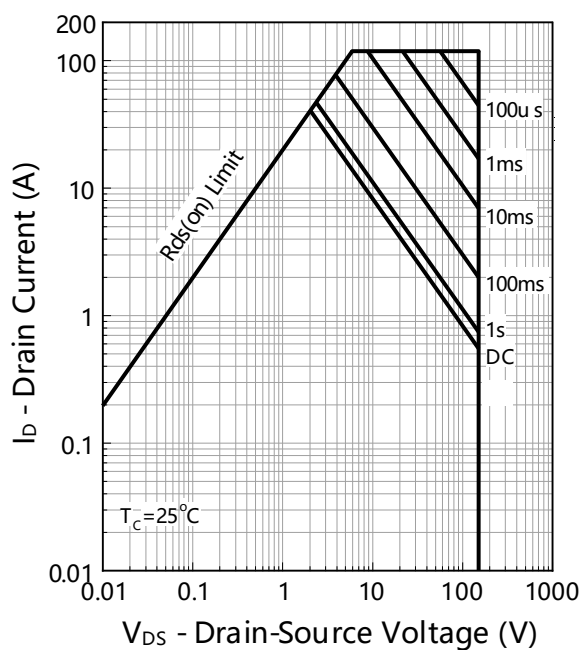
Power Capability



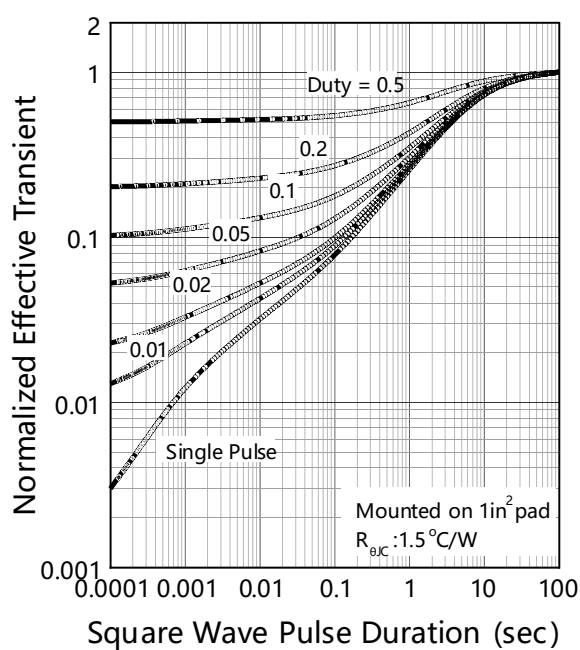
Current Capability



Safe Operation Area

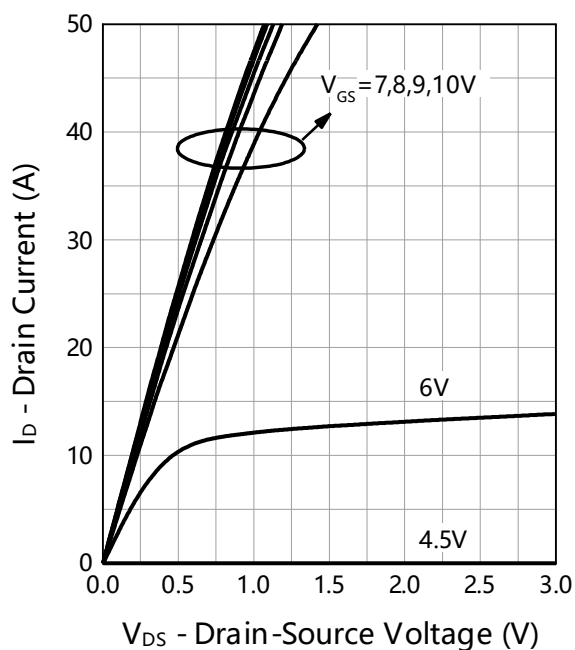


Transient Thermal Impedance

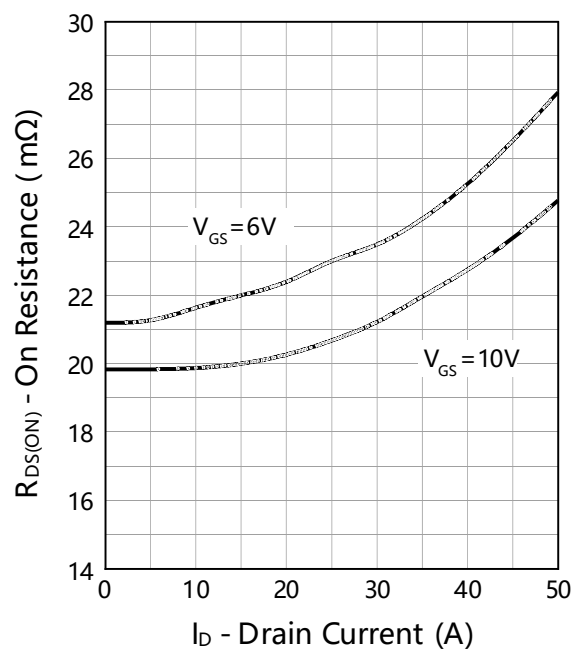


7. Typical Characteristics (cont.)

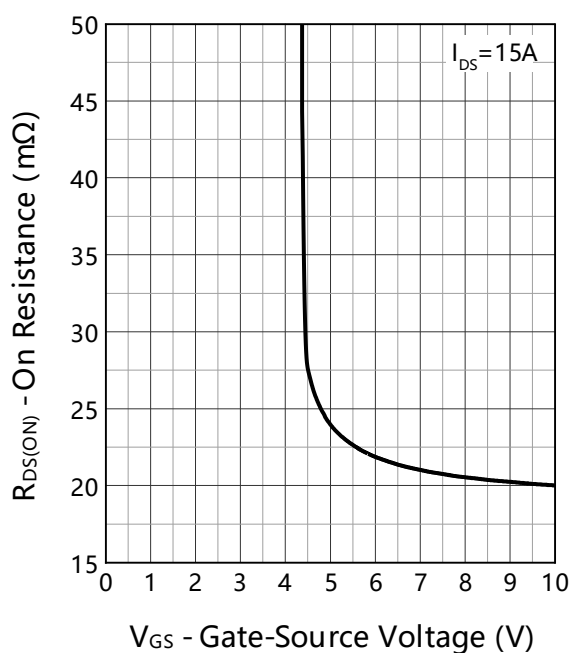
Output Characteristics



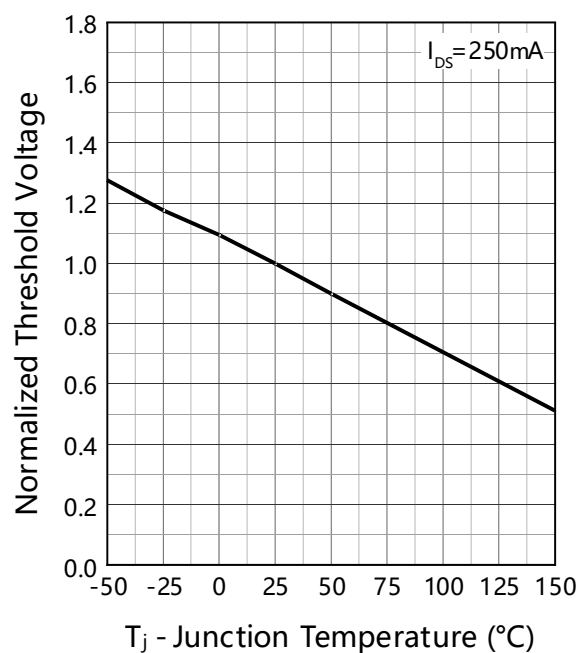
On Resistance



Transfer Characteristics

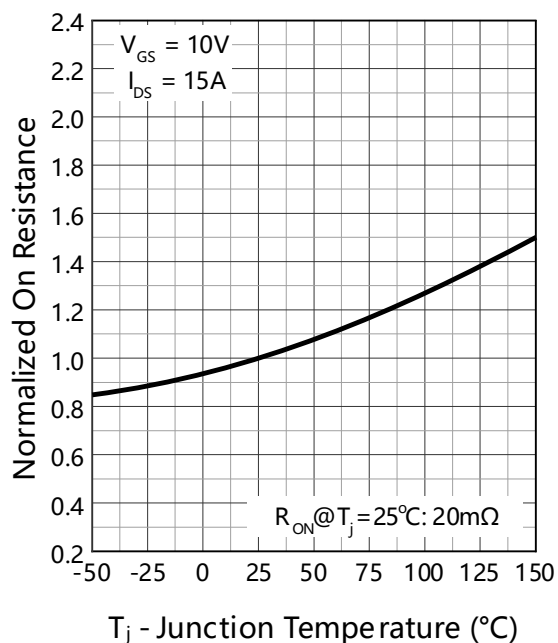


Normalized Threshold Voltage

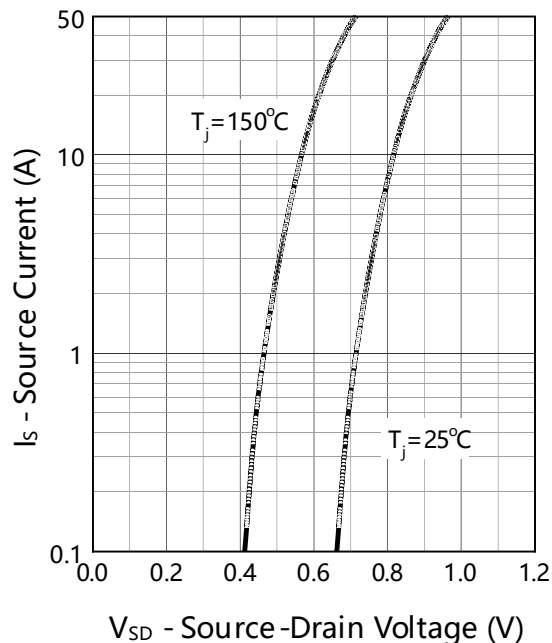


7. Typical Characteristics (cont.)

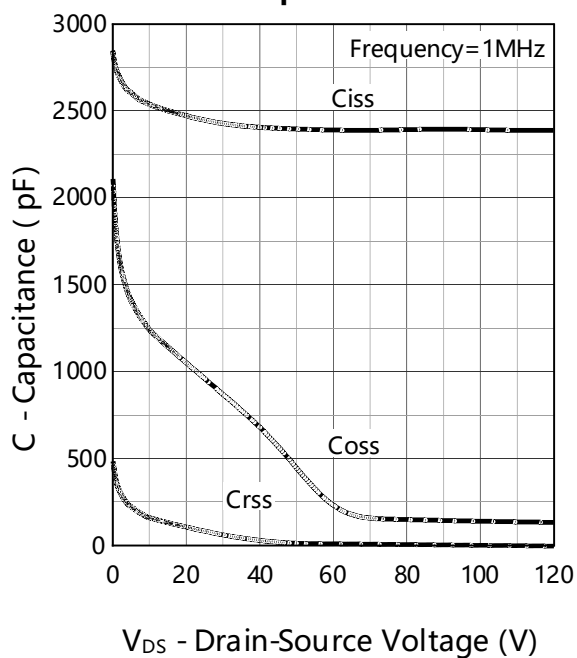
Normalized On Resistance



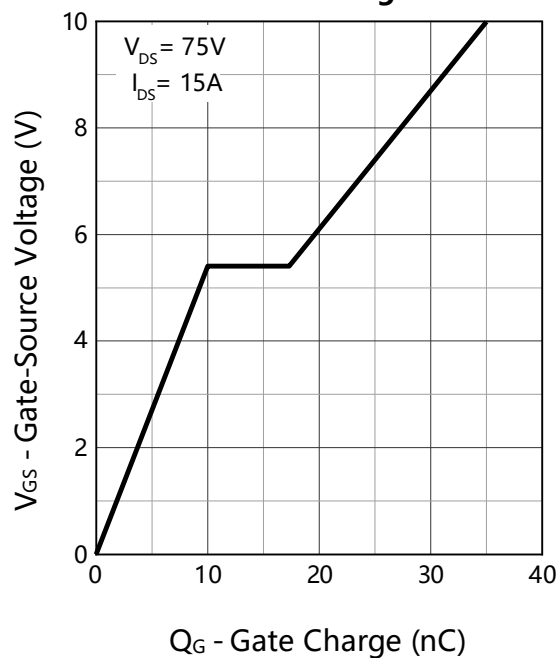
Diode Forward Current



Capacitance

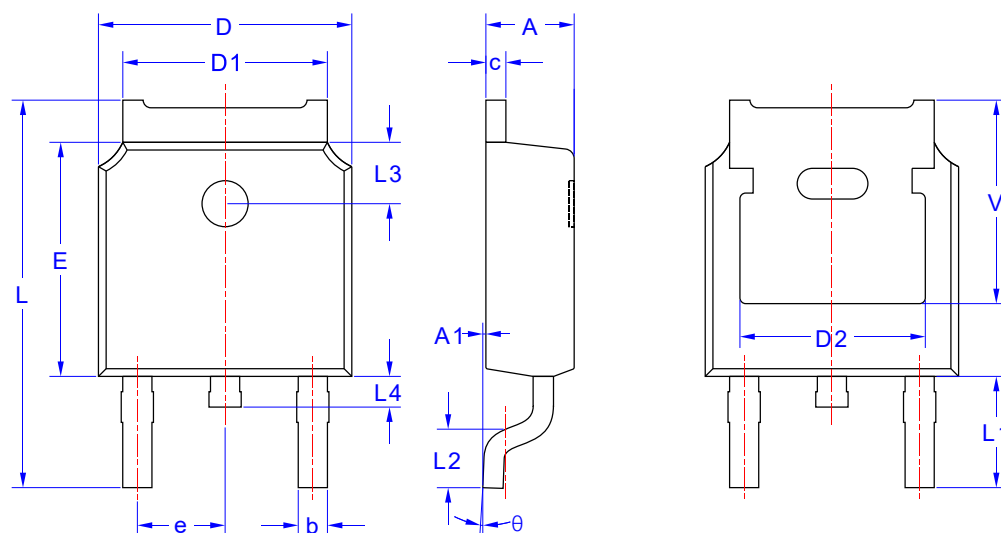


Gate Charge



8. Package Dimensions

TO-252-3L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	2.200	2.400
A1	0	0.127
b	0.660	0.860
c	0.460	0.580
D	6.500	6.700
D1	5.100	5.460
D2	4.830 REF.	
E	6.000	6.200
e	2.186	2.386
L	9.800	10.400
L1	2.900 REF.	
L2	1.400	1.700
L3	1.800 REF.	
L4	0.600	1.000
θ	0°	8°
V	5.600 REF.	