快捷芯
KUAIJIEXIN

KJ0604K

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Advanced Trench Technology
- ☑ Low Thermal Resistance

1.2 Applications

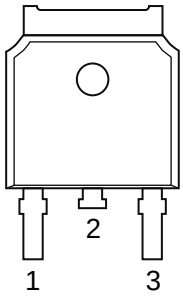
- ☑ Motor drivers
- ☑ DC-DC Converter

1.3 Quick reference

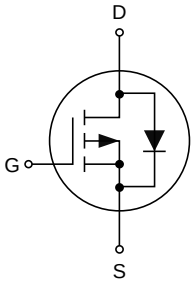
- ☑ BV ≧ 40 V
- ☑ P_{tot} ≦ 20.8 W
- ☑ I_D ≦ 40 A
- ☑ $R_{DS(ON)}$ ≦ 7 mΩ @V_{GS} = 10 V
- ☑ $R_{DS(ON)}$ ≦ 11 mΩ @V_{GS} = 4.5 V

2. Pin Description

Pin	Description
1	Gate (G)
2	Drain (D)
3	Source (S)



Top View
TO-252



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	-	40	A
		T_C=100℃, V_{GS}=10 V	-	26	A
I_{DM} *	Pulsed Source Current	T_C=25℃, V_{GS}=10 V	-	120	A
P_{tot}	Total Power Dissipation	T_C=25℃	-	20.8	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range		-55	150	℃
E_{AS} *	Single Pulsed Avalanche Energy	V_{DD}=40 V, L=0.3 mH	-	60	mJ
$R_{\theta JA}$ **	Thermal Resistance, Junction to Ambient		-	62.5	℃/W
$R_{\theta JC}$ **	Thermal Resistance, Junction to Case		-	6	

Notes:

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

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

*** Limited by maximum junction temperature.

4. Marking Information

Product Name	Marking
KJ0604K	**KJ0604K** **XXXXXX**

5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ0604K	**TO-252**	**13"**	**16 mm**	**2500**

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℃ 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	-	2.2	V
I_{DSS}	Zero Gate Voltage Drain 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
$R_{DS(ON)}$ [a]	On-State Resistance	V_{GS}=10 V, I_{DS}=12 A	-	5.8	7	mΩ
		V_{GS}=4.5 V, I_{DS}=10 A	-	8.5	11	
Diode Characteristics						
V_{SD} [a]	Diode Forward Voltage	I_{SD}=12 A, V_{GS}=0 V	-	0.8	1.2	V
t_{rr}	Reverse Recovery Time	I_{DS}=12 A, V_{GS}=0V, dI_{SD}/dt=100 A/μs	-	21	-	ns
Q_{rr}	Reverse Recovery Charge		-	7	-	nC
Dynamic Characteristics [b]						
C_{iss}	Input Capacitance	V_{GS}=0 V, V_{DS}=20 V, Frequency=1.0 MHz	-	630	-	pF
C_{oss}	Output Capacitance		-	330	-	
C_{rss}	Reverse Transfer Capacitance		-	23	-	
R_g	Gate resistance		-	4	-	Ω
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=20 V, V_{GEN}=10 V, R_G=3 Ω, I_{DS}=12 A	-	12	-	ns
t_r	Turn-on Rise Time		-	32	-	
$t_{d(off)}$	Turn-off Delay Time		-	20	-	
t_f	Turn-off Fall Time		-	8	-	
Gate Charge Characteristics [b]						
Q_g	Total Gate Charge	V_{DS}=20 V, V_{GS}=10 V, I_{DS}=12 A	-	17	-	nC
Q_{gs}	Gate-Source Charge		-	8	-	
Q_{gd}	Gate-Drain Charge		-	3	-	

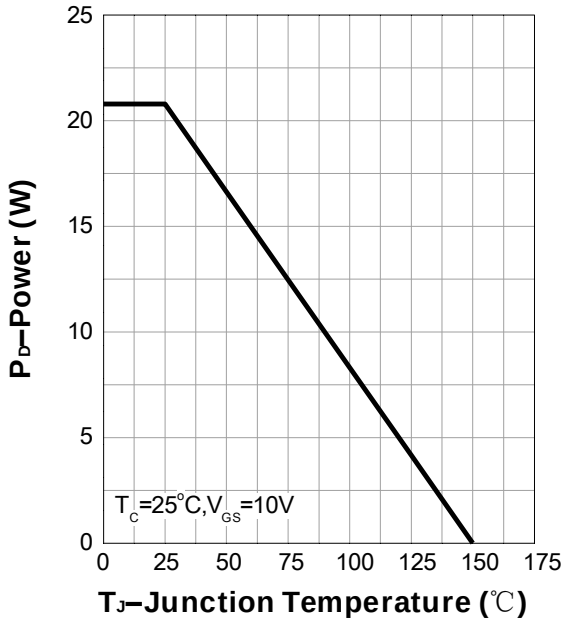
Notes:

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

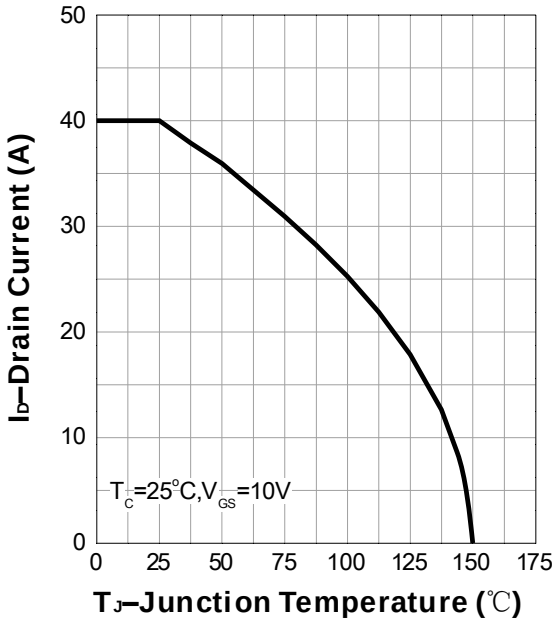
b. Guaranteed by design, not subject to production testing.

7. Typical Characteristics

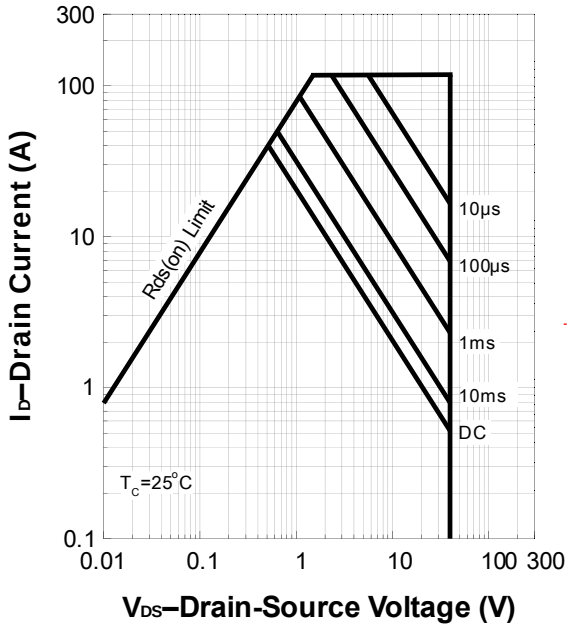
Power Capability



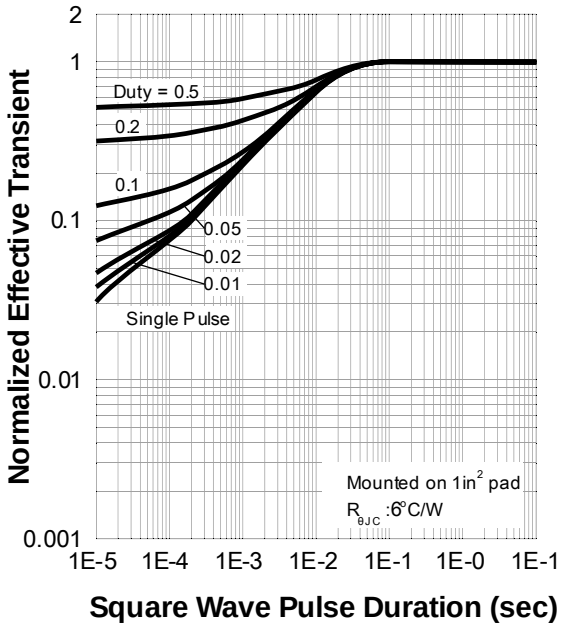
Current Capability



Safe Operating Area

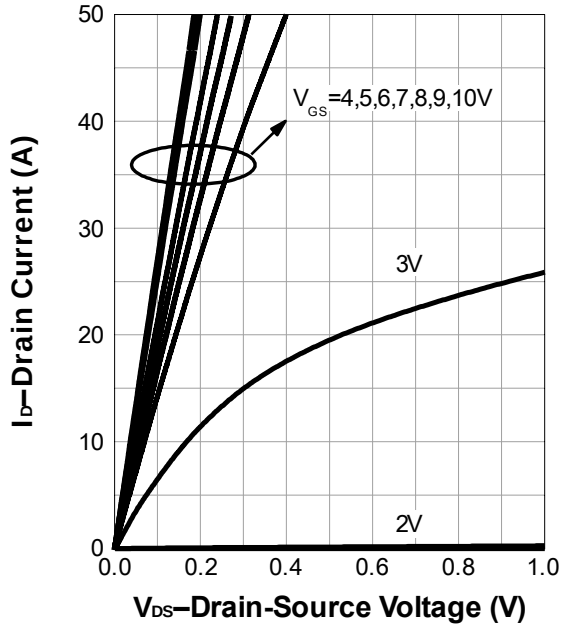


Transient Thermal Impedance

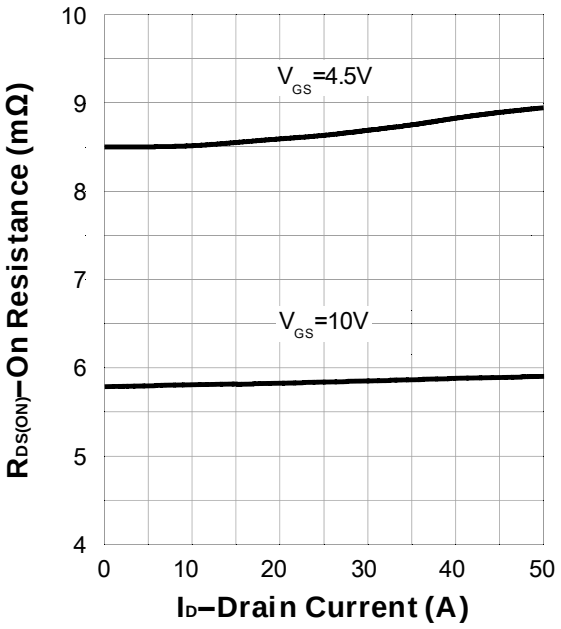


7. Typical Characteristics (cont.)

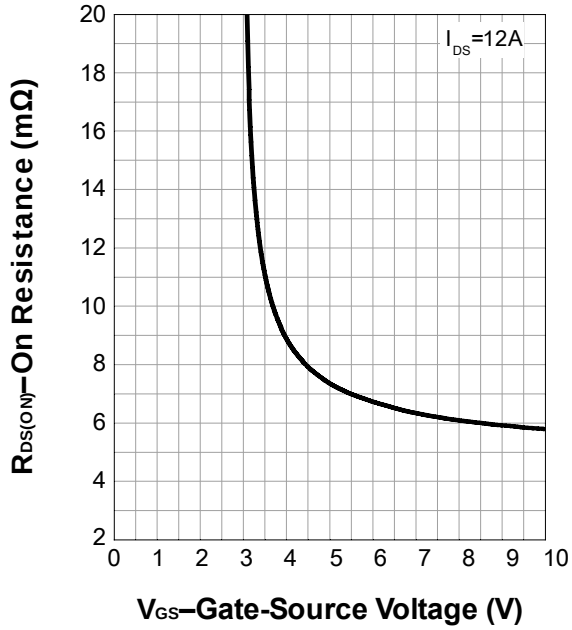
Output Characteristics



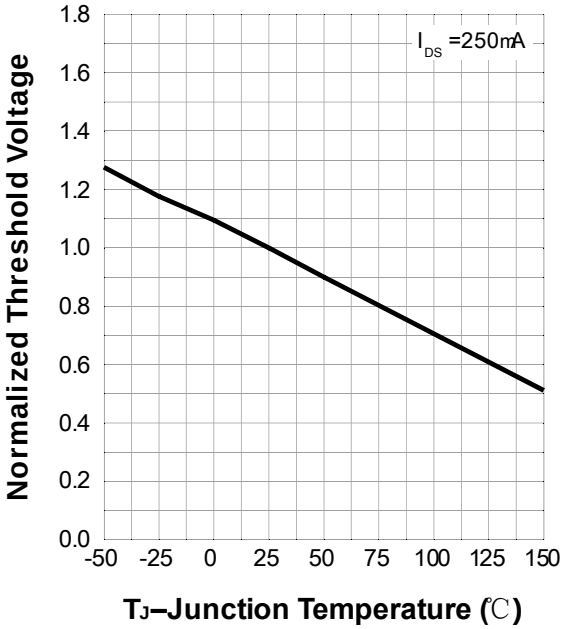
On Resistance



Transfer Characteristics

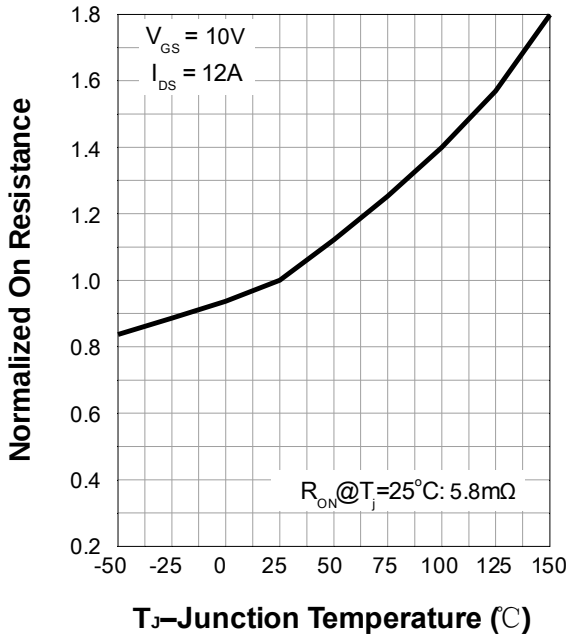


Normalized Threshold Voltage

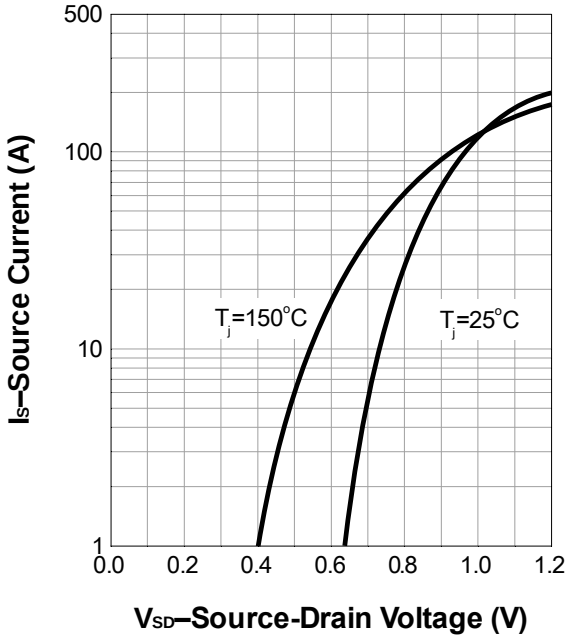


7. Typical Characteristics (cont.)

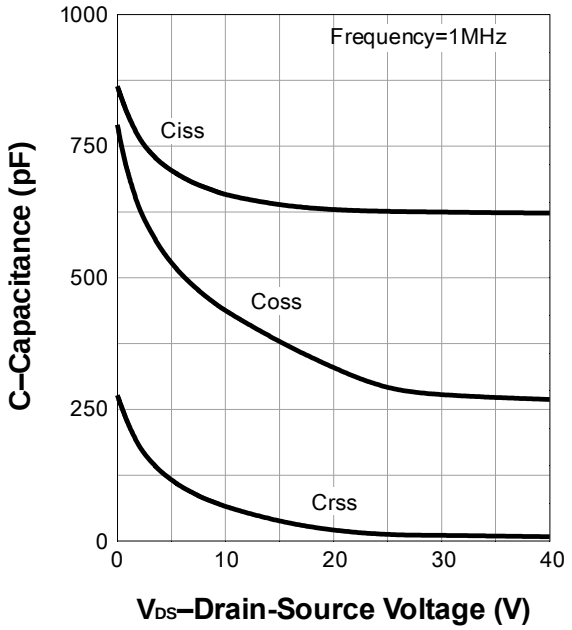
Normalized On Resistance



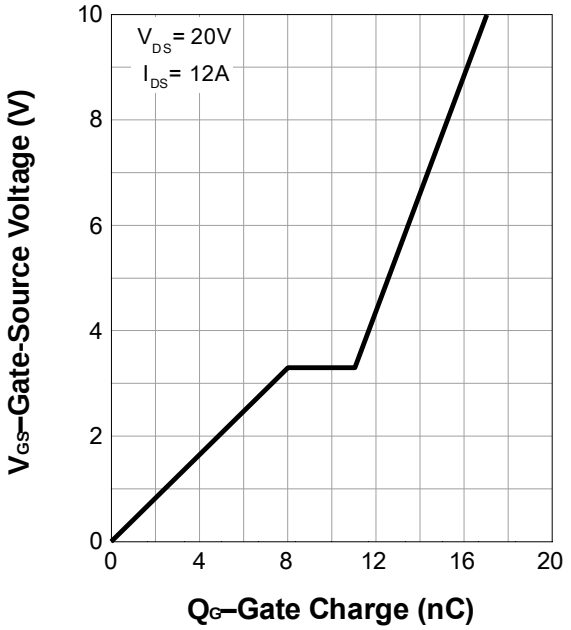
Diode Forward Current



Capacitance

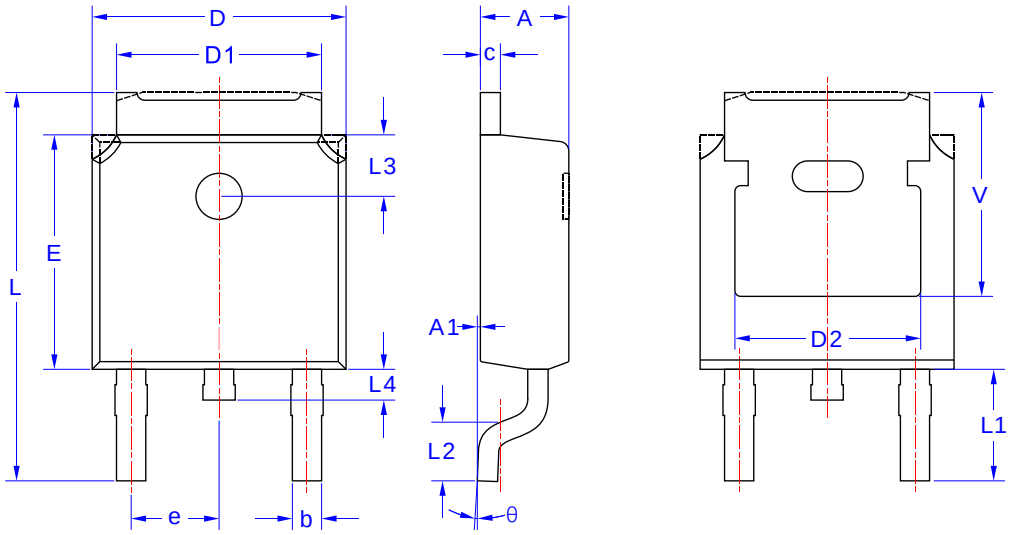


Gate Charge



8. Package Dimensions

TO-252 Package



Note: There are two possible shapes for the dashed area.

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	1.386
L	9.800	10.400
L1	2.900 REF.	
L2	1.400	1.700
L3	1.600 REF.	
L4	0.600	1.000
V	5.350 REF.	
θ	0°	8°