KJ5N20K

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Fast Switching Capability
Avalanche Energy Specified
Improved dv/dt Capability, High Ruggedness

Applications

Uninterruptible Power Supply
Power Factor Correction

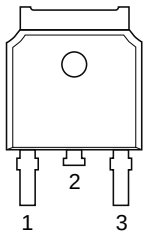
Quick reference

V_{DS} = 200 V
I_D = 5 A
$R_{DS(ON)}$ ≦ 550 mΩ @ V_{GS}=10 V（Type: 490 mΩ）

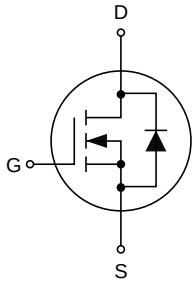
Pin Description

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

Simplified Outline	Symbol



Top View
TO-252



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ5N20K	TO-252	5N20K XXXXXX	13"	16 mm	2500

2. Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current Continuous	5	A
I_{DM}	Pulsed Drain Current	20	A
E_{AS}	Single Pulse Avalanche Energy	45	mJ
P_D	Power Dissipation	35	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	℃
R_{thJA}	Thermal Resistance, Junction to Case	60	℃/ W
R_{thJC}	Thermal Resistance, Junction to Ambient	3.6	℃/ W

3. Electrical Characteristics (T_C=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0 V, I_D=250 μA	200	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=200 V, V_{GS}=0 V	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0 V, V_{GS}=±20 V	-	-	±100	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS}=V_{GS}, I_D=250 μA	1.5	2	2.5	V
$R_{DS(on)}$	Drain-Source On-Resistance(note 3)	V_{GS}=10 V, I_D=2.5 A	-	490	550	mΩ
C_{iss}	Input Capacitance	V_{GS}=0 V, V_{DS}=25 V, f=1.0 MHz	-	260	-	pF
C_{oss}	Output Capacitance		-	45	-	
C_{rss}	Reverse Transfer Capacitance		-	10	-	
Q_g	Total Gate Charge	V_{DS}=100 V, V_{GS}=10 V, I_D=5 A	-	12	-	nC
Q_{gs}	Gate-Source Charge		-	2	-	
Q_{gd}	Gate-Drain Charge		-	3.5	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=100 V, V_{GS}=10 V, I_D=5 A, R_G=2 Ω	-	8	-	ns
t_r	Turn-on Rise Time		-	11	-	
$t_{d(off)}$	Turn-off Delay Time		-	19	-	
t_f	Turn-off Fall Time		-	12	-	
I_S	Maximum Continuous Drain-Source Diode Forward Current		-	-	5	A
V_{SD}	Diode Forward Voltage	V_{GS}=0 V, I_S=5 A	-	-	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS}=0 V,I_S=5 A, dI/dt=100 A/μs	-	170	-	ns
Q_{rr}	Reverse Recovery Charge		-	1.6	-	μC

Note:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2 OZ copper.
2. The E_{AS} data shows Max. rating. I_{AS}=3 A, V_{DD}=50 V, L=10 mH, R_G=25 Ω, Starting T_J=25℃.
3. Pulse Test: Pulse width ≤ 300 μs, Duty cycle ≤ 1%.
4. The power dissipation is limited by 150℃ junction temperature.
5. The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation.

4. Typical Characteristics

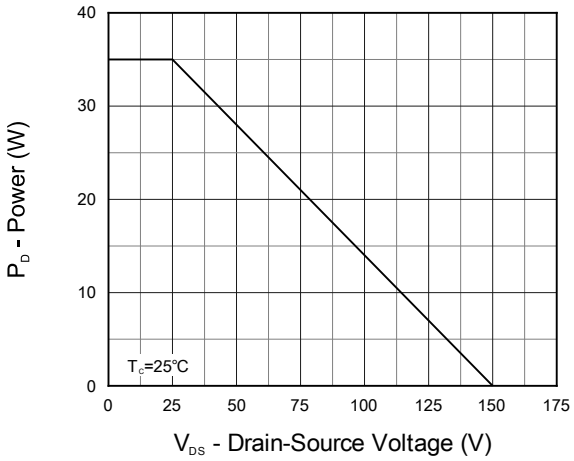


Figure 1. Output Characteristics

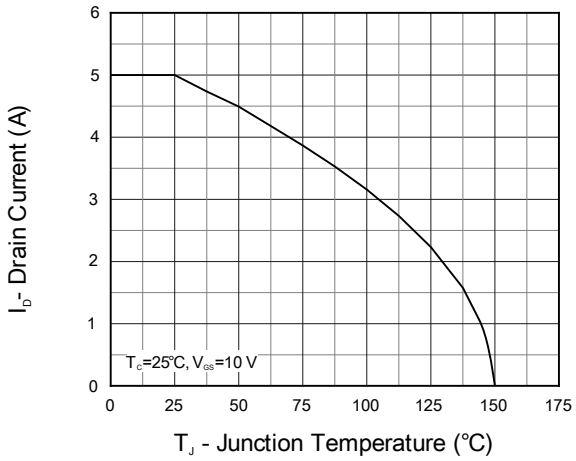


Figure 2. Current Capability

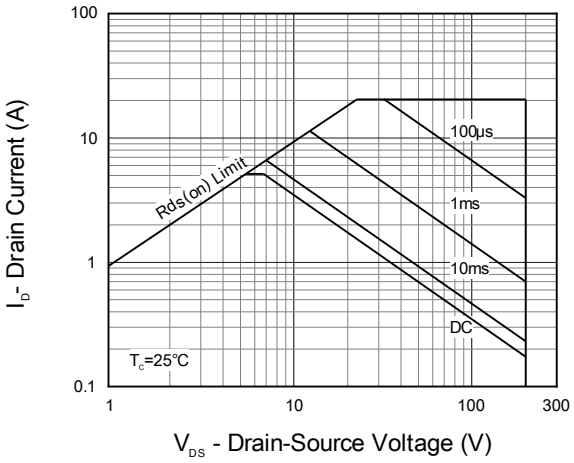


Figure 3. Safe Operation Area

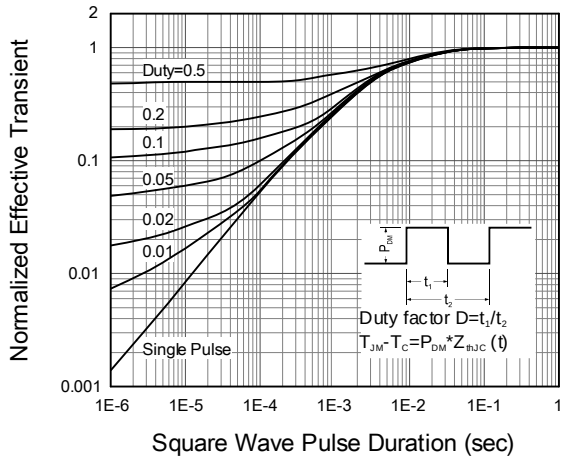


Figure 4. Transient Thermal Impedance

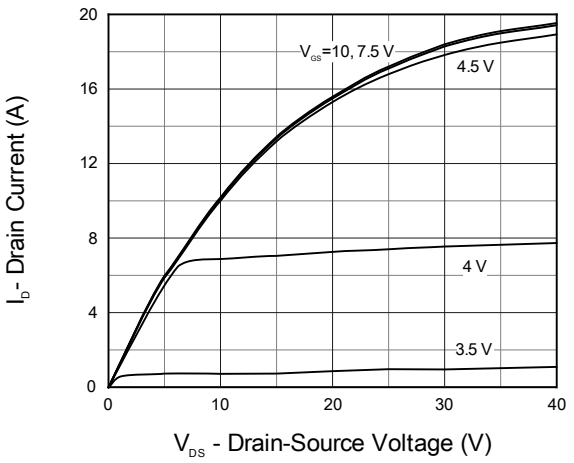


Figure 5. Output Characteristics

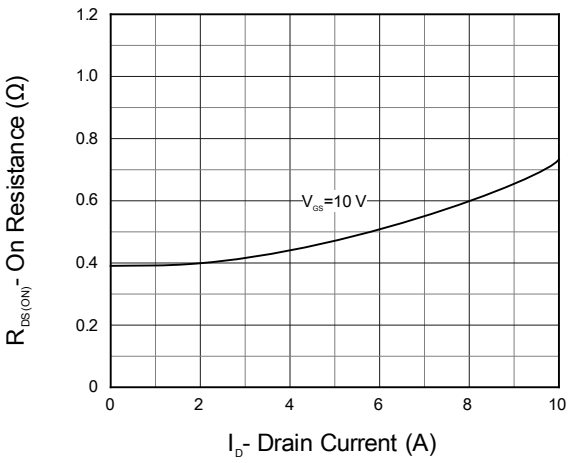


Figure 6. On Resistance

4. Typical Characteristics (cont.)

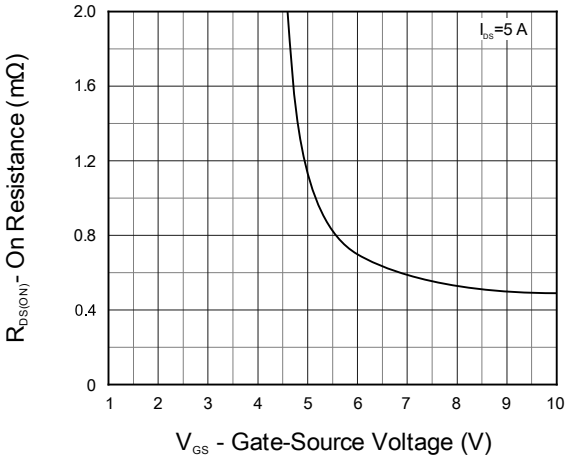


Figure 7. Transfer Characteristics

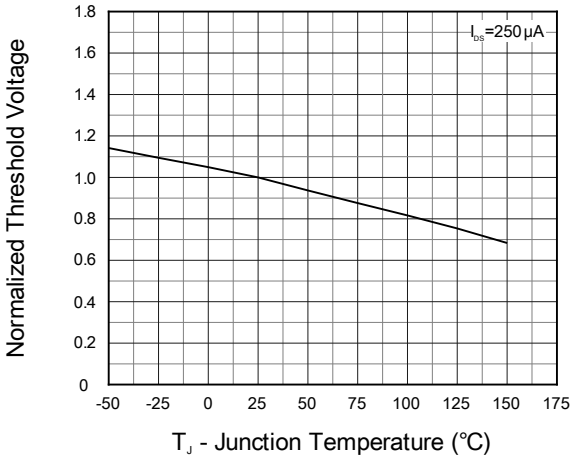


Figure 8. Normalized Threshold Voltage

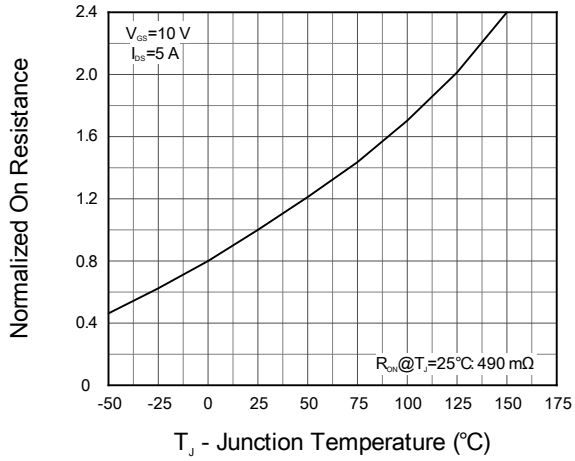


Figure 9. Normalized On Resistance

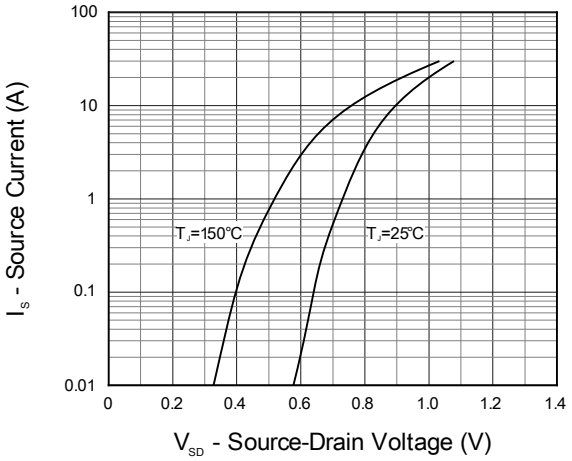


Figure 10. Diode Forward Current

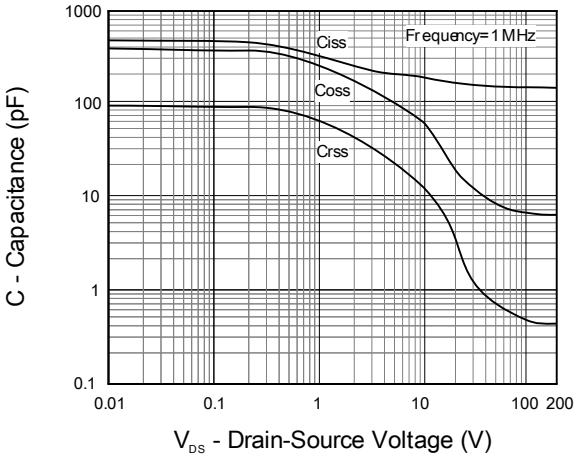


Figure 11. Capacitance

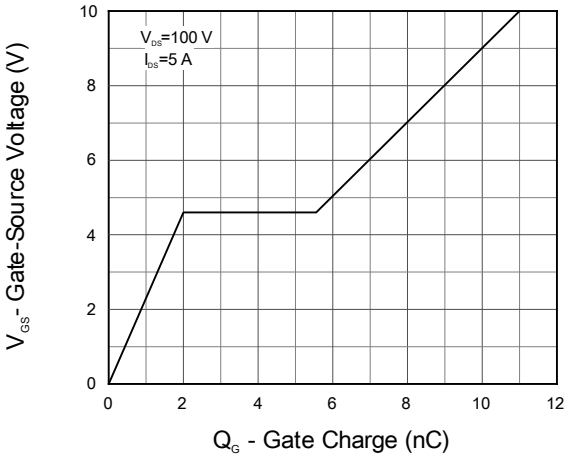
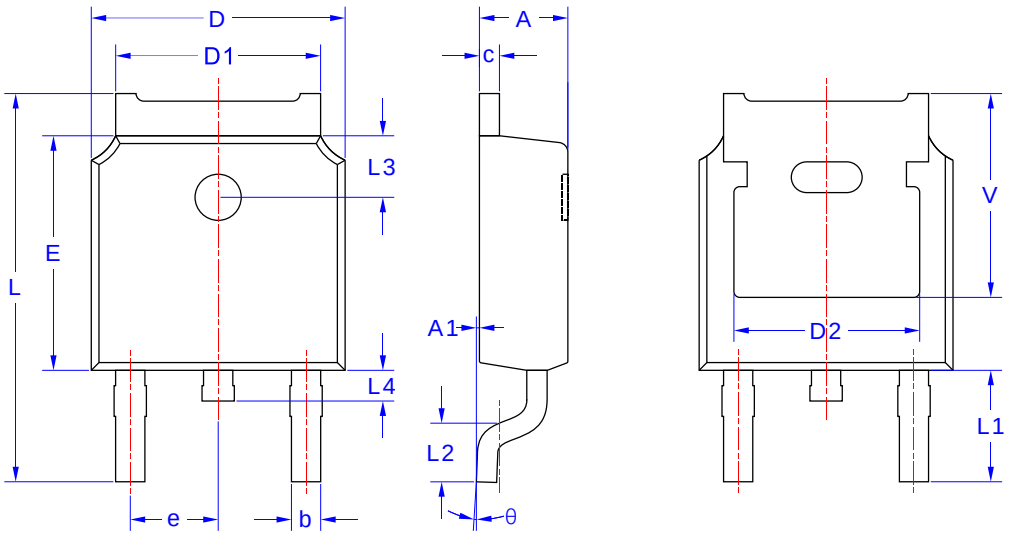


Figure 12. Gate Charge

5. Package Mechanical Data

TO-252 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.	