快捷芯
KUAIJIEXIN

KJ4N20S

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

Surface-mounted package

Excellent $R_{DS(ON)}$, Low gate charge

Applications

Automative Lighting

Load Switch

Uninterruptible Power Supply

Quick reference

V_{DS} = 200 V

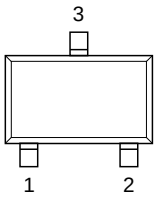
I_D = 3.8 A

$R_{DS(ON)}$ ≦ 580 mΩ @ V_{GS}=10V（Type: 450 mΩ）

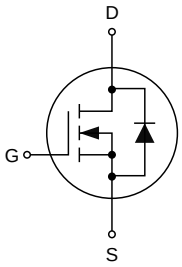
Pin Description

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

Simplified Outline	Symbol



Top View
SOT23-3L



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ4N20S	SOT23-3L	4N20	7 inch	-	3000

2. Absolute Maximum Ratings (T_C=25°C 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, V_{GS}@10 V, T_C=25°C	3.8	A
	Drain Current, V_{GS}@10 V, T_C=100°C	1.85	A
I_{DM}	Pulsed Drain Current [1]	10	A
P_D	Total Power Dissipation [3]	2	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	℃
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	85	℃/W
$R_{\theta JC}$	Thermal Resistance from Junction to Case	3.9	℃/W

3. Electrical Characteristics (T_J=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	230	-	V
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=250 μA	1.2	2.0	2.5	V
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0 V, V_{GS}=±20 V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=200 V, V_{GS}=0 V	-	-	1	μA
$R_{DS(on)}$	Drain-Source On-Resistance [2]	V_{GS}=10 V, I_D=1 A	-	450	580	mΩ
		V_{GS}=4.5 V, I_D=1 A	-	680	850	mΩ
g_{fs}	Forward Transconductance	V_{GS}=10 V, I_D=1 A	-	10	-	S
C_{iss}	Input Capacitance	V_{DS}=25 V, V_{GS}=0 V, f=1.0 MHz	-	900	-	pF
C_{oss}	Output Capacitance		-	130	-	
C_{rss}	Reverse Transfer Capacitance		-	4.6	-	
Q_g	Total Gate Charge	V_{DS}=160 V, V_{GS}=10 V, I_D=1 A	-	15	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	
Q_{gd}	Gate-Drain Charge		-	5.2	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=100 V, V_{GS}=10 V, I_D=1 A, R_G=3 Ω	-	22	-	ns
t_r	Turn-on Rise Time		-	34	-	
$t_{d(off)}$	Turn-off Delay Time		-	45	-	
t_f	Turn-off Fall Time		-	11	-	
I_S	Continuous Body Diode Current	V_{GS}=V_{DS}=0 V, Force Current	-	-	1	A
V_{SD}	Diode Forward Voltage	V_{GS}=0 V, I_S=1 A	-	-	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS}=0 V, I_S=1 A, $d_{IF/dt}$=100 A/μs	-	85	-	ns
Q_{rr}	Reverse Recovery Charge		-	257	-	μC

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2 OZ copper.
2. The test condition is Pulse Test: Pulse width ≤ 300 μs, Duty Cycle ≤ 1%.
3. The power dissipation is limited by 150℃ junction temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

4. Typical Characteristics

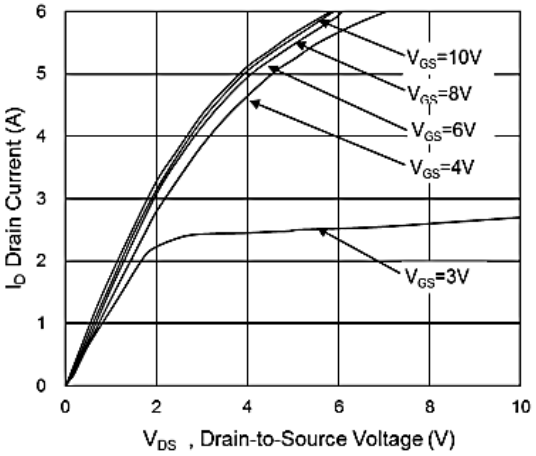


Fig.1 Typical Output Characteristics

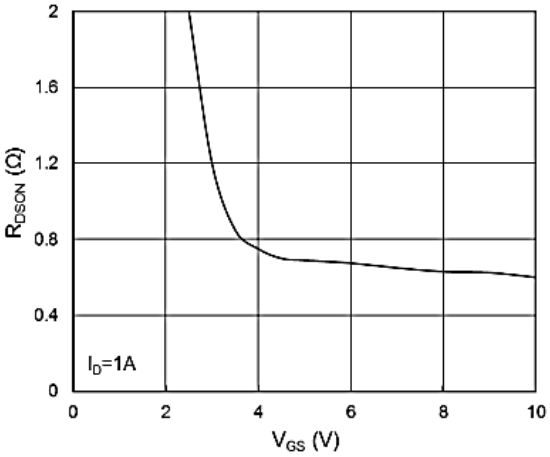


Fig.2 On-Resistance vs. G-S Voltage

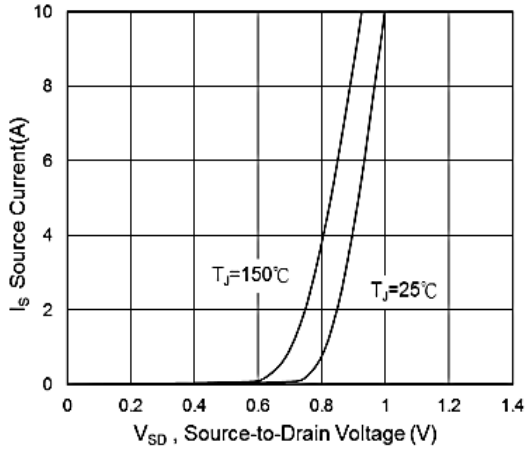


Fig.3 Forward Characteristics of Reverse

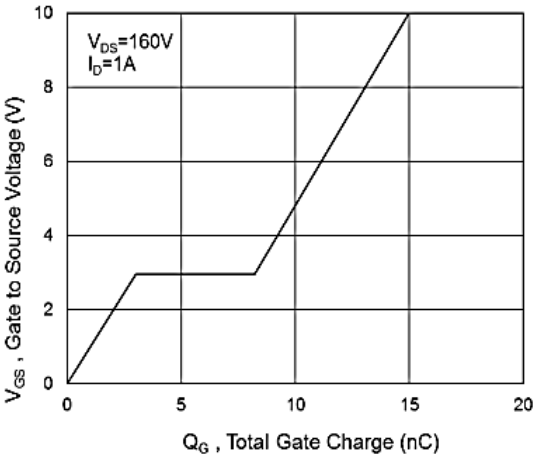


Fig.4 Gate-Charge Characteristics

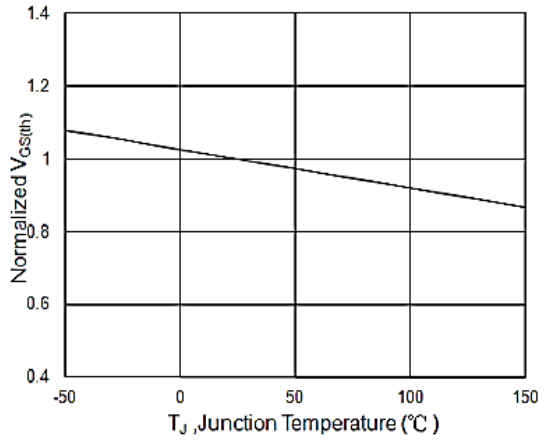


Fig.5 $V_{GS(th)}$ vs. T_J

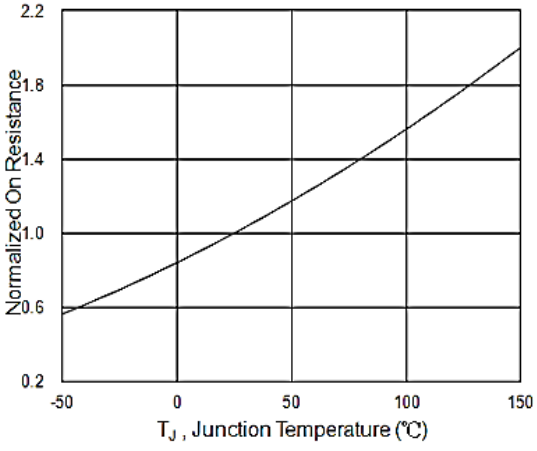


Fig.6 Normalized R_{DSON} vs. T_J

4. Typical Characteristics (Cont.)

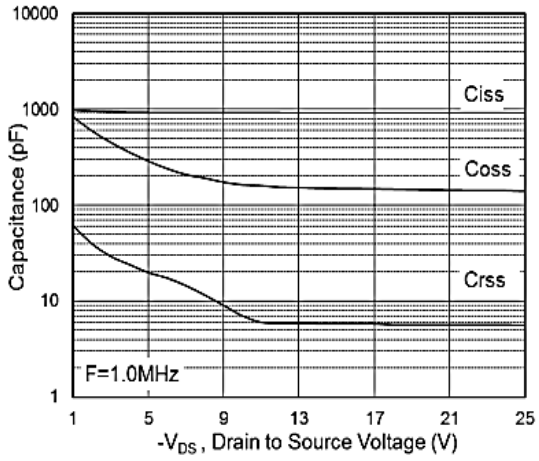


Fig.7 Capacitance

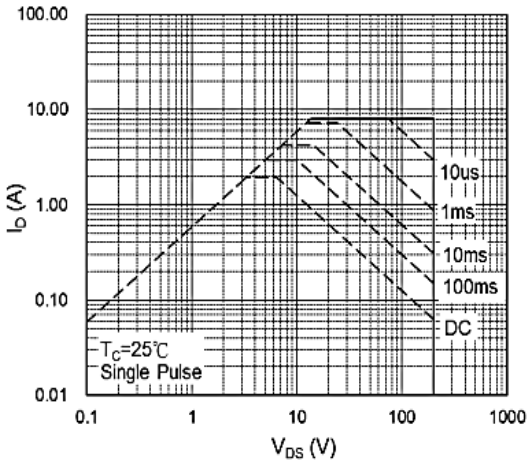


Fig.8 Safe Operating Area

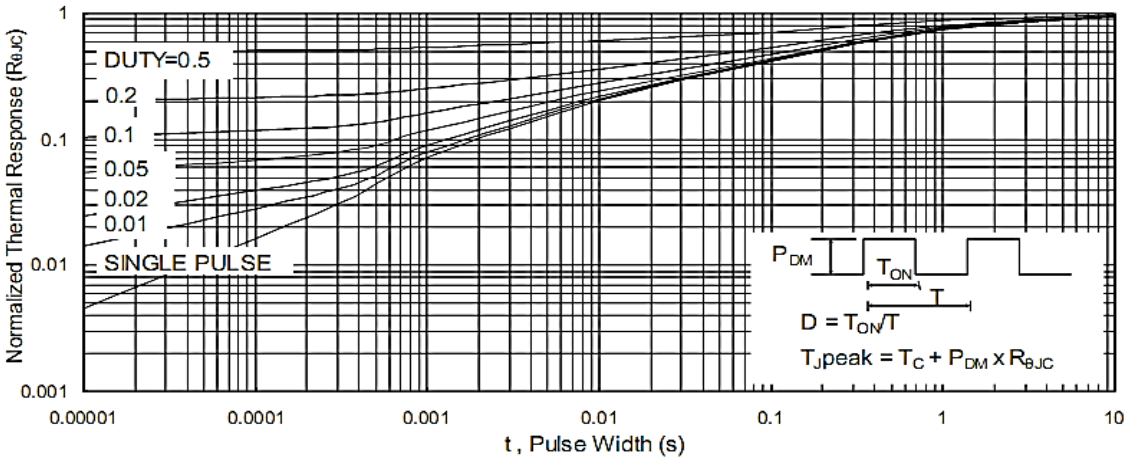


Fig.9 Normalized Maximum Transient Thermal Impedance

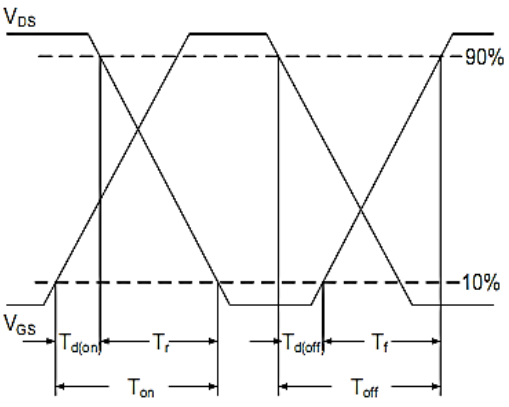


Fig.10 Switching Time Waveform

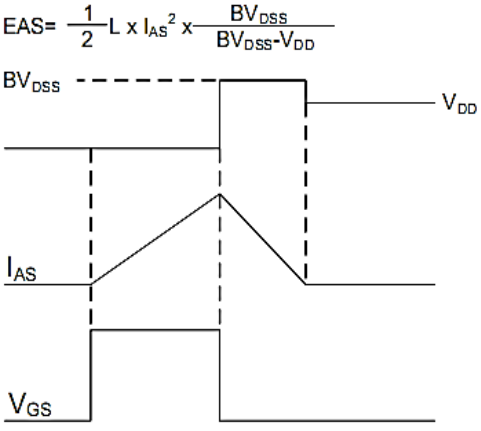
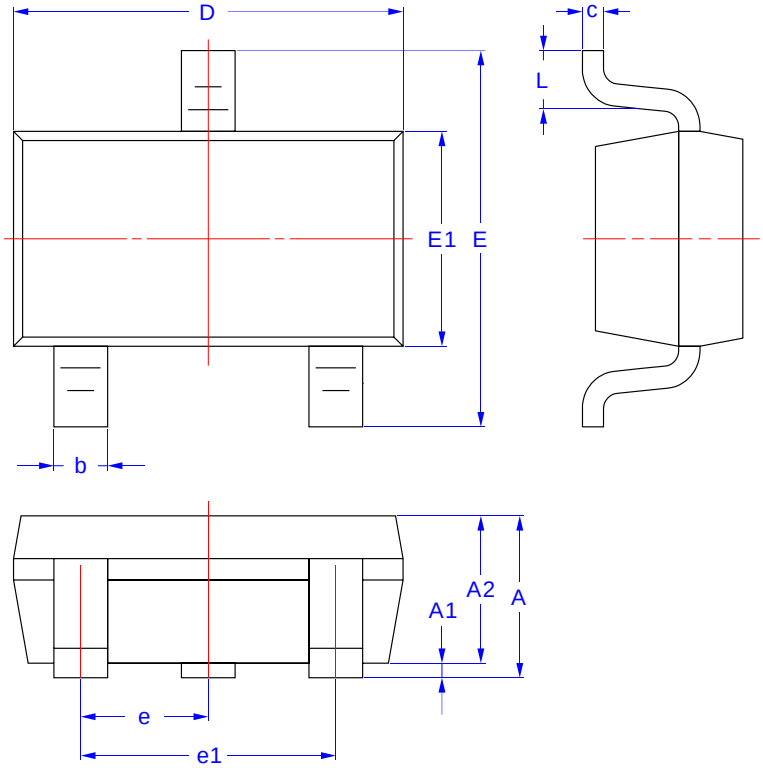


Fig.11 Unclamped Inductive Switching Waveform

5. Package Mechanical Data

SOT23-3L Package



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	1.00	1.45
A1	0.00	0.15
A2	1.00	1.30
D	2.70	3.10
E	2.60	3.00
E1	1.50	1.70
c	0.08	0.25
b	0.30	0.50
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60