快捷芯
KUAIJIEXIN

KJ5N50K

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

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

Applications

High frequency switching mode power supply
Electronic ballast
LED power supply

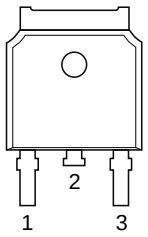
Quick reference

V_{DS} = 500 V
I_D = 5 A
$R_{DS(ON)}$ ≦ 1.5 Ω @ V_{GS}=10 V（Type: 1.2 Ω）

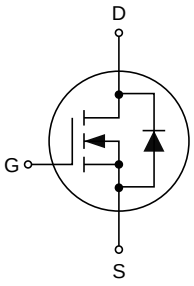
Pin Description

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(pcs)
KJ5N50K	TO-252	KJ5N50K XXXXXX	13"	16 mm	2500

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current Continuous	5	A
I_{DM}	Pulsed Drain Current [2]	20	A
I_{AR}	Repetitive Avalanche Current [2]	5	A
E_{AS}	Single Pulse Avalanche Energy [3]	300	mJ
E_{AR}	Repetitive Avalanche Energy [2]	7.3	mJ
dV/dt	Peak Diode Recovery dV/dt [4]	4.5	V/ns
P_D	Power Dissipation	125	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	℃

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L = 21.5 mH, I_{AS} = 5 A, V_{DD} = 50 V, R_G = 25 Ω, Starting T_J = 25°C
4. I_{SD} ≤ 5 A, di/dt ≤ 200 A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

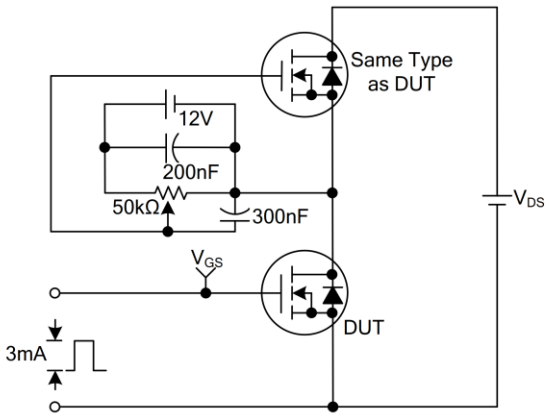
3. Electrical Characteristics (T_C=25℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0 V, I_D=250 μA	500	-	-	V
$\triangle BV_{DSS}/\triangle T_J$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=250 μA	-	0.5	-	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=500 V, V_{GS}=0 V	-	-	1	μA
		V_{DS}=400 V, T_C=125℃	-	-	10	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0 V, V_{GS}=±30 V	-	-	±100	nA
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS}=V_{GS}, I_D=250 μA	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS}=10 V, I_D=2.5 A	-	1.2	1.5	Ω
C_{iss}	Input Capacitance	V_{GS}=0 V, V_{DS}=25 V, f=1.0 MHz	-	480	625	pF
C_{oss}	Output Capacitance		-	80	105	
C_{rss}	Reverse Transfer Capacitance		-	15	20	
Q_g	Total Gate Charge	V_{DS}=400 V, V_{GS}=10 V, I_D=5 A [1,2]	-	18	24	nC
Q_{gs}	Gate-Source Charge		-	2.2	-	
Q_{gd}	Gate-Drain Charge		-	9.7	-	
t_d(on)	Turn-on Delay Time	V_{DD}=250 V, I_D=5 A, R_G=25 Ω [1,2]	-	12	35	ns
t_r	Turn-on Rise Time		-	46	100	
t_d(off)	Turn-off Delay Time		-	50	110	
t_f	Turn-off Fall Time		-	48	105	
I_S	Maximum Continuous Drain-Source Diode Forward Current		-	-	5	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		-	-	20	A
V_{SD}	Drain-Source 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	-	83	-	ns
Q_{rr}	Reverse Recovery Charge		-	0.25	-	μC

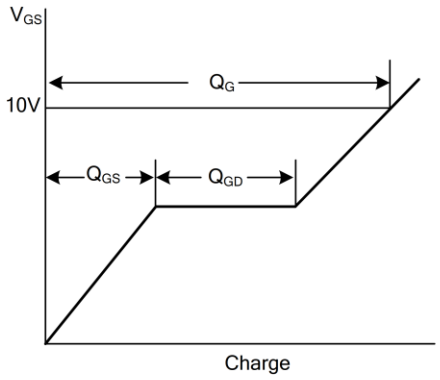
Note:

1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
2. Essentially independent of operating temperature

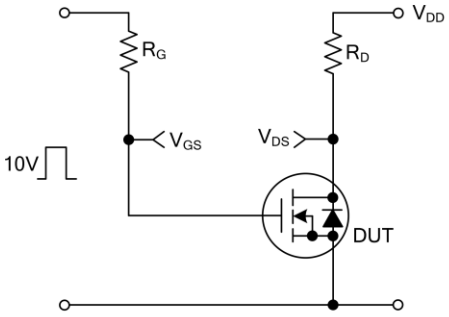
4. Test Circuits and Waveforms



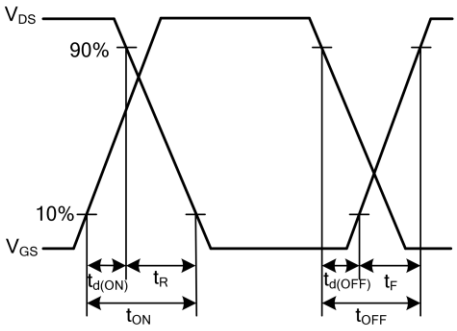
Gate Charge Test Circuit



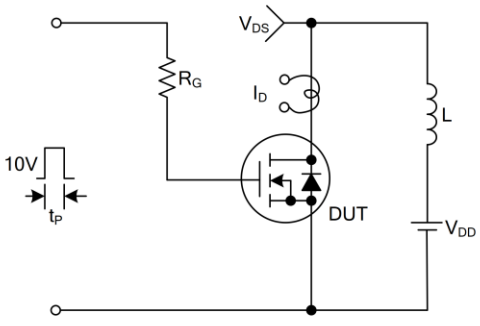
Gate Charge Waveforms



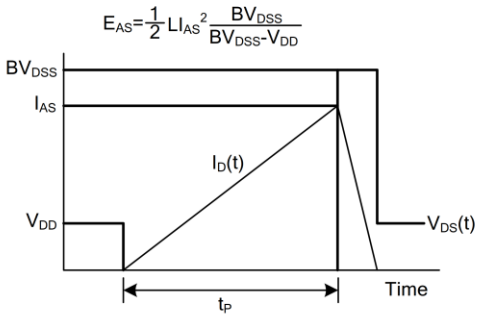
Resistive Switching Test Circuit



Resistive Switching Waveforms

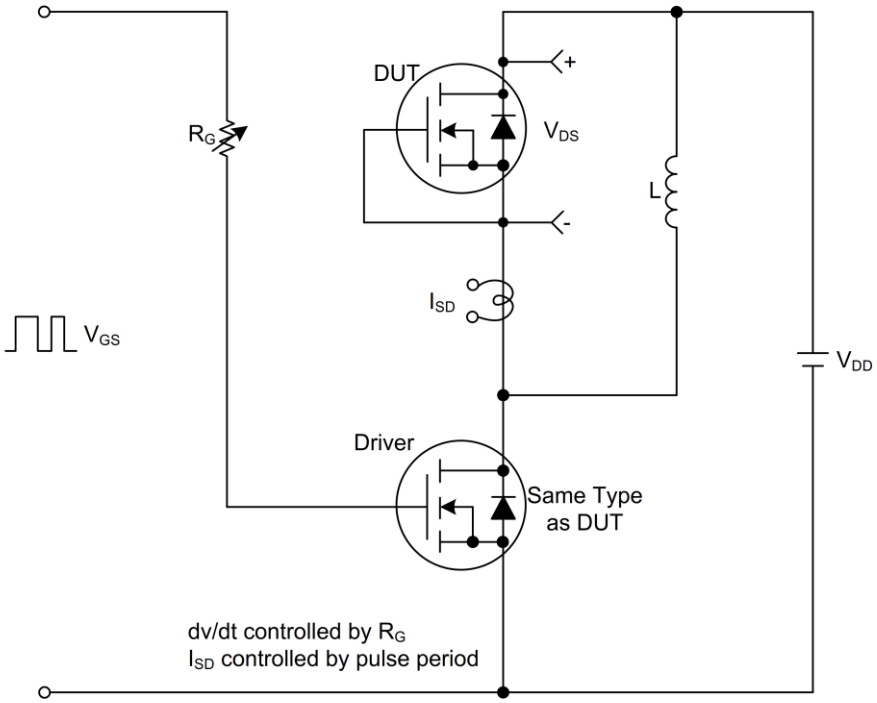


Unclamped Inductive Switching Test Circuit

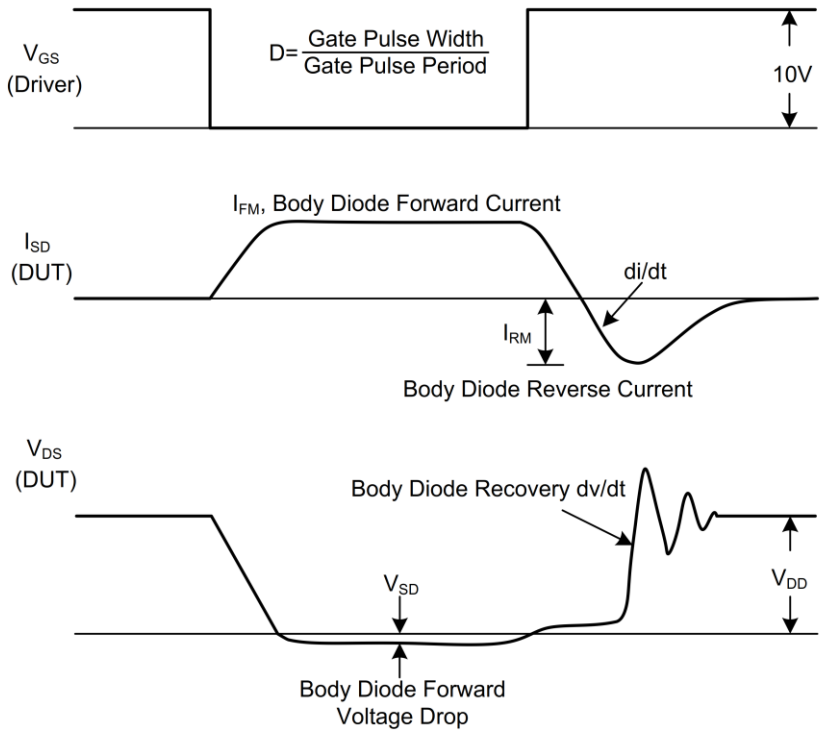


Unclamped Inductive Switching Waveforms

4. Test Circuits and Waveforms (Cont.)



Peak Diode Recovery dv/dt Test Circuit & Waveforms



5. Package Mechanical Data

TO-252 Package