

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

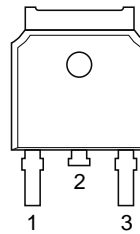
Quick reference

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

Pin Description

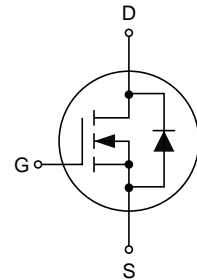
Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

Simplified Outline



Top View
TO-252

Symbol



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity
KJ5N50K	TO-252	KJ5N50K XXXXYY	-	-	2500

2. Absolute Maximum Ratings (T_C=25°C 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	°C

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/ μ s, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

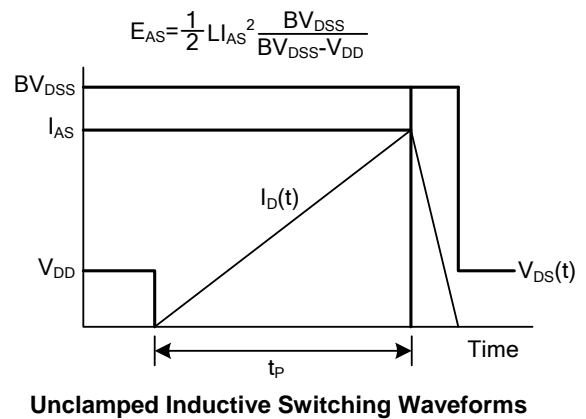
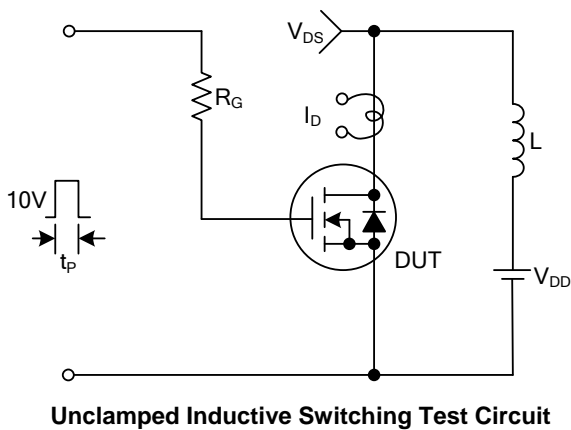
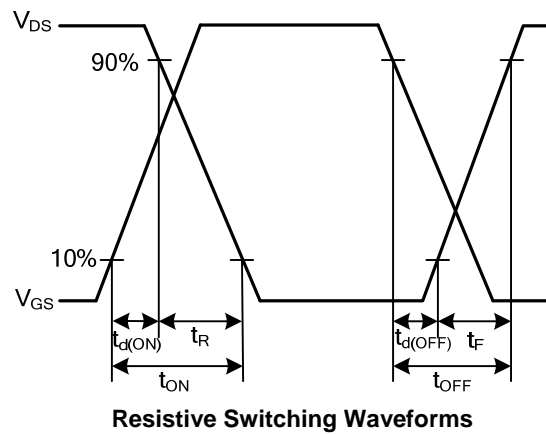
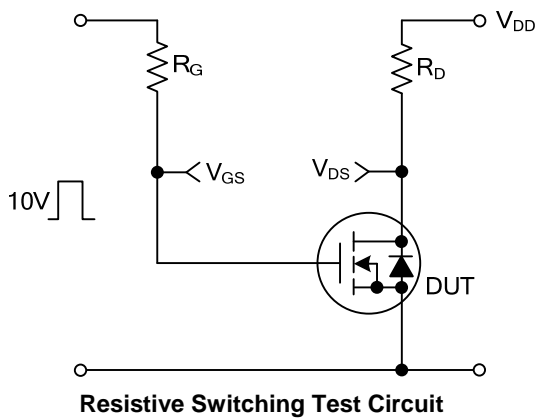
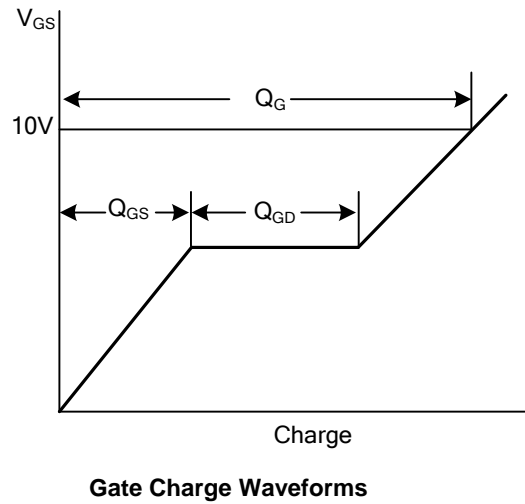
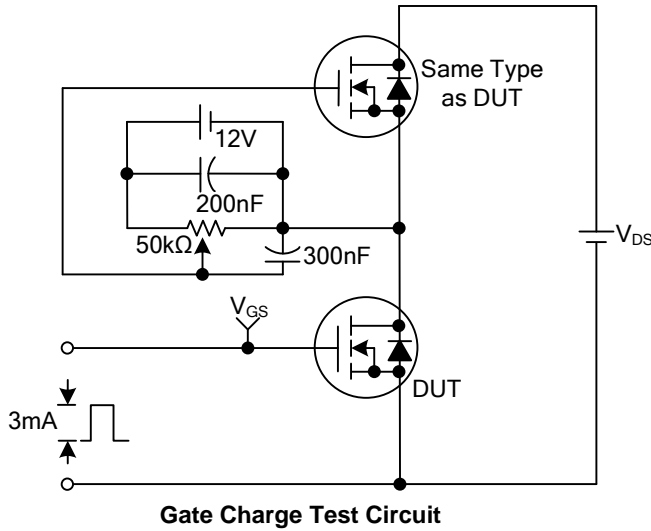
3. Electrical Characteristics (T_C=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	500	-	-	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =250 μA	-	0.5	-	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =500 V, V _{GS} =0 V	-	-	1	μA
		V _{DS} =400 V, T _C =125°C	-	-	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

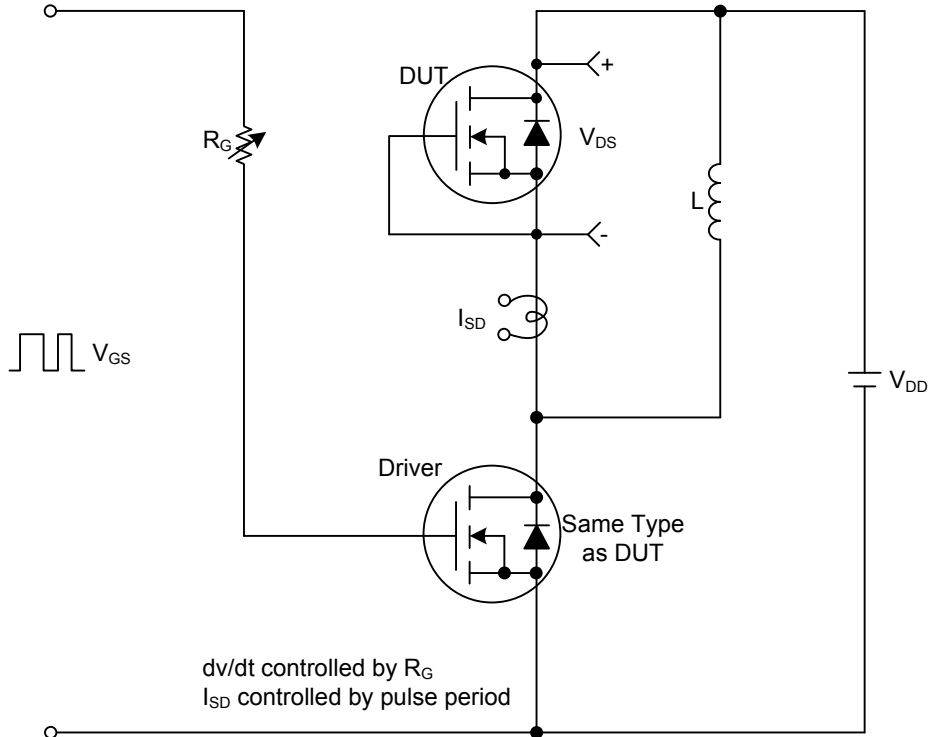
Note:

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

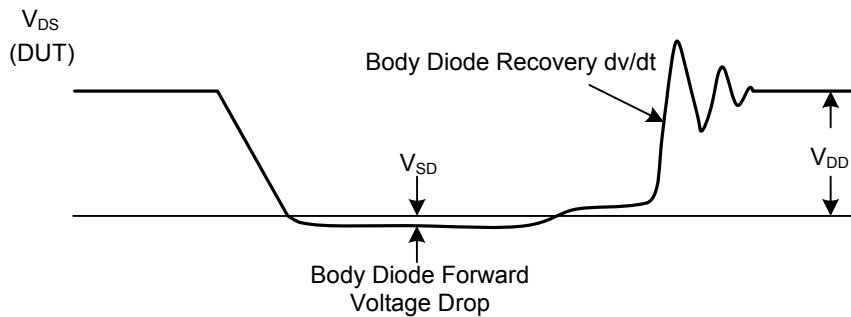
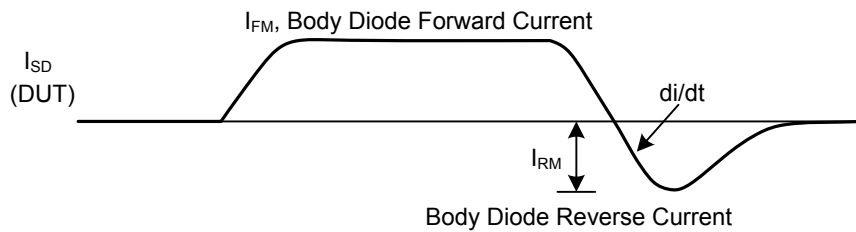
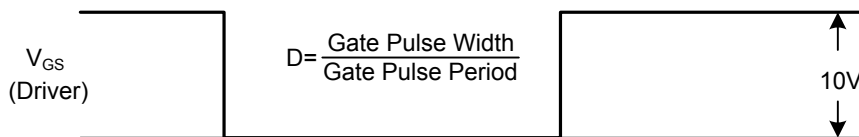
4. Test Circuits and Waveforms



4. Test Circuits and Waveforms (Cont.)



Peak Diode Recovery dv/dt Test Circuit & Waveforms



5. Package Mechanical Data

TO-252 Package

