



SK11N50-T

11A, 500V N-CHANNEL POWER MOSFET

DESCRIPTION

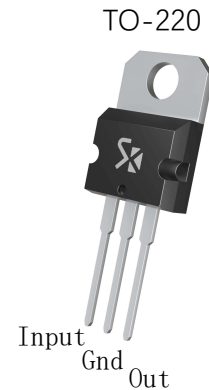
The SK11N50-T is a high voltage power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in switching power supplies and adaptors.

Features

- $R_{DS(ON)} \leq 0.7 \Omega$ @ $V_{GS}=10V$, $I_D=5A$
- Fast switching capability
- Avalanche energy tested
- Improved dv/dt capability, high ruggedness

Mechanical data

- Case: TO-220
- Lead free finish, RoHS compliant
- Case Material: "Green" molding compound, UL flammability classification 94V-0, "Halogen-free".



ABSOLUTE MAXIMUM RATINGS (TA=25°C, unless otherwise specified)

Parameter	Description	Min.	Typ.	Max.	Unit	Test Condition
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	500	—	—	V	$V_{GS}=0V$, $I_D=250\mu A$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	—	0.55	0.7	Ω	$V_{GS}=10V$, $I_D=5A^{**}$
$V_{GS(th)}$	Gate Threshold Voltage	2	3	4	V	$V_{DS}=V_{GS}$, $I_D=250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	1	μA	$V_{DS}=500V$, $V_{GS}=0V$
I_{GSS}	Gate-Body Leakage Current	—	—	± 100	nA	$V_{DS}=0V$, $V_{GS}=\pm 30V$
T_J , T_{STG}	Operating and Storage Temperature Range	-55°C to 150°C Max				

Notes: 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. $L = 1mH$, $I_{AS} = 3.4A$, $V_{DD} = 50V$, $R_G = 20\Omega$, Starting $T_J = 25^\circ C$

4. $ISD \leq 11A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BVDSS$, Starting $T_J = 25^\circ C$



D.U.T.

V_{DS}

I_{SD}

V_{GS}

R_G

Driver

Same Type as D.U.T.

V_{DD}

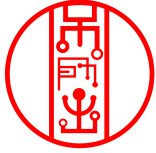
- * dv/dt controlled by R_G
- * I_{SD} controlled by pulse period
- * D.U.T.-Device Under Test

Timing diagram for a MOSFET switching a load inductor. The diagram shows three waveforms: V_{GS} (Driver), I_{SD} (D.U.T), and V_{DS} (D.U.T).

- V_{GS} (Driver): A square wave with period and pulse width (P.W.) indicated. The duty cycle is given by $D = \frac{P.W.}{\text{Period}}$. The peak voltage is $V_{GS} = 10V$.
- I_{SD} (D.U.T): The MOSFET current. It shows the MOSFET current during the on-state (I_{FM} , Body Diode Forward Current) and the reverse current during the switching transient (I_{RM} , Body Diode Reverse Current). The reverse current is labeled di/dt .
- V_{DS} (D.U.T): The drain-source voltage. It shows the forward voltage drop during the on-state and the reverse voltage (V_{DD}) during the switching transient. The reverse voltage is labeled V_{DD} .

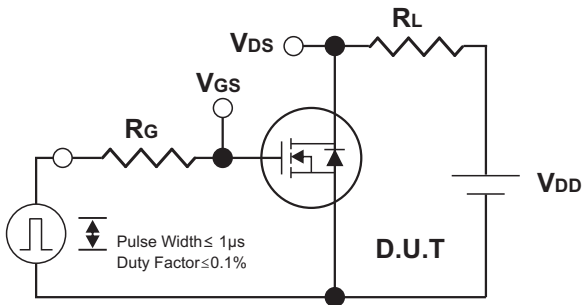
The diagram also indicates the body diode forward current and reverse current, and the di/dt during the reverse current phase.

2 of 4

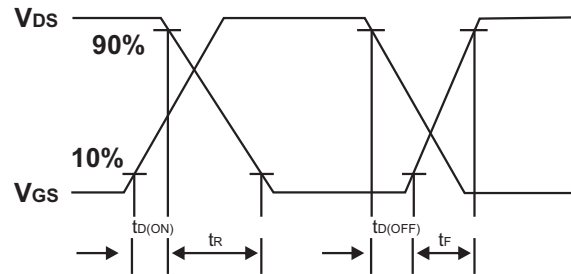


SK11N50-T

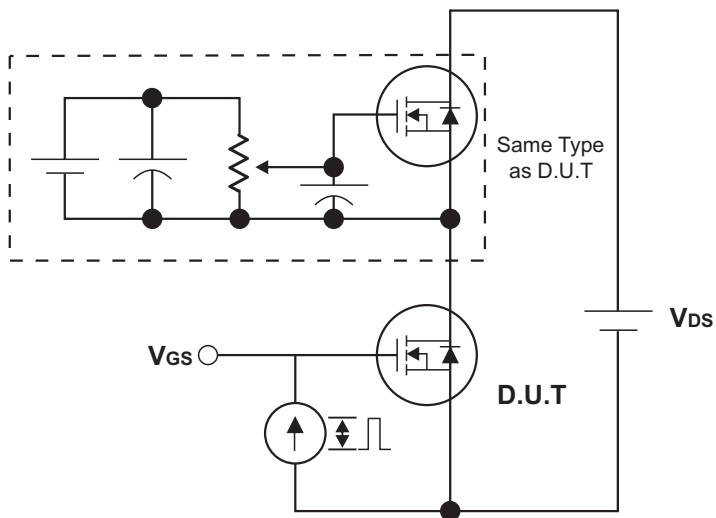
Test Circuits and waveforms



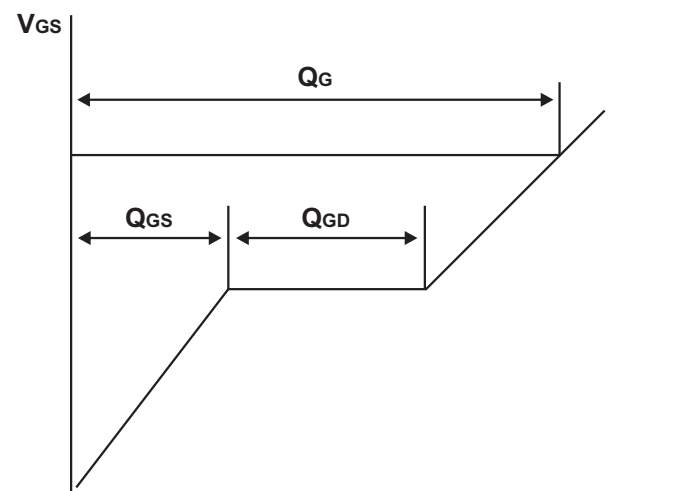
Switching Test Circuit



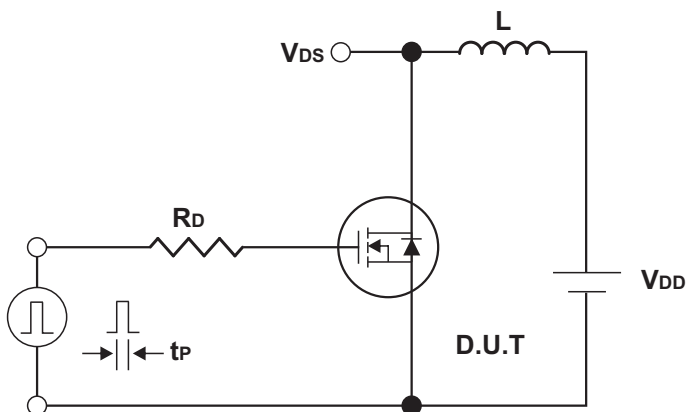
Switching Waveforms



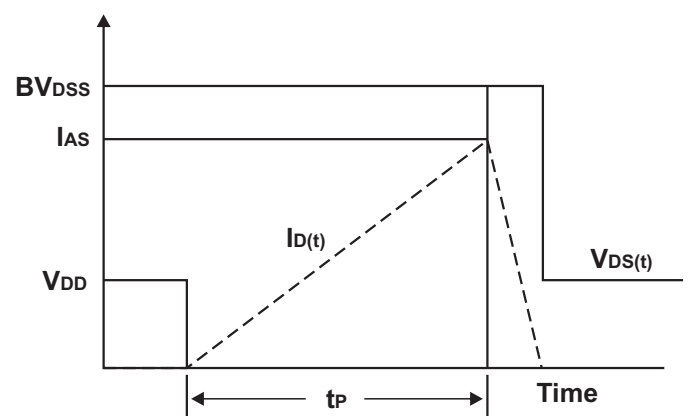
Gate Charge Test Circuit



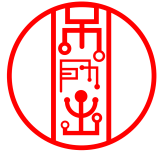
Charge
Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

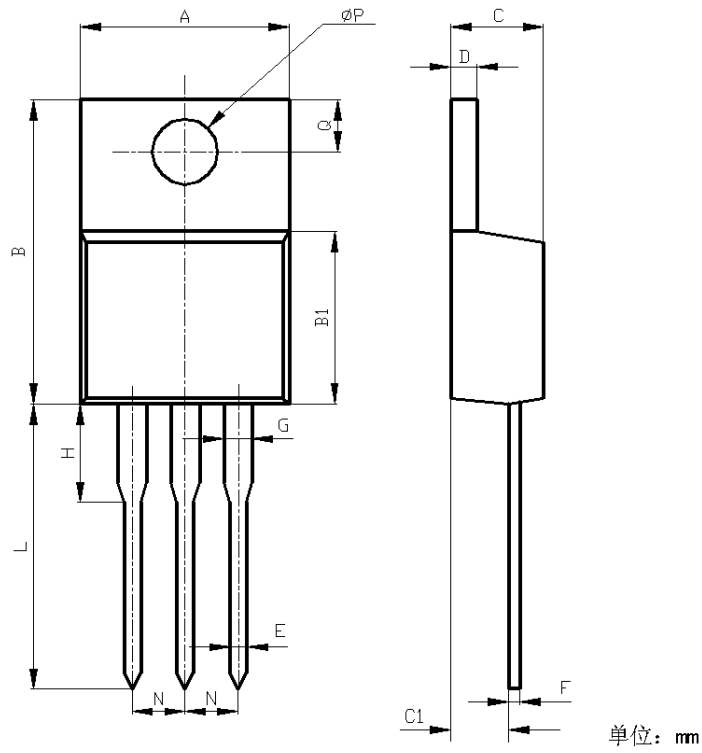


Unclamped Inductive Switching Waveforms



SK11N50-T

TO-220



	Unit (mm)	
	MIN	MAX
A	10.1	10.5
B	15.2	15.6
B1	9.00	9.40
C	4.40	4.60
C1	2.40	3.00
D	1.20	1.40
E	0.70	0.90
F	0.40	0.60
G	1.17	1.37
H	3.30	3.80
L	13.1	13.7
N	2.34	2.74
Q	2.40	3.00
Ø P	3.70	3.90