

### General Description

This planar stripe MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for switch mode power supplies and low power battery chargers.

### FEATURES

- $V_{DSS} = 600V$ ,  $I_D = 0.4A$
- Drain-Source ON Resistance :  
 $R_{DS(ON)} = 6.5$  (Typ.), @  $V_{GS} = 10V$

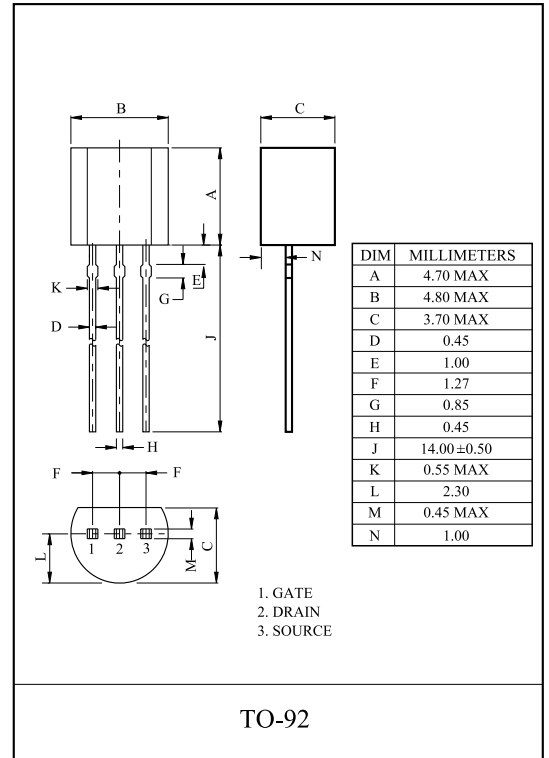
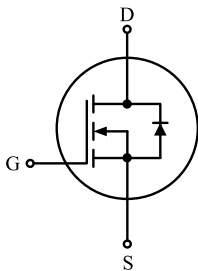
### MOSFET MAXIMUM RATING (Ta=25 Unless otherwise noted)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	600	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	V
Drain Current	DC	$I_D$	0.4 A
	Pulsed (Note1)	$I_{DP}$	1.6 A
Single Pulsed Avalanche Energy (Note 2)	$E_{AS}$	25	mJ
Drain-Source Diode Forward Current	$I_S$	0.4	A
Drain Power Dissipation ( $T_C=25$ )	$P_D$	3	W
Maximum Junction Temperature	$T_j$	-55~150	
Storage Temperature Range	$T_{stg}$	-55~150	
<b>Thermal Characteristics</b>			
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	120	/W

Note 1) Pulse Test : Pulse width  $10\mu s$ , Duty cycle 1%

Note 2) Starting  $T_j=25$ ,  $I_D=1A$ ,  $V_{DD}=50V$

### Equivalent Circuit



# KHB1D0N60G

## MOSFET ELECTRICAL CHARACTERISTICS (Ta=25 Unless otherwise noted)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\ \mu A, V_{GS}=0V$	600	-	-	V
Drain Cut-off Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V$	-	-	100	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{th}$	$V_{DS}=V_{GS}, I_D=250\ \mu A$	2	-	4	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=0.5A$	-	6.5	8	
Forward Transconductance	$g_{FS}$	$V_{DS}=15V, I_D=0.5A$	-	1	-	S
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	-	156	-	pF
Output Capacitance	$C_{oss}$		-	23.5	-	
Reverse Transfer Capacitance	$C_{rss}$		-	3.8	-	
Total Gate Charge	$Q_g$	$V_{DS}=480V, I_D=1A, V_{GS}=10V$	-	7	9	nC
Gate-Source Charge	$Q_{gs}$		-	1.1	-	
Gate-Drain Charge	$Q_{gd}$		-	3.7	-	
Turn-on Delay time	$t_{d(on)}$	$V_{DD}=300V, I_D=1A, R_G=25$	-	6.5	-	ns
Turn-on Rise time	$t_r$		-	10	-	
Turn-off Delay time	$t_{d(off)}$		-	22	-	
Turn-off Fall time	$t_f$		-	40	-	

## ELECTRICAL CHARACTERISTICS (Ta=25 Unless otherwise noted)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	$V_{DS}$	$I_{SD}=1A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	$T_{rr}$	$V_{GS}=0V, I_S=1A, dI_F/dt=100A/\mu s$	-	140	-	ns

Upper electrical characteristics can be changed because these are tentative specifications.

Graphs are omitted because these are tentative specifications.

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Fig1.  $I_D - V_{DS}$

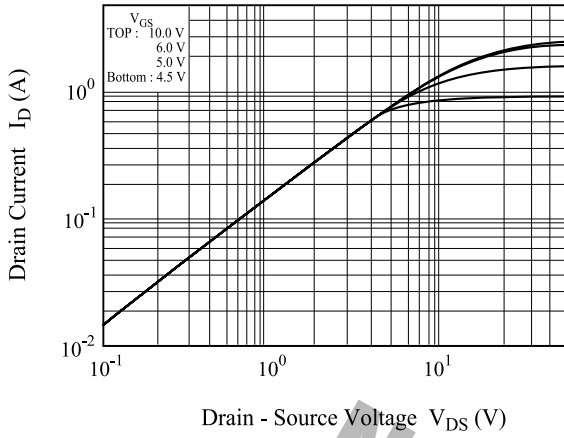


Fig2.  $I_D - V_{GS}$

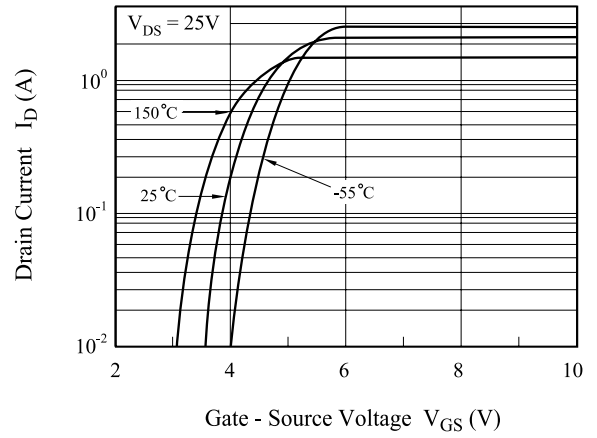


Fig3.  $BV_{DSS} - T_j$

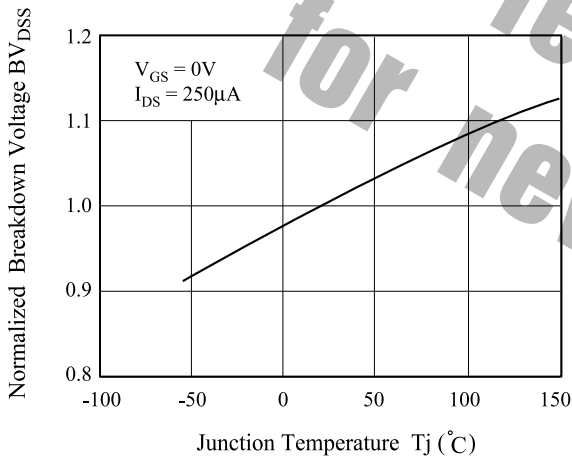


Fig4.  $R_{DS(ON)} - I_D$

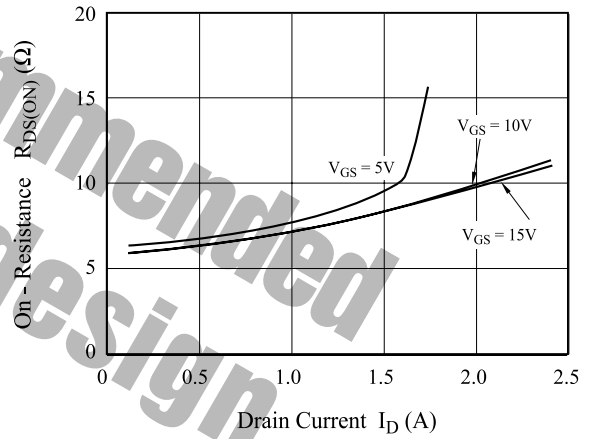


Fig5.  $I_S - V_{SD}$

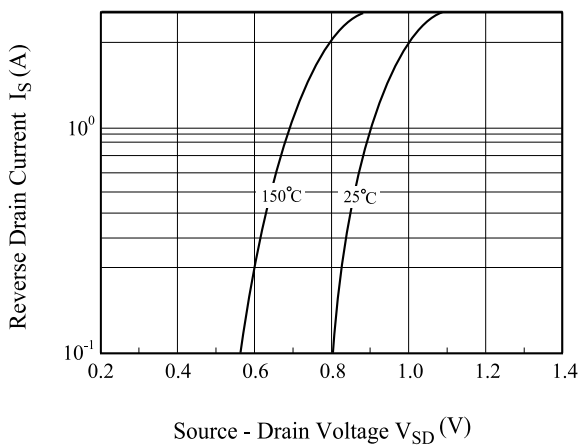
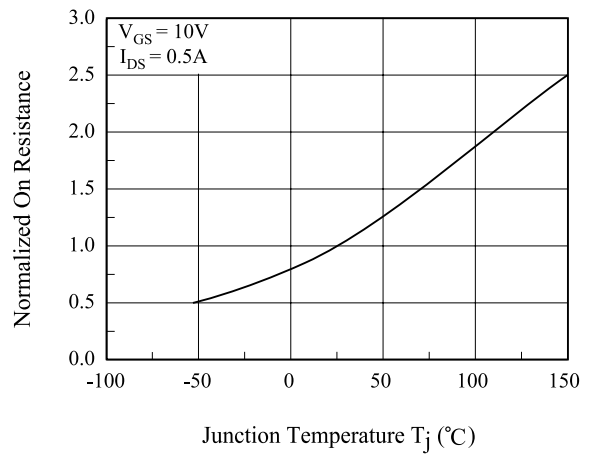
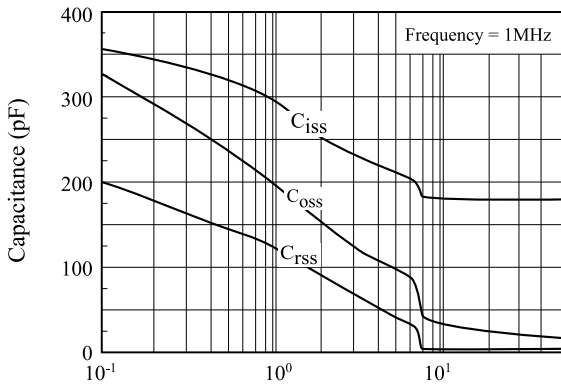


Fig6.  $R_{DS(ON)} - T_j$



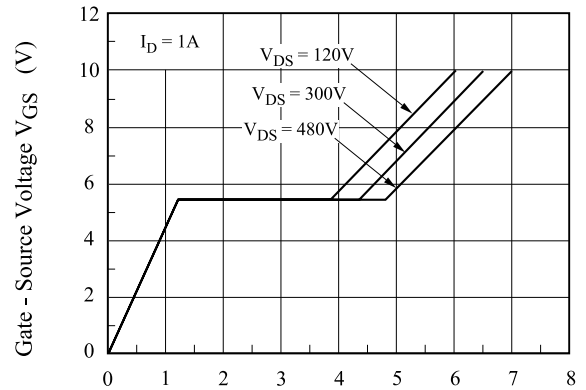
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Fig7. C - V<sub>DS</sub>



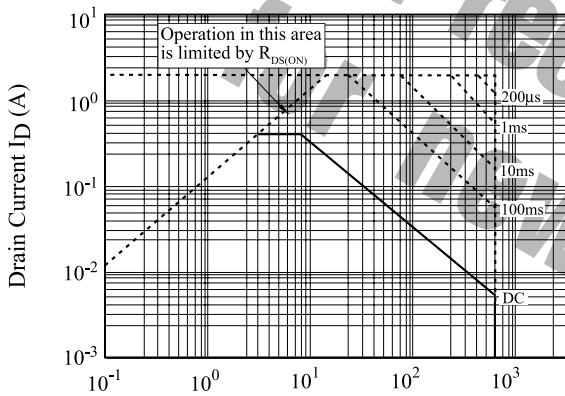
Drain - Source Voltage V<sub>DS</sub> (V)

Fig8. Q<sub>g</sub>- V<sub>GS</sub>



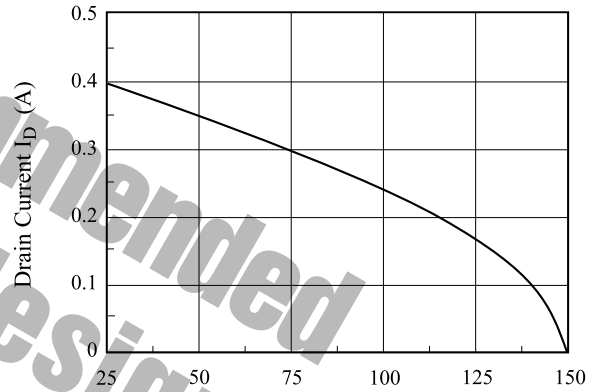
Gate - Charge Q<sub>g</sub> (nC)

Fig9. Safe Operation Area



Drain - Source Voltage V<sub>DS</sub> (V)

Fig10. I<sub>D</sub> - T<sub>C</sub>



Case Temperature T<sub>C</sub> (°C)

Fig11. Transient Thermal Response Curve

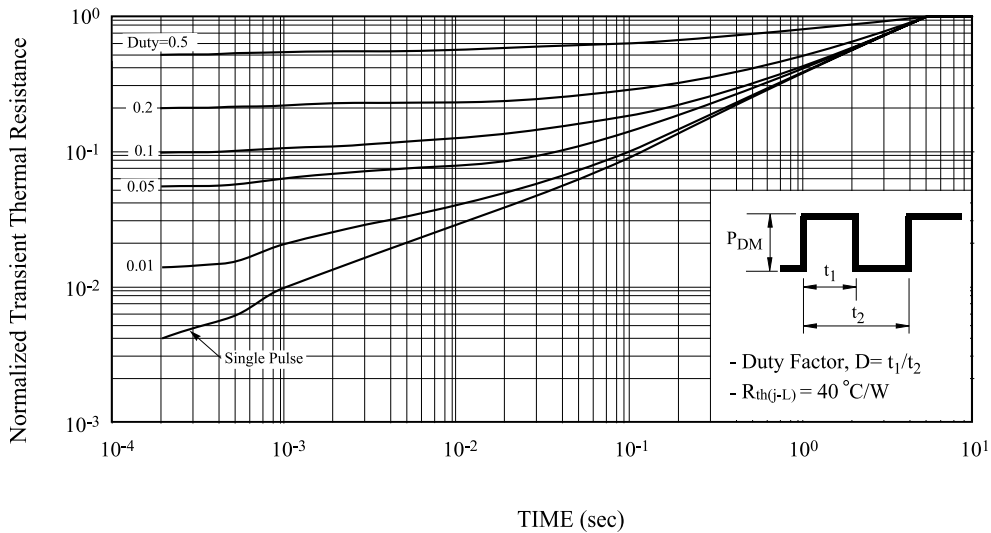


Fig12. Gate Charge

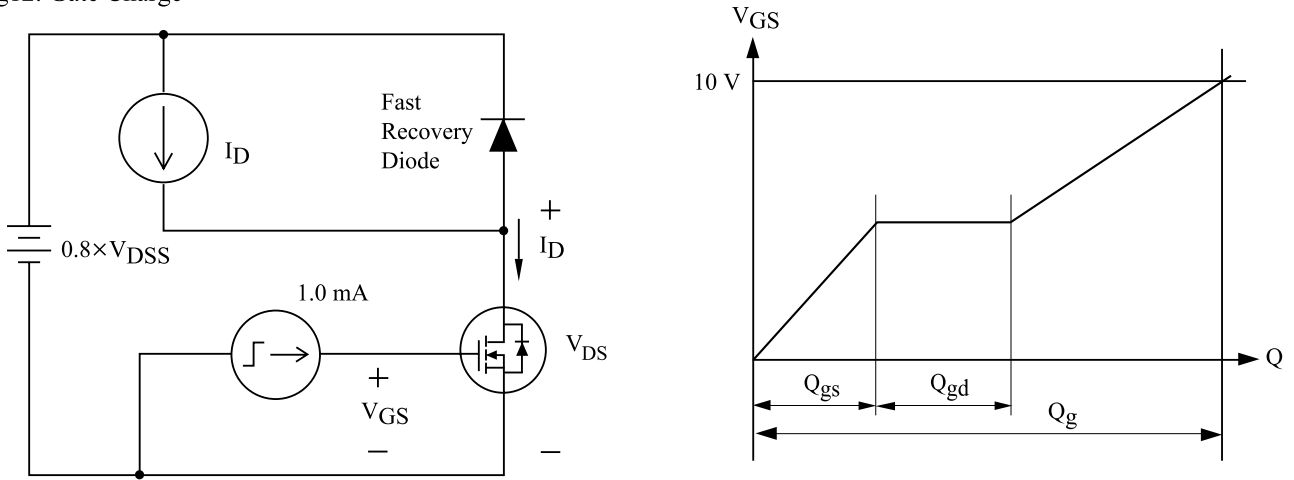


Fig13. Single Pulsed Avalanche Energy

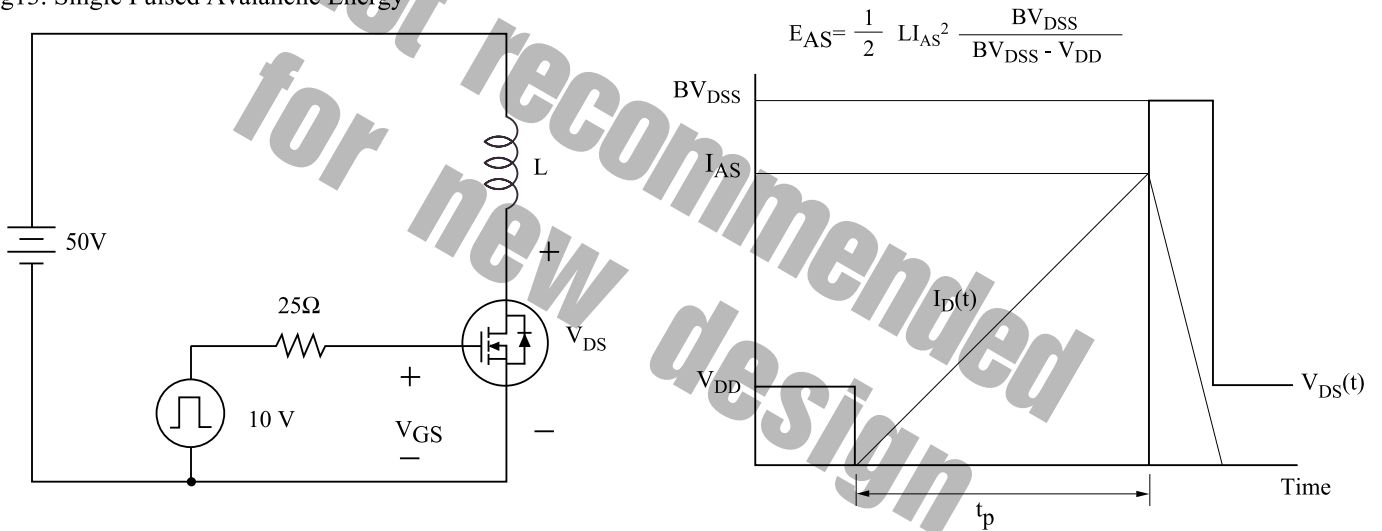
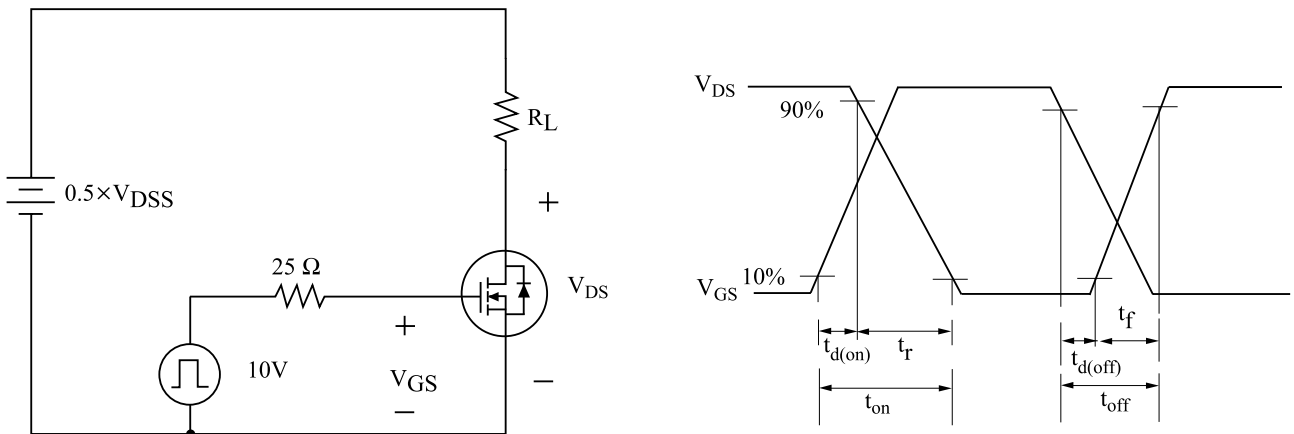
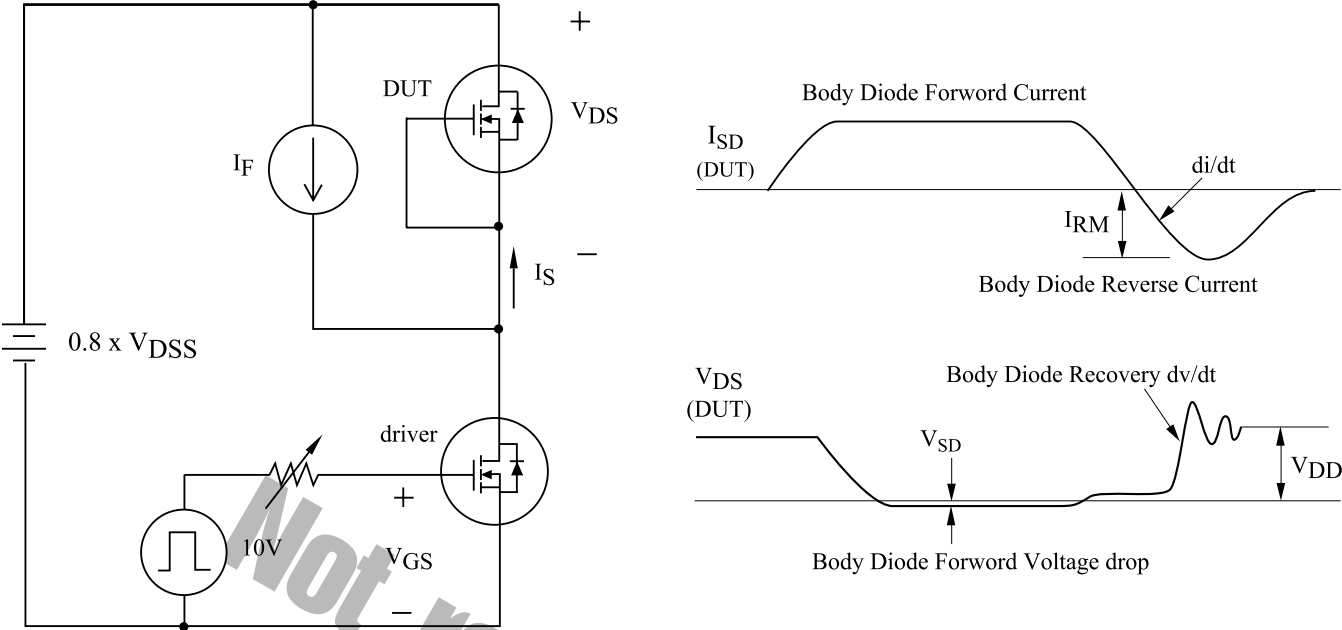


Fig14. Resistive Load Switching



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Fig15. Source - Drain Diode Reverse Recovery and dv /dt



Not recommended for new design