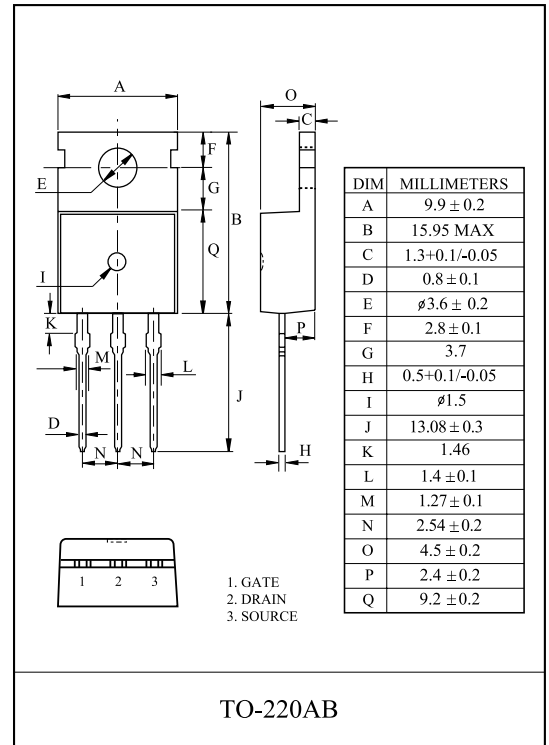


General Description

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 active power factor correction, electronic lamp ballasts based on half bridge topology and switching mode power supplies.

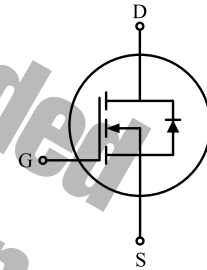
FEATURES

- $V_{DSS} = 60V$, $I_D = 50A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 0.022$ @ $V_{GS} = 10V$
- $Q_g(\text{typ.}) = 32nC$
- Improved dv/dt capacity, high Ruggedness
- Maximum Junction Temperature Range (175 °C)



MAXIMUM RATING (Tc=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	@Tc=25	50	A
	@Tc=100	35	
	Pulsed (Note1)	200	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	493	mJ
Repetitive Avalanche Energy (Note 1)	E_{AR}	12	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	7.0	V/ns
Drain Power Dissipation	Tc=25	120	W
	Derate above 25	0.8	W/°C
Maximum Junction Temperature	T_j	175	
Storage Temperature Range	T_{stg}	-55 ~ 175	
Thermal Characteristics			
Thermal Resistance, Junction-to-Case	R_{thJC}	1.24	/W
Thermal Resistance, Case-to-Sink	R_{thCS}	0.5	/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	/W



KMB050N60P

ELECTRICAL CHARACTERISTICS (T_c=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250 μA, V _{GS} =0V	60	-	-	V
Breakdown Voltage Temperature Coefficient	BV _{DSS} /T _j	I _D =250 μA, Referenced to 25	-	0.07	-	V/°C
Drain Cut-off Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V,	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250 μA	2.0	-	4.0	V
Gate Leakage Current	I _{GSS}	V _{GS} = ± 20V, V _{DS} =0V	-	-	± 100	nA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =25A	-	0.018	0.022	
Dynamic						
Total Gate Charge	Q _g	V _{DS} = 48V, I _D = 50A V _{GS} =10V (Note4,5)	-	32	42	nC
Gate-Source Charge	Q _{gs}		-	8	-	
Gate-Drain Charge	Q _{gd}		-	12	-	
Turn-on Delay time	t _{d(on)}	V _{DD} = 30V I _D =25A R _G = 25 (Note4,5)	-	20	50	ns
Turn-on Rise time	t _r		-	100	210	
Turn-off Delay time	t _{d(off)}		-	80	170	
Turn-off Fall time	t _f		-	85	180	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	1050	1365	pF
Reverse Transfer Capacitance	C _{rss}		-	70	90	
Output Capacitance	C _{oss}		-	460	600	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	50	A
Pulsed Source Current	I _{SP}		-	-	200	
Diode Forward Voltage	V _{SD}	I _S =50A, V _{GS} =0V	-	-	1.5	V
Reverse Recovery Time	t _{rr}	I _S =50A, V _{GS} =0V,	-	50	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/μs	-	70	-	μC

Note 1) Repetivity rating : Pulse width limited by junction temperature.

Note 2) L=230mH, I_S=50A, V_{DD}=25V, R_G=25 Ω, Starting T_j=25 °C.

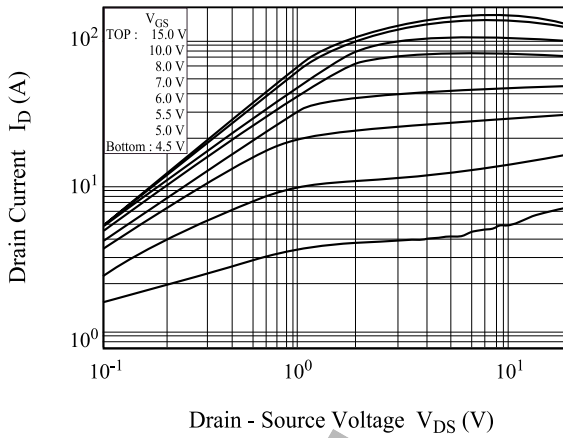
Note 3) I_S 50A, dI/dt 300A/μs, V_{DD} BV_{DSS}, Starting T_j=25 °C.

Note 4) Pulse Test : Pulse width 300μs, Duty Cycle 2%.

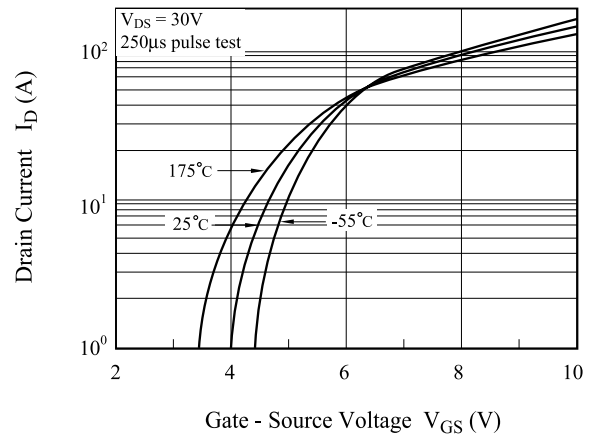
Note 5) Essentially independent of operating temperature.

KMB050N60P

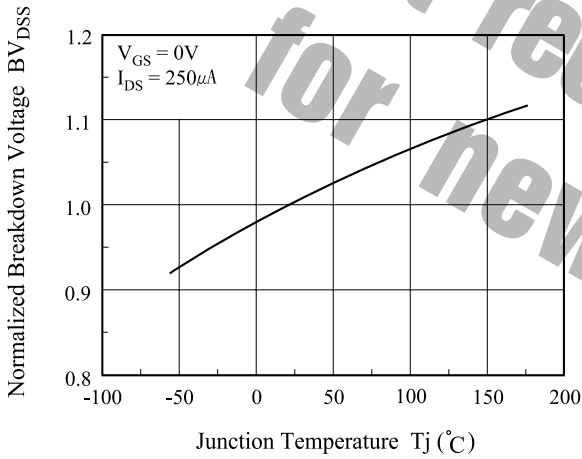
$I_D - V_{DS}$



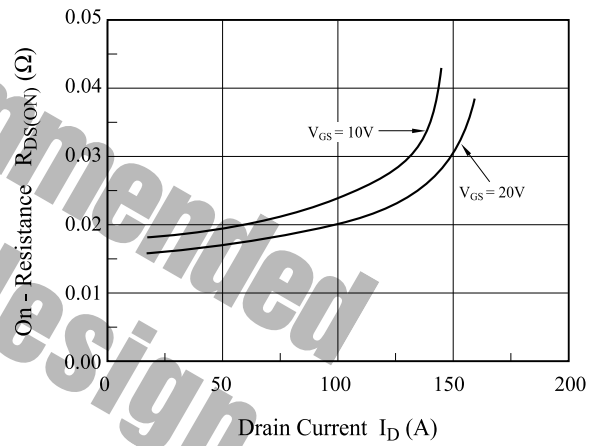
$I_D - V_{GS}$



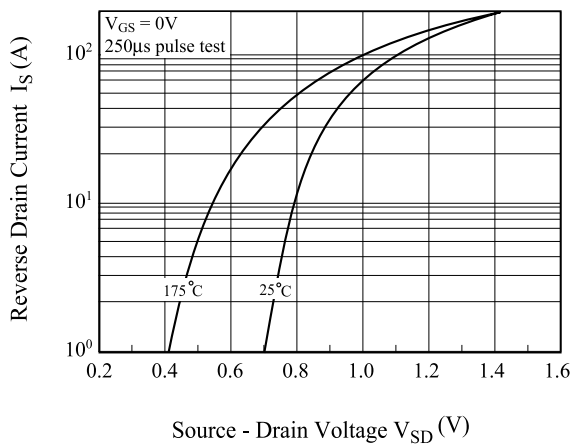
$BV_{DSS} - T_j$



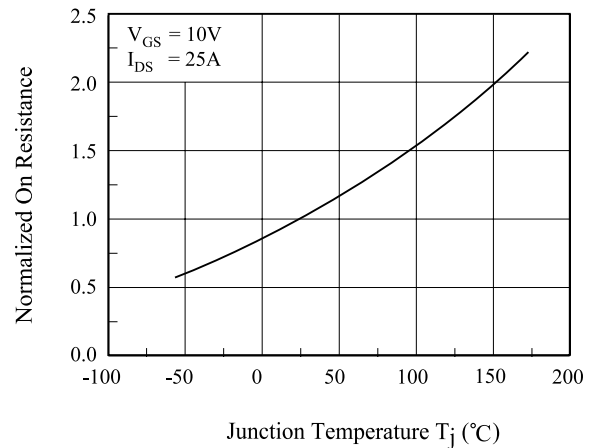
$R_{DS(ON)} - I_D$



$I_S - V_{SD}$

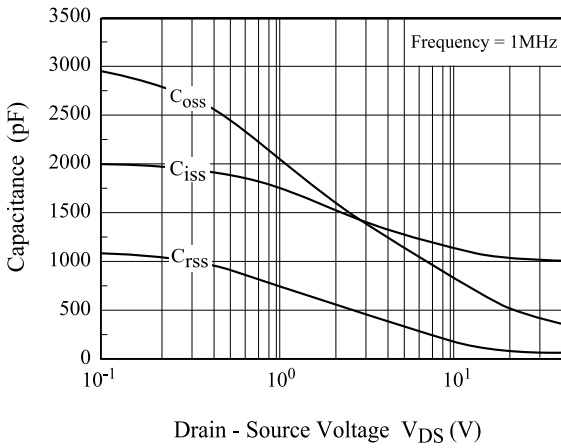


$R_{DS(ON)} - T_j$

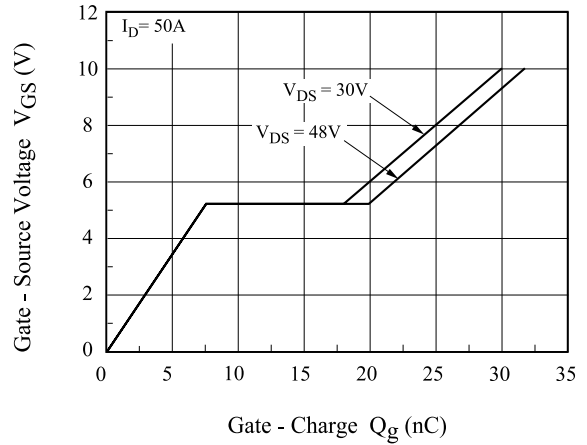


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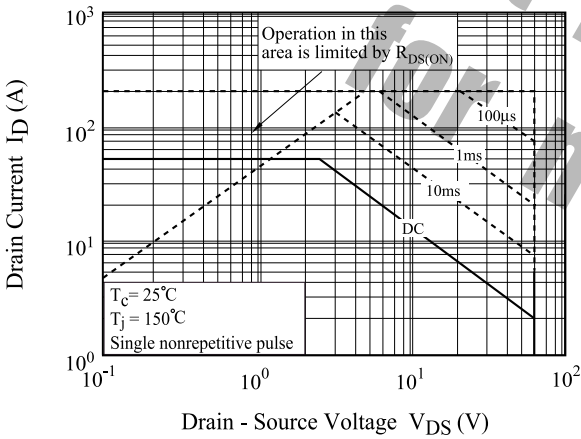
C - V_{DS}



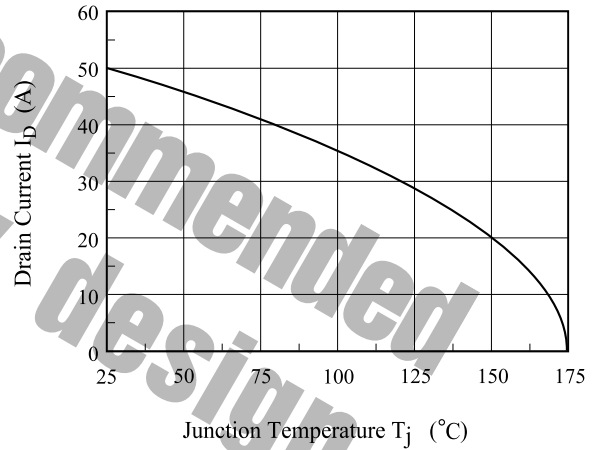
Q_g - V_{GS}



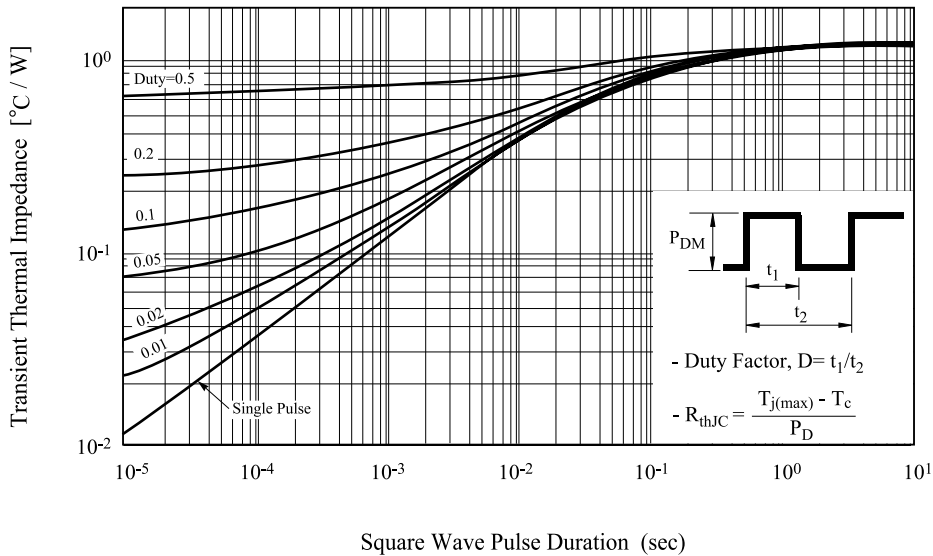
Safe Operation Area



I_D - T_j

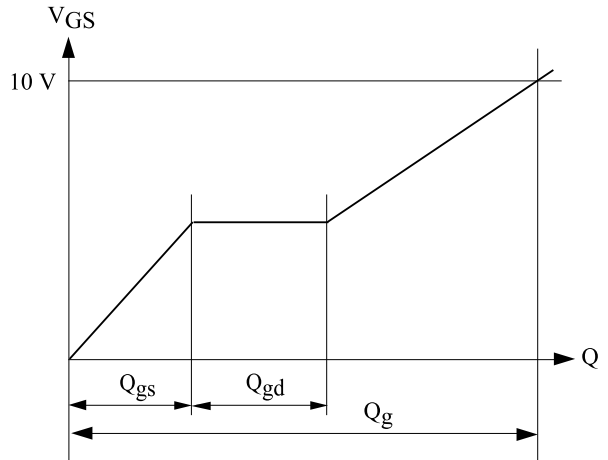
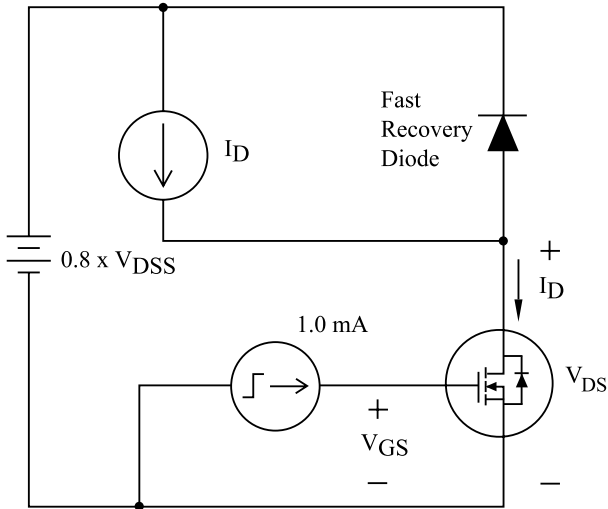


R_{th}

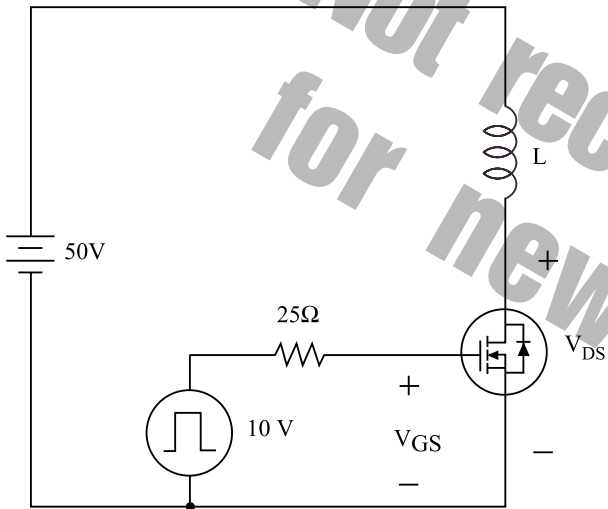


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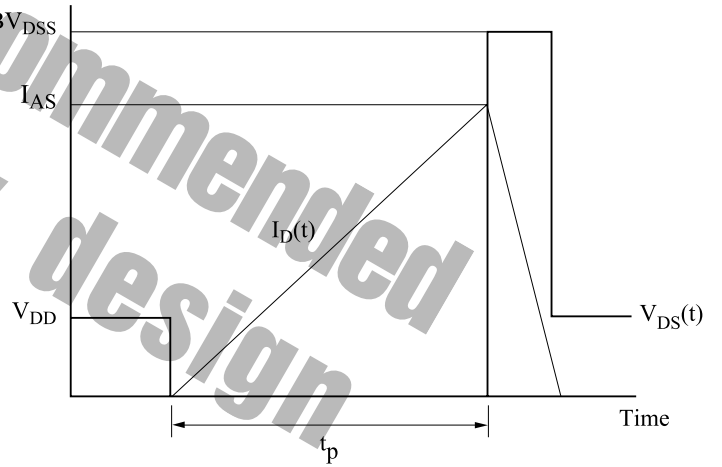
- Gate Charge



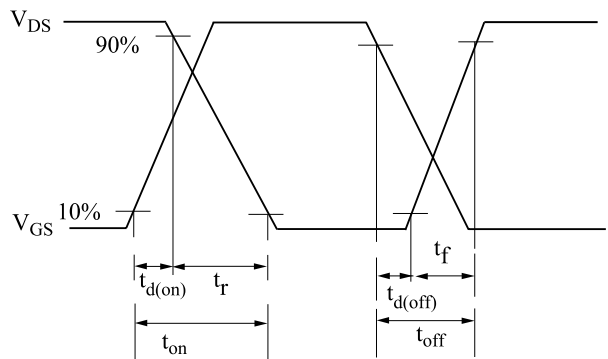
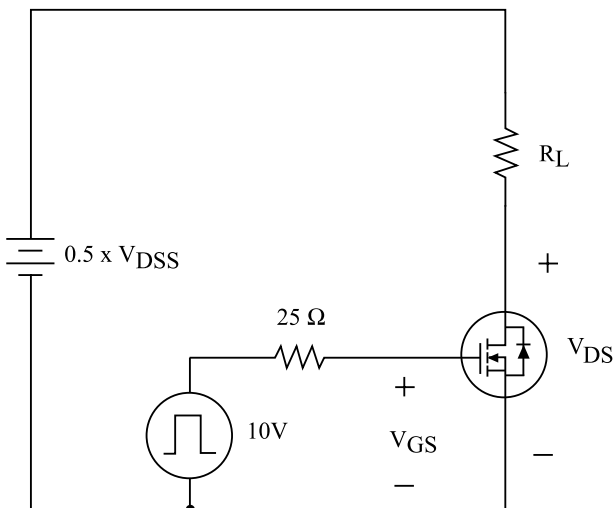
- Single Pulsed Avalanche Energy



$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

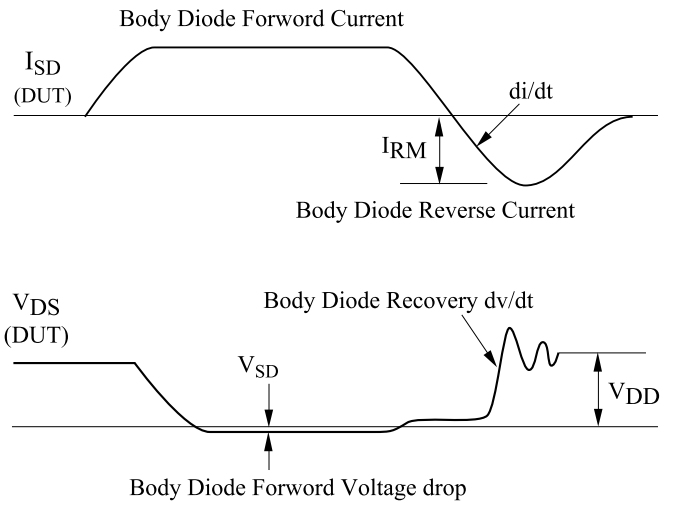
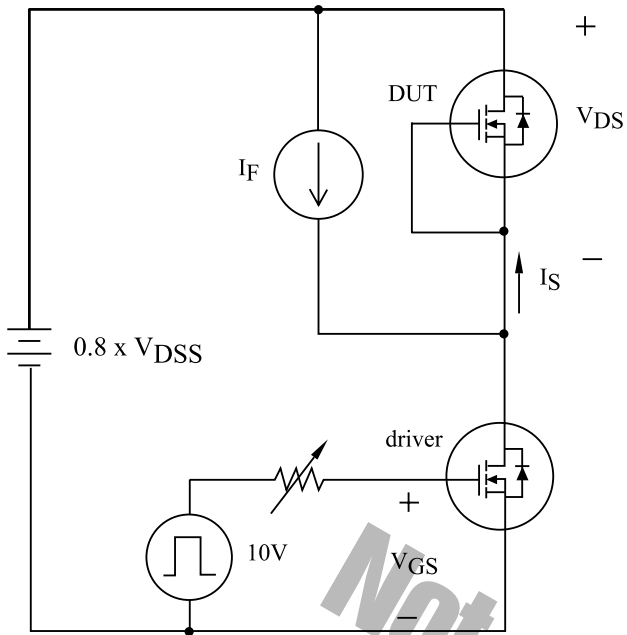


- Resistive Load Switching



KMB050N60P

- Source - Drain Diode Reverse Recovery and dv/dt



Not recommended for new design