

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 DC/DC Converters and switching mode power supplies.

FEATURES

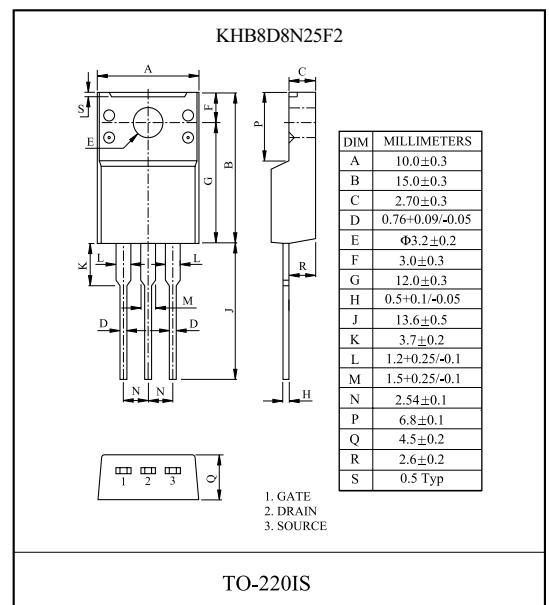
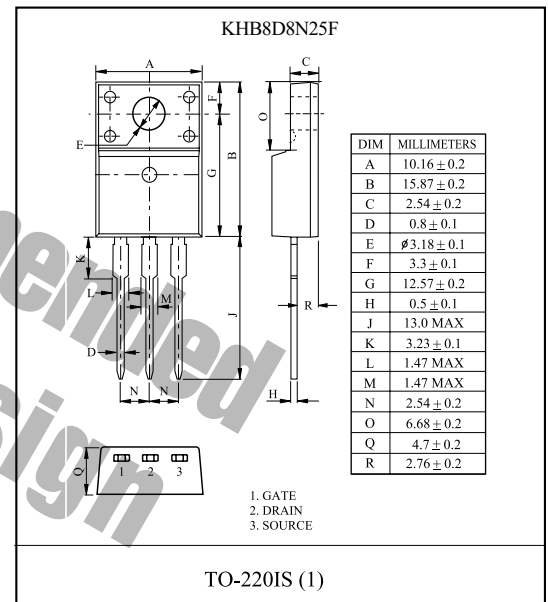
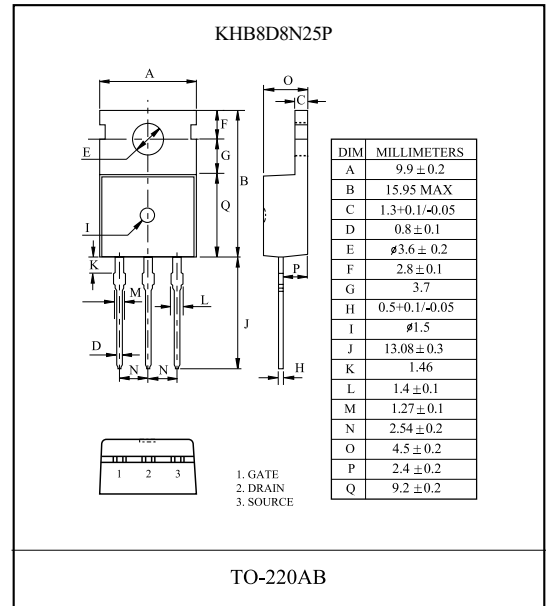
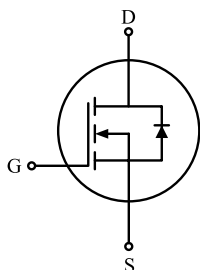
- $V_{DSS} = 250V$, $I_D = 8.8A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 450m \quad @V_{GS} = 10V$
- $Q_g(\text{typ.}) = 29.5nC$

MAXIMUM RATING (Ta=25)

CHARACTERISTIC	SYMBOL	RATING		UNIT
		KHB8D8N25P	KHB8D8N25F KHB8D8N25F2	
Drain-Source Voltage	V_{DSS}	250		V
Gate-Source Voltage	V_{GSS}	± 30		V
Drain Current	@ $T_C=25$	I_D 8.8	8.8*	A
	Pulsed (Note1)	I_{DP} 35.2	35.2*	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	285		mJ
Repetitive Avalanche Energy (Note 1)	E_{AR}	7.4		mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	5.5		V/ns
Drain Power Dissipation	Ta=25	P_D 74	38	W
	Derate above 25	0.59	0.3	W/
Maximum Junction Temperature	T_j	150		
Storage Temperature Range	T_{stg}	-55	150	
Thermal Characteristics				
Thermal Resistance, Junction-to-Case	R_{thJC}	1.69	3.29	/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	62.5	/W

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



KHB8D8N25P/F/F2

ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\ \mu A, V_{GS}=0V$	250	-	-	V
Breakdown Voltage Temperature Coefficient	BV_{DSS}/T_j	$I_D=250\ \mu A$, Referenced to 25	-	0.27	-	V/°C
Gate Threshold Voltage	V_{th}	$V_{DS}=V_{GS}, I_D=250\ \mu A$	2.0	-	4.0	V
Drain Cut-off Current	I_{DSS}	$V_{DS}=250V, V_{GS}=0V$,	-	-	10	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4.4A$	-	360	450	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=40V, I_D=4.4A$ (Note4)	-	7.6	-	S
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=200V, I_D=8.8A$ $V_{GS}=10V$ (Note4,5)	-	29.5	36.5	nC
Gate-Source Charge	Q_{gs}		-	3.8	-	
Gate-Drain Charge	Q_{gd}		-	14.5	-	
Turn-on Delay time	$t_{d(on)}$	$V_{DD}=125V$ $R_G=25\ \Omega$ $I_D=8.8A$ (Note4,5)	-	14.5	39	ns
Turn-on Rise time	t_r		-	69	148	
Turn-off Delay time	$t_{d(off)}$		-	73	156	
Turn-off Fall time	t_f		-	60	130	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	622	810	pF
Output Capacitance	C_{oss}		-	117	152	
Reverse Transfer Capacitance	C_{rss}		-	37	48	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	$V_{GS}<V_{th}$	-	-	8.8	A
Pulsed Source Current	I_{SP}		-	-	35.2	
Diode Forward Voltage	V_{SD}	$I_S=8.8A, V_{GS}=0V$	-	-	1.5	V
Reverse Recovery Time	t_{rr}	$I_S=8.8A, V_{GS}=0V$, $dI_S/dt=100A/\mu s$	-	170	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.91	-	μC

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

Note 2) $L = 5.9mH, I_S=8.8A, V_{DD}=50V, R_G = 25\ \Omega$, Starting $T_j = 25\ ^\circ C$.

Note 3) $I_S = 8.8A, dI/dt = 300A/\mu s, V_{DD} = BV_{DSS}$, Starting $T_j = 25\ ^\circ C$.

Note 4) Pulse Test : Pulse width $300\ \mu s$, Duty Cycle 2% .

Note 5) Essentially independent of operating temperature.

Fig1. $I_D - V_{DS}$

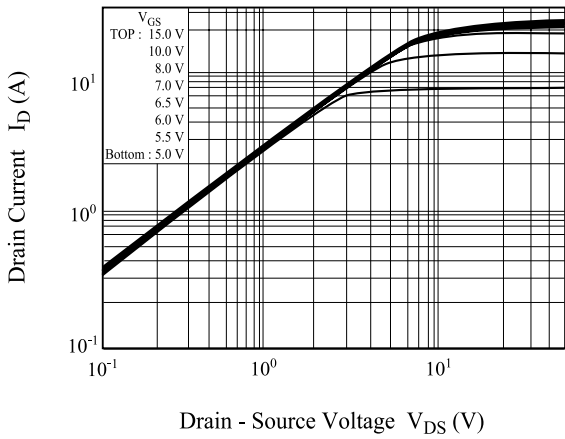


Fig2. $I_D - V_{GS}$

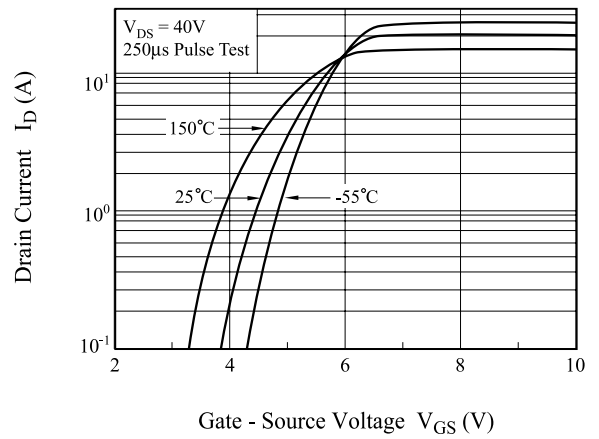


Fig3. $BV_{DSS} - T_j$

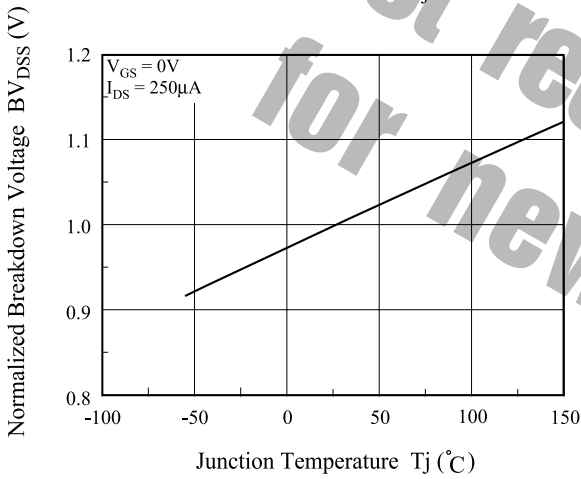


Fig4. $R_{DS(ON)} - I_D$

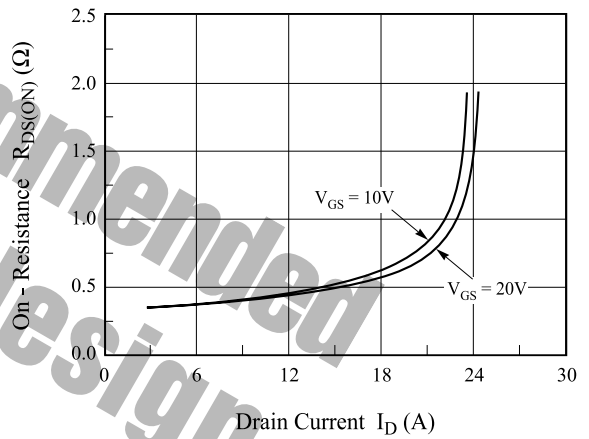


Fig5. $I_S - V_{SD}$

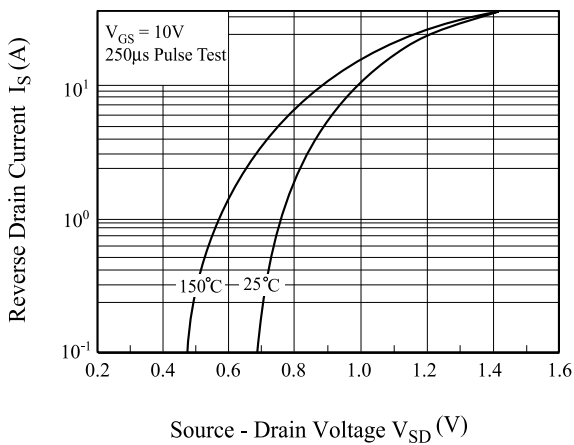
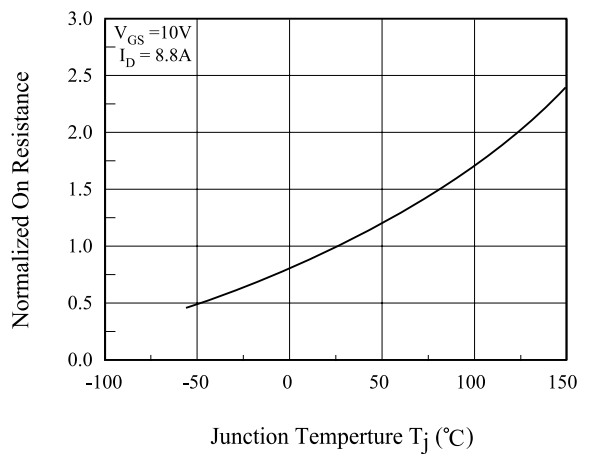


Fig6. $R_{DS(ON)} - T_j$



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Fig7. C - V_{DS}

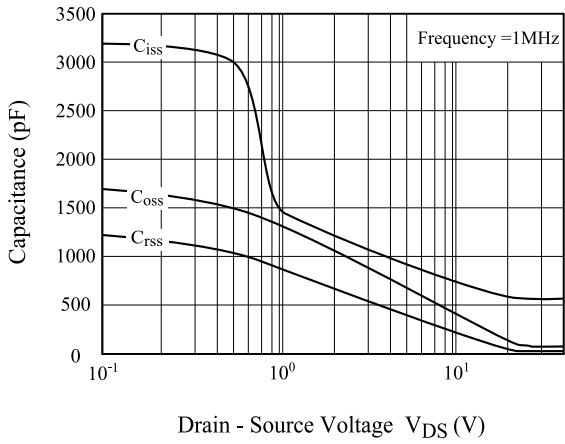


Fig8. Q_g- V_{GS}

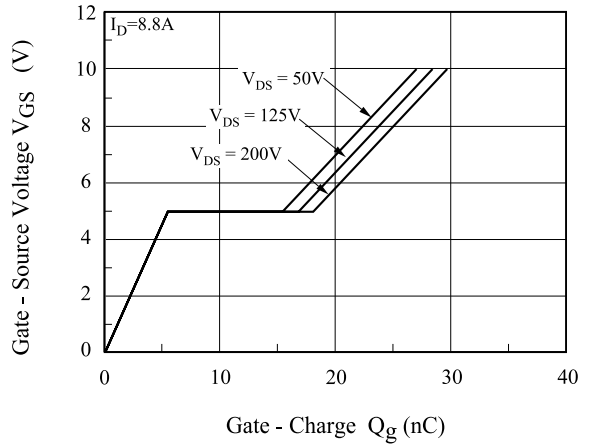


Fig9. Safe Operation Area

(KHB8D8N25P)

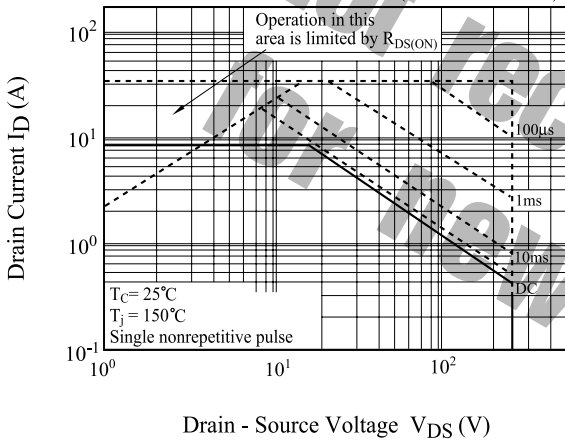


Fig10. Safe Operation Area

(KHB8D8N25F, KHB8D8N25F2)

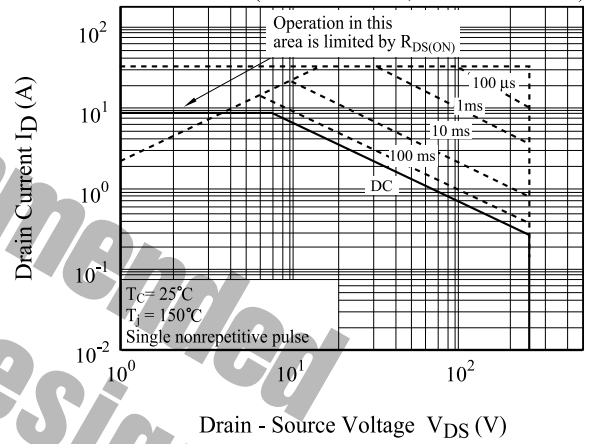


Fig11. I_D - T_j

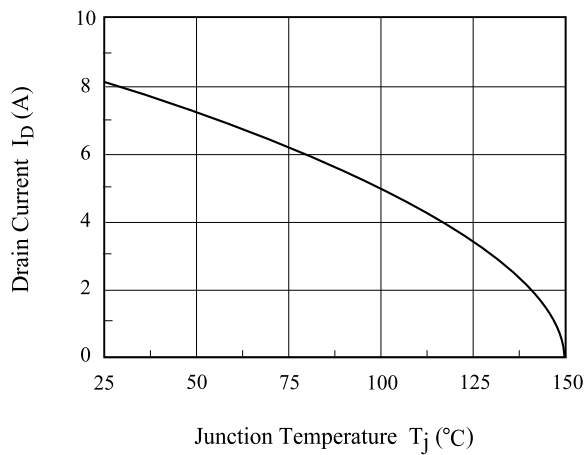


Fig12. Transient Thermal Response Curve

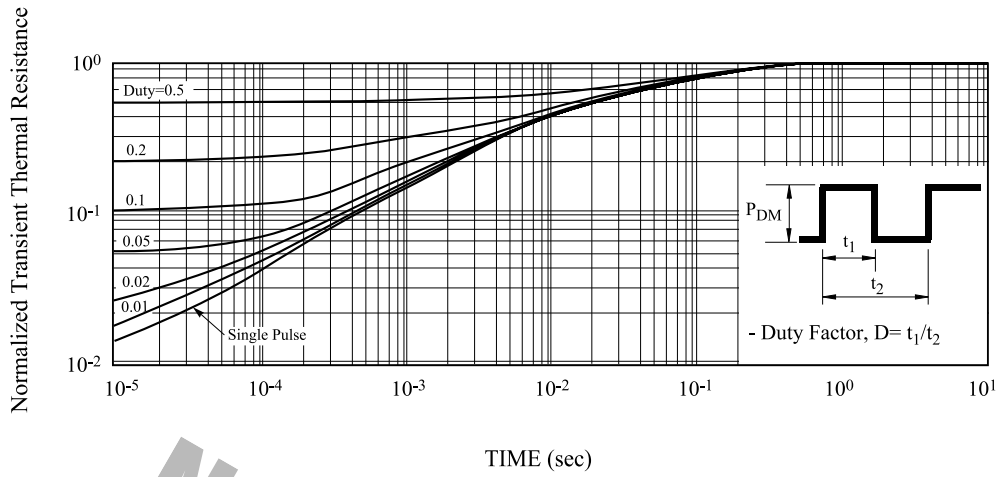


Fig13. Transient Thermal Response Curve

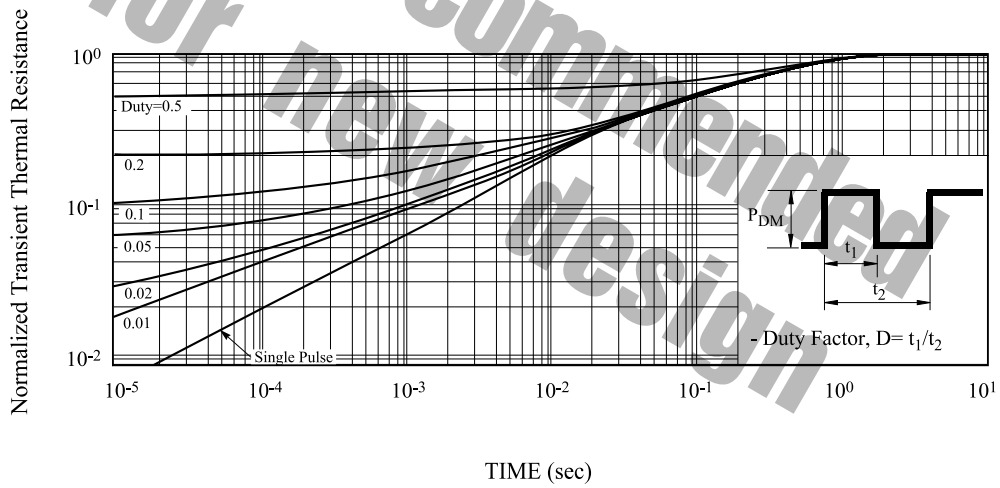


Fig14. Gate Charge

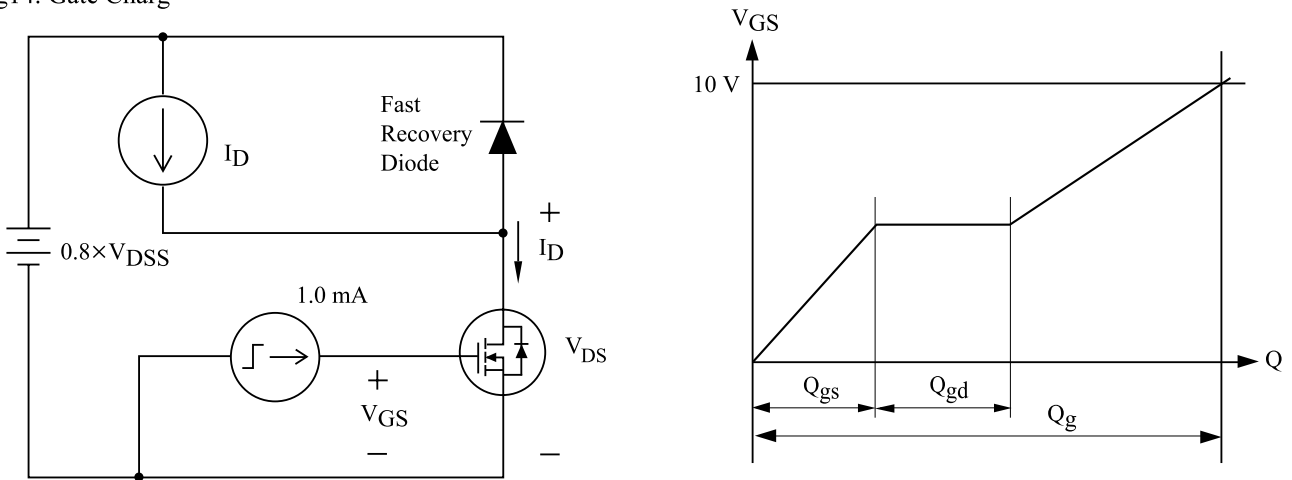


Fig15. Single Pulsed Avalanche Energy

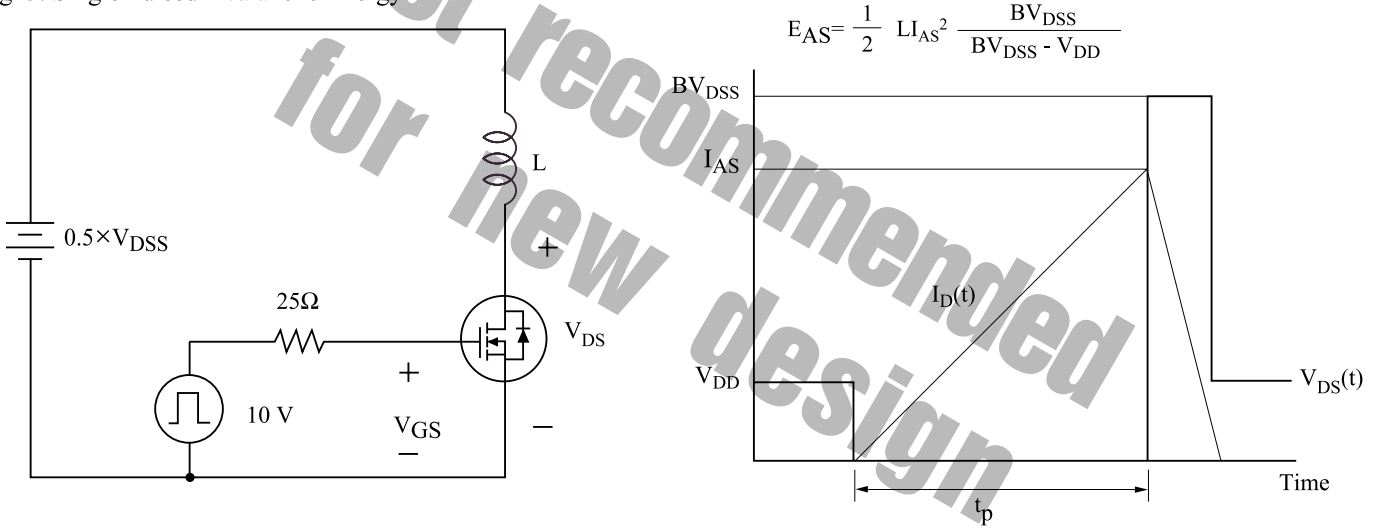


Fig16. Resistive Load Switching

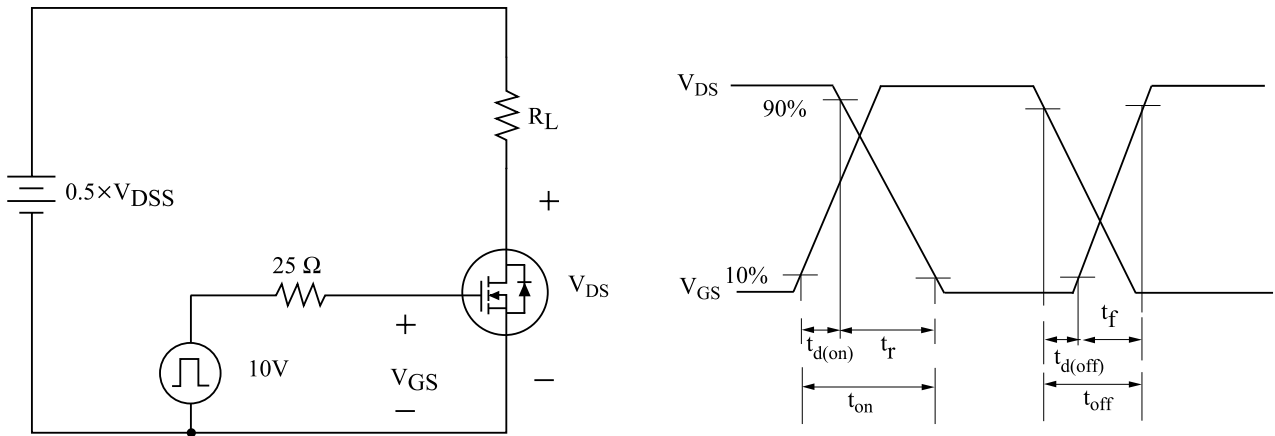


Fig17. Source - Drain Diode Reverse Recovery and dv/dt

