

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

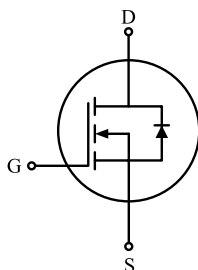
- $V_{DS} = 250V$, $I_D = 8.8A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 450m\Omega$ @ $V_{GS} = 10V$
- $Q_g(\text{typ.}) = 29.5nC$

MAXIMUM RATING ($T_a = 25^\circ C$)

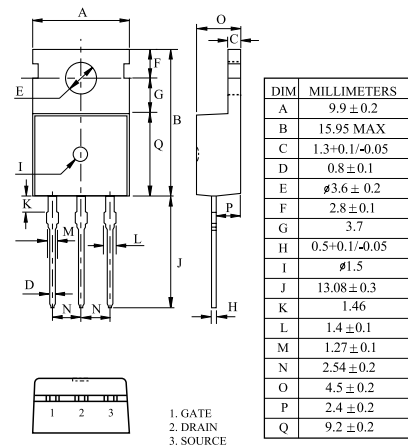
CHARACTERISTIC	SYMBOL	RATING		UNIT
		KHB8D8N25P	KHB8D8N25F KHB8D8N25F2	
Drain-Source Voltage	V_{DS}	250		V
Gate-Source Voltage	V_{GS}	± 30		V
Drain Current	@ $T_c = 25^\circ C$	8.8	8.8*	A
	Pulsed (Note1)	I_{DP} 35.2	35.2*	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	285		mJ
Repetitive Avalanche Energy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

* : Drain current limited by maximum junction temperature.

PIN CONNECTION

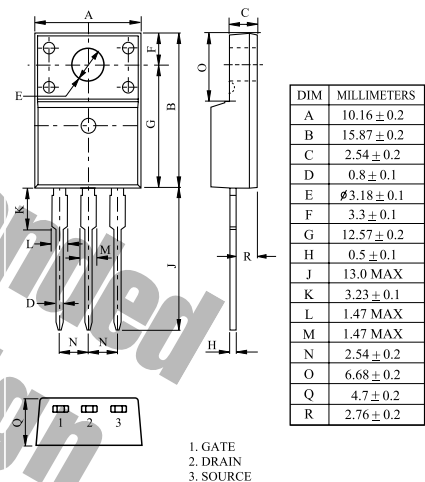


KHB8D8N25P



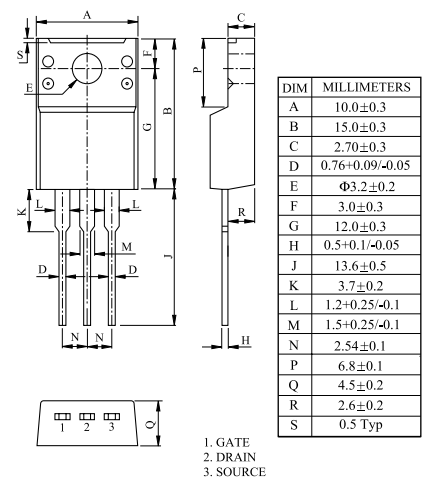
TO-220AB

KHB8D8N25F



TO-220IS (1)

KHB8D8N25F2



TO-220IS

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 μA, V _{GS} =0V	250	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / Δ T _j	I _D =250 μA, Referenced to 25°C	-	0.27	-	V/°C
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250 μA	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} =±30V, V _{DS} =0V	-	-	±100	nA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =4.4A	-	360	450	mΩ
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 =25Ω 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/ μs	-	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) $I_S \leq 8.8A$, $dI/dt \leq 300A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_j = 25^\circ C$.

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

Note 5) Essentially independent of operating temperature.

Fig1. $I_D - V_{DS}$

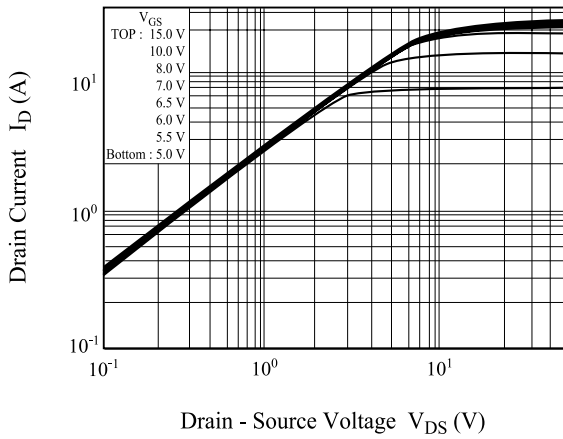


Fig2. $I_D - V_{GS}$

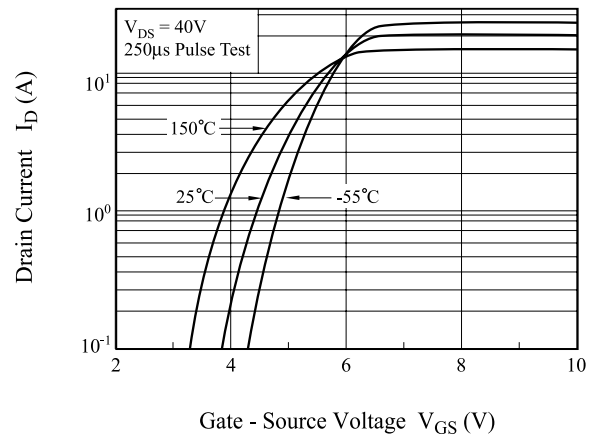


Fig3. $BV_{DSS} - T_j$

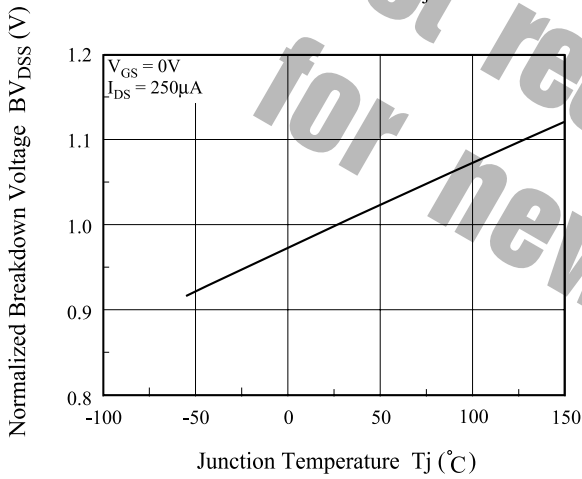


Fig4. $R_{DS(ON)} - I_D$

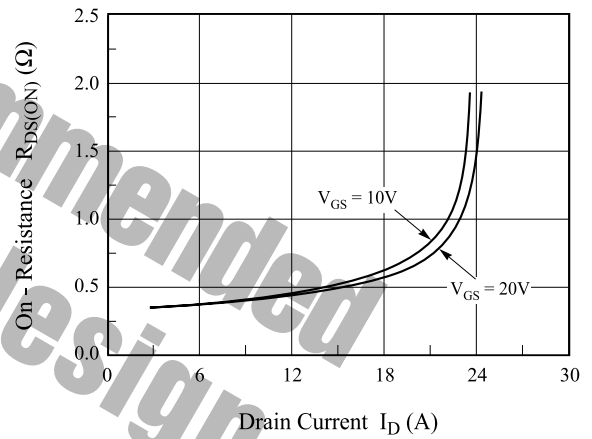


Fig5. $I_S - V_{SD}$

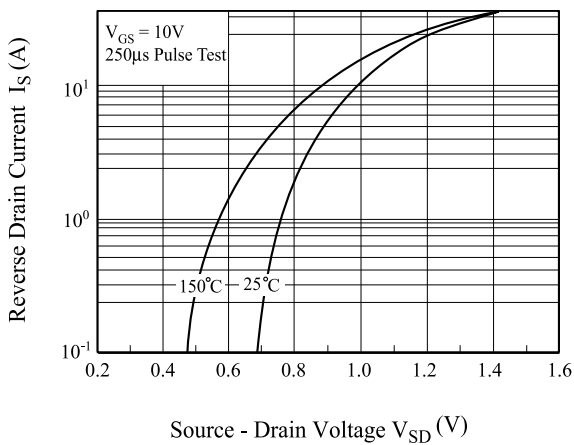


Fig6. $R_{DS(ON)} - T_j$

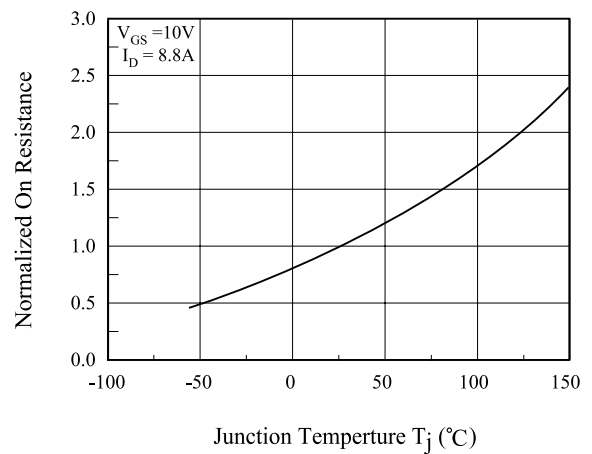


Fig7. C - V_{DS}

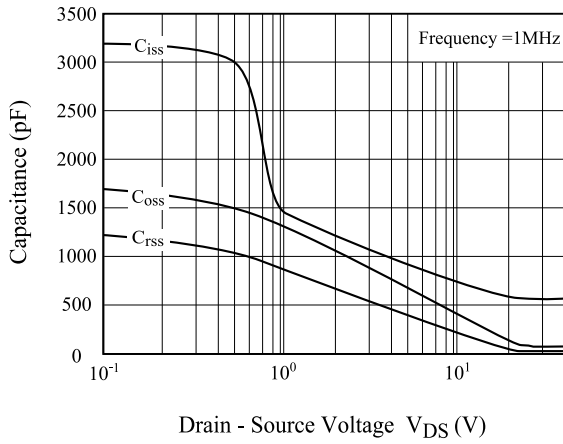


Fig8. Q_g - V_{GS}

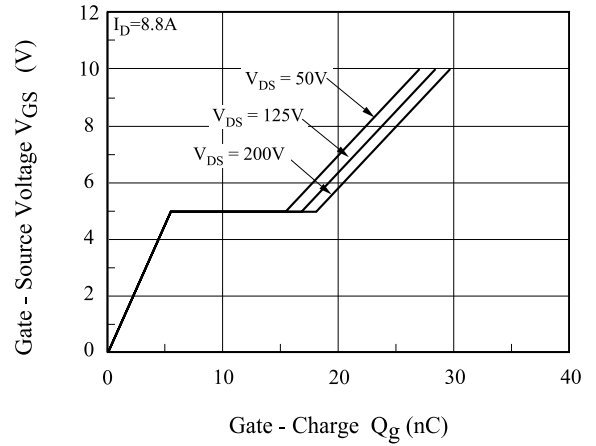


Fig9. Safe Operation Area

(KHB8D8N25P)

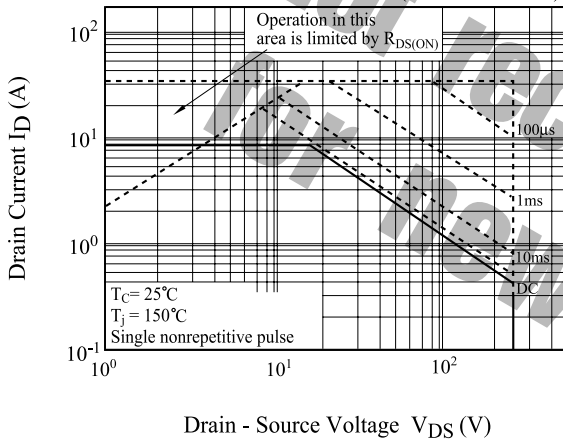


Fig10. Safe Operation Area

(KHB8D8N25F, KHB8D8N25F2)

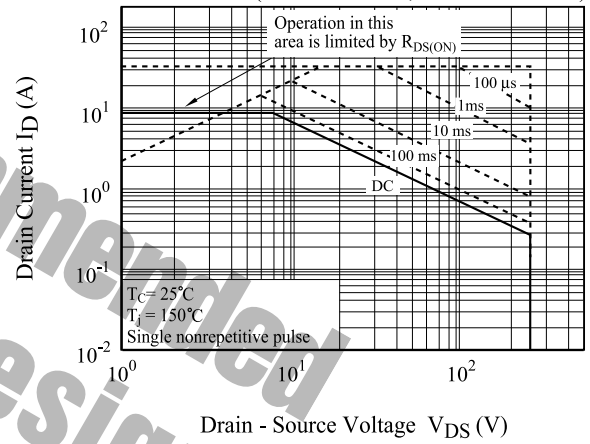


Fig11. I_D - T_j

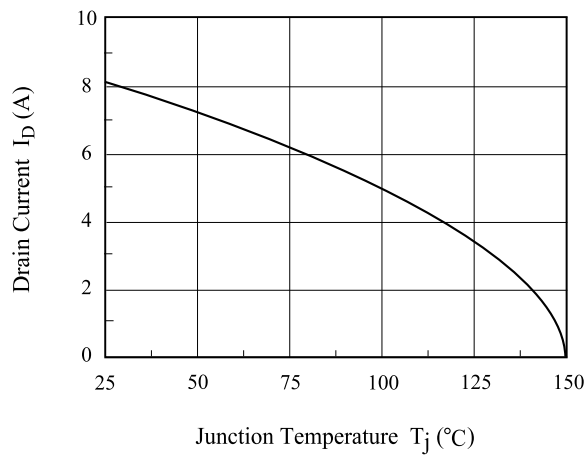


Fig12. Transient Thermal Response Curve

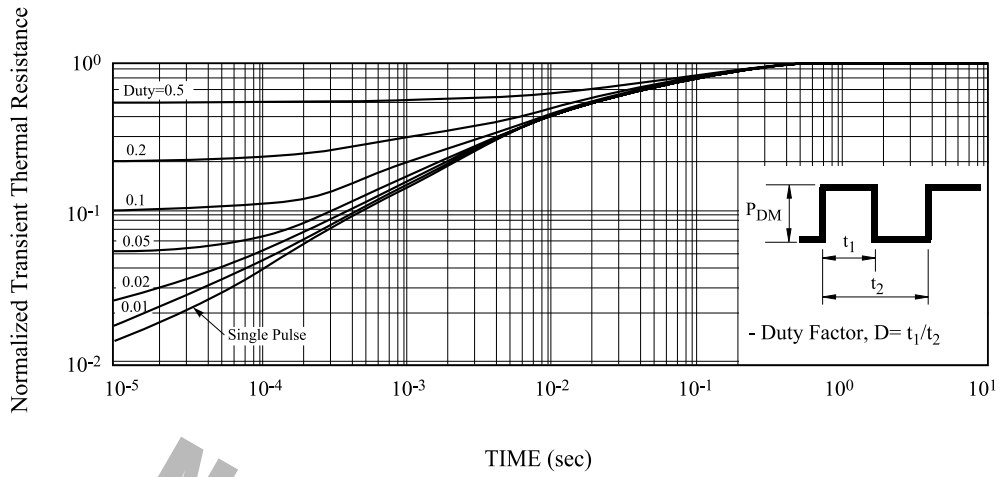


Fig13. Transient Thermal Response Curve

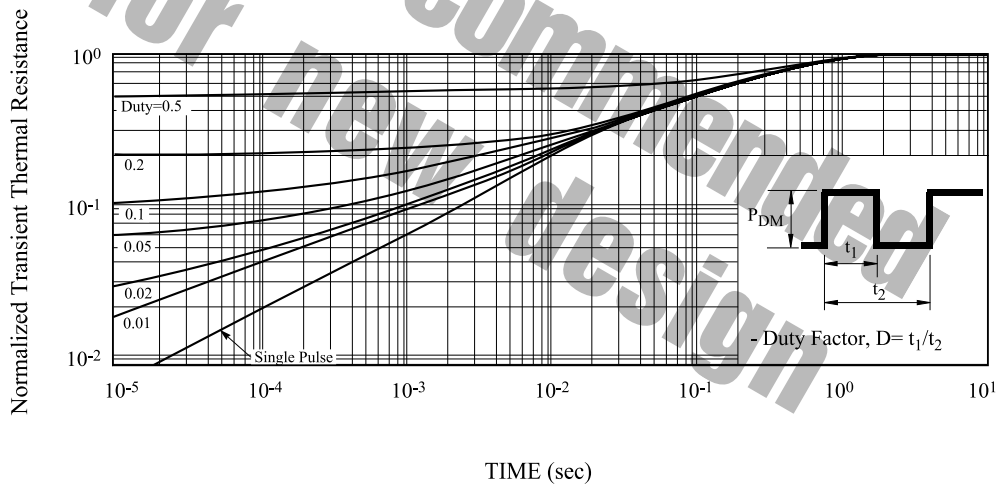


Fig14. Gate Charge

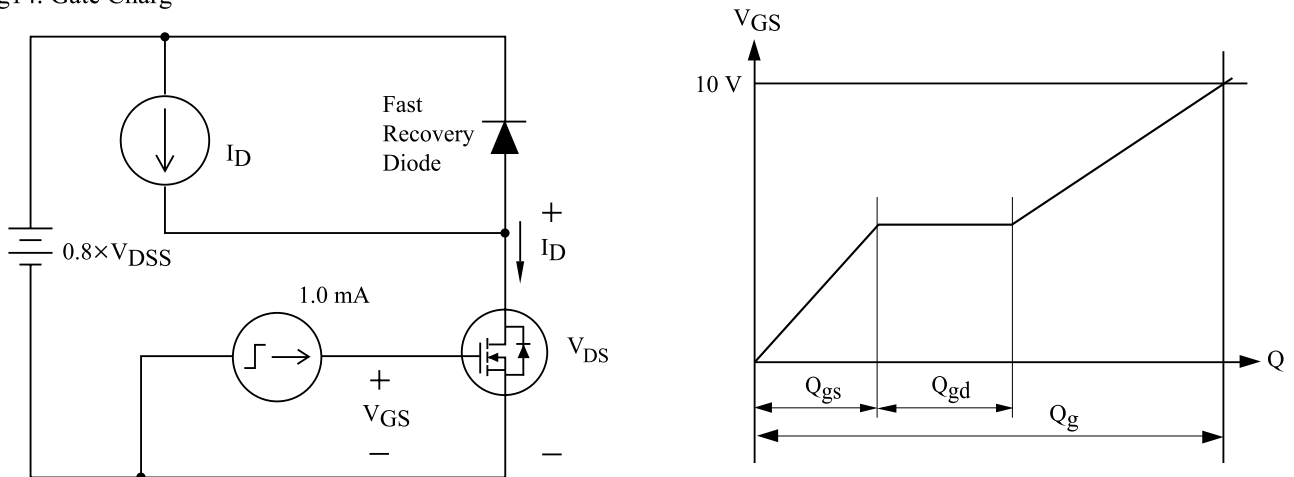


Fig15. Single Pulsed Avalanche Energy

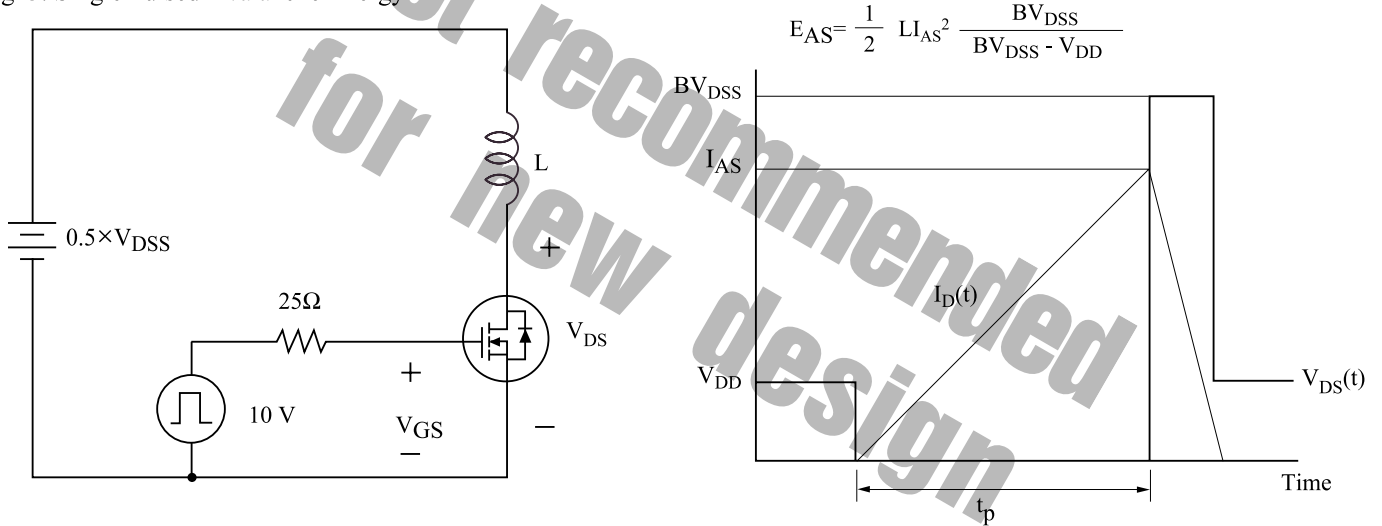


Fig16. Resistive Load Switching

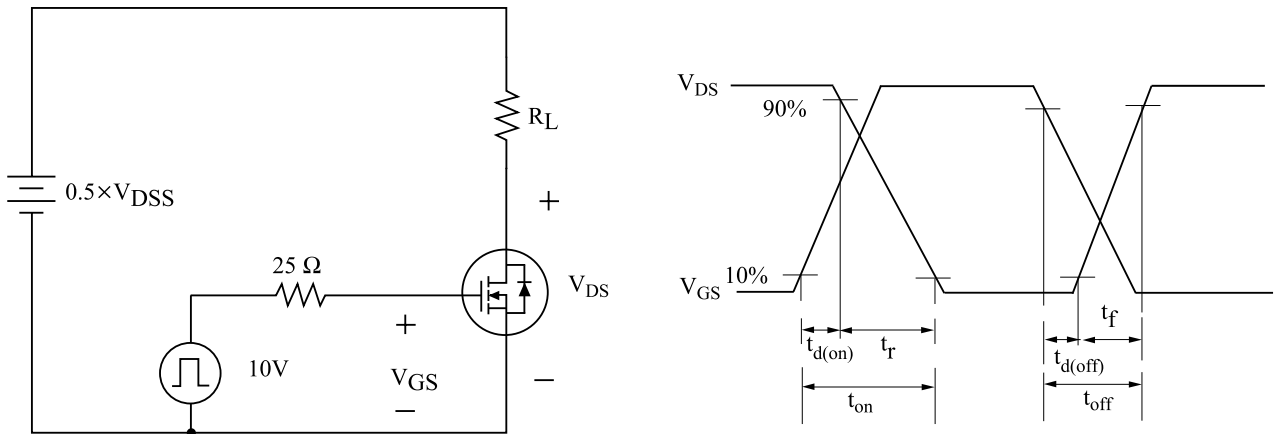


Fig17. Source - Drain Diode Reverse Recovery and dv/dt

