

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

- $V_{DSS} = 250V$, $I_D = 9.0A$
- Drain-Source ON Resistance : $R_{DS(ON)} = 0.4$ @ $V_{GS} = 10V$
- $Q_g(\text{typ}) = 14.5nC$

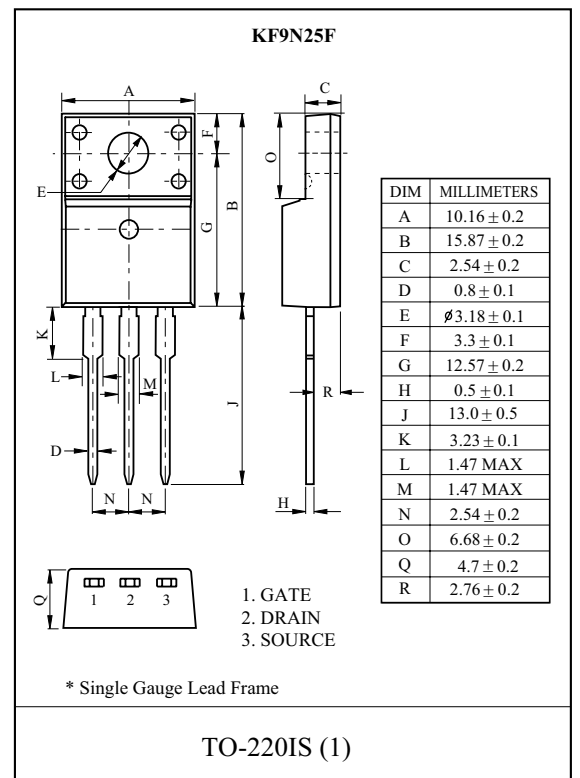
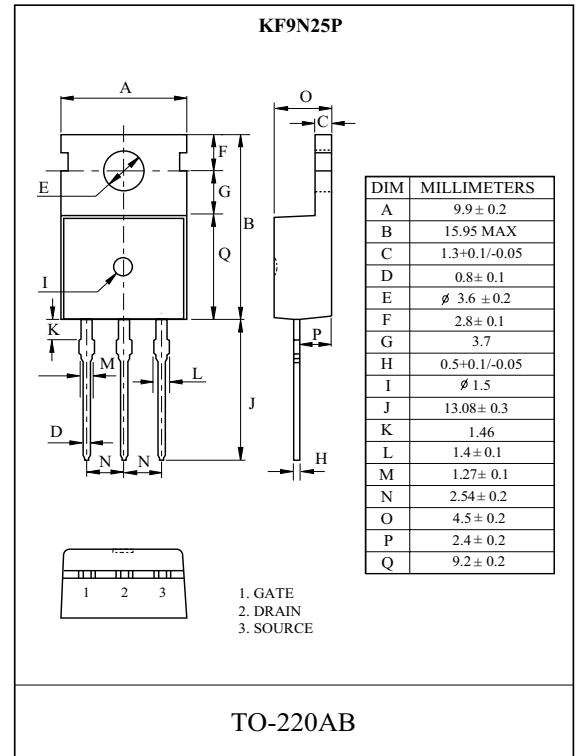
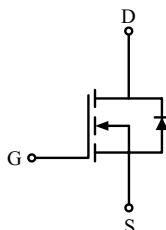
MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING		UNIT	
		KF9N25P	KF9N25F		
Drain-Source Voltage	V_{DSS}	250		V	
Gate-Source Voltage	V_{GSS}	± 30		V	
Drain Current	@ $T_c=25$	I_D	9.0	9.0*	A
	@ $T_c=100$		5.65	5.65*	
	Pulsed (Note1)		I_{DP}	25	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	180		mJ	
Repetitive Avalanche Energy (Note 1)	E_{AR}	4.0		mJ	
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5		V/ns	
Drain Power Dissipation	$T_c=25$	P_D	83	38	W
	Derate above 25		0.67	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}	1.5	3.3	/W	
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	62.5	/W	

* : Drain current limited by maximum junction temperature.

PIN CONNECTION

(KF9N25P, KF9N25F)



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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	-	0.22	-	V/°C
Drain Cut-off Current	I_{DSS}	$V_{DS}=250V, V_{GS}=0V$,	-	-	10	μA
Gate Threshold Voltage	V_{th}	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	-	4.5	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4.5A$	-	0.31	0.40	Ω
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=200V, I_D=9A$ $V_{GS}=10V$ (Note4,5)	-	14.5	-	nC
Gate-Source Charge	Q_{gs}		-	3.2	-	
Gate-Drain Charge	Q_{gd}		-	6.3	-	
Turn-on Delay time	$t_{d(on)}$	$V_{DD}=125V$ $I_D=9A$ $R_G=25$ (Note4,5)	-	15	-	ns
Turn-on Rise time	t_r		-	25	-	
Turn-off Delay time	$t_{d(off)}$		-	30	-	
Turn-off Fall time	t_f		-	15	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	560	-	pF
Output Capacitance	C_{oss}		-	96	-	
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	$V_{GS}<V_{th}$	-	-	9	A
Pulsed Source Current	I_{SP}		-	-	36	
Diode Forward Voltage	V_{SD}	$I_S=9A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$I_S=9A, V_{GS}=0V$, $dI_S/dt=100A/\mu s$	-	160	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.95	-	μC

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

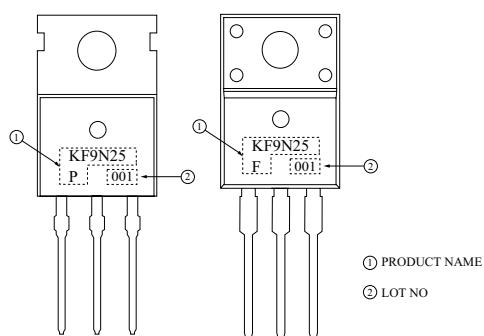
Note 2) $L=3.6mH, I_S=9A, V_{DD}=50V, R_G=25$, Starting $T_j=25$.

Note 3) $I_S=9A, dI/dt=100A/\mu s, V_{DD}=BV_{DSS}$, Starting $T_j=25$.

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

Note 5) Essentially independent of operating temperature.

Marking



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Fig1. $I_D - V_{DS}$

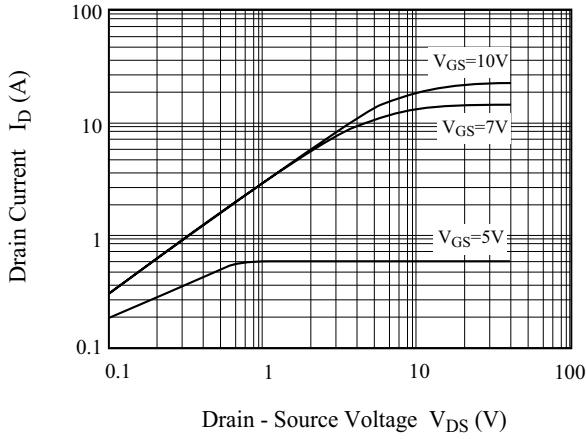


Fig2. $I_D - V_{GS}$

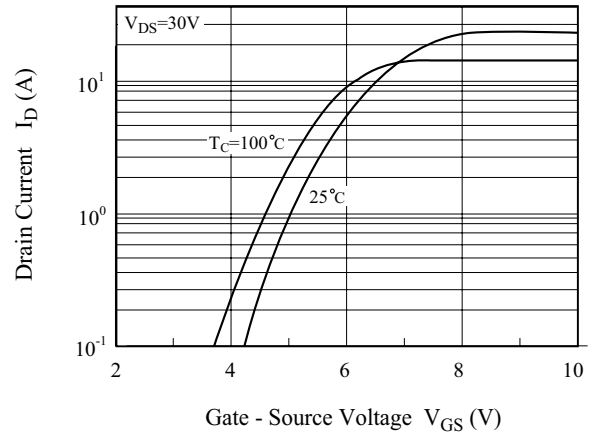


Fig3. $BV_{DSS} - T_j$

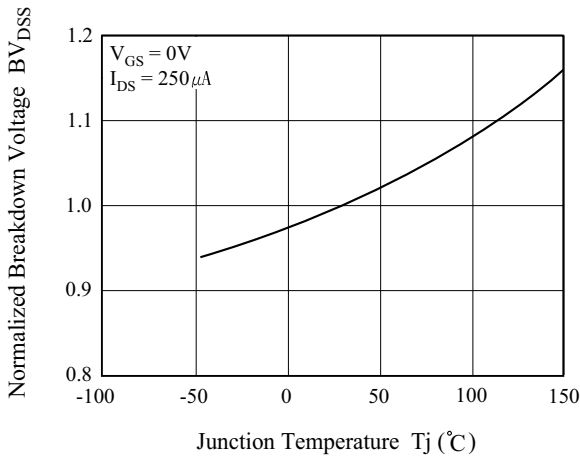


Fig4. $R_{DS(ON)} - I_D$

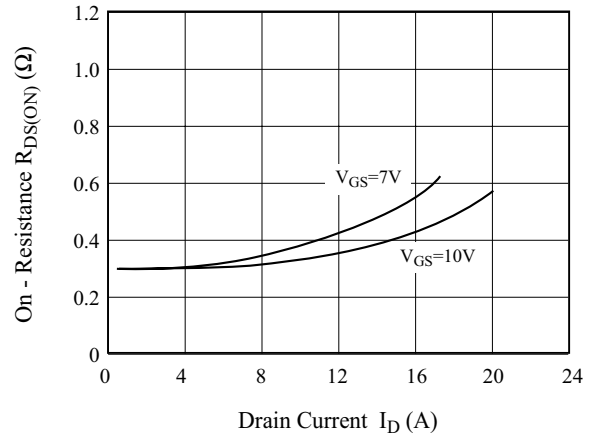


Fig5. $I_S - V_{SD}$

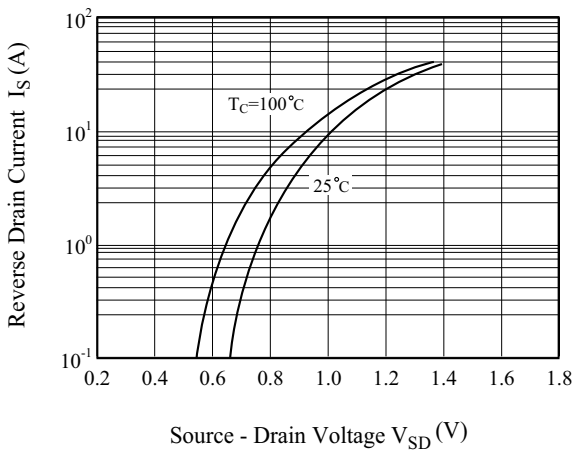
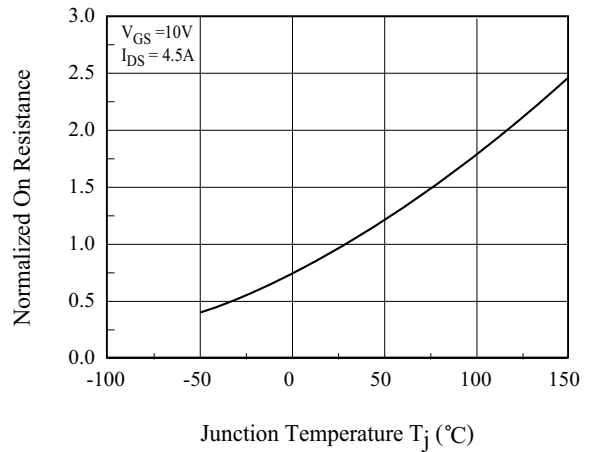


Fig6. $R_{DS(ON)} - T_j$



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Fig 7. C - V_{DS}

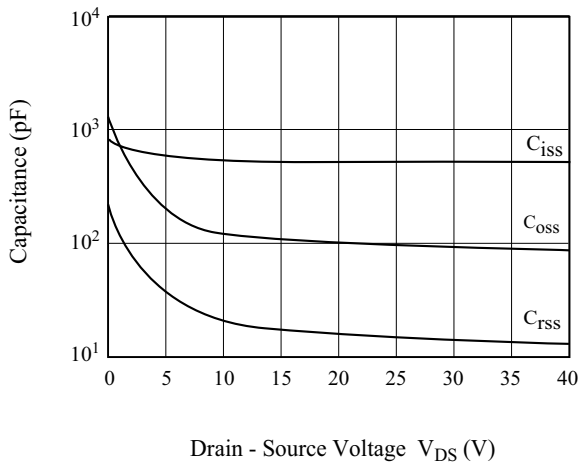


Fig8. Q_g- V_{GS}

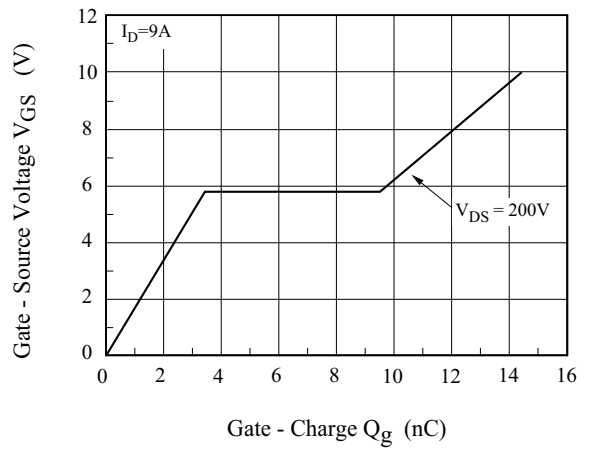


Fig9. Safe Operation Area

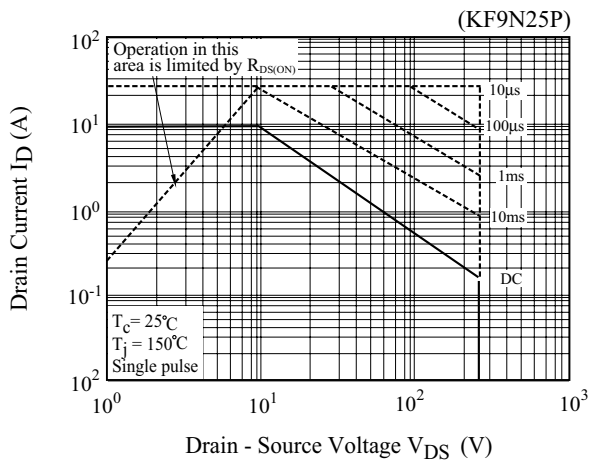


Fig10. Safe Operation Area

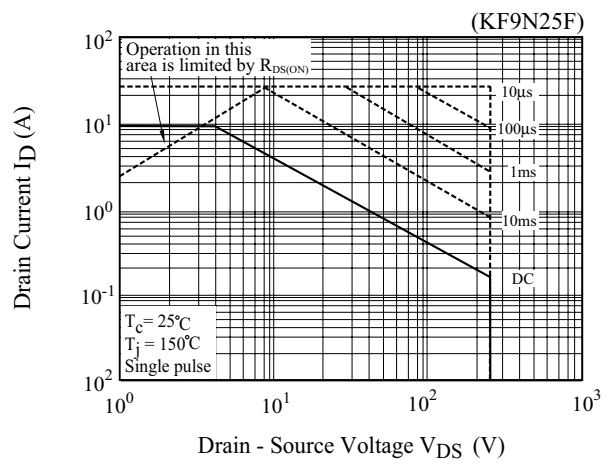
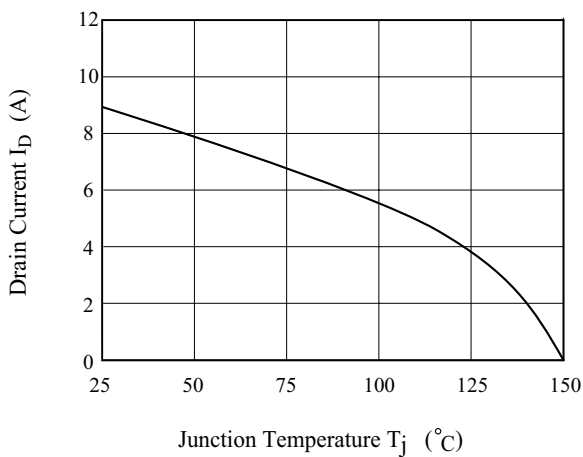


Fig11. I_D - T_j



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Fig12. Transient Thermal Response Curve

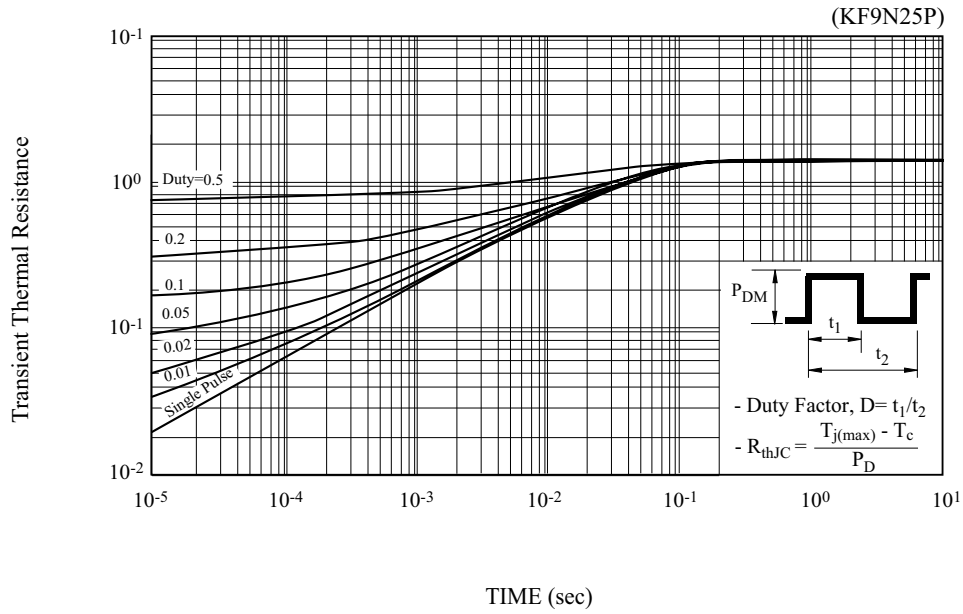


Fig13. Transient Thermal Response Curve

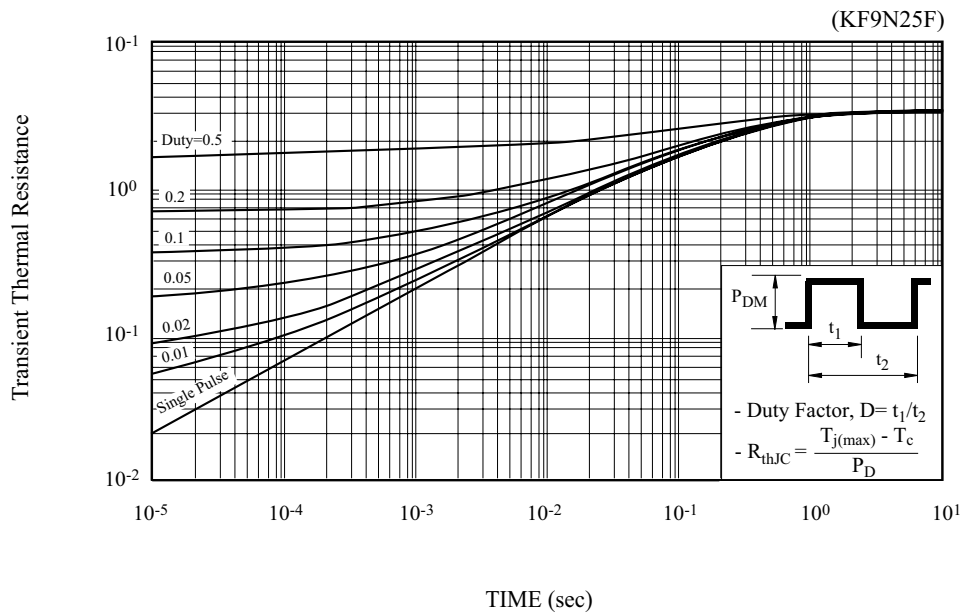


Fig14. Gate Charge

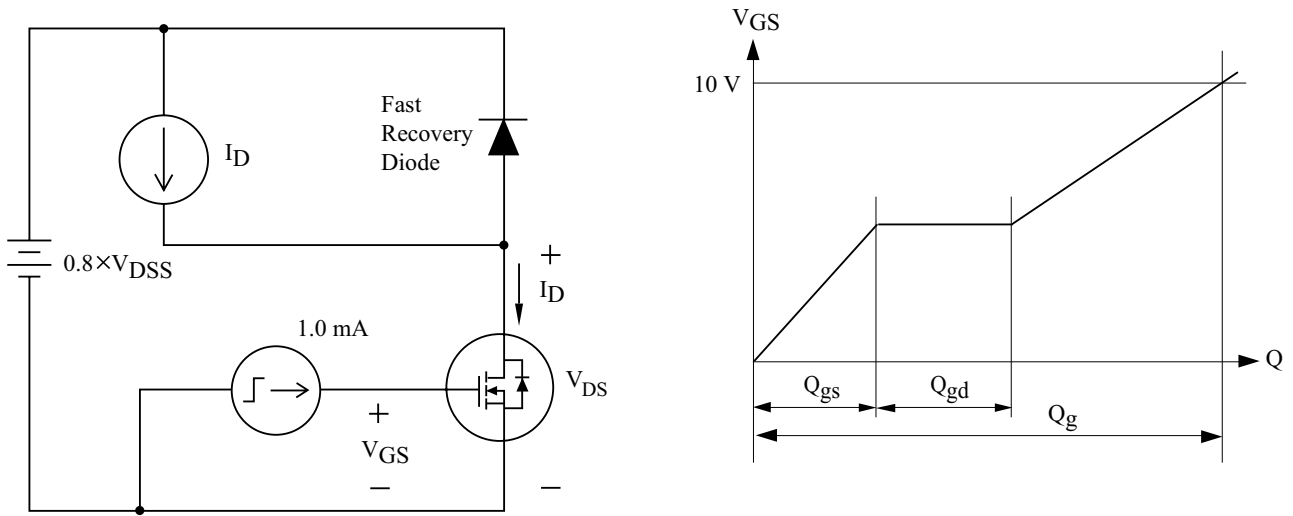


Fig15. Single Pulsed Avalanche Energy

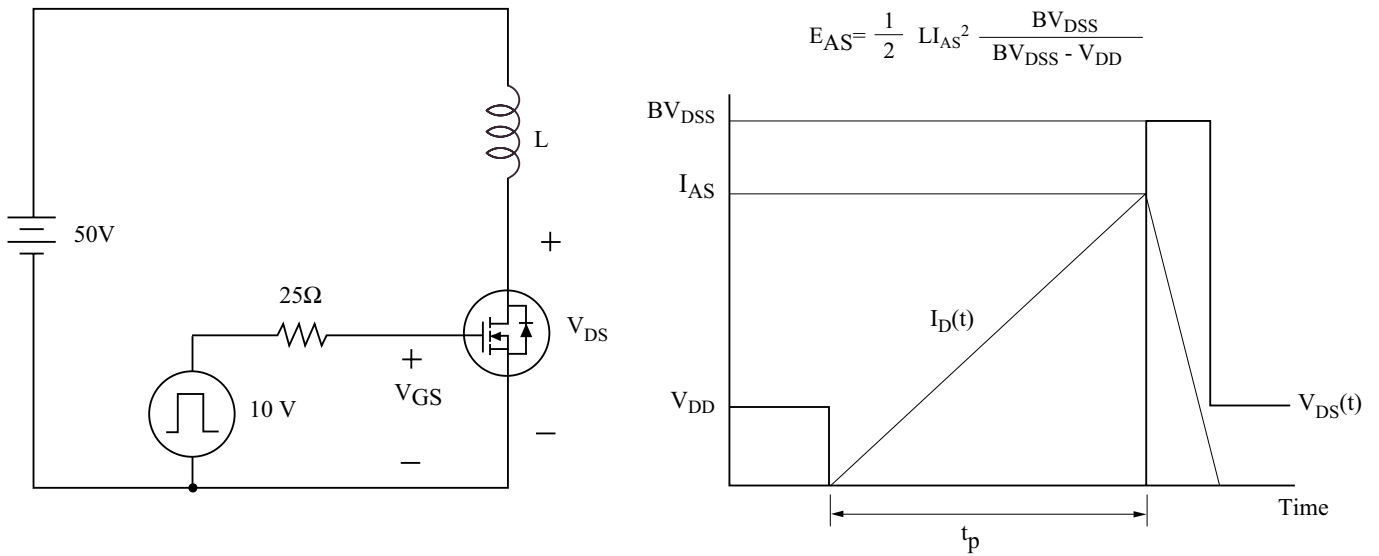


Fig16. Resistive Load Switching

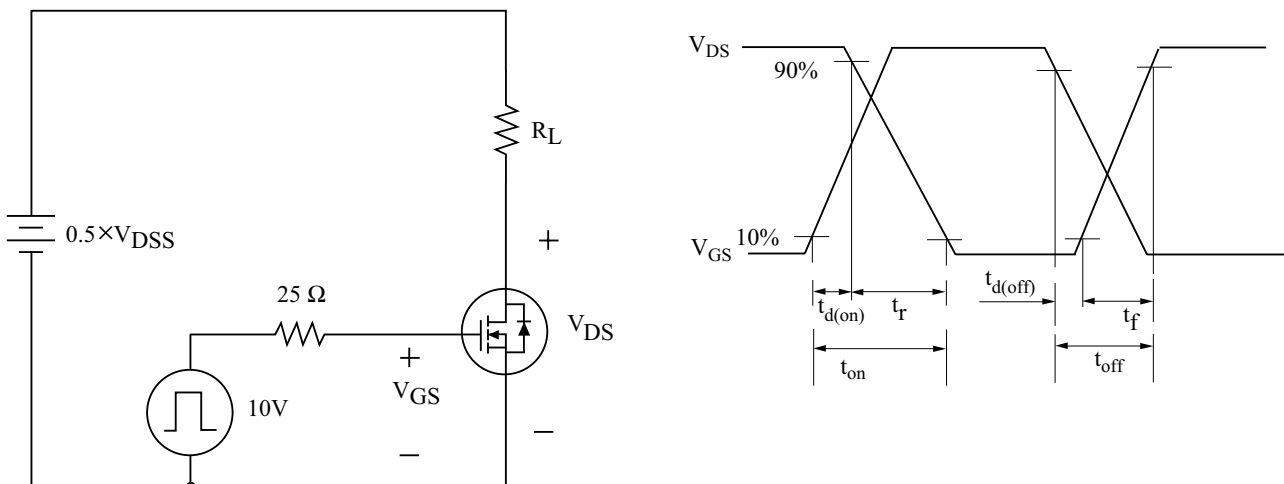


Fig17. Source - Drain Diode Reverse Recovery and dv/dt

