

## 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

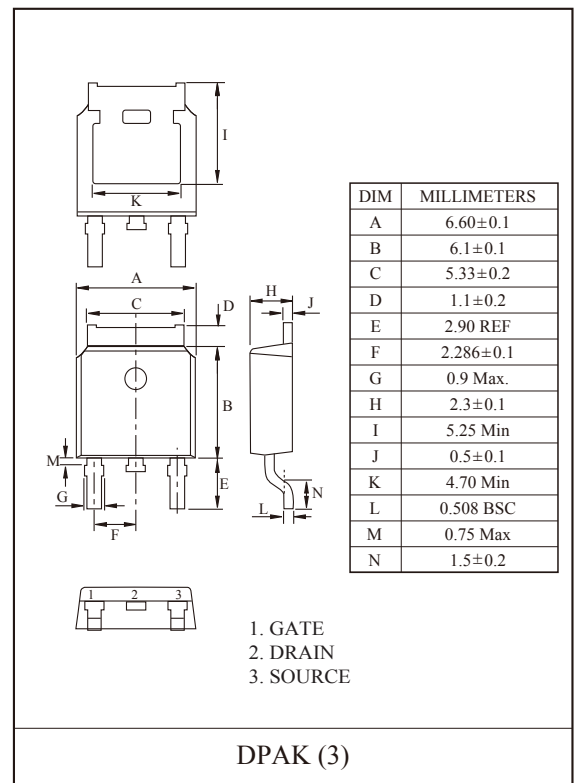
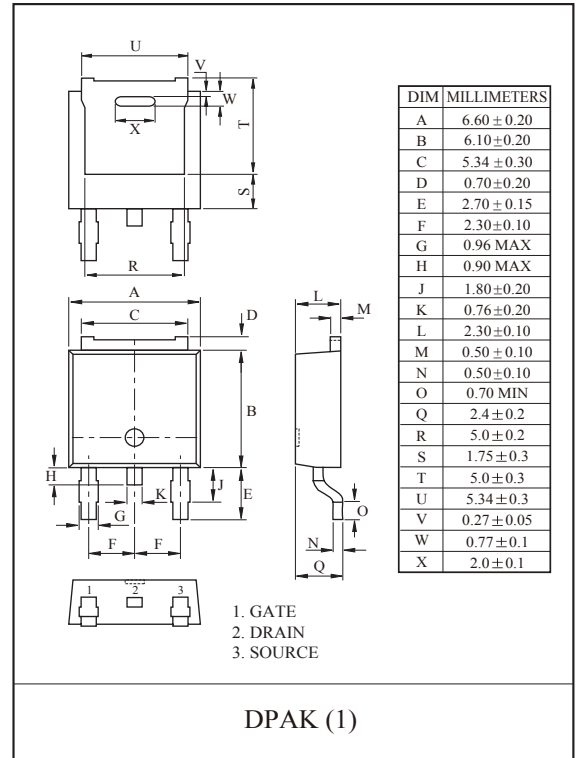
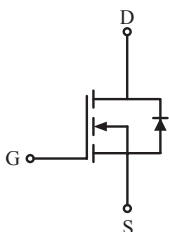
- $V_{DSS} = 250V$ ,  $I_D = 7.5A$
- Drain-Source ON Resistance :  $R_{DS(ON)} = 0.4\Omega$  @  $V_{GS} = 10V$
- $Q_g(\text{typ}) = 14.5nC$

## MAXIMUM RATING (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	250	V
Gate-Source Voltage	$V_{GSS}$	±30	V
Drain Current	@ $T_C = 25^\circ C$	7.5	A
	@ $T_C = 100^\circ C$	4.74	
	Pulsed (Note1)	25	
Single Pulsed Avalanche Energy (Note 2)	$E_{AS}$	126	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	$T_C = 25^\circ C$	54.3	W
	Derate above 25°C	0.43	W/°C
Maximum Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55 ~ 150	°C
<b>Thermal Characteristics</b>			
Thermal Resistance, Junction-to-Case	$R_{thJC}$	2.3	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	110	°C/W

\* : Drain current limited by maximum junction temperature.

## PIN CONNECTION



# KF9N25D

## ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	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	$\mu A$
Gate Threshold Voltage	$V_{th}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	-	4.5	V
Gate Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3.75A$	-	0.31	0.40	$\Omega$
<b>Dynamic</b>						
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	$t_{d(on)}$	$V_{DD}=125V$ $I_D=9A$ $R_G=25\Omega$ (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	-	
<b>Source-Drain Diode Ratings</b>						
Continuous Source Current	$I_S$	$V_{GS}<V_{th}$	-	-	9	A
Pulsed Source Current	$I_{SP}$		-	-	36	
Diode Forward Voltage	$V_{SD}$	$I_S=7.5A, V_{GS}=0V$	-	-	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	-	$\mu C$

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

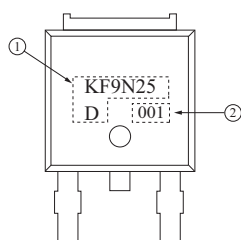
Note 2)  $L=3.6mH, I_S=7.5A, V_{DD}=50V, R_G=25\Omega$ , Starting  $T_j=25^\circ C$ .

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

## Marking



① PRODUCT NAME

② LOT NO

Fig1.  $I_D - V_{DS}$

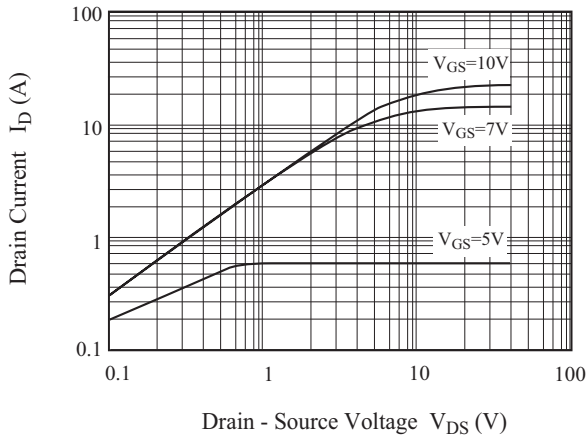


Fig2.  $I_D - V_{GS}$

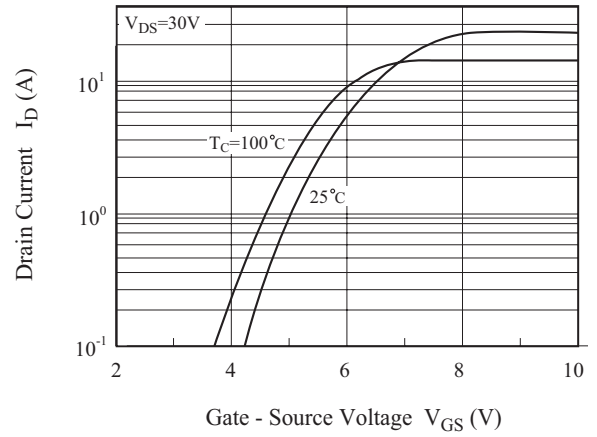


Fig3.  $BV_{DSS} - T_j$

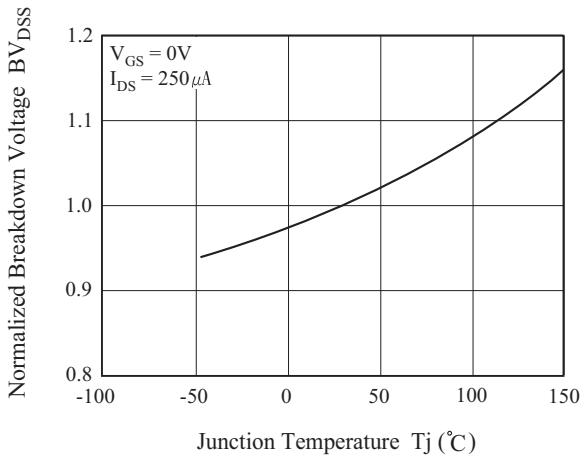


Fig4.  $R_{DS(ON)} - I_D$

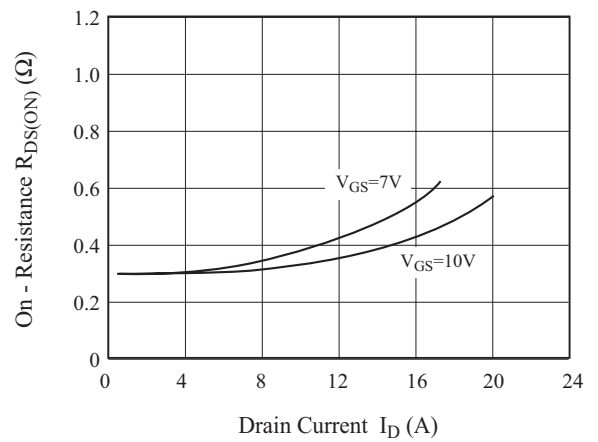


Fig5.  $I_S - V_{SD}$

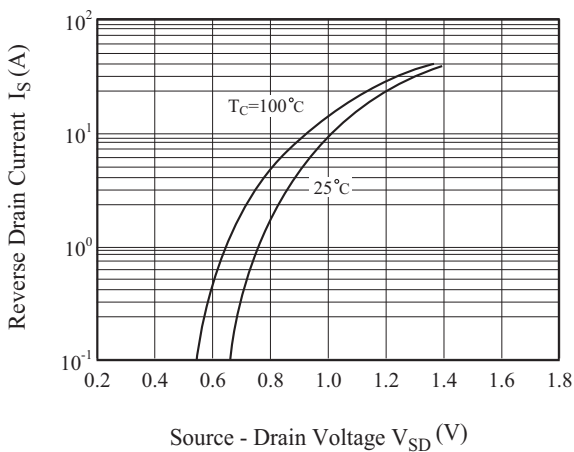
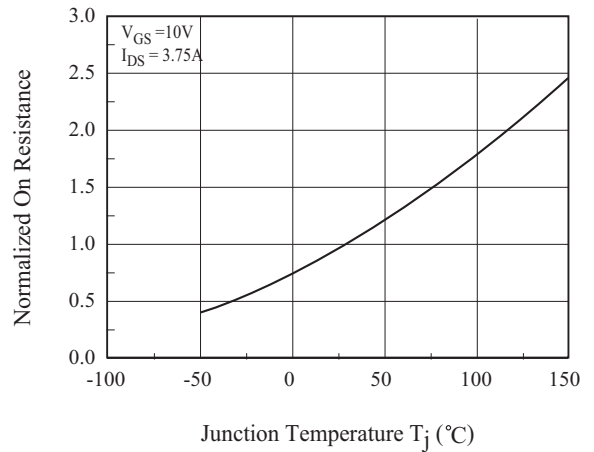


Fig6.  $R_{DS(ON)} - T_j$



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Fig 7. C - V<sub>DS</sub>

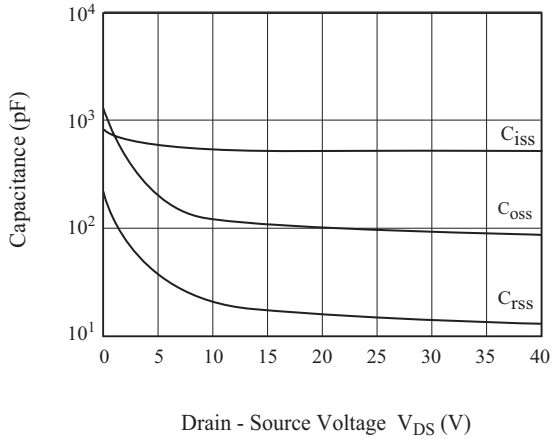


Fig8. Q<sub>g</sub>- V<sub>GS</sub>

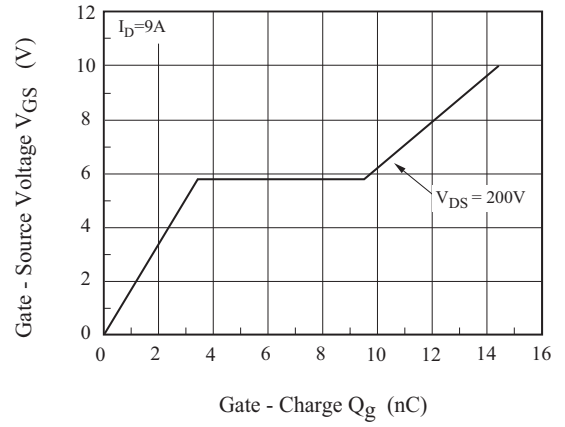


Fig9. Safe Operation Area

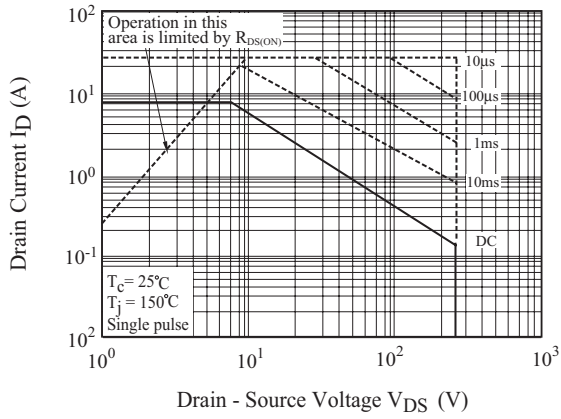


Fig10. ID - T<sub>j</sub>

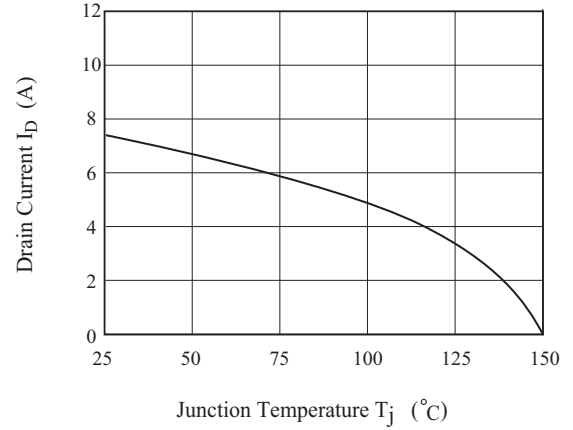


Fig11. Transient Thermal Response Curve

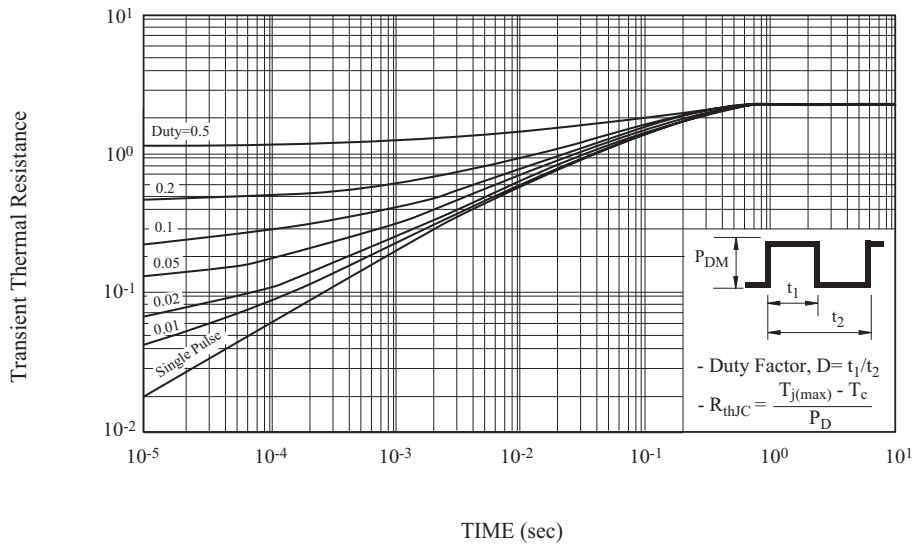


Fig12. Gate Charge

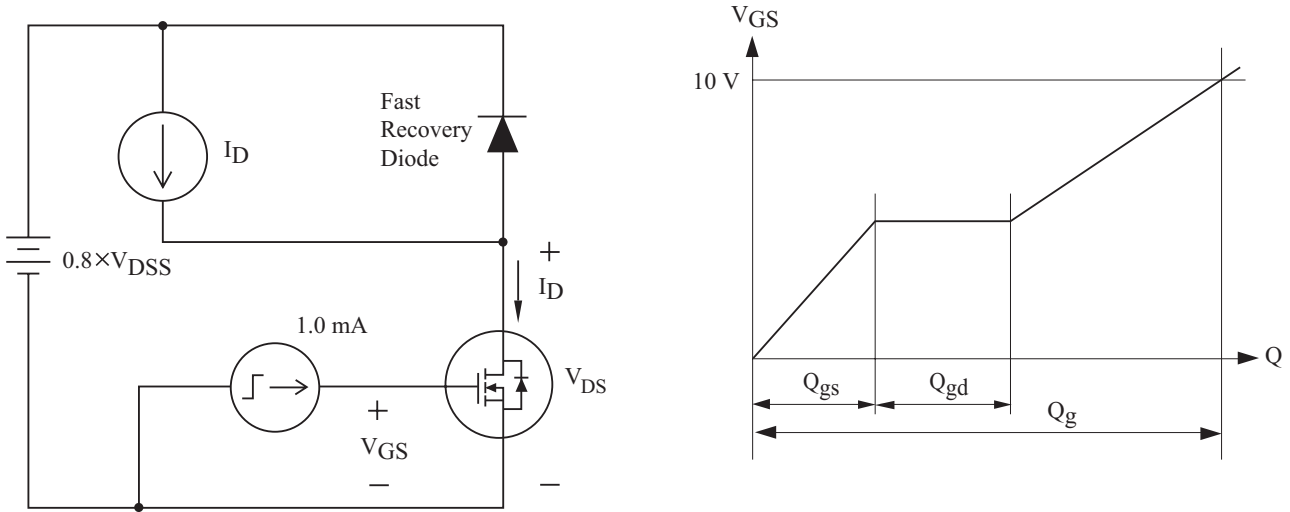


Fig13. Single Pulsed Avalanche Energy

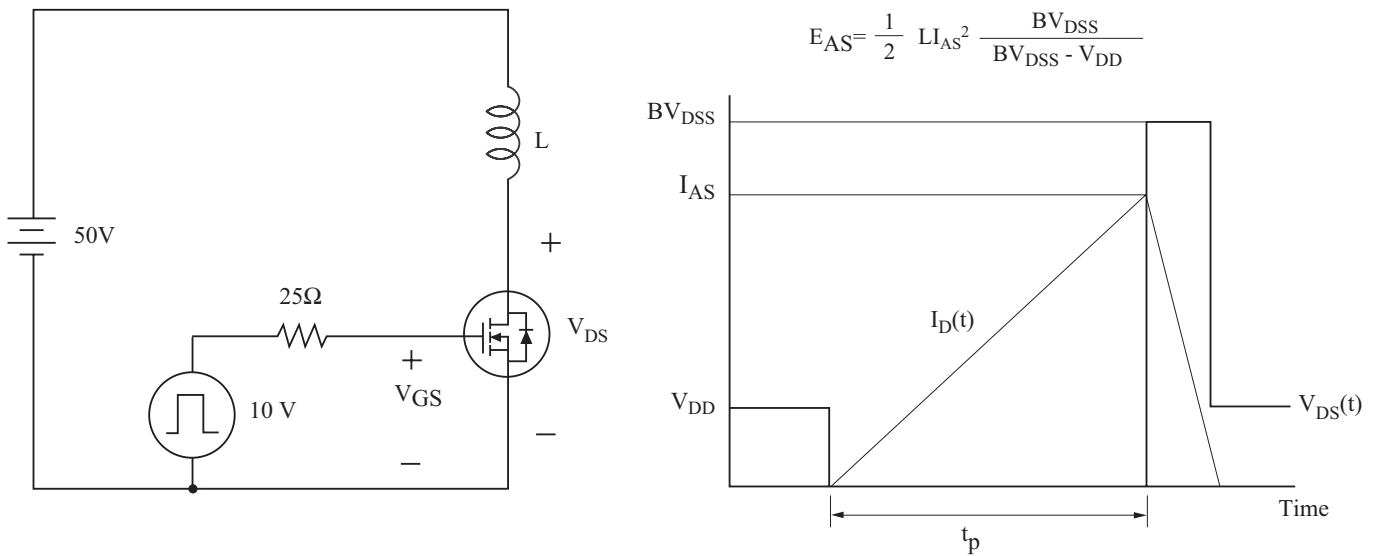


Fig14. Resistive Load Switching

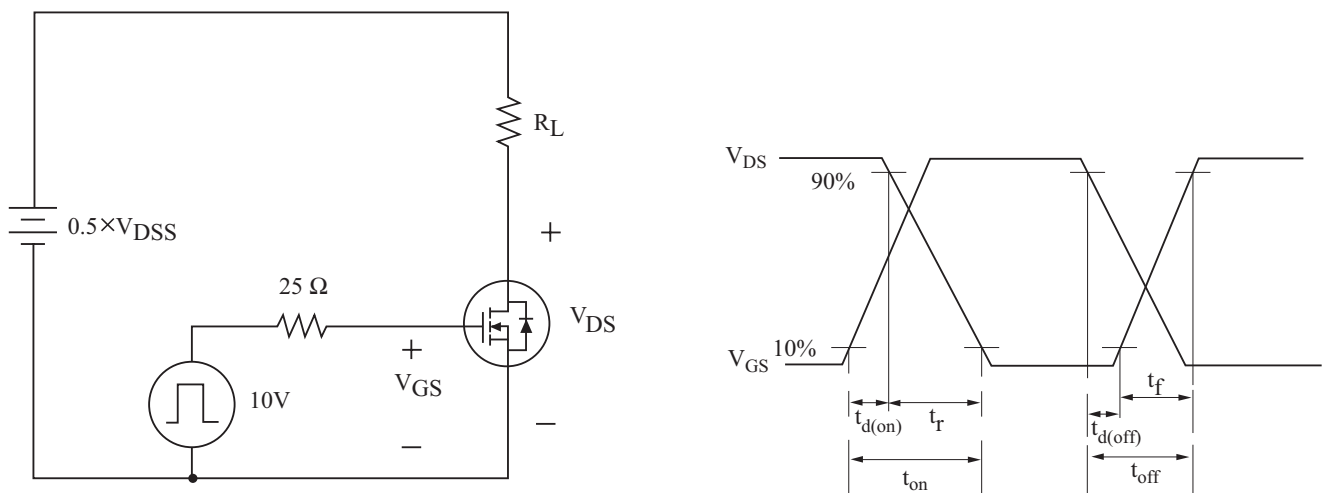


Fig15. Source - Drain Diode Reverse Recovery and  $dv/dt$

