

General Description

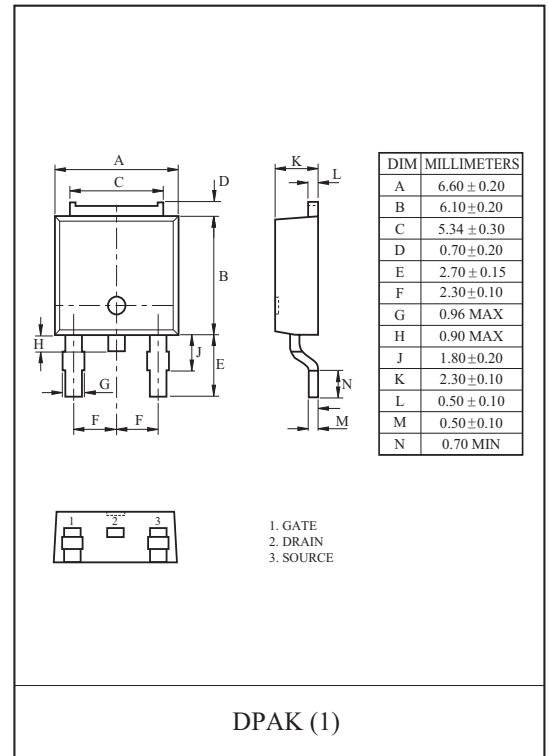
This planar stripe MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for electronic ballast and switching mode power supplies.

FEATURES

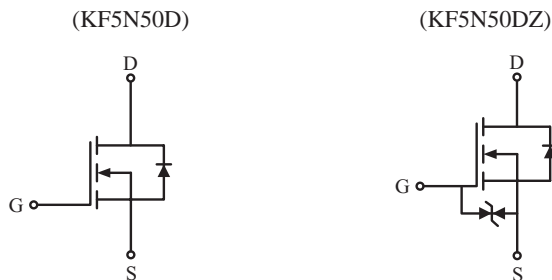
- $V_{DSS} = 500V$, $I_D = 4.3A$
- Drain-Source ON Resistance : $R_{DS(ON)} = 1.4$ (Max) @ $V_{GS} = 10V$
- $Q_g(\text{typ}) = 12nC$

MAXIMUM RATING (Tc=25)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	500	V
Gate-Source Voltage	V_{GSS}	± 30	V
Drain Current	@Tc=25	4.3	A
	@Tc=100	2.7	
	Pulsed (Note1)	13	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	270	mJ
Repetitive Avalanche Energy (Note 1)	E_{AR}	8.6	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	20	V/ns
Drain Power Dissipation	Tc=25	59.5	W
	Derate above 25	0.48	W/
Maximum Junction Temperature	T_j	150	
Storage Temperature Range	T_{stg}	-55 150	
Thermal Characteristics			
Thermal Resistance, Junction-to-Case	R_{thJC}	2.1	/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	110	/W



PIN CONNECTION



KF5N50D/DZ

ELECTRICAL CHARACTERISTICS (Tc=25)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	500	-	-	V
Breakdown Voltage Temperature Coefficient	BV _{DSS} / T _j	I _D =250μA, Referenced to 25	-	0.55	-	V/
Drain Cut-off Current	I _{DSS}	V _{DS} =500V, V _{GS} =0V,	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250μA	2.0	-	4.0	V
Gate Leakage Current	I _{GSS}	KF5N50D V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
		KF5N50DZ V _{GS} =±25V, V _{DS} =0V	-	-	±10	μA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.5A	-	1.10	1.4	
Dynamic						
Total Gate Charge	Q _g	V _{DS} =400V, I _D =5A V _{GS} =10V (Note4,5)	-	12	-	nC
Gate-Source Charge	Q _{gs}		-	3.4	-	
Gate-Drain Charge	Q _{gd}		-	4.5	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =250V R _L =50 R _G =25 (Note4,5)	-	23	-	ns
Turn-on Rise time	t _r		-	17	-	
Turn-off Delay time	t _{d(off)}		-	40	-	
Turn-off Fall time	t _f		-	13	-	
Input Capacitance	C _{iss}	KF5N50D V _{DS} =25V, V _{GS} =0V,	-	510	-	pF
		KF5N50DZ f=1.0MHz	-	440	-	
Output Capacitance	C _{oss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	69	-	
Reverse Transfer Capacitance	C _{rss}		-	6	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	5	A
Pulsed Source Current	I _{SP}		-	-	20	
Diode Forward Voltage	V _{SD}	I _S =5A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =5A, V _{GS} =0V, dI _S /dt=100A/μs	-	300	-	ns
Reverse Recovery Charge	Q _{rr}		-	3.1	-	μC

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

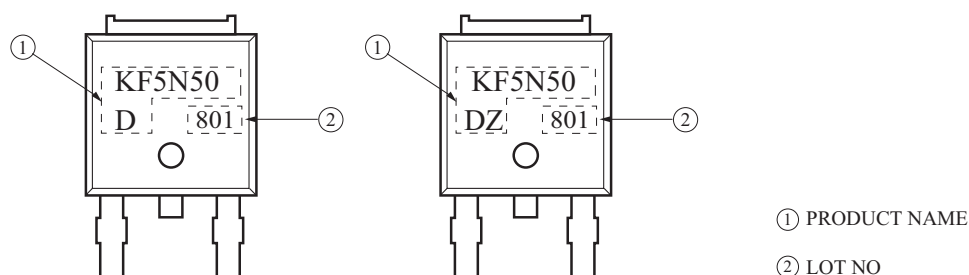
Note 2) L=19.5mH, I_S=5A, V_{DD}=50V, R_G=25 , Starting T_j=25 .

Note 3) I_S 5A, dI/dt 100A/μs, V_{DD} BV_{DSS}, Starting T_j=25 .

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

Note 5) Essentially independent of operating temperature.

Marking



KF5N50D/DZ

Fig1. $I_D - V_{DS}$

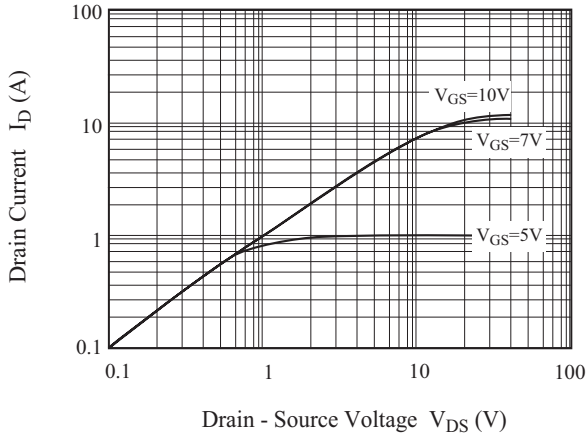


Fig2. $I_D - V_{GS}$

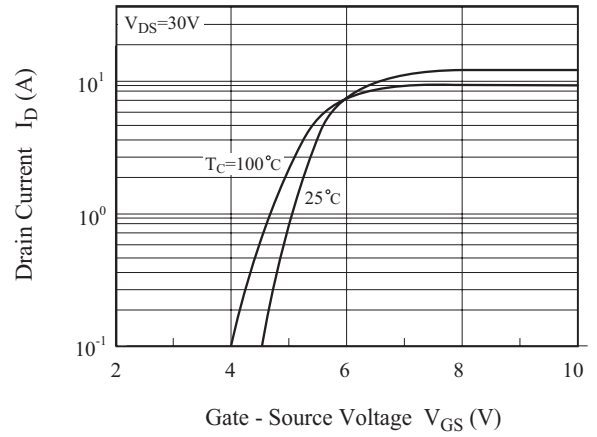


Fig3. $BV_{DSS} - T_j$

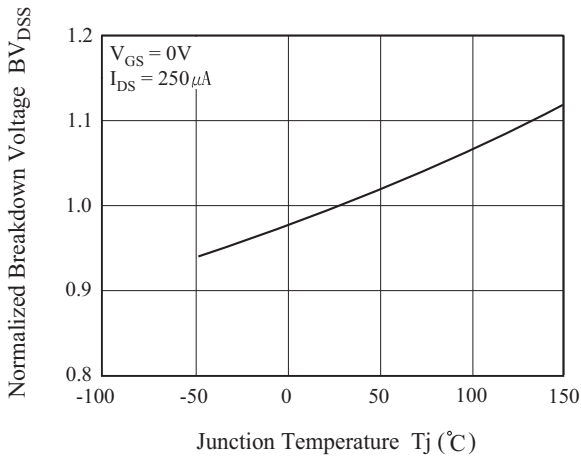


Fig4. $R_{DS(ON)} - I_D$

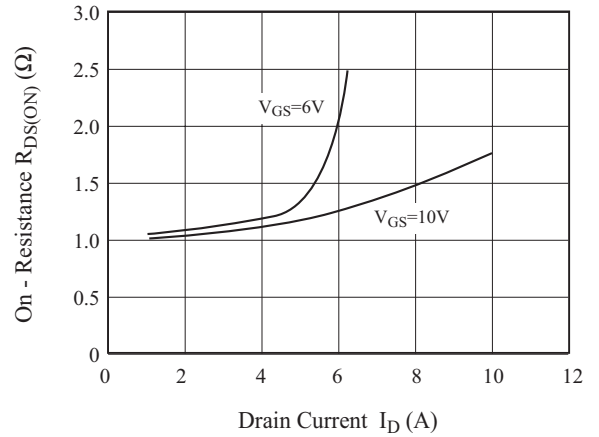


Fig5. $I_S - V_{SD}$

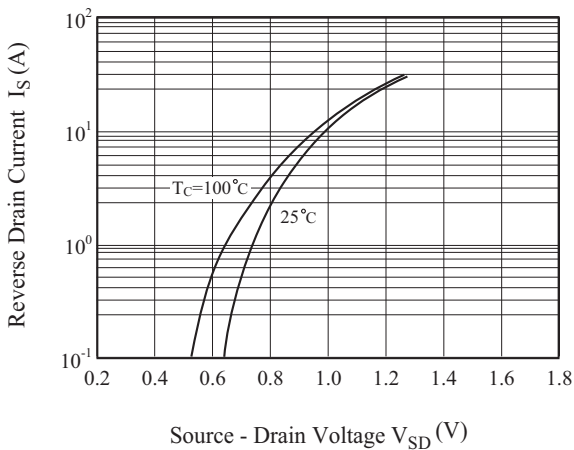
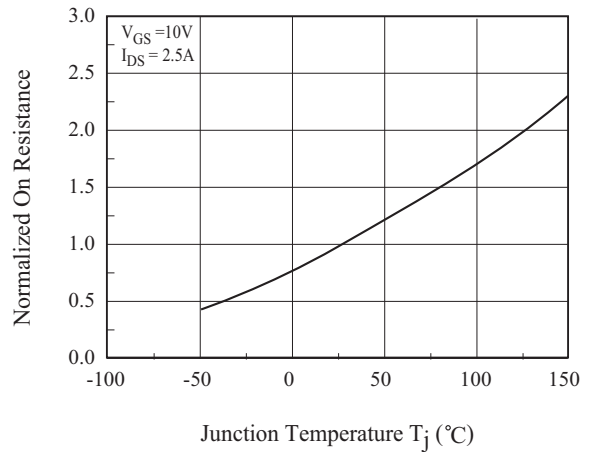


Fig6. $R_{DS(ON)} - T_j$



KF5N50D/DZ

Fig 7. C - V_{DS}

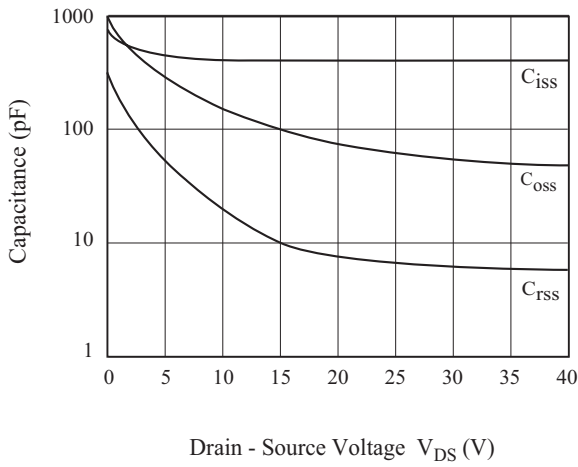


Fig8. Q_g- V_{GS}

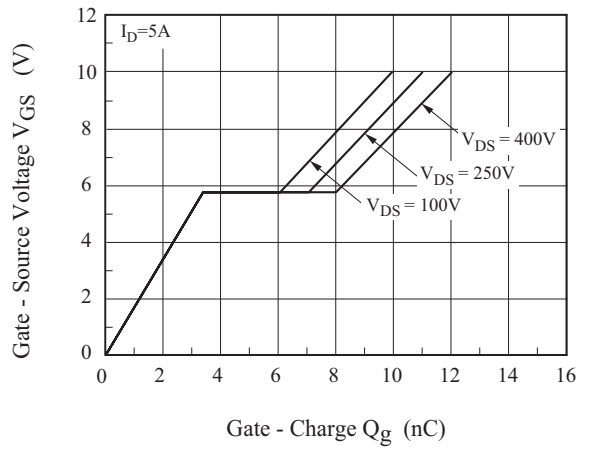


Fig9. Safe Operation Area

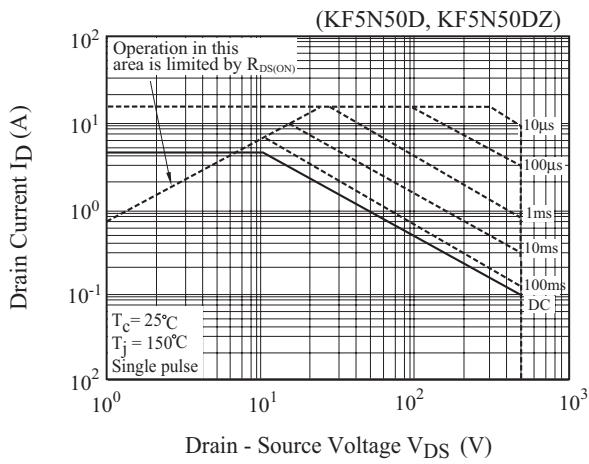


Fig10. I_D - T_j

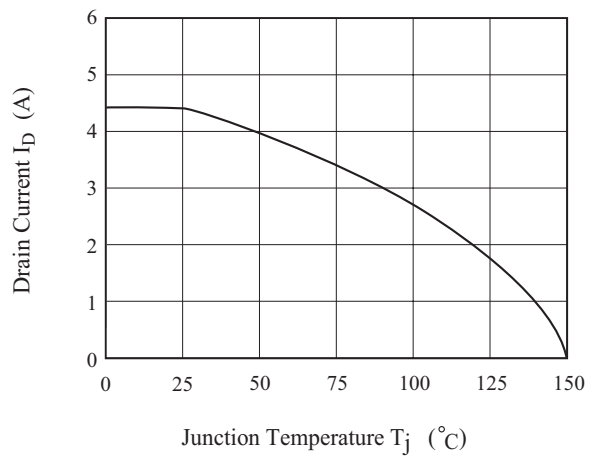


Fig11. Transient Thermal Response Curve

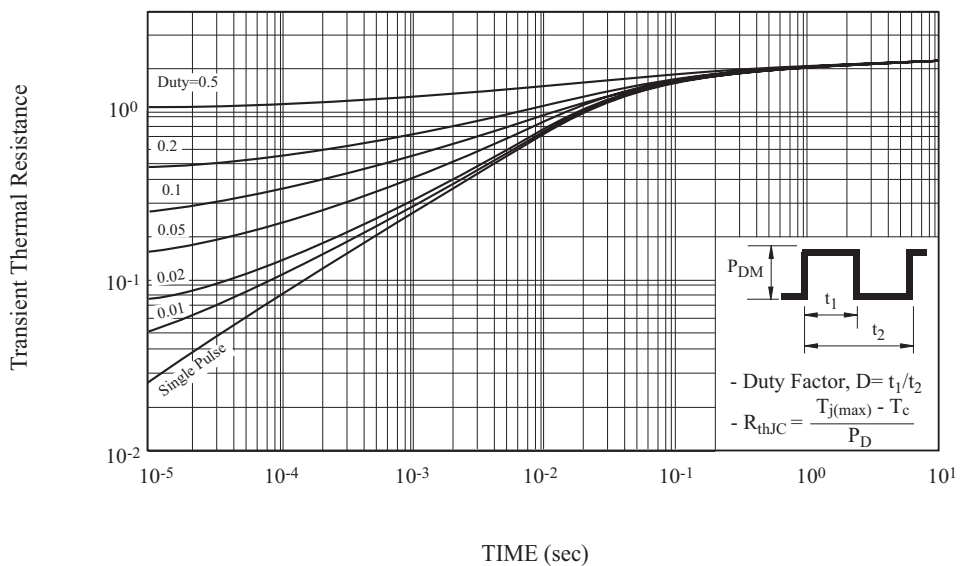


Fig12. Gate Charge

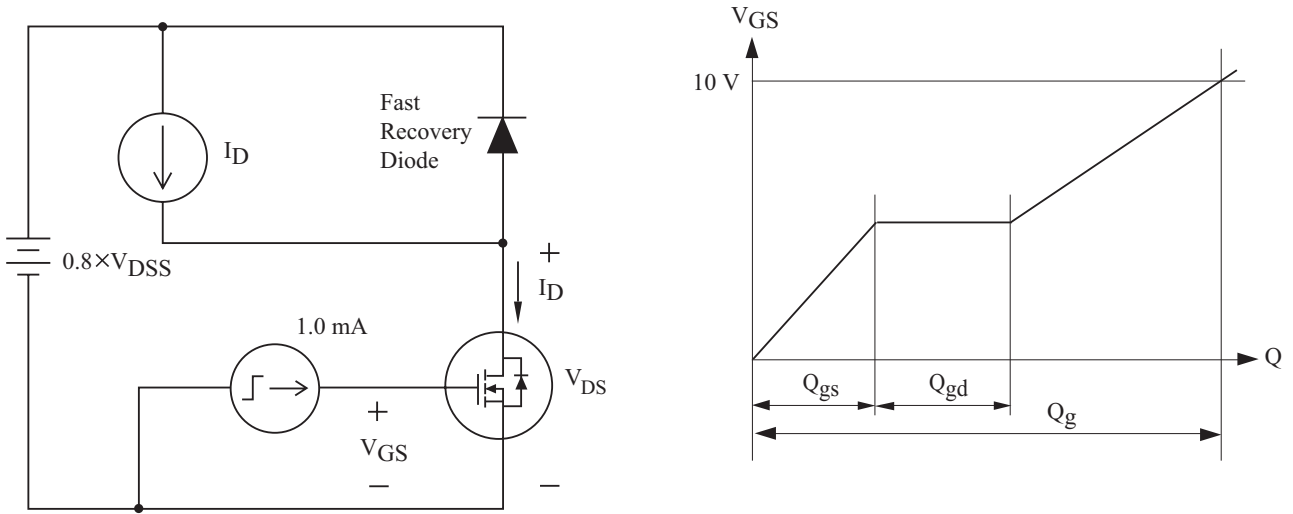


Fig13. Single Pulsed Avalanche Energy

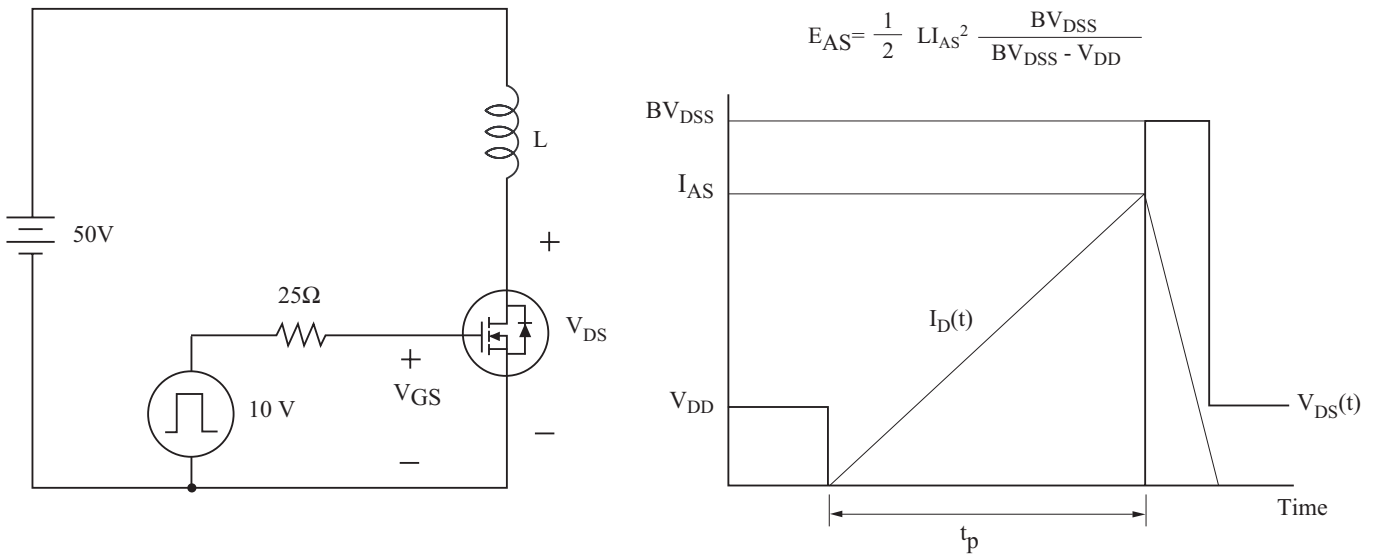


Fig14. Resistive Load Switching

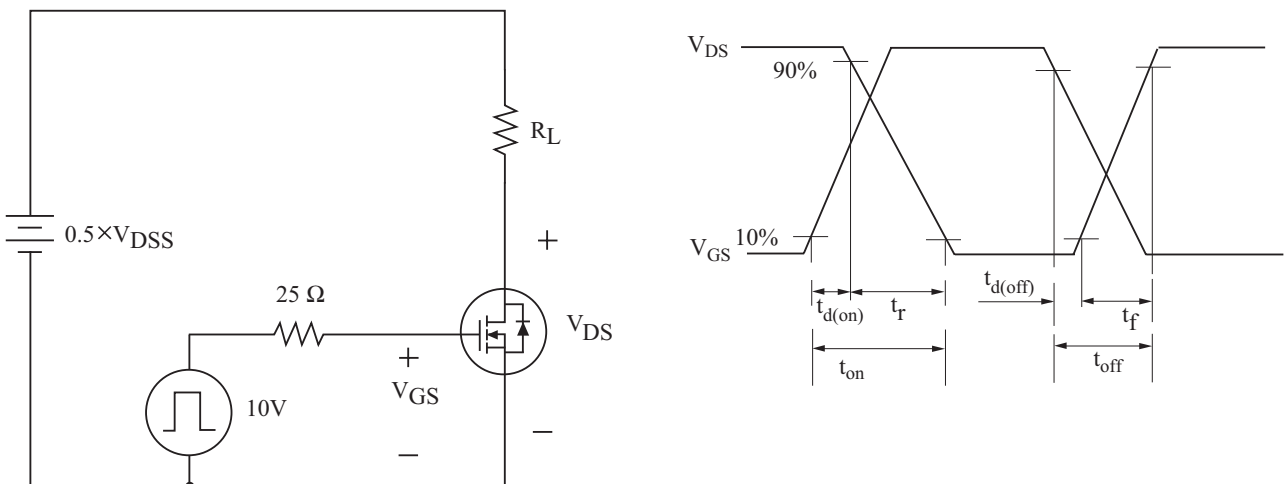


Fig15. Source - Drain Diode Reverse Recovery and dv/dt

