

General Description

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

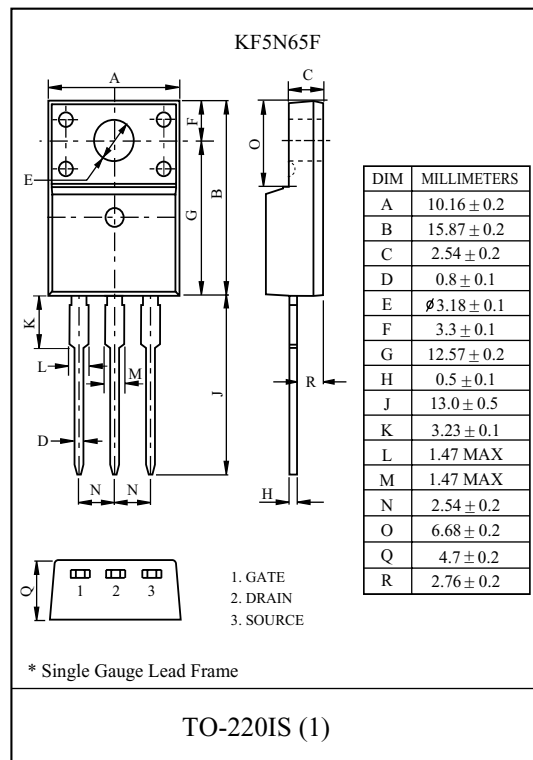
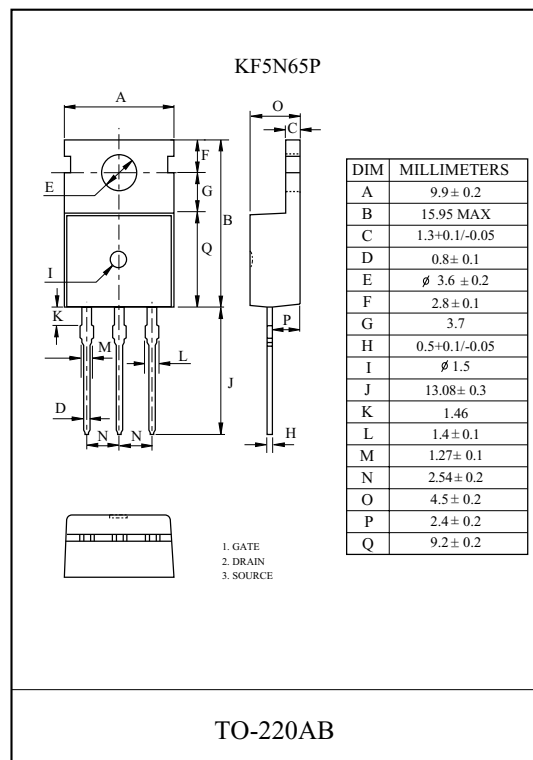
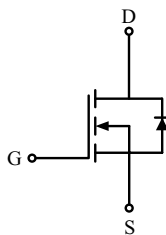
FEATURES

- $V_{DS} = 650V$, $I_D = 5A$
- Drain-Source ON Resistance : $R_{DS(ON)} = 1.75 \Omega (\text{Max}) @ V_{GS} = 10V$
- $Q_g(\text{typ}) = 14.5nC$

MAXIMUM RATING (Tc=25 °C)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			KF5N65P	KF5N65F	
Drain-Source Voltage		V _{DSS}	650		V
Gate-Source Voltage		V _{GSS}	± 30		V
Drain Current	@T _C =25	I _D	5	5*	A
	@T _C =100		3.0	3.0*	
	Pulsed (Note1)	I _{DP}	15		
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	150		mJ
Repetitive Avalanche Energy (Note 1)		E _{AR}	3.8		mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5		V/ns
Drain Power Dissipation	Tc=25	P _D	100	41.7	W
	Derate above 25		0.8	0.33	W/
Maximum Junction Temperature		T _j	150		
Storage Temperature Range		T _{stg}	-55 150		
Thermal Characteristics					
Thermal Resistance, Junction-to-Case		R _{thJC}	1.25	3.0	/W
Thermal Resistance, Junction-to-Ambient		R _{thJA}	62.5	62.5	/W

PIN CONNECTION



KF5N65P/F

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	650	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / Δ T _j	I _D =250μA, Referenced to 25	-	0.7	-	V/
Drain Cut-off Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V,	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250μA	2.5	-	4.5	V
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 =2.5A	-	1.5	1.75	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =520V, I _D =5.0A V _{GS} =10V (Note4,5)	-	14.5	-	nC
Gate-Source Charge	Q _{gs}		-	3.0	-	
Gate-Drain Charge	Q _{gd}		-	5.8	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =325V I _D =5.0A R _G =25 Ω (Note4,5)	-	35	-	ns
Turn-on Rise time	t _r		-	35	-	
Turn-off Delay time	t _{d(off)}		-	65	-	
Turn-off Fall time	t _f		-	25	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	720	-	pF
Output Capacitance	C _{oss}		-	72	-	
Reverse Transfer Capacitance	C _{rss}		-	7.2	-	
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 =5.0A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =5.0A, V _{GS} =0V,	-	300	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/μs	-	1.8	-	μC

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

Note 2) $L=12.4mH$, $I_S=5.0A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_j=25$.

Note 3) $I_S \leq 4.5A$, $dI/dt \leq 100A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_j=25$.

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

Note 5) Essentially independent of operating temperature.

Marking

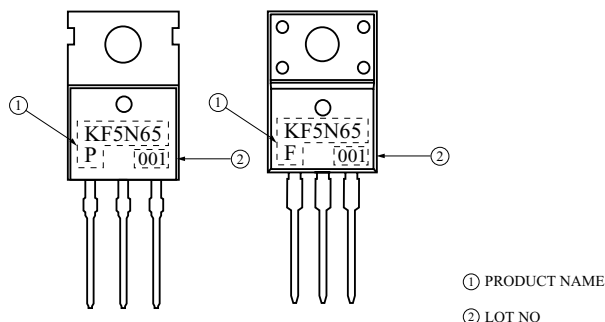


Fig1. $I_D - V_{DS}$

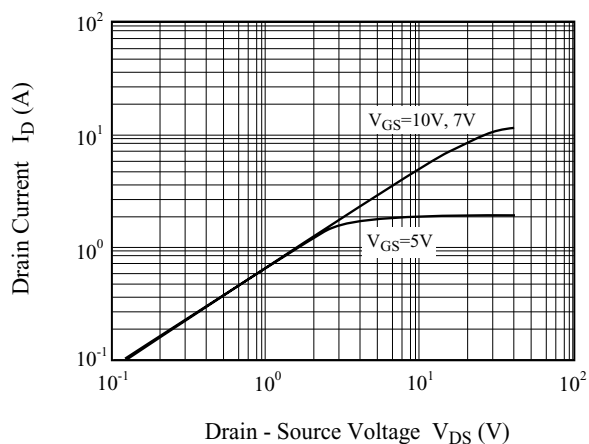


Fig2. $I_D - V_{GS}$

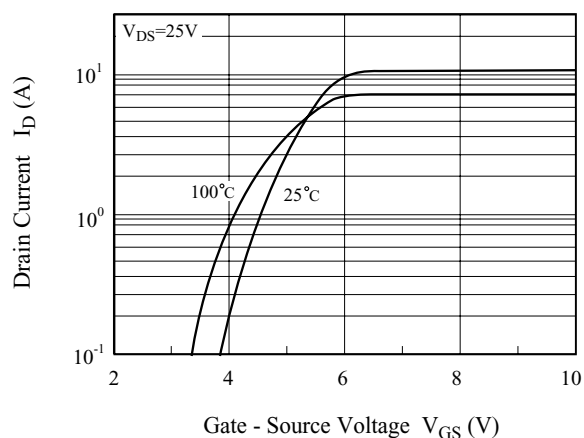


Fig3. $BV_{DSS} - T_j$

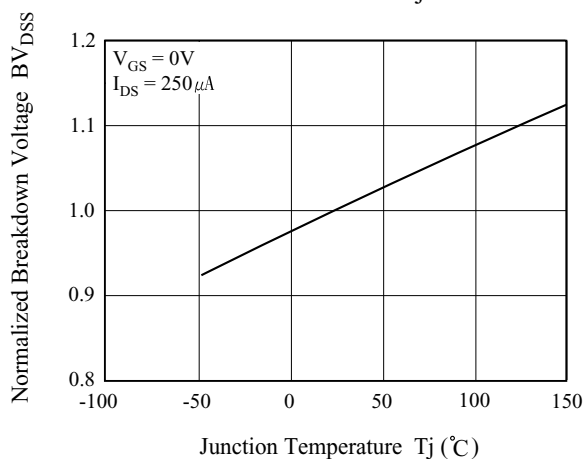


Fig4. $R_{DS(ON)} - I_D$

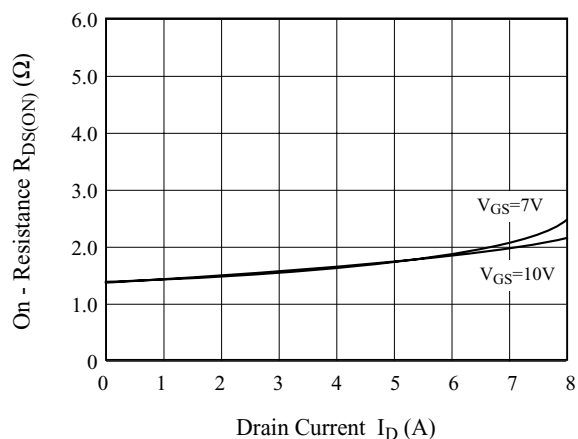


Fig5. $I_S - V_{SD}$

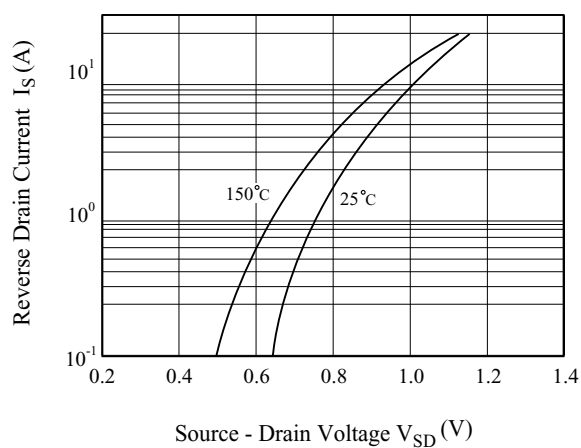


Fig6. $R_{DS(ON)} - T_j$

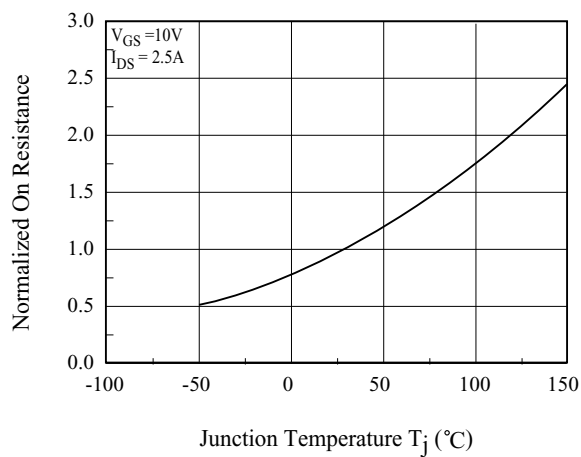


Fig 7. C - V_{DS}

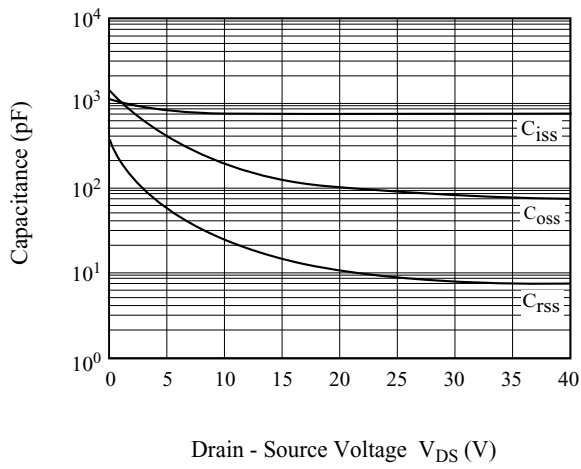


Fig8. Q_g - V_{GS}

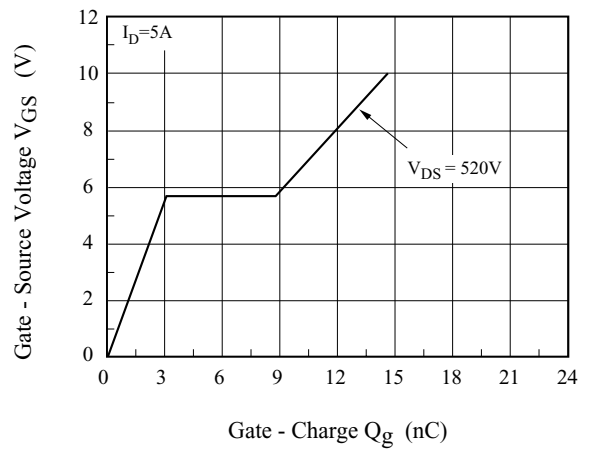


Fig9. Safe Operation Area

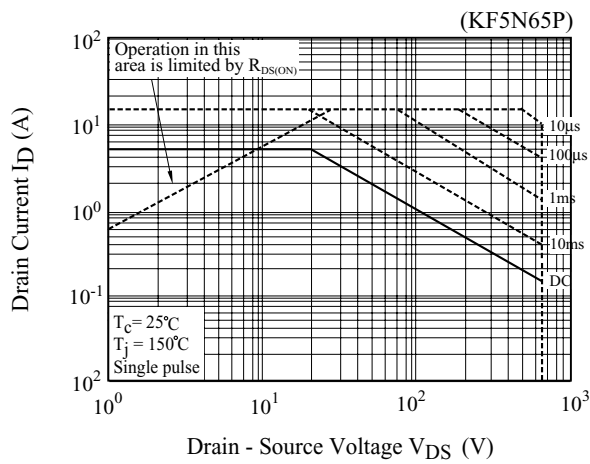


Fig10. Safe Operation Area

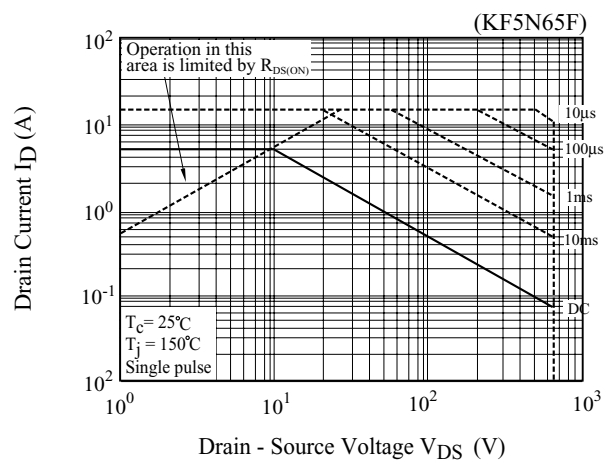


Fig11. I_D - T_j

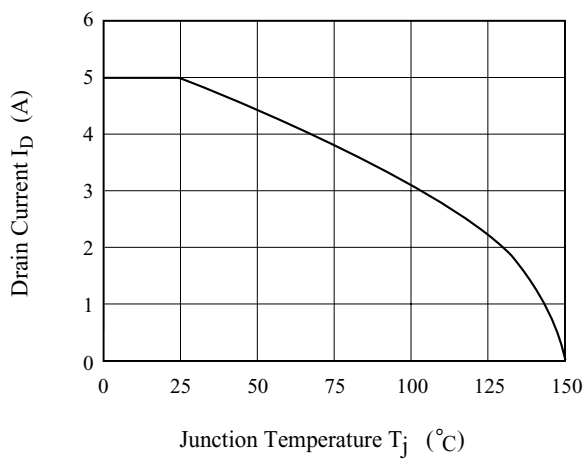


Fig12. Transient Thermal Response Curve

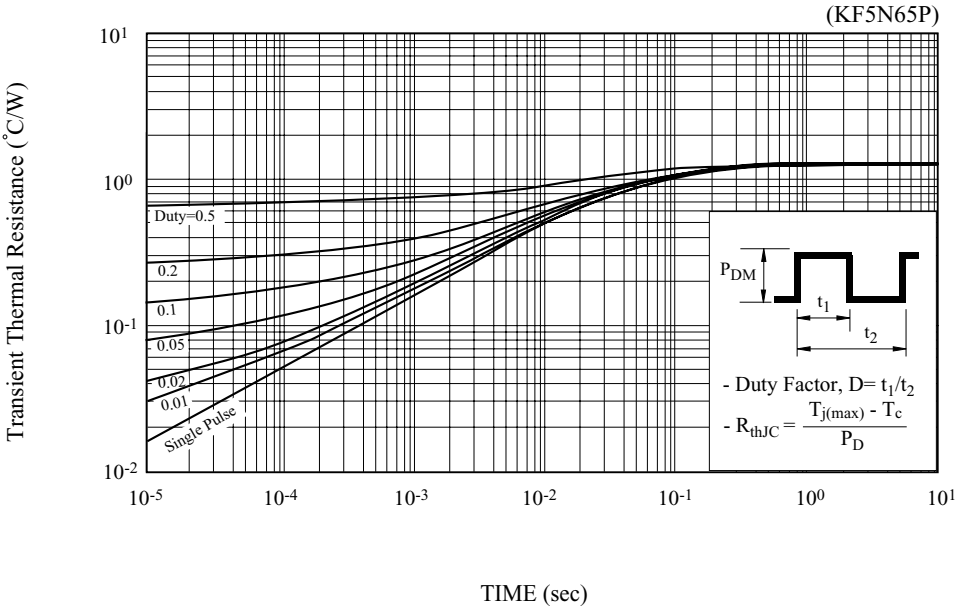


Fig13. Transient Thermal Response Curve

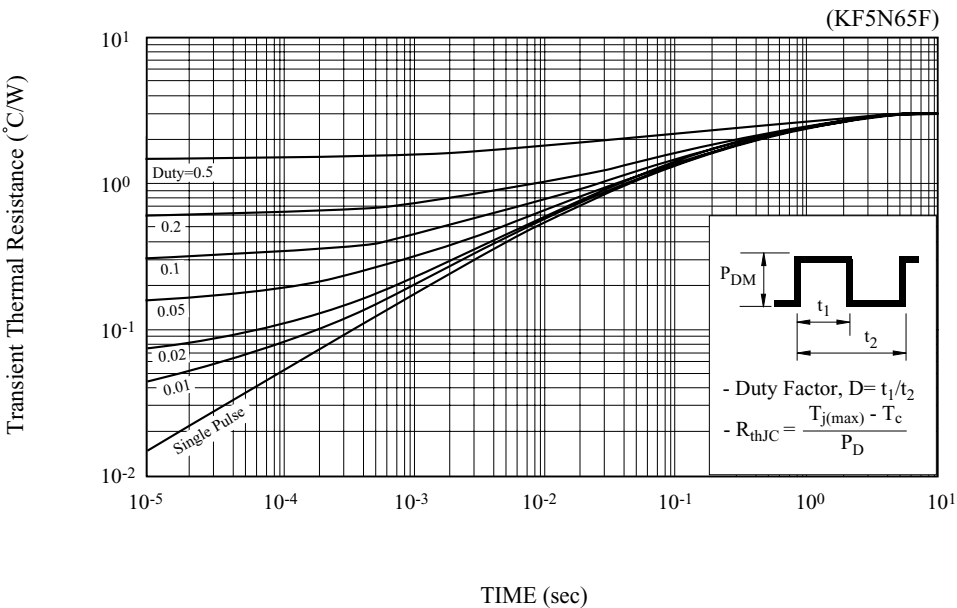


Fig14. Gate Charge

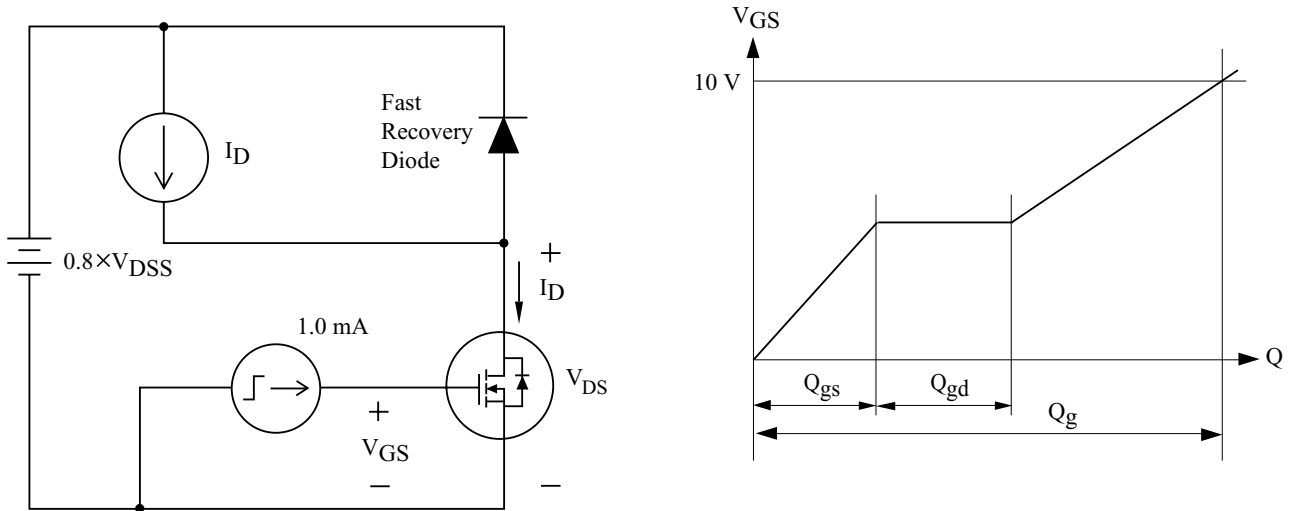


Fig15. Single Pulsed Avalanche Energy

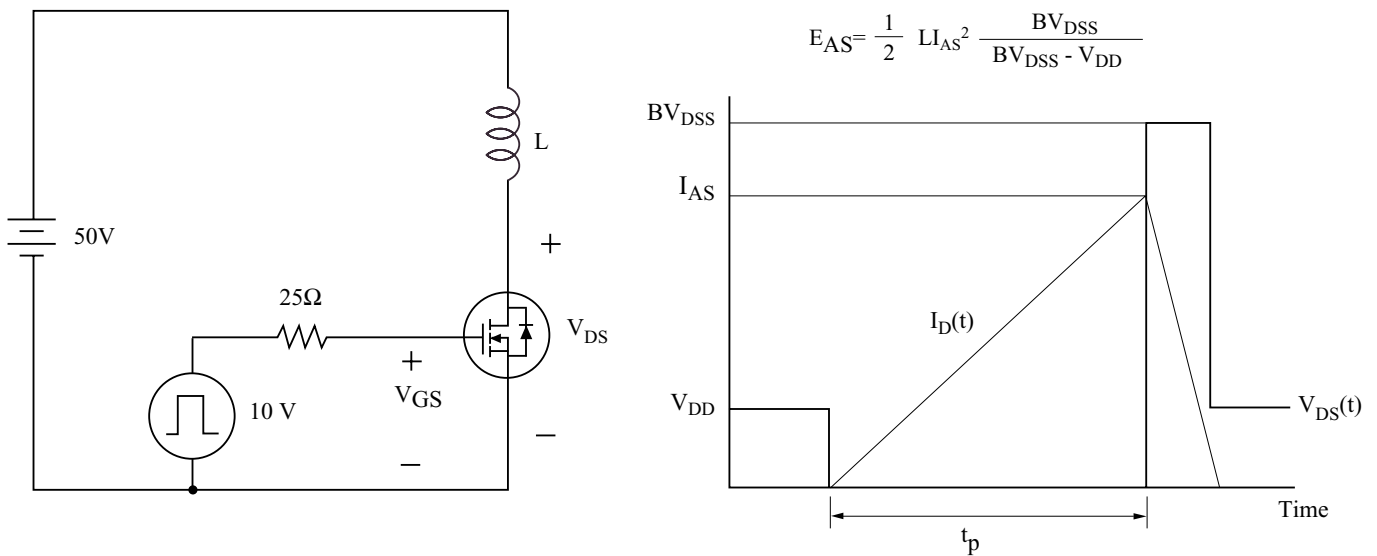


Fig16. Resistive Load Switching

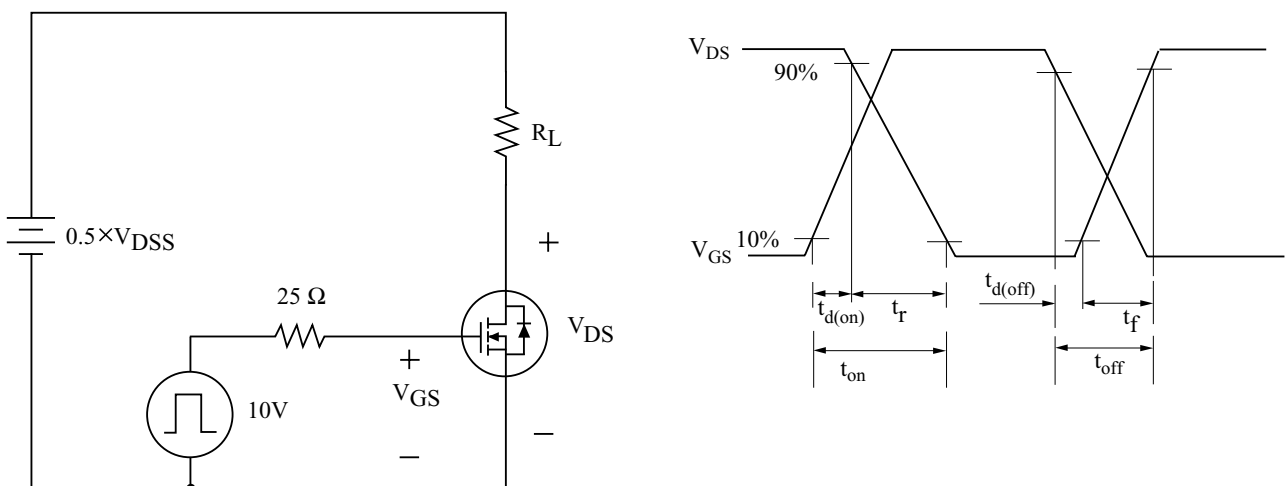


Fig17. Source - Drain Diode Reverse Recovery and dv/dt

