

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

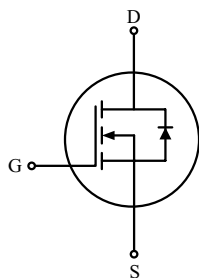
- $V_{DS} = 500V$, $I_D = 11A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 0.52\Omega(\text{Max}) @ V_{GS} = 10V$
- $Q_g(\text{typ.}) = 26nC$

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

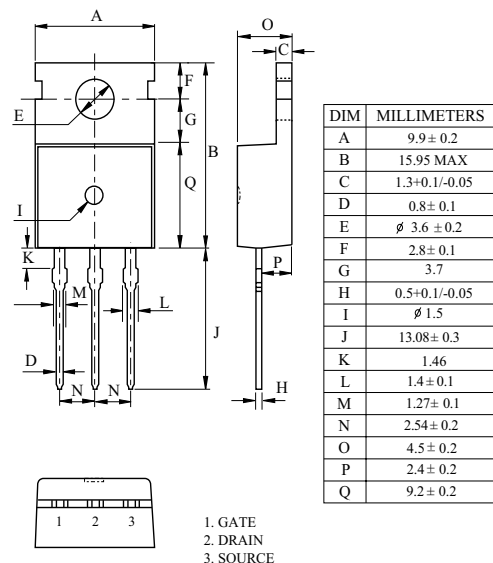
CHARACTERISTIC		SYMBOL	RATING		UNIT
			KF11N50P	KF11N50F	
Drain-Source Voltage		V _{DSS}	500		V
Gate-Source Voltage		V _{GSS}	±30		V
Drain Current	@T _C =25°C	I _D	11	11*	A
	@T _C =100°C		7	7*	
	Pulsed (Note1)	I _{DP}	33	33*	
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	400		mJ
Repetitive Avalanche Energy (Note 1)		E _{AR}	65		mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	45		V/ns
Drain Power Dissipation	Tc=25°C	P _D	178	46.3	W
	Derate above 25°C		1.43	0.37	W/°C
Maximum Junction Temperature		T _j	150		°C
Storage Temperature Range		T _{stg}	-55 150		°C
Thermal Characteristics					
Thermal Resistance, Junction-to-Case		R _{thJC}	0.7	2.7	°C/W
Thermal Resistance, Junction-to-Ambient		R _{thJA}	62.5	62.5	°C/W

* : Drain current limited by maximum junction temperature.

EQUIVALENT CIRCUIT

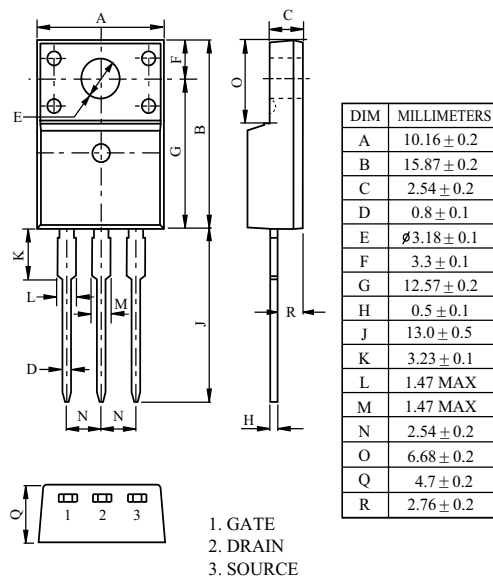


KF11N50P



TO-220AB

KF11N50F



TO-220IS (1)

KF11N50P/F

ELECTRICAL CHARACTERISTICS (Tc=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250 μA, V _{GS} =0V	500	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / Δ T _j	I _D =250 μA, Referenced to 25°C	-	0.55	-	V/°C
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 =250 μA	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 =5.5A	-	0.42	0.52	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =400V, I _D =11A V _{GS} =10V (Note4,5)	-	26	-	nC
Gate-Source Charge	Q _{gs}		-	6.5	-	
Gate-Drain Charge	Q _{gd}		-	9.1	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =250V I _D =11A R _G =25Ω (Note4,5)	-	45	-	ns
Turn-on Rise time	t _r		-	35	-	
Turn-off Delay time	t _{d(off)}		-	100	-	
Turn-off Fall time	t _f		-	35	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	1400	-	pF
Output Capacitance	C _{oss}		-	170	-	
Reverse Transfer Capacitance	C _{rss}		-	12	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} ≤V _{th}	-	-	11	A
Pulsed Source Current	I _{SP}		-	-	44	
Diode Forward Voltage	V _{SD}	I _S =11A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =11A, V _{GS} =0V,	-	360	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/ μs	-	4.4	-	μC

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

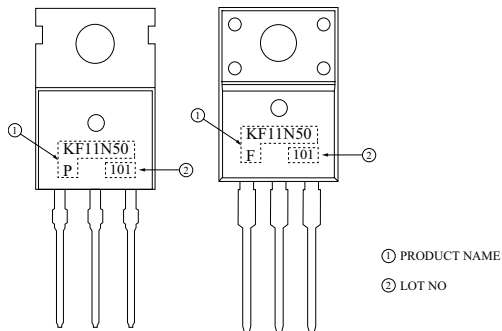
Note 2) $L=6.2mH$, $I_S=11A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_j=25^\circ C$.

Note 3) $I_S \leq 11A$, $dI/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, 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.

Marking



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Fig1. $I_D - V_{DS}$

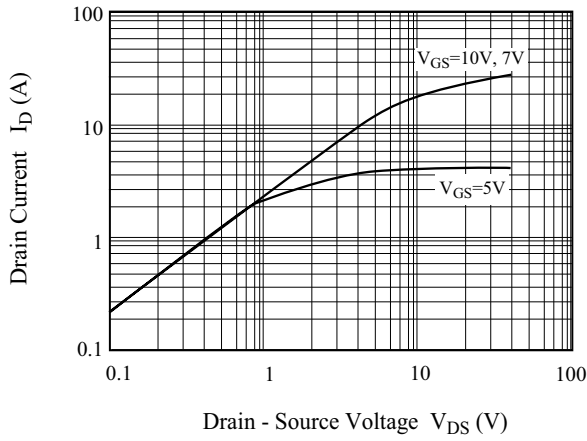


Fig2. $I_D - V_{GS}$

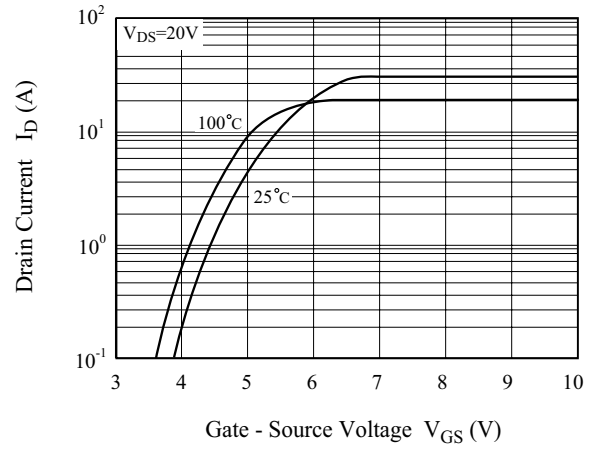


Fig3. $BV_{DSS} - T_j$

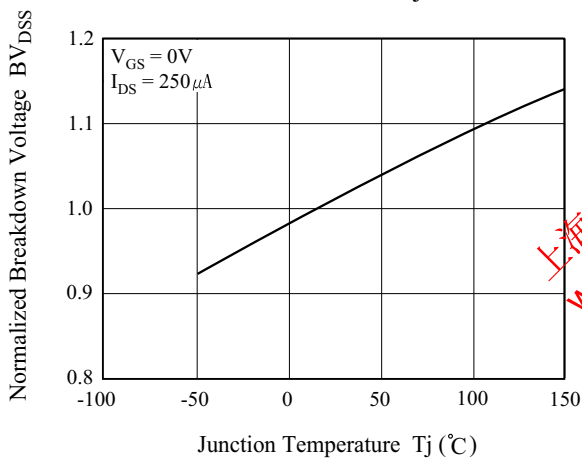


Fig4. $R_{DS(ON)} - I_D$

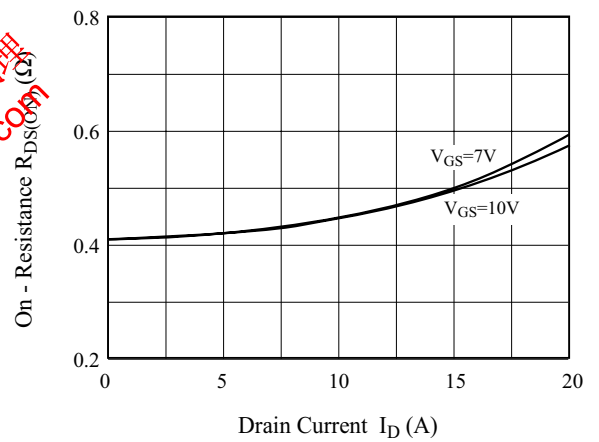


Fig5. $I_S - V_{SD}$

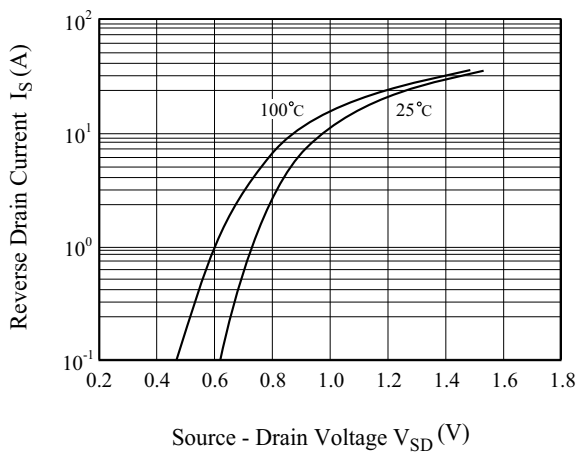
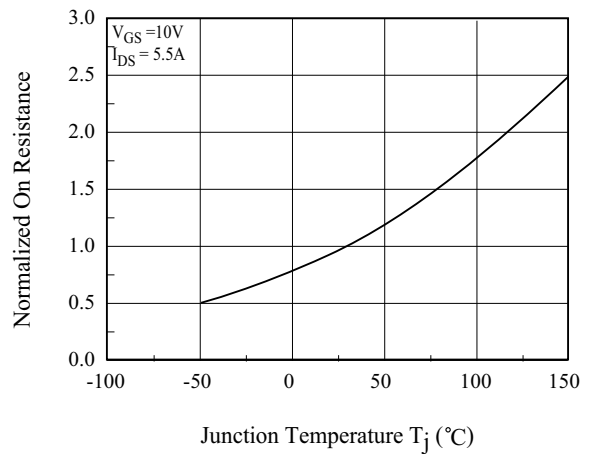


Fig6. $R_{DS(ON)} - T_j$



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Fig 7. C - V_{DS}

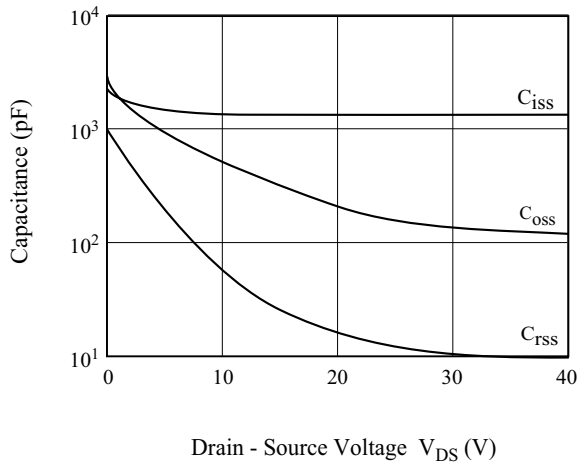


Fig8. Q_g - V_{GS}

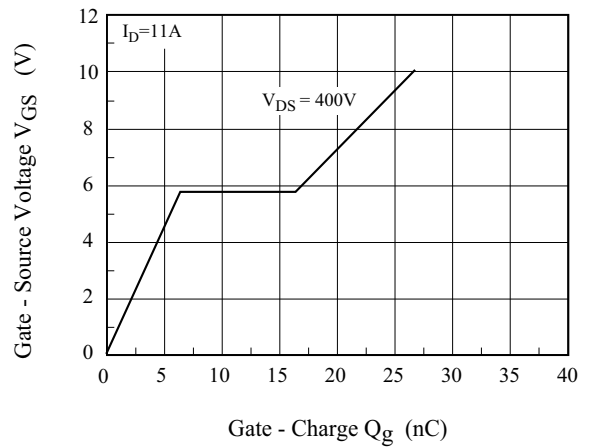


Fig9. Safe Operation Area

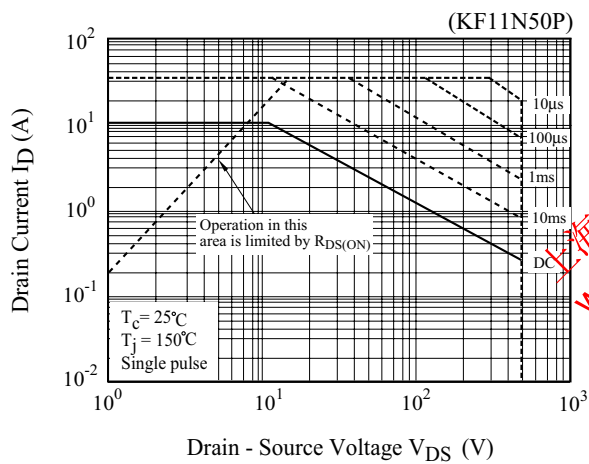


Fig10. Safe Operation Area

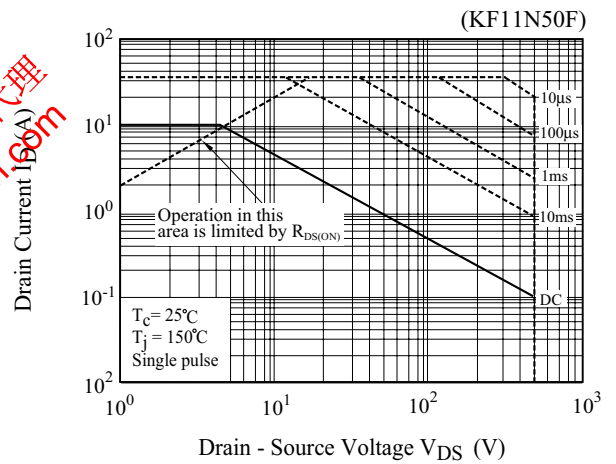
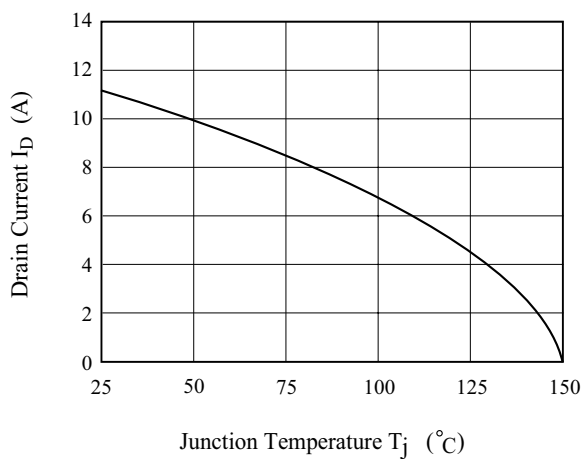


Fig11. I_D - T_j



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Fig12. Transient Thermal Response Curve

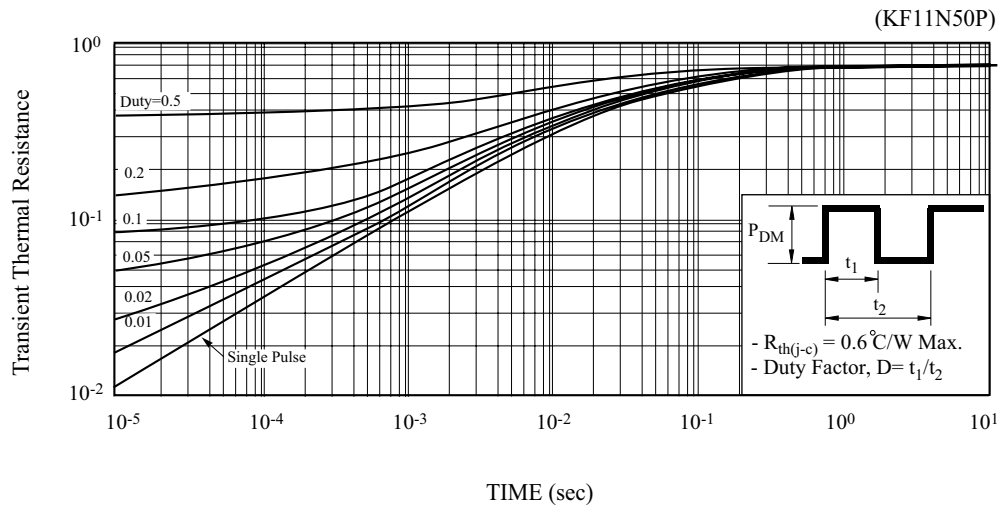


Fig13. Transient Thermal Response Curve

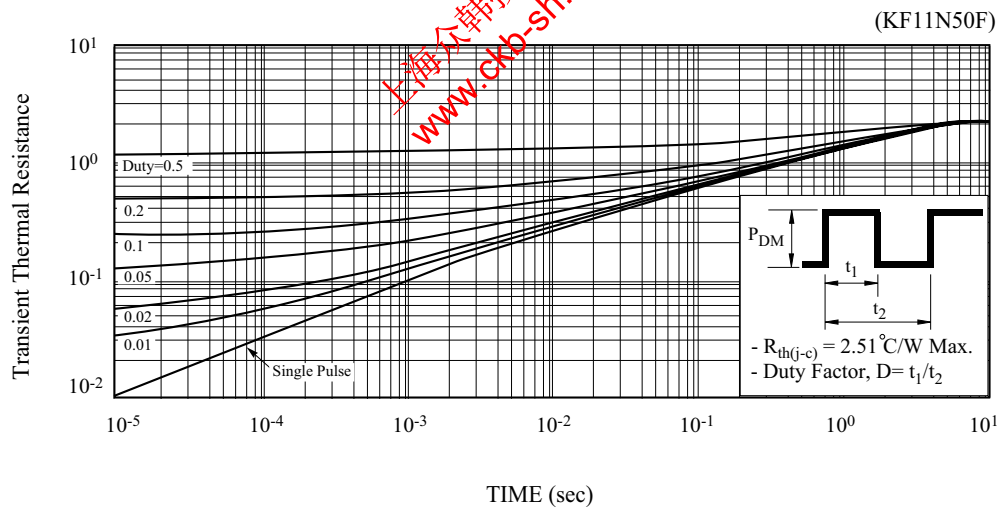


Fig14. Gate Charge

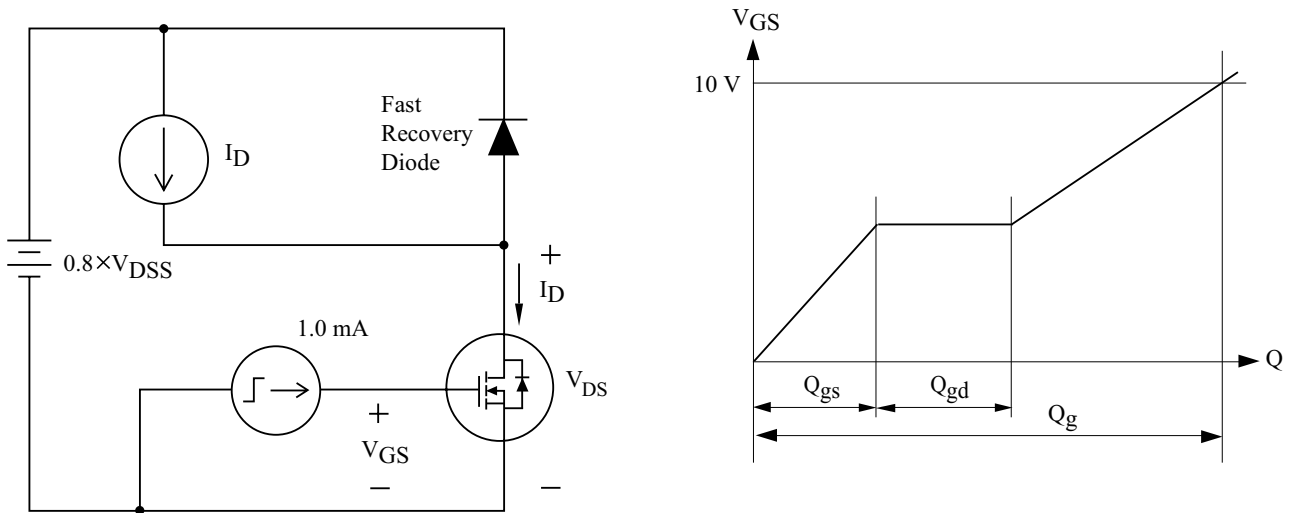


Fig15. Single Pulsed Avalanche Energy

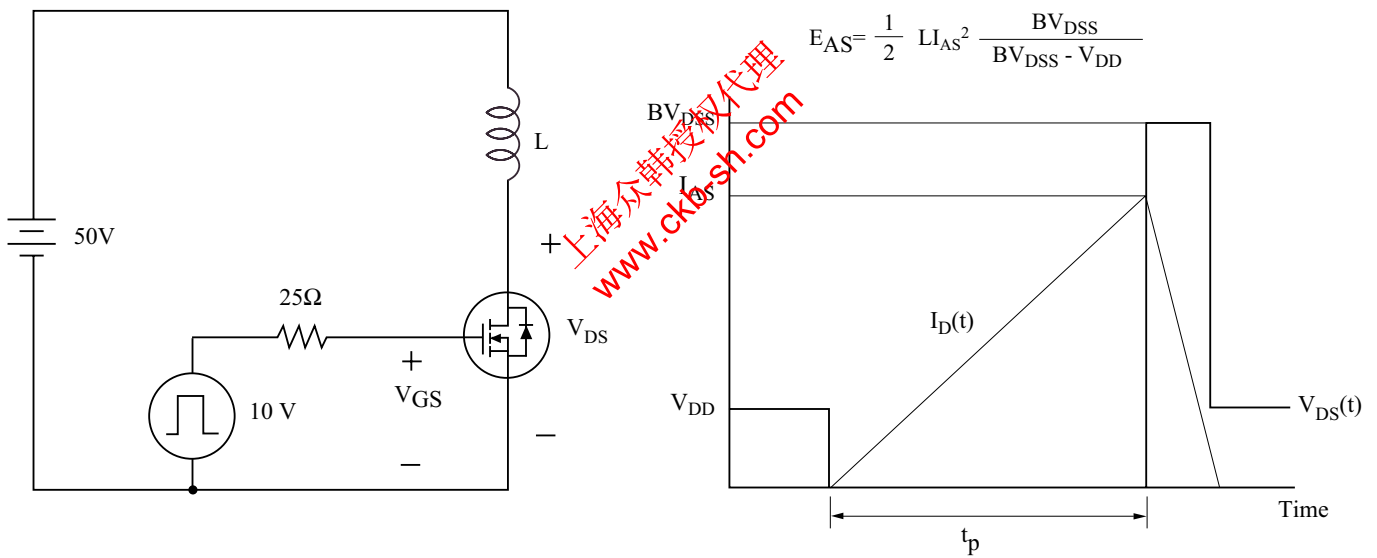


Fig16. Resistive Load Switching

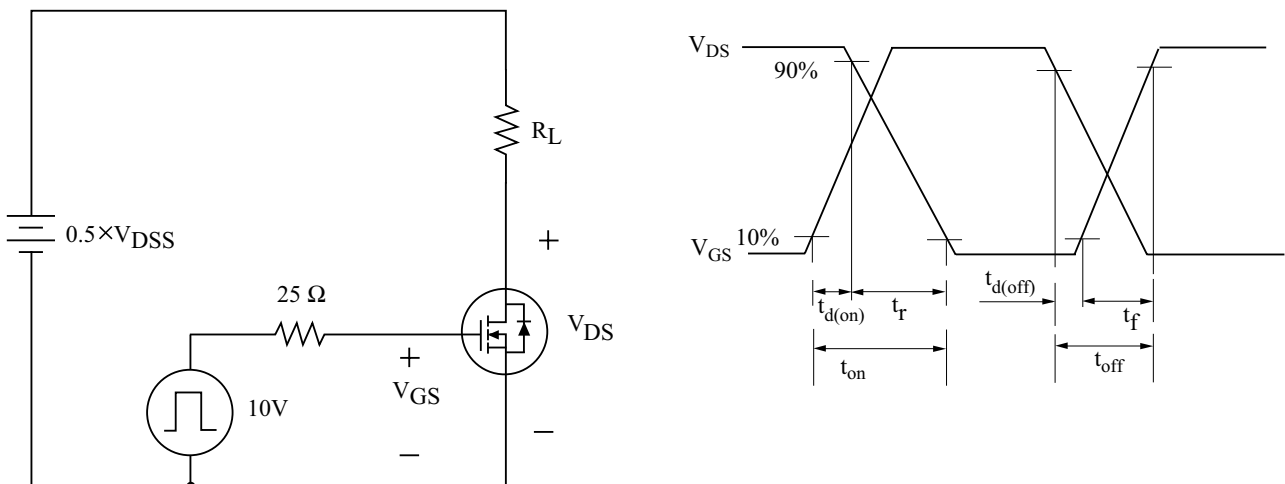
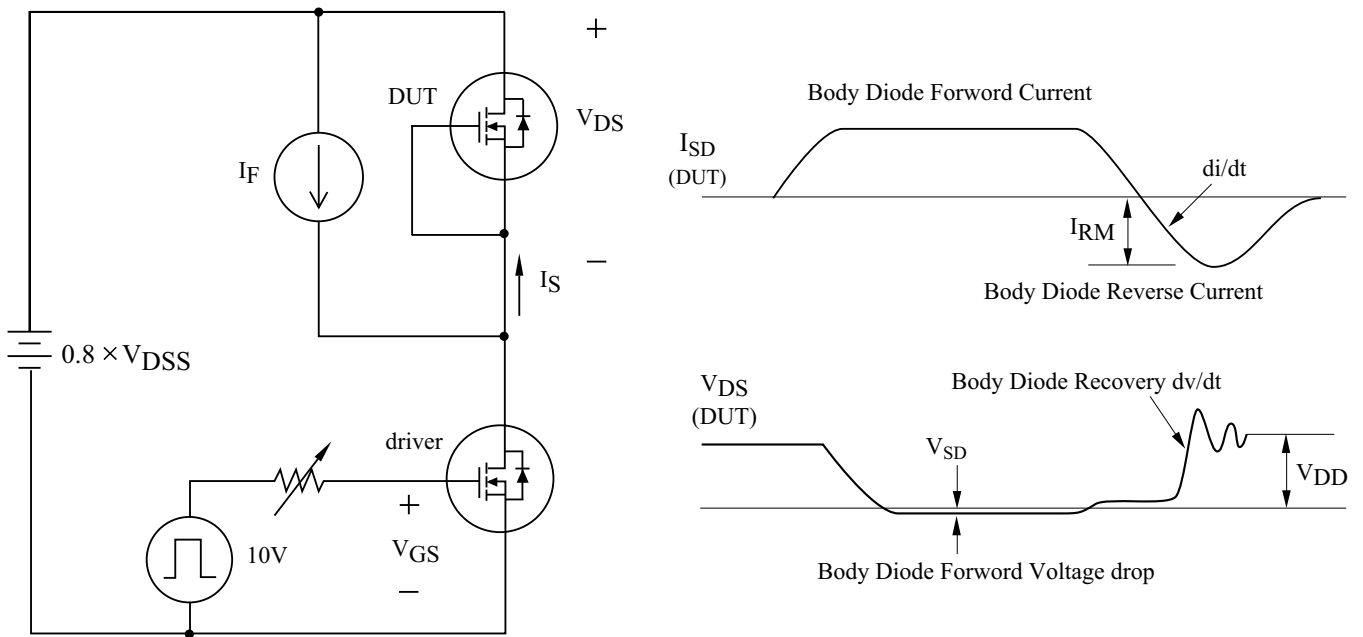


Fig17. Source - Drain Diode Reverse Recovery and dv/dt



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