

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 switch mode power supplies.

FEATURES

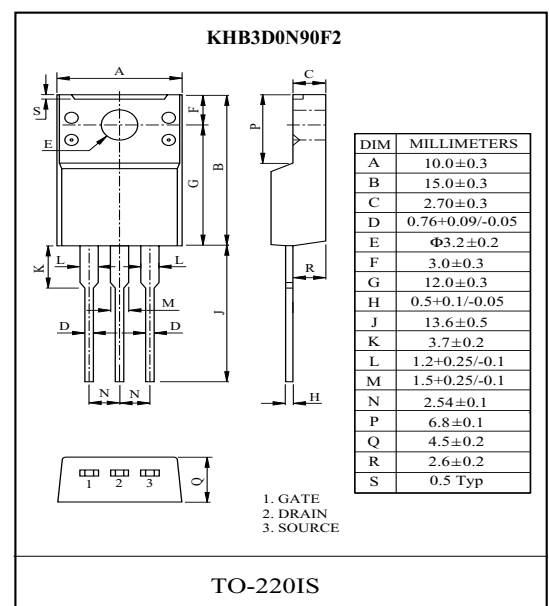
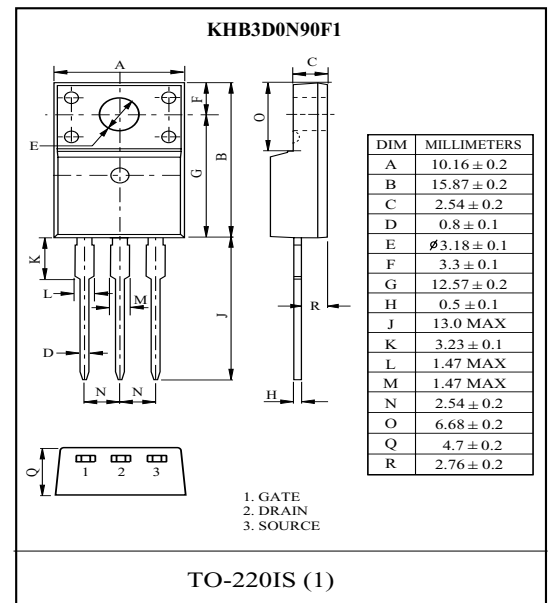
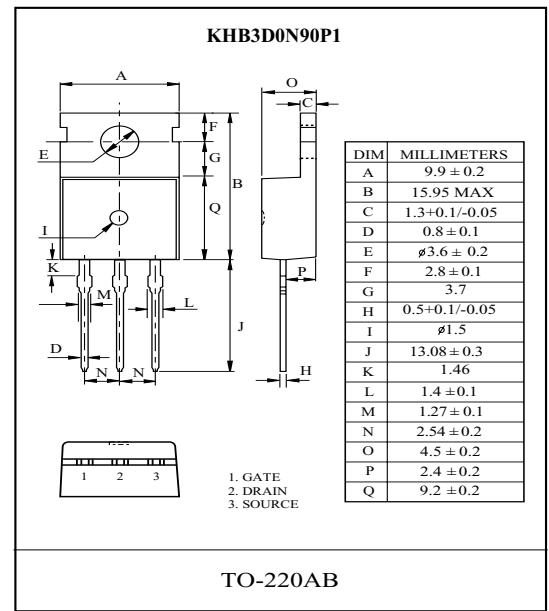
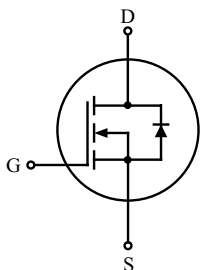
- $V_{DSS} = 900V$, $I_D = 3A$
- Drain-Source ON Resistance
: $R_{DS(ON)} = 4.5 \Omega$ @ $V_{GS} = 10V$
- $Q_g(\text{typ.}) = 25nC$

MAXIMUM RATING (Tc=25°C)

CHARACTERISTIC	SYMBOL	RATING		UNIT	
		KHB3D0N90P1	KHB3D0N90F1 KHB3D0N90F2		
Drain-Source Voltage	V_{DSS}	900		V	
Gate-Source Voltage	V_{GSS}	± 30		V	
Drain Current	@T _C =25°C	I_D	3.0	3.0*	A
	Pulsed (Note 1)	I_{DP}	12	12*	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	450		mJ	
Repetitive Avalanche Energy (Note 1)	E_{AR}	13		mJ	
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.0		V/ns	
Drain Power Dissipation	Tc=25°C	P_D	130	43	W
	Derate above 25°C		1.04	0.34	
Maximum Junction Temperature	T_j	150		°C	
Storage Temperature Range	T_{stg}	-55~150		°C	
Thermal Characteristics					
Thermal Resistance, Junction-to-Case	R_{thJC}	0.96	2.9	°C/W	
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	62.5	°C/W	

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



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ELECTRICAL CHARACTERISTICS (Tc=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	900	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _j	I _D =250μA, Referenced to 25 °C	-	1	-	V/°C
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250μA	2.0	-	4.0	V
Drain Cut-off Current	I _{DSS}	V _{DS} =900V, V _{GS} =0V,	-	-	10	μA
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 =1.5A	-	4.0	4.5	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =720V, I _D =3.0A V _{GS} =10V (Note4, 5)	-	25	32	nC
Gate-Source Charge	Q _{gs}		-	4	-	
Gate-Drain Charge	Q _{gd}		-	11.5	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =450V, R _G =25 Ω I _D =3.0A (Note4, 5)	-	31	72	ns
Turn-on Rise time	t _r		-	65	139	
Turn-off Delay time	t _{d(off)}		-	104	218	
Turn-off Fall time	t _f		-	127	264	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	820	1066	pF
Output Capacitance	C _{oss}		-	63	82	
Reverse Transfer Capacitance	C _{rss}		-	9	12	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	3.0	A
Pulsed Source Current	I _{SP}		-	-	12	
Diode Forward Voltage	V _{SD}	I _S =3.0A, V _{GS} =0V	-	-	1.6	V
Reverse Recovery Time	t _{rr}	I _S =3.0A, V _{DD} =450V, dI _S /dt=100A/μs (Note 4)	-	510	-	ns
Reverse Recovery Charge	Q _{rr}		-	2.2	-	μC

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

Note 2) L =94mH, I_S=3.0A, V_{DD}=50V, R_G=25 Ω, Starting T_j=25 °C.

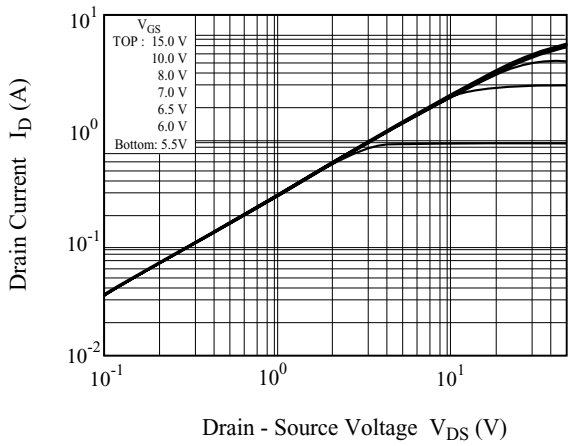
Note 3) I_S ≤3.0A, dI/dt ≤200A/μs, V_{DD} ≤BV_{DSS}, Starting T_j=25 °C.

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

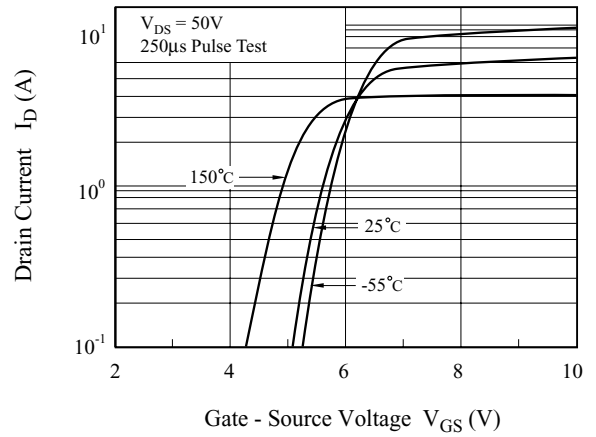
Note 5) Essentially independent of operating temperature.

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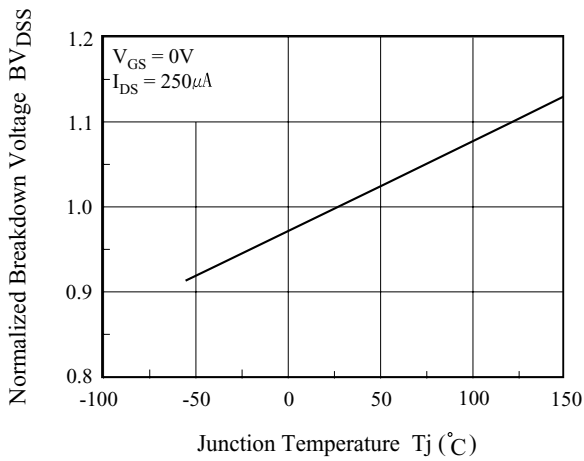
$I_D - V_{DS}$



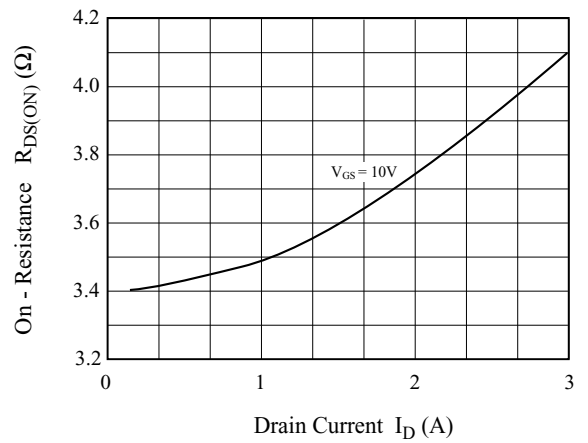
$I_D - V_{GS}$



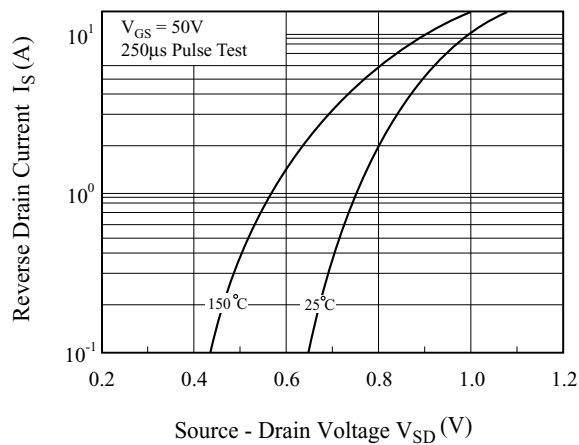
$BV_{DSS} - T_j$



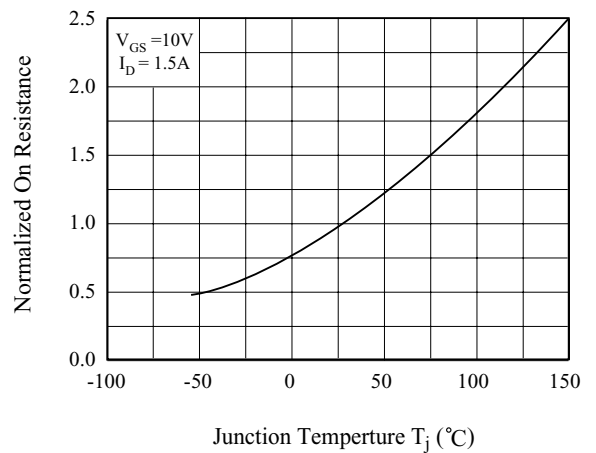
$R_{DS(ON)} - I_D$



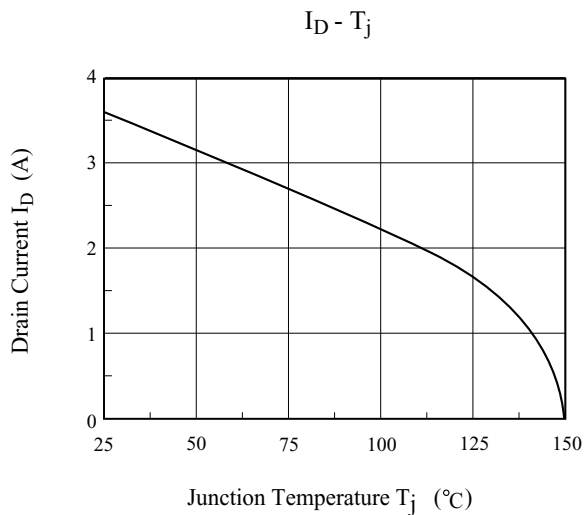
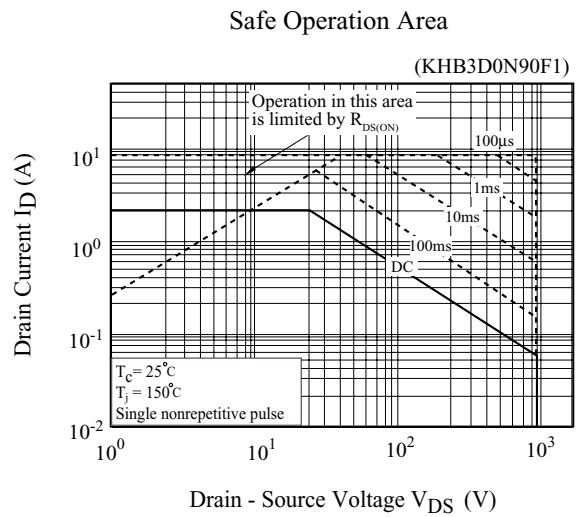
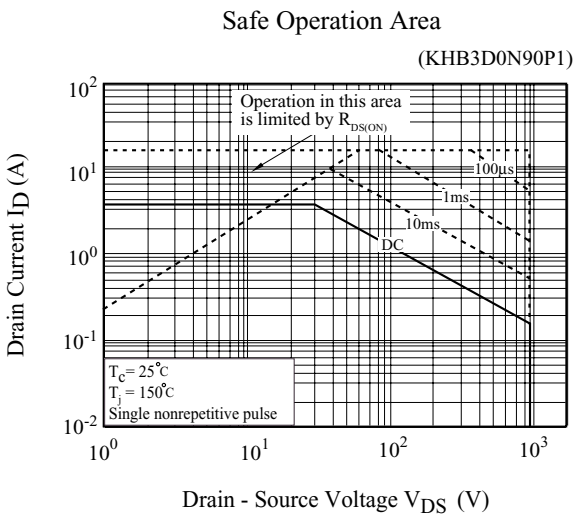
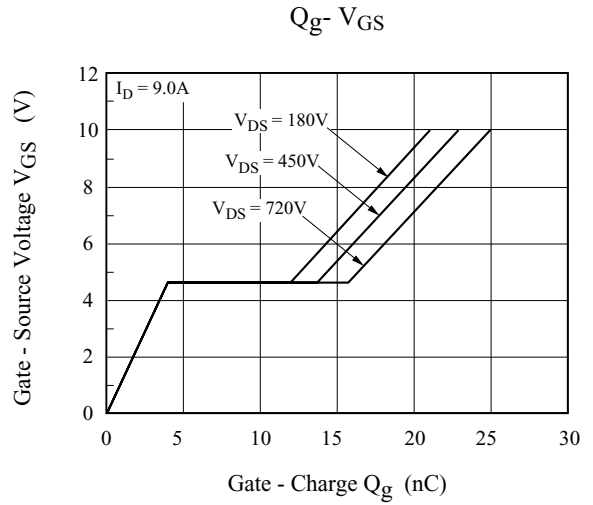
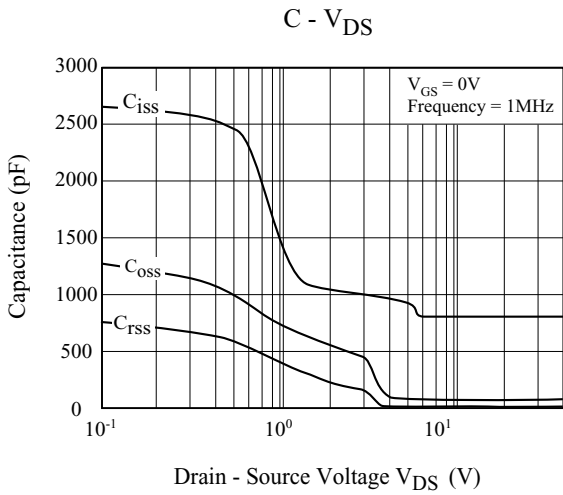
$I_S - V_{SD}$



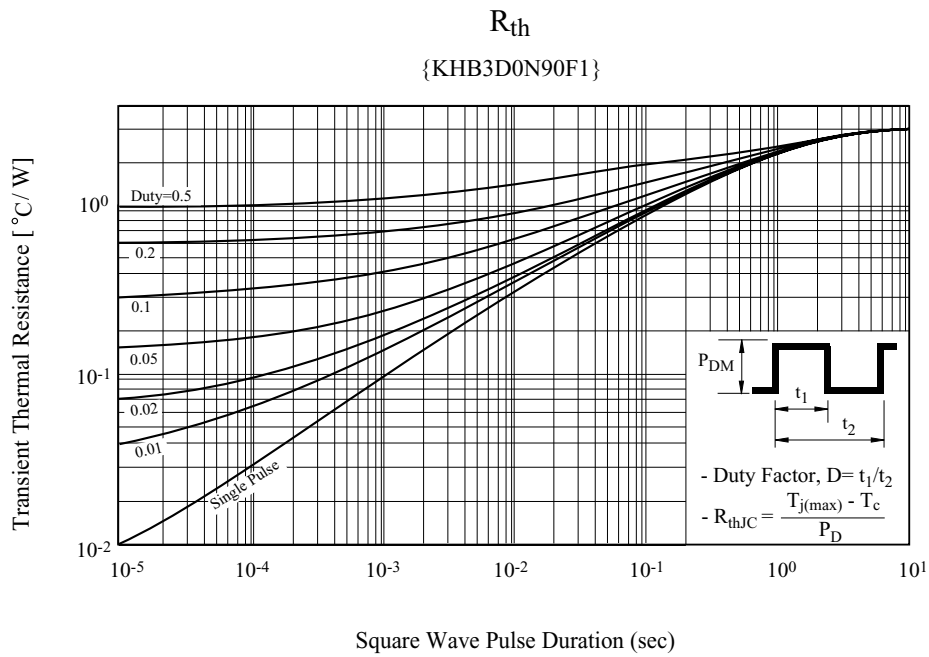
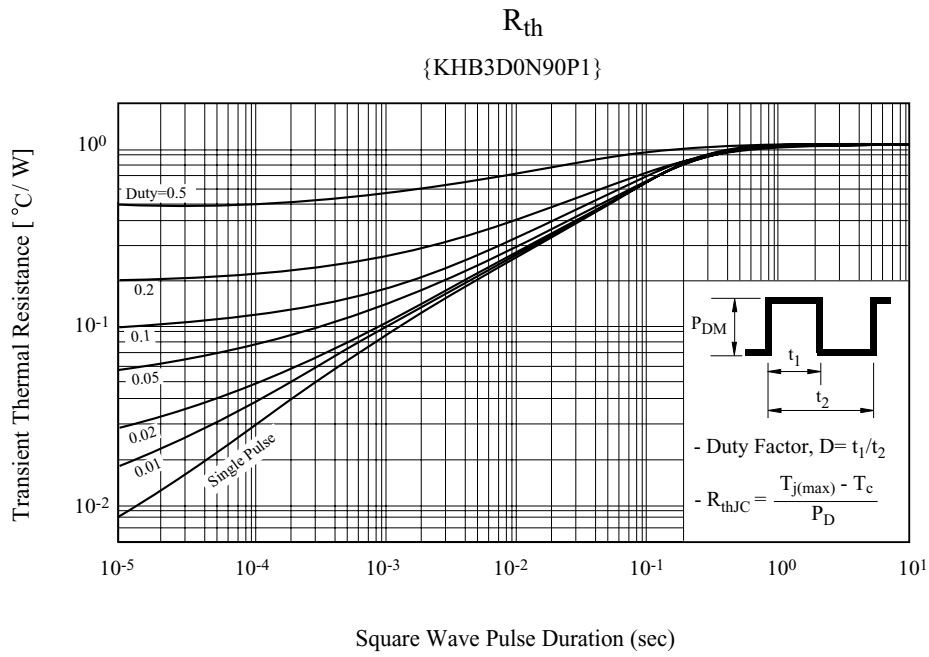
$R_{DS(ON)} - T_j$



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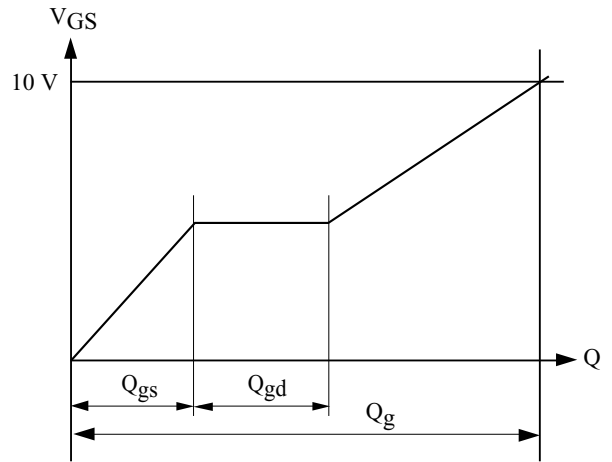
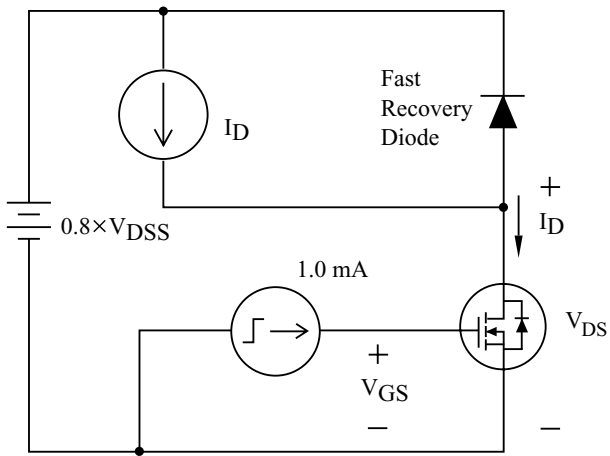


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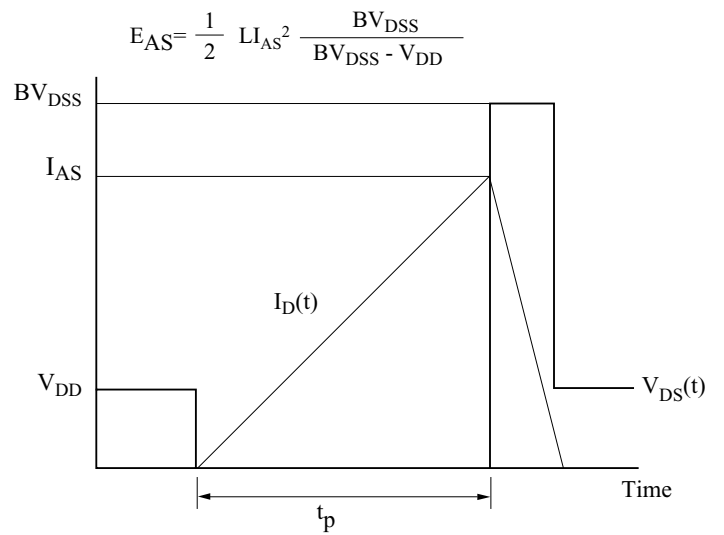
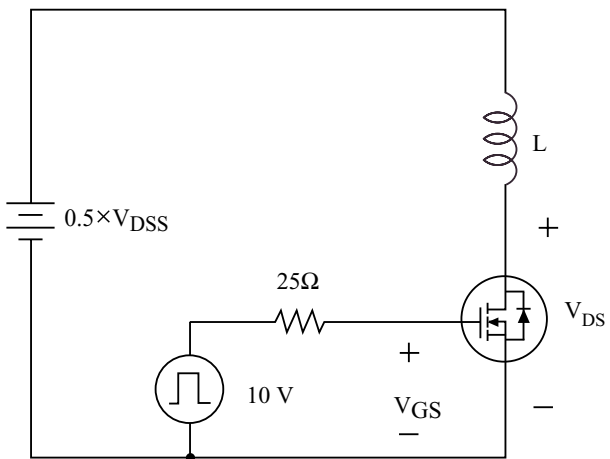


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- Gate Charge

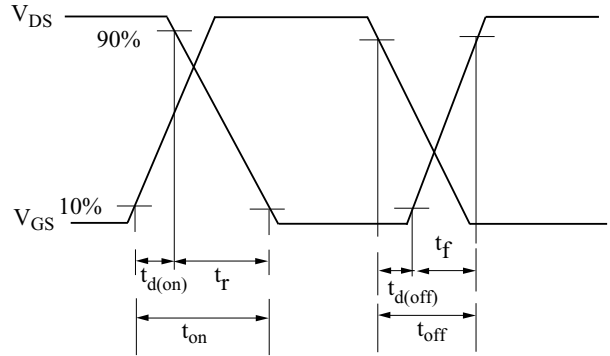
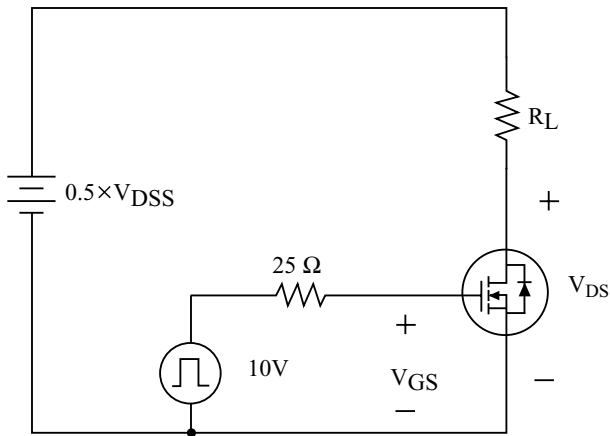


- Single Pulsed Avalanche Energy



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- Resistive Load Switching



- Source - Drain Diode Reverse Recovery and dv/dt

