

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.

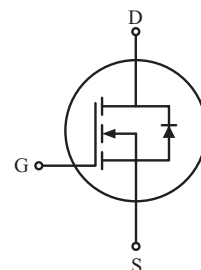
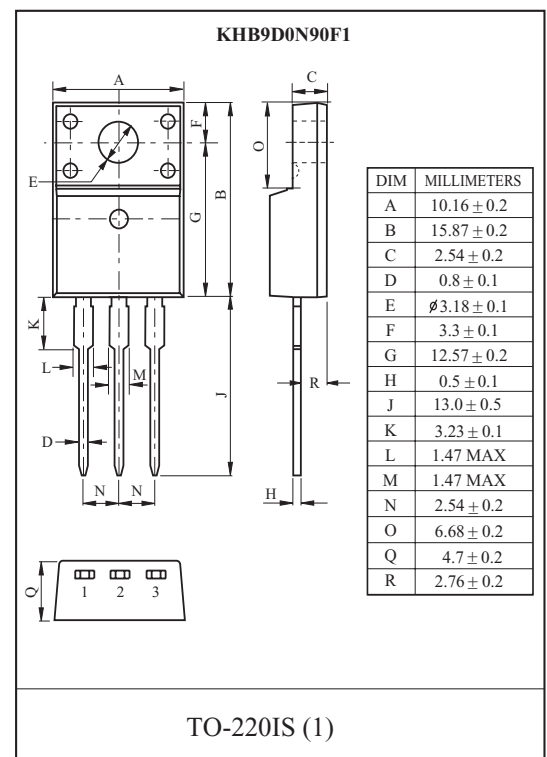
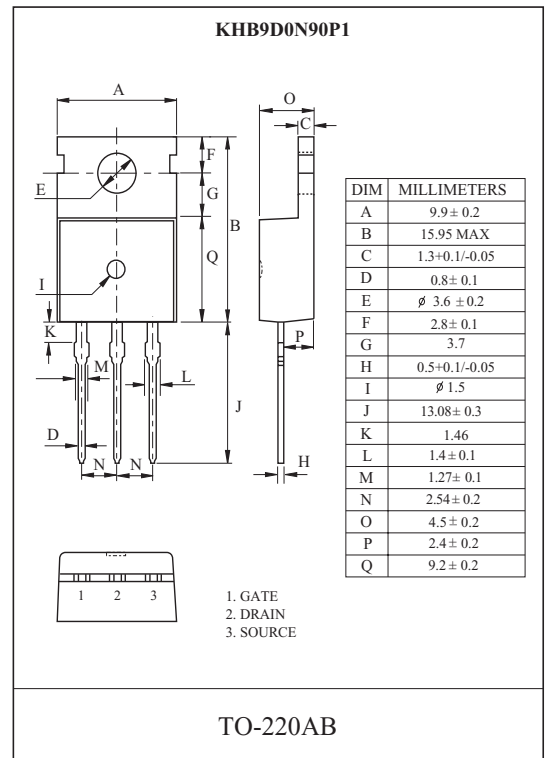
FEATURES

- $V_{DSS(Min.)} = 900V$, $I_D = 9A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 1.4 \Omega @ V_{GS} = 10V$
- $Q_g(typ.) = 75nC$

MAXIMUM RATING (Tc=25℃)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			KHB9D0N90P1	KHB9D0N90P1	
Drain-Source Voltage		V _{DSS}	900		V
Gate-Source Voltage		V _{GSS}	±30		V
Drain Current	@T _C =25 ℃	I _D	9.0	9.0*	A
	@T _C =100 ℃		36	36*	
	Pulsed (Note1)	I _{DP}	36	36*	
Single Pulsed Avalanche Energy (Note 2)		E _{AS}	900		mJ
Repetitive Avalanche Energy (Note 1)		E _{AR}	20.5		mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5		V/ns
Drain Power Dissipation	Tc=25 ℃	P _D	205	68	W
	Derate above25 ℃		1.65	0.54	W/ ℃
Maximum Junction Temperature		T _j	150		℃
Storage Temperature Range		T _{stg}	-55~150		℃
Thermal Characteristics					
Thermal Resistance, Junction-to-Case		R _{thJC}	0.61	1.85	℃/W
Thermal Resistance, Case-to-Sink		R _{thCS}	0.5	-	℃/W
Thermal Resistance, Junction-to-Ambient		R _{thJA}	62.5	62.5	℃/W

* : Drain current limited by maximum junction temperature.



KHB9D0N90P1/F1

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	-	0.99	-	V/°C
Drain Cut-off Current	I _{DSS}	V _{DS} =900V, V _{GS} =0V	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250 μA	2.0	-	4.0	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 =4.5A	-	1.12	1.4	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =720V, I _D =9A V _{GS} =10V (Note4,5)	-	75	90	nC
Gate-Source Charge	Q _{gs}		-	12	-	
Gate-Drain Charge	Q _{gd}		-	30.5	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =4500V R _L =25 Ω R _G =9.0A (Note4,5)	-	48	106	ns
Turn-on Rise time	t _r		-	70	150	
Turn-off Delay time	t _{d(off)}		-	289	588	
Turn-off Fall time	t _f		-	117	244	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	2663	3462	pF
Reverse Transfer Capacitance	C _{rss}		-	183	238	
Output Capacitance	C _{oss}		-	20	26	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	8.0	A
Pulsed Source Current	I _{SP}		-	-	32.0	
Diode Forward Voltage	V _{SD}	I _S =8.0A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =9.0A, V _{GS} =0V,	-	550	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/μs	-	6.5	-	μC

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

Note 2) $L = 21mH$, $I_S=9.0A$, $V_{DD}=50V$, $R_G = 25\Omega$, Starting $T_j = 25\text{ °C}$.

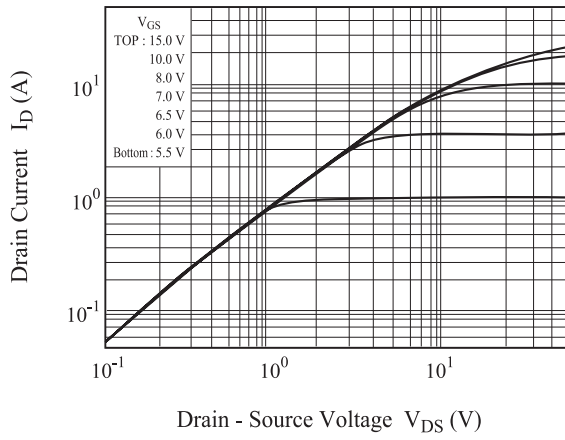
Note 3) $I_S \leq 9A$, $dI/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_j = 25\text{ °C}$.

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

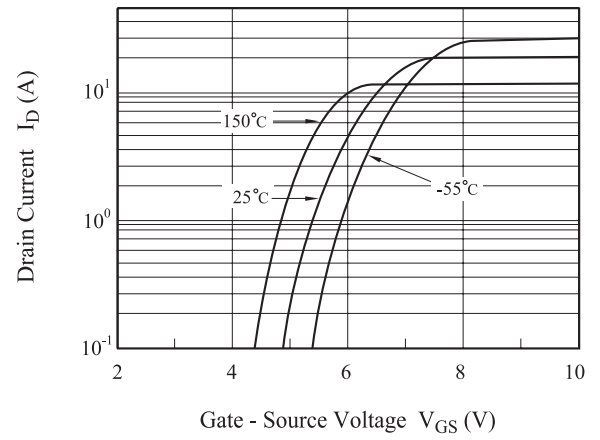
Note 5) Essentially independent of operating temperature.

KHB9D0N90P1/F1

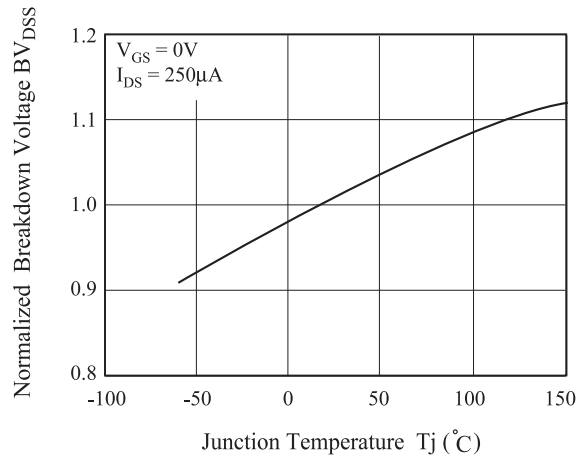
$I_D - V_{DS}$



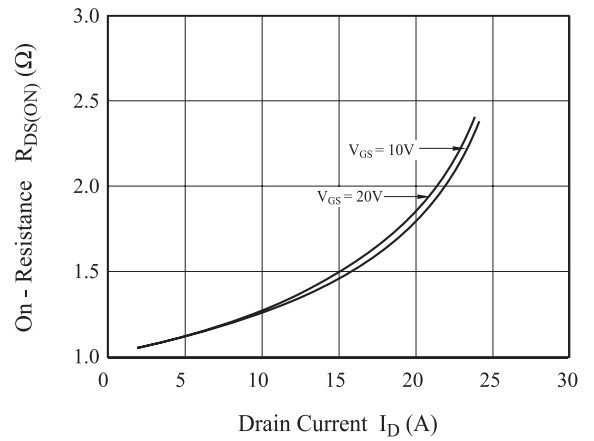
$I_D - V_{GS}$



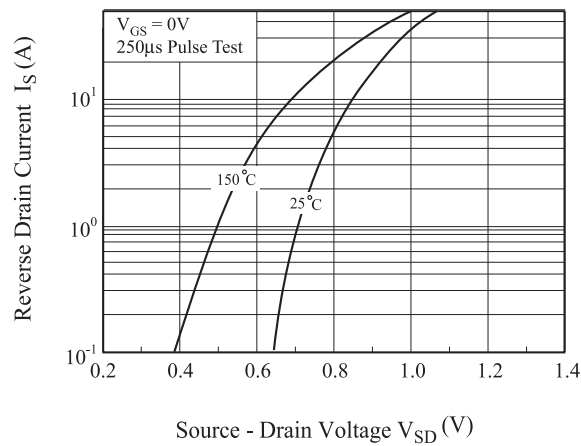
$BV_{DSS} - T_j$



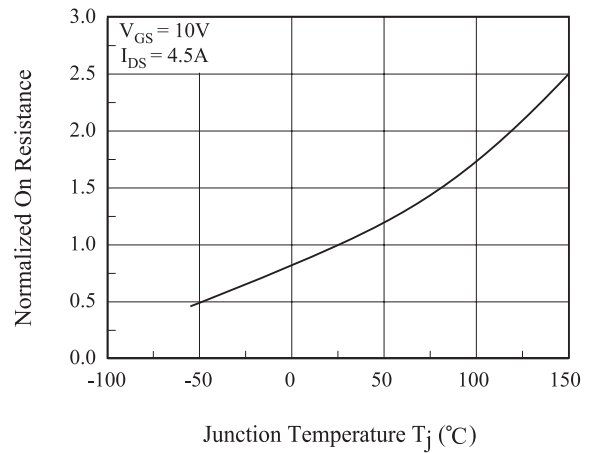
$R_{DS(ON)} - I_D$



$I_S - V_{SD}$

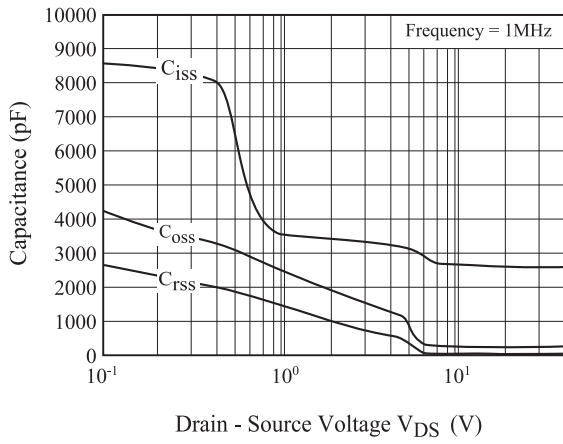


$R_{DS(ON)} - T_j$

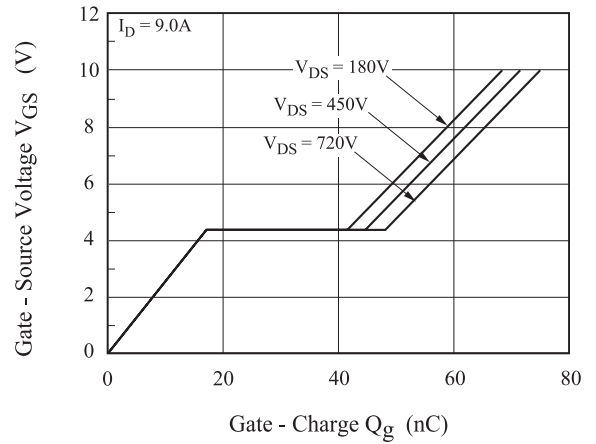


KHB9D0N90P1/F1

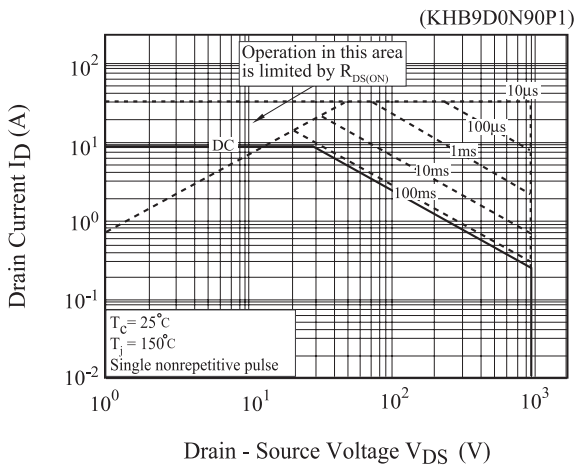
C - V_{DS}



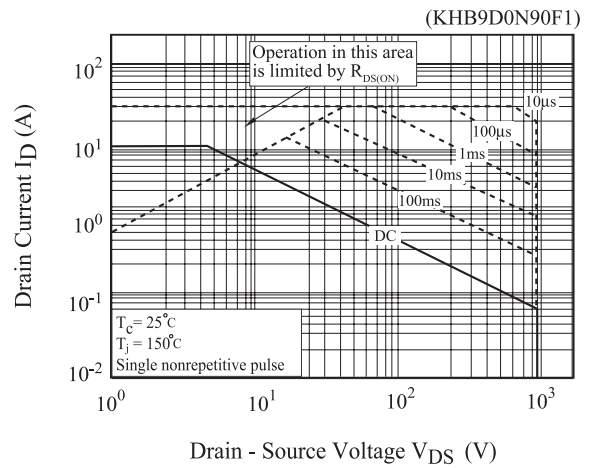
Q_g - V_{GS}



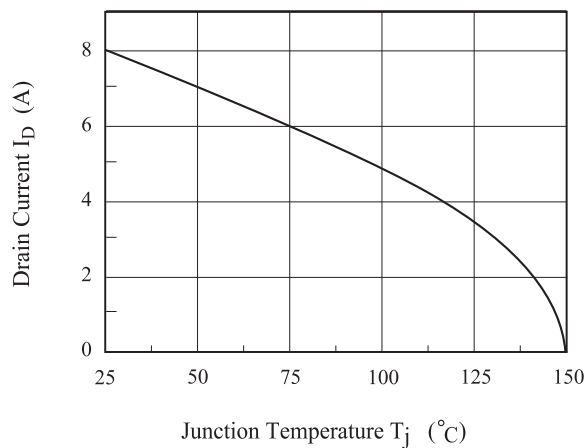
Safe Operation Area



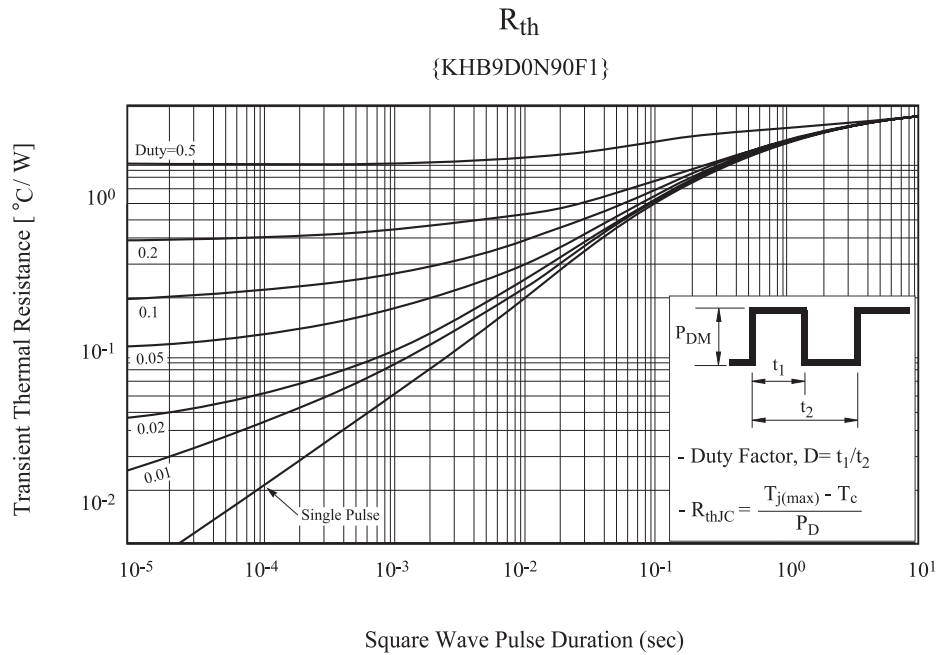
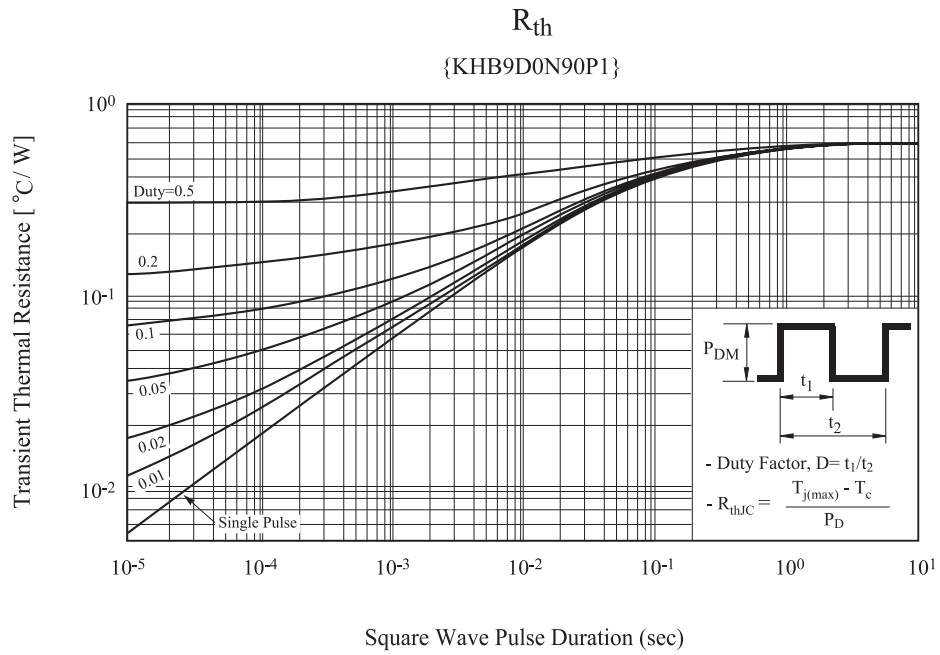
Safe Operation Area



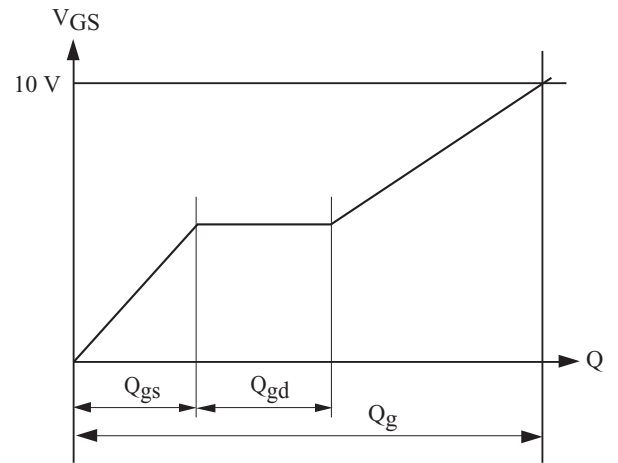
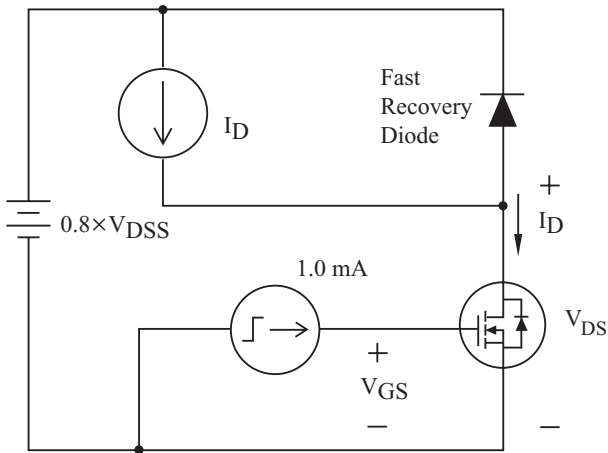
I_D - T_j



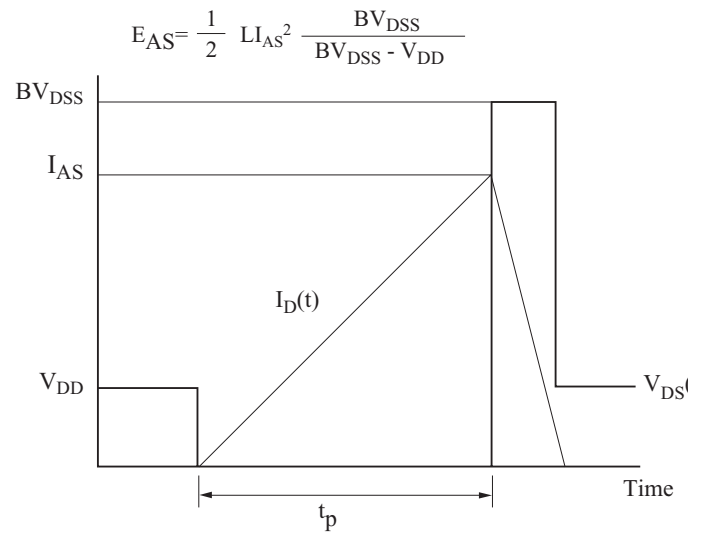
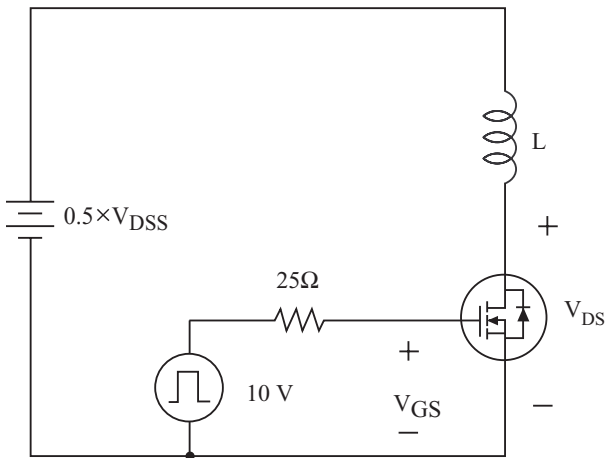
KHB9D0N90P1/F1



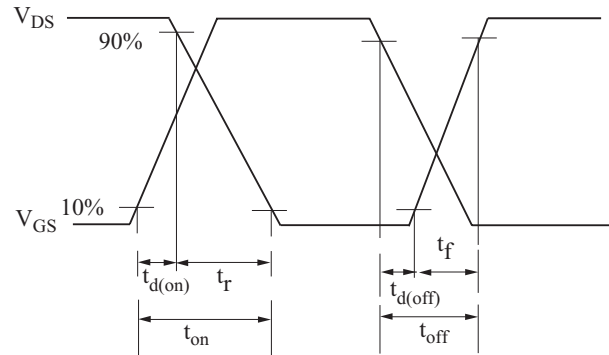
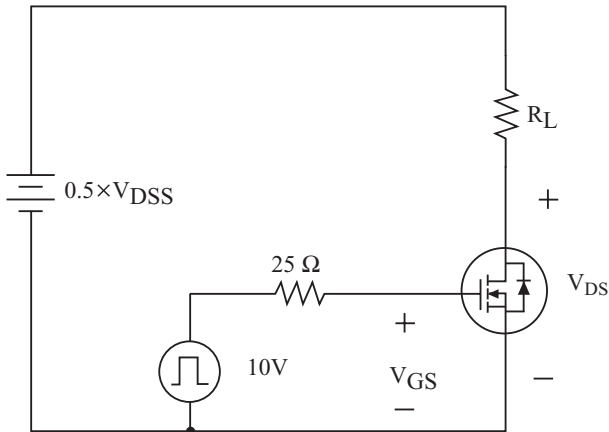
- Gate Charge



- Single Pulsed Avalanche Energy



- Resistive Load Switching



- Source - Drain Diode Reverse Recovery and dv/dt

