

General Description

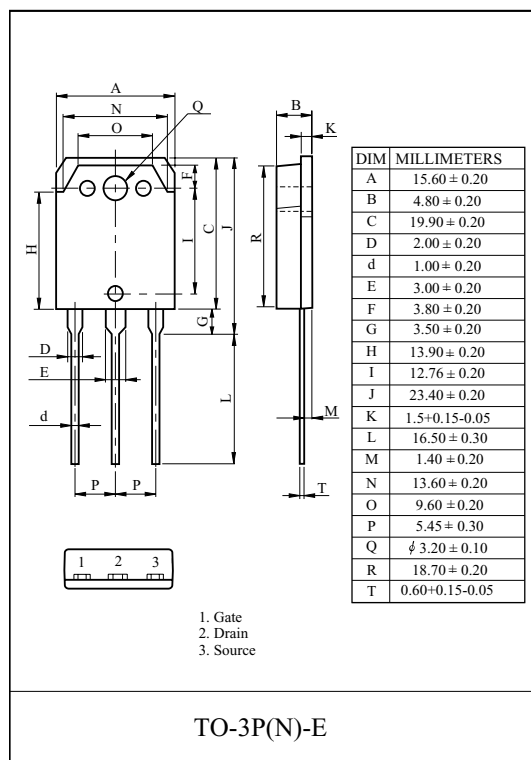
This planar stripe MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for electronic ballast and switching mode power supplies.

FEATURES

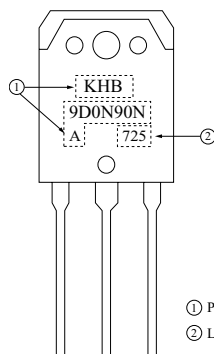
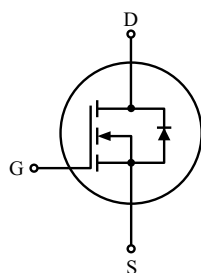
- $V_{DSS(Min.)} = 900V$, $I_D = 9A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 1.05(Typ.) @ V_{GS} = 10V$
- $Q_g(typ.) = 54nC$

MAXIMUM RATING (Tc=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	900	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	@T _C =25°C	I_D	9.0	A
	Pulsed (Note1)	I_{DP}	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°C	P_D	280	W
	Derate above 25°C		2.22	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}	0.45	°C/W
Thermal Resistance, Case-to-Sink		R_{thCS}	0.24	°C/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	40	°C/W



Marking



- ① PRODUCT NAME
② LOT NO

KHB9D0N90NA

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	900	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / Δ T _j	I _D =250 μA, Referenced to 25°C	-	0.99	-	V/°C
Drain Cut-off Current	I _{DSS}	V _{DS} =900V, V _{GS} =0V,	-	-	100	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	-	1.05	1.4	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =450V, I _D =9.0A V _{GS} =10V (Note4,5)	-	54	69	nC
Gate-Source Charge	Q _{gs}		-	12	-	
Gate-Drain Charge	Q _{gd}		-	17	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =450V, R _G =25Ω, I _D =9.0A (Note4,5)	-	48	96	ns
Turn-on Rise time	t _r		-	80	160	
Turn-off Delay time	t _{d(off)}		-	180	360	
Turn-off Fall time	t _f		-	140	280	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	2663	3462	pF
Output Capacitance	C _{oss}		-	183	238	
Reverse Transfer Capacitance	C _{rss}		-	20	26	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	9.0	A
Pulsed Source Current	I _{SP}		-	-	36.0	
Diode Forward Voltage	V _{SD}	I _S =9.0A, 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) $L = 21mH$, $I_{AS}=9.0A$, $V_{DD}=50V$, $R_G = 25\ \Omega$, Starting $T_j = 25^\circ C..0$

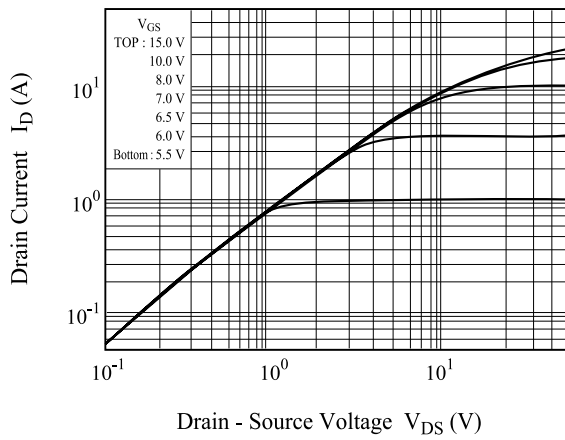
Note 3) $I_S \leq 9.0A$, $dI/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_j = 25^\circ C$.

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

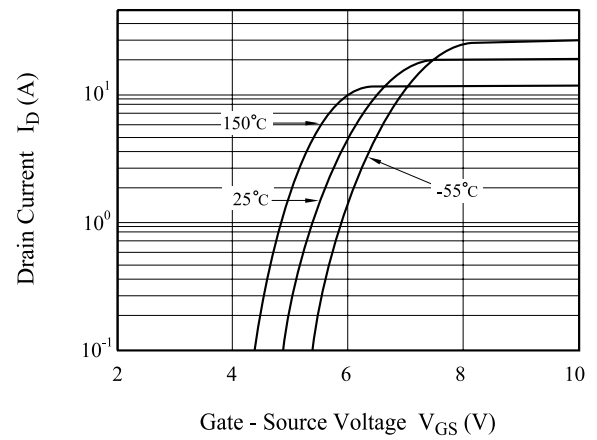
Note 5) Essentially independent of operating temperature.

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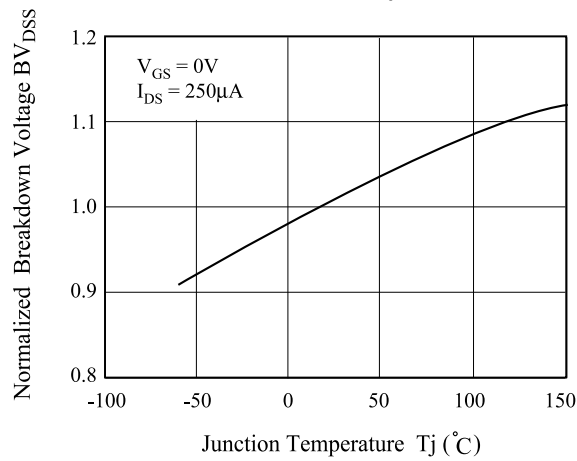
$I_D - V_{DS}$



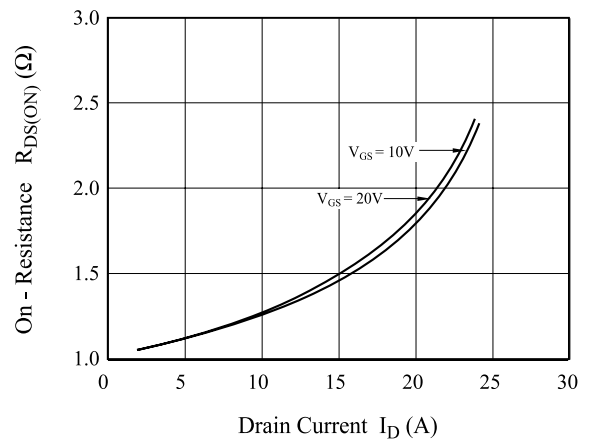
$I_D - V_{GS}$



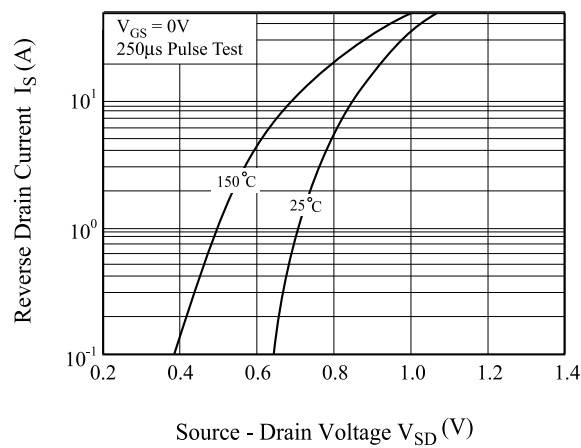
$BV_{DSS} - T_j$



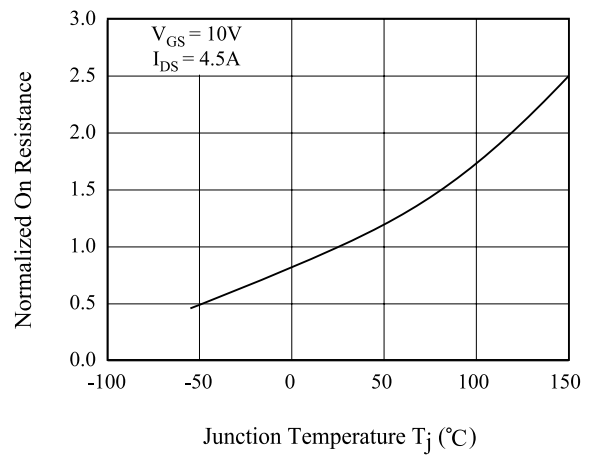
$R_{DS(ON)} - I_D$



$I_S - V_{SD}$

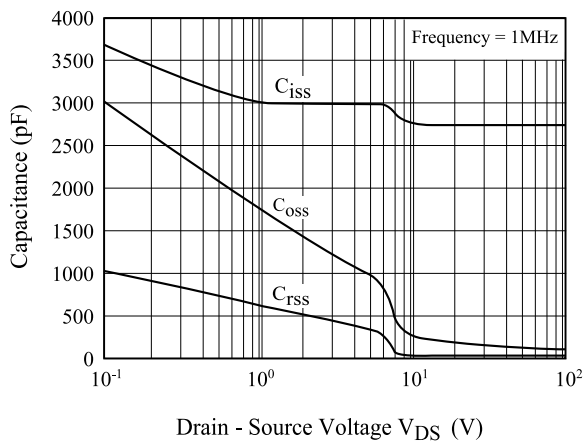


$R_{DS(ON)} - T_j$

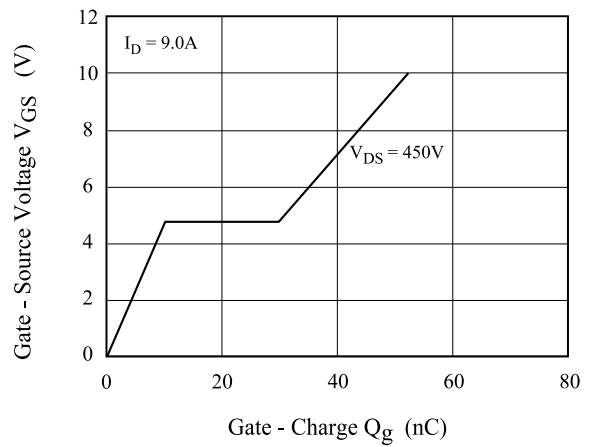


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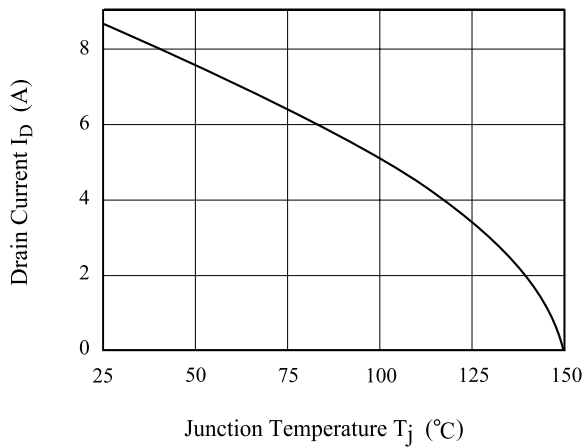
$C - V_{DS}$



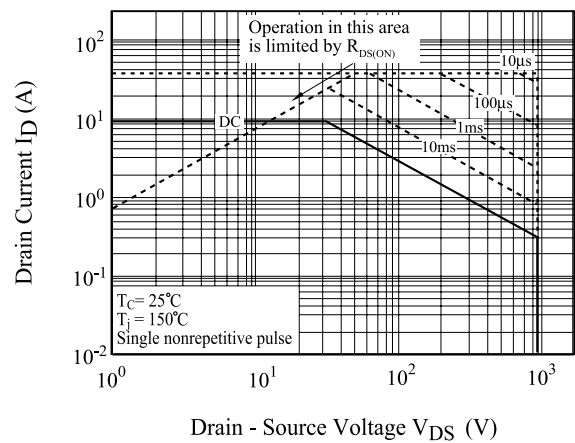
$Q_g - V_{GS}$



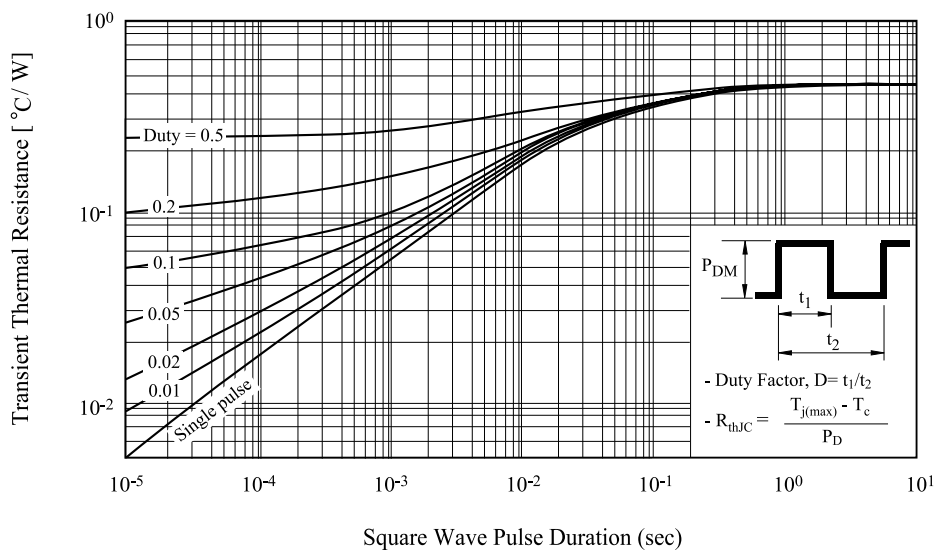
$I_D - T_j$



Safe Operation Area

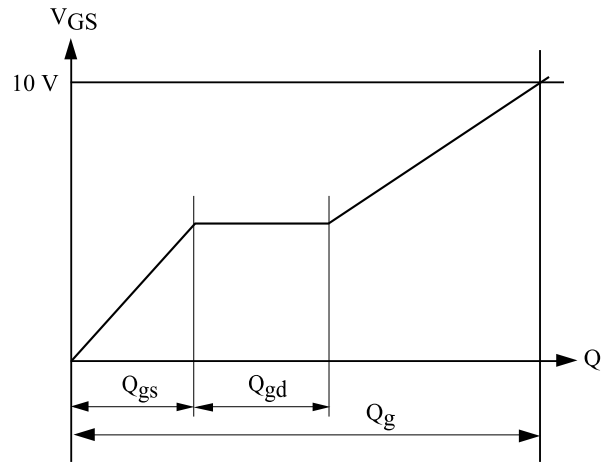
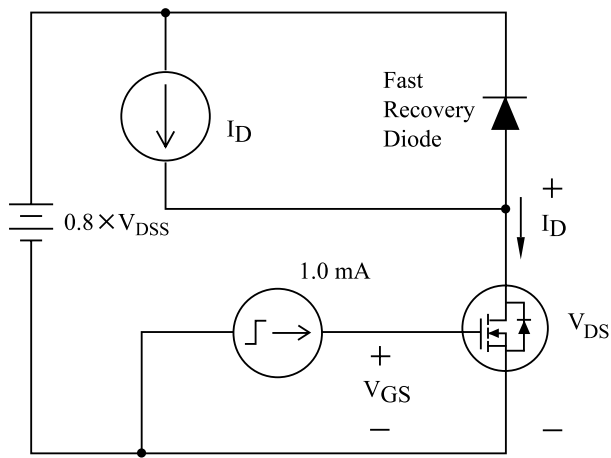


R_{th}

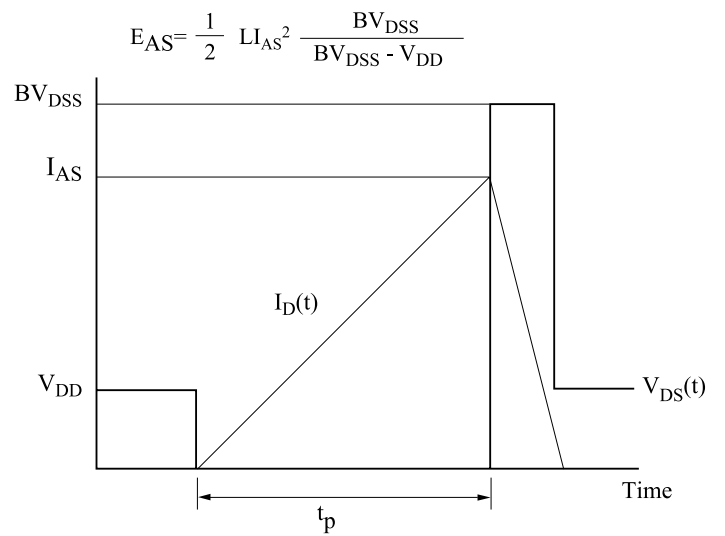
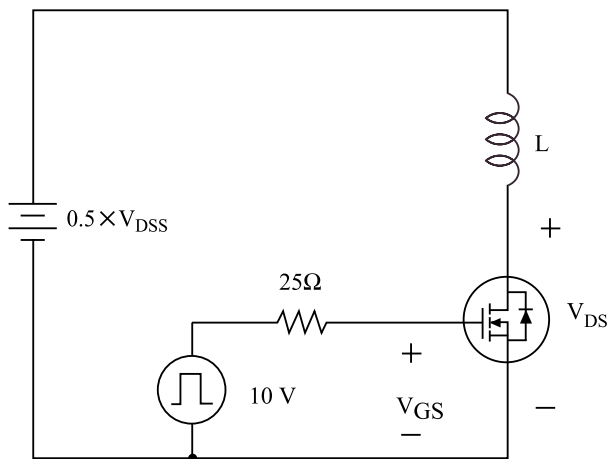


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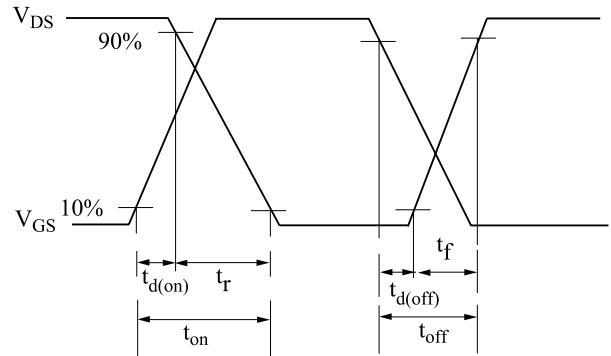
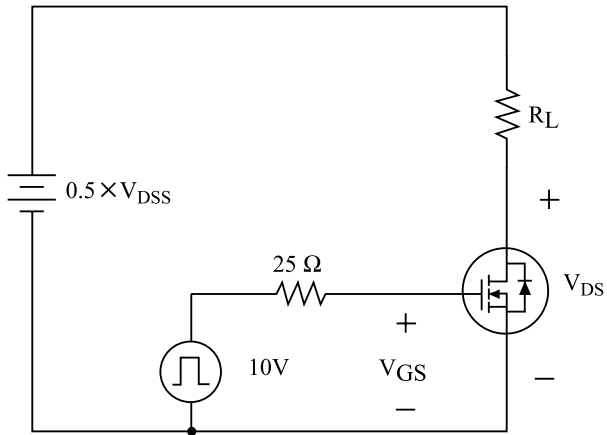
- Gate Charge



- Single Pulsed Avalanche Energy



- Resistive Load Switching



- Source - Drain Diode Reverse Recovery and dv/dt

