KHB1D2N80D/I

N CHANNEL MOS FIELD EFFECT TRANSISTOR

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

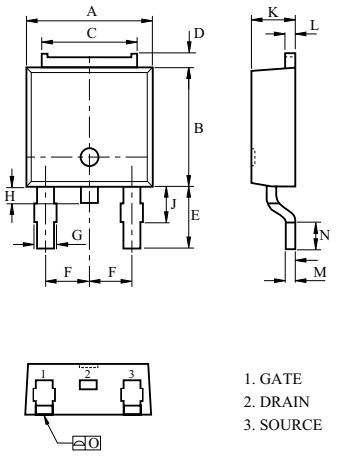
- V_{DSS}= 800V, I_D= 1.2A
- Drain-Source ON Resistance : $R_{DS(ON)}$=16Ω(Max), @V_{GS} = 10V
- Qg = 7.0nC(typ.)

MAXIMUM RATING (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING KHB1D2N80D | KHB1D2N80I	UNIT
Drain-Source Voltage		V_{DSS}	800	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	@T_C=25℃	I_D	1.2	A
	@T_C=100℃		0.75	
	Pulsed (Note1)	I_{DP}	4.8	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	130	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	5.0	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.0	V/ns
Drain Power Dissipation	Ta=25℃	P_D	50	W
	Derate above 25		0.36	W/℃
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 150	℃
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	2.5	℃/W
Thermal Resistance, Case-to-Sink		R_{thCS}	50	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	110	℃/W

* : Mounted on the minimum pad size recommended(PCB Mount)

KHB1D2N80D

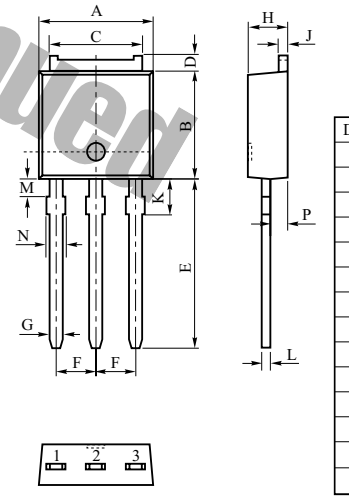


DIM	MILLIMETERS
A	6.60 ± 0.20
B	6.10±0.20
C	5.34 ± 0.30
D	0.70±0.20
E	2.70 ± 0.15
F	2.30±0.10
G	0.96 MAX
H	0.90 MAX
J	1.80±0.20
K	2.30±0.10
L	0.50 ± 0.10
M	0.50±0.10
N	0.70 MIN
O	0.1 MAX

1. GATE
2. DRAIN
3. SOURCE

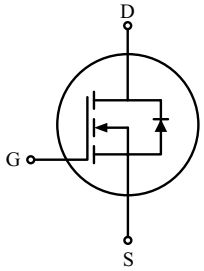
DPAK (1)

KHB1D2N80I



DIM	MILLIMETERS
A	6.6±0.2
B	6.1±0.2
C	5.34±0.3
D	0.7±0.2
E	9.3±0.3
F	2.3±0.2
G	0.76±0.1
H	2.3±0.1
J	0.5±0.1
K	1.8 ± 0.2
L	0.5 ± 0.1
M	1.0 ± 0.1
N	0.96 MAX
P	1.02 ± 0.3

IPAK(1)



ELECTRICAL CHARACTERISTICS (Ta=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250 μA, V_{GS}=0V	800	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	I_D=250 μA, Referenced to 25℃	-	1.0	-	V/℃
Gate Threshold Voltage	V_{th}	V_{DS}=V_{GS}, I_D=250 μA	3.0	3.75	5.0	V
Drain Cut-off Current	I_{DSS}	V_{DS}=800V, V_{GS}=0V,	-	-	10	μA
		V_{DS}=640V, V_{GS}=0V, T_C= 125℃	-	-	100	
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=0.6A	-	13	16	Ω
Dynamic						
Total Gate Charge	Q_g	V_{DS}=640V, I_D=1.2A V_{GS}=10V (Note4,5)	-	7.0	-	nC
Gate-Source Charge	Q_{gs}		-	1.5	-	
Gate-Drain Charge	Q_{gd}		-	4.0	-	
Turn-on Delay time	$t_{d(on)}$	V_{DD}=400V R_G=25Ω I_D=1.2A (Note4,5)	-	35	-	ns
Turn-on Rise time	t_r		-	90	-	
Turn-off Delay time	$t_{d(off)}$		-	40	-	
Turn-off Fall time	t_f		-	90	-	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	170	-	pF
Output Capacitance	C_{oss}		-	25	-	
Reverse Transfer Capacitance	C_{rss}		-	3	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	V_{GS}<V_{th}	-	-	1.2	A
Pulsed Source Current	I_{SP}		-	-	4.8	
Diode Forward Voltage	V_{SD}	I_S= 1.2A, V_{GS}=0V	-	-	1.5	V
Reverse Recovery Time	t_{rr}	I_S= 1.2A, V_{GS}=0V, dIs/dt=100A/μs	-	300	-	ns
Reverse Recovery Charge	Q_{rr}		-	600	-	μC

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

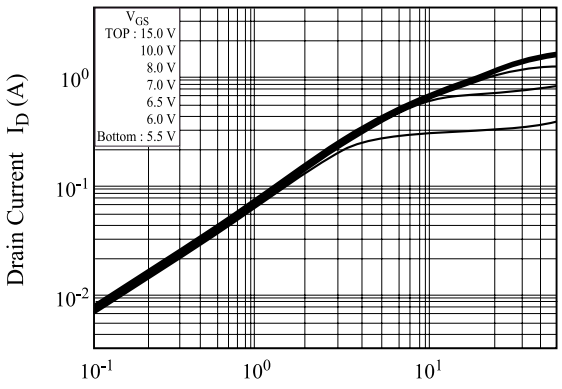
Note 2) L =170mH, I_S=1.2A, V_{DD}=50V, R_G = 25Ω, Starting T_j=25℃.

Note 3) I_S ≤1.2A, dI/dt≤300A/μs, V_{DD}≤BV_{DSS}, Starting T_j=25℃.

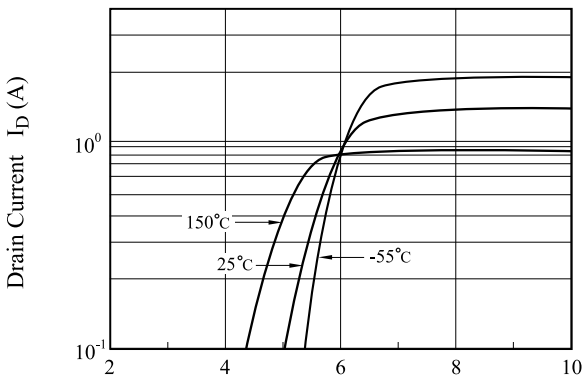
Note 4) Pulse Test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%.

Note 5) Essentially independent of operating temperature.

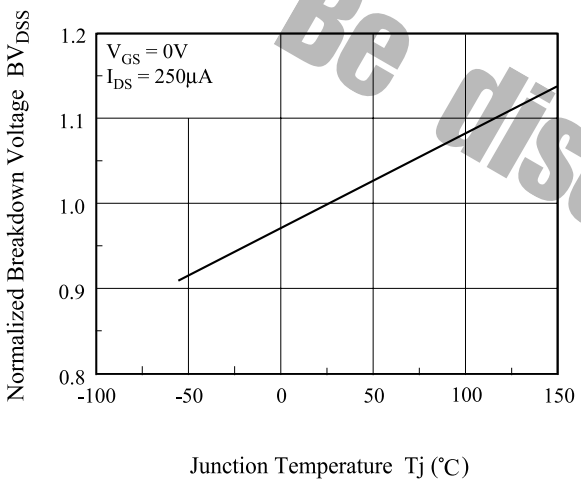
I_D - V_{DS}



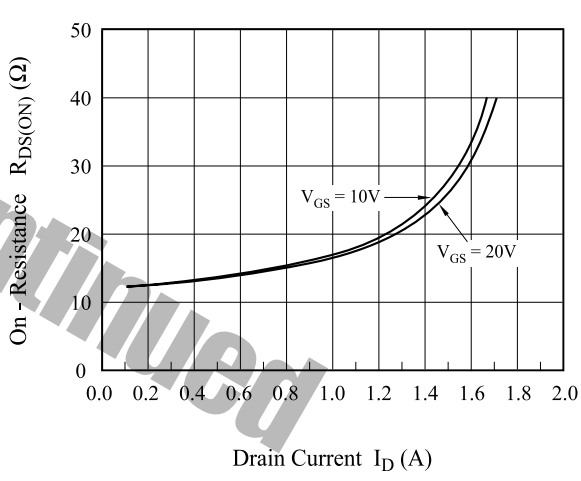
I_D - V_{GS}



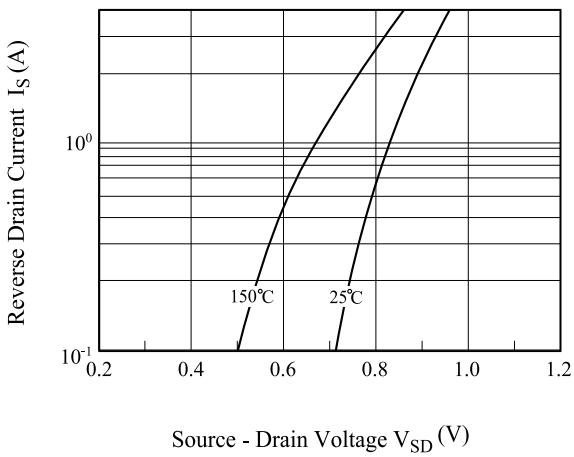
BV_{DSS} - T_j



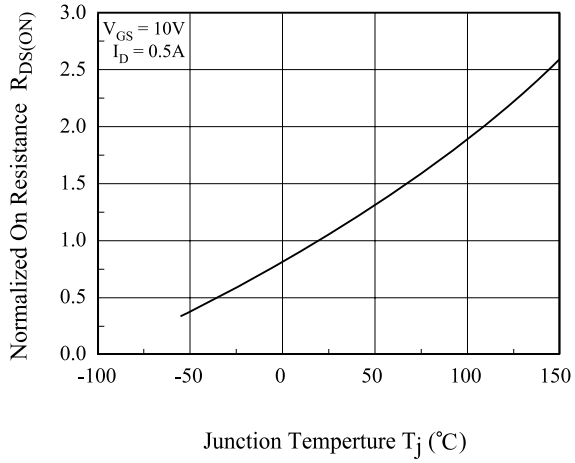
$R_{DS(ON)}$ - I_D



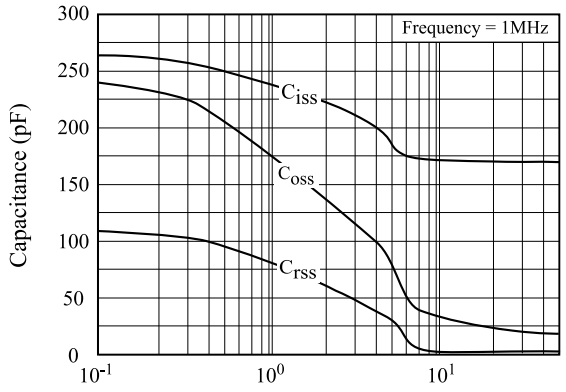
I_{DR} - V_{SD}



$R_{DS(ON)}$ - T_j

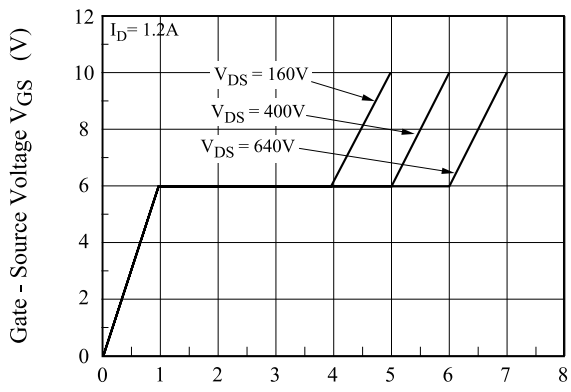


C - V_{DS}



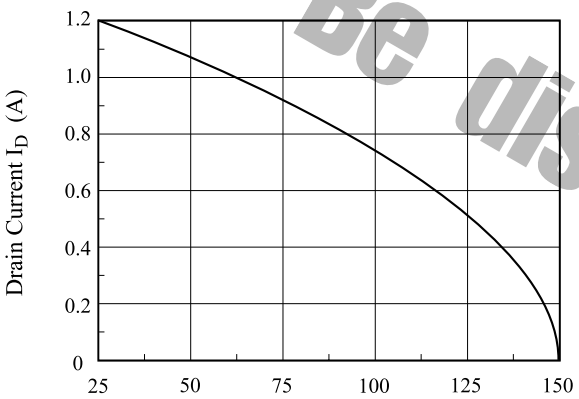
Drain - Source Voltage V_{DS} (V)

Qg - V_{GS}



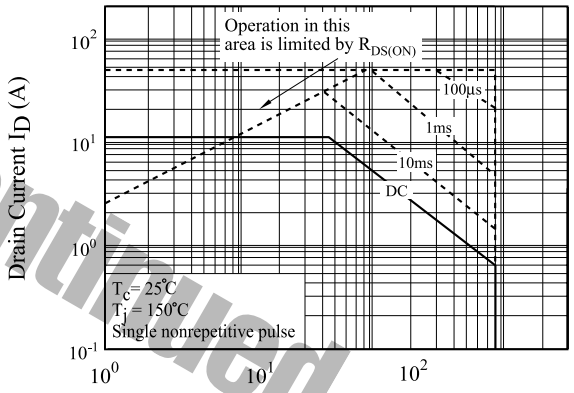
Gate - Charge Q_g (nC)

I_D - T_j



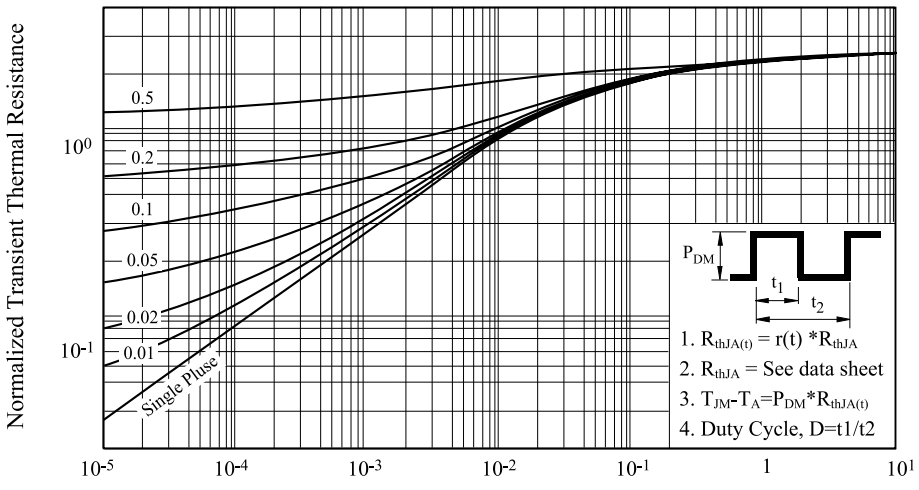
Junction Temperature T_j (℃)

Safe Operation Area



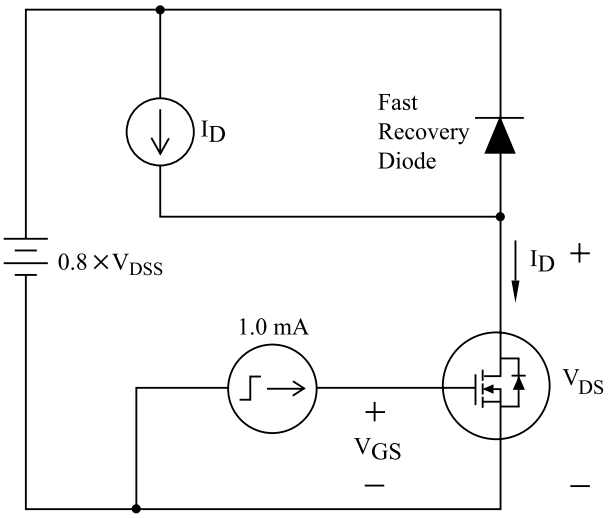
Drain - Source Voltage V_{DS} (V)

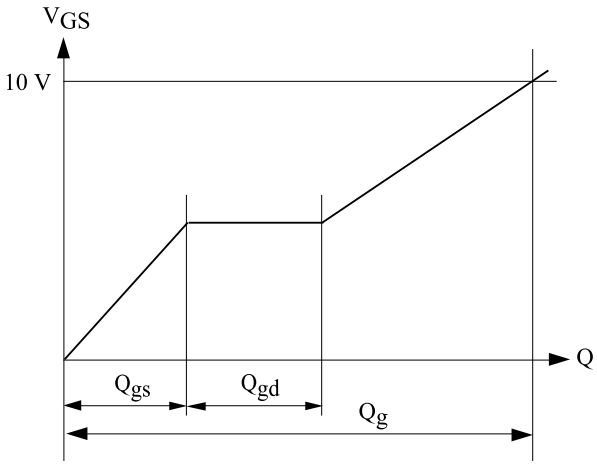
R_{th}



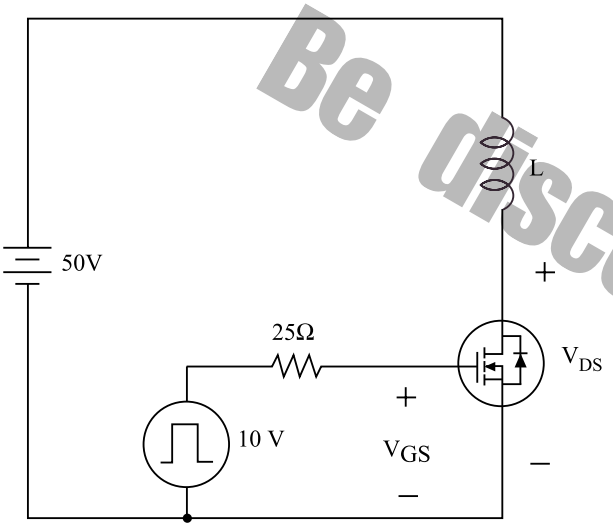
Square Wave Pulse Duration (sec)

- Gate Charge

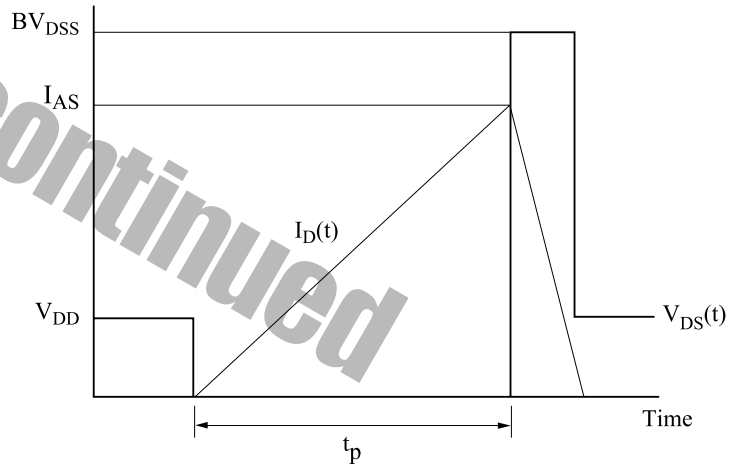




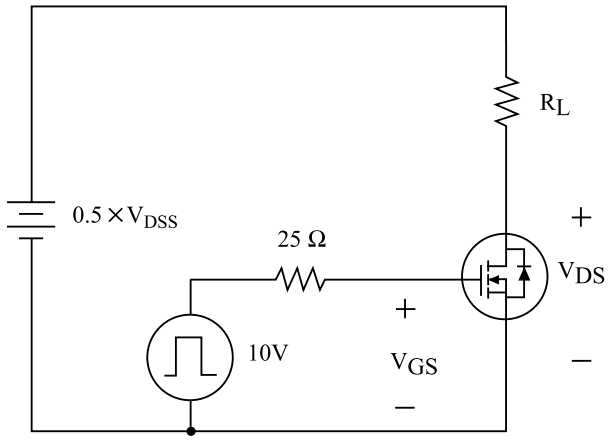
- Single Pulsed Avalanche Energy

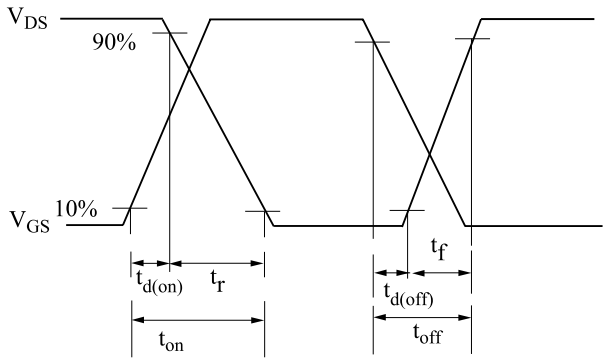


$$E_{AS} = \frac{1}{2} LI_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



- Resistive Load Switching





- Source - Drain Diode Reverse Recovery and dv /dt