KF5N50D/DZ

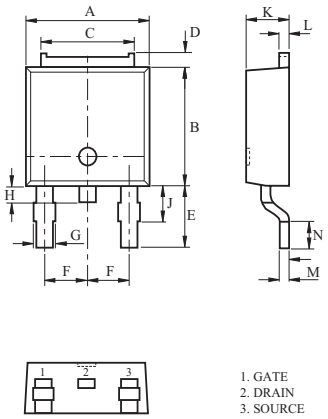
N CHANNEL MOS FIELD EFFECT TRANSISTOR

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}= 500V, I_D= 4.3A
- Drain-Source ON Resistance : $R_{DS(ON)}$=1.4Ω(Max) @V_{GS} = 10V
- Qg(typ) = 12nC



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

1. GATE
2. DRAIN
3. SOURCE

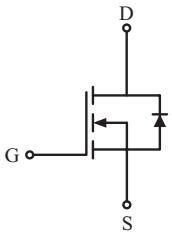
DPAK (1)

MAXIMUM RATING (Tc=25℃)

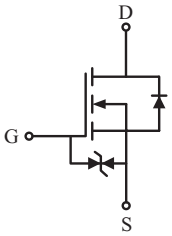
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	@T_C=25℃	I_D	4.3	A
	@T_C=100℃		2.7	
	Pulsed (Note1)	I_{DP}	13	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	270	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	8.6	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	20	V/ns
Drain Power Dissipation	Tc=25℃	P_D	59.5	W
	Derate above 25℃		0.48	W/℃
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 150	℃
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	2.1	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	110	℃/W

PIN CONNECTION

(KF5N50D)



(KF5N50DZ)



ELECTRICAL CHARACTERISTICS (Tc=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V		500	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	I_D=250μA, Referenced to 25℃		-	0.55	-	V/℃
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=250μA		2.0	-	4.0	V
Gate Leakage Current	I_{GSS}	KF5N50D	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
		KF5N50DZ	V_{GS}=±25V, V_{DS}=0V	-	-	±10	μA
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.5A		-	1.10	1.4	Ω
Dynamic							
Total Gate Charge	Q_g	V_{DS}=400V, I_D=5A V_{GS}=10V (Note4,5)		-	12	-	nC
Gate-Source Charge	Q_{gs}			-	3.4	-	
Gate-Drain Charge	Q_{gd}			-	4.5	-	
Turn-on Delay time	$t_{d(on)}$	V_{DD}=250V R_L=50Ω R_G=25Ω (Note4,5)		-	23	-	ns
Turn-on Rise time	t_r			-	17	-	
Turn-off Delay time	$t_{d(off)}$			-	40	-	
Turn-off Fall time	t_f			-	13	-	
Input Capacitance	C_{iss}	KF5N50D	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	510	-	pF
		KF5N50DZ		-	440	-	
Output Capacitance	C_{oss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz		-	69	-	
Reverse Transfer Capacitance	C_{rss}			-	6	-	
Source-Drain Diode Ratings							
Continuous Source Current	I_S	V_{GS}<V_{th}		-	-	5	A
Pulsed Source Current	I_{SP}			-	-	20	
Diode Forward Voltage	V_{SD}	I_S=5A, V_{GS}=0V		-	-	1.4	V
Reverse Recovery Time	t_{rr}	I_S=5A, V_{GS}=0V, dIs/dt=100A/μs		-	300	-	ns
Reverse Recovery Charge	Q_{rr}			-	3.1	-	μC

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

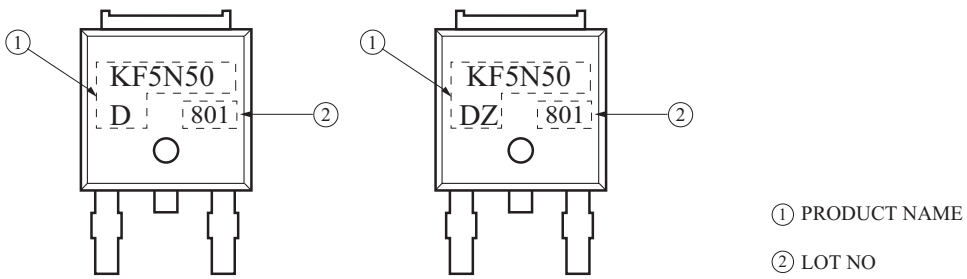
Note 2) L=19.5mH, I_S=5A, V_{DD}=50V, R_G=25Ω, Starting T_j=25℃.

Note 3) I_S≤5A, dI/dt≤100A/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.

Marking



① PRODUCT NAME

② LOT NO

Fig1. I_D - V_{DS}

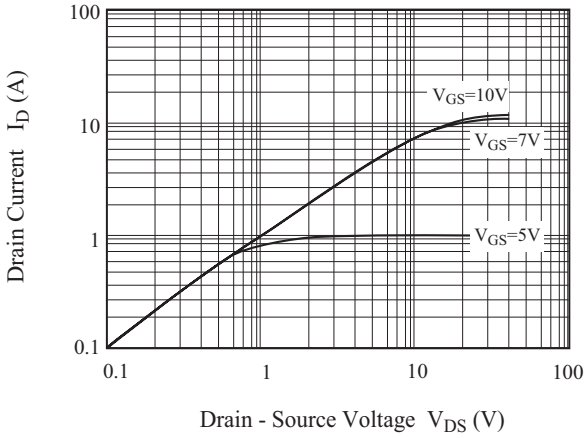


Fig2. I_D - V_{GS}

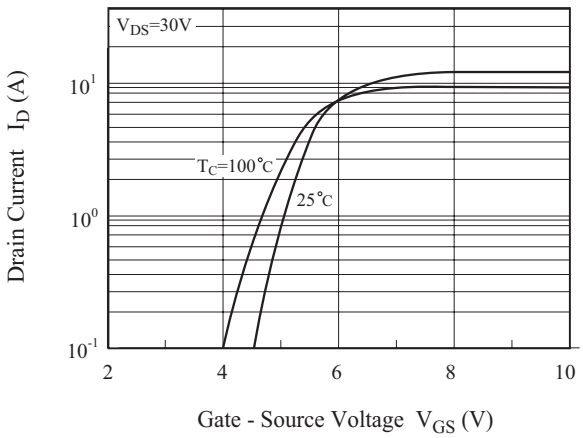


Fig3. BV_{DSS} - T_j

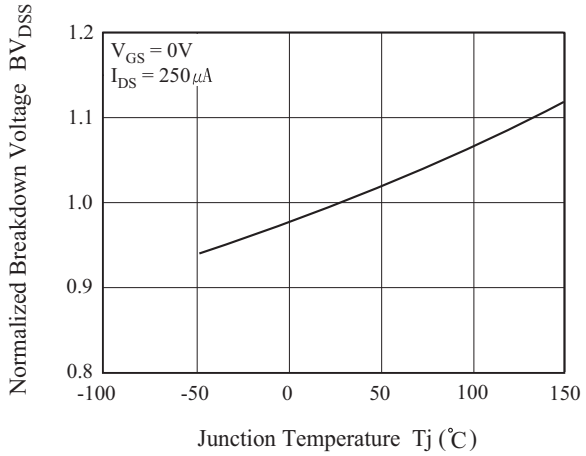


Fig4. $R_{DS(ON)}$ - I_D

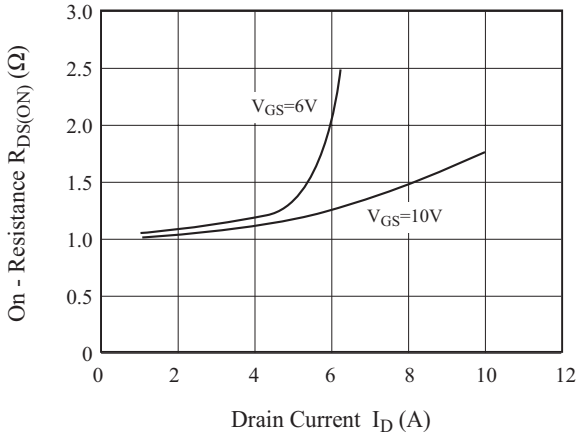


Fig5. I_S - V_{SD}

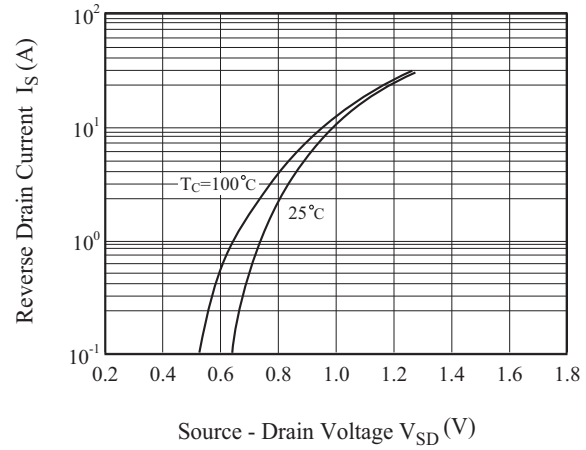


Fig6. $R_{DS(ON)}$ - T_j

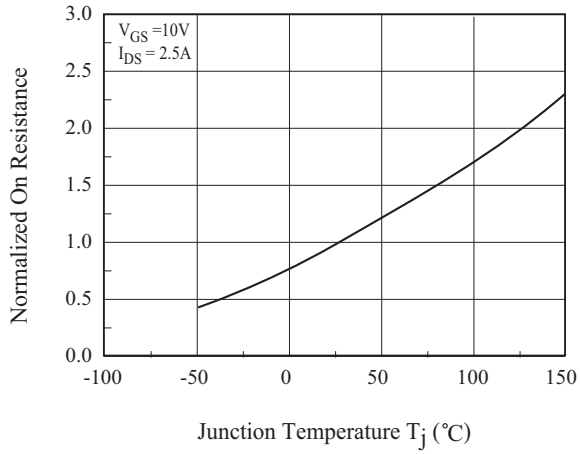


Fig 7. C - V_{DS}

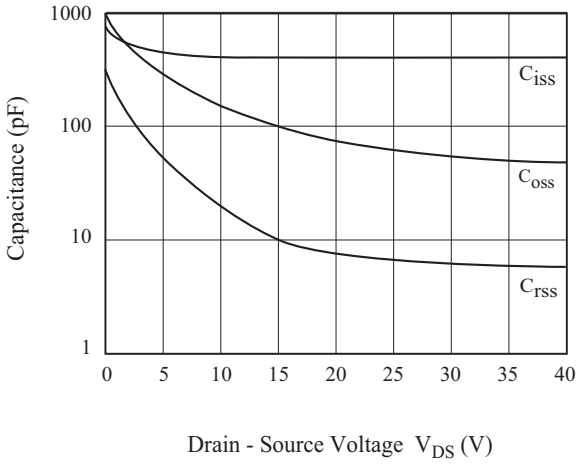


Fig8. Q_g- V_{GS}

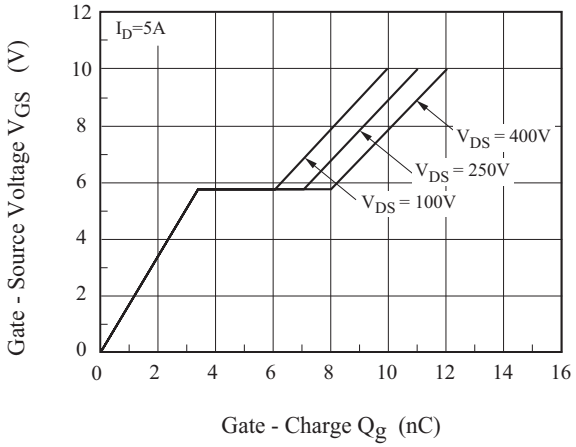


Fig9. Safe Operation Area

(KF5N50D, KF5N50DZ)

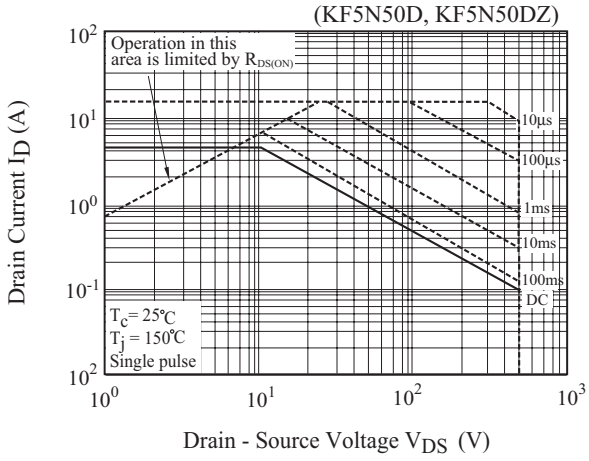


Fig10. I_D - T_j

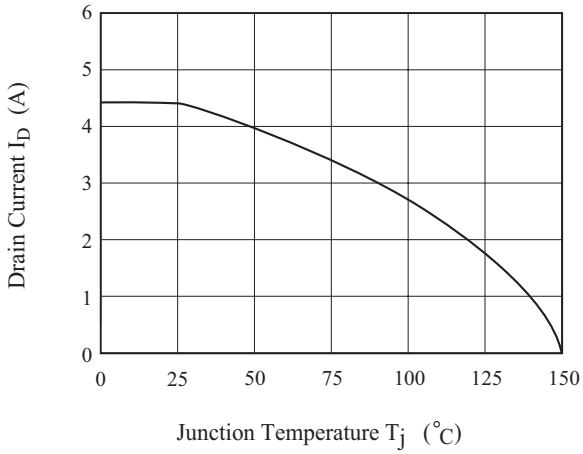


Fig11. Transient Thermal Response Curve

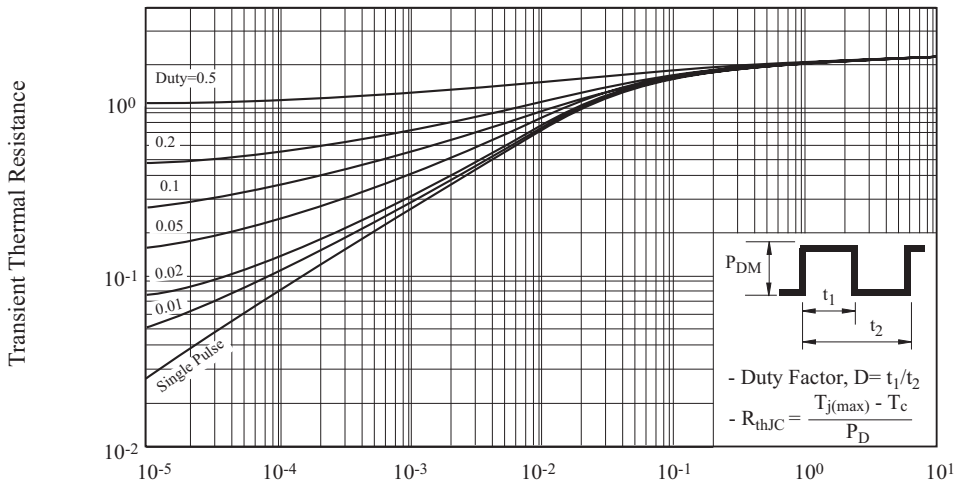


Fig12. Gate Charge

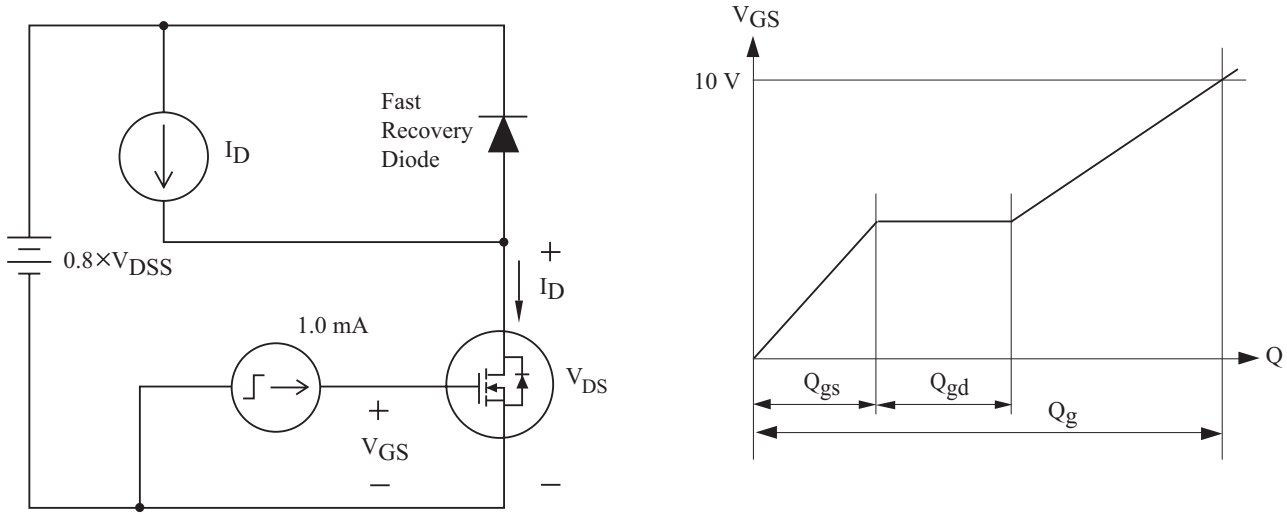


Fig13. Single Pulsed Avalanche Energy

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

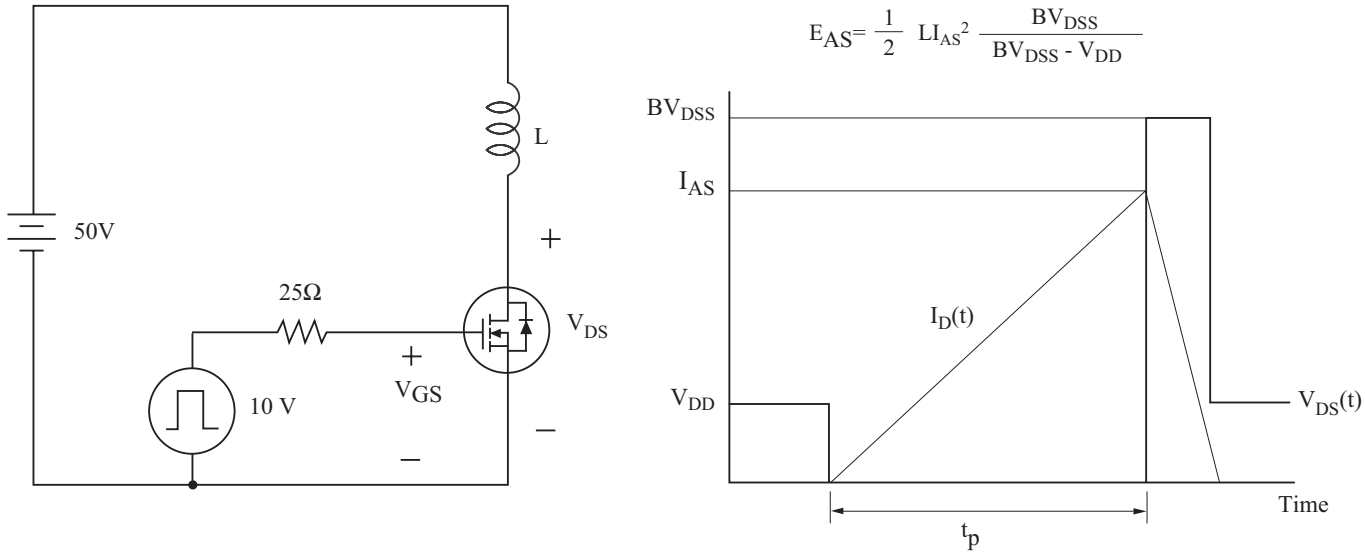


Fig14. Resistive Load Switching

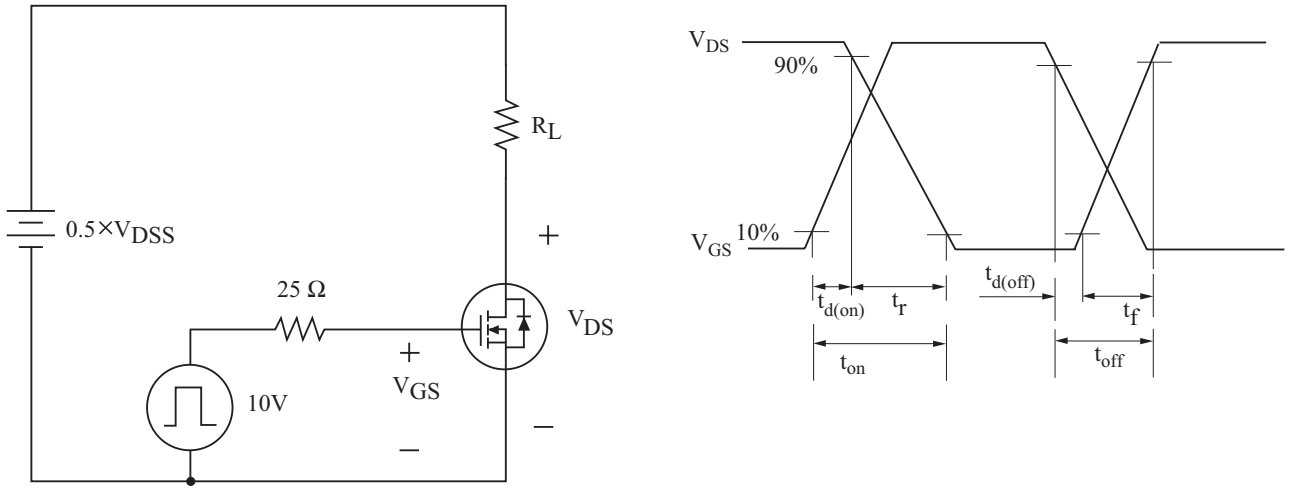


Fig15. Source - Drain Diode Reverse Recovery and dv /dt

