KF3N50DZ/DS

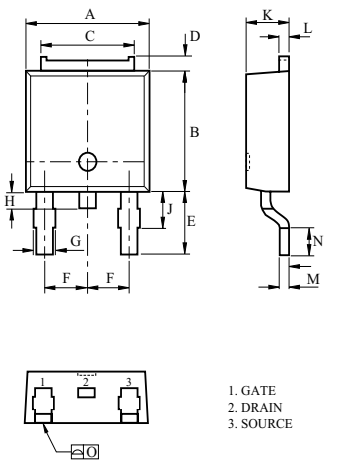
N CHANNEL MOS FIELD EFFECT TRANSISTOR

General Description

This planar stripe MOSFET has better characteristics, such as fast switching time, fast reverse recovery 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= 2.5A
- Drain-Source ON Resistance : $R_{DS(ON)}$=2.5Ω(Max) @V_{GS} = 10V
- Qg(typ) = 7.50nC
- t_{rr}(typ) = 120ns (KF3N50DS)
- t_{rr}(typ) = 300ns (KF3N50DZ)



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

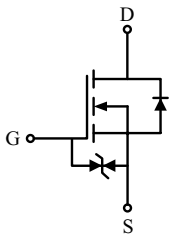
DPAK (1)

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	2.5	A
	@T_C=100℃		1.5	
	Pulsed (Note1)	I_{DP}	7	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	110	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	4	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	10	V/ns
Drain Power Dissipation	Tc=25℃	P_D	40	W
	Derate above 25℃		0.32	W/℃
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 150	℃
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	3.1	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	110	℃/W

PIN CONNECTION

(KF3N50DZ/DS)



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	2.5	-	4.5	V
Gate Leakage Current		I_{GSS}	V_{GS}=±25V, V_{DS}=0V	-	-	±10	μA
Drain-Source ON Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=1.25A	-	2.0	2.5	Ω
Dynamic							
Total Gate Charge		Q_g	V_{DS}=400V, I_D=3A V_{GS}=10V (Note4,5)	-	8.0	-	nC
Gate-Source Charge		Q_{gs}		-	2.0	-	
Gate-Drain Charge		Q_{gd}		-	3.5	-	
Turn-on Delay time		$t_{d(on)}$	V_{DD}=250V I_D=3A R_G=25Ω (Note4,5)	-	15	-	ns
Turn-on Rise time		t_r		-	20	-	
Turn-off Delay time		$t_{d(off)}$		-	25	-	
Turn-off Fall time		t_f		-	20	-	
Input Capacitance		C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	350	-	pF
Output Capacitance		C_{oss}		-	45	-	
Reverse Transfer Capacitance		C_{rss}		-	4.5	-	
Source-Drain Diode Ratings							
Continuous Source Current		I_S	V_{GS}<V_{th}	-	-	3	A
Pulsed Source Current		I_{SP}		-	-	12	
Diode Forward Voltage		V_{SD}	I_S=2.5A, V_{GS}=0V	-	-	1.4	V
Reverse Recovery Time	KF3N50DZ	t_{rr}	I_S=3A, V_{GS}=0V, dIs/dt=100A/μs	-	300	-	ns
	KF3N50DS			-	120	-	
Reverse Recovery Charge	KF3N50DZ	Q_{rr}		-	1.1	-	μC
	KF3N50DS			-	0.25	-	

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

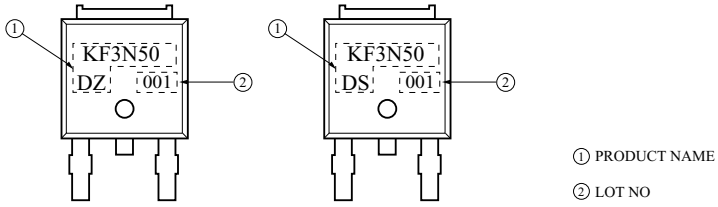
Note 2) L=22mH, I_S=3A, V_{DD}=50V, R_G=25Ω, Starting T_j=25℃.

Note 3) I_S≤3A, 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}

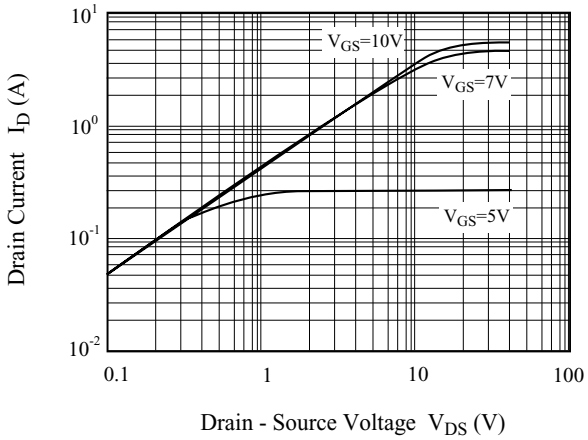


Fig2. I_D - V_{GS}

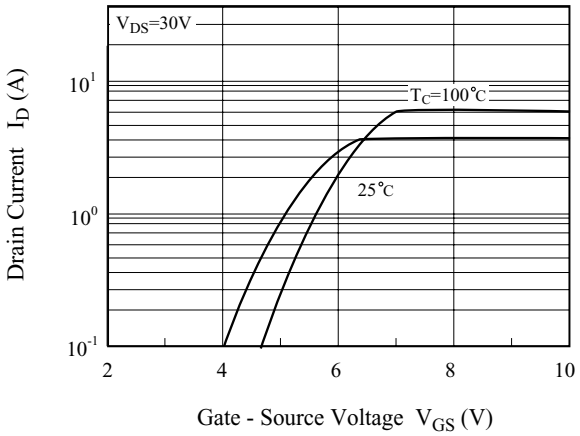


Fig3. BV_{DSS} - T_j

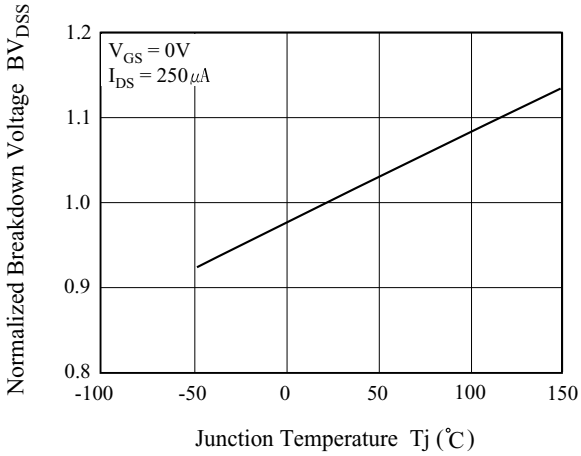


Fig4. $R_{DS(ON)}$ - I_D

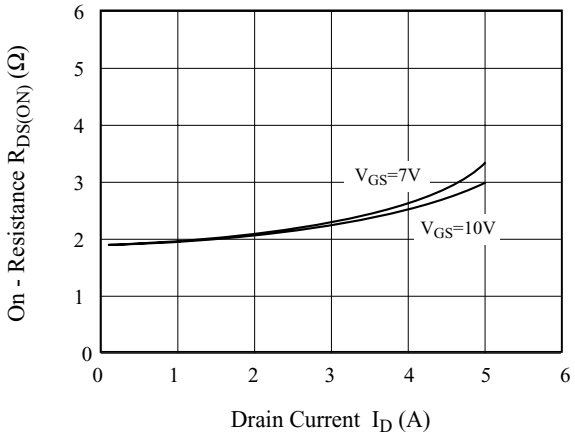


Fig5. I_S - V_{SD}

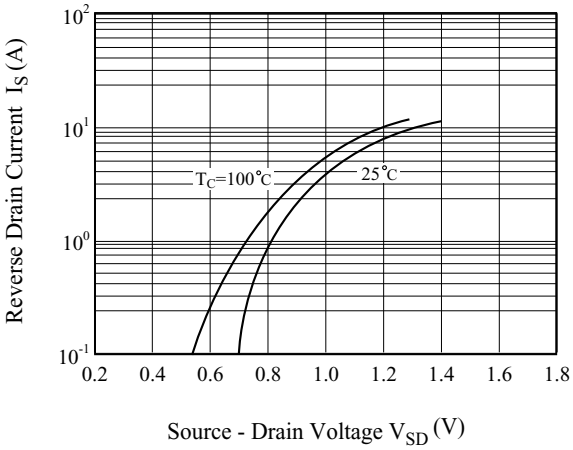


Fig6. $R_{DS(ON)}$ - T_j

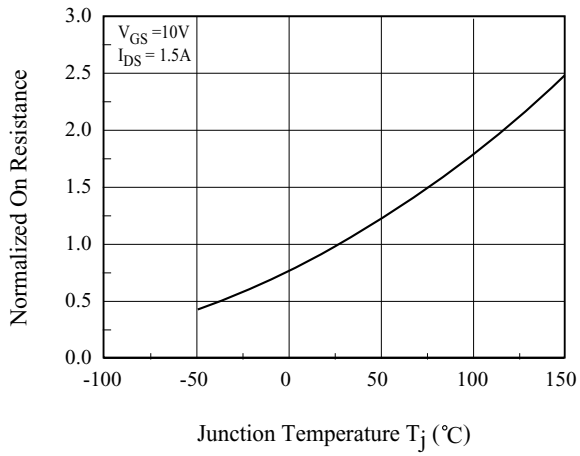


Fig 7. C - V_{DS}

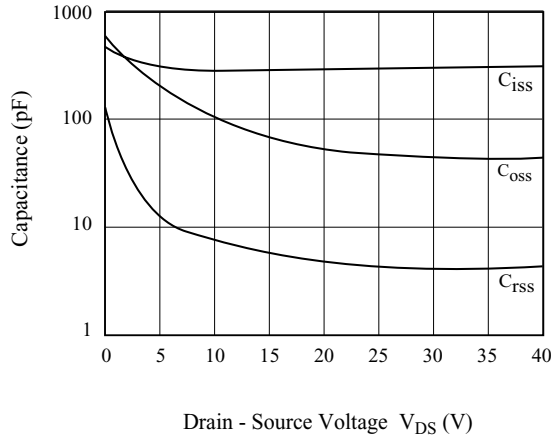


Fig8. Q_g- V_{GS}

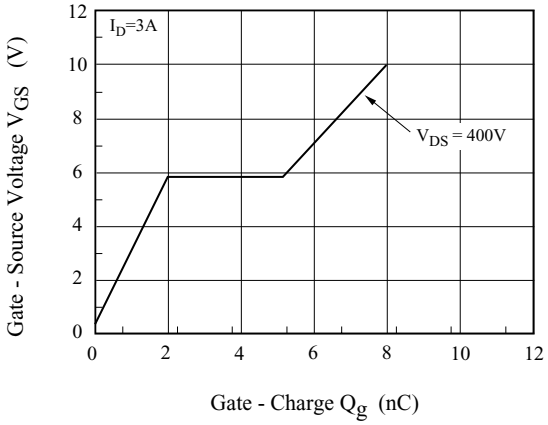


Fig9. Safe Operation Area

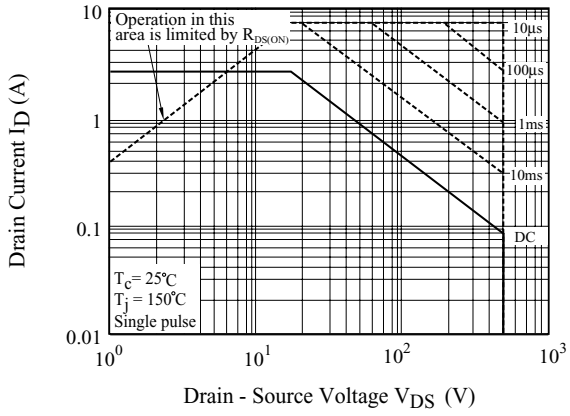


Fig10. I_D - T_j

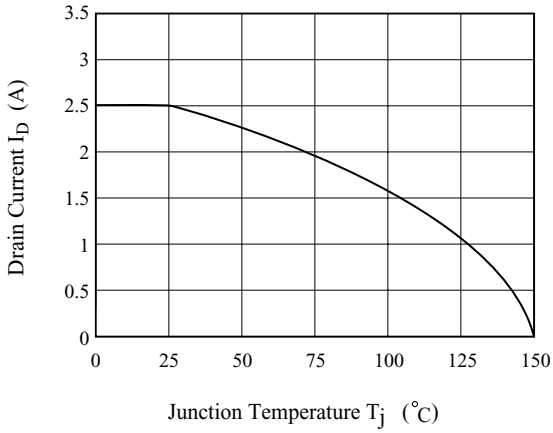


Fig11. Transient Thermal Response Curve

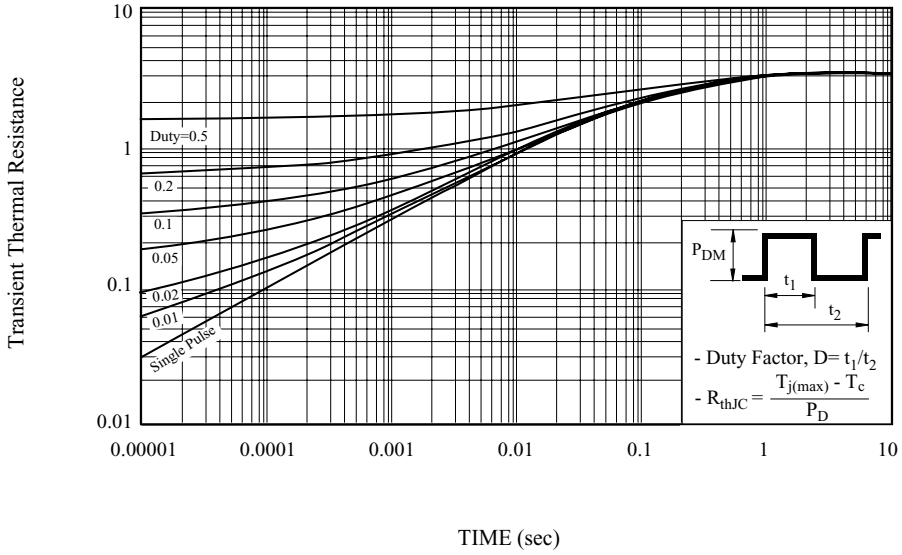


Fig12. Gate Charge

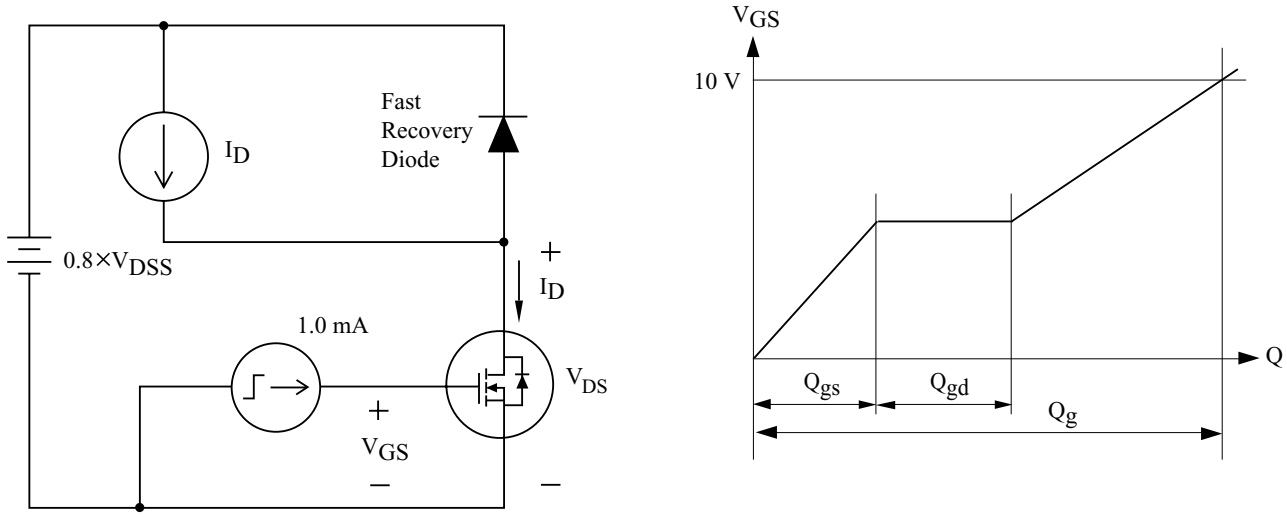


Fig13. Single Pulsed Avalanche Energy

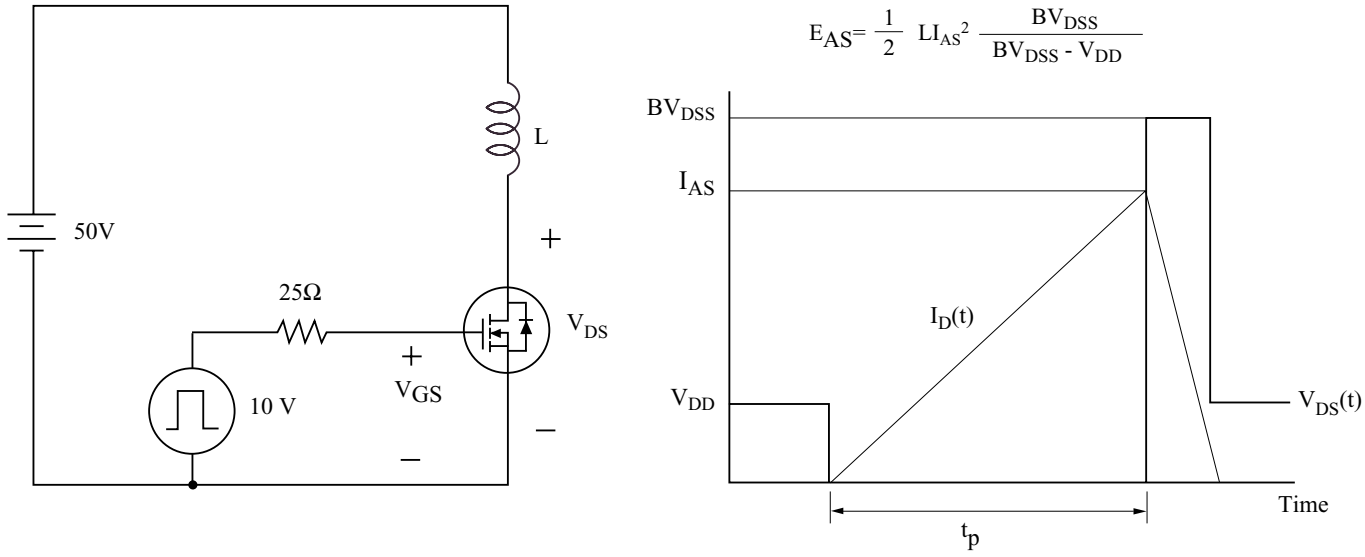


Fig14. Resistive Load Switching

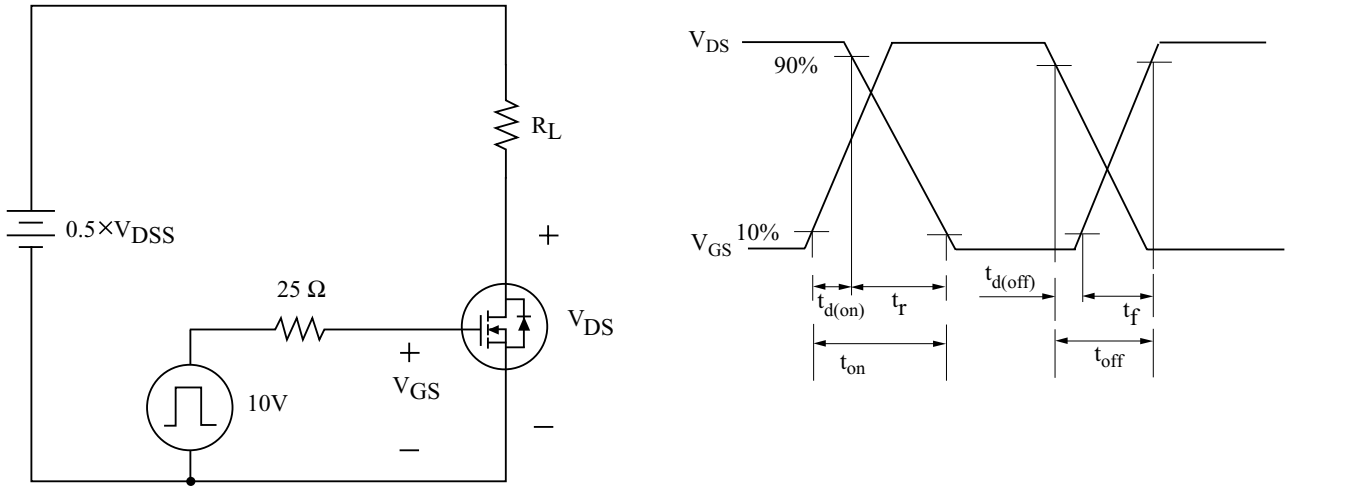


Fig15. Source - Drain Diode Reverse Recovery and dv /dt