SEMICONDUCTOR
TECHNICAL DATA

KF6N60D/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

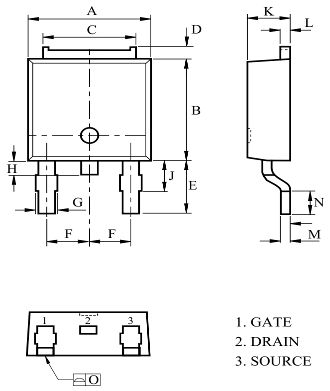
- $V_{DSS(Min.)}$= 600V, I_D= 5A
- $R_{DS(ON)}$=1.4 Ω(Max) @V_{GS} =10V
- Qg(typ.) =16nC

MAXIMUM RATING (Tc=25℃)

CHARACTERISTIC		SYMBOL	RATING KF6N60D/I	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	@T_C=25℃	I_D	5	A
	@T_C=100℃		3.15	
	Pulsed (Note1)	I_{DP}	15*	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	180	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	4	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	Tc=25℃	P_D	69.4	W
	Derate above25℃		0.56	W/℃
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 150	℃
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	1.8	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	110	℃/W

* : Drain current limited by maximum junction temperature.

KF6N60D

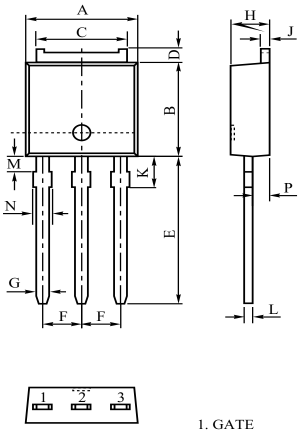


DIM	MILLIMETERS
A	6.60 ± 0.20
B	6.10±0.20
C	5.34 ± 0.30
D	0.70±0.20
E	2.70 ± 0.15
F	2.30±0.10
G	0.96 MAX
H	0.90 MAX
J	1.80±0.20
K	2.30±0.10
L	0.50 ± 0.10
M	0.50±0.10
N	0.70 MIN
O	0.1 MAX

1. GATE
2. DRAIN
3. SOURCE

DPAK (1)

KF6N60I

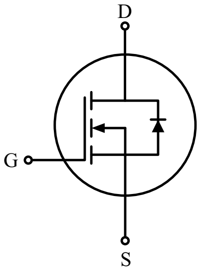


DIM	MILLIMETERS
A	6.6±0.2
B	6.1±0.2
C	5.34±0.3
D	0.7±0.2
E	9.3±0.3
F	2.3±0.2
G	0.76±0.1
H	2.3±0.1
J	0.5±0.1
K	1.8 ± 0.2
L	0.5 ± 0.1
M	1.0 ± 0.1
N	0.96 MAX
P	1.02 ± 0.3

1. GATE
2. DRAIN
3. SOURCE

IPAK(1)

PIN CONNECTION



ELECTRICAL CHARACTERISTICS (Tc=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250 μA, V_{GS}=0V	600	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	I_D=250 μA, Referenced to 25℃	-	0.6	-	V/℃
Drain Cut-off Current	I_{DSS}	V_{DS}=600V, V_{GS}=0V,	-	-	10	μA
Gate Threshold Voltage	V_{th}	V_{DS}=V_{GS}, I_D=250 μA	2.5	-	4.5	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=2.5A	-	1.2	1.4	Ω
Dynamic						
Total Gate Charge	Q_g	V_{DS}=480V, I_D=6A V_{GS}=10V (Note4,5)	-	16	-	nC
Gate-Source Charge	Q_{gs}		-	3.1	-	
Gate-Drain Charge	Q_{gd}		-	6.0	-	
Turn-on Delay time	$t_{d(on)}$	V_{DD}=300V, I_D=6A R_G=25Ω (Note4,5) V_{GS}=10V	-	20	-	ns
Turn-on Rise time	t_r		-	20	-	
Turn-off Delay time	$t_{d(off)}$		-	50	-	
Turn-off Fall time	t_f		-	20	-	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	710	-	pF
Output Capacitance	C_{oss}		-	80	-	
Reverse Transfer Capacitance	C_{rss}		-	8.0	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	V_{GS}<V_{th}	-	-	6	A
Pulsed Source Current	I_{SP}		-	-	24	
Diode Forward Voltage	V_{SD}	I_S=5A, V_{GS}=0V	-	-	1.4	V
Reverse Recovery Time	t_{rr}	I_S=6A, V_{GS}=0V, dIs/dt=100A/ μs	-	390	-	ns
Reverse Recovery Charge	Q_{rr}		-	2.2	-	μC

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

Note 2) L = 13.5mH, I_S=5A, V_{DD}=50V, R_G = 25Ω, Starting T_j = 25℃.

Note 3) $I_S \leq$6A, dI/dt≤100A/μs, $V_{DD} \leq BV_{DSS}$, Starting T_j = 25℃.

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

Note 5) Essentially independent of operating temperature.

Marking

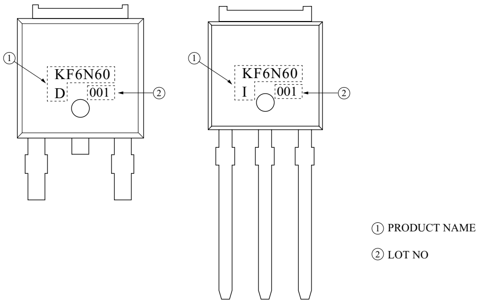


Fig1. I_D - V_{DS}

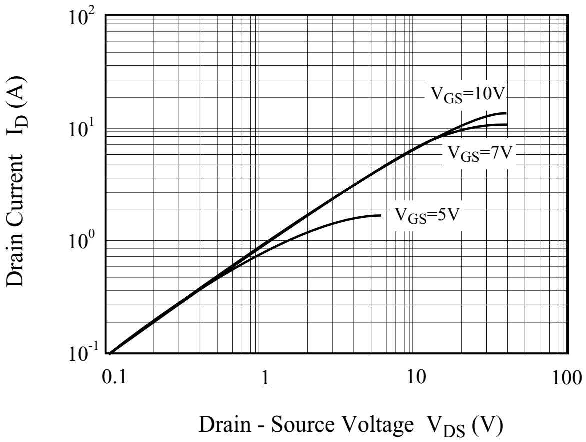


Fig2. I_D - V_{GS}

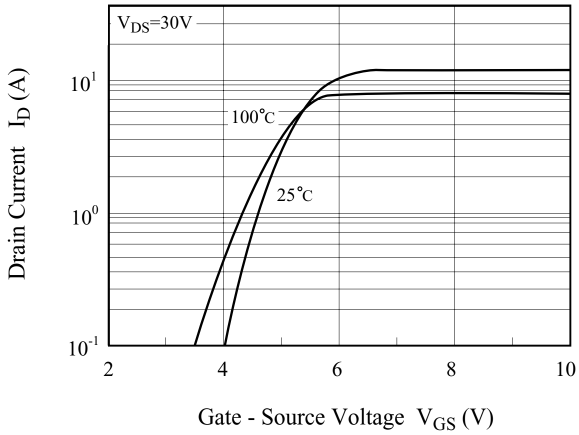


Fig3. BV_{DSS} - T_j

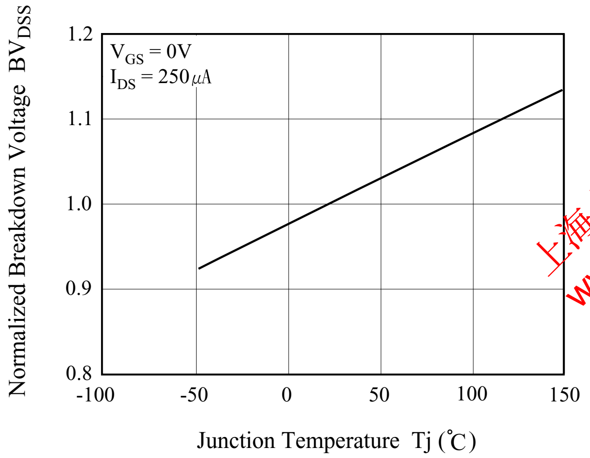


Fig4. $R_{DS(ON)}$ - I_D

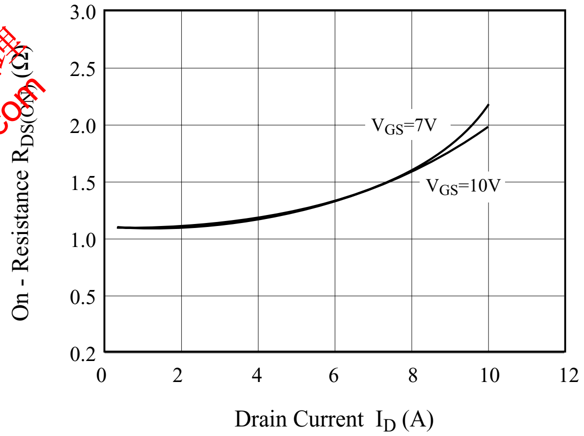


Fig5. I_S - V_{SD}

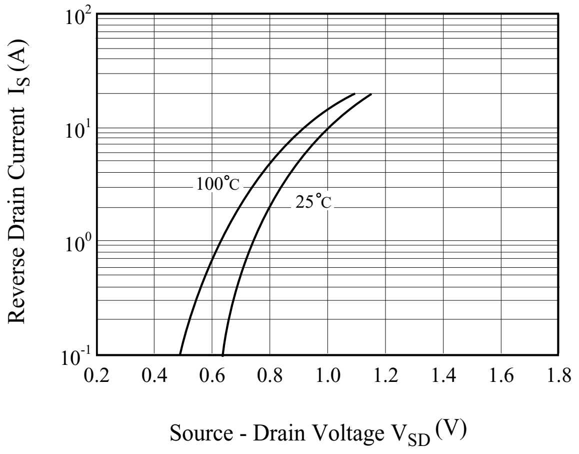


Fig6. $R_{DS(ON)}$ - T_j

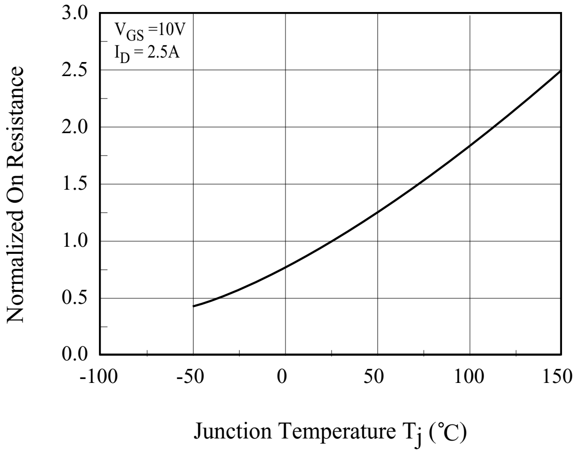


Fig 7. C - V_{DS}

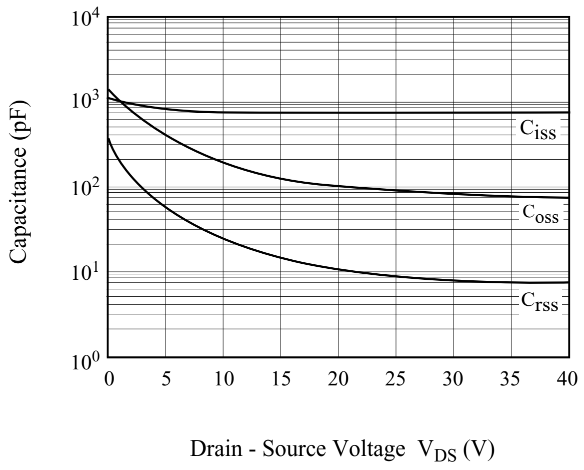


Fig8. Q_g- V_{GS}

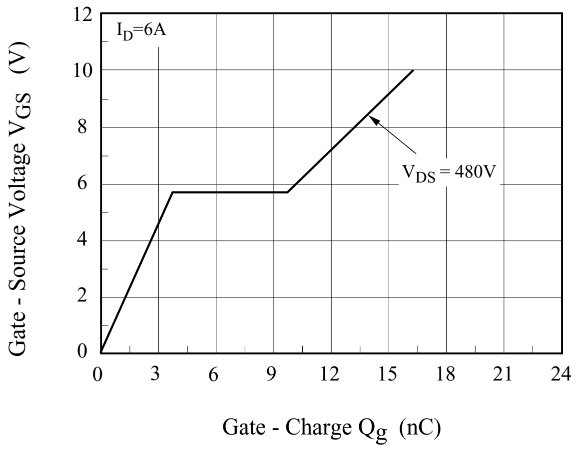


Fig9. Safe Operation Area

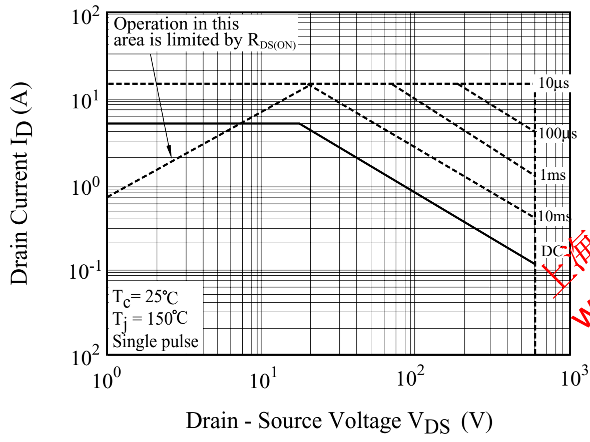


Fig10. I_D - T_j

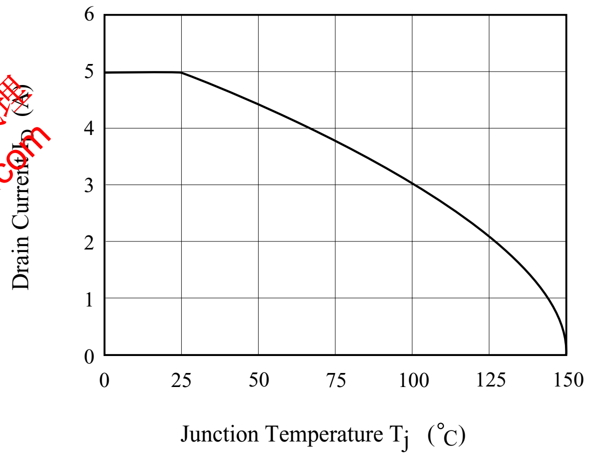


Fig11. Transient Thermal Response Curve

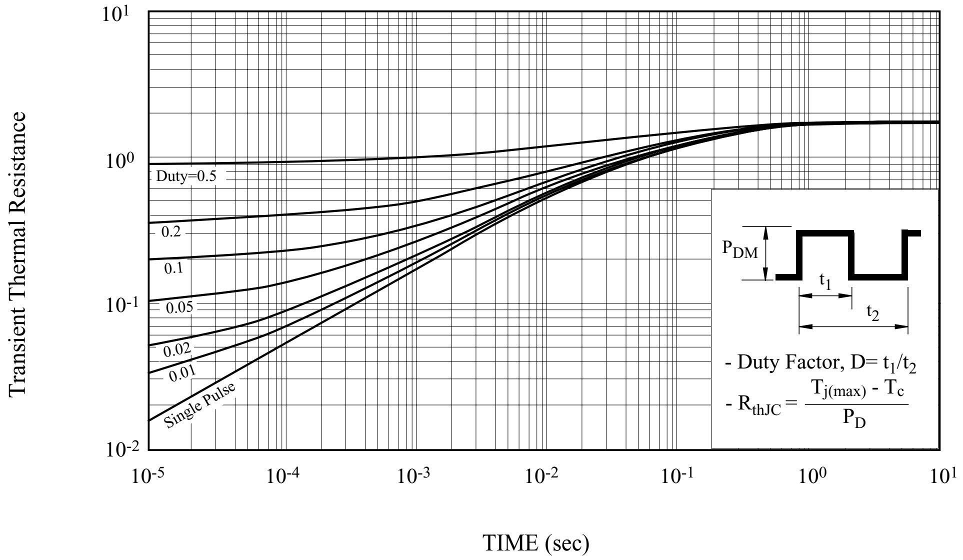


Fig12. Gate Charge

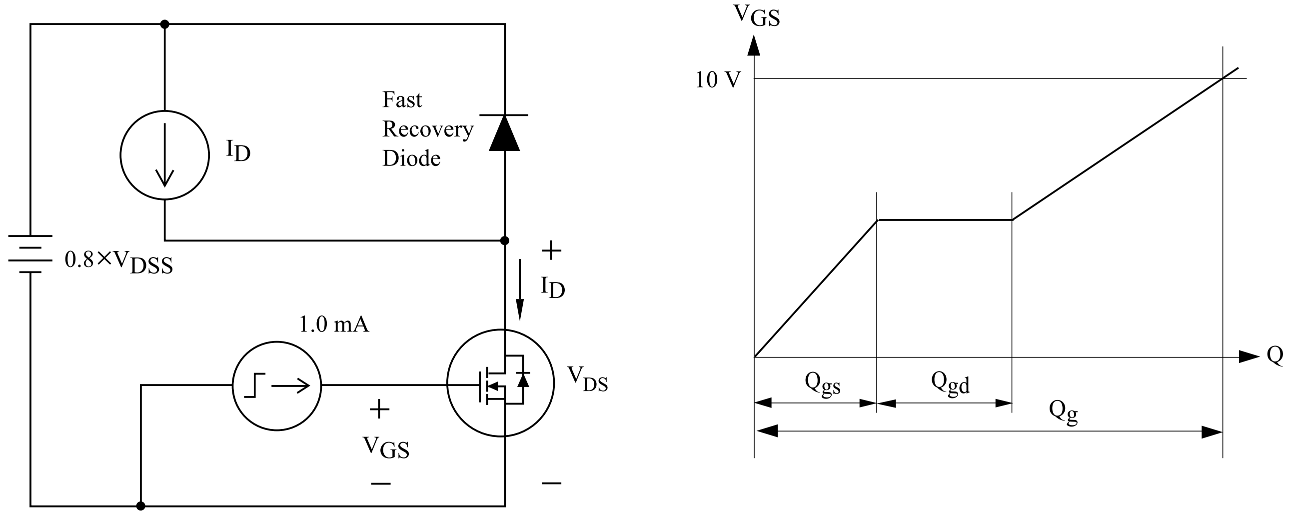


Fig13. Single Pulsed Avalanche Energy

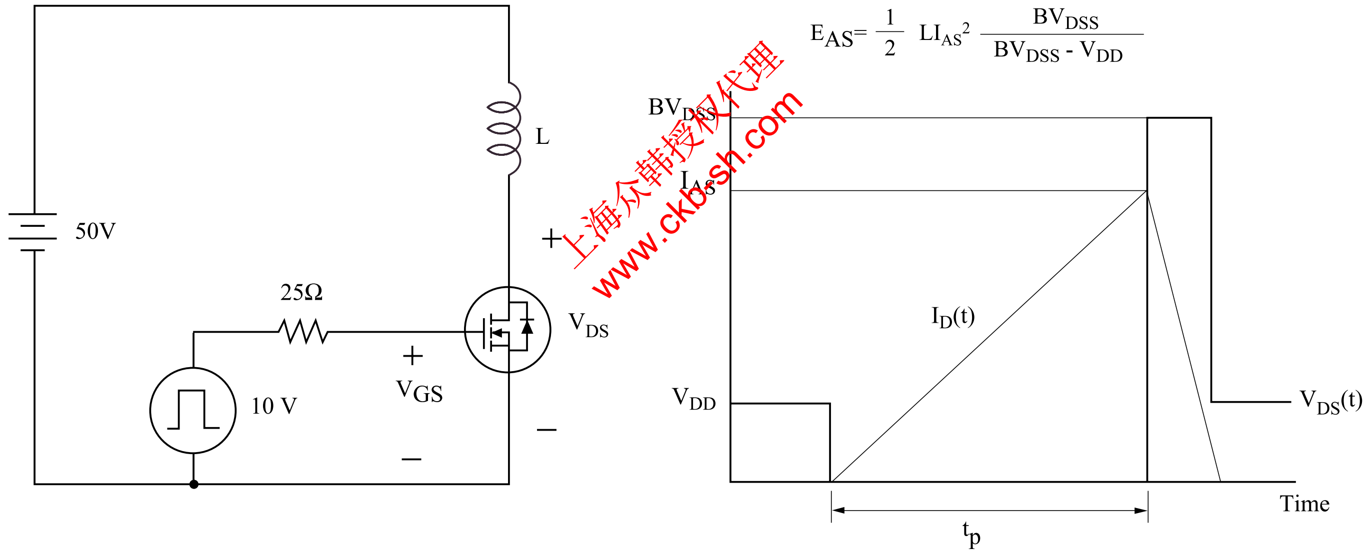


Fig14. Resistive Load Switching

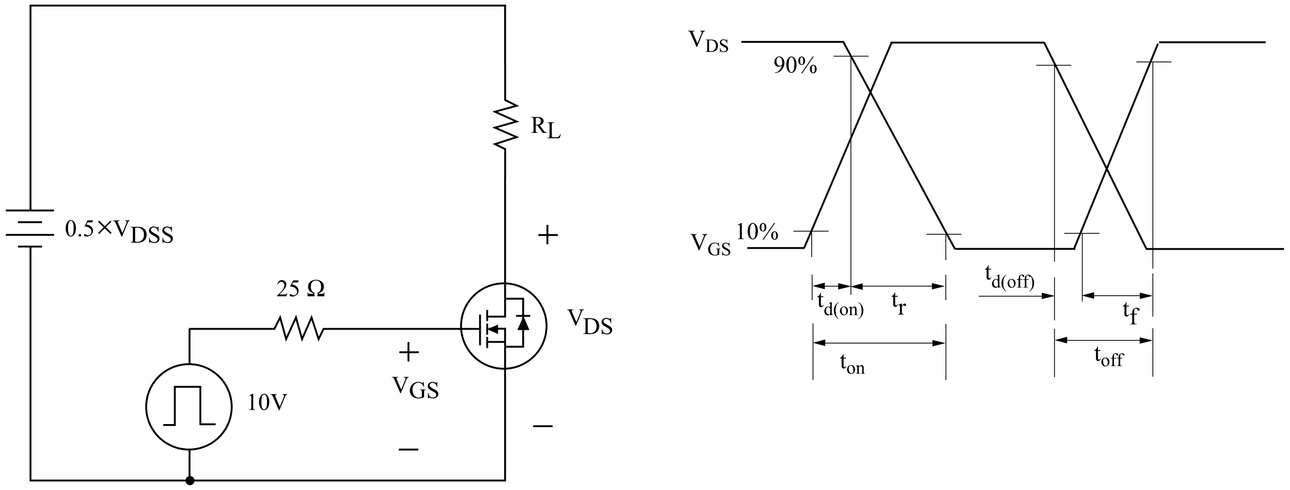


Fig15. Source - Drain Diode Reverse Recovery and dv /dt