

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 active power factor correction, electronic lamp ballasts based on half bridge topology and switching mode power supplies.

FEATURES

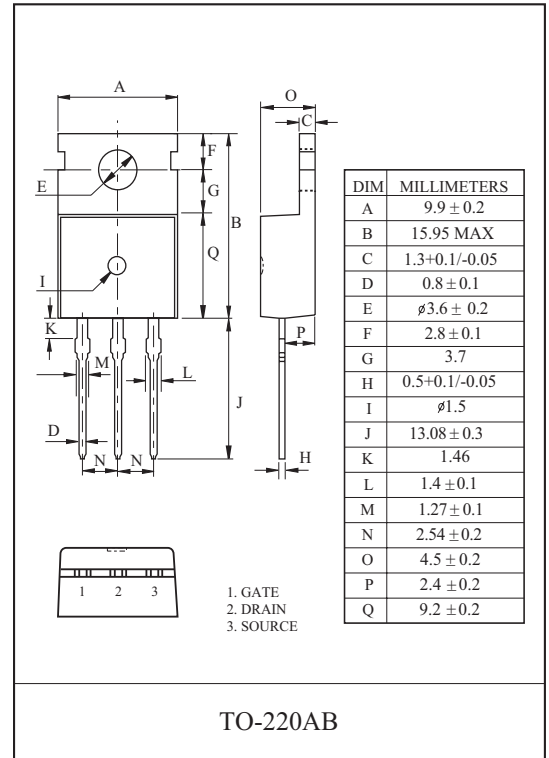
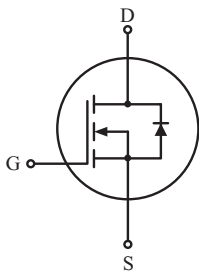
- $V_{DSS} = 60V$, $I_D = 50A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 17m\ \Omega$ (Max.) @ $V_{GS} = 10V$
- Qg (typ.) = 39.5nC

MOSFET MAXIMUM RATING (Ta=25 °C Unless otherwise noted)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	@ $T_C = 25$	I_D^*	50	A
	@ $T_C = 100$		32	
	Pulsed (Note1)	I_{DP}	170	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	330	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	9	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	$T_C = 25$	P_D	96	W
	Derate above 25		0.77	W/
Maximum Junction Temperature		T_j	150	
Storage Temperature Range		T_{stg}	-55 150	
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	1.3	/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	62.5	/W

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



KF50N06P

ELECTRICAL CHARACTERISTICS (Tc=25)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\ \mu A, V_{GS}=0V$	60	-	-	V
Breakdown Voltage Temperature Coefficient	BV_{DSS}/T_j	$I_D=250\ \mu A$, Referenced to 25	-	0.08	-	V/
Drain Cut-off Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V,$	-	-	10	μA
Gate Threshold Voltage	V_{th}	$V_{DS}=V_{GS}, I_D=250\ \mu A$	2	-	4	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=25A$	-	14.2	17.0	m
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=48V, I_D=50A$ $V_{GS}=10V$ (Note4,5)	-	39.5	-	nC
Gate-Source Charge	Q_{gs}		-	8	-	
Gate-Drain Charge	Q_{gd}		-	16	-	
Turn-on Delay time	$t_{d(on)}$	$V_{DD}=30V$ $I_D=50A$ $R_G=25$ (Note4,5)	-	30	-	ns
Turn-on Rise time	t_r		-	100	-	
Turn-off Delay time	$t_{d(off)}$		-	80	-	
Turn-off Fall time	t_f		-	64	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	1560	-	pF
Output Capacitance	C_{oss}		-	405	-	
Reverse Transfer Capacitance	C_{rss}		-	76	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	$V_{GS}<V_{th}$	-	-	50	A
Pulsed Source Current	I_{SP}		-	-	200	
Diode Forward Voltage	V_{SD}	$I_S=50A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$I_S=50A, V_{GS}=0V,$ $dI_S/dt=100A/\mu s$	-	72	-	ns
Reverse Recovery Charge	Q_{rr}		-	185	-	nC

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

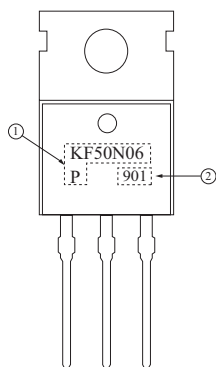
Note 2) $L=132\ \mu H, I_S=50A, V_{DD}=30V, R_G=25$, Starting $T_j=25$.

Note 3) $I_S=50A, dI/dt=200A/\mu s, V_{DD}=BV_{DSS}$, Starting $T_j=25$.

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

Note 5) Essentially independent of operating temperature.

Marking



① PRODUCT NAME

② LOT NO

KF50N06P

Fig1. $I_D - V_{DS}$

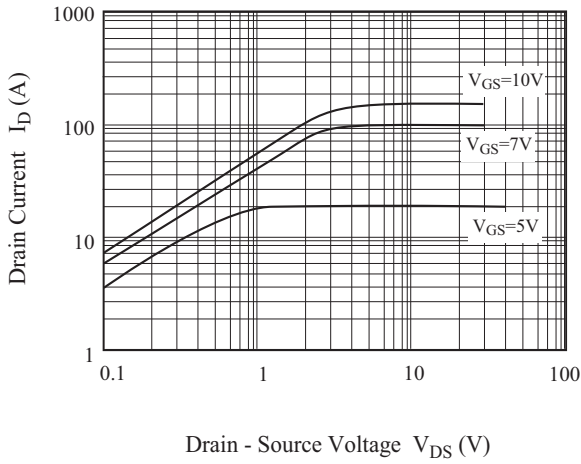


Fig2. $I_D - V_{GS}$

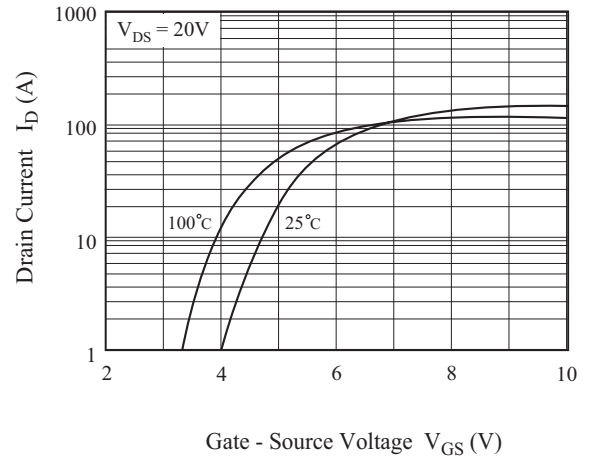


Fig3. $BV_{DSS} - T_j$

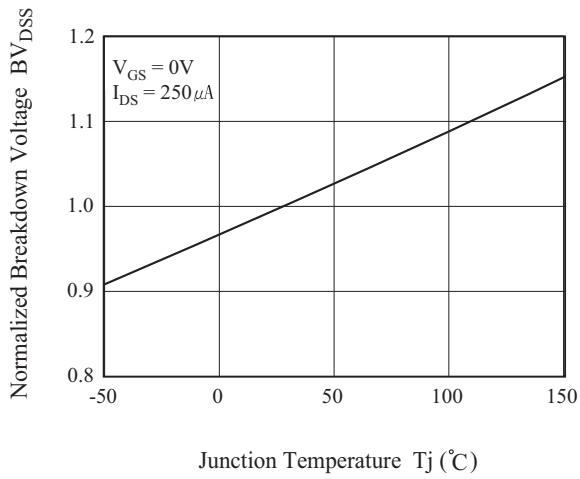


Fig4. $R_{DS(ON)} - I_D$

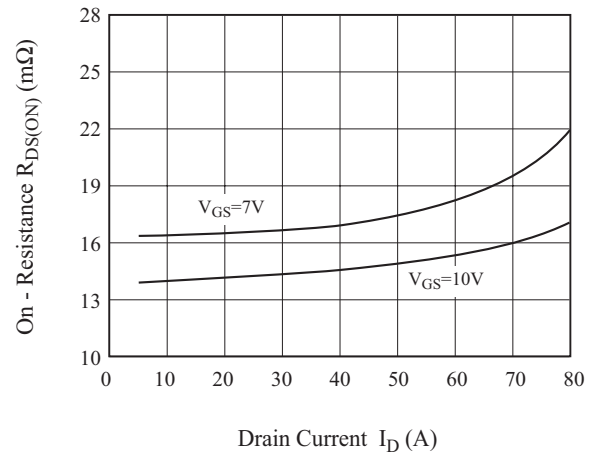


Fig5. $I_S - V_{SD}$

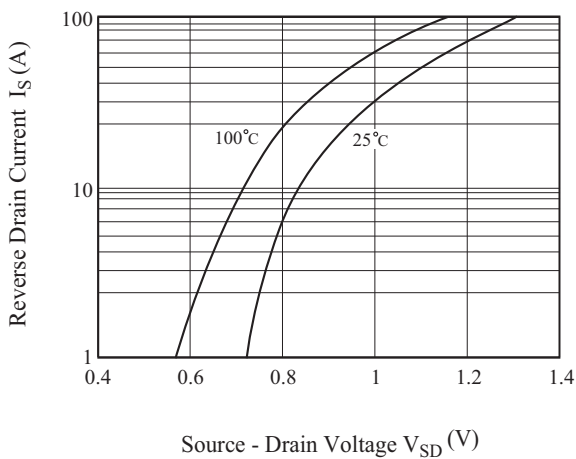
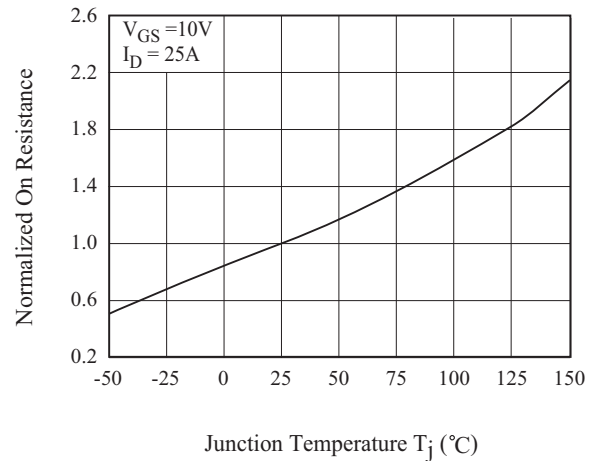


Fig6. $R_{DS(ON)} - T_j$



KF50N06P

Fig 7. C - V_{DS}

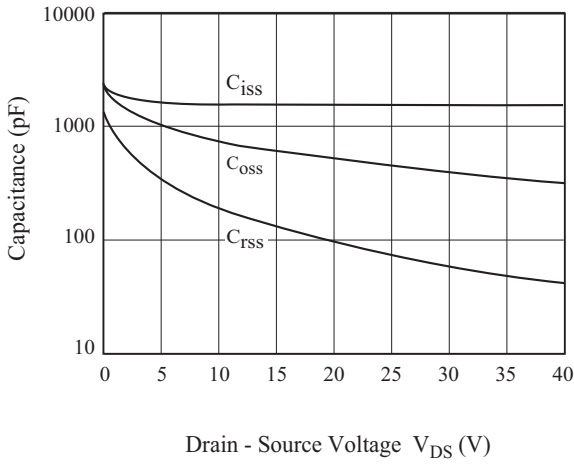


Fig 8. Q_g - V_{DS}

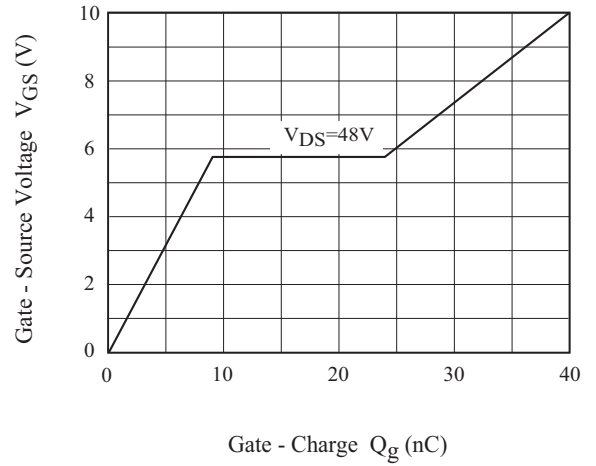


Fig 9. Safe Operation Area

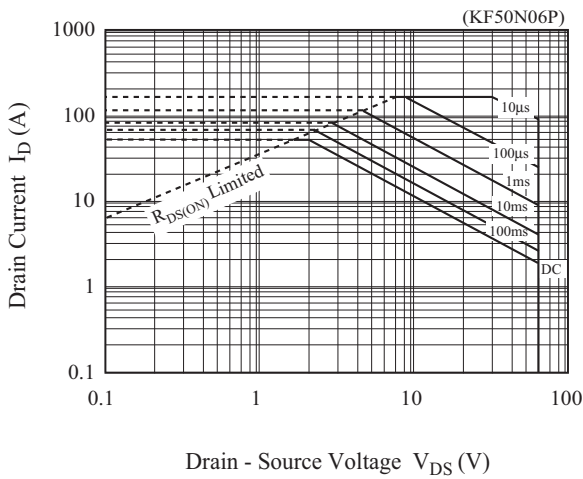


Fig 10. I_D - T_C

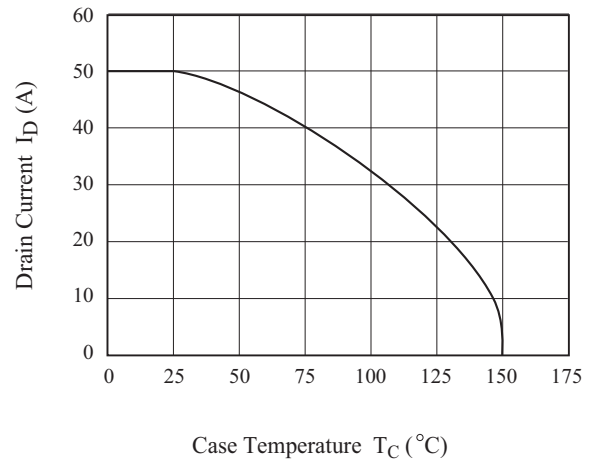


Fig 11. R_{th} of KF50N06P

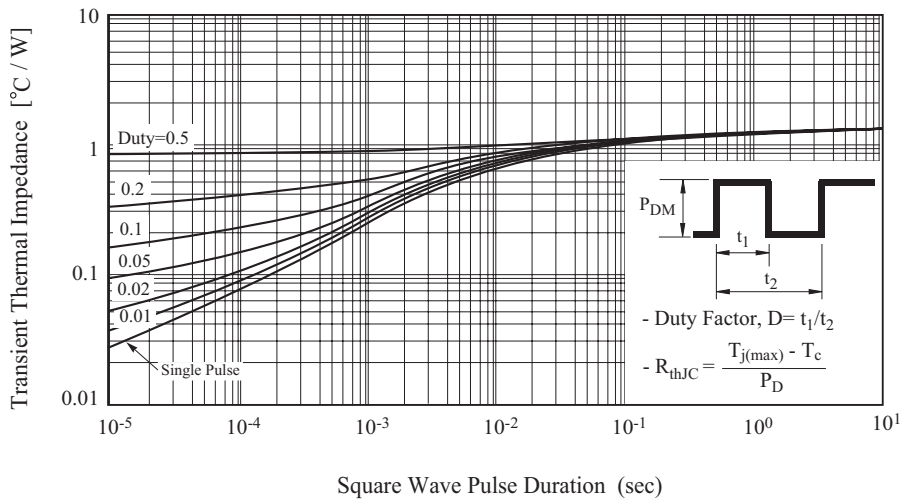


Fig12. Gate Charge

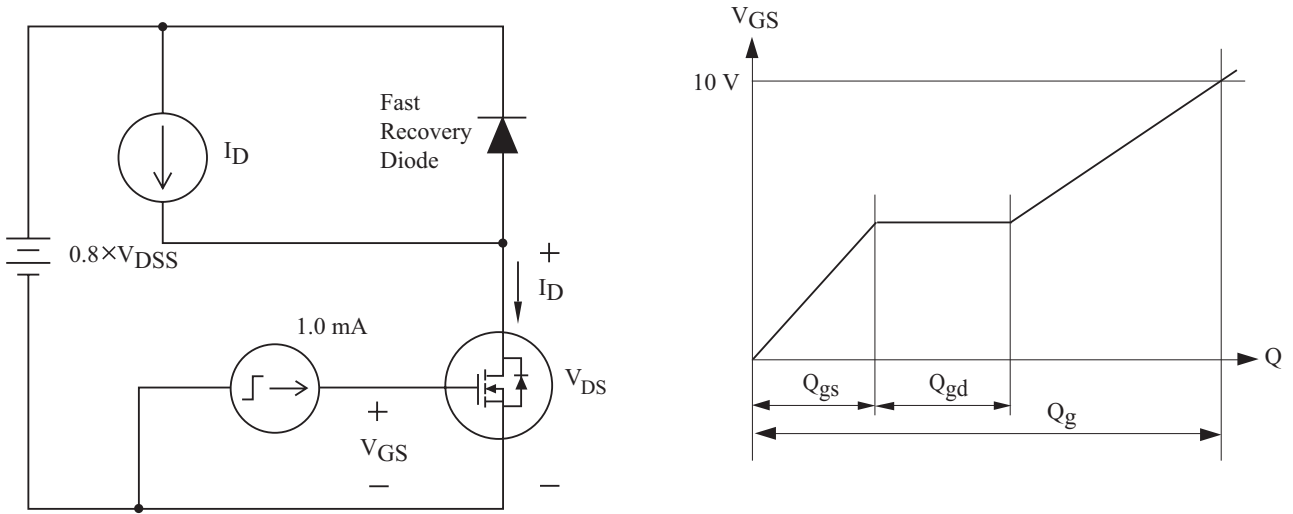


Fig13. Single Pulsed Avalanche Energy

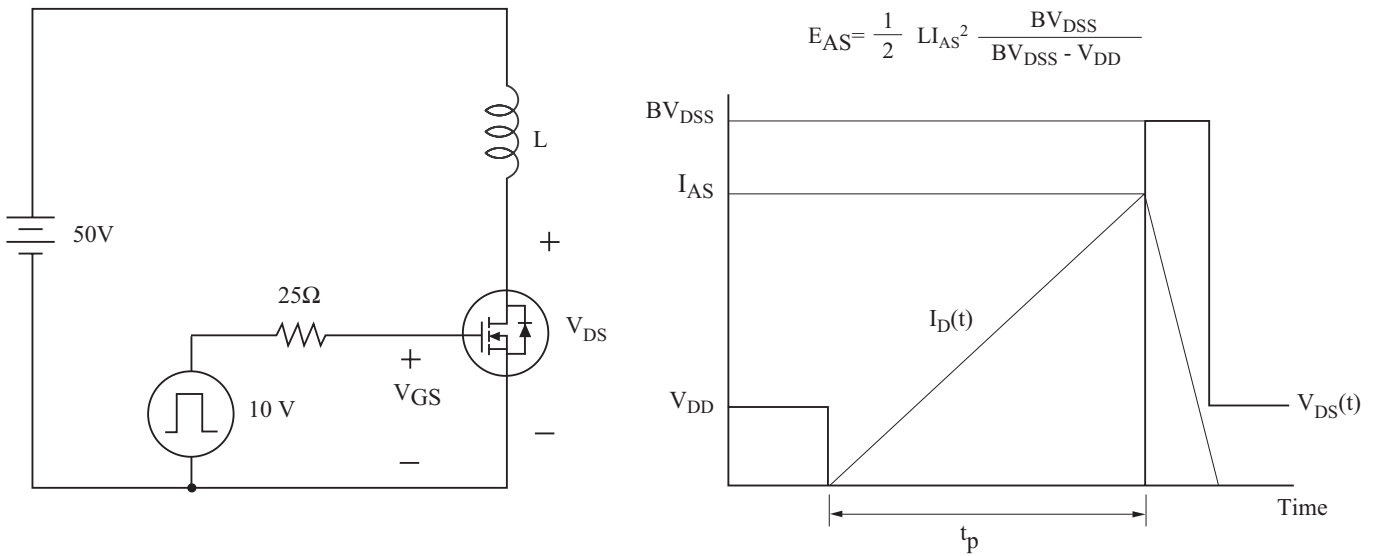


Fig14. Resistive Load Switching

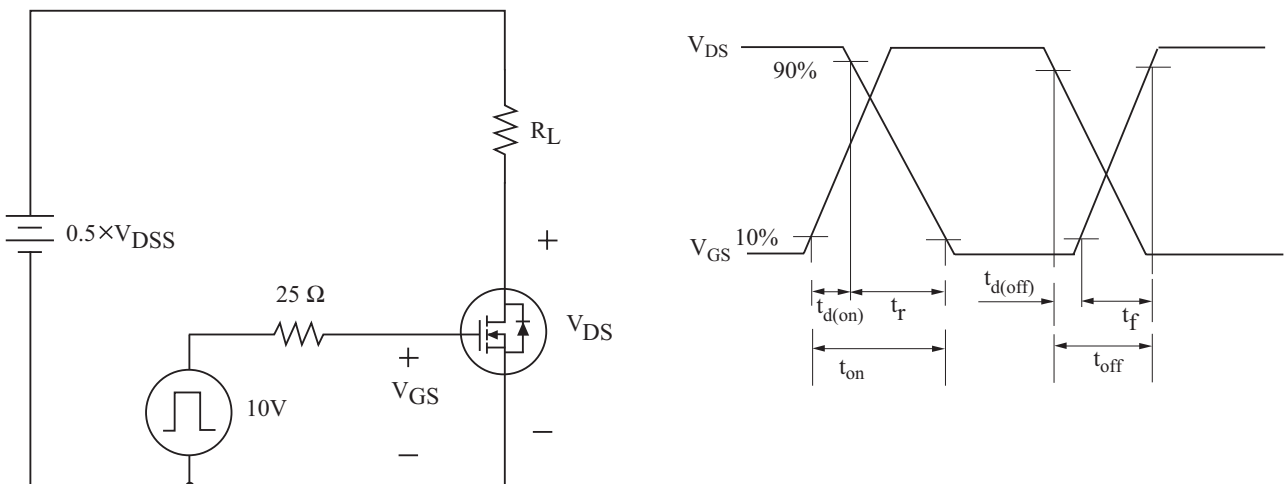


Fig15. Source - Drain Diode Reverse Recovery and dv/dt

