

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

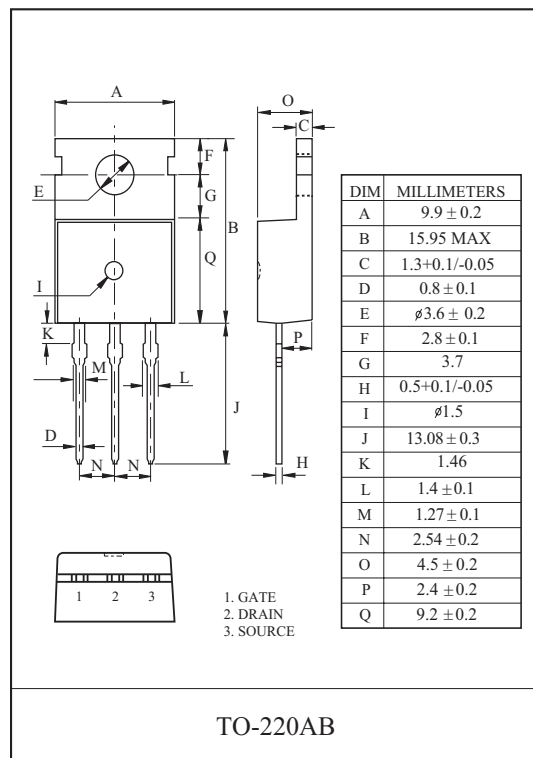
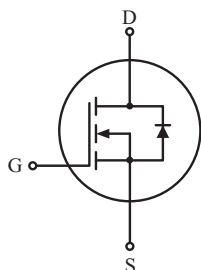
- $V_{DS} = 60V$, $I_D = 50A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 17m\ \Omega$ (Max.) @ $V_{GS} = 10V$
- Q_g (typ.) = 39.5nC

MOSFET MAXIMUM RATING ($T_a = 25^\circ C$ Unless otherwise noted)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	@ $T_C = 25^\circ C$	I_D^*	50	A
	@ $T_C = 100^\circ C$		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	$T_C = 25^\circ C$	P_D	96	W
	Derate above $25^\circ C$		0.77	W/ $^\circ C$
Maximum Junction Temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55 150	$^\circ C$
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	1.3	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient		R_{thJA}	62.5	$^\circ C/W$

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



KF50N06P

ELECTRICAL CHARACTERISTICS (Tc=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250 μA, V _{GS} =0V	60	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / Δ T _j	I _D =250 μA, Referenced to 25°C	-	0.08	-	V/°C
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 μA	2	-	4	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =25A	-	14.2	17.0	mΩ
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 =25Ω (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,	-	72	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/ μs	-	185	-	nC

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

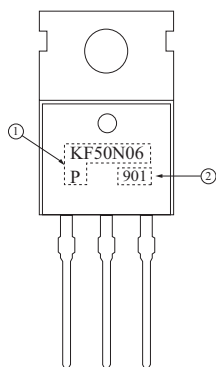
Note 2) $L=132\mu H$, $I_S=50A$, $V_{DD}=30V$, $R_G=25\Omega$, Starting $T_j=25^\circ C$.

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

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

Note 5) Essentially independent of operating temperature.

Marking



① PRODUCT NAME

② LOT NO

Fig1. $I_D - V_{DS}$

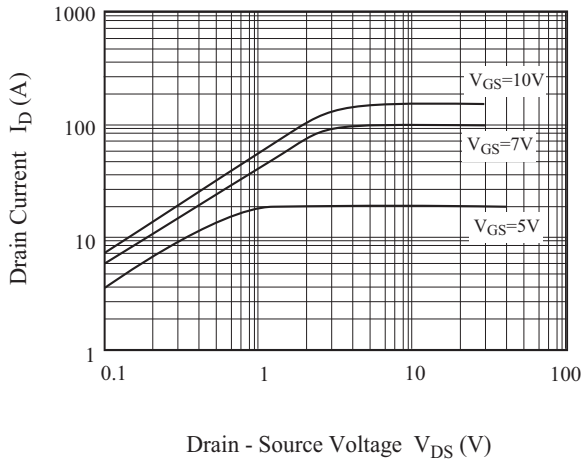


Fig2. $I_D - V_{GS}$

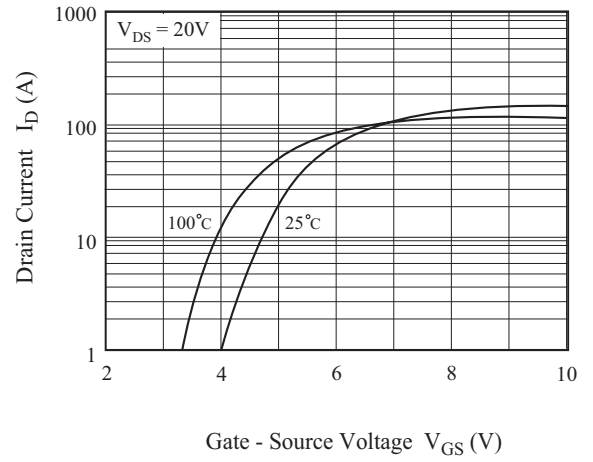


Fig3. $BV_{DSS} - T_j$

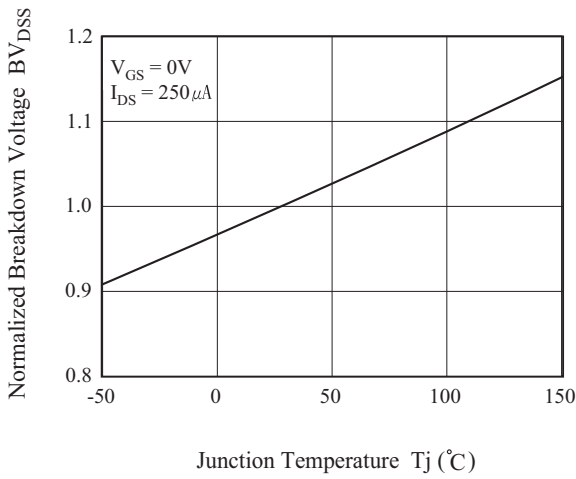


Fig4. $R_{DS(ON)} - I_D$

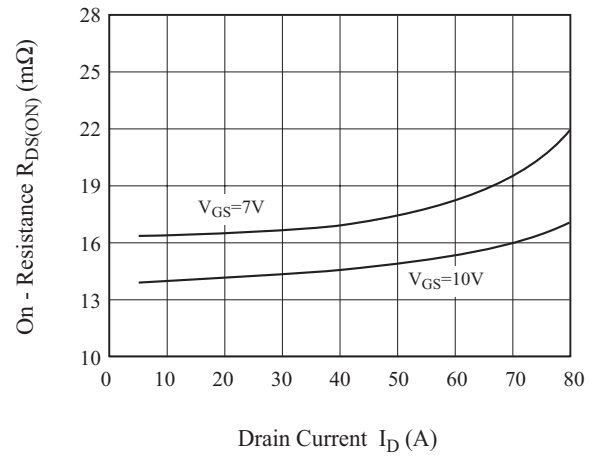


Fig5. $I_S - V_{SD}$

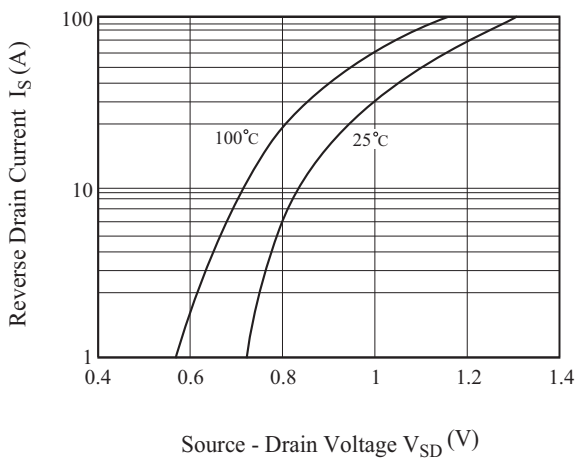
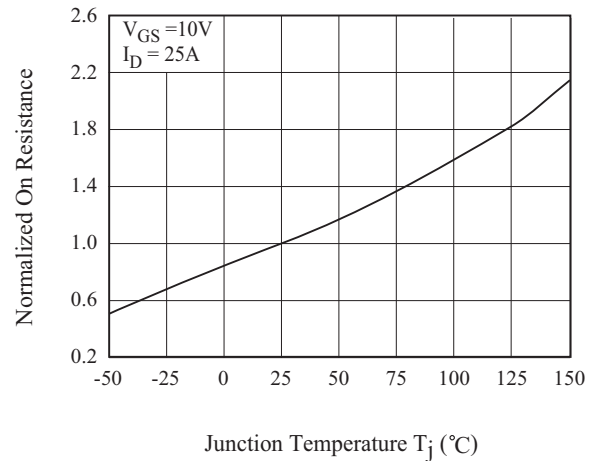


Fig6. $R_{DS(ON)} - T_j$



KF50N06P

Fig 7. C - V_{DS}

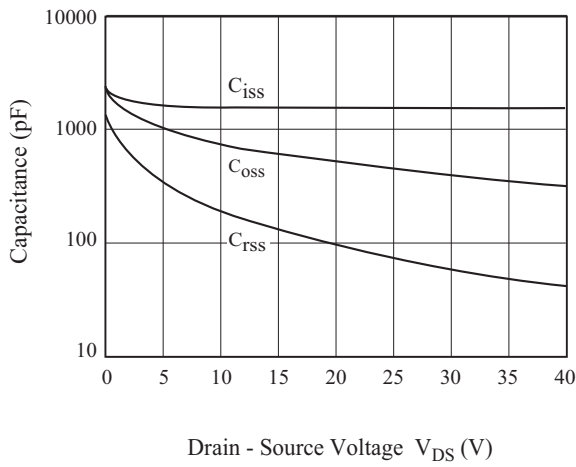


Fig 8. Q_g - V_{DS}

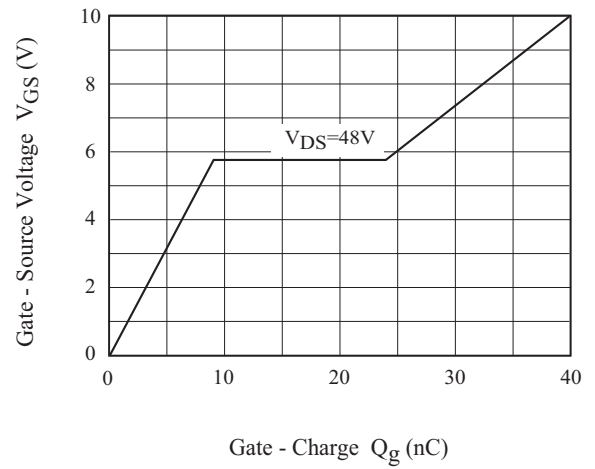


Fig 9. Safe Operation Area

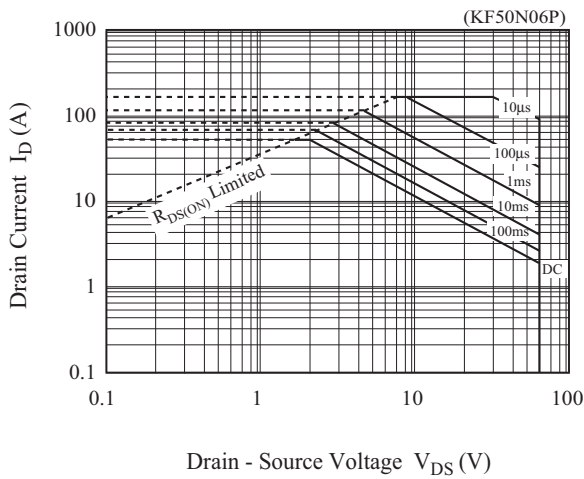


Fig 10. I_D - T_C

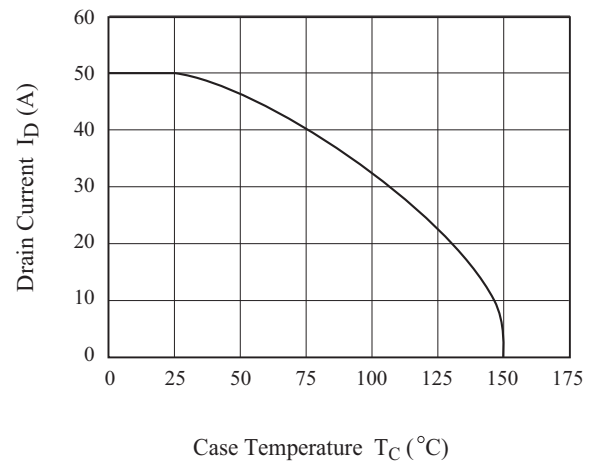


Fig 11. R_{th} of KF50N06P

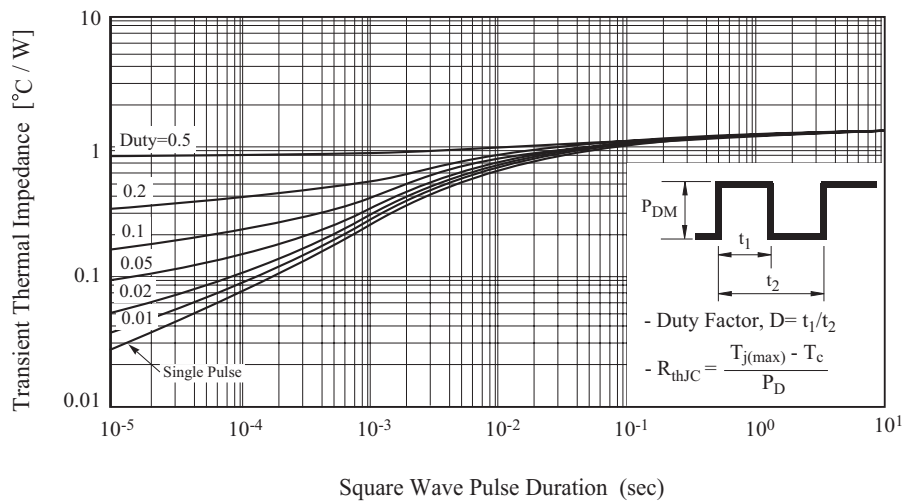


Fig12. Gate Charge

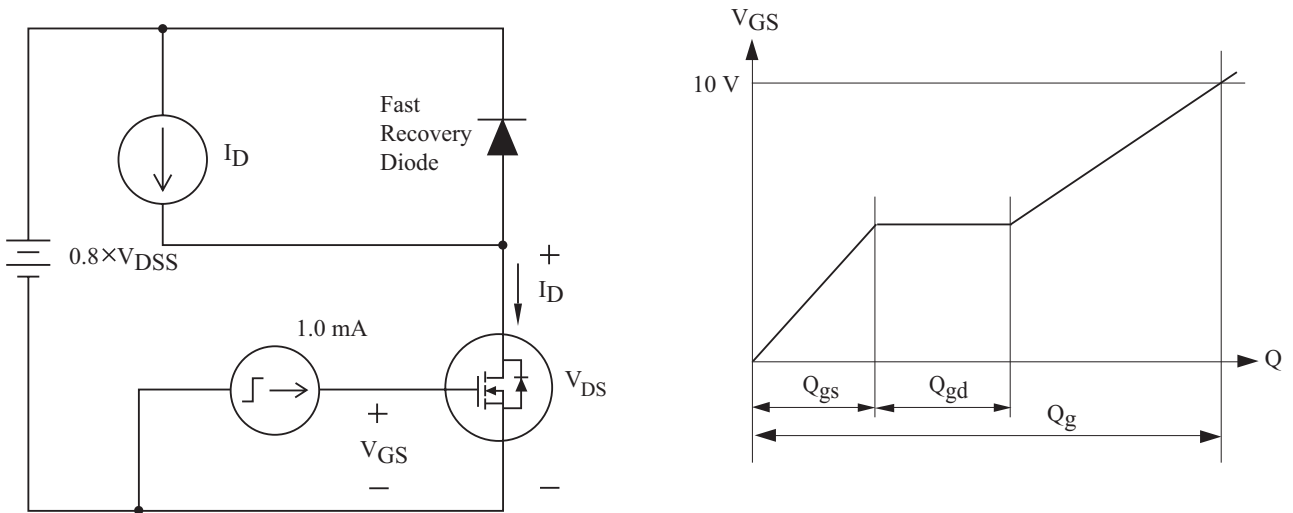


Fig13. Single Pulsed Avalanche Energy

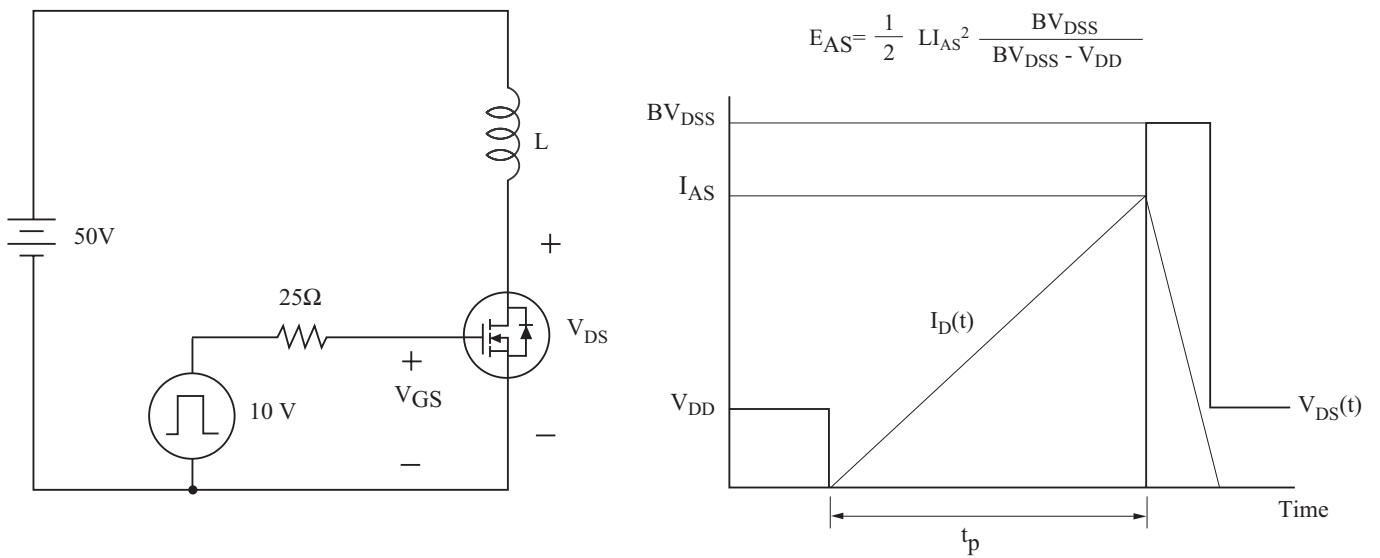


Fig14. Resistive Load Switching

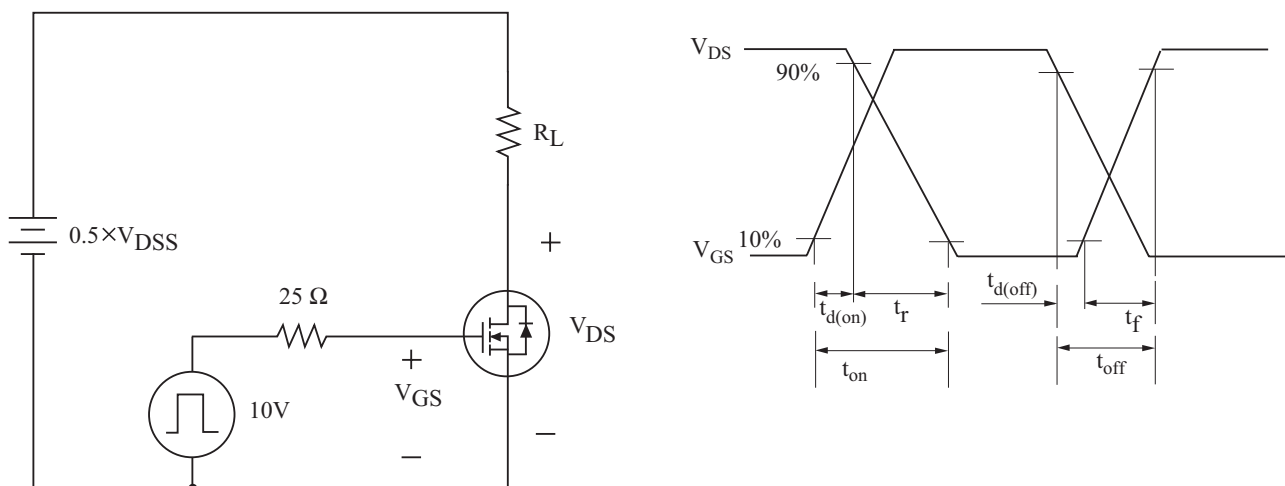


Fig15. Source - Drain Diode Reverse Recovery and dv/dt

