

General Description

This Super Junction 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 and switching mode power supplies.

FEATURES

□ $V_{DS}=600V$, $I_D=11A$

□ Drain-Source ON Resistance :

$R_{DS(ON)}(Max)=0.38\Omega$ @ $V_{GS}=10V$

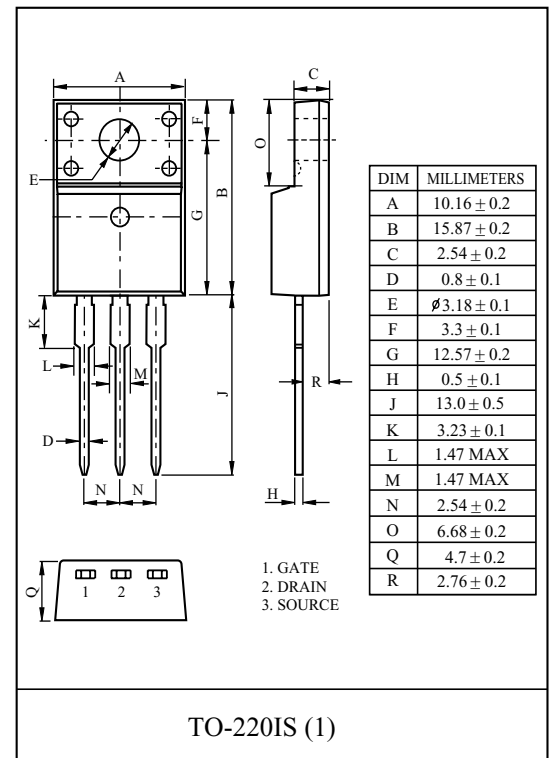
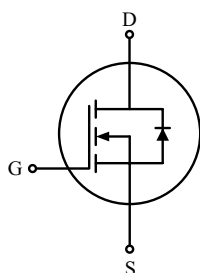
□ $Q_g(typ.)=20nC$

MAXIMUM RATING ($T_c=25^\circ C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current	@ $T_c=25^\circ C$	I_D 11*	A
	@ $T_c=100^\circ C$	6.9*	
	Pulsed (Note1)	I_{DP} 24*	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	195	mJ
Repetitive Avalanche Energy (Note 1)	E_{AR}	4.0	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Drain Power Dissipation	$T_c=25^\circ C$	P_D 34.7	W
	Derate above $25^\circ C$	0.28	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}	3.6	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	$^\circ C/W$

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



KP11N60F

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	600	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} /Δ T _j	I _D =250μA, Referenced to 25 °C	-	0.6	-	V/°C
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 =250μA	2.0	-	4.0	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 =5.5A	-	0.33	0.38	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =480V, I _D =11A V _{GS} =10V (Note 5)	-	20	-	nC
Gate-Source Charge	Q _{gs}		-	4.0	-	
Gate-Drain Charge	Q _{gd}		-	9.0	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =300V I _D =11A R _G =25Ω (Note4,5)	-	25	-	ns
Turn-on Rise time	t _r		-	35	-	
Turn-off Delay time	t _{d(off)}		-	65	-	
Turn-off Fall time	t _f		-	25	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	850	-	pF
Output Capacitance	C _{oss}		-	800	-	
Reverse Transfer Capacitance	C _{rss}		-	2.0	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	11	A
Pulsed Source Current	I _{SP}		-	-	44	
Diode Forward Voltage	V _{SD}	I _S =11A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =11A, V _{GS} =0V,	-	300	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/μs	-	3.0	-	μC

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

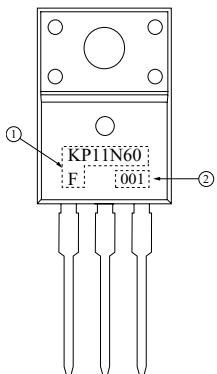
Note 2) $L=3mH$, $I_S=11A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_j=25^\circ C$.

Note 3) $I_S \leq 11A$, $dI/dt \leq 100A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_j=25^\circ C$.

Note 4) Pulse Test : Pulse width $\leq 10\mu s$, Duty Cycle $\leq 2\%$.

Note 5) Essentially independent of operating temperature.

Marking



① PRODUCT NAME

② LOT NO

KP11N60F

Fig1. $I_D - V_{DS}$

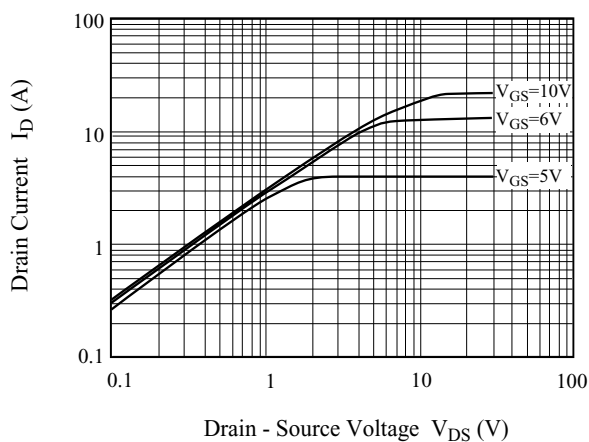


Fig2. $I_D - V_{GS}$

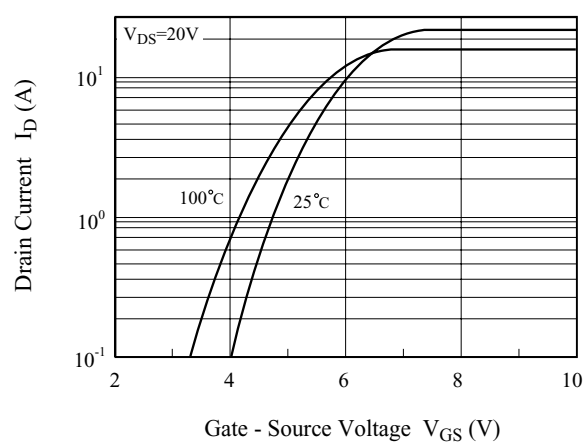


Fig3. $BV_{DSS} - T_j$

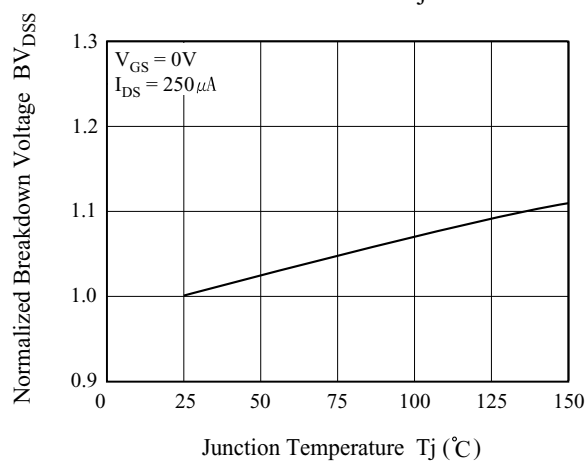


Fig4. $R_{DS(ON)} - I_D$

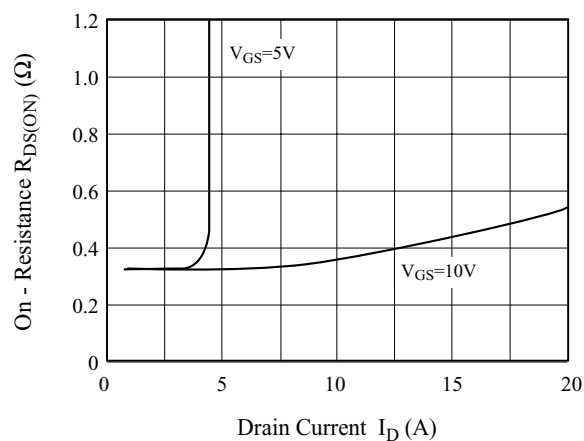


Fig5. $I_S - V_{SD}$

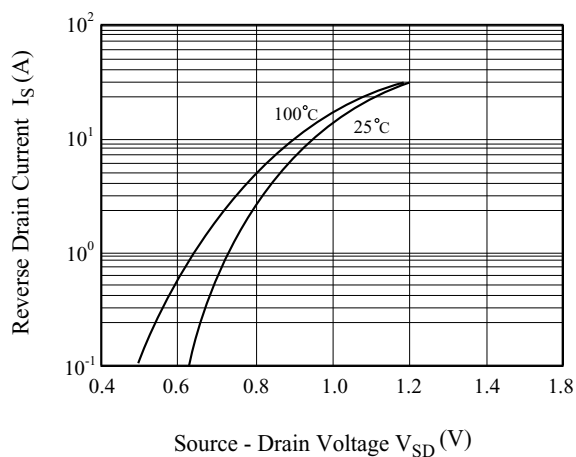
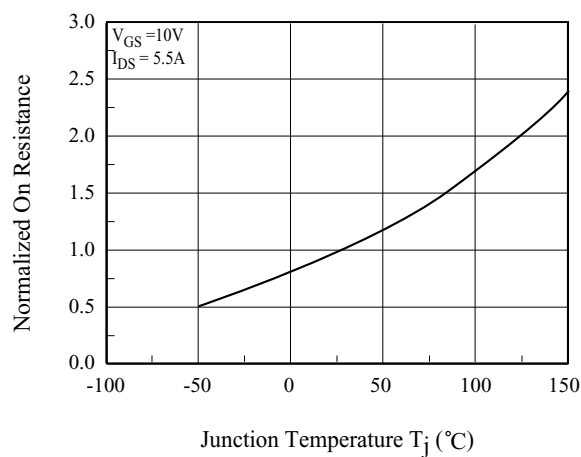


Fig6. $R_{DS(ON)} - T_j$



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Fig 7. C - V_{DS}

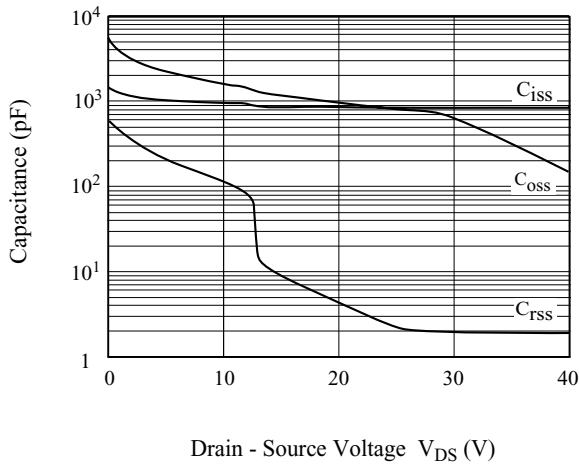


Fig8. Q_g - V_{GS}

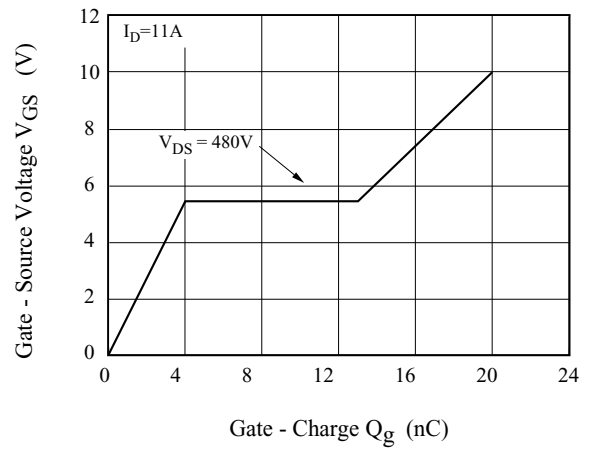


Fig9. Safe Operation Area

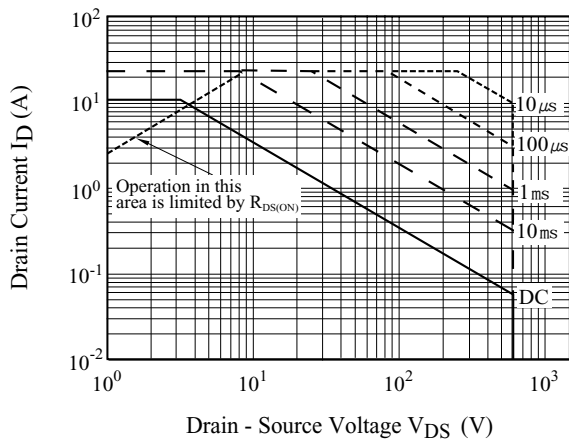


Fig10. Transient Thermal Response Curve

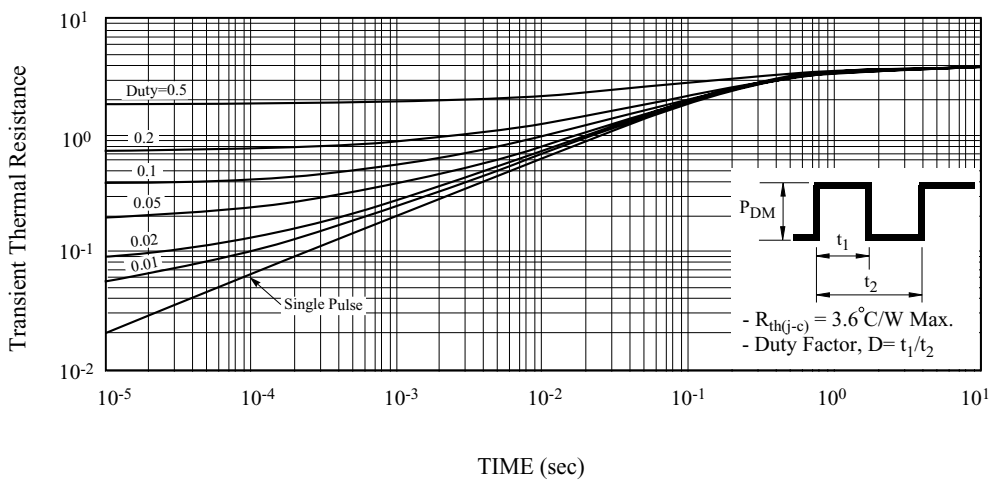


Fig11. Gate Charge

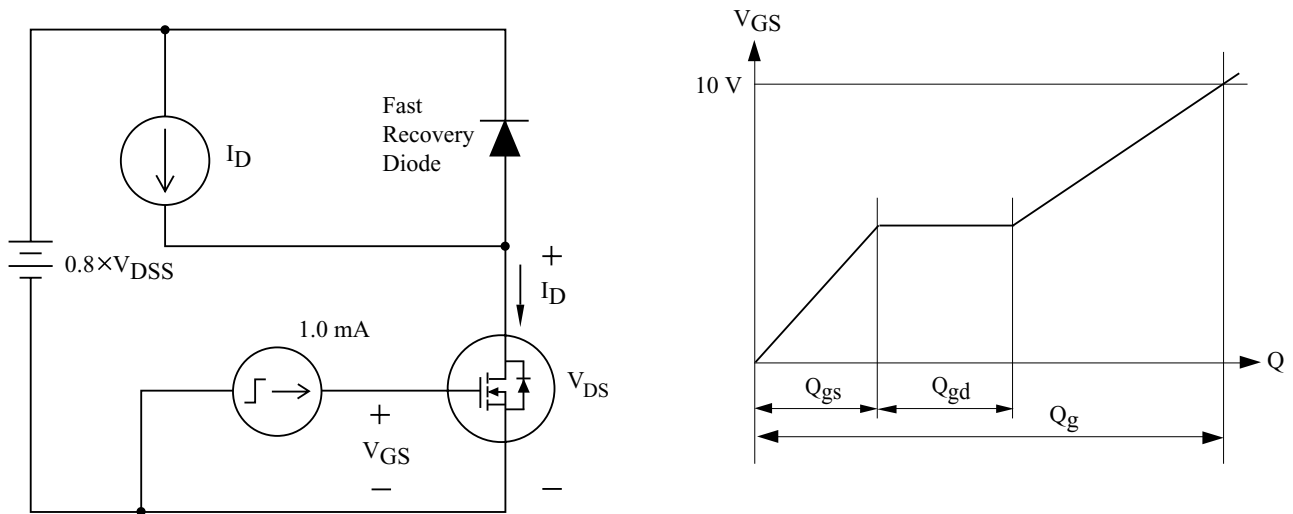


Fig12. Single Pulsed Avalanche Energy

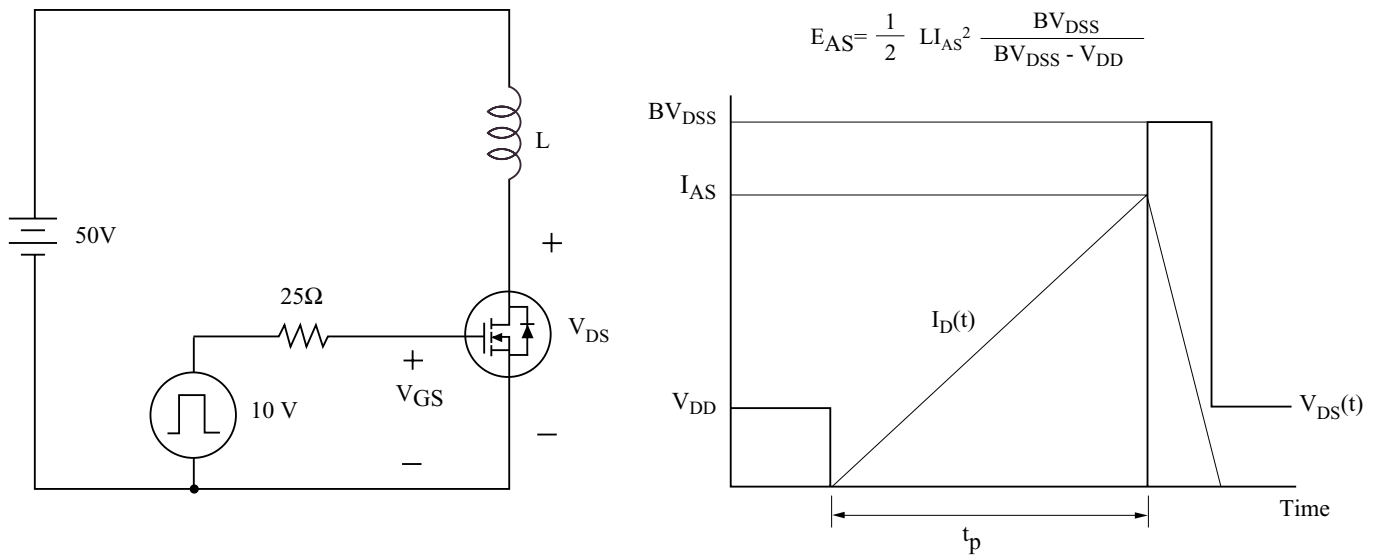


Fig13. Resistive Load Switching

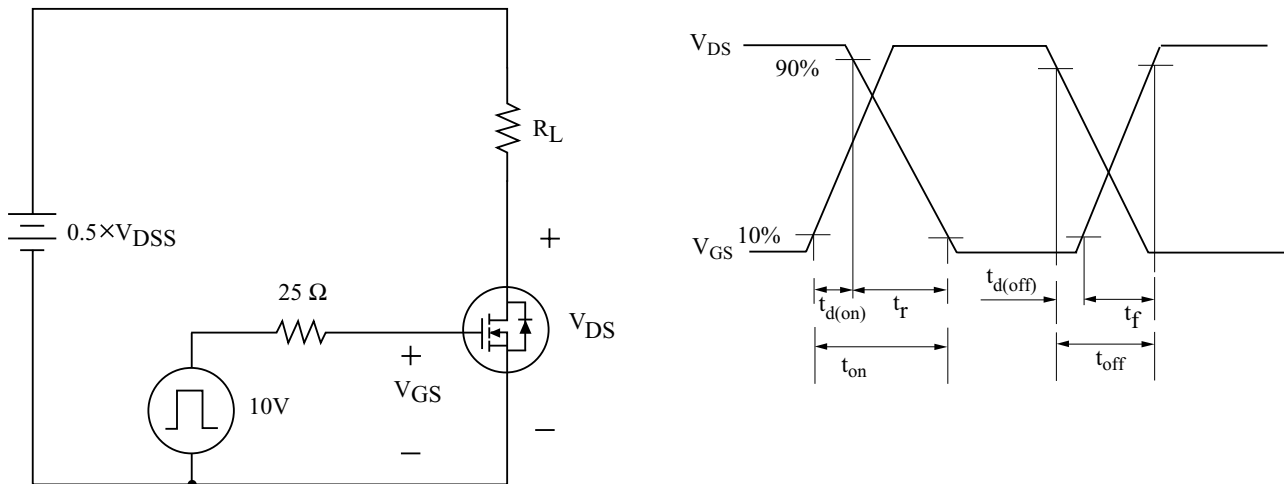


Fig14. Source - Drain Diode Reverse Recovery and dv/dt

