

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

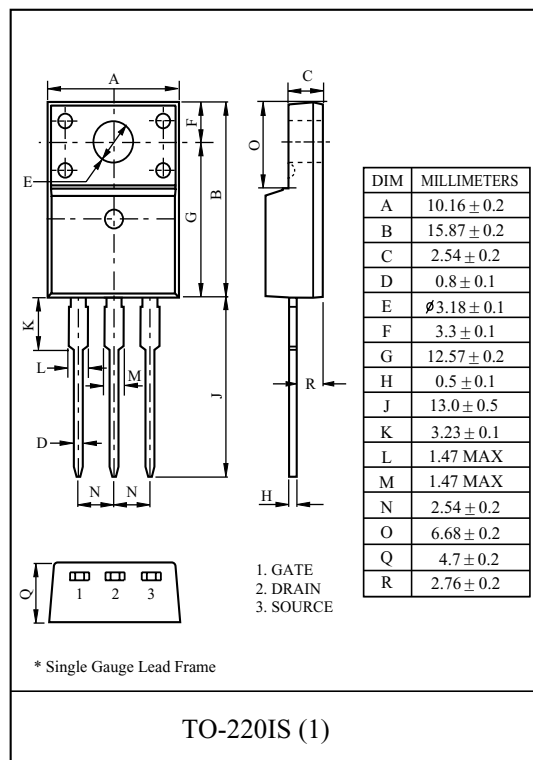
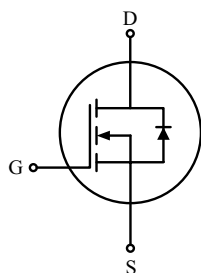
- $V_{DS}=600V$, $I_D=8A$
- Drain-Source ON Resistance :
 $R_{DS(ON)}(Max)=0.58\Omega$ @ $V_{GS}=10V$
- $Q_g(typ.)=16nC$

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 8*	A
	@ $T_c=100^\circ C$	5*	
	Pulsed (Note1)	I_{DP} 18*	
Single Pulsed Avalanche Energy (Note 2)	E_{AS}	125	mJ
Repetitive Avalanche Energy (Note 1)	E_{AR}	3.7	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Drain Power Dissipation	$T_c=25^\circ C$	P_D 37.9	W
	Derate above $25^\circ C$	0.3	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}	3.3	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	$^\circ C/W$

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



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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	600	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / Δ T _j	I _D =250 μA, 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 =250 μA	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 =4A	-	0.50	0.58	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =480V, I _D =8A V _{GS} =10V (Note 5)	-	16	-	nC
Gate-Source Charge	Q _{gs}		-	3.1	-	
Gate-Drain Charge	Q _{gd}		-	6.5	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =300V I _D =8A R _G =25Ω (Note4,5)	-	19	-	ns
Turn-on Rise time	t _r		-	20	-	
Turn-off Delay time	t _{d(off)}		-	49	-	
Turn-off Fall time	t _f		-	15	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	600	-	pF
Output Capacitance	C _{oss}		-	550	-	
Reverse Transfer Capacitance	C _{rss}		-	2.7	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	8	A
Pulsed Source Current	I _{SP}		-	-	32	
Diode Forward Voltage	V _{SD}	I _S =8A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =8A, V _{GS} =0V,	-	280	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/ μs	-	2.4	-	μC

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

Note 2) $L=3.65mH, I_S=8A, V_{DD}=50V, R_G=25\Omega$, Starting $T_j=25^\circ C$.

Note 3) $I_S \leq 8A, dI/dt \leq 100A/\mu s, V_{DD} \leq BV_{DSS}$, 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

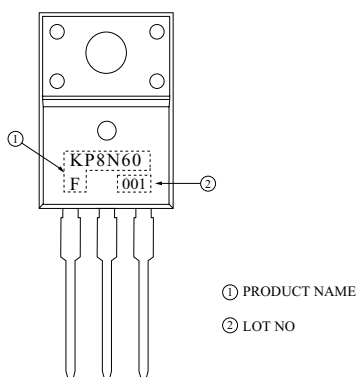


Fig1. $I_D - V_{DS}$

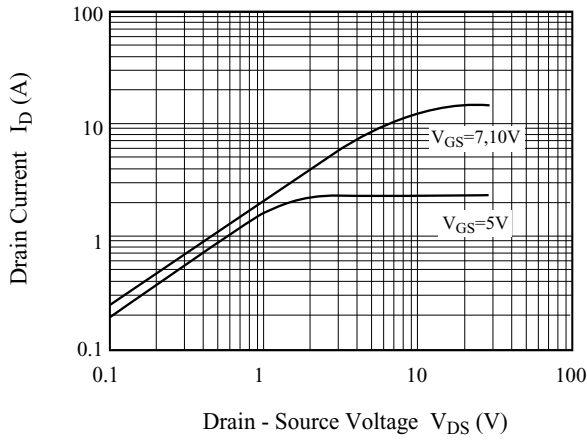


Fig2. $I_D - V_{GS}$

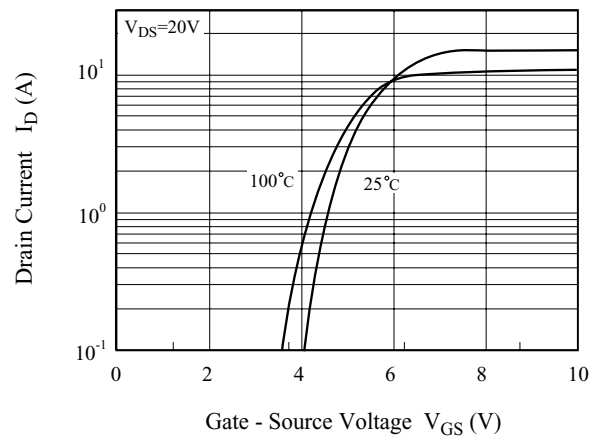


Fig3. $BV_{DSS} - T_j$

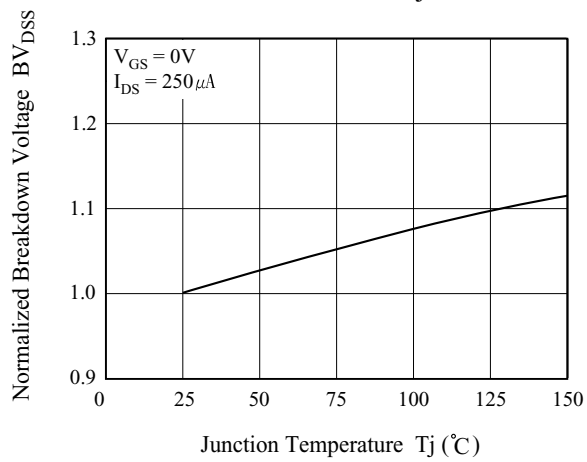


Fig4. $R_{DS(ON)} - I_D$

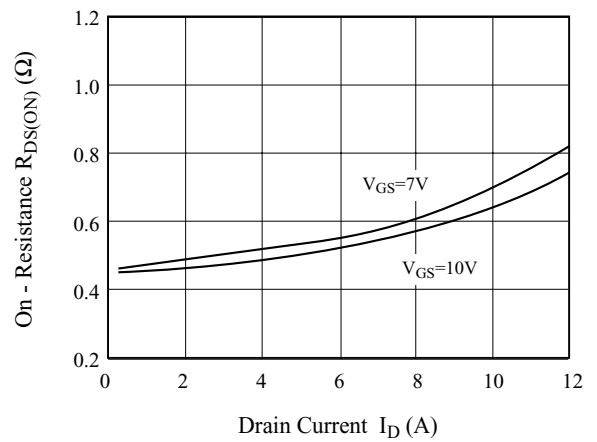


Fig5. $I_S - V_{SD}$

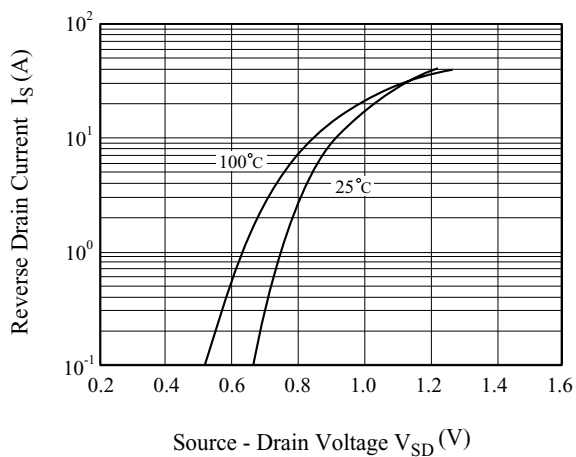
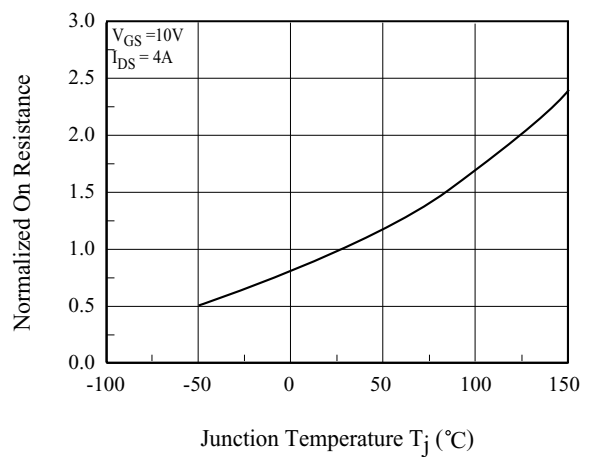


Fig6. $R_{DS(ON)} - T_j$



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Fig 7. C - V_{DS}

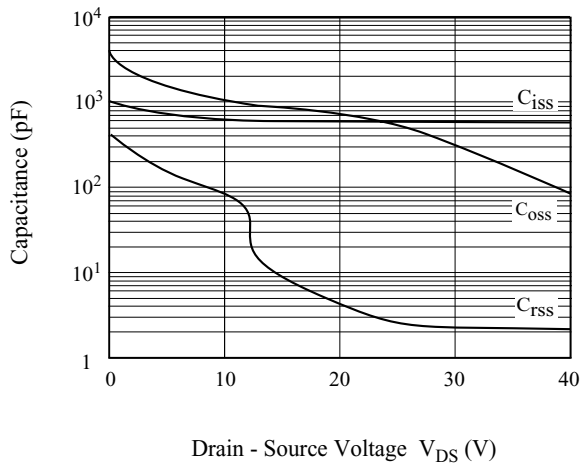


Fig8. Q_g - V_{GS}

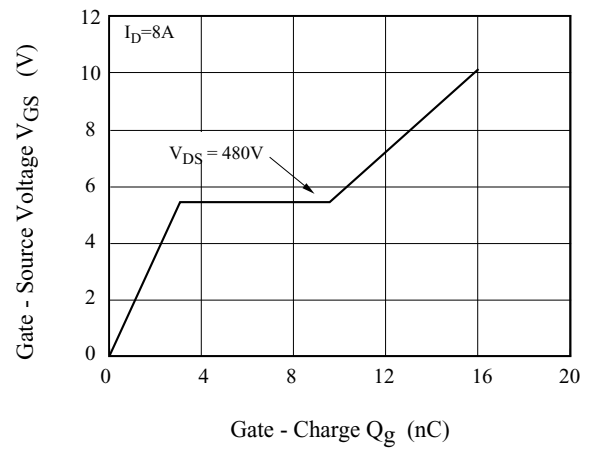


Fig9. Safe Operation Area

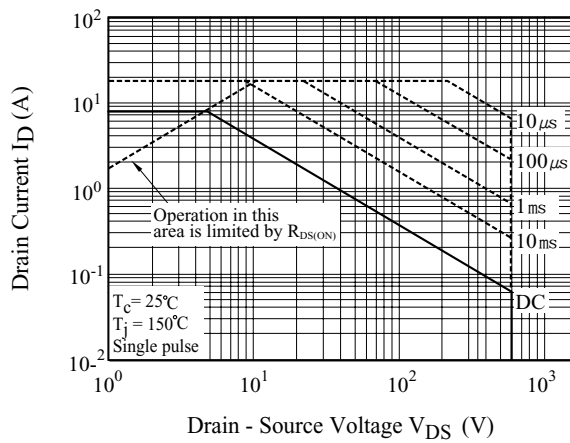


Fig10. Transient Thermal Response Curve

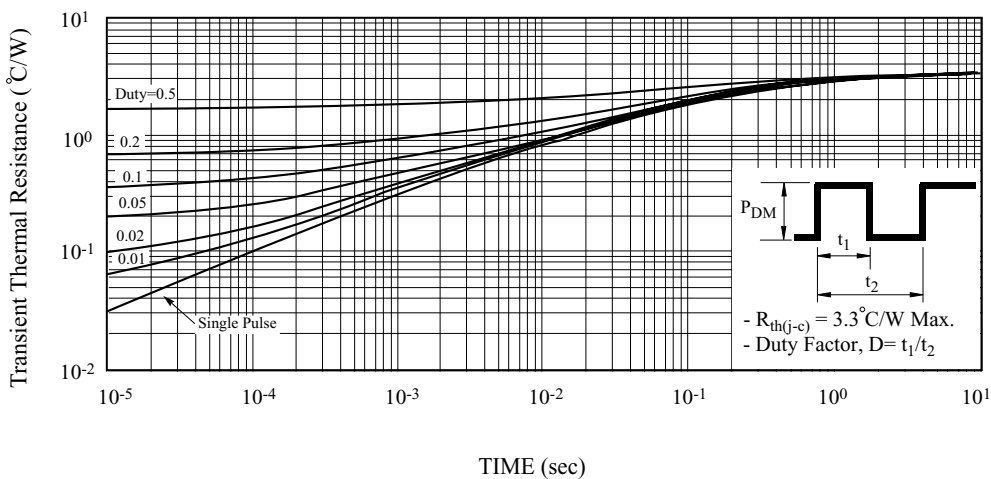


Fig11. Gate Charge

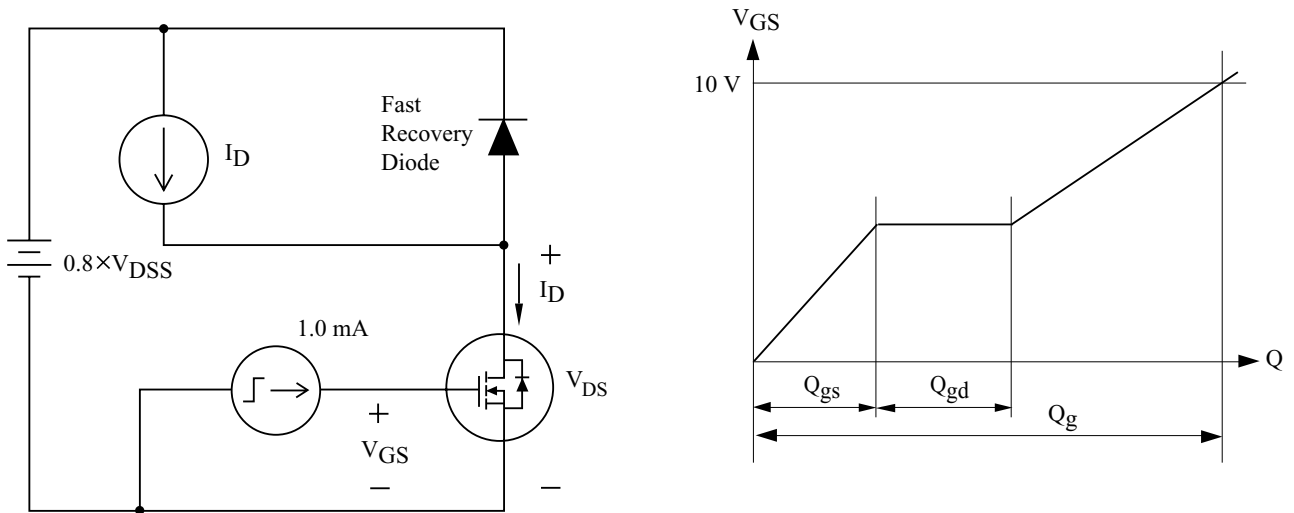


Fig12. Single Pulsed Avalanche Energy

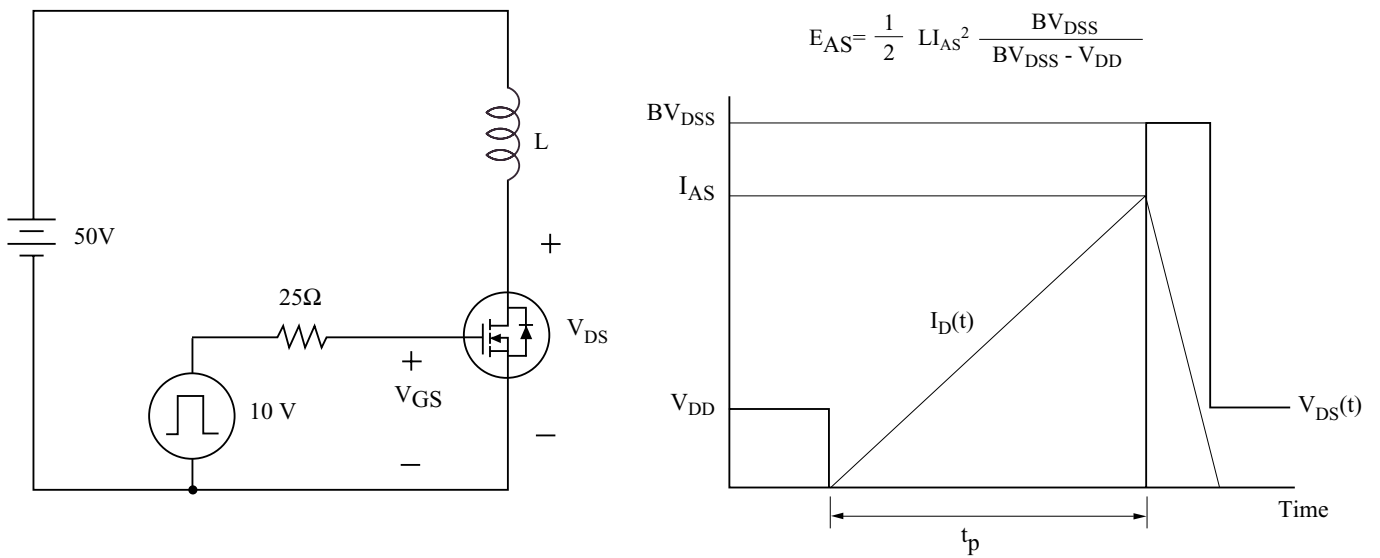


Fig13. Resistive Load Switching

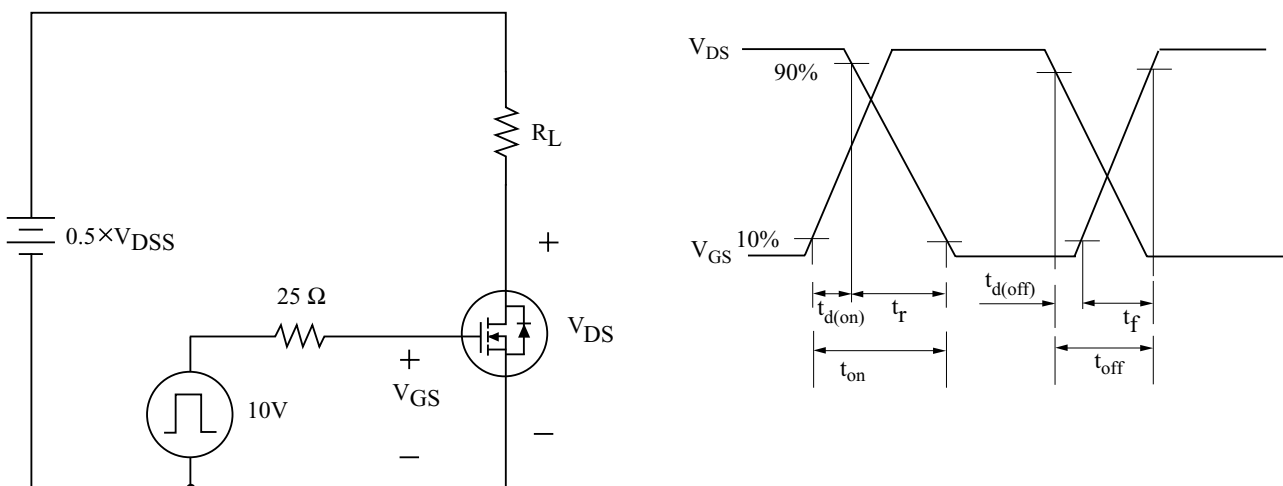


Fig14. Source - Drain Diode Reverse Recovery and dv/dt

