

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 DC/DC Converters and switching mode power supplies.

FEATURES

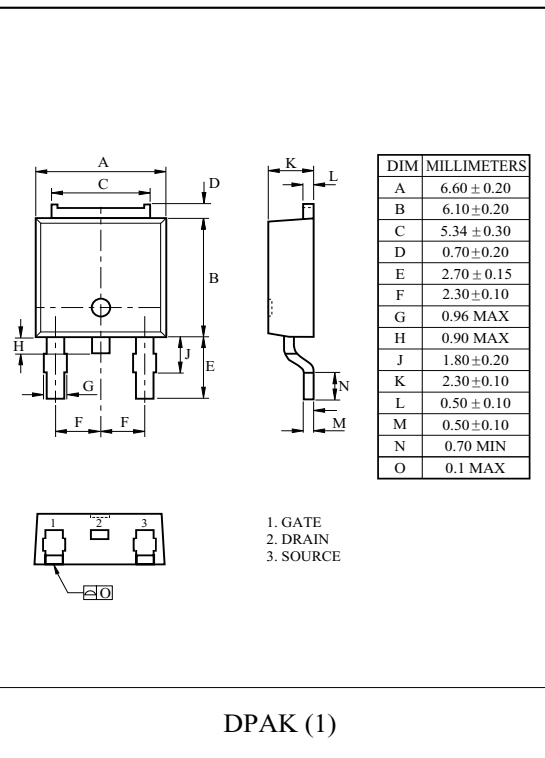
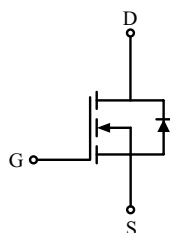
- $V_{DSS} = 250V$, $I_D = 7.5A$
- Drain-Source ON Resistance : $R_{DS(ON)} = 0.4\Omega$ @ $V_{GS} = 10V$
- $Q_g(\text{typ}) = 14.5nC$

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	250	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	@ $T_c = 25$	I_D	7.5	A
	@ $T_c = 100$		4.74	
	Pulsed (Note1)	I_{DP}	25	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	126	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	$T_c = 25$	P_D	54.3	W
	Derate above 25		0.43	W/
Maximum Junction Temperature		T_j	150	
Storage Temperature Range		T_{stg}	-55 150	
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	2.3	/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	110	/W

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



KF9N25D

ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA , V _{GS} =0V	250	-	-	V
Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / Δ T _j	I _D =250μA, Referenced to 25	-	0.22	-	V/
Drain Cut-off Current	I _{DSS}	V _{DS} =250V, V _{GS} =0V,	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250μA	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 =3.75A	-	0.31	0.40	Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =200V, I _D =9A V _{GS} =10V (Note4,5)	-	14.5	-	nC
Gate-Source Charge	Q _{gs}		-	3.2	-	
Gate-Drain Charge	Q _{gd}		-	6.3	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =125V I _D =9A R _G =25 Ω (Note4,5)	-	15	-	ns
Turn-on Rise time	t _r		-	25	-	
Turn-off Delay time	t _{d(off)}		-	30	-	
Turn-off Fall time	t _f		-	15	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	560	-	pF
Output Capacitance	C _{oss}		-	96	-	
Reverse Transfer Capacitance	C _{rss}		-	15	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	9	A
Pulsed Source Current	I _{SP}		-	-	36	
Diode Forward Voltage	V _{SD}	I _S =7.5A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =9A, V _{GS} =0V,	-	160	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/μs	-	0.95	-	μC

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

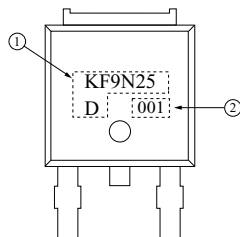
Note 2) $L=3.6mH$, $I_S=7.5A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_j=25^\circ C$.

Note 3) $I_S \leq 9A$, $dI/dt \leq 100A/\mu s$, $V_{DD} \leq BV_{DSS}$, 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. $I_D - V_{DS}$

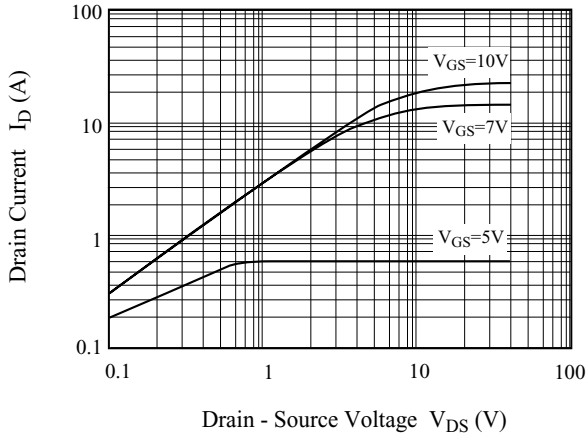


Fig2. $I_D - V_{GS}$

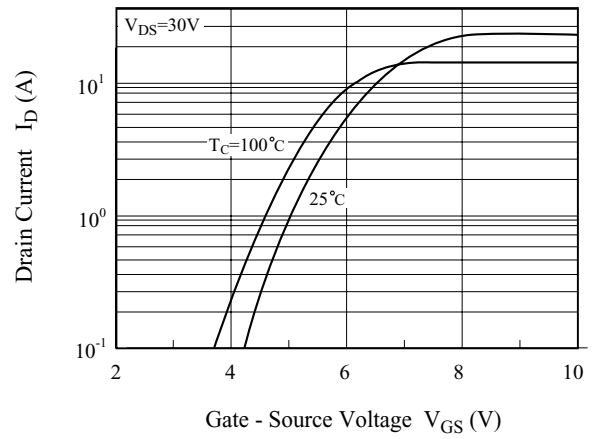


Fig3. $BV_{DSS} - T_j$

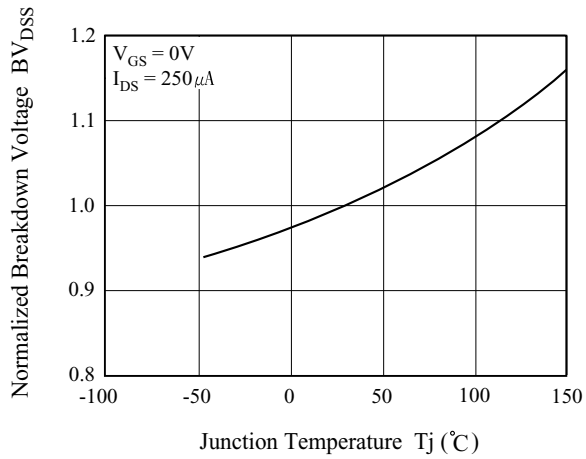


Fig4. $R_{DS(ON)} - I_D$

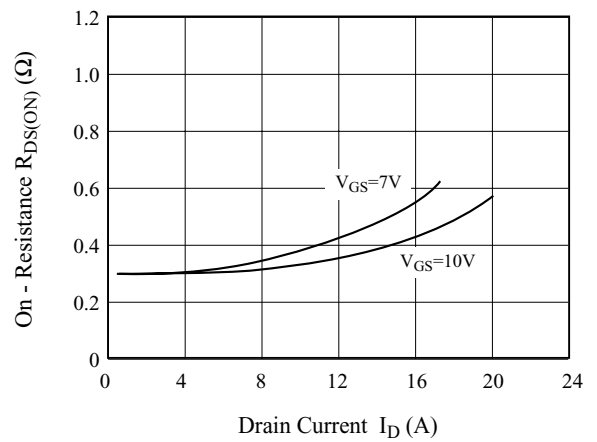


Fig5. $I_S - V_{SD}$

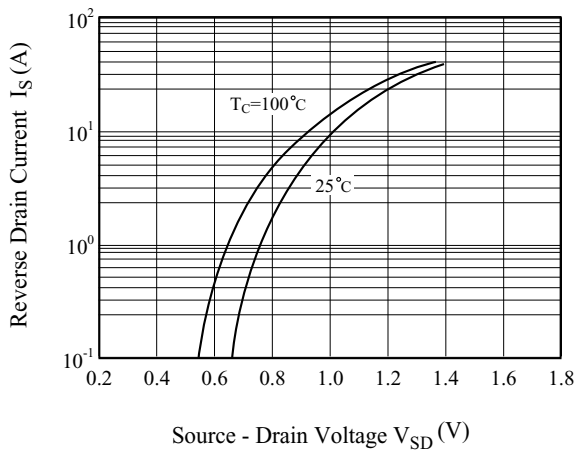
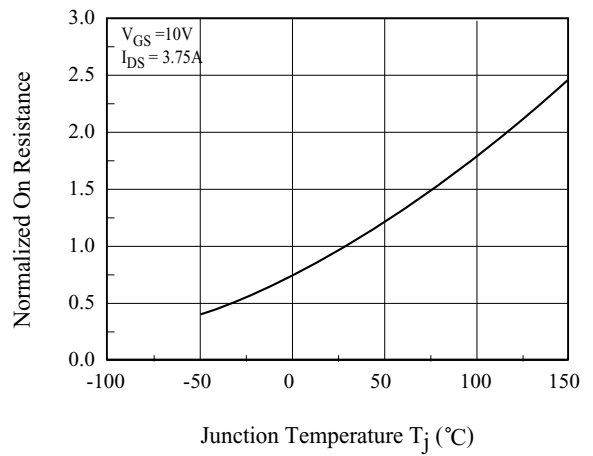


Fig6. $R_{DS(ON)} - T_j$



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Fig 7. C - V_{DS}

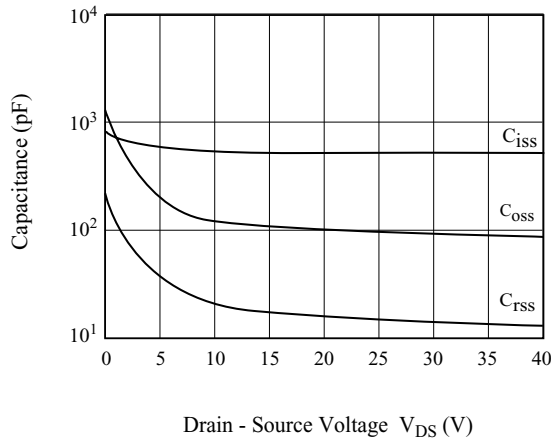


Fig8. Q_g - V_{GS}

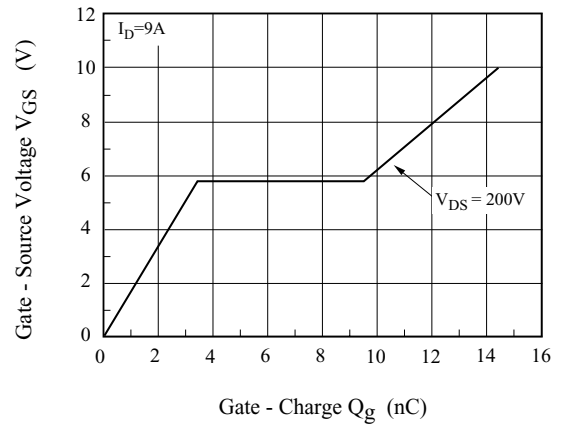


Fig9. Safe Operation Area

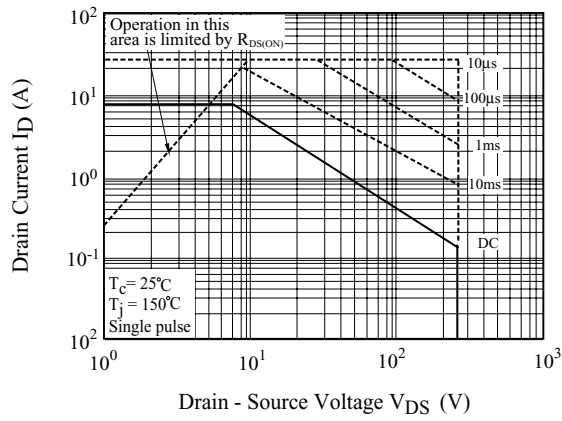


Fig10. I_D - T_j

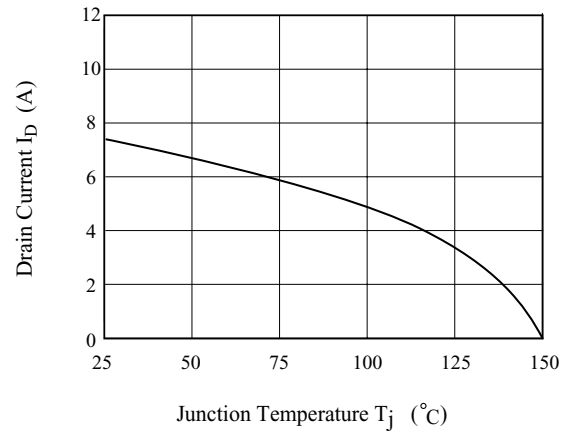


Fig11. Transient Thermal Response Curve

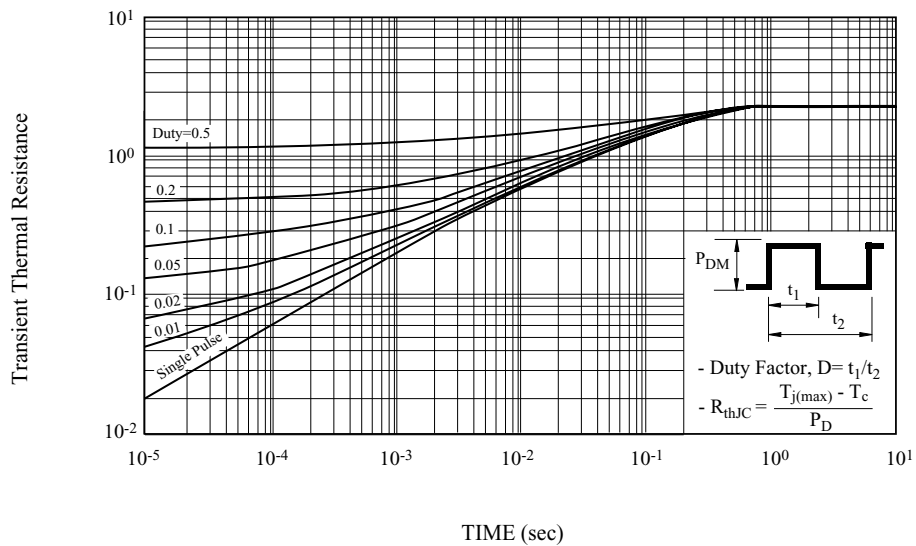


Fig12. Gate Charge

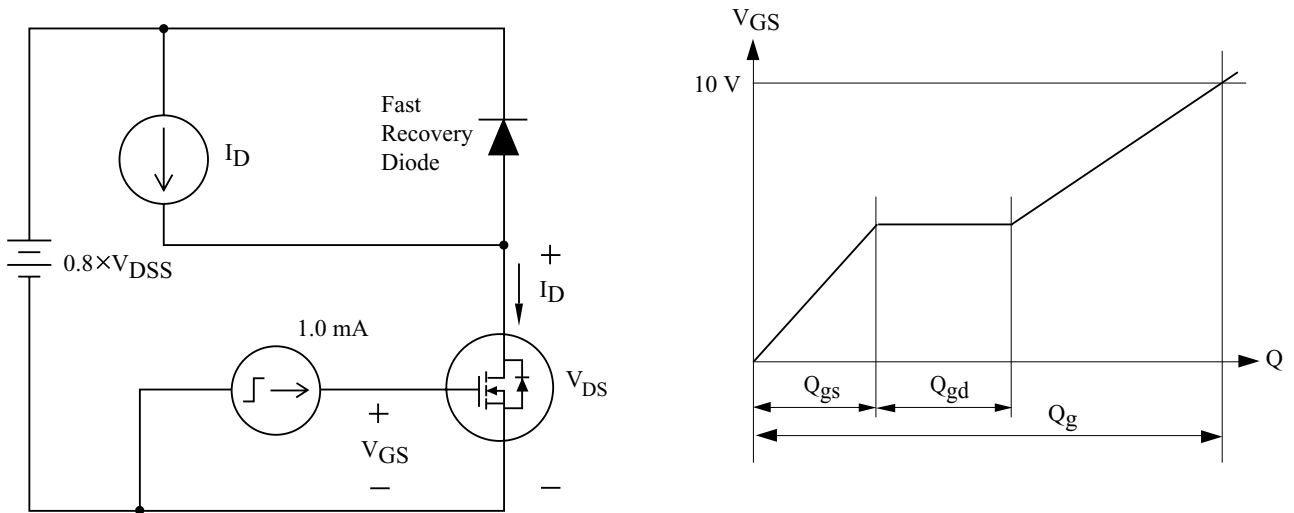


Fig13. Single Pulsed Avalanche Energy

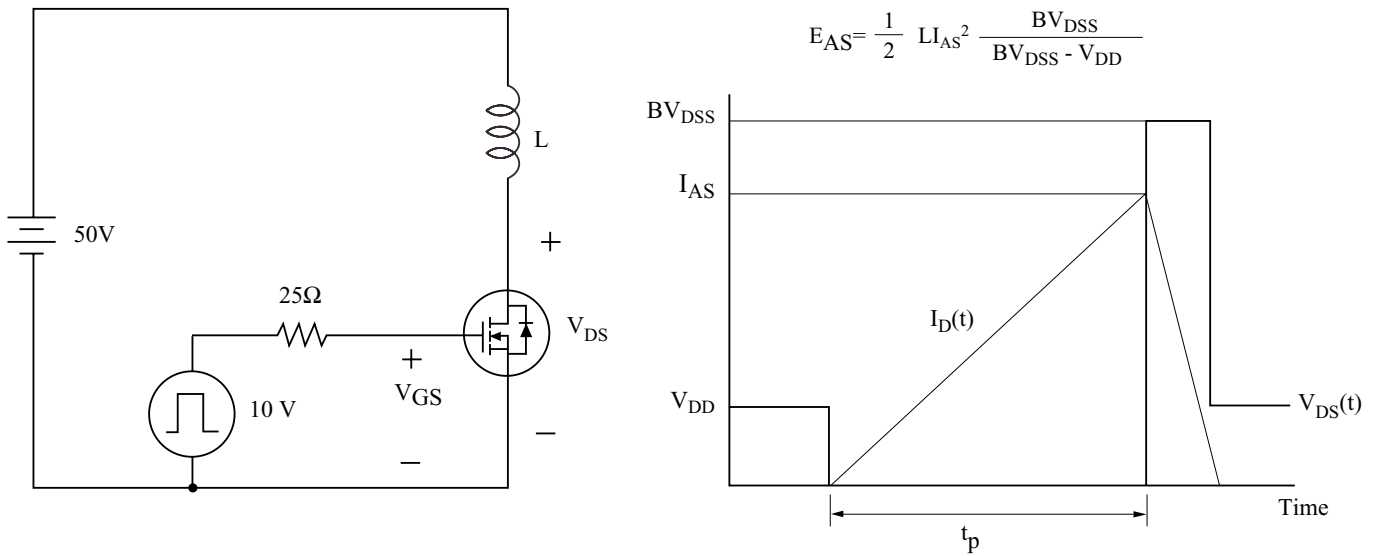


Fig14. Resistive Load Switching

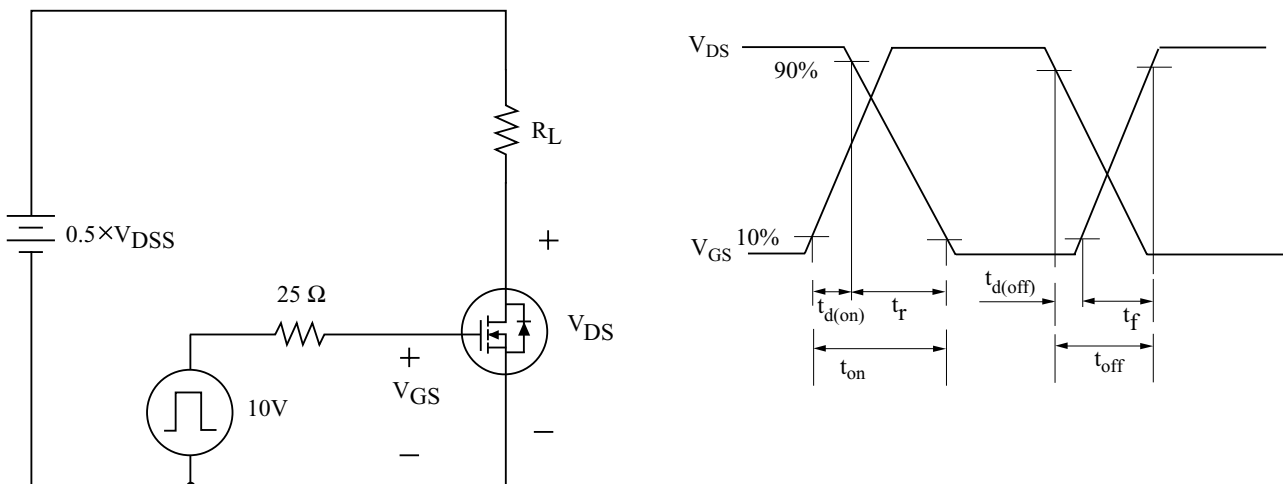


Fig15. Source - Drain Diode Reverse Recovery and dv /dt

