

### 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

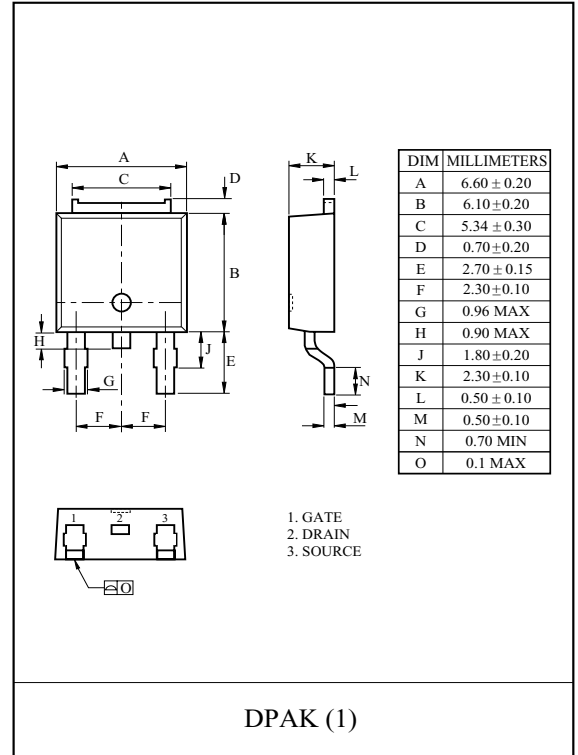
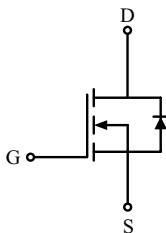
- $V_{DSS} = 250V$ ,  $I_D = 13A$
- Drain-Source ON Resistance :  $R_{DS(ON)} = 0.24$  @  $V_{GS} = 10V$
- $Q_g(\text{typ}) = 21nC$

### MAXIMUM RATING (Ta=25 °C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	250	V
Gate-Source Voltage		$V_{GSS}$	± 30	V
Drain Current	@ $T_c=25$	$I_D$	13	A
	@ $T_c=100$		8.1	
	Pulsed (Note1)	$I_{DP}$	39*	
Single Pulsed Avalanche Energy (Note 2)		$E_{AS}$	200	mJ
Repetitive Avalanche Energy (Note 1)		$E_{AR}$	4.7	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	$T_c=25$	$P_D$	85	W
	Derate above 25		0.68	W/
Maximum Junction Temperature		$T_j$	150	
Storage Temperature Range		$T_{stg}$	-55 150	
<b>Thermal Characteristics</b>				
Thermal Resistance, Junction-to-Case		$R_{thJC}$	1.47	/W
Thermal Resistance, Junction-to-Ambient		$R_{thJA}$	110	/W

\* : Drain Current limited by maximum junction temperature.

### PIN CONNECTION



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## ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	250	-	-	V
Breakdown Voltage Temperature Coefficient	$BV_{DSS}/T_j$	$I_D=250\mu A$ , Referenced to 25	-	0.29	-	V/°C
Drain Cut-off Current	$I_{DSS}$	$V_{DS}=250V, V_{GS}=0V$ ,	-	-	10	$\mu A$
Gate Threshold Voltage	$V_{th}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Gate Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6.5A$	-	0.2	0.24	$\Omega$
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=200V, I_D=16A$ $V_{GS}=10V$ (Note4,5)	-	21	-	nC
Gate-Source Charge	$Q_{gs}$		-	5	-	
Gate-Drain Charge	$Q_{gd}$		-	8	-	
Turn-on Delay time	$t_{d(on)}$	$V_{DD}=125V$ $I_D=16A$ $R_G=25$ (Note4,5)	-	23	-	ns
Turn-on Rise time	$t_r$		-	19	-	
Turn-off Delay time	$t_{d(off)}$		-	57	-	
Turn-off Fall time	$t_f$		-	22	-	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	-	930	-	pF
Output Capacitance	$C_{oss}$		-	140	-	
Reverse Transfer Capacitance	$C_{rss}$		-	16	-	
<b>Source-Drain Diode Ratings</b>						
Continuous Source Current	$I_S$	$V_{GS}<V_{th}$	-	-	13	A
Pulsed Source Current	$I_{SP}$		-	-	39	
Diode Forward Voltage	$V_{SD}$	$I_S=13A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	$t_{rr}$	$I_S=16A, V_{GS}=0V$ , $dI_S/dt=100A/\mu s$	-	170	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	1.15	-	$\mu C$

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

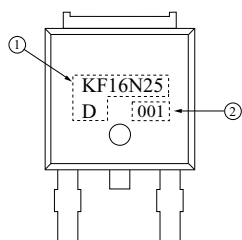
Note 2)  $L=1.62mH, I_S=13A, V_{DD}=50V, R_G=25$  , Starting  $T_j=25$  .

Note 3)  $I_S=16A, dI/dt=100A/\mu s, V_{DD}=BV_{DSS}$ , 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

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Fig1.  $I_D - V_{DS}$

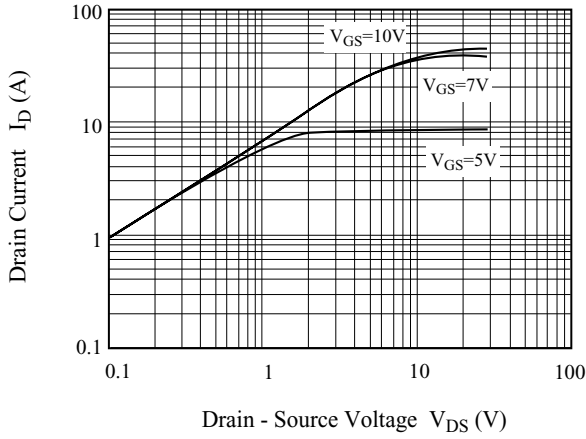


Fig2.  $I_D - V_{GS}$

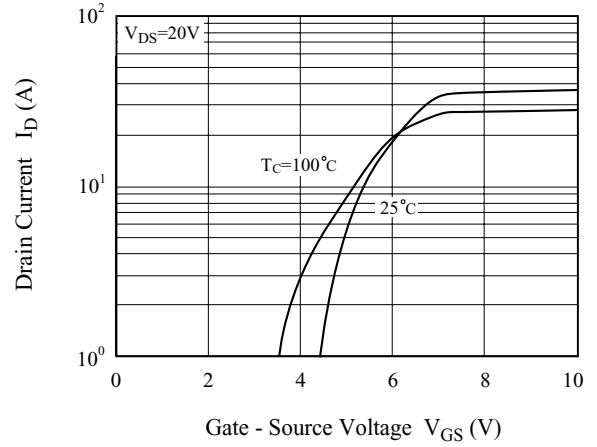


Fig3.  $BV_{DSS} - T_j$

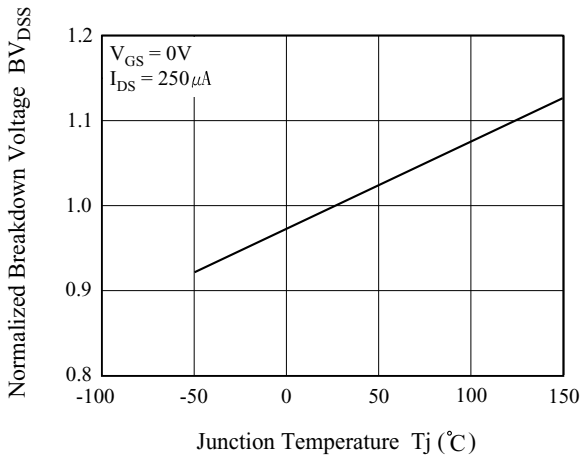


Fig4.  $R_{DS(ON)} - I_D$

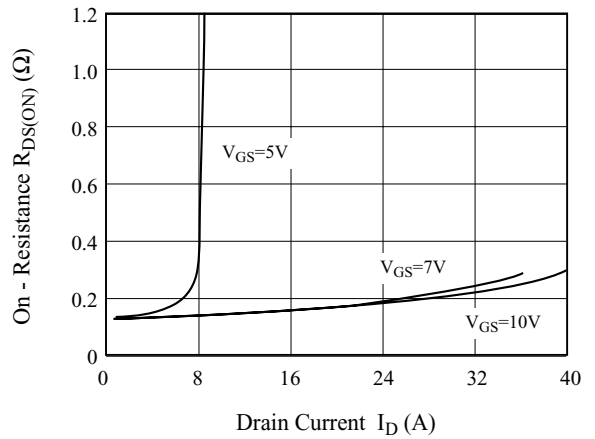


Fig5.  $I_S - V_{SD}$

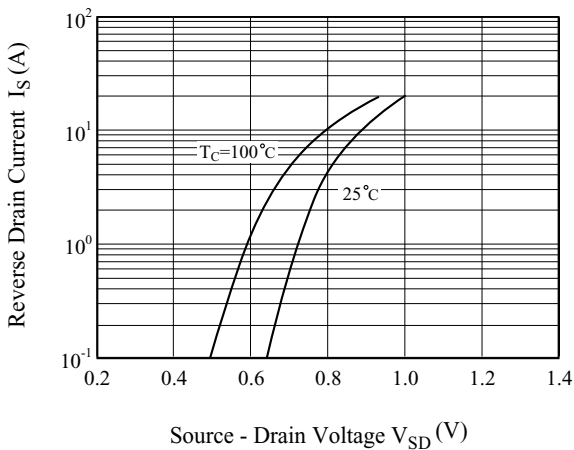
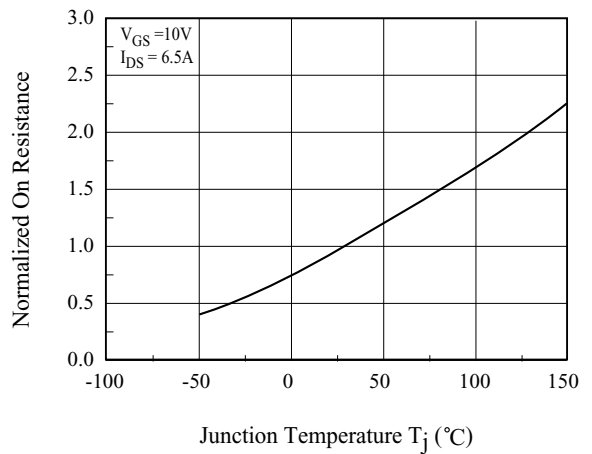


Fig6.  $R_{DS(ON)} - T_j$



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Fig 7. C -  $V_{DS}$

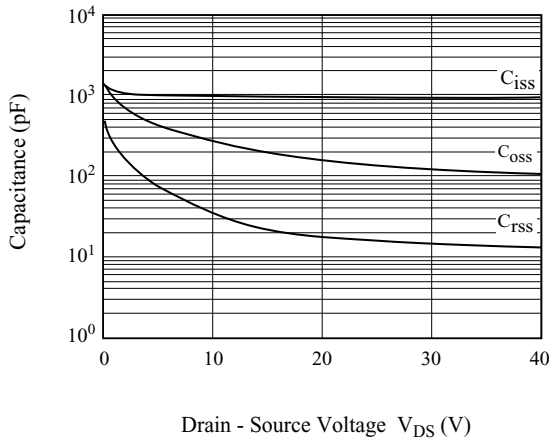


Fig8.  $Q_g$ -  $V_{GS}$

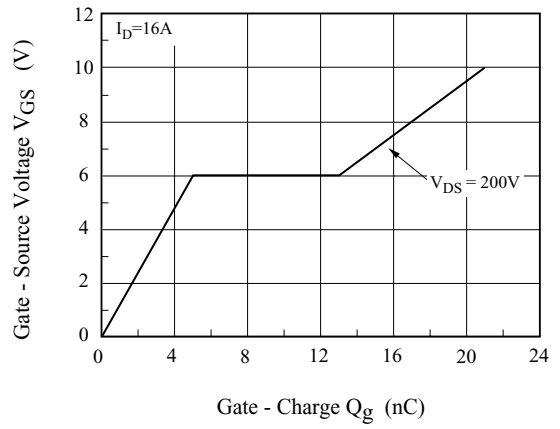


Fig9. Safe Operation Area

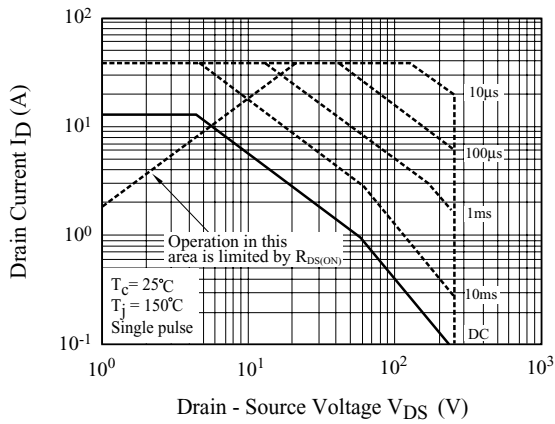


Fig10.  $I_D$  -  $T_j$

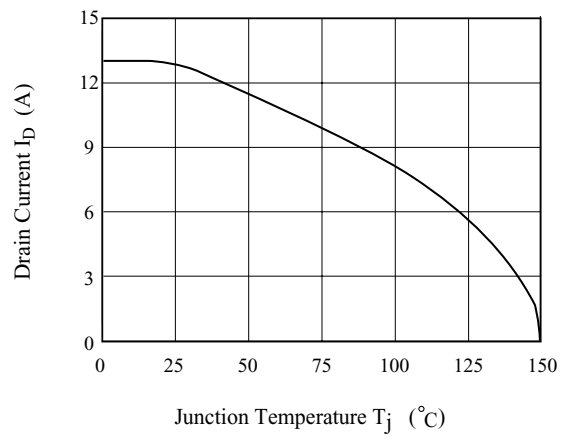
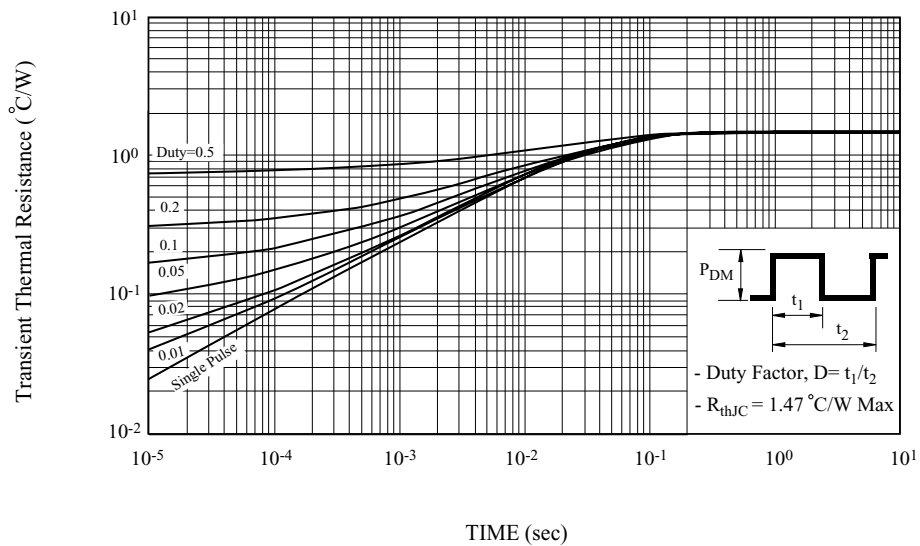


Fig11. Transient Thermal Response Curve



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Fig12. Gate Charge

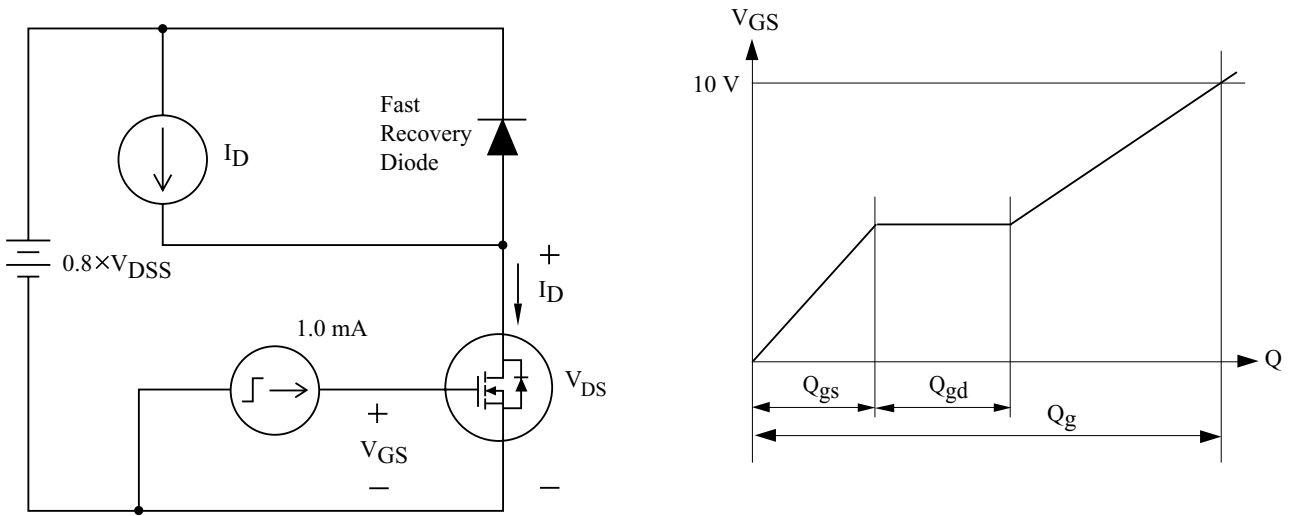


Fig13. Single Pulsed Avalanche Energy

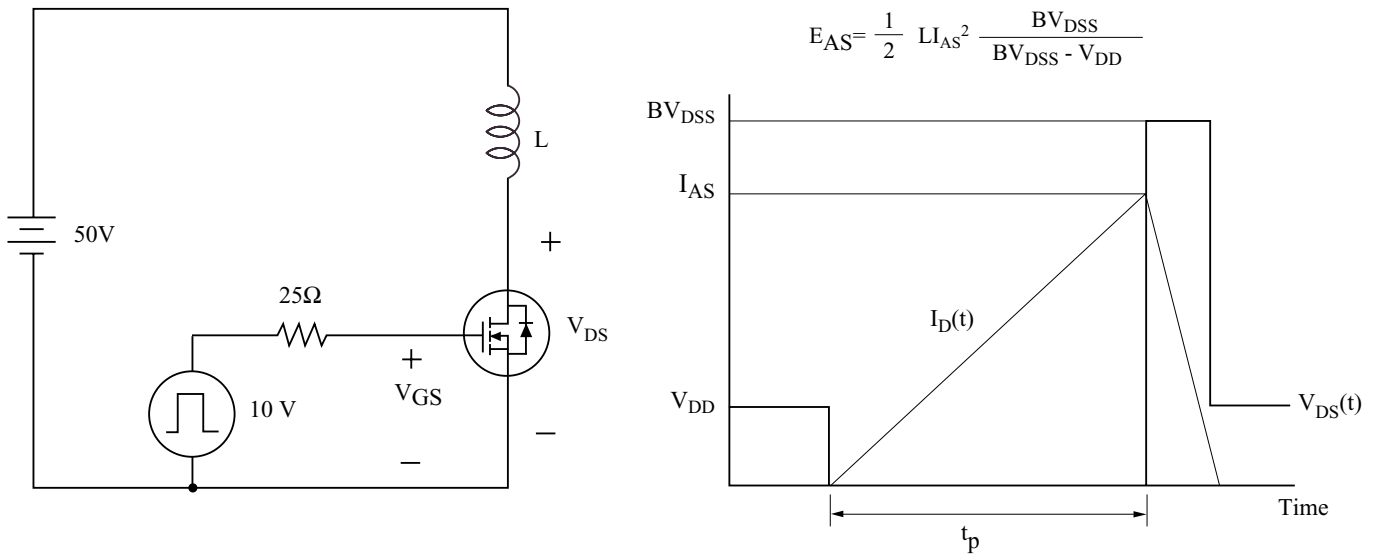
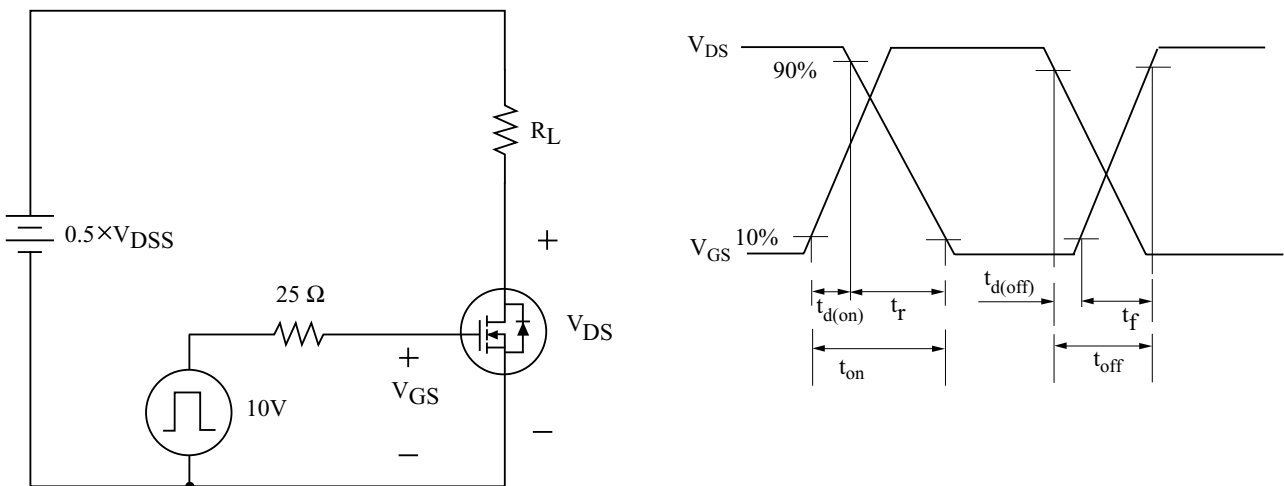


Fig14. Resistive Load Switching



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

