KF70N06P/F

N CHANNEL MOS FIELD EFFECT TRANSISTOR

General Description

It's mainly suitable for low viltage applications such as automotive, DC/DC converters and a load switch in battery powered applications

FEATURES

· V_{DSS}= 60V, I_D= 70A (KF70N06P)

· Drain-Source ON Resistance :

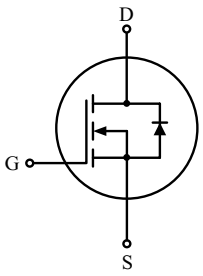
$R_{DS(ON)}$=12mΩ(Max.) @V_{GS} = 10V

MOSFET MAXIMUM RATING (Ta=25℃ Unless otherwise noted)

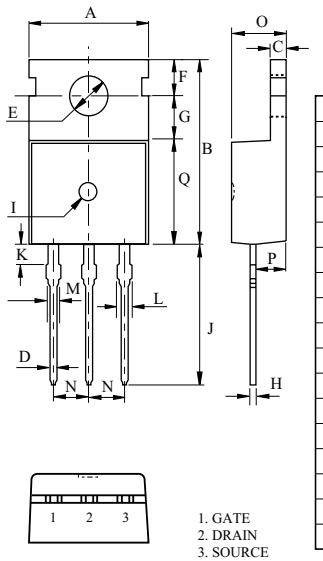
CHARACTERISTIC		SYMBOL	RATING		UNIT
			KF70N06P	KF70N06F	
Drain-Source Voltage		V_{DSS}	60		V
Gate-Source Voltage		V_{GSS}	±20		V
Drain Current	@T_C=25℃	I_D*	70	41	A
	@T_C=100℃		44	25	
	Pulsed (Note1)	I_{DP}	240	196	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	480		mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	12		mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5		V/ns
Drain Power Dissipation	Tc=25℃	P_D	125	43	W
	Derate above 25℃		1.0	0.34	W/℃
Maximum Junction Temperature		T_j	150		℃
Storage Temperature Range		T_{stg}	-55~150		℃
Thermal Characteristics					
Thermal Resistance, Junction-to-Case		R_{thJC}	1.0	2.9	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	62.5		℃/W

* : Drain current limited by maximum junction temperature.

PIN CONNECTION



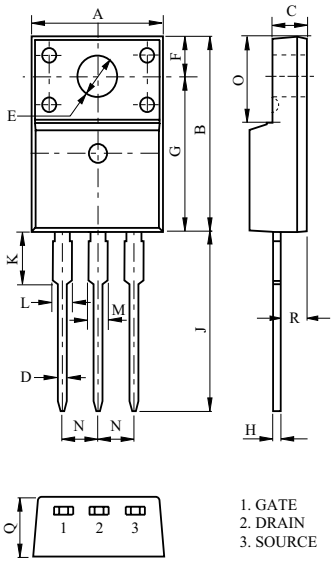
KF70N06P



DIM	MILLIMETERS
A	9.9 ± 0.2
B	15.95 MAX
C	1.3+0.1/-0.05
D	0.8 ± 0.1
E	ø3.6 ± 0.2
F	2.8 ± 0.1
G	3.7
H	0.5+0.1/-0.05
I	ø1.5
J	13.08 ± 0.3
K	1.46
L	1.4 ± 0.1
M	1.27 ± 0.1
N	2.54 ± 0.2
O	4.5 ± 0.2
P	2.4 ± 0.2
Q	9.2 ± 0.2

TO-220AB

KF70N06F



DIM	MILLIMETERS
A	10.16 ± 0.2
B	15.87 ± 0.2
C	2.54 ± 0.2
D	0.8 ± 0.1
E	ø3.18 ± 0.1
F	3.3 ± 0.1
G	12.57 ± 0.2
H	0.5 ± 0.1
J	13.0 ± 0.5
K	3.23 ± 0.1
L	1.47 MAX
M	1.47 MAX
N	2.54 ± 0.2
O	6.68 ± 0.2
Q	4.7 ± 0.2
R	2.76 ± 0.2

TO-220IS (1)

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	$\Delta BV_{DSS}/\Delta T_j$	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=35A	-	10.0	12.0	mΩ
Dynamic						
Total Gate Charge	Q_g	V_{DS}=48V, I_D=70A V_{GS}=10V (Note4,5)	-	51	-	nC
Gate-Source Charge	Q_{gs}		-	11.3	-	
Gate-Drain Charge	Q_{gd}		-	21.7	-	
Turn-on Delay time	$t_{d(on)}$	V_{DD}=30V R_L=0.43Ω R_G=25Ω (Note4,5)	-	38	-	ns
Turn-on Rise time	t_r		-	110	-	
Turn-off Delay time	$t_{d(off)}$		-	90	-	
Turn-off Fall time	t_f		-	72	-	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	2140	-	pF
Output Capacitance	C_{oss}		-	546	-	
Reverse Transfer Capacitance	C_{rss}		-	96.8	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	V_{GS}<V_{th}	-	-	70	A
Pulsed Source Current	I_{SP}		-	-	280	
Diode Forward Voltage	V_{SD}	I_S=70A, V_{GS}=0V	-	-	1.5	V
Reverse Recovery Time	t_{rr}	I_S=70A, V_{GS}=0V, dIs/dt=100A/μs	-	80	-	ns
Reverse Recovery Charge	Q_{rr}		-	280	-	μC

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

Note 2) L =47 μH, I_S=70A, V_{DD}=50V, R_G=25Ω, Starting T_j=25°C.

Note 3) I_S≤7.0A, dI/dt≤200A/μs, V_{DD}≤BV_{DSS}, Starting T_j=25°C.

Note 4) Pulse Test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%.

Note 5) Essentially independent of operating temperature.

Marking

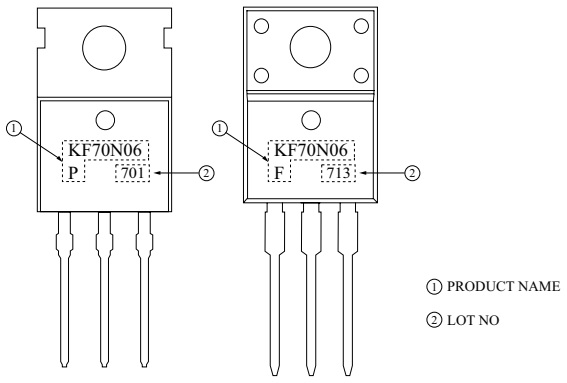


Fig1. I_D - V_{DS}

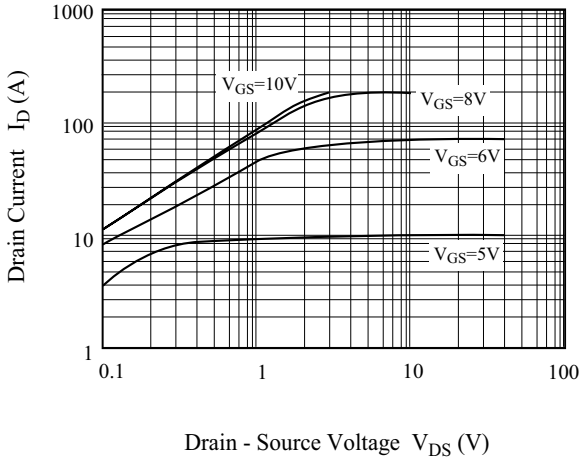


Fig2. I_D - V_{GS}

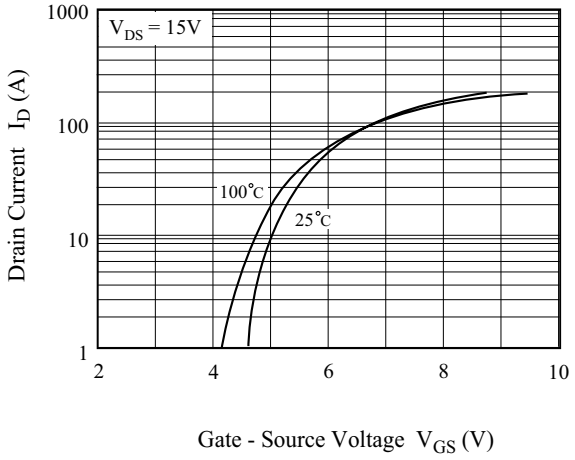


Fig3. BV_{DSS} - T_j

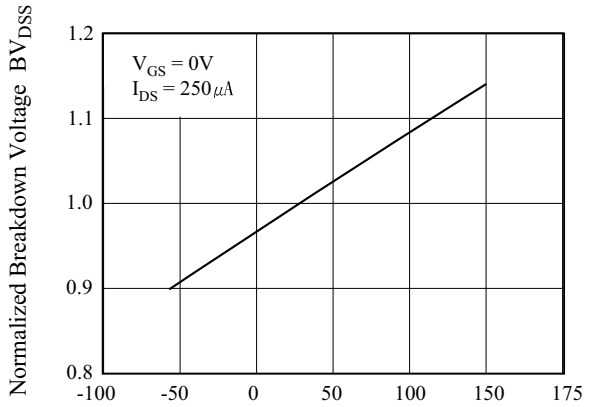


Fig4. $R_{DS(ON)}$ - I_D

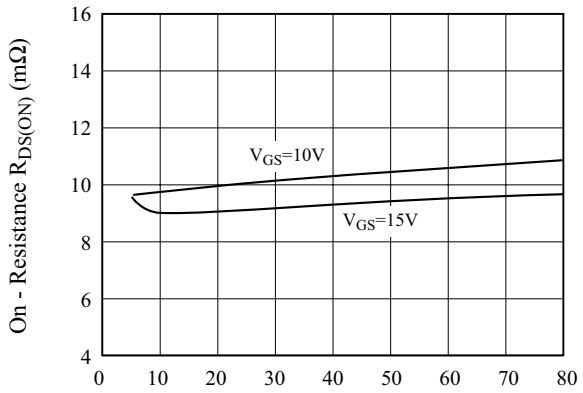


Fig5. I_S - V_{SD}

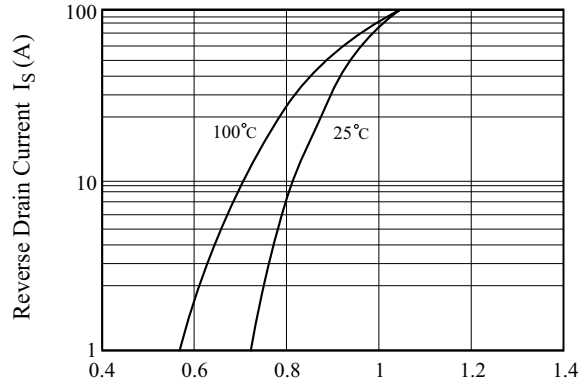


Fig6. $R_{DS(ON)}$ - T_j

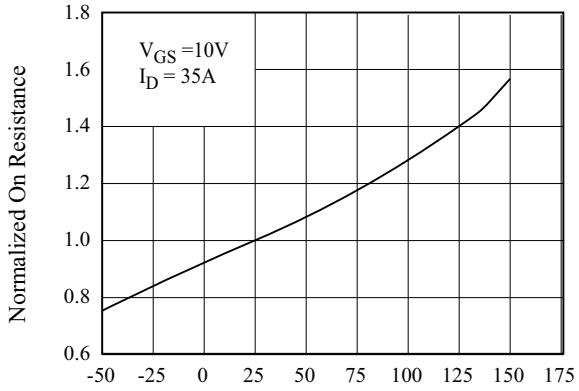


Fig 7. C - V_{DS}

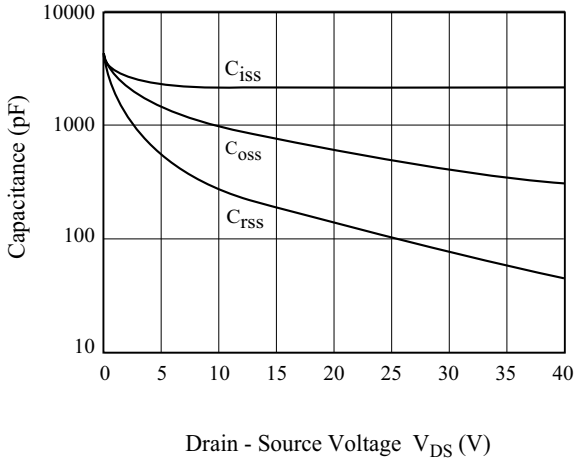


Fig 8. Q_g - V_{DS}

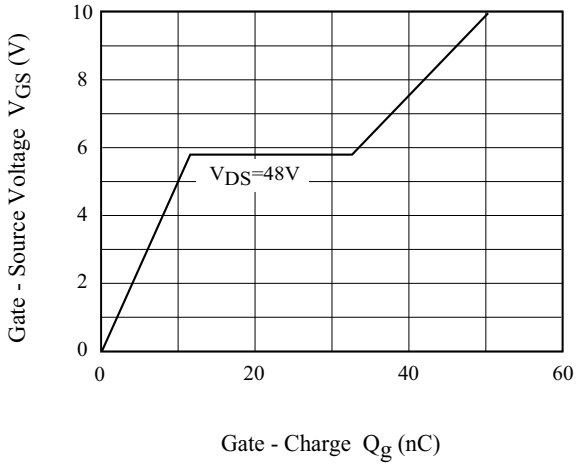


Fig 9. Safe Operation Area

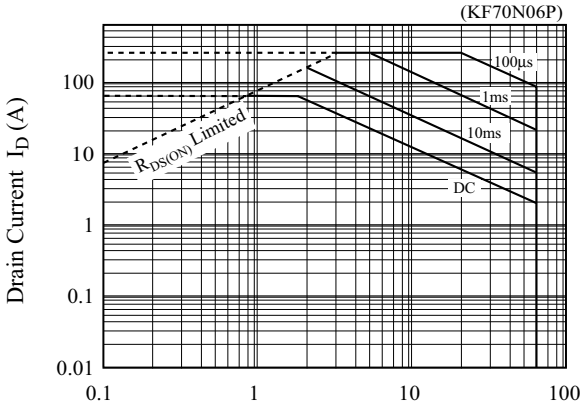


Fig 10. Safe Operation Area

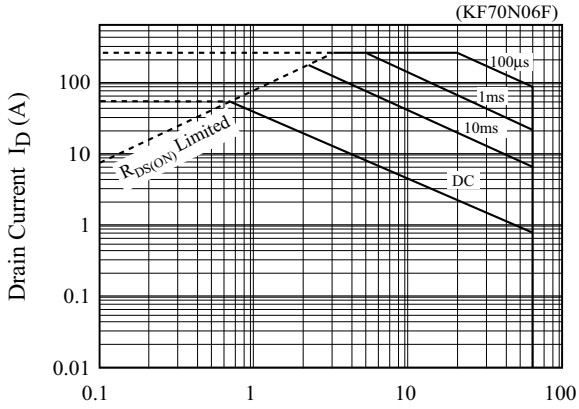


Fig 11. I_D - T_C

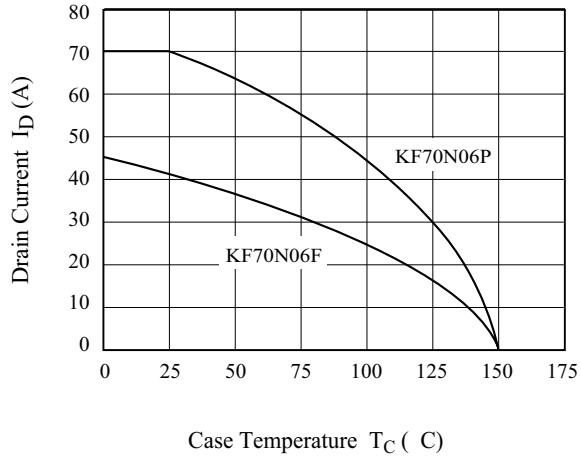


Fig 12. R_{th} of KF70N06P

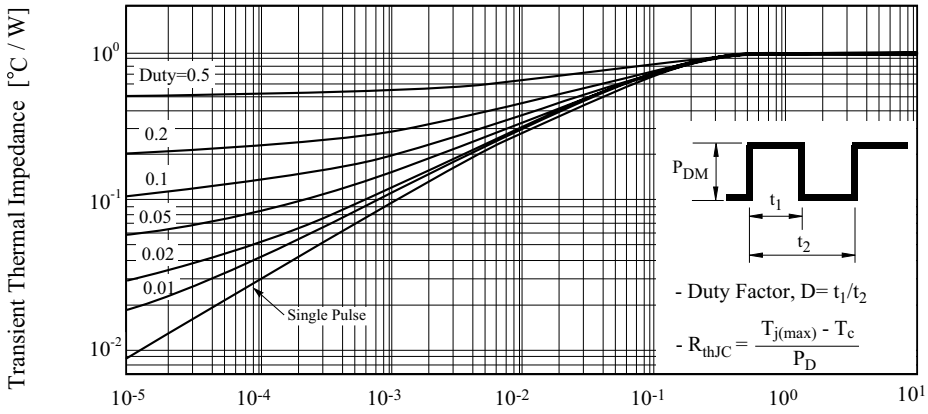


Fig 13. R_{th} of KF70N06F

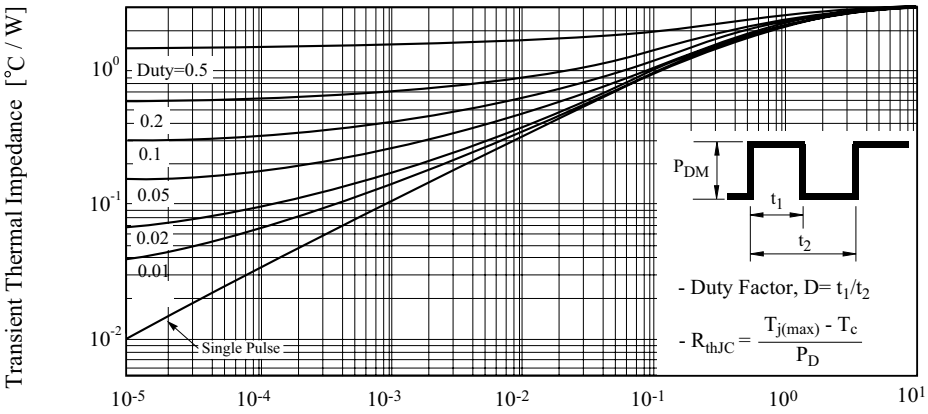


Fig14. Gate Charge

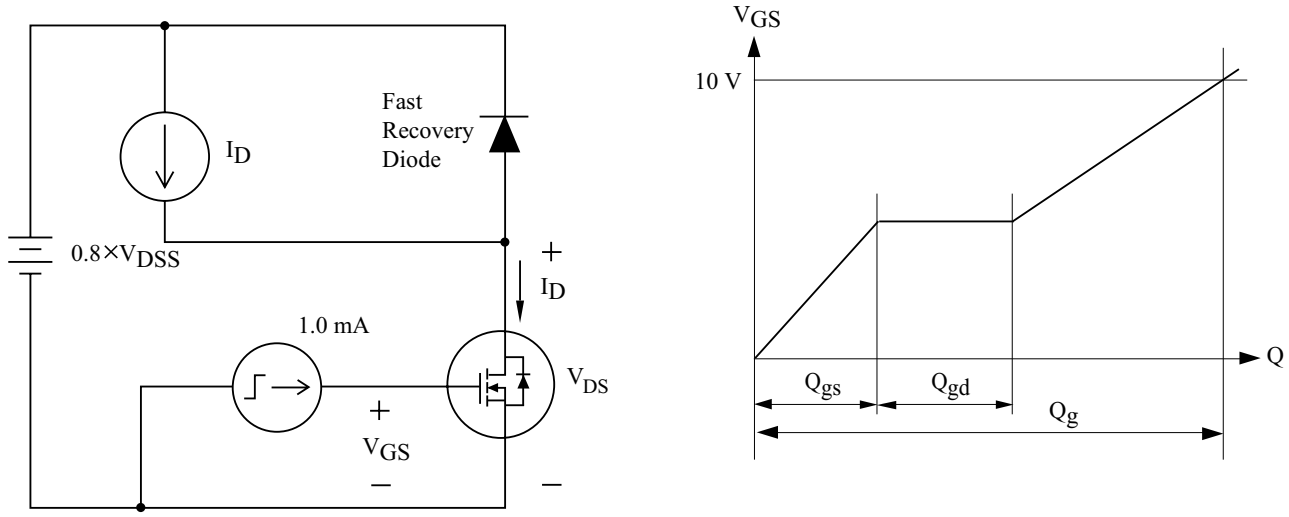


Fig15. Single Pulsed Avalanche Energy

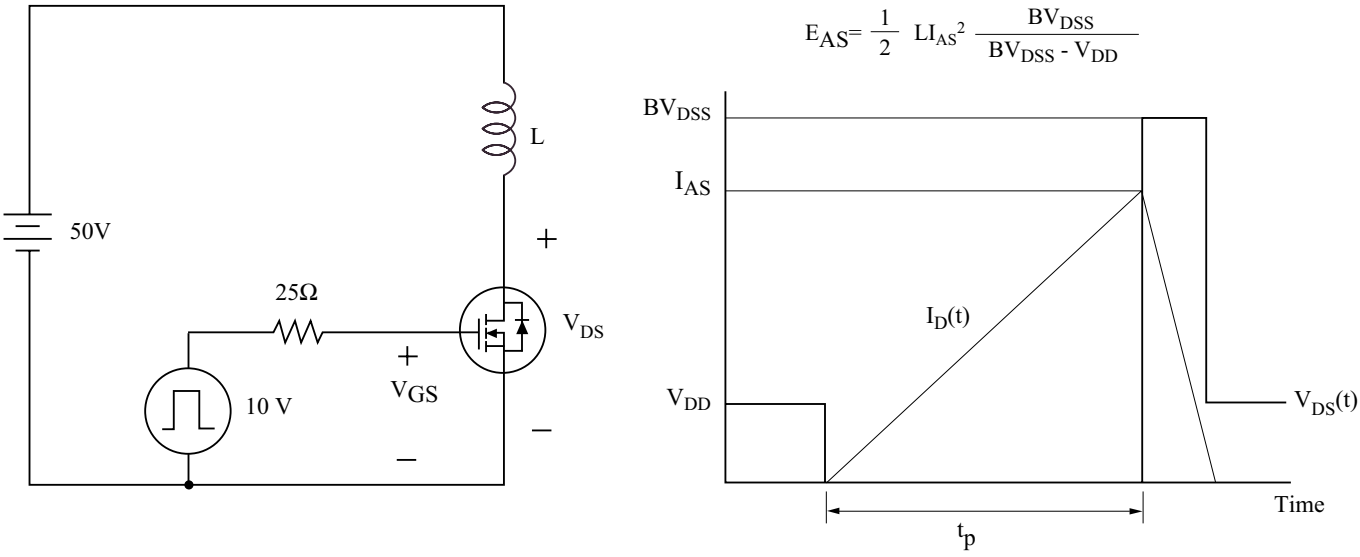


Fig16. Resistive Load Switching

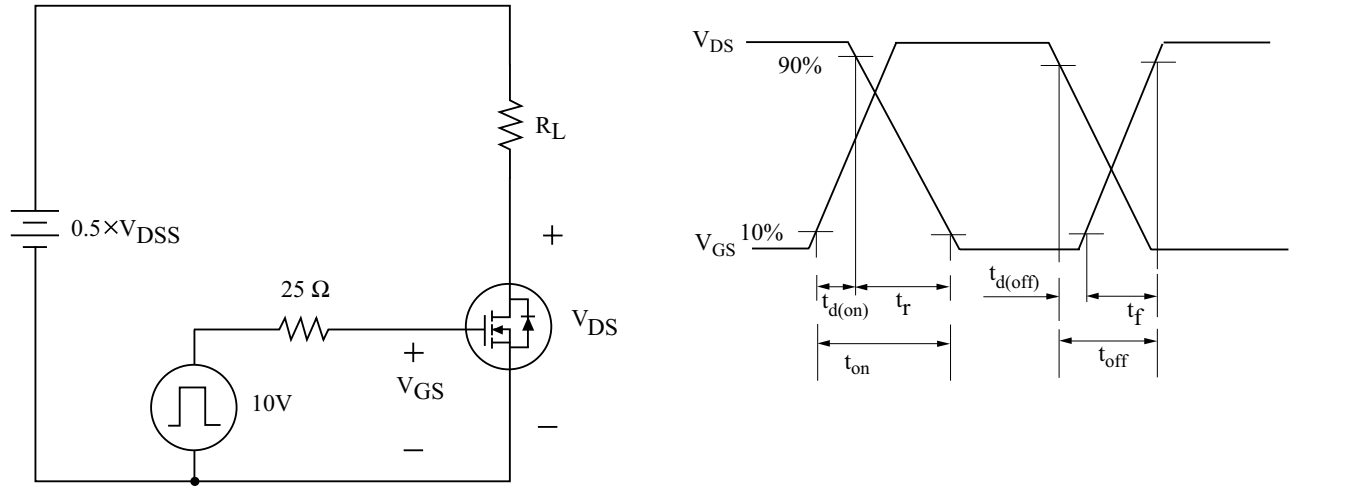


Fig17. Source - Drain Diode Reverse Recovery and dv /dt