General Description

This Trench 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 Converter, Synchronous Rectification and a load switch in battery powered applications

FEATURES

· V_{DSS}= 100V, I_D= 55A

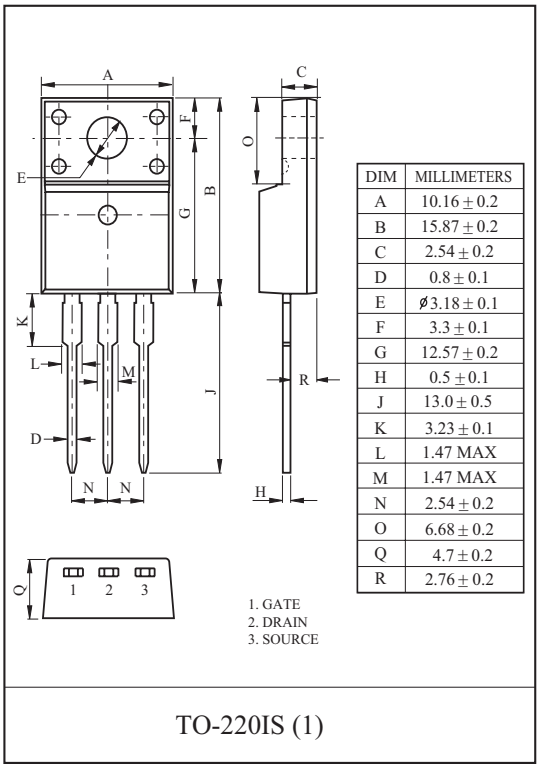
· Drain-Source ON Resistance :

$R_{DS(ON)}$=8.6mΩ(Max.) @V_{GS} = 10V

MAXIMUM RATING (Tc=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	@T_C=25℃	I_D	55	A
	@T_C=100℃		35.5	
	Pulsed (Note1)	I_{DP}	220*	
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	Tc=25℃	P_D	46.3	W
	Derate above 25℃		0.37	W/℃
Maximum Junction Temperature		T_j	150	℃
Storage Temperature Range		T_{stg}	-55 ~ 150	℃
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	2.7	℃/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	62.5	℃/W

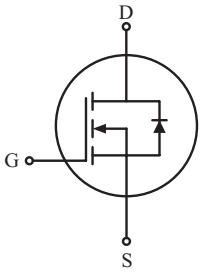
* : Drain current limited by maximum junction temperature.



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)

PIN CONNECTION



ELECTRICAL CHARACTERISTICS (Tc=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250 μA, V_{GS}=0V	100	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	I_D=250 μA, Referenced to 25℃	-	0.05	-	V/℃
Drain Cut-off Current	I_{DSS}	V_{DS}=100V, 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}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=27.5A	-	6	8.6	mΩ
		V_{GS}=6V, I_D=14A	-	-	12	
Dynamic						
Total Gate Charge	Q_g	V_{DS}=80V, I_D=55A V_{GS}=10V (Note4,5)	-	53	-	nC
Gate-Source Charge	Q_{gs}		-	13	-	
Gate-Drain Charge	Q_{gd}		-	14	-	
Turn-on Delay time	$t_{d(on)}$	V_{DD}=50V I_D=55A R_G=25Ω (Note4,5)	-	45	-	ns
Turn-on Rise time	t_r		-	36	-	
Turn-off Delay time	$t_{d(off)}$		-	138	-	
Turn-off Fall time	t_f		-	46	-	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	3100	-	pF
Output Capacitance	C_{oss}		-	1220	-	
Reverse Transfer Capacitance	C_{rss}		-	52	-	
Source-Drain Diode Ratings						
Continuous Source Current	I_S	V_{GS}<V_{th}	-	-	33	A
Pulsed Source Current	I_{SP}		-	-	132	
Diode Forward Voltage	V_{SD}	I_S=33A, V_{GS}=0V	-	-	1.4	V
=Reverse Recovery Time	t_{rr}	I_S=55A, V_{GS}=0V, dIs/dt=100A/μs	-	72	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.16	-	μC

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

Note 2) L =30.2 μH, I_S=55A, V_{DD}=80V, R_G=25Ω, Starting T_j=25℃.

Note 3) $I_S \leq$80A, $V_{DD} \leq BV_{DSS}$, Starting T_j=25℃.

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

Note 5) Essentially independent of operating temperature.

Marking

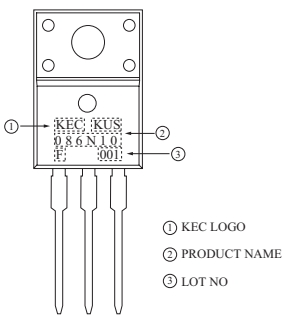


Fig1. I_D - V_{DS}

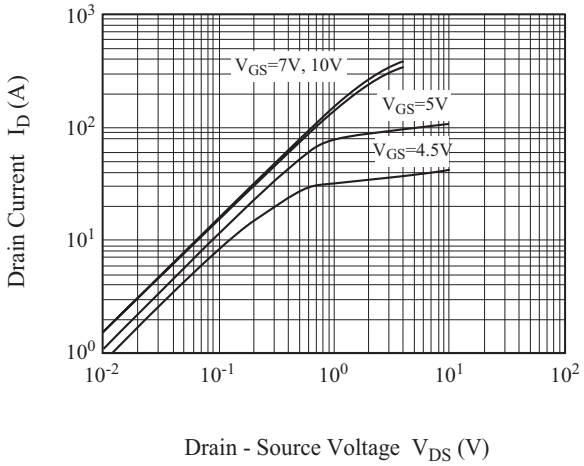


Fig2. I_D - V_{GS}

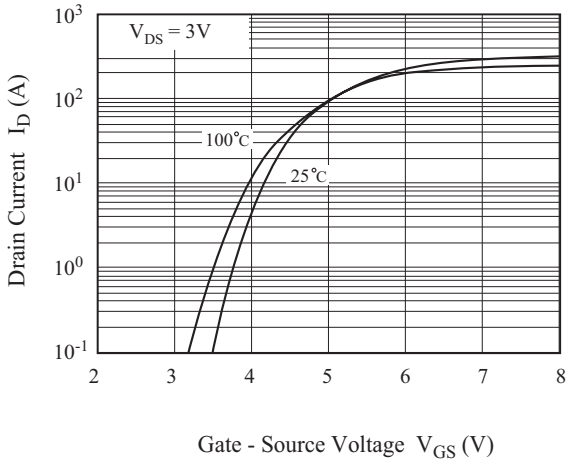


Fig3. BV_{DSS} - T_j

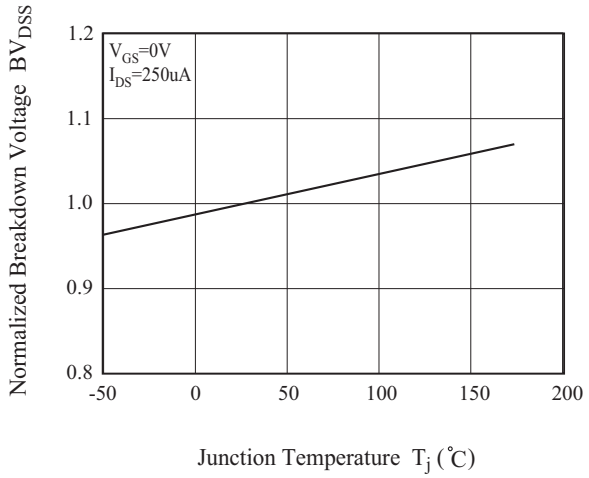


Fig4. $R_{DS(ON)}$ - T_j

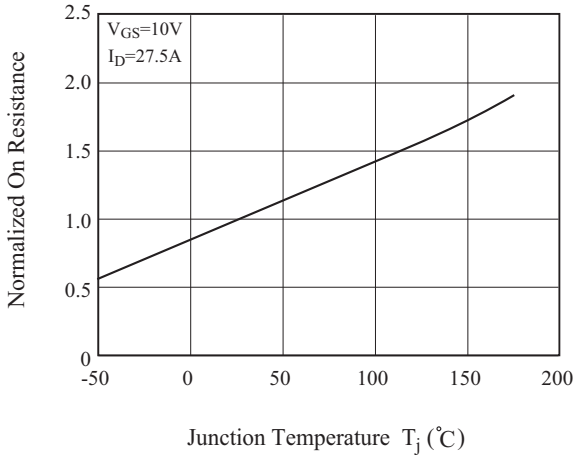


Fig5. I_S - V_{SD} - Ⅰ

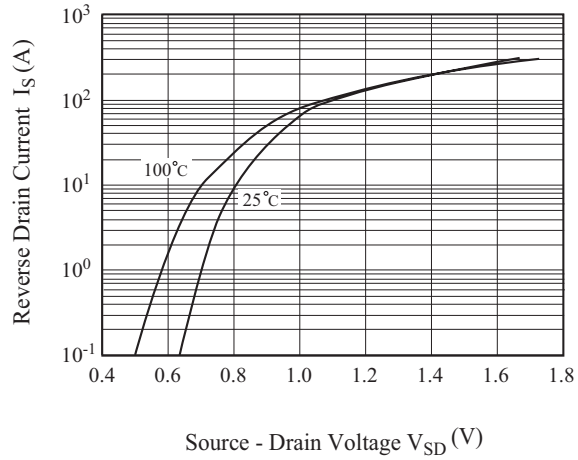


Fig6. I_S - V_{SD} - Ⅱ

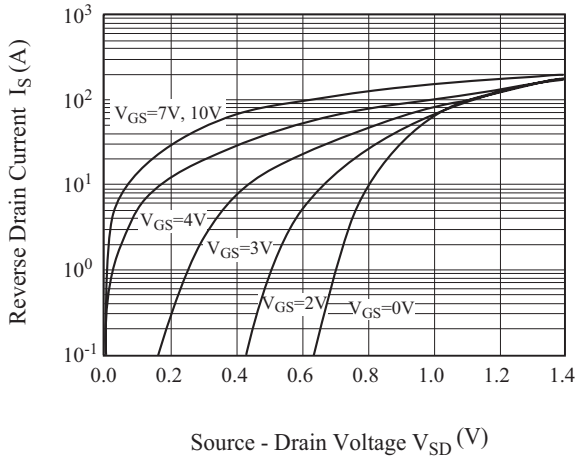


Fig7. $R_{DS(ON)}$ - I_D

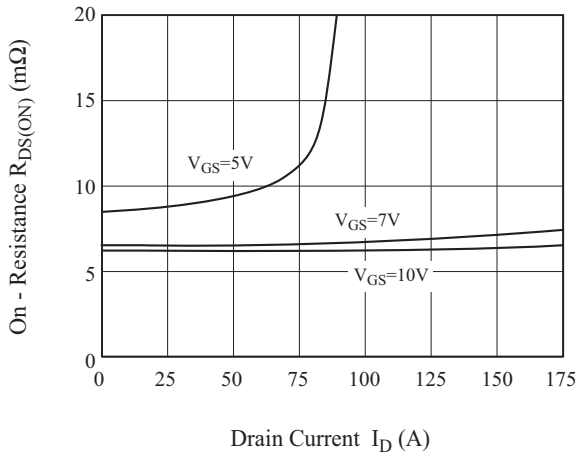


Fig8. V_{th}- T_j

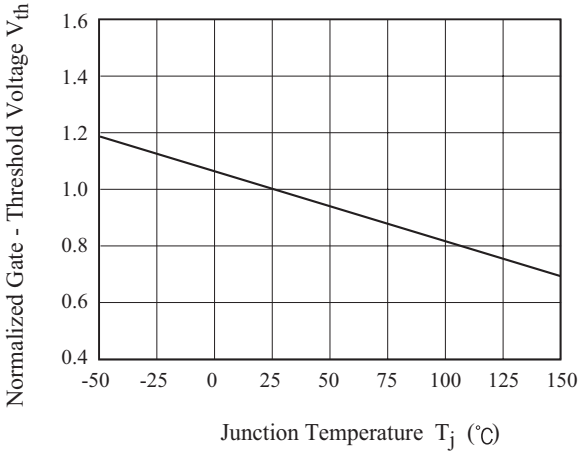


Fig 9. C - V_{DS}

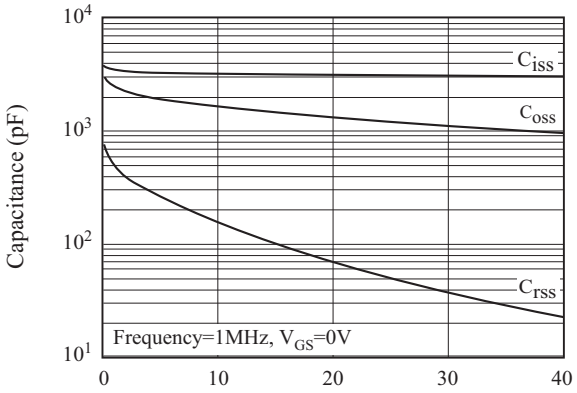


Fig10. Q_g- V_{GS}

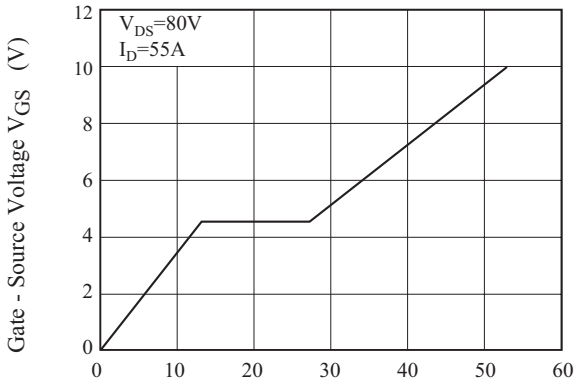


Fig11. I_D - T_j

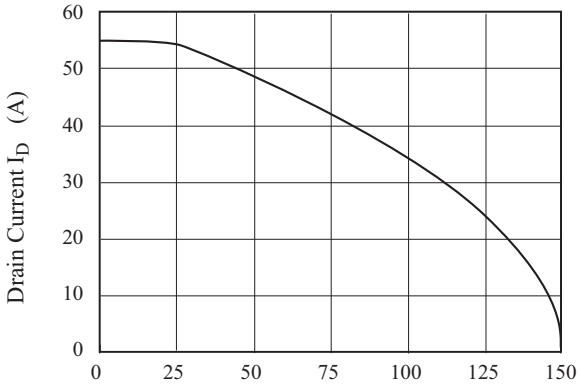


Fig12. Safe Operation Area

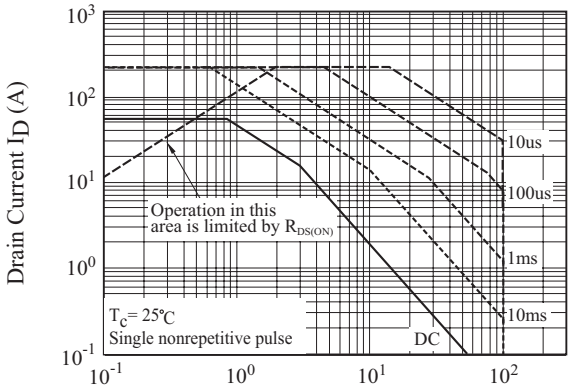


Fig13. Transient Thermal Response Curve

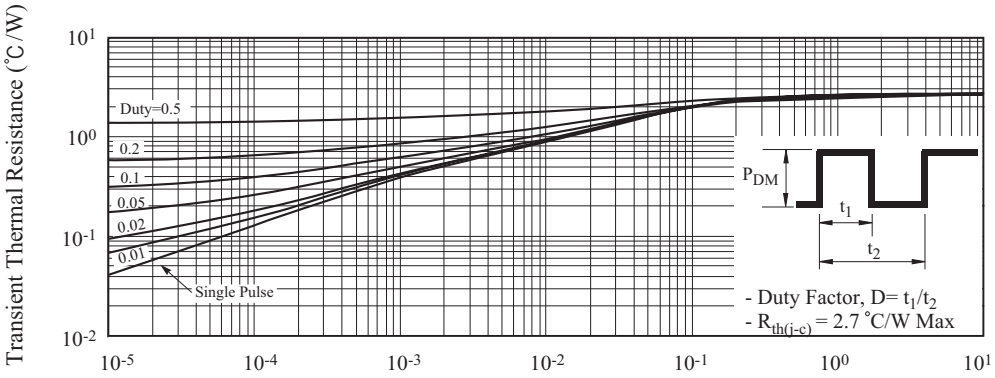


Fig14. Gate Charge

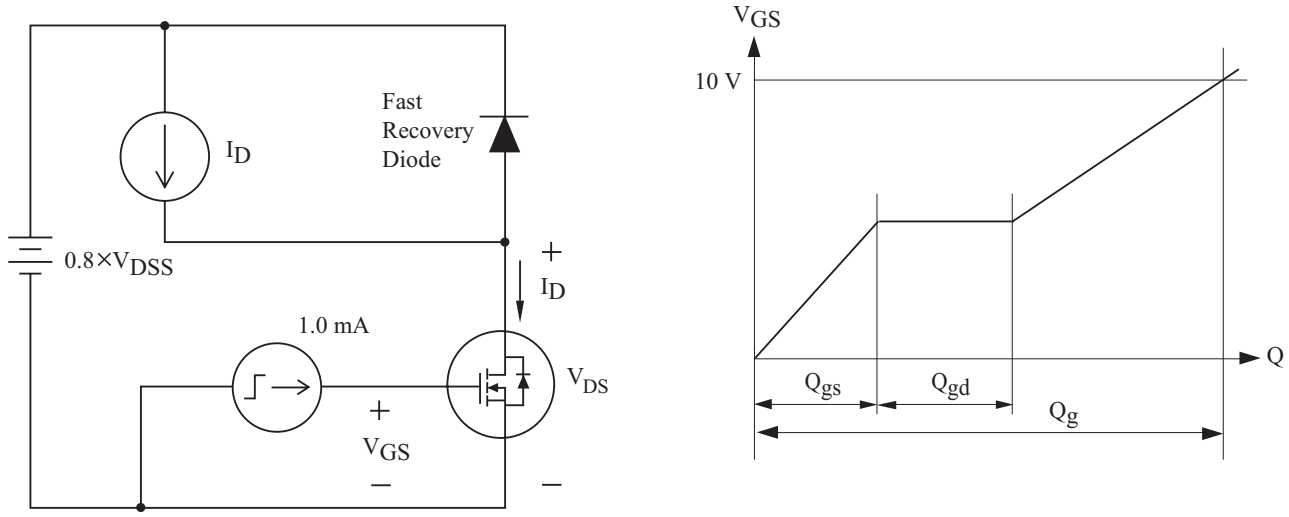


Fig15. Single Pulsed Avalanche Energy

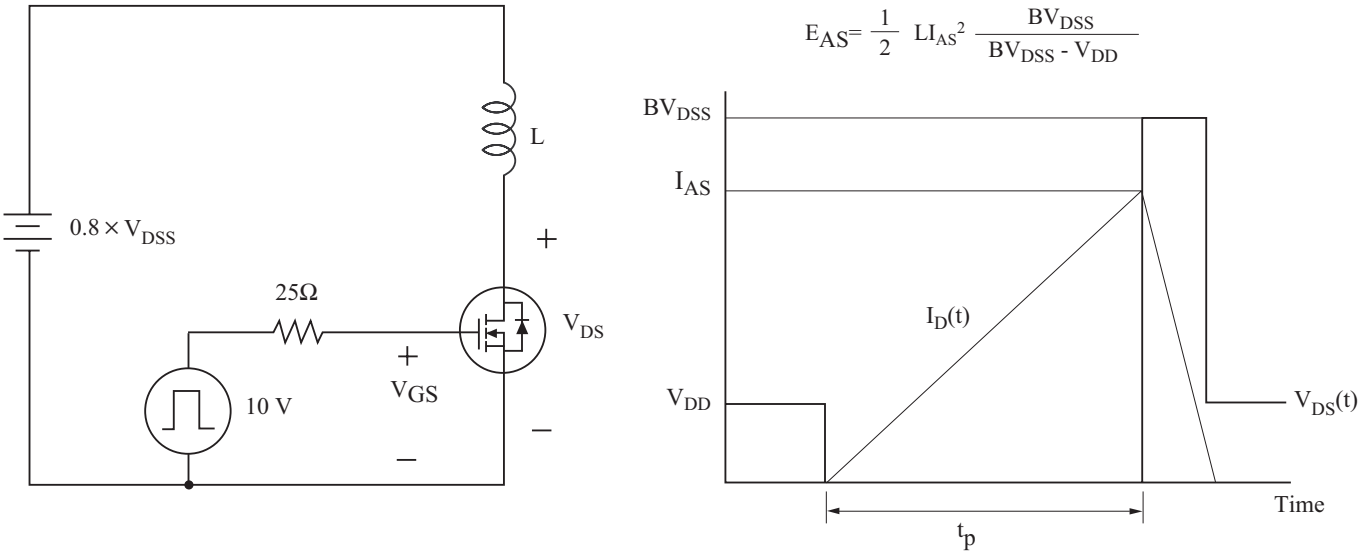


Fig16. Resistive Load Switching

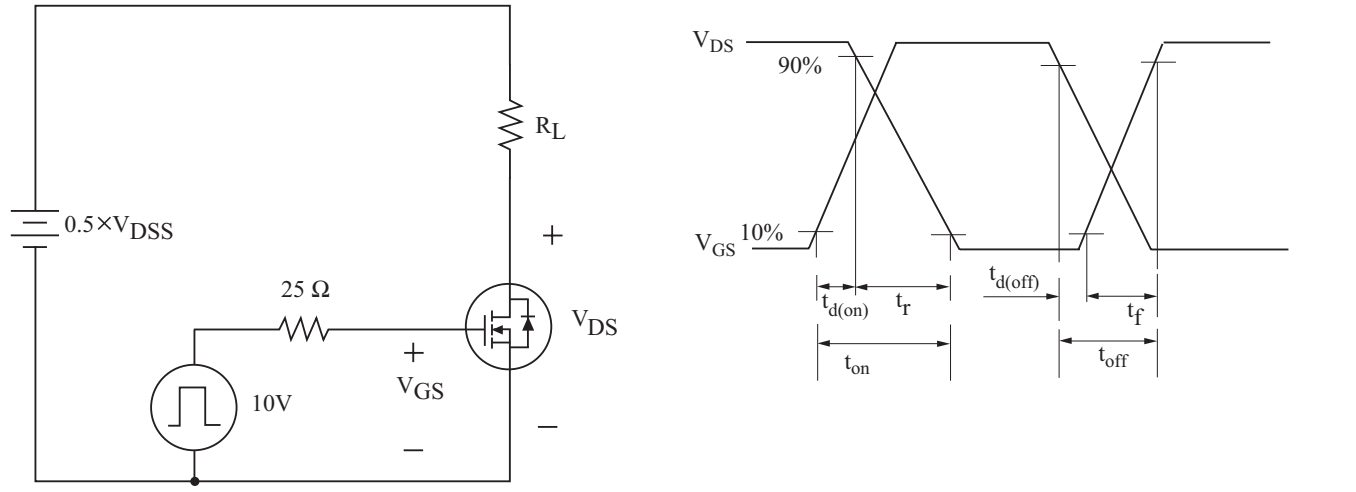


Fig17. Source - Drain Diode Reverse Recovery and dv /dt