

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

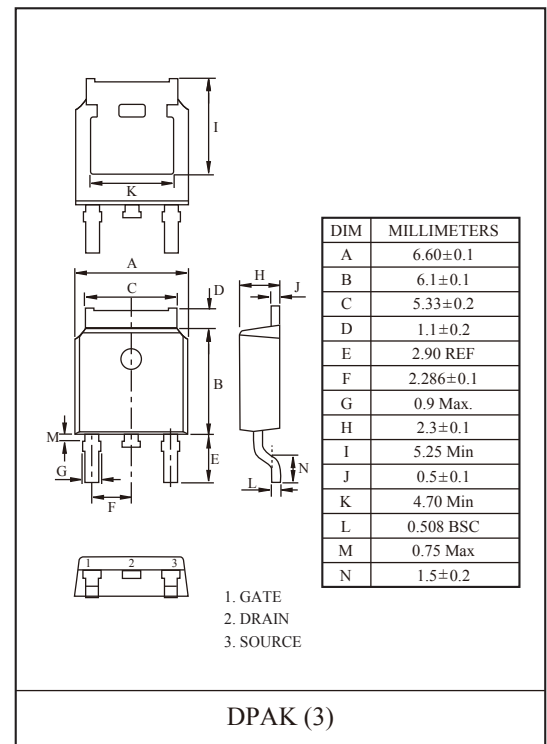
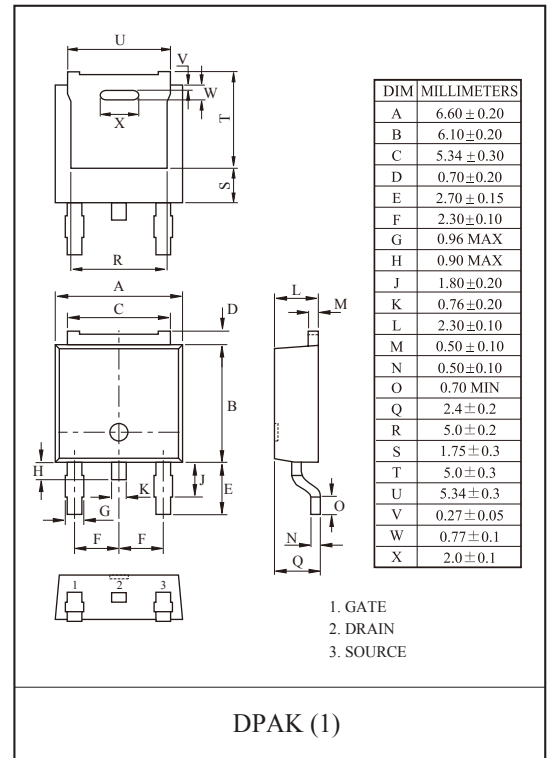
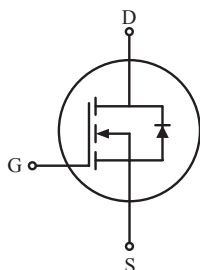
- $V_{DSS} = 100V$, $I_D = 63A$
- Drain-Source ON Resistance :
 $R_{DS(ON)} = 8.6m\Omega(\text{Max.}) @ V_{GS} = 10V$

MAXIMUM RATING (Tc=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	@T _c =25°C	I_D	63	A
	@T _c =100°C		39	
	Pulsed (Note1)	I_{DP}	252*	
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°C	P_D	62.5	W
	Derate above 25°C		0.5	W/°C
Maximum Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-55 ~ 150	°C
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	2.0	°C/W
Thermal Resistance, Junction-to-Ambient		R_{thJA}	110	°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}	$I_D=250\ \mu A, V_{GS}=0V$	100	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_j$	$I_D=250\ \mu A$, Referenced to 25 °C	-	0.05	-	V/°C
Drain Cut-off Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$,	-	-	10	μA
Gate Threshold Voltage	V_{th}	$V_{DS}=V_{GS}, I_D=250\ \mu A$	2.0	-	4.0	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=31.5A$	-	6	8.6	m Ω
		$V_{GS}=6V, I_D=16A$	-	-	12	
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=80V, I_D=63A$ $V_{GS}=10V$ (Note4,5)	-	53	-	nC
Gate-Source Charge	Q_{gs}		-	13	-	
Gate-Drain Charge	Q_{gd}		-	14	-	
Turn-on Delay time	$t_{d(on)}$	$V_{DD}=50V$ $I_D=63A$ $R_G=25\ \Omega$ (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	$V_{GS}<V_{th}$	-	-	44	A
Pulsed Source Current	I_{SP}		-	-	176	
Diode Forward Voltage	V_{SD}	$I_S=44A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$I_S=44A, V_{GS}=0V$, $dI_S/dt=300A/\mu s$	-	65	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.36	-	μC

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

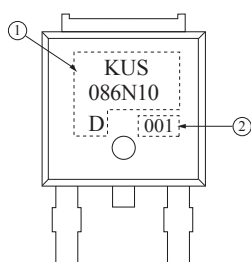
Note 2) $L=22.7\ \mu H, I_S=63A, V_{DD}=80V, R_G=25\ \Omega$, Starting $T_j=25\ ^\circ C$.

Note 3) $I_S \leq 44A, dI/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, 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

KUS086N10D

Fig1. $I_D - V_{DS}$

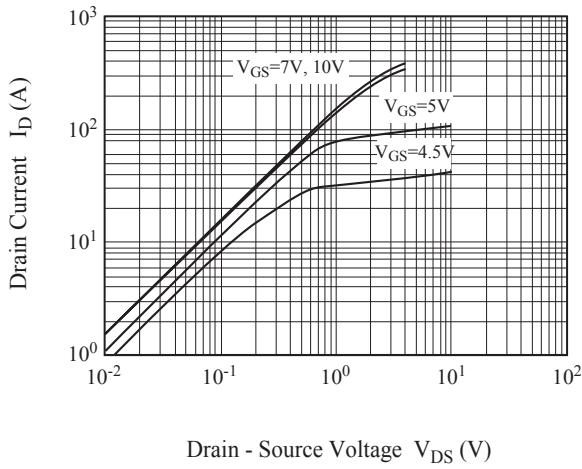


Fig2. $I_D - V_{GS}$

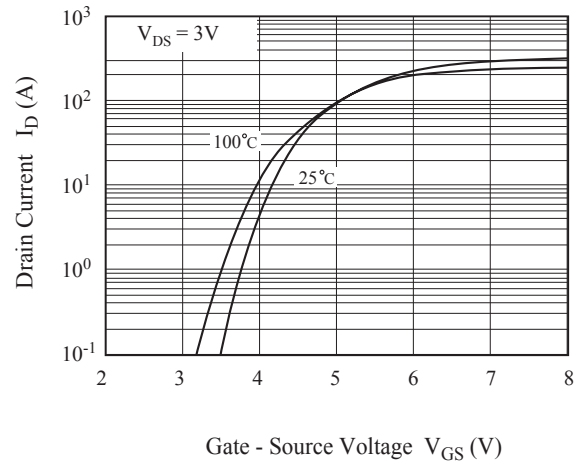


Fig3. $BV_{DSS} - T_j$

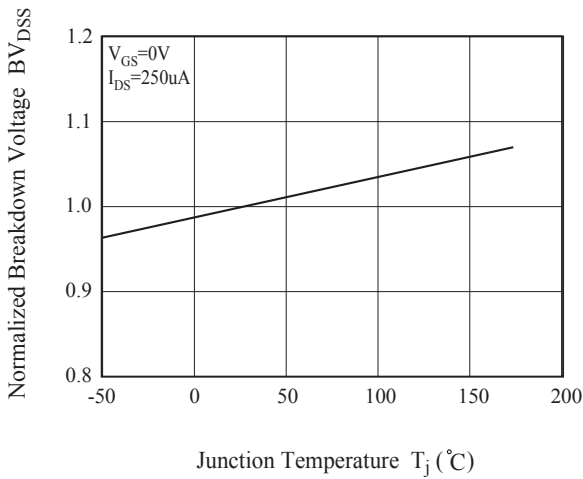


Fig4. $R_{DS(ON)} - T_j$

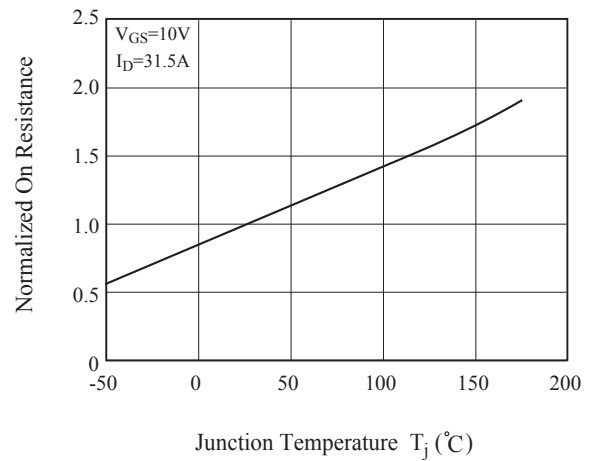


Fig5. $I_S - V_{SD} - I$

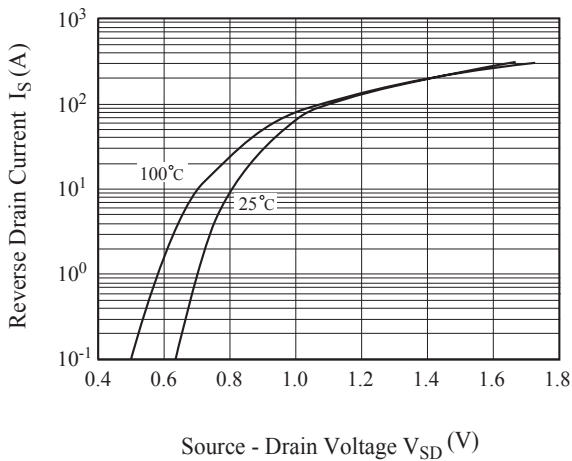
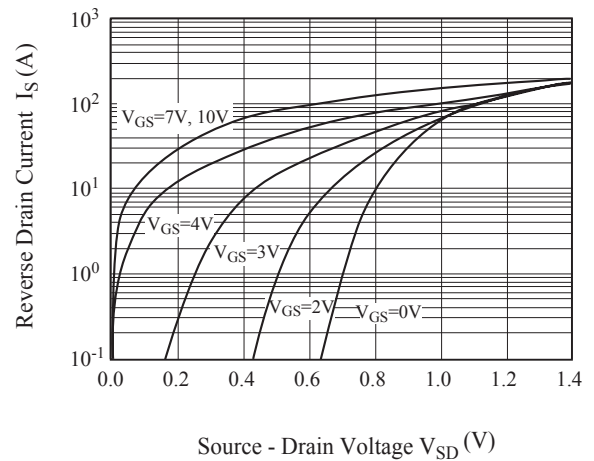


Fig6. $I_S - V_{SD} - II$



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

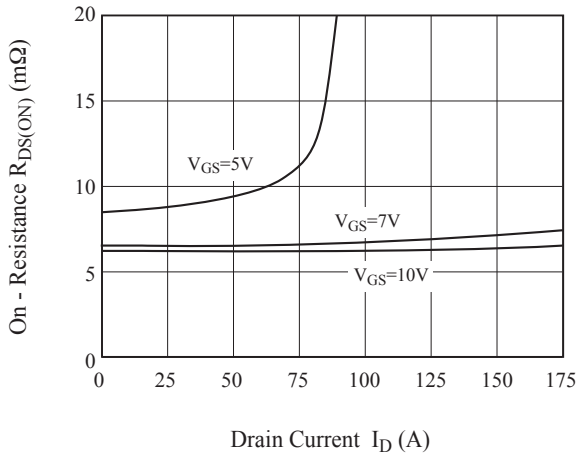


Fig8. $V_{th} - T_j$

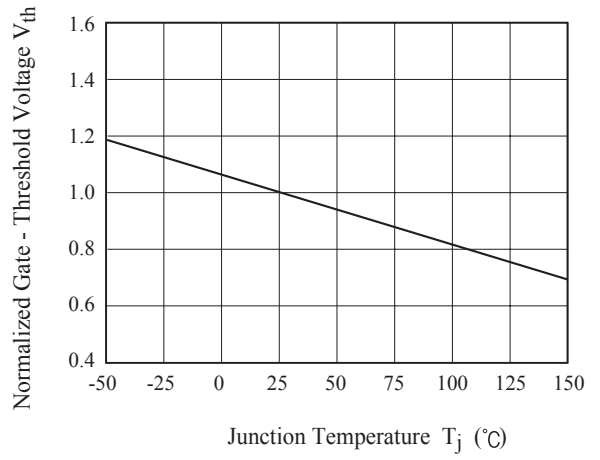


Fig 9. C - V_{DS}

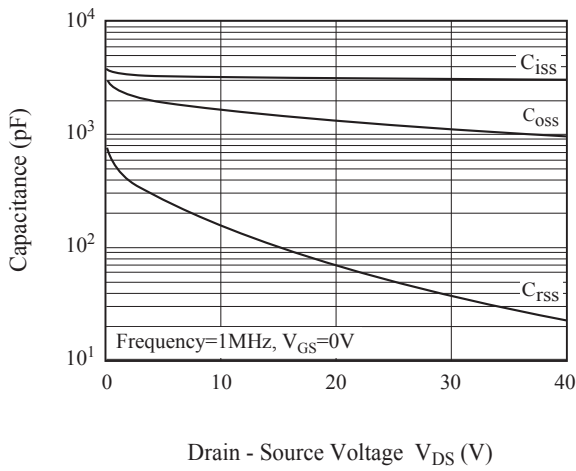


Fig10. $Q_g - V_{GS}$

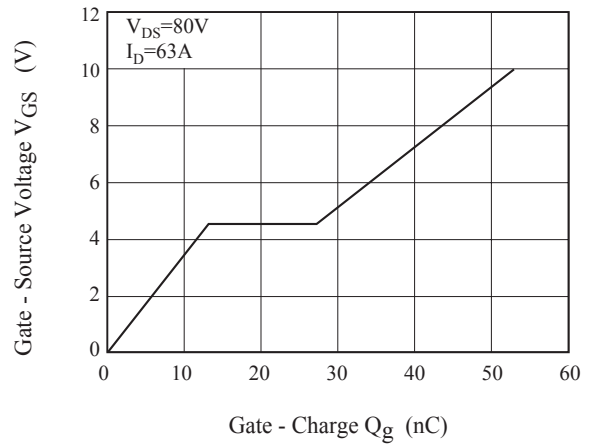


Fig11. $I_D - T_j$

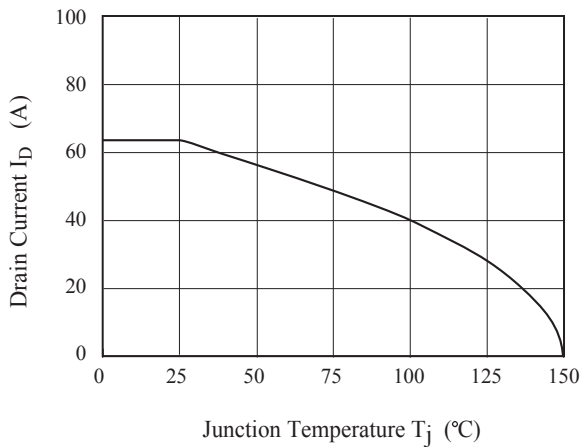
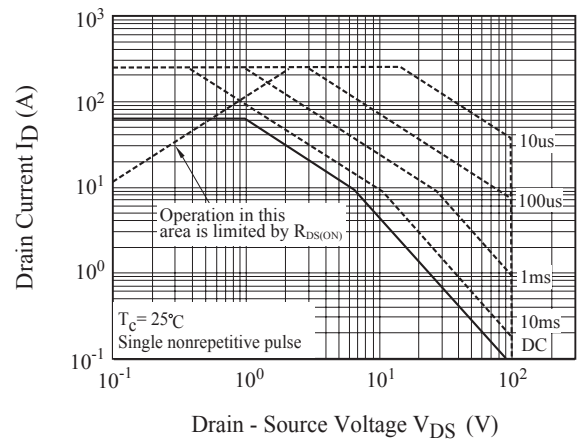


Fig12. Safe Operation Area



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Fig13. Transient Thermal Response Curve

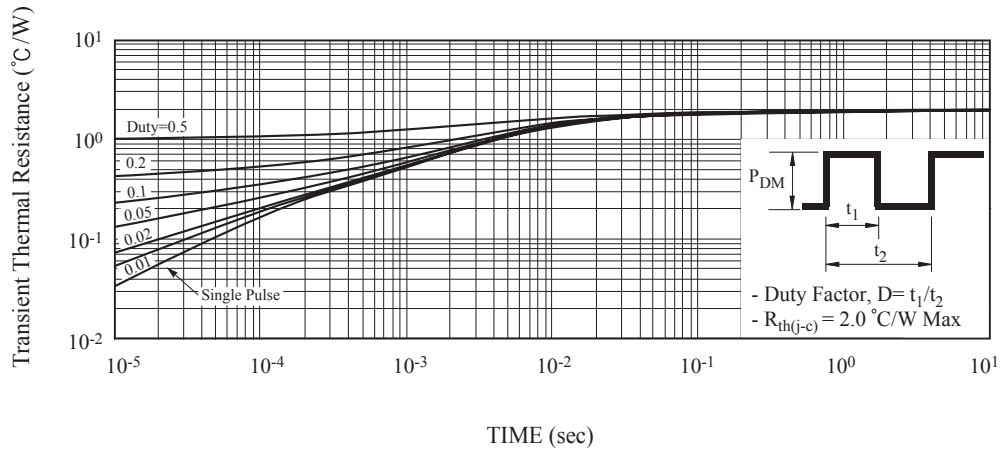


Fig14. Gate Charge

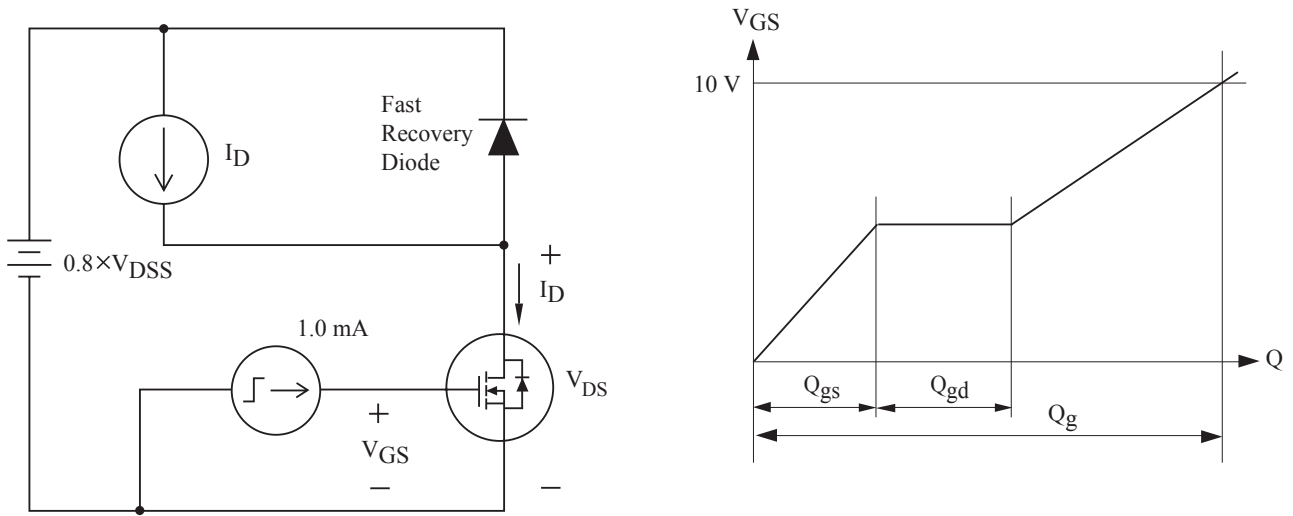


Fig15. Single Pulsed Avalanche Energy

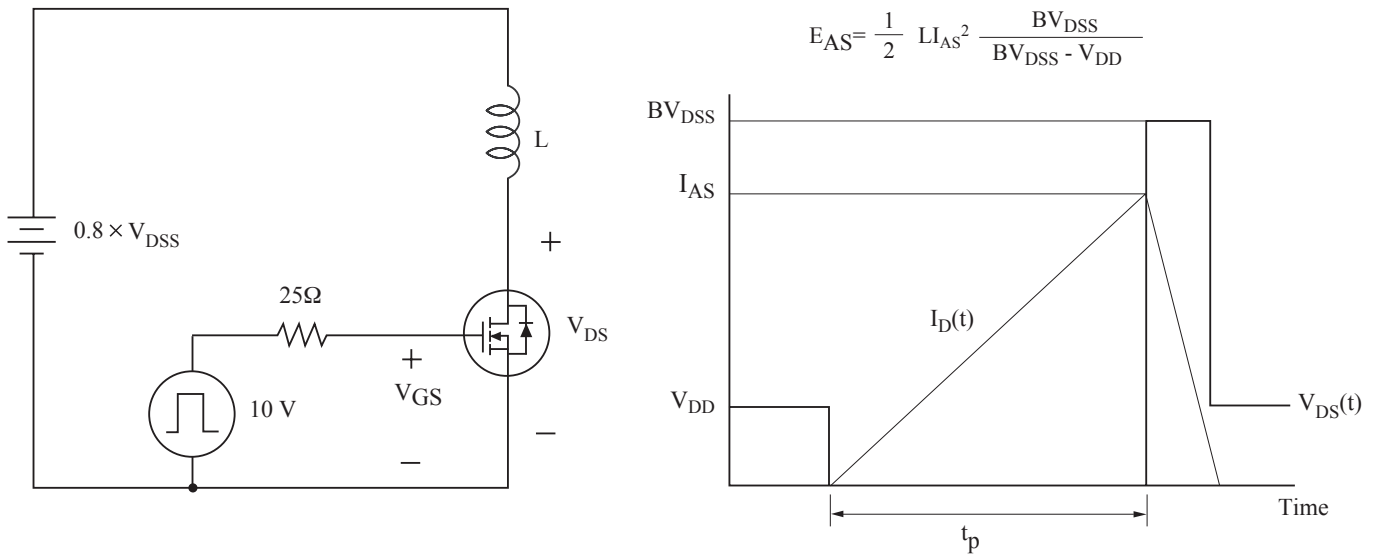


Fig16. Resistive Load Switching

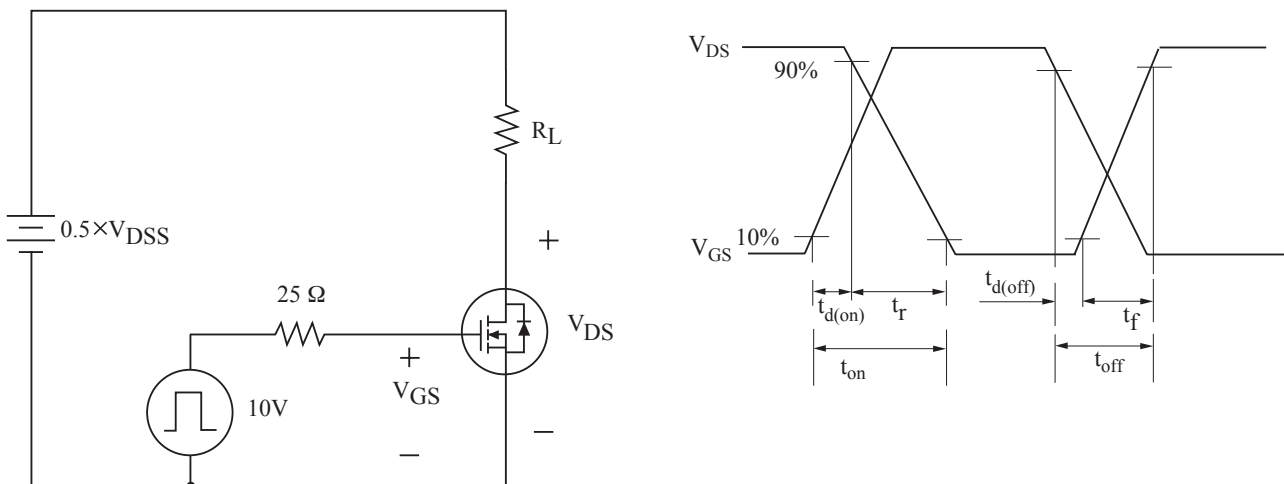


Fig17. Source - Drain Diode Reverse Recovery and dv/dt

