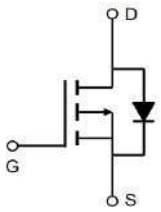
KLM1D08P02

-20V P-Channel Enhancement Mode MOSFET

Inner Equivalent Principium Chart



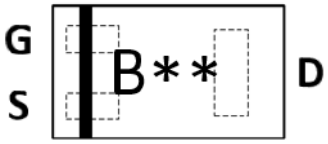
General Description

The KLM1D08P02 uses trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge . It can be used in a wide variety of applications. The package form is DFN1006-3 , which accords with the ROHS standard and Halogen Free standard.

General Features

V_{DS} = -20 V I_D = -0.8A
$R_{DS(ON)}$ < 450mΩ @ V_{GS}= -4.5V

Marking and Pin Assignment



Applications

- Battery switching application
- Hard switched and high frequency circuits
- Power Management

Package Marking and Ordering Information

Marking	Part Number	Package	Packing	Qty.
B	KLM1D08P02	DFN1006-3	Reel	10000 Pcs

Absolute Maximum Ratings (T_A = 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		-20	V
I_D	Continuous Drain Current	T_C=25℃	-0.8	A
	Continuous Drain Current	T_C=100℃	-0.5	A
I_{DM}[a2]	Pulsed Drain Current		-3.2	A
V_{GS}	Gate-to-Source Voltage		±10	V
P_D	Power Dissipation		0.35	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, -55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	℃/W

Electrical Characteristic (T_C = 25 °C, unless otherwise specified)

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-20	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-20V, V_{GS}=0V	--	--	-1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=-10V, V_{DS}=0V	--	--	-5.0	uA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=+10V, V_{DS}=0V	--	--	5.0	uA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-0.75	-1.0	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=-4.5V, I_D=-0.8A	--	350	450	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=-2.5V, I_D=-0.6A	--	500	690	mΩ
$R_{DS(ON)3}$	Drain-to-Source On-Resistance	V_{GS}=-1.8V, I_D=-0.5A	--	800	1200	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} =-10V f = 1.0MHz	--	84	--	pF
C_{oss}	Output Capacitance		--	13.7	--	
C_{rss}	Reverse Transfer Capacitance		--	8.72	--	
R_G	Gate resistance	V_{GS}=0V,V_{DS} Short	--	8.5	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =-0.8A V_{DS} =-10V V_{GS} =-4.5V R_G =10Ω	--	3.6	--	ns
t_r	Rise Time		--	20	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	8.4	--	
t_f	Fall Time		--	21	--	
Q_g	Total Gate Charge	V_{GS} =-4.5V V_{DS} = -10V I_D =-1.2A	--	1.48	--	nC
Q_{gs}	Gate to Source Charge		--	0.46	--	
Q_{gd}	Gate to Drain Charge		--	0.21	--	

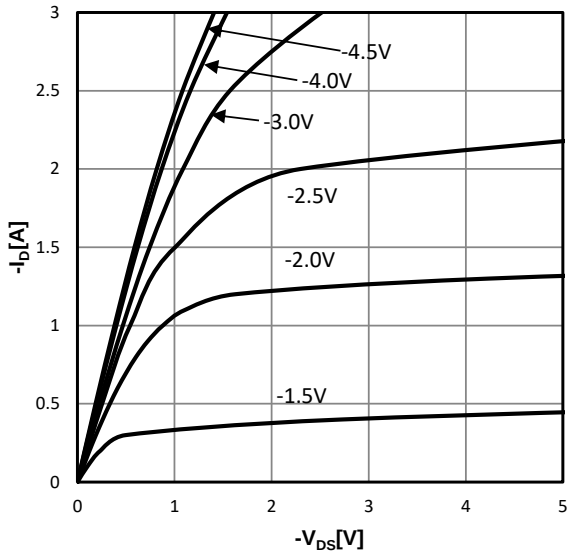
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	-0.8	A
V_{SD}	Diode Forward Voltage	I_S=-0.8A, V_{GS}=0V	--	--	-1.2	V

a1：** is defined as date code

a2：Repetitive rating; pulse width limited by maximum junction temperature

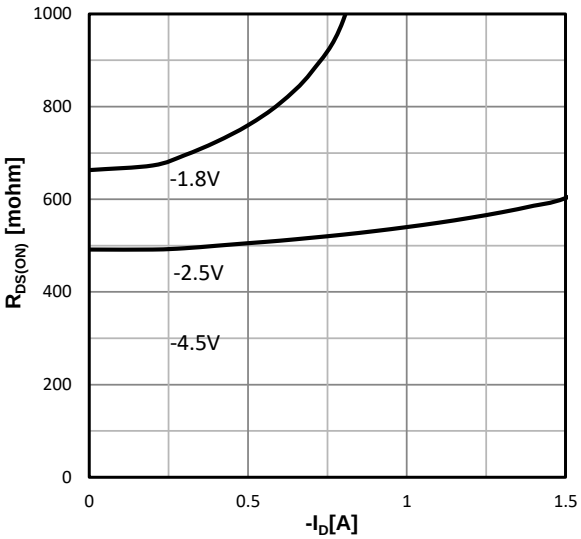
Characteristics Curve

Figure 1: Typ. output characteristics



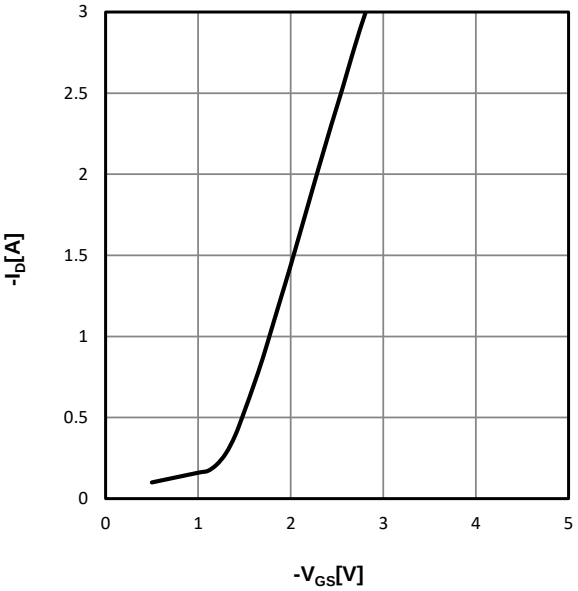
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}

Figure 2: Typ. drain-source on resistance



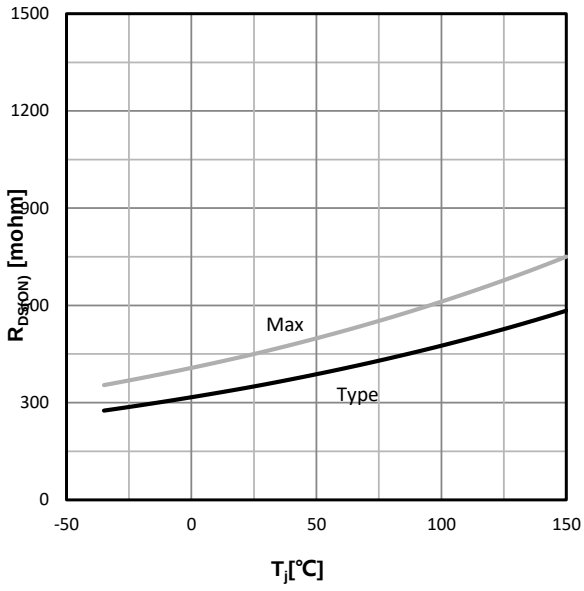
$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

Figure 3: Typ. transfer characteristics



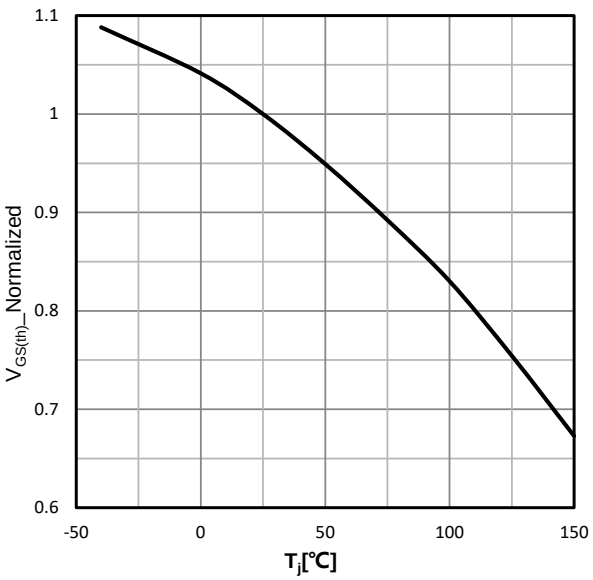
$I_D=f(V_{GS})$, $|V_{DS}|>2|I_D|R_{DS}(on)max$;

Figure 4: drain-source on resistance



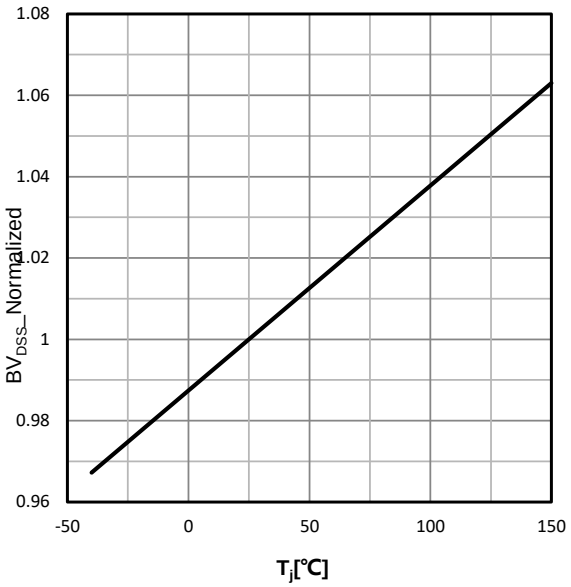
$R_{DS(on)}=f(T_j)$, I_D=-0.8A, V_{GS}=-4.5V;

Figure 5: Typ. gate threshold voltage



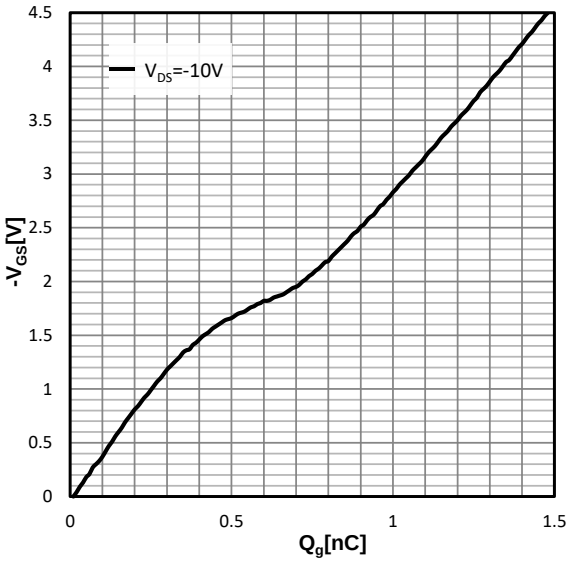
$V_{GS}=f(T_j)$, $V_{GS}=V_{DS,}$ I_D=-250μA;

Figure 6: Drain-source breakdown voltage



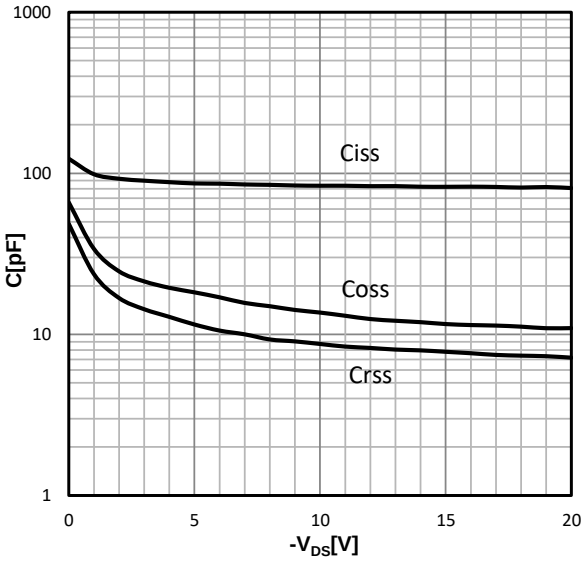
$V_{BR(DSS)}=f(T_j)$; I_D=-250μA;

Figure 7: Typ. gate charge



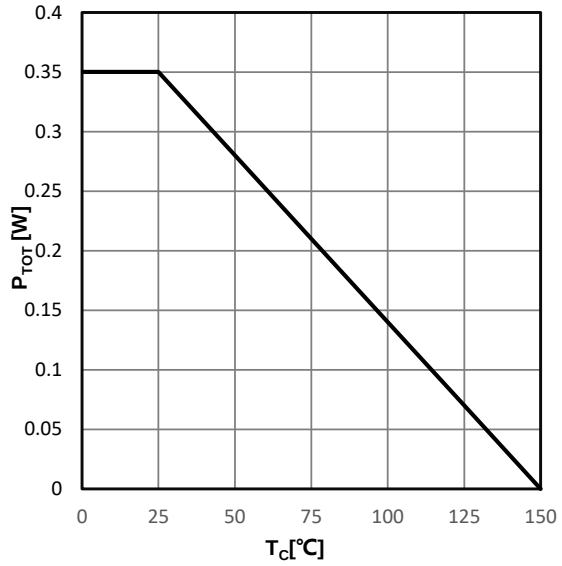
$V_{GS}=f(Q_g)$, I_D=-1.2A, T_j=25 °C; parameter: V_{DS}

Figure 8: Typ. Capacitances



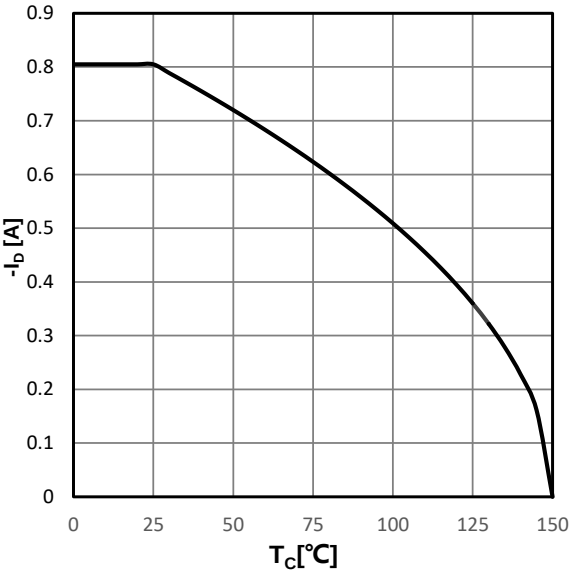
$C=f(V_{DS})$; V_{GS}=0V; f=1.0 MHz;

Figure 9: Power dissipation



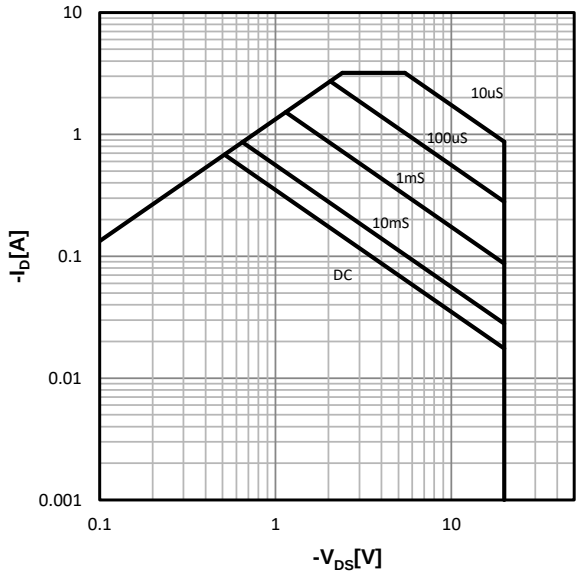
$P_{tot}=f(T_C)$;

Figure 10:Drain current



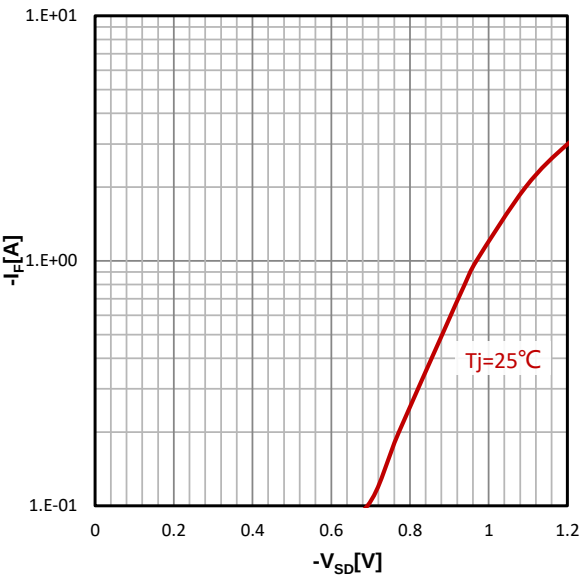
$I_D=f(T_C)$;

Figure 11: Safe operating area



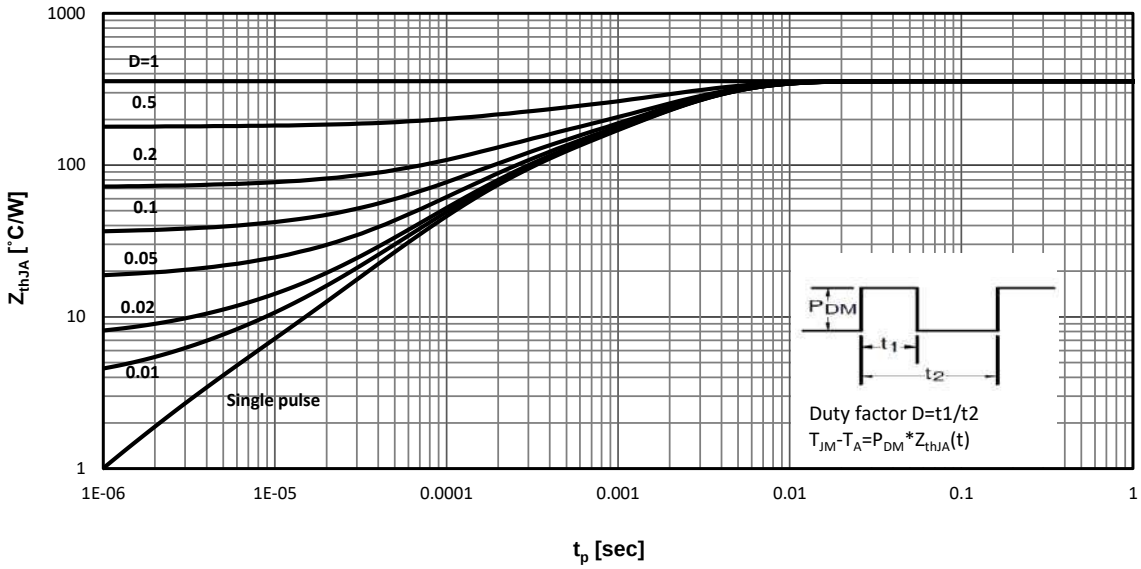
$I_D=f(V_{DS})$; T_C=25 °C; D=0; parameter: tp

Figure 12: Typ. forward characteristics



$I_F=f(V_{SD})$;

Figure 13: Max. Transient Thermal Impedance



$Z_{thJA}=f(t_p)$; parameter: D

Test Circuit & Waveform:

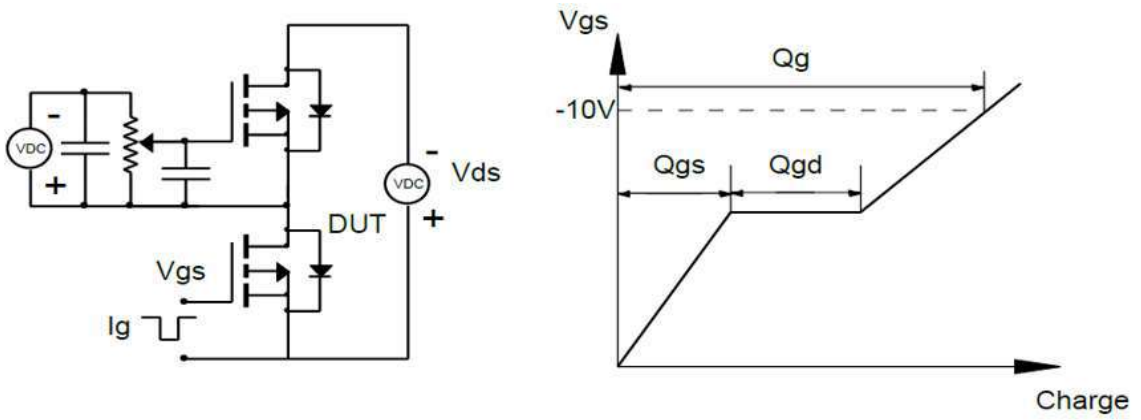


Figure 14: Gate Charge Test Circuit & Waveform

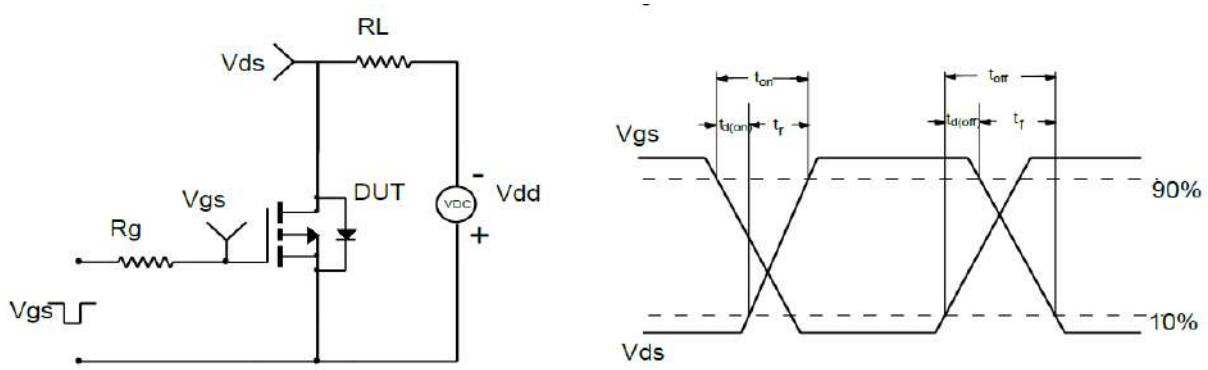


Figure 15: Resistive Switching Test Circuit & Waveforms

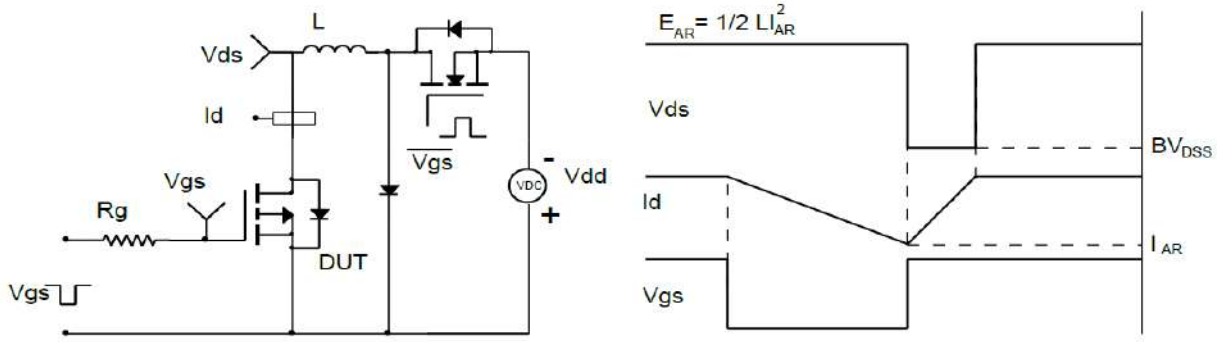
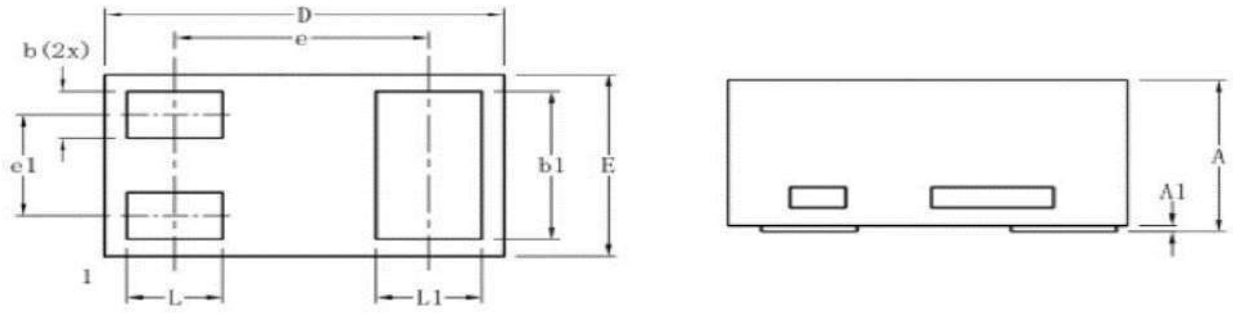


Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline



COMMON DIMENSION (MM)			
Symbol	**MIN**	**NOM**	**MAX**
A	0.450	0.500	0.550
A1	0.000	0.020	0.060
b	0.100	0.150	0.200
b1	0.440	0.500	0.560
D	0.950	1.000	1.050
e1	0.300	0.350	0.400
e	0.600	0.650	0.700
E	0.550	0.600	0.650
L/L1	0.200	0.250	0.300