

N-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

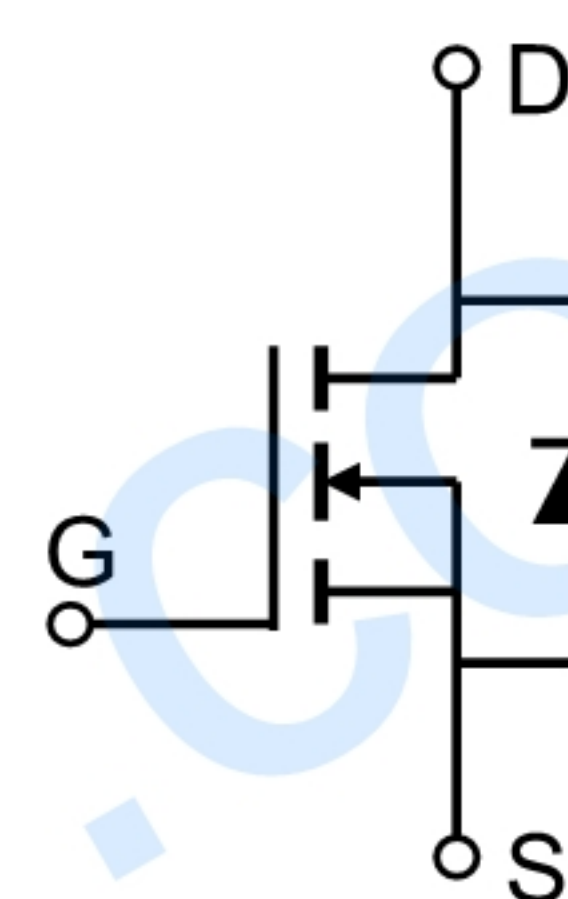
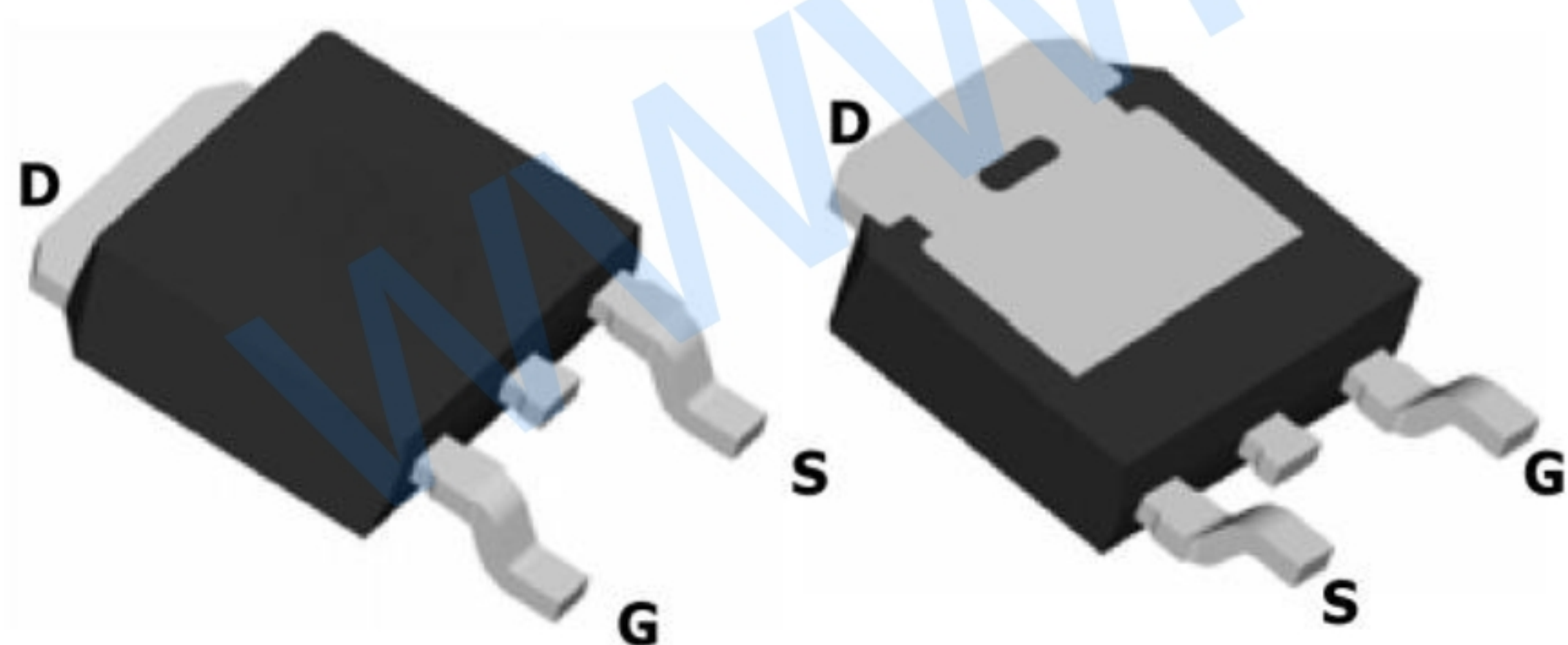
The PW20N03 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications

FEATURES

$V_{DS} = 30V$ $I_D = 20A$

$R_{DS(ON)} < 15m\Omega$ @ $V_{GS}=10V$

Available in TO252 DPAK Package

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	20	A
Continuous Drain Current $T_A=100^\circ C$	I_D	8	A
Pulsed Drain Current	I_{DM}	80	A
Total Power Dissipation	P_D	26	W
Storage Temperature Range	T_{STG}	-55 To 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 To 150	$^\circ C$
Thermal Resistance Junction-ambient	$R_{\theta JA}$	4.9	$^\circ C/W$
Single pulse avalanche energy	E_{AS}	30	mJ

ELECTRICAL CHARACTERISTICS

(TA = 25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage (Note 3)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.1	1.6	2.1	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =15A		15	20	mΩ
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =10A		23	28.5	mΩ
Input Capacitance (Note4)	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz		518		PF
Output Capacitance	C _{oss}			63		PF
Reverse Transfer Capacitance	C _{rss}			52		PF
Turn-on Delay Time (Note 4)	t _{d(on)}	V _{DD} =15V, I _D =15A V _{GS} =10V, R _{GEN} =3Ω		6		nS
Turn-on Rise Time	t _r			16		nS
Turn-Off Delay Time	t _{d(off)}			17		nS
Turn-Off Fall Time	t _f			5		nS
Total Gate Charge	Q _g	V _{DS} =15V, I _D =15A, V _{GS} =0 to 10V		16		nC
Gate-Source Charge	Q _{gs}			3.6		nC
Gate-Drain Charge	Q _{gd}			3.4		nC
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =13A			1.2	V
Diode Forward Current (Note 2)	I _S				20	A
Maximum Pulsed Drain to Source Diode Forward Current	I _{SM}				80	A
Body Diode Reverse Recovery Time	t _{rr}	I _F =13A, di/dt=100A/μs		9.4		ns
Body Diode Reverse Recovery Charge	Q _{rr}			3.3		nC

Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. R_{θJA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.
4. EAS condition: T_j=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25Ω

Test Circuit

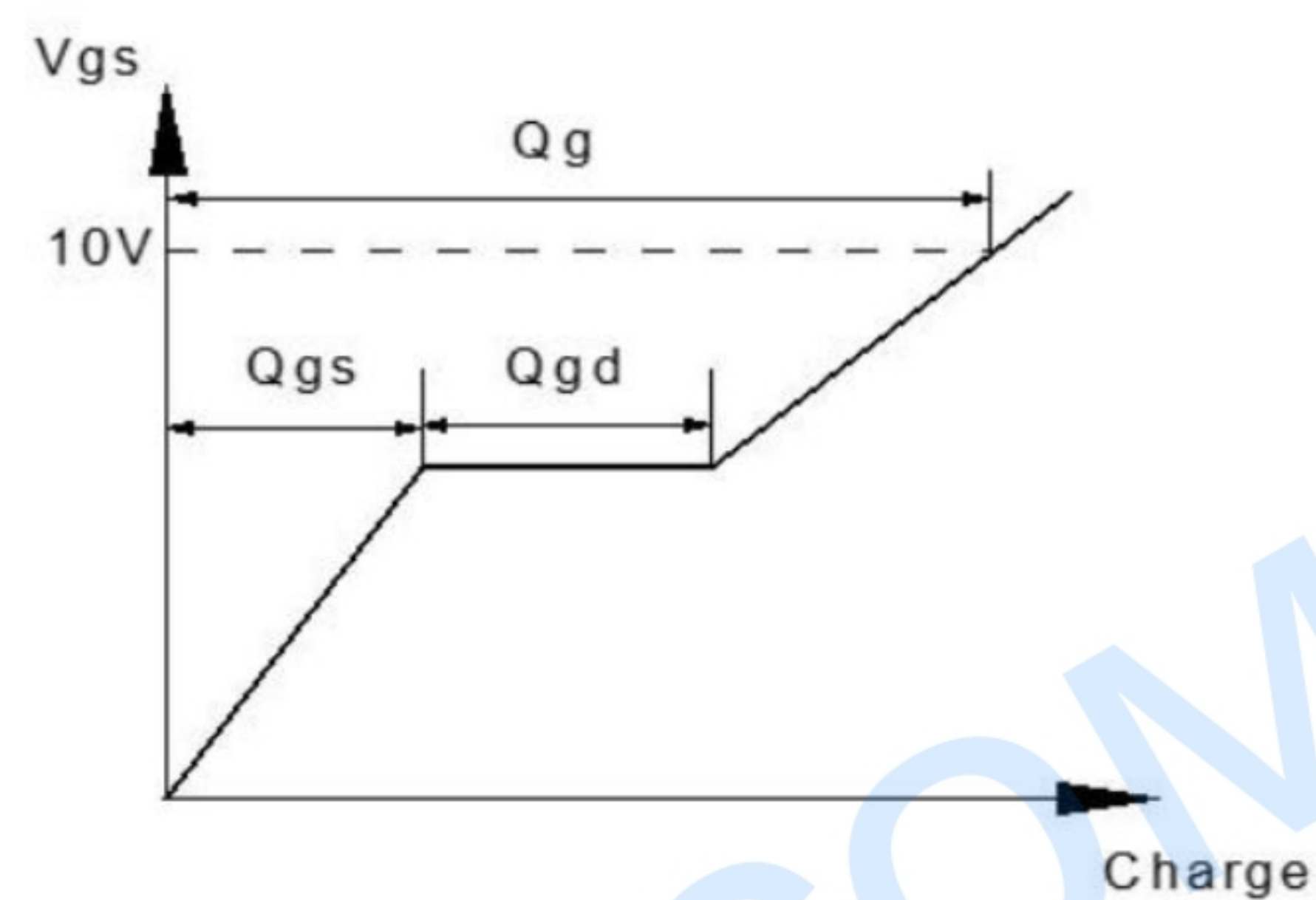
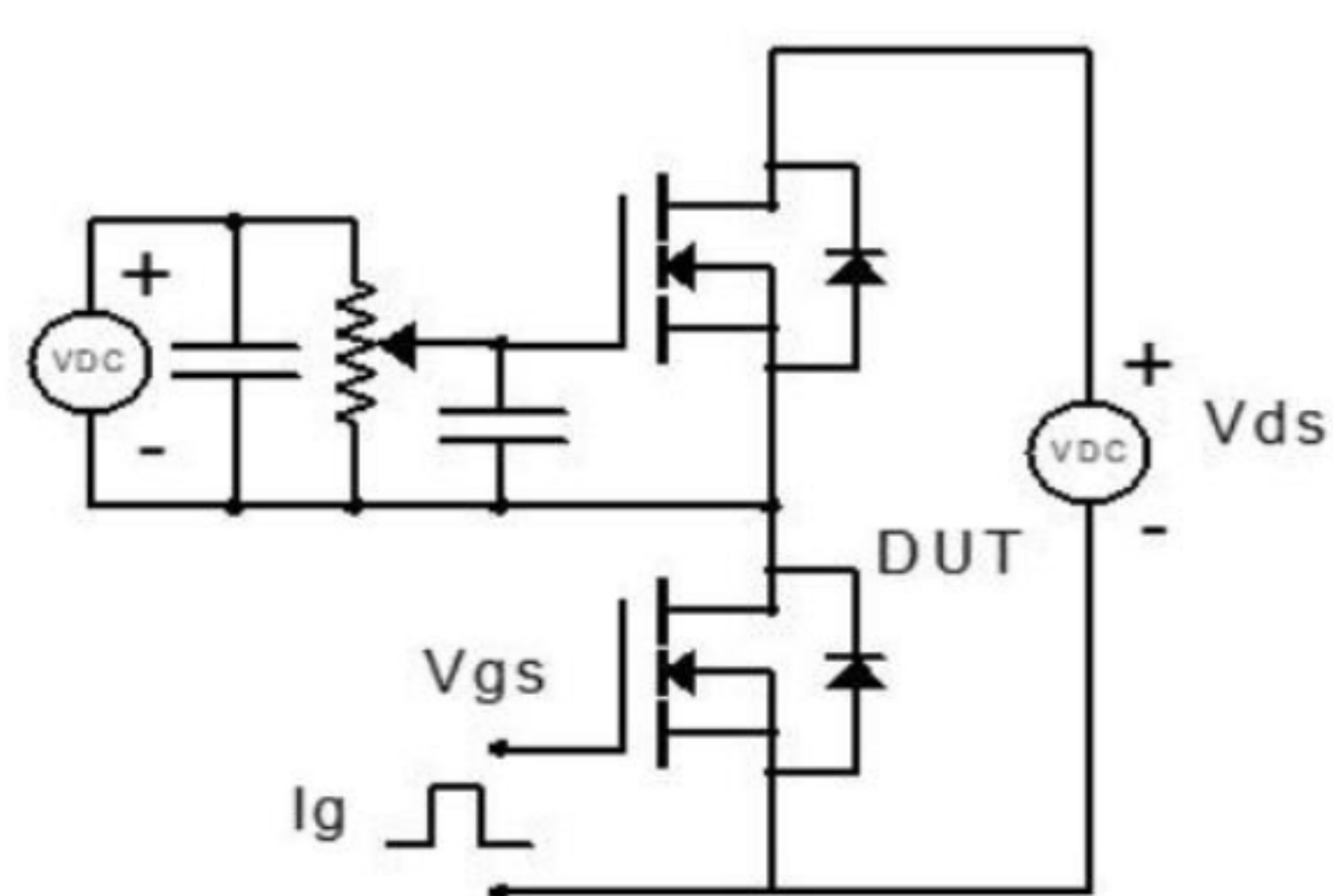


Figure 1: Gate Charge Test Circuit & Waveform

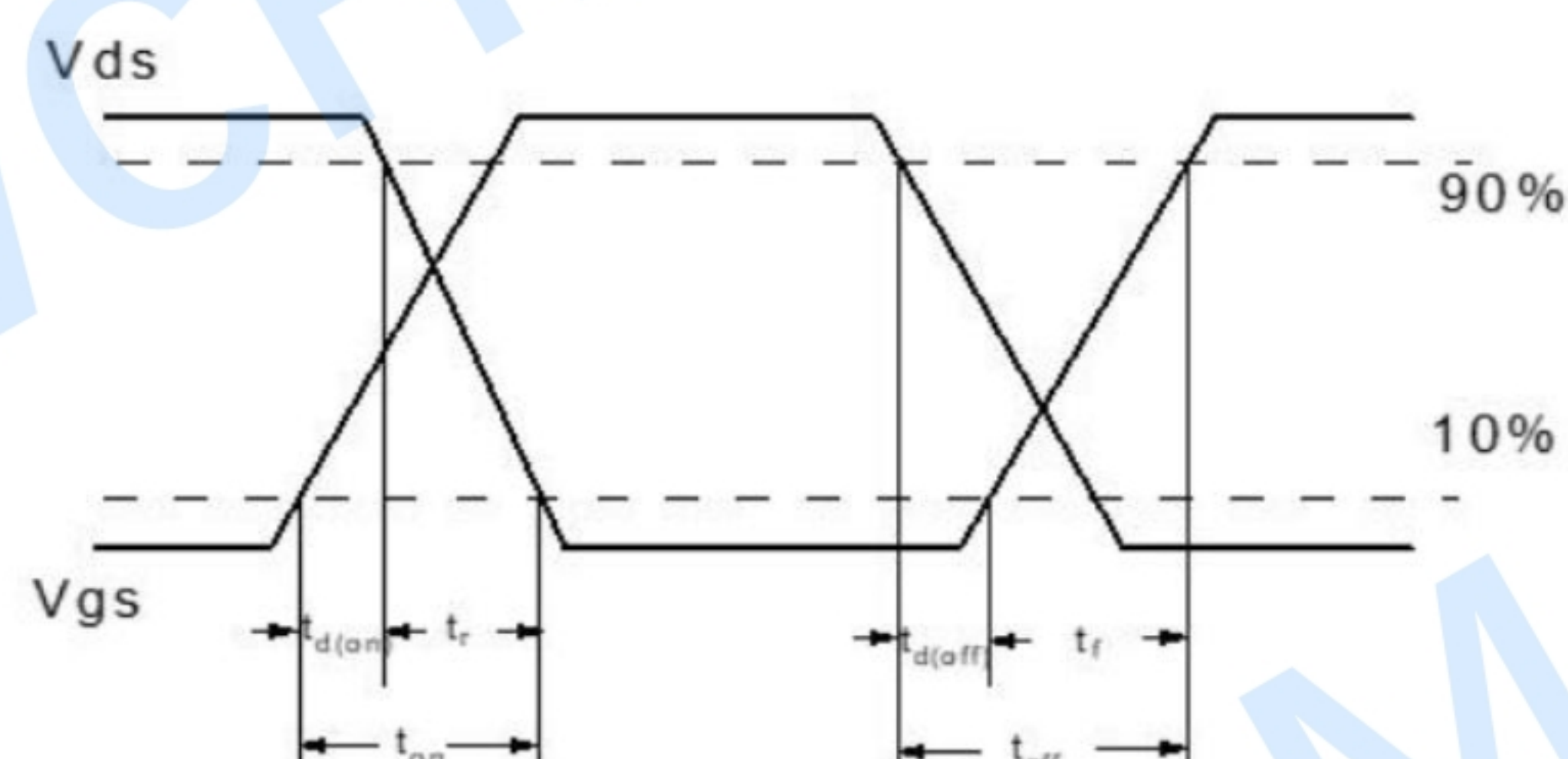
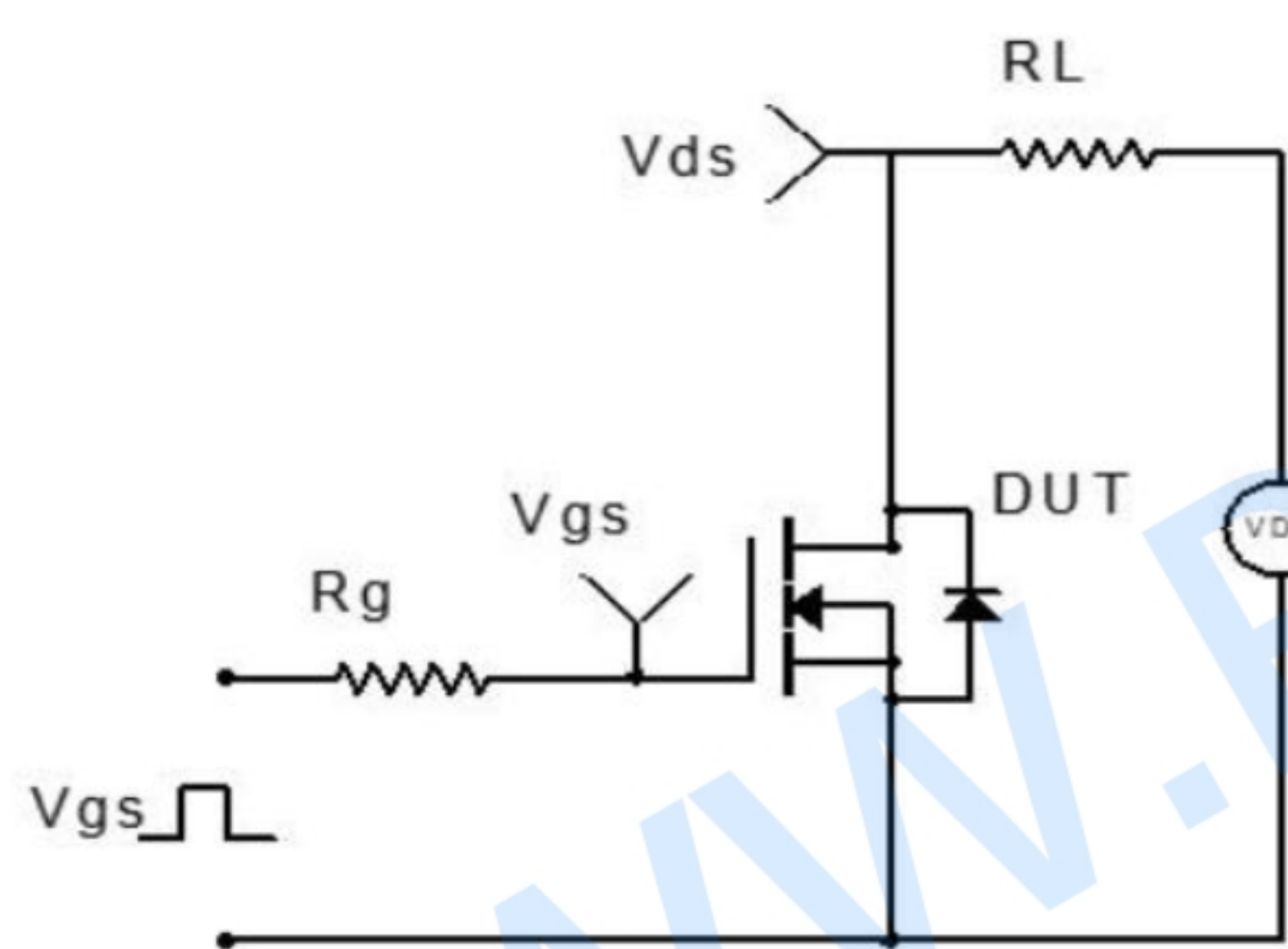


Figure 2: Resistive Switching Test Circuit & Waveform

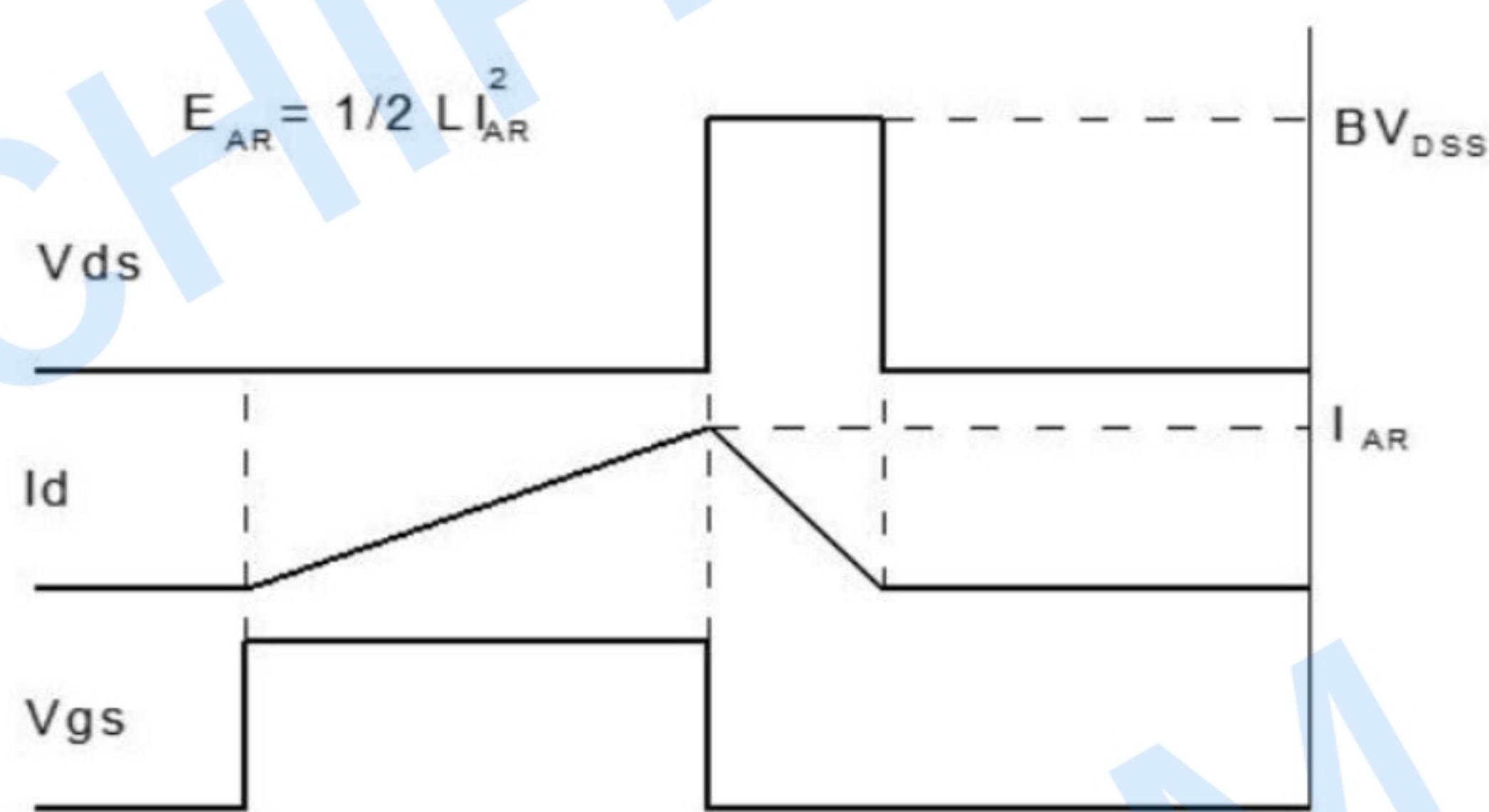
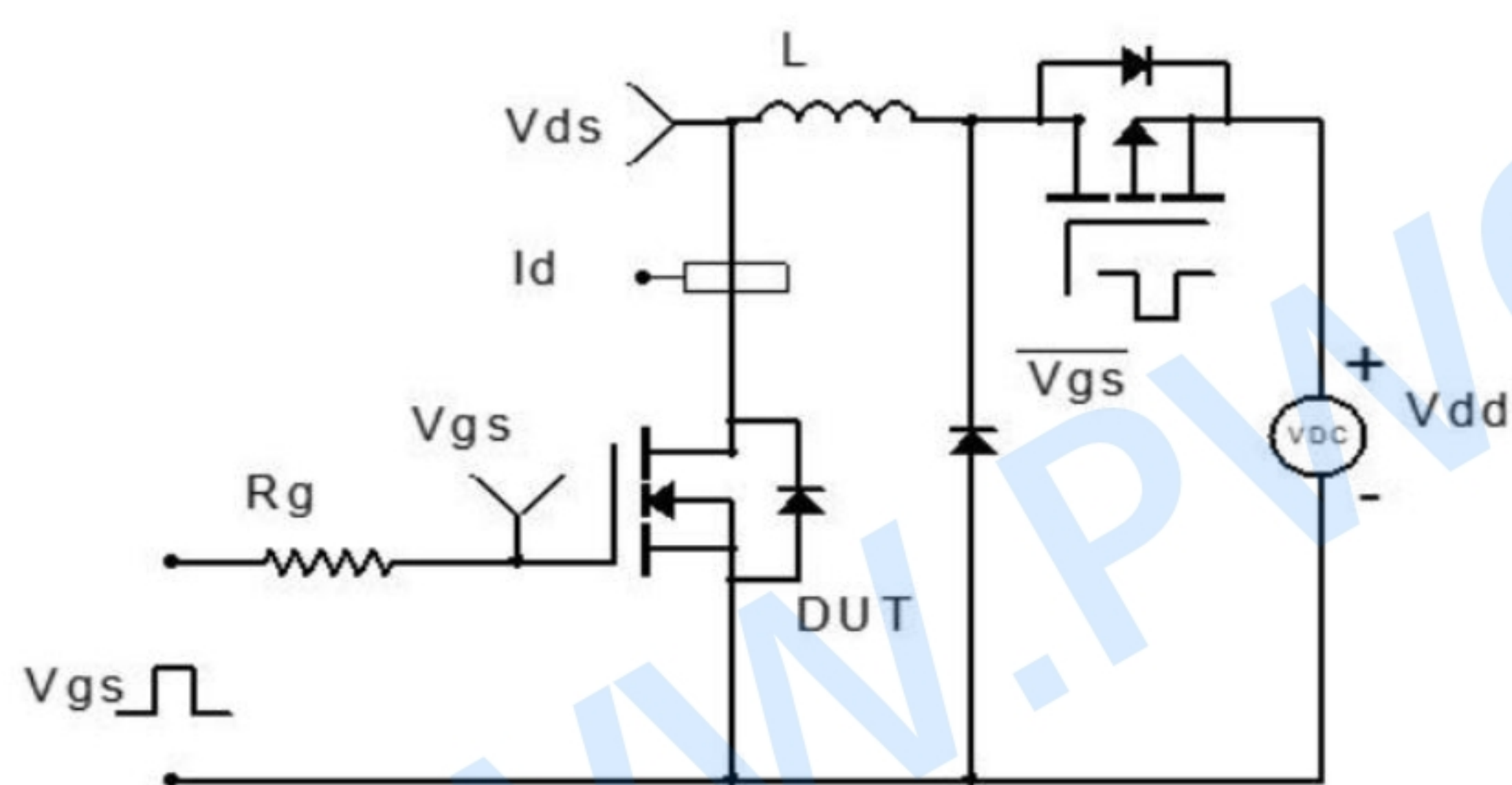


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

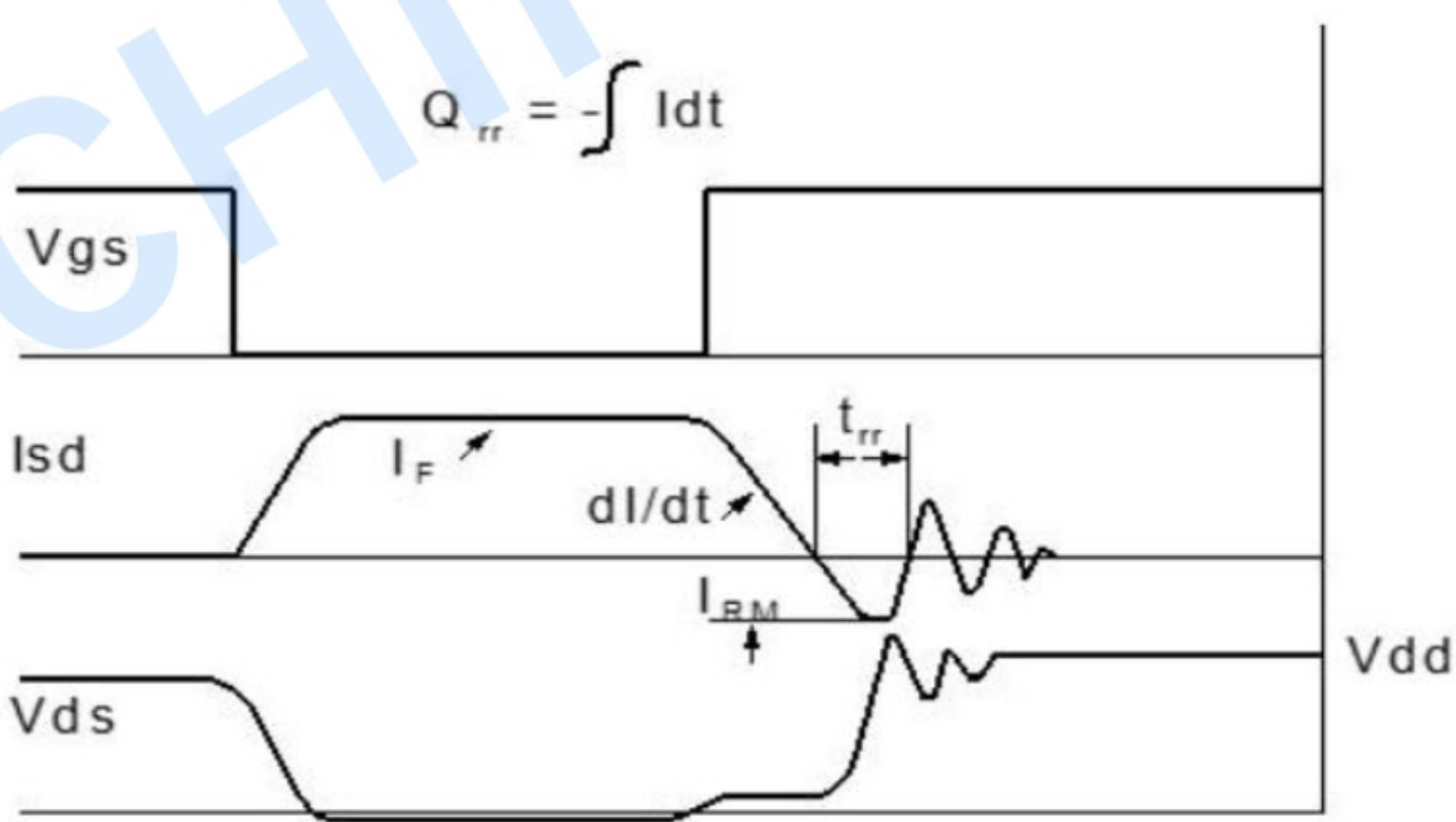
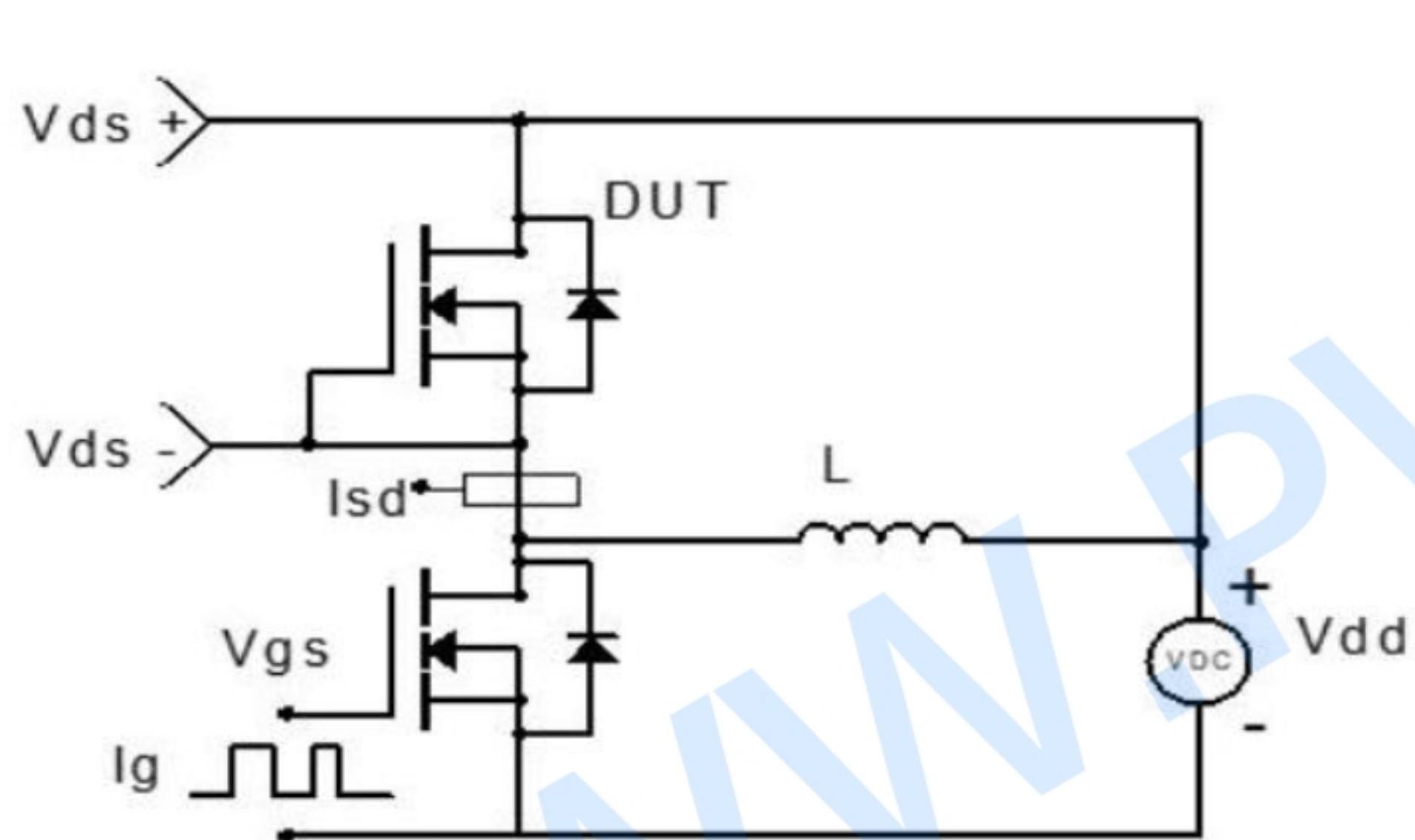
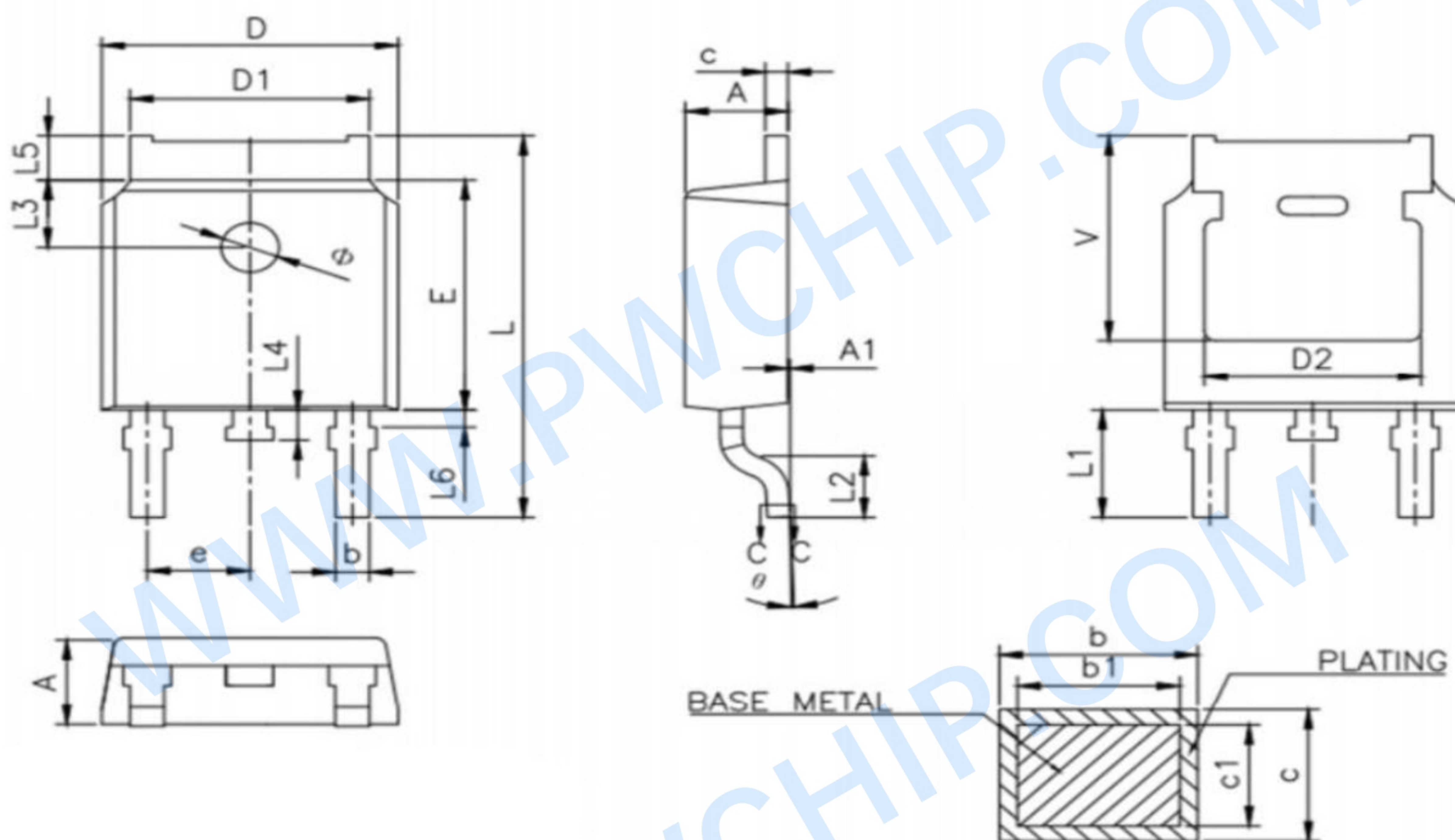


Figure 4: Diode Recovery Test Circuit & Waveform

PACKAGE DESCRIPTION

TO252-3L



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	--	0.127
b	0.66	--	0.86
b1	0.65	0.76	0.81
D	6.50	6.60	6.70
D1	5.10	5.33	5.46
c	0.47	--	0.60
c1	0.46	0.51	0.56
D2	4.83 REF.		
E	6.00	6.10	6.20
e	2.186	2.286	2.386
L	9.80	10.10	10.40
L1	2.90 REF.		
L2	1.40	1.50	1.60
L3	1.80 REF.		
L4	0.60	0.80	1.00
L5	0.90	--	1.25
L6	0.15	--	0.75
ϕ	1.10	--	1.30
θ	0°	--	8°
V	5.40 REF.		

IMPORTANT NOTICE

Wuxi PWChip Semi Technology CO., LTD (PW) reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any products or services. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

PW assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using PW components.

PW products are not authorized for use in safety-critical applications (such as life support devices or systems) where a failure of the PW product would reasonably be expected to affect the safety or effectiveness of that devices or systems.

The information included herein is believed to be accurate and reliable. However, PW assumes no responsibility for its use; nor for any infringement of patents or other rights of third parties which may result from its use.