





Лабораторная работа №1

Знакомство с OrCad Capture

New Project ✕

Name

Create a New Project Using

-   Analog or Mixed A/D
-   PC Board Wizard
-   Programmable Logic Wizard
-   Schematic

Tip for New Users

Create a new Analog or Mixed A/D project. The new project may be blank or copied from an existing template.

Location

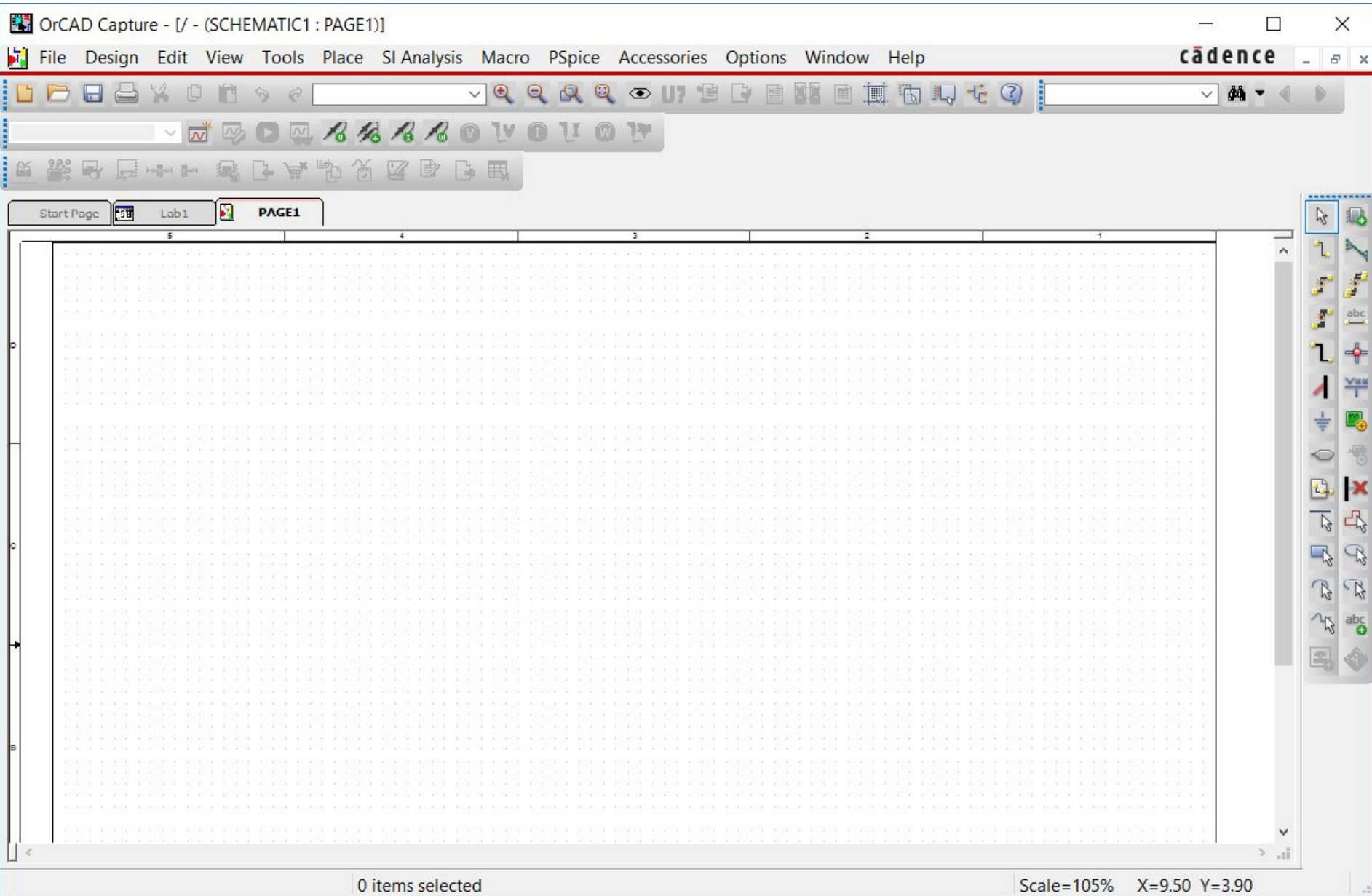
Create PSpice Project ✕

Create based upon an existing project

AnalogGNDsymbol.opj ▼

Create a blank project

# Рабочее окно Capture



# Создание режима МОДЕЛИРОВАНИЯ

New Simulation

Name:  
Lab1

Inherit From:  
none

Root Schematic: SCHEMATIC1

Create

Cancel

Simulation Settings - Lab1

General Analysis Configuration Files Options Data Collection Probe Window

Analysis type:  
Time Domain (Transient)

Options:

- General Settings
- Monte Carlo/Worst Case
- Parametric Sweep
- Temperature (Sweep)
- Save Bias Point
- Load Bias Point
- Save Check Points
- Restart Simulation

Run to time: 40ms seconds (TSTOP)

Start saving data after: 0 seconds

Transient options

- Skip the initial transient bias point calculation (SKIPBP)
- Run in resume mode

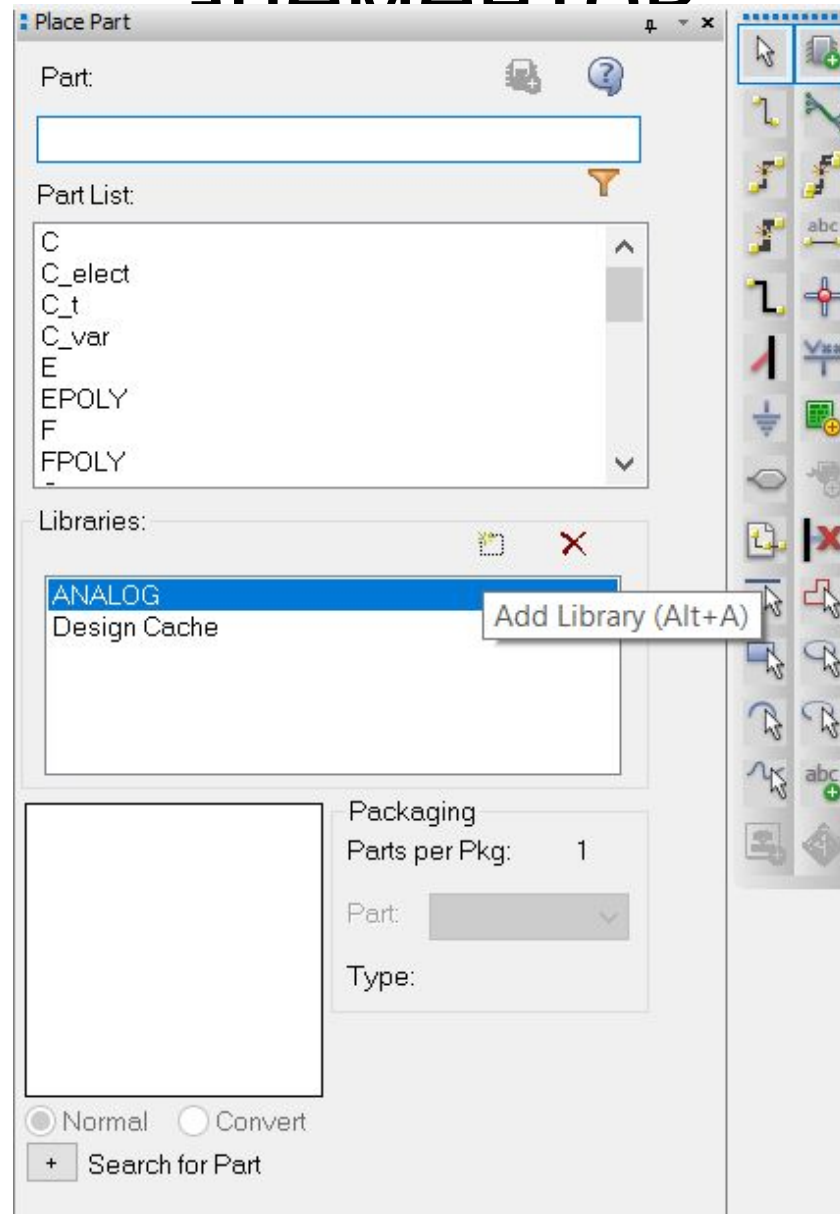
Maximum step size: 0.1ms seconds

Output File Options...

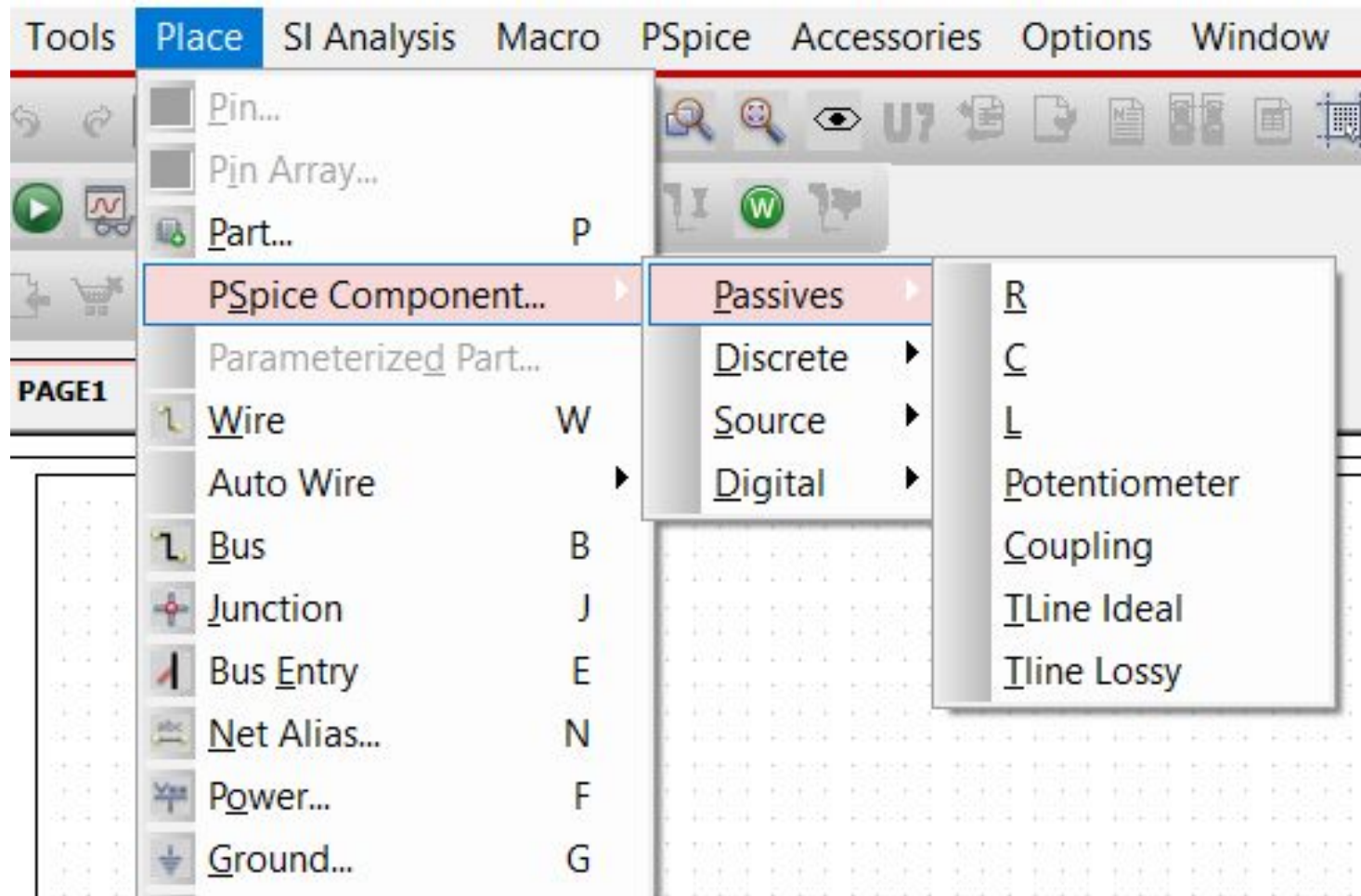
OK Отмена Применить Справка

# Добавление библиотек

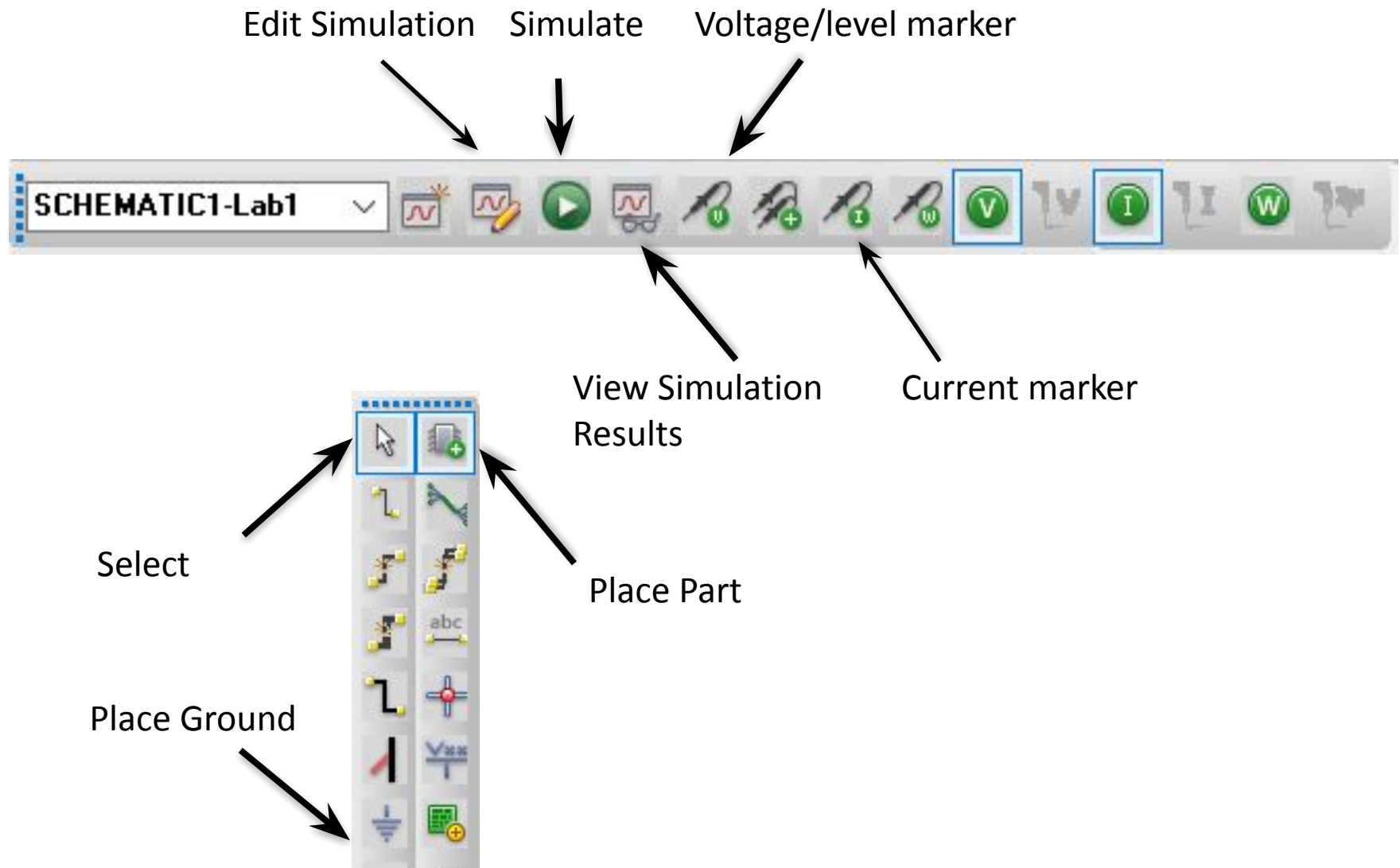
## ЭЛЕМЕНТЫ



# Основные панели Schematics

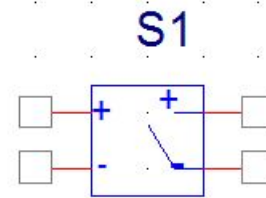
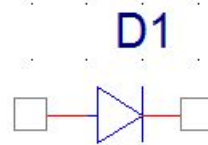
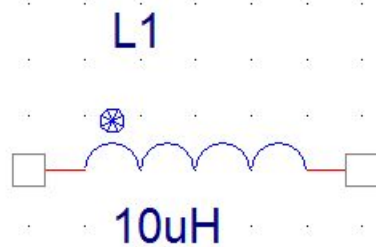
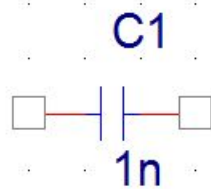
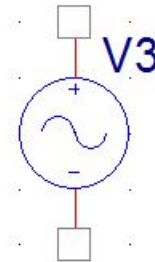
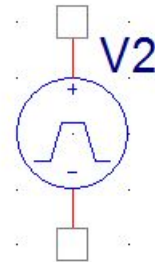
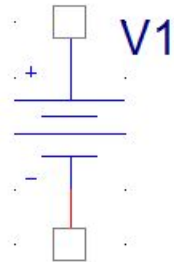
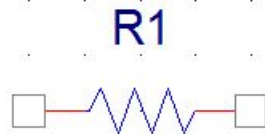


# Основные панели Schematics





# Основные электротехнические элементы



# Изменение параметров элементов

	A
	<b>+</b> SCHEMATIC1 : PAGE1
Color	Default
Designator	
DIST	FLAT
Graphic	R.Normal
ID	
Implementation	
Implementation Path	
Implementation Type	<none>
Location X-Coordinate	270
Location Y-Coordinate	220
MAX_TEMP	RTMAX
Name	INS39
Part Reference	R1
PCB Footprint	AX/RC05
POWER	RMAX
Power Pins Visible	<input type="checkbox"/>
Primitive	DEFAULT
PSpiceTemplate	R*@REFDES %1 %2 ?TOL
Reference	R1
SLOPE	RSMAX
Source Library	C:\ICADENCE\SPB_16...
Source Package	R
Source Part	R.Normal
TC1	0
TC2	0
TOLERANCE	
Value	1k
VOLTAGE	RVMAX

Display Properties

Name: Value

Value:

Font: Arial 5 (default)

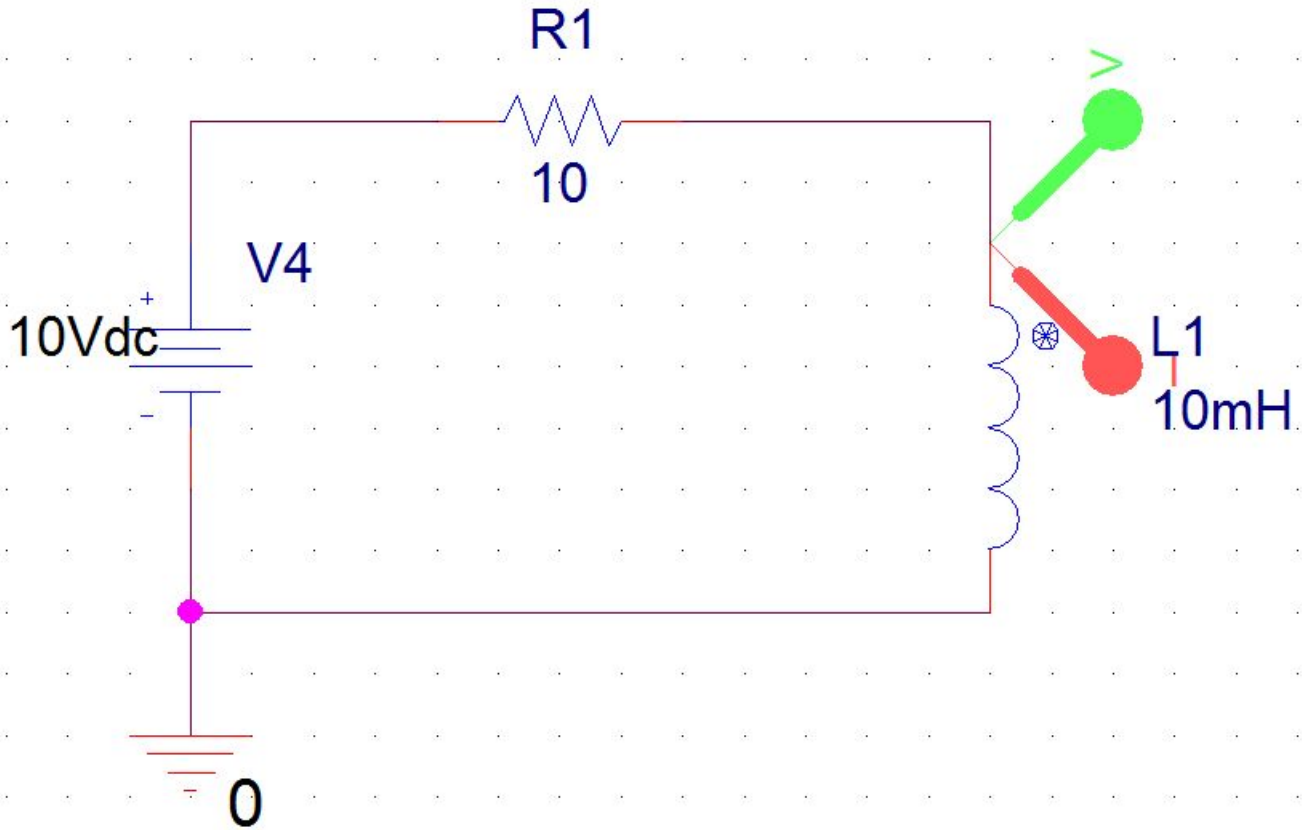
Display Format

Do Not Display  
 Value Only  
 Name and Value  
 Name Only  
 Both if Value Exists

Color:

Rotation:  0°  180°  
 90°  270°

# Создание электрической схемы



# Окно ошибки

The screenshot shows the Cadence PSpice interface. The main window displays a netlist with the following content:

```
11
12
13
14 ** Creating circuit file "Lab1.cir"
15 ** WARNING: THIS AUTOMATICALLY GENERATED FILE MAY BE OVERWRITTEN BY SUBSEQUENT SIMULATIONS
16
17 *Libraries:
18 * Profile Libraries :
19 * Local Libraries :
20 * From [PSpICE NETLIST] section of C:\Users\Николай\AppData\Roaming\SPB_Data\cdssetup\OrCAD_PSpice\16.6.0\PSpice.ini file:
21 .lib "noa.lib"
22
23 *Analysis directives:
24 .TRAN 0 10ms 0 0.1ms SKIPBP
25 .OPTIONS ADVCONV
26 .PROBE64 V(alias(*)) I(alias(*)) W(alias(*)) D(alias(*)) NOISE(alias(*))
27 .INC "..\SCHEMATIC1.net"
28
29
30
31 **** INCLUDING SCHEMATIC1.net ****
32 * source LAB1
33 R_R1      N00366 N00373 10 TC=0,0
34 L_L1      N00373 N00380 10mH
35 V_V4      N00366 N00380 10Vdc
36
37 **** RESUMING Lab1.cir ****
38 .END
39
40 ERROR(ORPSIM-15142): Node N00366 is floating
41 ERROR(ORPSIM-15142): Node N00373 is floating
42 ERROR(ORPSIM-15142): Node N00380 is floating
43
44
45 *
```

The error window at the bottom right displays the following text:

```
Reading and checking circuit
■ ERROR(ORPSIM-15142): Node N00366 is floating
■ ERROR(ORPSIM-15142): Node N00373 is floating
■ ERROR(ORPSIM-15142): Node N00380 is floating
Circuit has errors ... run aborted
See output file for details
INFO(DRPROBE-3188): Simulation aborted
```

The Command Window at the bottom left shows the following text:

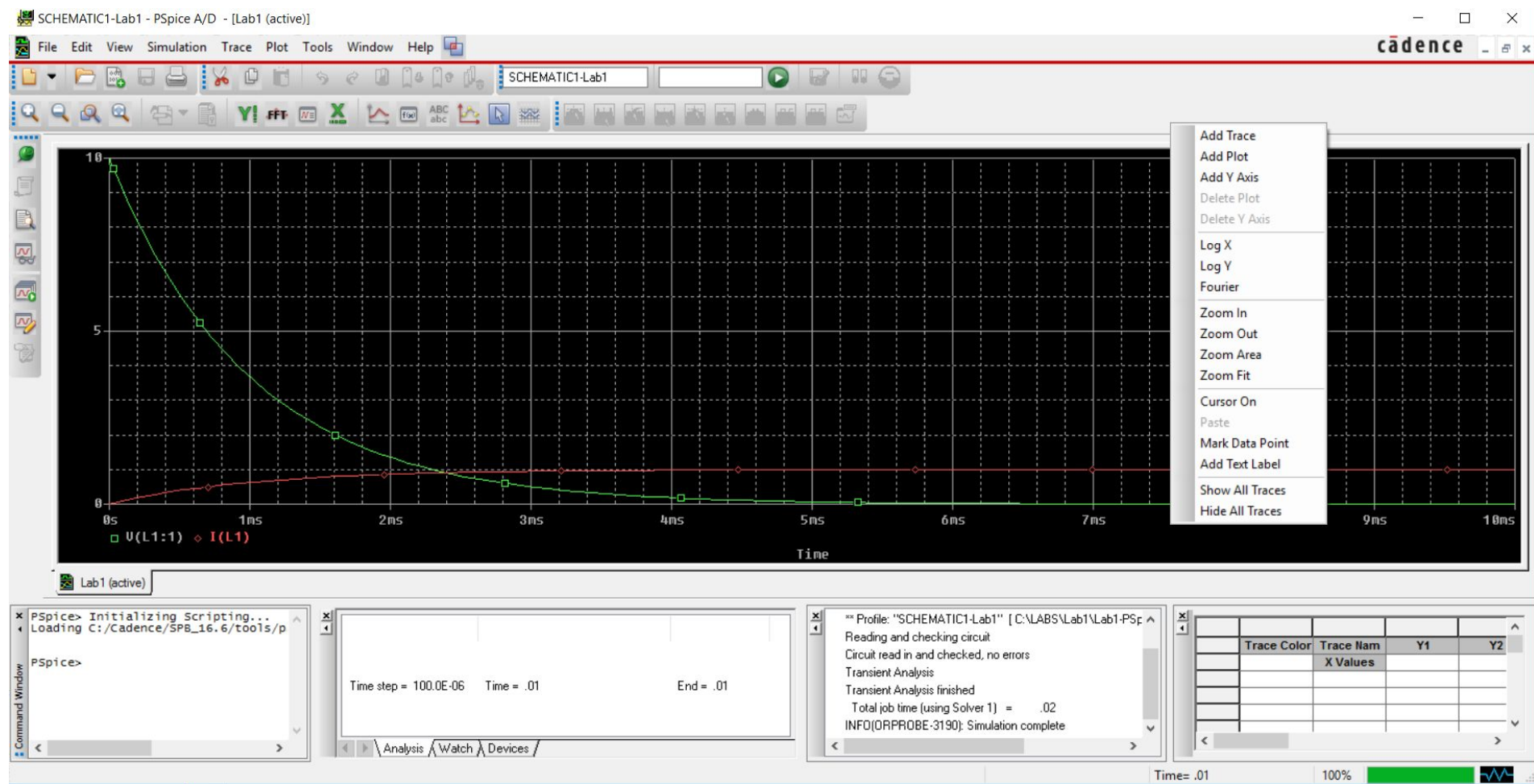
```
Ps spice> Initializing Scripting...
Loading C:/Cadence/SPB_16.6/tools/psp
Ps spice>
```

The Trace Window at the bottom right shows a table with the following columns: Trace Color, Trace Nam, Y1, Y2. The table is currently empty.

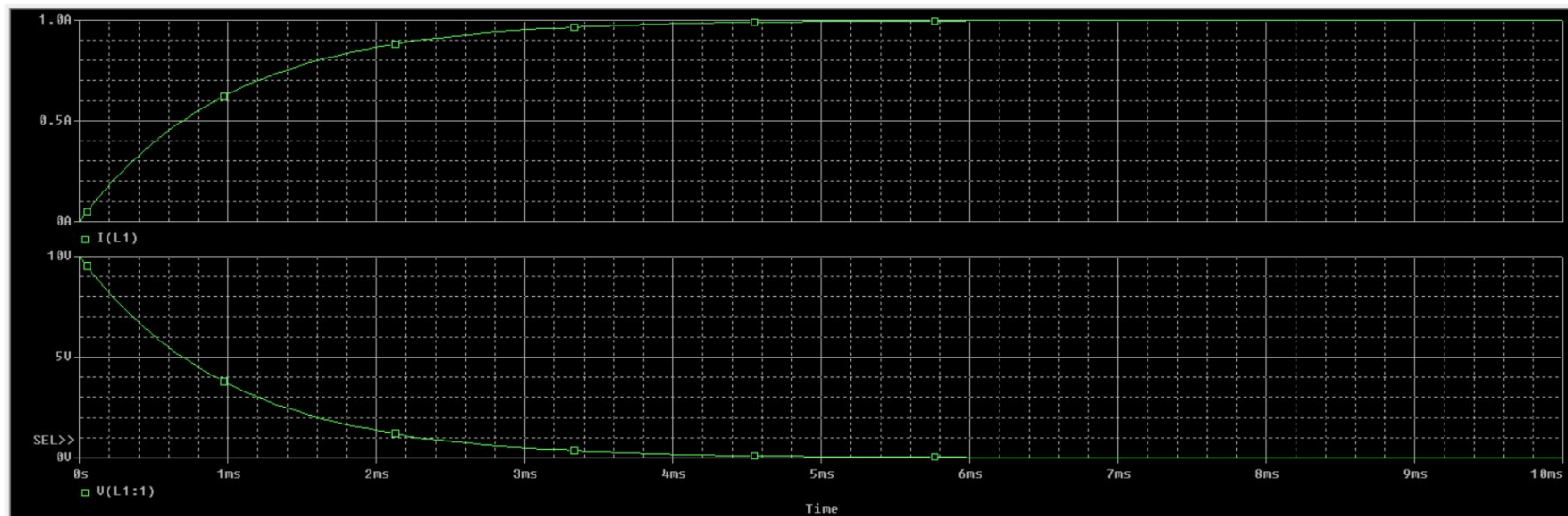
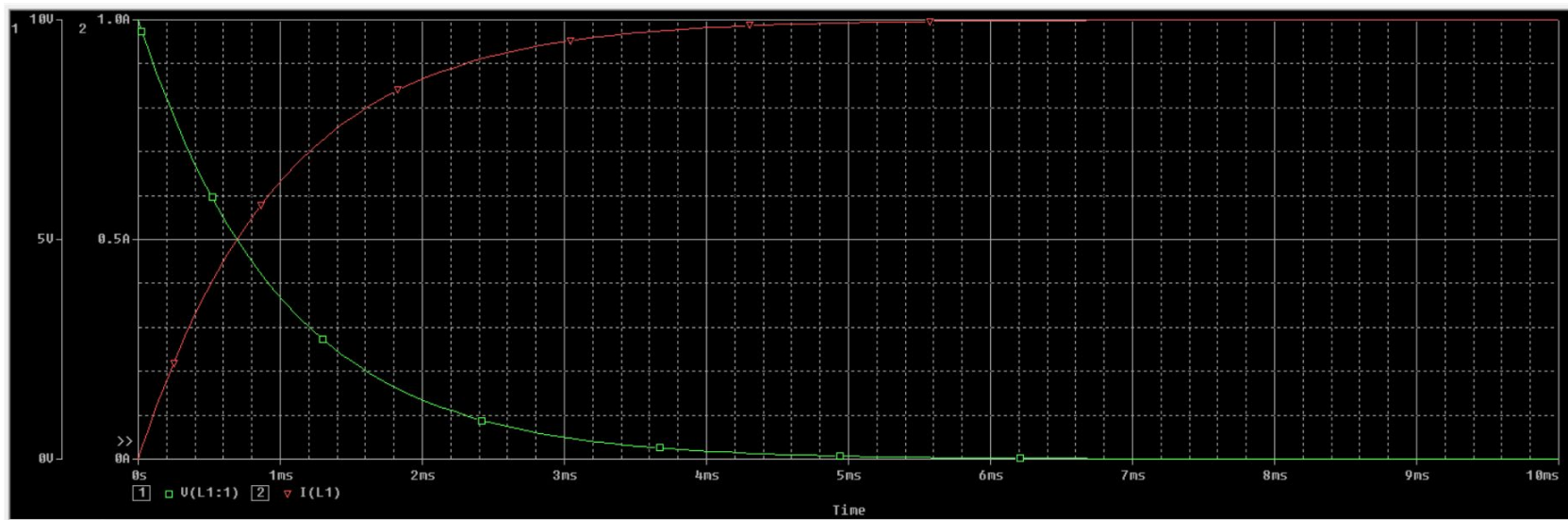
Position cursor at next peak value

Time: .01

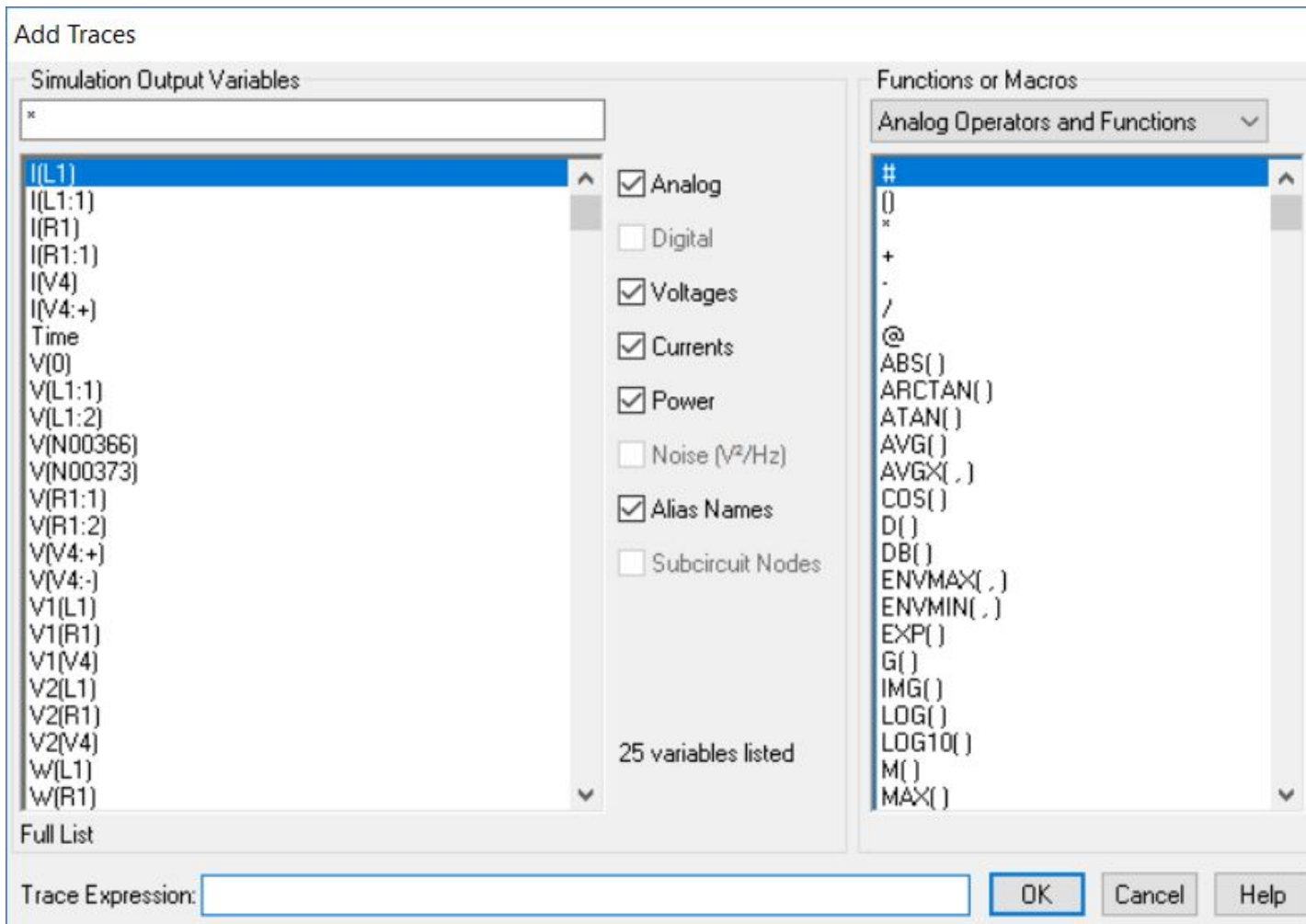
# Результаты моделирования



# Результаты моделирования

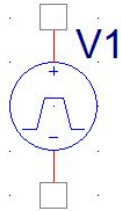


# Результаты моделирования

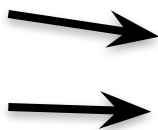


# Источник импульсного напряжения

V1 =  
 V2 =  
 TD =  
 TR =  
 TF =  
 PW =  
 PER =



Время нарастания  
 Первого  
 уровня  
 напряжения

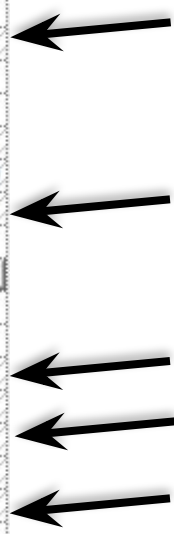


A	
	SCHEMATIC1 : PAGE1
AC	
Color	Default
DC	
Designator	
Graphic	VPULSE.Normal
ID	
Implementation	
Implementation Path	
Implementation Type	PSpice Model
Location X-Coordinate	390
Location Y-Coordinate	200
Name	INS568
Part Reference	V1
PCB Footprint	
PER	
Power Pins Visible	<input type="checkbox"/>
Primitive	DEFAULT
PSpiceOnly	TRUE
PSpiceTemplate	V*@REFDES %+ %- ?DCID
PW	
Reference	V1
Source Library	C:\CADENCE\SPB_16...
Source Package	VPULSE
Source Part	VPULSE.Normal
TD	
TF	
TR	
V1	
V2	
Value	VPULSE

Период  
 Д

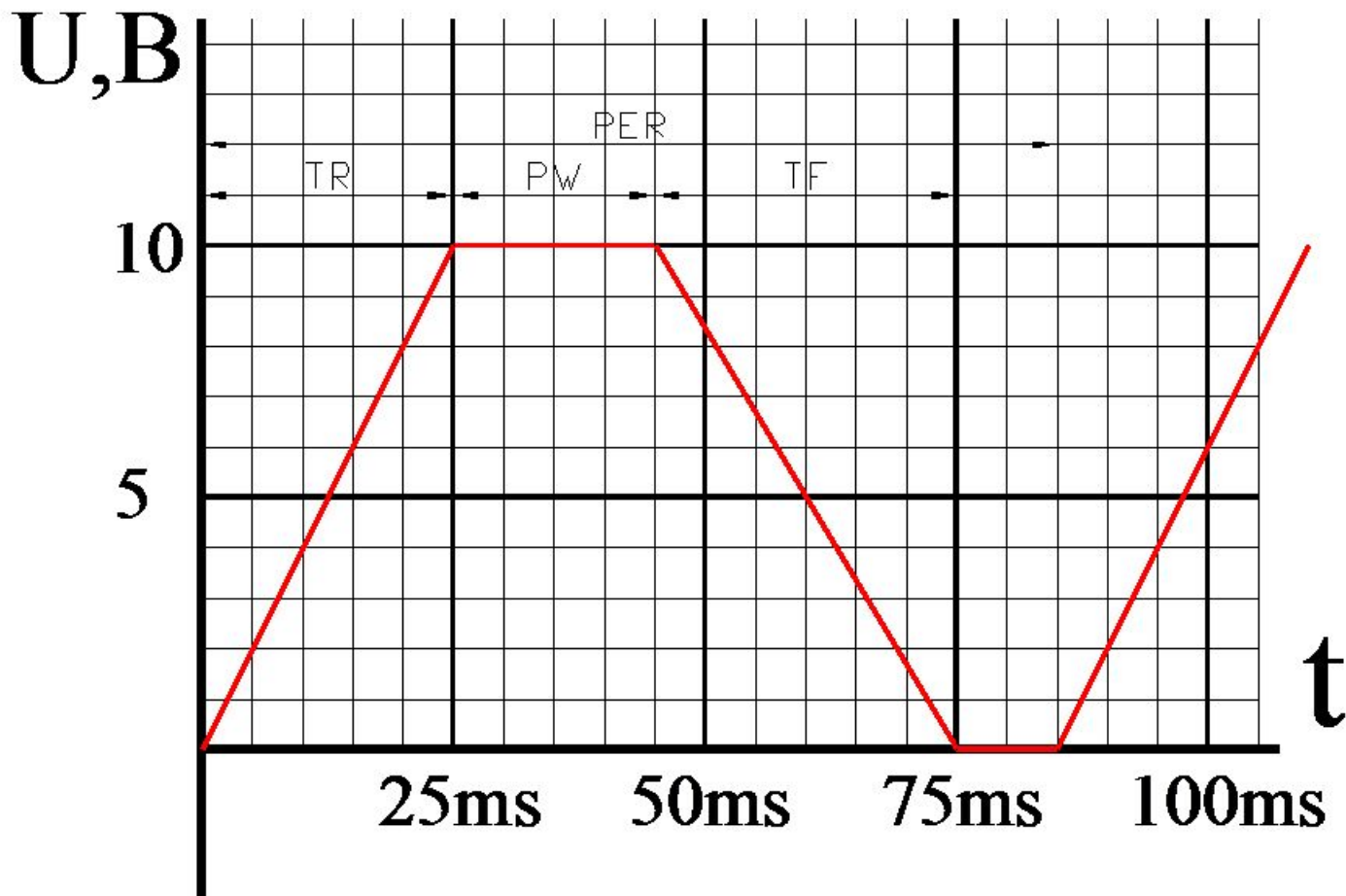
Длительность  
 импульса

Время  
 задержки  
 Время спада  
 импульса  
 Второй  
 уровень  
 напряжения

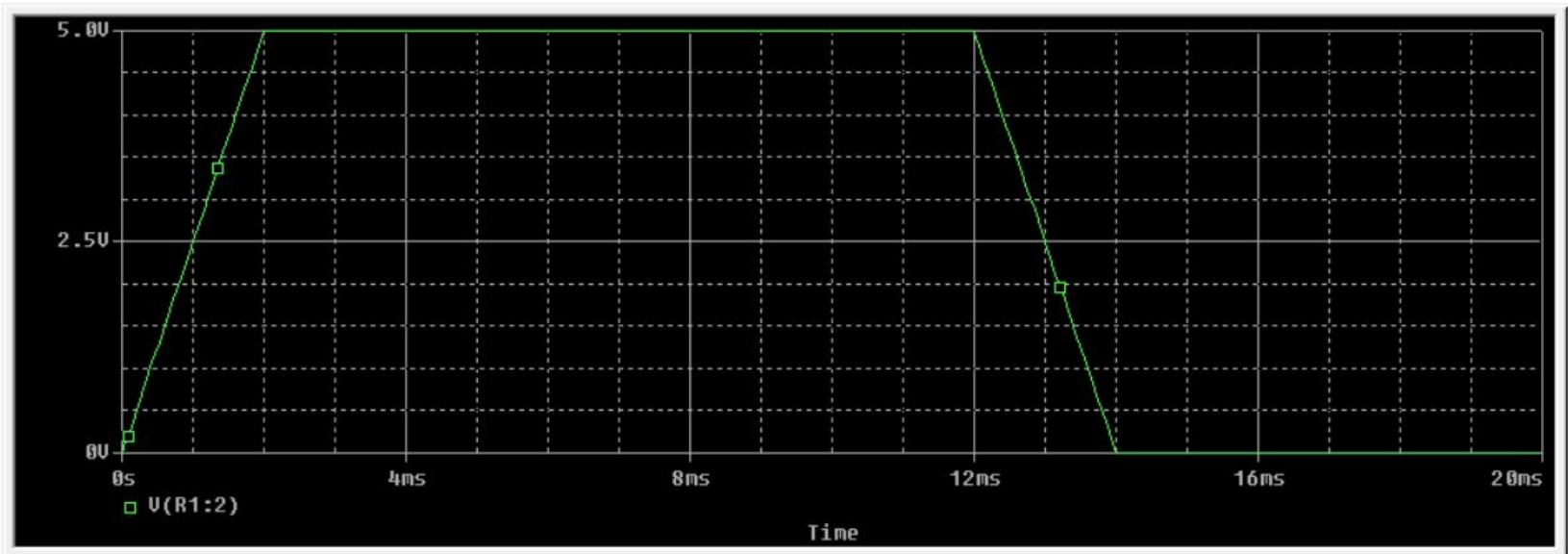
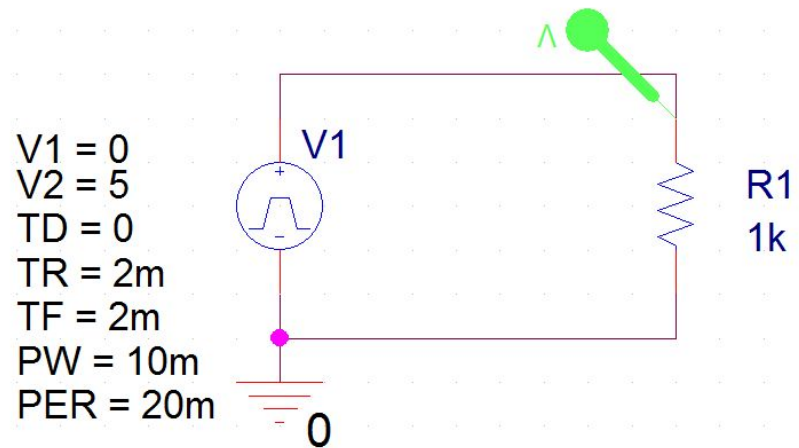




# Источник импульсного напряжения

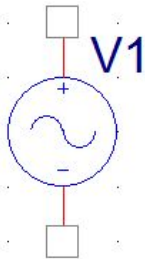


# Источник импульсного



# Источник синусоидального напряжения

VOFF =  
 VAMPL =  
 FREQ =  
 AC =



A	
SCHEMATIC1 : PAGE1	
AC	
Color	Default
DC	
Designator	
DF	0
FREQ	
Graphic	VSIN.Normal
ID	
Implementation	
Implementation Path	
Implementation Type	PSpice Model
Location X-Coordinate	410
Location Y-Coordinate	200
Name	INST86
Part Reference	V1
PCB Footprint	
PHASE	0
Power Pins Visible	<input type="checkbox"/>
Primitive	DEFAULT
PSpiceOnly	TRUE
PSpiceTemplate	V*@REFDES %+ %- ?DCID
Reference	V1
Source Library	C:\CADENCE\SPB_16
Source Package	VSIN
Source Part	VSIN.Normal
TD	0
Value	VSIN
VAMPL	
VOFF	

← Частота

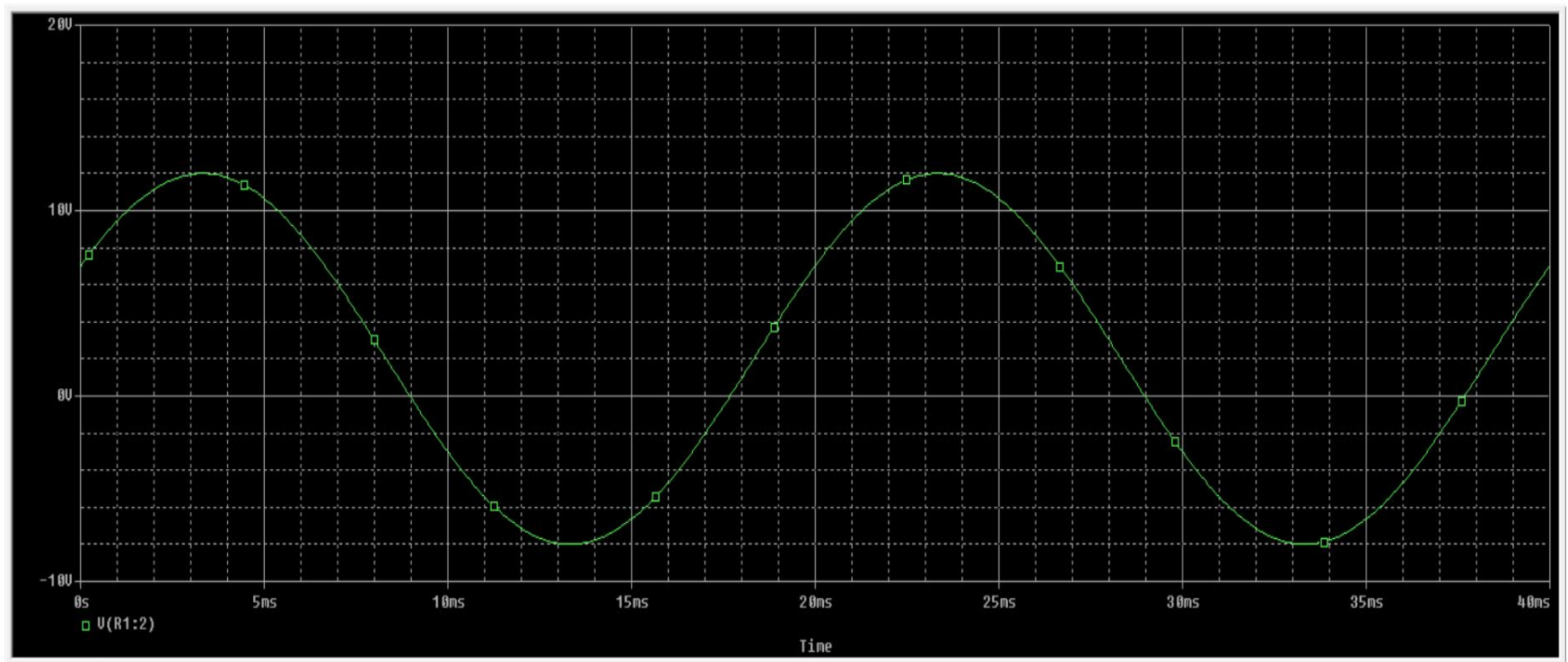
← Фазовый сдвиг

← Амплитудное значение

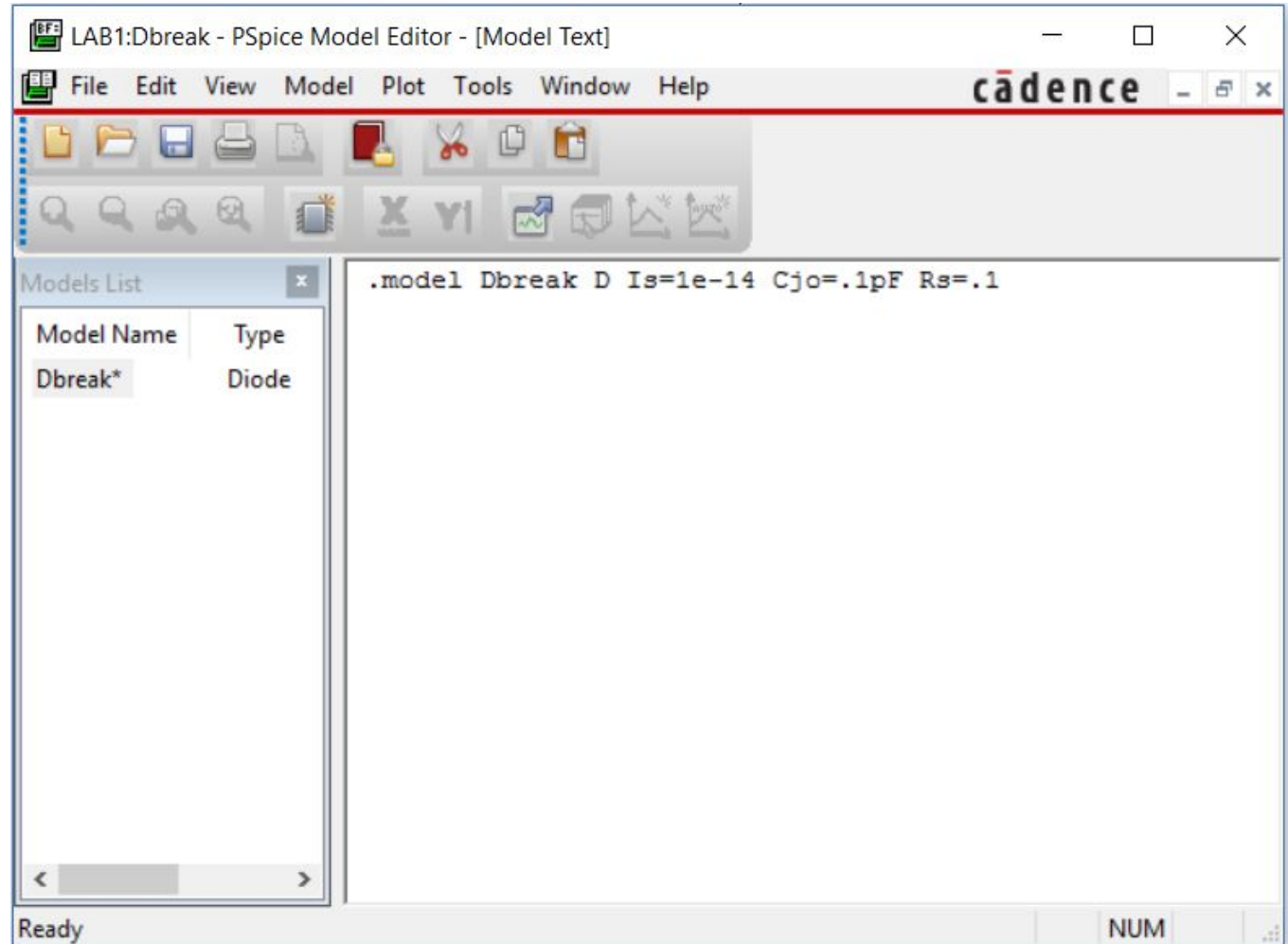
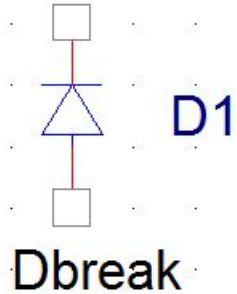
Постоянная составляющая



# Источник синусоидального напряжения

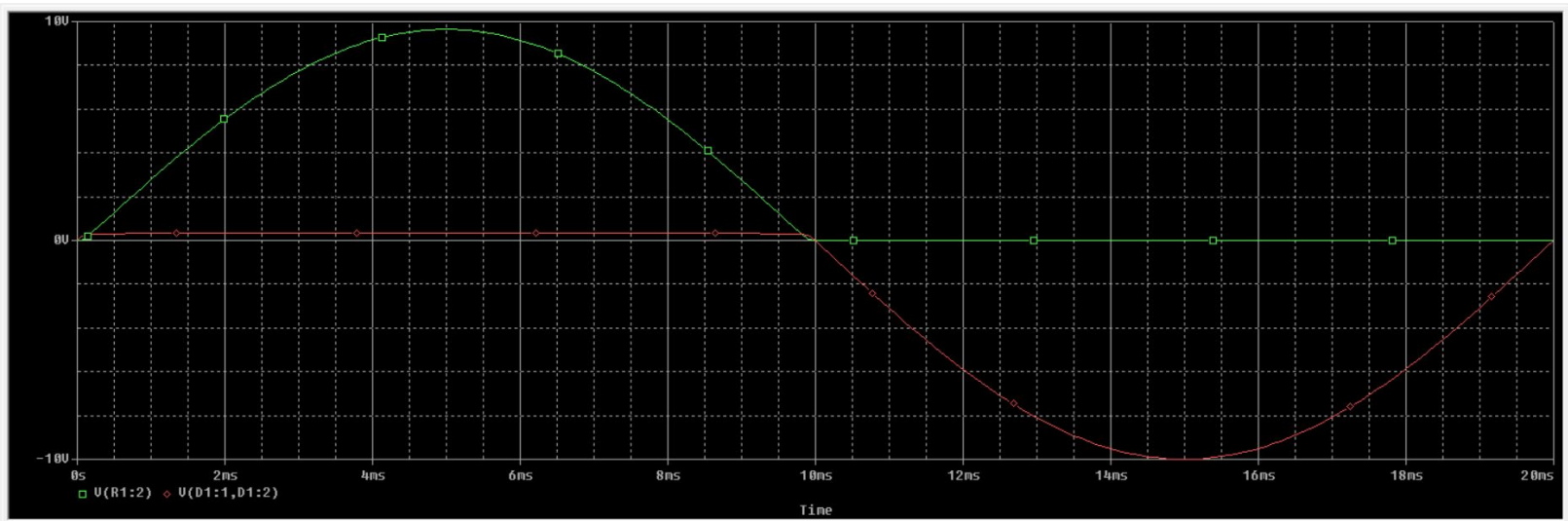
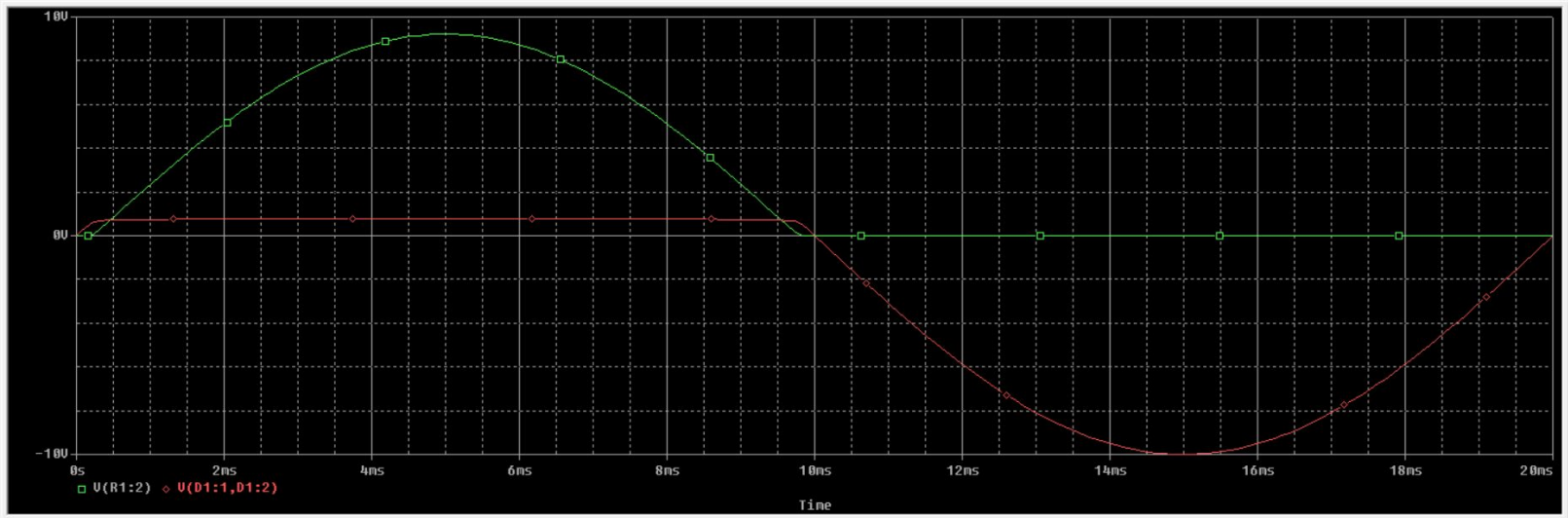


# Идеализированный диод

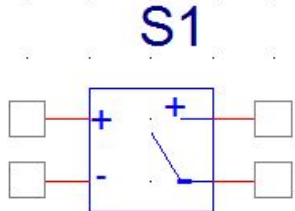




# Идеализированный диод



# Идеализированный ключ



**S**  
 $V_{OFF} = 0.0V$   
 $V_{ON} = 1.0V$

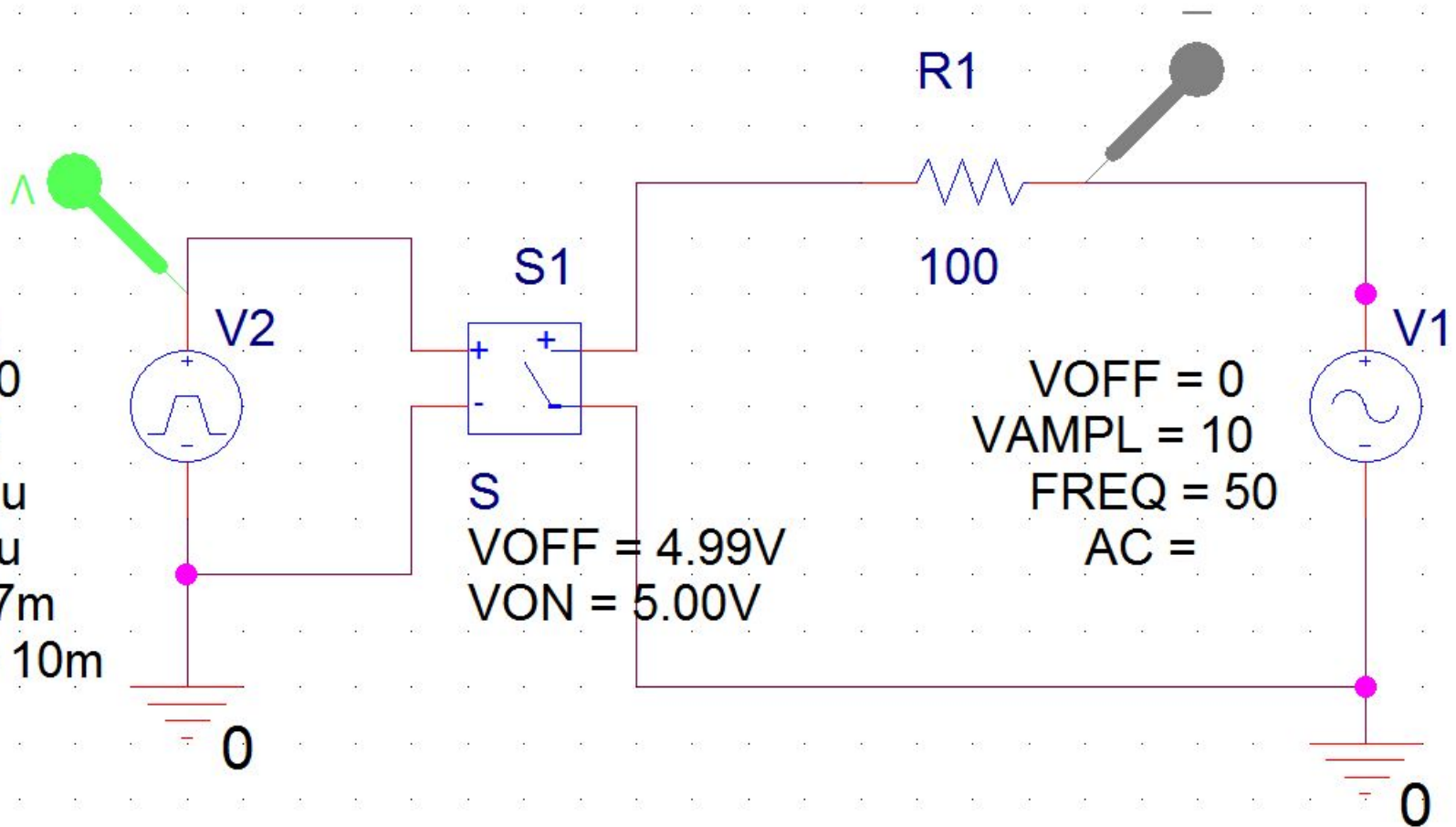
A	
SCHEMATIC1 : PAGE1	
Color	Default
Designator	
Graphic	S.Normal
ID	
Implementation	
Implementation Path	
Implementation Type	<none>
Location X-Coordinate	420
Location Y-Coordinate	470
Name	INS1279
Part Reference	S1
PCB Footprint	
Power Pins Visible	<input type="checkbox"/>
Primitive	DEFAULT
PSpiceOnly	TRUE
PSpiceTemplate	S^@REFDES %3 %4 %1 %
Reference	S1
ROFF	1e6
RON	1.0
Source Library	C:\CADENCE\SPB_16...
Source Package	S
Source Part	S.Normal
Value	S
VOFF	0.0V
VON	1.0V

Сопротивление  
 В  
 выключенном  
 состоянии  
 Сопротивление во  
 включенном  
 состоянии  
 Напряжени  
 е  
 выключени  
 Напряжени  
 я  
 е  
 включения



# Идеализированный ключ

V1 = 0  
V2 = 10  
TD = 0  
TR = 1u  
TF = 1u  
PW = 7m  
PER = 10m



# Идеализированный ключ

