Diode 특성

모델 라이브러리

|		
anl_misc.olb	1-Dec-1998	42K
anlg_dev.lib	27-Jul-1998	1660K
anlg_dev.olb	25-Nov-1998	653K
apex.lib	15-Aug-1995	45K
apex.olb	25-Nov-1998	40K
bipolar.lib	16-Apr-1998	414K
bipolar.olb	25-Nov-1998	549K
breakout.lib	13-Oct-1998	8K
breakout.olb	27-Apr-1999	55K
burr_brn.lib	25-Mar-1998	516K
burr_brn.olb	23-Feb-1999	197K
cd4000.lib	17-Apr-1998	158K
cd4000.olb	25-Nov-1998	147K
cel.lib	5-Oct-1998	114K
cel.olb	25-Nov-1998	45K

모델 라이브러리: OLB 화일

OLB 화일은

OrCAD_16.6_Lite\tools\capture\library\pspice 로 복사.
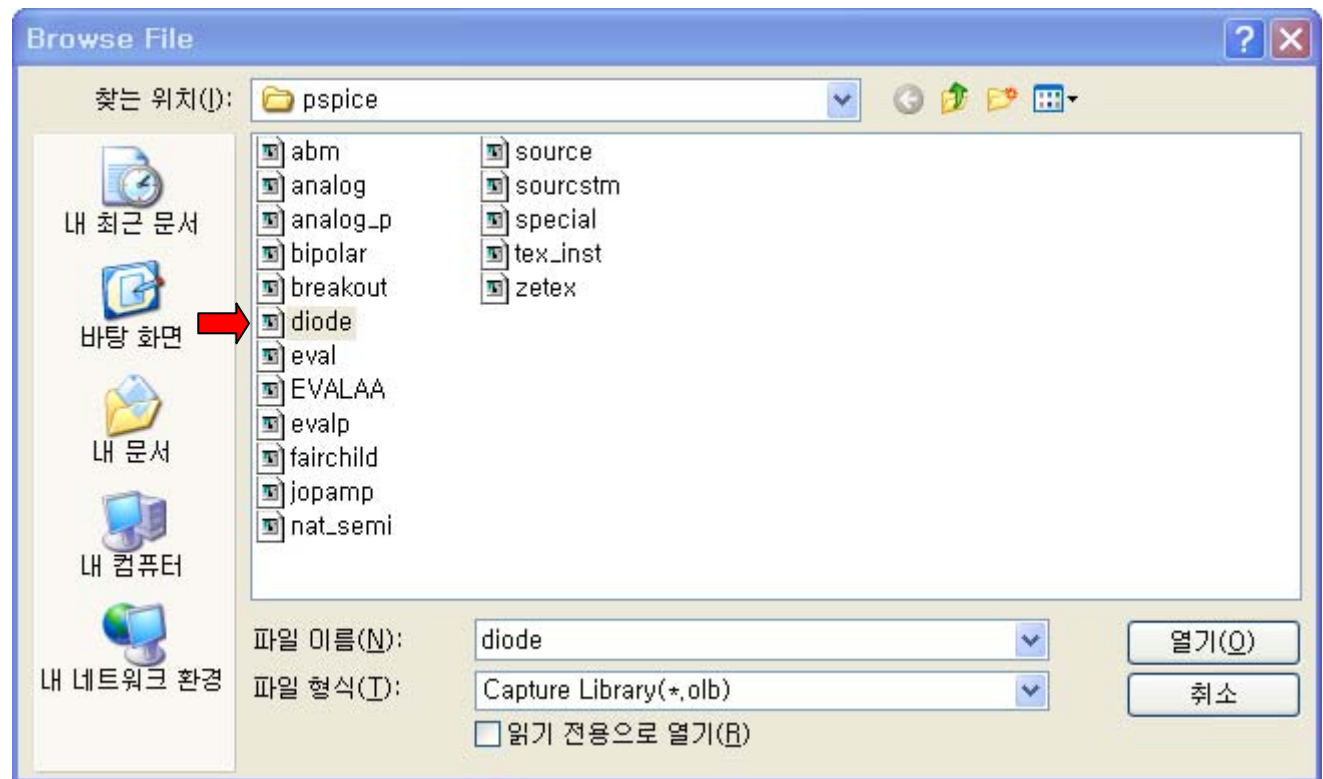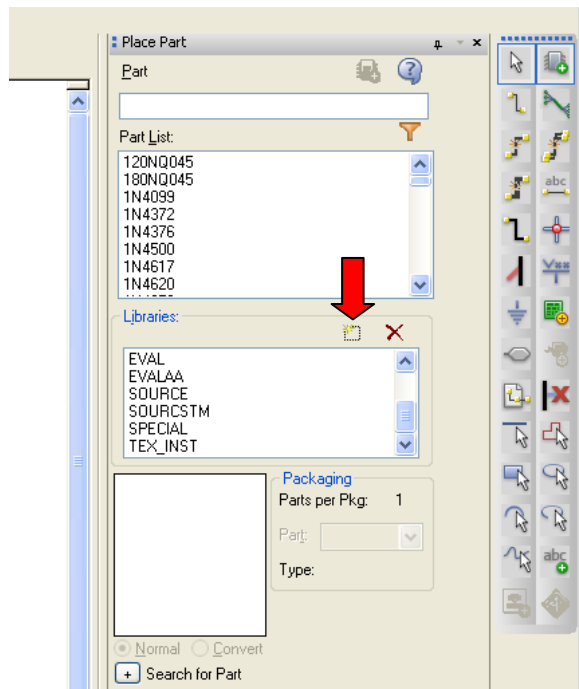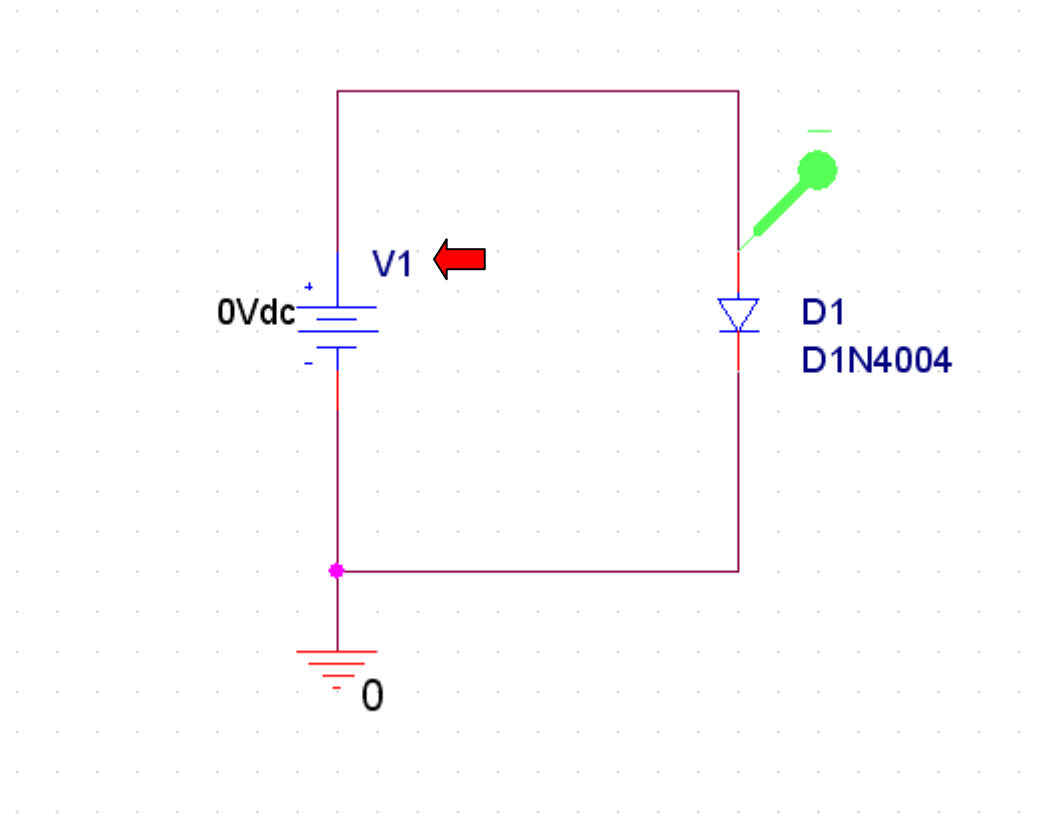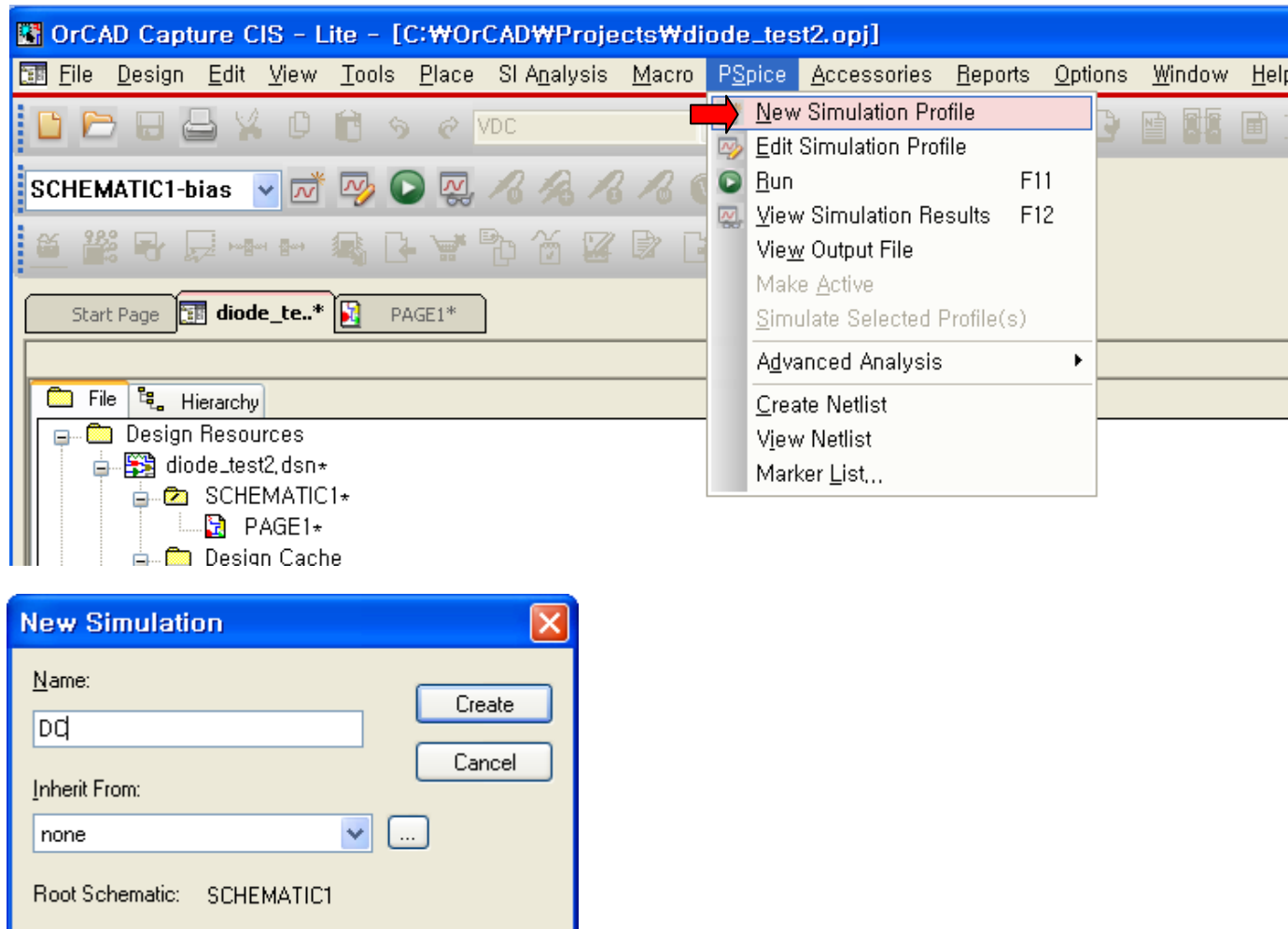
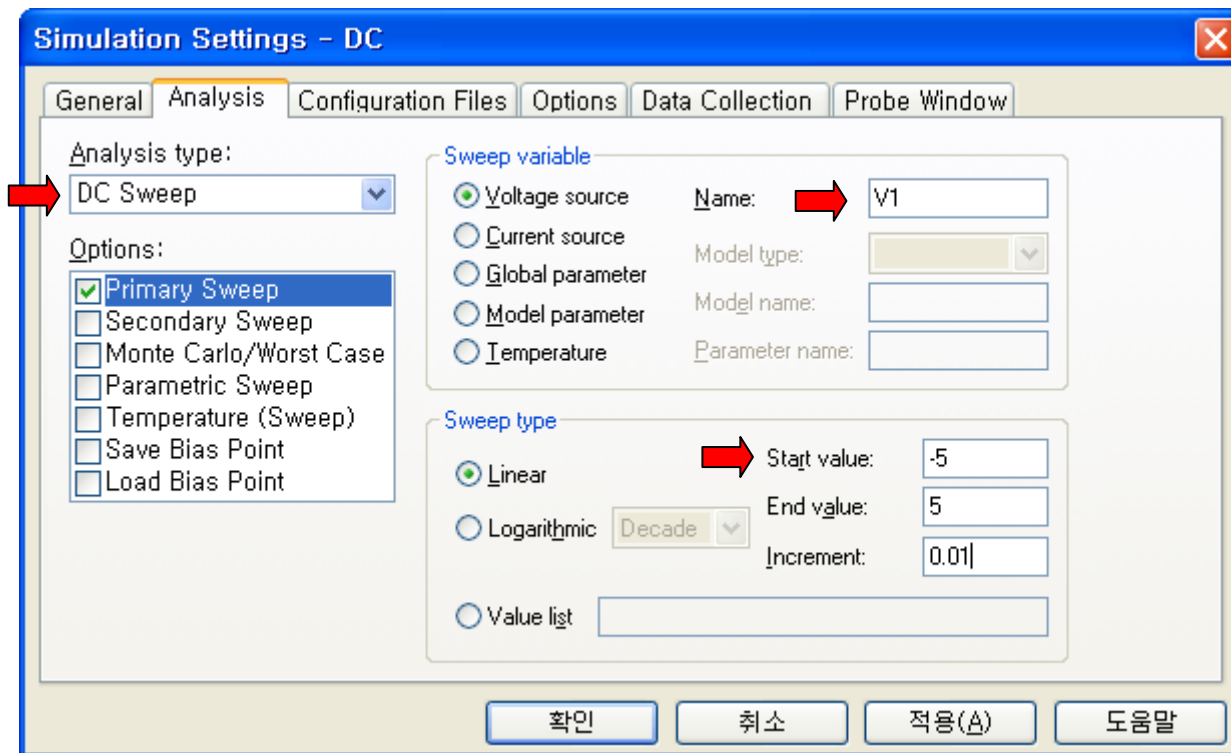# 모델 라이브러리: OLB 화일
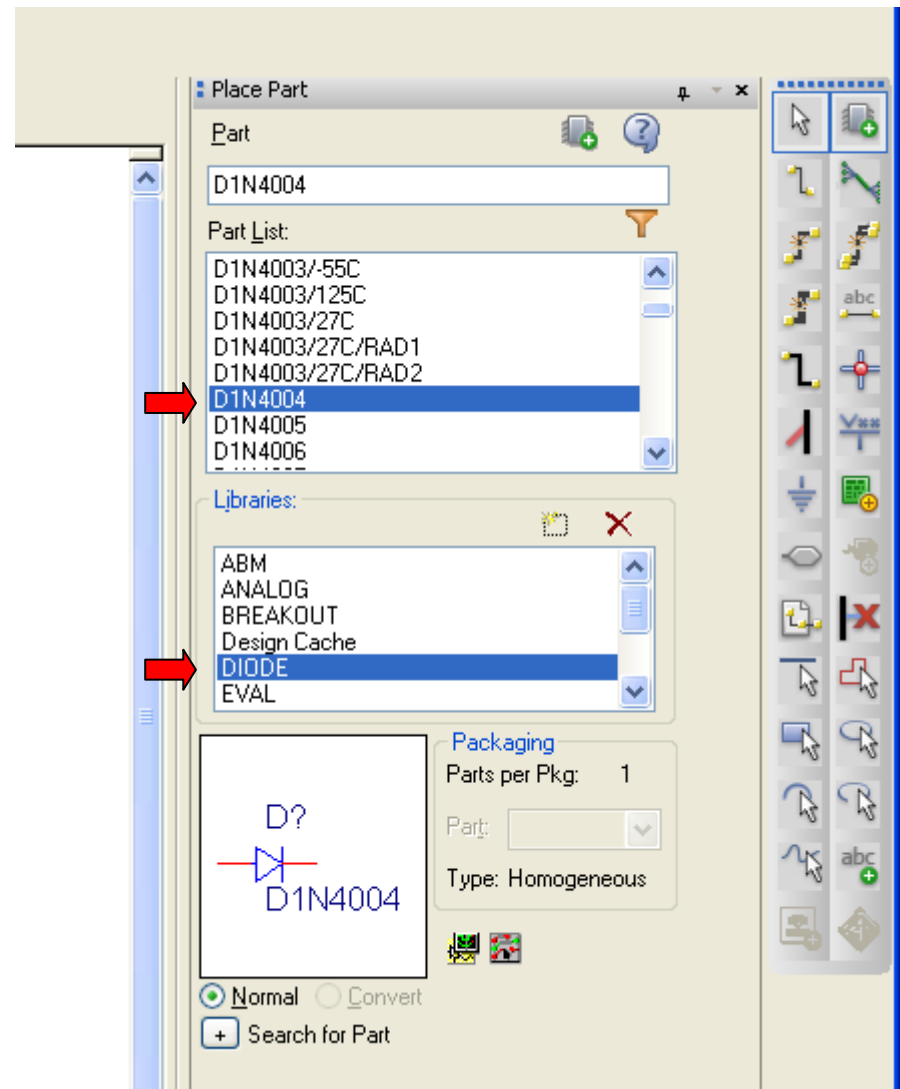
DIODE>>D1N4004

모델 라이브러리: OLB 화일

DC SWEEP
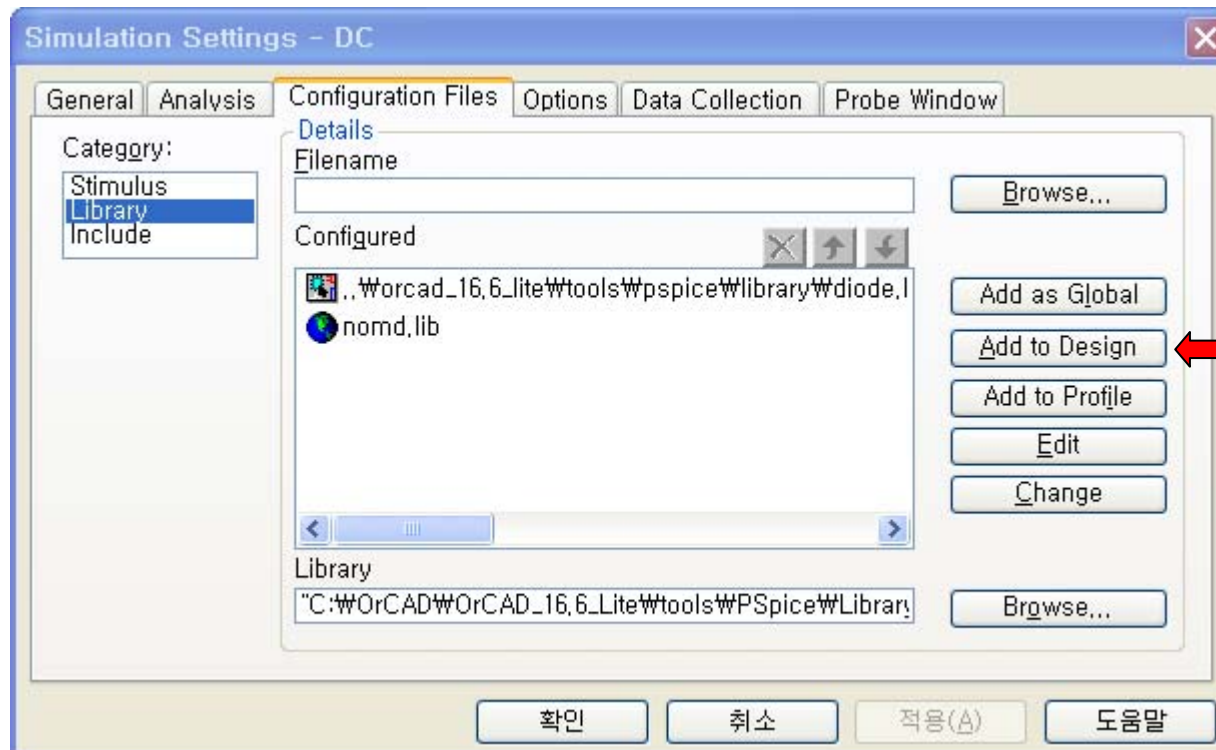
Simulation Profile 추가

DC SWEEP

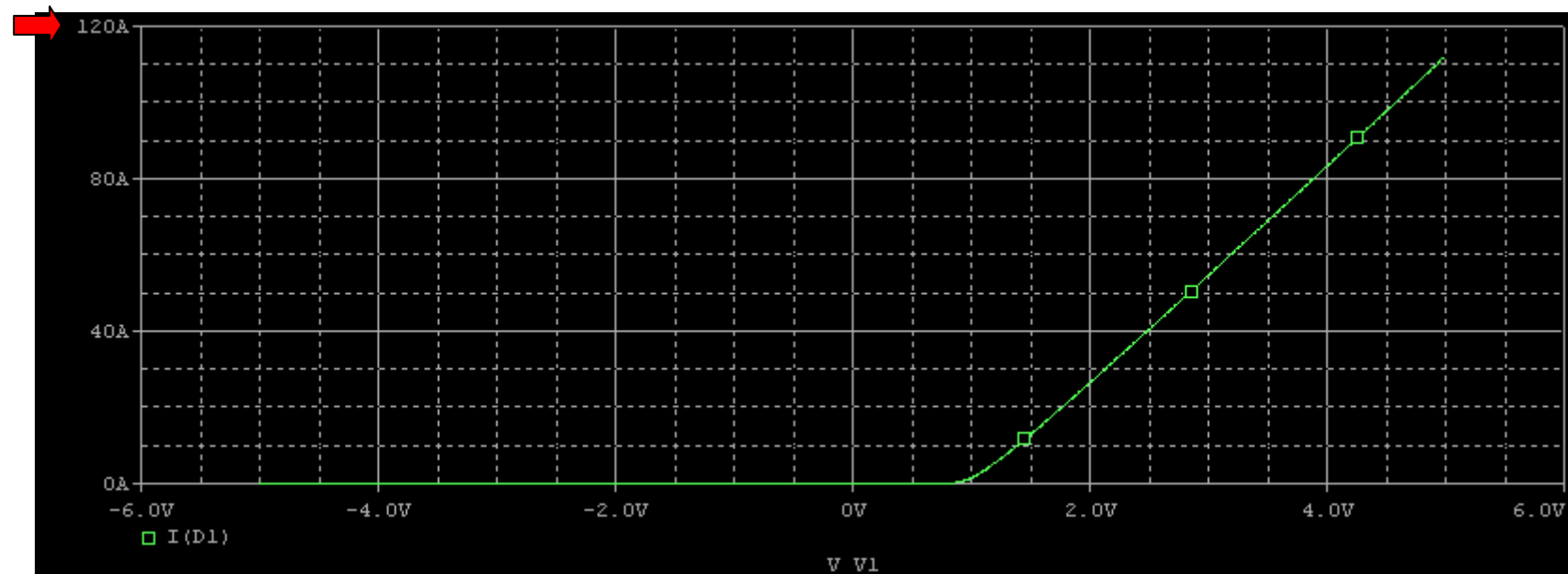Analysis type을 'DC Sweep'으로 설정하고, variable 및 범위 설정.

DC SWEEP, LIB 화일

LIB 화일은

OrCAD_16.6_Lite₩tools₩PSpice₩Library 로 복사
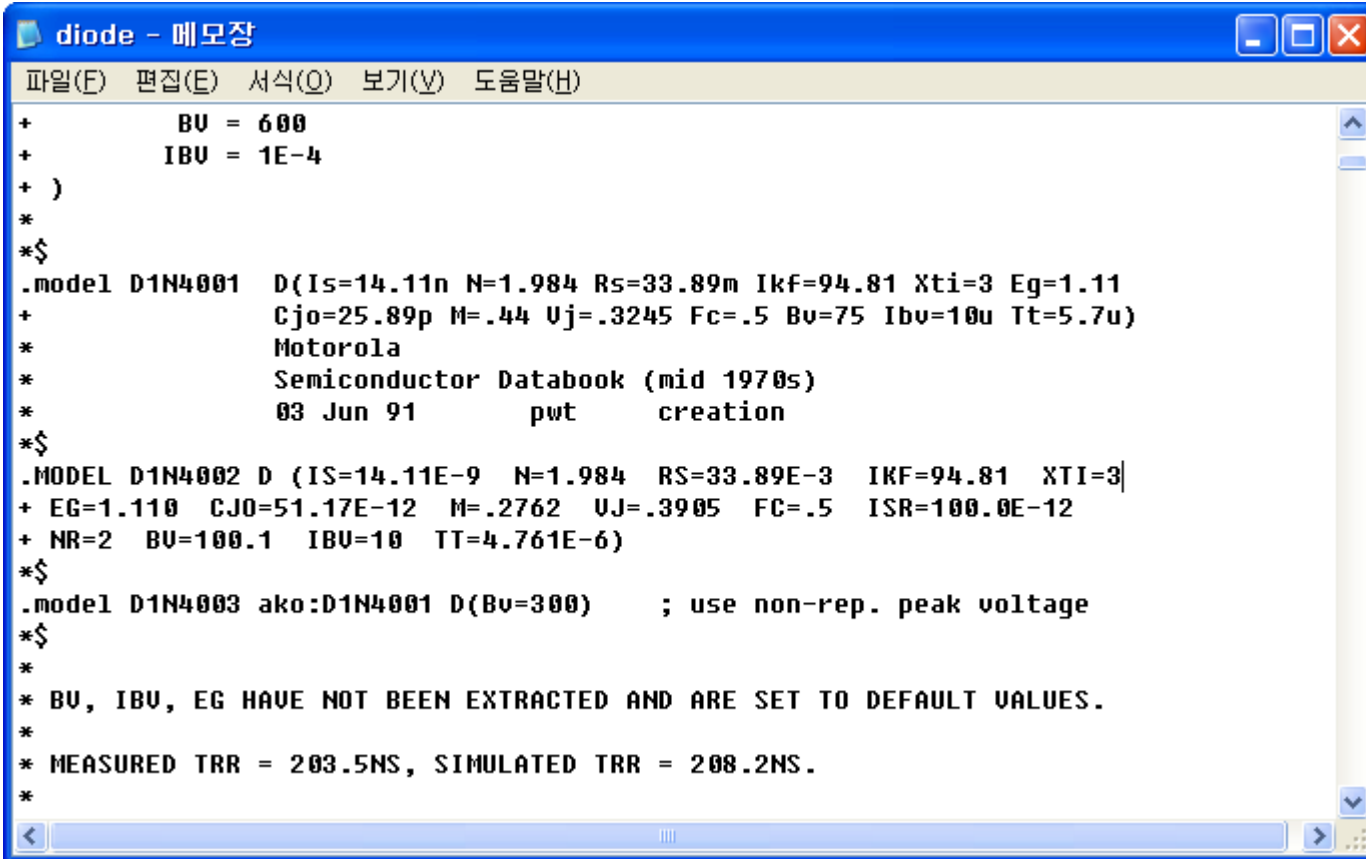
DC SWEEP

Simulation 결과.

LIB 화일

LIB 파일 내부


```
diode - 메모장

파일(F)   편집(E)   서식(O)   보기(V)   도움말(H)

+         BV = 600
+        IBV = 1E-4
+ )
*
*$
.model D1N4001   D(Is=14.11n N=1.984 Rs=33.89m Ikf=94.81 Xti=3 Eg=1.11
+               Cjo=25.89p M=.44 Vj=.3245 Fc=.5 Bv=75 Ibv=10u Tt=5.7u)
*               Motorola
*               Semiconductor Databook (mid 1970s)
*               03 Jun 91      pwt     creation
*$
.MODEL D1N4002 D (IS=14.11E-9   N=1.984   RS=33.89E-3   IKF=94.81   XTI=3
+ EG=1.110  CJO=51.17E-12  M=.2762  VJ=.3905  FC=.5  ISR=100.0E-12
+ NR=2  BV=100.1  IBV=10  TT=4.761E-6)
*$
.model D1N4003 ako:D1N4001 D(Bv=300)    ; use non-rep. peak voltage
*$
*
* BV, IBV, EG HAVE NOT BEEN EXTRACTED AND ARE SET TO DEFAULT VALUES.
*
* MEASURED TRR = 203.5NS, SIMULATED TRR = 208.2NS.
*
```

LIB 화일

Modeling in SPICE a diode is not a trivial job. Although its working is quite simple, extract a model from datasheet takes some time.Every component has its own syntax defined in SPICE , in the case of the diode:

.model ModelName D (par1=a par2=b.........parn=x)

where *par1 par2 .... parn* are characteristic parameters of diode.

we can sum up the set of main parameters in the following table:

Parameter	Description	Unit	Default value
BV	Reverse breakdown knee voltage	V	Infinite
CJO	Zero-bias p-n capacitance	F	0
EG	Bandgap voltage	eV	1.11
FC	Forward-bias depletion capacitance coefficient	no unit dimension	0.5
IBLV	Low-level reverse breakdown knee corrent	A	0
IBV	Reverse breakdown knee corrent	A	1e-10
IKF	High-injection knee current	A	Infinite
IS	Saturation corrent	A	1e-14
ISR	Recombination current parameter	A	0
M	p-n grading coefficient	no unit dimension	0.5
N	Emission coefficient	no unit dimension	1.0
NR	Emission coefficient for ISR	no unit dimension	2.0
RS	Parasitic resistance	Ohm	0
TT	Transit time	sec	0
VJ	p-n potential	V	1.0
XTI	IS temperature exponent	no unit dimension	3.0

http://www.youspice.com/ys/diodefromdatasheet.3sp

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HANYANG UNIVERSITY

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http://web.yonsei.ac.kr/hgjung

사양서, Specification

FAIRCHILD
SEMICONDUCTOR®

May 2009

1N4001 - 1N4007
General Purpose Rectifiers

Features
- Low forward voltage drop.
- High surge current capability.

DO-41
COLOR BAND DENOTES CATHODE

Absolute Maximum Ratings * T$_A$ = 25 °C unless otherwise noted

Symbol	Parameter	Value							Units
		4001	4002	4003	4004	4005	4006	4007	
V$_{RRM}$	Peak Repetitive Reverse Voltage	50	100	200	400	600	800	1000	V
I$_{F(AV)}$	Average Rectified Forward Current .375 " lead length @ T$_A$ = 75°C	1.0							A
I$_{FSM}$	Non-Repetitive Peak Forward Surge Current 8.3ms Single Half-Sine-Wave	30							A
I²t	Rating for Fusing (t<8.3ms)	3.7							A²sec
T$_{STG}$	Storage Temperature Range	-55 to +175							°C
T$_J$	Operating Junction Temperature	-55 to +175							°C

* These ratings are limiting values above which the serviceability of any semiconductor device may by impaired.

Thermal Characteristics

Symbol	Parameter	Value	Units
P$_D$	Power Dissipation	3.0	W
R$_{θJA}$	Thermal Resistance, Junction to Ambient	50	°C/W

Electrical Characteristics T$_A$ = 25 °C unless otherwise noted

Symbol	Parameter		Value	Units
V$_F$	Forward Voltage @ 1.0A		1.1	V
I$_{rr}$	Maximum Full Load Reverse Current, Full Cycle	T$_A$ = 75°C	30	µA
I$_R$	Reverse Current @ Rated V$_R$	T$_A$ = 25°C	5.0	µA
		T$_A$ = 100°C	50	µA
C$_T$	Total Capacitance V$_R$ = 4.0V, f = 1.0MHz		15	pF

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1N4001 - 1N4007 Rev. C2   1   www.fairchildsemi.com

Typical Performance Characteristics
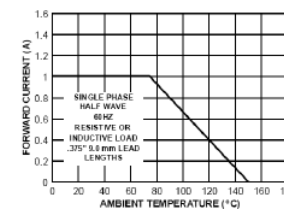
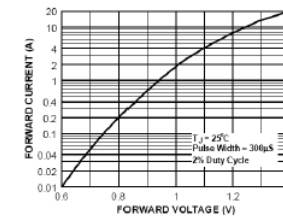Figure 1. Forward Current Derating Curve

Figure 2. Forward Characteristics

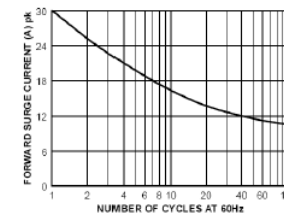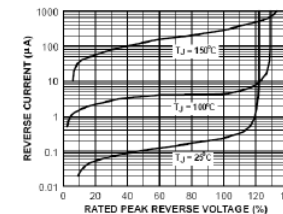Figure 3. Non-Repetitive Surge Current
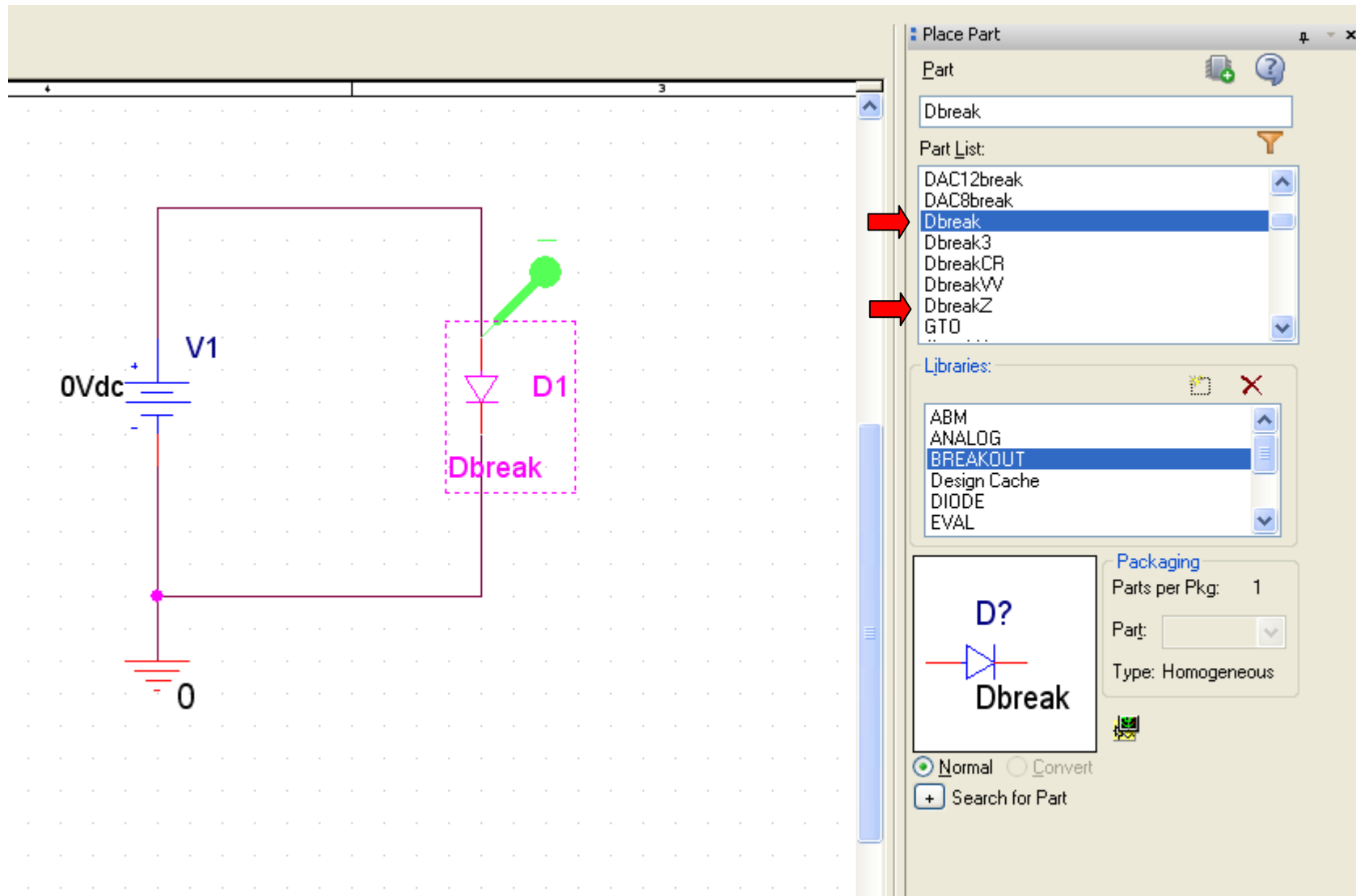
Figure 4. Reverse Characteristics

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E-mail: hogijung@hanyang.ac.kr
http://web.yonsei.ac.kr/hgjung

한양대학교
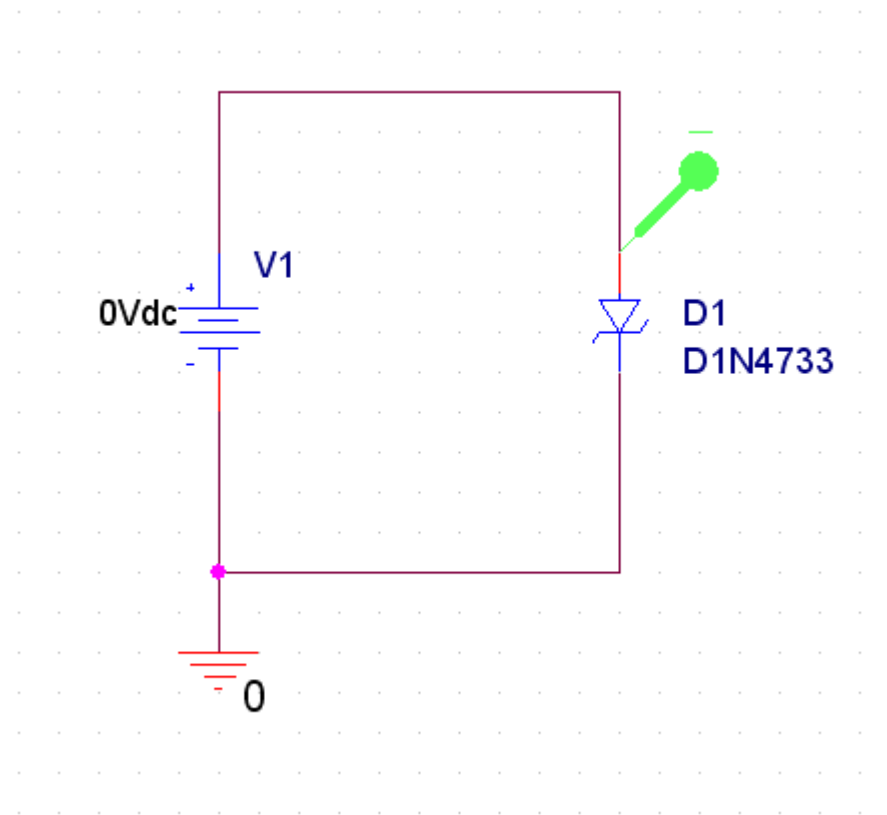HANYANG UNIVERSITY

DBREAKOUT 라이브러리

DBREAKOUT 라이브러리
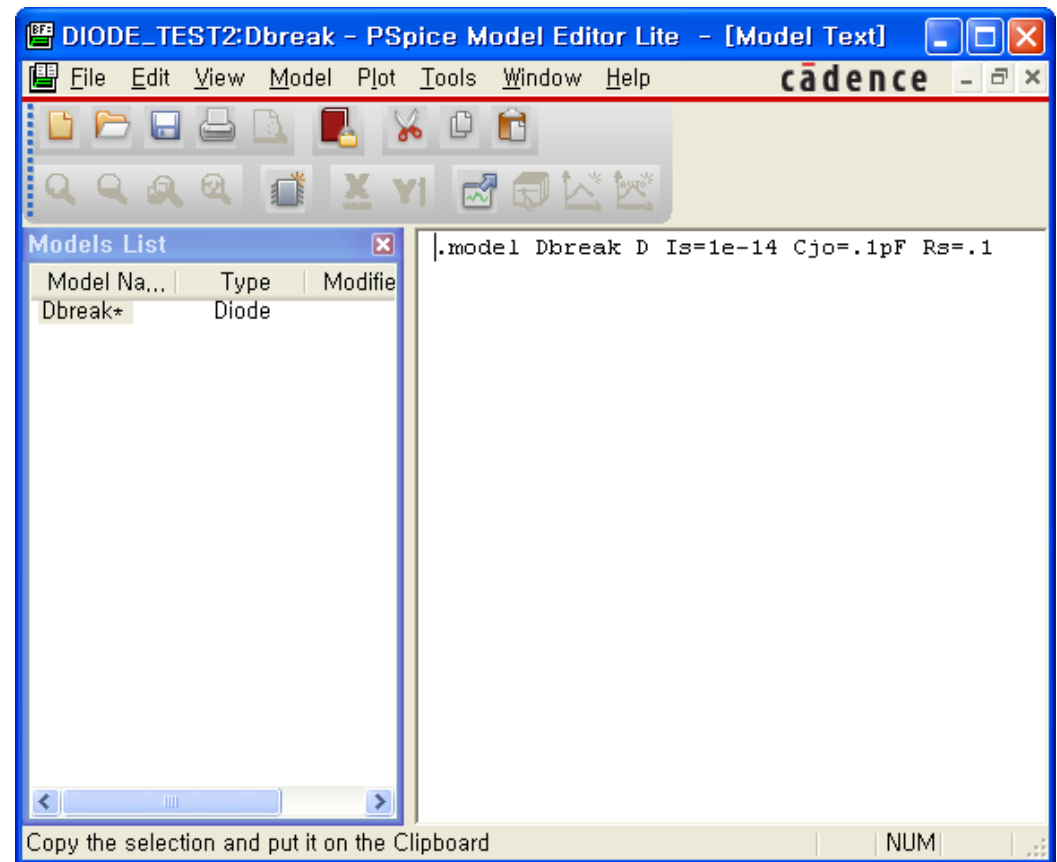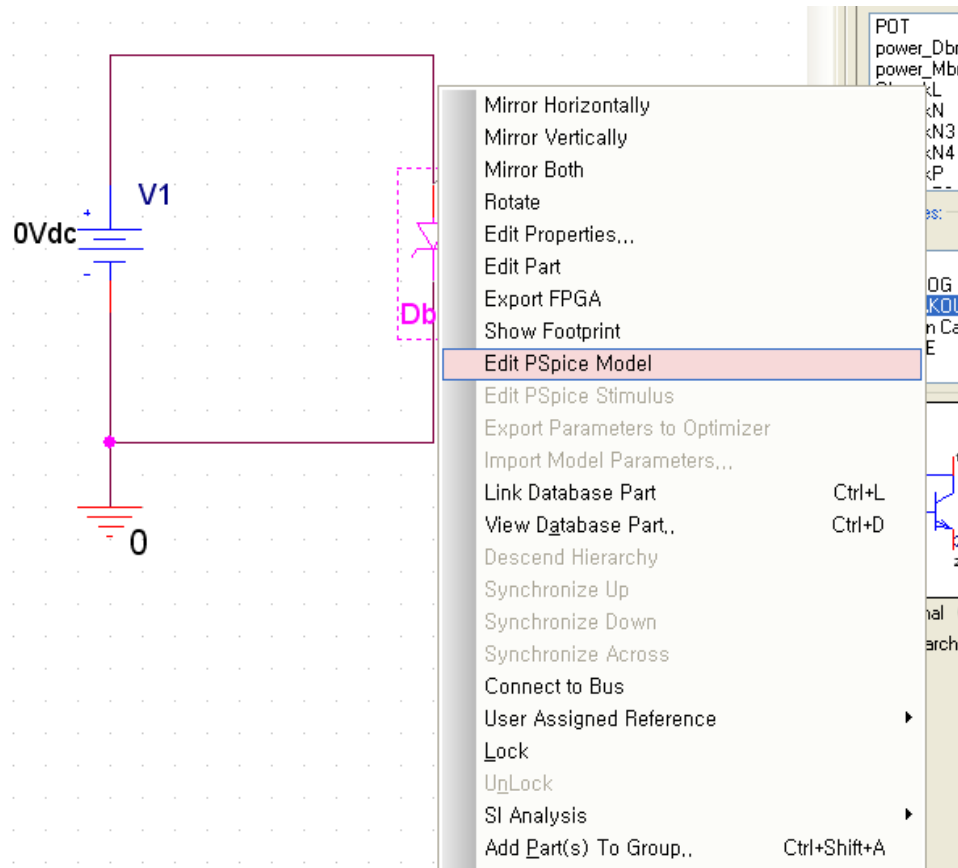
숙제

1. DC SWEEP을 이용한 다이오드 D1N4004의 V-I 특성 곡선을 구하라.

2. DC SWEEP을 이용해 제너 다이오드 D1N4733의 V-I 특성 곡선을 구하라.

숙제

DC SWEEP을 이용해 제너 다이오드 D1N4733의 V-I 특성 곡선을 구하라.