2A & 2B – 4155B - SHEET Mode

SMU4   SMU1

F1P   S1P

F2P   S2P

SMU3   SMU2

SMU1

S1P

SMU2

SMU4

F1P

F2P

SMU3

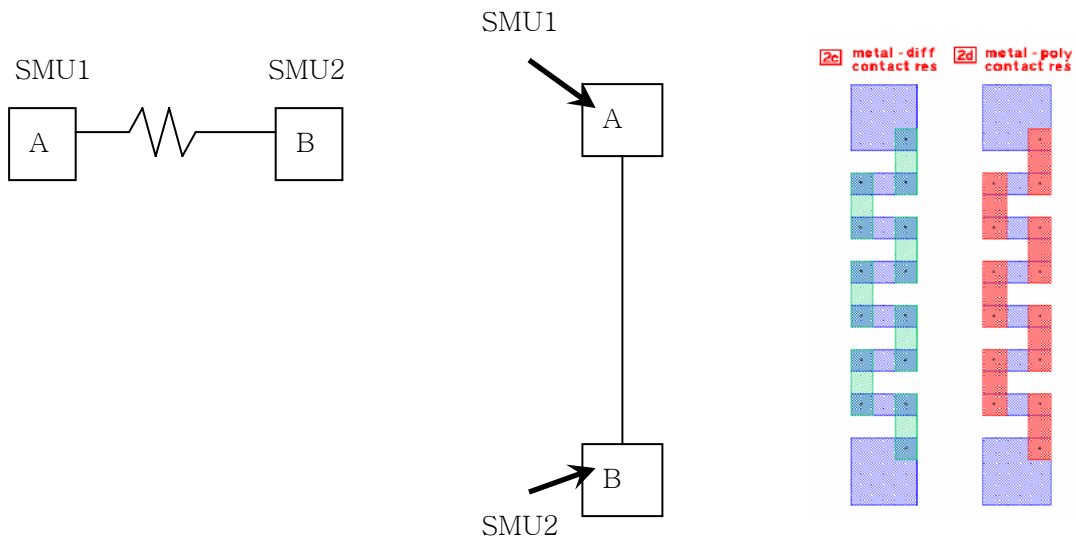R_{diff} 2a   2b R_{poly}

Settings

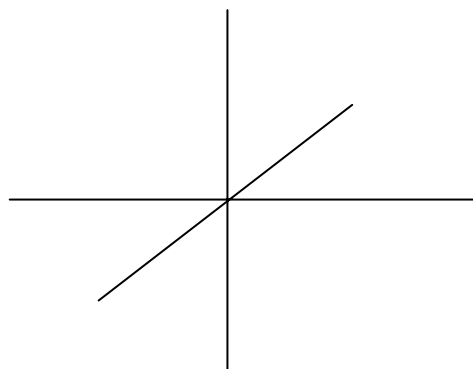|	Stimulus	Measure	Sweep
F1P (SMU4)	Current	Current	Sweep Start -0.1 Stop 0.1 Compliance 5
F2P (SMU3)	Voltage		Constant
S1P (SMU1)	Current	Voltage	Constant Compliance 5
S2P (SMU1)	Current	Voltage	Constant Compliance 5

Device 2A
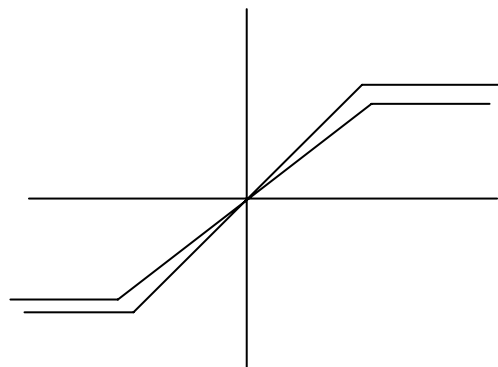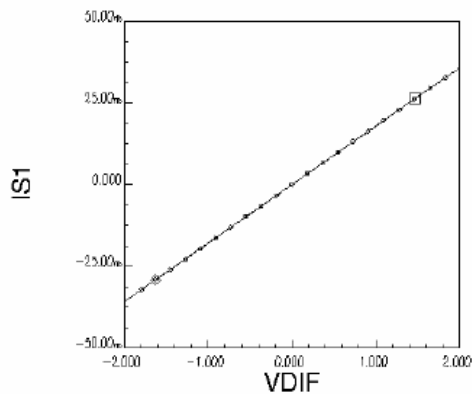
2C & 2D - 4155B - RESISTOR Mode

SMU1   SMU2

SMU1

A   B

A

B
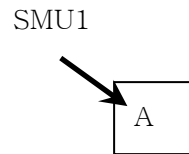
SMU2

2c metal-diff contact res   2d metal-poly contact res

Settings

	Stimulus	Measure	Sweep
A	Voltage	Voltage Current	Sweep Start -5 Stop 5
B			Constant

Device 2c: I vs V

7 - 4155B - DIODE mode

SMU1   SMU2   SMU1

A ◁ K   A
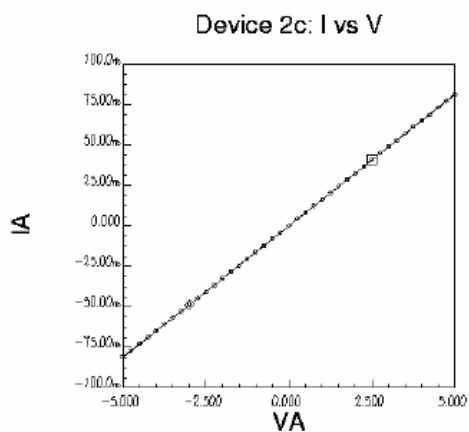
Diode
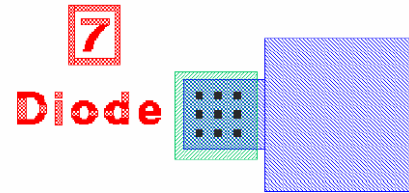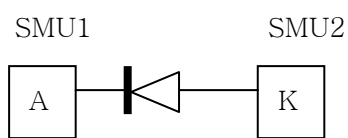
Please make sure to connect a stage connector to "SMU2."

Settings

	Stimulus	Measure	Sweep	Sweep
A	Voltage	Voltage Current	Sweep Start -1 Stop 1	Sweep Start -40 Stop 40 Compliance 0.05
K			Constant	-40 Compliance 0.05

Device 7: I vs V
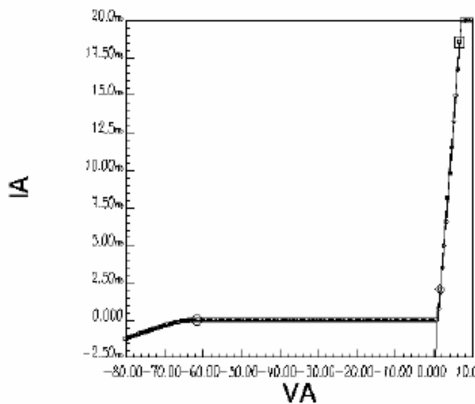
Device 7: I vs V
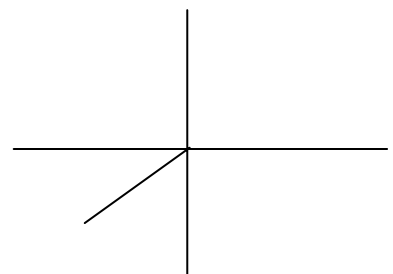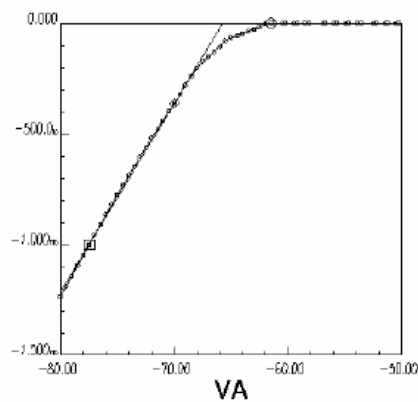
8, 9, 10, 11, & 12 - 4155B - MOSFET mode
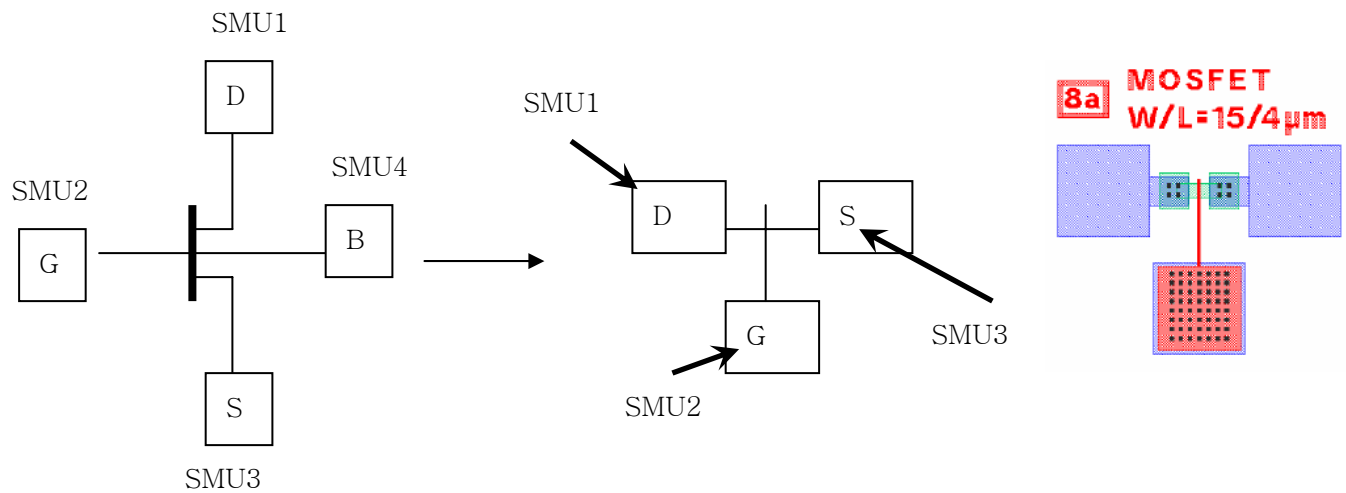
Please make sure to connect a stage connector to "SMU4."

Setting for Measurement #1

	Stimulus	Measure	Sweep
D	Voltage	Voltage Current	Sweep Start 0 Stop 5
S	Voltage		Constant
B	Voltage		Constant
G	Voltage		Step Start 0 Stop 5 Step size 1

Device 8d: ID vs VD
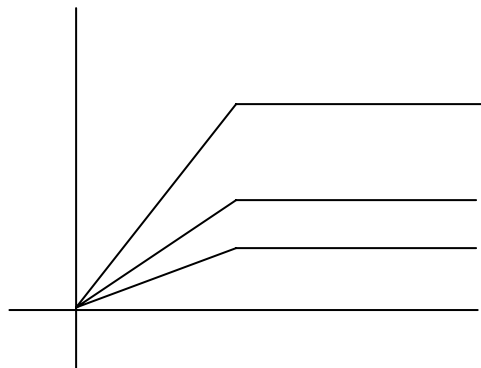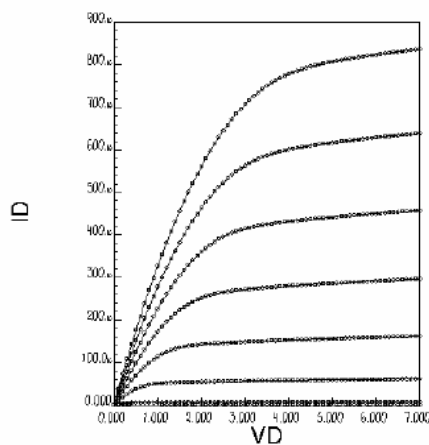
Setting for Measurement #2

Don't forget to turn off the light of the microscope. The light will induce much noise.

	Stimulus	Measure	Sweep
D	Voltage	Current	Constant 0.05
S	Voltage		Constant
B	Voltage		Step Start 0 Stop -2 Step size -1
G	Voltage	Voltage	Sweep Start 0 Stop (Device #8 up to 12) (Others up to 5)

Device 8D: ID vs VG, VD=50mV

14 - 4155B - MOSFET mode

SMU1

SMU1

SMU4

```
        D                            D
                                  (SMU4 →)
SMU2         SMU4
  G          B           G          B
                        (SMU2 →)
        S                    S
                         (SMU3 →)
      SMU3
```
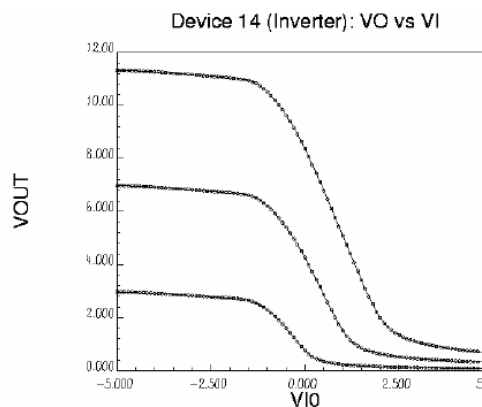
14 Inverter

V_{DD} V_o

V_{in} Gnd
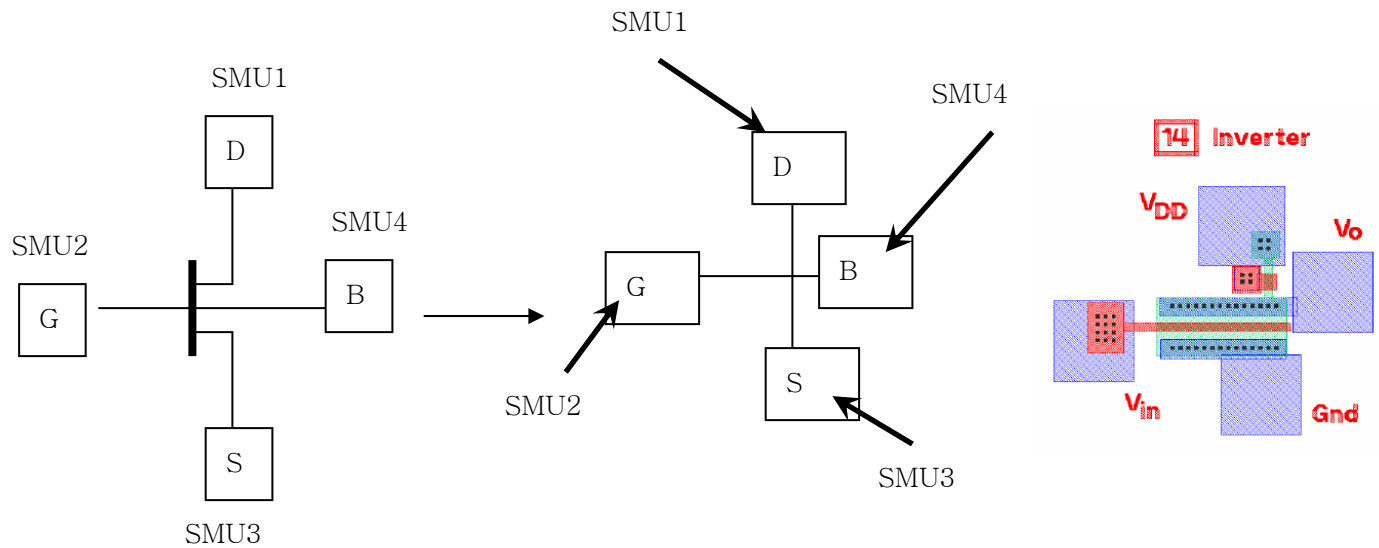
Please make sure to connect a stage connector to "SMU3."

Setting for Measurement

	Stimulus	Measure	Sweep
D	Voltage		Step Start 5 Stop 15 Step size 5
S	Voltage		Constant
B	Current	Voltage	Constant
G	Voltage	Voltage	Sweep Start -5 Stop 5

Device 14 (Inverter): VO vs VI
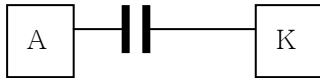
3 & 4 - 4284 - CAP mode
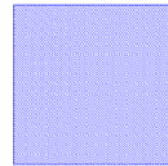
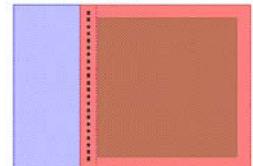HP4284.CML   HP4284.CMH   SMU4

A ──┤├── K   A

3 Field Oxide   4 Gate Oxide

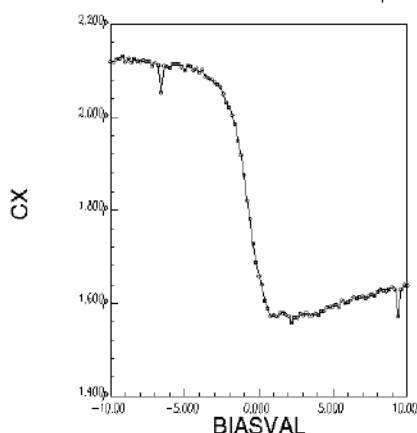Please make sure to connect a stage connector to "SMU1."

Zero calibration : Meas setup – Change to Mega Hz (Use cursor keys and screen keys)– Meas setup - correction (Use screen keys)- Enlight "open" (Use cursor keys)– Measure open (Wait a few minutes until it said completed)– Display

Notice that you need one measurement of Device #3 without light and two measurements of Device #4 with light and without light.

Settings

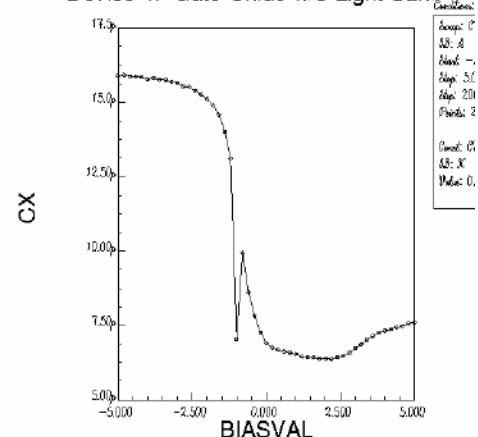| HP4284.CMH	Display1 : C Display2: R	Oscillation level : 0.02 Circuit mode : Par	Device #3 Sweep : Voltage Start -10 Stop 10 Step size : 0.2 Option: integration Medium	Device #4 Sweep : Voltage Start -5 Stop 5 Step size : 0.2 Option: integration Medium
HP4284.CML	No need to change			

Device 3: Field Oxide Sample

Device 4: Gate Oxide w/ Light Sample
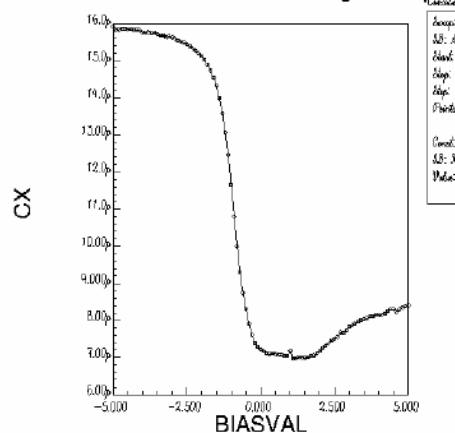
Device 4: Gate Oxide w/o Light Sample

⑤ - **4284 -** CAP mode

HP4284.CML   HP4284.CMH   SMU1   SMU4

[A] —||— [K]   [A] [K]

⑤ Intermediate Oxide

Disconnect the stage connection from SMU1 and connect #1 probe to SMU1. When you measure capacitance, you will notice negative values of capacitance. Do two measurements. One measurement is with a probed device and the other without a probed device. So that a real capacitance = C (with) – C (Without). Make sure of tuning off light

Settings

HP4284.CMH	Display1 : C Display2: R	Circuit mode : Par Oscillation level : 0.02	Device #5 Sweep : Voltage Start -5 Stop 0 Step size : 0.2
HP4284.CML	No need to change		

Device 4: Intermediate Oxide Sample