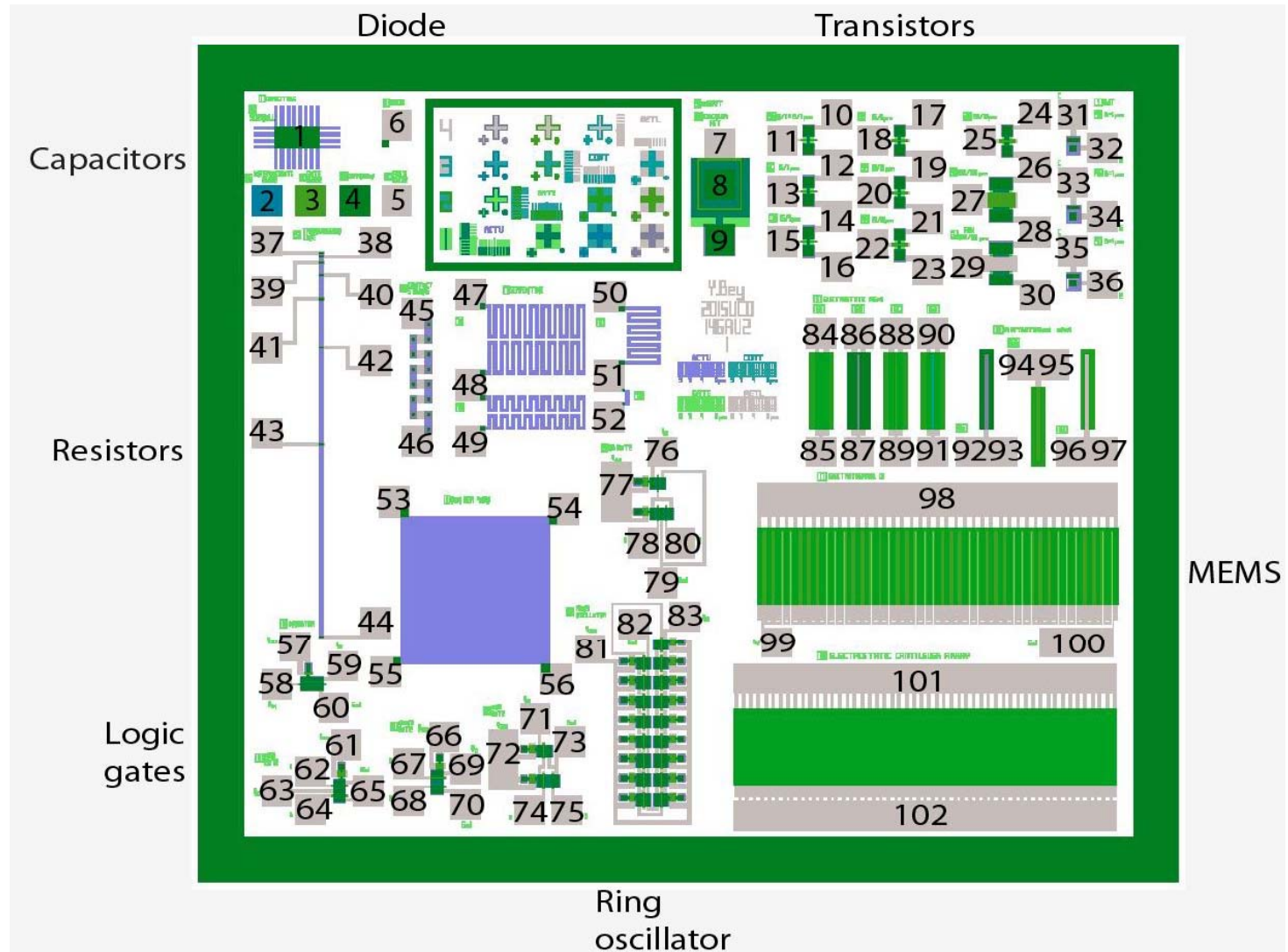


EEC146A Electrical Characterization Measurements

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Dec 11, 2015



1. NMOS FET (Pin 24, 25, 26)

Probe setup>

Pin 24 (Source) - probe 3

Pin 25 (Gate) - probe 2

Pin 26 (Drain) - probe 1

Channel button>

V1 (V_D), I1(I_D) - mode V, FCTN Var1

V2 (V_G), I2 - mode V, FCTN Const

V3 (V_S), I3 - mode Common, FCTN Const

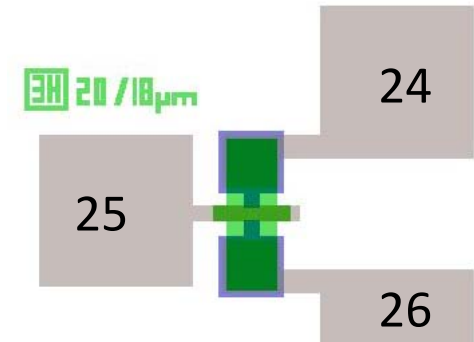
Measures button>

V1: 0 ~ 10V, 100mV step

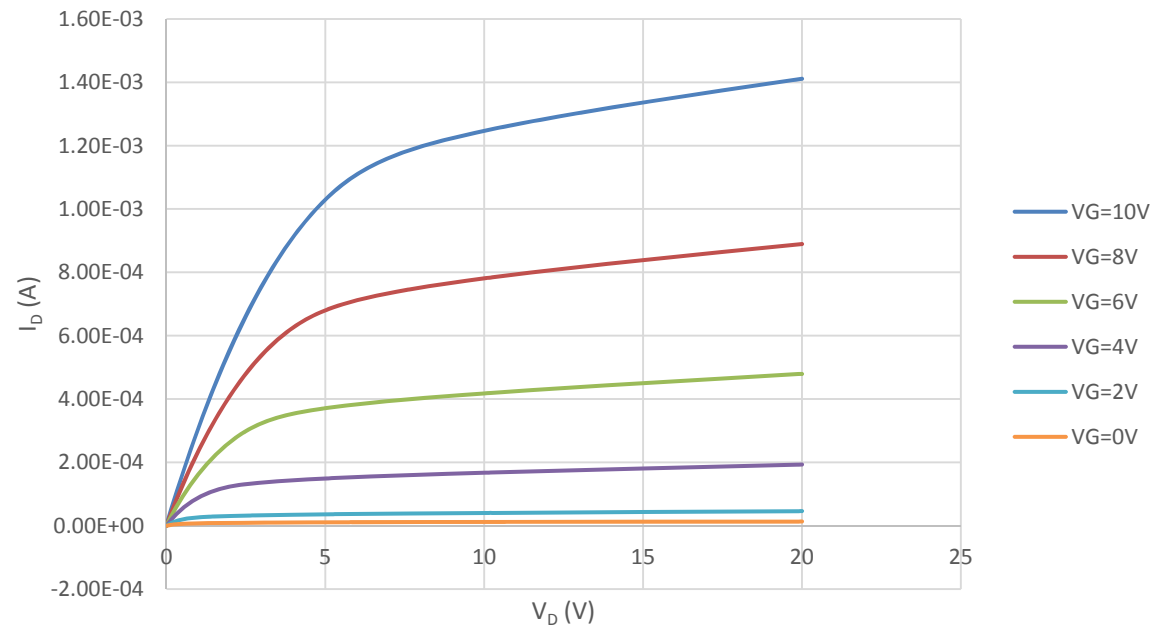
V2: 0, 2, ..., 10V

Display button>

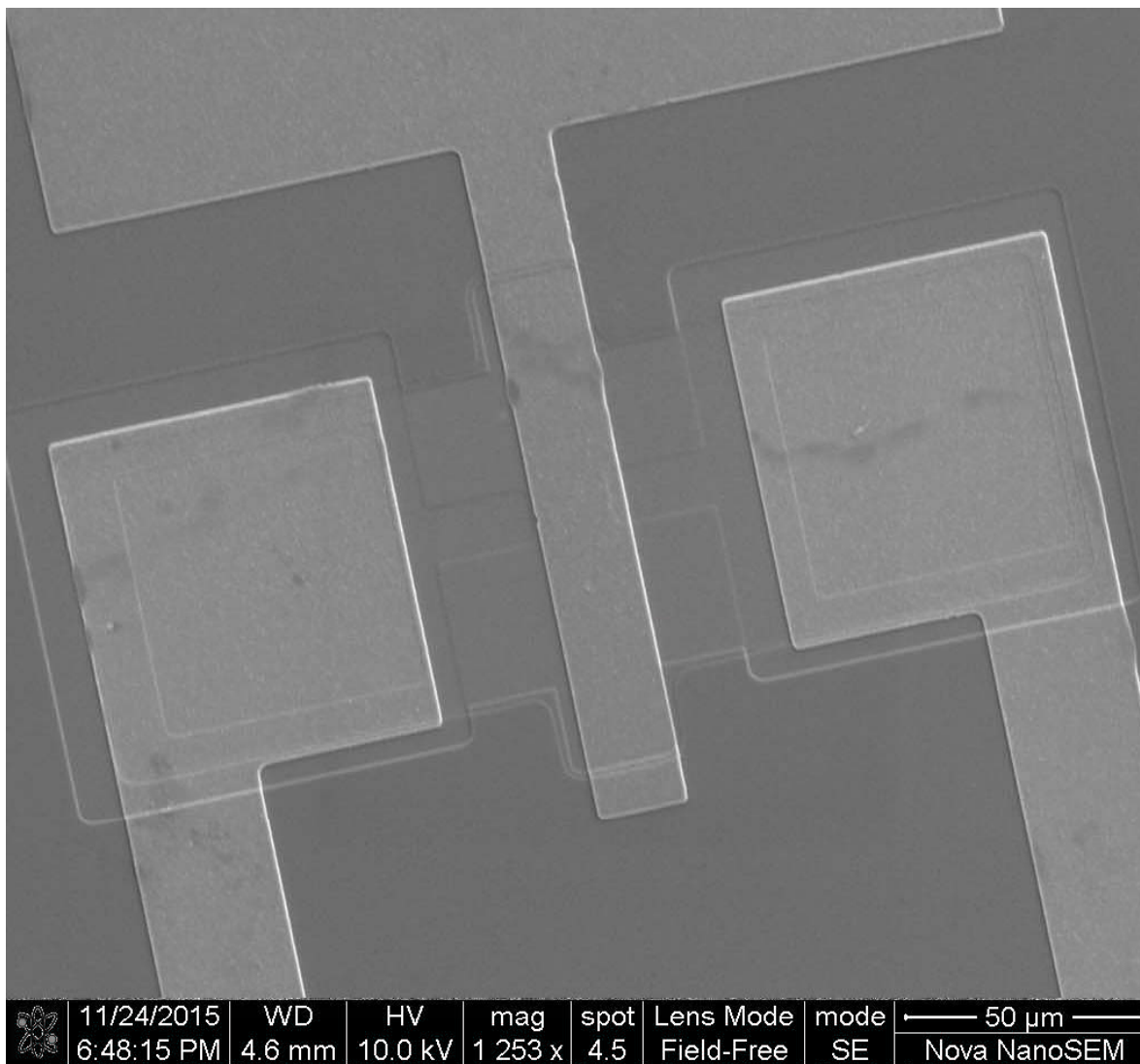
X-axis: V1, Y-axis: I1



N MOSFET (24,25,26)



SEM picture



2. Diode (Pin 6)

Probe setup>

Pin 6 - probe 3

Copper tape - probe 1

Channel button>

V1, I1 - mode V, FCTN Var1

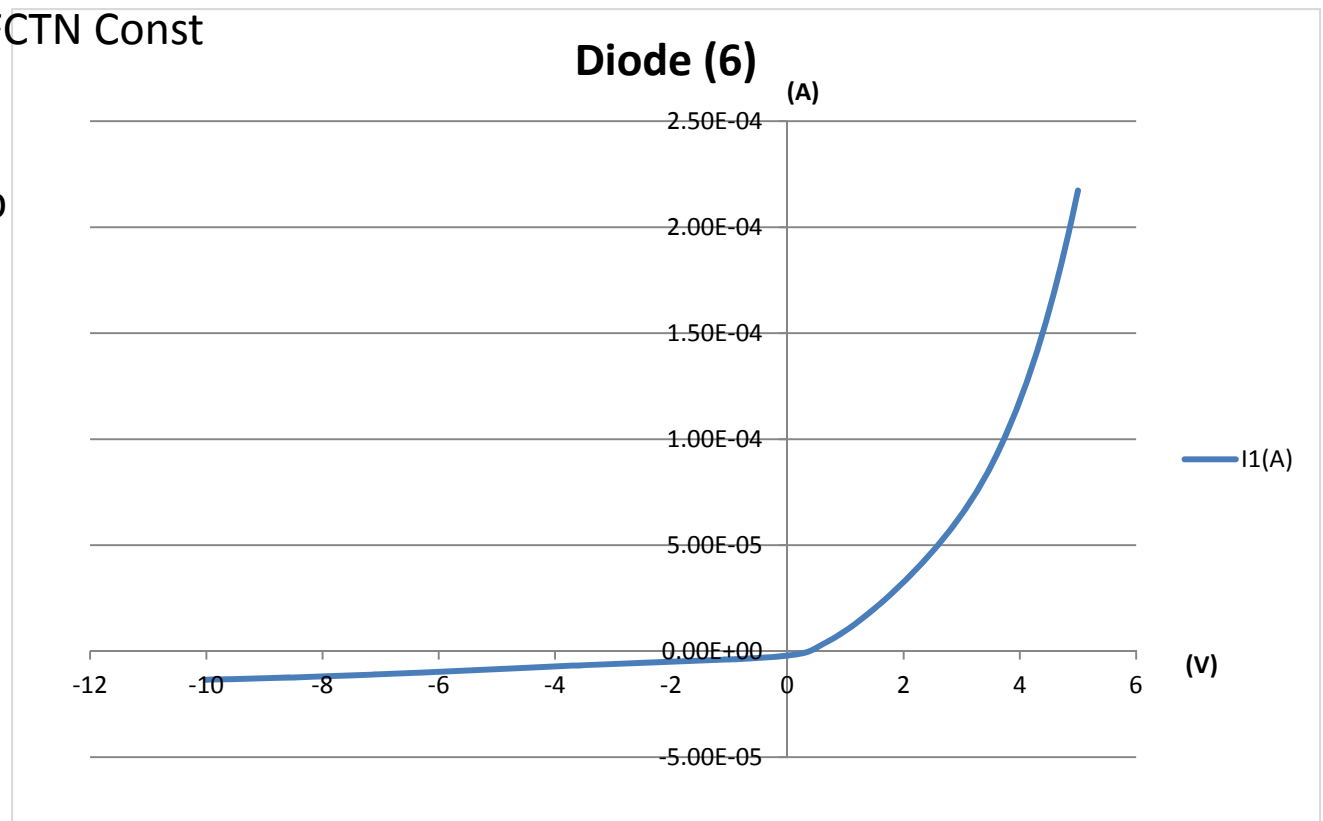
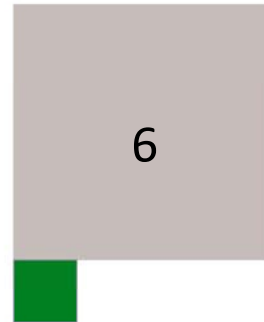
V3, I3- mode Common, FCTN Const

Measures button>

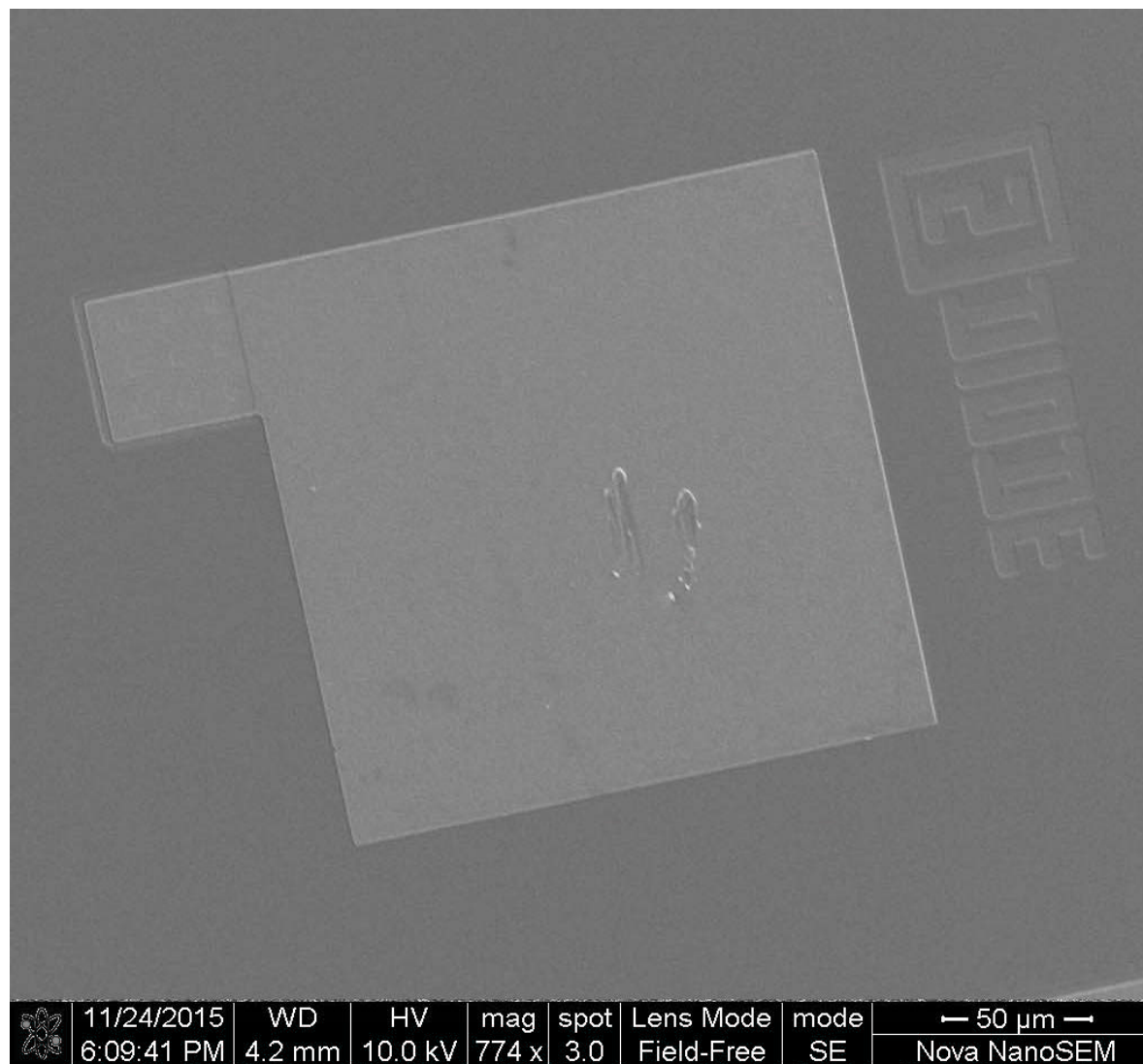
V1: -10 ~ 5V, 100mV step

Display button>

X-axis: V1, Y-axis: I1



SEM picture



3. Resistor (Pin 47, 48)

Probe setup>

Pin 47 – probe 1

Pin 48 – probe 2

Channel button>

V1, I1 - mode V, FCTN Var1

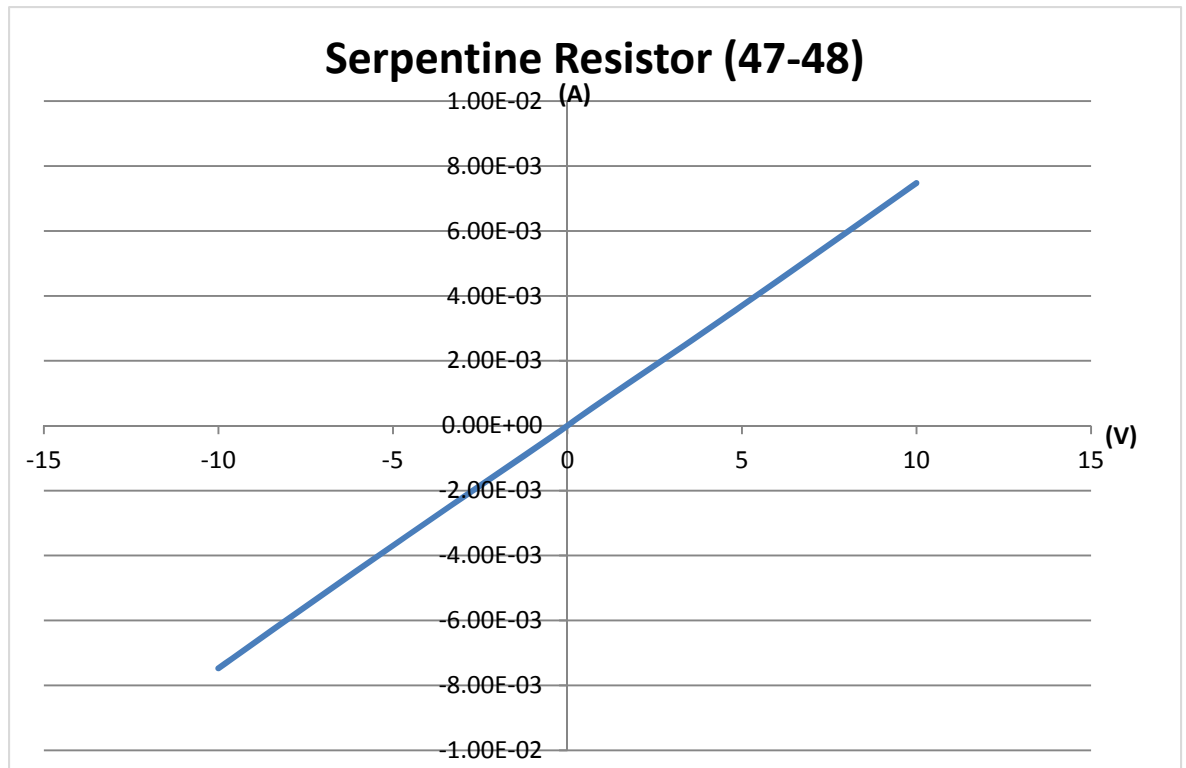
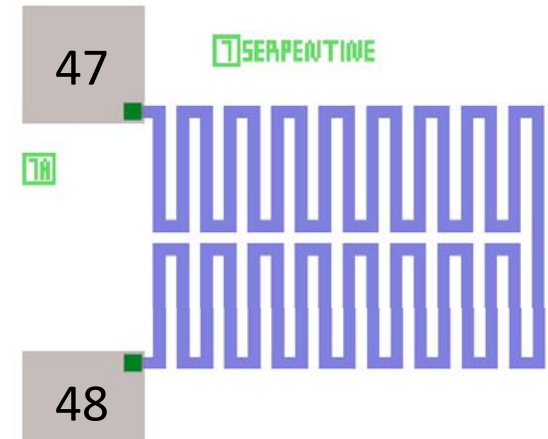
V2, I2- mode Common, FCTN Const

Measures button>

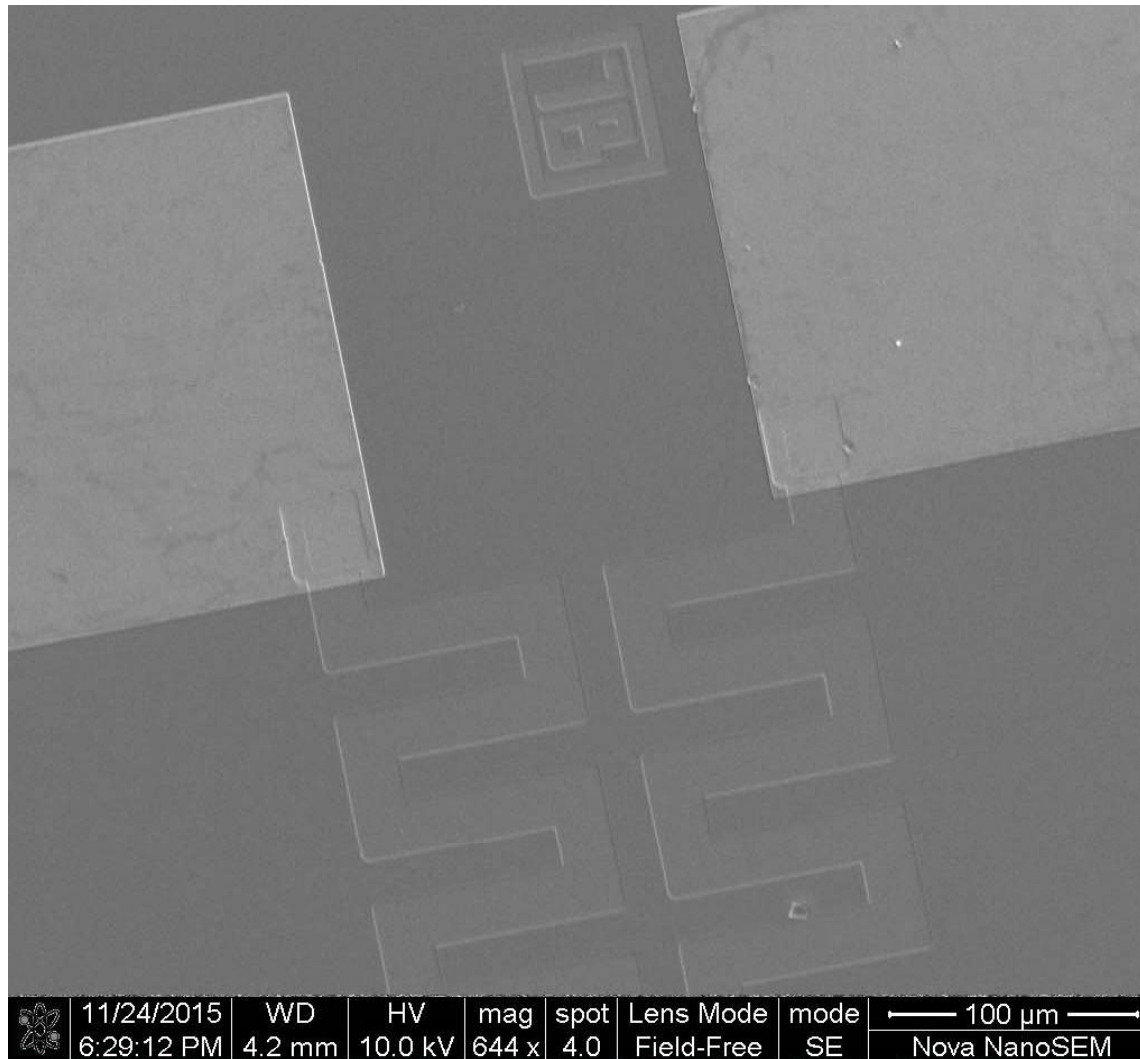
V1: -10 ~ 10V, 100mV step

Display button>

X-axis: V1, Y-axis: I1



SEM picture



4. Transmission Line (Pin 37~38,...,44)

Probe setup>

Pin 37 – probe 2

Pin 38~44 – probe 1

Channel button>

V1, I1 - mode V, FCTN Var1

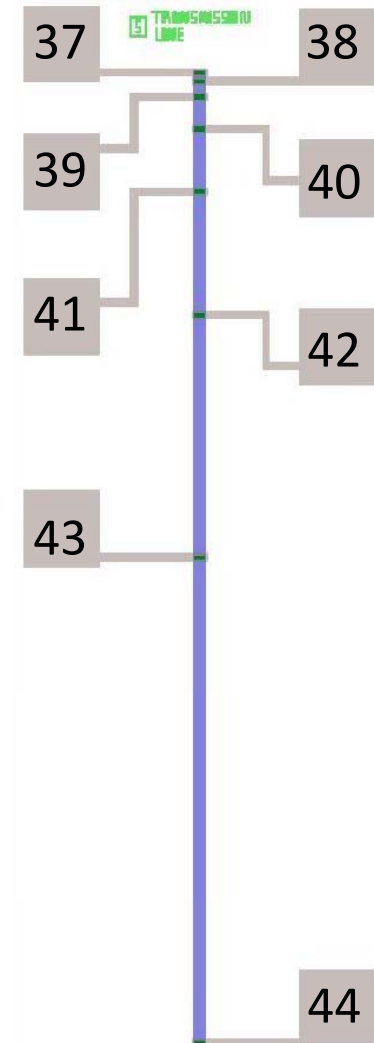
V2, I2- mode Common, FCTN Const

Measures button>

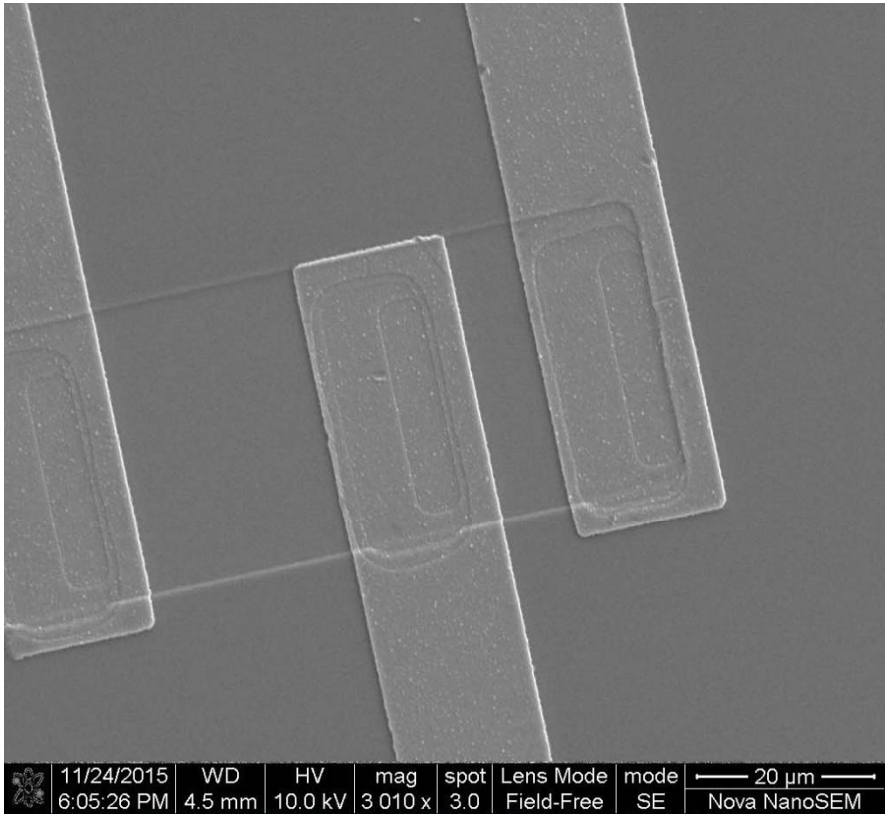
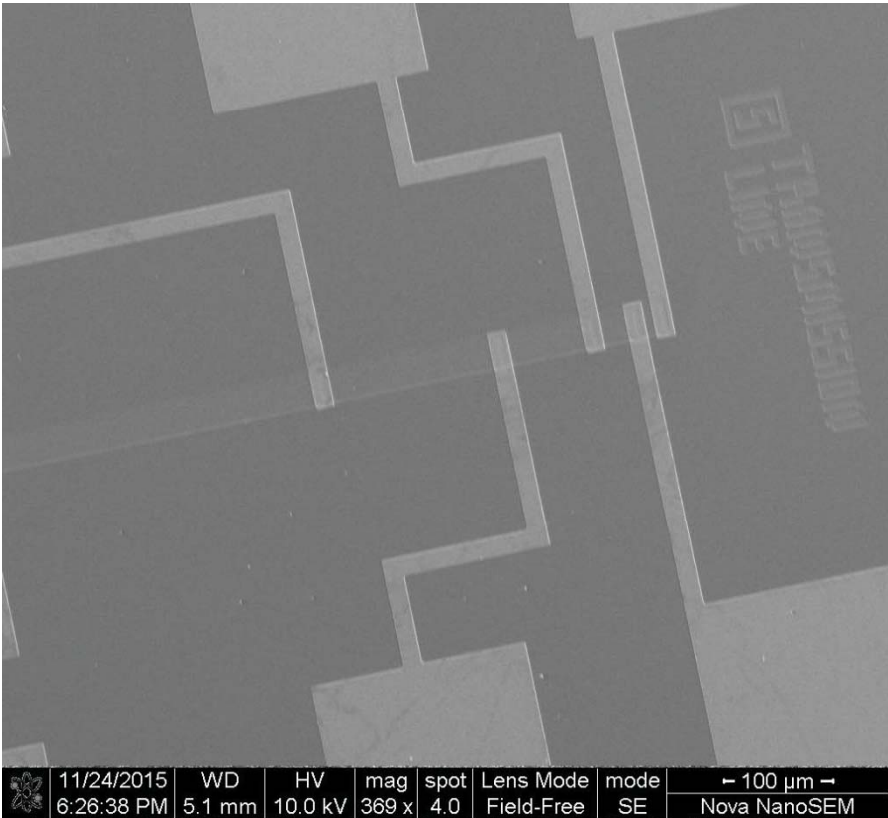
V1: -10 ~ 10V, 100mV step

Display button>

X-axis: V1, Y-axis: I1



SEM picture

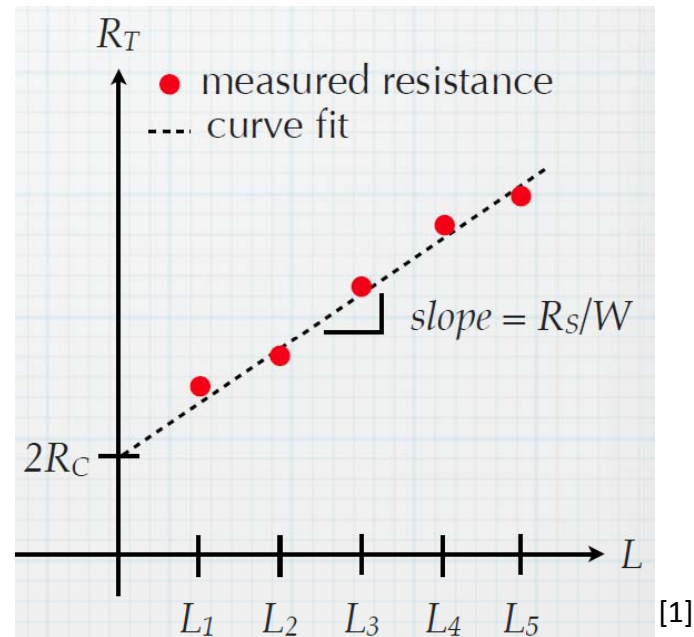


$$R_T = 2R_C + R_S * L/W$$

R_T : Total R (Ω)

R_C : Contact R (Ω)

R_S : Sheet R (Ω/sq)



In addition,

$$R_T = 2R_C + R_S * L/W$$

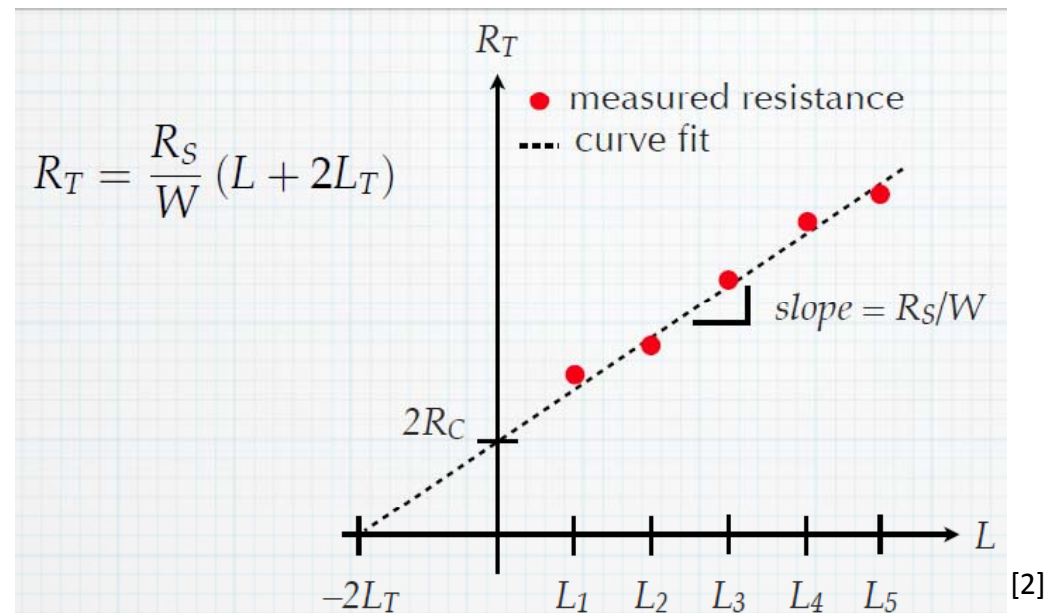
$$= 2R_S * L_T/W + R_S * L/W$$

$$= R_S/W * (2L_T + L)$$

$$L_T = \sqrt{(\rho_C/R_S)}$$

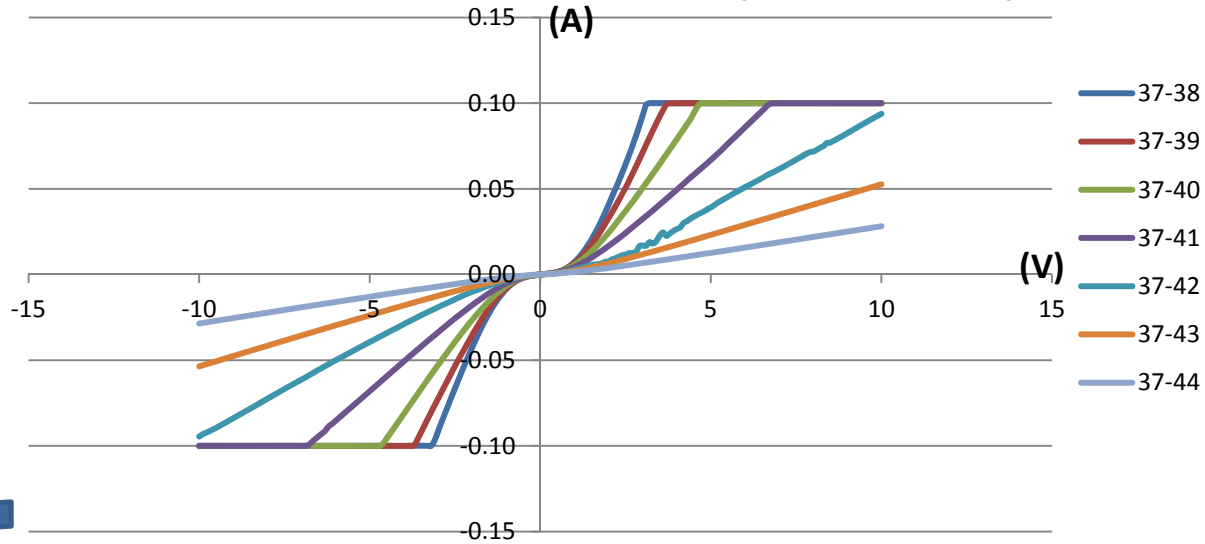
L_T : Transfer length (m)

ρ_C : Contact resistivity (ohm-m^2)

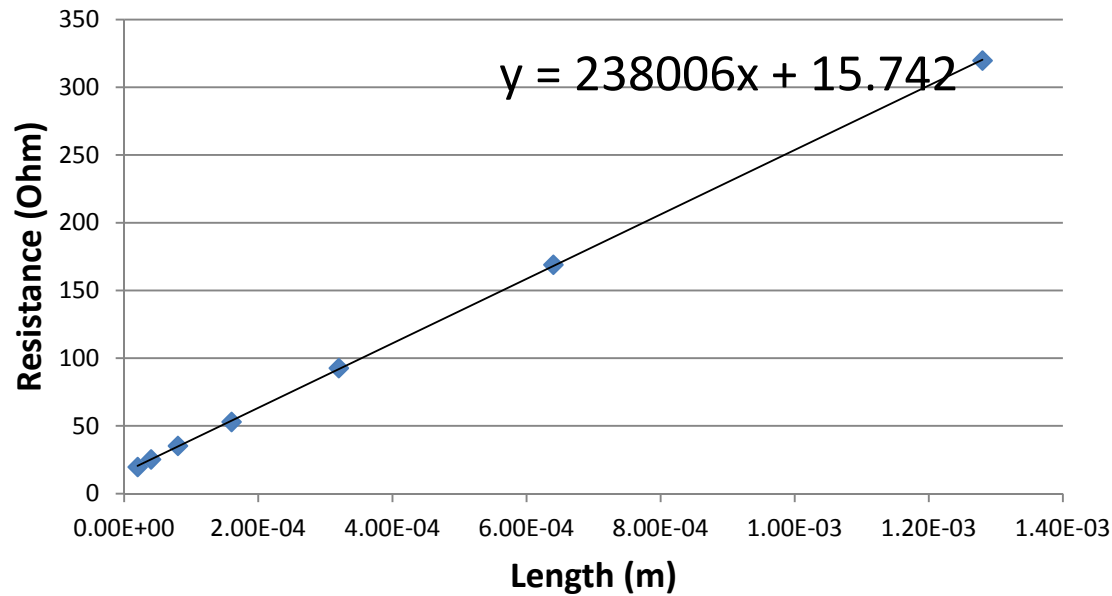


[1, 2] Refer to the document by searching in google “contact resistance and tlm measurements”

Transmission Line Resistor (37 ~ 38,...,44)



	width	Length	R
37-38	3.00E-05	2.00E-05	19.6782
37-39		4.00E-05	25.2954
37-40		8.00E-05	35.2658
37-41		1.60E-04	52.9521
37-42		3.20E-04	92.7128
37-43		6.40E-04	169.033
37-44		1.28E-03	319.795



Rs(ohm/sq)	Rc(ohm)	LT(m)
7.14E+00	7.871	3.30706E-05

ρ_c (ohm-m ²)
7.81E-09

5. BJT (Pin 33, 34)

Probe setup>

Pin 33 (Collector) – probe 2

Pin 34 (Emitter) – probe 1

Copper tape (Base) –probe 3

Channel button>

V1, I1 (I_E) - mode I, FCTN Const

V2 (V_C), I2 (I_C) - mode V, FCTN Var1

V3, I3 - mode Common, FCTN Const

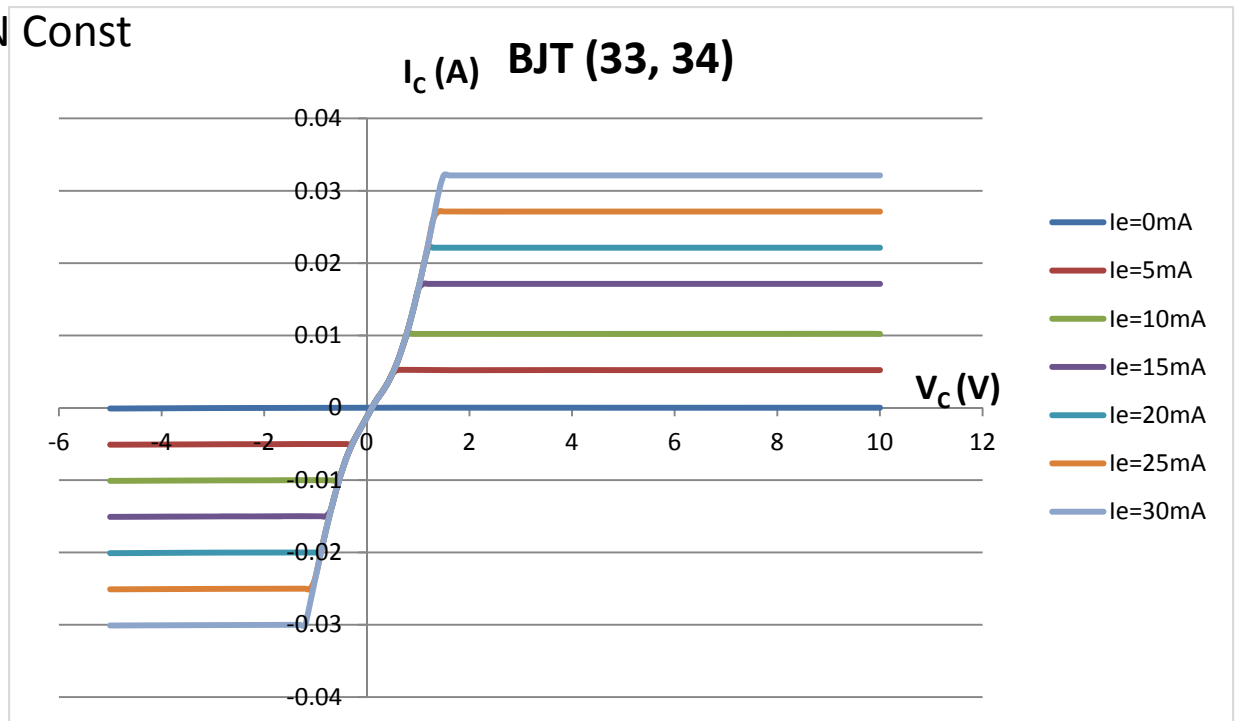
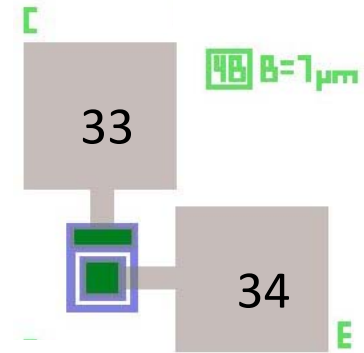
Measures button>

V2: -5 ~ 10V, 100mV step

I1: 0, 5, ..., 30mA

Display button>

X-axis: V2, Y-axis: I2



SEM picture

