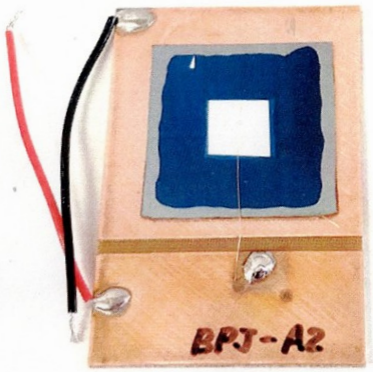
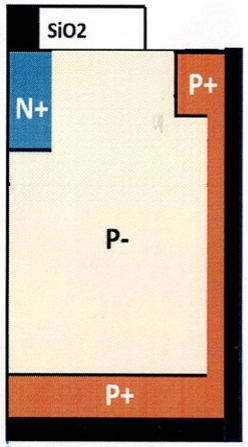
2026年3月26日(木)　東京工芸大学 小林信一教授　第１回試作結果報告

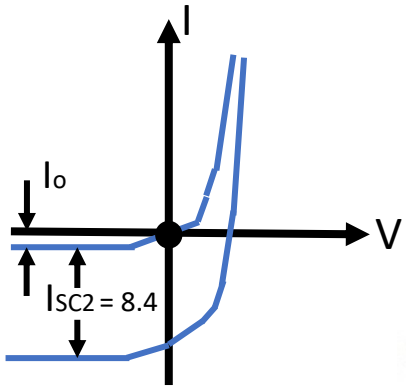
$I_{SC2} / I_{SC1} = 12.4 / 8.4 = 148\ \%$

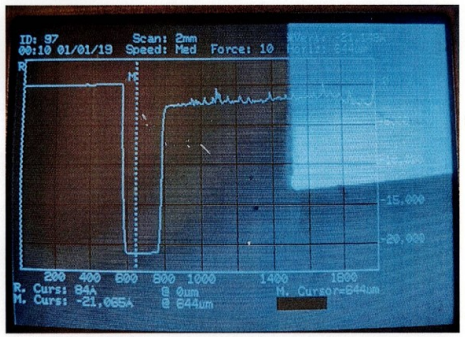
KOH Silicon Etching

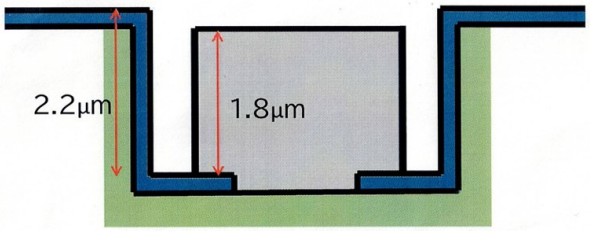
(2) Single Junction
Sample Photo



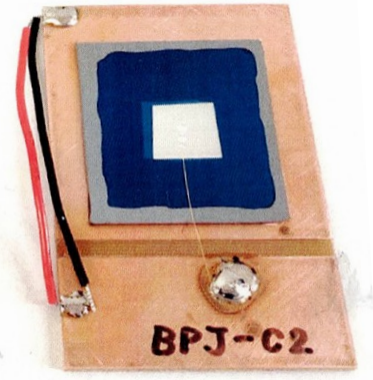


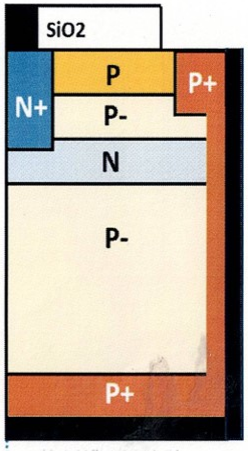


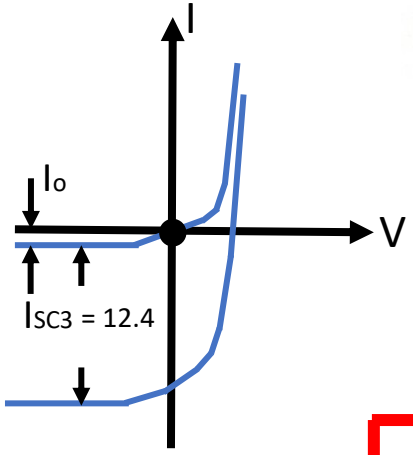




(3) Double Junction
Sample Photo







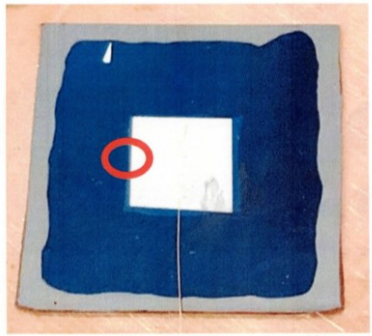
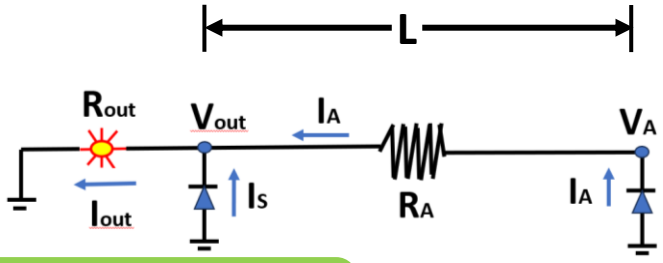


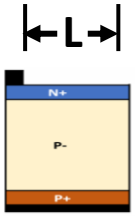
Photo Current

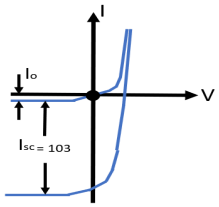
Chip Size
3 cm x 3 cm

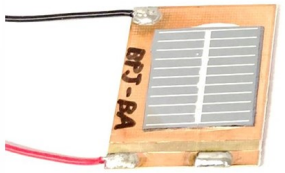
	I_0 [A]	n	Rs [Ω]	Rp [Ω]	V_{OC} [V]	I_{SC} [mA]	η [%]	S [cm^2]
(2) Single B	2.4×10^{-10}	1.04	2.00	14.4M	0.46	8.4	0.29	9
(3) Double			2.37	15.2k	0.46	12.4	0.32	9

(1)





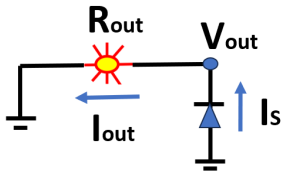


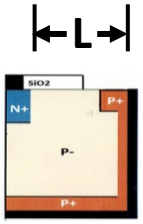


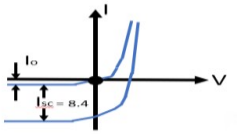
微細MASK使用

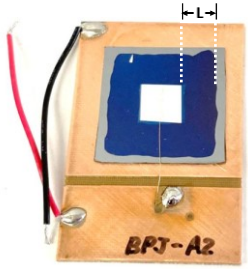
I_{SC1} = 103mA　　L = 1 mm ;

(2)









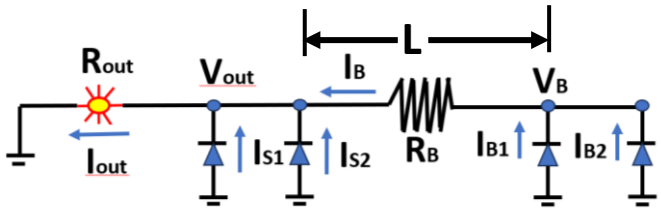
Chip Size 3 cm x 3 cm

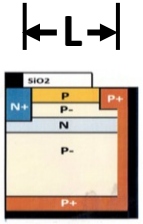
手描き

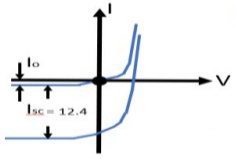
I_{SC2} = 8.4mA　　L = 10 mm ;

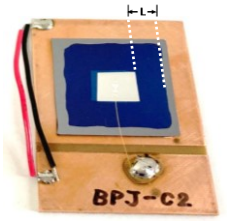
I_{SC3} / I_{SC2} = 1.48

(3)









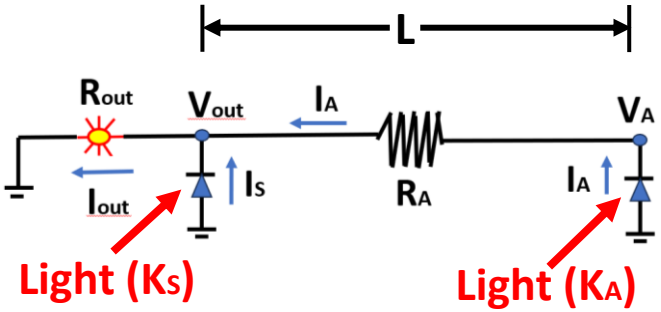
Chip Size 3 cm x 3 cm

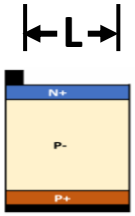
手描き

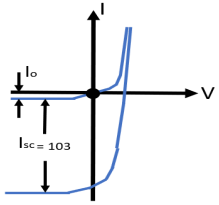
I_{SC3} = 12.4mA　　L = 10 mm :

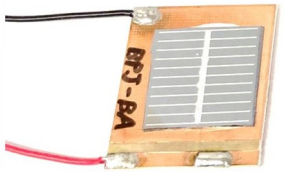
	I_0 [A]	n	Rs [Ω]	Rp [Ω]	V_{OC} [V]	I_{SC} [mA]	η [%]	S [cm^2]
(1) Single				160	0.60	103	8.0	4.3
(2) Single B	2.4×10^{-10}	1.04	2.00	14.4M	0.46	8.4	0.29	9
(3) Double			2.37	15.2k	0.46	12.4	0.32	9

(1)









微細MASK使用

L = 1 mm ;

$$I_{SC1} = I_S + I_A = 103 \text{ mA}$$

(1.1) $I_{out} = I_S + I_A$;

(1.2) $I_S = (A_S)\,(J_S) = (A_S)(K_S)\{ \exp(- V_{out}/kT) - 1 \}$;

(1.3) $I_A = (A_A)\,(J_A) = (A_A)(K_A)\{ \exp(- V_A /kT) - 1 \}$;

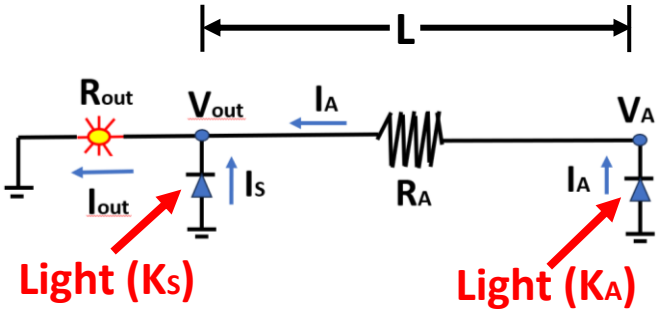
(1.4) $(V_{out} - V_A) = (I_A)\,(R_A)$;

(1.5) $A_A >> A_S$;

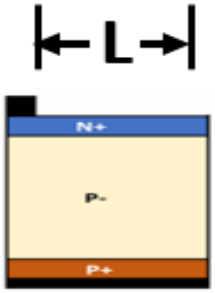
(1.6) $R_A << R_{out} = (V_{out}) / (I_{out})$;

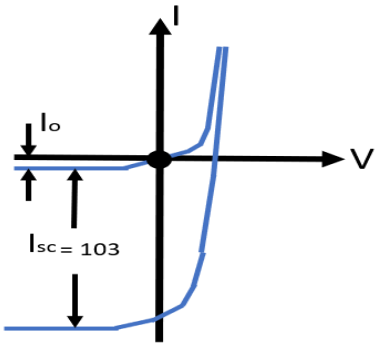
	I_0 [A]	n	Rs [Ω]	Rp [Ω]	V_{OC} [V]	I_{SC} [mA]	η [%]	S [cm^2]
(1) Single				160	0.60	103	8.0	4.3
(2) Single B	2.4×10^{-10}	1.04	2.00	14.4M	0.46	8.4	0.29	9
(3) Double			2.37	15.2k	0.46	12.4	0.32	9

(1)

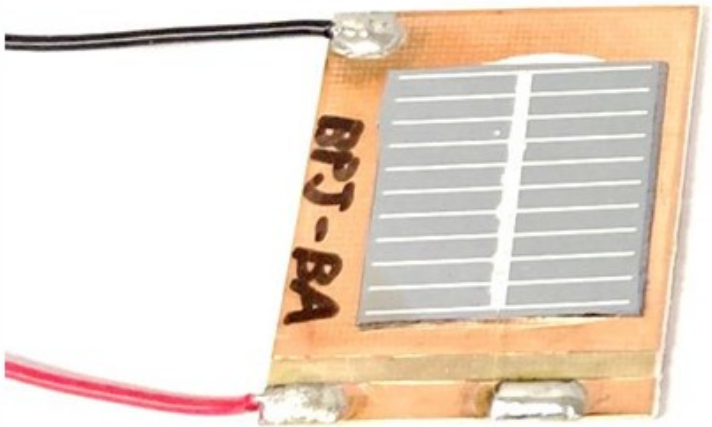


$I_{SC1} = I_S + I_A = 103$ mA



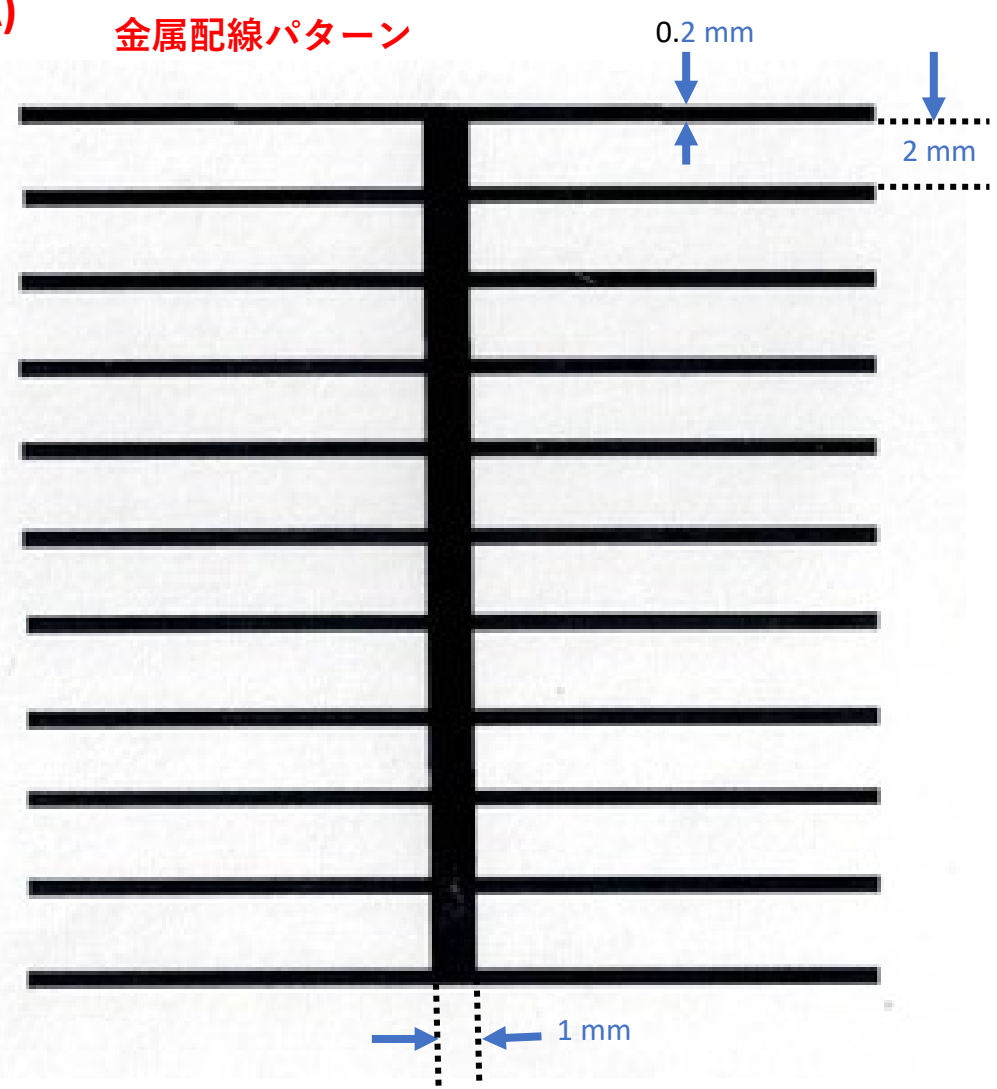


L = 1 mm ;

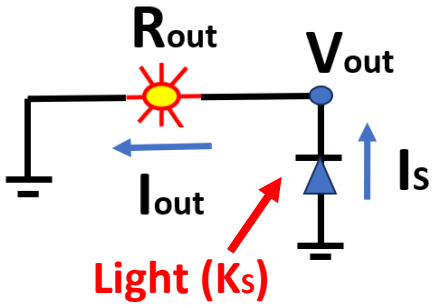


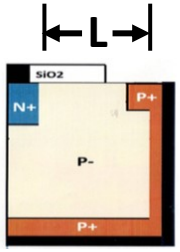
微細MASK使用

金属配線パターン

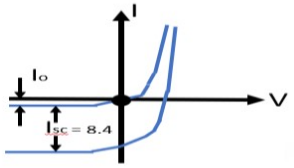


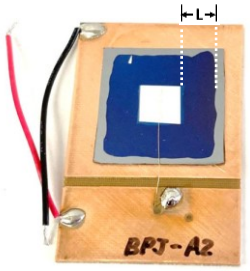
(2)





L = 10 mm ;





Chip Size 3 cm x 3 cm

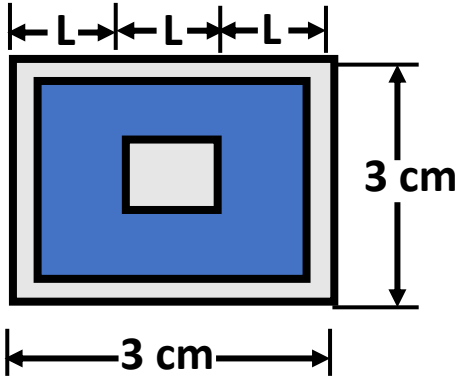
手描き

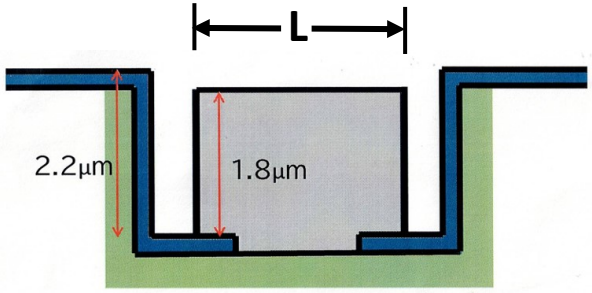
$I_{SC2} = 8.4\text{mA}$

(2.1) $I_S = (A_S)\,(J_S) = (A_S)(K_S)\{\exp(-V_{out}/kT) - 1\}$;

L = 1 cm ;

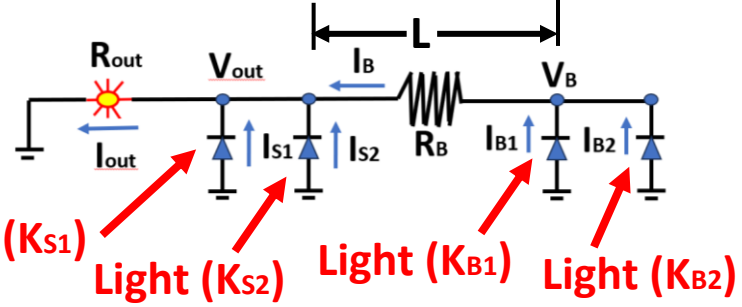
Chip (2) and Chip (3)

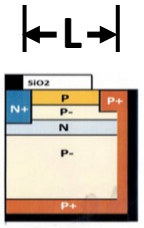




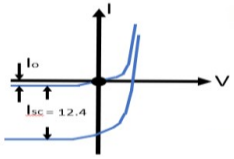
	I_0 [A]	n	Rs [Ω]	Rp [Ω]	V_{OC} [V]	I_{SC} [mA]	η [%]	S [cm^2]
(1) Single				160	0.60	103	8.0	4.3
(2) Single B	2.4×10^{-10}	1.04	2.00	14.4M	0.46	8.4	0.29	9
(3) Double			2.37	15.2k	0.46	12.4	0.32	9

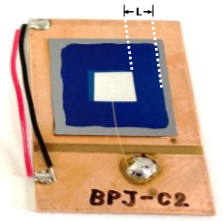
(3)





L = 10 mm :





Chip Size 3 cm x 3 cm

手描き

$$I_{SC3} = I_{S1} + I_{S2} = 12.4 \text{ mA}$$

(3.1) $I_{out} = I_{S1} + I_{S2} + I_B$; $I_B = I_{B1} + I_{B2}$; $K_B = K_{B1} + K_{B2}$;

(3.2) $I_{S1} = (A_S)\,(J_{S1}) = (A_S)\,(K_{S1})\{\exp(-V_{out}/kT) - 1\}$;

(3.3) $I_{S2} = (A_S)\,(J_{S2}) = (A_S)\,(K_{S2})\{\exp(-V_{out}/kT) - 1\}$;

(3.4) $I_B = (A_B)\,(J_B) = (A_B)\,(K_B)\{\exp(-V_B/kT) - 1\}$;

(3.5) $(V_{out} - V_B) = (I_B)\,(R_B)$;

(3.6) $A_B >> A_S$;

(3.7) $R_B >> R_{out} = (V_{out}) / (I_{out}) \rightarrow I_B << (I_{S1} + I_{S2})$;

$$I_{SC3} / I_{SC2} = 1.48$$

	I_0 [A]	n	Rs [Ω]	Rp [Ω]	V_{OC} [V]	I_{SC} [mA]	η [%]	S [cm^2]
(1) Single				160	0.60	103	8.0	4.3
(2) Single B	2.4×10^{-10}	1.04	2.00	14.4M	0.46	8.4	0.29	9
(3) Double			2.37	15.2k	0.46	12.4	0.32	9