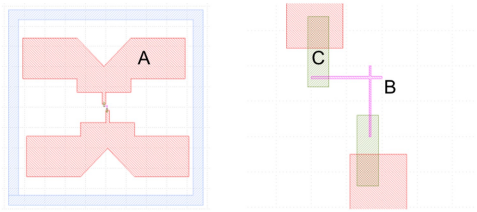
03-02-23 Manhattan Recipe

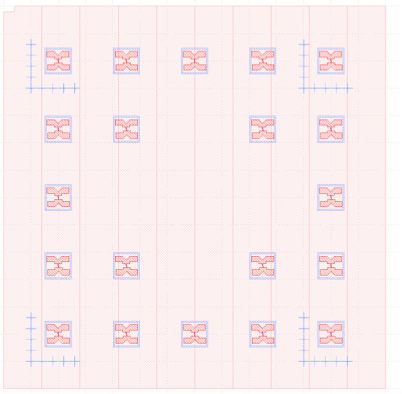
Sunday, 7 May 2023 09.39

Device Design

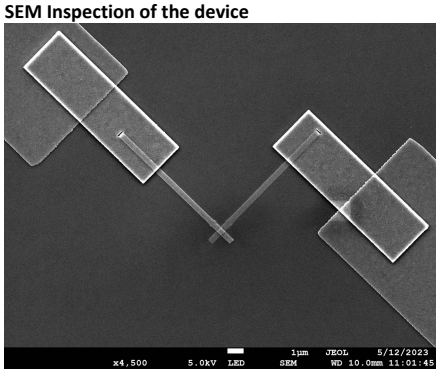
3 Fabrication Steps:
- A) Pads - red
- B) Manhattan JJ - purple
- C) Patches - green

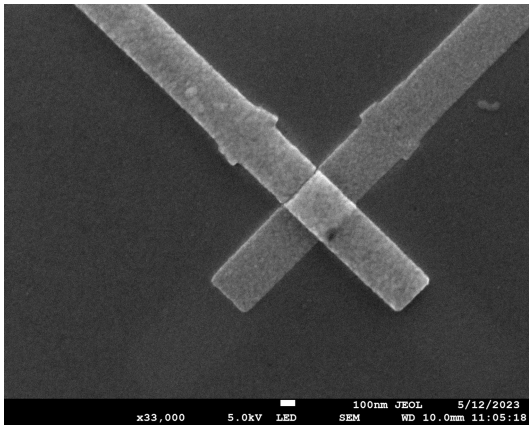
20 identical Devices each Chip (7mm x 7mm) - 300nm electrode widfth



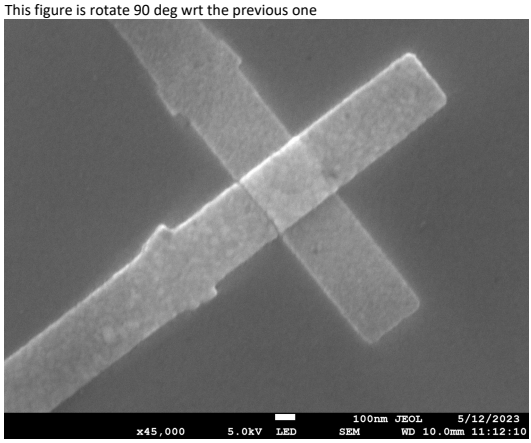


SEM Inspection of the device





This figure is rotate 90 deg wrt the previous one



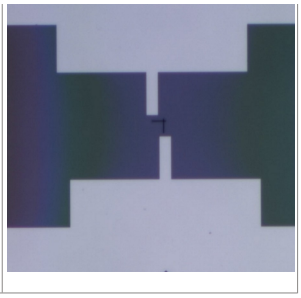
Here is a recipe only to produce cross-type Jospehson Junctions using two stacked resists (and a single exposure)

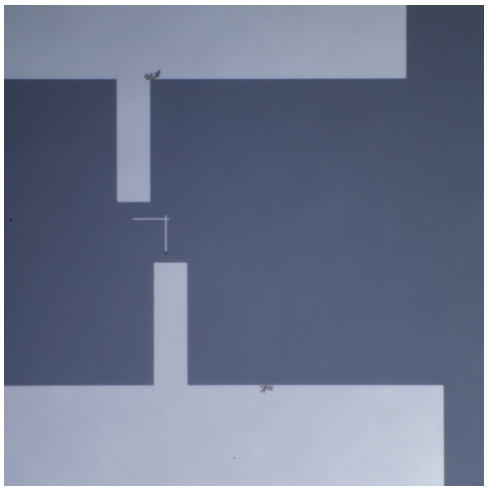
Pads

Operation	Description	Tool	Comment	Inspection
Clean	1,3 Dioxilane - 10 min			
	Acetone –5 min			
	IPA -1 min			
Pre-Bake	185C – 120s			
Spin	PMMA A4 spin (vent hole closed) 90 s@4.0krpm, (film ≈ 300 nm)			
Bake	120 s bake, 185 · C			
Expose	Base dose 1000 $\frac{\mu C}{cm2}$	10nA		
Ash	45 s			
Develop	MIBK: IPA 1: 3 – 60s + IPA 10 s			
Evaporate	θ = 0 , 1.0 A/s, 100nm			
Lift Off	Acetone Overnight (or 3 h)			

Junctions

Operation	Description	Tool	Comment	Inspection
Clean	1,3 Dioxilane - 10 min			
	Acetone –5 min			
	IPA -1 min			
Pre-Bake	185C – 120s			
Spin	MMA EL 13 spin (vent hole closed) 90 s@5.0krpm, (film ≈ 350 nm)			
Bake	90 s bake, 185 · C			
Spin	CSAR 960 s@2.0krpm (film ≈ 300 nm)			
Bake	90 s bake 185 · C			
Expose	Base dose –825μC/cm2	1nA		

Develop	n-Amyl- 60s + IPA 15 s; then MIBK: IPA $1:3-75s$ + IPA 15 s	Ash 30 s at the End		
Evaporate	$\theta = 42$,1.6 A/s, 45 nm			
Evaporate	$\theta = 42$,1.6 A/s, 65 nm			
Lift Off	Acetone Overnight (or 3 h)			

Patches

Operation	Description	Tool	Comment	Inspection
Clean	1,3 Dioxilane - 10 min			
	Acetone −5 min			
	IPA -1 min			
Pre-Bake	185C − 120s			
Spin	PMMA A4 spin (vent hole closed) 60 s@4.0krpm, (film ≈ 300 nm)			
Bake	120 s bake 185 · C			
Expose	Base dose 1000 μC/cm2	*3nA*		
Ash	45 s			
Develop	MIBK: IPA $1:3-60s$ + IPA 10 s			
Mill	500V | 27mA | Acc V= 90 | T= 3.30min | Tilt =30			
Evaporate	$\theta = 0$, $\frac{1.0\ A}{s}$, 140nm			
Lift Off	Acetone Overnight (or 3 h)			