

AMOLED Manufacturing Process Report

Ver. 4

2022



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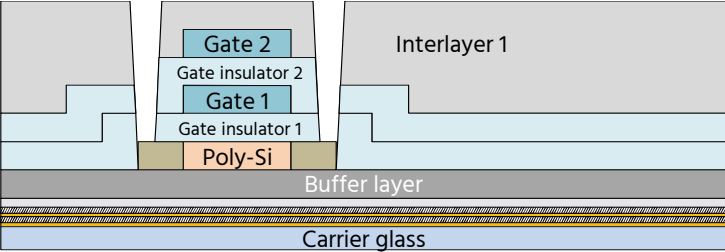
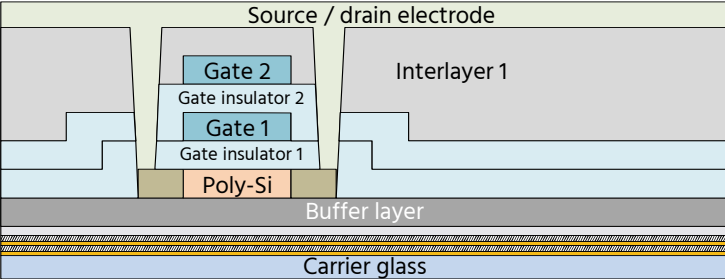
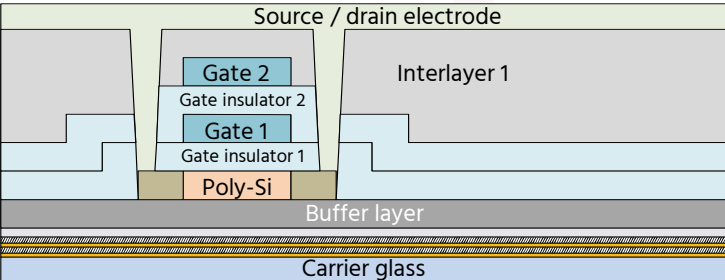
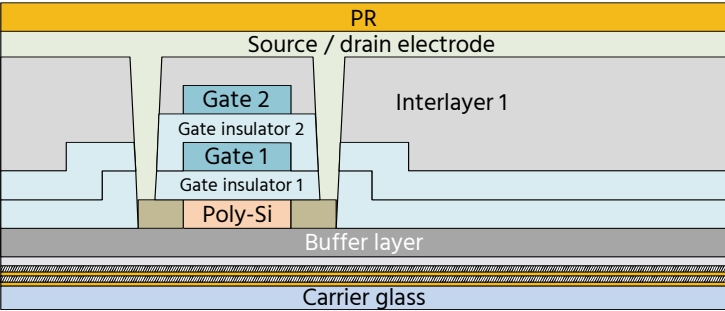
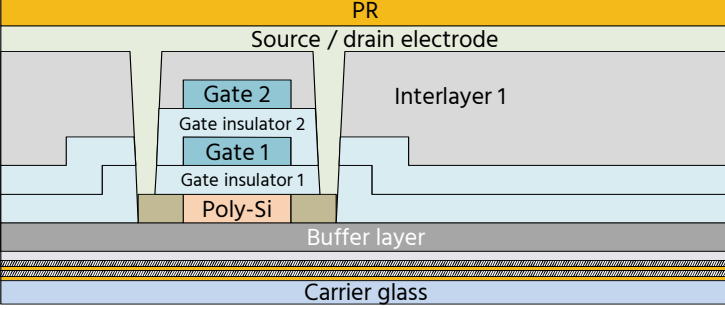
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2. TFT Manufacturing Process

2.3 SDC LTPS TFT Manufacturing Process

- Source/drain electrode 1 deposition

LTPS TFT manufacturing process and equipment

Process	Materials	Equipment
	EUV, DI water	Cleaner
	Ti/Al/Ti	Sputter
	EUV	Cleaner
	Positive PR	Coater
	-	Oven

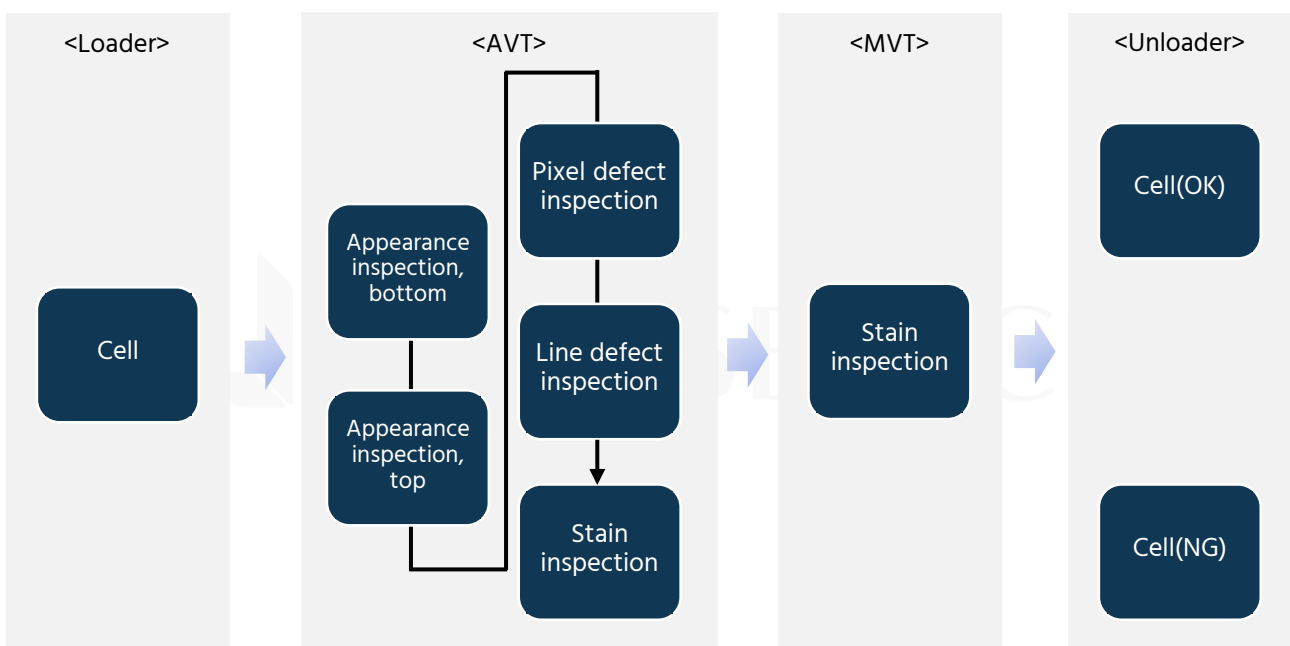
4. Cell Manufacturing Process

4.5 Cell Inspection and Measurement Process

AVT/MVT equipment

- AVT(auto vision tester) equipment is used to inspect the top and bottom of the OLED cell to check for defects such as scratches and cracks, and then to check for stain, pixel defect, line defect, etc.
- MVT(manual vision tester) equipment is used to inspect OLED cell to check for defects such as stains after AVT process.

Process of AVI and MVI, details

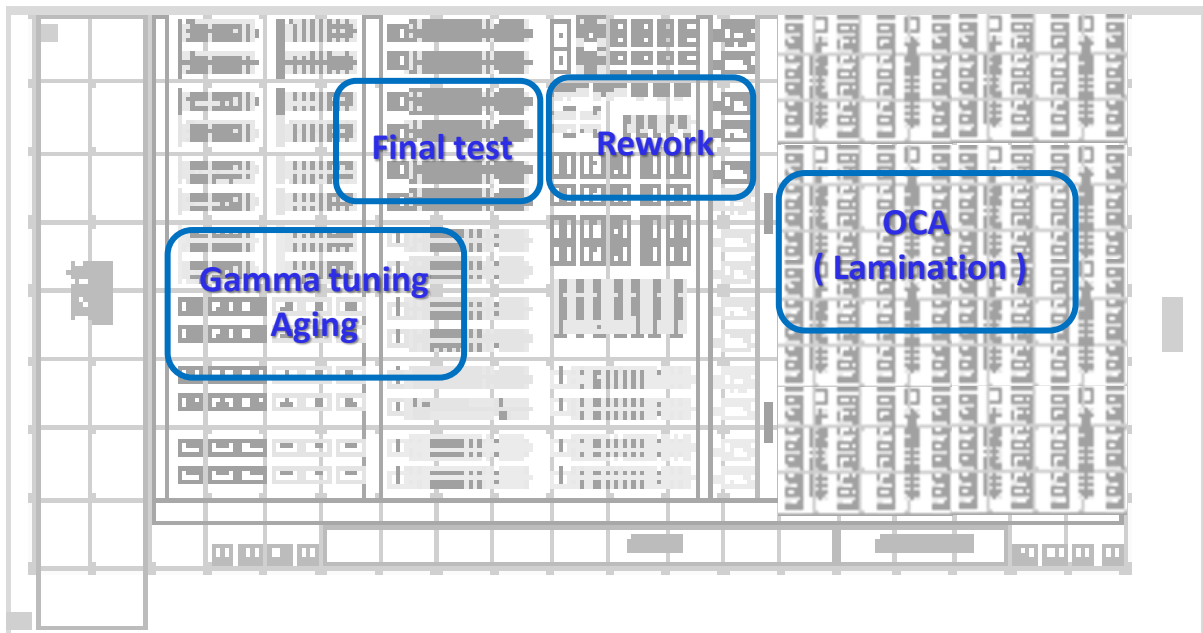
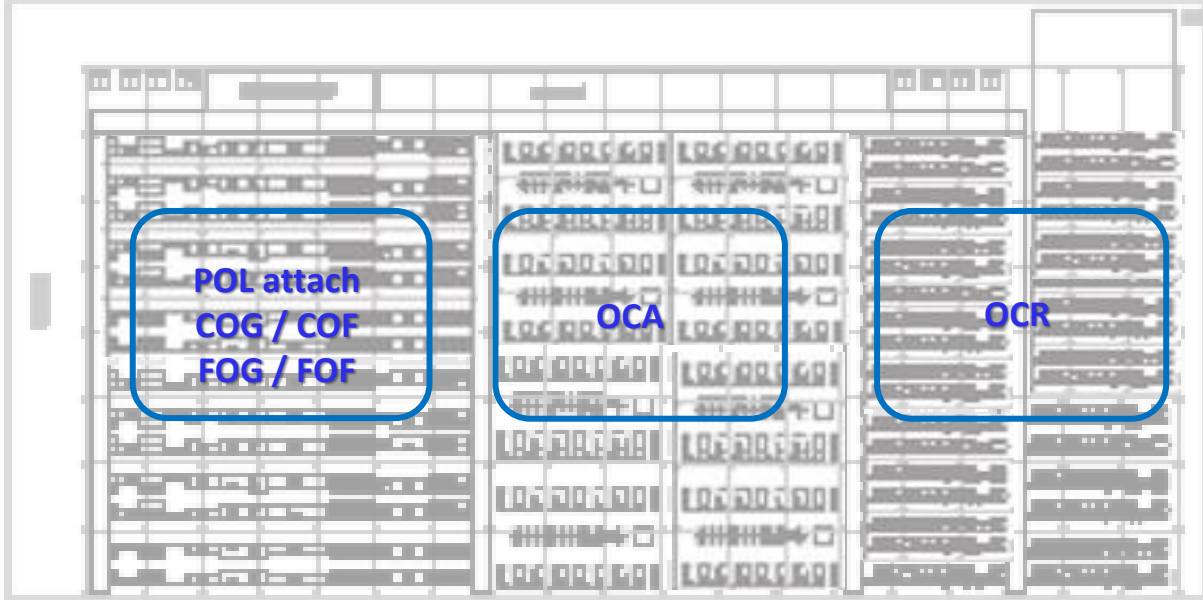


Equipment	Inspection	Details
AVT	Appearance inspection, bottom	Check for defects such as scratches and cracks
	Appearance inspection, top	
	Stain inspection	Automatic stain test
	Pixel defect inspection	Specific pixel defect test such as LD (line defect) and PD (point defect)
	Line defect inspection	Test for Line open/short
MVT	Stain inspection	Manual stain test

5. Module Manufacturing Process

5.1 Module Manufacturing Equipment Layout

Module layout example

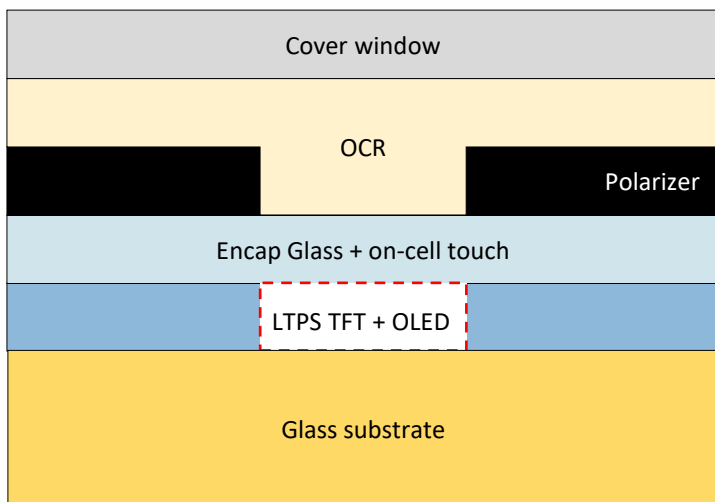


5. Module Manufacturing Process

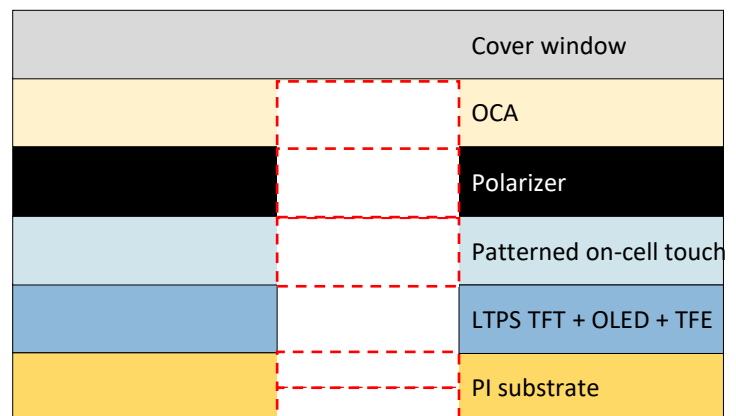
5.4 Camera Punch Hole Manufacturing Process

Basic structure

- Punch hole structure of rigid OLED is a structure like (a) that can pass light by eliminating TFT, emitting layer and electrode layer by laser drilling in vacuum environment after deposition of OLED.
- Camera punch hole of Flexible OLED removes all of PI substrate to OCA (b).
- The polarizer for rigid OLED is attached with hole formed, and for flexible OLED, hole is formed by laser



(a) Rigid device structure



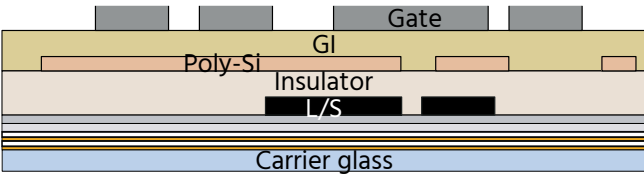
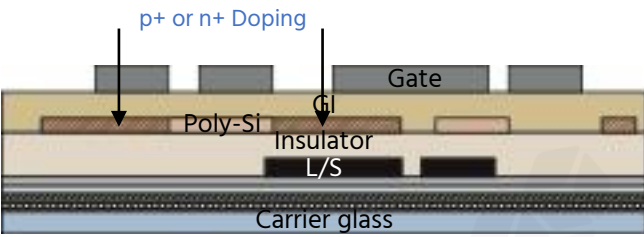
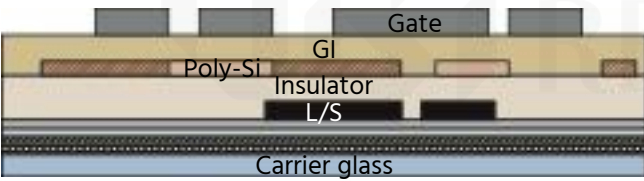
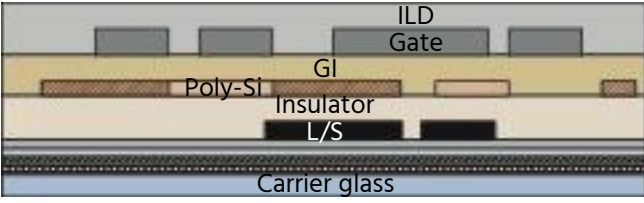
(b) Flexible device structure

6. Apple Watch 5 LTPO TFT Manufacturing Process

6.2 Manufacturing Process

- Ion doping and interlayer 1 deposition

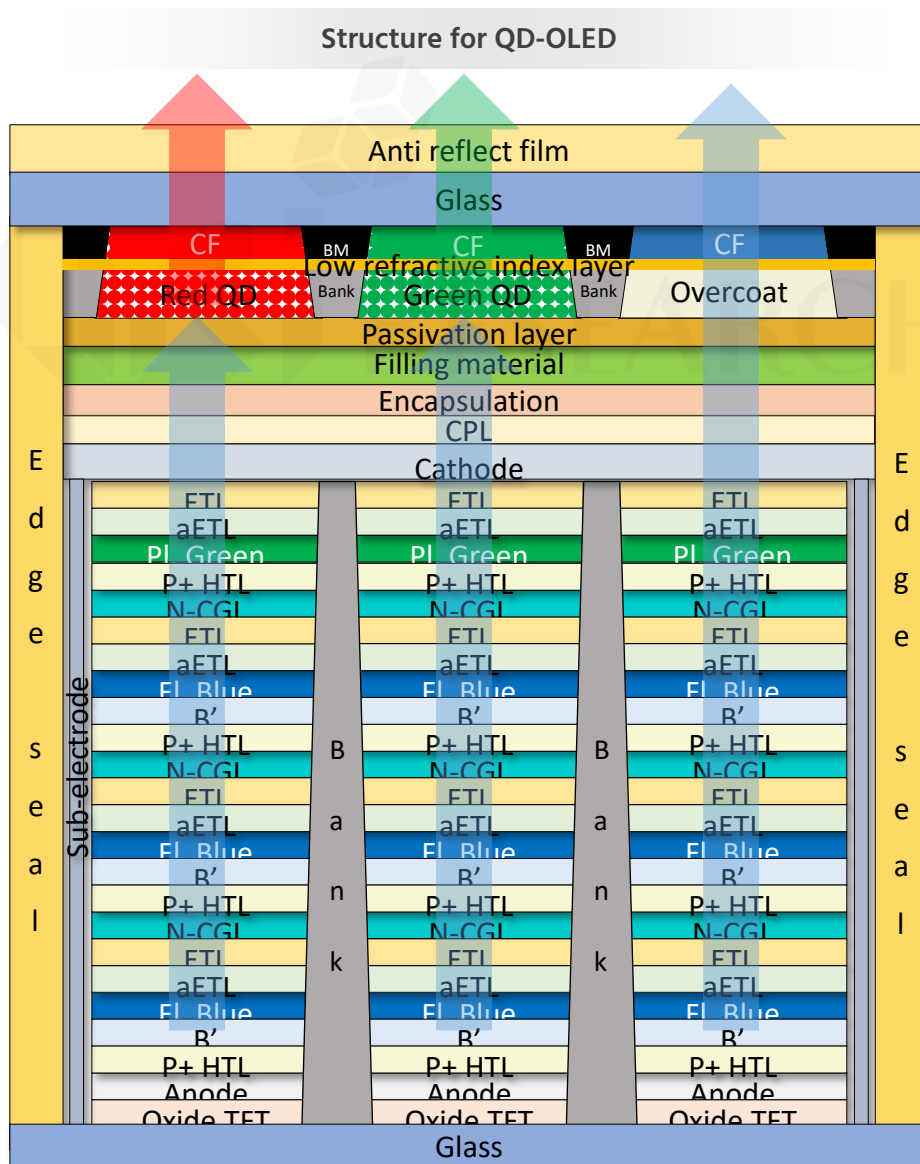
LTPO TFT manufacturing process and equipment

Process	Materials	Equipment
	-	Ion implanter
	-	RTA or furnace
	EUV, HF, O ₃ , H ₂ , DI water	Cleaner
	SiN _x	PECVD

7. QD-OLED Manufacturing Process

7.1 Expected Structure

- Oxide TFT is used, and OLED pixel is a 4 stack structure with top emission structure.
- A color filter is applied initially to prevent the emission of QD material caused by external incident light.
- A low refractive index layer is added between the color filter and QD to improve light extraction.
- There is no polarizer, and an anti-reflect film is applied to the upper substrate to prevent reflection of external light.



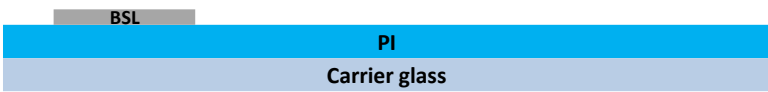
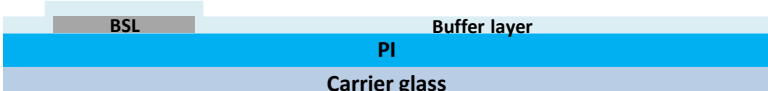
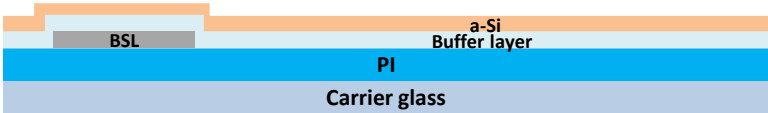
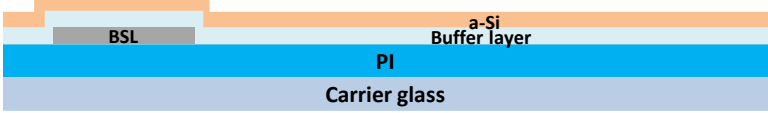
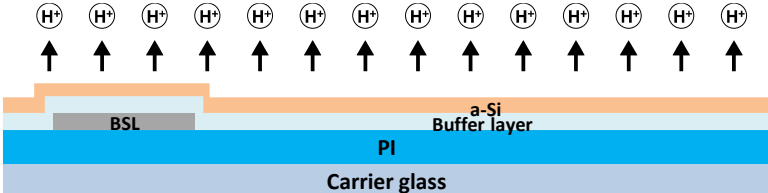
Source: UBI Research DB

8. Galaxy Note21 Ultra HOP(LTPO) TFT Manufacturing Process

8.2 Manufacturing Process

- Buffer & LTPO precursor layer deposition

HOP(LTPO) TFT Manufacturing Process and equipment

Process	Materials	Equipment
	Cleaning	EUV, DI water Cleaner
	Buffer layer deposition	SiNx/SiOx 500/3000Å PECVD
	a-Si precursor deposition	a-Si 500Å PECVD
	Cleaning	EUV Cleaner
	Dehydrogenation	- Furnace