

- Low Leakage Current Feature
- Super Light Sensitivity Feature
- Low Surface Dark Current Feature
- No Image Lag Feature
- Schottky Barrier on Gallium Oxide
- Conclusions



Slide 32 now conclusion.....Before Hagiwara 1975 inventions, all image sensors were based on the single junction type floating N+P photodiode with the serious image lag problem or the CCD/MOS photo capacitor type with the very poor short wave blue light sensitivity and the large surface dark current noise.

Double Junction (PNP or NPN) type Buried Pinned Photodiode originally invented by Yoshiaki Hagiwara at Sony in 1975.

See Japanese Patent Application JPA 1975-127647

The evidence that Hagiwara invented Pinned Photodiode is given in Fig. 7 of JPA 1975-127647.

- (1) the P+P or N+N surface barrier doping profile resulting in very high blue light sensitivity
- (2) the built-in MOS Capacitor Buffer Memory for Global Shutter Function for CMOS imagers
- (3) Pinned flat surface potential of no surface electric field gives very low surface dark current
- (4) Complete Charge Transfer gives No Image Lag.

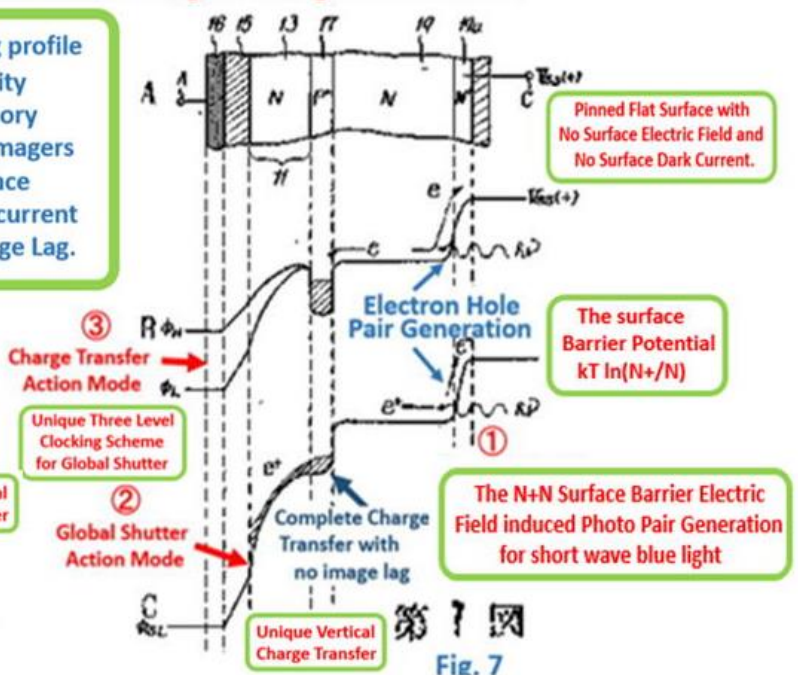
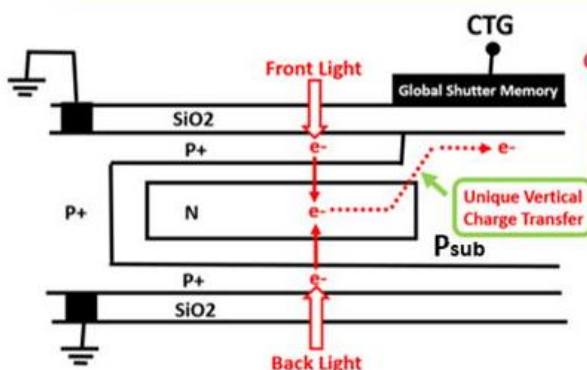


Fig. 7