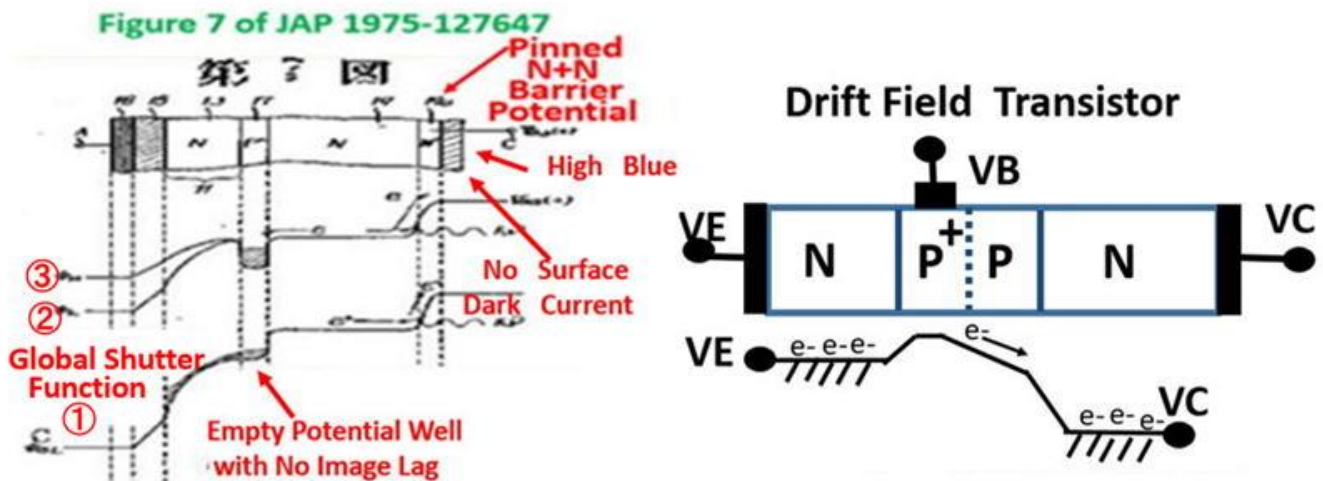


## Super Light Sensitivity Feature

<http://www.aiplab.com/>  
Yoshiaki Hagiwara



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Hagiwara proposed the N+NP+N junction type Pinned Photodiode in 1975.

The surface N+N doping slope profile is similar to the minority carrier electrons injected from the emitter terminal in the high frequency N+NP+PNN+ bipolar transistor, and drifting quickly, in Hagiwara 1975 invention, into the majority carrier hole-rich buried charge collecting and storage P+ region the N+NP+N junction type Pinned Photodiode which was proposed by Hagiwara in 1975.

If the base region width is narrow enough, one or two electrons may recombine with the holes in the base, but the most of the electrons can reach the collector terminal of the strongly reverse-biased depletion region.

The buried N type region of Pinned Photodiode acts as if the collector region of the NPN bipolar transistor does.

This photo electron generation separation physical mechanism is unique and quite different from the ordinary electron hole pair separation in the normal PN junction depletion region

The same surface P+P or N+N doping slope was utilized in the original 1975 pinned photodiode to realize the excellent short wave blue light sensitivity.