II. Difference between Floating Surface and Pinned Surface Buried Photodiodes

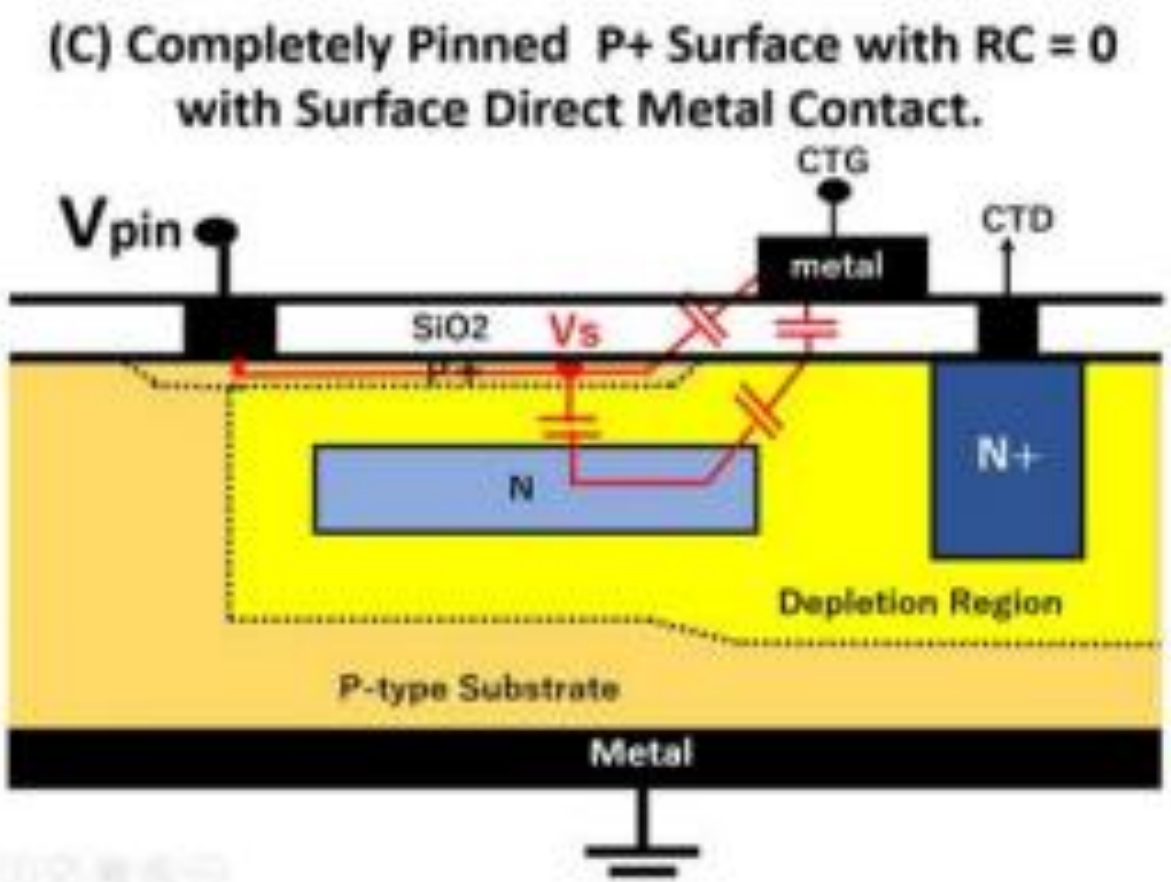

Fig.4 Difference of Buried Photodiode and Pinned Photodiode

The other two are Buried Photodiodes with a pinned surface and a pinned empty potential well. Hinted by Pinned Surface Devices produced by Sony bipolar IC technology, Hagiwara invented Pinned Buried Photodiode [4] as shown in Fig. 4c. Hagiwara Team developed in 1978 Pinned Buried Photodiode [5] as shown in Fig. 4d.

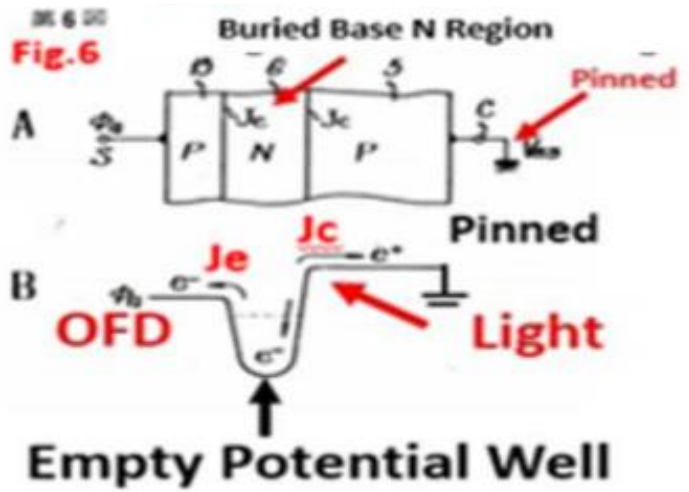

Fig 7 The patent claims in Japanese and an English translation with a reproduction of a figure drawn in Japanese patent application JPA1975-134985 which defined an PNP double junction dynamic photo transistor type Pinned Buried Photodiode with in-pixel overflow draining (VOD) capability.

[4] http://www.aiplab.com/JPA_1975_134985_on_PPD_with_VOD.html

[5] Y. Hagiwara, Motoaki Abe and Chikara Okada,"A 380H X 488V CCD Imager with Narrow Channel Transfer Gates", Proceeding of the 10th Conference on Solid StateDevices, Tokyo 1978.