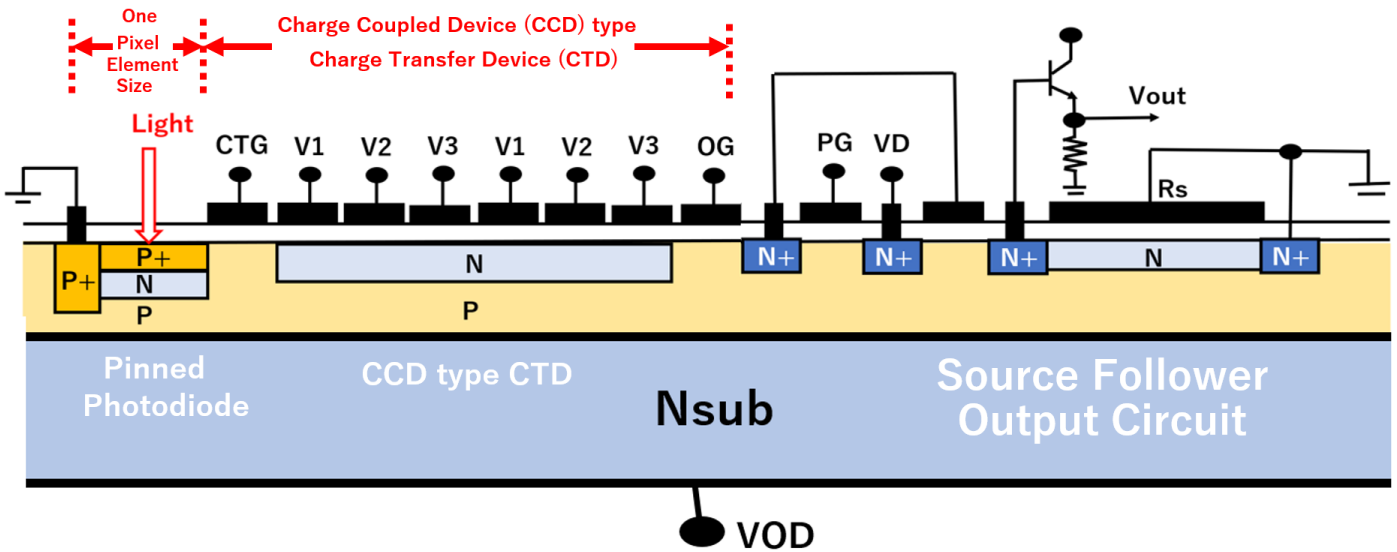


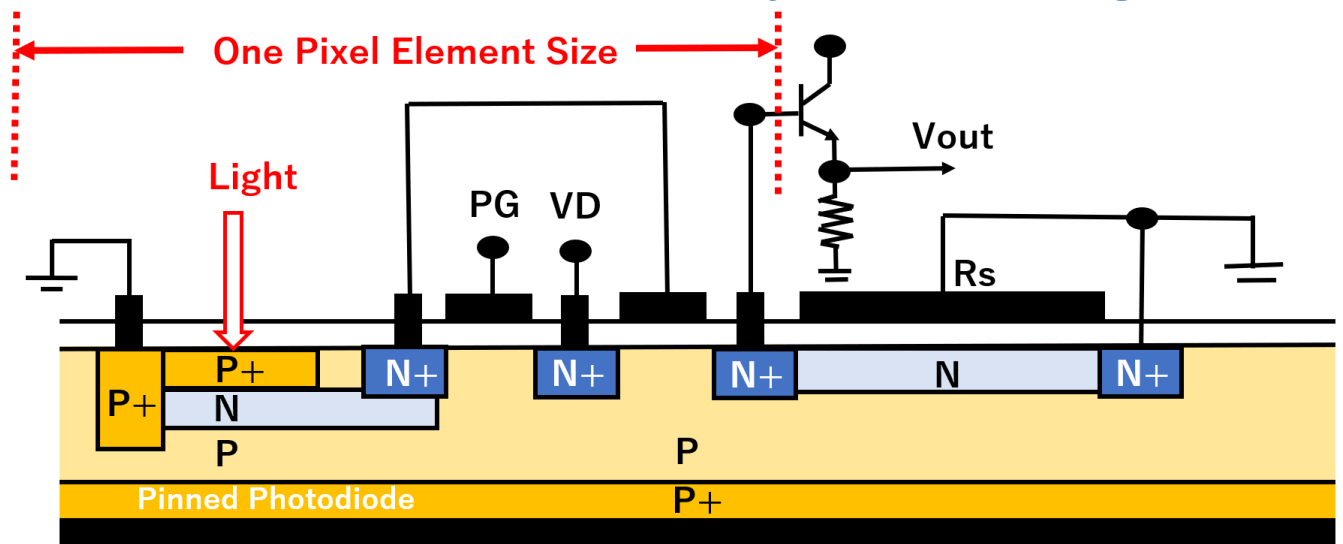
CCD was invented in 1970 by Bell Lab, USA
 Pinned Photodiode was invented in 1975 by Sony.



For 1975~2000, CCD was used widely to transfer one single photo electron signal charge.

By 2010 in Modern Digital TV era, CCD was completely replaced by the In-pixel Active Source-Follower Current-Amplifier Circuit originally invented by Peter Noble in 1966.

But Pinned Photodiode is still used widely now in CMOS image sensors.



[Japanese Patent Application JPA1975-127646](#)

[Japanese Patent Application JPA1975-127647](#)

[Japanese Patent Application JPA1975-134985](#)

[P1977 Narrow Channel Transfer Gate CCD SSDM1977 Paper by Hagiwara.pdf](#)

[Japanese Patent Application JPA1977-126885](#)

[P1978 SSDM1978 Paper on the double junction type Pinned Photodiode.pdf](#)