

IV. SURFACE BARRIER FIELD FOR BLUE-LIGHT SENSITIVITY

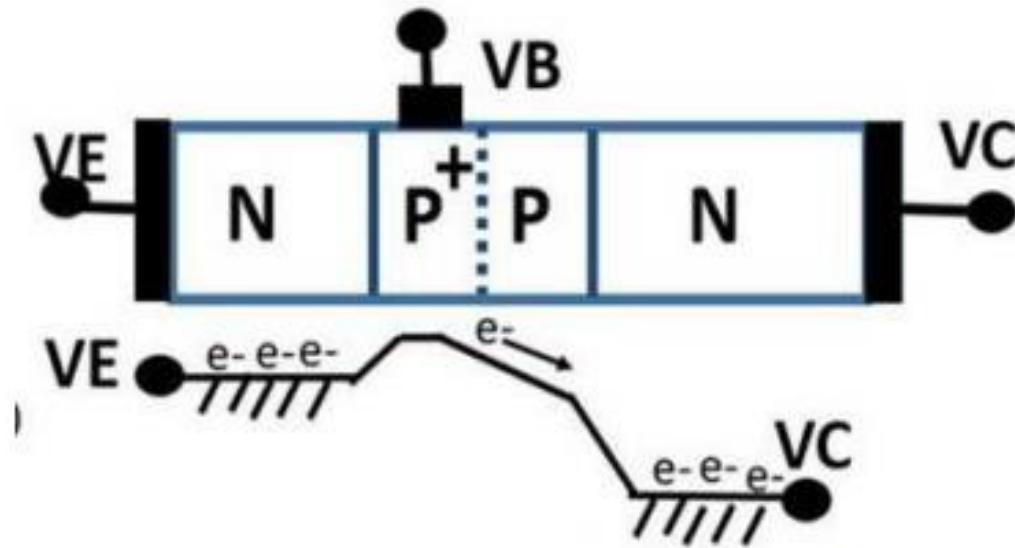


Fig. 8 Drift Field Transistor with the base barrier electric field formed by the P+P base doping-engineering for high frequency operations.

The drift-field transistor, invented by Herbert Kroemer in 1953 [7], has a graded base. See Fig. 8. The graded base was formed by diffusing the base dopant in a clever way. Having a doping-engineered electric field in the graded base, a higher doping concentration is formed near the emitter reducing towards the collector, resulting in a high-speed bipolar junction transistor with the reduced charge carrier base transit time. Hagiwara in 1975 used P+P doping engineering to enhance the short-wave blue light sensitivity in Pinned Buried Photodiodes.

[7] https://en.wikipedia.org/wiki/Herbert_Kroemer