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Pinned-surface and double-junction photodiode type super high-performance image sensor with built-in solar cell structure

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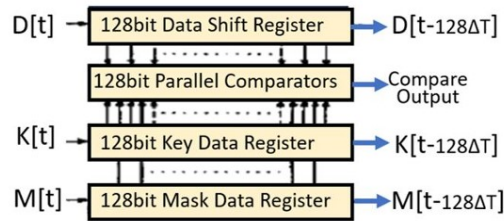


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128-bit Comparator Block

one-bit Comparator Element Block



$c_0 = 1$ only if $M[i]=0$ and $D[i]=K[i]$ for all i 's;
 When ϕ_3 is ON the block is in latch-state.

$$c = \text{OR}(\text{EXNOR}(d,k),m)$$

\bar{m}	d	k	c	
1	1	1	1	If $m=0$ and $d=k$, no passage to the ground, inactive with c pulled up to V_{dd}
1	0	0	1	
1	1	0	0	If $m=0$ and if d is not k , c is pulled down, active with a passage to the ground.
1	0	1	0	
0	-	-	1	If $m=1$, no passage to the ground, always inactive with c pulled up to V_{dd}

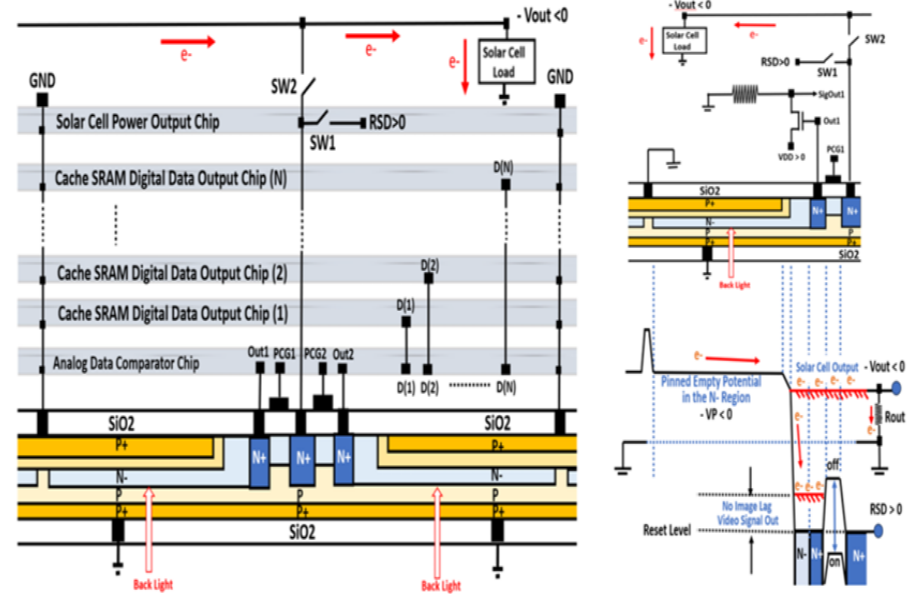
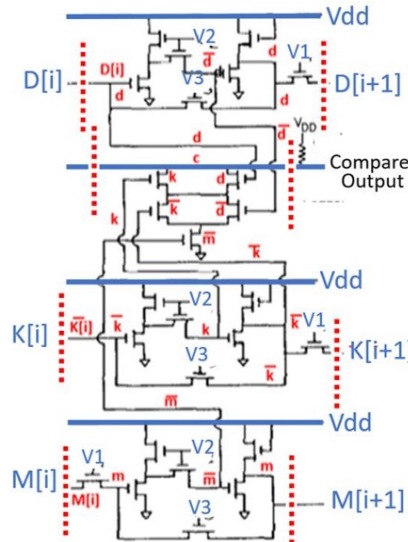


Figure 4. A cross-sectional view of a new AI Robot Vision chip in 3DIC multichip architecture

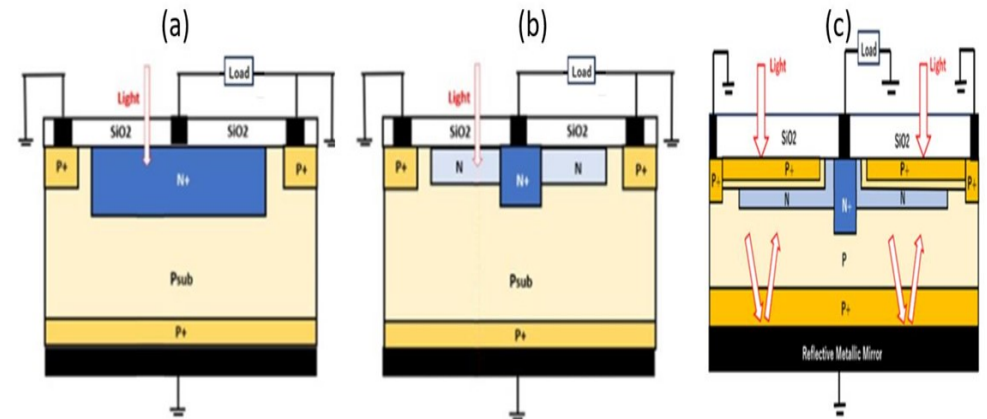


Figure 10. Two types of single junction photodiodes (a) and (b) with a double junction photodiode (c).

The buried N region in Fig.10c is always completely depleted.

Figure 3. Full schematics of one bit slice of a new 128-bit multi-comparator for AI robot vision