

# Eight-block division power\_supply scheme control signal generator for the subretinal prosthesis

## Nonoverlapping phase

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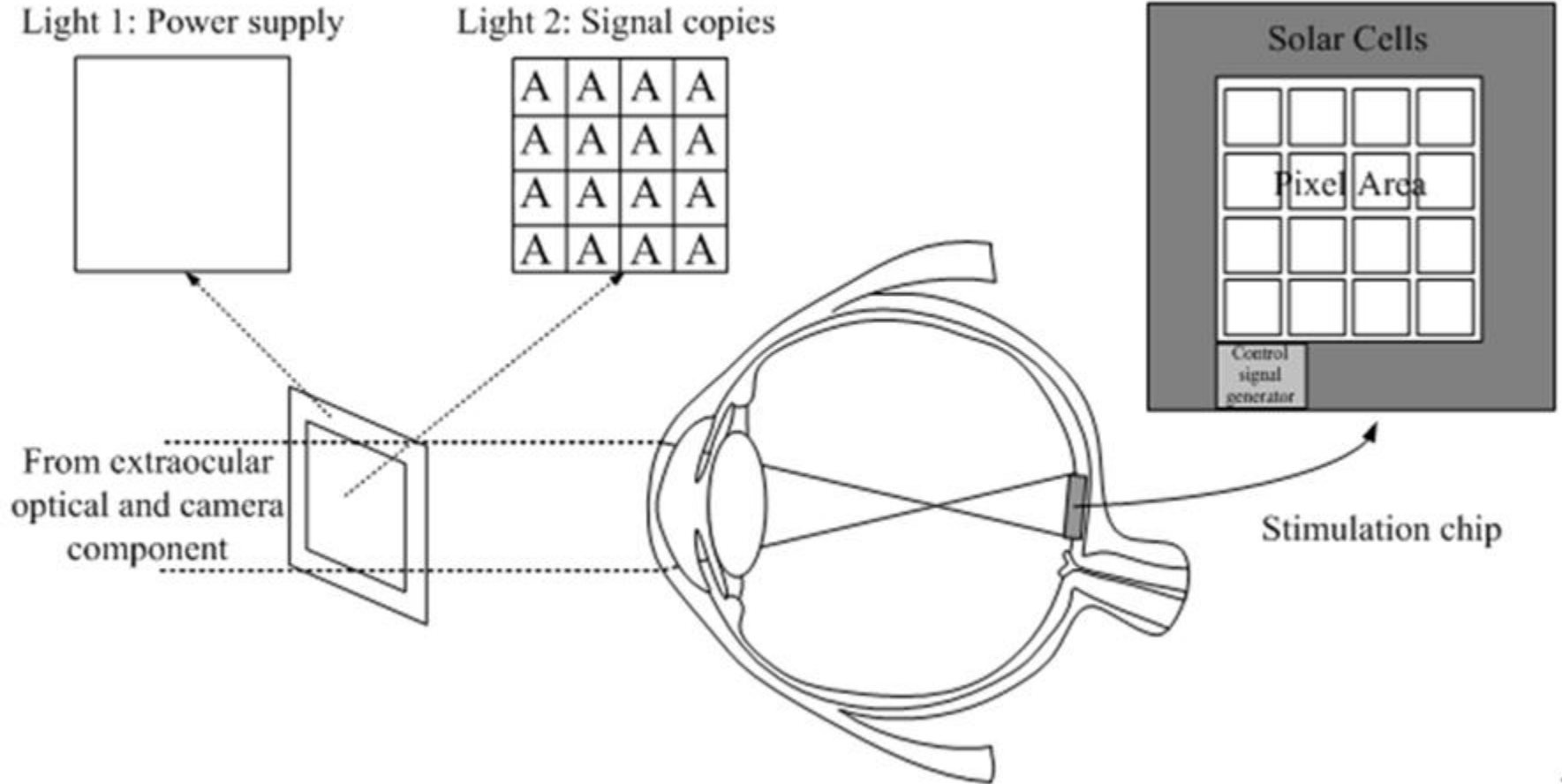
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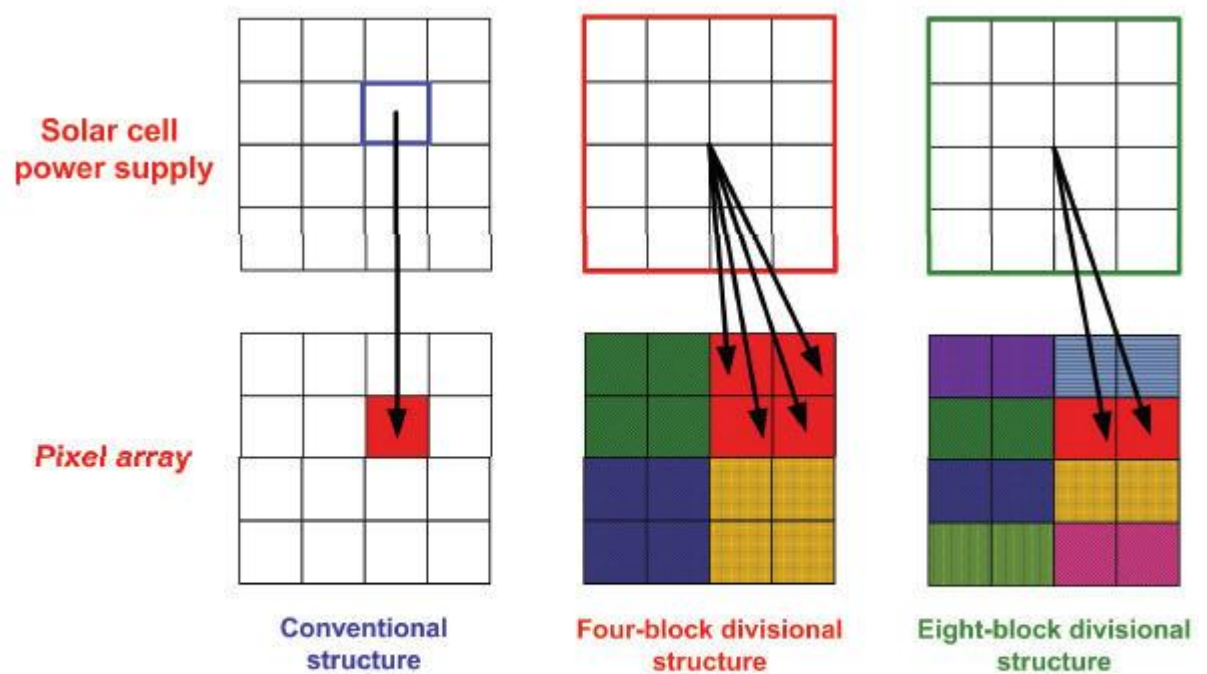
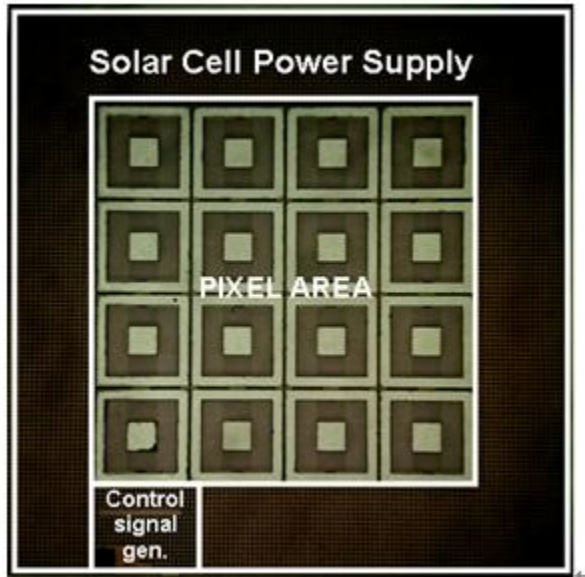
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# Schematic of solar cell division power\_supply simulation chip and subretinal implant system



# Eight-block division power\_supply Simulation Chip

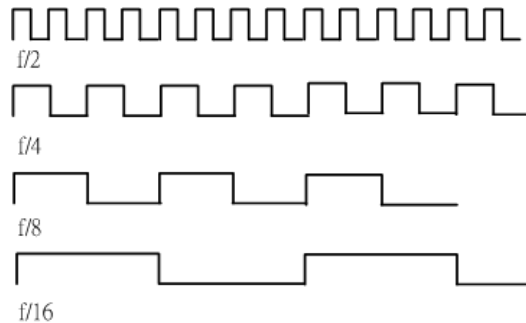


Schematic of 16-pixel (a) conventional SCA, (b) four-block divisional SCA and (c) eight-block divisional SCA.

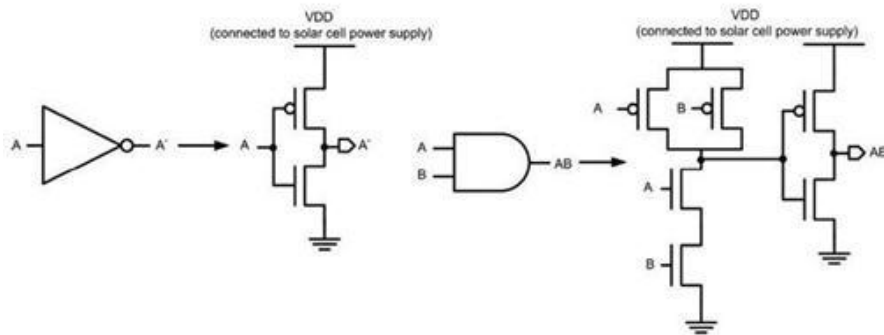
# Simulation Circuit

- Three frequency divider generate four different frequency signals.(Fig.1)
- those signal pass through designed circuit generating eight nonoverlapping phase.(Fig.2)

**Fig.1**

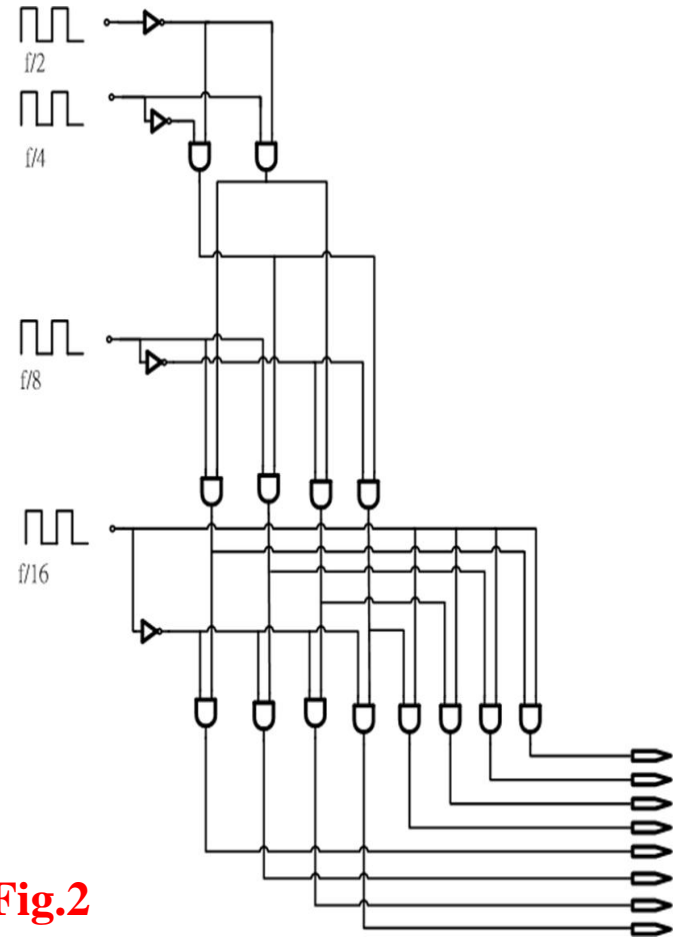


**INV & AND size**



INV nMOS:(W/L=1um/0.18um)  
pMOS:(W/L=4um/0.18um)

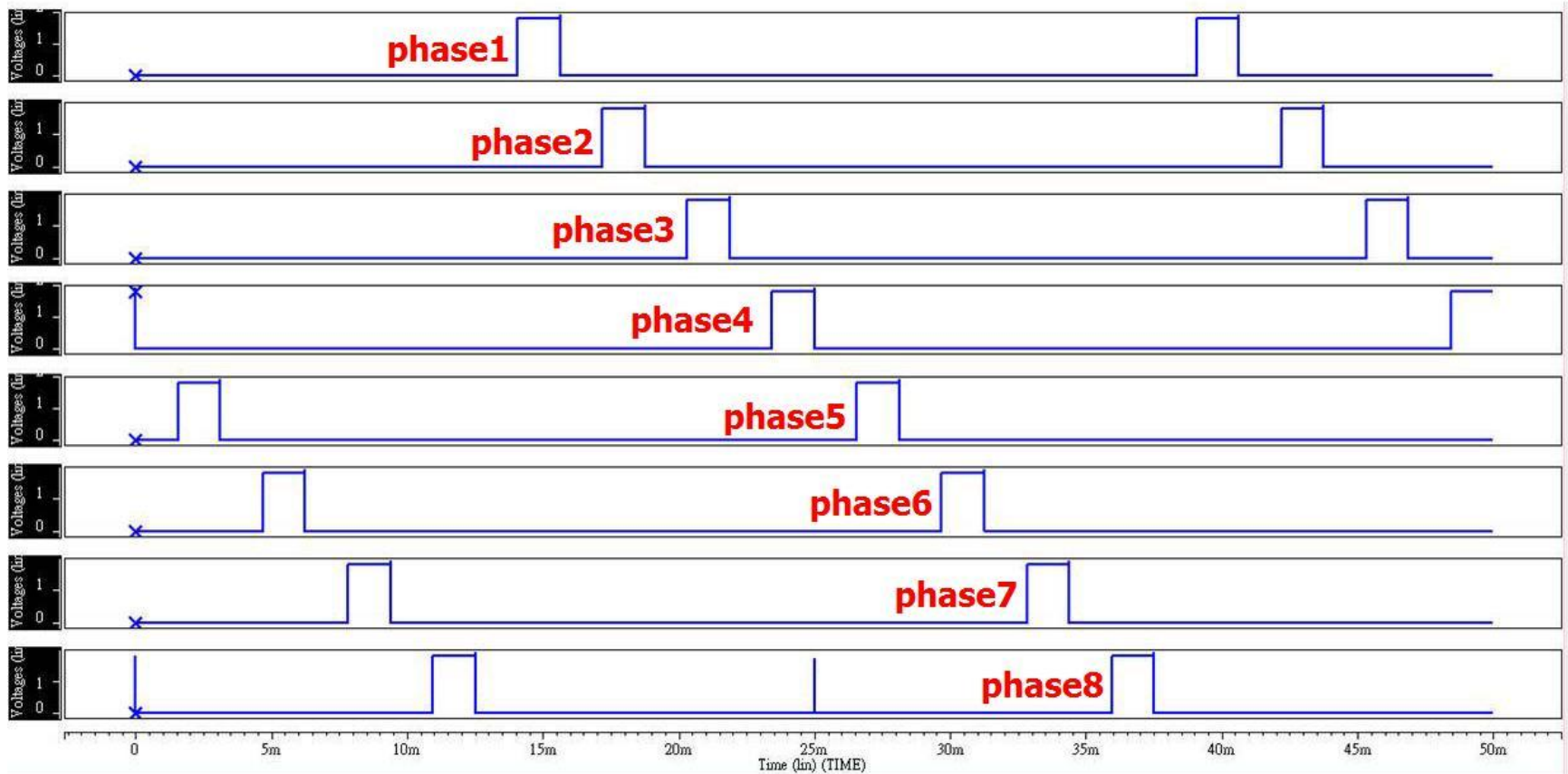
AND nMOS:(W/L=1um/0.18um)  
pMOS:(W/L=4um/0.18um)



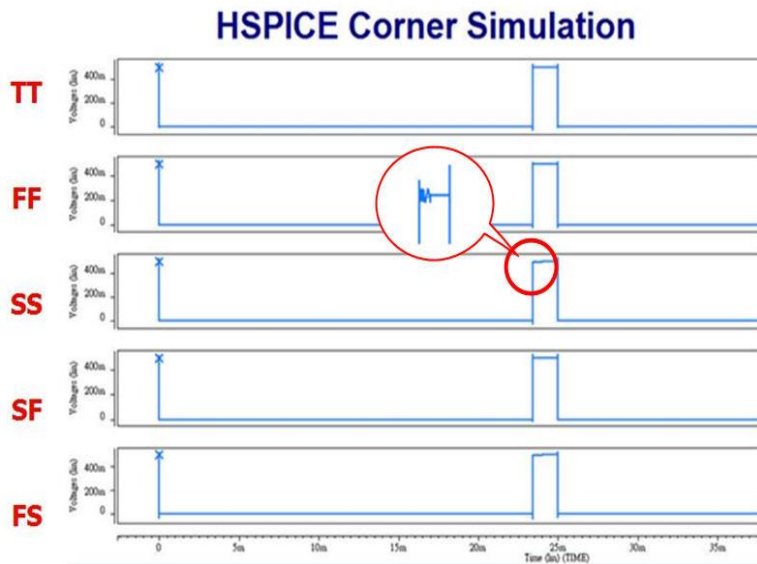
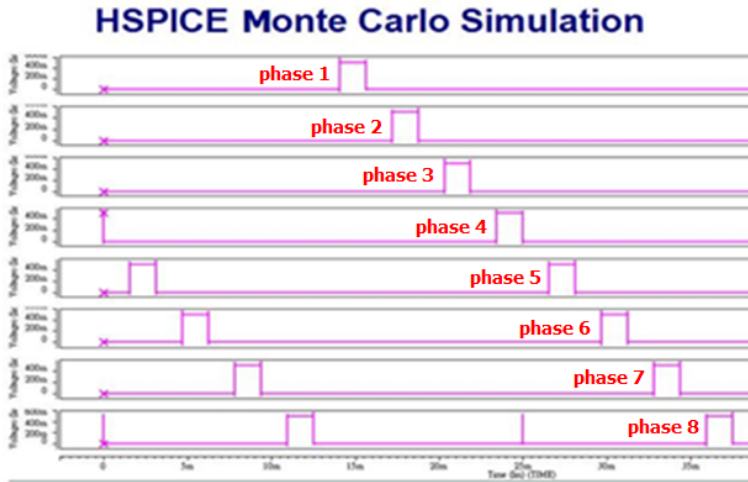
**Fig.2**

# Simulation Result

Through designed circuit ,successfully generates eight nonoverlapping control signals.



# Monte Carlo & Corner Simulation



- ◆ **monte carlo simulation** checks the stability of the designed circuit under different W/L size.
- ◆ Left figure is monte carlo sweep 10 times result ,it shows output signal not drift.
- ◆ If the output signals drift ,it imply some bugs in the designed circuit or layout.
- ◆ **Corner simulation** is in order to consider the mismatch in process.
- ◆ Wafer quality will be affected by process temperature and the position of wafer.
- ◆ Left figure is the corner simulation of phase 1.
- ◆ The output signal vibrates slightly ,but the swing is small ,and still in acceptable region.