

Sensors

Previous meeting:

- Optimization of guard ring structure for 1000 V n^+np^+ -sensor including surface radiation damage effects
- Generic simulation of n^+n -cells

Little work on sensor design done since !

→ need to agree on specifications, in particular:

- type and doping concentration
- thickness
- maximum voltage
- biasing scheme
- maximum dark current and coupling scheme
- exact pixel geometry and inter-pixel parameters (C/R)
- dead regions at corners
- technology and (tentative) vendor
- etc

How to agree ?

working party (experts for science ⊗ sensor ⊗ electronics ⊗ layout ⊗ experience at SR-sources ⊗ ???)

An attempt at this meeting ???



parameter	value	comments
dimensions	$x \cdot x \text{ mm}^2$	mounting, test experiments
thickness	500-700 μm	U_{dep} , plasma effects, shielding, efficiency, science
material/diode type	p^+ on n	h-collection, plasma effects, pulse shape
doping	3-5 $\text{k}\Omega \cdot \text{cm}$	U_{dep} , plasma effects
doping uniformity		charge collection distortions
pixel dimensions	200·200 μm	electronics, science
U_{max}	1000 V	mounting, pulse shape, dead space at edges
pad layout		bump bonding, capacitance
biasing scheme		detector tests
coupling type	DC	bias current correction
inter-pixel capacitance		noise, cross-talk, avalanche breakdown, $U_{\text{operation}}$
total dark current	2 μA	detector technology ok
max. dark current/pixel	50 nA	noise, uniformity
passivation	SiO_2 , (Si_3N_4)	irradiation, environmental effects
dead region at edges		dead space for science