

RECENT PERFORMANCE IMPROVEMENTS IN BCMD IMAGE SENSORS

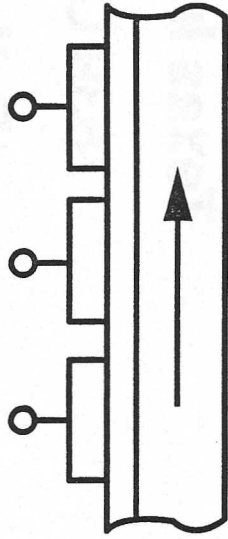
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Dallas, Texas 75251 USA**

Recent Performance Improvements in BCMD Image Sensors

INTRODUCTION

CCD Image Sensors



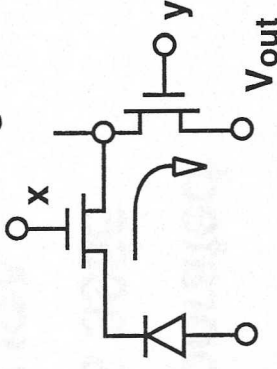
Advantages

- Simple structure
- Good quantum efficiency
- High uniformity
- High resolution
- Low noise charge detection

Disadvantages

- Charge transfer efficiency
- Higher power consumption
- Serial data processing
- Large smear
- Field shift shutter only
- Difficult for system integration
- Weak against radiation

X-Y Addressable Image Sensors



Advantages

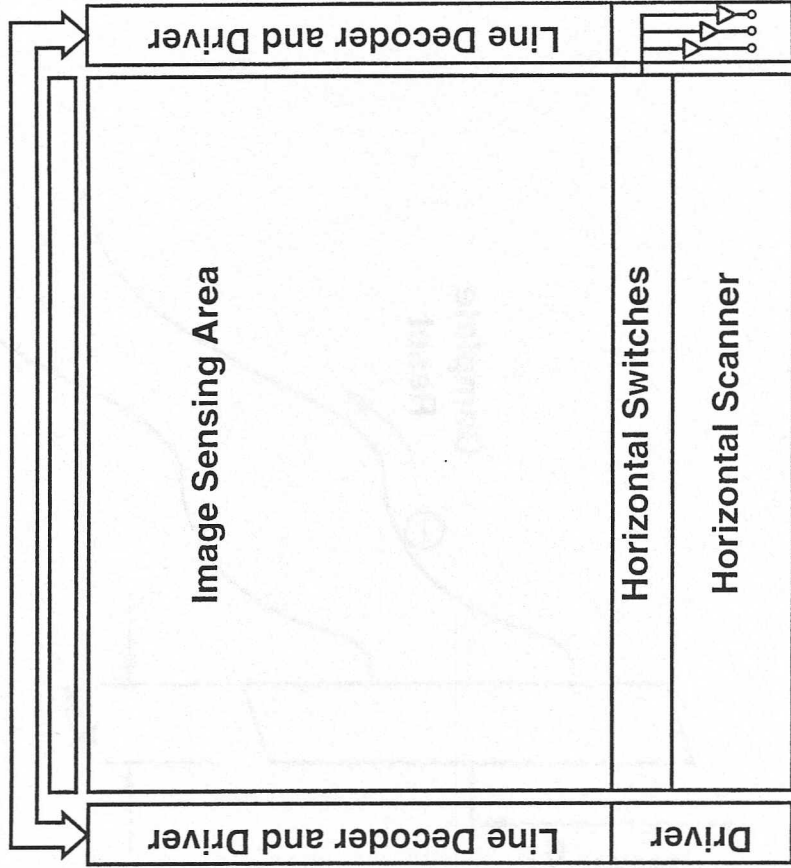
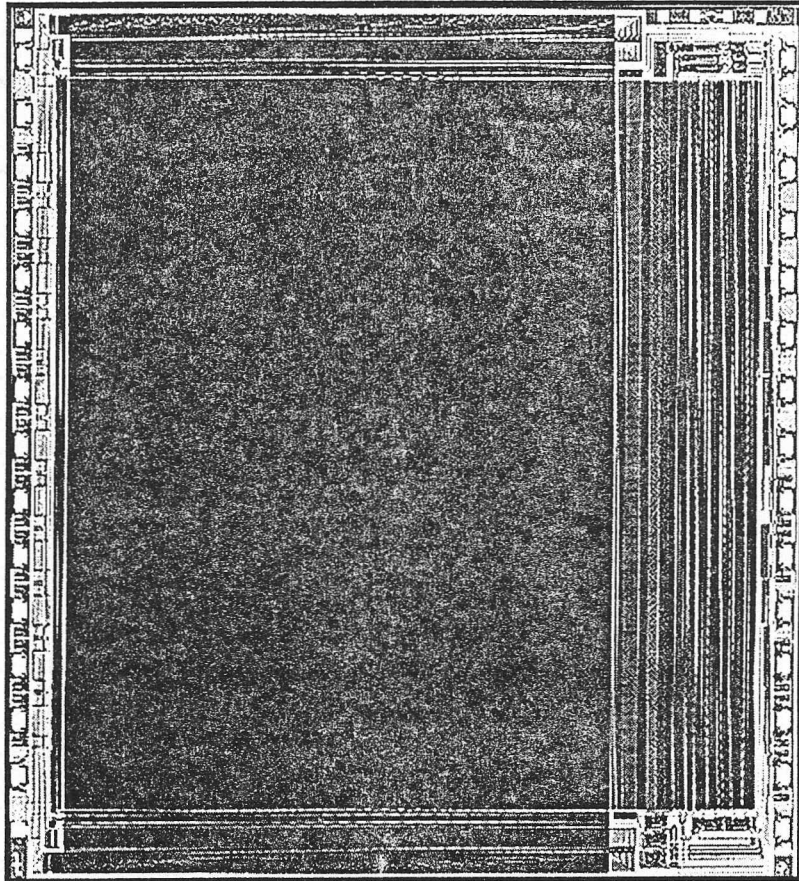
- No charge transfer
- Random access of data
- High speed
- Low power consumption
- Good antiblooming
- System integration compatibility

Disadvantages

- Complicated photosite structure
- Lower sensitivity
- Higher readout noise
- Larger nonuniformity
- Focal plane shutter only

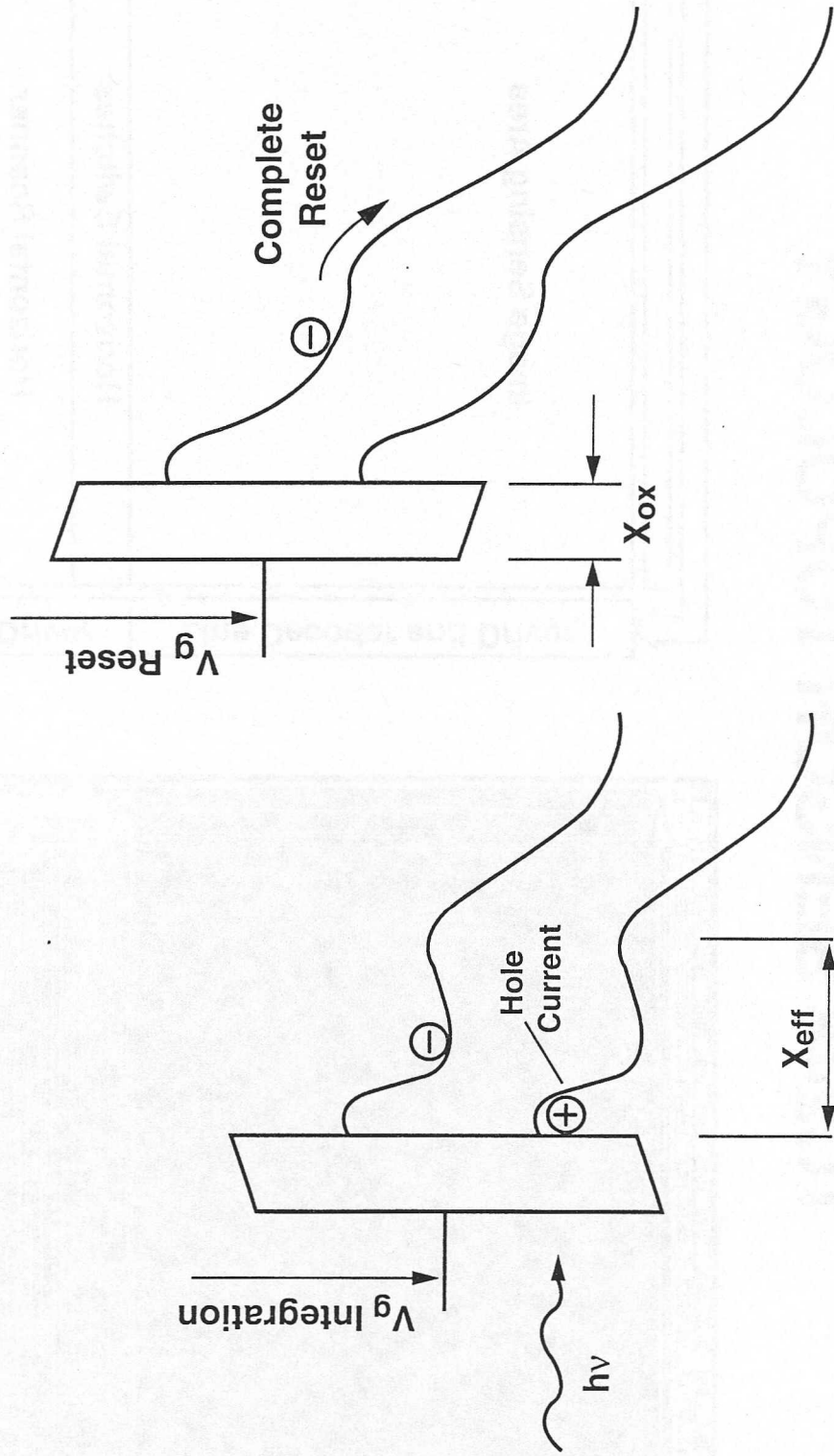
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TC248 SENSOR TOPOLOGY

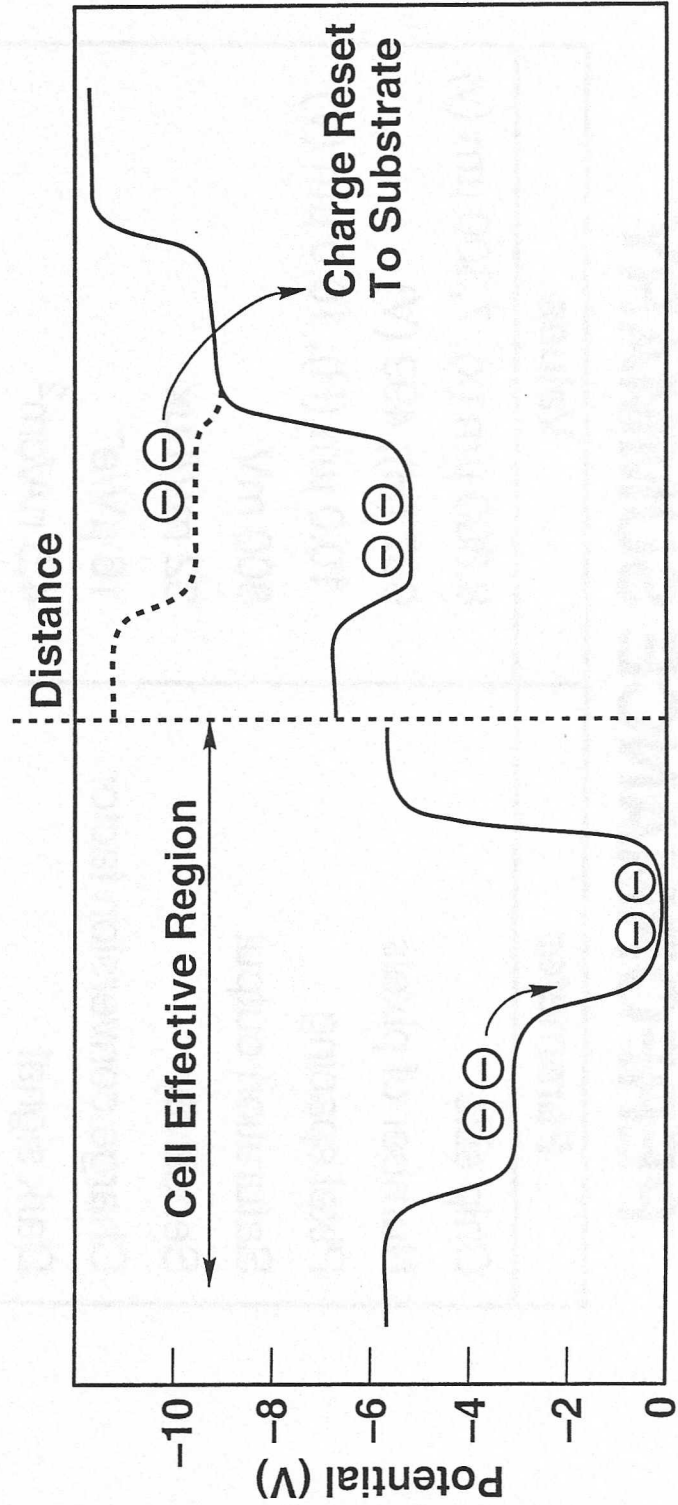
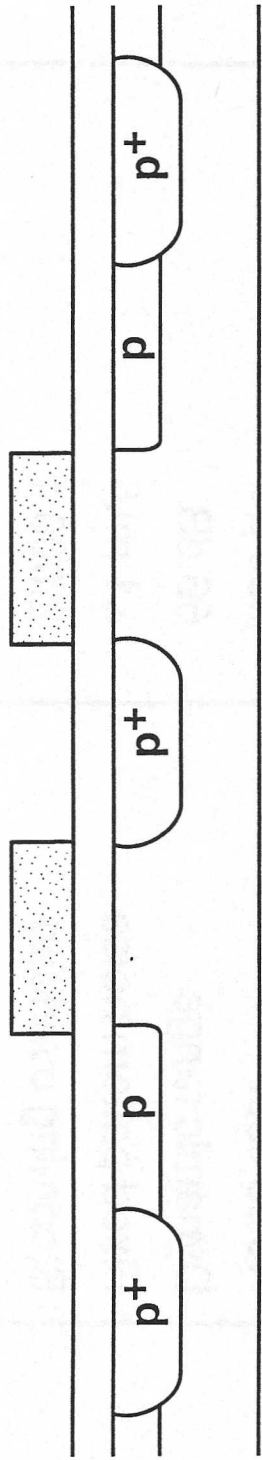


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PHOTOCELL BAND DIAGRAMS



IMPROVED PHOTOSITE POTENTIAL PROFILE



Potential Profile
During Integration

Potential Profile
During Readout and Reset

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PERFORMANCE SUMMARY

Parameter	Values
Chip size	8,300 μm (x); 7,300 μm (y)
Number of pixels	687 (H); 499 (V)
Pixel spacing	10.0 μm (H); 10.0 μm (V)
Saturation output	800 mV
Sensitivity	32 mV/Lux
Charge conversion factor	16 $\mu\text{V}/\text{e}^-$
Dark signal	4.5 nA/cm ²
Noise floor	390 μV
Dynamic range	66 dB
Fixed pattern noise	<1 mV
Blooming overload	2,000:1
Exposure control range	262:1
Smear	0.0
Lag	0.0