IR CoE ASTRONOMY TEAM

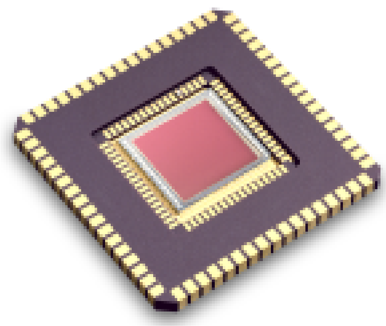
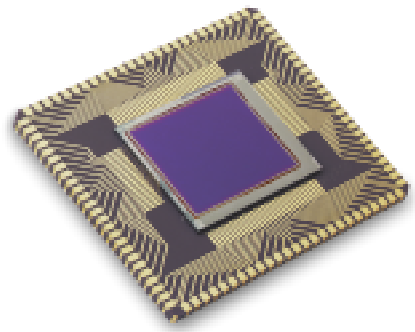
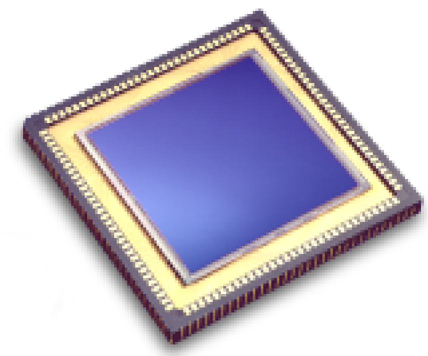
Raytheon

IR Center of Excellence

Astronomical Infrared Sensor Chip Assemblies

Standard Products

High performance InSb and Impurity Band Conduction (IBC) focal plane arrays are available with spectral responses from 0.4µm to 28µm for ground based astronomy and space based instruments. Raytheon IR CoE is one of the worlds leading suppliers of focal plane arrays for astronomical applications for the past 10 years. IR CoE utilizes state-of-the-art facilities and processes to produce these arrays. Listed below are some of the InSb and IBC arrays available from the IR CoE as standard products for astronomical applications. Custom arrays incorporating our latest multiplexer designs are also available in a variety of formats. The IR CoE has also developed a double layer heterostructure HgCdTe process for large format arrays. Custom arrays utilizing this process are available for those customers desiring HgCdTe with its ability to tailor the bandgap for any cutoff wavelength.

			
	The "SIRTF" Array	ALADDIN III Quadrant	ALADDIN III
Format:	256 x 256 (65,536 elements)	512 x 512 (262,144 elements)	1024 x 1024 (1,048,576 elements)
Pixel Size:	30 µm	27 µm	27 µm
Active Fill Factor:	> 98%	> 98%	> 98%
Spectral Response:	0.4–5.3µm (~flat from 1-5µm)	0.4–5.3µm (~flat from 1-5µm)	0.4–5.3µm (~flat from 1-5µm)
Average Quantum Efficiency:	> 70% (1–5.0 µm),	> 70% (1–5.0 µm),	> 70% (1–5.0 µm),
Typical Response Uniformity:	≤ 5% (1σ)	≤ 8% (1σ)	≤ 8% (1σ)
Average Dark Current:	≤ 1 e^-/sec	≤ 1 e^-/sec	≤ 1 e^-/sec
Typical Integration Capacity:	2.0×10^5 e^- (0.06 pF and 0.6V)	2.0×10^5 e^- (0.06 pF and 0.6V)	2.0×10^5 e^- (0.06 pF and 0.6V)
Mean Input Referred Noise:	6–50 e^- (sampling technique dependent)	8–50 e^- (sampling technique dependent)	8–50 e^- (sampling technique dependent)
Optimal Operating Temperature:	15–30Kelvin	30–35 Kelvin	30–35 Kelvin
Readout Type:	Source Follower per Detector (SFD)	SFD	SFD
Operational Modes:	Destructive or non-destructive readout	Destructive or non-destructive readout	Destructive or non-destructive readout
Compatible Sampling Techniques:	Standard correlated sampling & multiple correlated sampling (Fowler and "up-the-ramp")	Standard correlated sampling & multiple correlated sampling (Fowler and "up-the-ramp")	Standard correlated sampling & multiple correlated sampling (Fowler and "up-the-ramp")
Typical Frame Rates:	1-20 Hz	1-20 Hz	1-20Hz
Number of Outputs:	4	8	32 (8 per quadrant)
512 x 412 InSb format available upon request (contact Dr. Peter Love)	**InSb**		
	Low Background		

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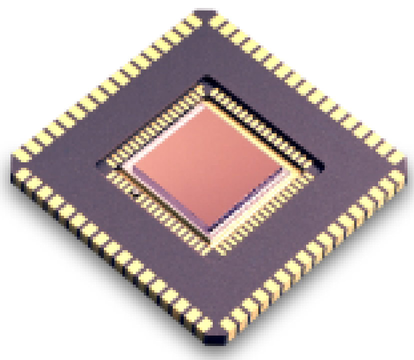
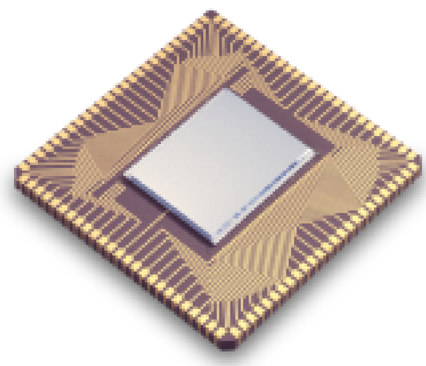
(Science Grade Operability > 99%)	 The "SIRTF" Array	
Format:	256 x 256 (65,536 elements)	320 x 240 (76,800 elements)
Pixel Size:	30 µm	50 µm
Active Fill Factor:	$\geq$ 98%	$\geq$ 98%
Spectral Response:	1–28 µm	1–28 µm
Average Responsive Quantum Efficiency:	$\geq$ 40%	$\geq$ 40%
Typical Response Uniformity:	$\leq$ 8% (σ/mean)	$\leq$ 8% (σ/mean)
Average Dark Current:	< 1 e^-/sec (@ T=6K)	< 100 e^-/sec (@ T=6K)
Typical Integration Capacity:	> 1.8 x 10^5 e^- (30fF and 1.0V bias)	1.0–3.0 x 10^7 e^- (Gain dependent)
Mean Input Referred Noise:	15–50 e^- rms (Sampling technique dependent)	< 1000 e^- rms (CDS, high gain)
Operating Temperature:	4–12 Kelvin	4–10 Kelvin
Readout Type:	Source Follower per Detector (SFD)	Direct Injection (DI)
Operational Modes:	Destructive or non-destructive readout	Integrate-while-read, Integrate-then-read
Compatible Sampling Techniques:	Standard correlated sampling & multiple correlated sampling (Fowler and "up-the-ramp")	Built-in correlated double sampling; multiple sampling can be implemented
Typical Frame Rates:	1-20 Hz	100-500 Hz
Number of Outputs:	4	16 or 32
512 x 412 & 1024 x 1024 IBC formats available upon request (contact Dr. Peter Love)	**IBC** — ***Low Background***	**IBC** — ***High Background***

For more information contact:

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