

Reverse Costing analysis



Apple iPhone 4S Camera Module Sony IMX145 8Mpixel 1.4 μ m BSI CIS

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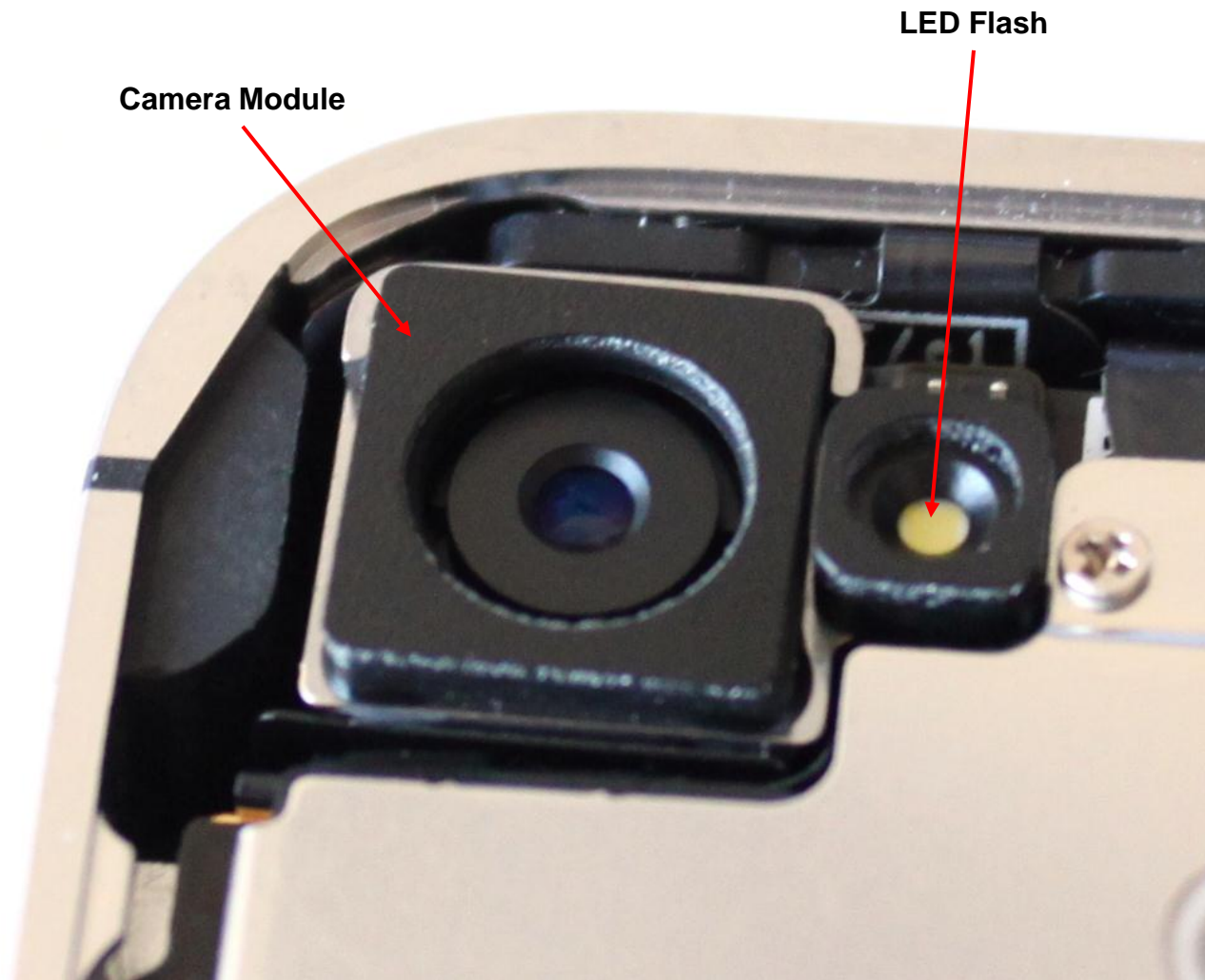
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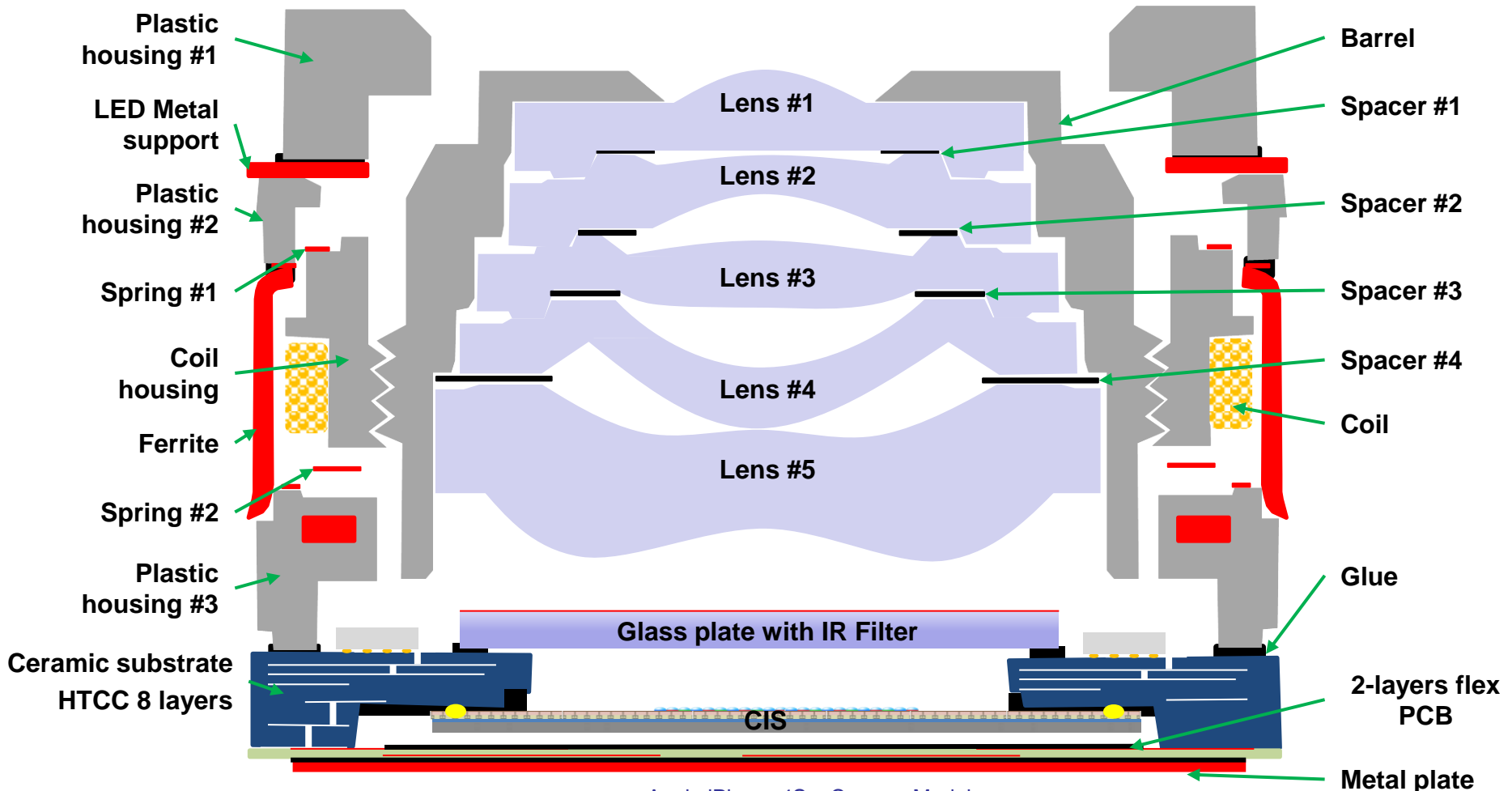
- Camera Module Price

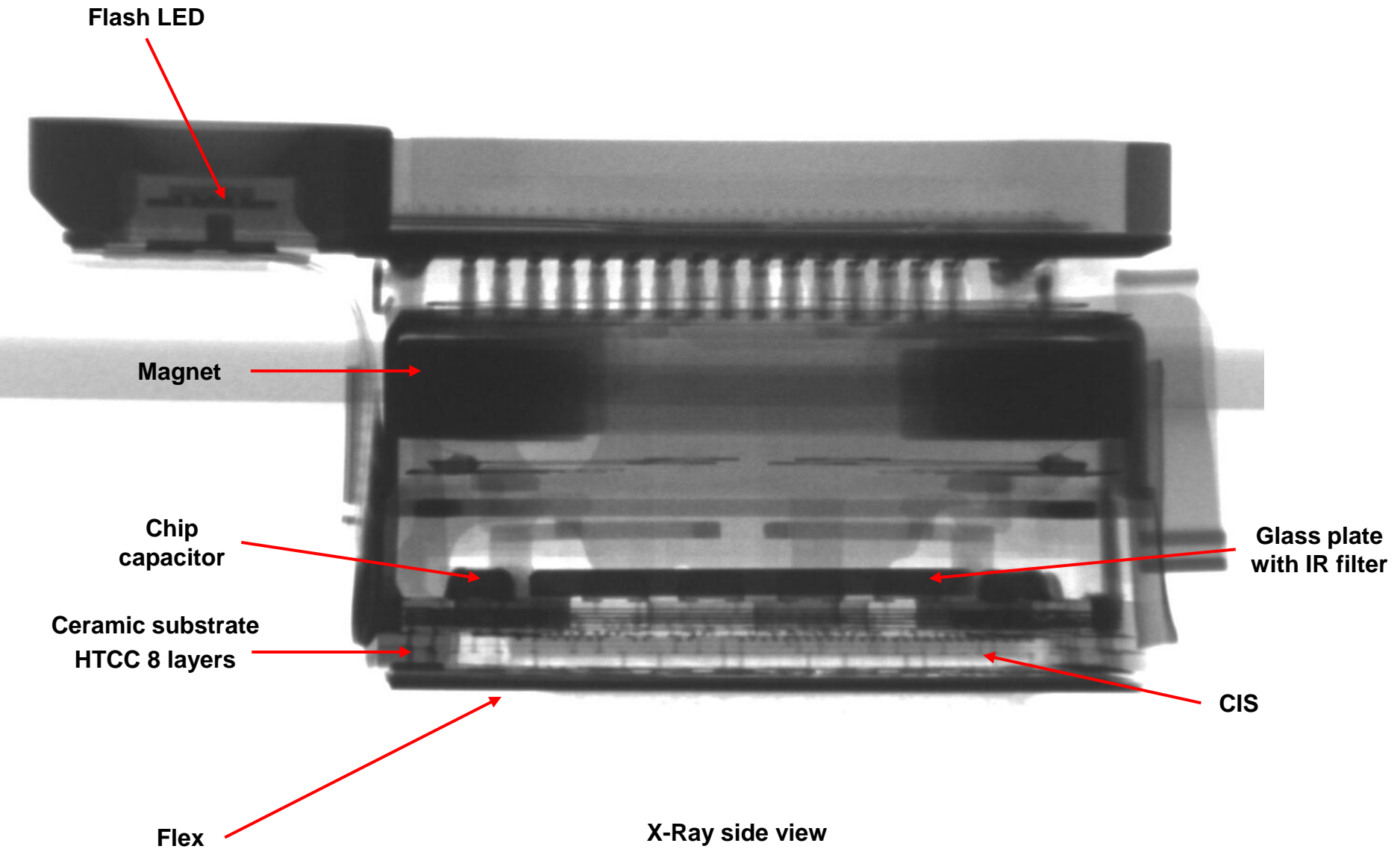


Camera Module

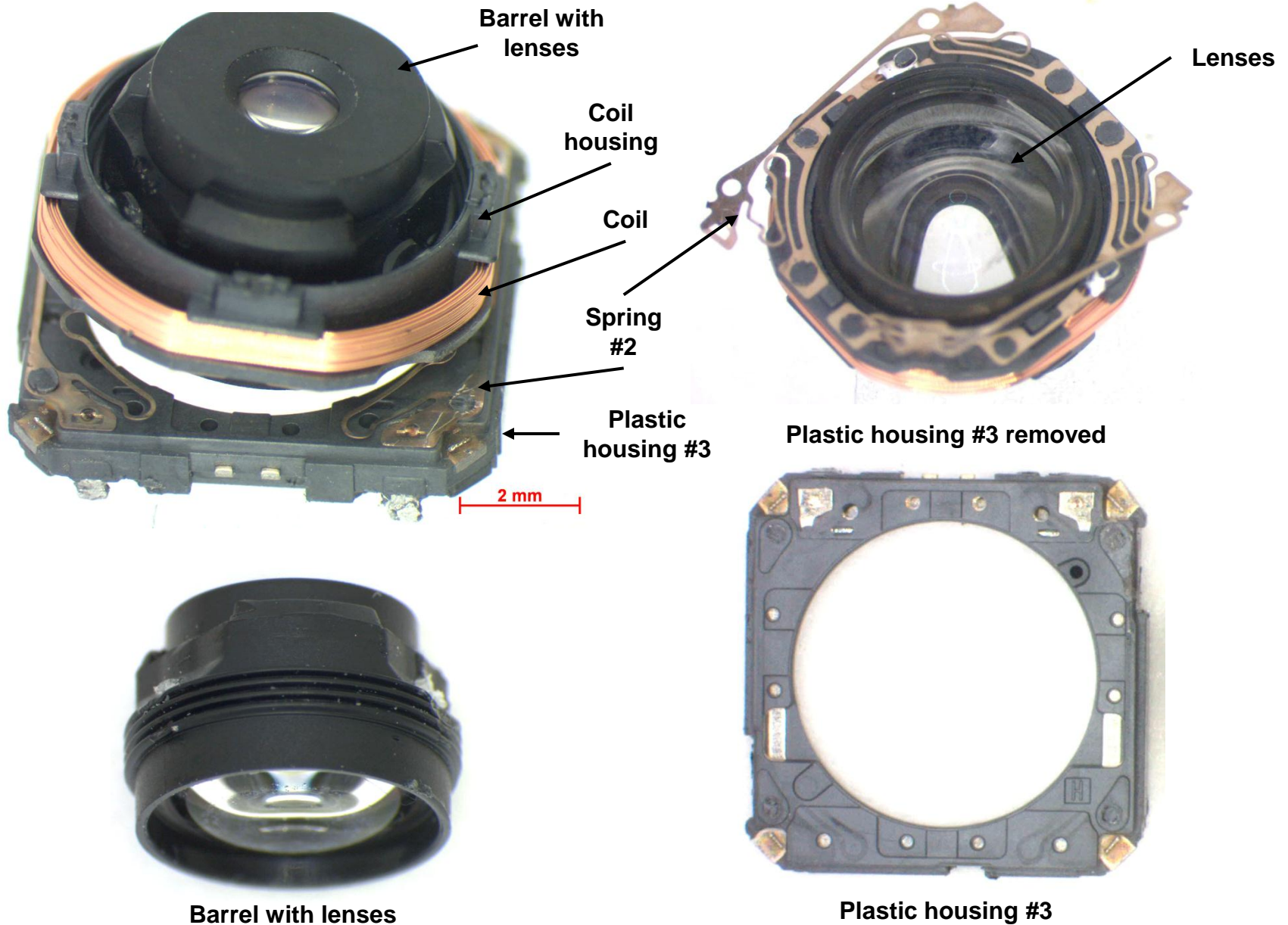
LED Flash

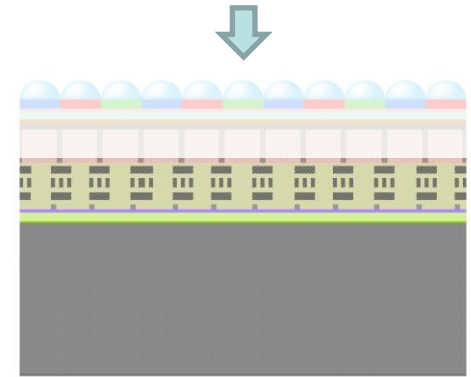
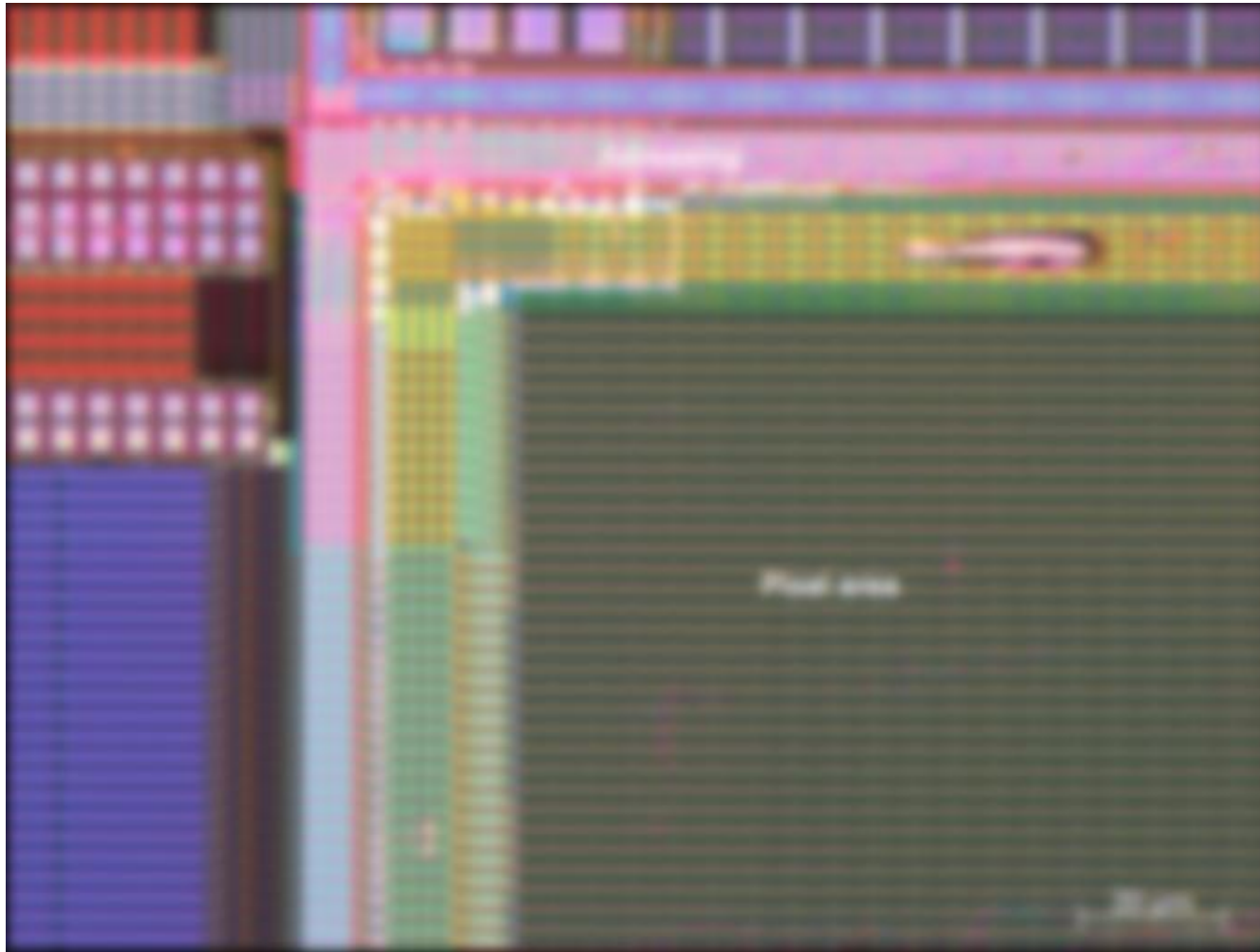
- Package is analyzed and measured.
 - X-ray pictures are used to identify the package construction and the redistribution.
- Package is opened in order to identify the elements constituting it.
- Cross-section are realized to get overall package data : dimensions, main characteristics.
- An analysis of the technologies and of the materials used is performed.





X-Ray side view





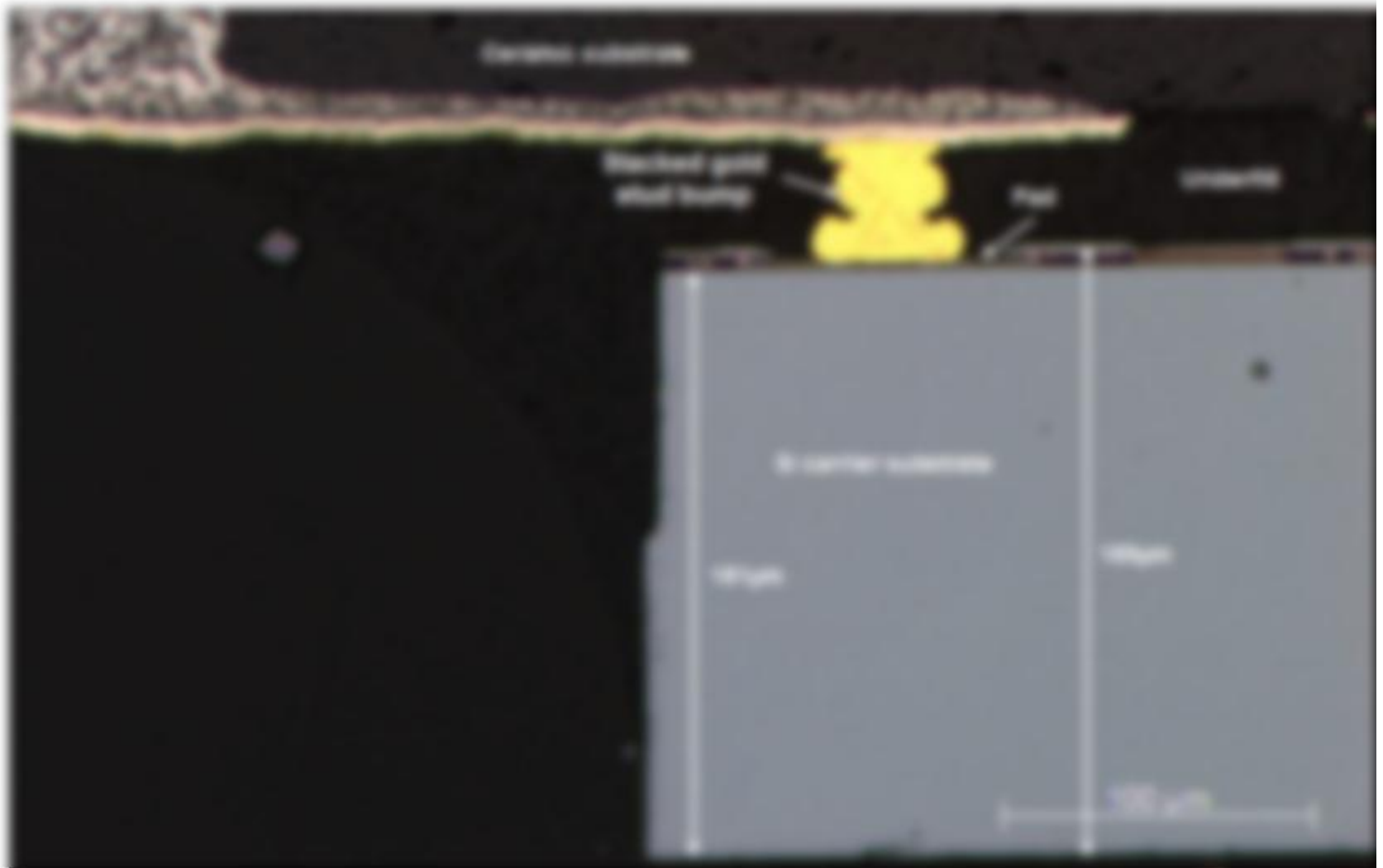
CIS top view (microlenses, color filters and tungsten removed)



Camera module cross-section – Optical view

Apple iPhone 4S – Camera Module

- The CIS uses a BackSide Illumination (BSI) technology.
- The silicon carrier substrate thickness is 187µm.

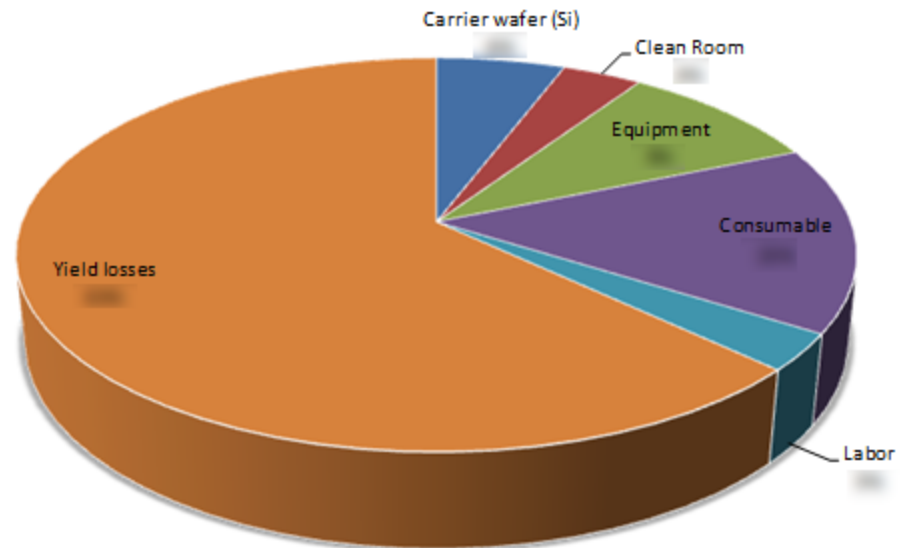


CIS bumping cross-section – SEM view

BSI	Low Yield		Medium Yield		High Yield	
	Cost	Breakdown	Cost	Breakdown	Cost	Breakdown
Carrier wafer (Si)	\$50.00	4.3%	\$50.00	4.3%	\$50.00	4.3%
Clean Room	\$27.14	2.3%	\$27.14	2.3%	\$27.14	2.3%
Equipment	\$85.71	7.3%	\$85.71	7.3%	\$85.71	7.3%
Consumable	\$107.00	9.2%	\$107.00	9.2%	\$107.00	9.2%
Labor	\$21.43	1.8%	\$21.43	1.8%	\$21.43	1.8%
Yield losses	\$400.25	34.2%	\$400.25	34.2%	\$400.25	34.2%
BSI Manufacturing Cost	\$1,166.73	100%	\$1,166.73	100%	\$1,166.73	100%
FE : CIS BSI Manufacturing yield		85.3%		85.3%		85.3%

- The cost of the BSI steps ranges from **\$1,167** to **\$798** according to yield variations.
- The main part of the cost is due to the yield losses with **34.2%**.

CIS BSI Cost Breakdown (Medium Yield)



CIS Die Price Breakdown

