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Global and China CMOS Camera Module Industry Report, 2009-2010

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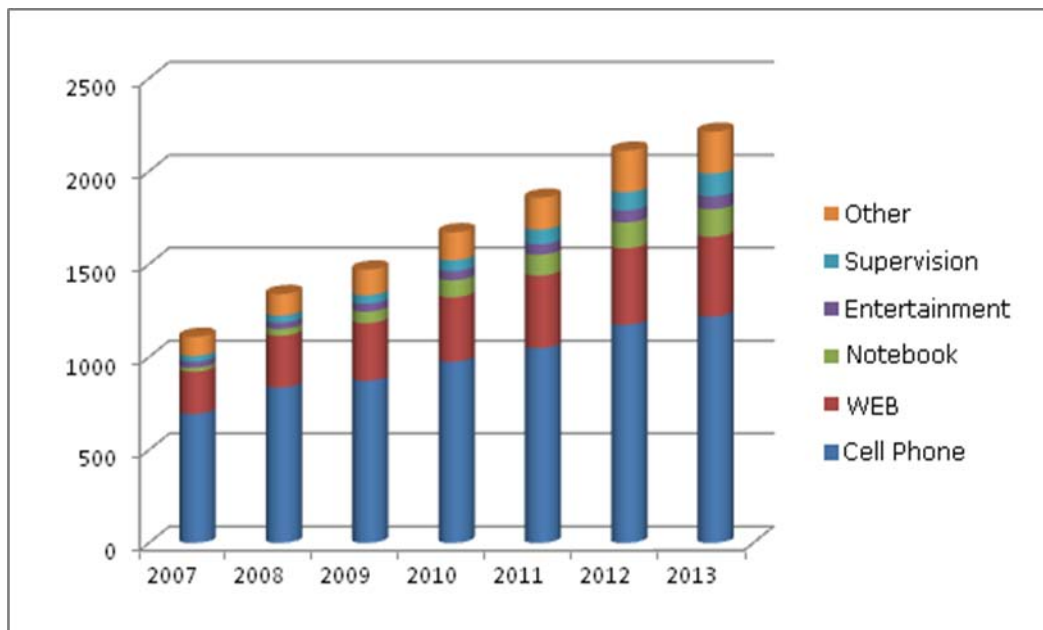
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1. Status Quo and Trends of CMOS Camera Module

1.1 Market

CMOS camera module was originally applied in cell phones and its application scope and quantity gradually expanded later.

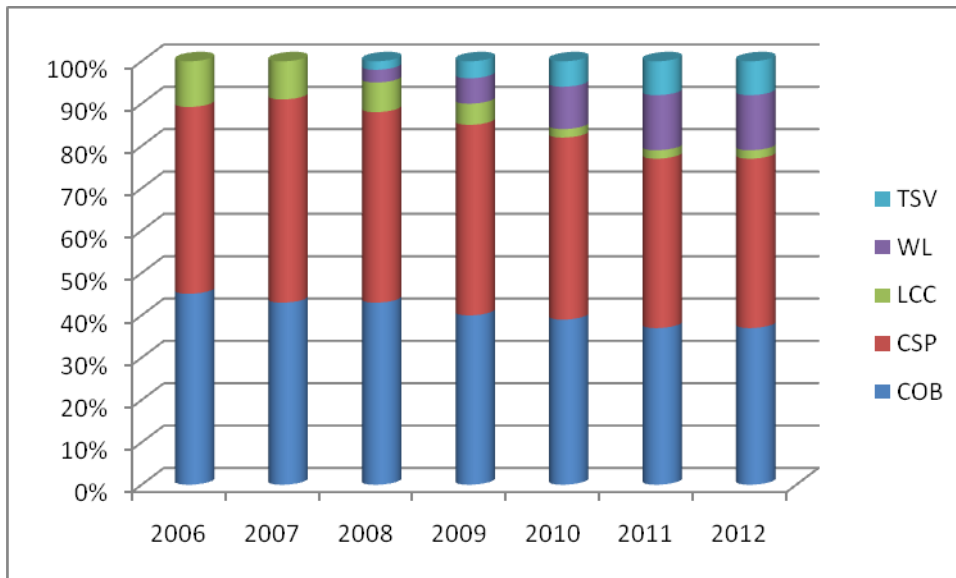
Global CMOS Camera Module Shipment by Application, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Cell Phone	695	837	***	***	***	***	***
WEB	228	279	***	***	***	***	***
Notebook	21	36	***	***	***	***	***
Entertainment	32	35	***	***	***	***	***
Supervision	31	38	***	***	***	***	***
Other	103	115	***	***	***	***	***

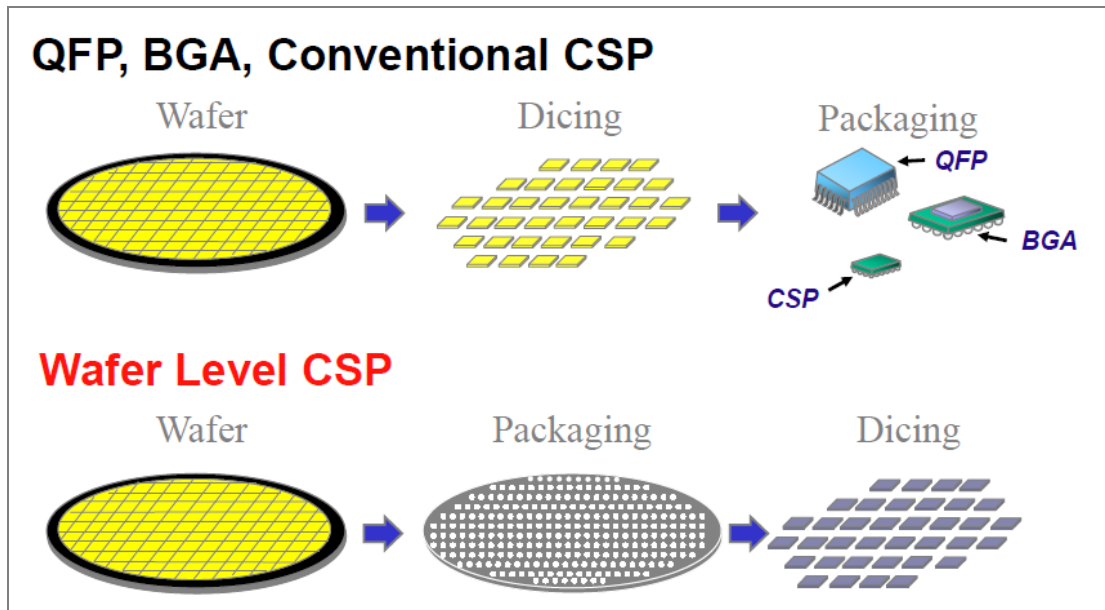
1.2 Packaging

Packaging Modes of CMOS Camera Modules, 2006-2012

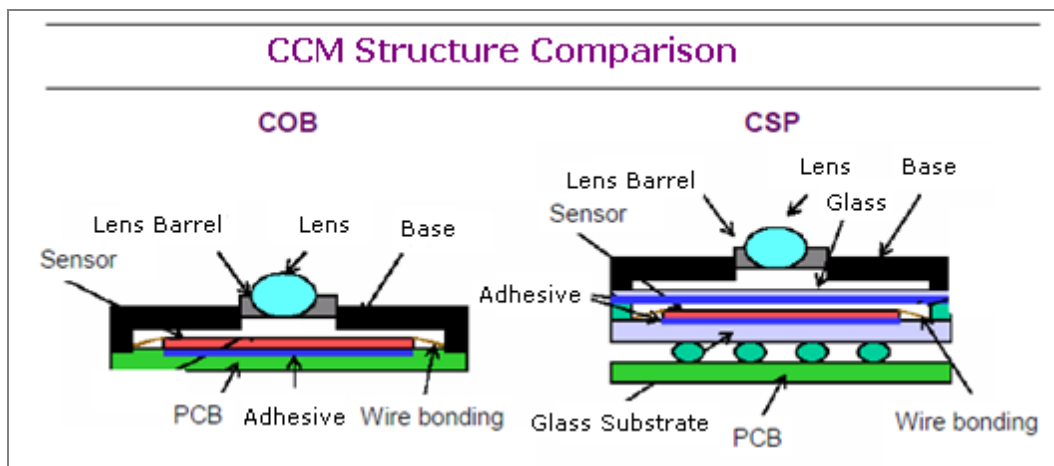


	2006	2007	2008	2009	2010	2011	2012
COB	46%	43%	43%	**	**	**	**
CSP	45%	48%	45%	**	**	**	**
LCC	11%	9%	7%	**	**	**	**
WL-CSP			3%	**	**	**	**
TSV			2%	**	**	**	**

What deserves to be mentioned is that wafer-level packaging and wafer-level camera module are different concepts, of which, the former refers to packaging before cutting and the latter stands for attaching micro-lens before cutting.



One of the shortcomings of CSP is that all the programs cannot be finished in one same factory during the production of CCM, it must be divided into forepart wafer-level packaging program (professional packaging plant) and back-end SMT & optical assemblage (module plant), which leads to the higher cost than COB and the uncontrollable output capacity and delivery time.



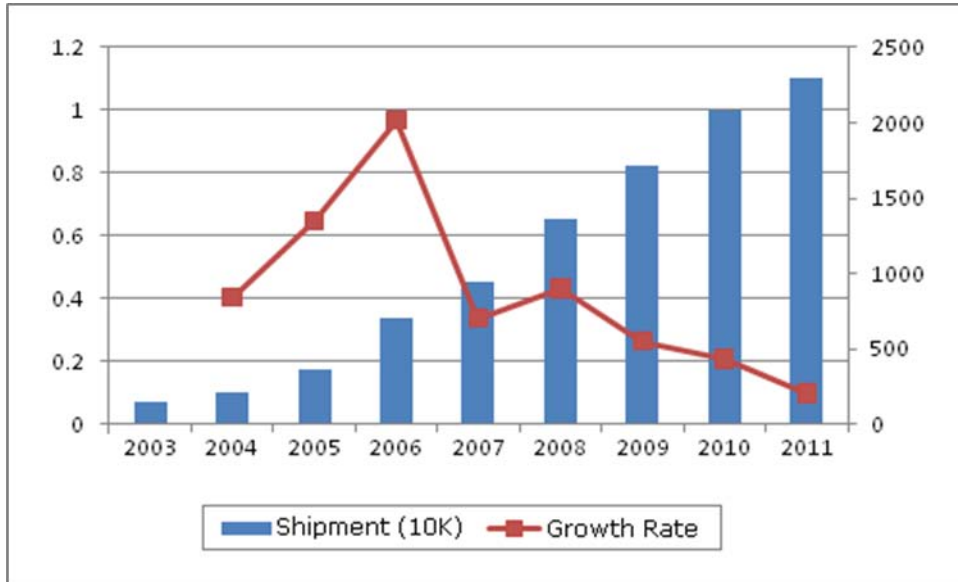
On the contrary, COB is of low price but relatively high image quality, of small size if it is made into CCM and the entire process can be completed in the same factory, and no patent issues will be involved as CSP packaging. In conclusion, theoretically, COB will soon replace CSP and become the main stream, but the requirement of high cleanness of COB hinders its rapid popularity. It is serious for the manufacturing process of COB it there exists dust pollution, however, as for those module manufacturers with semiconductor background, dust-free room is not a very big problem for them.

To sum up, the sensor manufacturers such as OmniVision which formerly only support CSP have begun to supply COB products, while those manufacturers such as Micron who originally give priority to COB have also started to offer CSP packaging products (e.g. iCSP of Micron), as a result, both of the two parties will still co-exist in the future market.

2. CMOS Camera Module Downstream Market

2.2 China Laptop Market Scale

China's Laptop Shipment, 2003-2011

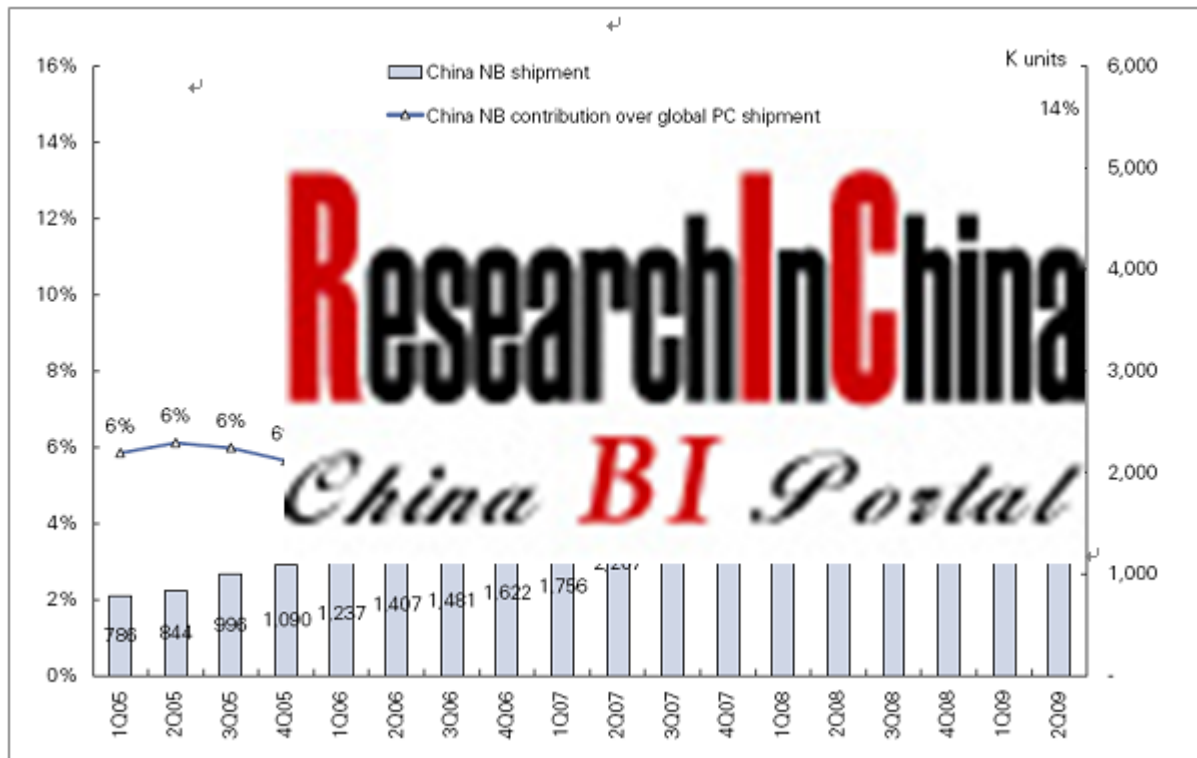


	2003	2004	2005	2006	2007	2008	2009	2010	2011
Shipment (10K)	156	219	361	***	***	***	***	***	***
Growth Rate		40.4%	64.8%	***	***	***	***	***	***

China's PC Shipment, Q1 2005-Q2 2009



China's Laptop Shipment, Q1 2005-Q2 2009



4. CMOS Camera Lens

4.1 Industry Patterns

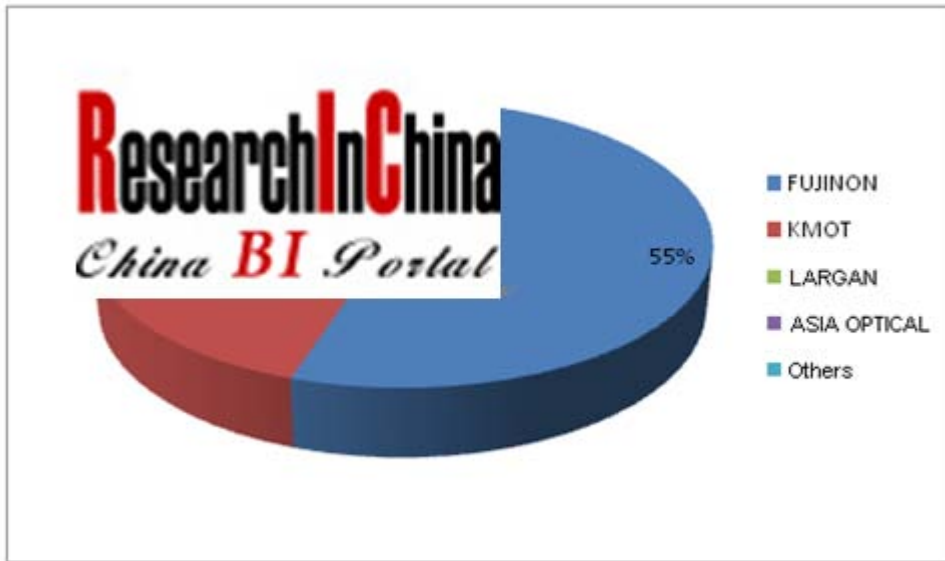
Revenue of 11 CMOS Camera Lens Manufacturers, 2009 (Unit: USD mln)

FUJINON	KMOT	LARGAN	ASIA OPTICAL	SUNNY	KANKATSU	SEKONIX	MCNEX	TAMRON	HITACHI MAXELL	SAMSUNG TECHWIN	Others
840	527	**	**	**	**	**	**	**	**	**	**

Market Shares of Cell Phone Camera Lens Manufacturers, 2009



Market Shares of Cell Phone Camera Module Lens (above 3 megapixel) Manufacturers, 2009



FUJINON	KMOT	LARGAN	ASIA OPTICAL	Others
55%	**	**	**	**

Market Shares of Cell Phone Camera Module Lens (1-3 megapixel) Manufacturers, 2009



FUJINON	KMOT	LARGAN	ASIA OPTICAL	SAMSUNG TECHWIN	TAMRON	KANKATSU	Others
**	22%	**	**	**	**	**	**

Market Shares of Cell Phone Camera Module Lens (below 1 megapixel) Manufacturers, 2009



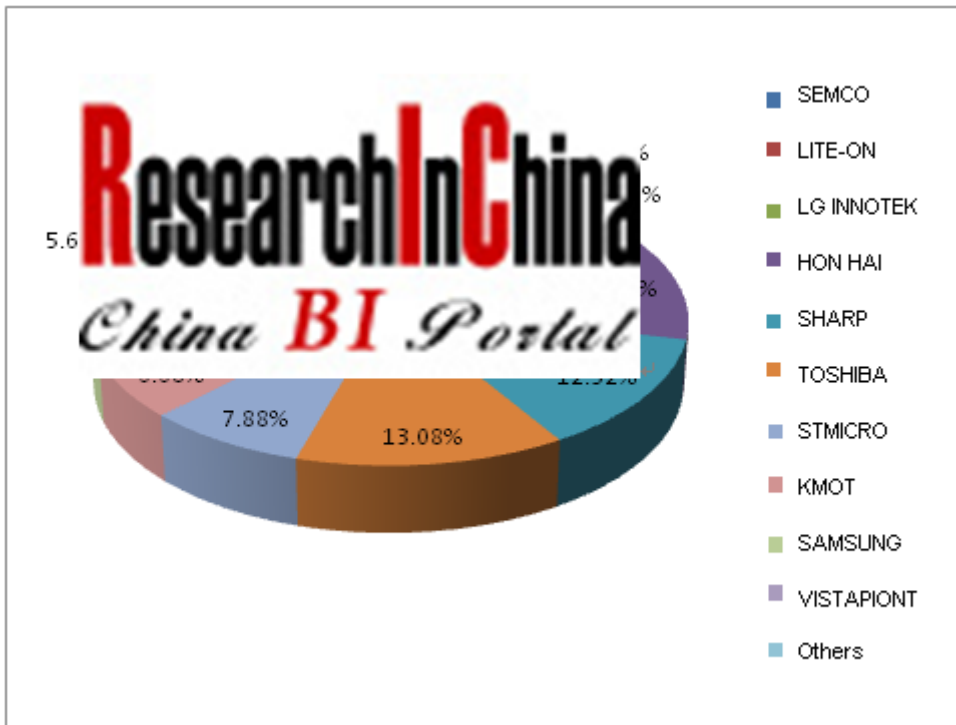
KMOT	LARGAN	ASIA OPTICAL	SAMSUNG TECHWIN	TAMRON	KANKATSU	Others
**	**	14%	19%	**	**	**

5. Camera Module Assembly

5.1 Industry Patterns

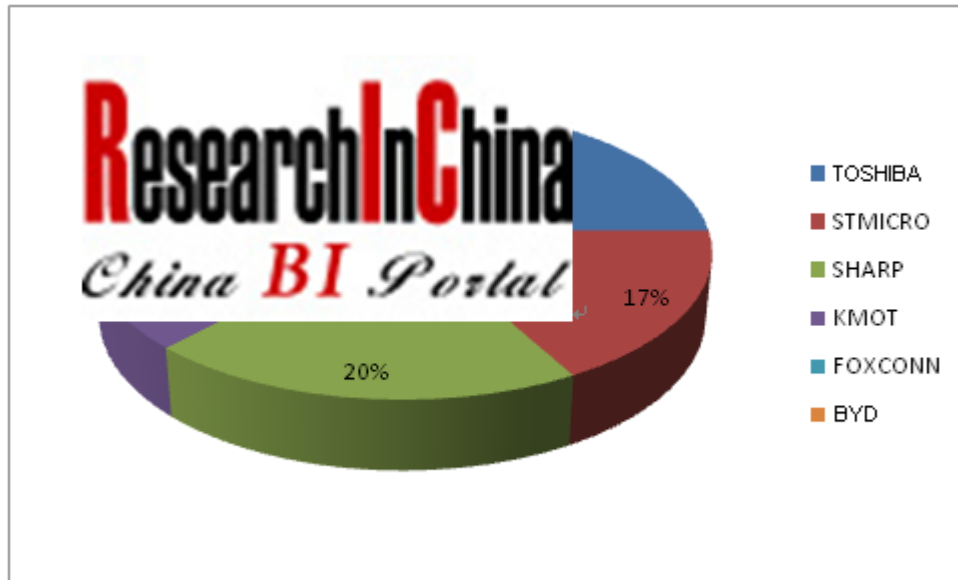
Cell phone camera module manufacturers are generally divided into three groups, the first group consists of large CMOS image sensor manufacturers. Module factories have been established in order to integrate resources and expand vertical system. TOSHIBA had commissioned most of its camera module business to other manufacturers before the end of 2007, and has done the business by itself in the semiconductor factory in Yanshou County after 2008. SHARP is a large CCD camera module manufacturer, with rich experience and monthly production capacity of about 9.8 million sets. STMICRO and SAMSUNG, too, own advanced CMOS image sensor technology. SAMSUNG commissions part of its module business to SAMSUNG ELECTRO-MECHANICS, and completes the other part by itself. The second group consists of cell phone OEMs or cell phone and notebook parts and components manufacturers, including large cell phone OEMs such as HON HAI, BYD and VISTAPIONT, and smaller cell phone parts manufacturers which generally have experience in LCD field and resources in clean room, such as LGINNOTEK, TRULY and ALPS. Chicony as the world's largest notebook keyboard manufacturer has almost monopolized the notebook camera module business. The third group consists of professional optoelectronic enterprises, such as KMOT and LITE-ON.

Market Shares of Cell Phone Camera Module Assembly Factories in the World, 2009



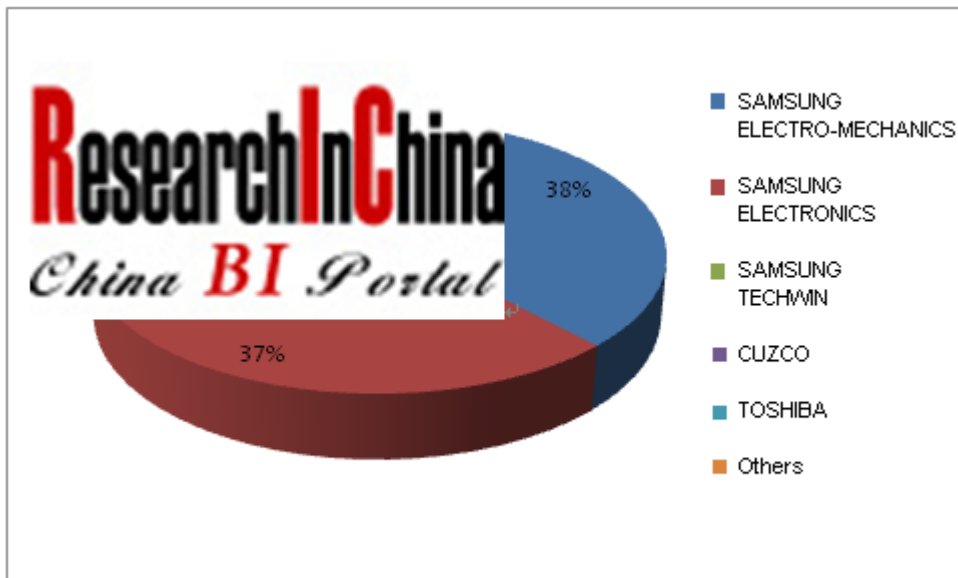
SEMCO	**
LITE-ON	**
LG INNOTEK	**
HON HAI	**
SHARP	**
TOSHIBA	**
STMICRO	**
KMOT	**
SAMSUNG	**
VISTAPIONT	**
Others	**

Major Camera Module Suppliers of Nokia, 2009



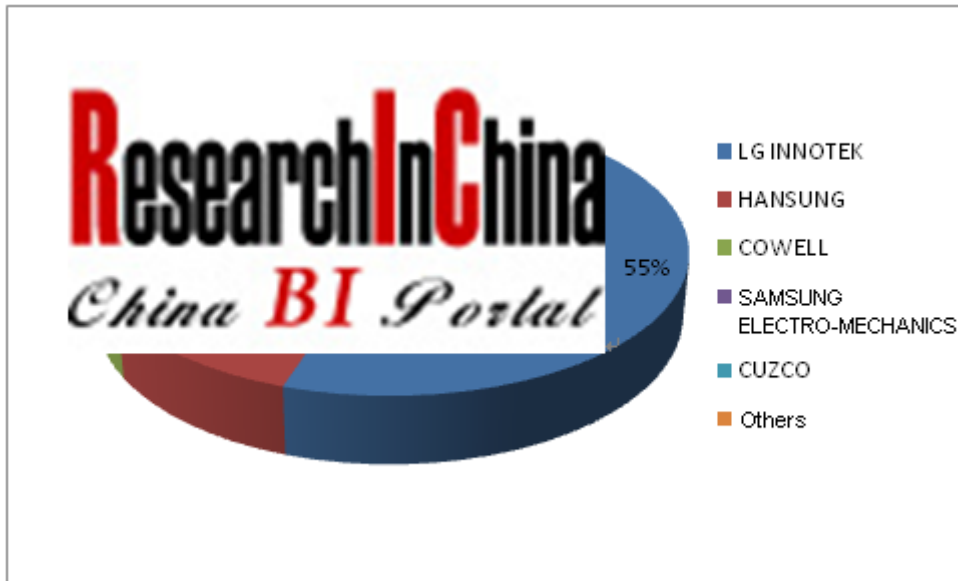
TOSHIBA	STMICRO	SHARP	KMOT	FOXCONN	BYD
**	17%	20%	**	**	**

Major Camera Module Suppliers of Samsung, 2009



SAMSUNG ELECTRO-MECHANICS	SAMSUNG ELECTRONICS	SAMSUNG TECHWIN	CUZCO	TOSHIBA	Others
38%	37%	**	**	**	**

Major Camera Module Suppliers of LG, 2009



LG INNOTEK	HANSUNG	COWELL	SAMSUNG ELECTRO-MECHANICS	CUZCO	Others
55%	**	**	**	**	**

Major Camera Module Suppliers of Sony Ericsson, 2009



FOXCONN	ASIA OPTICAL	SHARP	VISTAPIONT	SONY	Others
**	**	15%	**	**	**

Major Camera Module Suppliers of Motorola, 2009



FOXCONN	SHARP	VISTAPIONT	SAMSUNG ELECTRO-MECHANICS	ALPS	Others
21%	**	**	**	**	**

→ Related Reports

- **Global and China PCB (printed circuit board) Industry Report, 2010**
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- **China Touch Screen Industry Report, 2010**
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- **Global and China Flat-Panel TV IC Industry Report, 2009-2010**
<http://www.researchinchina.com/htmls/Report/2010/5860.html>
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<http://www.researchinchina.com/htmls/Report/2010/5831.html>
- **Global and China Crystal Oscillator Industry Report, 2009-2013**
<http://www.researchinchina.com/htmls/Report/2010/5825.html>
- **Global and China Optical Component and Subsystem Industry Report, 2009**
<http://www.researchinchina.com/htmls/Report/2010/5813.html>
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