

Camera-Module for Mobile-Phone
View Point from Module Assembly Maker

Hiroaki Muraishi

(Shinko Electric Industries Co., Ltd/Japan)

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from Module Assembly Maker

Shinko Electric Industries Co.,Ltd.

Hiroaki . Muraishi

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The mobile-phone which Camera was put on was released at the end of 2000 and dramatically puts up the deployment ratio because not only simple Camera but also a function that the photograph which I took is dispatched was added.

It is the force that demand in this year presses 600,000,000 sale of a mobile-phone is estimated to be 960,000,000 of them in 2006, and to be able to include two errands with a support model after 3G.

A person of entry to a camera-module appear much. In addition, the various kinds of products open markedly which a product comes to be known widely in the world, and the application range has opened widely, and considered QCDT come to be key issues for answer to market demand.

By manufacturing industry, there is peculiar culture to each industry, camera-module is the composition the various industries. The construction of true Supply-chain becomes unavoidable to make a good product.

I describe the point that the situation of each supply-chain and the direction for the future by the view point of module assembly maker.

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The situation of Supply-chain

- ★ Mobile phone Maker
- ★ Module Supplier
- ★ Module Assembler
- ★ Sensor Maker
- ★ Lens Maker

A point to keep in mind of true Supply-chain construction

- ★ Sharing of Culture between each company
- ★ Each maker must use of there strong point and makes superior product
- ★ Each maker must take responsibility for there own parts

Future direction

- ★ Development status
- ★ Hurdle is high for the oligopoly not like as Memory
- ★ Present scheme product will continue for a while

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<< Mobile Phone Maker >>

- ★ The number of installing models increases and abundant variation is necessary.
- ★ The performance at the digital camera level is hoped for thin, light and small products.
- ★ The cheap one is demanded by the location with the addition function of the telephone.
- ★ The tendency with the model update is vertically start-up strongly, and standing lowering same as the telephone life time.
- ★ Gap of architecture by coexistence of communication high reliability and commodity product
- ★ Discount request to get market expansion for each quarterly.

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<< A Module Supplier >>

- ★ Role of Interface with Mobile-phone Maker
- ★ Knowledge that covers the whole concerning Camera is necessary.
- ★ Sensor and Module assembly maker and Camera Maker are suitable.
- ★ Needs the knowledge to solve the problems of QCD by adjusting Supply-chain.
- ★ Interface of each model is selected again due to problems.
- ★ The oligopoly shows a tendency.
- ★ There is some company that cannot expect amount increase, and withdraw.

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<< Module Assembler >>

- ★ There are a company including making Key Part and a company that specializes in Assembly and Test.
- ★ Company which aims at a high yield by simple process using the high accuracy and high quality parts.
- ★ Company which aims at certain yield by using cheap parts while fine-tuning it.
- ★ 1 line production amount is about 500Kpcs/M and the line increase is inevitable in the production increase. (Test machine capacity is a level of half.)
- ★ Some portion that special machine of each model is inevitable.
- ★ It is necessary to adjust differences of culture such as Sensor maker and Lens maker.

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<< Sensor Maker >>

- ★ It has been consolidated in CMOS Image Sensor.
- ★ The image quality of each company reaches prescribed Level.
- ★ The Sensor making that uses fine pitch technology at 12" wafer factory starts.
- ★ General-purpose equipment can be used and Rump Up is comparatively easy. (1 line capacity is huge numbers)
- ★ It is possible to correspond to Camera of various functions with same sensor.
- ★ There is a tendency to making oligopoly, and those who withdraw are beginning to appear.
- ★ The approach of Wafer Level camera element starts.

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<< Lens Maker : Key Parts >>

- ★ The entry from lens manufacturer from Photo Camera.
- ★ The entry from plastic component manufacturer.
- ★ There are a lot of numbers of parts in lens unit that several lenses, apertures, and the IR-cut filter and the function such as Macro, Auto-focus, and Optical -zoom, etc.)
- ★ The adjustment is key of Operator number at Up of the demand and the Down. The country where the labor cost is cheaper is main assemble site.
- ★ The tooling charge for mold when starts the business and increasing the production, lens maker ask to customer is original culture.
- ★ Capacity of the tooling for mold is about 500Kpcs/M by one set.
- ★ Tuning of the tooling is inevitable to get high yield products at present situation.
- ★ Plastic Lens which enabled for reflow process at board assembly is developed
- ★ Fixed distance between lens and sensor has developed

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<< Sharing of Culture of each company >>

- ★ Culture of each industry should share each other, and aims at a good direction for the market expansion.
- ★ Common recognition of initial investment, product's life-cycle, and product quality and etc. is necessary.
- ★ Sharing the information such as L/T, capacity of each line, for each company.
- ★ The meeting between Supply-chain that can able free discussion is necessary.
- ★ Each company must support their own parts and to get a proper profit to doing continuous increasing business.

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Competitiveness number

Small : Weak

Big : Strong

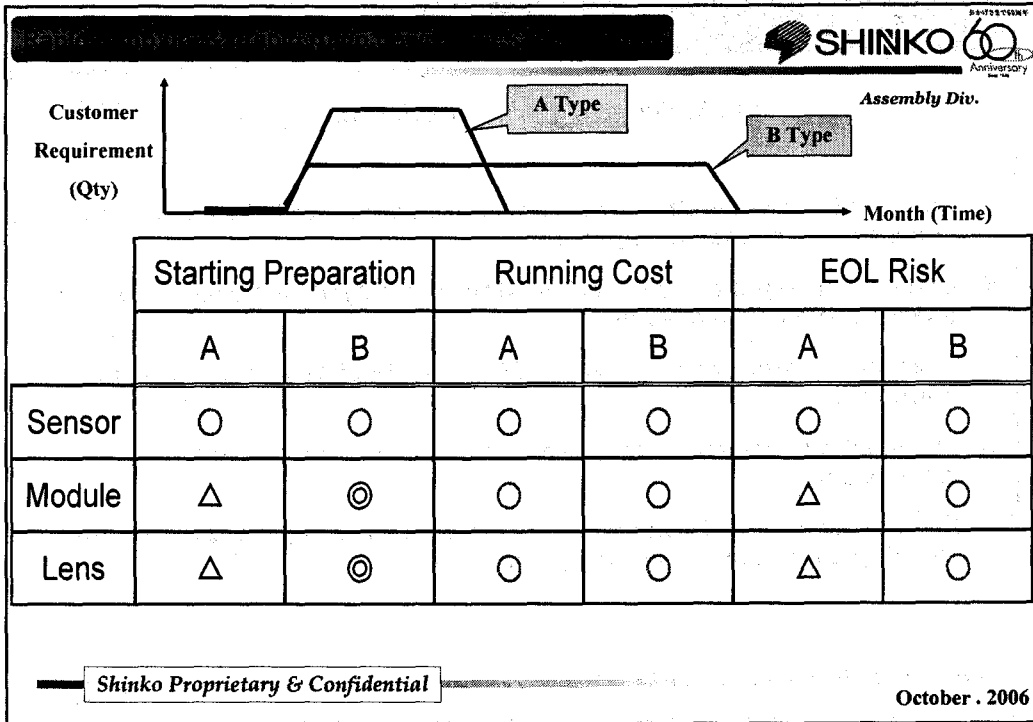
		Sensor		
		Big	Middle	Small
Package	Big	1	4	3
	Middle	4	5	6
	Small	3	6	10

Item to consider for investigation

- ★ Application (VGA to 5Mega)
- ★ Quality of picture
- ★ TOTAL yield and Price

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- ★ Camera which ensure the high temp board assembly will appear
 - ★ Camera which is made on sensor will appear (This makes sensor size camera)
 - ★ Mobile-phone will be added more function to use camera
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