

Apple iPhone 4S Camera Module

Sony IMX145 8Mpixel 1.4µm BSI CIS

Reverse Costing Analysis – December 2011



Physical Analysis of the Camera and the CMOS Image Sensor

Step by Step Reconstruction of the Process Flow

Cost of Manufacturing and Estimation of Selling Price

System Plus Consulting is proud to publish the reverse costing report of the Apple iPhone 4S Camera Module.

This camera module integrates a 1.4µm pixel CMOS Image Sensor (CIS) ref. IMX145 from Sony. The CIS die is manufactured using a CMOS architecture with a 90nm process.

The CIS uses a Backside Illumination (BSI) architecture.

The CIS is assembled in a ceramic package using flip chip, gold stud ball technique.

The module integrates a Voice Coil Motor (VCM) auto-focus.

This report provides complete teardown of the camera module with:

- Detailed photos
- Material analysis
- Schematic assembly description
- Manufacturing Process Flow
- In-depth economical analysis
- Manufacturing cost breakdown
- Selling price estimation

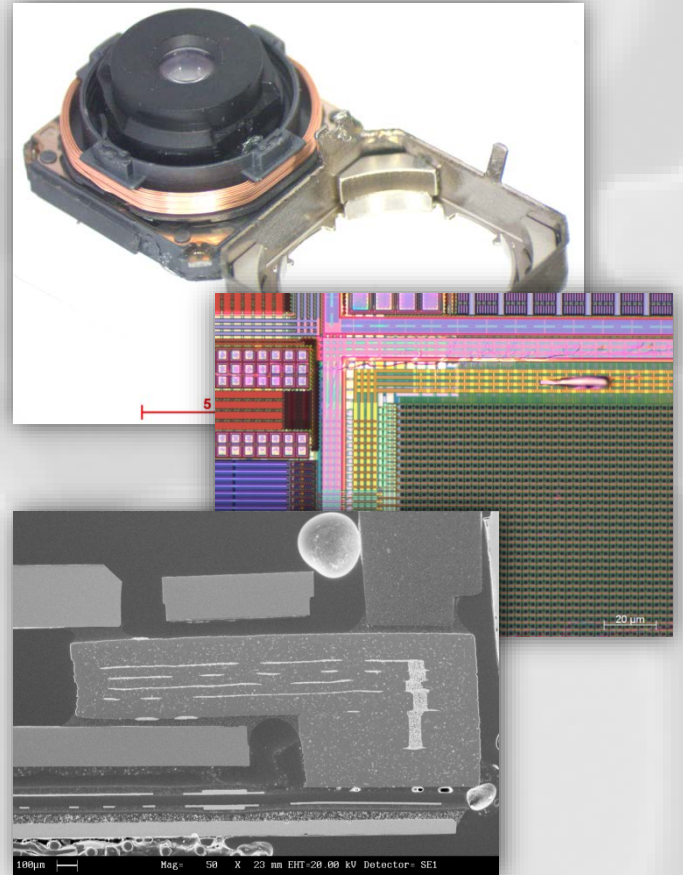


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Around this main line System Plus Consulting developed a complete range of services and costing tools to provide **in-depth production cost studies** and estimation of the **objective selling price** of the product.

COSTING SERVICES

- ✓ **On demand Reverse Costing studies** are performed on ICs, ASICs, MEMs, Power Devices, ECUs, electronic boards and full electronic systems
- ✓ **The catalog of available reports** includes cost analyzes on MEMS, Electronic components and Electronic systems (Telecom terminals, Power systems, Consumer products)

All these studies are performed using in-house developed costing tools and their technological databases.

COSTING TOOLS

Parametric Cost Models

- ✓ **IC Price+** to calculate the cost of any integrated circuit
- ✓ **Power Price+** to calculate the cost of any power component or module

Process Simulation Tools

- ✓ **MEMS** Cosim+
- ✓ **LED** Cosim+
- ✓ **Sapphire** Cosim+ (raw wafer)
- ✓ **TSV** Cosim+ (thru silicon vias)
- ✓ **Power** Cosim+ (transistors, diodes and modules, Si, SiC, GaN)
- ✓ **PV** Cosim+ (photovoltaic)

Other Tools

- ✓ Board Assembly - PCB
- ✓ System in Package – System on Chip
- ✓ Other costing models can be developed according to customer specification

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