Huawei P9 Rear-Facing
Dual Camera Module

With strategic technical choices in its dual camera module, Huawei is seeking to differentiate itself from Samsung and Apple.

Competition for the best camera in a phone has been revived by Huawei with its new flagship, the P9. Unlike the other players except LG, Huawei uses a dual camera module. This module of f/2.2 aperture integrates two CMOS Image Sensors (CIS) from Sony, using Exmor-RS Technology with 11.8M pixel resolution, a monochrome and a color sensor.

The P9 camera module, with dimensions of 18 x 9.2 x 5.1mm, is equipped with two sub-modules each including a Sony CIS, a closed loop voice coil motor (VCM) and a 6-element lens. Doubling the number of cameras gives more light, vivid colors and crisper details. Moreover, it compensates for the fact that the module is provided without optical image stabilization (OIS). The CISs are assembled on a copper metal core 4-layer PCB using a wire bonding process. An external image processor chip is present on the phone’s printed circuit board (PCB).

The Sony Exmor-RS technology stacks two separate chips with through-silicon vias (TSVs) using optimized processes. One chip is a pixel array circuit which uses a Back-Side Illuminated (BSI) technology, and the other is a logic ISP circuit. For these sensors, an all-new TSV process is used and surprisingly both sensors are very similar but show significant process differences. Compared to the previous Huawei P8 and iPhone 6s with similar resolution, the P9’s 1.25µm pixels are larger.

The report includes technology and cost analyses of the P9 dual camera module. Also, comparisons with Samsung Galaxy S7 and iPhone 6S rear camera modules are provided. These comparisons highlight structures, technical choices and manufacturing cost.
TABLE OF CONTENTS

Overview/Introduction
Dual Camera Module Supply Chain and Company Profile
Huawei P9 Teardown

Physical Analysis
- Dual Camera Module View and Dimensions
- Dual Camera Module Disassembly
- Cross-Section Dual Camera Module - Housing, Flex PCB, IR Filter
- CMOS Image Sensor - Color and Monochrome
  ✓ View and dimensions
  ✓ Pads, wire bonding and tungsten grid
  ✓ CIS pixels
- Cross-Section CMOS Image Sensor - Color and Monochrome
  ✓ Overview
  ✓ Pixel array and logic circuit
- Comparison Between Color and Monochrome CMOS Image Sensors
- Comparison With Samsung Galaxy S7 and Apple iPhone 6S Plus

CIS Manufacturing Process Flow
- Overview
- Logic Circuit Front-End Process
- Pixel Array Circuit Front-End Process
- BSI + TSV + Microlens Processes for the Color CIS
- BSI + TSV + Microlens Processes for the Monochrome CIS
- CIS Wafer Fabrication Unit

Cost Analysis
- Cost Analysis Synthesis
- The Main steps Used in the Economic Analysis
- Yields Hypotheses
- CMOS Image Sensor Cost
- Color and Monochrome CMOS Image Sensor
  ✓ Logic circuit front-end cost
  ✓ Pixel array front-end cost
  ✓ BSI and TSV front-end cost
  ✓ Color filter and Microlens front-end cost
  ✓ Total front-end cost
  ✓ Back-end: tests and dicing
  ✓ CIS wafer and die cost
- Dual Camera Module Assembly Cost
- Lens Module Cost
- AFA Cost
- Final Assembly Cost
- Dual Camera Module Cost

Comparison with Galaxy S7 and iPhone 6S Plus Cost

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For the Galaxy S7, Samsung has chosen the best CMOS image sensor technology, the first with copper-copper hybrid bonding.

For the iPhone 6s Plus, Apple uses a new camera module: it has changed the supply chain, integrating some design changes.

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