Sony IR Day 2018
Semiconductors Segment
May 22, 2018

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Sony Corporation
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Agenda

1. FY2017 Review
2. FY2018 Action Plan
3. FY2018 – FY2020 Mid-Range Plan
1. FY2017 Review

Achieved record high profit for the Semiconductors business

<table>
<thead>
<tr>
<th>Operating Income Analysis (bln yen)</th>
<th>Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales: 773.1</td>
<td>Increased image sensor sales and profit</td>
</tr>
<tr>
<td>Image Sensors: 548.6</td>
<td>Steady customer expansion for automotive image sensors</td>
</tr>
<tr>
<td>Others: 164.0</td>
<td>Improved operating results in the non-image sensor businesses</td>
</tr>
<tr>
<td>Exchange Rates</td>
<td></td>
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<tr>
<td>Earthquake</td>
<td></td>
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<tr>
<td>Mobile Module</td>
<td></td>
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<tr>
<td>Mobile Sensor</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td>Image Sensors: 649.4</td>
<td></td>
</tr>
<tr>
<td>Operating Income</td>
<td></td>
</tr>
<tr>
<td>FY16 1 USD = 108.4 yen</td>
<td></td>
</tr>
<tr>
<td>FY17 110.9 yen</td>
<td></td>
</tr>
</tbody>
</table>

Issues

- Ability to respond to fluctuations in demand from Chinese smartphone manufacturers
- Optimization of inventory level
- High currency sensitivity
2. FY2018 Action Plan

Our View of the Image Sensor Market

Mobile application growth led by dual lens and sensing. Growth in new areas expected.

Trend in World Wide Image Sensor Shipment Amount

- **New Area**
  - Automotive: Rise of the ADAS market
  - Factory Automation: Market expansion due to smart manufacturing
  - Security: Market expansion due to automatic monitoring using AI technology

- **Mobile Area**
  - Market expansion from dual lens and mobile sensing

- **AV Area**
  - Expansion of high-end sensor market

*Source: Sony*
Activities for Mobile

Evolve in plane, time and space to deliver “KANDO” in addition to achieving DSLR camera-like image quality.

Evolution of Mobile Sensors

<table>
<thead>
<tr>
<th>Present</th>
<th>Future ~</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Image Quality</strong>&lt;br&gt;High Dynamic Range / High Sensitivity / Low Noise&lt;br&gt;No blocked up shadows&lt;br&gt;Sharpness even in dark places&lt;br&gt;Reproduce kando as is</td>
<td><strong>Plane</strong>&lt;br&gt;Wide Angle / Enlargement&lt;br&gt;Free from Structure&lt;br&gt;<strong>Time</strong>&lt;br&gt;Super Slow&lt;br&gt;Free from Shutter&lt;br&gt;<strong>Space</strong>&lt;br&gt;Depth / Focus&lt;br&gt;Three-Dimensional / Immersive</td>
</tr>
</tbody>
</table>

Activities for Sensing

Succeeded in developing back-illuminated high-resolution ToF* sensor capable of distance measurement. Anticipate deployment to a wide range of use cases.

Development of ToF Sensor | Use Cases of ToF Sensor
---|---
Front-Illuminated ToF Sensor | **Automotive**
Back-Illuminated ToF Sensor | **aibo**
*ToF: Time of Flight

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Activities for Automotive

Completed commercialization of stacked image sensor for ADAS. Strengthen cooperation with key players.

Realization of “Safety Cocoon”

Cooperation with Key Players*

*Logos are arranged in alphabetical order

Activities for Factory Automation

The market is expanding due to industrial automation. Transition from CCD to CMOS sensor proceeds.

Evolution of FA Sensors

*GS: Global Shutter
Activities for Security

The security market is expanding due to the penetration of automatic monitoring using AI technology.

Evolution of Security Sensors

<table>
<thead>
<tr>
<th>Present</th>
<th>Future ~</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back-illuminated CMOS</td>
<td>Low Noise Miniaturization</td>
</tr>
<tr>
<td>High Sensitivity</td>
<td>Stacked</td>
</tr>
<tr>
<td>Full Color Image Capturing at Night</td>
<td>Optimization for AI monitoring</td>
</tr>
<tr>
<td>Wider Area Image Capturing in Outdoors</td>
<td>Data Capacity Reduction</td>
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</tbody>
</table>

Activities for Technology Development (1)

Proceed with technology development that creates added value responding to market needs.

Direction of Technology Development

<table>
<thead>
<tr>
<th>Present</th>
<th>Future ~</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back-illuminated</td>
<td>Sensitivity Improvement</td>
</tr>
<tr>
<td>Stacked</td>
<td>Miniaturization and High Functionality</td>
</tr>
<tr>
<td>Cu-Cu* Connection</td>
<td>Productivity Improvement and Space Saving</td>
</tr>
<tr>
<td>Pixel-Parallel ADC</td>
<td>Image Distortion Cancellation</td>
</tr>
<tr>
<td>Event Driven</td>
<td>Power Consumption 1/100</td>
</tr>
<tr>
<td>Region Control</td>
<td>Data Capacity Reduction</td>
</tr>
<tr>
<td>ToF</td>
<td>Distance Information Detection</td>
</tr>
<tr>
<td>Polarization</td>
<td>Distortion and Scratch Detection</td>
</tr>
<tr>
<td>Infrared</td>
<td>Invisible Light Inspection</td>
</tr>
</tbody>
</table>

*Cu-Cu: Copper to Copper
## Activities for Technology Development (2)

**Developed event-driven stacked CMOS image sensor realizing 1/100 power consumption.**

**Image of Sensor**
Realized by stacked structure with Cu-Cu connection

**Image of Motion Detection**
Low resolution Fast Detection system & Ultra Low Power
Motion Detection & Automatic Switching

## Activities for Technology Development (3)

**Quick Response & Anti-shake Motion Detection**
**FY2018 Forecast**

**Semiconductors Segment**

**Increase Capital Investment and R&D to Accelerate “Preparation”**

**Operating Income Analysis (bln yen)**

- **Sales** 850.0
  - Image Sensors 646.4
  - One Time Items
  - Exchange Rates
- **Operating Income**
  - Image Sensors 690
  - Depreciation/R&D Expenses
  - Inventory Change
  - Quantity Increase
  - Product Mix Improvement/Cost Reduction
- **One Time Items**
  - Depreciation/R&D Expenses
  - Inventory Change
  - Quantity Increase
  - Product Mix Improvement/Cost Reduction
- **Exchange Rates**
- **Depreciation/R&D Expenses**
- **Inventory Change**
- **Quantity Increase**
- **Product Mix Improvement/Cost Reduction**

**Environment**

- Advancement of dual lens for smartphones
- Rise of sensing and automotive market
- Appreciation of the yen and sluggish smartphone market growth are risks

**Basic Policy**

- Increase capital investment and R&D to accelerate “Preparation”
- Maximize profitability of mobile and AV fields which are the leading profit drivers
- Foster new areas such as sensing and automotive
- Continue activities to reduce manufacturing cost of sensors

**Operating Income**

- **FY17**
  - 164.0
- **FY18 (Apr.-Mar.)**
  - 100

1 USD = 110.9 yen

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3. **FY2018 – FY2020 Mid-Range Plan**
Financial Target for FY2020

- **Financial Target for FY2020**
  - Operating Income 160 - 200 billion yen
    *1 USD = 105 yen
  - Sales Amount (For Reference): 1,100 billion yen

- **Mid-Range Plan for FY2020**
  - Maximize mobile sensor profit by enhancing response to environmental changes
  - Aim for profit contribution by new areas including sensing and automotive business
  - Promote technology development including function and performance expansion