Market Perspective & Strategy

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The materials in this report include forward-looking statements which can generally be identified by phrases such as Samsung Electronics (SEC) or its management "believes," "expects," "anticipates," "foresees," "forecasts," "estimates" or other words or phrases of similar implications. Similarly, such statements that describe the company’s business strategy, outlook, objectives, plans, intentions or goals are also forward-looking statements. All such statements are subject to certain risks and uncertainties that could cause actual results to differ materially from those in the presentation files above.

For us, particular uncertainties which could adversely or positively affect our future results include:

- The behavior of financial markets including fluctuations in exchange rates, interest rates and commodity prices
- Strategic actions including dispositions and acquisitions
- Unanticipated dramatic developments in our major businesses including CE (Consumer Electronics), IM (IT & Mobile communications), DS (Device Solutions)
- Numerous other matters at the national and international levels which could affect our future results

These uncertainties may cause our actual results to be materially different from those expressed in this report.
Display Market History

Growth Engine: IT → TV → Mobile

1st Wave
- CAGR IT 35%
- 1998: $7B

2nd Wave
- CAGR TV 35%
- 2004: $54B

3rd Wave
- CAGR Mobile 35%
- 2010: $112B
- 2013(E): $128B

※ Source: Display Search
※ Tablet is included in mobile
SDC Excellence: Revenue & Profit

SDC has been continuously outperforming

Annual revenue growth (2006~2012)
: Market 8%, SDC 15%

Revenue

Profit

2006
$13B
5%
1%

2009
$19B
5%
0%

2012
$29B
10%
-5%

SDC

Others

※ Source: Company IR
※ Avg. of top 4 players
SDC has been operating the capacity efficiently

* Source: Company IR, Display Search Capacity
SDC Excellence: Market Leadership

SDC is the No.1 in 4 major applications

- Smartphone: 45%
- Tablet: 32%
- Large-size TV: 30%
- Above 7": 30%
- Above 46": 30%
- PID: 50%

*Source: Display Search

(2013.1H Revenue)
SDC Excellence: Technology Leadership

**Ultra Large LCD TV**
- FHD (65”/75” 240Hz)
- UHD (65”/85” 120Hz)

**55” Curved AMOLED TV**
- Smart Dual View (240Hz)
- Deep Black / High Contrast
- Vivid Color

<table>
<thead>
<tr>
<th>Year</th>
<th>Product</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Ultra Slim (Edge-LED TV)</td>
<td>Best Picture Quality (240Hz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ultra Slim Bezel (3.95mm)</td>
</tr>
<tr>
<td>2011</td>
<td>Ultra Large (75”FHD)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ultra Large (65”/85”UHD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Curved AMOLED TV (55”FHD)</td>
</tr>
</tbody>
</table>

※ FHD: 1920 X 1080, UHD: 3840 X 2160
Curved & wearable

- World 1st FHD Flexible Display
  : Display on plastic film

<table>
<thead>
<tr>
<th>On Cell Touch (OCTA)</th>
<th>High resolution (FHD: 440ppi)</th>
<th>Flexible &amp; Wearable</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2013.1H</td>
<td>2013.2H</td>
</tr>
</tbody>
</table>

※ OCTA : On Cell Touch AMOLED
Business Portfolio

SDC evolves to well-balanced portfolio

※ Source: SDC
AMOLED drives the growth of the company

2009

2011

2013 (E)

※ Source: SDC
Contents

I. Business Overview
II. Industry Outlook
III. SDC Core Competency
IV. SDC Strategy
Everyone and everything are connected seamlessly
Key Elements of Hyper Connected World

Database  Computer  Storage

Cloud

High speed connectivity

D2D (Device to Device)

Unlimited and fast sharing of contents
Display is the key component of smart devices in the cloud environment.

<table>
<thead>
<tr>
<th></th>
<th>Standalone Smartphone</th>
<th>Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computing</td>
<td>Quad 2.3Ghz</td>
<td>∞</td>
</tr>
<tr>
<td>Storage</td>
<td>32GB</td>
<td>∞</td>
</tr>
</tbody>
</table>

Both value and demand of display will increase.
High Speed Connectivity

Network revolution → Multimedia experience: High performance display

### 4G LTE-Advanced

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015~</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 hours movie data</strong></td>
<td>Full HD</td>
<td>WQHD</td>
<td>UHD</td>
</tr>
<tr>
<td>Download time</td>
<td>280sec</td>
<td>65sec</td>
<td>35sec</td>
</tr>
</tbody>
</table>

* 3rd Generation Partnership Project
* WQHD: 2560 X 1440

(Source: Cisco Data Meter, 2013) % of data consumption

- Video
- Information*
- Web
- SNS

※ App. & Push Information
Device to Device

Trillion devices will be connected, display is the window

UHD video streaming ‘Display of things’
[IEEE 802.11ac/ad]

FHD video streaming ‘N-Screen’
[IEEE 802.11n]

Picture, Voice
[IEEE 802.15]

Wireless LAN speed
- 2009 20Mbps
- 2013 300Mbps
- 2015~ 7Gbps

10m Range

50~100m Range

100~250m Range
Display Centric World

Display is the window for the world. "5 Every..."

Where  Time  Thing  Body  Purpose

One day with display
Display Centric World
Contents

1. Business Overview
2. Industry Outlook
3. SDC Core Competency
4. SDC Strategy
SDC Core Competency

**Legacy**
Distinguished track record in display and semiconductor

**Advanced Technology**
World largest AMOLED & Flexible IP portfolio
Technology readiness for Flexible AMOLED

**Operational Capability**
AMOLED, the 1st commercialization to 500M cumulative units produced

**Eco-System Leadership**
Vertical integration:
Samsung affiliates & other partners
Distinguished track record in display and semiconductor

World Best Display

- World 1st AMOLED MP
  - 2007
- LCD M/S No.1
  - 2000
- LCD MP Start
  - 1995

MP : Mass Production

No.1 in Market share since 2000

World Best High Density Technology

- Encapsulation
- Substrate (Glass or Plastic)

TFT

1440

2560

11,000,000

No.1 Fine Patterning Technology Synergy with Semiconductor Tech.
World largest AMOLED & Flexible IP portfolio

**Strong IP* Portfolio**

<table>
<thead>
<tr>
<th>Year</th>
<th>SDC AMOLED Patents (Unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>2,285</td>
</tr>
<tr>
<td>2008</td>
<td>5,072</td>
</tr>
<tr>
<td>2010</td>
<td>7,045</td>
</tr>
<tr>
<td>2012</td>
<td>9,469</td>
</tr>
</tbody>
</table>

**Flexible related Patents**

- Samsung 33%
- A 21%

(2013. Sep. US)

* IP: Intellectual Property

Able to validate manufacturability for ‘Design for Manufacturing’
Technology readiness for flexible AMOLED

**Evaporation**
- Substrate
- World 1st RGB evaporated AMOLED Mass Production
- 45 um (560ppi)
- X4 times
- 2007
- 2014

**Thin Film Encapsulation**
- Acquisition of essential patents for TFE (Sep.2010)
- TFE : Thin Film Encapsulation
- 2014

**Key Technology for Flexible**
- Encapsulation

**Plastic Substrate**
- Establishment of Joint Venture, SUM (Aug.2011)
- SUM : Samsung Ube Materials
SDC has proven capability to bring the new technology to the large scale mass production.

**SDC AMOLED Cumulative Production**
- 2007: 100M
- 2009: 300M
- 2011: 500M
- 2013(E): World 1st. Mass Production

**SDC AMOLED Capacity Ramp-Up**
- 2009: 10K
- 2010: 20K
- 2011: 75K
- 2012: 110K
- 2013: 140K

[ K sheets/Month, 5.5G Equivalent ]
※ based on 4Q Capacity

WW. LTPS Capa. 2013(E)
Organize AMOLED ecosystem through JVs & capital investment

**OLED Structure**

- **Encapsulation**
  - TFE equipment
  - Capital Investment
  - Joint Venture
  - A Company

- **Emitting Layer**
  - Organic material
  - Soluble material
  - through SVIC

- **TFT**
  - Laser equipment
  - B Company

- **Substrate** (Glass or Plastic)
  - Glass
  - Plastic
  - Equipment for plastic
  - Samsung Corning Advanced Glass
  - Samsung Ube Materials
  - C Company

※ SVIC : Samsung Venture Investment Corp.
Strategy Framework

Command Current Market

- TV
- Retail
- Tablet
- Education
- Smartphone
- Healthcare
- Wearable
- Automotive
- Architecture

Create New Opportunities
Trend: Smartphone

Competition: Color → Resolution → Design Innovation

Change of Differentiation Factors in Mobile

<table>
<thead>
<tr>
<th>Year</th>
<th>Color</th>
<th>Resolution</th>
<th>UX + Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>256K</td>
<td>X63</td>
<td>16M</td>
</tr>
<tr>
<td>2005</td>
<td>QVGA</td>
<td>X48</td>
<td>WQHD</td>
</tr>
<tr>
<td>2014</td>
<td>Flexible</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Smart Phone Market

Flexible Penetration

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2015</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>($) Bil.</td>
<td>30</td>
<td>43</td>
<td>50</td>
</tr>
</tbody>
</table>

* QVGA: 320 X 240
* Source: Display Search, SDC
Strategy: Smartphone

H/E value up with Flexible, M/E penetration with AMOLED

AMOLED Base Benefit:
- **Contrast**: (2,000,000:1 vs 1,000:1)
- **Color gamut**: (100% vs 70%)
- **Response Time**
- **Thin & Light**
- **Power Efficient**

Flexible
- Profit Maximization

Cost Performance
- Scale Economy
- Material Innovation
High resolution and low power display for various usages

Trend: Tablet

"Usage Diversification"

Display Needs:
- Slim & light
- High resolution
- Low power

Market:
- WQXGA
  - 2013: 5%
  - 2015: 26%
  - 2018: 50%
- LTPS/Oxide (including OLED)
  - 2013: 5%
  - 2015: 40%
  - 2018: 60%

*$WQXGA: 2560 \times 1600$

Source: Display Search, SDC
Strategy: Tablet

Cover all segments: AMOLED for H/E, Oxide for M/E, a-Si for L/E

"Bigger & Finer"

Average Size 10"

Over 300ppi

Over 250ppi

Under 250ppi

Average Size 8"

Over 300ppi

Under 300ppi

2013

2018

Key Value

AMOLED (LTPS-Based)

Excellent Performance
Flexible
Slim & Light (40 ~ 45%)
Color Gamut (1.4 times larger)

Oxide LCD

Optimized Performance & Cost

a-Si LCD

Competitive Cost Structure
Trend: TV

Real Image, Large size and Immersive Design

<table>
<thead>
<tr>
<th>Trend</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resolution</strong></td>
<td></td>
</tr>
<tr>
<td>FHD</td>
<td>UHD</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td></td>
</tr>
<tr>
<td>71% (NTSC)</td>
<td>100% (UHD)</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td></td>
</tr>
<tr>
<td>35&quot; Class ('11)</td>
<td>40&quot; Class ('15)</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td></td>
</tr>
<tr>
<td>Flat</td>
<td>Curved</td>
</tr>
</tbody>
</table>

- QUHD: 7680 X 4320

※ Source: Display Search, SDC
Dominate market with leading edge technology

**Advanced Performance**
- High Picture Quality
  - Motion blur-less 240Hz
  - Super Large UHD/QUHD

**Superb Design**
- Immersive Curve
  - 7000~8000R
  - Ideal Curvature

**Premium**
- Industry
- SDC

**Main stream**
- High Resolution with Low Power
- Slim Display with Narrow Bezel
  - UHD
  - Green UHD
  - D - LED Narrow bezel
  - Slim D - LED Super Narrow Bezel
Create New Opportunities

Continuously expanding to different applications

Business Opportunity Portfolio

Sharing Market
Customer Technology

Smartphone

TV

Tablet

Wearable

Retail

Architecture

Automotive

Education
Trend: Wearable

Wearable usage increase in always connected world

Wearable Device Market Forecast

- Source: Allied Business Intelligence Research

- 2.5" WQVGA (400x240), 52% On Pixel Ratio
Create wearable market with Flexible and sensor integration

**Strategy: Wearable**

**Design Evolution**
- Curved
- Bended
- Foldable
- Stretchable

**Sensor Integration**
- Position & Motion Sensor: GPS, Gyroscope, Accelerometer
- Bio Sensor: Blood glucose, Pulse, Temperature

**Application**
- **Watch** (2013~)
- **Fitness & Healthcare** (2015~)
- **Fashion** (2018~)
In the near future, AMOLED will replace TFT LCD

### Trend in Automotive

<table>
<thead>
<tr>
<th>AMOLED Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contrast</strong> (2,000,000:1 vs 1,000:1)</td>
</tr>
<tr>
<td>‘True black’, Less eye fatigue</td>
</tr>
<tr>
<td><strong>Color Gamut</strong> (100% vs 70%)</td>
</tr>
<tr>
<td>Natural, saturated, consistent color</td>
</tr>
<tr>
<td><strong>Low Temp. Response Time</strong></td>
</tr>
<tr>
<td>No staggering in extreme coldness</td>
</tr>
<tr>
<td><strong>Power Consumption</strong> (for EV)</td>
</tr>
<tr>
<td>About 60% of LCD’s</td>
</tr>
<tr>
<td><strong>Flexible</strong></td>
</tr>
<tr>
<td>Design innovation, Unbreakable</td>
</tr>
</tbody>
</table>

"Nothing flat inside & Unbreakable"
Strategy: Automotive

Enter the market with AMOLED based differentiation from 2016

- RSE & CID (2016~)
  Excellent video quality

- Cluster (2017~)
  Vivid color, true black

- Flexible & new application (2018~)
  Innovative design
  Safe for collision e-mirror
E-textbook will evolve to Vook, rapidly replacing paper book

Trend: Education

US Digital Textbook Adoption

(Source: SETDA)

SETDA: the State Educational Technology Directors Association

(Contents based)

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>19.5%</td>
</tr>
<tr>
<td>2018</td>
<td>50%</td>
</tr>
</tbody>
</table>

Total Cost of Ownership

$2,100 Paper Textbook
High school 3 Years (USA Today)

$1,250 Digital Textbook
(Contents + H/W) (Gartner, OnlineEducation)
Create video book market with AMOLED

<table>
<thead>
<tr>
<th>VOOK (Video + Book)</th>
<th>Flexible</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Color in <strong>Printed Media</strong></td>
<td><strong>1</strong> Safety (Unbreakable)</td>
</tr>
<tr>
<td>= AMOLED (Adobe RGB 97%)</td>
<td>= LCD (Adobe RGB 74%)</td>
</tr>
<tr>
<td><strong>2</strong> High Contrast ratio &amp; Resolution for <strong>Readability</strong></td>
<td><strong>2</strong> Mobility (Carrying Small Seeing Big)</td>
</tr>
<tr>
<td><strong>3</strong> Fast Response time for <strong>Video Contents</strong></td>
<td></td>
</tr>
</tbody>
</table>
Strategic investment will secure growth momentum

**CAPEX Plan**

<table>
<thead>
<tr>
<th>Year</th>
<th>CAPEX $6B</th>
<th>LCD</th>
<th>AMOLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Strategy**

- Secure AMOLED growth
  - Asan (Korea)
- Sustain growth momentum for LCD
  - Suzhou (China)
"What is seen is all of our business area!"

Annual revenue growth (2012~2020)
- Market 5%, SDC 15%
Final Remarks

Display industry's outlook is brighter than ever as potential market for displays will be immeasurable in the future.

SDC will continue to lead the industry's growth through innovative products enabled by our technology leadership.

The innovative ways of SDC will create new opportunities, which will allow the realization of

"Display Beyond Imagination"
Thank You