Nanya Technology

KGI Greater China Corporate Day

2017Q4

Presentation to Investors & Analysts, December 14th, 2017

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Safe Harbor

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Outline

01. DRAM Industry

02. Business Strategy

03. NTC Overview
Vigorous Development of Big Data Era

- AI, IoT, Smart Car and High Performance Computing are expediting the proliferation of semiconductor
DRAM Essential to Electronic Devices

Portable Devices

Smart Home 、Smart Office 、Smart City

IoT 、Smart Car 、Industry 4.0

High Performance Computing (A.I., Big Data, Cloud)

Big Data Computing

PC Era
Strong Momentum of Semiconductor Industry

- In 2017, semiconductor YoY revised upward to 20%, total revenue $411.1B
- In 2017, Memory YoY revised upward to 57%, total revenue $126B
- In 2017, Memory accounts for 31% of total semiconductor revenue

Source: Gartner   Sep’17
Memory Industry Growth Solid

In 2017, Memory annual revenue will exceed $120B mark
In 2017, 67% YoY and $68.5B revenue of DRAM is forecasted
In 2017, 57% YoY and $53.5B market size of NAND is predicted
DRAM + NAND consisting of 97% memory market

Source: Gartner Sep’17
Memory Industry Capex

Unit: $ M

- Significant NAND capex expected for 3D NAND capacity ramp-up
- DRAM capex mainly for advanced technology conversion and maintaining current capacity level
- DRAM capacity addition expected to come on-line from 2H’18
- Annual bit growth forecast: DRAM 20%~25%, NAND 40%~45%

Source: Gartner Sep’17, IHS Oct’17
WW DRAM Capacity

WW DRAM Wafer Start (K/M, 300mm)

WW DRAM average monthly capacity will moderately increase to 1,210K/M in 2018.

Source: DRAMeXchange, inSpectrum, IHS, NTC MKT.
## Demand Forecast for 2018

- 23% YoY bit demand growth forecasted for 2018

<table>
<thead>
<tr>
<th>Unit: QTY(Mu)</th>
<th>C/B(GB)</th>
<th>QTY</th>
<th>C/B</th>
<th>Bit Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cloud</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Server + Work Station</td>
<td></td>
<td>17.4</td>
<td>188</td>
<td>34%</td>
</tr>
<tr>
<td><strong>P2P</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td></td>
<td>255</td>
<td>6.0</td>
<td>4%</td>
</tr>
<tr>
<td>Tablet</td>
<td></td>
<td>155</td>
<td>3.0</td>
<td>13%</td>
</tr>
<tr>
<td>Smart phone</td>
<td></td>
<td>1,600</td>
<td>3.2</td>
<td>22%</td>
</tr>
<tr>
<td>TV</td>
<td></td>
<td>225</td>
<td>2.4</td>
<td>17%</td>
</tr>
<tr>
<td><strong>M2M</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto</td>
<td></td>
<td>95</td>
<td>1.8</td>
<td>101%</td>
</tr>
</tbody>
</table>

2018 Demand
27.37Bn
(4Gb eq./ YR)

- Consumers & Others, 12%
- Server + WS, 24%
- Handset, 38%
- DTV, 4%
- Tablet, 3%
- PC + upgrade modules, 16%
- Auto + Industrial, 3%
- Consumer & Others includes: STB, Storage (HDD/SSD), Printer, Game Console, Graphic card, DSC, IP Camera, Industrial, smart watch, etc.

Source: IHS, Gartner, NTC MKT

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Favorable DRAM market conditions expected to continue throughout 2018

Source: Gartner, IHS, DRAMexchange, NTC MKT
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DRAM Specification Trend Forecast

**DRAM Interface (%)**

- DDR5
- DDR4
- DDR3
- Low Power (LPDDR5/4/3/2/1)
- Others

**DRAM Density (%)**

- 2016
- 2017
- 2018
- 2019
- 2020
- 2021

- <512Mb
- 1Gb
- 2Gb
- 4Gb
- 8Gb
- 16Gb

Source: IHS, Gartner, NTC MKT
20nm DDR4 8Gb Deployment Strategy

Data Center / Commodity

- Server
- Data Center
- Commodity

Consumer

- TV
- STB
- Networking
- SSD
- Surveillance
## Comprehensive DRAM Product Portfolio

<table>
<thead>
<tr>
<th>Technology</th>
<th>30/42nm</th>
<th>20nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spec.</td>
<td>DDR/DDR2/DDR3</td>
<td>DDR3/DDR4</td>
</tr>
<tr>
<td></td>
<td>LPDDR1/LPDDR2/LPDDR3</td>
<td>LPDDR3/LPDDR4</td>
</tr>
<tr>
<td></td>
<td>Custom</td>
<td>Custom</td>
</tr>
<tr>
<td>Density</td>
<td>512Mb/1Gb/2Gb/4Gb</td>
<td>1Gb/2Gb/4Gb/6Gb/8Gb</td>
</tr>
<tr>
<td>Grade</td>
<td>Commercial / Industrial / Automotive</td>
<td></td>
</tr>
<tr>
<td>Lifecycle</td>
<td>Long-life and stable supply</td>
<td></td>
</tr>
</tbody>
</table>

- 20nm enable DDR4 and LPDDR4 offerings to fully fulfill diversified requirements
20nm Execution

- **Q2'17**: Production of 8Gb DDR4
- **Q4'17**: Production of 8Gb LPDDR3 and 4Gb LPDDR4X
- **2H'18**: Continuous optimization

### 20nm Production Plan
- **Q4'17**
  - 38K/M wafer start
  - >20K/M wafer output
  - Bit output to exceed 30nm node in December

### Product Schedule
- **Q2'17**: 4Gb DDR3 verified and mass production
- **Q4'17**: 8Gb DDR4 mass production, shipment from December
- **2H'18**: 8Gb LPDDR3 & 4Gb LPDDR4X rollout

### Monthly Capacity Mix
- 38K/20nm + 30K/30nm
Advanced Technology
20nm in production and new generation technology development

New Product Design
DDR4/LPDDR4 Custom Products

New Product Development
Product Verification SiP (System in Package) Auto & Industrial

NTC as Key DRAM Supplier
Outline

01. DRAM Industry

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### Q1’17 ~ Q3’17 P&L Results

<table>
<thead>
<tr>
<th></th>
<th>Q3 2017</th>
<th>1H 2017</th>
<th>Q1- Q3 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>13.3B</td>
<td>24.8B</td>
<td>38.1B</td>
</tr>
<tr>
<td><strong>Gross Profit</strong></td>
<td>5.9B</td>
<td>10.4B</td>
<td>16.3B</td>
</tr>
<tr>
<td><strong>Gross Margin (%)</strong></td>
<td>44.2%</td>
<td>42.0%</td>
<td>42.8%</td>
</tr>
<tr>
<td><strong>Operating Income</strong></td>
<td>4.2B</td>
<td>8.0B</td>
<td>12.3B</td>
</tr>
<tr>
<td><strong>Operating Margin (%)</strong></td>
<td>31.9%</td>
<td>32.3%</td>
<td>32.1%</td>
</tr>
<tr>
<td><strong>Non-operating Income</strong></td>
<td>4.3B</td>
<td>3.3B</td>
<td>7.6B</td>
</tr>
<tr>
<td><strong>Net Income</strong></td>
<td>8.5B</td>
<td>9.8B</td>
<td>18.3B</td>
</tr>
<tr>
<td><strong>Net Margin (%)</strong></td>
<td>64.3%</td>
<td>39.3%</td>
<td>48.0%</td>
</tr>
<tr>
<td><strong>Capital</strong></td>
<td>27.5B</td>
<td>27.5B</td>
<td>27.5B</td>
</tr>
<tr>
<td><strong>EPS (NT$)</strong></td>
<td>3.09</td>
<td>3.55</td>
<td>6.65</td>
</tr>
</tbody>
</table>

**Company highlights**

- **1Q’17** Net Income of NT$ 3,275M, Net Margin 26.8%, EPS NT$ 1.19
- **2Q’17** Net Income of NT$ 6,490M, Net Margin 51.4%, EPS NT$ 2.36

* Financial numbers are reviewed by CPA*
Financial Highlights

- 20nm ramp-up will further enhance operating results
### Q1’17 ~ Q3’17 Cash Flows

(Unit: Million NT$)

<table>
<thead>
<tr>
<th></th>
<th>Q1~Q3 2017</th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beginning Balance</strong></td>
<td>9,102</td>
<td>3,104</td>
<td>7,268</td>
</tr>
<tr>
<td>Cash from Operating</td>
<td>13,835</td>
<td>15,945</td>
<td>18,522</td>
</tr>
<tr>
<td>Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital expenditures</td>
<td>-26,530</td>
<td>-22,336</td>
<td>-3,842</td>
</tr>
<tr>
<td>Long-term &amp; Short-term</td>
<td>-2,439</td>
<td>-6,351</td>
<td>-14,382</td>
</tr>
<tr>
<td>loans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investments and others</td>
<td>30,572</td>
<td>18,740</td>
<td>-4,463</td>
</tr>
<tr>
<td><strong>Ending Balance</strong></td>
<td>24,540</td>
<td>9,102</td>
<td>3,104</td>
</tr>
<tr>
<td>Free Cash Flow (1)</td>
<td>-12,695</td>
<td>-6,391</td>
<td>14,680</td>
</tr>
</tbody>
</table>

(1) Free Cash Flow = Cash from operating activities – Capital expenditures
Monthly Revenue & Debt Ratio

**Y2017 Monthly Revenue**

- **Net operating revenues (Million NT$)**
  - Jan: 4,067
  - Feb: 3,970
  - Mar: 4,193
  - Apr: 4,115
  - May: 4,193
  - Jun: 4,297
  - Jul: 4,352
  - Aug: 4,644
  - Sep: 5,072
  - Oct: 5,745
  - Nov: 5,918

**Debt/Asset Ratio**

- 2014: 60.1%
- 2015: 47.3%
- 2016: 37.5%
- Q1'2017: 38.9%
- Q2'2017: 41.5%
- Q3'2017: 29.1%

- **Successful 20nm ramp-up resulting in revenue growth in Q4’17**
- **Debt/Asset ratio down to 29.1% at the end of the 30th of September, 2017**
- **Debt ratio to be further reduced in Q4’17 by repaying FPG borrowings and Bank loans**
Key Takeaways

- Tight supply continued into Q1’18, solid ASP movement
- 2018 DRAM market in balance and healthy expected
- Nanya Technology Operation Focuses:
  - Mid-teen bit growth in Q4’17 and 20nm bit output exceeding 30nm in December expected
  - 20nm capacity ramp-up, ~45% YoY bit output in 2018 forecasted
  - Launch 20nm DDR4 8Gb to enhance participation in Server segment
  - Expand 20nm product line up for diversified applications
Thanks & Questions