



# Nanya Technology Q4' 2019 Investor Conference Section I – Financial Results

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The background features two decorative geometric patterns. On the left, there is a cluster of overlapping triangles in shades of blue and yellow-green, connected by a network of white lines. On the right, there is a larger, more complex network of grey lines connecting various points, forming a web-like structure.

01

# Q4'19 REVENUE & RESULTS



# Q4'19 Financial Results Summary

Amount in Million NT\$, except for EPS & BVPS	Q4'19 Unaudited		Q3'19 Audited		QoQ	Q4'18 Audited		YoY
Net Sales	13,116	100%	14,799	100%	-11.4%	16,958	100%	-22.7%
Gross Profit (Loss) <i>Gross Margin(%)</i>	3,377	25.7%	4,137	28.0%	-18.4%	8,972	52.9%	-62.4%
Operating Income (Loss) <i>Operating Margin(%)</i>	1,440	11.0%	2,252	15.2%	-36.1%	7,092	41.8%	-79.7%
EBITDA* <i>EBITDA Margin (%)</i>	5,170	39.4%	5,957	40.3%	-13.2%	10,217	60.2%	-49.4%
Non-operating Income (Expense)	109	0.8%	432	2.9%		893	5.3%	
Income Tax Benefit (Expense)	-271	-2.1%	-479	-3.2%		-32	-0.2%	
Net Income (Loss) <i>Net Margin (%)</i>	1,278	9.7%	2,205	14.9%	-42.1%	7,953	46.9%	-83.9%
Earnings Per Share (NT\$)	0.42**		0.72			2.57		
Book Value Per Share (NT\$)	49.78***		49.71			54.02		
Shares Outstanding(million shares)	3,053		3,053			3,053		

Note: \* EBITDA = Operating income + Depreciation & Amortization Expenses

\*\* EPS is based on weighted average outstanding shares of 3,053M

\*\*\* BVPS is calculated based on 3,053M outstanding shares after deduction of NT\$ 7.11 cash dividend

# Quarterly Revenue Results

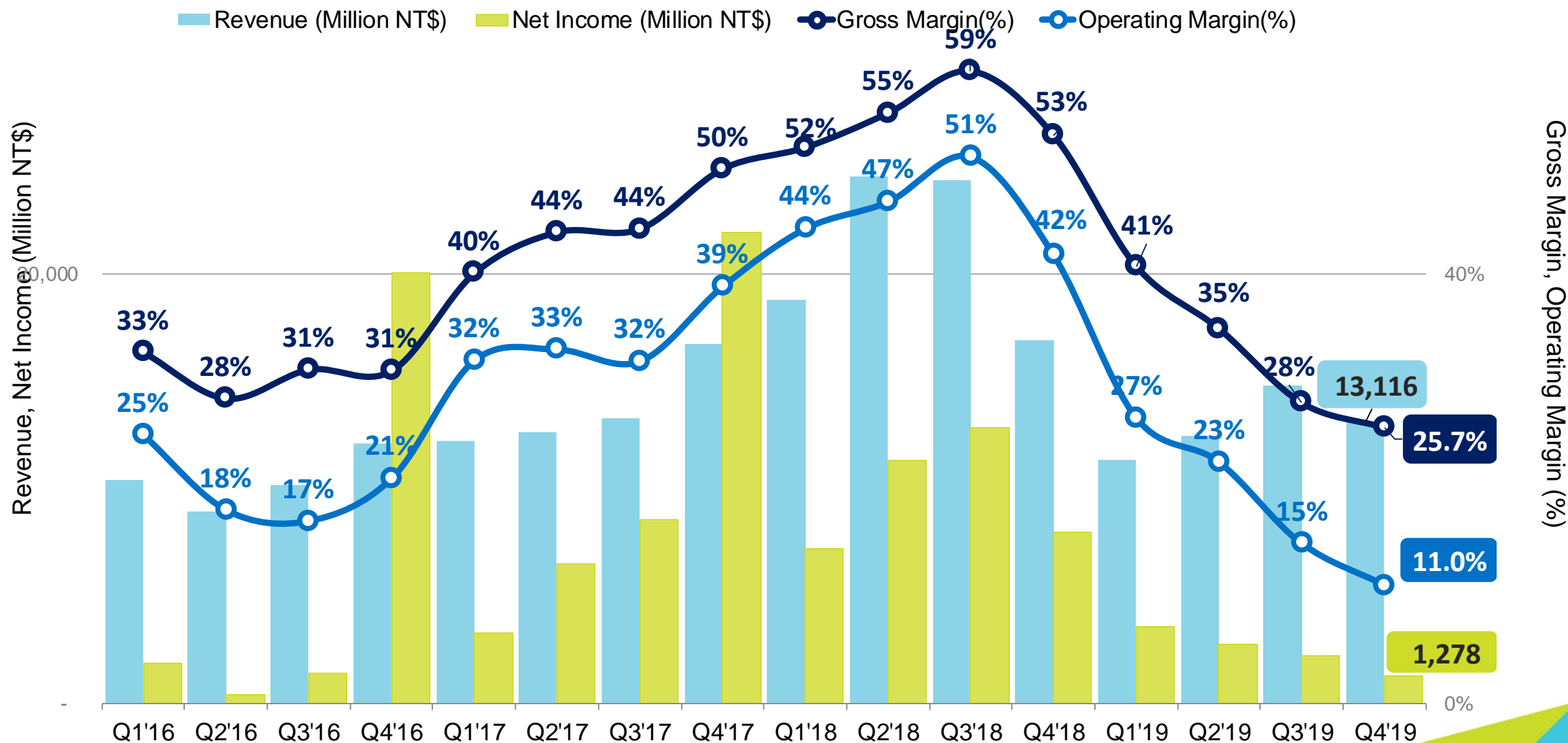
	QoQ Q4 '19 vs. Q3'19	YoY Q4'19 vs. Q4'18
Revenue	-11.4%	-22.7%
Shipment	Decreased mid single digits %	Increased high fortys%
ASP	Decreased low single digits%	Decreased high fortys%
Exchange Rate	-2.1%	-1.0%

- Q4'19 Revenue decreased by 11.4% QoQ
- Q4'19 Bit shipment decreased mid single digits% QoQ
- Q4'19 ASP decreased low single digits% QoQ

# Q4'19 vs. Q3'19 Results Comparison

Amount in Million NT\$	Q4'19 Unaudited	Q3'19 Audited	QoQ (PPT* Delta)	Remarks
<b>Net Sales</b>	13,116	14,799	-11.4%	<ul style="list-style-type: none"> <li>■ Bit shipment decreased by mid single digits% range QoQ</li> <li>■ ASP decreased by low single digits% QoQ</li> <li>■ NTD/USD appreciated 2.1%</li> </ul>
<b>Gross Profit (Loss)</b> Gross Margin(%)	3,377 <b>25.7%</b>	4,137 <b>28.0%</b>	-2.3%	<ul style="list-style-type: none"> <li>■ Q4'19 Gross profit decreased NT\$ 760M, mainly due to shipment &amp; ASP decrease &amp; FX impact</li> </ul>
<b>Operating Expense</b>	1,937 <b>14.8%</b>	1,885 <b>12.7%</b>	+2.1%	<ul style="list-style-type: none"> <li>■ SG&amp;A increased NT\$ 22M, R&amp;D expense increased NT\$ 30M</li> </ul>
<b>Operating Income (Loss)</b> Operating Margin(%)	1,440 <b>11.0%</b>	2,252 <b>15.2%</b>	-4.2%	<ul style="list-style-type: none"> <li>■ Q4'19 OP Income decreased NT\$ 812M</li> </ul>
<b>Net Income (Loss)</b> Net Margin (%)	1,278 <b>9.7%</b>	2,205 <b>14.9%</b>	-5.2%	<ul style="list-style-type: none"> <li>■ Net Income decreased NT\$ 927M               <ul style="list-style-type: none"> <li>• Primarily from OP Income decrease of NT\$ 812M</li> <li>• FX losses &amp; others: NT\$ 323M unfavorable</li> <li>• Income tax: NT\$ 208M favorable</li> </ul> </li> </ul>

# Quarterly Financial Highlights



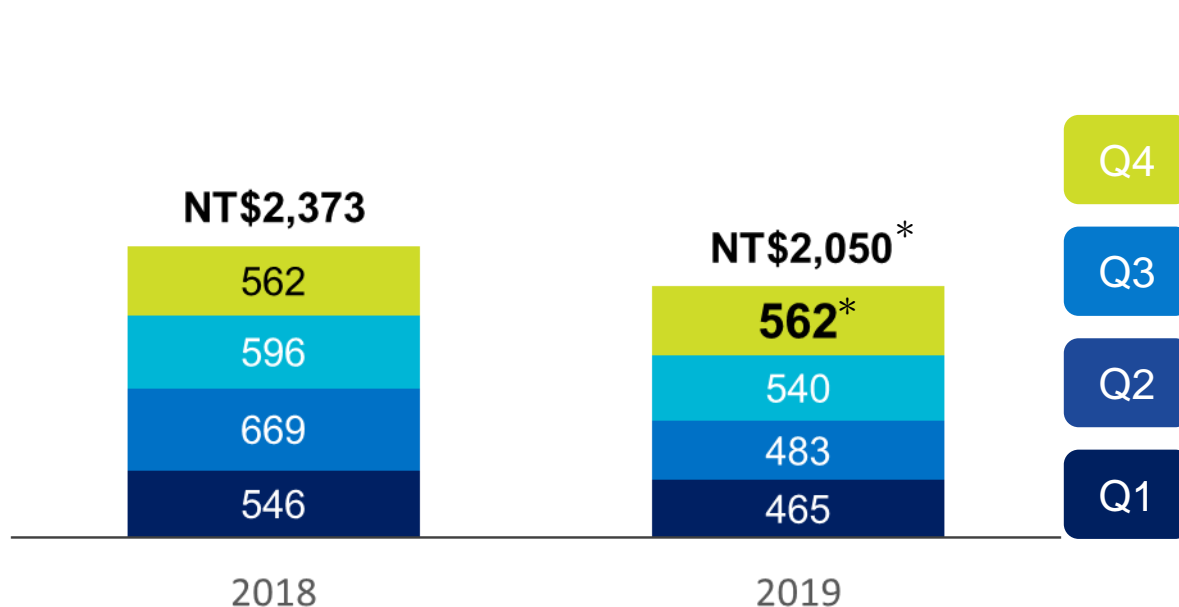


# Operating Expenses

## SG&A Expenses

(Million NT\$)

\* Unaudited number

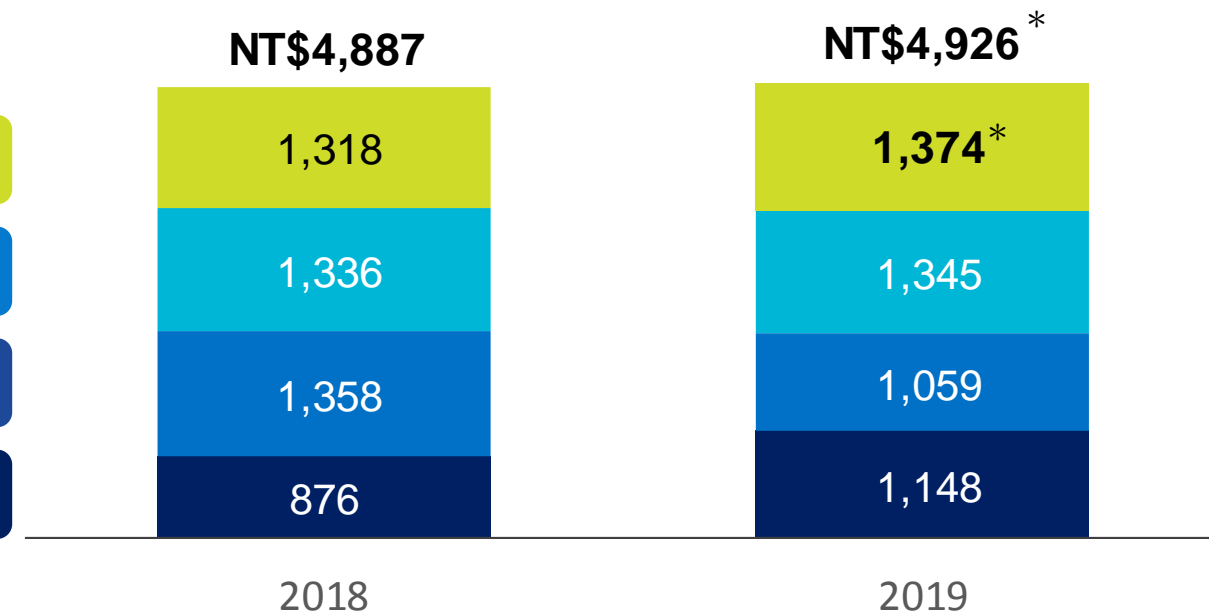


Note: 2019 SG&A expenses decreased NT\$ 323million mainly due to expense decrease.

## R&D Expenses

(Million NT\$)

\* Unaudited number



Note: 2019 R&D expenses increased NT\$ 39million, continued invested resources on the both new process technology and product development.

# Cash Flows

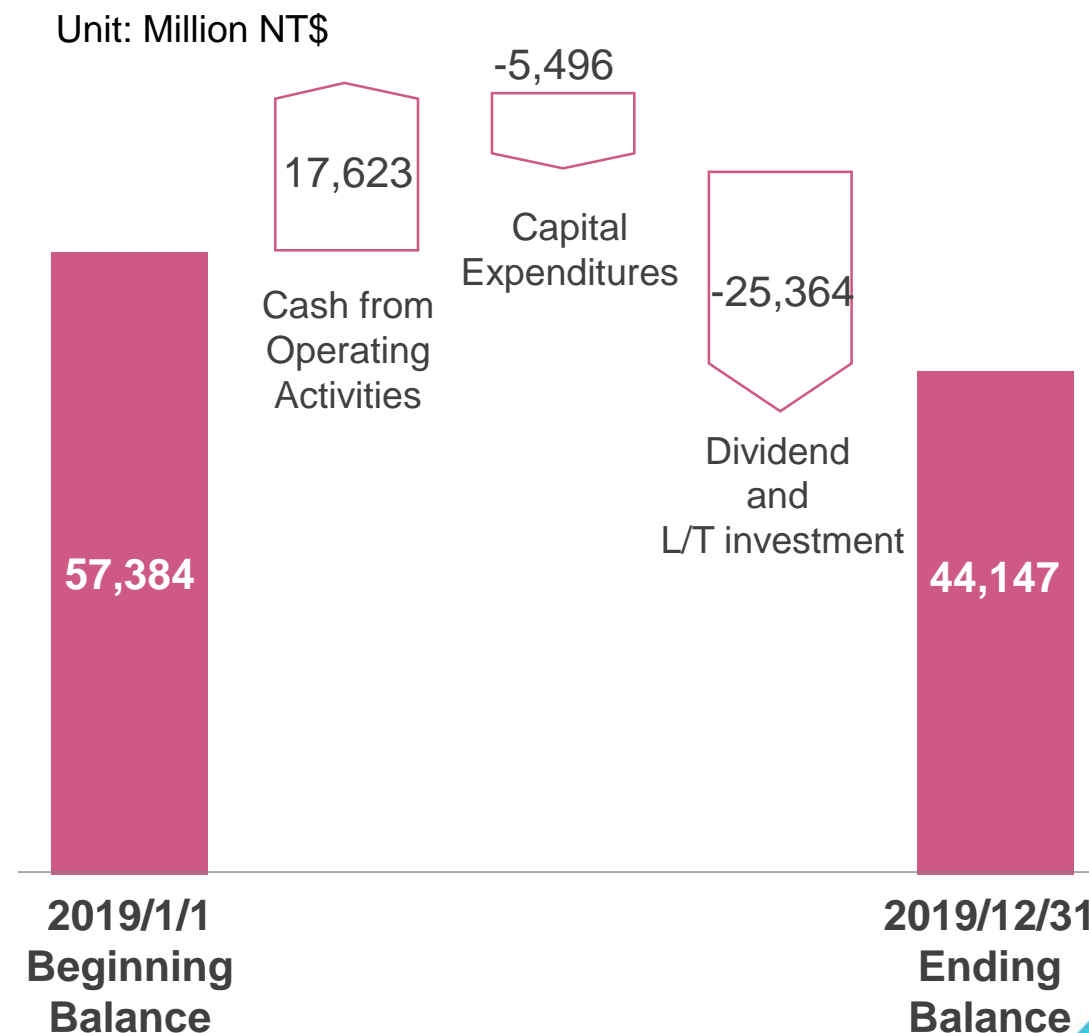
	Q4'19	Q3'19
	Unaudited & Consolidated	Audited & Consolidated
Unit: Million NT\$		
<b>Beginning Balance</b>	<b>43,184</b>	<b>60,861</b>
Cash from Operating Activities	5,013	5,103
Capital expenditures	-840	-1,106
Financial Activities	-3,210*	-21,673**
<b>Ending Balance</b>	<b>44,147</b>	<b>43,184</b>
<b>Free Cash Flow <sup>(1)</sup></b>	<b>4,173</b>	<b>3,996</b>

(1) Free Cash Flow = Cash from operating activities – Capital expenditures

\* NT\$ 2.05 billion(B) investment to acquire FATC shares, and NT\$ 1.1B currency translation due to NTD appreciation

\*\* Mainly from dividend payout of NT\$ 21.7B

## 2019 Cash Flow



**2019 Free Cash Flow NT\$12,127 Million**

The background features abstract geometric patterns. On the left, there are overlapping triangles in shades of blue and yellow. On the right, there is a network of grey dots connected by thin lines, forming a web-like structure.

# 02

## 2019 REVENUE & RESULTS

# 2019 Consolidated Income Statement


Amount: Million NT\$

	2019		2018		YoY
	Unaudited		Audited		
Net Sales	51,727	100.0%	84,722	100.0%	-38.9%
Cost of Goods Sold	35,233	68.1%	38,106	45.0%	
Gross Margin	16,494	31.9%	46,616	55.0%	-64.6%
SG&A Expenses	2,051	4.0%	2,373	2.8%	
R&D Expenses	4,926	9.5%	4,887	5.8%	
Operating Income	9,517	18.4%	39,355	46.5%	-75.8%
Non-operating Income (Exp.)	1,707	3.3%	2,229	2.6%	
Income before Tax	11,224	21.7%	41,584	49.1%	-73.0%
Income Tax Benefit (Expense)	-1,407	-2.7%	-2,223	-2.6%	
Net Income	9,816	19.0%	39,361	46.5%	-75.1%
EPS(NT\$)	3.22		12.80		
Book Value Per Share	49.78		54.02		

# 2019 vs. 2018 Results Comparison

Amount in Million NT\$	2019 Unaudited	2018 Audited	YoY (PPT* Delta)	Remarks
<b>Net Sales</b>	<b>51,727</b>	<b>84,722</b>	<b>-38.9%</b>	<ul style="list-style-type: none"> <li>■ ASP decreased by high-fortys % YoY</li> <li>■ Bit shipment increased by low-teens YoY</li> <li>■ FX positive impact +2.6%</li> </ul>
<b>Gross Income (Loss)</b> Gross Margin(%)	<b>16,494</b> <b>31.9%</b>	<b>46,616</b> <b>55.0%</b>	<b>-23.1%</b>	<ul style="list-style-type: none"> <li>■ Gross Income decreased mainly due to ASP decrease</li> </ul>
<b>Operating Income (Loss)</b> Operating Margin(%)	<b>9,517</b> <b>18.4%</b>	<b>39,355</b> <b>46.5%</b>	<b>-28.1%</b>	<ul style="list-style-type: none"> <li>■ Operating Income decreased mainly due to ASP decrease</li> </ul>
<b>Net Income (Loss)</b> Net Margin (%)	<b>9,816</b> <b>19.0%</b>	<b>39,362</b> <b>46.5%</b>	<b>-27.5%</b>	<ul style="list-style-type: none"> <li>■ Net Income decreased by NT\$ 29,545M mainly due to:               <ul style="list-style-type: none"> <li>• Operating Income decreased NT\$ 29,838M</li> <li>• FX loss unfavorable NT\$ 1,366M (2019: NT\$ -186M, 2018: NT\$ 1,180M)</li> <li>• Other income favorable NT\$ 272M (2019: NT\$ 1,303M, 2018: NT\$ 1,030M)</li> <li>• Income tax favorable 816M (2019: NT\$ 1,407M, 2018: NT\$ 2,223M)</li> </ul> </li> </ul>

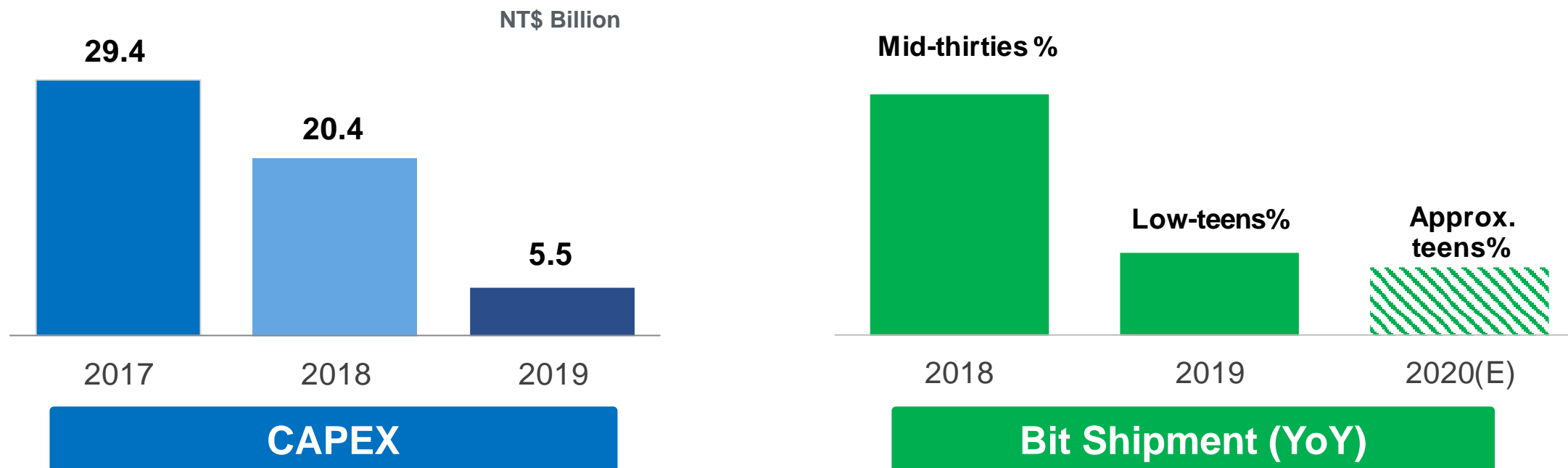


The background features abstract geometric patterns. On the left, there are overlapping triangles in shades of blue and yellow. On the right, there is a network diagram with grey dots connected by thin grey lines, forming a web-like structure.

03

# CAPEX & BIT SHIPMENT

# CAPEX & Bit Shipment



## Capital

### Expenditure (CAPEX)

- 2019 CAPEX NT\$ 5.5Billion (B)
- 2020 CAPEX plan will be announced after BoD approval

## Bit Shipment

- Q4'19 Bit shipment decreased by mid single digits %
- 2019 YoY bit shipment grew by low-teens%
- Q1'20 QoQ bit shipment expected to be low single digits increase
- 2020 YoY bit shipment growth guided for approx. teens%
- Continue allocating 5~10% capacity to technology & product development

The slide features two decorative geometric patterns. On the left, a cluster of overlapping triangles in shades of blue and yellow-green is connected by a network of white lines. On the right, a larger, more complex network of grey dots connected by thin grey lines forms a web-like structure. The main title "04 MARKET OUTLOOK" is centered over the right pattern.

# 04

## MARKET OUTLOOK

# Market Outlook (Year 2020)

## Outlook


- **Macro:** Optimistic market outlook throughout 2020, inventory normalized, and supply and demand gradually stabilized
- **Sectors Outlook:** Server demand recovery, mobile DRAM content growth, healthy outlook on PC shipment and consumer demand

## Supply

- Conservative 2019 Capex, discipline bit supply growth in 2020

## Demand

- **Mobile Market:** 2020 smartphone unit shipment grow slightly, 5G phone with 8GB DRAM sales increase; 12GB units increase in high-end models of Android phones
- **Server Market:** Solid server demand growth. Demand increase with 5G base station deployment, 64GB high-density module, and edge computation
- **PC Market:** Strong enterprise and gaming PC demand. Dual monitors PC, 5G laptops, creators (enhanced independent graphics capabilities) sustain DRAM demand. Microsoft Windows transition and Intel new processors helping new demand
- **Consumer Market:** DRAM demand in consumer segments including TV, set-top box, SSD, gaming, smart speaker, routers and smart watch...etc. to grow steadily

The background features two large, abstract geometric patterns. On the left, a cluster of overlapping triangles in shades of blue and yellow-green is connected by a network of white lines. On the right, a more sparse network of grey dots connected by thin grey lines forms a web-like structure.

# 05

## **BUSINESS REVIEW & OUTLOOK**



# Nanya Business Review & Outlook

- Complete DDR4, LPDDR4/X, LPDDR3 product portfolio, and begin volume shipment in server market
- Acquired additional 13% FATC shares, total holding 32%
- Optimistic market outlook throughout 2020
- 2020 bit shipment will increase teens%, grow in-line with market demand growth
- Successful DRAM proprietary core cell development based on 10nm class process technology



# Section II – Technical Briefing



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**01** DRAM  
R&D  
Strategy

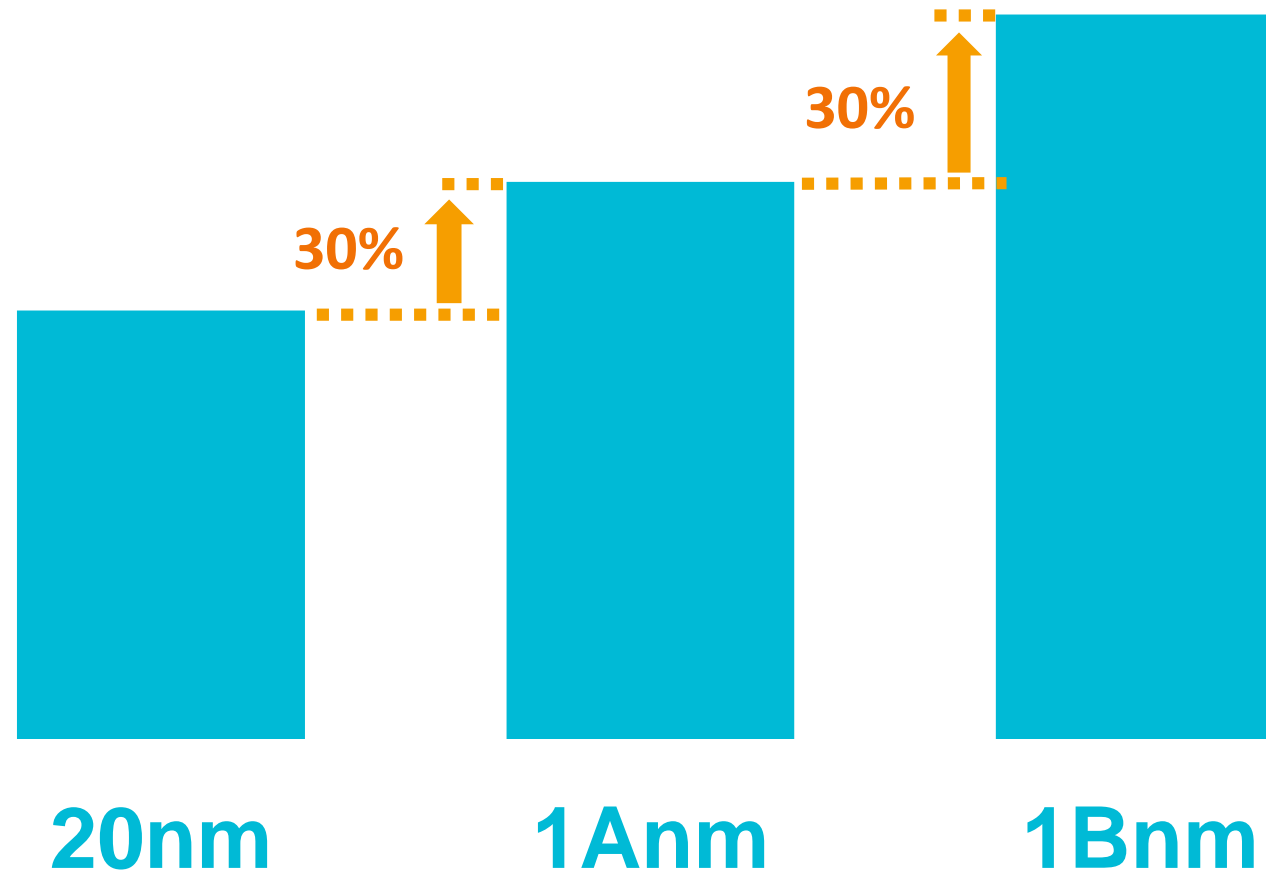
**02** Advanced  
DRAM Cell  
Features

**03** NTC  
Patent  
Portfolio

**04** DRAM  
Technology  
Roadmap

# NTC DRAM R&D Strategy

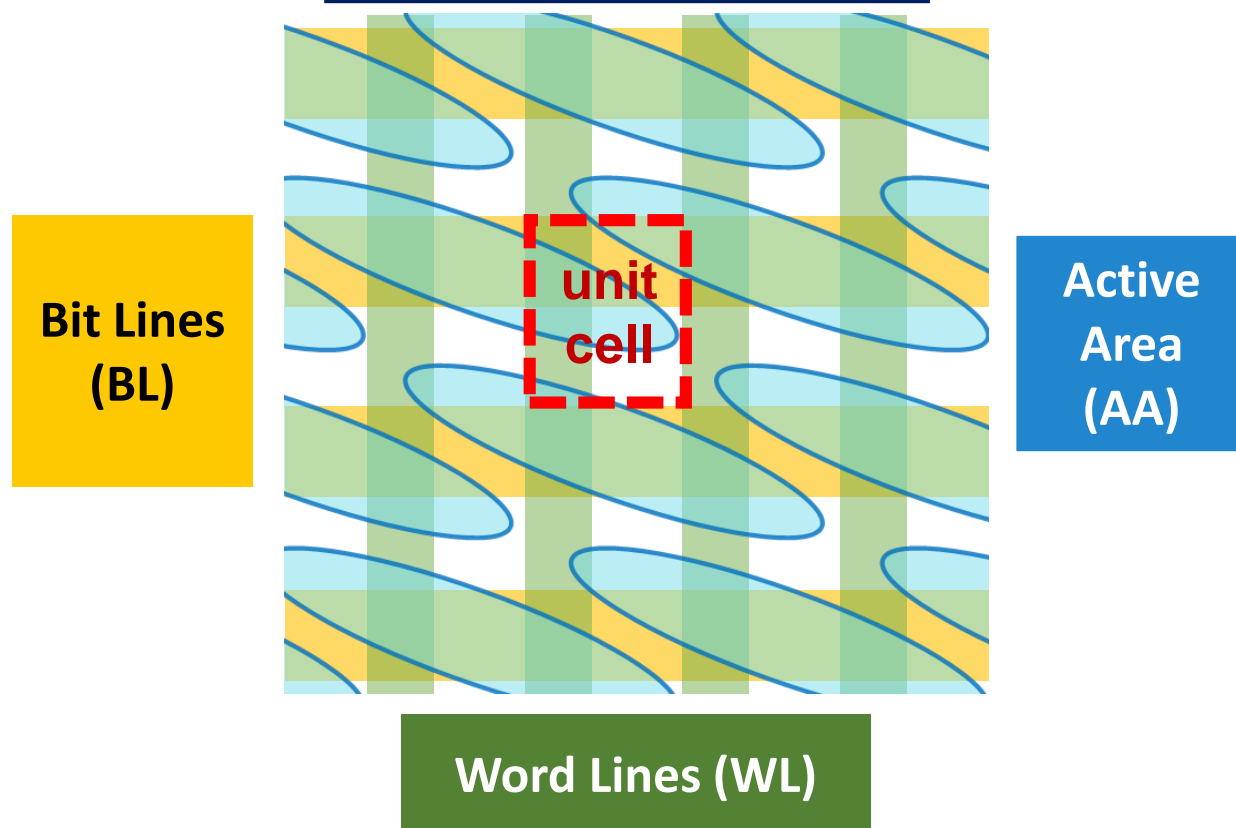
To enable 30% productivity gain per technology node



# Advanced DRAM Cell Features

Active Area minimum pitch  $6F^2$  cell design

## AA-min Cell Design



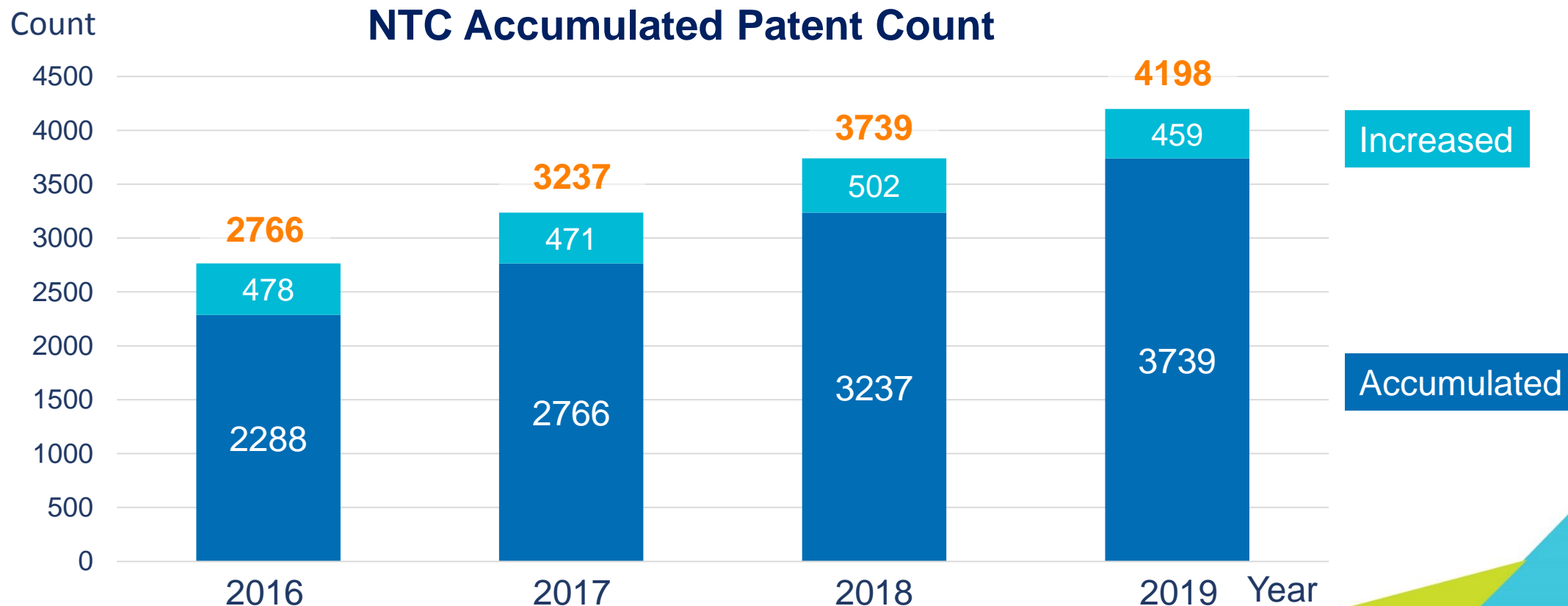
## Key Features

- Self-aligned epitaxial Si growth to enlarge cell contact area
- Cell landing pads to enable hexagonal close-packed (HCP) capacitors
- Bit-line air gaps to improve signal margin



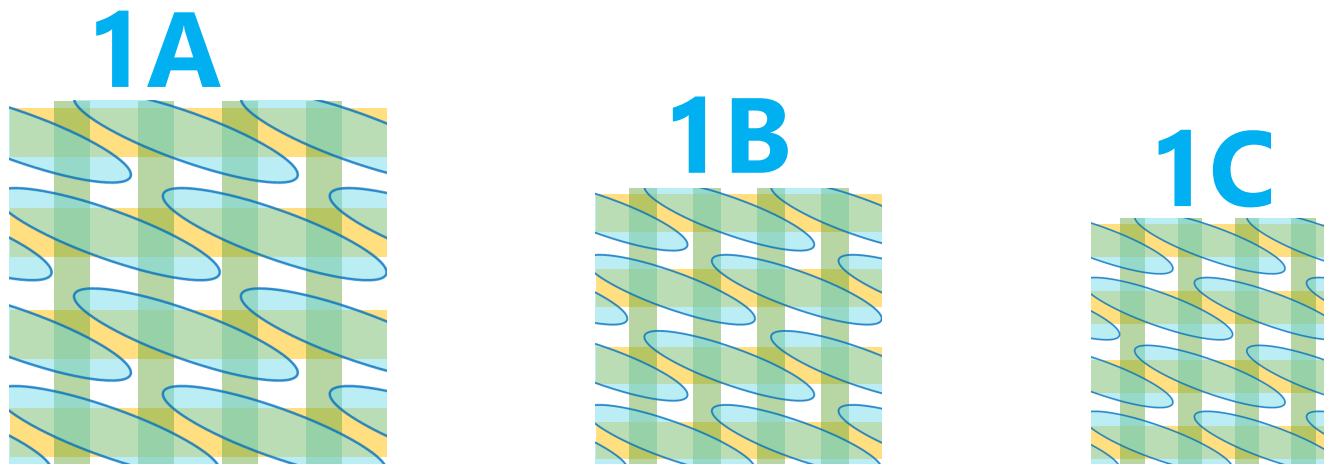
# NTC Patent Portfolio

NTC has accumulated more than 4000 patents. This established strong patent portfolio is beneficial to NTC technology development.



# DRAM Technology Roadmap

- Active Area minimum pitch cell is scalable to 1B node and beyond.
- 1A lead product will be 8Gb LPDDR4 using NTC proprietary design and process platform.
- 1A and 1B technology platforms will enable DDR5 and 16Gb products.



**Active Area minimum pitch**



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Thanks & Questions

# Q4'19 Consolidated Income Statement

Amount: Million NT\$

	Q4'19 Unaudited		Q3'19 Audited		QoQ	Q4'18 Audited		YoY
Net Sales	13,116	100.0%	14,799	100.0%	-11.4%	16,958	100.0%	-22.7%
Cost of Goods Sold	9,739	74.3%	10,662	72.0%		7,986	47.1%	
Gross Margin	3,377	25.7%	4,137	28.0%	-18.4%	8,972	52.9%	-62.4%
SG&A Expenses	562	4.3%	540	3.6%		562	3.3%	
R&D Expenses	1,374	10.5%	1,345	9.1%		1,318	7.8%	
Operating Income	1,440	11.0%	2,252	15.2%	-36.1%	7,092	41.8%	-79.7%
Non-operating Income (Exp.)	109	0.8%	432	2.9%		893	5.3%	
Income before Tax	1,549	11.8%	2,684	18.1%	-42.3%	7,985	47.1%	-80.6%
Income Tax Benefit (Expense)	-271	-2.1%	-479	-3.2%		-32	-0.2%	
Net Income	1,278	9.7%	2,205	14.9%	-42.1%	7,953	46.9%	-83.9%
EPS(NT\$)	0.42		0.72			2.57		
Book Value Per Share	49.78		49.71			54.02		