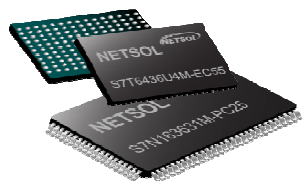




NETSOL Company Profile

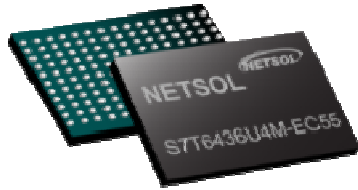


High Quality & High Performance Memory Provider

Q3. 2018

NETSOL Co., Ltd.

Netsol – History



2017

02. Developed 32Mb Customized SRAM

2016

03. Developed 1/2/4/8Mb Low Power SRAM

2015

03. Developed 144Mb Sync. SRAM

2014

09. Move office to Innoplex Bldg.
03. Developed 144Mb Quadruple/DDR SRAM



2013

11. Developed 72Mb Quadruple/DDR SRAM
06. Developed 4Mb Async Fast SRAM
02. Developed 18/36Mb Quadruple/DDR SRAM

2012

11. Patent License from Samsung Electronics
06. Developed 18Mb Sync SRAM
02. Developed 4Mb Sync SRAM

2011

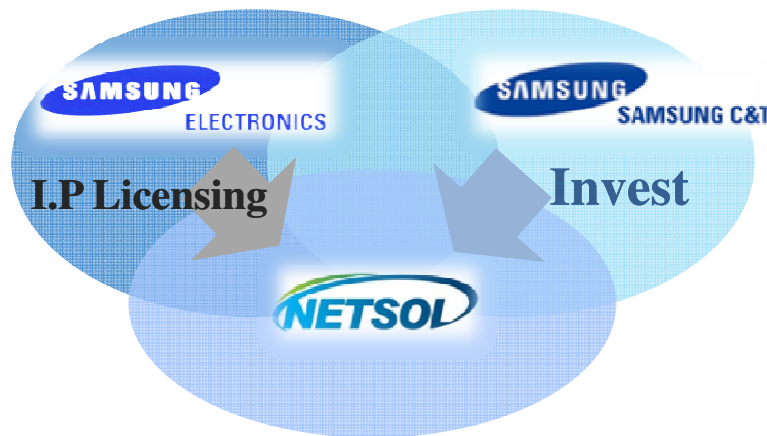
11. Developed 9Mb Sync SRAM
06. ISO 9001:2008 certification

2010

09. Establishment of the company



- Netsol is focusing on Niche Memory Market with Longevity



- ✓ **About 20 years** of Key Engineers' career
- *All from Samsung*
- ✓ **10 years** of Product Supply Guarantee
- *No PCN, Stable Supply*
- *Stable Quality Management*

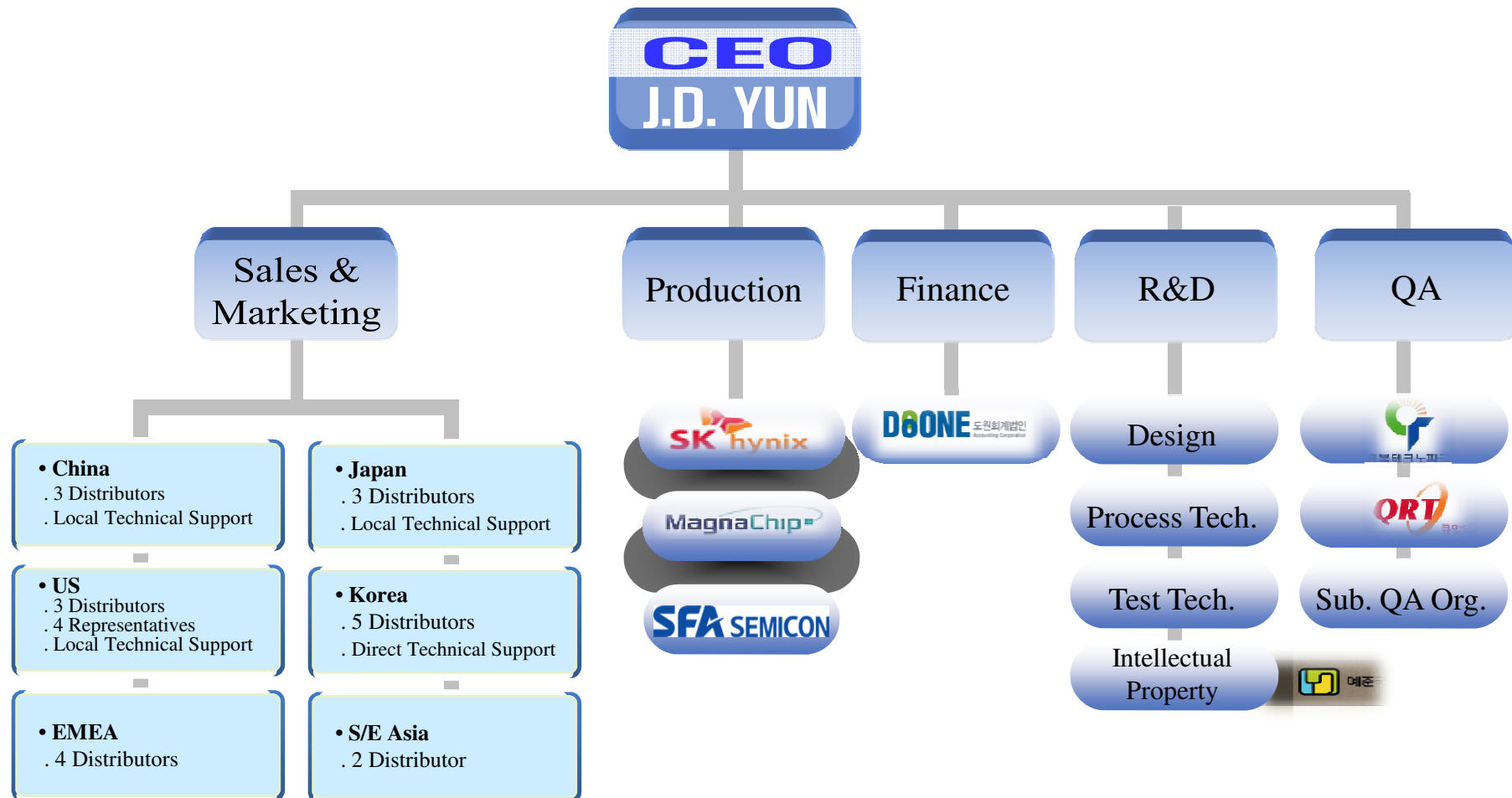
- Netsol Goal



● Netsol Profile



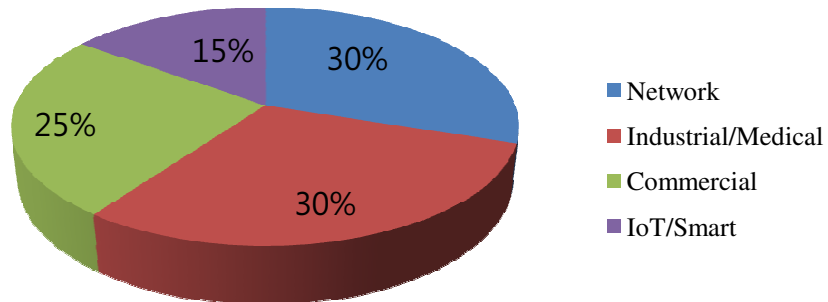
NETSOL – Organization Chart



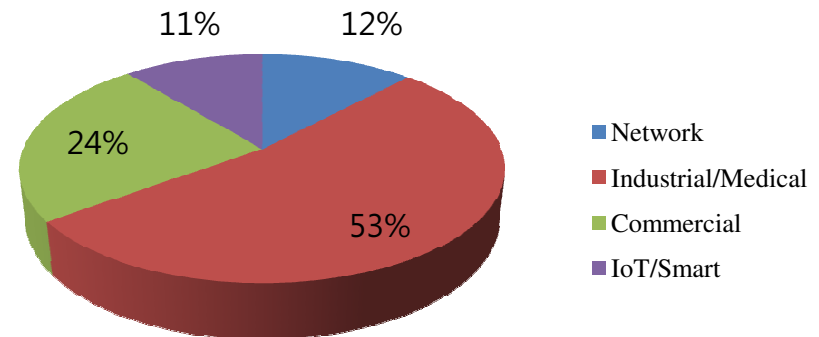
● SRAM Target Market



SRAM TAM



NETSOL Sales



I Longevity

II Cost Competitiveness

III High Quality

IV Customer Oriented Management

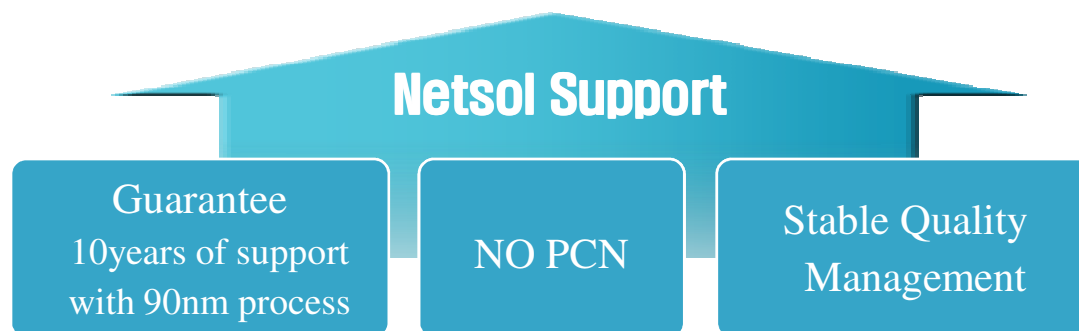
I. Longevity

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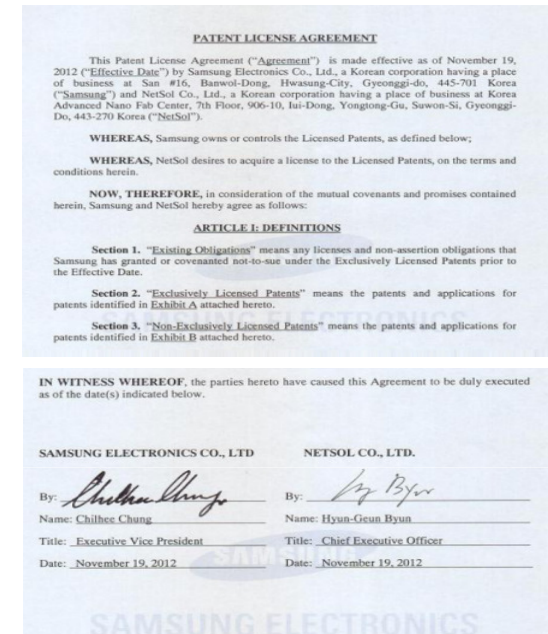


● Customer Requirement

Application		Long-Term Support Requirement
Commercial	. Office Appliance . POS, ATM	5~7 years
Network	. Switch . Router	More than 10 years
Industrial/ Medical	. Factory Automation . Medical Diagnostic	10 years
IoT/Smart	. Smart Grid . Smart Home	5~10 years



● Strongest IP Holder



● Foundry (SK Hynix M8 Line)

- . Capacity : 100K wafers/m
- . Allocated to Netsol : 20K wafers/m

● Wafer Test

- . In-House Clean Room

● Backend (SFA semi.)

- . Capacity : 35Mpcs/m
- . Allocated to Netsol : 2Mpcs/m

II. Cost Competitiveness & High Quality

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● Tile Type Cell Architecture

	Netsol	Competitors
Cell Type	Tile Type	Thin Type
Cell Architecture		
Layer	1 Poly, 2 metal	1 poly, 3 metal
Contact per cell	9.5 contacts (contact, via-1)	16 contacts (contact, via-1, via-2)
Vcc/Vss	One common Vcc/Vss	2 separated Vcc/Vss

✓ **Better Reliability :** Symmetric Type Cell
Common Power
Less Contact and Metal Layer

✓ **Less Cost :** Small Cell Size (30~40% Shrink)

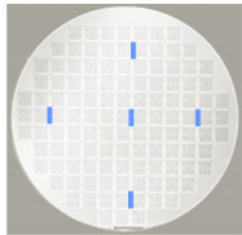
III. High Quality

• Superior Quality Control

• Maverick Die Control by IET(In-line Electrical Test)

• Others

→ 5 Point per Wafer, 1~2 wafer per Lot
Normal ET(Electrical Test) using HP4145 or HP4062

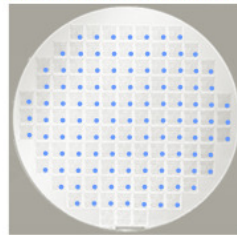


⊗ Mainchip ET

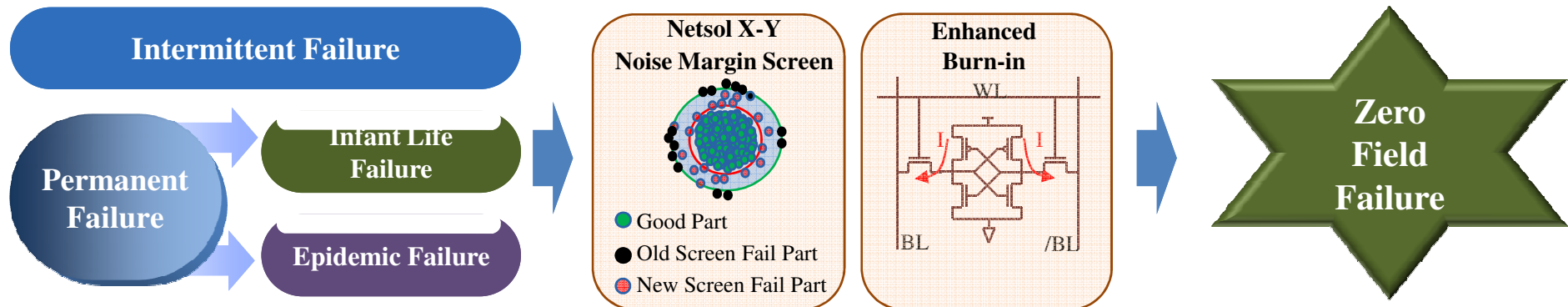
US 7,307,441 B2
(Filed Feb. 12, 2003)

• Netsol

→ All chip and All Lot
IET(In-line Electrical Test) during Wafer Sort Test



• Advanced Screen-Ability



III. High Quality- ISO Certification

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● Quality Certification



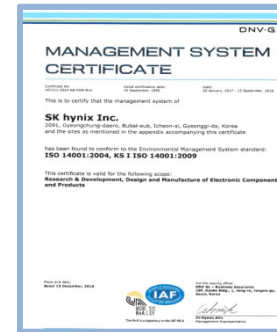
NETSOL Certification

NETSOL comply with the provisions of ISO and also attach subcontractor's ISO document.

[ISO/TS 16949]



[ISO 14001]



[ISO 18001]



SK hynix

SK Hynix
Certification

[TS 16949]



[ISO 14001]



[OHSAS 18001]



[SONY Green-Partner]



SFA(STS)
Certification

[SEC Eco-Partner]



Customer Satisfaction

Small Qty Batch Production

- 180 different products with small Qty to support all customers demand
- Small MOQ

Short Lead Time

- Normal Lead Time 8 weeks
- Special Lead Time 5 weeks (Hot Run)

Quick Response Time

- within 12 hours, answer to inquiry of price/lead time
- within 24 hours, preliminary FA report after receipt of samples
- within 2 weeks, final FA report after receipt of samples
- Engineer Dispatch : within 2 days after requested by customers

Netsol Design win Status

• Netsol's Customers by Applications

• Commercial

Panasonic - IP Phone, MFP	
Toshiba - MFP, POS	
Polycom - IP Phone	
Unify - IP Phone	
Avaya - IP Phone	
Ditron - POS	
Smuff Bio - Security	

• Industrial

Hitachi - Radio system	
Bosch Rexroth - Automotive	
Sick AG - Factory Auto.	
Rigol - Oscilloscope	
LTX Credence - Tester	
AGFA Healthcare - Medical	
Ziehm Imaging - Medical	

• Network

Nokia - Switch / Router	
Palo Alto NW - Switch / Router	
Radware - Switch / Router	
Avaya - Switch / Router	
Zhone - Switch / Router	
cPacket - Switch / Router	
ECI Telecom - Switch / Router	

• IoT

Sunrise - Smart Meter	
Kaifa - Smart Meter	
Commax - Smart Home	
Seagate - Storage Server	
Inspur - Storage Server	
Sugon - Storage Server	
Harmonic - Broadcast	

Confidential

Product



Product Roadmap

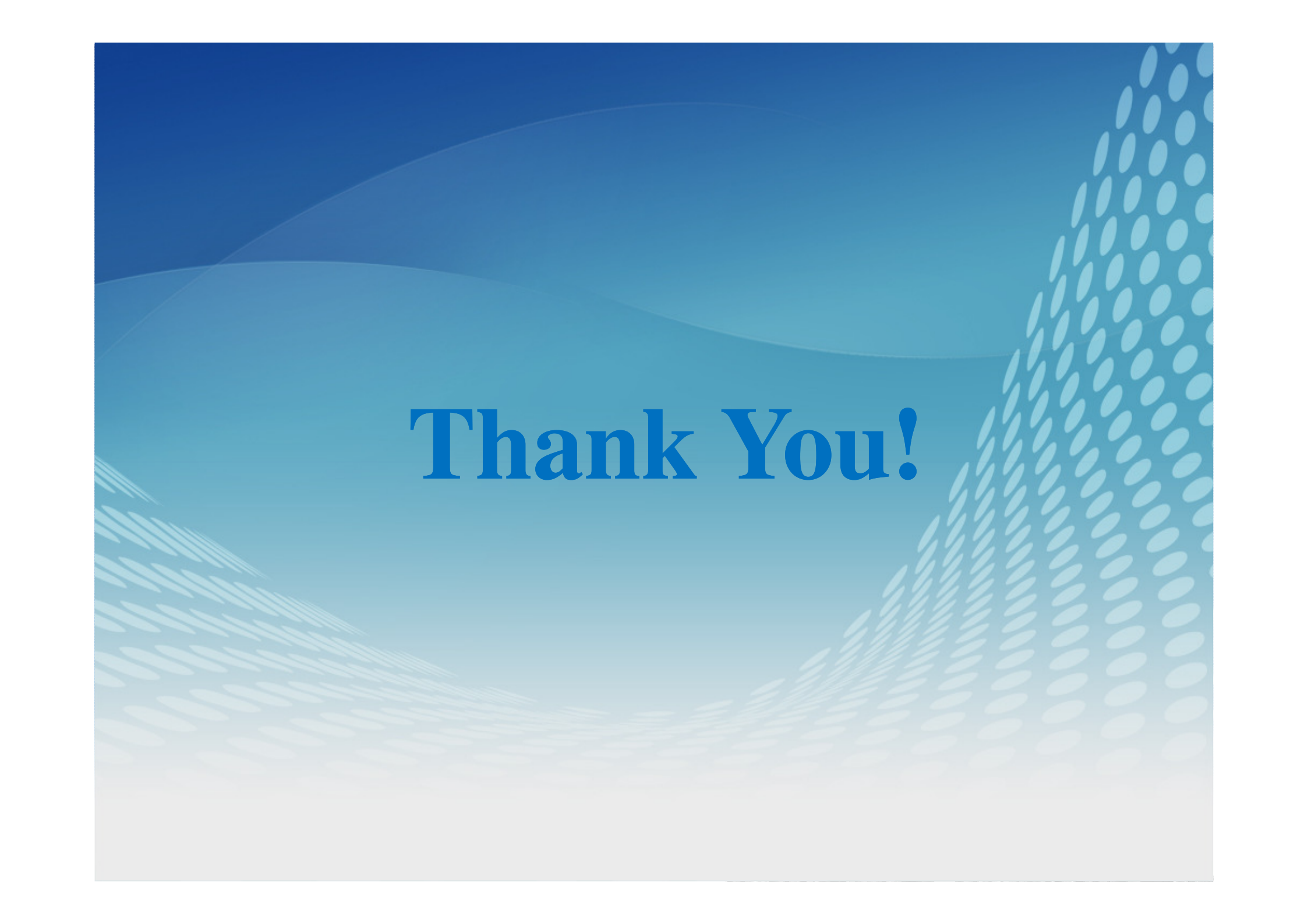
● SRAM

Memory	Density	2018				2019				2020				2021			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Async Fast SRAM	1Mb, 2Mb, 4Mb, 8Mb, 16Mb, 32Mb	1.65V~3.6V, 5.0V (8ns, 10ns)															
Sync/QDDR SRAM	4Mb, 9Mb, 18Mb, 36Mb, 72Mb, 144Mb	1.8V Vdd, 1.5/1.8V VddQ (250~550MHz, QDDR-I/II/II+, ODT support)															
Low Power SRAM	1Mb, 2Mb, 4Mb, 8Mb	2.3V~3.6V, 5.0V (45ns, 55ns, 70ns, Isb < 10uA)															
Frame Buffer SRAM	32Mb	2.3V~3.6V (100MHz)															

Product Roadmap

● FLASH

Memory	Density	2018				2019				2020				2021			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SLC NAND	1G bit																
SLC NAND	2G bit																
SLC NAND	4G bit																
SLC NAND	8G bit																

The background is a solid dark blue at the top, transitioning into a lighter blue with large, overlapping, wavy shapes. On the right side, there is a pattern of small, light blue dots arranged in a grid-like fashion, which fades out towards the center. The overall effect is a modern, abstract design.

Thank You!