

# ***Analog Semiconductor Leaders' Forum***

## ***Dongbu HiTek's Analog Manufacturing Competitiveness***

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# Introduction

## Dongbu HiTek Manufacturing Division

- **One of the Top 5 Semiconductor foundries in the world.**
- **Leading Analog/Mixed Signal foundry founded in 1997.**
- **Generated \$250M revenue in 1H 2010.**
- **2 world class 200mm fabs with capacity of 94K WSPM.**
- **Certified for QS9000/9001, TS16949, ISO27001.**
- **Talented and dedicated HR with TPM and 6 Sigma.**

# Fab Facilities

- *Fab1 in Bucheon producing state of the art chips across 0.15-0.35u*
- *Fab2 in Eumsung producing cutting edge solutions across 90nm-0.25u*

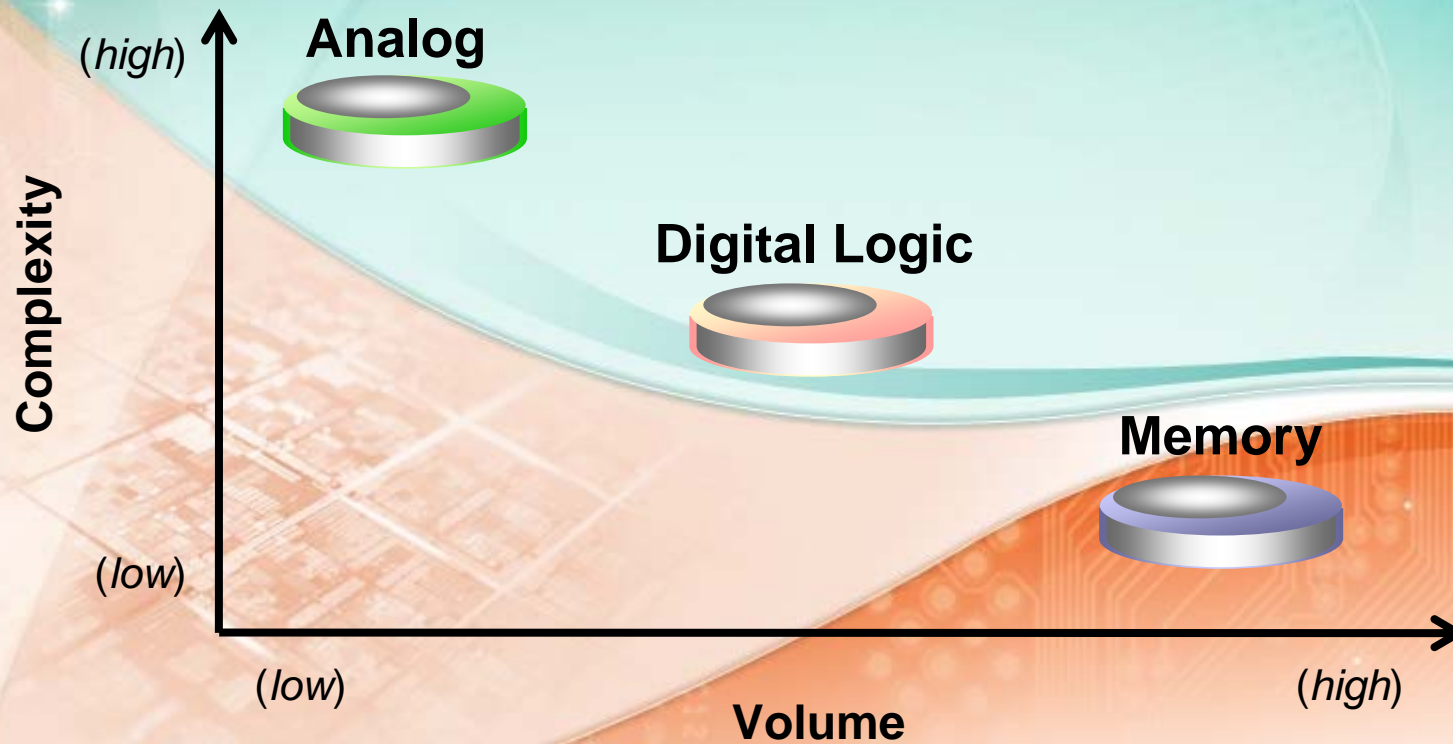


Fab 1	
Capacity	52,000 wafers/month
Tech Nodes	0.35, 0.25, 0.18, 0.15um
Main Technology	BCDMOS, Analog CMOS and HV CMOS, Logic
Wafer Size	200mm (8 inch)
Location	Bucheon, Gyunggi-do

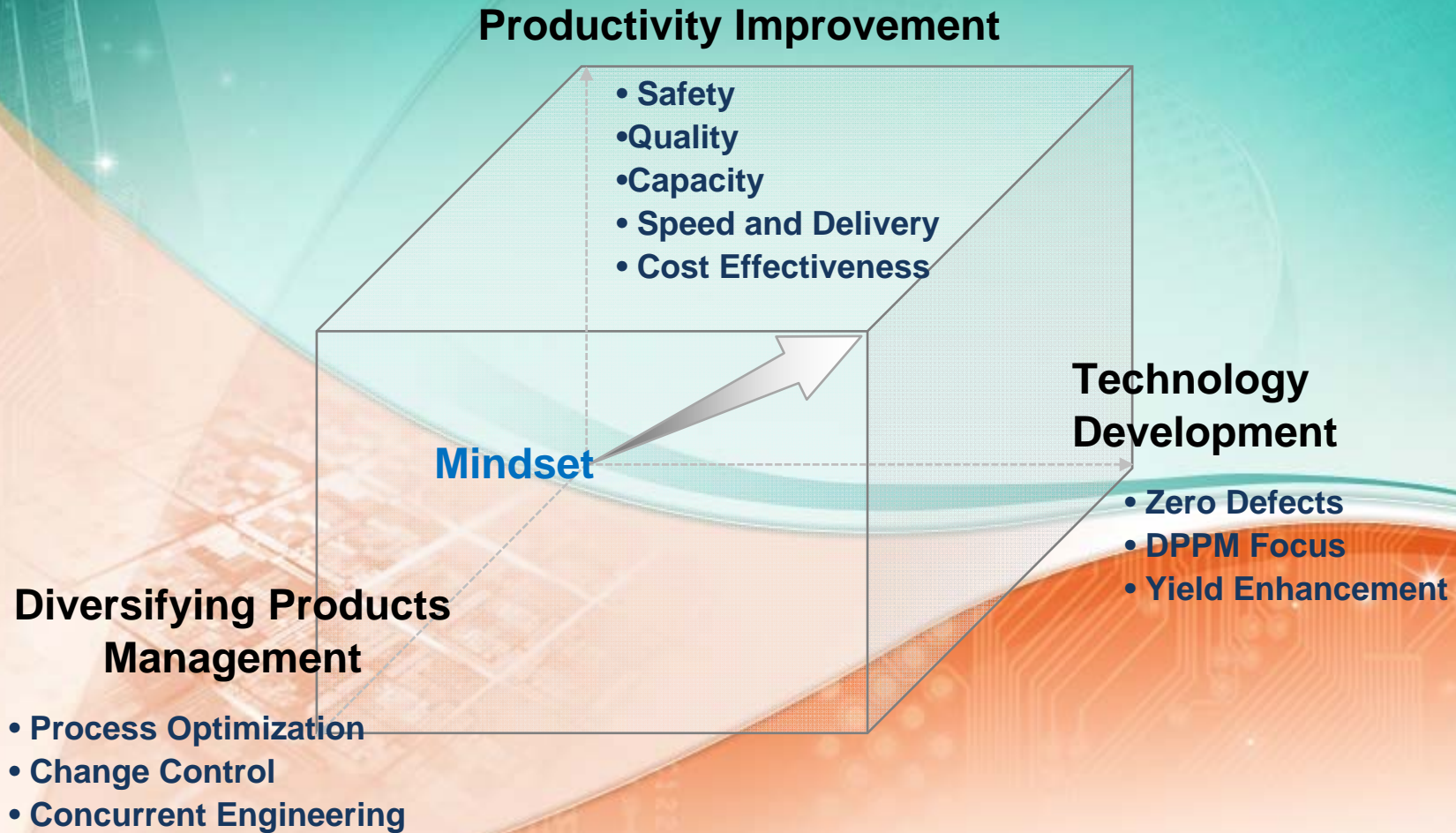
Fab 2	
Capacity	42,000 wafers/month
Tech Nodes	0.25, 0.18, 0.13, 0.11, 0.09um
Main Technology	Mixed Signal, Flash, RF CMOS, CIS and HV CMOS, Logic
Wafer Size	200mm (8 inch)
Location	Eumsung, Choong Chung Book-do

# Analog Manufacturing Model

- *High complexity with low volume business*



# The Key Factors of Analog Manufacturing



# Analog Management Mindset

## ➤ **Silicon Accuracy**

- Rich Component Set
- Tight Parametric Distributions
- Exhaustive Device Characterization

## ➤ **Simulation Accuracy**

- Thorough PDK “That Works “
- SPICE Models That Match Silicon
- Proven IP Blocks for Key Functions

## ➤ **Manufacturability**

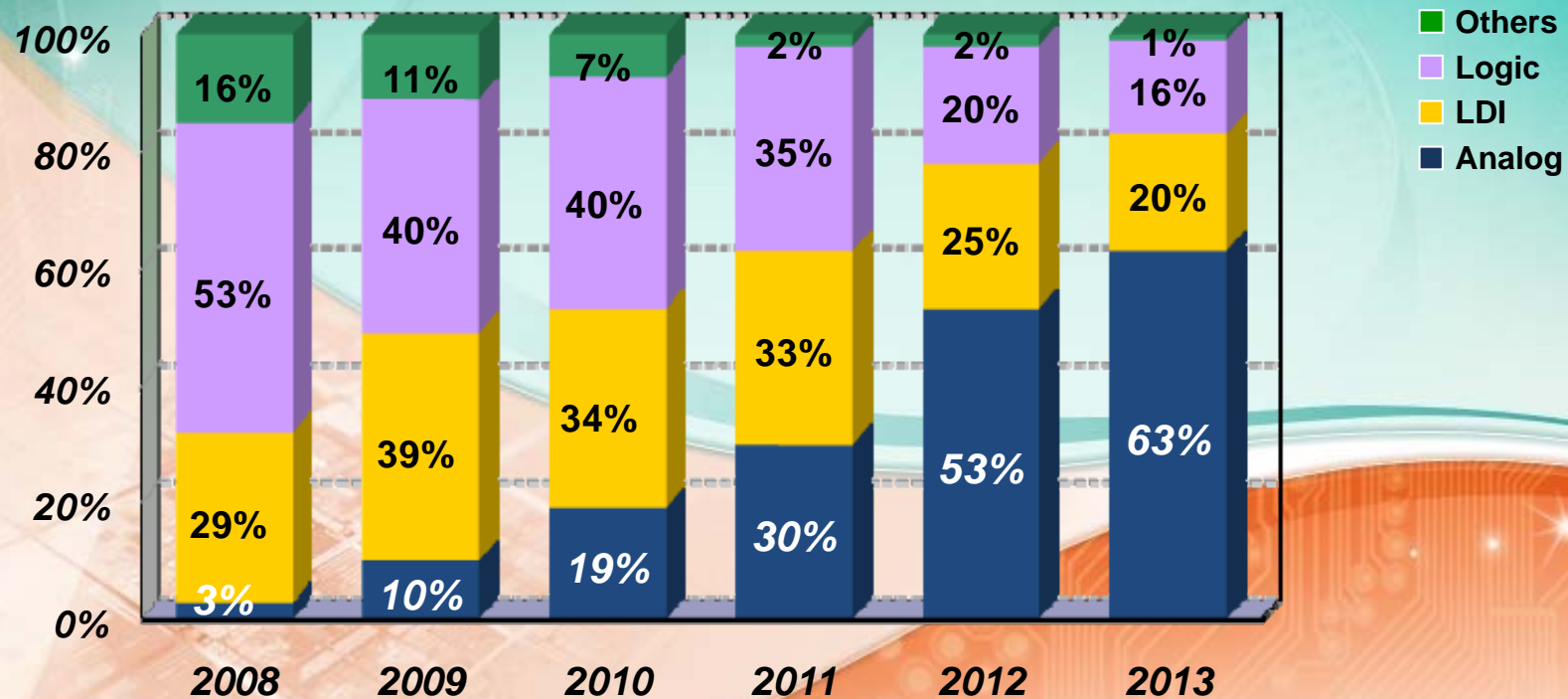
- Advanced Statistical Factory Control
- Zero Defects, DPPM Focus
- Yield Enhancement
- Fast, Consistent and Predictable

# Manufacturing Services and Support

- **Small volume product focus, too.**
- **Fast cycle times for prototypes and production.**
- **On time delivery.**
- **Demonstrated manufacturability.**
- **Responsiveness and willingness to be flexible.**

# Trend (1) Total Output Breakdown

- *Continuous Analog business growth*

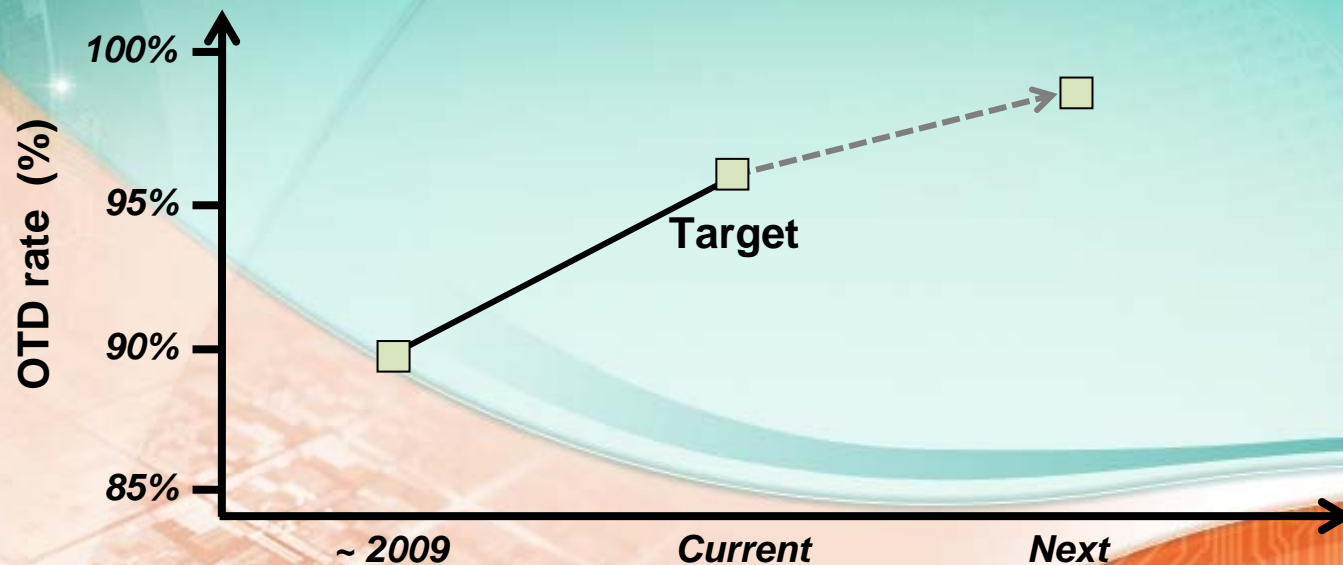


Source : Dongbu HiTek Internal estimation ( for Bucheon Fab)



# Trend (2) On Time Delivery

- **Criticality of time to market focus**



- **Productivity improvement for the bottleneck process.**
- **Process streamline and dedication free for flexible process**
- **Automated scheduling and processing based on 'Pull paradigm'**
- **Customized components sets based on advanced 'Backbone process'**

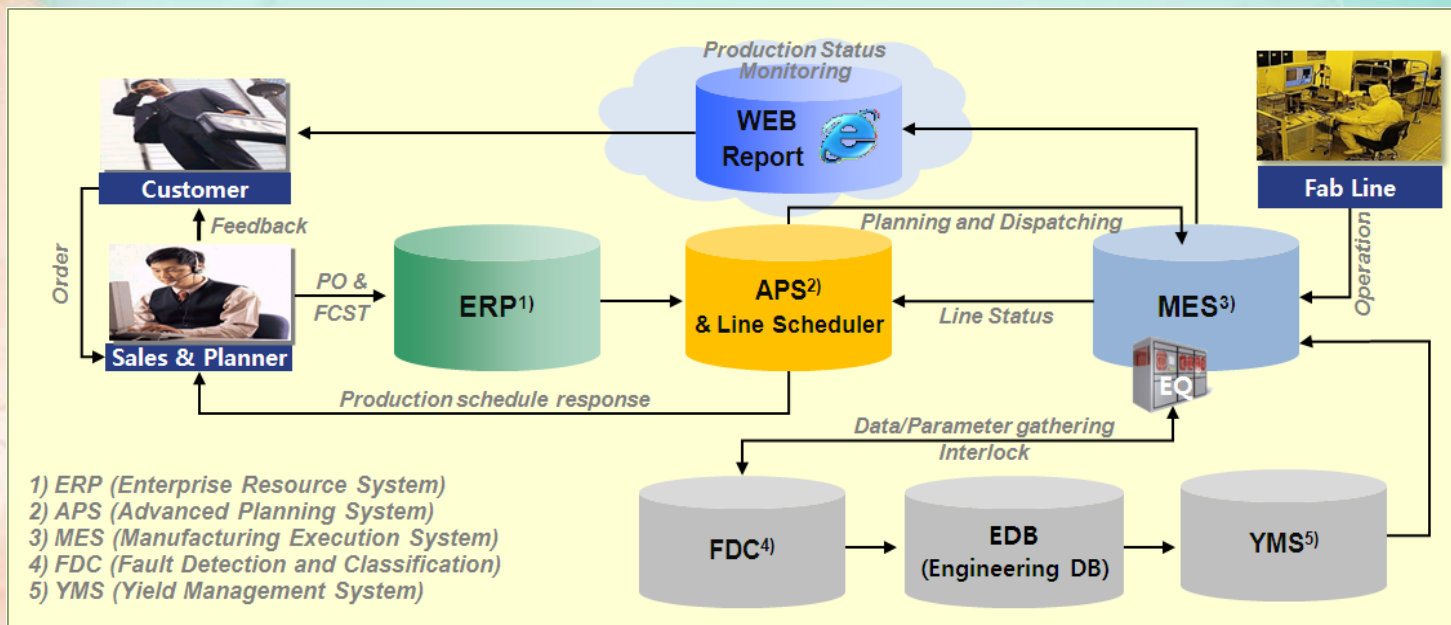
# Manufacturing Infrastructure

## ➤ Advanced and Computerized Fab

for highly optimized management on complexity, utilization and SPC.

## ➤ Sophisticated Scheduling

for improving cycle time and on-time delivery.

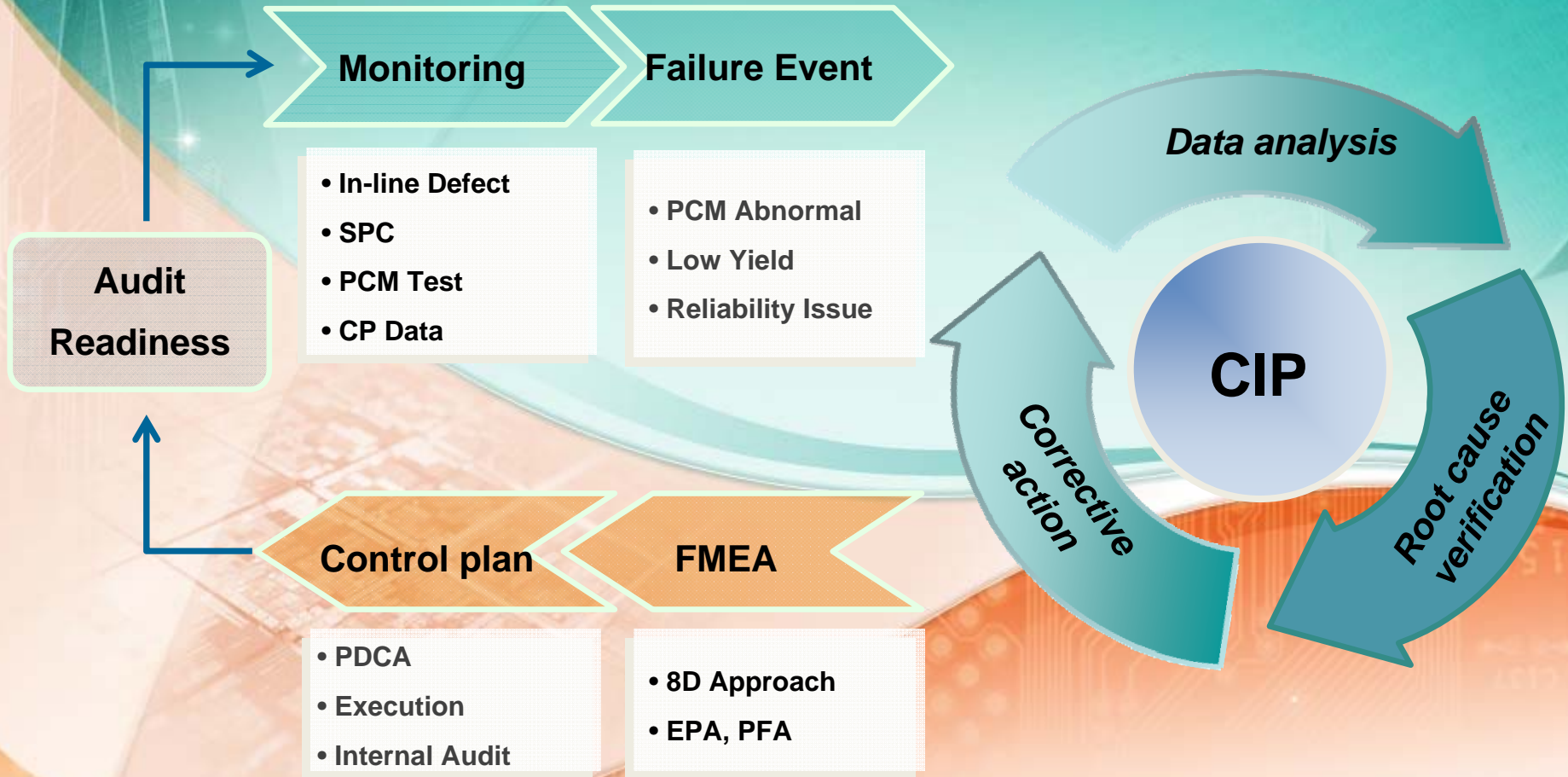


- Planning and dispatching for complex manufacturing flows
- Real time SPC and early quality management

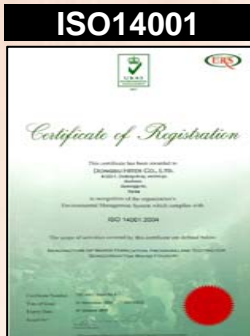
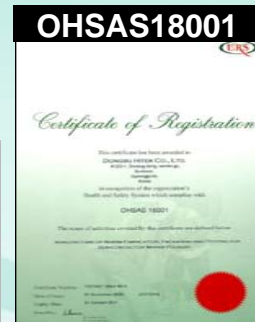
# Quality Mindset

- **Zero defects and DPPM performance.**
- **Inline defect monitoring and process control.**
- **Tight and predictable parametric performance.**
- **Yield maximizing techniques.**
- **Rigorous product qualification.**
- **Long term reliability.**

# Integrated Quality Management System



# Quality Assurance Certification



- **Information Security**
  - ISO27001 (Oct.02, 2006, BSI / UKAS)
  - **Green Partner Environmental System**
    - Sony G-partner (Jun.12, 2006, Sony)
    - Samsung S-partner (Mar.04, 2009, Samsung)

- **Occupational Health & Safety Management System**
  - OHSAS18001 (Nov.03, 2004, URS / UKAS)

- **Quality Management System**
  - ISO9001: 2000(update to ISO version 2000, Dec.09, 2003, BSI / IATF)
  - ISO/TS16949 (Dec.09, 2003, BSI / IATF) for automotive

- **Certification in Environment Program**
  - ISO14001 (Jan.24, 2002, URS / UKAS)

# DBH Automotive Audit Success

## Tier-1 Supplier Audit

## Audit Results:

- 1) Degree of conformity: 91.7
- 2) Grade: A
- 3) Rating: "Strategic Component Supplier"

## Audit Comments:

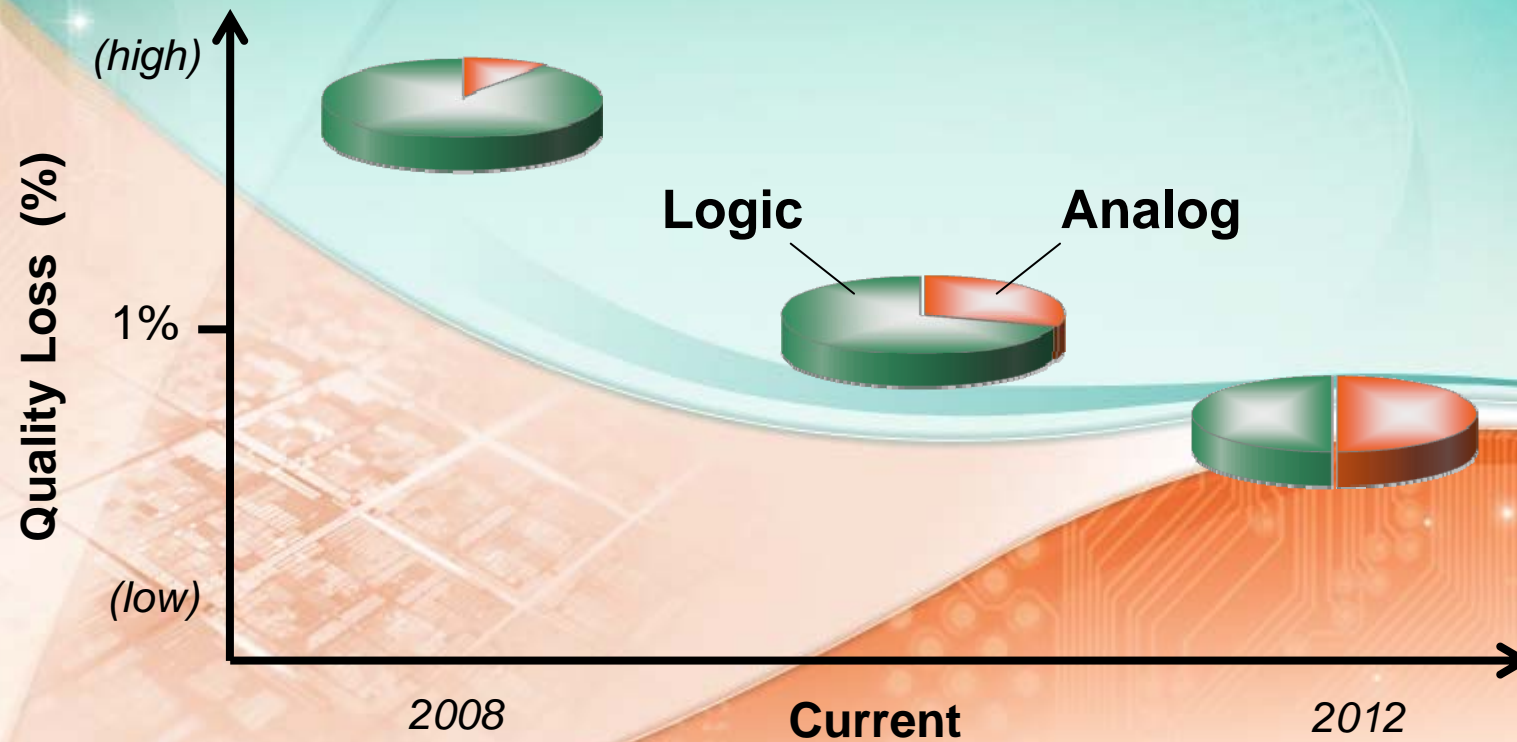
- 1) Very Clean Fab
- 2) Very Well Disciplined
- 3) Preparation for Our Audit Was Evident
- 4) Training Program Looks Excellent
- 5) Dongbu Has Been Very Cooperative
- 6) Excellent Job Responding to Open Items

VDA 6, Part 3 Process Audit Overall Evaluation	
Audited company/unit	DongbuHITEK
Auditing company / unit	[REDACTED]
Auditors	[REDACTED]
Audited process / product / service	WaferFab/0.18um process/[REDACTED]
Audit Date	May 26,27 2010
Reason for the audit	Dongbu is new wafer fab for [REDACTED]. Some [REDACTED] at Dongbu will be strategic parts.
Degree of conformity	<input type="text" value="91.7"/>
Grading	<input type="text" value="A"/> Downgrade no <input type="text"/>
Remarks to the evaluation:	<b>Highlight:</b> refer to "Positive" tab <b>Lowlight:</b> refer to "corrective action" tab
Remarks to effectiveness check in related preaudit:	
Completion of action plan / responsibility / Scheduled date	
New audit necessary	Yes <input type="text"/> No <input checked="" type="checkbox"/>
Distributor	
<input type="text"/> Sign and Date audited unit	<input type="text"/> Sign and Date auditor

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# Trend(3) Quality Loss Rate

- *Reducing loss rate even higher analog volume*



# Technology Availability

● 90nm ~ 130nm 
 ● 0.15 ~ 0.18μm 
 ● 0.22 ~ 0.25μm 
 ● 0.30 ~ 0.60μm

Process	Available Technology						
BCDMOS	<span style="color: purple;">●</span> 0.35μm 1P3M 3.3V or 5V /8V, 12V ~ 60V	<span style="color: purple;">●</span> 0.35μm 1P3M 3.3V or 5V /8V /85V	<span style="color: purple;">●</span> 0.35μm 1P3M 5.5V, 7V ~ 24V	<span style="color: blue;">●</span> 0.18μm 1P4M 1.8V/5V/12~60V			
Analog CMOS	<span style="color: purple;">●</span> 0.6μm 1P3M 5V						
CIS	<span style="color: blue;">●</span> 0.18μm 2.8um Pixel CIF, VGA,1.3M	<span style="color: orange;">●</span> 0.13μm 2.2um Pixel VGA, 1.3M,2M	<span style="color: orange;">●</span> 0.11μm 1.75μm Pixel 1.3M,2M				
RF	<span style="color: orange;">●</span> 0.13μm 1P8M 1.2V/2.5&3.3V						
sFlash	<span style="color: blue;">●</span> 0.18μm 2P3M 3.3V	<span style="color: orange;">●</span> 0.13μm 2P3M 3.3V	<span style="color: orange;">●</span> 0.13μm 2P3M 1.8V	<span style="color: orange;">●</span> 90nm 2P3M 3.3V	<span style="color: orange;">●</span> 90nm 2P3M 1.8V		
LDI	<span style="color: purple;">●</span> 0.30μm 3.3/13.5V	<span style="color: blue;">●</span> 0.18μm 3.3V/13.5V	<span style="color: blue;">●</span> 0.18μm 3.3V/18V	<span style="color: blue;">●</span> 0.16μm 1.8V/9V	<span style="color: blue;">●</span> 0.16μm 1.8V/18V		
Standard Logic	<span style="color: purple;">●</span> 0.30μm 1P4M 5V	<span style="color: cyan;">●</span> 0.25μm 1P5M 2.5V/3.3V	<span style="color: blue;">●</span> 0.18μm 1P6M 1.8V/3.3V	<span style="color: blue;">●</span> 0.18μm 1P6M 1.8V/5V	<span style="color: blue;">●</span> 0.16/0.15μm 1P6M 1.8V/3.3V&5V	<span style="color: orange;">●</span> 0.13μm 1P8M 1.2V/2.5&3.3V	<span style="color: orange;">●</span> 0.11μm Cu/AL 1P6M 1.2V/3.3V
Low Power/Voltage	<span style="color: blue;">●</span> 0.18μm 1P6M 1.5V/3.3V	<span style="color: blue;">●</span> 0.18μm 1P6M 1.8V/2.5&3.3V	<span style="color: orange;">●</span> 0.13μm 1P8M (Cu) 1.5V/2.5&3.3V				
Mixed Signal	<span style="color: cyan;">●</span> 0.25μm 1P5M 2.5V/3.3V	<span style="color: blue;">●</span> 0.18μm 1P6M 1.8V/3.3V	<span style="color: blue;">●</span> 0.18μm 1P6M 1.8V/3.3V&5V(Low Noise)	<span style="color: blue;">●</span> 0.16μm 1P6M 1.8V/3.3V	<span style="color: blue;">●</span> 0.15μm 1P6M 1.8V/3.3V	<span style="color: orange;">●</span> 0.13μm 1P8M 1.2V/2.5&3.3V	



# Conclusions

## We are Committed to Your Success

- **Dongbu Hitek understands and is totally focused on the unique requirements of Analog Manufacturing.**
- **We have Invested in new and improved processes, capabilities and capacity till now.**
- **Our vision....To be “the Most Respected Analog Foundry in the Industry” !**

# Thank You

