Company Overview

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ASIC Solutions

Fujitsu 90nm Solutions

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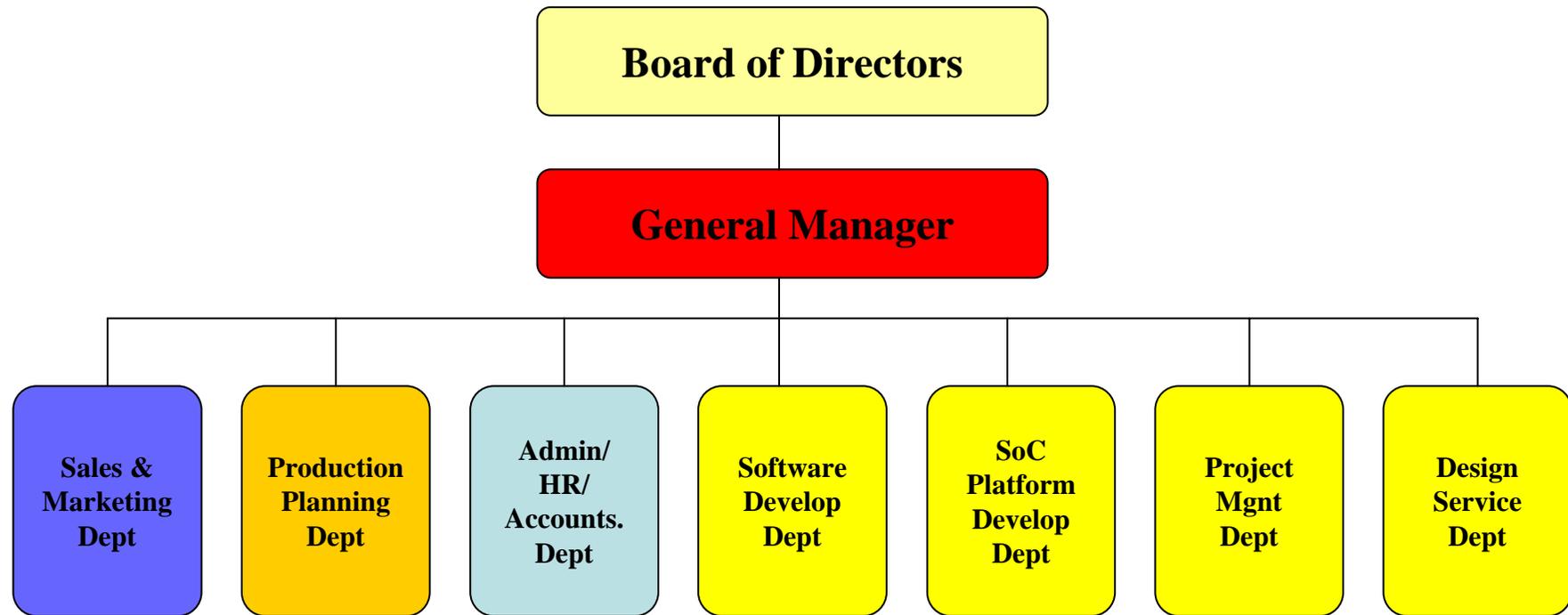
Conclusion

Company Brief- General Info

- ➢ **1996 > An independent ASIC business unit in a Taiwanese network company**

- ➢ **January 2000 > spun off and named IC Nexus**

- ➢ **Specialized in**

  1. ASIC solutions- RTL/Netlist handoff to GDS/Wafer/Chip
  2. IP solutions- comprehensive IP portfolio also partnering with foundry and IP venders to achieve true one-stop design services
  3. Foundry services- multi-foundry support, MPW services
  4. Packaging and test services- Wafer probe, diverse package solutions, SiP/MCM, FT, and logistics

- ➢ **Privately owned and mainly by the management team**

- ➢ **FY2005 sales revenue ～ 8M USD**

FY2005 Revenue by Business Scope

ASIC 71%
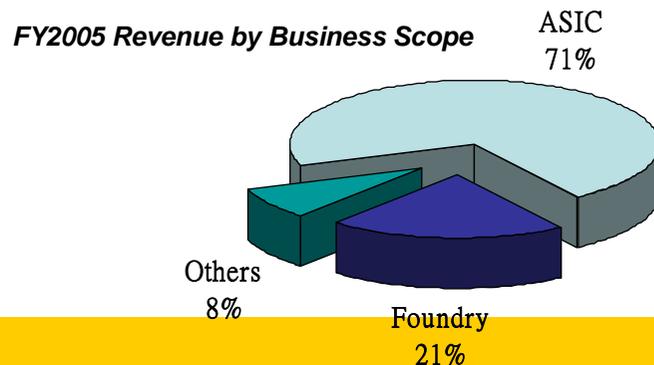
Others 8%

Foundry 21%

FY2005 Revenue by Region
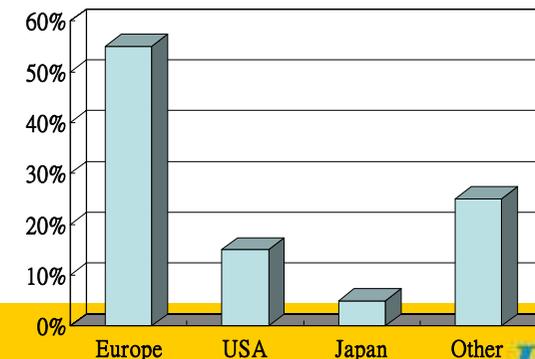
Company Brief- Organization

```
                    ┌─────────────────────────┐
                    │   Board of Directors    │
                    └────────────┬────────────┘
                                 │
                    ┌─────────────────────────┐
                    │    General Manager      │
                    └────────────┬────────────┘
```

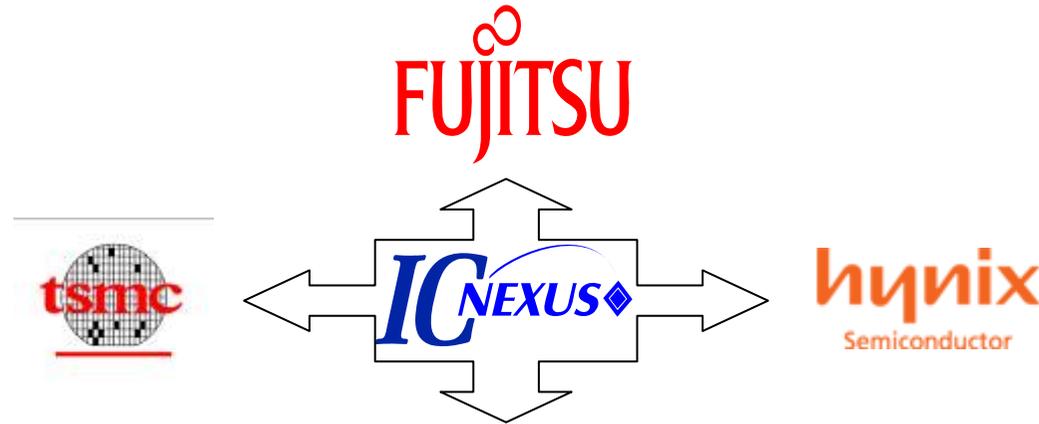| Sales & Marketing Dept	Production Planning Dept	Admin/ HR/ Accounts. Dept	Software Develop Dept	SoC Platform Develop Dept	Project Mgnt Dept	Design Service Dept

Company Brief- Mfg Partner Network

- ➤ **Multi-Foundry Support**

  Especially with Fujitsu- Strategic, Long-term Partnership

  OTHERS- VIS, Siltera…

- ➤ **Diverse Assembly and Test Partner Base**

  - ❑ **ASE Group, Amkor, Greatek, Advanced Interconnect Technologies, Taiwan IC Packaging, Formosa Advanced Technologies, Test-Serv, True Test…**

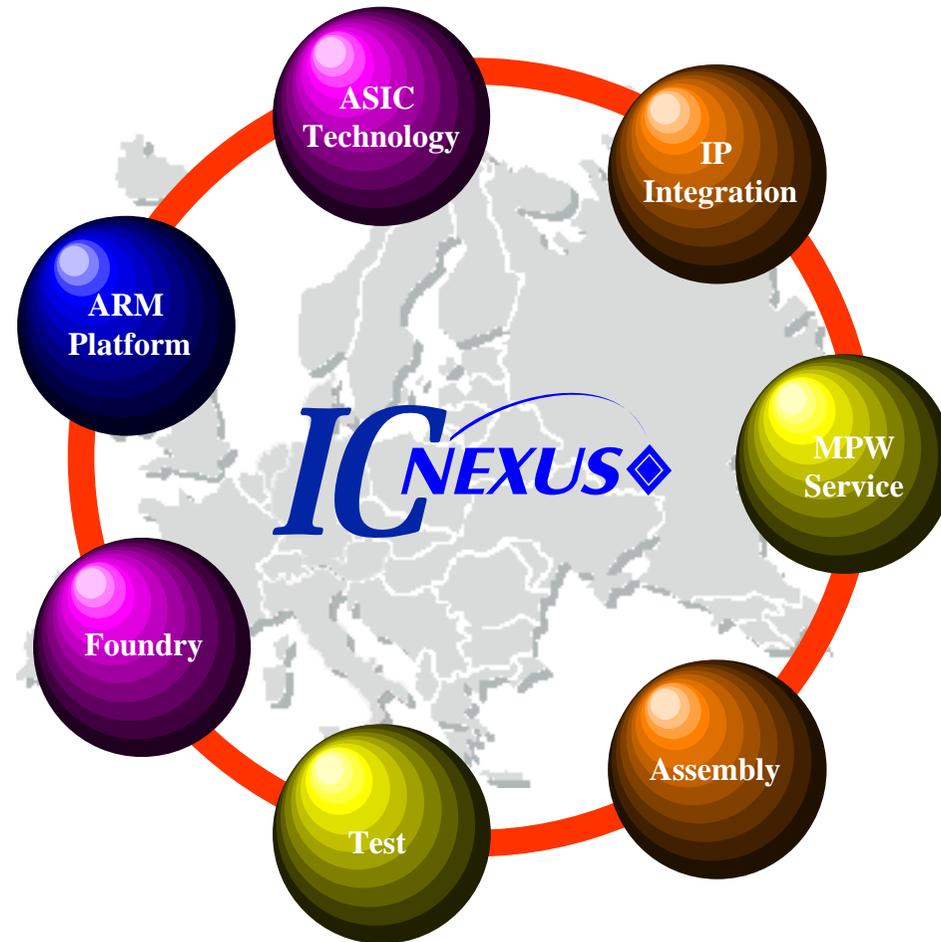# Company Brief- Capability

➢ **Broad Technology Portfolio**

❑ **65nm, 90nm, 0.13um, 0.18um, 0.25um, 0.5um, 0.6um**

❑ **Logic, Mixed-Signal, High Voltage, Standard Cell, Embedded Array, Gate Array, ARM based SoC, Structured ASICs, FPGA Conversion**

Company Brief- Our Value

Our Value

- ➤ **State of Art Technology**

- ➤ **Broad Design Support**

- ➤ **Fast Time to Market**

- ➤ **Short Time to Volume**

- ➤ **Competitive Pricing**

- *One-Stop Shop to Satisfy Customers' IC Design Service and Manufacture Demand with Proven Capabilities and Track Records*

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ASIC Solutions- Overview

Standard Cell

Embedded Flash ASIC

Macro Embedded Array

SOC (ARM based)

Gate Array

Structured ASIC

ASIC Products
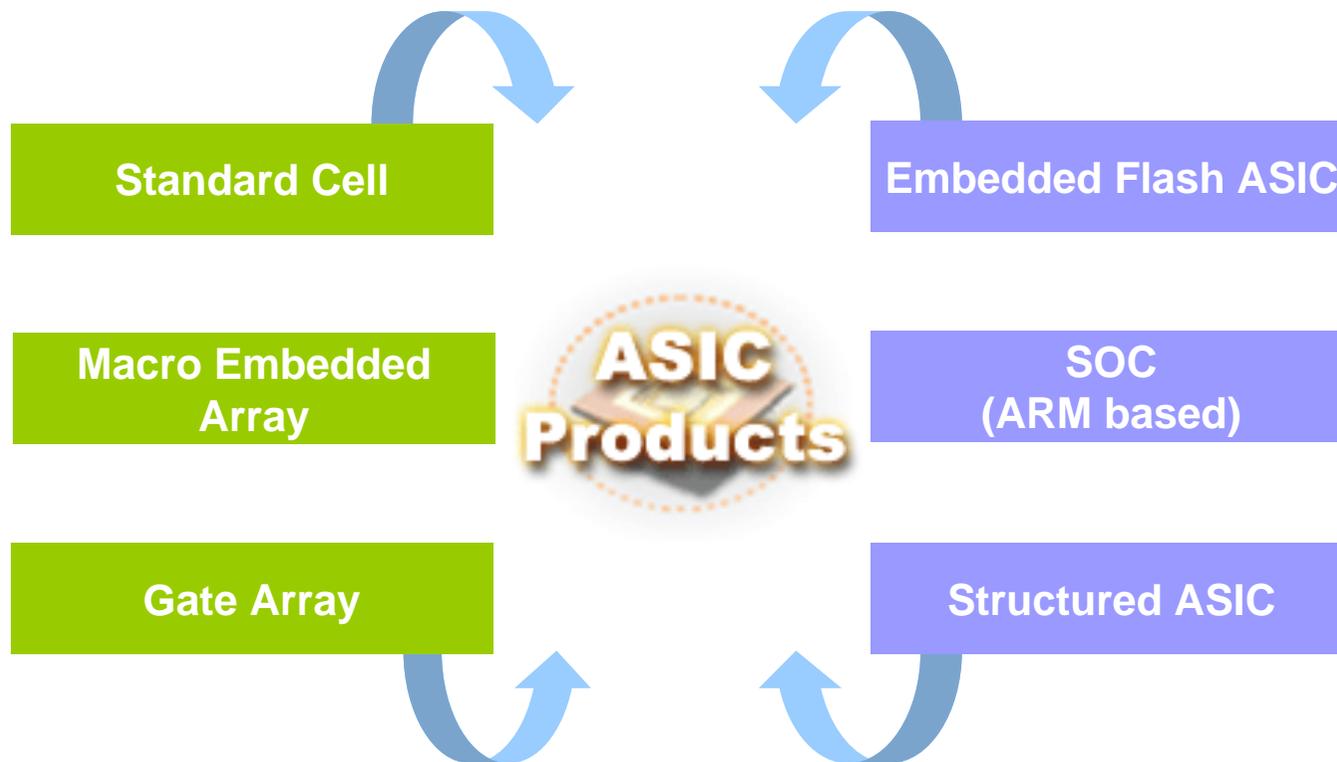
- *Broad ASIC Support to Satisfy Your Demands*

ASIC Solutions- Category I

➤ **Standard Cell**

- ❑ **90n, 0.11u, 0.13u, 0.18u, 0.25u, 0.35u, 0.5u**
- ❑ **Fully Optimized Silicon Performance**
- ❑ **Highest Configuration Flexibility**

➤ **Macro Embedded Array**

- ❑ **0.18u, 0.25u, 0.35u**
- ❑ **A Variety of Embedded Functions**
- ❑ **Fast Time to Market and Volume**

➤ **Gate Array**

- ❑ **0.65um, 0.35um**
- ❑ **Very Low NRE Cost**
- ❑ **Fast Time to Market and Volume**
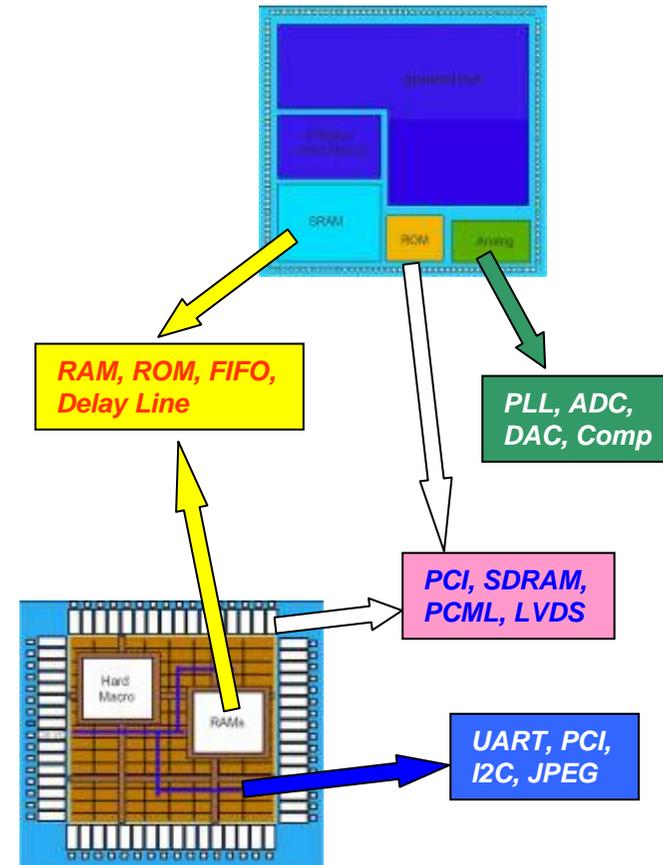
－ *Versatile ASIC Technologies to Fit Your Demand Profile*

<Standard Cell ASIC>

RAM, ROM, FIFO, Delay Line

PLL, ADC, DAC, Comp

PCI, SDRAM, PCML, LVDS

UART, PCI, I2C, JPEG

<Macro Embedded Array ASIC>

ASIC Solutions- Category II

➤ ## SoC (ARM Based)

- ❑ **ARM7TDMI-S**

- ❑ **ARM926EJ-S**

- ❑ **ARM946E-S**

- ❑ **ARM1176JZF-S**
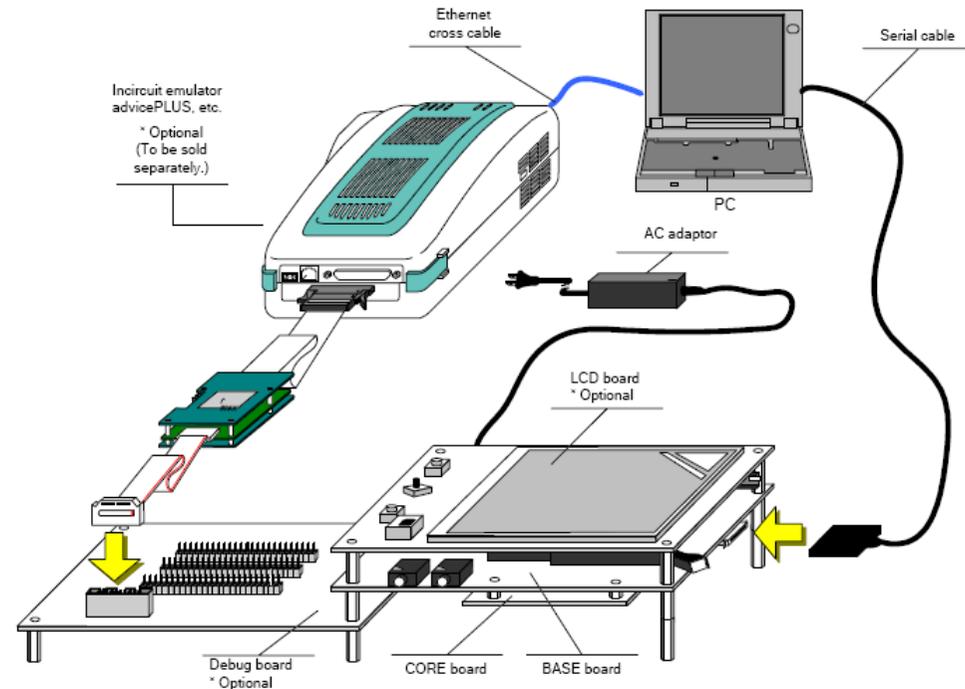
◎ **Development Kits for ARM926EJ-S Available**

T-Engine Board, Debug Board, LCD Board with Touch Panel,

FPGA Expansion Board, LAN Board, Battery Board, and others

ASIC Solutions- Category III

➢ **Structured ASIC**

Alternative to high end ASSPs, FPGAs and cell-based ASICs

☐ **Competitive Cost**

   ♦ **NRE cost: 80% less than cell-based ASICs in 0.11µm technology**

   ♦ **Lower power consumption with performance similar to cell based ASIC**

☐ **Time to Market**

   ♦ **Short Time-to-Marke similar to FPGA (8 weeks)**

☐ **Performance**

   ♦ **3x performance of high end FPGAs at lower costs**

   ♦ **Power dissipation is twice better than similar solutions**

Networking · Storage Networking · Medical Imaging · Industrial Automation · Telecom · Satellites · Aerospace

Architecture is designed to support high-bandwidth, memory-intensive applications driven by 0.11µm performance
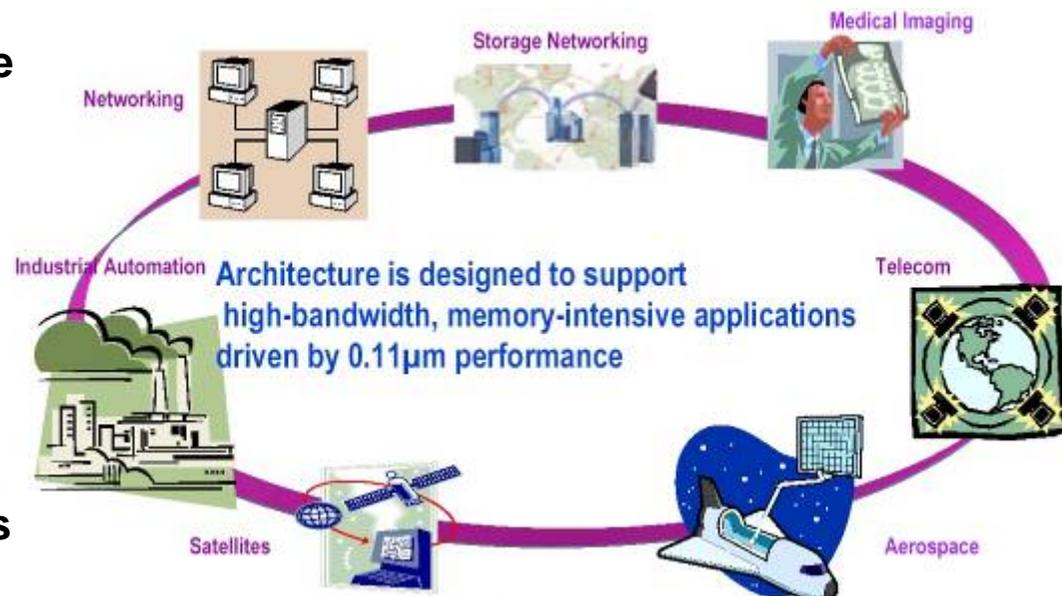
ASIC Solutions- Business Model

Business Models Overview
1. **RTL Handoff**
2. **Netlist Handoff**
3. **GDS Handoff**
4. **FPGA Handoff**

PS. Mixed-signal, Structured ASIC, MPW, and other business models are also available

Design Services ➡ **Manufacturing Services** ➡

| RTL Check-in | Netlist Check-in | Tape-Out GDS | Wafer Check-out | Chip Check-out | SiP/MCP Check-out |
| FPGA Check-in |

RTL to Wafer/ to Chip/ to SiP | SiP/MCP

Netlist to Wafer/ to Chip/ to SiP | SiP/MCP

FPGA to Chip/ to SiP | SiP/MCP

Meet Your Different Design Interface and Design Support Requests

IC NEXUS

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IC NEXUS

Fujitsu 90nm Solutions- Highlight

➤ **Rank Top 5 ASIC Supplier Worldwide (From: Gartner Dataquest)**

➤ **Proven Track Records of 90nm**

> **PRIMEPOWER and PRIMEQUEST Computing Processors and Chipsets; FOMA 3G Mobile Phone Base-band Chip; Transmeta CPU; Lattice FPGA, etc.**
>
> **In Excess of 80 Taped-out Products with Chipsizes from 20mm^2 to 450mm^2.**

➤ **High Performance Transistors**

> **Advanced Lithography and Etch Technology to Achieve 40nm Gate Length; Low Temp Process for Shallow Junction; Process Optimization for High Carrier Mobility; Low-k (~2.9); Dual Damascene Cu; High Density 6T SRAM with sub-1um^2 cell.**
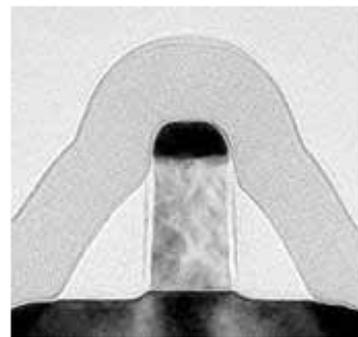
<40nm Gate>

1nm-thick Gate Oxide

Poly-Si
Nitrided-SiO$_x$
Si substrate

Surface Cleaning

40% increase

After optimize

Before

Normalized g$_m$ (∝ mobility)

Electric Field [MV/cm]
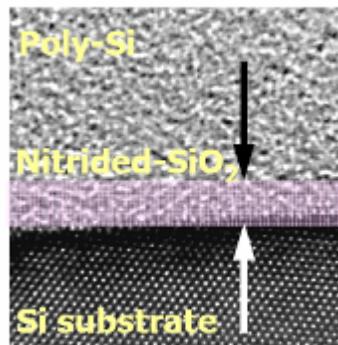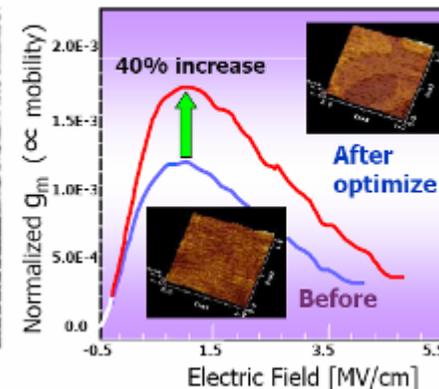
Fujitsu 90nm Solutions- What We Offer

♦ **Low-Leak to High-Performance Process**

Ex. Low-Leak Process Cell Library Lineup

Cell Type / Feature	Low Leak	Standard
High Speed	CS101SZ	CS101MZ
Standard	CS101SN	CS101MN
Low Leak	CS101SL	CS101ML

PS. You can combine same or different cell types with different feature cells in one design under same process

♦ **Less NRE Cost, Unit Cost, and TCO Total Solutions Through Our Current ASIC Business Model Offerings**

♦ **Fujitsu Proven in-house and Partner Comprehensive IP Portfolio**

Fujitsu 90nm Solutions- Benchmark
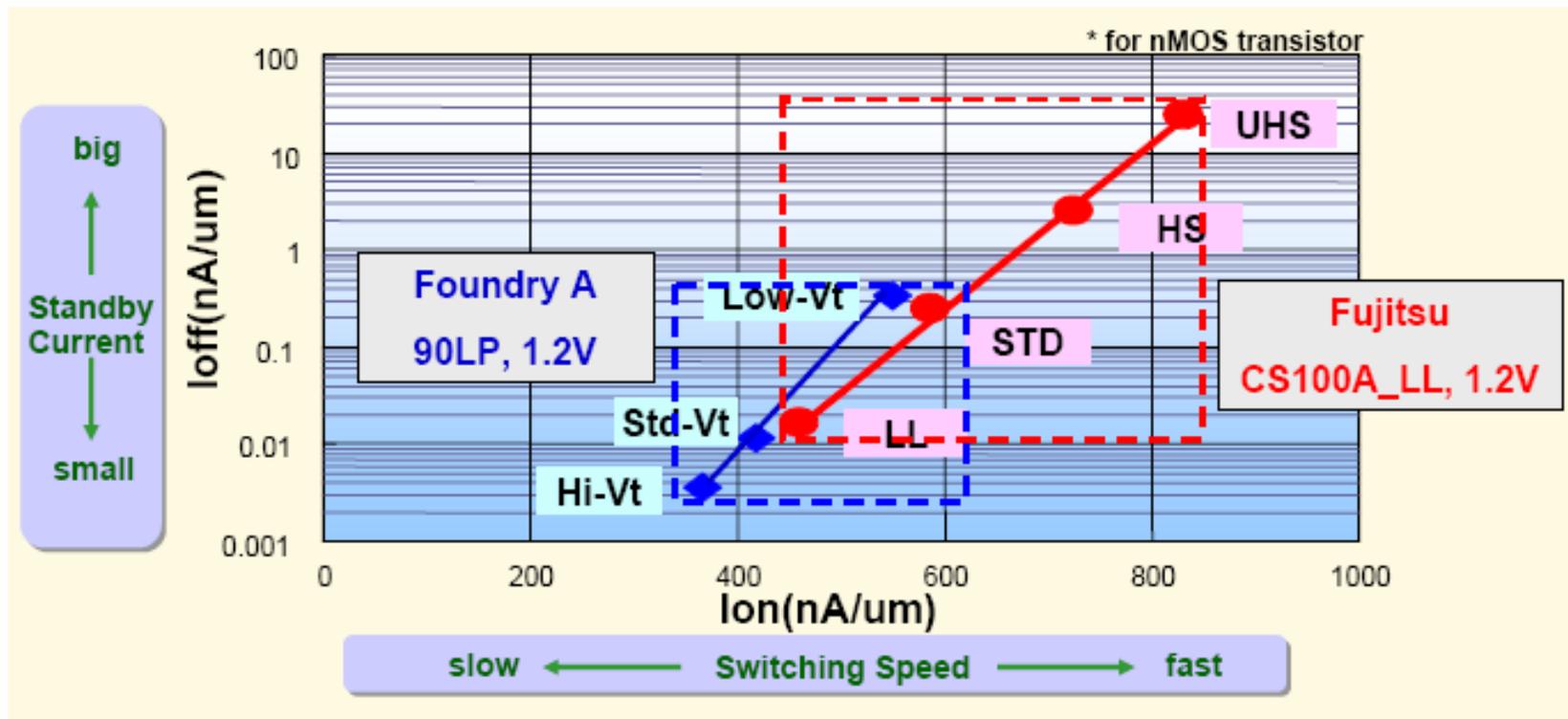
CS100A_LL process covers a *broad range* of requirement for both high performance and low leakage current.

Note:
CS100A_LL: Low-Leak Process
LL: Low –Leak Tr.   STD: Standard Tr.   HS: High-Speed Tr.   UHS: Ultra-High-Speed Tr.

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- *90nm*

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IP Portfolio- Overview

♦ **ICNexus offers various silicon-proven digital and analog IPs by teaming up with foundries, pure IP vendors, and design house partners.**

♦ **Our customers get the advantage of one-stop shopping ensuring successful IP integration at one single vendor.**

IP Portfolio- 90nm Partial List

- **MPU**
  - ARM7TDMI-S
  - ARM926EJ-S
  - ARM946E-S
  - ARM1176JZF-S
- **Interface Macro**
  - USB2.0 Device PHY; USB2.0 Host PHY; USB2.0 OTG PHY; USB1.1 PHY
  - PCI-Express 2.5G Endpoint PHY
  - DRAM Interface- DDR2 Controller Interface 400~533Mbps x32, 400~533Mbps x16, ~800Mbps x16; Mobile DDR 266Mbps
  - S-ATA 1.5G/3.0G Host/Target PHY
- **Special I/O**
  - SSTL2 for DDR333; SSTL18 for DDR400; SSTL18 for DDR667
  - LVDS
  - PCI-66
  - I^{2}C
- **Others**
  - ADC/DAC; PLL; DLL
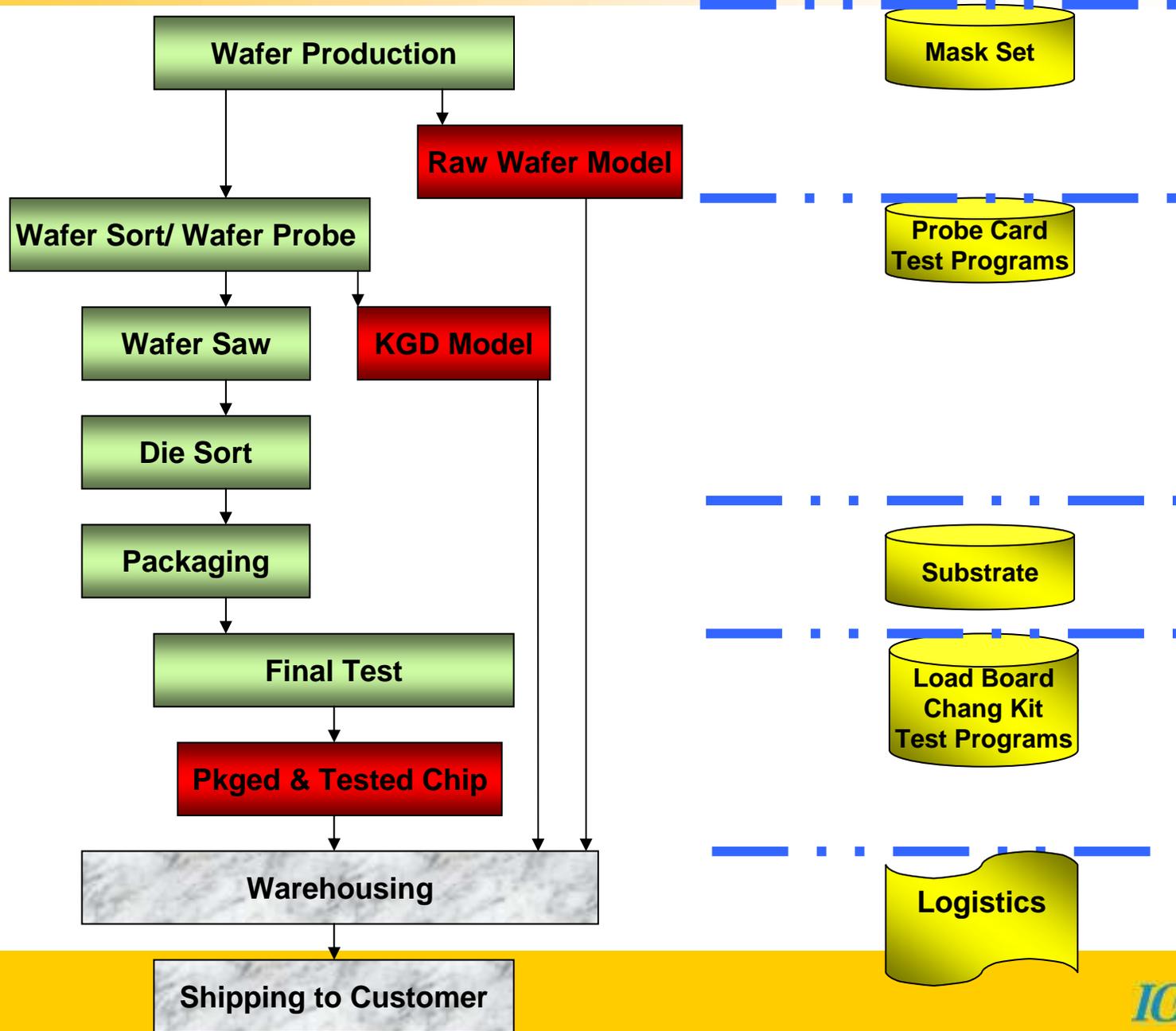
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Manufacturing To Logistics

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┌─────────────────────┐                                    ┌──────────────┐
│  Wafer Production    │                                    │   Mask Set   │
└─────────────────────┘                                    └──────────────┘
        │              │
        │              ▼
        │      ┌─────────────────────┐
        │      │  Raw Wafer Model    │
        │      └─────────────────────┘                      ┌──────────────┐
        ▼                                                   │  Probe Card  │
┌─────────────────────┐                                    │ Test Programs│
│ Wafer Sort/ Wafer Probe │                                └──────────────┘
└─────────────────────┘
        │        │
        ▼        ▼
┌──────────┐  ┌──────────┐
│ Wafer Saw│  │KGD Model │
└──────────┘  └──────────┘
        │                                                   ┌──────────────┐
        ▼                                                   │  Substrate   │
┌──────────┐                                                └──────────────┘
│ Die Sort │
└──────────┘                                                ┌──────────────┐
        │                                                   │  Load Board  │
        ▼                                                   │  Chang Kit   │
┌──────────┐                                                │ Test Programs│
│Packaging │                                                └──────────────┘
└──────────┘
        │
        ▼
┌─────────────────────┐
│    Final Test       │
└─────────────────────┘
        │
        ▼
┌─────────────────────┐
│ Pkged & Tested Chip │
└─────────────────────┘
        │
        ▼
┌─────────────────────────────────┐                        ┌──────────────┐
│         Warehousing             │                        │  Logistics   │
└─────────────────────────────────┘                        └──────────────┘
        │
        ▼
┌─────────────────────────────────┐
│     Shipping to Customer        │
└─────────────────────────────────┘
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ICNEXUS

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Conclusion

- ➢ **You One-Stop Shop Partners From RTL to Silicon**

- ➢ **Strategically Allied with Top Wafer Foundry- Ex. Fujitsu on 90nm and Beyond to Provide Mature Production Services**

- ➢ **Broad Range of IP Portfolio Specifically meeting Modern Technology Trend**

- ➢ **Worldwide Service Network to Facilitate Services Globalization**

- ➢ **Proven Records of Success**
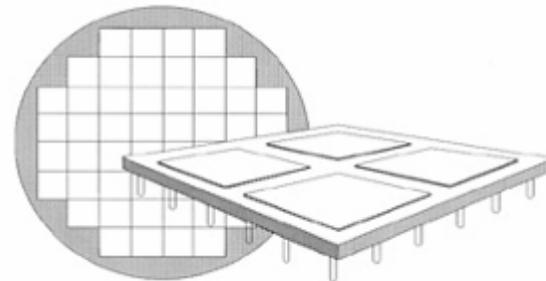
Your Long-term ASIC Partner - ICNexus