

IC Package/Substrate Report

March 31,2024/A4 Size/210 pages

- Study of IC substrates and related semiconductor package technology, electronic materials
- Market and Technology analysis for IC substrates by key applications:
(Processors for Server/Mobile SOC/Processors for PC/Memory IC)
- Market size forecast through 2023, based on volume & value
- Manufacturers share based on volume & value
- Case study of IC substrate manufacturers: 14 companies

Japan Marketing Survey Co., Ltd.

<http://www.jms21.co.jp/>

Outline of this research report

1. Purpose

Our goal is to provide you with foundational data for business strategy development in the relevant market by conducting a detailed studies of the technology and market trends of IC packages and substrates.

2. Research period

Survey: May-November/2023, Analysis: December 2023- February 2024

3. Method

Information gathering: Direct interview or questionnaire, secondary research
Analysis:

4. Object of the research

Products:

- IC substrates (FCBGA/ FCCSP)
- IC substrates related materials (CCL/Insulation material, Ultra-thin copper foil, Solder resist)
- IC Packages: FCBGA/ FCCSP/ 2.xD PKG/ Interposer (Glass/Si)

Applications:

- Processors (CPU/GPU/FPGA/ASIC) for server, Processors(CPU/GPU/Chipset) for PC
- Mobile SOC, Memory IC (RAM/NAND Flash Memory)

Region: Global

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Sample

Market size forecast by IC types

| | | | 2021 | 2022 | 2023 | 2024 | 2025 | 2027 | 2029 | 2032 | CAGR |
|------------|----------------------|----------|-------|-------|------|------|------|------|------|------|------|
| Analog IC | General purpose | | 102.7 | 123.4 | | | | | | | |
| | Application specific | | 99.6 | 118.7 | | | | | | | |
| | Sub total | | 202.3 | 242.1 | | | | | | | |
| Digital IC | Logic | CPU | 2.7 | 2.9 | | | | | | | |
| | | MCU | 29.8 | 31.4 | | | | | | | |
| | | Standard | 37.6 | 42.3 | | | | | | | |
| | | Specific | 48.7 | 54.1 | | | | | | | |
| | | S-total | 118.8 | 130.7 | | | | | | | |
| | Memory | DRAM | 23.9 | 21.7 | | | | | | | |
| | | Flash | 17.2 | 15.8 | | | | | | | |
| | | Others | 10.1 | 10.3 | | | | | | | |
| | | S-total | 51.2 | 47.8 | | | | | | | |
| | Sub total | | 170.0 | 178.5 | | | | | | | |
| Total | | | 372.3 | 420.6 | | | | | | | |

(Billion PCS)

Sample

Market size forecast by IC package types

| | | | 2021 | 2022 | 2023 | 2024 | 2025 | 2027 | 2029 | 2032 | CAGR |
|--------------|----------------|-----------|------|------|------|------|------|------|------|------|------|
| Lead Frame | PIH: SIP/DIP | | | | | | | | | | |
| | SMT: SOP/QFP | | | | | | | | | | |
| | CSP: SON/QFN | | | | | | | | | | |
| | Sub total | | | | | | | | | | |
| substrates | CSP | PCSP | | | | | | | | | |
| | | FCCSP | | | | | | | | | |
| | | S-total | | | | | | | | | |
| | BGA | PBGA | | | | | | | | | |
| | | FCBGA | | | | | | | | | |
| | | 2.x D | | | | | | | | | |
| | | S-total | | | | | | | | | |
| | Sub total | | | | | | | | | | |
| | Substrate-less | Bare Chip | | | | | | | | | |
| FOWLP/FI-WLP | | | | | | | | | | | |
| Sub total | | | | | | | | | | | |
| Total | | | | | | | | | | | |

Units: Billion pieces, CAGR: %

Overview of the server processors & IC substrates industry

| | Systems | Processors | substrates | Materials |
|---------------|---|---|---|--|
| Major Players | <u>Server: 94%</u> DELL: 19% HPE: 12% IBM: 7% INSPUR: 6% LENOVO: 5% Fujitsu: 4% Oracle: 3% Hitachi: 2% <u>AI Server: 6%</u> NVIDIA: 4% DELL: <1% HPE: <1% | <u>X86 Core CPU: 92%</u> INTEL: 74% AMD: 14% <u>ARM Core CPU: 8%</u> AWS(Amazon): 5% Ampere: 1% NVIDIA: 1% Huawei: <1% Phytium: <1% | <u>FCBGA substrate</u> IBIDEN: SHINKO: UNIMICRON AT&S: <u>2.5D PKG substrate</u> IBIDEN: SHINKO: | CCL Panasonic: % Resonac: % <u>Insulation material</u> Ajinomoto FT: % Sekisui: % |
| | | <u>GPU</u> NVIDIA: 75% INTEL: 10% AMD: 15% | | |
| | | <u>FPGA/ASIC</u> INTEL, AMD | | |
| Market Scale | Billion USD | Billion USD | MUSD | MUSD |

Overview of the server processors & IC substrates market

| Items | | | Trends/Overview |
|-----------|--------------------------------|-----|-----------------|
| Processor | CPU | X86 | |
| | | Arm | |
| | GPU | | |
| | Market size | | |
| | Adaption Status of IC Packages | | |
| | | | |
| Substrate | Types | | |
| | Major suppliers | | |
| | Market size | | |

Sales volume and value of FCBGA substrates for server processors by major manufacturers

| | Value: MUSD | | | | Volume: Million PCS | | | |
|-----------|-------------|-----|---------------|-------|---------------------|-----|---------------|-------|
| | CPU | GPU | FPGA/ ASIC | Total | CPU | GPU | FPGA/ ASIC | Total |
| Ibiden | | | | | | | | |
| UNIMICRON | | | | | | | | |
| Shinko | | | | | | | | |
| KINSUS | | | | | | | | |
| AT&S | | | | | | | | |
| NanYa | | | | | | | | |
| Kyocera | | | | | | | | |
| Toppan | | | | | | | | |
| SEMCO | | | | | | | | |
| Others | | | | | | | | |
| Total | | | | | | | | |

Supply Status of FCBGA substrates for server processors

| | | Sales volume/ year | Customers |
|-----------|-----------|-----------------------|-------------------------|
| IBIDEN | CPU | | INTEL: %, AMD: % |
| | GPU | | NVIDIA: 100% |
| | FPGA/ASIC | | |
| UNIMICRON | CPU | | AMD: %, INTEL:%, AWS: % |
| | GPU | | NVIDIA: % |
| | FPGA/ASIC | | Broadcom: % |
| SHINKO | CPU | | |
| | GPU | | |
| | FPGA/ASIC | | |
| AT&S | CPU | | |
| | GPU | | |
| | FPGA/ASIC | | |

Packaging technology trends for Server Processors

| | | 2023 | 2025 | 2027 | 2029 | 2032 |
|------------|------------------------|------|------|------|------|------|
| Package | Type | | | | | |
| | Body size: mm | | | | | |
| Substrate | Layer Counts | | | | | |
| | L/S: um | | | | | |
| | Via Dia.: um | | | | | |
| | Thickness per Bu layer | | | | | |
| | Via forming | | | | | |
| | Seed layer | | | | | |
| Interposer | Type | | | | | |
| | Layer Counts | | | | | |
| | L/S: um | | | | | |
| | Via Dia.: um | | | | | |
| | Thickness per Bu layer | | | | | |
| | Via forming | | | | | |
| | Seed layer | | | | | |

Major Suppliers by manufacturing process of FCBGA substrates for server

| Process | | Suppliers | Remarks |
|----------------------------------|-------------------------|-----------|---------|
| Core layer | | | |
| Insulation layer/ Multi layer | Material | | |
| | Laminate | | |
| | Roughening treatment | | |
| Via forming | Laser Via | | |
| | Desmear | | |
| | Seed layer | | |
| | Via filling | | |
| Patterning | DFR | | |
| | Exposure | | |
| | Etching | | |
| Solder Mask | Solder resist | | |
| | Exposure | | |
| Surface treatment | | | |
| Solder bump | | | |
| Electrical test | | | |
| Visual inspection | | | |

Market size forecast of FCBGA substrates for server

| | | 2022 | 2023 | 2024 | 2025 | 2027 | 2029 | 2032 |
|---------------|--------|------|------|------|------|------|------|------|
| CPU | Value | | | | | | | |
| | Volume | | | | | | | |
| GPU | Value | | | | | | | |
| | Volume | | | | | | | |
| FPGA/ ASIC | Value | | | | | | | |
| | Volume | | | | | | | |
| Total | Value | | | | | | | |
| | Volume | | | | | | | |

Value: MUSD, Volume: Million PCS

Sample (Case study of IBIDEN)



Company performance

| | | 2020 | 2021 | 2022 |
|--------------|------------------|------|------|------|
| Overall | Revenue | | | |
| | Operating Profit | | | |
| PCB division | Revenue | | | |
| | Operating Profit | | | |

IC substrates Sales

| | 2020 | 2021 | 2022 |
|------------------|------|------|------|
| FCBGA Substrates | | | |
| PBGA Substrates | | | |
| FCCSP Substrates | | | |
| PCSP Substrates | | | |
| Total | | | |

Units: MSD

Sample (Case study)

Sales of IC Substrates by types

| | FCBGA | PBGA | FCCSP | PCSP | Total |
|------------------|-------|------|-------|------|-------|
| Value: MUS\$ | | | | | |
| Volume: M Pieces | | | | | |

Sales by customers

| Customers | | Sales/year | Situation |
|------------------|--------|------------|-----------|
| FCBGA substrates | Intel | | |
| | AMD | | |
| | NVIDIA | | |
| | Apple | | |

Sample (Case study)

Plant of IC substrates

| | | Products | Capacity |
|-------|--|----------|----------|
| Japan | | | |
| | | | |
| | | | |
| | | | |
| Asia | | | |

Investment for IC substrate business

| | 2023 | | |
|------------------|------|--|--|
| Amount | | | |
| Plant | | | |
| Purpose | | | |
| Operating status | | | |

Order, Contract, Payment, etc.,

1. Contract & Price

1) Corporate contract : JPY 500,000-

This contract allows for use within the purchasing company / organization.

2) Global contract : JPY 690,000-

This contract allows for use within the purchasing company / organization and the subsidiaries with a 51% stake or more.

*We (JMS) hold the copyright on this report in any contract

2. Order

1) Please fill out the blanks in the application form

2) Please send the application form by E-mail (info@jms21.co.jp) or go to our website to purchase our reports.

3. Payment: We have the following two ways

1) Credit Card

Please send an application form for credit card payment with next page

2) Wire Transfer

We will send you an invoice after your application, please pay it within three weeks from invoice date.

4. Remarks

Depending on the type of business other than manufacturers or trading companies, above these prices may not apply, or this publication may not be available.

Application Form (for Credit Card)



Date: / /

Report Title: IC Package / Substrate report

Please check ☒ type of contract → ☐ Corporate Contract / ☐ Global Contract

[Accepting the conditions of the type of contract \(previous page\)](#)

Corporate Name: _____.

Applicant's Name: _____.

Applicant's Department: _____.

Corporate Address: _____.

Phone: _____ Email: _____.

Credit Card Information:

Card Type: Visa / Master / AMEX _____ Card Number : _____.

Expiration date: _____ / _____ Name on the card: _____.

Your request:

Application Form (for Wire Transfer)



Date: / /

Report Title: IC Package / Substrate report

Please check ☒ type of contract → ☐ Corporate Contract / ☐ Global Contract

[Accepting the conditions of the type of contract \(previous page\)](#)

Corporate Name: _____.

Applicant's Name: _____.

Applicant's Department: _____.

Corporate Address: _____.

Phone: _____ Email: _____.

Please transfer the payment to the following:

*Bank : MIZUHO BANK (Swift code: MHCBJPJT)
*Branch: Kobunacho Branch (Phone:+81-3-3661-3111), [Branch code: 105]
*Branch address: 8-1 Nihonbashi Kobunacho, Chuo, Tokyo 103-0024 Japan
*Account Number: 1653912, *Account Name: Japan Marketing Survey Co., Ltd.

Your request: