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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 2032, 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

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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)

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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: %

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Overview of the server processors & IC substrates industry

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

Overview of the server processors & IC substrates market

<table>
<tr><th colspan="3">Items</th><th>Trends/Overview</th></tr>
<tr><td rowspan="5">Processor</td><td rowspan="2">CPU</td><td>X86</td><td></td></tr>
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<tr><td rowspan="3">Substrate</td><td colspan="2">Types</td><td></td></tr>
<tr><td colspan="2">Major suppliers</td><td></td></tr>
<tr><td colspan="2">Market size</td><td></td></tr>
</table>

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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

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		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

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		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					

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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			

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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: MUSD					
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			

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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: