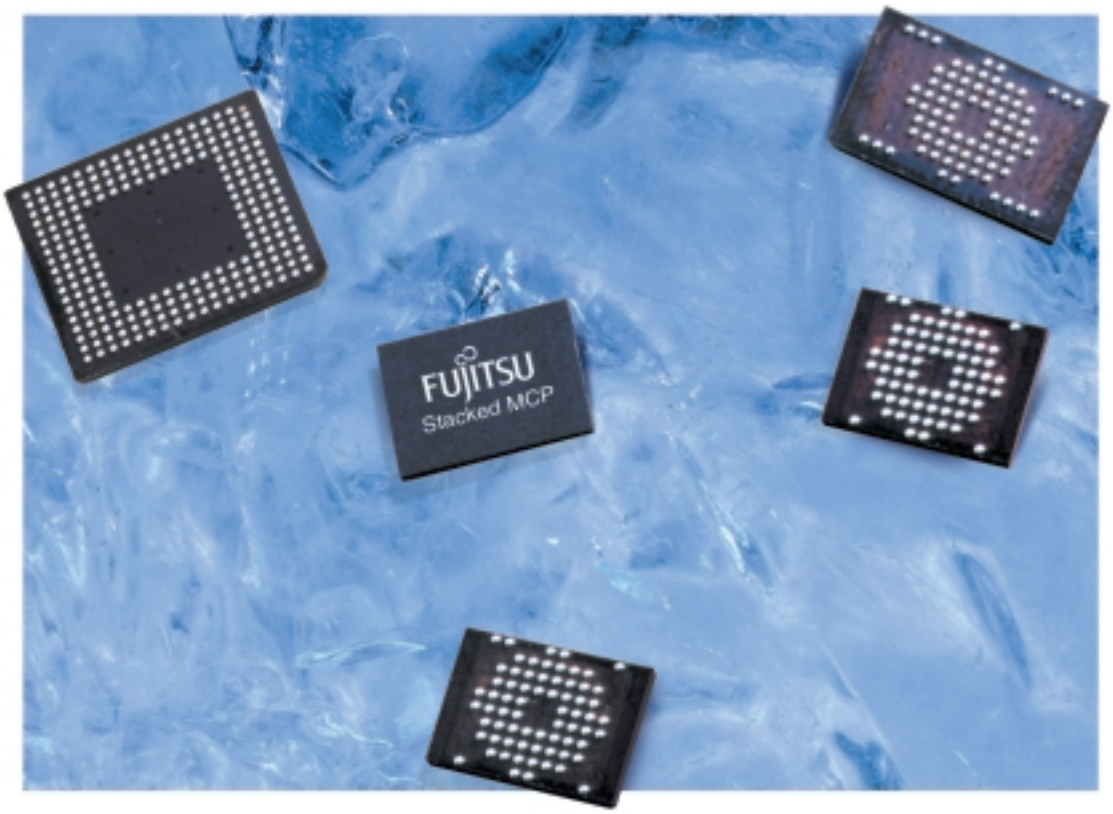
Stacked MCP

Stacked Multi-Chip Package (Stacked MCP) is one of the most suitable chip scale packages for wireless applications. Its advantage is the compact stacked chip configuration. In the Flash memory and SRAM configuration, the pin layout can accomodate a 128 MB combination.Typical package construction consists of two die back lapped down to 100µm and total package height is only 1.2 mm. Different combinations of Flash and SRAM can be mounted in this package up to package size 10.4 x 10.8mm.

Stacked MCP supports packaging solutions up to 8 die stacked using flip-chip interconnection and stacked wire bonded die. Additional logic-memory and logic-logic combinations are available.

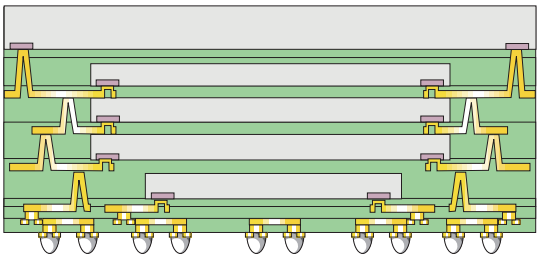


- Saves board space
- Ideal for integrating technologies or functions in one single package
- Ideal for combining logic and memory at low cost
- Low profile

25µm Thin Wafer

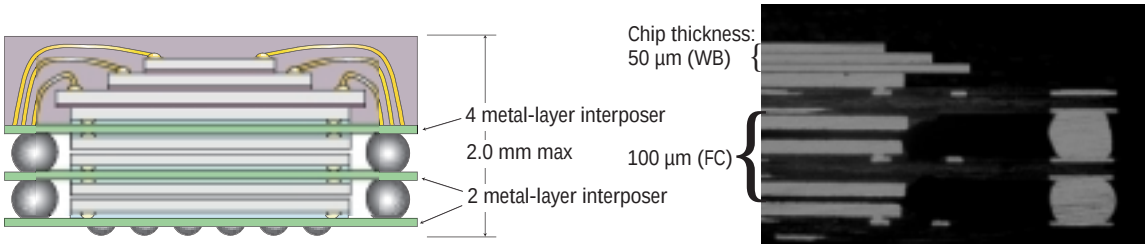
Stacked MCP

5-chip stacked

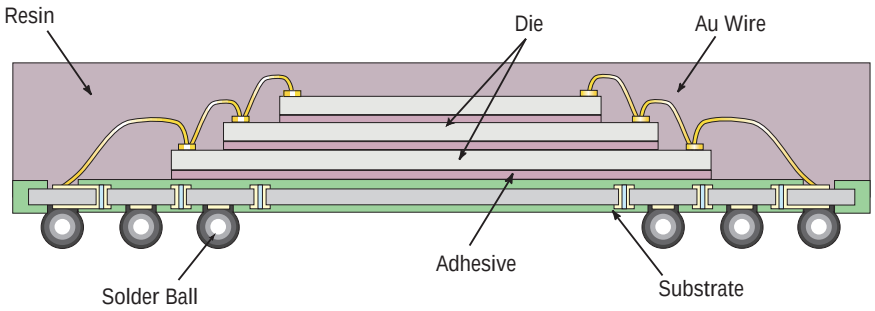


The new module combines advances in wafer thinning technology, which reduces the thickness of existing chips by about 16% , with chip stacking and re-distribution technologies. Compared to SiPs with similar functionalities, the prototype chip boasts a 30% reduced board area and 65% thinner profile, making it the ideal system LSI solution for miniaturized digital equipment.

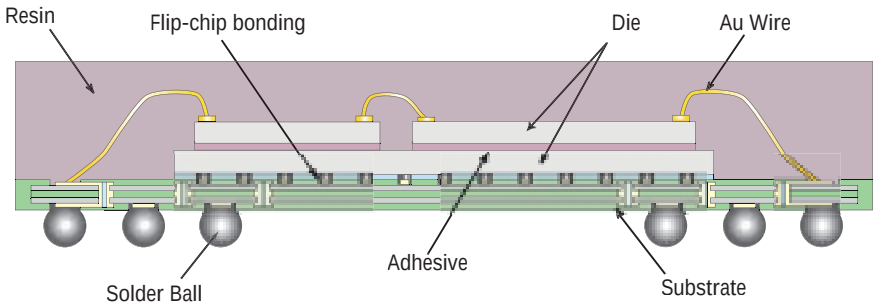
8-chip stacked



3-chip stacked, wire bonding



Flip-chip bonding and wire bonding



Stacked MCP

Standard Package Line-up

Package Type	Package Code	Body Size (mm)	Pitch (mm)	Configuration
FBGA61	BGA-61P-M02	9 x 9 x 1.4	0.8	16M Flash + 2M SRAM
FBGA69	BGA-69P-M02	8 x 11 x 1.4	0.8	16M Flash + 4M SRAM
FBGA77	BGA-77P-M01	9 x 14 x 1.4	0.8	32M Flash + 4M SRAM
FBGA73	BGA-73P-M01	8 x 11.6 x 1.4	0.8	32M Flash + 2M SRAM 32M Flash + 4M SRAM
FBGA56	BGA-56P-M01	7 x 7.2 x 1.2	0.8	16M Flash + 2M SRAM 16M Flash + 4M SRAM
FBGA71	BGA-71P-M01	7 x 12 x 1.2	0.8	32M Flash + 8M SRAM
FBGA71	BGA-71P-M02	7 x 11 x 1.2	0.8	32M Flash + 16M SRAM 32M Flash + 4M SRAM
FBGA101	BGA-101P-M01	11 x 12 x 1.4	0.8	64M Flash + 8M SRAM 64M Flash + 16M FCRAM
FBGA123	BGA-123P-M01	11 x 12 x 1.4	0.8	64M Flash (NAND) + 16M FCRAM
FBGA81	BGA-81P-M03	10.4 x 10.8 x 1.2	0.8	64M Flash + 32M FCRAM
FBGA85	BGA-85P-M02	10.4 x 10.8 x 1.3	0.8	64M Flash + 16M FCRAM+ 4M SRAM 64M Flash (NAND) + 32M FCRAM+ 32 FCRAM
FBGA111	BGA-111P-M01	10.4 x 10.8 x 1.4	0.8	64M Flash (NAND) + 32M FCRAM

Custom configurations including non-memory applications are available.

Package Reliability (FBGA69)

Test Item	Condition	Criteria	Result
Temperature Cycle*	-65°C ~ 150°C	200 cycles	Pass
HTS	150°C	1008 hours	Pass
Thermal Shock	0°C ~ 100°C	200 cycles	Pass
PTHS*	121°C, 85%	504 hours	Pass
PTHB	121°C, 85%	96 hours	Pass

* Preconditioning: Baking 125°C, 24 hours, +85°C ~ 85%, 20 hours + IR 250°C max.

Moisture Sensitivity (FBGA69)

Condition	Result
85°C/85%RH, 24 hours + IR250°C	Pass
30°C/80%RH, 240 hours + IR250°C	Pass

Thermal Performance (FBGA69)

θ-ja (°C/W)			θ-jc (°C/W)
0m/sec	1m/sec	3m/sec	
45	40	35	10