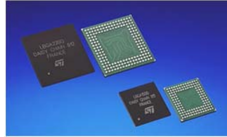
FLIP-CHIP

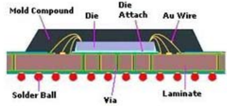
ims — TAMIS

Lead Less Chip Carrier

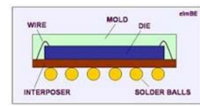
Ball technology

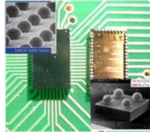


BGA : Ball Grid Array

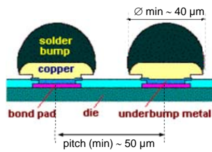


CSP : Chip Scale Package

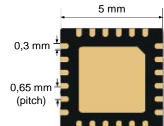




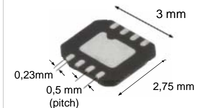
Flip-Chip



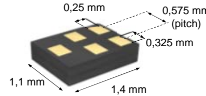
QFN (Quad Flat No Lead)



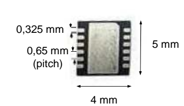
2 Watt C-Band Packaged Power Amplifier
TriQuint TGA2706-SM



Low noise amplifier
Analog device ADL5523



Low-loss RF filter for mobile telephone bluetooth systems
Epcos B9413



4W High Linearity InGaP HBT Amplifier
TriQuint AH 420

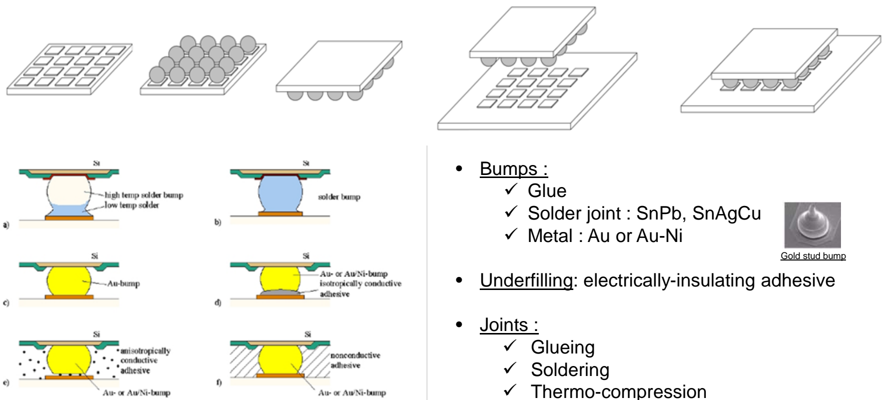
Flip chip assembly

	WIRE-BONDING		FLIP CHIP	
	COB (Chip On Board)			
	Ball	Wedge		
Material	Au	Al	PbSn AuSn SnAg	Cond. Polymer
Connection Method	TS/TC	US	Soldering	Adhesive
Process Temp. (°C)	100-150	RT	225-330	150
Typ. Pad pitch (µm)	150-200	50-200	200-250	100-200
Area Ratio to Die	1.5	1.5	1	1
Maximum I/O count	300-500	500-700	>1000	>1000
Resistance (mΩ)	122	142	1.2	5-10 (Au)
Lead capacitance (pF)	0.025	0.025	< 0.001	< 0.001
Lead inductance (nH)	2.6	2.6	< 0.2	< 0.1

↘ area and height
↗ signal transmission and heating conduction

TS = Thermo-Sonic
TC = Thermo-Compression
US = Ultra-Sonic

Assembly steps



- Bumps :
  - ✓ Glue
  - ✓ Solder joint : SnPb, SnAgCu
  - ✓ Metal : Au or Au-Ni

Gold stud bump

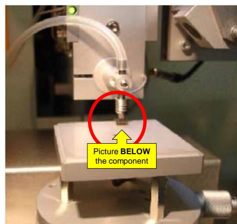
- Underfilling: electrically-insulating adhesive
- Joints :
  - ✓ Glueing
  - ✓ Soldering
  - ✓ Thermo-compression

Equipment

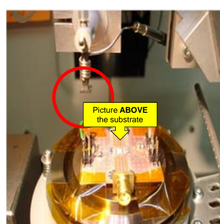
Characteristics (JFP Microtechnic)

- Chip size : 150 µm to 40 mm
- T max = 450°C
- Cooling : 5 à 6°C/s
- Contact force : 10 g to 400 g ± 1%
- Additional force: until 80 kg
- Placement resolution : 5 µm

Assembly steps



Chip holding



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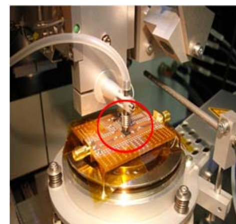

Chip positionning

Component and substrate's pictures alignment

*Final placement with **pressure** and/or **temperature***

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Laboratoire de l'Intégration du Matériau au Système