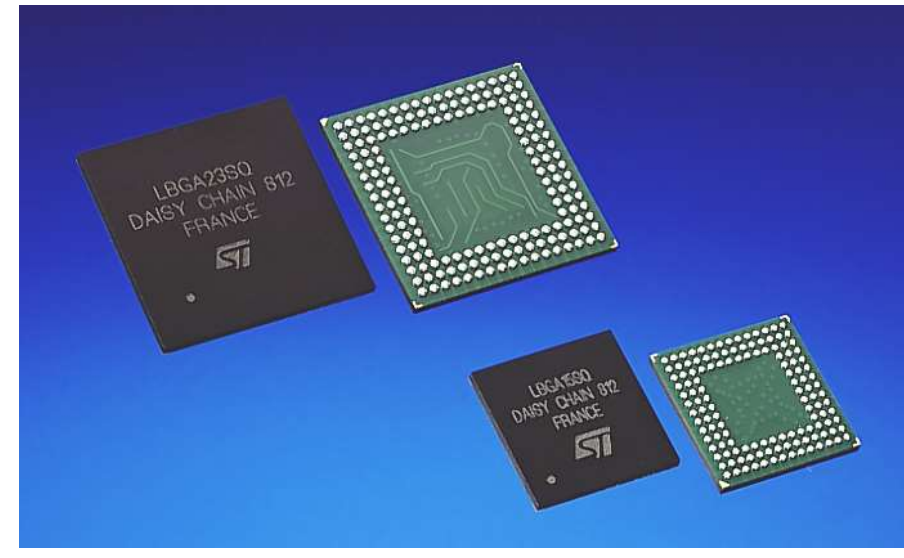


Lead Less Chip Carrier

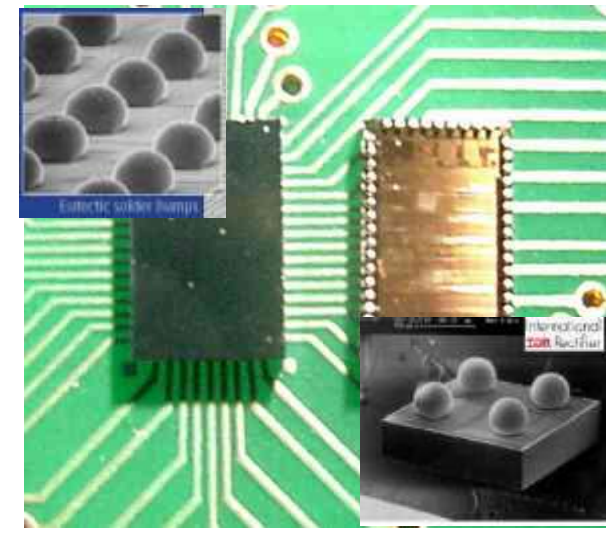
Ball technology



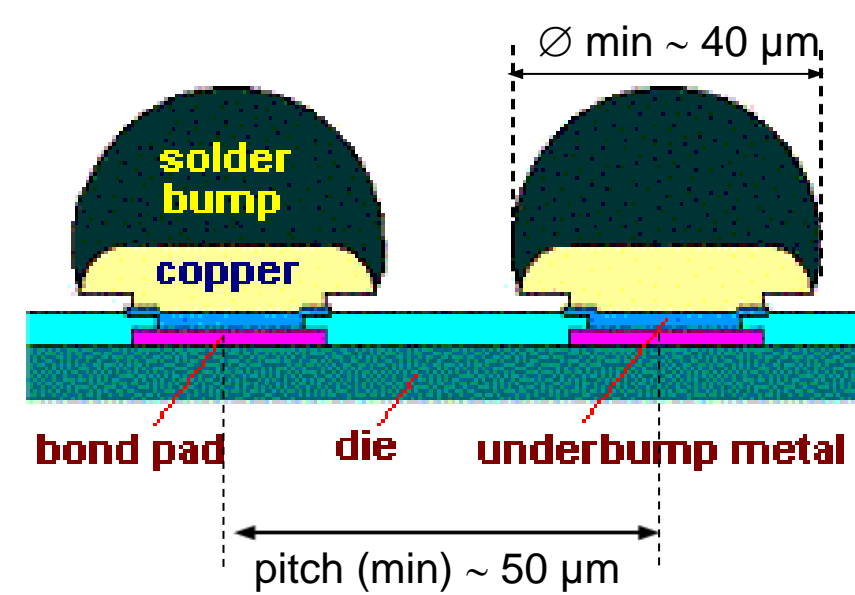
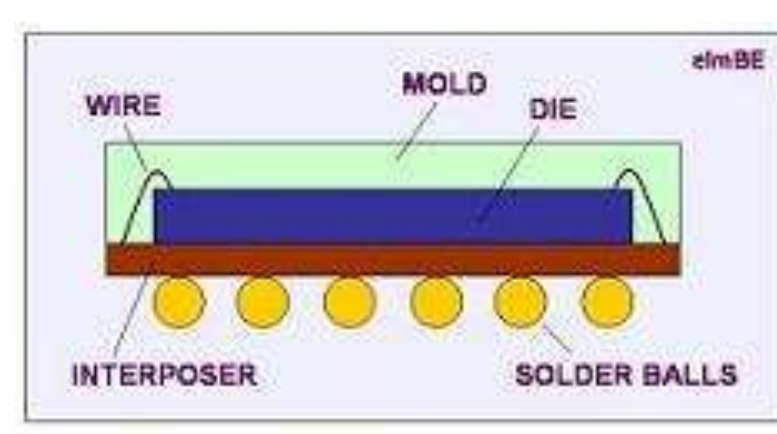
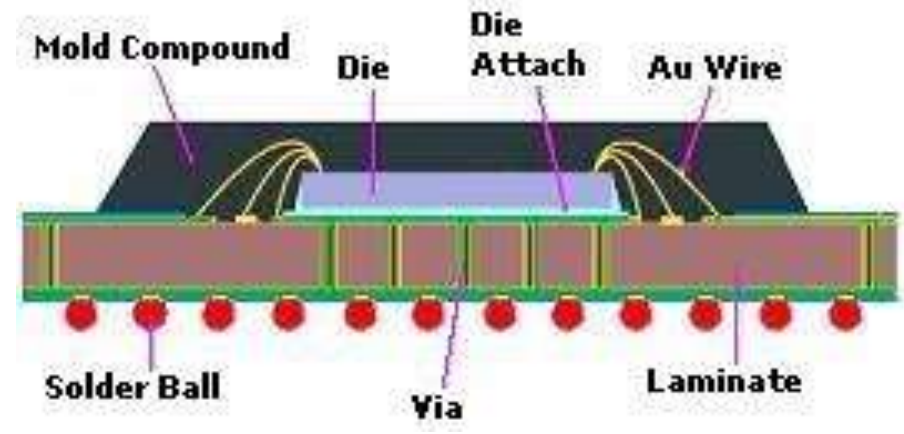
BGA : Ball Grid Array



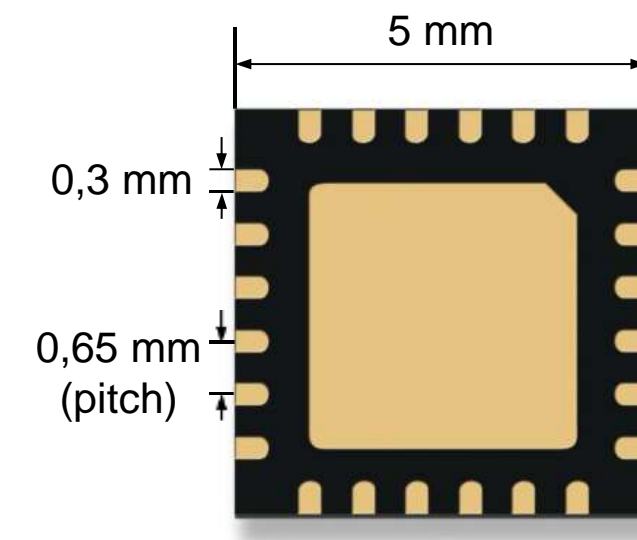
CSP : Chip Scale Package



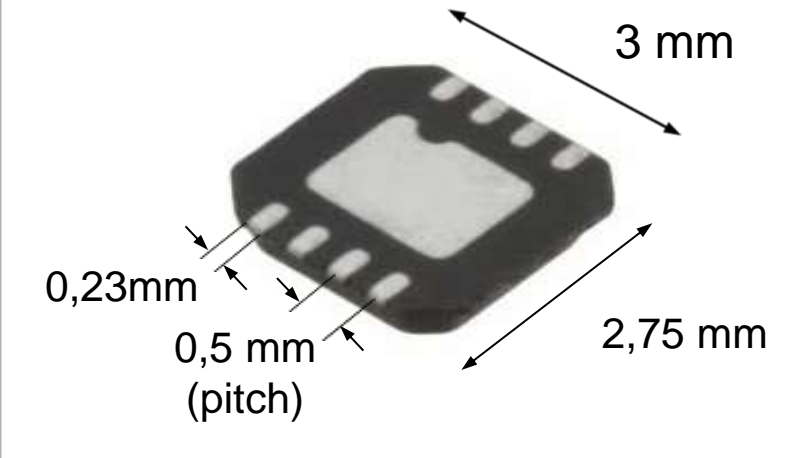
Flip-Chip



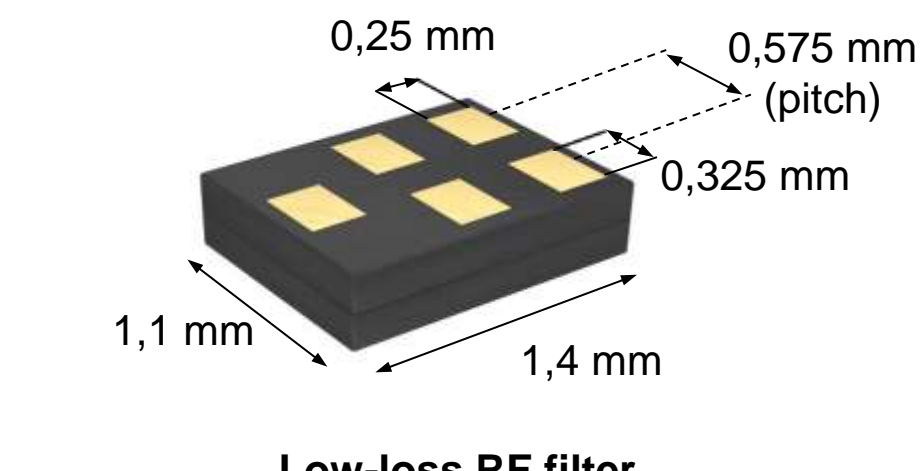
QFN (Quad Flat No Lead)



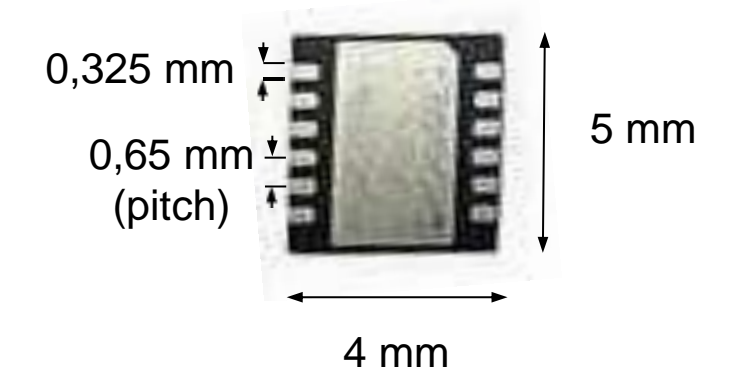
2 Watt C-Band Packaged Power Amplifier
TriQuint TGA2706-SM



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

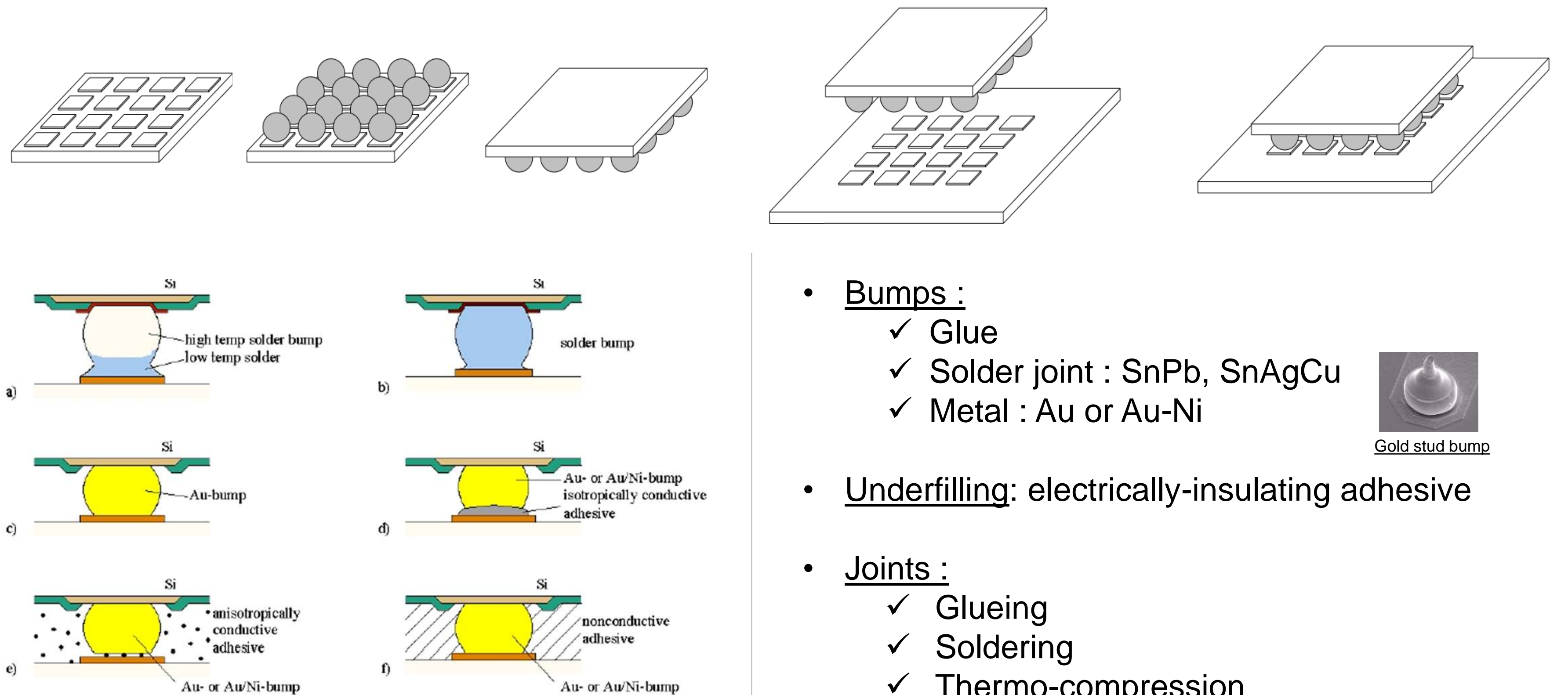
Flip chip assembly

	WIRE-BONDING		FLIP CHIP	
	Ball	Wedge	PbSn AuSn SnAg	Cond. Polymer
Encapsulant (glob top)				
Die attach				
Wire bonds				
PCB				
COB (Chip On Board)				
Material	Au	Al	PbSn AuSn SnAg	Cond. Polymer
Connection Method	TS/TC	US	Soldering	Adhesive
Process Temp. (°C)	100-150	RT	225-360	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

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

area and height
signal transmission and heating conduction

Assembly steps



- Bumps :**
 - ✓ Glue
 - ✓ Solder joint : SnPb, SnAgCu
 - ✓ Metal : Au or Au-Ni
- Underfilling:** electrically-insulating adhesive
- Joints :**
 - ✓ Glueing
 - ✓ Soldering
 - ✓ Thermo-compression

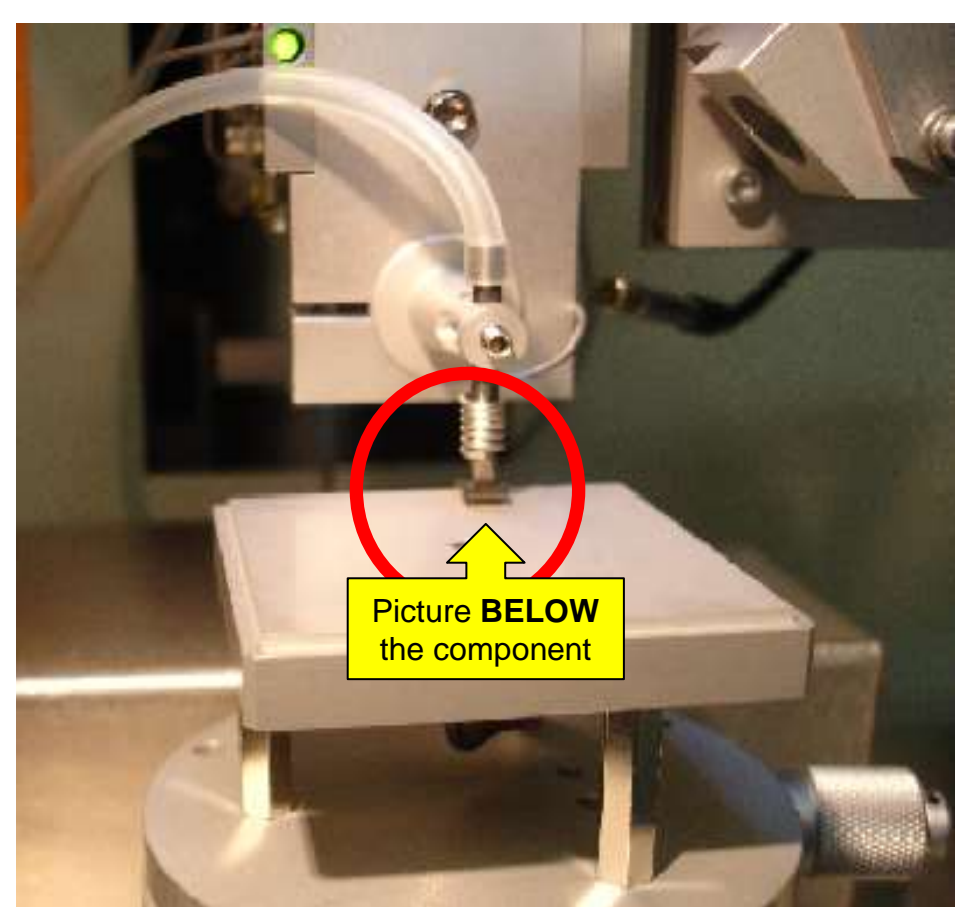
Equipment



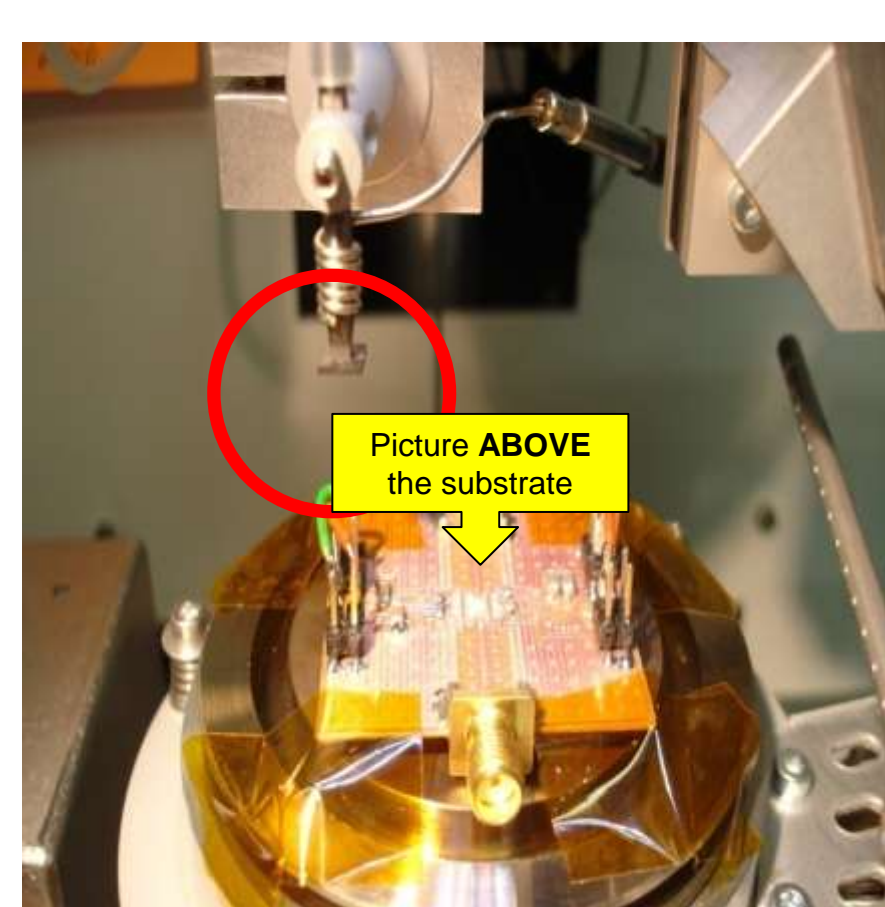
Characteristics (JFP Microtechnic)

- 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

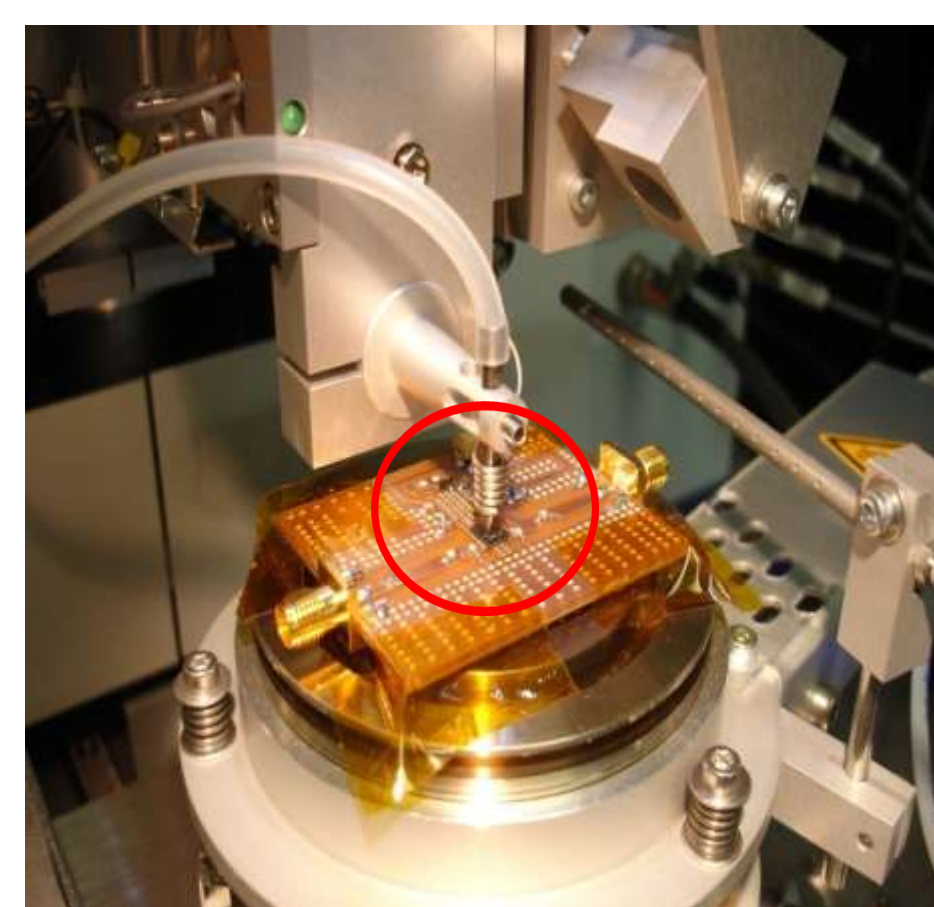
Assembly steps



Chip holding

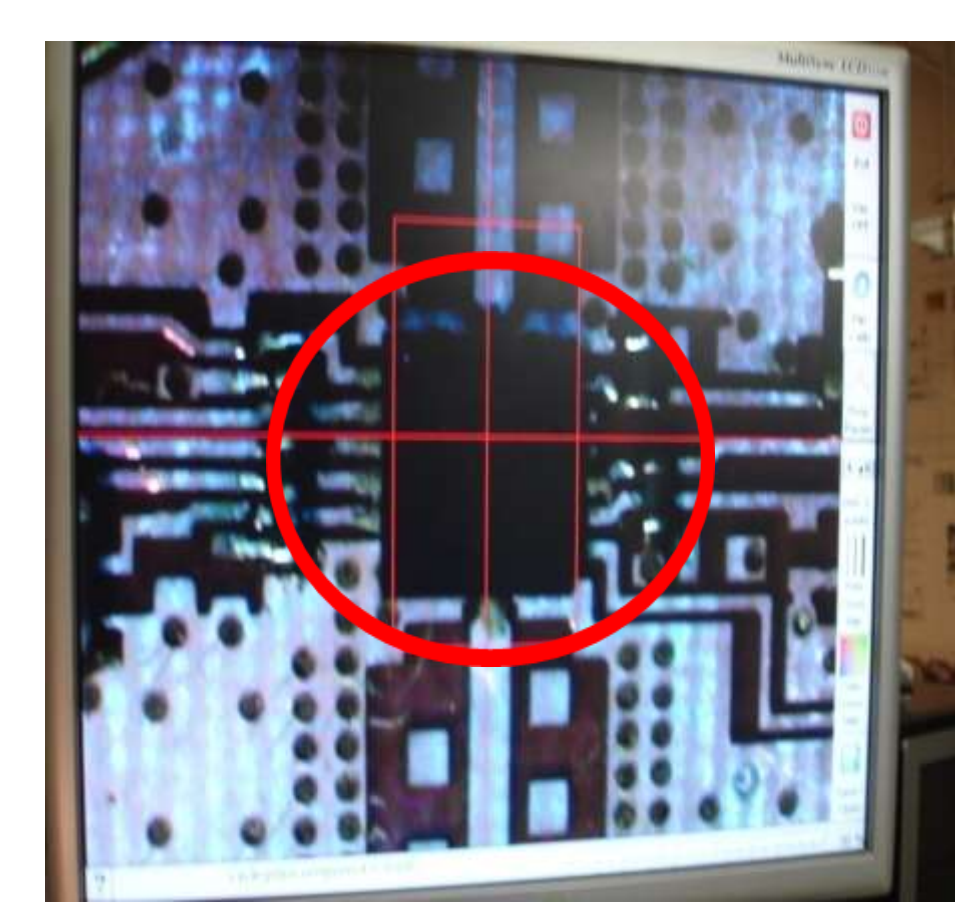


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Chip positioning

Component and substrate's pictures alignment



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