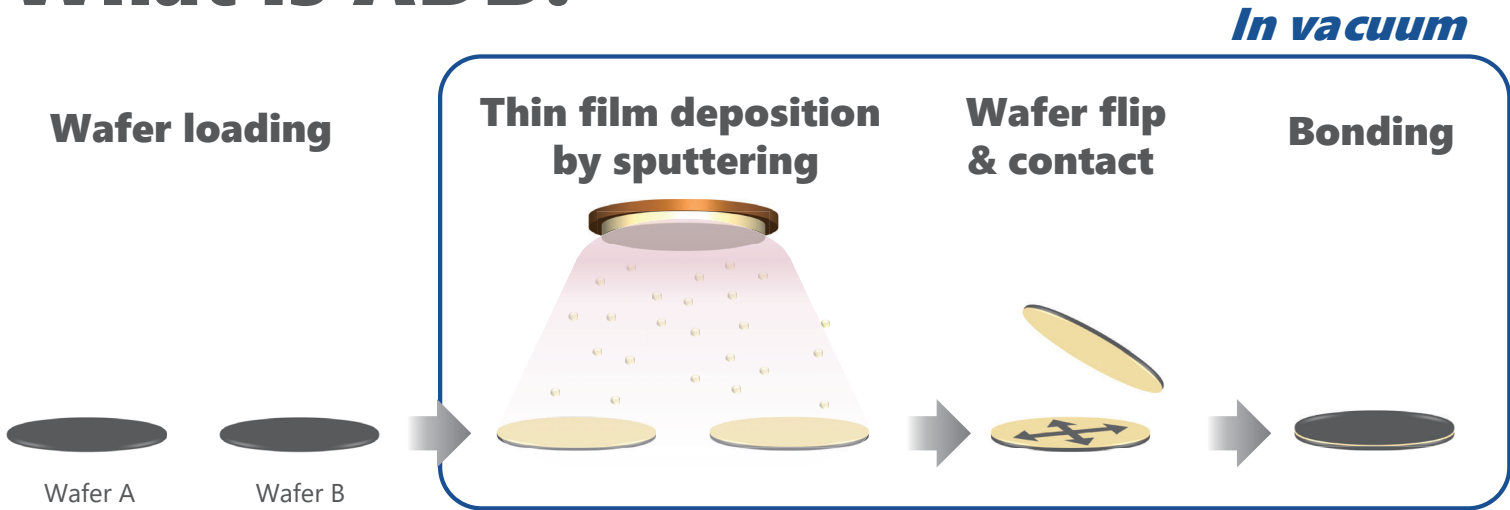


Atomic Diffusion Bonding

as Permanent wafer bonding at room temperature

What is ADB?



- ✓ Room temperature bonding
- ✓ Any substrates available
- ✓ Various bonding materials

Equipment

BC7000 for $\varnothing 100$ / $\varnothing 150$ mm



BC7300 for $\varnothing 200$ / $\varnothing 300$ mm



- ✓ Multi-processing in ultra-high vacuum
- ✓ High throughput
- ✓ Low particle level control

Atomic Diffusion Bonding

as Permanent wafer bonding at room temperature

Using Various Metal Films

As a contact metal

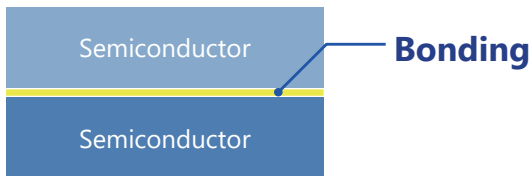


Fig.1 Engineered Substrate

As a thermal conductive layer

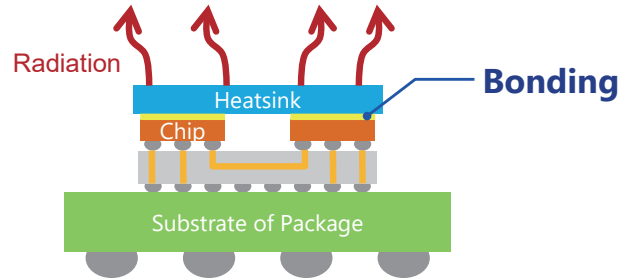
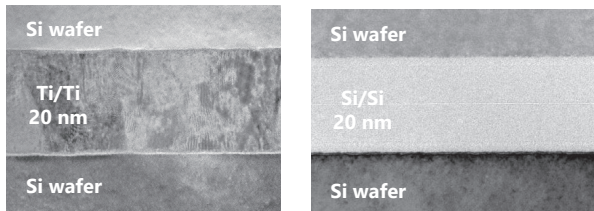


Fig.2 2.5D packaging



* Courtesy of Shimatsu Laboratory, Tohoku University

	ADB (Metal interlayer)	Solder bonding
Thermal Conductivity [W/mK]	154	50 ^{*1)}
Bonding layer [μm]	0.11 Ta (5 nm) / Au (50 nm) on each side	50 ^{*1)}
Thermal Resistance [m ² K/W]	7.1×10 ⁻¹⁰	1.0×10 ⁻⁶

*1) Thickness & thermal conductivity of the solder bonding is estimated value

Reliable conductive bonding

Innovative heat management for high performance devices

Using Various Dielectric Films

As a thin isolation layer

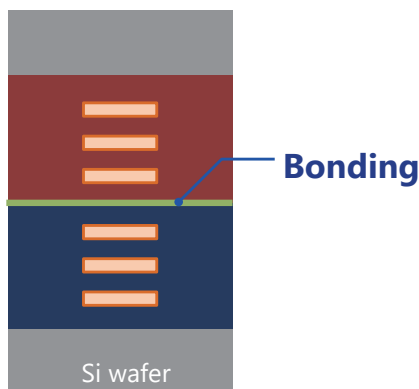
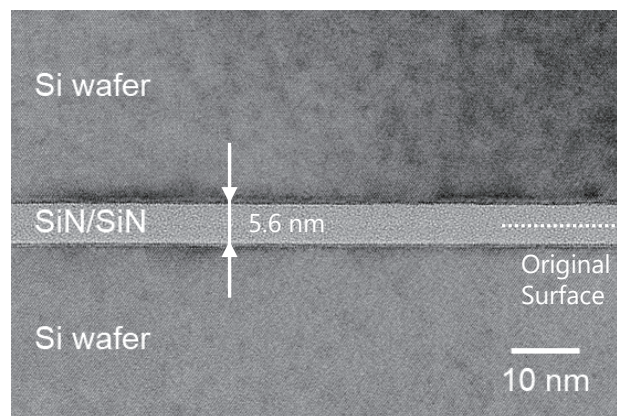


Fig.3 CFET structure



Ideal for future advanced logic device