Large FC-BGA Substrate for Large Die and Chiplet Integration

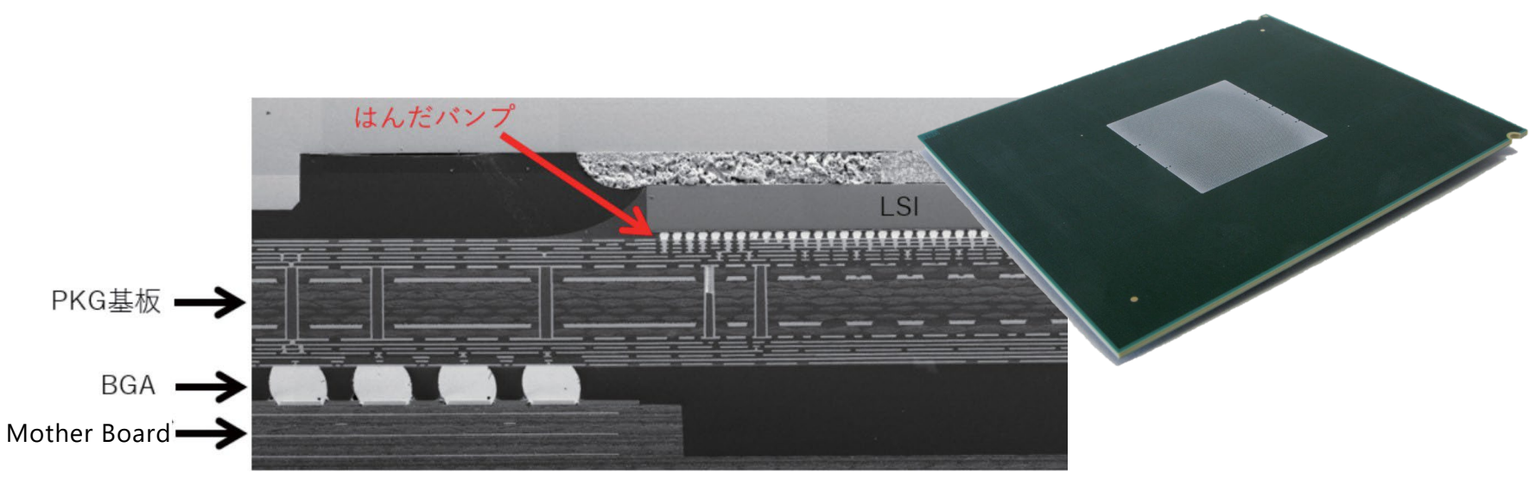
Next generation high-performance large package substrate

■ FC-BGA substrate for large Die

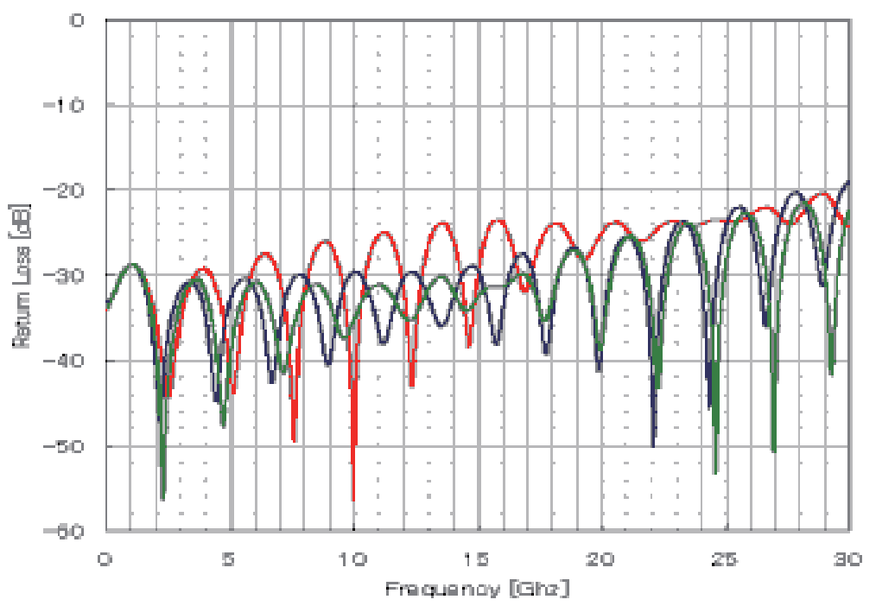
- >100mm□ size of 16-n-16 buildup substrate is available.
- High-power application with thick copper layer

■ GHz bandwidth HF operation

- High density Via connection and thick copper power supply layer support low inductance and high voltage and high current in the power supply system



Example of multi-pin LSI mounting



Transmission characteristics

TFC* Embedded Substrate “GigaModule-EC”

TFC*:Thin Film Capacitor

■ High frequency range

4.2GHz CPU operating frequency

■ Flexible design selection for capacitance

Material	$BaTiO_3$
Capacitance	1.0μF/cm² 2.0μF/cm²
Voltage	4.0V

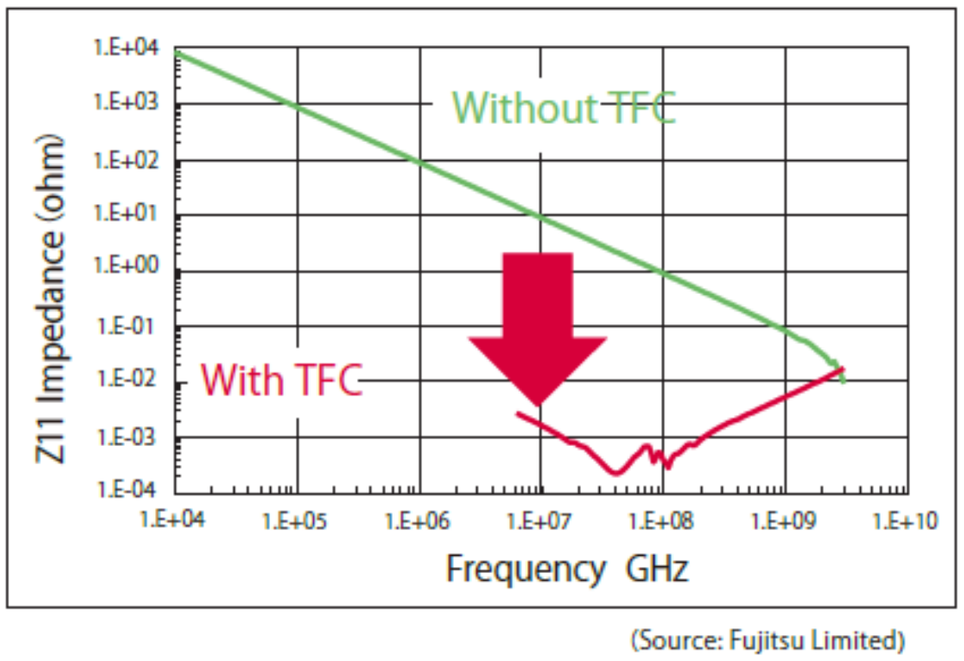
■ Effectiveness verification

TFC integration allows impedance reduction

■ Technology Application

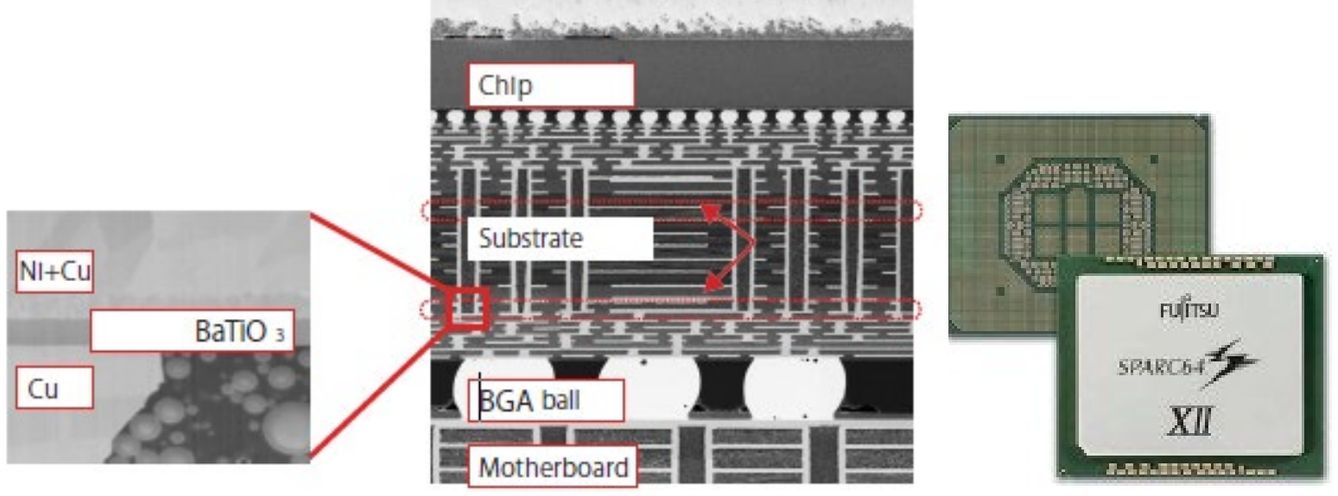
Stable operation beyond the 4 GHz CPU frequency barrier

Condition： GigaModule-4EC, 8 layers, TFC=2.0μF/cm², FTCP SignalAdviser-PI



(Source: Fujitsu Limited)

Change of impedance between V/G



SPARC64™XII Cross Section

SPARC64™XII

Capacitance : 1.0μF/cm²

TFC : 2set

Max. frequency : 4.25GHz