

南亞電路板股份有限公司

NAN YA PRINTED CIRCUIT BOARD CORPORATION

COMPANY BRIEFING

March 2015

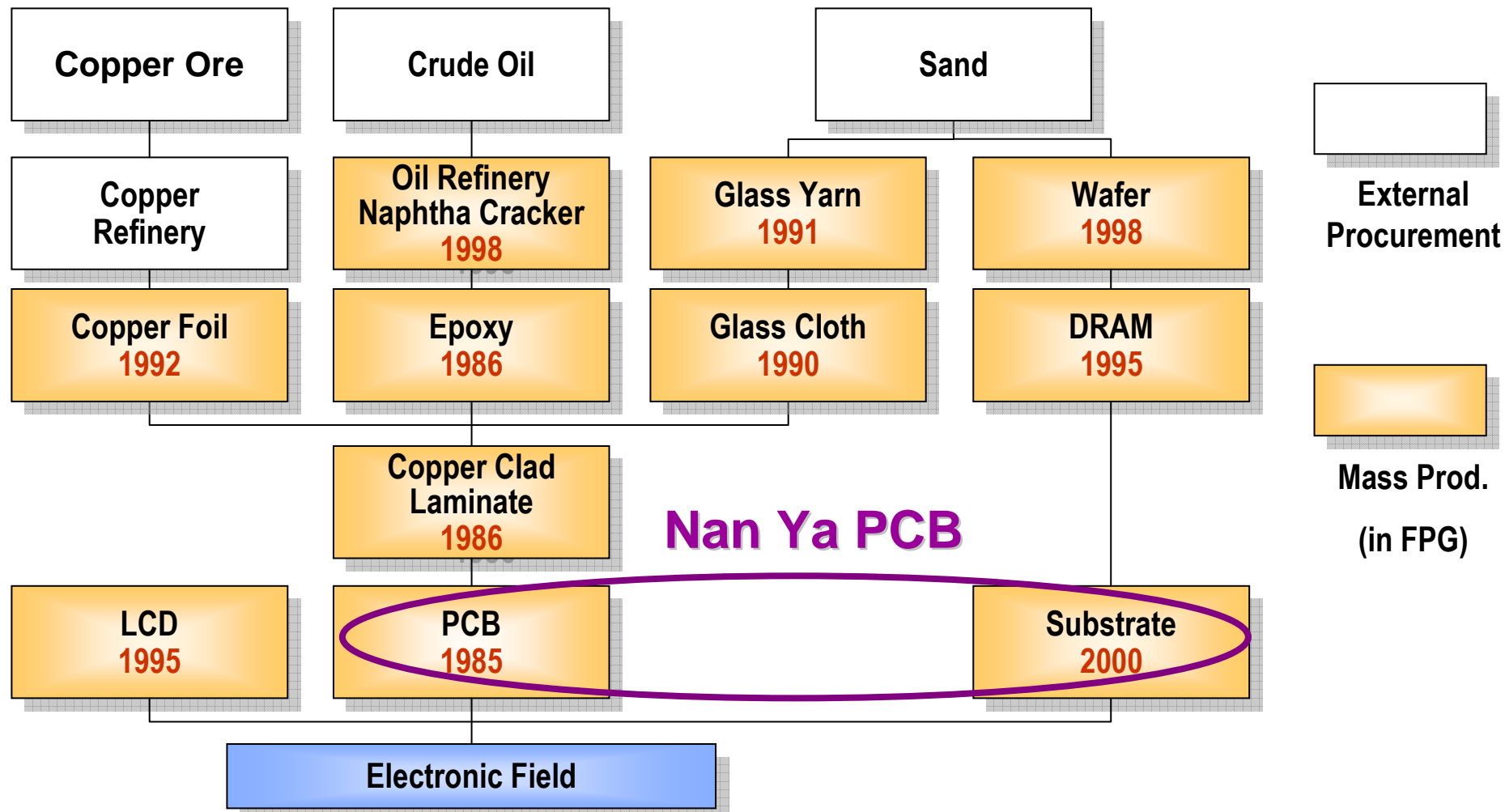


Safe Harbor Notice

- Nan Ya PCB's statements of its current expectations are forward-looking statements subject to significant risks and uncertainties and actual results may differ materially from those contained in the forward-looking statements.
- Except as required by law, we undertake no obligation to update any forward-looking statement, whether as a result of new information, future events, or otherwise.



Vertical Integration within FPG





Milestone

Year 1985	Start PCB mass production
Year 1997	Establish Na Ya PCB Corporation
Year 2000	Start wire bond substrate mass production
Year 2001	Start flip chip substrate mass production
Year 2002	Start Kunshan PCB mass production
Year 2006	IPO (TWSE Ticker No.: 8046)
Year 2010	Start flip chip substrate back-end process production for CPU products
Year 2013	Start embedded passive substrate production

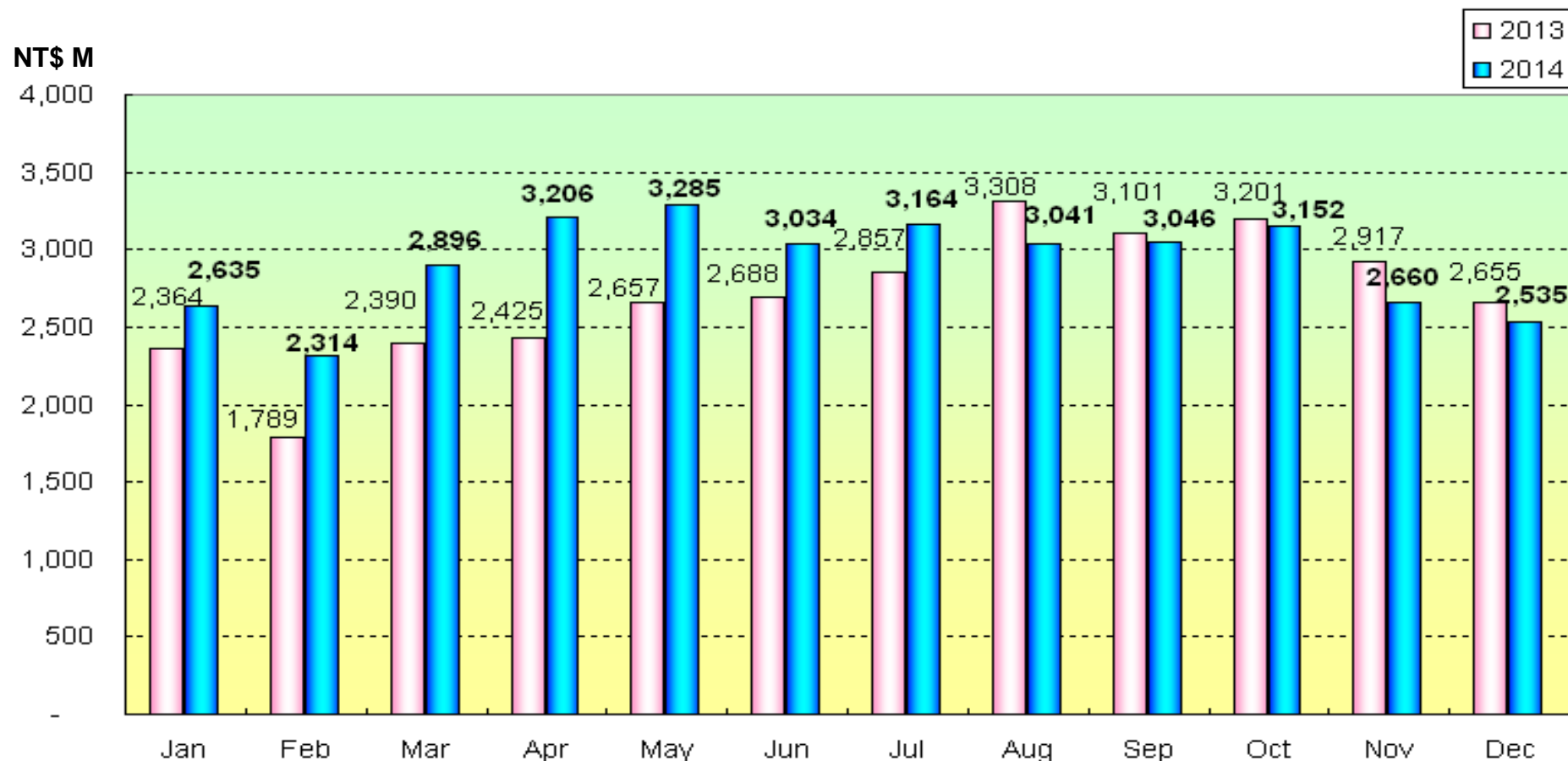


Manufacturing Location





2013 and 2014 Consolidated Monthly Revenue

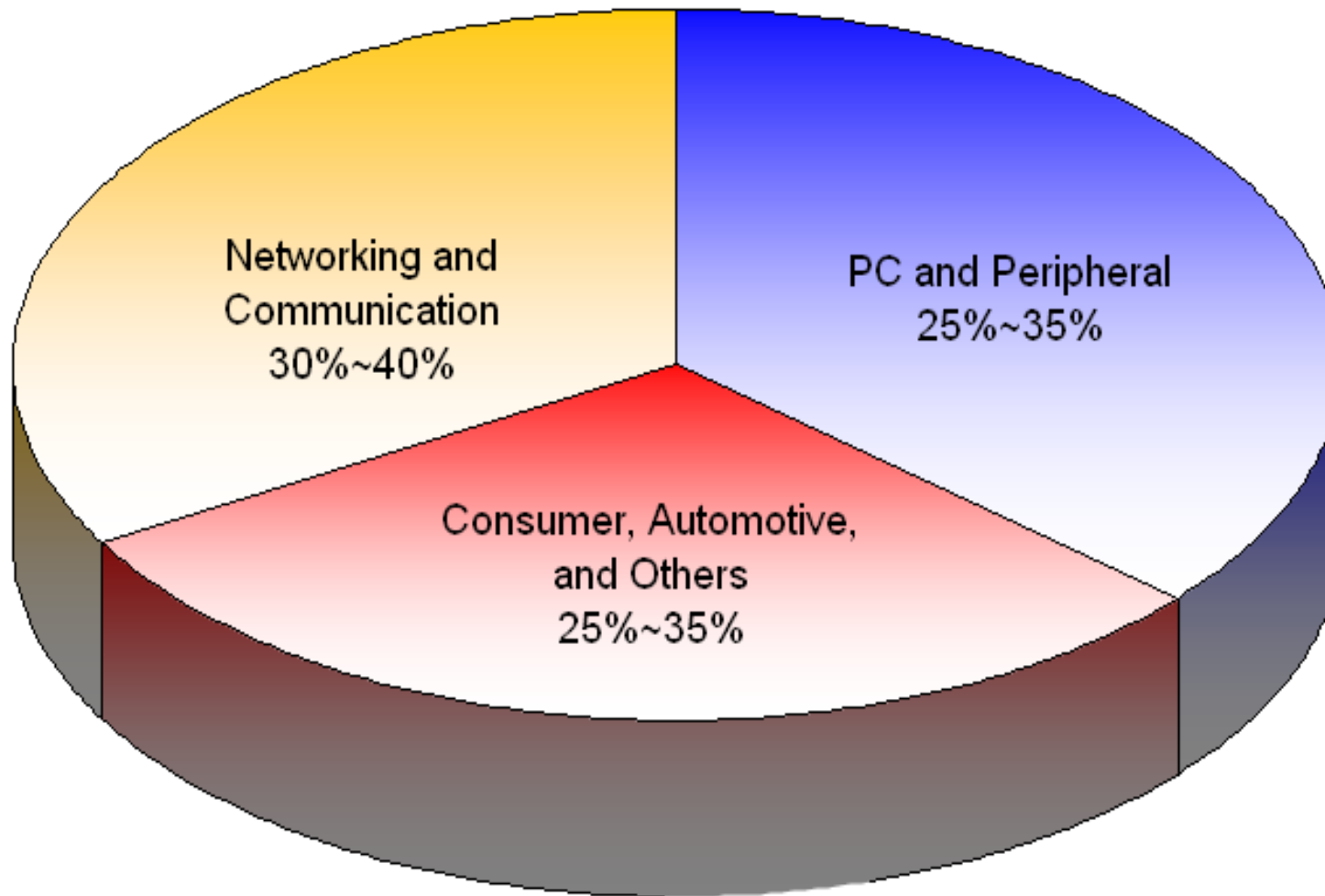


➤ **2014 Sales = NT\$ 35.0 Billion ; YoY=+8.1%**

➤ **Jan. to Feb. 2015 Sales= NT\$ 5.0 Billion ; YoY= +2.2%**



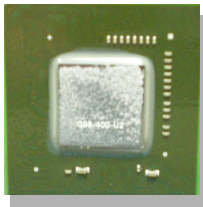
2014 Sales Breakdown by Application





Products & Applications-PC

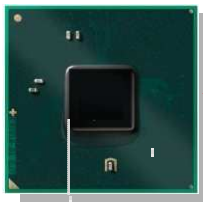
GPU
FC-BGA
29mm*29mm
2/2/2



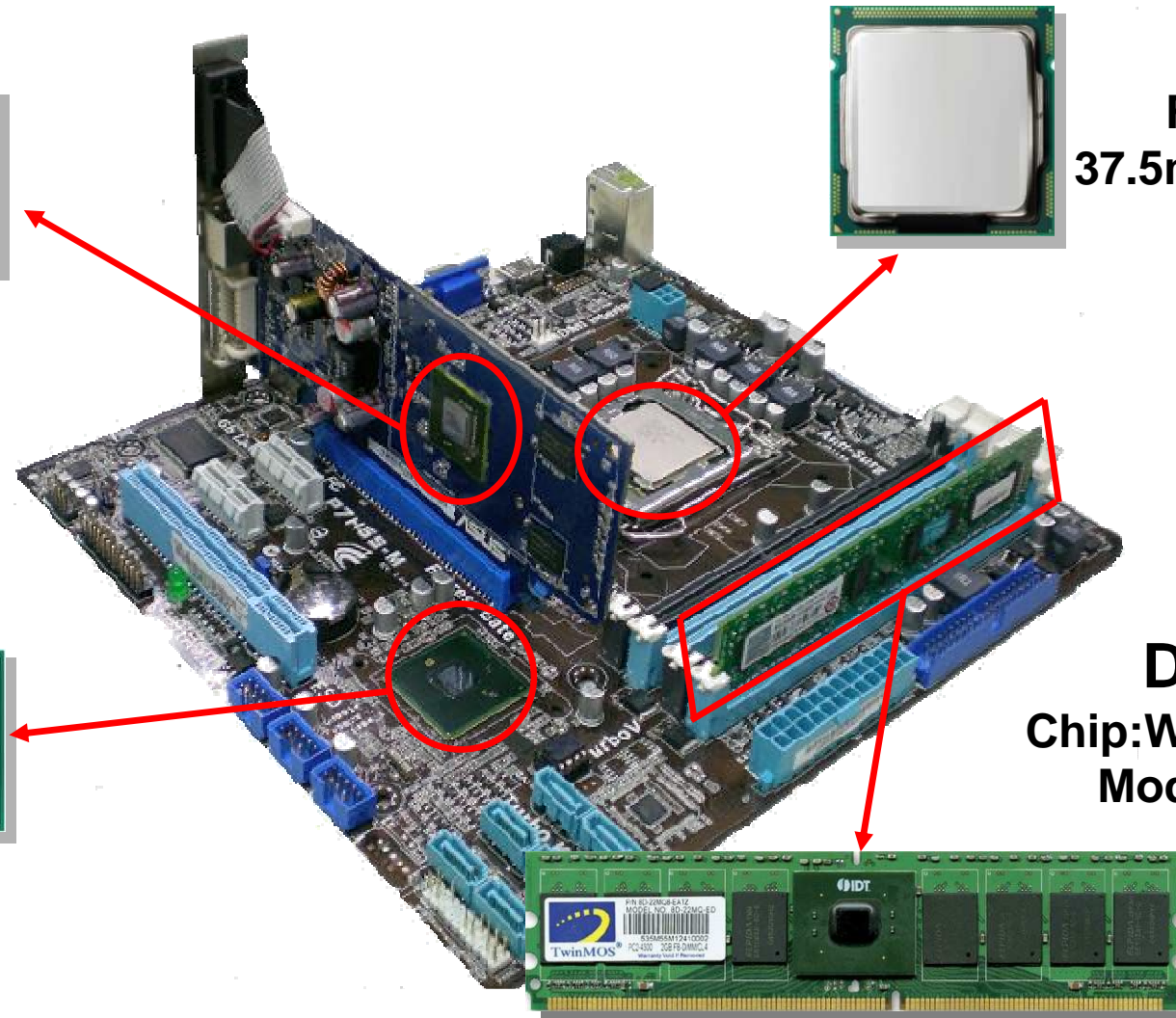
CPU
FC-BGA
37.5mm*37.5mm
3/2/3



Chipset
FC-BGA
23mm*22mm
2/2/2



DRAM
Chip:Wire Bonding
Module:PCB





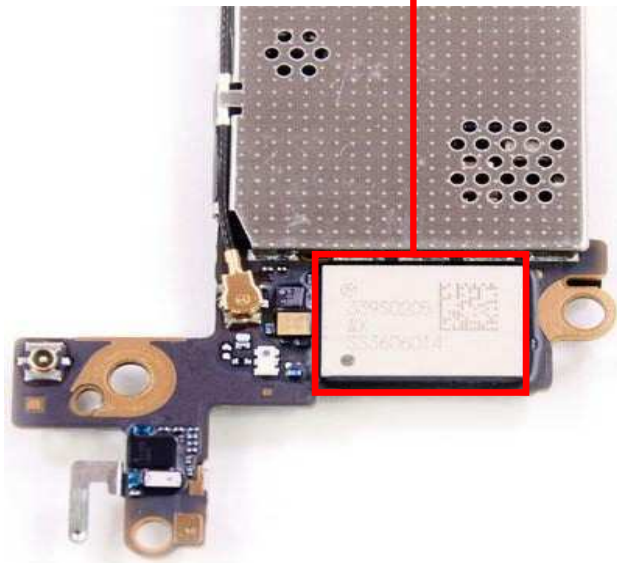
Products & Applications-Smart Phone

Wi-Fi Module

Any-Layer HDI

14mm*17mm

2/2/2

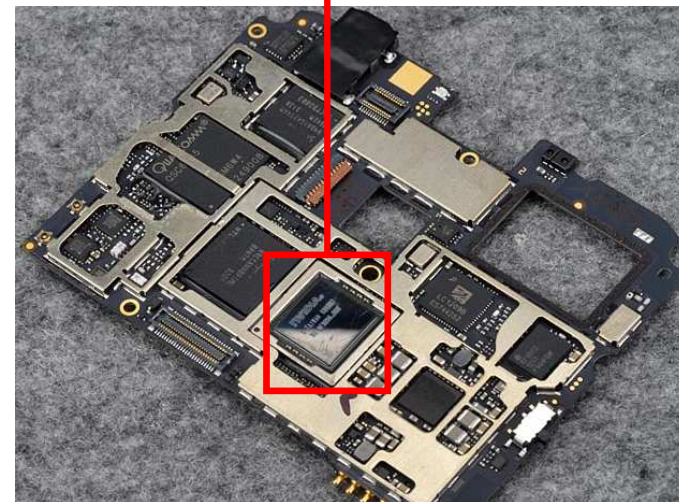


Application Processor

FC-BGA

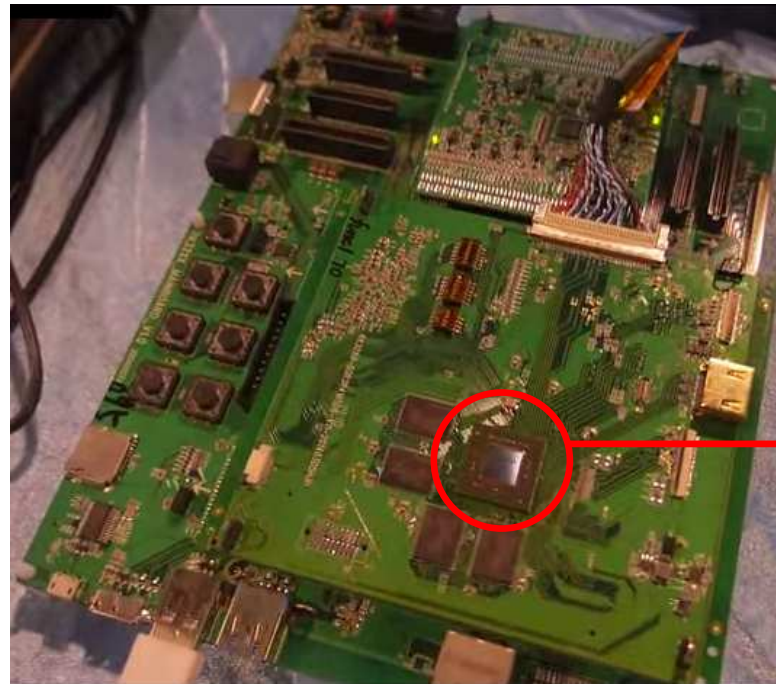
14mm*14mm

2/2/2





Products & Applications-Tablet PC



**Application
Processor**
FC-BGA
19mm*19mm
1/2/1



Products & Applications-Automotive



- Advanced Driver Assistance System
- Infotainment
- Keyless
- Safety
- Powertrain



Products & Applications-Networking



Router



Hub/Switcher



Base Station



Products & Applications-Others



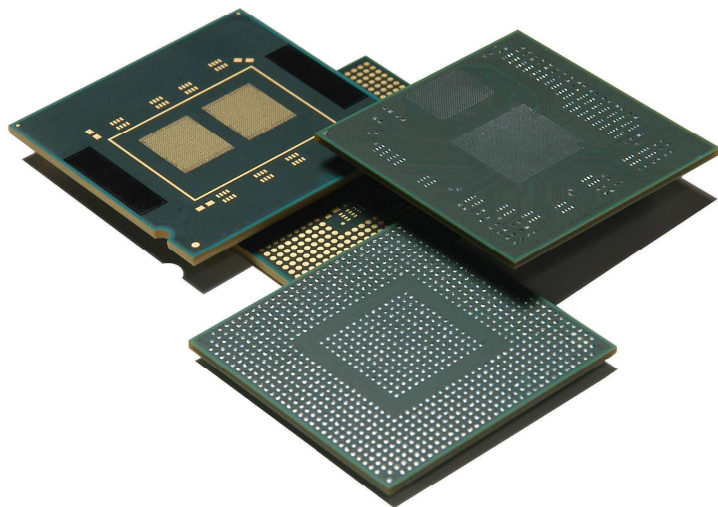
Server



Game Console



TV



Thank You

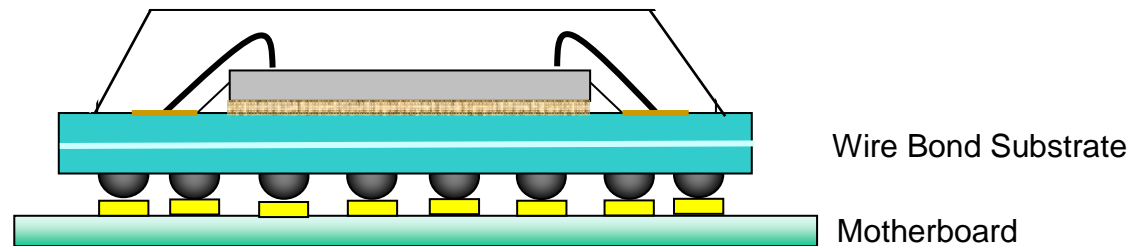
Q & A



IC Substrate Introduction

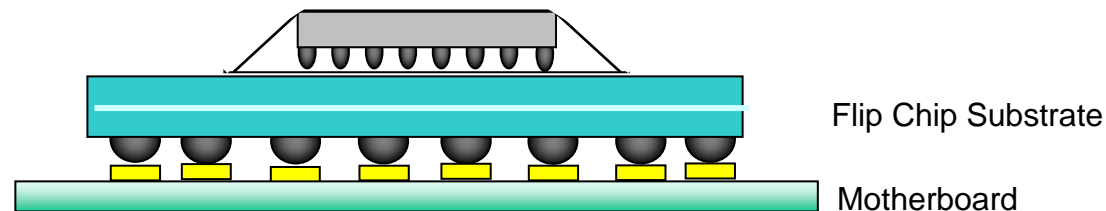
Wire Bonding Substrate Outline :

By using gold wires to connect electrical pads with the so-call wire bonding substrate which plays the function as a buffer between the chip and motherboard.



Flip Chip Substrate Outline :

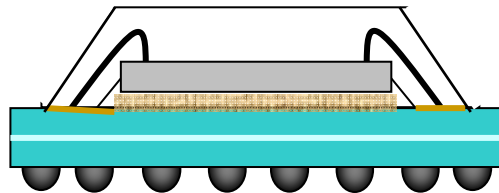
The die is directly attached to the substrate which plays as the connections between the chip and motherboard by using solder bumps rather than gold wires.



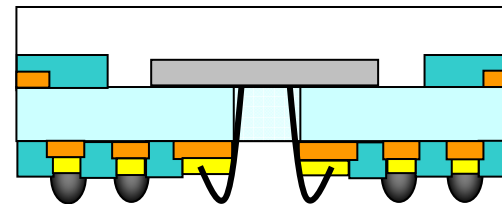


Types of Wire Bonding Substrates

•Ball Grid Array (BGA)

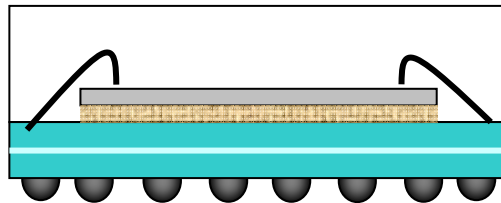


Plastic Ball Grid Array (PBGA)

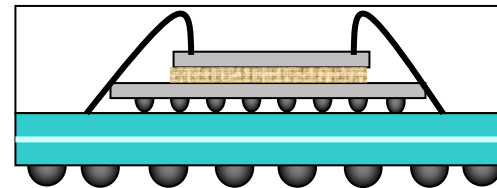


Window BGA

•Chip Scale Package (CSP)



Wire Bonding CSP (WB-CSP)

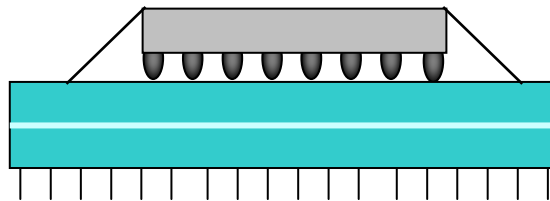


Flip Chip CSP (FC-CSP)

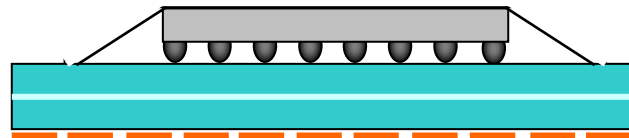


Types of Flip Chip Substrates

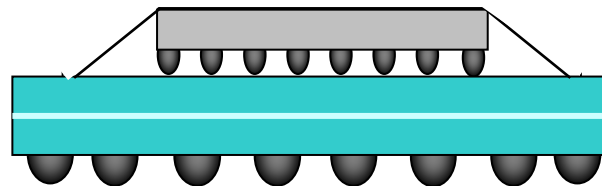
- FC-Pin Grid Array (FC-PGA)



- FC-Land Grid Array (FC-LGA)



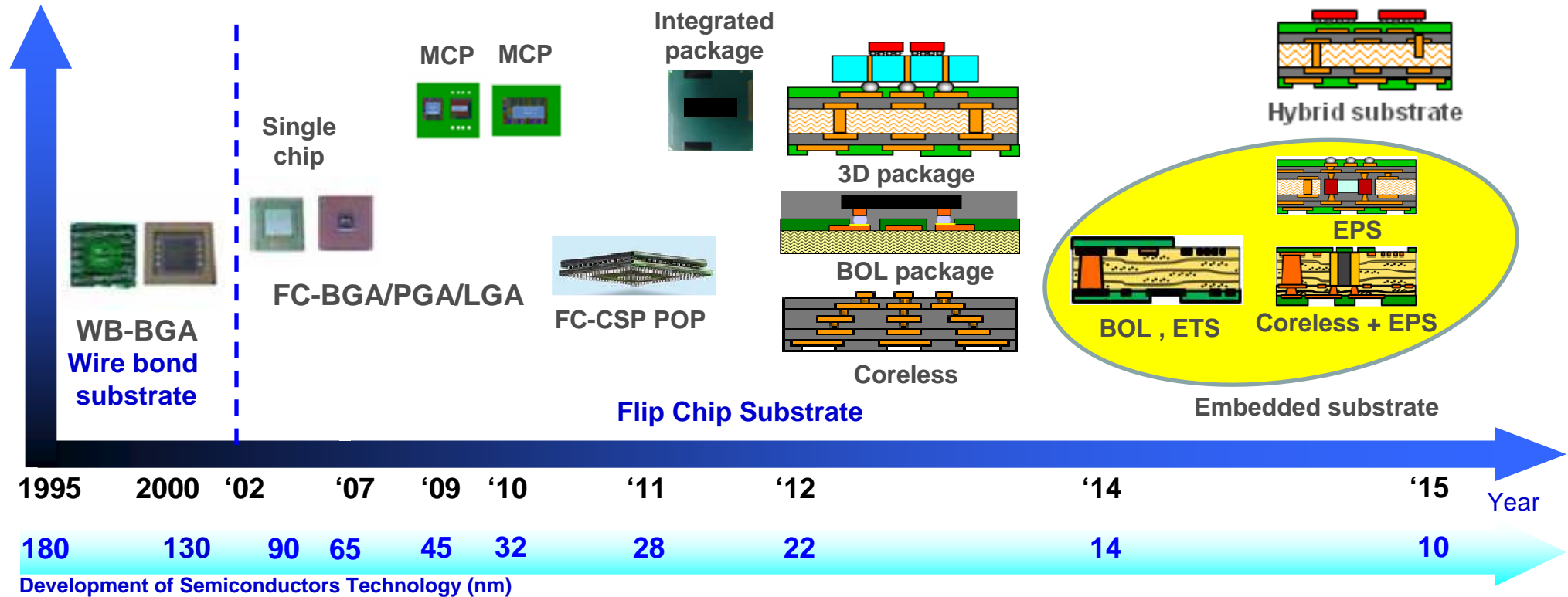
- FC-Ball Grid Array (FC-BGA)





IC Substrate Technology Development

Signal I/O Count



- Wire bond substrates were limited by the density of gold wire contacts on their edges and replaced by flip chip substrates.
- Electronics became thinner and tinier but high efficient and low power consuming, which made single-chip packaging evolve to multi-chips packaging and then to integrated packaging.
- Signal I/O count grew with chips' processing efficiency, and line width and space were tightened continuously; BOL and 3D package designs are the trend of future substrates.
- Embedded substrates reduced the thickness, bump counts, and costs.



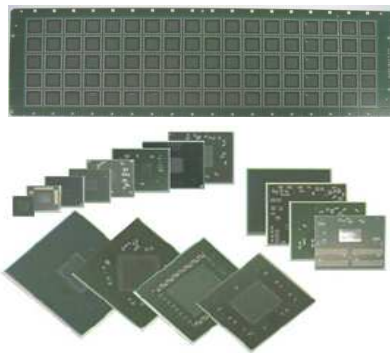
ADVANCED FLIP CHIP SUBSTRATE TECHNOLOGY

Various Product

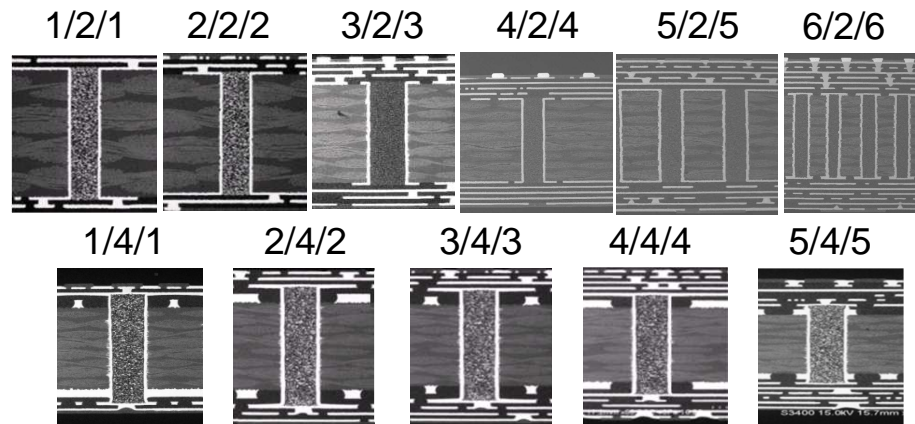
Coreless Technology

Package Size

10 ~ 55mmSQ

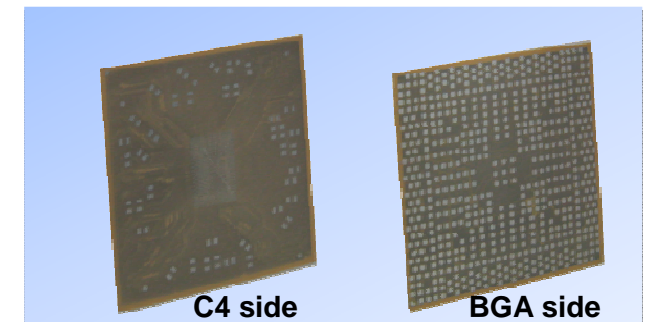


Build Up Type



Coreless

- Substrate thickness.: 0.25mm
 - Layer count: 5+1
 - Stacked via No.: 3 stacks
- Top view



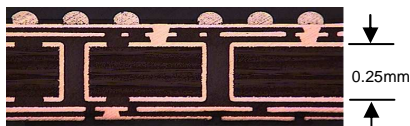
Advanced Technology

Thinner Core

0.1mm

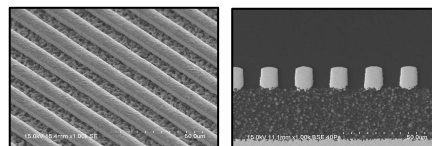


0.25mm

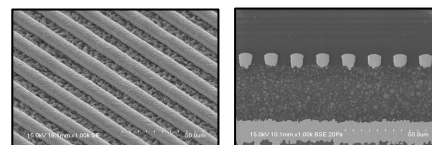


Line Width / Space

10 um / 10 um

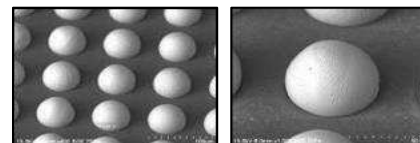
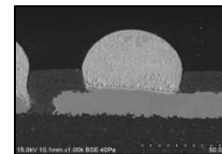


8 um / 8 um

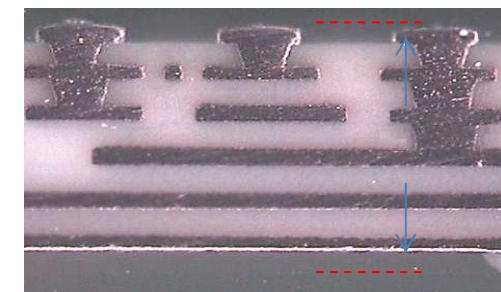


C4 Bump

SRO size : 55um
Bump pitch : 90um



X-Section



250um