Your Complete Connection

Flip Chip Selector Guide

Kulicke & Soffa

Future Developments

Currently, the Flip Chip Division of K&S has an active 300mm development program that includes research in copper bond pad interconnect, low-k dielectrics, increasing bump density architecture, and other WLP technologies.

Technology Licensing

K&S licenses its proprietary technology to companies who choose to contain internal interconnect processes or offer it as a part of their service (IC packaging, wafer fab, contract manufacturing, etc.).

Alloy Selection Guide

Standard Eutectic
37/63 (Pb/Sn)

High Lead (Pb)
95/5 (Pb/Sn)
90/10 (Pb/Sn)

Lead (Pb) Free
Sn/Ag/Cu

Low Alpha
37/63 (Pb/Sn)

Ultra-Low Alpha
37/63 (Pb/Sn)

For sales, service and manufacturing locations, visit:

www.kns.com

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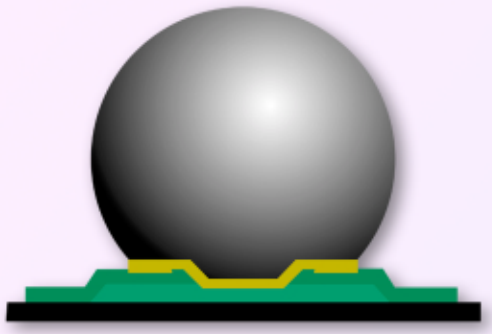
K&S Flip Chip Divison Technology Comparison

	FOC	FOC Redistribution	*Ultra* CSP	Polymer Collar WLP™	Spheron WLP
Cost Effective	+	–	+	O	+
Small Size & Thin	O	+	+	+	+
Electrical Performance	+	O	O/+	O/+	+
Solder Joint Reliability	+	O	O	+	+
2nd Level Reliability	+	O	O	+	+
Ease of Use – SMT	–	– / O	+	+	+
Underfill Required	Yes	Yes	No	No	No
Alloy Selection	37Pb/63Sn Low Alpha Ultra-Low Alpha 90Pb/10Sn Sn/Ag/Cu	37Pb/63Sn Low Alpha Ultra-Low Alpha Sn/Ag/Cu	37Pb/63Sn 95Pb/5Sn Sn/Ag/Cu	37Pb/63Sn Sn/Ag/Cu	37Pb/63Sn 95Pb/5Sn Sn/Ag/Cu
Second Sources	+	O	+	+	+

Key: + Good O Acceptable – Poor

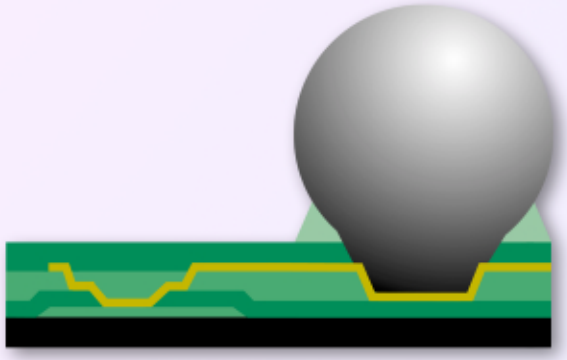
Bump Interconnect Options



FOC Flex-On-Cap (Standard Flip Chip)

Pitch: >125 microns
Matrix: >5000 I/O
Bump Height: 70 to 140 microns

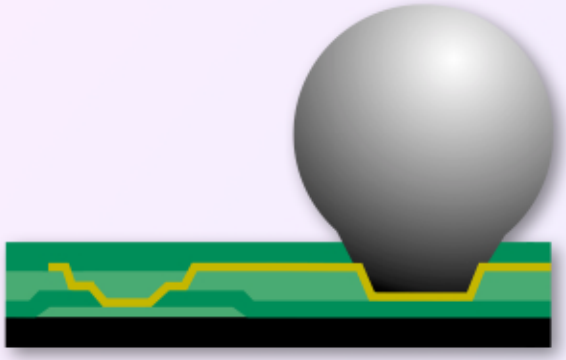
- Tight pitch design capability
- Designed for medium to high I/O count devices
- Superior electrical performance
- Flexible alloy selection



Polymer Collar WLP™

Pitch: 0.50mm to 1.0mm
Matrix: 9 x 9 array
Bump Height: 240 to 400 microns

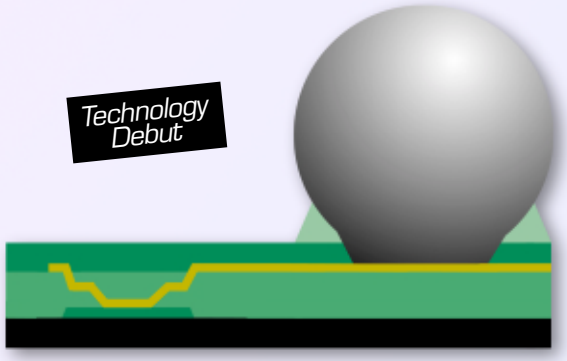
- Die sized WLP with improved solder joint reliability
- Redistributed or bump on I/O designs
- For medium I/O count devices
- Improved solder joint reliability



***Ultra* CSP®**

Pitch: 0.5mm to 1.0mm
Matrix: 6 x 6 array
Bump Height: 240 to 400 microns

- Die sized WLP
- Redistribution or bump on I/O designs
- For lower I/O count devices
- No underfill required



Spheron WLP™ (Bump-On-Polymer)

Pitch: 0.50mm to 1.0mm
Matrix: 10 x 10 array
Bump Height: 240 to 400 microns

- Die sized WLP with optimized electrical performance
- Redistributed or bump on I/O designs
- Specifically designed for non-nitride passivation, though compatible with all passivation structures
- Improved reliability for robust end use applications

Standard Bumping

K&S Flip Chip Division has the bumping experience and expertise needed to provide the correct wafer bumping solution for your I/C applications. For medium to high I/O count devices with tighter pitches, K&S offers the Flex-On-Cap solder bumping solution. The FOC bump process utilizes an industry proven under bump metalization (UBM) which provides superior reliability and the flexibility to utilize a broad range of solder alloys. Less costly than evaporated (C4) solutions and much more flexible than plated solutions, the FOC process has been proven in volume applications in diverse industries including automotive, medical, computing and consumer electronics. With proven 300mm scalability, direct bump on Cu interconnect capability and low-k dielectric compatibility, the FOC bumping process is an ideal solution for all your flip chip bumping needs. K&S offers high volume manufacturing in Phoenix, Arizona (15k wafers per week) and a worldwide network of licensees to provide design and manufacturing solutions for all of your logistical needs.

Wafer-Level Packaging

Kulicke & Soffa's *Ultra* CSP® is the WLP market share leader due to its die sized form factor, industry standard reliability and cost effective wafer-level manufacturing process. The *Ultra* CSP® is compatible with standard SMT placement equipment and product lines. Underfill is not required for final assembly. With the ability to redistribute peripheral wirebond pads to area arrays it is easy for you to migrate your existing TSOP or QFP package to the *Ultra* CSP® without changing your current IC design.

The Polymer Collar WLP leverages all of the advantages of the *Ultra* CSP® and offers 50% improved solder joint life to allow larger array devices to benefit from the advantages of a WLP. The Polymer Collar WLP utilizes an innovative supporting structure that surrounds the solder ball neck to produce significantly improved solder joint reliability. This enables more robust portable electronic end use products.

The Spheron WLP is the newest addition to the K&S WLP family. Utilizing a proven bump on polymer structure, the Spheron WLP provides optimized electrical performance for high end ICs. By utilizing a new polymer material the Spheron WLP provides a WLP which is compatible with all IC final passivations. The Spheron WLP provides solutions for next generation ICs.