SHENMAO SOLDER
Pb-free Material Edition

CHARACTERISTICS

SHENMAO's BGA and CSP solder sphere are developed and produced under a strict research and quality control policy. We are committed to be at leading edge of technical development in this field, and gained a high reputation. We have contributed to the development of lead free solder for protecting the global environment from lead contamination.

Characteristics of Shenmao Solder Sphere:

1. Purest Alloys

Composed principally of Sn alloy with Ag, Cu, Bi, Zn, etc. Other alloy compositions and requirements are available upon special request.

2. Precise Sizes

Sphere diameter from 0.76mm to 0.2mm.

3. Defect Quality Minimized

Our homogenized size, composition and liquidus temperature assure trouble free production. Fluid screening and sieving perfectly remove oversize and undersize balls. We have the technology to produce the highest quality NJ balls with excellent homogenization.

4. Reasonable Price

Idealized Ultra Micron Technology enables very competitive price by producing big volume. On top of it, our own developed technology reduces raw material cost and reflects on price directly, accordingly competitive price can be benefited to users.

5. Most Efficient Production Ability

With our newest in-house production machine, we can comply with customers request of various bulk volume order.

Tin/Lead BGA Sphere

Item / Product Code	Alloy Composition	Melting Point (°C)	Gravity	Remark
Sn62	Sn62/Pb36 /Ag2	179	8.3	All of alloy composition to meet JIS-Z 3282 E specification standards.
Sn63	Sn63/Pb37	183	8.4	

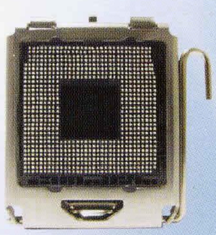
- All alloy composition were to conform to SONY Green Partner and comply RoHS requirement

Lead Free BGA Sphere

Item / Products Code	Alloy Composition	Melting Point (°C)	Gravity	Strength (kgf/mm)	Elongation (%)
PF603-S	Sn/Ag3.5/	221	7.36	4.18	58
*PF606-S	Sn/Ag3.0/Cu0.5/X	217~219	7.40	5.30	47
*PF607-S	Sn/Ag3.5/Cu0.7/X	217~219	7.42	5.34	48
*PF608-S	Sn/Ag3.9/Cu0.6/X	217~219	7.42	5.34	48
*PF609-S	Sn/Ag3.8/Cu0.7/X	217~219	7.42	5.34	48
*PF610-S	Sn/Ag3.0/Cu0.5/Ni0.06/Ge0.01	217~219	7.40	5.40	48
PF611-S	Sn/Ag3.0	217~220	7.34	6.60	27
*PF614-S	Sn/Ag4.0/Cu0.5/X	217~219	7.42	5.34	48
**PF636-S	Sn/Ag3.0/Cu0.5	217~219	7.40	5.30	47
**PF637-S	Sn/Ag3.5/Cu0.7	217~219	7.42	5.34	48
**PF638-S	Sn/Ag3.9/Cu0.6	217~219	7.42	5.34	48
**PF639-S	Sn/Ag3.8/Cu0.7	217~219	7.42	5.34	48
**PF640-S	Sn/Ag4.0/Cu0.5	217~219	7.42	5.34	48

" * " Fuji Electric Holdings Co., Ltd. Patent Number as follow :
Japan No.3296289, U.S No. 6179935B1, Germany No.19816671C2 (" * " add content of percentage of Ni and Ge)
" ** " Iowa State University Research Foundation Inc. Patent Number as following:
U.S No. 5527628

- **Alloy**: Pure tin & Solder alloys (Up to 300¢J melting point)
  - * Impurity refers to **JIS Z 3283 A standard specification.**
  - * Diameter : Ø 0.2~ 0.76mm
  - * Accuracy : Grade 1 ± 5£gm
    Grade 2 ±10£gm
    Grade 3 ±20£gm



Lead Free BGA Flux

Test Item / Flux Code	SMF-2	SMF-P	SMF-PW
Appearance	Yellow cream	Yellow cream	Yellow cream
Flux	ROL0	ROL1	ORH0
Viscosity (Pa.s)	25.5±1.5	26±2	27±2
Halide Content (%)	0	< 0.1	0
Fluorine	None	None	None
Copper Plate Corrosion Test	PASS	PASS	PASS
Copper Mirror Test	PASS	PASS	PASS
Sliver Chromate Test	PASS	PASS	PASS
SIR	$> 1 \times 10^9$	$> 1 \times 10^9$	$> 1 \times 10^9$
Electro Migration	PASS	PASS	PASS

- SHENMAO Solder Sphere characteristics Of excellent dimension accuracy and Uniformity, suits for BGA and CSP packages, Produced in our developed Special processes, so surface oxidization is barely seen and sphericity is Superior.