**Material Safety Data Sheet**

Product name : Cu-based silver plated leadframe

Date prepared : Sep 21th, 2009

Rev07

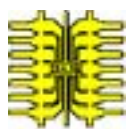
1. Product and Company Identification

| | |
|----------------------|--|
| Product name | Cu-based silver plated leadframe |
| Chemical family | Metal leadframe |
| Manufacturer | Dong Guan Chang An QPL Electronics Factory No 1, Pin Zhi Road, Xin An Industrial Park, Chang An Town, Dong Guan 523860, China Phone: 86-769-85391118 |
| Emergency assistance | 8/F Hale Weal Industrial Building, 22-28 Tai Chung Road, Tsuen Wan, New Territories, Hong Kong SAR Phone: (852) 24065111 |

2. Composition / Information of ingredients (% by weight)

| Constituent | CAS No. | EFTEC64T | CDA194 | C7025 | CDA151 | KLF125 | KFC |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Cu | 7440-50-8 | Balance | Balance | Balance | Balance | Balance | Balance |
| Fe | 7439-89-6 | - | 2.100-2.600 | 0.20max | 0.005 max | - | 0.05-0.15 |
| Si | 7440-21-3 | - | - | 0.250-1.200 | - | 0.6-0.75 | - |
| Mn | 7439-96-5 | - | - | 0.10max | 0.005 max | - | - |
| Ni | 7440-02-0 | - | - | 2.200-4.200 | - | 3.00-3.40 | - |
| Zr | 7440-67-7 | - | - | - | 0.050-0.150 | - | - |
| P | 7723-14-0 | - | 0.015-0.150 | - | - | - | 0.025-0.04 |
| Zn | 7440-66-6 | 0.180-0.260 | 0.050-0.200 | 1.0max | - | 0.20-0.35 | - |
| Mg | 7439-95-4 | - | - | 0.050-0.300 | - | - | - |
| Pb | 7439-92-1 | - | 0.01 max | - | - | - | - |
| Cr | 7440-47-3 | 0.200-0.300 | - | - | - | - | - |
| Co | 7440-48-8 | - | - | - | - | - | - |
| Sn | 7440-31-5 | 0.230-0.270 | - | - | - | 1.00-1.50 | - |
| Al | 7429-90-5 | - | - | - | 0.005 max | - | - |
| Ag | 7440-22-4 | 0.0738-1.998 | 0.0738-1.998 | 0.0738-1.998 | 0.0738-1.998 | 0.0738-1.998 | 0.0738-1.998 |
| *Polyimide | Trade secret | 0.0936 min | | | | | |
| *NBR | 9003-18-3 | 0.0156 max | | | | | |
| *Bismaleimide | 79922-55-7 | 0.0156 max | | | | | |
| *Phenol resin | 28453-20-5 | 0.0134 max | | | | | |

Remark: The compositions highlighted with asterisk (*) are from the tape material.



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3. Hazardous Identification

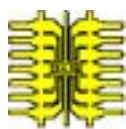
| | |
|------------|---|
| Inhalation | Not applicable |
| Ingestion | Not applicable |
| Skin | Skin contact with this material may cause, in some sensitive individual, an allergic response if element such as copper and nickel are present. |
| Eye | Particulate metal (dust) may be dangerous to the eye and surrounding tissue. |
| Toxicity | There is no information on the toxicity of this material. Under normal handling and use of the solid form of this material, there are few health hazards. |

4. First Aid Measures

| | |
|------------|---|
| Inhalation | Breathing difficulty caused by inhalation of dust requires remove to fresh air. If breathing has stopped, perform artificial respiration and obtain medical assistance at once. |
| Ingestion | Swallowing metal power or dust can be treated by having the affected person swallow large quantities of water and attempting to induce vomiting if conscious. Obtain medical assistance at once. Never give liquids to an unconscious person. |
| Skin | Skin cuts and abrasions can be treated by standard first aid. Skin contamination with dust or power can be removed by washing with soap and water. If irritation persists, obtain medical assistance at once. |
| Eye | Dust or powder should be flushed from the eyes with copious amounts of clean water. If irritation persists, obtain medical assistance. Contact lenses should not be worn if working with metal dusts and powders. |

5. Fire Fighting Measures

Not Applicable.



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6. Accidental Release Measures

Not Applicable.

7. Handling And Storage

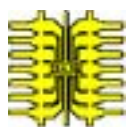
| | |
|----------|---|
| Handling | Good housekeeping in order to prevent the accumulation of dust. |
| Storage | Store in original sealed packing filled with nitrogen (N ₂). Storage condition: 21.5+/-6.5 and relative humidity <70%. |

8. Exposure Controls/Personal Protection

| | |
|------------------------|--|
| Ventilation | Good general ventilation should be sufficient for most condition. |
| Respiratory Protection | For most conditions, no respiratory protection should be needed; however, in dusty atmospheres, wear a NIOSH approved respirator to protect from dust. |
| Eye protection | For most condition, no eye protection should be needed; Wear safety glasses when risk of eye injury is present, for example, metal powder handling. |
| Skin protection | Wear clean body covering clothing. Wear gloves to prevent metal cuts and skin abrasions. |

9. Physical And Chemical Properties

| | |
|-------------------------------|---|
| Freezing point | Not applicable |
| Vapor pressure (mmHg) | Not applicable |
| Melting point / Boiling point | Not applicable |
| Solubility in water | Insoluble in water |
| Vapor density (Air=1) | Not applicable |
| Evaporation rate | Not applicable |
| Appearance | Solid (Copper color with silver at pad & coined lead) |
| Odor | No odor |



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10. Stability And Reactivity

| | |
|---|--|
| Flash point | None |
| Flammable limits | None (LFL: not applicable, UFL: not applicable) |
| Extinguishing media | Leadframe is noncombustible. Use of extinguishing media appropriate to the surrounding fire. |
| Chemical stability (Conditions to avoid) | Leadframe is a stable material. Contact with strong acids, bases or oxidizing agents. Contact with acetylene may form unstable acetylides. Burns spontaneously in gaseous chlorine. Acetic acid may form poisonous verdigris. |
| Incompatibility (Materials to avoid) | Mercury, acetylene, chlorine, hydrogen, peroxide. |

11. Toxicological Information

The products comply with RoHS & WEEE directive and REACH regulation.

12. Ecological Information

| | |
|-----------------------|---|
| Waste disposal Method | Maximize product recovery for reuse or recycling. Follow federal, state and local regulations to ascertain proper disposal procedure. |
| Environmental hazards | In solid form this material poses no special environmental problem, avoid overexposure by using protection equipment. |

13. Disposal Considerations

| | |
|----------------|---|
| Waste disposal | Maximize product recovery for reuse or recycling. Follow federal, state and local regulations to ascertain proper disposal procedure. |
|----------------|---|

14. Transport Information

| | |
|---|---------------------------------------|
| Transportation and hazardous material description | Not a hazardous material for shipping |
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15.Regulatory Information

The products comply with RoHS & WEEE directive and REACH regulation.

16.Other Information

Not applicable.

Additional Information

This information in this document is believed to be correct as of the date issued. However no warranty of merchantability, fitness for any use, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the results to be obtained from use of this information or the product, the safety of this product, or the hazards related to its use. This information and the product are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof.