Technical Data Sheet

THICK FILM MATERIALS

Product Type: Conductors

Product Name: C7720 (LPA913-294)

Copper Conductor / DPIS*
* Development Product Information Sheet

Description

C7720 is a lead-free copper conductor system developed for applying thick layers of copper onto **96 % alumina, and lapped and pre-oxidized AlN substrates**. It is intended for use where cost sensitive applications involving high thermal and electrical properties are required. C7720 can be applied by screen or stencil printing, dried in air and fired in a Nitrogen atmosphere.

Key Benefits

- High fired film thickness
- Excellent electrical and thermal properties
- Excellent fired film density
- Aluminum thick wire bondable
- Suitable for NiAu-plating (ENIG)
- Free of lead, cadmium and nickel

Processing

1) Spatulate well prior to processing.

   When stored in a refrigerator: The paste should have acquired room temperature before being opened, to avoid condensation.

2) Pretreatment of AlN substrates

   Prior printing, the pre-lapped substrate should be fired for 1.5 h in air at 1150 °C to for oxide layer for excellent cohesion.

3) Print through a 80 – 160 mesh stainless steel screen
4) Level at room temperature for 10 – 15 minutes.
5) Dry at 150 °C for 10 minutes.
6) Fire the paste in Nitrogen with O_2 between 2 – 10 ppm at 950 °C (peak) for 10 – 12 minutes, and with a total firing cycle time of approx. 60 minutes.

Thinner

HVS 507

Typical Properties (Paste)

Form	Pseudoplastic paste
Viscosity	30 – 90 Pas (25 °C, D = 100/s)
Solids	90.0 % ± 1.5 %
Printing Speed	Up to 6 cm/s
Coverage	c. 45 cm^2/g (FFT: 30 µm) (measured on alumina 96 %)
Shelf Life	6 months from date of shipment with correct storage (in a dry, cool (5 – 25 °C) and dark place with container tightly shut).

Typical Properties (Fired)[1]

Fired Film Thickn. (FFT)	a) 1 print[2] : 40 – 60 µm b) 6 prints[3] : 220 – 300 µm
Resistivity	≤ 0.8 mΩ/☐ (FFT: 50 µm)
Solderability (Sn96/Ag3.5/Cu0.5)	Good ≥ 95 % (245 °C, 5s dip) (assessment acc. DIN 41850-2 E)
Aged Adhesion (Sn96/Ag3.5/Cu0.5)	≥ 18 N (48 h, 150 °C)
Leach Resistance (Sn96/Ag3.5/Cu0.5)	≥ 5 dips (245 °C, 5s each)
Bond Adhesion[6]	300 µm Al wire (Al H11), initial
Pull test:	≥ 670 cN, 100 % wire break
Shear test:	≥ 1460 cN, no lift off, all bond Nuggets >> 50 %

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Legend:

[1] Typical properties based on laboratory test methods. For optimum results all materials should be fired in a profiled furnace supplied with dried, hydrocarbon and other contaminant free Nitrogen (PP-1).

[2] Measured after 1 x Print-Dry-Fire with an 80 mesh stainless steel screen; thickness of screen and emulsion combined was c. 145 µm, and the resultant printed track was 500 µm wide.

[3] Measured after 6 x Print-Dry-Fire with an 80 mesh stainless steel screen; thickness of screen and emulsion combined was c. 145 µm, and the resultant printed track was 500 µm wide.

[6] Al wire bonded in HERAEUS Labs; other values may depend on various parameters e.g. bonder, bonding speed, wire, loop lengths employed, etc.

* See the data sheet issue date (DD/MM/YY) as reference of validity of latest edition which is available on request

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