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MULTILAYER DIELECTRIC COMPOSITION

4905-C 4905-CH

The 4905-C and 4905-CH dielectrics are non-porous blue multilayer dielectrics with an excellent TCE match to 96% alumina. It is possible to print and re-fire many layers of these dielectrics with minimal distortion of the substrate. Substrate sizes up to 150 mm x 100 mm x 1 mm have been used successfully with multiple large area prints of 4905-CH. Screen gaps up to 1.8 mm are used with the large area screens (300 mm x 300 mm) necessary to print large circuits.

These dielectrics can be used in multilayer builds using gold or silver-based conductors. Typical systems in use are ESL 9695/4905-CH/9633-B and ESL 8836/4905-CH/8836. Via filling should be carried out using 8835-Via Fill in gold-based multilayer systems. It is possible to resolve 175 micrometer vias using 4905-CH.

The 4905-C dielectric is able to support the 3900 Series resistors (see separate resistor data sheet). Both gold based and silver based conductors may be used as the resistor termination on top of the dielectric but different resistor values and TCR shifts will be observed.

PASTE DATA

RHEOLOGY:	Thixotropic, screen printable paste
VISCOSITY: (Brookfield RVT, 10 rpm, ABZ spindle, 25.5°C±0.5°C)	250±25 Pa·s
COLOR:	blue
SHELF LIFE: (25°C)	6 months

4905-C/CH 0306-F

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See Caution and Disclaimer on other side.

PROCESSING

SCREEN MESH/EMULSION:

GOLD BEARING CONDUCTOR: 325/25 μm

SILVER BEARING CONDUCTOR: 200/25 μm

LEVELING TIME (25°C): 5-10 minutes

DRYING AT 125°C: 10-15 minutes

FIRING TEMPERATURE RANGE: 850°C-950°C, in air

OPTIMUM: 850°C

TIME AT PEAK: 10 minutes

RATE OF ASCENT/DESCENT: 50°C-60°C/minute

SUBSTRATE FOR CALIBRATION: 96% alumina

THINNER: ESL 401

TYPICAL PROPERTIES

FIRED THICKNESS (at least 2 layers between conductors on 96% alumina) $\geq 38 \mu\text{m}$

When using silver based conductors, a fired thickness $\geq 45\mu\text{m}$ is recommended.

APPROXIMATE COVERAGE: (40 μm thickness) 60-70 cm^2/g

DIELECTRIC CONSTANT (K) AT 1 kHz: (25°C) 7-10

DIELECTRIC CONSTANT (K) AT 1 MHz: (25°C) 7-11

DISSIPATION FACTOR AT 1 kHz: (depending upon conductor, 25°C) $\leq 0.25\%$

INSULATION RESISTANCE: (100 VDC) $\geq 10^{11} \Omega$

SALT TEST: (10 VDC in 1M NaCl) $< 1 \mu\text{A}$

PRESSURE COOKER: $\leq 10^2 \Omega$ change, initial to final

BREAKDOWN VOLTAGE: (25°C in air)

4905-C/4905-CH: $\geq 650 \text{ VDC}/25 \mu\text{m}$

VIA DEFINITION:

4905-C: 250 μm x 250 μm

4905-CH: 175 μm x 175 μm

SOLDER WETTABILITY OF CONDUCTORS OVER 4905-C AND 4905-CH DIELECTRICS:

(RMA flux, 5 sec. dip, 62 Sn/36 Pb/2 Ag, 220°C \pm 5°C)

9633-B (Ag/Pd) 95%

5837 (Pt/Au) 85-90%

9695 (Ag/Pd) 85-90%

For other information, please see the relevant conductor data sheet.

4905-C/CH 0306-F

CAUTION: Proper industrial safety precautions should be exercised in using these products. Use with adequate ventilation. Avoid prolonged contact with skin or inhalation of any vapors emitted during use or heating of these compositions. The use of safety eye goggles, gloves or hand protection creams is recommended. Wash hands or skin thoroughly with soap and water after using these products. Do not eat or smoke in areas where these materials are used. Refer to appropriate MSDS sheet.

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