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4905-C
4905-CH

MULTILAYER DIELECTRIC COMPOSITION

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 refire 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

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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)	≥ 38 µm
When using silver based conductors, a fired thickness ≥ 45µm 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)	≤ 0.25%
INSULATION RESISTANCE: (100 VDC)	≥ $10^{11}\ \Omega$
SALT TEST: (10 VDC in 1M NaCl)	< 1 µA
PRESSURE COOKER:	≤ $10^2\ \Omega$ change, initial to final
BREAKDOWN VOLTAGE: (25°C in air)	
4905-C/4905-CH:	≥ 650 VDC/25 µm
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±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.