MRA Laboratories, Inc.

TECHNICAL DATA SHEET
"K"-2200 X8R dielectric
"LF-222M"

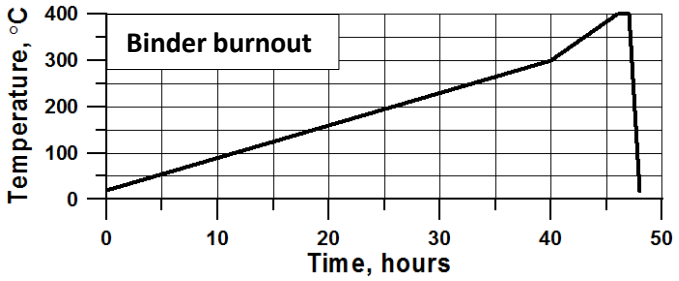
LF-222M is an environmentally friendly low fire X8R/BX dielectric with excellent reliability. It is RoHS compliant (not formulated with lead or cadmium). LF-222M meets the EIA X8R/BX temperature characteristic and exhibits very good insulation resistance to 200°C. This dielectric is compatible with up to 85% Ag / 15% Pd electrode systems.

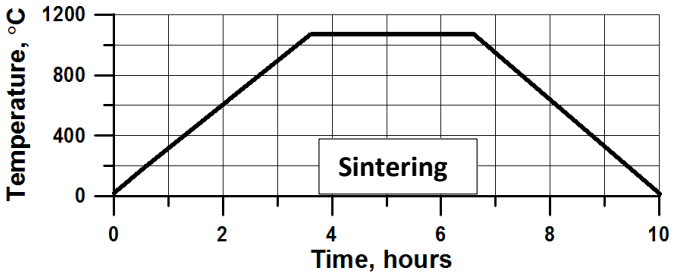
Key Features

- Environmentally friendly (RoHS compliant)
- Based on 8x rated 180°C HALT
- Good high temperature characteristics to 200°C
- Compatible with up to 85% Ag / 15% Pd electrode systems
- Excellent lot to lot uniformity

Typical powder properties

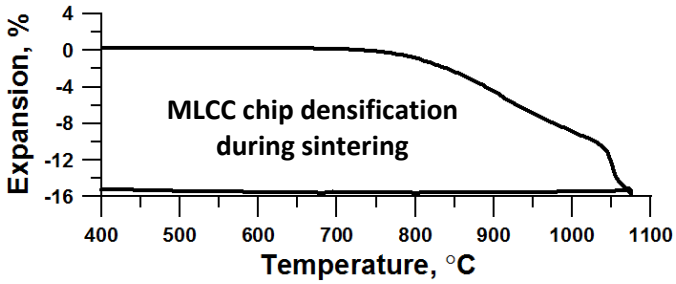
Powder density, g/cm³	≥ 5.80
Surface area, m²/g	2.65 ± 0.65
Particle size, µm	
D_{90}	≤ 1.50
D_{50}	0.60 ± 0.15
D_{10}	0.35 ± 0.15
LOI (650°C, 6 hours), %	≤ 0.30





Sintering conditions

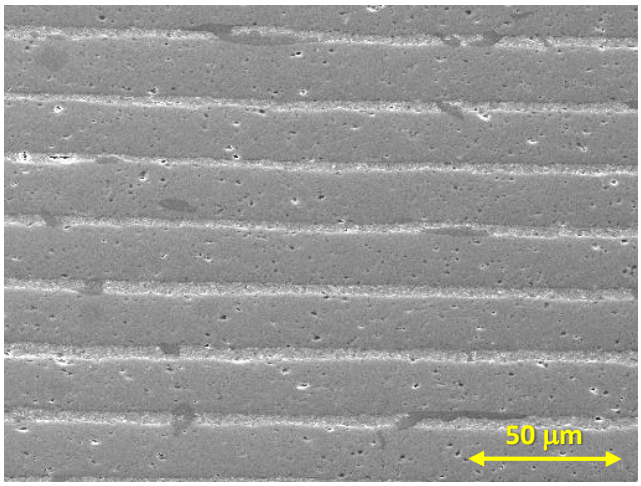
- Binder burnout up to 400°C in air
- Sintering 1070°C ± 20°C/3 hours in air
- Heating rate 5°C/min
- Open ZrO_2 setter
- Fired density ≥ 5.7 g/cm³

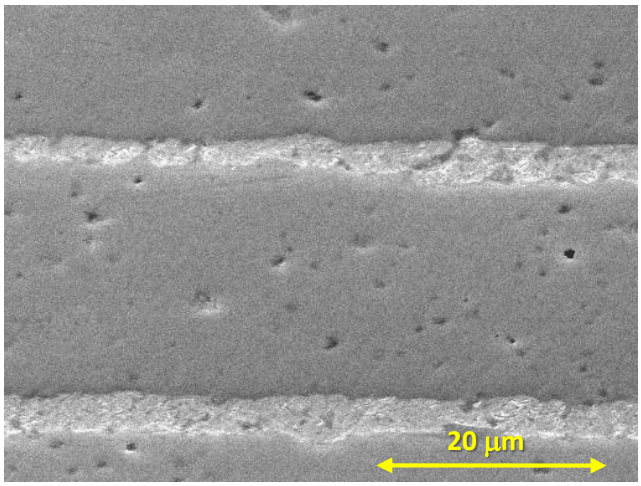


MRA - committed to excellence in multi-layer ceramic device technology.

ISO 9001:2008 BUREAU VERITAS Certification

Typical cross-sectional microstructure of sintered MLCC chip





Mechanical properties of the dielectric

- Coefficient of thermal expansion from 200°C to 600°C, µm/m*K — 12.1

Typical MLCC characteristics

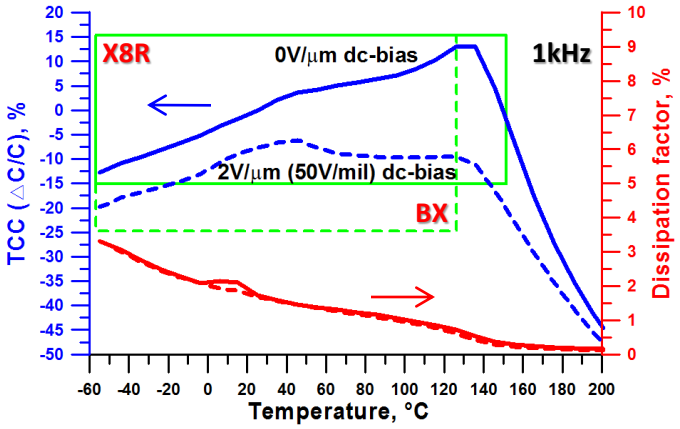
- Chip size — 0805
- Active layers — 10
- Electrode: 80% Ag / 20% Pd
- Dielectric thickness, µm — ~20
- Dielectric constant — 2300 ± 300
- Dissipation factor, % — ≤ 2.0 @ 1kHz, 1Vrms
- Insulation resistance at 400V and 180°C, Ω — > 10^{10}
- Dielectric withstanding voltage, V/µm — ≥ 40

TCC X8R (±15% from -55°C to +150°C)

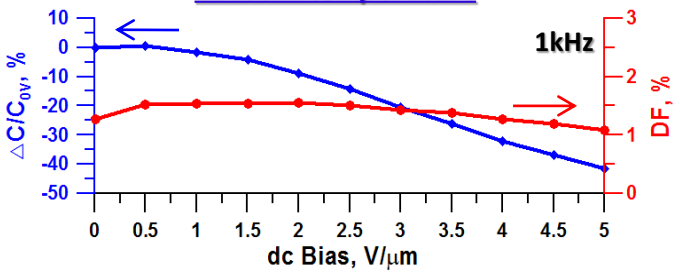
TCC BX (from +15% to -25% from -55°C to +125°C) at rated voltage

Temperature and voltage variation of capacitance

(50V rated MLCC chips)



Voltage variation of capacitance at room temperature



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