



MRA Laboratories, Inc.

# TECHNICAL DATA SHEET "K"-2800 X7R dielectric "LF-262"

LF-262 is a low fire X7R dielectric formulated from high purity sub-micron barium titanate. LF-262 has a dielectric constant of  $2900 \pm 400$ . This dielectric is compatible with 75% Ag / 25% Pd electrode systems.

## Key Features

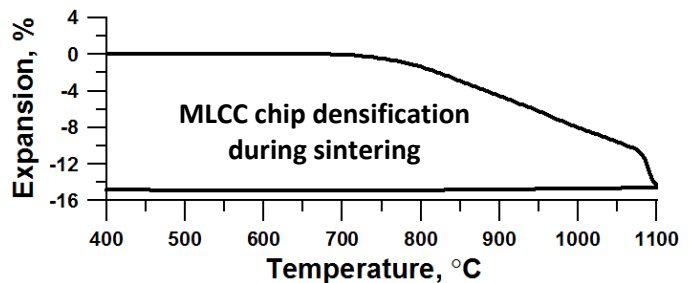
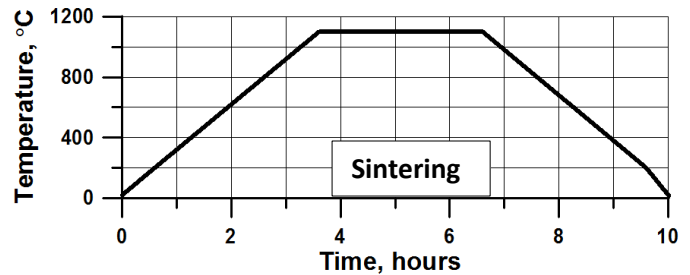
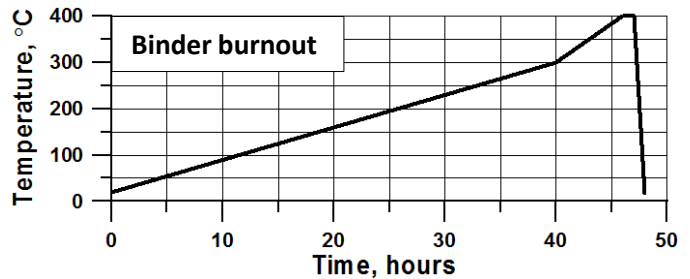
- ❖ User friendly
- ❖ Wide firing range of 1080 – 1120°C
- ❖ Very stable X7R TCC
- ❖ Compatible with up to 75% Ag / 25% Pd electrode systems

### Typical powder properties

- Powder density, g/cm<sup>3</sup>  $\geq 5.80$
- Surface area, m<sup>2</sup>/g  $2.50 \pm 0.50$
- Particle size,  $\mu\text{m}$ 
  - D<sub>90</sub>  $\leq 2.00$
  - D<sub>50</sub>  $0.600 \pm 0.200$
  - D<sub>10</sub>  $0.375 \pm 0.125$
- LOI (650°C, 6 hours), %  $\leq 0.30$

### Sintering conditions

- Binder burnout up to 400°C in air
- Sintering 1100°C  $\pm 20^\circ\text{C}$ /3 hours in air
- Heating rate 5°C/min
- Open ZrO<sub>2</sub> setter
- Fired density  $\geq 5.7 \text{ g/cm}^3$

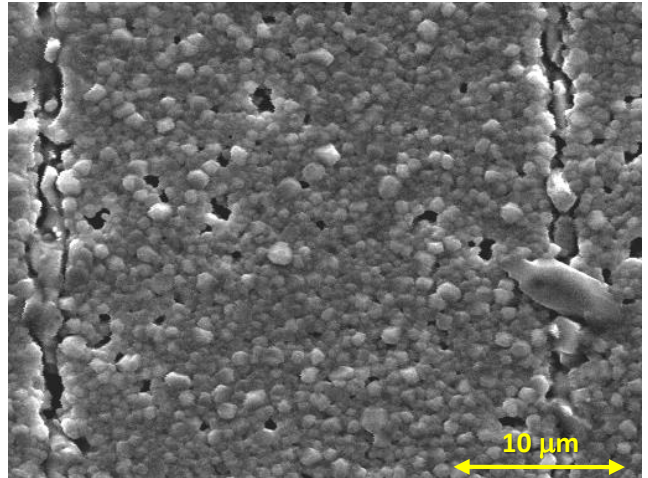
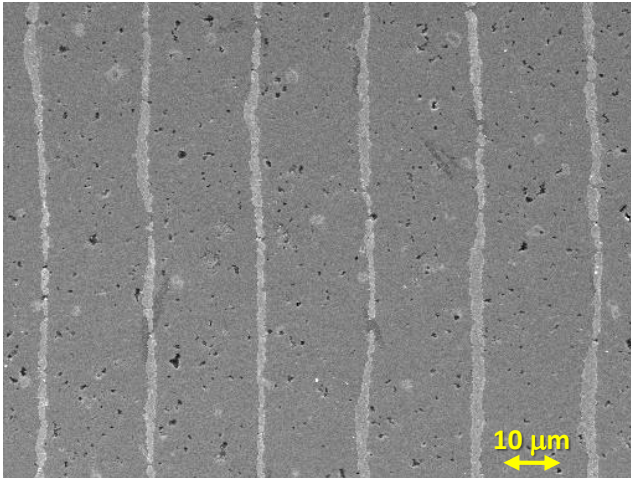


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multi-layer ceramic device technology.

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,  $\mu\text{m}/\text{m}\cdot\text{K}$  **11.5**

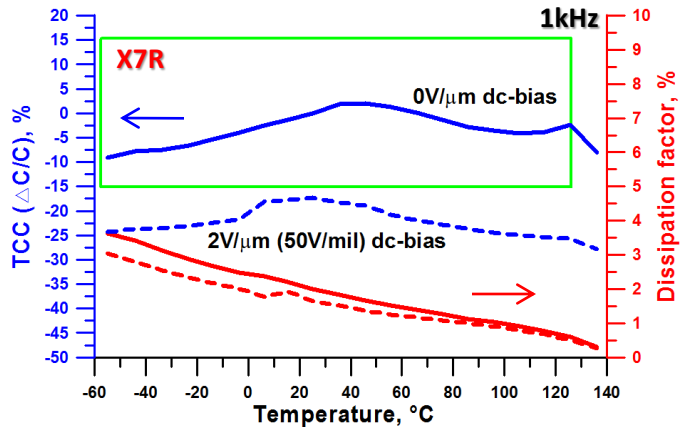
### Typical MLCC characteristics

- Chip size **0805**
- Active layers **10**
- Electrode: **70% Ag / 30% Pd**
- Dielectric thickness,  $\mu\text{m}$  **~20**
- Dielectric constant **2900 ± 400**
- Dissipation factor, % **≤ 2.0 @ 1kHz, 1Vrms**

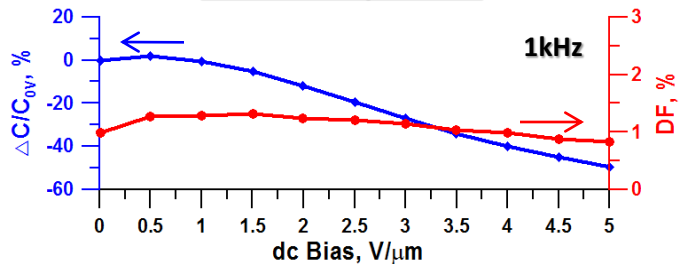
- Insulation resistance at 400V and 180°C,  $\Omega$  **> 10<sup>10</sup>**
- Dielectric withstanding voltage,  $\text{V}/\mu\text{m}$  **≥ 40**

**TCC X7R (±15% from -55°C to +125°C)**

### Temperature and voltage variation of capacitance (50V rated MLCC chips)



### Voltage variation of capacitance at room temperature



*The data presented is based on our research and is considered to be fair representation of this product. MRA makes no warranties, expressed or implied, as to its accuracy and assumes no liability out of its use by others.*

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