



## ESL ELECTROSCIENCE

CERAMIC TAPES &  
THICK-FILM MATERIALS

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### LO-FIRE TAPE

### 412xx

### RoHS Compliant\* Low-Temperature Capacitor Dielectric Tapes with Dielectric Constants of 18 to 250 for Burying in LTCC Tape

These tapes are flexible cast films of inorganic dielectric powder dispersed in an organic matrix and are designed to be used for capacitors buried in LTCC tape. The range of dielectric constant achievable depends on the firing schedule and host tape and is about 18-250. The dissipation factor for the tapes is 1-3% and exhibits X7R temperature characteristics.

#### PROCESSING PARAMETERS

<b>LAMINATING:</b>	21 MPa at 70°C
<b>FIRING TEMPERATURE:</b>	850°C-930°C
<b>TIME AT PEAK TEMPERATURE:</b>	15-60 minutes

#### TAPE CHARACTERISTICS

<b>TAPE THICKNESS:</b>	100-130 µm
<b>COLOR:</b>	beige
<b>SHELF LIFE:</b>	6 months

ESL Europe (KOP) 412xx 0403-B

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See Caution and Disclaimer on other side.

## FIRED TAPE PROPERTIES

(Calibrated on ESL41050/903-A)

PROPERTY	<u>41230</u>	<u>41240</u>	<u>41250</u>	<u>41260</u>
FIRED THICKNESS, $\mu\text{m}$	60-85	60-85	60-85	60-85
DIELECTRIC CONSTANT (K) @ 1kHz (fired at 875°C)	18 $\pm$ 25%	50 $\pm$ 25%	100 $\pm$ 25%	250 $\pm$ 25%
EIA DESIGNATION	X7R	X7R	X7R	X7R
DISSIPATION FACTOR @1kHz	$\leq$ 1.0%	$\leq$ 1.0%	$\leq$ 2.0%	$\leq$ 3.0%
BREAKDOWN VOLTAGE (VDC/25 $\mu\text{m}$ . 25°C air)	$\geq$ 200	$\geq$ 200	$\geq$ 200	$\geq$ 200
RECOMMENDED CONDUCTORS				ESL 903-A, 953

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\*None of the six substances referred to in the RoHS Directive (2002/95/EC) are used in the formulation of this product.

**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 vapours 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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