



# ESL Electro-Science

416 East Church Road • King of Prussia, PA 19406-2625, USA  
610-272-8000 • Fax: 610-272-6759 • www.ElectroScience.com • Sales@ElectroScience.com

## LO-FIRE TAPE

## 412XX

### Lead-Free 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: (20-25°C)</b>	6 months

412XX 0403 Rev B

#### ESL Affiliates

**ESL China** • Rm#1707, Tower A • City Center of Shanghai • 100 Zunyi Road • Shanghai, China 200051 Tel: (011-86)-21-62370336 • Fax: (011-86)-21-62370338 • eschina@guomai.sh.cn

**ESL Europe** • 8 Commercial Road • Reading, Berkshire, England RG2 0QZ • Tel: (011-44)-118-918-2400 • Fax: (011-44)-118-986-7331 • Sales@ESLEurope.co.uk

**ESL Nippon** • Sukegawa Bldg • 6<sup>th</sup> floor • 3-4 Yanagibashi 1-chome • Taito-ku • Tokyo 111, Japan • Tel: (011-81)-3-3864-8521 • Fax: (011-81)-3-3864-9270 • NipponSales@ESLNippon.com

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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**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.

**DISCLAIMER:** The product information and recommendations contained herein are based on data obtained by tests we believe to be accurate, but the accuracy and completeness thereof is not guaranteed. No warranty is expressed or implied regarding the accuracy of these data, the results obtained from the use hereof, or that any such use will not infringe any patent. Electro-Science assumes no liability for any injury, loss, or damage, direct or consequential arising out of its use by others. This information is furnished upon the condition that the person receiving it shall make their own tests to determine the suitability thereof for their particular use, before using it. User assumes all risk and liability whatsoever in connection with their intended use. Electro-Science's only obligation shall be to replace such quantity of the product proved defective.

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