

DATA SHEET

Multilayer suppressors EMI-suppression products

Supersedes data of February 2002

2004 Sep 01

EMI-suppression products

Multilayer suppressors

MULTILAYER SUPPRESSORS

Multilayer suppressors are a powerful solution for EMI/RFI attenuation for electronic equipment. Supplied in seven standard sizes (0402, 0603, 0805, 1206, 1210, 1806 and 1812), they have impedances between 6 and 2 000 Ω at 100 MHz.

When installed in series with signal and/or power circuits, high frequency noise is suppressed. There is no need for ground termination, which makes these devices very suitable for circuits with difficult ground. Typical suppression frequencies range from 10 MHz to 1 000 MHz and rated currents are between 0.1 and 6 A.

Multilayer suppressors are specially designed to reduce noise in low impedance circuits while keeping the signal free from distortion. This is because at the interfering frequencies these components behave as a resistor. The high frequency noise is converted into heat rather than reflected to the source. This dissipation prevents ringing and parasitic oscillations.

These characteristics can be used for many different purposes:

- Absorption of generated noise.
- Filtering and wave-shape correction of digital signals from high speed clock oscillators.
- Prevention of high frequency interference entering circuit electronics.

Features

- Monolithic structure for closed magnetic path and high reliability
- Standard EIA and EIAJ sizes: 0402, 0603, 0805, 1206, 1210, 1806 and 1812
- High impedance per volume which leads to effective high density circuits
- Suitable for wave and reflow soldering
- Plating material lead-free
- Wide range of impedance values
- Superior physical properties
- Available in standard EIA and EIAJ tape-and-reel
- Operating temperature -40°C to +125°C
- 100% sorting out on impedance

Main applications areas for multilayer suppressors are:

- computer and peripheral equipment: mother board, notebook, CD-Rom, DVD-Rom, CD-RW, scanner, hard disc, VGA card, sound card, LCD monitor, printer, PC server thumb drive, PCMCIA card, graphic card, etc.
- network: LAN card, hub, switcher, router set top box, etc.
- telecom: cell phone, ADSL, wired modem, cable modem, ISDN, GPS satellite receiver, etc.
- consumer: walkman, walkdisc, digital still camera (DSC), sound system, HDTV, projector, DVD player, VCD player, tuner for TV, cable modem, etc.

To help designers in the trial and error process of finding the most suitable suppression component, we offer a sample box with a selection of products.

Ordering code: SAMPLEBOX12

EMI-suppression products

Multilayer suppressors

TYPE NUMBER STRUCTURE

Type numbers for these products consist of the following:

- Product type
- Size
- Impedance.

Product type

MLS: Multilayer Suppressor.

MLP: Multilayer Power Beads.

MLN: Multilayer Narrow Band.

Size

0402: 1.0 × 0.5 × 0.5 mm
 0603: 1.6 × 0.8 × 0.8 mm
 0805: 2.0 × 1.25 × 0.9 mm
 1206: 3.2 × 1.6 × 1.1 mm
 1210: 3.2 × 2.5 × 1.3 mm
 1806: 4.5 × 1.6 × 1.6 mm
 1812: 4.5 × 3.2 × 1.5 mm.

Impedance value

Expressed in ohms (Ω)

First two digits are significant figures

Last digit is the number of zeros to follow.

EXAMPLES

600: 60 Ω
 101: 100 Ω
 121: 120 Ω
 151: 150 Ω
 301: 300 Ω
 102: 1000 Ω

Multilayer Suppressor MLS0603-4S7-600

| TYPE | SIZE | INTERNAL CODE | IMPEDANCE |
|------|------|---------------|-----------|
| MLS | 0603 | 4S7 | 60 |

Multilayer Power Bead MLP0603-121

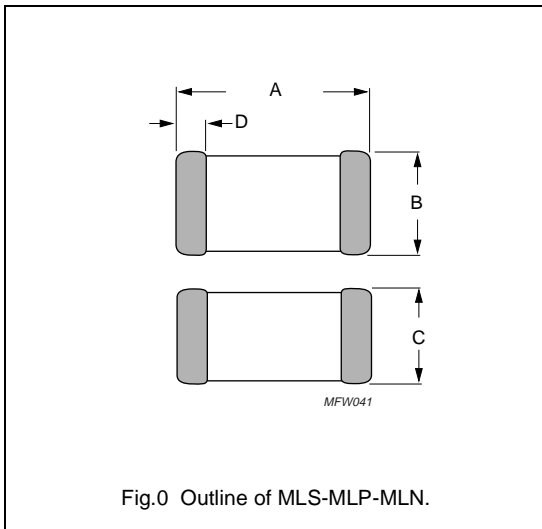
| TYPE | SIZE | IMPEDANCE |
|------|------|-----------|
| MLP | 0603 | 120 |

Multilayer Narrow Band MLN0603-601

| TYPE | SIZE | IMPEDANCE |
|------|------|-----------|
| MLN | 0603 | 600 |

Standard products are delivered taped on reel and have a tolerance on impedance of 25%.

MULTILAYER SUPPRESSORS



Product dimensions of Multilayer Suppressors MLS - MLP - MLN

| SIZE | A | B | C | D | mass (mg) |
|------|----------------|-----------------|----------------|-----------------|-----------|
| 0402 | 1.0 ± 0.15 | 0.5 ± 0.15 | 0.5 ± 0.15 | 0.25 ± 0.15 | ≈ 1 |
| 0603 | 1.6 ± 0.20 | 0.8 ± 0.15 | 0.8 ± 0.15 | 0.3 ± 0.20 | ≈ 5 |
| 0805 | 2.0 ± 0.20 | 1.25 ± 0.20 | 0.9 ± 0.20 | 0.5 ± 0.30 | ≈ 11 |
| 1206 | 3.2 ± 0.20 | 1.6 ± 0.20 | 1.1 ± 0.20 | 0.5 ± 0.30 | ≈ 28 |
| 1210 | 3.2 ± 0.20 | 2.5 ± 0.20 | 1.3 ± 0.20 | 0.5 ± 0.30 | ≈ 50 |
| 1806 | 4.5 ± 0.25 | 1.6 ± 0.20 | 1.6 ± 0.20 | 0.5 ± 0.30 | ≈ 55 |
| 1812 | 4.5 ± 0.25 | 3.2 ± 0.20 | 1.5 ± 0.20 | 0.5 ± 0.30 | ≈ 100 |

EMI-suppression products

Multilayer suppressors

Product specifications Multilayer Suppressors MLS

| SIZE | $ Z_{typ} $ at 100 MHz (Ω) | R_{DC} MAX. (Ω) | I MAX. (mA) | TYPE NUMBER | |
|----------------|-------------------------------------|----------------------------|-----------------|---------------------|---------------------|
| 0402 | 6 \pm 25% | 0.05 | 500 | MLS0402-4S4-060 | des |
| | 10 \pm 25% | 0.05 | 500 | MLS0402-4S4-100 | des |
| | 40 \pm 25% | 0.3 | 300 | MLS0402-4S4-400 | des |
| | 80 \pm 25% | 0.4 | 200 | MLS0402-4S4-800 | des |
| | 120 \pm 25% | 0.5 | 200 | MLS0402-4S4-121 | des |
| | 240 \pm 25% | 0.5 | 200 | MLS0402-4S4-241 | des |
| | 480 \pm 25% | 0.8 | 100 | MLS0402-4S4-481 | des |
| 0603 | 11 \pm 25% | 0.05 | 500 | MLS0603-4S4-110 | des |
| | 19 \pm 25% | 0.08 | 500 | MLS0603-4S4-190 | des |
| | 30 \pm 25% | 0.1 | 400 | MLS0603-4S7-300 | des |
| | 40 \pm 25% | 0.1 | 400 | MLS0603-4S7-400 | des |
| | 60 \pm 25% | 0.1 | 300 | MLS0603-4S7-600 | des |
| | 80 \pm 25% | 0.15 | 300 | MLS0603-4S7-800 | des |
| | 100 \pm 25% | 0.25 | 300 | MLS0603-4S7-101 | des |
| | 120 \pm 25% | 0.25 | 300 | MLS0603-4S7-121 | des |
| | 150 \pm 25% | 0.3 | 200 | MLS0603-4S7-151 | des |
| | 220 \pm 25% | 0.3 | 200 | MLS0603-4S7-221 | des |
| | 300 \pm 25% | 0.4 | 200 | MLS0603-4S7-301 | des |
| | 450 \pm 25% | 0.5 | 200 | MLS0603-4S7-451 | des |
| | 600 \pm 25% | 0.5 | 200 | MLS0603-4S7-601 | des |
| | 750 \pm 25% | 0.7 | 200 | MLS0603-4S7-751 | des |
| 1000 \pm 25% | 0.7 | 200 | MLS0603-4S7-102 | des | |
| 1500 \pm 25% | 1 | 50 | MLS0603-4S4-152 | des | |
| 0805 | 7 \pm 25% | 0.1 | 600 | MLS0805-4S4-070 | des |
| | 9 \pm 25% | 0.1 | 600 | MLS0805-4S4-090 | des |
| | 11 \pm 25% | 0.1 | 600 | MLS0805-4S4-110 | des |
| | 17 \pm 25% | 0.1 | 600 | MLS0805-4S4-170 | des |
| | 30 \pm 25% | 0.1 | 600 | MLS0805-4S4-300 | des |
| | 60 \pm 25% | 0.15 | 500 | MLS0805-4S4-600 | des |
| | 70 \pm 25% | 0.15 | 500 | MLS0805-4S7-700 | des |
| | 80 \pm 25% | 0.15 | 500 | MLS0805-4S7-800 | des |
| | 120 \pm 25% | 0.25 | 300 | MLS0805-4S7-121 | des |
| | 150 \pm 25% | 0.25 | 300 | MLS0805-4S7-151 | des |
| | 220 \pm 25% | 0.3 | 300 | MLS0805-4S7-221 | des |
| | 300 \pm 25% | 0.3 | 300 | MLS0805-4S7-301 | des |
| | 400 \pm 25% | 0.3 | 300 | MLS0805-4S7-401 | des |
| | 500 \pm 25% | 0.4 | 300 | MLS0805-4S7-501 | des |
| | 600 \pm 25% | 0.4 | 300 | MLS0805-4S7-601 | des |
| 750 \pm 25% | 0.5 | 200 | MLS0805-4S4-751 | des | |

EMI-suppression products

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| SIZE | $ Z_{typ} $ at 100 MHz (Ω) | R_{DC} MAX. (Ω) | I MAX. (mA) | TYPE NUMBER | |
|-------------------------------|--|-------------------------------|-----------------|---------------------|---------------------|
| 0805 | 1000 \pm 25% | 0.5 | 200 | MLS0805-4S7-102 | des |
| | 1500 ⁽¹⁾ \pm 25% | 0.6 | 200 | MLS0805-4S7-152 | des |
| | 2000 \pm 25% | 0.8 | 100 | MLS0805-4S4-202 | des |
| 1206 | 19 \pm 25% | 0.05 | 600 | MLS1206-4S4-190 | des |
| | 26 \pm 25% | 0.05 | 600 | MLS1206-4S4-260 | des |
| | 30 \pm 25% | 0.05 | 600 | MLS1206-4S4-300 | des |
| | 50 \pm 25% | 0.1 | 500 | MLS1206-4S4-500 | des |
| | 60 \pm 25% | 0.1 | 500 | MLS1206-4S4-600 | des |
| | 70 \pm 25% | 0.1 | 500 | MLS1206-4S4-700 | des |
| | 90 \pm 25% | 0.15 | 500 | MLS1206-4S4-900 | des |
| | 120 \pm 25% | 0.15 | 500 | MLS1206-4S4-121 | des |
| | 150 \pm 25% | 0.15 | 500 | MLS1206-4S4-151 | des |
| | 200 \pm 25% | 0.2 | 400 | MLS1206-4S4-201 | des |
| | 400 \pm 25% | 0.2 | 400 | MLS1206-4S4-401 | des |
| | 500 \pm 25% | 0.2 | 400 | MLS1206-4S4-501 | des |
| | 600 \pm 25% | 0.3 | 400 | MLS1206-4S4-601 | des |
| | 1000 ⁽¹⁾ \pm 25% | 0.4 | 200 | MLS1206-4S7-102 | des |
| 1200 ⁽¹⁾ \pm 25% | 0.4 | 200 | MLS1206-4S7-122 | des | |
| 2000 ⁽²⁾ \pm 25% | 0.6 | 200 | MLS1206-4S7-202 | des | |
| 1210 | 32 \pm 25% | 0.2 | 500 | MLS1210-4S4-320 | des |
| | 60 \pm 25% | 0.2 | 500 | MLS1210-4S4-600 | des |
| | 90 \pm 25% | 0.2 | 500 | MLS1210-4S4-900 | des |
| 1806 | 50 \pm 25% | 0.2 | 600 | MLS1806-4S4-500 | des |
| | 60 \pm 25% | 0.2 | 600 | MLS1806-4S4-600 | des |
| | 80 \pm 25% | 0.2 | 600 | MLS1806-4S4-800 | des |
| | 100 \pm 25% | 0.3 | 500 | MLS1806-4S4-101 | des |
| | 150 \pm 25% | 0.3 | 500 | MLS1806-4S4-151 | des |
| | 170 \pm 25% | 0.3 | 500 | MLS1806-4S4-171 | des |
| 1812 | 70 \pm 25% | 0.3 | 500 | MLS1812-4S4-700 | des |
| | 120 \pm 25% | 0.3 | 500 | MLS1812-4S4-121 | des |

Note

1. at 50 MHz
2. at 30 MHz

- RDC: Resistance of component for DC current.
- Maximum rated current: measure of current capacity of the component. When the maximum rated current is applied, temperature rise shall not exceed 20°C.
- Standard tolerance on impedance is $\pm 25\%$.
- Other tolerances can be provided upon request.
- Operating temperature: -40°C to +125°C.

EMI-suppression products

Multilayer suppressors

Product specifications Multilayer Power Beads MLP

| SIZE | $ Z_{typ} $ at 100 MHz (Ω) | R_{DC} MAX. (Ω) | I MAX. (mA) | TYPE NUMBER | |
|-------------------------------|-------------------------------------|----------------------------|-------------|---------------------|---------------------|
| 0603 | 11 \pm 25% | 0.02 | 4000 | MLP0603-110 | des |
| | 25 \pm 25% | 0.03 | 3000 | MLP0603-250 | des |
| | 40 \pm 25% | 0.035 | 3000 | MLP0603-400 | des |
| | 60 \pm 25% | 0.04 | 3000 | MLP0603-600 | des |
| | 120 \pm 25% | 0.07 | 1800 | MLP0603-121 | des |
| | 300 \pm 25% | 0.14 | 1500 | MLP0603-301 | des |
| | 500 \pm 25% | 0.18 | 1500 | MLP0603-501 | des |
| | 600 \pm 25% | 0.2 | 1000 | MLP0603-601 | des |
| | 1000 \pm 25% | 0.25 | 800 | MLP0603-102 | des |
| 0805 | 11 \pm 25% | 0.01 | 6000 | MLP0805-110 | des |
| | 17 \pm 25% | 0.02 | 5000 | MLP0805-170 | des |
| | 30 \pm 25% | 0.02 | 4000 | MLP0805-300 | des |
| | 60 \pm 25% | 0.03 | 3000 | MLP0805-600 | des |
| | 80 \pm 25% | 0.04 | 3000 | MLP0805-800 | des |
| | 120 \pm 25% | 0.04 | 3000 | MLP0805-121 | des |
| | 200 \pm 25% | 0.05 | 2500 | MLP0805-201 | des |
| | 300 \pm 25% | 0.08 | 2000 | MLP0805-301 | des |
| | 600 \pm 25% | 0.1 | 2000 | MLP0805-601 | des |
| 1000 \pm 25% | 0.12 | 1500 | MLP0805-102 | des | |
| 1206 | 19 \pm 25% | 0.015 | 7000 | MLP1206-190 | des |
| | 32 \pm 25% | 0.015 | 4000 | MLP1206-320 | des |
| | 50 \pm 25% | 0.02 | 4000 | MLP1206-500 | des |
| | 70 \pm 25% | 0.025 | 3000 | MLP1206-700 | des |
| | 80 \pm 25% | 0.025 | 3000 | MLP1206-800 | des |
| | 100 \pm 25% | 0.03 | 2500 | MLP1206-101 | des |
| | 300 \pm 25% | 0.06 | 2000 | MLP1206-301 | des |
| | 600 \pm 25% | 0.1 | 1800 | MLP1206-601 | des |
| | 1000 ⁽¹⁾ \pm 25% | 0.15 | 1200 | MLP1206-102 | des |
| | 1200 ⁽¹⁾ \pm 25% | 0.18 | 1000 | MLP1206-122 | des |
| 1500 ⁽¹⁾ \pm 25% | 0.2 | 800 | MLP1206-152 | des | |
| 1210 | 60 \pm 25% | 0.025 | 4000 | MLP1210-600 | des |
| | 90 \pm 25% | 0.025 | 3000 | MLP1210-900 | des |
| 1806 | 50 \pm 25% | 0.02 | 6000 | MLP1806-500 | des |
| | 60 \pm 25% | 0.02 | 5000 | MLP1806-600 | des |
| | 80 \pm 25% | 0.025 | 4000 | MLP1806-800 | des |
| | 150 \pm 25% | 0.1 | 2000 | MLP1806-151 | des |
| 1812 | 70 \pm 25% | 0.03 | 6000 | MLP1812-700 | des |
| | 120 \pm 25% | 0.03 | 4000 | MLP1812-121 | des |

EMI-suppression products

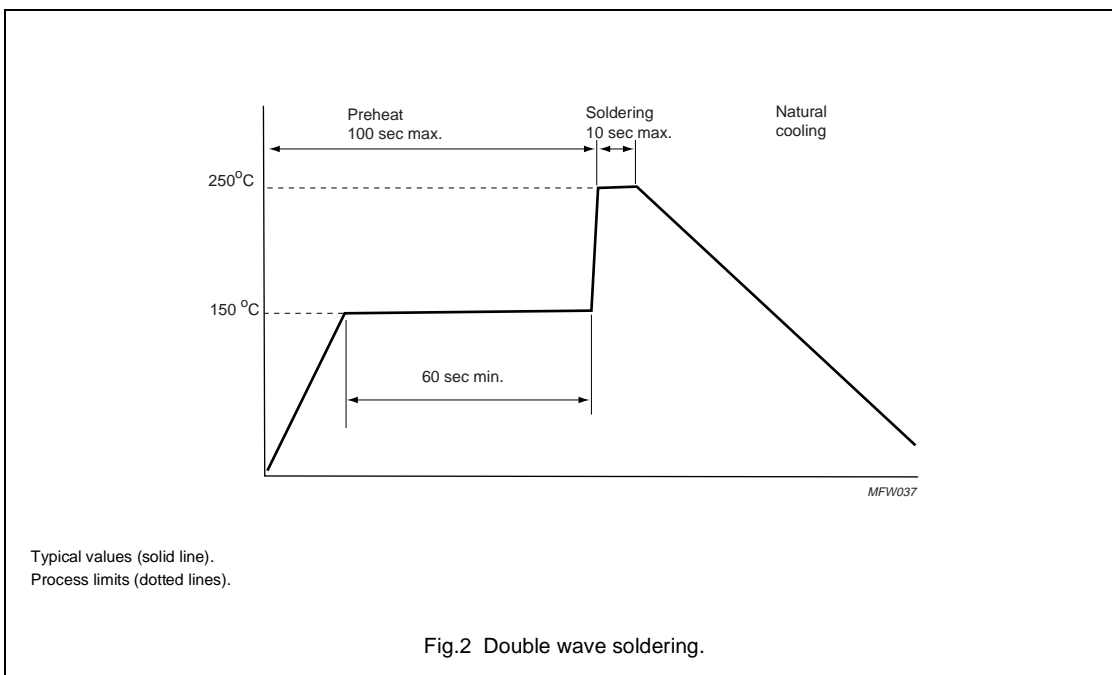
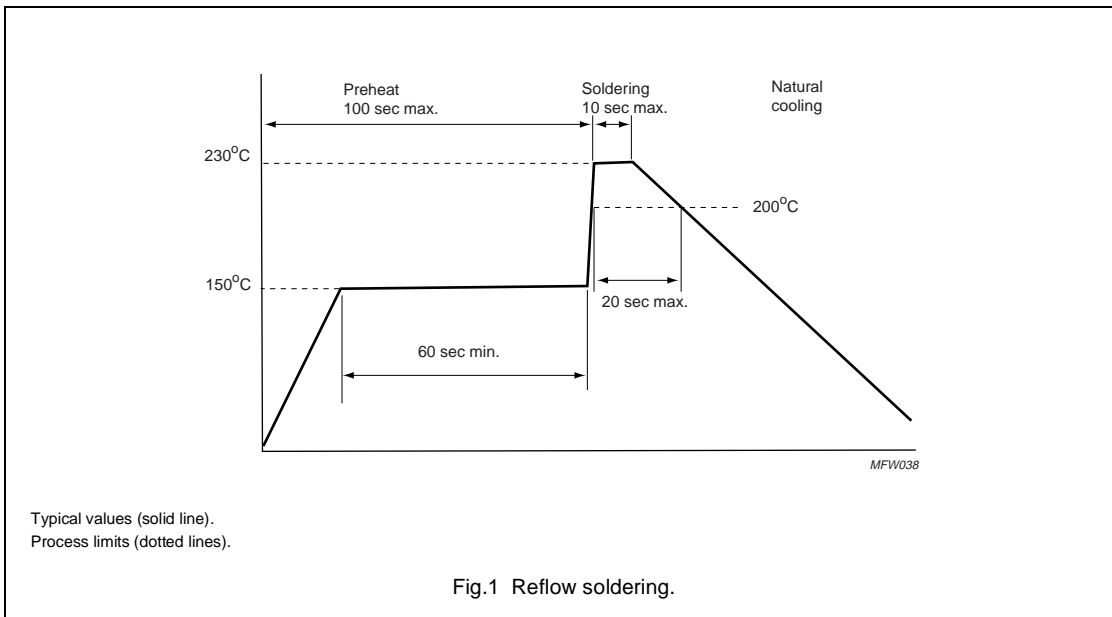
Multilayer suppressors

Product specifications Multilayer Narrow Band MLN

| SIZE | $ Z_{typ} $ at 100 MHz (Ω) | R_{DC} MAX. (Ω) | I MAX. (mA) | TYPE NUMBER | |
|----------------|-------------------------------------|----------------------------|-------------|-------------|-----|
| 0603 | 6 \pm 25% | 0.05 | 500 | MLN0603-060 | des |
| | 10 \pm 25% | 0.07 | 400 | MLN0603-100 | des |
| | 40 \pm 25% | 0.30 | 300 | MLN0603-400 | des |
| | 80 \pm 25% | 0.50 | 300 | MLN0603-800 | des |
| | 120 \pm 25% | 0.40 | 300 | MLN0603-121 | des |
| | 240 \pm 25% | 0.60 | 200 | MLN0603-241 | des |
| | 300 \pm 25% | 0.60 | 200 | MLN0603-301 | des |
| | 480 \pm 25% | 0.70 | 150 | MLN0603-481 | des |
| | 600 \pm 25% | 0.60 | 100 | MLN0603-601 | des |
| 0805 | 6 \pm 25% | 0.07 | 800 | MLN0805-060 | des |
| | 11 \pm 25% | 0.10 | 700 | MLN0805-110 | des |
| | 26 \pm 25% | 0.20 | 600 | MLN0805-260 | des |
| | 32 \pm 25% | 0.20 | 600 | MLN0805-320 | des |
| | 60 \pm 25% | 0.30 | 500 | MLN0805-600 | des |
| | 75 \pm 25% | 0.30 | 500 | MLN0805-750 | des |
| | 90 \pm 25% | 0.30 | 500 | MLN0805-900 | des |
| | 120 \pm 25% | 0.40 | 400 | MLN0805-121 | des |
| | 150 \pm 25% | 0.40 | 400 | MLN0805-151 | des |
| | 170 \pm 25% | 0.50 | 400 | MLN0805-171 | des |
| | 220 \pm 25% | 0.50 | 300 | MLN0805-221 | des |
| | 300 \pm 25% | 0.50 | 300 | MLN0805-301 | des |
| | 400 \pm 25% | 0.60 | 300 | MLN0805-401 | des |
| | 500 \pm 25% | 0.70 | 200 | MLN0805-501 | des |
| | 600 \pm 25% | 0.50 | 200 | MLN0805-601 | des |
| 1000 \pm 25% | 1.0 | 100 | MLN0805-102 | des | |
| 1200 \pm 25% | 0.70 | 100 | MLN0805-122 | des | |
| 1500 \pm 25% | 0.70 | 100 | MLN0805-152 | des | |
| 1206 | 32 \pm 25% | 0.20 | 600 | MLN1206-320 | des |
| | 60 \pm 25% | 0.30 | 500 | MLN1206-600 | des |
| | 80 \pm 25% | 0.30 | 500 | MLN1206-800 | des |
| | 90 \pm 25% | 0.30 | 500 | MLN1206-900 | des |
| | 120 \pm 25% | 0.40 | 400 | MLN1206-121 | des |
| | 150 \pm 25% | 0.40 | 400 | MLN1206-151 | des |
| | 200 \pm 25% | 0.50 | 300 | MLN1206-201 | des |
| | 220 \pm 25% | 0.50 | 300 | MLN1206-221 | des |
| | 350 \pm 25% | 0.60 | 300 | MLN1206-351 | des |
| | 400 \pm 25% | 0.60 | 300 | MLN1206-401 | des |
| | 600 \pm 25% | 0.80 | 300 | MLN1206-601 | des |
| | 1200 \pm 25% | 1.00 | 200 | MLN1206-122 | des |

MOUNTING

Soldering profiles



Dimensions of solderlands

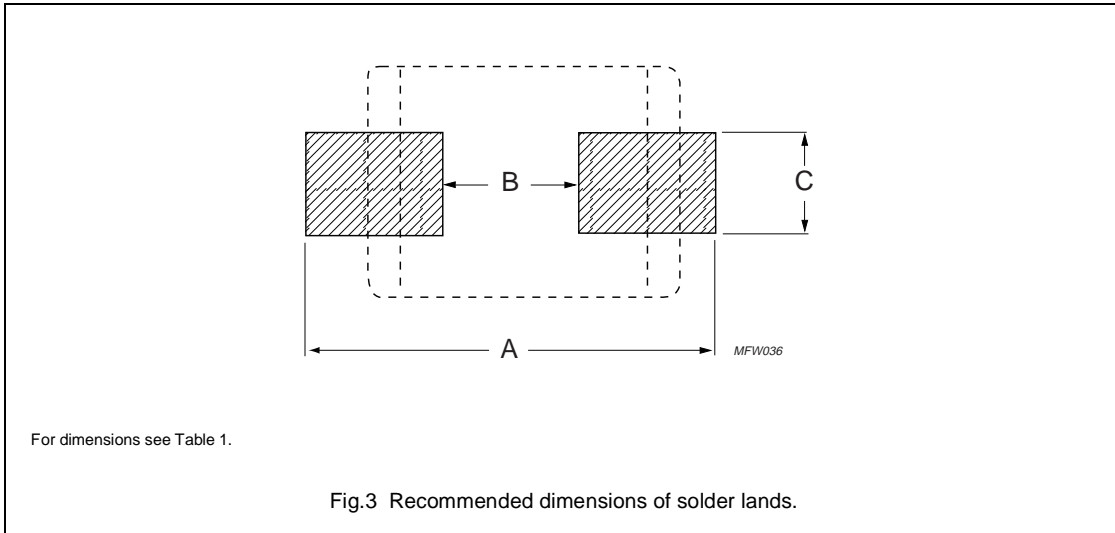


Table 1 Solder land dimensions for MLS, MLP and MLN types; see Fig.3

| SIZE | FOOTPRINT DIMENSIONS (mm) | | |
|------|------------------------------|-----|-----|
| | A | B | C |
| 0402 | 1.2 – 1.4 | 0.4 | 0.4 |
| 0603 | 2.4 – 3.4 | 0.8 | 0.6 |
| 0805 | 3.0 – 4.0 | 1.2 | 1.0 |
| 1206 | 4.2 – 5.2 | 2.0 | 1.2 |
| 1210 | 5.5 – 6.5 | 2.0 | 1.8 |
| 1806 | 5.5 – 6.5 | 3.0 | 1.2 |
| 1812 | 5.5 – 6.5 | 3.0 | 2.4 |

BLISTER TAPE AND REEL DIMENSIONS

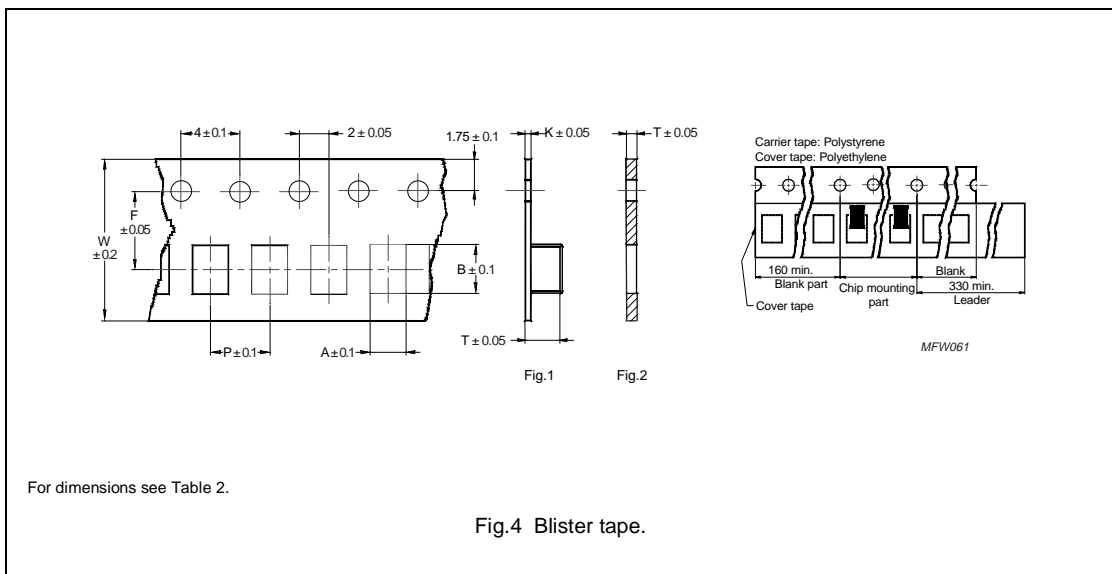


Table 2 Dimensions of blister tape for relevant product size code; see Fig.4

| DIMENSION | PRODUCT SIZE CODE | | | | | | |
|-----------|-------------------|-------|------|------|------|------|------|
| | 0402 | 0603 | 0805 | 1206 | 1210 | 1806 | 1812 |
| A | 0.65 | 0.975 | 1.54 | 1.94 | 2.80 | 1.94 | 3.64 |
| B | 1.15 | 1.8 | 2.32 | 3.54 | 3.42 | 4.94 | 4.94 |
| T | 0.7 | 1.05 | 1.15 | 1.29 | 1.64 | 1.90 | 1.80 |
| W | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 12 | 12 |
| P | 2.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 8.0 |
| F | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 5.5 | 5.5 |
| K | - | - | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 |
| Tape fig. | 2 | 2 | 1 | 1 | 1 | 1 | 1 |

MATERIAL BLISTER TAPE:

- Sizes 0402 and 0603: paper
- Other sizes: Polystyrene

MATERIAL COVER FILM:

- Polyethylene

EMI-suppression products

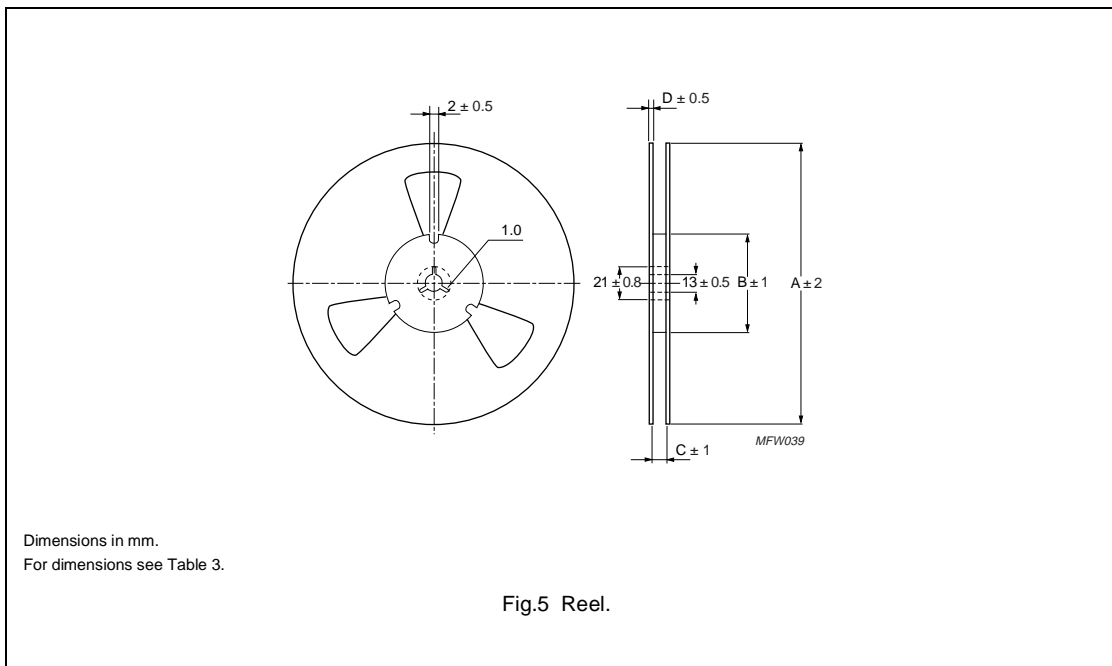


Table 3 Reel dimensions; see Fig.5

| DIMENSION | PRODUCT SIZE CODE | | | | | | |
|-----------|-------------------|------|------|------|------|------|------|
| | 0402 | 0603 | 0805 | 1206 | 1210 | 1806 | 1812 |
| A | 178 | 178 | 178 | 178 | 178 | 178 | 178 |
| B | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| C | 10 | 10 | 10 | 10 | 10 | 14 | 14 |
| D | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

Table 4 Packing quantities

| | PRODUCT SIZE CODE | | | | | | |
|------------------|-------------------|-------|-------|-------|-------|-------|-------|
| | 0402 | 0603 | 0805 | 1206 | 1210 | 1806 | 1812 |
| Pcs./reel | 10 000 | 4 000 | 4 000 | 3 000 | 2 500 | 2 000 | 1 000 |

EMI-suppression products

Multilayer suppressors




DATA SHEET STATUS DEFINITIONS

| DATA SHEET STATUS | PRODUCT STATUS | DEFINITIONS |
|---------------------------|----------------|--|
| Preliminary specification | Development | This data sheet contains preliminary data. Ferroxcube reserves the right to make changes at any time without notice in order to improve design and supply the best possible product. |
| Product specification | Production | This data sheet contains final specifications. Ferroxcube reserves the right to make changes at any time without notice in order to improve design and supply the best possible product. |

DISCLAIMER

Life support applications — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Ferroxcube customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Ferroxcube for any damages resulting from such application.

PRODUCT STATUS DEFINITIONS

| STATUS | INDICATION | DEFINITION |
|------------------|---|--|
| Prototype |  | These are products that have been made as development samples for the purposes of technical evaluation only. The data for these types is provisional and is subject to change. |
| Design-in |  | These products are recommended for new designs. |
| Preferred | | These products are recommended for use in current designs and are available via our sales channels. |
| Support |  | These products are not recommended for new designs and may not be available through all of our sales channels. Customers are advised to check for availability. |

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Largest Supplier of Electrical and Electronic Components

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[EFD30/15/9-3C90](#) [TX63/38/25-3E25](#) [EFD15/8/5-3F3-A63-S](#) [T102/66/25-3C90](#) [ETD59/31/22-3C90](#) [4312-020-37500](#) [ETD49-3C94](#) [RM10/I-3C90-A250](#) [E25/13/7-3F3](#) [CPH-U15/11/6-1S-4P](#) [4322-021-35150](#) [RM6S-3H3](#) [E55/28/21-3F3](#) [CON-P30/19](#) [U15/11/6-3C94](#) [CLI-EFD15](#)
[EFD30/15/9-3F3](#) [058374D](#) [EFD15/8/5-3F3-S](#) [058351G](#) [TN32/19/13-3F3](#) [U93/76/16-3C90](#) [RM10/I3C90-A400](#) [CSHS-EFD15-1S-8P-Z](#)
[RM14/I-3F3](#) [EFD20/10/7-3F3](#) [CSH-EFDD20-1S-8P](#) [E42/21/15-3C94](#) [E65/32/27-3F3](#) [TX10/6/4-3E5](#) [EFD20-3C90/K](#) [ETD54-3C94](#) [CLI-](#)
[EFD30](#) [TX102/66/15-3C11](#) [TX58/41/18-3C11](#) [CLI-EP13](#) [009968H](#) [4322-020-97010](#) [TX58/41/18-3E25](#) [TN13/7.5/5-3F3](#) [EFD10-3F3-S](#) [CLI-](#)
[EP7](#) [E55/28/21-3C94](#)