

SMP253 Series Metallized Impregnated Paper, Class Y2, 250 VAC, Surface Mount Device

Overview

The SMP253 Series is constructed of multilayer metallized paper, encapsulated and impregnated in self-extinguishing material meeting the requirements of UL 94 V-0.

Applications

Typical applications include worldwide use as electromagnetic interference suppressor in all Y2 applications, line-to-earth.

Benefits

- Approvals: ENEC, UL, CSA
- Rated voltage: 250 VAC 50/60 Hz
- Capacitance range: 0.001 – 0.0047 μ F
- Size code: 5045, 12.7 mm
- Capacitance tolerance: \pm 20%
- Climatic category: 40/100/56/B, IEC 60068-1
- Tape and reel packaging in accordance with IEC 60286-3
- RoHS Compliant and lead-free terminations
- Operating temperature range of -40°C to +100°C
- 100% screening factory test at 3,000 VDC



Legacy Part Number System

| SMP253 | M | A | 4100 | M | TR24 |
|----------------------|---------------------|------------------|--|-----------------------|----------------------------|
| Series | Rated Voltage (VAC) | Chip Length (mm) | Capacitance Code (pF) | Capacitance Tolerance | Packaging |
| Y2, Metallized Paper | M = 250 | A = 12.7 | The last three digits represent significant figures. The first digit specifies the total number of digits. | M = \pm 20% | See Ordering Options Table |

New KEMET Part Number System

| P | 101 | AA | 102 | M | 250 | V |
|-----------------|----------------------|---------------------|--|-----------------------|---------------------|----------------------------|
| Capacitor Class | Series | Chip Size | Capacitance Code (pF) | Capacitance Tolerance | Rated Voltage (VAC) | Packaging |
| P = Paper | Y2, Metallized Paper | See Dimension Table | First two digits represent significant figures. Third digit specifies number of zeros. | M = \pm 20% | 250 = 250 | See Ordering Options Table |

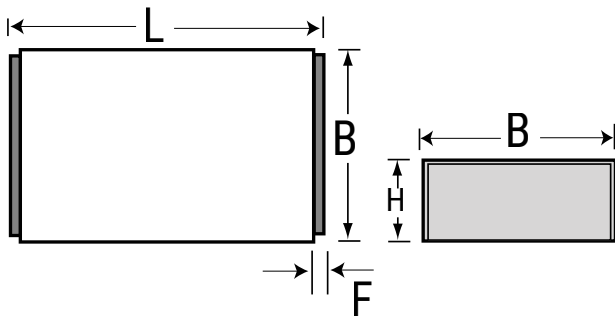
Benefits cont'd

- Highest possible safety regarding active and passive flammability
- Excellent self-healing properties ensure long life even when subjected to frequent over voltages
- Good resistance to ionization due to impregnated dielectric
- High dV/dt capability
- Impregnated paper ensures excellent stability and reliability properties, particularly in applications with continuous operation

Ordering Options Table

| Packaging Type | KEMET Lead and Packaging Code | Legacy Lead and Packaging Code |
|--|-------------------------------|--------------------------------|
| Standard Lead and Packaging Options | | |
| Tape & Reel (Standard Reel) | V | TR24 |
| Bulk (Bag) | A | BULK |
| Other Lead and Packaging Options | | |
| Tape & Reel (Vertical Orientation Standard Reel) | Y | TV24 |

Dimensions – Millimeters



| Chip Size | B | | H | | L | | F | |
|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance |
| 5045 | 11.5 | +/-0.2 | 6.5 | +/-0.2 | 12.7 | +/-0.2 | 0.5 | Nominal |



Performance Characteristics

| | | |
|--------------------------------|--|------|
| Rated Voltage | 250 VAC 50/60 Hz | |
| Capacitance Range | 0.001 – 0.0047 μ F | |
| Capacitance Tolerance | \pm 20% | |
| Temperature Range | -40°C to +100°C | |
| Climatic Category | 40/100/56/B | |
| Approvals | S, UL, CSA | |
| Dissipation Factor | Maximum Values at +23°C | |
| | 1 kHz | 1.3% |
| Test Voltage Between Terminals | The 100% screening factory test is carried out at 3,000 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test. It is not permitted to repeat this test as there is a risk to damage the capacitor. KEMET is not liable in such case for any failures. | |
| Insulation Resistance | Minimum Value Between Terminals | |
| | \geq 12,000 M Ω | |

Environmental Test Data

| Test | IEC Publication | Procedure |
|----------------------|-----------------------|--|
| Vibration | IEC 60068-2-6 Test Fc | 3 directions at 2 hours each 10 – 500 Hz at 0.75 mm or 98 m/s ² |
| Active Flammability | IEC 60384-14 | |
| Passive Flammability | IEC 60384-14 | Needle-flame test |
| Humidity | IEC 60068-2-3 Test Ca | +40°C and 90 – 95% RH |

Approvals

| Mark | Specification | File Number |
|---|--------------------------------------|-------------|
|  | EN/IEC 60384-14 | Pending |
|  | UL 60384 and CAN/CSA E60384-14:09 | Pending |

Environmental Compliance

All KEMET EMI capacitors are RoHS Compliant.

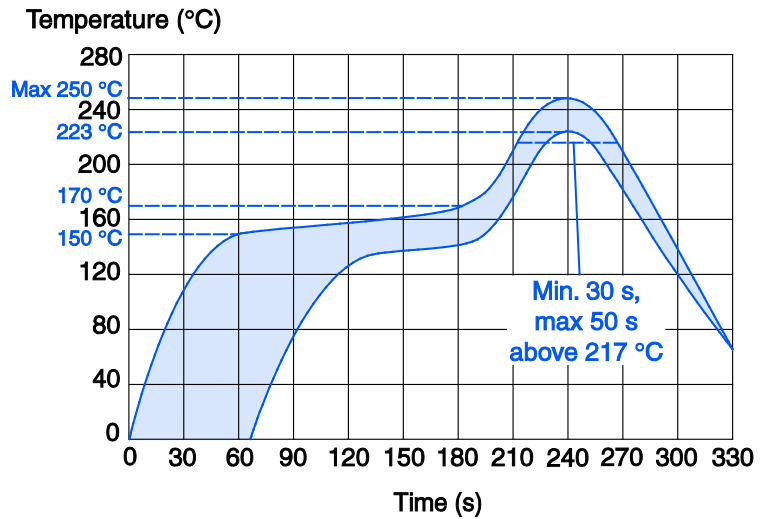
Table 1 – Ratings & Part Number Reference

| Capacitance Value (µF) | Maximum Dimensions in mm | | | dV/dt (V/µs) | New KEMET Part Number | Legacy Part Number |
|------------------------|--------------------------|--------|--------|--------------|-----------------------|--------------------|
| | B | H | L | | | |
| 0.0010 | 11.5 | 6.5 | 12.7 | 2000 | P101AA102M250(1) | SMP253MA4100M(1) |
| 0.0015 | 11.5 | 6.5 | 12.7 | 2000 | P101AA152M250(1) | SMP253MA4150M(1) |
| 0.0022 | 11.5 | 6.5 | 12.7 | 2000 | P101AA222M250(1) | SMP253MA4220M(1) |
| 0.0025 | 11.5 | 6.5 | 12.7 | 2000 | P101AA252M250(1) | SMP253MA4250M(1) |
| 0.0033 | 11.5 | 6.5 | 12.7 | 2000 | P101AA332M250(1) | SMP253MA4330M(1) |
| 0.0039 | 11.5 | 6.5 | 12.7 | 2000 | P101AA392M250(1) | SMP253MA4390M(1) |
| 0.0047 | 11.5 | 6.5 | 12.7 | 2000 | P101AA472M250(1) | SMP253MA4470M(1) |
| Capacitance Value (µF) | B (mm) | H (mm) | L (mm) | dV/dt (V/µs) | New KEMET Part Number | Legacy Part Number |

(1) Insert packaging code. See Ordering Options Table for available options.

Soldering Process

Reflow soldering temperature shall be measured on the top body surface of the component. The profiles herewith are recommended soldering profiles for convection reflow ovens and IR reflow ovens. If vapor phase reflow oven is used, please consult KEMET. Exceeding the manufacturer's process recommendations may harm the component. KEMET is not liable for any defect caused by exceeding recommendations. According to international standards, the maximum temperature capability shall be measured on the top surface of a component. The international standards do not define how the thermocouple should be fastened on the component. Our recommendation for attaching the thermocouple on the top surface of the component is to glue it with high temperature resistant glue.



Marking

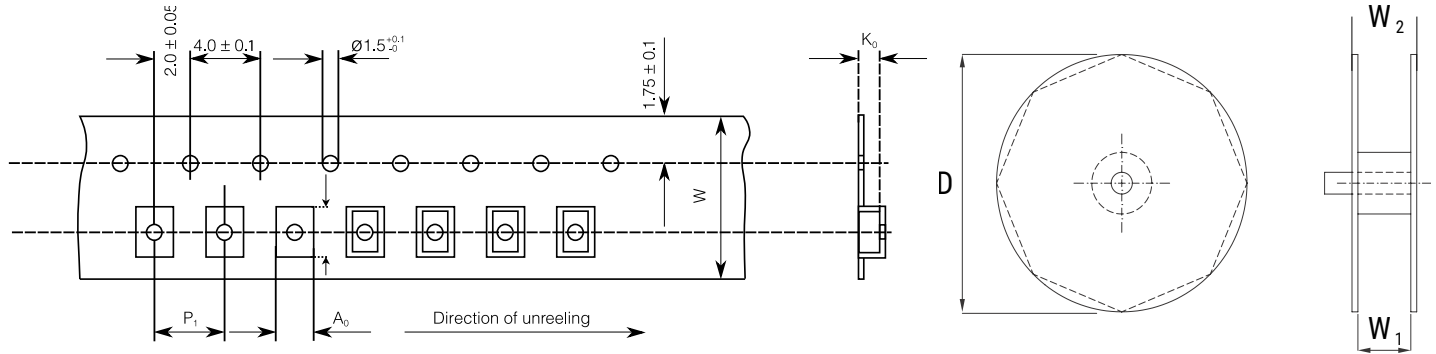
- KEMET's logo
- Series
- Capacitance
- Rated voltage
- Capacitor class
- Manufacturing date code

Packaging Quantities

| Chip Size EIA | Thickness (mm) | Height (mm) | Length (mm) | Standard Reel ø 330 mm | |
|---------------|----------------|-------------|-------------|------------------------|----------------------|
| | | | | Horizontal Orientation | Vertical Orientation |
| 5045 | 11.5 | 6.5 | 12.7 | 600 | 400 |

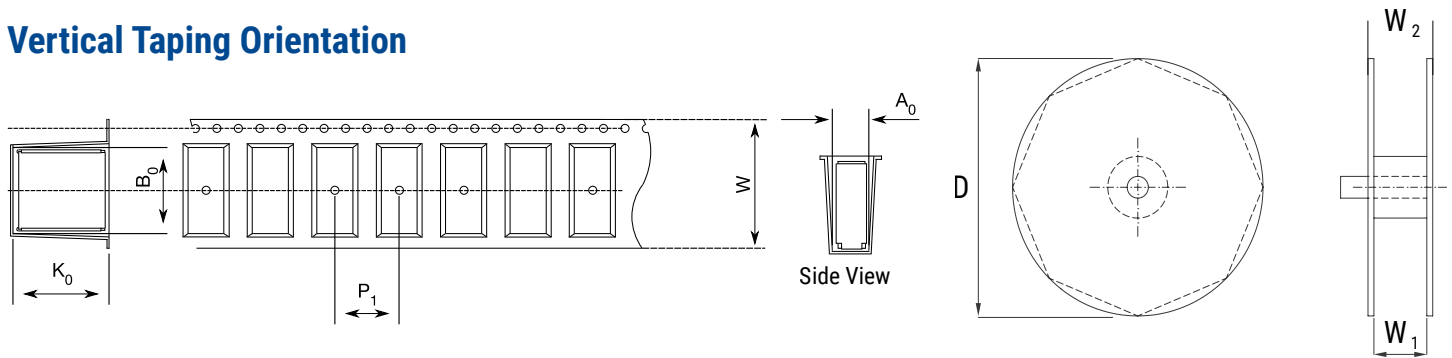
Carrier Taping & Packaging (IEC 60286-2)

Horizontal Taping Orientation



| EIA Size Code Horizontal Mounting | Dimensions in mm | | | Taping Specification | | | | | | | |
|---|------------------|---------|---------|----------------------|----------------|----------------|----------------|----------------|--------|----------------|----------------|
| | B | H | L | W | P ₁ | A ₀ | B ₀ | K ₀ | D | W ₁ | W ₂ |
| | Nominal | Nominal | Nominal | -0/+0.3 | +/-0.1 | Nominal | Nominal | Nominal | -/+2.0 | -0/+2 | Maximum |
| 5045 | 11.5 | 6.5 | 12.7 | 24.0 | 16.0 | 11.9 | 13.1 | 6.8 | 330 | 24.4 | 30.0 |

Vertical Taping Orientation



| EIA Size Code Vertical Mounting | Dimensions in mm | | | Taping Specification | | | | | | | |
|---------------------------------------|------------------|---------|---------|----------------------|----------------|----------------|----------------|----------------|--------|----------------|----------------|
| | B | H | L | W | P ₁ | A ₀ | B ₀ | K ₀ | D | W ₁ | W ₂ |
| | Nominal | Nominal | Nominal | -0/+0.3 | +/-0.1 | Nominal | Nominal | Nominal | -/+2.0 | -0/+2 | Maximum |
| 5026 (5045) | 12.7 | 6.5 | 11.5 | 24.0 | 16.0 | 6.9 | 13.1 | 11.8 | 330 | 24.4 | 30.0 |

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