

## Metallized Polyphenylene-Sulphide (PPS) SMD Film Capacitors with Box Encapsulation. Capacitances from 0.01 $\mu\text{F}$ to 2.2 $\mu\text{F}$ . Rated Voltages from 63 VDC to 1000 VDC. Size Codes from 1812 to 6054.

### Special Features

- Size codes 1812, 2220, 2824, 4030, 5040 and 6054 with PPS and encapsulated
- Operating temperature up to 140° C
- Self-healing
- Suitable for lead-free soldering
- Low dissipation factor
- Low dielectric absorption
- Very constant capacitance value versus temperature
- According to RoHS 2011/65/EU

### Typical Applications

For general applications in high temperature circuits e.g.

- By-pass
- Blocking
- Coupling and decoupling
- Timing
- Filtering
- Oscillating circuits

### Construction

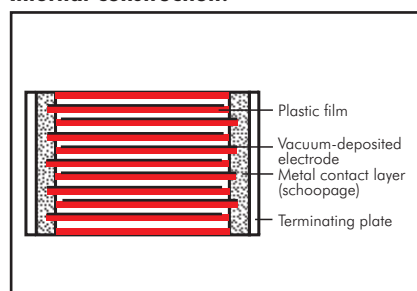
#### Dielectric:

Polyphenylene-sulphide (PPS) film

#### Capacitor electrodes:

Vacuum-deposited

#### Internal construction:



#### Encapsulation:

Solvent-resistant, flame-retardant plastic case, UL 94 V-0

#### Terminations:

Tinned plates.

#### Marking:

Box colour: Black.

### Electrical Data

**Capacitance range:** 0.01  $\mu\text{F}$  to 2.2  $\mu\text{F}$

#### Rated voltages:

63 VDC, 100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC

#### Capacitance tolerances:

$\pm 20\%$ ,  $\pm 10\%$  ( $\pm 5\%$  available subject to special enquiry)

#### Operating temperature range:

$-55^\circ\text{C}$  to  $+140^\circ\text{C}$

#### Climatic test category:

55/140/56 in accordance with IEC

#### Insulation resistance at $+20^\circ\text{C}$ :

| $U_r$                  | $U_{\text{test}}$ | $C \leq 0.33 \mu\text{F}$            | $0.33 \mu\text{F} < C \leq 2.2 \mu\text{F}$          |
|------------------------|-------------------|--------------------------------------|------------------------------------------------------|
| 63 VDC<br>100 VDC      | 50 V<br>100 V     | $\geq 1 \times 10^4 \text{ M}\Omega$ | $\geq 3000 \text{ sec (M}\Omega \times \mu\text{F)}$ |
| $\geq 250 \text{ VDC}$ | 100 V             | $\geq 3 \times 10^4 \text{ M}\Omega$ | $\geq 6000 \text{ sec (M}\Omega \times \mu\text{F)}$ |

Measuring time: 1 min.

#### Dissipation factors at $+20^\circ\text{C}$ : $\tan \delta$

| at f    | $C \leq 0.1 \mu\text{F}$ | $0.1 \mu\text{F} < C \leq 1.0 \mu\text{F}$ | $C > 1.0 \mu\text{F}$    |
|---------|--------------------------|--------------------------------------------|--------------------------|
| 1 kHz   | $\leq 15 \times 10^{-4}$ | $\leq 20 \times 10^{-4}$                   | $\leq 20 \times 10^{-4}$ |
| 10 kHz  | $\leq 25 \times 10^{-4}$ | $\leq 25 \times 10^{-4}$                   | –                        |
| 100 kHz | $\leq 50 \times 10^{-4}$ | –                                          | –                        |

#### Maximum pulse rise time: for pulses equal to the rated voltage

| Capacitance $\mu\text{F}$ | Pulse rise time V/ $\mu\text{sec}$<br>max. operation/test |         |         |         |         |          |
|---------------------------|-----------------------------------------------------------|---------|---------|---------|---------|----------|
|                           | 63 VDC                                                    | 100 VDC | 250 VDC | 400 VDC | 630 VDC | 1000 VDC |
| 0.01 ... 0.022            | 25/250                                                    | 25/250  | 30/300  | 35/350  | 40/400  | 45/450   |
| 0.033 ... 0.068           | 15/150                                                    | 15/150  | 20/200  | 25/250  | 28/280  | 32/320   |
| 0.1 ... 0.22              | 10/100                                                    | 10/100  | 12/120  | 15/150  | –       | –        |
| 0.33 ... 0.68             | 5/50                                                      | 5/50    | 6/60    | 8/80    | –       | –        |
| 1.0 ... 2.2               | 3/30                                                      | 3/30    | –       | –       | –       | –        |

### Dip Solder Test/Processing

#### Resistance to soldering heat:

Test Tb in accordance with DIN IEC

60068-2-58/DIN EN 60384-20.

Soldering bath temperature max.  $260^\circ\text{C}$ .

Soldering duration max. 5 sec.

Change in capacitance  $\Delta C/C < 5\%$ .

#### Soldering process:

Re-flow soldering (see temperature/time graphs page 13).

### Packing

Available taped and reeled in blister pack.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

## Continuation

### General Data

| Capacitance | 63 VDC/40 VAC*       |                   |                                                                                          | 100 VDC/63 VAC*      |                   |                                                                                          | 250 VDC/160 VAC*     |                   |                                                                                          |
|-------------|----------------------|-------------------|------------------------------------------------------------------------------------------|----------------------|-------------------|------------------------------------------------------------------------------------------|----------------------|-------------------|------------------------------------------------------------------------------------------|
|             | Size code            | H<br>± 0.3        | Part number                                                                              | Size code            | H<br>± 0.3        | Part number                                                                              | Size code            | H<br>± 0.3        | Part number                                                                              |
| 0.01 µF     | 1812<br>2220         | 3.0<br>3.5        | SMDIC02100KA00_____<br>SMDIC02100QA00_____<br>SMDIC02100TA00_____<br>SMDIC02100VA00_____ | 1812<br>2220         | 3.0<br>3.5        | SMDID02100KA00_____<br>SMDID02100QA00_____<br>SMDID02100TA00_____<br>SMDID02100VA00_____ | 2220                 | 3.5               | SMDIF02100QA00_____<br>SMDIF02100TA00_____<br>SMDIF02100VA00_____                        |
| 0.015 "     | 1812<br>2220         | 3.0<br>3.5        | SMDIC02150KA00_____<br>SMDIC02150QA00_____<br>SMDIC02150TA00_____<br>SMDIC02150VA00_____ | 1812<br>2220         | 3.0<br>3.5        | SMDID02150KA00_____<br>SMDID02150QA00_____<br>SMDID02150TA00_____<br>SMDID02150VA00_____ | 2220                 | 3.5               | SMDIF02150QA00_____<br>SMDIF02150TA00_____<br>SMDIF02150VA00_____                        |
| 0.022 "     | 1812<br>2220         | 3.0<br>3.5        | SMDIC02220KA00_____<br>SMDIC02220QA00_____<br>SMDIC02220TA00_____<br>SMDIC02220VA00_____ | 1812<br>2220         | 3.0<br>3.5        | SMDID02220KA00_____<br>SMDID02220QA00_____<br>SMDID02220TA00_____<br>SMDID02220VA00_____ | 2220<br>2824         | 3.5<br>3.0        | SMDIF02220QA00_____<br>SMDIF02220TA00_____<br>SMDIF02220VA00_____                        |
| 0.033 "     | 1812<br>2220<br>2824 | 3.0<br>3.5<br>3.0 | SMDIC02330KA00_____<br>SMDIC02330QA00_____<br>SMDIC02330TA00_____<br>SMDIC02330VA00_____ | 1812<br>2220<br>2824 | 3.0<br>3.5<br>3.0 | SMDID02330KA00_____<br>SMDID02330QA00_____<br>SMDID02330TA00_____<br>SMDID02330VA00_____ | 2824<br>4030         | 3.0<br>5.0        | SMDIF02330QA00_____<br>SMDIF02330TA00_____<br>SMDIF02330VA00_____                        |
| 0.047 "     | 1812<br>2220<br>2824 | 3.0<br>3.5<br>3.0 | SMDIC02470KA00_____<br>SMDIC02470QA00_____<br>SMDIC02470TA00_____<br>SMDIC02470VA00_____ | 1812<br>2220<br>2824 | 3.0<br>3.5<br>3.0 | SMDID02470KA00_____<br>SMDID02470QA00_____<br>SMDID02470TA00_____<br>SMDID02470VA00_____ | 2824<br>4030         | 5.0<br>5.0        | SMDIF02470TB00_____<br>SMDIF02470QA00_____<br>SMDIF02470TA00_____<br>SMDIF02470VA00_____ |
| 0.068 "     | 1812<br>2220<br>2824 | 3.0<br>3.5<br>3.0 | SMDIC02680KA00_____<br>SMDIC02680QA00_____<br>SMDIC02680TA00_____<br>SMDIC02680VA00_____ | 2220<br>2824         | 3.5<br>3.0        | SMDID02680QA00_____<br>SMDID02680TA00_____<br>SMDID02680VA00_____                        | 2824<br>4030         | 5.0<br>5.0        | SMDIF02680TB00_____<br>SMDIF02680QA00_____<br>SMDIF02680TA00_____<br>SMDIF02680VA00_____ |
| 0.1 µF      | 1812<br>2220<br>2824 | 3.0<br>3.5<br>3.0 | SMDIC03100KA00_____<br>SMDIC03100QA00_____<br>SMDIC03100TA00_____<br>SMDIC03100VA00_____ | 2220<br>2824         | 3.5<br>3.0        | SMDID03100QA00_____<br>SMDID03100TA00_____<br>SMDID03100VA00_____                        | 2824<br>4030<br>5040 | 5.0<br>5.0<br>6.0 | SMDIF03100TB00_____<br>SMDIF03100QA00_____<br>SMDIF03100TA00_____<br>SMDIF03100VA00_____ |
| 0.15 "      | 1812<br>2220<br>2824 | 4.0<br>3.5<br>3.0 | SMDIC03150KB00_____<br>SMDIC03150QA00_____<br>SMDIC03150TA00_____<br>SMDIC03150VA00_____ | 2824                 | 3.0               | SMDID03150TA00_____<br>SMDID03150VA00_____                                               | 4030<br>5040<br>6054 | 5.0<br>6.0<br>7.0 | SMDIF03150VA00_____<br>SMDIF03150QA00_____<br>SMDIF03150TA00_____<br>SMDIF03150VA00_____ |
| 0.22 "      | 2220<br>2824         | 4.5<br>5.0        | SMDIC03220QB00_____<br>SMDIC03220TB00_____<br>SMDIC03220VA00_____                        | 2220<br>2824         | 4.5<br>5.0        | SMDID03220QB00_____<br>SMDID03220TB00_____<br>SMDID03220VA00_____                        | 4030<br>5040<br>6054 | 5.0<br>6.0<br>7.0 | SMDIF03220QA00_____<br>SMDIF03220TB00_____<br>SMDIF03220VA00_____<br>SMDIF03220QA00_____ |
| 0.33 "      | 2220<br>2824<br>4030 | 4.5<br>5.0<br>5.0 | SMDIC03330QB00_____<br>SMDIC03330TB00_____<br>SMDIC03330VA00_____<br>SMDIC03330QA00_____ | 2824<br>4030         | 5.0<br>5.0        | SMDID03330TB00_____<br>SMDID03330VA00_____<br>SMDID03330QA00_____                        | 5040<br>6054         | 6.0<br>7.0        | SMDIF03330QA00_____<br>SMDIF03330TB00_____<br>SMDIF03330VA00_____                        |
| 0.47 "      | 2220<br>2824<br>4030 | 4.5<br>5.0<br>5.0 | SMDIC03470QB00_____<br>SMDIC03470TB00_____<br>SMDIC03470VA00_____<br>SMDIC03470QA00_____ | 2824<br>4030         | 5.0<br>5.0        | SMDID03470TB00_____<br>SMDID03470VA00_____<br>SMDID03470QA00_____                        | 6054                 | 7.0               | SMDIF03470QA00_____<br>SMDIF03470TB00_____<br>SMDIF03470VA00_____                        |
| 0.68 "      | 2824<br>4030         | 5.0<br>5.0        | SMDIC03680TB00_____<br>SMDIC03680VA00_____<br>SMDIC03680QA00_____                        | 4030                 | 5.0               | SMDID03680VA00_____<br>SMDID03680QA00_____                                               |                      |                   |                                                                                          |
| 1.0 µF      | 2824<br>4030<br>5040 | 5.0<br>5.0<br>6.0 | SMDIC04100TB00_____<br>SMDIC04100VA00_____<br>SMDIC04100QA00_____<br>SMDIC04100TA00_____ | 5040                 | 6.0               | SMDID04100QA00_____<br>SMDID04100TA00_____                                               |                      |                   |                                                                                          |
| 1.5 "       | 4030<br>5040         | 5.0<br>6.0        | SMDIC04150VA00_____<br>SMDIC04150QA00_____<br>SMDIC04150TA00_____                        | 6054                 | 7.0               | SMDID04150QA00_____<br>SMDID04150TA00_____                                               |                      |                   |                                                                                          |
| 2.2 "       | 6054                 | 7.0               | SMDIC04220YA00_____<br>SMDIC04220QA00_____                                               | 6054                 | 7.0               | SMDID04220YA00_____<br>SMDID04220QA00_____                                               |                      |                   |                                                                                          |

\* AC voltages:  $f \leq 400 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$   
Dims. in mm.

Rights reserved to amend design data without prior notification.

#### Part number completion:

Tolerance: 20 % = M

10 % = K

5 % = J

Packing: bulk = S

Pin length: none = 00

Taped version see page 148.

## Continuation

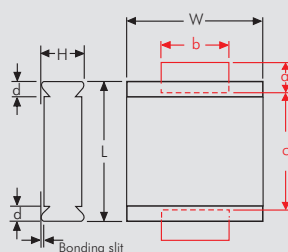
### General Data

| Capacitance        | 400 VDC/200 VAC*     |                   |                                                       | 630 VDC/300 VAC* |            |                 | 1000 VDC/400 VAC* |            |                 |
|--------------------|----------------------|-------------------|-------------------------------------------------------|------------------|------------|-----------------|-------------------|------------|-----------------|
|                    | Size code            | H<br>± 0.3        | Part number                                           | Size code        | H<br>± 0.3 | Part number     | Size code         | H<br>± 0.3 | Part number     |
| 0.01 $\mu\text{F}$ |                      |                   |                                                       | 5040             | 6.0        | SMDIJ02100XA00_ | 5040              | 6.0        | SMDIO12100XA00_ |
| 0.015 "            |                      |                   |                                                       | 5040             | 6.0        | SMDIJ02150XA00_ | 5040              | 6.0        | SMDIO12150XA00_ |
| 0.022 "            | 4030<br>5040         | 5.0<br>6.0        | SMDIG02220VA00_<br>SMDIG02220XA00_                    | 5040             | 6.0        | SMDIJ02220XA00_ | 6054              | 7.0        | SMDIO12220YA00_ |
| 0.033 "            | 4030<br>5040         | 5.0<br>6.0        | SMDIG02330VA00_<br>SMDIG02330XA00_                    | 5040             | 6.0        | SMDIJ02330XA00_ | 6054              | 7.0        | SMDIO12330YA00_ |
| 0.047 "            | 4030<br>5040         | 5.0<br>6.0        | SMDIG02470VA00_<br>SMDIG02470XA00_                    | 5040             | 6.0        | SMDIJ02470XA00_ |                   |            |                 |
| 0.068 "            | 4030<br>5040         | 5.0<br>6.0        | SMDIG02680VA00_<br>SMDIG02680XA00_                    | 6054             | 7.0        | SMDIJ02680YA00_ |                   |            |                 |
| 0.1 $\mu\text{F}$  | 4030<br>5040<br>6054 | 5.0<br>6.0<br>7.0 | SMDIG03100VA00_<br>SMDIG03100XA00_<br>SMDIG03100YA00_ |                  |            |                 |                   |            |                 |
| 0.15 "             | 5040<br>6054         | 6.0<br>7.0        | SMDIG03150XA00_<br>SMDIG03150YA00_                    |                  |            |                 |                   |            |                 |
| 0.22 "             | 6054                 | 7.0               | SMDIG03220YA00_                                       |                  |            |                 |                   |            |                 |
| 0.33 "             | 6054                 | 7.0               | SMDIG03330YA00_                                       |                  |            |                 |                   |            |                 |

\* AC voltages:  $f \leq 400 \text{ Hz}$ ;  $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_{\text{r}}$

Dims. in mm.

Solder pad recommendation



Part number completion:

Tolerance: 20 % = M

10 % = K

5 % = J

Packing: bulk = S

Pin length: none = 00

Taped version see page 148.

| Size code | L<br>±0.3 | W<br>±0.3 | d   | a<br>min. | b<br>min. | c<br>max. |
|-----------|-----------|-----------|-----|-----------|-----------|-----------|
| 1812      | 4.8       | 3.3       | 0.5 | 1.2       | 3.5       | 3.5       |
| 2220      | 5.7       | 5.1       | 0.5 | 1.2       | 4         | 4.5       |
| 2824      | 7.2       | 6.1       | 0.5 | 1.2       | 4         | 6.5       |
| 4030      | 10.2      | 7.6       | 0.5 | 2.5       | 6         | 9         |
| 5040      | 12.7      | 10.2      | 0.7 | 2.5       | 6         | 11.5      |
| 6054      | 15.3      | 13.7      | 0.7 | 2.5       | 6         | 14        |

Rights reserved to amend design data without prior notification.

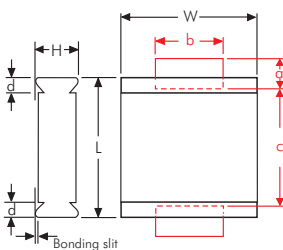
# Recommendation for Processing and Application of SMD Capacitors



## Layout Form

The components can generally be positioned on the carrier material as desired. In order to prevent soldering shadows or ensure regular temperature distribution, extreme concentration of the components should be avoided. In practice, it has proven best to keep a minimum distance of the soldering surfaces between two WIMA SMDs of twice the height of the components.

## Solder Pad Recommendation



| Size code | L<br>± 0.3 | W<br>± 0.3 | d   | a<br>min. | b<br>min. | c<br>max. |
|-----------|------------|------------|-----|-----------|-----------|-----------|
| 1812      | 4.8        | 3.3        | 0.5 | 1.2       | 3.5       | 3.5       |
| 2220      | 5.7        | 5.1        | 0.5 | 1.2       | 4         | 4.5       |
| 2824      | 7.2        | 6.1        | 0.5 | 1.2       | 4         | 6.5       |
| 4030      | 10.2       | 7.6        | 0.5 | 2.5       | 6         | 9         |
| 5040      | 12.7       | 10.2       | 0.7 | 2.5       | 6         | 11.5      |
| 6054      | 15.3       | 13.7       | 0.7 | 2.5       | 6         | 14        |

The solder pad size recommendations given for each individual series are to be understood as minimum dimensions which can at any time be adjusted to the layout form.

## Processing

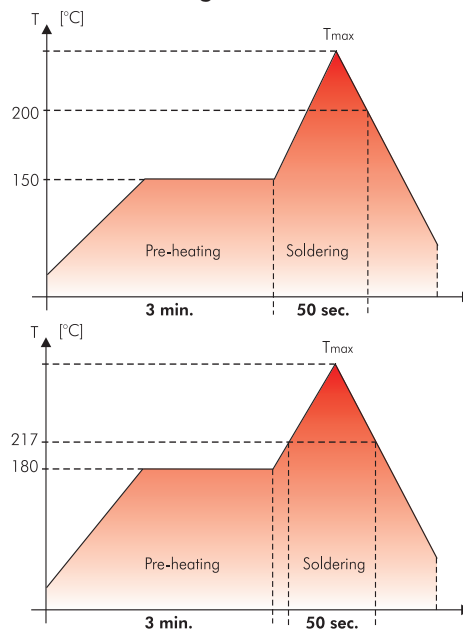
The processing of SMD components

- assembling
- soldering
- electrical final inspection/calibrating

must be regarded as a complete process. The soldering of the printed circuit board, for example, can constitute considerable stress on all the electronic components. The manufacturer's instructions on the processing of the components are mandatory.

## Soldering Process

### Re-flow soldering



| SMD-PET   |                   |
|-----------|-------------------|
| Size code | T <sub>max.</sub> |
| 1812      | 220° C            |
| 2220      | 230° C            |
| 2824      | 230° C            |
| 4030      | 230° C            |
| 5040      | 240° C            |
| 6054      | 250° C            |

Temperature/time graph for the permissible processing temperature of the WIMA SMD film capacitor for typical convection soldering processes.

Due to versatile procedures exact processing parameters for re-flow soldering processes cannot be specified. The graph depicted is to be understood as a recommendation to help establishing a suitable soldering profile fulfilling the requirements

in practice at the user. During processing a max. temperature of T=210° C inside the component should not be exceeded. Due to the differing heat absorption the length of the soldering process should be kept as short as possible for smaller size codes.

## SMD Handsoldering

WIMA SMD capacitors with plastic film dielectric are generally suitable for hand-soldering, e. g. for lab purposes, with a soldering iron where, however, similar to automated soldering processes, a certain duration and temperature should not be exceeded. These parameters are dependent on the physical size of the components and the relevant heat absorption involved.

The below data are to be regarded as guideline values and should serve to avoid damage to the dielectric caused by excessive heat during the soldering process. The soldering quality depends on the tool used and on the skill and experience of the person with the soldering iron in hand.

| Size code | Temperature °C / °F | Time duration                             |
|-----------|---------------------|-------------------------------------------|
| 1812      | 250 / 482           | 2 sec plate 1 / 5 sec off / 2 sec plate 2 |
| 2220      | 250 / 482           | 3 sec plate 1 / 5 sec off / 3 sec plate 2 |
| 2824      | 260 / 500           | 3 sec plate 1 / 5 sec off / 3 sec plate 2 |
| 4030      | 260 / 500           | 5 sec plate 1 / 5 sec off / 5 sec plate 2 |
| 5040      | 260 / 500           | 5 sec plate 1 / 5 sec off / 5 sec plate 2 |
| 6054      | 260 / 500           | 5 sec plate 1 / 5 sec off / 5 sec plate 2 |

## Recommendation for Processing and Application of SMD Capacitors (Continuation)

### Solder Paste

To achieve reliable soldering results one of the following solder alloys have from case to case proven being workable:

#### Lead free solder paste

Sn - Bi  
Sn - Zn (Bi)  
Sn - Ag - Cu (suitable for SMD-PET 5040/6054, SMD-PEN and SMD-PPS)

#### Solder paste with lead

Sn - Pb - Ag (Sn60-Pb40-A, Sn63-Pb37-A)

### Washing

WIMA SMD components with plastic encapsulation - like all other components of similar construction irrespective of the make - cannot be regarded as hermetically sealed. Due to today's common washing substances, e. g. on aqueous basis instead of the formerly used halogenated hydrocarbons, with enhanced washing efficiency it became obvious that assembled SMD capacitors may show an impermissibly high deviation of the electrical parameters after a corresponding washing process. Hence it is recommended to refrain from applying industrial washing processes for WIMA SMD capacitors in order to avoid possible damages.

### Initial Operation/Calibration

Due to the stress which the components are subjected to during processing, reversible parameter changes occur in almost all electronic components. The capacitance recovery accuracy to be expected with careful processing is within a scope of

$$|\Delta C/C| \leq 5 \%$$

For the initial operation of the device a minimum storage time of

$$t \geq 24 \text{ hours}$$

is to be taken into account. With calibrated devices or when the application is largely dependent on capacitance it is

advisable to prolong the storage time to

$$t \geq 10 \text{ days}$$

In this way ageing effects of the capacitor structure can be anticipated. Parameter changes due to processing are not to be expected after this period of time

### Humidity Protection Bags

Taped WIMA SMD capacitors are shipped in humidity protection bags according to JEDEC standard (ESD/EMI-shield/water-vapour proof).

Under controlled conditions the components can be stored two years and more in the originally sealed bag. Opened packing units should immediately be used up for processing. If storage is necessary the opened packing units should be stored air-tight in the original plastic bag.

### Reliability

Taking account of the manufacturer's guidelines and compatible processing, the WIMA SMD stand out for the same high quality and reliability as the analogous through-hole WIMA series. The technology of metallized film capacitors used e.g. in WIMA SMD-PET achieves the best values for all fields of application. The expected value is about:

$$\lambda_0 \leq 2 \text{ fit}$$

Furthermore the production of all WIMA components is subject to the regulations laid down by ISO 9001:2015 as well as the guidelines for component specifications set out by IEC quality assessment system (IECQ) for electronic components.

### Electrical Characteristics and Fields of Application

Basically the WIMA SMD series have the same electrical characteristics as the analogous through-hole WIMA capacitors. Compared to ceramic or tantalum dielectrics WIMA SMD capacitors have a

number of other outstanding qualities:

- favourable pulse rise time
- low ESR
- low dielectric absorption
- available in high voltage series
- large capacitance spectrum
- stand up to high mechanical stress
- good long-term stability

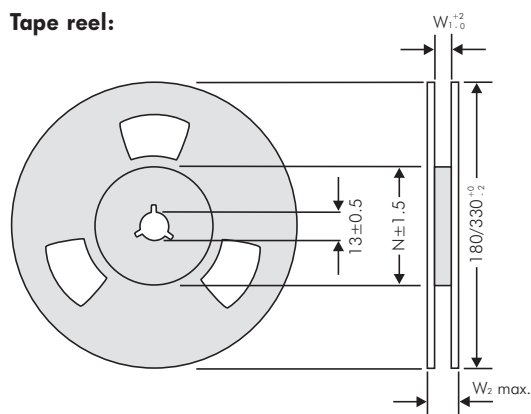
As regards technical performance as well as quality and reliability, the WIMA SMD series offer the possibility to cover nearly all applications of conventionally through-hole film capacitors with SMD components. Furthermore, the WIMA SMD series can now be used for all the demanding capacitor applications for which, in the past, the use of through-hole components was mandatory:

- measuring techniques
- oscillator circuits
- differentiating and integrating circuits
- A/D or D/A transformers
- sample and hold circuits
- automotive electronics

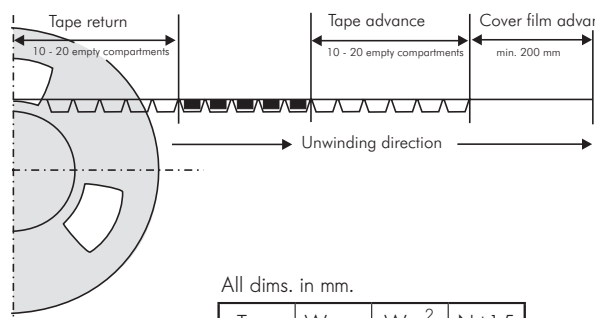
With the WIMA SMD programme available today, the major part of all plastic film capacitors can be replaced by WIMA SMD components. The field of application ranges from standard coupling capacitors to use in switch-mode power supplies as filter or charging capacitors with high voltage and capacitance values, as well as in telecommunications e.g. the well-known telephone capacitor  $1 \mu\text{F}/250\text{VDC}$ .

# Blister Tape Packaging and Packing Units of the WIMA SMD Capacitors

Tape reel:



Tape advance and return:



All dims. in mm.

| Type | W <sub>2max</sub> | W <sub>1</sub> ± 0.2 | N ± 1.5 |
|------|-------------------|----------------------|---------|
| 1812 | 19                | 12.4                 | 62      |
| 2220 | 19                | 12.4                 | 62      |
| 2824 | 19                | 12.4                 | 62      |
| 4030 | 22.4              | 16.4                 | 60      |
| 5040 | 30.4              | 24.4                 | 90      |
| 6054 | 30.4              | 24.4                 | 90      |

| Size Code 1812 |      | A <sub>0</sub> ± 0.1 | A <sub>1</sub> | B <sub>0</sub> ± 0.1 | B <sub>1</sub> | D <sub>0</sub> +0.1 -0 | D <sub>1</sub> +0.1 -0 | P ± 0.1 | P <sub>0</sub> * ± 0.1 | P <sub>2</sub> ± 0.05 | E ± 0.1 | F ± 0.05 | G   | W ± 0.3 | W <sub>0</sub> ± 0.2 | K ± 0.1 | T ± 0.1 |
|----------------|------|----------------------|----------------|----------------------|----------------|------------------------|------------------------|---------|------------------------|-----------------------|---------|----------|-----|---------|----------------------|---------|---------|
| Box size       | Code |                      |                |                      |                |                        |                        |         |                        |                       |         |          |     |         |                      |         |         |
| 4.8x3.3x3      | KA   | 3.55                 | 3.3            | 5.1                  | 4.8            | Ø1.5                   | Ø1.5                   | 8       | 4                      | 2                     | 1.75    | 5.5      | 2.2 | 12      | 9.5                  | 3.4     | 0.3     |
| 4.8x3.3x4      | KB   | 3.55                 | 3.3            | 5.1                  | 4.8            | Ø1.5                   | Ø1.5                   | 8       | 4                      | 2                     | 1.75    | 5.5      | 2.2 | 12      | 9.5                  | 4.4     | 0.3     |

Packing units

| taped Reel 180 mm Ø | taped Reel 330 mm Ø | bulk Standard |
|---------------------|---------------------|---------------|
| 700                 | 2500                | 3000          |
| 500                 | 2000                | 3000          |

| Size Code 2220 |      | A <sub>0</sub> ± 0.1 | A <sub>1</sub> | B <sub>0</sub> ± 0.1 | B <sub>1</sub> | D <sub>0</sub> +0.1 -0 | D <sub>1</sub> +0.1 -0 | P ± 0.1 | P <sub>0</sub> * ± 0.1 | P <sub>2</sub> ± 0.05 | E ± 0.1 | F ± 0.05 | G    | W ± 0.3 | W <sub>0</sub> ± 0.2 | K ± 0.1 | T ± 0.1 |
|----------------|------|----------------------|----------------|----------------------|----------------|------------------------|------------------------|---------|------------------------|-----------------------|---------|----------|------|---------|----------------------|---------|---------|
| Box size       | Code |                      |                |                      |                |                        |                        |         |                        |                       |         |          |      |         |                      |         |         |
| 5.7x5.1x3.5    | QA   | 6.3                  | 5.7            | 5.6                  | 5.1            | Ø1.5                   | Ø1.5                   | 8       | 4                      | 2                     | 1.75    | 5.5      | 1.95 | 12      | 9.5                  | 3.7     | 0.3     |
| 5.7x5.1x4.5    | QB   | 6.3                  | 5.7            | 5.6                  | 5.1            | Ø1.5                   | Ø1.5                   | 8       | 4                      | 2                     | 1.75    | 5.5      | 1.95 | 12      | 9.5                  | 4.7     | 0.3     |

| taped Reel 180 mm Ø | taped Reel 330 mm Ø | bulk Standard |
|---------------------|---------------------|---------------|
| 500                 | 1800                | 3000          |
| 400                 | 1500                | 3000          |

| Size Code 2824 |      | A <sub>0</sub> ± 0.1 | A <sub>1</sub> | B <sub>0</sub> ± 0.1 | B <sub>1</sub> | D <sub>0</sub> +0.1 -0 | D <sub>1</sub> +0.1 -0 | P ± 0.1 | P <sub>0</sub> * ± 0.1 | P <sub>2</sub> ± 0.05 | E ± 0.1 | F ± 0.05 | G   | W ± 0.3 | W <sub>0</sub> ± 0.2 | K ± 0.1 | T ± 0.1 |
|----------------|------|----------------------|----------------|----------------------|----------------|------------------------|------------------------|---------|------------------------|-----------------------|---------|----------|-----|---------|----------------------|---------|---------|
| Box size       | Code |                      |                |                      |                |                        |                        |         |                        |                       |         |          |     |         |                      |         |         |
| 7.2x6.1x3      | TA   | 6.6                  | 6.1            | 7.7                  | 7.2            | Ø1.5                   | Ø1.5                   | 12      | 4                      | 2                     | 1.75    | 5.5      | 0.9 | 12      | 9.5                  | 3.4     | 0.3     |
| 7.2x6.1x5      | TB   | 6.6                  | 6.1            | 7.7                  | 7.2            | Ø1.5                   | Ø1.5                   | 12      | 4                      | 2                     | 1.75    | 5.5      | 0.9 | 12      | 9.5                  | 5.4     | 0.4     |

| taped Reel 330 mm Ø | bulk Standard |
|---------------------|---------------|
| 1500                | 2000          |
| 750                 | 2000          |

|                |  | Code | A <sub>0</sub> ± 0.1 | A <sub>1</sub> | B <sub>0</sub> ± 0.1 | B <sub>1</sub> | D <sub>0</sub> +0.1 -0 | D <sub>1</sub> +0.1 -0 | P ± 0.1 | P <sub>0</sub> * ± 0.1 | P <sub>2</sub> ± 0.05 | E ± 0.1 | F ± 0.05 | G    | W ± 0.3 | W <sub>0</sub> ± 0.2 | K ± 0.1 | T ± 0.1 |
|----------------|--|------|----------------------|----------------|----------------------|----------------|------------------------|------------------------|---------|------------------------|-----------------------|---------|----------|------|---------|----------------------|---------|---------|
| Size Code 4030 |  | VA   | 10.7                 | 10.2           | 8.1                  | 9.1            | Ø1.5                   | Ø1.5                   | 16      | 4                      | 2                     | 1.75    | 7.5      | 1.9  | 16      | 13.3                 | 5.5     | 0.3     |
| Size Code 5040 |  | XA   | 13.5                 | 12.7           | 11                   | 11.5           | Ø1.5                   | Ø1.5                   | 16      | 4                      | 2                     | 1.75    | 11.5     | 4.7  | 24      | 21.3                 | 6.5     | 0.3     |
| Size Code 6054 |  | YA   | 17.0                 | 16.5           | 15.6                 | 15.0           | Ø1.5                   | Ø1.5                   | 20      | 4                      | 2                     | 1.75    | 11.5     | 2.95 | 24      | 21.3                 | 7.5     | 0.3     |

| taped Reel 330 mm Ø | bulk Standard |
|---------------------|---------------|
| 775                 | 2000          |
| 600                 | 1000          |
| 450                 | 500           |

\* cumulative after 10 steps ± 0.2 mm max.  
Samples and pre-production needs on request or 1 Reel minimum.

Part number codes for SMD packing

| W (Blister)   | Ø in mm | Code |
|---------------|---------|------|
| 12            | 180     | P    |
| 12            | 330     | Q    |
| 16            | 330     | R    |
| 24            | 330     | T    |
| Bulk Standard |         | S    |

A WIMA part number consists of 18 digits and is composed as follows:

- Field 1 - 4: Type description
- Field 5 - 6: Rated voltage
- Field 7 - 10: Capacitance
- Field 11 - 12: Size and PCM
- Field 13 - 14: Version code (e.g. Snubber versions)
- Field 15: Capacitance tolerance
- Field 16: Packing
- Field 17 - 18: Pin length (untaped)

| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2 | 3 | 4 | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6 | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8 | 9 | 10 | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12 | 13 | 14 | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 16   | 17   | 18 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|----|
| M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | K | S | 2 | C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0 | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 | 0 | 0  | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | A  | 0  | 0  | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | S    | S    | D  |
| MKS 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |   |   | 63 VDC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   | 0.01 µF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |   |    | 2.5x6.5x7.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    | -  |    | 20%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | bulk | 6 -2 |    |
| <b>Type description:</b><br>SMD-PET = SMDT<br>SMD-PEN = SMDN<br>SMD-PPS = SMDI<br>FKP 02 = FKPO<br>MKS 02 = MKSO<br>FKS 2 = FKS2<br>FKP 2 = FKP2<br>FKS 3 = FKS3<br>FKP 3 = FKP 3<br>MKS 2 = MKS2<br>MKP 2 = MKP2<br>MKS 4 = MKS4<br>MKP 4C = MKPC<br>MKP 4 = MKP4<br>MKP 10 = MKP1<br>FKP 1 = FKP1<br>MKP-X2 = MKX2<br>MKP-X1 R = MKX1<br>MKP-Y2 = MKY2<br>MP 3-X2 = MPX2<br>MP 3-X1 = MPX1<br>MP 3-Y2 = MPY2<br>MP 3R-Y2 = MPRY<br>MKP 4F = MKPF<br>Snubber MKP = SNMP<br>Snubber FKP = SNFP<br>GTO MKP = GTOM<br>DC-LINK MKP 3 = DCP3<br>DC-LINK MKP 4 = DCP4<br>DC-LINK MKP 4S = DCP5<br>DC-LINK MKP 5 = DCP5<br>DC-LINK MKP 6 = DCP6<br>DC-LINK HC = DCHC<br>DC-LINK HY = DCHY |   |   |   | <b>Rated voltage:</b><br>50 VDC = B0<br>63 VDC = C0<br>100 VDC = D0<br>250 VDC = F0<br>400 VDC = G0<br>450 VDC = H0<br>520 VDC = H2<br>600 VDC = I0<br>630 VDC = J0<br>700 VDC = K0<br>800 VDC = L0<br>850 VDC = M0<br>900 VDC = N0<br>1000 VDC = O1<br>1100 VDC = P0<br>1200 VDC = Q0<br>1250 VDC = R0<br>1500 VDC = S0<br>1600 VDC = T0<br>2000 VDC = U0<br>2500 VDC = V0<br>3000 VDC = W0<br>4000 VDC = X0<br>6000 VDC = Y0<br>250 VAC = 0VV<br>275 VAC = 1VV<br>300 VAC = 2VV<br>305 VAC = AVV<br>350 VAC = BVV<br>440 VAC = 4VV<br>500 VAC = 5VV<br>... |   | <b>Capacitance:</b><br>22 pF = 0022<br>47 pF = 0047<br>100 pF = 0100<br>150 pF = 0150<br>220 pF = 0220<br>330 pF = 0330<br>470 pF = 0470<br>680 pF = 0680<br>1000 pF = 1100<br>1500 pF = 1150<br>2200 pF = 1220<br>3300 pF = 1330<br>4700 pF = 1470<br>6800 pF = 1680<br>0.01 µF = 2100<br>0.022 µF = 2220<br>0.047 µF = 2470<br>0.1 µF = 3100<br>0.22 µF = 3220<br>0.47 µF = 3470<br>1 µF = 4100<br>2.2 µF = 4220<br>4.7 µF = 4470<br>10 µF = 5100<br>22 µF = 5220<br>47 µF = 5470<br>100 µF = 6100<br>220 µF = 6220<br>1000 µF = 7100<br>1500 µF = 7150<br>... |   |   |    | <b>Size:</b><br>4.8x3.3x3 Size 1812 = KA<br>4.8x3.3x4 Size 1812 = KB<br>5.7x5.1x3.5 Size 2220 = QA<br>5.7x5.1x4.5 Size 2220 = QB<br>7.2x6.1x3 Size 2824 = TA<br>7.2x6.1x5 Size 2824 = TB<br>10.2x7.6x5 Size 4030 = VA<br>12.7x10.2x6 Size 5040 = XA<br>15.3x13.7x7 Size 6054 = YA<br>2.5x7x4.6 PCM 2.5 = 0B<br>3x7.5x4.6 PCM 2.5 = 0C<br>2.5x6.5x7.2 PCM 5 = 1A<br>3x7.5x7.2 PCM 5 = 1B<br>2.5x7x10 PCM 7.5 = 2A<br>3x8.5x10 PCM 7.5 = 2B<br>3x9x13 PCM 10 = 3A<br>4x9x13 PCM 10 = 3C<br>5x11x18 PCM 15 = 4B<br>6x12.5x18 PCM 15 = 4C<br>5x14x26.5 PCM 22.5 = 5A<br>6x15x26.5 PCM 22.5 = 5B<br>9x19x31.5 PCM 27.5 = 6A<br>11x21x31.5 PCM 27.5 = 6B<br>9x19x41.5 PCM 37.5 = 7A<br>11x22x41.5 PCM 37.5 = 7B<br>19x31x56 PCM 48.5 = 8D<br>25x45x57 PCM 52.5 = 9D<br>... |    |    |    | <b>Tolerance:</b><br>±20% = M<br>±10% = K<br>±5% = J<br>±2.5% = H<br>±1% = E<br>...<br><br><b>Packing:</b><br>AMMO H16.5 340x340 = A<br>AMMO H16.5 490x370 = B<br>AMMO H18.5 340x340 = C<br>AMMO H18.5 490x370 = D<br>REEL H16.5 360 = F<br>REEL H16.5 500 = H<br>REEL H18.5 360 = I<br>REEL H18.5 500 = J<br>ROLL H16.5 = N<br>ROLL H18.5 = O<br>BLISTER W12 180 = P<br>BLISTER W12 330 = Q<br>BLISTER W16 330 = R<br>BLISTER W24 330 = T<br>Bulk/TPS Standard = S<br>...<br><br><b>Pin length (untaped)</b><br>3.5 ±0.5 = C9<br>6 -2 = SD<br>16 ±1 = P1<br>...<br><b>Pin length (taped)</b><br>none = 00 |      |      |    |
| <b>Version code:</b><br>Standard = 00<br>Version A1 = 1A<br>Version A1.1.1 = 1B<br>Version A2 = 2A<br>...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |   |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |      |    |

The data on this page is not complete and serves only to explain the part number system. Part number information is listed on the pages of the respective WIMA range.