

Metallized Polyethylenaphthalate (PEN) SMD Film Capacitors with Box Encapsulation

Special Features

- Size codes 1210, 1812, 2220, 2824, 4030, 5040 and 6054 with PEN and encapsulated
- Operating temperature up to 125° C
- Self-healing
- Suitable for lead-free soldering
- According to RoHS 2002/95/EC

Typical Applications

For general DC-applications e.g.

- By-pass
- Blocking
- Coupling and decoupling
- Timing

Construction

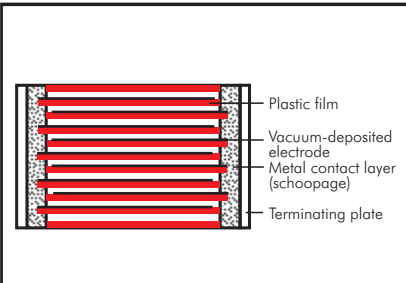
Dielectric:

Polyethylenaphthalate (PEN) film

Capacitor electrodes:

Vacuum-deposited

Internal construction:



Encapsulation:

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

Terminations:

Tinned plates.

Marking:

Colour: Black.

Marking (from size code 4030): Silver.

Electrical Data

Capacitance range:

1000 pF to 6.8 µF

Rated voltages:

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

Capacitance tolerances:

±20%, ±10%, (±5% available subject to special enquiry)

Operating temperature range:

-55° C to +125° C

Climatic test category:

55/125/21 according to IEC

for size codes 1210 to 2824

55/125/56 according to IEC

for size codes 4030 to 6054

Insulation resistance at +20° C:

U_r	U_{test}	$C \leq 0.33 \mu F$	$0.33 \mu F < C \leq 6.8 \mu F$
63 VDC	50 V	$\geq 3.75 \times 10^3 M\Omega$ (mean value: $1 \times 10^4 M\Omega$)	$\geq 1250 \text{ sec} (M\Omega \times \mu F)$ (mean value: 3000 sec)
100 VDC	100 V		
$\geq 250 \text{ VDC}$	100 V	$\geq 1 \times 10^4 M\Omega$ (mean value: $5 \times 10^4 M\Omega$)	$\geq 3000 \text{ sec} (M\Omega \times \mu F)$ (mean value: 10000 sec)

Measuring time: 1 min.

Dissipation factors at +20° C: $\tan \delta$

at f	$C \leq 0.1 \mu F$	$0.1 \mu F < C \leq 1.0 \mu F$	$C > 1.0 \mu F$
1 kHz	$\leq 8 \times 10^{-3}$	$\leq 8 \times 10^{-3}$	$\leq 10 \times 10^{-3}$
10 kHz	$\leq 15 \times 10^{-3}$	$\leq 15 \times 10^{-3}$	-
100 kHz	$\leq 30 \times 10^{-3}$	-	-

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

Capacitance pF/µF	Pulse rise time V/µsec max. operation/test					
	63 VDC	100 VDC	250 VDC	400 VDC	630 VDC	1000 VDC
1000 ... 6800	35/350	35/350	40/400	50/500	-	-
0.01 ... 0.022	30/300	35/350	40/400	35/350	40/400	50/500
0.033 ... 0.068	20/200	20/200	40/400	21/210	25/250	32/320
0.1 ... 0.22	10/100	10/100	12/120	14/140	17/170	-
0.33 ... 0.68	8/80	6/60	9/90	10/100	-	-
1.0 ... 2.2	3.5/35	4/40	7/70	-	-	-
3.3 ... 6.8	3/30	3/30	-	-	-	-

Dip Solder Test/Processing

Resistance to soldering heat:

Test Tb in accordance with DIN IEC

60068-2-20/EN 132200.

Soldering bath temperature max. 260° C.

Soldering duration max. 5 sec.

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

Soldering process:

Wave soldering and re-flow soldering

(see temperature/time graphs page 14).

Packing

Available taped and reeled in 12 mm 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*		400 VDC/200 VAC*		630 VDC/300 VAC*		1000 VDC/400 VAC*																																																									
	Size code	H ± 0.3	Size code	H ± 0.3	Size code	H ± 0.3	Size code	H ± 0.3	Size code	H ± 0.3	Size code	H ± 0.3																																																								
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0.068 "	1812 2220 2824	3.0 2.5 2.0	1812 2220 2824	3.0 2.5 2.0	2220 2824	3.5 3.0	2824 4030	5.0 5.0	5040	6.0																																																										
0.1 µF	1812 2220 2824	3.0 2.5 2.0	1812 2220 2824	3.0 2.5 2.0	2220 2824 4030	4.5 4.0 5.0	4030	5.0	6054	7.0																																																										
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0.22 "	2220 2824	3.5 3.0	2220 2824	3.5 3.0	4030	5.0	5040	6.0	<table border="1"> <thead> <tr> <th>Size code</th> <th>L ±0.3</th> <th>W ±0.3</th> <th>d</th> <th>a min.</th> <th>b min.</th> <th>c max.</th> </tr> </thead> <tbody> <tr> <td>1210</td> <td>3.2</td> <td>2.5</td> <td>0.5</td> <td>1.2</td> <td>3</td> <td>2.5</td> </tr> <tr> <td>1812</td> <td>4.8</td> <td>3.3</td> <td>0.5</td> <td>1.2</td> <td>3.5</td> <td>3.5</td> </tr> <tr> <td>2220</td> <td>5.7</td> <td>5.1</td> <td>0.5</td> <td>1.2</td> <td>4</td> <td>4.5</td> </tr> <tr> <td>2824</td> <td>7.2</td> <td>6.1</td> <td>0.5</td> <td>1.2</td> <td>4</td> <td>6.5</td> </tr> <tr> <td>4030</td> <td>10.2</td> <td>7.6</td> <td>0.5</td> <td>2.5</td> <td>6</td> <td>9</td> </tr> <tr> <td>5040</td> <td>12.7</td> <td>10.2</td> <td>0.7</td> <td>2.5</td> <td>6</td> <td>11.5</td> </tr> <tr> <td>6054</td> <td>15.3</td> <td>13.7</td> <td>0.7</td> <td>2.5</td> <td>6</td> <td>14</td> </tr> </tbody> </table>				Size code	L ±0.3	W ±0.3	d	a min.	b min.	c max.	1210	3.2	2.5	0.5	1.2	3	2.5	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
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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																																																														
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1.0 µF	2824 4030	5.0 5.0	2824 4030	5.0 5.0	6054	7.0	Solder pad recommendation.																																																													
1.5 "	4030	5.0	4030	5.0	Dims. in mm.																																																															
2.2 "	5040	6.0	5040	6.0																																																																
3.3 "	5040	6.0	5040	6.0																																																																
4.7 "	6054	7.0	6054	7.0																																																																
6.8 "	6054	7.0	6054	7.0																																																																

* AC voltage: $f = 50 \text{ Hz}; 1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$
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Metallized Polyphenylene-Sulphide (PPS) SMD Film Capacitors with Box Encapsulation

Special Features

- Size codes 1812, 2220 and 2824 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 2002/95/EC

Typical Applications

For general applications in high temperature circuits e.g.

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

Construction

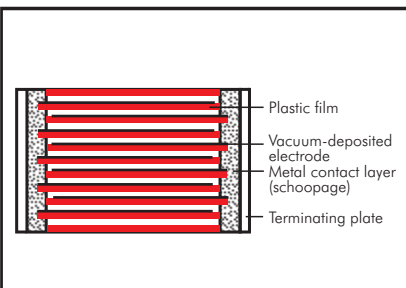
Dielectric:

Polyphenylene-sulphide (PPS) film

Capacitor electrodes:

Vacuum-deposited

Internal construction:



Encapsulation:

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

Terminations:

Tinned plates.

Marking:

Colour: Black.

Electrical Data

Capacitance range:

0.01 µF to 0.47 µF

Rated voltages:

63 VDC, 100 VDC, 250 VDC

Capacitance tolerances:

±20%, ±10%, ±5%

Operating temperature range:

-55° C to +140° C

Climatic test category:

55/140/56 in accordance with IEC

Insulation resistance at +20° C:

$C \leq 0.33 \mu\text{F}$: $\geq 1 \times 10^4 \text{ M}\Omega$

(mean value: $3 \times 10^4 \text{ M}\Omega$)

$C = 0.47 \mu\text{F}$: $\geq 3000 \text{ sec (M}\Omega \times \mu\text{F)}$

(mean value: 6000 sec)

Measuring voltage: 50 V/1 min.

Test voltage: 1.6 U_r, 2 sec.

Maximum pulse rise time:

Capacitance µF	Pulse rise time V/µsec max. operation/test		
	63 VDC	100 VDC	250 VDC
0.01 ... 0.022	35/350	35/350	50/500
0.033 ... 0.068	20/200	20/200	40/400
0.1 ... 0.47	15/150	15/150	40/400

for pulses equal to the rated voltage

Dip Solder Test/Processing

Resistance to soldering heat:

Test T_b in accordance with

DIN IEC 60068-2-20/EN 132 200.

Soldering bath temperature max. 260° C.

Soldering duration max. 5 sec.

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

Soldering process:

Wave soldering and re-flow soldering

(see temperature/time graphs page 14).

Dissipation factors at +20° C: tan δ

at f	$C \leq 0.1 \mu\text{F}$	$0.1 \mu\text{F} < C \leq 0.47 \mu\text{F}$
1 kHz	$\leq 15 \times 10^{-4}$	$\leq 20 \times 10^{-4}$
10 kHz	$\leq 20 \times 10^{-4}$	$\leq 25 \times 10^{-4}$
100 kHz	$\leq 50 \times 10^{-4}$	-

Voltage derating:

For DC and AC voltages a voltage derating factor of 1 % per K must be applied from + 100° C and of 2 % per K from + 125° C.

Reliability:

Operational life > 300 000 hours

Failure rate < 2 fit (0.5 x U_r and 40° C)

Packing

Available taped and reeled in 12 mm blister pack.

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

For further details and graphs please refer to Technical Information.

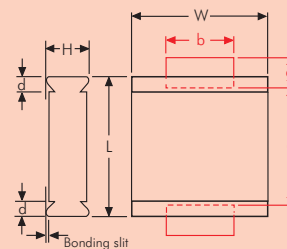
Continuation

General Data

Capacitance	63 VDC/40 VAC*		100 VDC/63 VAC*		250 VDC/160 VAC*	
	Size code	H ±0.3	Size code	H ±0.3	Size code	H ±0.3
0.01 μF	1812	2.0	1812	2.0	2220	2.5
0.015 "	1812	2.0	1812	2.0	2220	2.5
0.022 "	1812	3.0	1812	3.0	2220	3.5
0.033 "	1812	3.0	2220	2.5	2824	3.0
0.047 "	2220	2.5	2220	2.5	2824	4.0
0.068 "	2220	2.5	2220	2.5	2824	4.0
0.1 μF	2220	3.5	2824	3.0	2824	5.0
0.15 "	2824	3.0	2824	3.0		
0.22 "	2824	4.0	2824	4.0		
0.33 "	2824	4.0	2824	4.0		
0.47 "	2824	5.0	2824	5.0		

* AC voltage: $f \leq 400 \text{ Hz}$; $1.4 \times U_{\text{rms}} + \text{UDC} \leq U_r$

Taped version see page 99.



Solder pad recommendation

Dims. in mm.

Size code	L ± 0.3	W ± 0.3	d	a max.	b min.	c 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

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WIMA SMD capacitors with PET or MP dielectric according to catalogue 2004 available on request.