

# Film Chip Capacitors



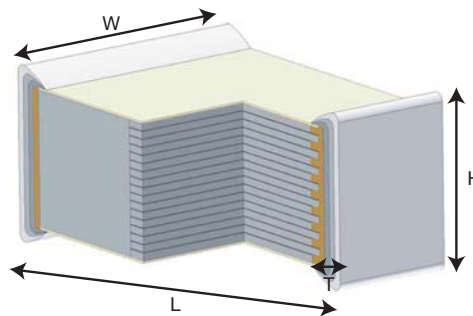
## How to Order, Dimensions and Construction

### HOW TO ORDER

CB	04	2	G	0104	K	--
<b>Type</b>	<b>Size</b>	<b>Dielectric</b>	<b>Voltage</b>	<b>Capacitance</b>	<b>Tolerance EIA Code</b>	<b>Suffix Packaging</b>
CB: SMD Lead Free CL	01: 1206 02: 1210 03: 1812 04: 2220 05: 2824 95: 2840 16: 4030 17: 5040 18: 6054	2 = PET-HT 8 = PPS 7 = PEN	B = 16V C = 25V D = 50/63V E = 100V G = 250V I = 400V K = 630V	1st digit: 0 2nd & 3rd: the 2nd significant figures of the capacitance value. 4th digit: the number of zeros to be added to the capacitance value.	G <sup>(1)</sup> = 2% J = 5% K = 10%	-- = bulk BA = tape & reel diameter: 180mm BC = tape & reel diameter: 330mm

**Example of an order:** How to order a chip film PET-HT 100nF ±10% 250V bulk packaging.

<sup>(1)</sup>: Tolerance G available only for PPS Series.



### CASE DIMENSIONS: millimeters (inches)

Size Code	Equivalent size	Length (L)	Width (W)	Termination Return
01	1206	3.30±0.30 (0.130±0.012)	1.60±0.30 (0.063±0.012)	0.50±0.30 (0.020±0.012)
02	1210	3.30±0.30 (0.130±0.012)	2.50±0.30 (0.098±0.012)	0.50±0.30 (0.020±0.012)
03	1812	4.50±0.50 (0.177±0.020)	3.20±0.50 (0.126±0.020)	0.60±0.40 (0.024±0.157)
04	2220	5.80±0.50 (0.228±0.020)	5.00±0.50 (0.197±0.020)	0.80±0.60 (0.032±0.024)
05	2824	7.20±0.50 (0.283±0.020)	6.10±0.50 (0.240±0.020)	0.80±0.60 (0.032±0.024)
95	2840	7.20±0.50 (0.283±0.020)	10.0±0.80 (0.343±0.031)	0.80±0.60 (0.032±0.024)
16	4030	10.5±0.60 (0.413±0.024)	7.60±0.80 (0.299±0.031)	0.80±0.60 (0.032±0.024)
17	5040	12.8±0.60 (0.504±0.024)	10.2±0.80 (0.401±0.031)	0.80±0.60 (0.032±0.024)
18	6054	15.3±0.60 (0.602±0.024)	13.7±0.80 (0.539±0.031)	0.80±0.60 (0.032±0.024)

### STACKED FILM CONSTRUCTION

Our SMD Film capacitors (CB series) are using stacked technology with metallized plastic film, which forms the basis for the capacitive element. Combined with the nacked design choice, it gives our products an again better self-healing capability as well as a very good capacitance per volume ratio. This also means that internal construction of the multi-layer stack, usually hidden in encapsulated film capacitors design, is visible at the cut edges in the surface mount configuration. In a typical film capacitor stack, hundreds of film layers are compacted during manufacture. Under a micro-

scope these have the appearance of pages in a book. Subsequent manufacturing and pcb assembly processes allow a small amount of relaxation in these layers. In some cases, small gaps between layers may become visible. These are referred to as microgaps, and their occurrence is a standard feature of this technology. Even if it can be considered an cosmetic issue, presence of these gaps has no effect at all on mechanical or electrical performance or reliability. (Detailed report is available upon request.)

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## Electrical Properties and Test Conditions – CB Series

### STANDARDIZATION

Reference Standard is CECC 32201

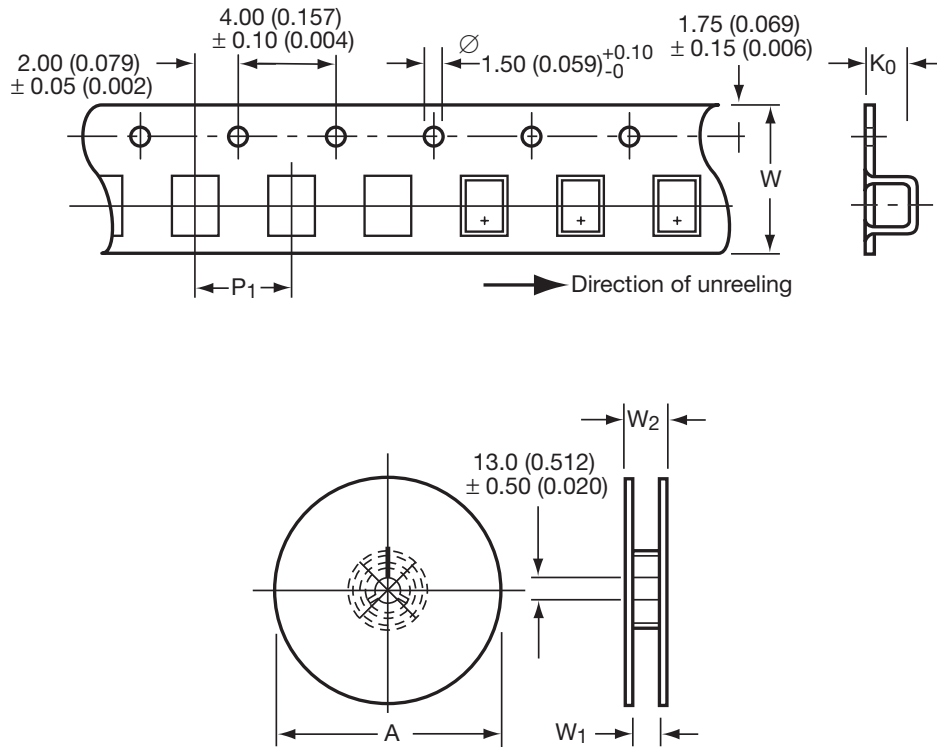
Test	Description	Performance
<b>Capacitance C</b>	Measurement frequency 1 KHz 20°C	Shall be within tolerance of the rated value
<b>Dissipation Factor DF</b>	Measurement frequency 1 KHz 20°C	DF < 100.10 <sup>-4</sup>
<b>Insulation Resistance IR</b>	Voltage applied: 10V for Vr < 100V 100V for Vr ≥ 100V	IR > 1000 Mohms for C <= 0.33μF IR x C > 400sec. For C > 0.33μF
<b>Dielectric Strength</b>	Surge Voltage = 1.4Vr applied for 1mm between terminals	There shall be no direct breakdown
<b>Mounting</b>	Board = 1.6mm (0.063") thick epoxy glass laminated or alumine substrate	C = within ± 2% of initial value DF = <= 50.10 <sup>-4</sup> at 1 KHz IR = within initial limit
<b>Adhesion</b>	Force of 5 N applied for 10 secs.	No visible damage
<b>Board Bending Test</b>	Bending of 1 mm(0.039") for 90 mm (3.543") length	C = within ± 2% of initial value No visible damage
<b>Thermal Shock</b>	500 cycles -55/+125°C	C = within ± 5% of initial value ESR = no more than 3 times initial value IR = not less than 50% of the initial limit
<b>Damp Heat Steady State</b>	40°C 93% RH / no voltage / 56 days	C = within ± 7% of initial value Delta DF = < 50.10 <sup>-4</sup> at 1 KHz IR = not less than 50% of the initial limit
<b>Accelerated Damp Heat (Load Humidity)</b>	85°C 85% RH 1.5V-500H	C = within ± 7% of initial value Delta DF = <= 70.10 <sup>-4</sup> at 1 KHz IR = not less than 50% of the initial limit
<b>Life Test</b>	85°C / 1.25Vr / 1000H	C = within ± 8% of initial value Delta DF = < 50.10 <sup>-4</sup> at 1 KHz IR = not less than 50% of the initial limit
<b>Life Test</b>	105°C / Vr/1,000 Hours 125°C / Vr/1,000 Hours	C = within ± 7% of initial value Delta DF = < 50.10 <sup>-4</sup> at 1 KHz IR = not less than 50% of the initial limit
<b>Charge/Discharge</b>	10,000 cycle / Vr	C = within ± 5% of initial value DF = < 50.10 <sup>-4</sup> at 1 KHz IR = not less than 50% of the initial limit

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## Packaging – CB Series

### TAPE & REEL DIMENSIONS



### TAPE & REEL CHARACTERISTICS

In accordance with IEC 286 and EIA 481, the material used:

Carrier tape: Antistatic Material

Cover tape: Polyester

Reel: Recyclable Material

Parts in bulk or on reel are packed in hermetically sealed plastic bags.

### RECOMMENDATIONS

Once the sealed bag is opened, the capacitors must be stored in a dry atmosphere until soldering.

Recommended storage conditions are:

PET & PEN: < 30°C and R.H.<60% for a maximum of 168 hours

PPS: < 30°C and R.H.<60% for a maximum of 4 weeks

The use-by date is 3 years if kept in origin plastic bags.

In case of storage outside the conditions recommended above the capacitors must be dried prior to soldering.

Recommended drying conditions are:

48 hours minimum at 60°C and RH < 10%.