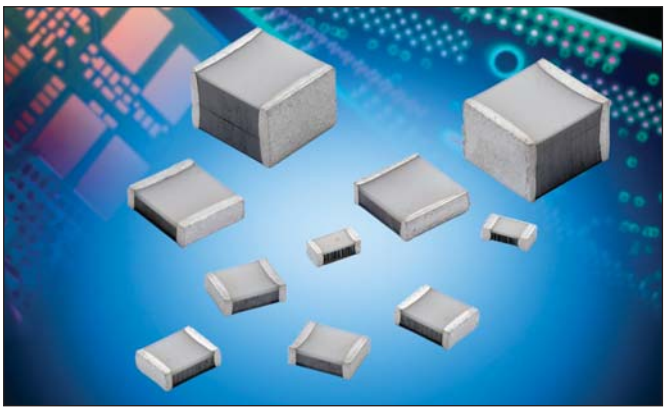
Film Chip Capacitors

PEN DIELECTRIC – CB Series



APPLICATIONS

General purpose function in low voltage applications where miniaturization and SMD is required. Typical applications would be:

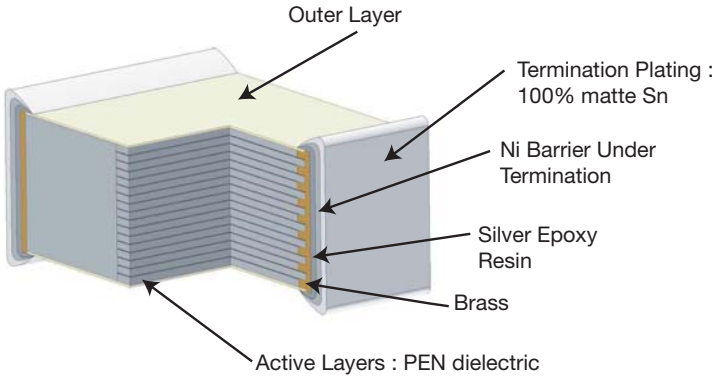
- Automotive (Airbag, Fuel injection calculator...)
- Telecom (Public switching systems, modems, telephone set, cordless, mobile)
- Industrial (SMPS, Power convertor module...)

GENERAL DESCRIPTION

Film chip capacitor using a naked and stacked construction with metallized PEN (polyethylene naphtalate).

ADVANTAGES

- Use of high temperature dielectric films make these capacitors suitable for IR or vapor phase reflow processes. This chip is built without specific encapsulation.
- The intrinsic elasticity of the dielectric film allows an excellent compatibility of the capacitor with all types of material for printed circuit boards.
- The self-healing property of film technology results to a safety open failure mode and better overall reliability.
- Excellent thermal shock resistance.
- Low dissipation factor ESR & ESL.
- No piezoelectric effect.
- Available in tape and reel suitable for automatic placement.
- Non-polar construction.



PERFORMANCE CHARACTERISTICS

Climatic Category	55/125/56
Capacitance Range	1nF to 4.7µF
Tolerance on C_R	±5%, ±10%
Nominal Voltages	25Vdc to 630Vdc
Test Voltage	1.4Vr 2 sec. at 25°C
Soldering methods	IR or vapor phase reflow (not suitable for wave soldering)
Tangent of Loss Angle at 1kHz (DF)	$< 100 \times 10^{-4}$
Insulation resistance minimum : IR	for C ≤ 0.33µF IR > 1000 MΩ at 20°C for 1 min. charge at 10Vdc for VR < 100Vdc and 100Vdc for VR ≥ 100Vdc
	for C > 0.33µF IR C > 400 sec. at 20°C for 1 min. charge at 10Vdc for VR < 100Vdc and 100Vdc for VR ≥ 100Vdc
Temperature range	-55°C to 125°C with voltage derating of 1.25%/°C between 105°C and 125°C
A.C. applications	For high frequency A.C. application please check with AVX

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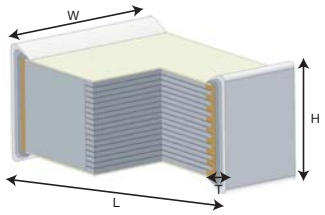
CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 25V Vac: 16V												Reel Pkg Code
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.001µF	CB017C0102+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0012	CB017C0122+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0015	CB017C0152+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0018	CB017C0182+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0022	CB017C0222+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0027	CB017C0272+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0033	CB017C0332+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0047	CB017C0472+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0056	CB017C0562+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0068	CB017C0682+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0082	CB017C0822+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.010µF	CB017C0103+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.012	CB017C0123+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.015	CB017C0153+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.018	CB017C0183+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.022	CB017C0223+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.027	CB027C0273+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.033	CB027C0333+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.047	CB027C0473+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.056	CB027C0563+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.068	CB027C0683+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.082	CB027C0823+ --	3.30 (0.130)	2.50 (0.098)	2.20 (0.087)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	2.33 (0.092)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2000	BA
0.100µF	CB027C0104+ --	3.30 (0.130)	2.50 (0.098)	2.30 (0.091)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	2.33 (0.092)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2000	BA

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA = tape & reel

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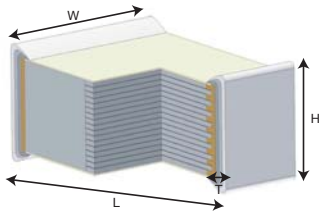
CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 50V Vac: 40V												
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.001µF	CB017D0102+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0012	CB017D0122+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0015	CB017D0152+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0018	CB017D0182+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0022	CB017D0222+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0027	CB017D0272+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0033	CB017D0332+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
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0.0056	CB017D0562+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0068	CB017D0682+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
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0.010µF	CB017D0103+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.012	CB017D0123+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
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0.033	CB027D0333+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.047	CB027D0473+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
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0.100µF	CB027D0104+ --	3.30 (0.130)	2.50 (0.098)	2.30 (0.091)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	2.33 (0.092)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2000	BA

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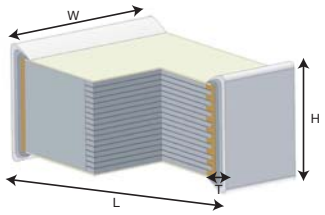


millimeters (inches)

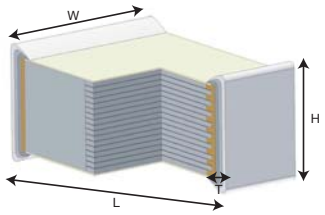
Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 63V Vac: 40V												
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.001µF	CB037D0102+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0012	CB037D0122+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0015	CB037D0152+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0018	CB037D0182+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.6 (0.024)	12.0 (0.472)	8.0 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0022	CB037D0222+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0027	CB037D0272+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.6 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0033	CB037D0332+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0047	CB037D0472+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0056	CB037D0562+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0068	CB037D0682+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0082	CB037D0822+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.6 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.010µF	CB037D0103+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



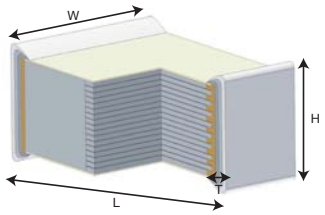
Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 63V Vac: 40V												Reel Pkg Code
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.010µF	CB037D0103+ --	4.70 (0.185)	3.20 (.0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.0 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.012	CB037D0123+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.015	CB037D0153+ --	4.70 (0.185)	3.20 (0.126)	2.40 (0.095)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.40 (0.095)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.018	CB037D0183+ --	4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.022	CB037D0223+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.027	CB037D0273+ --	4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	1.90 (0.075)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.033	CB037D0333+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.047	CB037D0473+ --	4.70 (0.185)	3.20 (0.126)	2.70 (0.107)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	700	BA
		4.70 (0.185)	3.20 (0.126)	2.70 (0.107)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.056	CB037D0563+ --	4.70 (0.185)	3.20 (0.126)	2.30 (0.091)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.30 (0.091)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.068	CB037D0683+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.082	CB037D0823+ --	4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.100µF	CB037D0104+ --	4.70 (0.185)	3.20 (0.126)	2.80 (0.111)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	700	BA
		4.70 (0.185)	3.20 (0.126)	2.80 (0.111)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 63V Vac: 40V												Reel Pkg Code
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.120	CB037D0124+ --	4.70 (0.185)	3.20 (0.126)	2.30 (0.091)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.30 (0.091)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.150	CB037D0154+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.180	CB037D0184+ --	4.70 (0.185)	3.20 (0.126)	2.40 (0.095)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.40 (0.095)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.220	CB037D0224+ --	4.70 (0.185)	3.20 (0.126)	3.00 (0.118)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	700	BA
		4.70 (0.185)	3.20 (0.126)	3.00 (0.118)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.330	CB047D0334+ --	5.80 (0.228)	5.00 (0.195)	4.00 (0.158)	0.80 (0.031)	16.0 (0.629)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2300	BC
0.470	CB047D0474+ --	5.80 (0.228)	5.00 (0.195)	4.00 (0.158)	0.80 (0.031)	12.0 (0.472)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2300	BC
0.560	CB047D0564+ --	5.80 (0.228)	5.00 (0.195)	2.50 (0.099)	0.80 (0.031)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.680	CB047D0684+ --	5.80 (0.228)	5.00 (0.195)	3.90 (0.154)	0.80 (0.031)	12.0 (0.472)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2300	BC
0.82*	CB057D0824+ --	7.30 (0.287)	6.10 (0.240)	4.40 (0.173)	0.80 (0.031)	16.0 (0.629)	12.0 (0.472)	5.23 (0.206)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1100	BC
1µF*	CB057D0105+ --	7.30 (0.287)	6.10 (0.240)	4.70 (0.185)	0.80 (0.031)	16.0 (0.629)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1800	BC
1.5*	CB057D0155+ --	7.30 (0.287)	6.10 (0.240)	4.70 (0.185)	0.80 (0.031)	16.0 (0.629)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1800	BC
2.2	CB167D0225+ --	10.5 (0.413)	7.60 (0.299)	6.10 (0.240)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
2.7	CB177D0275+ --	12.8 (0.503)	10.2 (0.402)	6.70 (0.264)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	7.00 (0.274)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	600	BC
3.3	CB187D0335+ --	15.3 (0.601)	13.7 (0.539)	5.30 (0.209)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	6.30 (0.248)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	400	BC
4.7	CB187D0475+ --	15.3 (0.601)	13.7 (0.539)	7.20 (0.283)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	7.60 (0.299)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	300	BC
		VOLTAGE Vdc: 100V Vac: 63V												
0.001µF	CB017E0102+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0012	CB017E0122+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0015	CB017E0152+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0018	CB017E0182+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA

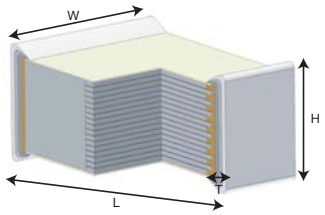
For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

*Special length: 7.3 +0.7/-0.3 (0.287 +0.026/-0.012)

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

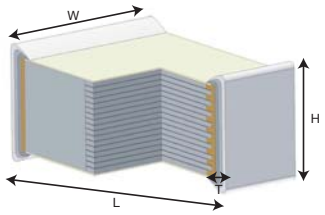
Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 100V Vac: 63V												Reel Pkg Code
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.0022	CB017E0222+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0027	CB017E0272+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0033	CB017E0332+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0047	CB017E0472+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0056	CB017E0562+ --	3.30 (0.130)	1.60 (0.063)1	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0068	CB017E0682+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.0082	CB017E0822+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.010µF	CB017E0103+ --	3.30 (0.130)	1.60 (0.063)	1.15 (0.045)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.20 (0.047)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	3500	BA
0.012	CB027E0123+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.015	CB027E0153+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.018	CB027E0183+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.0 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.022	CB027E0223+ --	3.30 (0.130)	2.50 (0.098)	1.80 (0.071)	0.50 (0.020)	8.00 (0.315)	4.00 (0.158)	1.90 (0.075)	180 (7.087)	8.40 (0.331)	14.4 (0.567)	2000	2500	BA
0.027	CB037E0273+ --	4.70 (0.185)	3.20 (0.126)	2.20 (0.087)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.1024)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.20 (0.087)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.1024)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.033	CB037E0333+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.047	CB037E0473+ --	4.70 (0.185)	3.20 (0.126)	2.60 (0.102)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	700	BA
		4.70 (0.185)	3.20 (0.126)	2.60 (0.102)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.056	CB037E0563+ --	4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.068	CB037E0683+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.082	CB037E0823+ --	4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	900	BA

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

Capacitance Range (CR)	Ordering Code	Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
		VOLTAGE Vdc: 100V Vac: 63V												
0.082	CB037E0823+ --	4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.100µF	CB037E0104+ --	4.70 (0.185)	3.20 (0.126)	3.00 (0.118)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	700	BA
		4.70 (0.185)	3.20 (0.126)	3.00 (0.118)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.120	CB047E0124+ --	5.80 (0.228)	5.00 (0.195)	4.00 (0.158)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2300	BC
0.150	CB047E0154+ --	5.80 (0.228)	5.00 (0.195)	3.30 (0.130)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.45 (0.136)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2800	BC
0.180	CB047E0184+ --	5.80 (0.228)	5.00 (0.195)	3.00 (0.118)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.220	CB047E0224+ --	5.80 (0.228)	5.00 (0.195)	4.00 (0.158)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2300	BC
0.330	CB047E0334+ --	5.80 (0.228)	5.00 (0.195)	4.00 (0.158)	0.80 (0.032)	16.0 (0.629)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1500	2300	BC
0.47*	CB057E0474+ --	7.30 (0.287)	6.10 (0.240)	4.50 (0.177)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1800	BC
0.56*	CB057E0564+ --	7.30 (0.287)	6.10 (0.240)	4.00 (0.158)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	4.10 (0.162)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	2300	BC
0.68*	CB057E0684+ --	7.30 (0.287)	6.10 (0.240)	4.50 (0.177)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1800	BC
0.82	CB167E0824+ --	10.5 (0.413)	7.6 (0.299)	5.80 (0.229)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
1	CB167E0105+ --	10.5 (0.413)	7.60 (0.299)	6.00 (0.237)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
1.5	CB177E0155+ --	12.8 (0.503)	10.2 (0.402)	5.50 (0.217)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	5.70 (0.224)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	700	BC
2.2	CB177E0225+ --	12.8 (0.503)	10.2 (0.402)	6.90 (0.272)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	7.00 (0.274)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	600	BC
3.3	CB187E0335+ --	15.3 (0.601)	13.7 (0.539)	7.10 (0.280)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	7.60 (0.299)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	300	BC
		VOLTAGE Vdc: 250V Vac: 160V												
0.001µF	CB037G0102+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0012	CB037G0122+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0015	CB037G0152+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0018	CB037G0182+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA

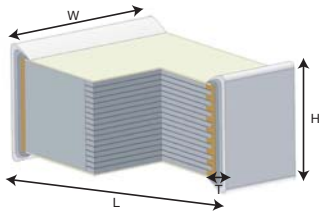
For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

*Special length: 7.3 +0.7/-0.3 (0.287 +0.026/-0.012)

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

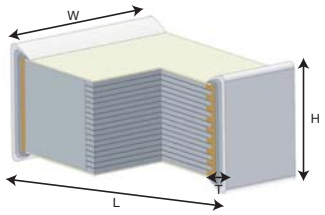
Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 250V Vac: 160V												
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.0018	CB037G0182+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0022	CB037G0222+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0027	CB037G0272+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0033	CB037G0332+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0047	CB037G0472+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0056	CB037G0562+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0068	CB037G0682+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0082	CB037G0822+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.010µF	CB037G0103+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.012	CB037G0123+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.015	CB037G0153+ --	4.70 (0.185)	3.20 (0.126)	2.40 (0.094)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.40 (0.094)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC
0.018	CB037G0183+ --	4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	900	BA
		4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.60 (0.102)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3600	BC

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

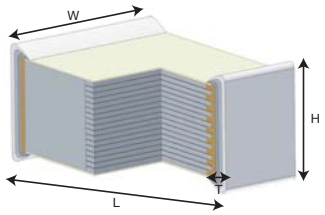
Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 250V Vac: 160V												
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.022	CB037G0223+ --	4.70 (0.185)	3.20 (0.126)	2.90 (0.114)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	180 (7.087)	12.4 (0.488)	18.4 (0.724)	1500	700	BA
		4.70 (0.185)	3.20 (0.126)	2.90 (0.114)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.027	CB047G0273+ --	5.80 (0.228)	5.00 (0.195)	1.80 (0.071)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	2.43 (0.096)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3500	BC
0.033	CB047G0333+ --	5.80 (0.228)	5.00 (0.195)	2.20 (0.087)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	2.43 (0.096)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3500	BC
0.047	CB047G0473+ --	5.80 (0.228)	5.00 (0.195)	2.90 (0.114)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.056	CB047G0563+ --	5.80 (0.228)	5.00 (0.195)	2.90 (0.114)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.068	CB047G0683+ --	5.80 (0.228)	5.00 (0.195)	4.00 (0.158)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	4.10 (0.161)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2800	BC
0.082	CB047G0823+ --	5.80 (0.228)	5.00 (0.195)	4.50 (0.177)	0.80 (0.032)	16.0 (0.629)	8.00 (0.315)	4.60 (0.181)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1500	1900	BC
0.100µF	CB047G0104+ --	5.80 (0.228)	5.00 (0.195)	4.50 (0.177)	0.80 (0.032)	16.0 (0.629)	8.00 (0.315)	4.60 (0.181)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1500	1900	BC
0.120	CB057G0124+ --	7.20 (0.283)	6.10 (0.240)	3.90 (0.153)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	1000	1800	BC
0.150	CB057G0154+ --	7.20 (0.283)	6.10 (0.240)	4.70 (0.185)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1800	BC
0.180	CB057G0184+ --	7.20 (0.283)	6.10 (0.240)	5.00 (0.197)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	5.23 (0.206)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1100	BC
0.22µF	CB057G0224+ --	7.20 (0.283)	6.10 (0.240)	5.70 (0.225)	0.80 (0.032)	16.0 (0.629)	12.0 (0.472)	5.90 (0.232)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	900	BC
0.330	CB167G0334+ --	10.5 (0.413)	7.60 (0.299)	6.10 (0.240)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
0.470	CB177G0474+ --	12.8 (0.503)	10.2 (0.402)	5.50 (0.205)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	5.70 (0.224)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	700	BC
0.560	CB177G0564+ --	12.8 (0.503)	10.2 (0.402)	6.00 (0.236)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	5.70 (0.224)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	700	BC
0.680	CB187G0684+ --	15.3 (0.601)	13.7 (0.539)	4.30 (0.169)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	4.50 (0.177)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	600	BC
1µF	CB187G0105+ --	15.3 (0.601)	13.7 (0.539)	6.40 (0.252)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	6.30 (0.248)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	400	BC
		VOLTAGE Vdc: 400V Vac: 200V												
0.001µF	CB037I0102+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0012	CB037I0122+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0015	CB037I0152+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

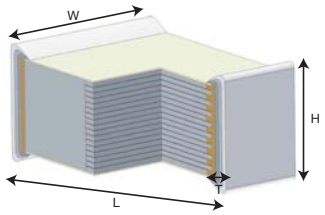
Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 400V Vac: 200V												
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.0015	CB037I0152+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0018	CB037I0182+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0022	CB037I0222+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0027	CB037I0272+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0033	CB037I0332+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0047	CB037I0472+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0056	CB037I0562+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0068	CB037I0682+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0082	CB037I0822+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.010µF	CB047I0103+ --	5.80 (0.228)	5.00 (0.195)	1.90 (0.075)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	2.10 (0.083)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
0.012	CB047I0123+ --	5.80 (0.228)	5.00 (0.195)	2.20 (0.087)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	2.43 (0.096)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3500	BC
0.015	CB047I0153+ --	5.80 (0.228)	5.00 (0.224)	2.00 (0.079)	0.80 (0.087)	12.0 (0.472)	8.00 (0.315)	2.43 (0.096)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
0.018	CB047I0183+ --	5.80 (0.228)	5.00 (0.195)	2.30 (0.091)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	2.43 (0.096)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3500	BC
0.022	CB047I0223+ --	5.80 (0.228)	5.00 (0.195)	2.80 (0.110)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.027	CB047I0273+ --	5.80 (0.228)	5.00 (0.195)	3.30 (0.130)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.45 (0.136)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2800	BC

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

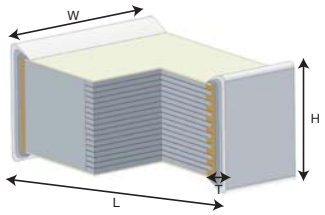
Capacitance Range (CR)	Ordering Code	Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
		VOLTAGE Vdc: 400V Vac: 200V												
0.033	CB047I0333+ --	5.80 (0.228)	5.00 (0.195)	3.90 (0.154)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2300	BC
0.047	CB057I0473+ --	7.20 (0.283)	6.10 (0.24)	3.20 (0.126)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	24.4 (0.96)	30.4 (1.196)	1000	2250	BC
0.056	CB057I0563+ --	7.20 (0.283)	6.10 (0.24)	3.70 (0.146)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	2250	BC
0.068	CB057I0683+ --	7.20 (0.283)	6.10 (0.24)	4.40 (0.173)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1800	BC
0.082	CB167I0823+ --	10.5 (0.413)	7.60 (0.299)	4.50 (0.177)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	4.90 (0.193)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	1100	BC
0.100µF	CB167I0104+ --	10.5 (0.413)	7.60 (0.299)	4.00 (0.158)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	4.90 (0.193)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	1100	BC
0.120	CB167I0124+ --	10.5 (0.413)	7.60 (0.299)	5.00 (0.196)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
0.150	CB167I0154+ --	10.5 (0.413)	7.60 (0.299)	6.00 (0.235)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
0.180	CB177I0184+ --	12.8 (0.503)	10.2 (0.402)	5.10 (0.200)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	5.70 (0.225)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	700	BC
0.220	CB177I0224+ --	12.8 (0.503)	10.2 (0.402)	5.00 (0.196)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	5.70 (0.225)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	700	BC
0.270	CB177I0274+ --	12.8 (0.503)	10.2 (0.402)	6.50 (0.255)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	7.00 (0.275)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	600	BC
0.330	CB187I0334+ --	15.3 (0.601)	13.7 (0.539)	4.20 (0.165)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	4.50 (0.178)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	600	BC
0.390	CB187I0394+ --	15.3 (0.601)	13.7 (0.539)	5.80 (0.228)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	6.30 (0.248)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	400	BC
0.470	CB187I0474+ --	15.3 (0.601)	13.7 (0.539)	6.50 (0.255)	0.80 (0.0315)	24.0 (0.944)	24.0 (0.944)	7.60 (0.299)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	300	BC
		VOLTAGE Vdc: 630V Vac: 250V												
0.001µF	CB037K0102+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0012	CB037K0122+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0015	CB037K0152+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0018	CB037K0182+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0022	CB037K0222+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

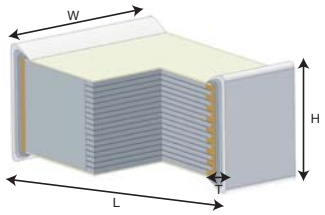
Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 630V Vac: 250V												
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.0022	CB037K0222+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0027	CB037K0272+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0033	CB037K0332+ --	4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1200	BA
		4.70 (0.185)	3.20 (0.126)	2.00 (0.079)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0047	CB037K0472+ --	4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	1201	BA
		4.70 (0.185)	3.20 (0.126)	2.50 (0.099)	0.60 (0.024)	12.0 (0.472)	8.00 (0.315)	2.06 (0.081)	180 (7.09)	12.4 (0.488)	18.4 (0.724)	1500	4500	BC
0.0056	CB047K0562+ --	5.80 (0.228)	5.00 (0.195)	2.00 (0.079)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	2.10 (0.083)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
0.0068	CB047K0682+ --	5.80 (0.228)	5.00 (0.195)	2.00 (0.079)	0.80 (0.032)	12.0 (0.472)	8.0 (0.315)	2.10 (0.083)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
0.0082	CB047K0822+ --	5.80 (0.228)	5.00 (0.195)	2.20 (0.086)	0.80 (0.032)	12.0 (0.472)	8.0 (0.315)	2.43 (0.096)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3500	BC
0.010µF	CB047K0103+ --	5.80 (0.228)	5.00 (0.195)	2.00 (0.079)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	2.10 (0.083)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	4400	BC
0.012	CB047K0123+ --	5.80 (0.228)	5.00 (0.195)	3.00 (0.118)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.10 (0.122)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	3000	BC
0.015	CB047K0153+ --	5.80 (0.228)	5.00 (0.195)	3.40 (0.136)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	3.45 (0.136)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2800	BC
0.018	CB047K0183+ --	5.80 (0.228)	5.00 (0.195)	4.00 (0.157)	0.80 (0.032)	12.0 (0.472)	8.00 (0.315)	4.10 (0.162)	330 (12.99)	12.4 (0.488)	18.4 (0.724)	1500	2300	BC
0.022	CB057K0223+ --	7.20 (0.283)	6.10 (0.240)	3.40 (0.136)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.80 (0.149)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	2250	BC
0.027	CB057K0273+ --	7.20 (0.283)	6.10 (0.240)	4.00 (0.157)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	4.80 (0.189)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1800	BC
0.033	CB057K0333+ --	7.20 (0.283)	6.10 (0.240)	4.80 (0.189)	0.8 (0.032)	16.0 (0.629)	12.0 (0.472)	5.23 (0.206)	330 (12.99)	16.4 (0.645)	22.4 (0.881)	1000	1100	BC
0.047	CB167K0473+ --	10.5 (0.413)	7.60 (0.299)	3.80 (0.150)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	3.93 (0.155)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	1400	BC
0.056	CB167K0563+ --	10.5 (0.413)	7.60 (0.299)	4.60 (0.181)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
0.068	CB167K0683+ --	10.5 (0.413)	7.60 (0.299)	5.50 (0.216)	0.80 (0.032)	24.0 (0.944)	12.0 (0.472)	6.19 (0.244)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	500	900	BC
0.082	CB177K0823+ --	12.8 (0.503)	10.2 (0.402)	4.50 (0.177)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	4.70 (0.185)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	900	BC
0.100µF	CB177K0104+ --	12.8 (0.503)	10.2 (0.402)	4.60 (0.181)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	4.70 (0.185)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	900	BC

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

Film Chip Capacitors

PEN DIELECTRIC – CB Series

CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

Capacitance Range (CR)	Ordering Code	VOLTAGE Vdc: 630V Vac: 250V												
		Chip Dimensions *Tolerances (page 6)				Tape Dimensions			Reel Dimensions			Packaging Unit		Reel Pkg Code
		L	W	H max	T	W	P1	K0	A	W1	W2 max	Bulk	Reel	
0.120	CB177K0124+ --	12.8 (0.503)	10.2 (0.402)	6.00 (0.236)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	7.00 (0.275)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	600	BC
0.15*	CB177K0154K --	12.8 (0.503)	10.2 (0.402)	6.90 (0.271)	0.80 (0.032)	24.0 (0.944)	16.0 (0.629)	7.00 (0.275)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	600	BC
0.180	CB187K0184+ --	15.3 (0.601)	13.7 (0.539)	5.60 (0.220)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	6.30 (0.248)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	400	BC
0.220	CB187K0224+ --	15.3 (0.601)	13.7 (0.539)	6.00 (0.236)	0.80 (0.032)	24.0 (0.944)	24.0 (0.944)	6.30 (0.248)	330 (12.99)	24.4 (0.961)	30.4 (1.196)	300	400	BC

For other Values: upon request
Replace the + by the tolerance code: J = 5% or K = 10%
Replace the -- by the packaging suffix: -- = bulk
BA or BC = tape & reel

*Only available in tolerance ±10%

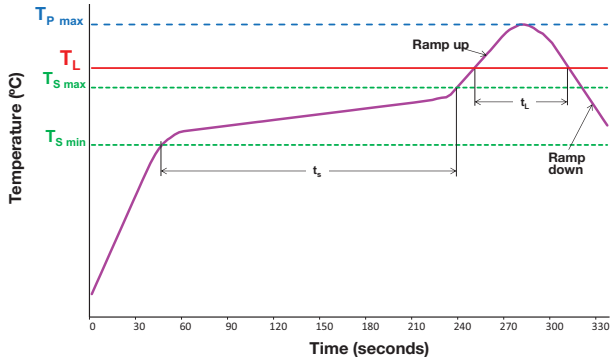
MOUNTING AND SOLDERING RECOMMENDATIONS
SOLDERING PROFILE

The capacitors can be mounted using infrared and vapor phase soldering following recommended below.
They are NOT suitable for wave soldering.

All temperature refer to topside of the package, measured on the package body surface.

Profile Feature	1206 to 1812	2220 to 6054
Ramp-Up ($T_{s\ max}$ to T_p)	3°C / second max	3°C / second max
Preheat - Temperature Min ($T_{s\ min}$) - Temperature Max ($T_{s\ max}$) - Time ($t_{s\ min}$ to $t_{s\ max}$)	 150°C 200°C 180 sec. max	 150°C 200°C 180 sec. max
Time maintained above - Temperature (T_L) - Time (t_L)	 217°C 60 sec. max	 217°C 75 sec. max
Peak temperature ($T_{p\ max}$)	250°C	255°C
Customer Peak temperature (T_p)	< 250ºC	< 255ºC
Time within 5°C of peak temperature (T_p -5ºC)*	10 sec.	10 sec.
Ramp-Down	6°C / sec.	6°C / sec.

* Example : T_p = 238.5°C =>> t_p = time between 238.5°C and 233.5°C (T_p-5°C)

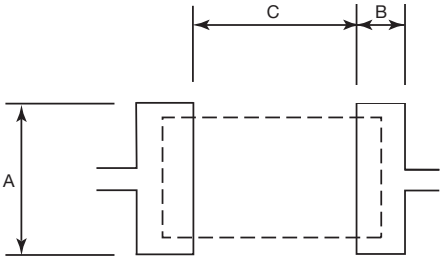


Reflow soldering referring to JEDEC Standard with some limitations
JEDEC J-Std 020C

RECOMMENDED SOLDER PASTE THICKNESS

For optimum solderability, the recommended soldering paste thickness: 1206 to 2824: 150 to 200µm
4030 to 6054: 200 to 300µm

In case of hand soldering, the temperature of the soldering iron should not be above 250°C. Special care must be taken to avoid touching the capacitor body with the iron tip.



PAD DIMENSIONS: millimeters (inches)

Size Code	Case Size	A	B	C
01	1206	1.30 (0.051)	1.30 (0.051)	2.20 (0.087)
02	1210	2.00 (0.079)	1.30 (0.051)	2.20 (0.087)
03	1812	3.00 (0.118)	1.50 (0.059)	3.50 (0.137)
04	2220	5.00 (0.195)	1.90 (0.075)	4.50 (0.178)
05	2824	6.00 (0.234)	2.50 (0.098)	5.70 (0.224)
16	4030	7.50 (0.295)	3.00 (0.118)	8.00 (0.315)
17	5040	11.2 (0.441)	3.50 (0.137)	10.3 (0.406)
18	6054	14.6 (0.575)	3.60 (0.147)	12.6 (0.496)

RECOMMENDED CLEANING

To clean flux from the PC board assembly, the recommended products are: ethanol, isopropyl alcohol, and deionized water wash. The cleaning products to avoid are: Toluene, Xylene, Trichloroethylene, Terpene Cleaner EC-7, surface active agent. In case of using another solvent, please contact us.

OTHER CAUTIONS

Flame retardancy: the dielectric film is not a flame retardant material.

Environment: contact us when chips are used in humid or gas atmosphere and /or when using resin.

Recommended handling: do not use edged tools, so not to damage the capacitors.

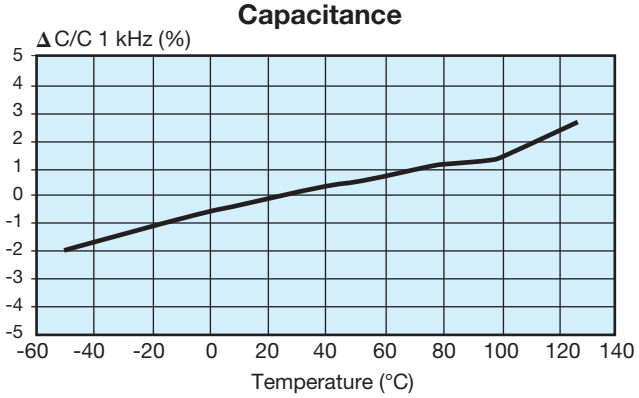
TIN WHISKERS TESTS : JEDEC STANDARD NO 22A121

Stress Type	Ref. Spec.	Test Conditions	Analysis	Results
Temperature cycling	JESD22-A104	-55°C +85(+10/-0)°C air 5 to 10 minutes soak 3 cycles/hour	SEM x 1000	Pass
Ambient Temperature / Humidity Storage		30+/-2°C - 60+/-3% RH -2000H	SEM x 1000	Pass
High Temperature / Humidity Storage		70+/-5°C - 93+3/-2% RH -1000H	SEM x 1000	Pass

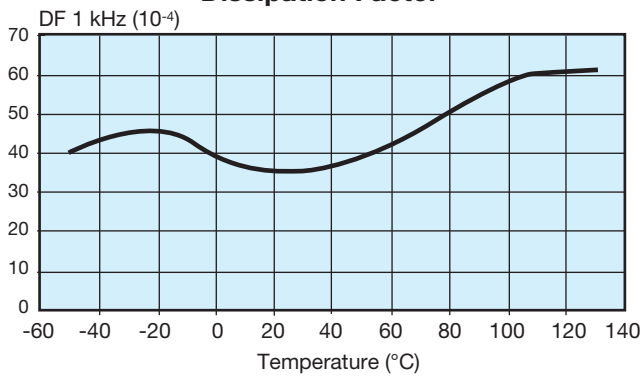
ELECTRICAL CHARACTERISTICS VERSUS TEMPERATURE AND FREQUENCY

ELECTRICAL CHARACTERISTICS

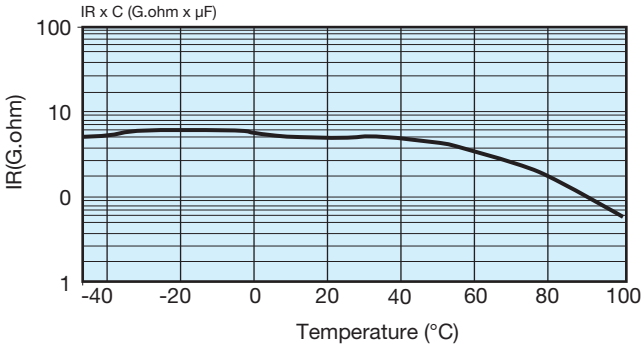
Capacitance



Dissipation Factor

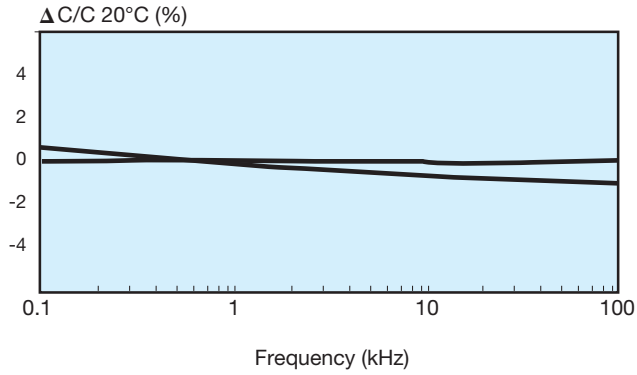


Insulation Resistance

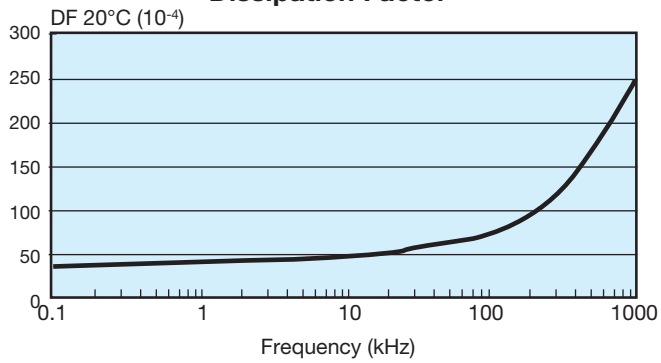


FREQUENCY CHARACTERISTICS

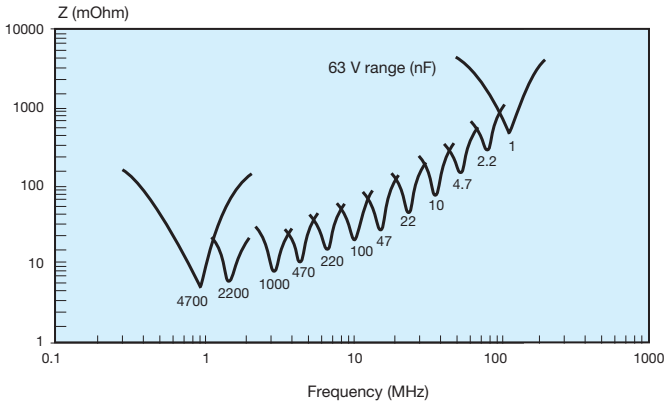
Capacitance



Dissipation Factor



Impedance

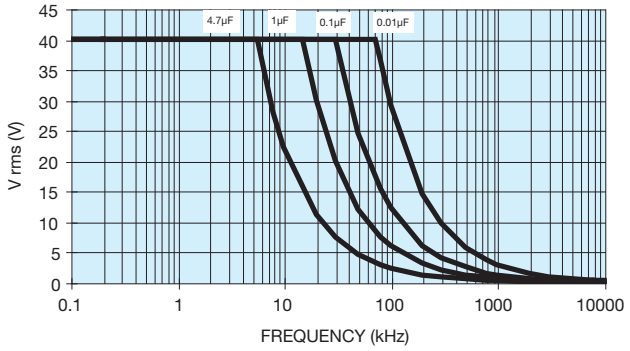


RMS VOLTAGE AND CURRENT VERSUS FREQUENCY

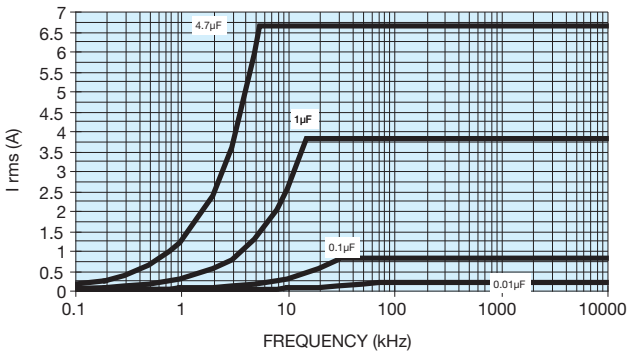
MAXIMUM VOLTAGE (VRMS) AND CURRENT (IRMS) VS FREQUENCY

Typical curves results from measurement carried out at ambient temperature (25ºC) and sinusoidal wave-forms (for size CB01 to CB05)

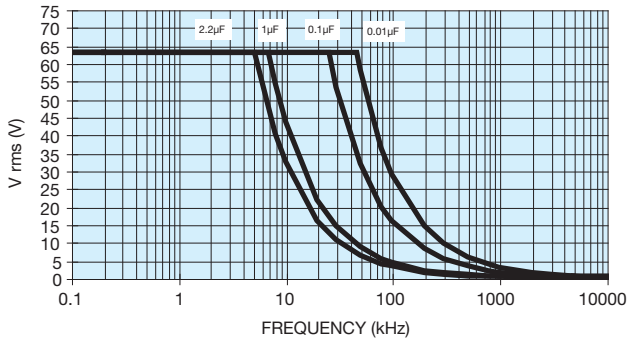
63 V**dc** / 40 V**ac**



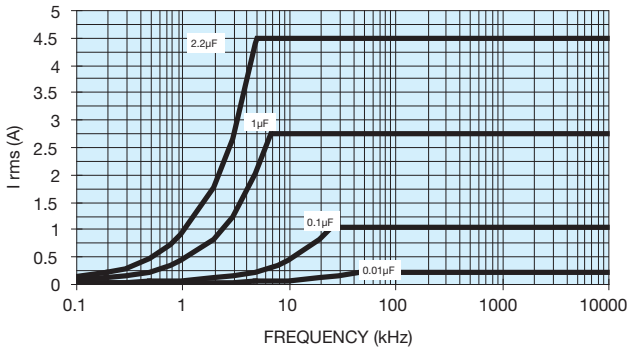
63 V**dc** / 40 V**ac**



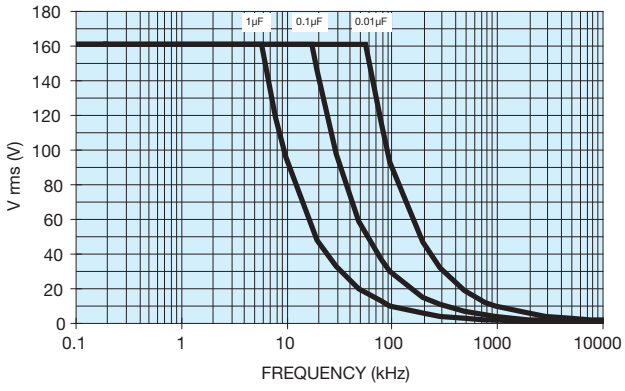
100 V**dc** / 63 V**ac**



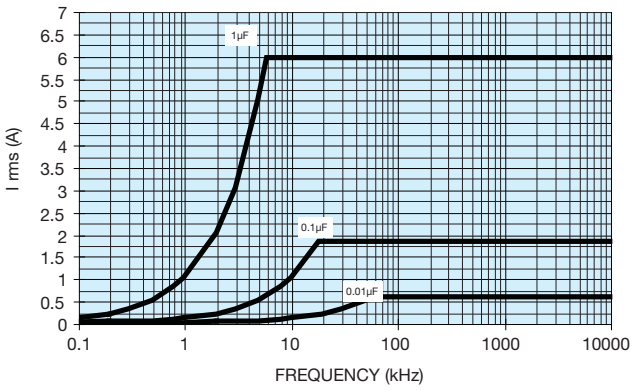
100 V**dc** / 63 V**ac**



250 V**dc** / 160 V**ac**



250 V**dc** / 160 V**ac**

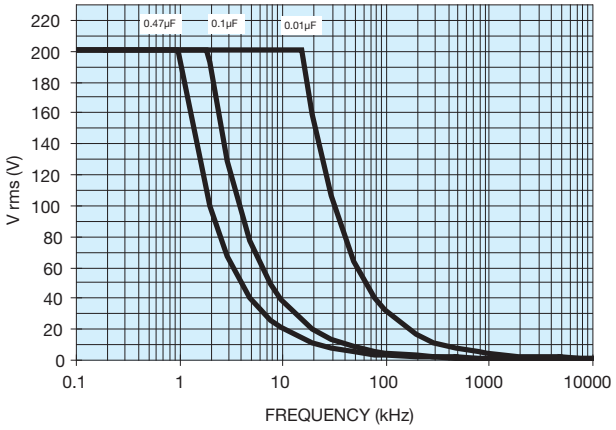


RMS VOLTAGE AND CURRENT VERSUS FREQUENCY

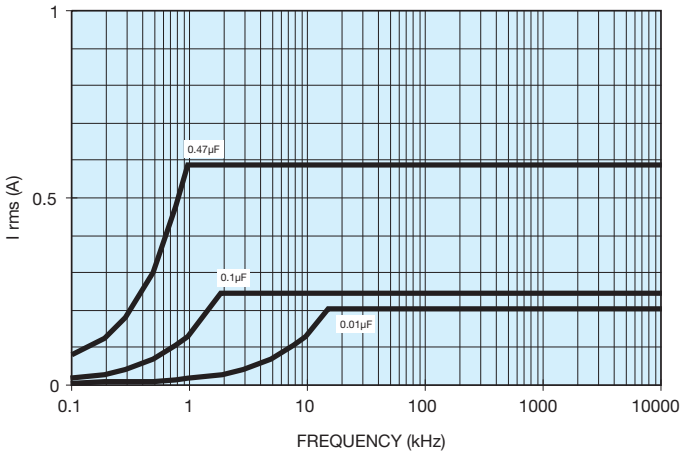
MAXIMUM VOLTAGE (VRMS) AND CURRENT (IRMS) VS FREQUENCY

Typical curves results from measurement carried out at ambient temperature (25ºC) and sinusoidal wave-forms (for size CB03 to CB05)

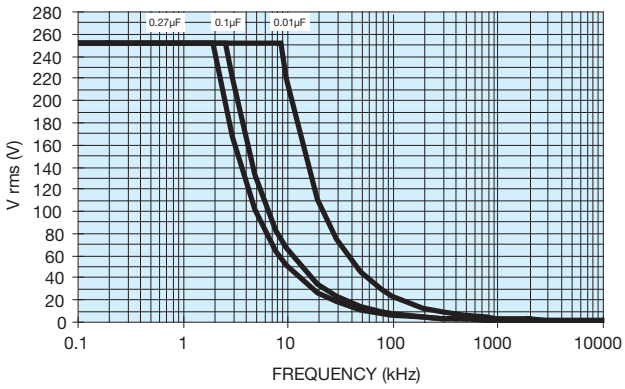
400 V**dc** / 200 V**ac**



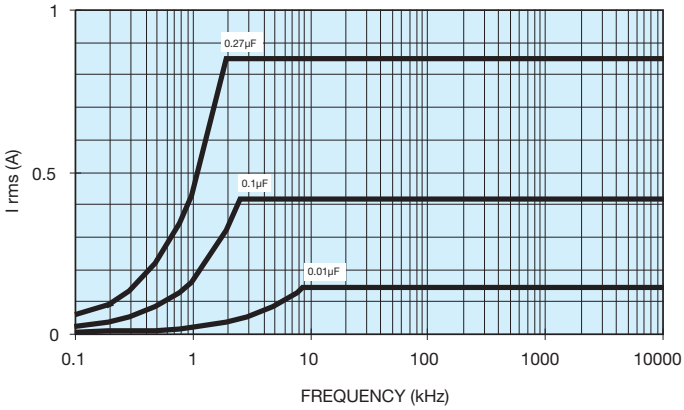
400 V**dc** / 200 V**ac**



630 V**dc** / 250 V**ac**



630 V**dc** / 250 V**ac**



MAXIMUM PULSE RISE TIME (**DV**/**DT**)

Voltage Range	25	50	63	100	250	400	630
Dv/dt max. (V/µsec)	15	40	40	50	150	200	250

Film Chip Capacitors

PEN DIELECTRIC – CB Series – RoHS

MATERIALS CONTROLLED BY ROHS (PPM BY WEIGHT):

Mass / unit (g)	Lead	Mercury	Cadmium	Hexavalent Chromium	PBB	PBDE
CB range	0	0	0	0	0	0
RoHS Limit (ppm)	1000	1000	100	1000	1000	1000
Pass/Fail	Pass	Pass	Pass	Pass	Pass	Pass

This product has been tested and found to be compliant with all requirements, provisions, and exemptions of EU Directive 2002/95/EC of the European Parliament and Council of January 27, 2003. On the Restriction of use of certain Hazardous Substances (RoHS) in electrical and electronic equipment and EU Directive 2000/53/EC regarding ELV or End of Life Vehicle.

ROHS / ELV STATUS

External Plating

100% Matte Sn as standard

LEAD-FREE STATUS / MOISTURE SENSITIVITY RANKING

Pb Free Reflow Solder compliant, MSL = 3.

Reflow soldering referring to Jedec Standard with some limitations. Additional JESD-97 data to be phased in MSL e3 termination.

PRODUCT LABELING:

(For informational purposes only to be phased in on reel and container.)

Pb Free:

RoHS Compliant:

PRODUCT TRACEABILITY:

Full internal material traceability by reference to unique lot number marked on reel and external package.