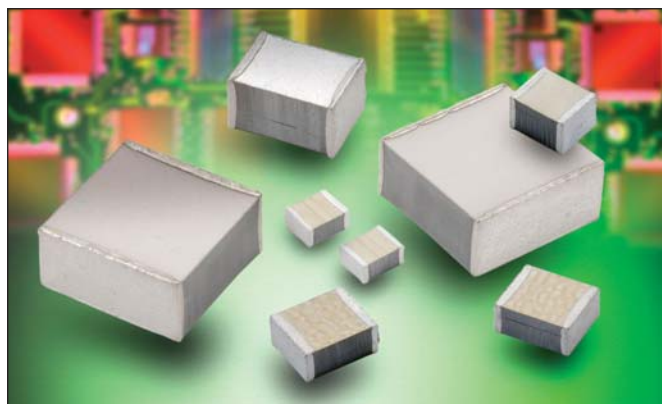


# Film Chip Capacitors

## PET-HT DIELECTRIC – CB Series



### APPLICATIONS

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

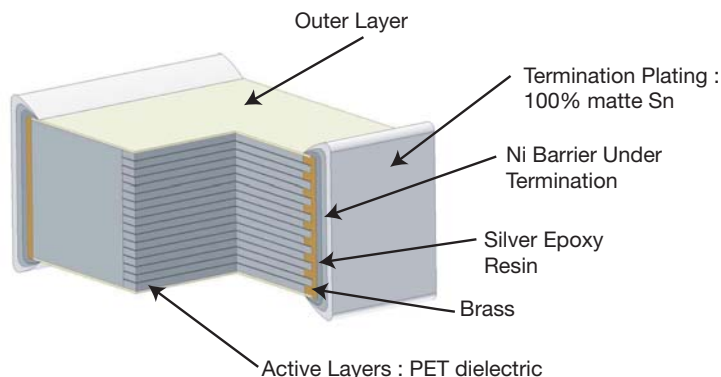
- Automotive (Airbag, Fuel injection calculator...)
- Telecom (Public switching systems, modems, telephone set, cordless, mobile)
- Industrial (SMPS, Power convertor module...)

### GENERAL DESCRIPTION

Film chip capacitor using a naked and stacked construction with metallized High Temperature PET (polyethylene terephthalate).

### ADVANTAGES

- Use of high temperature dielectric films makes 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

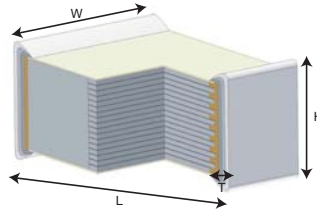
|                                    |                                                                                                                                                                                                                                 |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climatic Category                  | 55/125/56                                                                                                                                                                                                                       |
| Capacitance Range                  | 10nF to 4.7μF                                                                                                                                                                                                                   |
| Tolerance on C <sub>R</sub>        | ±5%, ±10%                                                                                                                                                                                                                       |
| Nominal Voltages                   | 63Vdc 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 x 10 <sup>-4</sup>                                                                                                                                                                                                        |
| Insulation resistance minimum : IR | for C ≤ 0.33μF IR > 1000 MΩ at 20°C for 1 min. charge at 10Vdc<br>for VR < 100Vdc and 100Vdc for VR ≥ 100Vdc<br>for C > 0.33μF IR C > 400 sec. at 20°C for 1 min. charge at 10Vdc<br>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                                                                                                                                                                       |

# Film Chip Capacitors



## PET-HT DIELECTRIC – CB Series

### CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

| Capacitance Range (CR) | Ordering Code   | VOLTAGE Vdc: 63V Vac: 40V               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                |      |               |
|------------------------|-----------------|-----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|------|---------------|
|                        |                 | Chip Dimensions<br>*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 |               |
| 0.270µF                | CB042D0274+ --  | 5.8<br>(0.228)                          | 5.0<br>(0.195)  | 2.8<br>(0.110)  | 0.8<br>(0.032)  | 12.0<br>(0.472) | 8.0<br>(0.315)  | 3.1<br>(0.122)  | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 3000 | BC            |
| 0.330µF                | CB042D0334+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 3.30<br>(0.130) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 3.45<br>(0.136) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2800 | BC            |
| 0.390                  | CB042D0394++ -- | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 3.40<br>(0.134) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 3.45<br>(0.136) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2800 | BC            |
| 0.470                  | CB042D0474+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 3.50<br>(0.138) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.162) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.560                  | CB042D0564+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 3.50<br>(0.138) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.162) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.680                  | CB042D0684+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 4.00<br>(0.158) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.162) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.820                  | CB052D0824+ --  | 7.2<br>(0.283)                          | 6.1<br>(0.24)   | 3.7<br>(0.146)  | 0.8<br>(0.032)  | 24.0<br>(0.944) | 12<br>(0.472)   | 3.8<br>(0.149)  | 330<br>(12.99)  | 24.4<br>(0.96)  | 30.4<br>(1.196) | 1000           | 2250 | BC            |
| 1µF                    | CB052D0105+ --  | 7.2<br>(0.283)                          | 6.1<br>(0.24)   | 3.7<br>(0.146)  | 0.8<br>(0.032)  | 24.0<br>(0.944) | 12<br>(0.472)   | 3.8<br>(0.149)  | 330<br>(12.99)  | 24.4<br>(0.96)  | 30.4<br>(1.196) | 1000           | 2250 | BC            |
| 1.5                    | CB052D0155+ --  | 7.20<br>(0.283)                         | 6.10<br>(0.240) | 5.30<br>(0.209) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 5.50<br>(0.216) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1000 | BC            |
| 2.2                    | CB162D0225+ --  | 10.5<br>(0.413)                         | 7.6<br>(0.299)  | 5.8<br>(0.229)  | 0.8<br>(0.032)  | 24.0<br>(0.944) | 12<br>(0.472)   | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.96)  | 30.4<br>(1.196) | 500            | 900  | BC            |
| 3.3                    | CB172D0335+ --  | 12.8<br>(0.503)                         | 10.2<br>(0.401) | 5.50<br>(0.216) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 5.70<br>(0.224) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 700  | BC            |
| 4.7µF                  | CB182D0475+ --  | 15.3<br>(0.601)                         | 13.7<br>(0.539) | 4.90<br>(0.193) | 0.80<br>(0.032) | 24.0<br>(0.944) | 24.0<br>(0.944) | 5.50<br>(0.216) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 500  | BC            |
|                        |                 | VOLTAGE Vdc: 100V Vac: 63V              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                |      |               |
| 0.180µF                | CB042E0184+ --  | 5.8<br>(0.228)                          | 5.0<br>(0.195)  | 2.3<br>(0.091)  | 0.8<br>(0.032)  | 12.0<br>(0.472) | 8.0<br>(0.315)  | 2.43<br>(0.096) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 3500 | BC            |
| 0.220µF                | CB042E0224+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 3.30<br>(0.130) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 3.45<br>(0.136) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 3000 | BC            |
| 0.270µF                | CB042E0274+ --  | 5.8<br>(0.228)                          | 5.0<br>(0.195)  | 3.4<br>(0.134)  | 0.8<br>(0.032)  | 12.0<br>(0.472) | 8.0<br>(0.315)  | 3.45<br>(0.136) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2800 | BC            |
| 0.330                  | CB042E0334+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 4.00<br>(0.158) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.390                  | CB042E0394+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 3.90<br>(0.154) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.470                  | CB042E0474+ --  | 5.80<br>(0.228)                         | 5.00<br>(0.195) | 4.30<br>(0.169) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.0<br>(0.315)  | 4.50<br>(0.177) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 1900 | BC            |
| 0.560                  | CB052E0564+ --  | 7.20<br>(0.283)                         | 6.10<br>(0.240) | 4.20<br>(0.165) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 4.80<br>(0.189) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1800 | BC            |
| 0.680                  | CB052E0684+ --  | 7.20<br>(0.283)                         | 6.10<br>(0.240) | 5.00<br>(0.197) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 5.23<br>(0.206) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1100 | BC            |
| 0.820                  | CB052E0824+ --  | 7.20<br>(0.283)                         | 6.10<br>(0.240) | 4.70<br>(0.185) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 4.80<br>(0.189) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1800 | BC            |
| 1µF                    | CB052E0105+ --  | 7.20<br>(0.283)                         | 6.10<br>(0.240) | 5.70<br>(0.224) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 5.90<br>(0.232) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 900  | BC            |
| 1.5                    | CB162E0155+ --  | 10.5<br>(0.413)                         | 7.60<br>(0.299) | 6.10<br>(0.240) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |

Replace the + by the tolerance code: J = 5% or K = 10%  
 Replace the -- by the packaging suffix: -- = bulk  
 BC = tape & reel

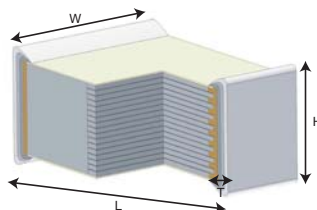


# Film Chip Capacitors

## PET-HT DIELECTRIC – CB Series



### CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

| Capacitance Range (CR)      | Ordering Code  | VOLTAGE Vdc: 100V Vac: 63V                 |                 |                 |                  |                 |                 |                 |                 |                 |                 |                |      |               |
|-----------------------------|----------------|--------------------------------------------|-----------------|-----------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|------|---------------|
|                             |                | Chip Dimensions<br>*Tolerances<br>(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 |               |
| 2.2                         | CB172E0225+ -- | 12.8<br>(0.503)                            | 10.2<br>(0.401) | 5.50<br>(0.216) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 16.0<br>(0.629) | 5.70<br>(0.224) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 700  | BC            |
| 3.3                         | CB182E0335+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 5.20<br>(0.204) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 24.0<br>(0.944) | 5.50<br>(0.216) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 500  | BC            |
| 4.7µF                       | CB182E0475+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 7.10<br>(0.279) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 24.0<br>(0.944) | 7.60<br>(0.299) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 300  | BC            |
| VOLTAGE Vdc: 250V Vac: 160V |                |                                            |                 |                 |                  |                 |                 |                 |                 |                 |                 |                |      |               |
| 0.047µF                     | CB042G0473+ -- | 5.80<br>(0.228)                            | 5.00<br>(0.195) | 3.00<br>(0.118) | 0.80<br>(0.032)  | 12.0<br>(0.472) | 8.00<br>(0.315) | 3.10<br>(0.122) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 3000 | BC            |
| 0.056                       | CB042G0563+ -- | 5.80<br>(0.228)                            | 5.00<br>(0.195) | 3.60<br>(0.142) | 0.80<br>(0.032)  | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.068                       | CB042G0683+ -- | 5.80<br>(0.228)                            | 5.00<br>(0.195) | 4.00<br>(0.158) | 0.80<br>(0.032)  | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.082                       | CB042G0823+ -- | 5.80<br>(0.228)                            | 5.00<br>(0.195) | 4.00<br>(0.158) | 0.80<br>(0.032)  | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.1µF                       | CB042G0104+ -- | 5.80<br>(0.228)                            | 5.00<br>(0.195) | 4.00<br>(0.158) | 0.80<br>(0.032)  | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.448) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.120                       | CB052G0124+ -- | 7.20<br>(0.283)                            | 6.10<br>(0.240) | 4.30<br>(0.169) | 0.80<br>(0.032)  | 16.0<br>(0.629) | 12.0<br>(0.472) | 4.80<br>(0.189) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1800 | BC            |
| 0.150                       | CB052G0154+ -- | 7.20<br>(0.283)                            | 6.10<br>(0.240) | 4.30<br>(0.169) | 0.80<br>(0.032)  | 16.0<br>(0.629) | 12.0<br>(0.472) | 4.80<br>(0.189) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1800 | BC            |
| 0.180                       | CB052G0184+ -- | 7.20<br>(0.283)                            | 6.10<br>(0.240) | 5.10<br>(0.200) | 0.80<br>(0.032)  | 16.0<br>(0.629) | 12.0<br>(0.472) | 5.23<br>(0.206) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1100 | BC            |
| 0.220                       | CB052G0224+ -- | 7.20<br>(0.283)                            | 6.10<br>(0.240) | 4.90<br>(0.193) | 0.80<br>(0.032)  | 16.0<br>(0.629) | 12.0<br>(0.472) | 5.23<br>(0.206) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1100 | BC            |
| 0.270                       | CB162G0274+ -- | 10.5<br>(0.413)                            | 7.60<br>(0.299) | 4.80<br>(0.189) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 1100 | BC            |
| 0.330                       | CB162G0334+ -- | 10.5<br>(0.413)                            | 7.60<br>(0.299) | 5.60<br>(0.220) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |
| 0.390                       | CB162G0394+ -- | 10.5<br>(0.413)                            | 7.60<br>(0.299) | 5.40<br>(0.213) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |
| 0.470                       | CB162G0474+ -- | 10.5<br>(0.413)                            | 7.6<br>(0.299)  | 6.15<br>(0.241) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |
| 0.560                       | CB172G0564+ -- | 12.8<br>(0.503)                            | 10.2<br>(0.402) | 5.60<br>(0.220) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 16.0<br>(0.629) | 5.70<br>(0.225) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 700  | BC            |
| 0.680                       | CB172G0684+ -- | 12.8<br>(0.503)                            | 10.2<br>(0.402) | 6.50<br>(0.255) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 16.0<br>(0.629) | 7.00<br>(0.275) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 600  | BC            |
| 0.820                       | CB182G0824+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 5.10<br>(0.201) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 24.0<br>(0.944) | 5.50<br>(0.217) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 500  | BC            |
| 1µF                         | CB182G0105+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 6.00<br>(0.236) | 0.80<br>(0.032)  | 24.0<br>(0.944) | 24.0<br>(0.944) | 6.30<br>(0.248) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 400  | BC            |
| 1.5                         | CB182G0155+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 7.00<br>(0.276) | 0.80<br>(0.0315) | 24.0<br>(0.944) | 24.0<br>(0.944) | 7.60<br>(0.299) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 300  | BC            |

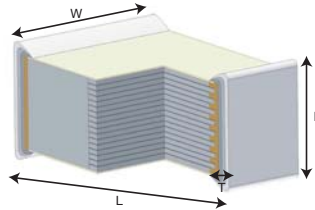
Replace the + by the tolerance code: J = 5% or K = 10%  
 Replace the -- by the packaging suffix: -- = bulk  
 BC = tape & reel

# Film Chip Capacitors



## PET-HT 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 |               |
| 0.010μF                     | CB042I0103+ -- | 5.80<br>(0.228)                      | 5.00<br>(0.195) | 3.00<br>(0.017) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 3.10<br>(0.122) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 3000 | BC            |
| 0.012                       | CB042I0123+ -- | 5.80<br>(0.228)                      | 5.00<br>(0.195) | 2.40<br>(0.095) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 2.43<br>(0.096) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 3500 | BC            |
| 0.015                       | CB042I0153+ -- | 5.80<br>(0.228)                      | 5.00<br>(0.195) | 4.00<br>(0.158) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.018                       | CB052I0183+ -- | 7.2<br>(0.283)                       | 6.1<br>(0.240)  | 2.8<br>(0.110)  | 0.8<br>(0.032)  | 16.0<br>(0.629) | 12<br>(0.472)   | 3.8<br>(0.150)  | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 2250 | BC            |
| 0.022                       | CB052I0223+ -- | 7.2<br>(0.283)                       | 6.1<br>(0.240)  | 3.5<br>(0.138)  | 0.8<br>(0.032)  | 16.0<br>(0.629) | 12<br>(0.472)   | 3.8<br>(0.150)  | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 2250 | BC            |
| 0.027                       | CB052I0273+ -- | 7.2<br>(0.283)                       | 6.1<br>(0.240)  | 2.8<br>(0.110)  | 0.8<br>(0.032)  | 16.0<br>(0.629) | 12<br>(0.472)   | 3.8<br>(0.150)  | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 2250 | BC            |
| 0.033                       | CB052I0333+ -- | 7.2<br>(0.283)                       | 6.1<br>(0.240)  | 3.3<br>(0.130)  | 0.8<br>(0.032)  | 16.0<br>(0.629) | 12<br>(0.472)   | 3.8<br>(0.150)  | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 2250 | BC            |
| 0.047                       | CB052I0473+ -- | 7.20<br>(0.283)                      | 6.10<br>(0.240) | 4.50<br>(0.177) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 4.80<br>(0.189) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1800 | BC            |
| 0.056                       | CB162I0563+ -- | 10.5<br>(0.413)                      | 7.60<br>(0.299) | 3.10<br>(0.122) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 3.93<br>(0.155) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 1400 | BC            |
| 0.068                       | CB162I0683+ -- | 10.5<br>(0.413)                      | 7.60<br>(0.299) | 3.60<br>(0.141) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 3.93<br>(0.155) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 1400 | BC            |
| 0.082                       | CB162I0823+ -- | 10.5<br>(0.413)                      | 7.60<br>(0.299) | 4.20<br>(0.165) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |
| 0.100μF                     | CB162I0104+ -- | 10.5<br>(0.413)                      | 7.60<br>(0.299) | 4.70<br>(0.185) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |
| 0.120                       | CB172I0124+ -- | 12.8<br>(0.503)                      | 10.2<br>(0.402) | 3.90<br>(0.154) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 4.00<br>(0.157) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 1100 | BC            |
| 0.150                       | CB172I0154+ -- | 12.8<br>(0.503)                      | 10.2<br>(0.402) | 4.60<br>(0.181) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 4.70<br>(0.185) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 900  | BC            |
| 0.180                       | CB172I0184+ -- | 12.8<br>(0.503)                      | 10.2<br>(0.402) | 5.60<br>(0.220) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 7.00<br>(0.274) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 600  | BC            |
| 0.220                       | CB172I0224+ -- | 12.8<br>(0.503)                      | 10.2<br>(0.402) | 6.80<br>(0.265) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 7.00<br>(0.274) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 600  | BC            |
| 0.270                       | CB172I0274+ -- | 12.8<br>(0.503)                      | 10.2<br>(0.402) | 6.80<br>(0.265) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 7.00<br>(0.274) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 600  | BC            |
| 0.330                       | CB182I0334+ -- | 15.3<br>(0.601)                      | 13.7<br>(0.539) | 5.60<br>(0.220) | 0.80<br>(0.032) | 24.0<br>(0.944) | 24.0<br>(0.944) | 6.30<br>(0.248) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 400  | BC            |
| 0.470μF                     | CB182I0474+ -- | 15.3<br>(0.601)                      | 13.7<br>(0.539) | 6.20<br>(0.244) | 0.80<br>(0.032) | 24.0<br>(0.944) | 24.0<br>(0.944) | 6.30<br>(0.248) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 400  | BC            |
| VOLTAGE Vdc: 630V Vac: 250V |                |                                      |                 |                 |                 |                 |                 |                 |                 |                 |                 |                |      |               |
| 0.010μF                     | CB042K0103+ -- | 5.80<br>(0.228)                      | 5.00<br>(0.195) | 2.80<br>(0.110) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 3.10<br>(0.122) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 3000 | BC            |
| 0.012                       | CB042K0123+ -- | 5.80<br>(0.228)                      | 5.00<br>(0.195) | 3.30<br>(0.130) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 3.10<br>(0.122) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2800 | BC            |
| 0.015                       | CB042K0153+ -- | 5.80<br>(0.228)                      | 5.00<br>(0.195) | 4.00<br>(0.158) | 0.80<br>(0.032) | 12.0<br>(0.472) | 8.00<br>(0.315) | 4.10<br>(0.161) | 330<br>(12.99)  | 12.4<br>(0.488) | 18.4<br>(0.724) | 1500           | 2300 | BC            |
| 0.018                       | CB052K0183+ -- | 5.80<br>(0.228)                      | 6.10<br>(0.240) | 2.80<br>(0.110) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 3.80<br>(0.149) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 1000           | 2250 | BC            |

Replace the + by the tolerance code: J = 5% or K = 10%  
 Replace the -- by the packaging suffix: -- = bulk  
 BC = tape & reel

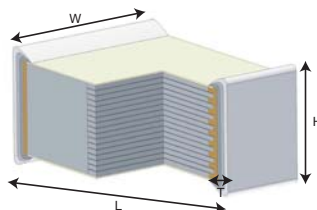


# Film Chip Capacitors



## PET-HT DIELECTRIC – CB Series

### CAPACITANCE VALUES (CR) AND NOMINAL VOLTAGES (VR)



millimeters (inches)

| Capacitance Range (CR) | Ordering Code  | VOLTAGE Vdc: 630V Vac: 250V                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                |      |               |
|------------------------|----------------|--------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|------|---------------|
|                        |                | Chip Dimensions<br>*Tolerances<br>(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                  | CB052K0223+ -- | 7.20<br>(0.283)                            | 6.10<br>(0.240) | 3.50<br>(0.138) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 3.80<br>(0.149) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 1000           | 2250 | BC            |
| 0.027                  | CB052K0273+ -- | 7.20<br>(0.283)                            | 6.10<br>(0.240) | 4.10<br>(0.161) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 4.80<br>(0.189) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1800 | BC            |
| 0.033                  | CB052K0333+ -- | 7.20<br>(0.283)                            | 6.10<br>(0.240) | 5.00<br>(0.197) | 0.80<br>(0.032) | 16.0<br>(0.629) | 12.0<br>(0.472) | 4.80<br>(0.189) | 330<br>(12.99)  | 16.4<br>(0.645) | 22.4<br>(0.881) | 1000           | 1100 | BC            |
| 0.047                  | CB162K0473+ -- | 10.5<br>(0.413)                            | 7.60<br>(0.299) | 3.60<br>(0.141) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 3.93<br>(0.155) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 1400 | BC            |
| 0.056                  | CB162K0563+ -- | 10.5<br>(0.413)                            | 7.60<br>(0.299) | 4.30<br>(0.169) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |
| 0.068                  | CB162K0683+ -- | 10.5<br>(0.413)                            | 7.60<br>(0.299) | 5.20<br>(0.205) | 0.80<br>(0.032) | 24.0<br>(0.944) | 12.0<br>(0.472) | 6.19<br>(0.244) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 500            | 900  | BC            |
| 0.082                  | CB172K0823+ -- | 12.8<br>(0.503)                            | 10.2<br>(0.402) | 4.30<br>(0.169) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 4.70<br>(0.185) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 900  | BC            |
| 0.100µF                | CB172K0104+ -- | 12.8<br>(0.503)                            | 10.2<br>(0.402) | 5.00<br>(0.197) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 5.70<br>(0.225) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 700  | BC            |
| 0.120                  | CB172K0124+ -- | 12.8<br>(0.503)                            | 10.2<br>(0.402) | 5.60<br>(0.220) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 5.70<br>(0.225) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 700  | BC            |
| 0.150                  | CB172K0154+ -- | 12.8<br>(0.503)                            | 10.2<br>(0.402) | 6.90<br>(0.271) | 0.80<br>(0.032) | 24.0<br>(0.944) | 16.0<br>(0.629) | 7.00<br>(0.275) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 600  | BC            |
| 0.180                  | CB182K0184+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 5.00<br>(0.197) | 0.80<br>(0.032) | 24.0<br>(0.944) | 24.0<br>(0.944) | 5.50<br>(0.217) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 500  | BC            |
| 0.220                  | CB182K0224+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 5.80<br>(0.229) | 0.80<br>(0.032) | 24.0<br>(0.944) | 24.0<br>(0.944) | 6.30<br>(0.248) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 400  | BC            |
| 0.270µF                | CB182K0274+ -- | 15.3<br>(0.601)                            | 13.7<br>(0.539) | 7.20<br>(0.284) | 0.80<br>(0.032) | 24.0<br>(0.944) | 24.0<br>(0.944) | 7.60<br>(0.299) | 330<br>(12.99)  | 24.4<br>(0.961) | 30.4<br>(1.196) | 300            | 300  | BC            |

Replace the + by the tolerance code: J = 5% or K = 10%

Replace the -- by the packaging suffix: -- = bulk

BC = tape & reel

# Film Chip Capacitors



## PET-HT DIELECTRIC – CB Series

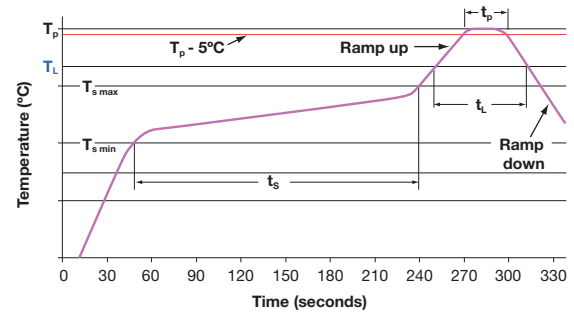
### MOUNTING AND SOLDERING RECOMMENDATIONS

#### 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                               | 2220 to 2824     | 4030 to 6054     |
|-----------------------------------------------|------------------|------------------|
| Ramp-Up ( $T_s$ max to $T_p$ )                | 3°C / second max | 3°C / second max |
| Preheat                                       |                  |                  |
| - Temperature Min ( $T_s$ min)                | 150°C            | 150°C            |
| - Temperature Min ( $T_s$ max)                | 200°C            | 200°C            |
| - Time ( $t_s$ min to $t_s$ max)              | 180 sec. max     | 180 sec. max     |
| Time maintained above                         |                  |                  |
| - Temperature ( $T_L$ )                       | 217°C            | 217°C            |
| - Time ( $t_L$ )                              | 60 sec. max      | 75 sec. max      |
| Peak temperature ( $T_p$ )                    | 240°C            | 245°C            |
| Time within 5°C of peak temperature ( $t_p$ ) | 10 sec.          | 10 sec.          |
| Ramp-Down                                     | 6°C / sec.       | 6°C / sec.       |

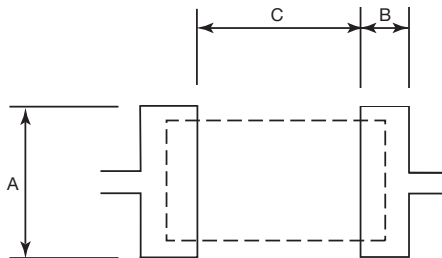


\*Reflow soldering referring to JEDEC Standard with some limitations  
\*JEDEC J-Std 020C

#### RECOMMENDED SOLDER PASTE THICKNESS

For optimum solderability, the recommended soldering paste thickness: 2220 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            |
|-----------|-----------|--------------|--------------|--------------|
| 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        | 6064      | 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<br>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    |



# Film Chip Capacitors

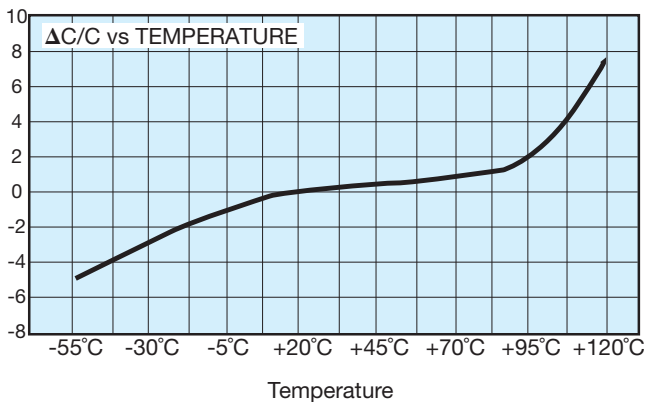
## PET-HT DIELECTRIC – CB Series



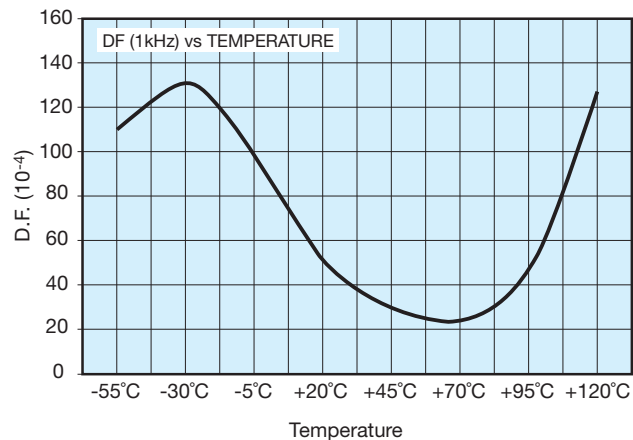
### ELECTRICAL CHARACTERISTICS VERSUS TEMPERATURE AND FREQUENCY

#### ELECTRICAL CHARACTERISTICS

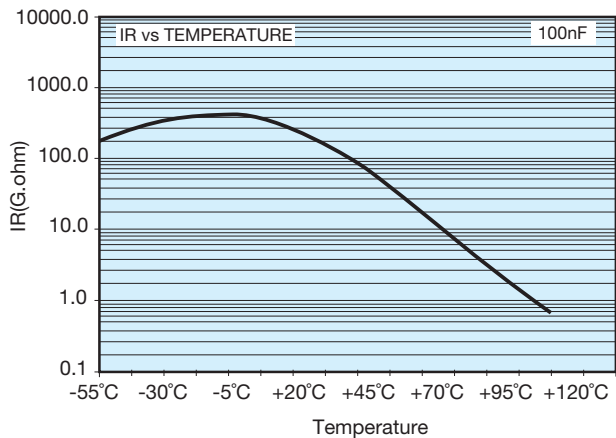
##### Capacitance



##### Dissipation Factor

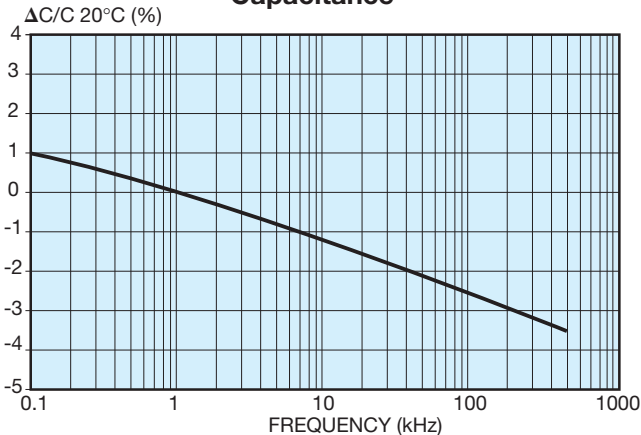


##### Insulation Resistance

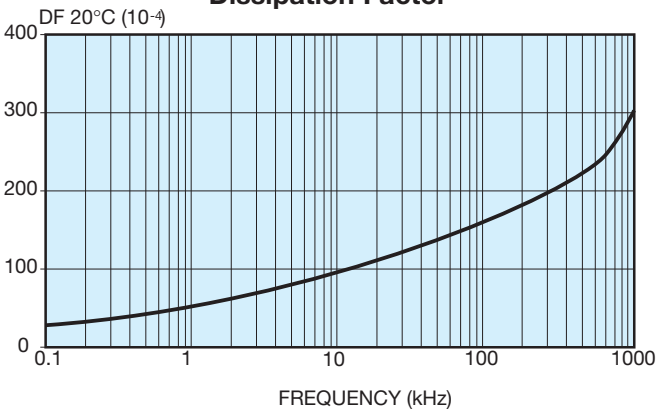


#### FREQUENCY CHARACTERISTICS

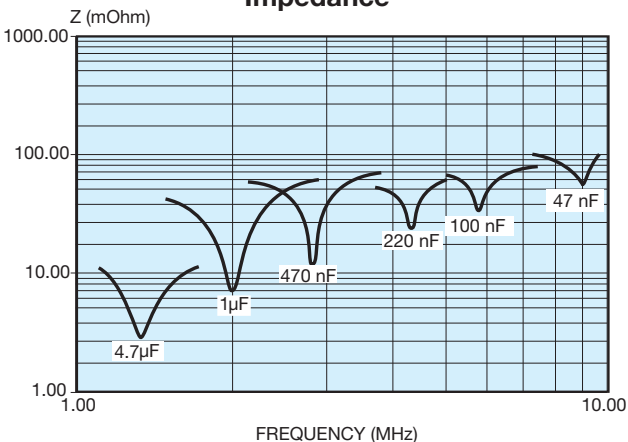
##### Capacitance



##### Dissipation Factor



##### Impedance





# Film Chip Capacitors

## PET-HT DIELECTRIC – CB Series

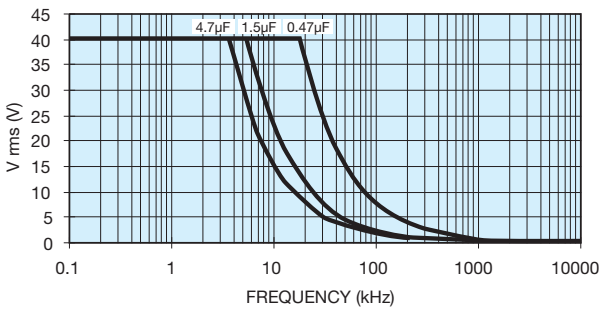


### RMS VOLTAGE AND CURRENT VERSUS FREQUENCY

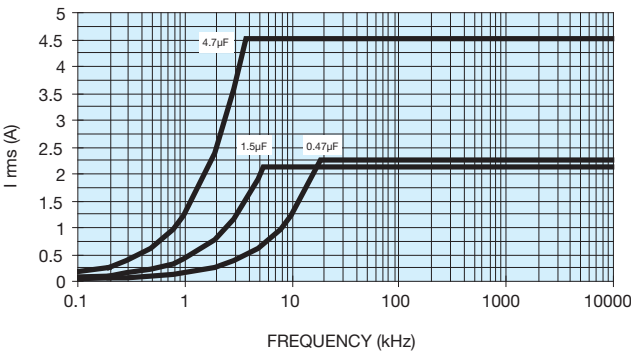
#### MAXIMUM VOLTAGE (V<sub>RMS</sub>) AND CURRENT (I<sub>RMS</sub>) VS FREQUENCY

Typical curves results from measurement carried out at ambient temperature (25°C) and sinusoidal wave-forms  
(for size CB04 to CB18)

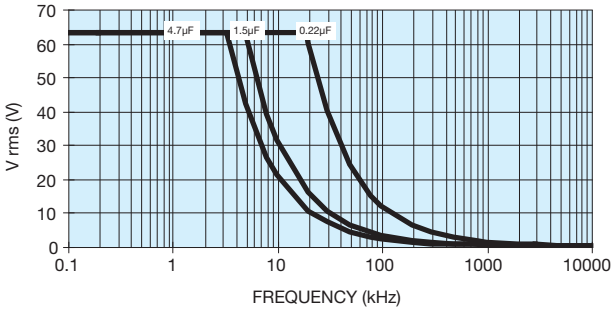
63Vdc / 40 Vac



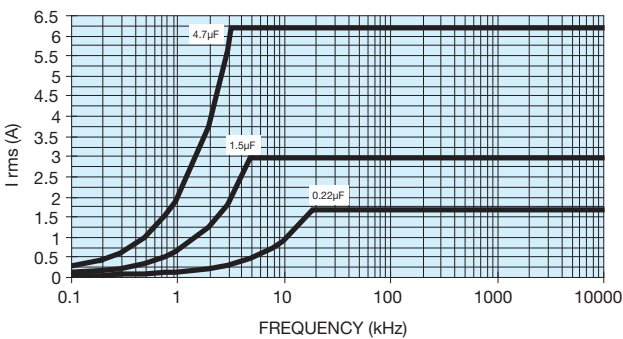
63Vdc / 40 Vac



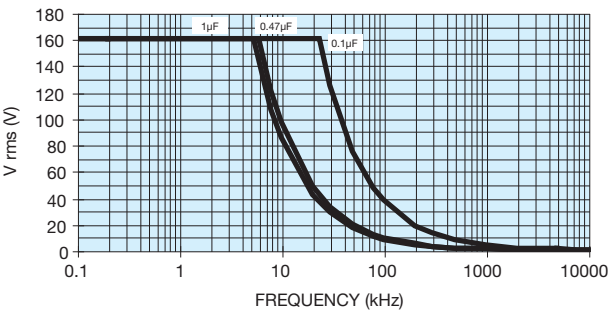
100 Vdc / 63 Vac



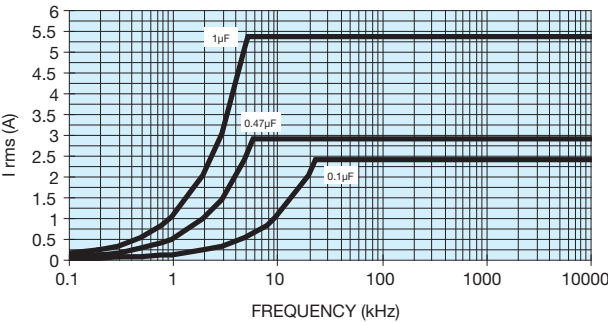
100 Vdc / 63 Vac



250 Vdc / 160 Vac



250 Vdc / 160 Vac





# Film Chip Capacitors

## PET-HT DIELECTRIC – CB Series

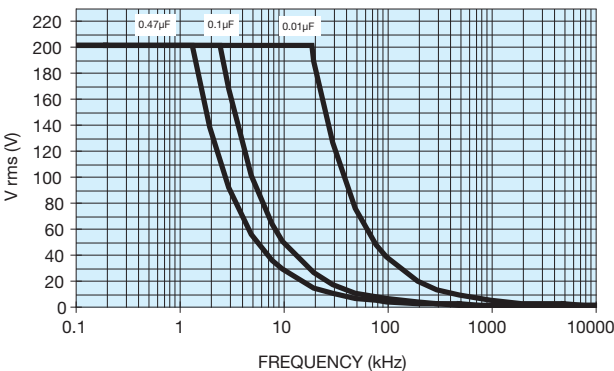


### RMS VOLTAGE AND CURRENT VERSUS FREQUENCY

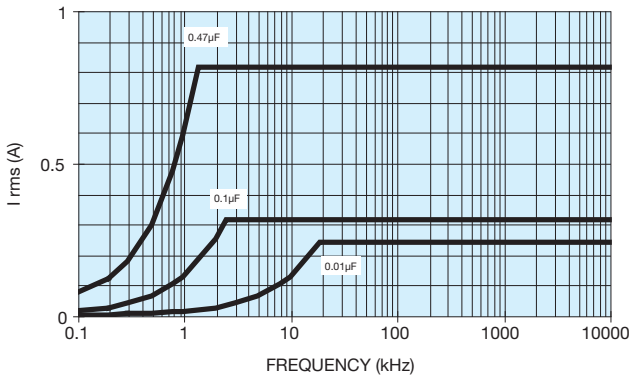
#### MAXIMUM VOLTAGE (V<sub>RMS</sub>) AND CURRENT (I<sub>RMS</sub>) VS FREQUENCY

Typical curves results from measurement carried out at ambient temperature (25°C) and sinusoidal wave-forms  
(for size CB04 to CB18)

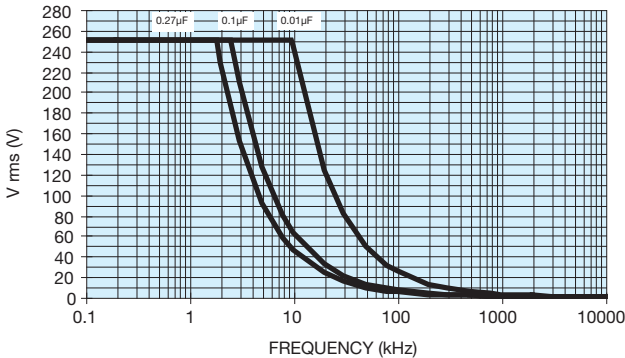
400 Vdc / 200 Vac



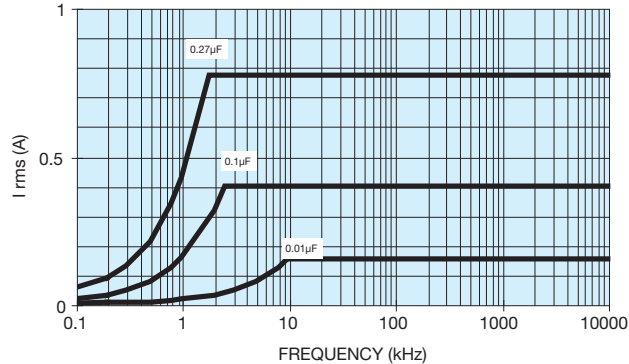
400 Vdc / 200 Vac



630 Vdc / 250 Vac



630 Vdc / 250 Vac



#### MAXIMUM PULSE RISE TIME (D<sub>V</sub>/D<sub>T</sub>)

| Voltage Range                       | 63 | 100 | 250 | 400 | 630 |
|-------------------------------------|----|-----|-----|-----|-----|
| D <sub>v</sub> /dt max.<br>(V/µsec) | 40 | 50  | 150 | 200 | 250 |

# Film Chip Capacitors



## PET-HT 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.)

### PRODUCT TRACEABILITY:

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

Pb Free:



RoHS Compliant:

