

# Planar Capacitors

Wide variety of custom and industry standard geometries available.

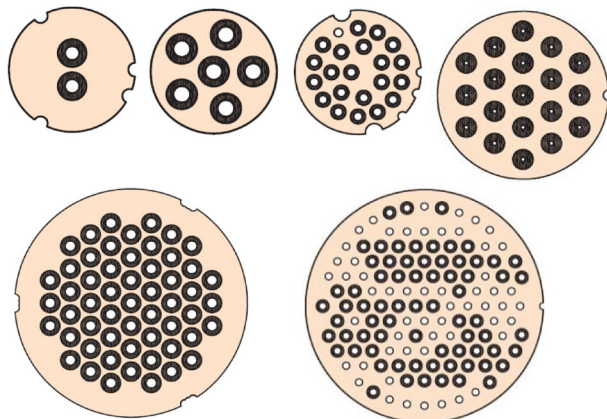
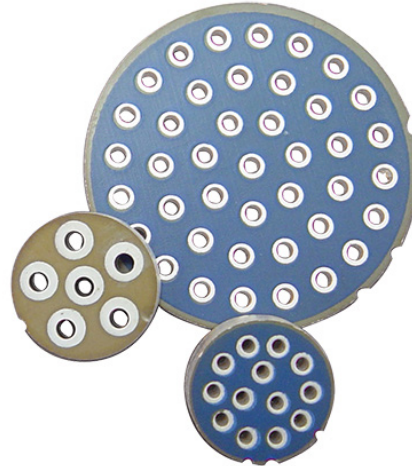
## Electrical Specifications

|                                  |                                  |
|----------------------------------|----------------------------------|
| Operating Temperature:           | -55°C to +125°C                  |
| Capacitance:                     | Up to 1µF                        |
| Capacitance Tolerance:           | ±10%, ±20%, +100%                |
| Capacitance Rating :             | Up to 1500 VDC                   |
| Dielectric Withstanding Voltage: | Up to 3000 VDC                   |
| Insertion Loss:                  | 60 dB Min, typical hole to hole. |

The electrical properties listed above are typical and can be exceeded based on customer requirements and mechanical configuration. Many variables affect the design, it is best to contact us directly for a detailed assessment of your planar capacitor needs.

## Mechanical Specifications

|               |   |
|---------------|---|
| Dielectrics:  | EIA Codes: NP0 (COG), X7R, Z5U  |
| Terminations: | Fired-on: silver, solder-able silver<br>Plating: gold, silver or copper over nickel barrier |
| Surface:      | Lapped, termination bandwidth, and insulated coating options                                |
| Geometry:     | Defense circulars, D-Sub, ARINC, Micro-D, custom configurations                             |
| Thickness:    | Up to 0.150"  |



Typical Design Layouts

## Features

- Exceptional electrical performance and reliability
- 100% electrical and mechanical testing of critical parameters
- Fast prototyping and short lead times
- Custom packaging to suit end-user needs
- Custom and standard designs available
- Multiple capacitance values up to 400:1 ratio
- Multiple voltage ratings available
- Hole ground resistance to a specified maximum
- Conformal coat available for high voltage designs

## Applications

- Designs for military specification filtered circular connectors
- Designs for D-sub filtered interconnects

## Advantages Over Stand-alone Chip, Discoidal, or Tubular Capacitors

- Low profile, compact, quick assembly time
- Various custom and industry standard available
- Designs can incorporate multiple capacitance values, feedthrough holes, and ground holes

# Processing & Soldering Notes

## General Soldering Recommendations for Leadless Ceramic Capacitors

### Soldering Ceramic Capacitors with High Temperature Process

#### SN10 Solder

*Ramp Rate, Heating and Cooling:* Approx. 30°C/min.

*Peak Temperature:* Approx. 320°C

*Dwell at Peak:* <30 Seconds

### Soldering Ceramic Capacitors with Medium Temperature Process

#### SN96 Solder

*Ramp Rate, Heating and Cooling:* Approx. 30°C/min.

*Peak Temperature:* Approx. 250°C

*Dwell at Peak:* <30 Seconds

### Soldering Ceramic Capacitors with Low Temperature wProcess

#### SN62 Solder

*Ramp Rate, Heating and Cooling:* Approx. 30°C/min.

*Peak Temperature:* Approx. 220°C

*Dwell at Peak:* <30 Seconds

## Notes

Care must be taken to minimize the time silver terminations are exposed to molten solder to avoid leaching (amalgamation of the silver into molten solder). APITech recommends the use of a silver (Ag) bearing solder when terminating directly to ceramic ceramic capacitors to reduce the potential for leaching. Gradual heating and cooling of the components are essential to prevent thermal stresses to the ceramic.

## Application Note: Soldering Recommendations for Switch Mode Power Supply Capacitors

- SMPS capacitors are highly durable structures designed to provide long service per lifetime, however they require attention to basic considerations during assembly. Like all ceramic components, SMPS capacitors are subject to thermal stresses. For this reason, preheating of the capacitor assemblies is recommended. Preheat components using hot plate to 120 to 150°C, or within 50 to 60°C of the soldering temperature being applied. Avoid over-exposure to high temperatures during assembly and allow for gradual, post-assembly cooling.
- For hand iron soldering, recommended soldering iron tip temperature is 330 to 350°C. Contact the pad adjacent to the pre-tinned lead should be made from below the PCB (opposite of the component side), and the dwell time on the solder joint should be less than five seconds. An aluminum heat sink plate may be placed adjacent to the SMPS lead frame to protect the ceramic body during assembly. Avoid direct contact between soldering iron and ceramic during assembly process. Soldering time is dependant upon heat sinking provided by the chassis and boardmaterial, so a longer preheat cycle may be required.
- Standard solders (Sn60, Sn63, Sn60/38/2) may be used. Please consult the factory for use with RoHS compliant solders.
- Use a controlled temperature profile ramp not exceeding 4°C per second as measured by an attached low mass thermocouple.
- Soldering time and temperatures can vary with component size, board material and layout. Please consult the factory for assistance.