The multilayer planar array is an application specific multi capacitor array designed for use in multiway EMI filter circuits. Derived from discoidal capacitor theory, it provides capacitance between the outside perimeter and the internal through holes.

The most common use of planar arrays is as the capacitor element in filter connectors, although they are also suitable in many other applications.

Knowles' core wet manufacturing process and ceramic handling expertise allows components to be produced with mechanical precision and electrical accuracy, enabling a filter assembly to withstand the most rigorous of electrical specifications. This has resulted in Knowles' position as the manufacturer of choice for the filter connector industry. To date, Knowles have delivered in excess of 4,000 different designs of planar array.

Mechanical

With many years experience, Knowles have developed a comprehensive range of designs, including planform designs for the following connectors:

- Circular (MIL-C-38999, MIL-C-26482 and similar)
- Arinc 404 and 600
- 'D' sub
- High Density 'D' sub
- µD (MIL-C-83513)

Special custom shapes and layouts can also be accommodated. Complex shapes including internal and external radii, multiple hole diameters and alignment guides can be considered.

As a guide, Knowles can manufacture planars to a maximum of 3.18mm (0.125") thick and to a maximum of 100mm (4.0") diameter or square.

Standard termination finish is gold plate over nickel for maximum electrical and mechanical performance.

Solderless assembly/compliant spring clip

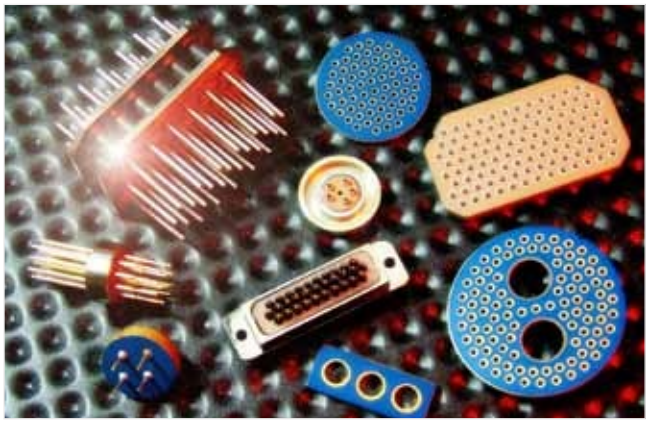
Solderless assembly of planars can be accommodated by the inclusion of compliant spring clips into the holes, allowing the array to be push fitted to through contact pins.

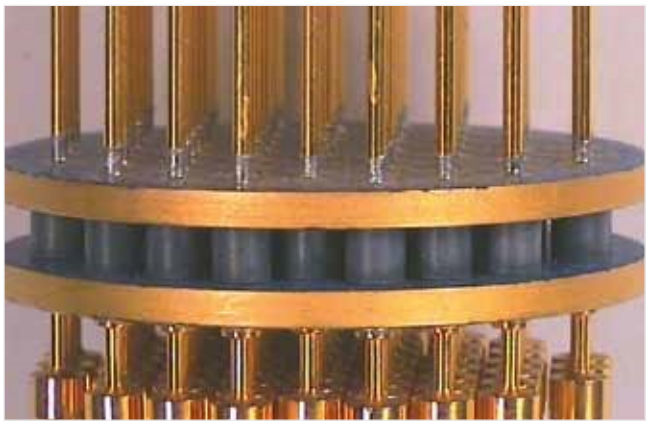
Knowles can supply a standard range of solder-in spring clips, or fit customer supplied compliant clips before shipping the finished array assembly.

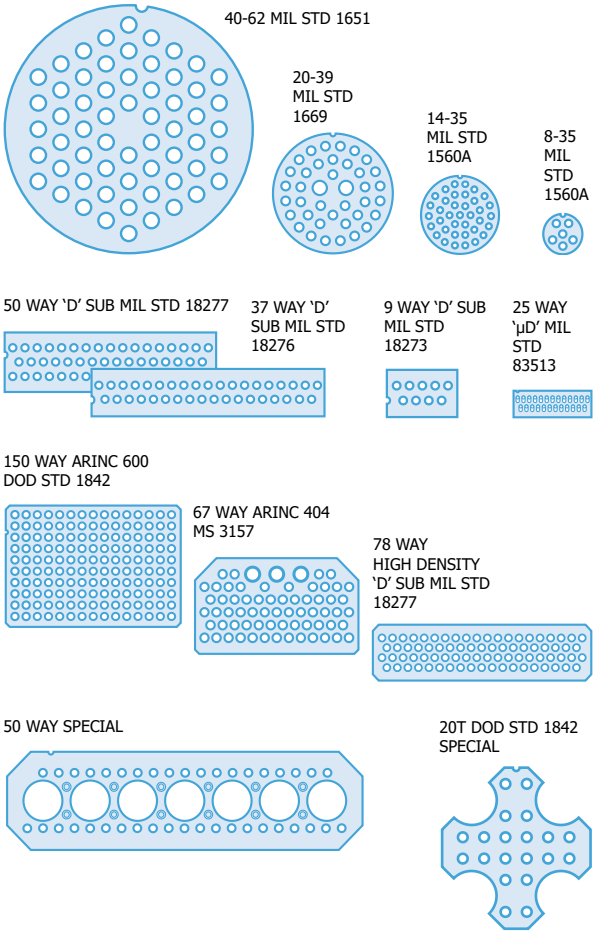
Contract assembly and technical back-up

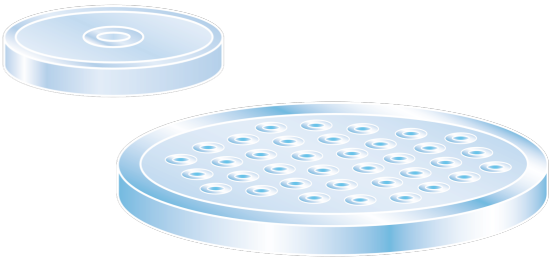
Having an EMI filter assembly line alongside the ceramic manufacturing area allows Knowles to offer unprecedented technical back-up and advice to planar array and discoidal customers. This can include design and handling advice and forensic analysis assistance. Knowles personnel have many years experience in the use of planar arrays, having been involved directly in the development of the technology from its inception.

Knowles are also able to offer subcontract and prototype manufacturing services to planar customers and connector companies.







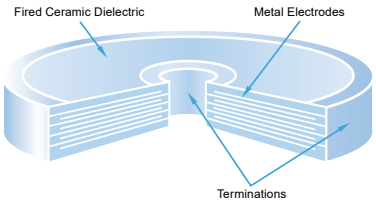


Discoidal capacitors

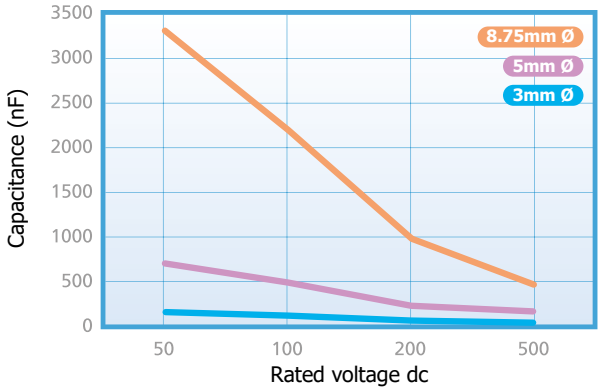
C0G/NP0 & X7R

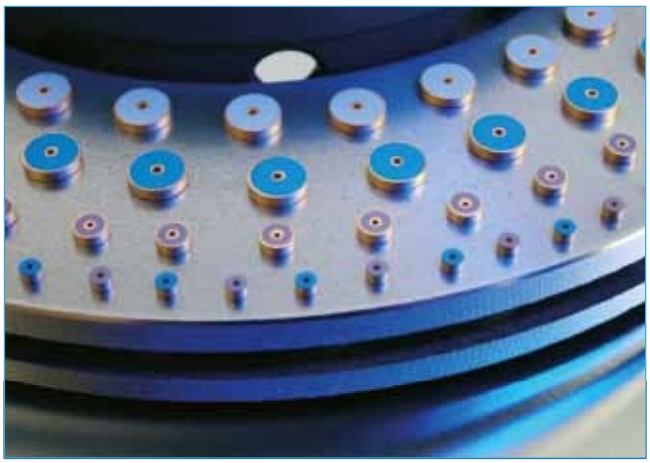
Discoidal capacitors are at the heart of many EMI filters. More robust and reliable than tubular capacitors, they offer higher capacitance options, with values up to several microfarads. In addition to standard configurations, Knowles is able to meet customers' specific drawings in terms of electrical performance and mechanical design.

Discoidal multilayer ceramic capacitors are of a configuration suitable for direct mounting into filters, onto bulkheads and hybrid circuits. Due to their geometry, they have excellent RF performance characteristics as well as very high self resonant frequencies. They are offered with a choice of C0G/NP0 or X7R ceramic.



Typical capacitance vs disc size vs voltage
Based on typical hole diameter of 0.8mm, and X7R dielectric.





General Specification

Dielectrics:
C0G/NP0, X7R

Mechanical:
Outer diameter 2.0mm minimum
Inner diameter 0.5mm minimum
Minimum wall thickness requirements apply. Refer to factory.

Capacitance range:
pF to µF

Capacitance tolerance:
±5%, ±10%, ±20%, -0%+100%

Voltage:
50V to 3kVdc or higher

Operating temperature range:
-55°C to +125°C

Termination:
Gold over nickel

To reflect the unique custom nature of discoidals and planar arrays, we do not list a standard range. Please contact the sales office to discuss your specific requirements.

Electrical

- Only stable X7R and ultra stable C0G/NP0 dielectrics used
- Capacitance values from pF to µF
- High voltage capability - DWV (Dielectric Withstand Voltage) to 10kV
- Feedthrough low capacitance unterminated lines
- Grounded earth lines - maximum ground plane resistance specifications included
- Mix of capacitance values within planar – up to a ratio of 400:1 within individual planar possible
- Mixed capacitance lines/no cap feedthrough lines/grounded earth lines available within single planar

Quality

All planars are tested for the following:

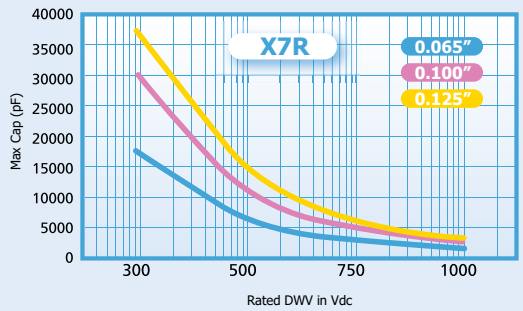
- Capacitance
- Dissipation factor
- DWV (Dielectric Withstand Voltage)
- Insulation resistance
- Visual inspection
- Sample solderability and dimensional check

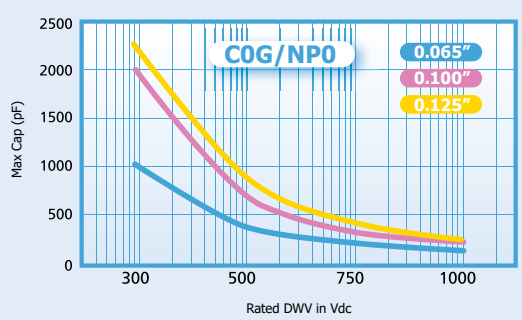
} 100%

100% SAM (Scanning Acoustic Microscopy) testing is offered as an option on all planars intended for more critical applications.

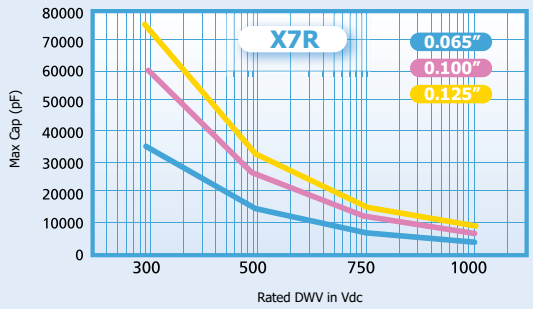
Graphs of typical maximum capacitance values against voltage for array thicknesses of 0.065" (1.65mm), 0.100" (2.54mm) and 0.125" (3.18mm).

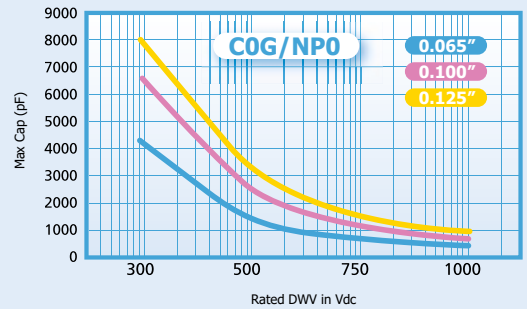
µD planforms



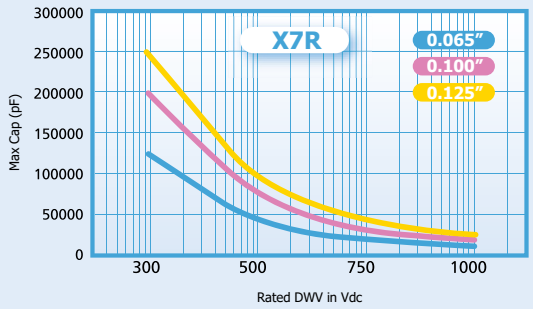


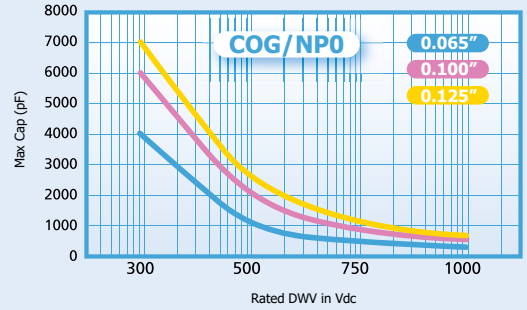
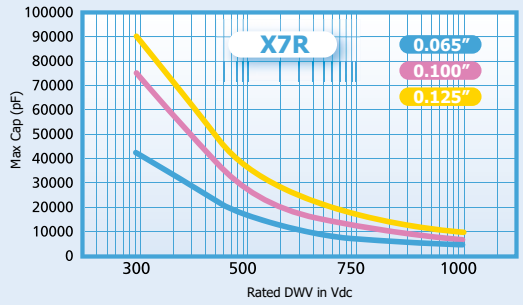
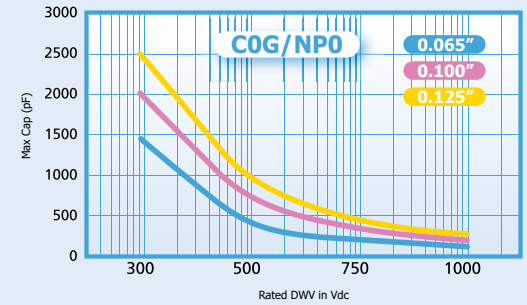
D-Sub planforms





Low density circular planforms





High density circular planforms