

Series 80 Mighty Mouse
EMI/EMP Filtered Connectors
Introduction



PRODUCT FACTS

- Compact Weight-Saving Design with #23 Contacts
- C and Pi Filters from 400 pF to 56000 pF
- 3 Through 130 Contacts
- Multilayer Ceramic Planar Capacitor Array
- 250 Volt DC
- PC Tail and Solder Cup Versions
- Fully Sealed with Thermally Conductive Epoxy
- Space-Grade Bake-Out Processing Available
- Double-Start, Triple-Start and Push-Pull Versions

Glenair's "Mighty Mouse" Delivers EMI/EMP Filtering in a Lightweight, Ultraminiature Package

Glenair's filtered Series 80 "Mighty Mouse" connector family provides significant size and weight savings compared to larger "MS" connectors. The high density #23 contacts provide almost double the density of D38999. Designed to meet stringent aerospace performance requirements, these connectors are offered with standard low pass Pi or C filter arrays, or with customized filters to meet your specific needs. Thermally conductive epoxy protects the filter package from mechanical and heat stress. These filtered receptacles mate to standard Series 80 plugs and are available in jam nut or square flange versions. **Now available with size #16 and size #12 contacts.**



SPECIFICATIONS

Current Rating	#23 5 AMPS, #20HD 7.5 A., #16 13 A., #12 23 A.
Dielectric Withstanding Voltage	250 VDC
Insulation Resistance	5000 megohms minimum @ 200 VDC
Operating Temperature	-55° C. to +125° C.
Shock	300 g.
Vibration	37 g.
Shielding Effectiveness	50 dB minimum from 100MHz to 1000MHz.

MATERIALS AND FINISHES

Shells, Jam Nuts	Aluminum alloy or stainless steel
Contacts	Copper alloy, 50 µInch gold plated
Insulators	Liquid crystal polymer (LCP)
Interfacial Seal, O-rings, Wire Sealing Grommet	Fluorosilicone rubber

Dimensions in inches (millimeters) and are subject to change without notice.

About Filtered Connectors

"Filtering" or suppression of electromagnetic noise within the connector package is reliably accomplished through the integration of capacitors and diodes into the connector to segregate interfering high-frequency or high voltage noise from the desired lower frequency signals.

While various types of capacitor filters are available, perhaps the most widely applied is the Planar Array type. Planar Arrays are extremely effective at filtering high-frequency interference. Planar arrays may be fabricated with different capacitive values on individual pins for additional flexibility in achieving the desired level of EMC. Diodes are used to clamp the voltage below a certain value, thereby protecting the electronic circuitry. They are typically integrated into the connector using a small printed circuit board.

Using filter technology has certain advantages to the electrical system

engineer, most especially improved signal integrity as well as size and weight reduction. In addition, filters can be incorporated into an interconnect system late in the research and development process; for example after an unforeseen noise problem has been detected. In every filter application the signal levels and frequency bands must be well understood in order to select the appropriate mode or type of filter technology.

EMI noise covers a broad range of frequencies. Filter modes and types are consequently specified according to the EMI frequency ranges which are the source of the actual signal degradation and the operating frequency of the affected device. Filter selection must take the following into account:

- Capacitance Value*
- Working Voltage*
- Surge Voltage*
- Dielectric Withstanding Voltage*
- Insulation Resistance*
- Transient Protection*

Filter connectors suitable for most defense/aerospace applications are broadly identified as "low-pass" filters (i.e. they let low frequency signals pass through and attenuate higher frequencies). The attenuation curve can be shaped using different filter types (different configurations of capacitors and inductors). These types include: Pi Filter, L-C or C-L Filter, and C Filter. These filter connector types are characterized by their relative abilities to filter noise according to capacitance, voltage values and load impedances.

Prior to shipping a filtered connector, Glenair offers extensive testing, qualification and burn-in options. Tests range from a simple capacitance (C), insulation resistance (IR), and dielectric withstanding voltage (DWV), to more elaborate options such as RF insertion loss, dissipation factor, Zener/TVS diode test, ground resistance, voltage conditioning and thermal shock.

About Multilayer Ceramic Planar Array Filters

Planar, multi-layer ceramic capacitive filters offer reduced size and improved performance compared to discrete discoidal or tubular capacitors. Planar array filter devices have the advantage, especially when compared to capacitive filters integrated at the circuit board level, of being bidirectionally effective at attenuating unwanted noise travelling into and out of equipment enclosures.

As mentioned above, the planar array can be designed with different capacitive values on individual pins, and pin groupings, and can also be selectively equipped with surge protection diodes. The ability to accommodate such Transient Voltage Suppressions (TVS) diodes to protect against voltage spikes from transient sources such as EMP, lightning or Electrostatic Discharge

(ESD) is an additional strength of the planar array design. The planar array package can also easily accommodate ferrite elements to add inductance to the filter device. For these reasons and more, the planar array is the most common filter type specified in defense/aerospace and other high-performance applications.

The planar array consists of multiple layers of ceramic dielectric separated by individual sheets of a ceramic tape material screen-printed with a pattern of metal electrodes. The exact configuration of the electrodes—their combined capacitance values, positions vis-a-vis individual contacts, selective grounding to the connector shell, etc.—determines the EMI attenuation properties of the filter device. After the layer-cake of dielectric materials and conductive elements is assembled, it is fired

at high temperature to create a unified, monolithic structure.

Typically, custom-configured planar arrays, with unique capacitive elements and values, are required to effectively address complex EMI problems such as might be encountered in an avionics bay or in the body of a missile. For this reason, planar array fabrication is accomplished using the most advanced CAD software and CNC machine tools. As critical EMI problems are often discovered late in the development process—perhaps only after equipment has been installed for use—it is critical that turnaround times in design and fabrication of custom designs are kept to a minimum. Glenair is committed to meeting the most aggressive delivery requirements for planar array type filter connectors.

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