



MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 6



An example of a high-power, filtered connector incorporating EMC suppression from MPE

Integrating EMC suppression into high-power connectors for military vehicles

Military vehicles often have separate power connectors and EMC filters which together take up too much valuable space and add weight. Now integrating the required EMC suppression for the first time ever into the connectors themselves, MPE has developed techniques enabling the capacitor to be wound into the backshell of the high-power military connector, where the greater the space for windings, the greater the EMC suppression that can be achieved.

As applications become ever more sophisticated, complex and power-hungry, connector manufacturers have identified a distinct trend towards increased power and voltage requirements on such applications as military and electric drive vehicles, aircraft and communications base stations.

Many military vehicle applications traditionally utilise a box-type EMC filter that may add unnecessary cost and weight and may take up too much space. Hence MPE is now working with interested connector manufacturers to produce connectors with integrated EMC filtering, in a footprint within very tight physical constraints.

The challenge is to deliver a high degree of suppression inside the envelope of a filtered connector that provides mechanical compliance to MIL-DTL-38999 Series III and EMC suppression compliance to DEF STAN 59-411 and MIL-STD-461. These are for standard ranges of MOTS (Military-Off-The-Shelf) filters suitable for EMC suppression of COTS (Commercial-Off-The-Shelf) equipment on military vehicles.

Typically, the use of single pole contacts can create an electrical interface that exceeds typical interconnect requirements via a hyperbolic socket contact construction. The latter distributes normal forces over a high percentage of the mating surface, to ensure a smooth and even engagement force with exceptionally high performance under vibration. The large surface area of the socket contact also results in a very low contact resistance, enabling much higher current ratings which suit those power-hungry applications. Such connectors are now commonly available from a wide range of connector manufacturers.