



MPE
Quality, Reliability, Performance

Company Bulletin

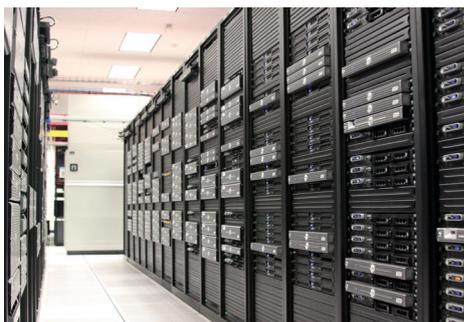
for EMC, EMP & TEMPEST Protection

Issue 6



Preserving information security at data centres

The TEMPEST threat to information security was first recognised by the US National Security Agency (NSA) and GCHQ in the 1960s. Governments, armed forces, municipal authorities and companies now share this concern that electrical and electronic equipment such as computers and peripherals give off unintended electromagnetic emanations which can then be reconstructed beyond the building boundary as intelligible data. Countermeasures are aimed at preventing eavesdropping on data radiated as signals via conducting lines such as power, telephone or control line cables.



The evidence is that TEMPEST countermeasures are becoming as important for information security in the civilian world as in the military arena. Examples of sites at risk are data centres handling sensitive personal and financial information, where power line cables are vulnerable to electronic eavesdropping.

Paul Currie, Sales and Marketing Director of MPE, explains: "High-speed information-bearing signals are the ones most likely to couple onto the low impedance, copper power cables trailing through a data centre, and then be most vulnerable to interception beyond the building boundary. Accordingly, to be effective, the electrical filters designed for TEMPEST anti-eavesdropping applications have to perform across the full frequency spectrum to Super High Frequency or SHF (3GHz to 30GHz), and above.

"MPE filters with incorporated feedthrough suppression capacitors do just that. Commercial grade equipment filters, employing two-terminal capacitors and designed for suppression of EMI up to typically 30MHz, will fall into resonance well before the SHF band, and are therefore unsuitable for TEMPEST uses."



MPE offers a comprehensive range of TEMPEST power line filters of alternative performance specifications. These extend from 6A to 16A filters, which might be used to treat individual power inlets, up to 2400A filters for the hardening of a main building power supply.

Now a critical consideration of any data centre manager is that installed TEMPEST filters will be reliable over time. The undiminished long-term performance of installed filters becomes highly significant when most cannot be accessed easily to survey or replace – having been installed deep within building infrastructure.

So, having been originally designed to support mission-critical military applications, MPE's EMI, EMP and TEMPEST filters apply the most stringent design margins to ensure maximum in-service reliability. MPE has also – over several decades – supplied TEMPEST products which adhere to the onerous specifications of CESG (the Communications Electronics Security Group at GCHQ) and of the US NSA and more recently NATO SDIP Standards.



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250V AC, 50/60Hz, 16A MPE TEMPEST powerline filter for information security at data centres



Typical 5A to 100A MPE TEMPEST powerline filters for data centres

Filters contain resistive and reactive elements that are all at risk of in-service degradation, which may lead to failure. Although the electrical supply would be expected to cope with the possibility of a filter failing from a short circuit, it is the prospective loss of service that is of most concern to the data centre manager. The filter component at greatest risk of in-service failure is the capacitor.

However, filters such as MPE's incorporating capacitors manufactured from self-healing, high-reliability, metallised plastic film would generally be expected to be fully reliable for the intended lifetime of an installation.

MPE manufactures power line filters which support the highest level of TEMPEST hardening, providing very high insertion loss performance (dB against frequency in Hz) across the full frequency spectrum from Very Low Frequency (VLF) to Super High Frequency (SHF). Hence the performance of MPE filters comfortably exceeds the industry benchmarks for mains supply applications, which can be as high as 100dB in a frequency range across 10kHz to 10GHz.

Housed in electroplated steel cases, TEMPEST filters from MPE are of compact size for easy, flexible, bulkhead or chassis mounting into the rack systems of data centres, and include product options where low earth leakage is of critical importance.