

# Do's and Don'ts of EMI Filtering

*Filtronica, Inc*

FILTRONICA, Inc.  
Designer and manufacturer of

- Inverter Filters
- dV/dT Filters
- Sinusoidal Filters

# Do's and Don'ts of EMI Filtering

- GENISCO Filter Corporation
- Manufacturer of EMI/RFI filters
  - Power Line Filters
  - Signal Line Filters
  - Custom EMI Filters
  - Military EMI Filters

# Do's and Don'ts of EMI Filtering

- Power Line Filters aka Facility Filters
  - Sizes from mA to kA
  - Used in shielded Rooms
  - Used in mobile Shelters
  - Provides clean power to the EUT

# Do's and Don'ts of EMI Filtering

## ■ Proper Installation

- Voltage Rating
- Current Rating
- Frequency
  - Low Pass
  - High Pass

# Do's and Don'ts of EMI Filtering

- Insertion loss
  - Measured in dB
  - Typical range is 14 kHz to 18 GHz
  - Typical Insertion loss is 55, 80, 100 dB
  - Insertion loss testing per:
    - MIL-Std-15733
    - MIL-Std-285
    - MIL-Std-202
    - MIL-Std-220A (Most widely used)

# Do's and Don'ts of EMI Testing

## ■ Power Line Filters

### – Issues

- Bigger and Better usually doesn't work here
- Minimum and maximum operating range
- Usage effectiveness, don't operate a 100 Amp filter at 2 Amps (and vice versa)
- Miss-matched impedances ( we operate at 480 VAC/600 Amps= .8 Ohms, we test at 50 Ohms)
- Voltage Gains at certain frequencies

# Do's and Don'ts of EMI Filtering

- Power Line Filters
  - Proper Installation
  - Capacitive Input vs Inductive inputs
  - Maintenance
  - Proper Fusing (Protection)
  - TVSS installation (Caution, that Voltage gain might get you)

# Do's and Don'ts of EMI Filtering

## ■ Power Line Filters

- Summary
- Although an EMI filter is a relatively “dumb” component, many dynamic factors will affect the performance of the filter and as such the unit to be protected.
- Know your sizing, voltage and current of NORMAL use should be used for sizing
- Be aware of the pitfalls of filtering, I.e. testing standards vs. real life