

EMI/EMP FILTER PROTECTION WORKSHEET

Use the following sections as a guide for determining EMI options and solutions

SECTION 1:

- Is there a need to meet EMC or DO-160 requirements?
- Are EMC issues, EMP or Lightning Protection Issues a concern?

SECTION 2:

- Who is the responsible person for ensuring projects meet EMC Issues?
- Who is responsible for testing systems for EMC Compliance?
- What are the current solutions used to deal with EMC problems in design?
 - Shielded cable (Section 3)
 - EMI gasketing (Section 4)
 - On-Board filtering with chip caps and inductors (Section 5)
 - EMI Backshells (Section 6)
 - Filter Connectors (Section 7)
 - Transient Protected Connectors (Section 8)

SECTION 3 - SHIELDED CABLE:

- If using shielded cable, is weight a concern? Can this be reduced and/or eliminated by using an I/O filter connector?
- Consider cabling solutions by Amphenol cable houses (Amphenol Griffith Enterprises, Amphenol SEFEE, Amphenol Ionix Systems) or Amphenol accessories (Amphenol Interconnect India backshells, Amphenol PCD/ Amphenol AirLB system attachments)

A correctly terminated connector interface could reduce emissions making the cable lighter and cheaper and could eliminate the need for screened twisted pairs.

SECTION 4 - EMI GASKETS:

- If using EMI gaskets around the I/O connector, integrating the panel into the machined connector flange can be an option. Use Amphenol Canada, Amphenol Aerospace, or Amphenol Limited to machine the connector as one piece to the back panel of the system.
- What about ground pins to provide a low impedance ground path?

SECTION 5 - ON-BOARD FILTERING:

- If using on-board filtering, does this satisfy both conducted and radiated emissions in both directions?
- Is board real estate a concern or is it desirable to reduce the board size?
 - (If so, go to Section 7 – Filter Connectors)
- If not sure, consider a filter connector.
- If using on board filtering, consider complete board assembly by Amphenol Invotec, Amphenol Printed Circuits, or Amphenol Borisch Technologies.

L filters could be combined with on-board capacitors.

A filter connector could reduce size and weight by eliminating clean and dirty areas in the equipment.

SECTION 6:

- If using backshells with the I/O connectors, whose backshells are currently used?
- Consider Amphenol Interconnect India for circular backshells and Amphenol Canada for rectangular backshells.
- Is an integrated backshell that is machined into the connector housing of special interest?

SECTION 7 - FILTER CONNECTORS:

If you have established the need to use a filter connector there are questions that need to be asked to design the right filter connector that will solve the specific EMC issues.

- What is the connector that needs to be filtered? Specific part numbers are helpful.
- What capacitance per line is required?
- Are all lines filtered the same or not? Be as specific as possible by utilizing the EMI check sheet*.
- What is the rated voltage and dielectric voltage requirement?
- What termination is needed? PC Tail, Solder cup, or Crimp?
- Are there any special dimensional constraints?
- Are there any special design features (Dual flange, Special sealing, Float mount, High DWV, Press-fit headers, etc.)?

SECTION 8 - TRANSIENT PROTECTED CONNECTORS:

This section deals with connectors that contain active devices such as diodes, metal oxide varistors (MOVs) and fuses.

- What connector needs to be protected?
- Does the solution require both filters and transient protection or just transient protection?
- What devices are preferred? Diodes, MOVs, or fuses?
- What are the ratings of the devices, i.e. power rating and breakdown voltages (can have more than 1 device in a connector)?
- Are there any dimensional constraints?

SECTION 9 - PROGRAM INFORMATION:

- What is the program and/or application being working on? This helps with knowing environmental conditions.
- Is there a target pricing to the solution? This can impact technologies used to define the solution needed.
- What are the anticipated production quantities?
- What is the time frame of the program?
- What other companies or solutions are being considered?

* To view our EMI check sheet, visit www.amphenol-aerospace.com/emi-checksheet

Contact Amphenol Military & Aerospace for more information on EMI/EMP Filter Protection Solutions.