



EMI Test of Component Power Supply

20th Aug. 2008

This statement defines the EMI test setup and load style of MEAN WELL's enclosed type and PCB type power supply referring to International EMI regulation CISPR 11 and CISPR 22. It also explains the way we make the CE declaration and emphasize that end users should re-check the EMI issue at system level.

1. Component Power Application

When the power supply is built-in customer's system and used as a "component", functionality of the power supply can be fully performed only after connecting with system loads. Standard power products providing by MEAN WELL may be used in ITE (Information Technology Equipment) or ISM (Industrial, Scientific, Medical equipment) end products and will not restrict the load style to any specific category. In order to meet EMI requirement for the majority of applications and refer to the typical setup in the switching power supply industry, we define the standard EMI test assembly and requirement for component power supply as below.

2. Setup of Metal Plate for EUT (Equipment Under Test)

Since most of the casing of ITE or ISM equipment is metal in material, the EMI test need to simulate customers' deployment and hence we assemble the power supply unit on a metal plate. To prevent the distortion of outcome from using too big metal plate that induces the shielding effect, MEAN WELL chooses different plates based on the output power rating, size of power supply unit, and size of cabinet may be used by end users. Right now we have three kinds of metal plate made by 1mm of iron plate coated with zinc: 23*23mm, 36*36mm, 36*72mm. Each EMC report will specify the size of metal plate that been used for that product.

3. Load Style and Load Rating for EUT

Since the scope of application and load style are quite different, for power supplies that don't specify load style, we'll use "resistance load" to do the tests. As to the load rating, unless specially requested, 100% and 50% of rated load (The EMI performance will be better at 0% load. We only check but don't record it!) will be tested and all the test data will be recorded in the EMC report for users' reference.

4. Input / Output Connection for EUT

Terminal block and wafer are the most popular I/O styles for MEAN WELL's enclosed type and PCB type power supplies. So, wires or cables with suitable length (I/P: 10~20cm, O/P; 10~30cm typically) will be used at both input and output terminal while testing. Since the mechanical design and I/O location are quite

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different for MEAN WELL's standard products, users can refer to the EMC test report for details about I/O allocation of each model.

5. CE Declaration

For EMC directive of MEAN WELL's CE declaration, our products are certified by authorized third party with suitable margin (-5dB typically) and acquired the EMC report (confidential document, available on Distributor Network [<http://distributor.meanwell.com/channel>] or can request from our sales representative). Based on this test report, MEAN WELL is ultimately responsible for issuing its own CE declaration of conformity and regularly sampling mass production products to make sure it still comply with the EMC requirement.

6. Recheck EMC after Installation

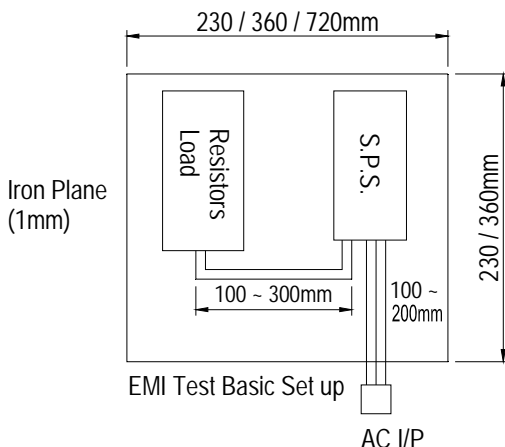
For component power supplies built-in end systems, EMC performance is dependent on how SPS is assembled in the system. If the enclosure of the system happens to be made by plastic, not assembled in the same cabinet (need to connect to other external system or parts), or there's problems of noise from main PCB and grounding connection, the EMC results may be different from what is found on our test report. So, MEAN WELL always emphasize in our entire document such as declaration, SPEC sheet, and catalog:

“Since EMC performance is affected by the final installation of a product, MEAN WELL cannot guarantee that the final equipment will meet EMC directives. Final product manufacturers must re-confirm that their product meets EMC directives.”

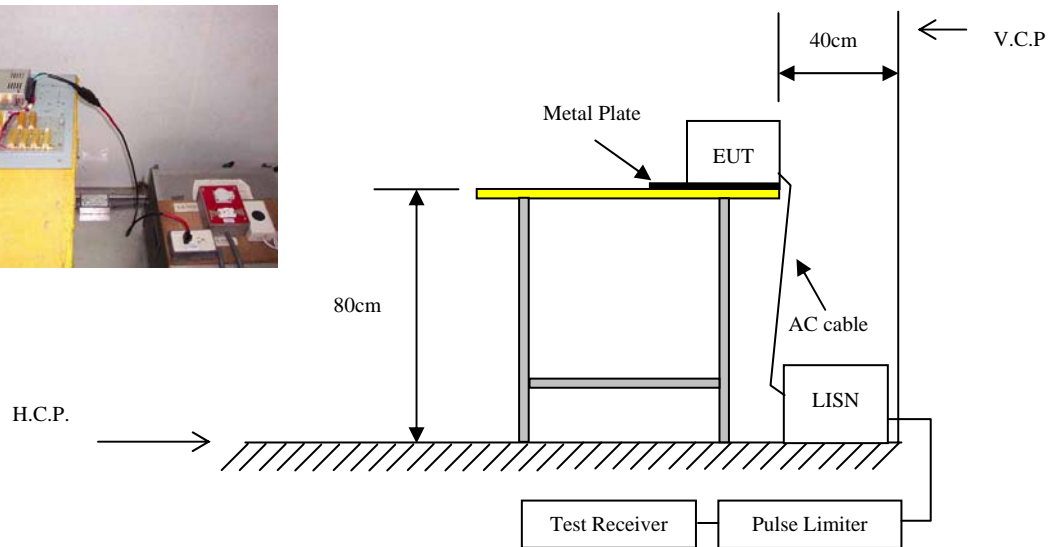
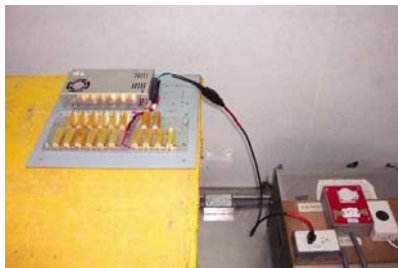
We do not suggest customers to test the EMI of the power supply alone (if you have to do so, please refer to the assembly method on our CE report), but do encourage them to verify the whole system with complete deployment of all components which would make more sense.

7. Setup of MEAN WELL's EMI Test

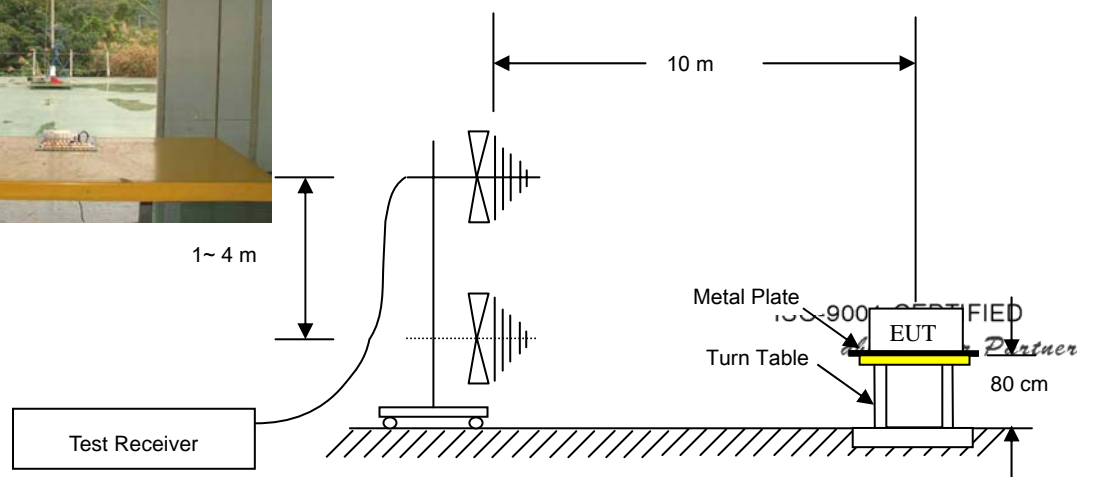
■ EUT Setup



■ Configuration of Conduction Set up



■ Configuration of Radiation Set up





Debug Suggestion for System Customers

Generally, system EMI debug should be done by system designers, however, in order to support our customers, MEAN WELL provide the following tips based on our experience. We believe that these suggestions should give help to solve system EMI problems.

- A. Complex system with many sources of noise: Add an EMI filter at AC input and grounding to the case with minimum distance. *****
- B. Connection between SPS and AC inlet should be as short as possible or add a high μ core. Connection between output of SPS and main PCB of the system also should be as short as possible. If the length of output wiring is too long, adding a high μ core is also suggested.*****

- C. Grounding connection should be short and thick in order to reduce the resistance. Sometimes removing the paint or coating at the grounding area on the chassis is needed. Add ground choke (3~6 turns / high μ core) between chassis and the grounding pin of the AC inlet. ****
- D. Twist the output wiring of the SPS if possible, or add a common choke near the main PCB to suppress the noise especially in long length wires. ****
- E. Reserve the place for LC filter or model Π filter at the main PCB of the system input (connecting with output of the power supply). This will help isolate common mode noise. ****
- F. If the main PCB is too close to the SPS, there might be some interference between each other and we need some shielding to solve it. ***
- G. Grounding of the main PCB is vital to suppress noise and EMS susceptibility. We do suggest to place a capacitor at the mounting whole of the main PCB. ***
- H. If the output wire of SPS connecting to the main PCB of the system is too long, adding a common choke (1~3 turns / high μ core) close to either SPS or main PCB of the system is suggested. *****

