

## Lecture 1 Homework

### Question:

Please use your own words to describe what means by Electromagnetic (EM) Compatibility (EMC), in terms of EM and Compatibility, such as where you can see EMC problems, characteristics of EMC problems, management, and so on.

Electromagnetic compatibility (EMC) refers to the ability of various electronic devices and systems to function properly near one another without experiencing interference or disruptions. EM is the short for Electromagnetic which is the branch of physics that deals with the interaction between electrically charged particles and electromagnetic fields. Since electronic devices are everywhere in people's daily life nowadays, the Electromagnetic field generated by them is necessary to be taken into consideration. Electromagnetic Interference (EMI) caused by electronic devices is one of the biggest issues of EMC. EMI is the unwanted electromagnetic energy that can interfere with the normal operation of electronic devices and systems. EMI can be caused by a variety of sources, including other electronic devices such as handphones, cars, or microwaves in the space like WiFi and 5G communication, and even natural phenomena such as lightning. It can cause a wide range of problems for electronic devices and systems, including disruptions to communication systems, errors in data transmission, and equipment malfunctions. Some common examples of EMI include noise appears in sound equipment when getting a phone call; the Electrostatic discharge damage the computer mainboard. To prevent or mitigate EMI, electronic devices and systems must be designed and tested to minimize their susceptibility to interference, and proper shielding and filtering techniques must be used to protect against EMI. However, it is not an easy work. There are many things need to be considered in design including a wide range of frequency (from 0 to very high), a wide range of electricity. As a result, EMC design is always without general solutions, highly based on experience and must understand subsequent EM physics knowledge. But there are still some managements we can rely on. Modern EMC design conducts before production, carries on hundreds of tests by test houses. The most important is there is standard we can execute which can simplify 99% of possible troubles.

In general, the prospect of electromagnetic compatibility (EMC) is likely to continue to be important as electronic devices and systems become increasingly integrated into all aspects of our lives. The growing use of electronic devices and systems in homes, offices, and industrial environments is likely to increase the potential for EMC problems. Additionally, the increasing use of wireless communication technologies and the Internet of Things (IoT) will also lead to more potential EMC issues. So it continues attracts the attention of engineers and researchers to study and work on it.