## PCB Design

While designing a PCB, some EMI (Electro Magnetic Interfere) issues have been considered. These considered points are explained in the following subsection.

### Electro Magnetic Interfere (EMI)

*What is EMI?*

According to Maxwell equations, changing in the electrical field causes a change in the  
magnetic field the opposite of it is also correct. This effect can be called EMI and designing a PCB it has a big role to make some decisions. Some tricks are listed below.

* *Trace Spacing Layout:* Traces are the conducting paths on which the current flows. If those traces are very close to each, there should be some capacitive effect between them. To prevent this capacitive effect on the design performance, most of the time the distance between traces on PCB has been left 3 times of the trace width.
* *Using Sharp Bends:* Using 90⁰ turns on the traces increase the capacitive effect and change of characteristic impedance of traces. Therefore, most of the time, sharp bends have been used in PCB design stage. In the following Figure X, some possible bends usage from the worst choice to the best.



Figure Corner examples of traces from the worst case to the best one

* *Grounding:* In all circuit designs, ground point is used as a reference bus. While designing a PCB using more than one ground line may cause some voltage difference between those ground points. This situation results using different references in the same circuit design and hence the performance of the circuit may be affected from this difference.

The above tricks can be increased, and these issues are not insignificant. In industry, an electronic device should be taken CE certificate to be released. To take this certificate, some EMC (Electro Magnetic Compatibility) standards must be provided. These standards have been specified based on the EMI performance of the designs. Therefore, in the designing steps, using this kind of tricks may increase the EMC performance of the product.

Considering the above tricks, the PCB for this project has been designed, and in the following Figure Y, Figure Z & Figure T shows 2D and 3D views from different perspectives of the PCB design.

metin, skorbord içeren bir resim

Açıklama otomatik olarak oluşturuldu

Figure 2D view of PCB Design

![metin içeren bir resim

Açıklama otomatik olarak oluşturuldu]()

Figure 3D view of PCB Design from Different Perspectives

![metin, devre, elektronik eşyalar içeren bir resim

Açıklama otomatik olarak oluşturuldu]()

Figure 3D view of PCB Design from Top and Bottom views