

## ABSTRACT

*EMC (Electromagnetic Compatibility) is a branch of science that studies the emissions and immunity of electronic equipment so that it can function in accordance with the desired environment of electromagnetic fields. The need for improved power quality is due to the destructive harmonic effect along the distribution of electrical power both from the supplier side and the user side. Harmonic problems in the electric power system are increasingly complex with the increasing use of non-linear loads such as LEDs where the use of this load produces harmonics in current and voltage. One way to increase immunity and reliability of electronic equipment is to reduce harmonics and increase the power factor passive filter installation. To overcome this problem further research needs to be carried out on system systems to conform to the IEC 61000-3-2 class C standard.*

*This study intends to design LED lamp with the standard IEC 61000-3-2 to optimize the value of current harmonics in the 5W LED lamp device with wireless on / off devices using the Blynk platform with ESP 8266 module as a hardware Interface with the internet in order to remote control. The filter that will be implemented consists of a passive Low pass filter using L and C components that will be installed at a voltage of 20 V AC. Research methods include literature review, design, simulation, implementation, measurement and analysis. Filter design and simulation will be made using LTspice software.*

*The results of several tests carried out, the LED lamp driver using LM317 is able to issue an average current of 265mA, power of 4.04W, voltage of 15.25V. The low pass harmonic filter used is able to reduce the THDi value by 17.73% and the third HDi by 14.7%. IoT devices that are designed, namely control on / off the device can work with a 100% success rate in testing.*

**Keywords:** *EMC, harmonic filter, IoT*