BANANA FIBER WOVEN MOBILE POUCH DESIGN & DEVELOPMENT OF EMI/EMC MITIGATION DESIGN FOR MOBILE APPLICATIONS

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Abstract

A mobile pouch has fabricated on banana fibre material which has investigated by Electromagnetic Interference/ Electromagnetic Compatibility (EMI/EMC) testing process is presented in this paper. It uses the shielding materials and reduces the EMI disturbances on surrounding of biological organ and also do not eliminating the degradation of mobile performance. The mobile pouch has investigated by Equipment Under Test (EUT) setup. It consists of transceiver setup which excited by radio Frequency (RF) sources (800 MHz to 1GHz). In this EUT setup, RF receiver antenna has used as horn, parabolic, dipole, yagi-uda and loop antennas respectively which obtained their radiation patterns. These validation results have compared with isotropic radiation pattern (3dB). Finally, these results have evaluated with EMI/EMC degradation of both banana fabric and graphite coated banana fabric pouches.

I. INTRODUCTION

There is no doubt that the best materials for electromagnetic shields possess both high conductivity and high permeability and that shielding devices based on the use of metals are the best ones. However apart from military applications, metals are being increasingly replaced by thermoplastics for housing commercial equipments, due to flexibility, light weight and low cost. Metalized thermoplastic materials are now commonly used for shielding elements. Among these materials, several commercial metalized fabrics are also available. Textiles are also suitable to provide protective clothing for people exposed to high frequency electromagnetic fields, to fulfill safety requirements in the field of non-ionizing radiation.

Problem testimonial

Generally Electro Magnetic Interference caused due to either electromagnetic induction or electromagnetic radiation from an external source which affects electronic devices such as Mobile phones, Televisions, Speakers, Electronic music instruments .To reduce Electro Magnetic Interference (EMI) problems, and we are using banana fiber.

All electronic devices give off electromagnetic interference. This is radiation that is a byproduct of electrical or magnetic activity. Unfortunately, the emissions from one device can interfere with other devices, causing potential problems. Interference can lead to data loss, picture quality degradation on monitors, and other problems with your mobile phones, or problems with other devices such as television sets and radios. These are generally categorized as electromagnetic interference or EMI problems.

Related works

The rapid growth of the electrical and electronics devices, which emit electromagnetic energy in the same frequency bands used by other users in markets, it becomes essential to limit and shield electronic equipment against all sources of interference due to all these electromagnetic energies. The electromagnetic interference (EMI) is basically electrical in nature and is due to unwanted electromagnetic emission being either radiated or conducted. Metal is considered to be the best material for electromagnetic shielding but it is expensive and heavy. On the other hand, the uses of polymers for housing the electronics device is popular due to it being light weight, exible and less expensive. But polymers are electrically insulating and transparent to electro-magnetic radiation i.e. their inherent EMI shielding effectiveness (SE) is practically zero. In order to shield against electromagnetic interference, the technical approach, which has been considered extensively, is to incorporate electrically conductive in polymer matrices. Various materials are selected for use in different microelectronics devices depending on their SE over different frequency ranges. They are also used in microwave applications to avoid interference due to unwanted electro-magnetic waves.

Anyone who has flown aboard a commercial airliner has been told to turn off any electronic device before takeoff. This is to prevent the occurrence of a phenomenon called electromagnetic interference (EMI). The effect of Electromagnetic interferences can range from degradation to interception and obstruction of the performance of electronic or electrical equipment. Well known examples include interference with TV signals, mobile phone communication difficulties, and EMI effects on medical, military, and aircraft systems ranging from jamming to burn out of sensitive equipment. Electromagnetic interferences remains a technical challenge given the rapid development of electronic devices such as laptop computers, medical instruments, and wireless communication devices that run at high frequencies and in smaller packages. Electrical and electronic components need to be shielded for the full range of the EMI frequency spectrum.