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Mitsubishi Cable Industries, Ltd.

Mitsubishi Cable Develops Electromagnetic Interference Shielding Film for Wireless LAN to Shield Radio Waves Selectively in Multiple Frequency Bands

Mitsubishi Cable Industries, Ltd. (President and CEO：Hiroshi Okamoto, Head office：Shin Kokusai Bldg, 4-1, Marunouchi 3-chome, Chiyoda-ku, Tokyo, Japan) has developed an electromagnetic shielding film to shield radio waves selectively in different frequency bands. This shielding material was newly developed using the FSS (Frequency Selective Surface) technology.

One shielding films can shield more than 20dB of radio waves both in the 2.45GHz and 5.2GHz frequency bands used in wireless LANs. It is expected to improve the quality of communication and ensure security in wireless LAN systems.

1. Background

Mitsubishi Cable Industries has developed and commercialized a variety of electromagnetic wave absorbers for the ETC (Electronic Toll Collection System)-related applications as well as directivity improvement for communications offset dishes. Now, Mitsubishi Cable Industries focuses on radio wave environments made by the introduction of wireless LAN network and its periphery in offices and housing complexes that connects society.

In communications through the medium of radio waves such as the wireless LAN, we have the advantage of ubiquitous environment however, the-disadvantages would be security issues such as radio interference or information leaks. In order to achieve a comfortable radio communication environment, proper use of electromagnetic shielding material will be essential.

Nevertheless, even within an environment shielded from outside, free use of other wireless appliances such as mobile phones, PHS and so on, should be secured.

Therefore, radio waves, other than that of wireless LAN applications, should remain unshielded. Also, today there are various standards for wireless LAN, and as either radio waves in the 2.45GHz or 5.2GHz frequency band is used according to system specifications, it is necessary to shield radio waves in both frequencies at the same time.

Currently Mitsubishi Cable has proceeded to develop an electromagnetic shielding film to shield radio waves selectively in multiple frequency bands.

2. Outline of the Shielding Film

Pre-production sample of an electromagnetic shielding film for dual frequencies sharing, as shown in Figures 2 and 3, is a product that an array of TY type antenna element is printed with a conductive coating on PET (Polyethylene Teleftarate) film.

By arranging the TY type antenna elements in a hexagon, it causes the elements with different sizes (with different frequencies applied) to coexist on the same surface enabling a selective shield of radio waves in multiple frequencies.

Also, by changing the size of the elements, it is possible to apply other frequency bands (ex. 800MHz band and 1.5GHz band for mobile phones, 1.9GHz band for PHS, 5.8GHz band for DSRC(Dedicated Short Range Communication), and so on).

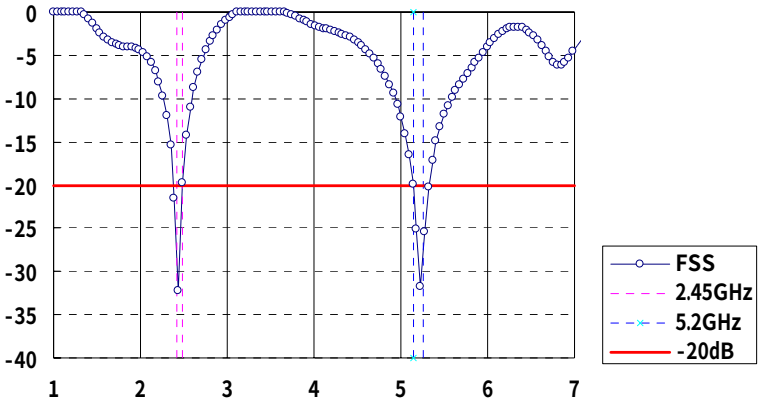

Fig.1 Shield property of FSS (Frequency Selective Surface) for wireless LAN

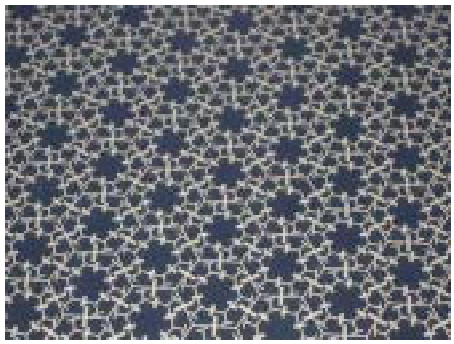

Fig.2 Outer Appearance of a dual band FSS for Wireless LAN

Fig.3 Outer Appearance of a dual band FSS for Wireless LAN (Close-up picture)

(cf.1) Transmission losses of 20dB: to attenuate the passing radio field intensity to 1/100

(cf.2) In case of dual frequencies sharing there is limit in combination of bands due to the conditions of antenna element size.

(cf.3) Data described above is a typical example and does not provide any guarantees.

3. Outlook for The Future

Wireless LAN is now rapidly spreading into enterprises in Japan, due to the price decline of wireless LAN devices and equipment, improvements in the security measures, and the communications speed with the rapid changes in the office environment. With this newly-developed material it is possible to build security measures and a stable wireless LAN environment. It is expected that this material will greatly contribute to the spread and promote the future ubiquitous society.

For a start, Mitsubishi Cable plans to apply this material to the wireless LAN field, but it is also assumed that this kind of product will be used for a variety of radio interference measures in other different fields.

Therefore, Mitsubishi Cable is planning to advance expansion of the products meeting different frequencies, utilizing the flexible design concept of this material.