Analysis of Frequency Response Characteristics of Film-Type Frequency Selective Surface under Temperature and Humidity Test

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1. Introduction

A frequency selective surface (FSS) is widely used in various applications, such as antenna radomes [1], subreflectors [2], circuit-aided absorbers [3], and interference cancellation [4]. Many studies have been conducted to improve the stability of polarization and incident angle using various methods, such as stacking dielectrics or structures and designing complex structures using simple unit structures.

In this paper, we design a film-type frequency selective surface that can be easily applied to building walls. The changes in transmission characteristics were analyzed from environmental tests according to temperature and humidity.

2. Body of abstract

The proposed structure is designed with a complex rectangular loop pattern to realize stability and miniaturization according to the change of polarization and incident angle, and a film-type FSS having blocking characteristics in the WLAN band is manufactured by using a screen printing method. To investigate the effect of the environmental change on the film-type FSS, high temperature and high humidity test evaluation and temperature change test evaluation were performed. As a result of comparison, the proposed film-type structure has a relatively stable performance due to the resonance frequency error up to 1.3% depending on the ambient temperature and humidity.

3. Equations, figures, and tables

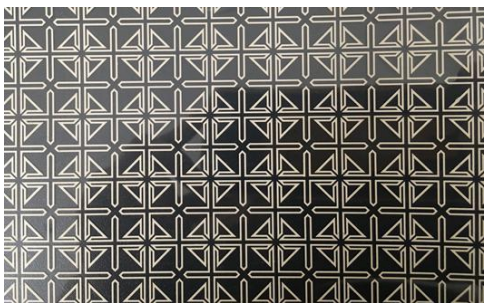

Fig.1 Fabricated film type FSS

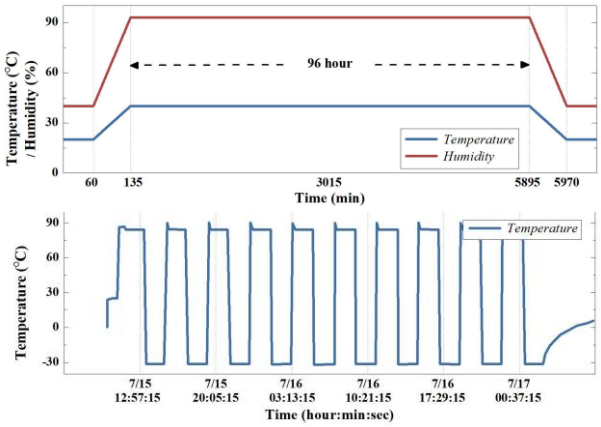

Fig.2 Conditions of environmental change test

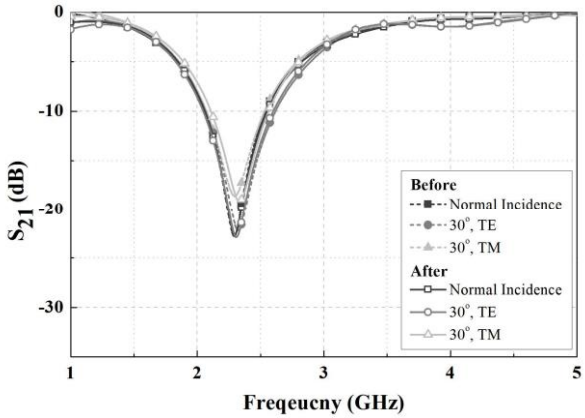

Fig.3 Transmission characteristics of film type FSS with high temperature and high humidity tests

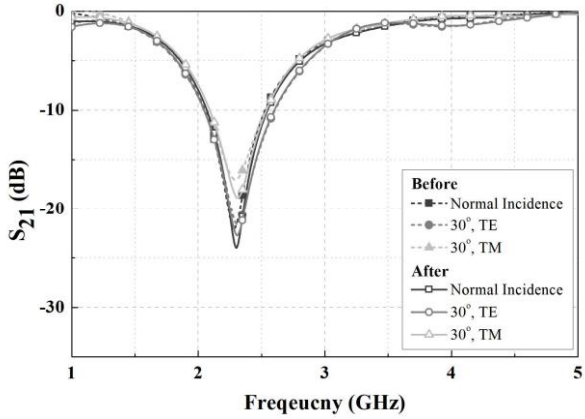

Fig.4 Transmission characteristics of film type FSS with temperature change tests

Acknowledgment

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References

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