Tohoku Univ. Technology

Liquid Crystal Reflect Arrays for Electromagnetic Wave

LC device eliminates coverage hole in millimeter wave communication

Overview

- At millimeter wave communication, there is a concern about increasing coverage hole which is area where the communication becomes impossible.
- Therefore, installing the reflect array for all over city that can control the direction of electromagnetic wave is proposed.
- A conventional reflect array composed of liquid crystal (LC) has **problem of slow response**.
- In the invention, **reduction of response time is achieved** by **forming a stripe electrode on substrate** which can be applied vertical and horizonal electric field.
- The invention is not only expected to apply for reflect arrays, but also phase modulators and phased array antennas.

Product Application

☐ Reflect Array, Phase Modulator, Phased Array Antenna

IP Data

IP number : Not published
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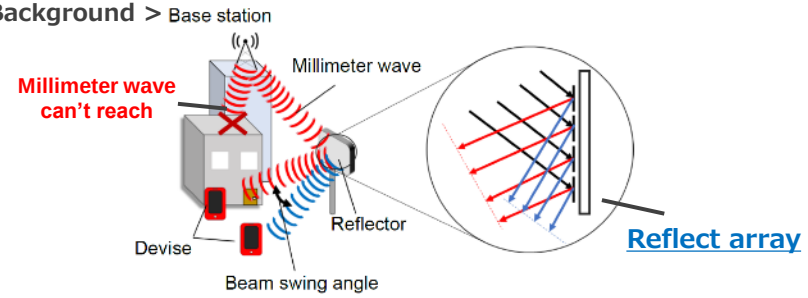
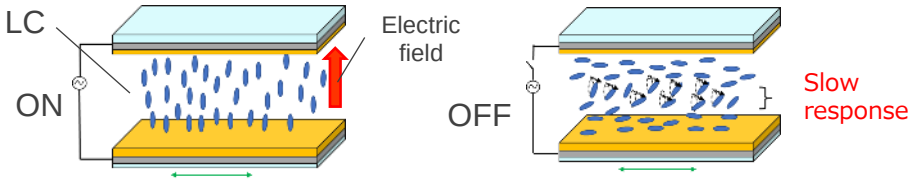
Admin No. : T23-078

Features・Outstandings

< Background > Base station

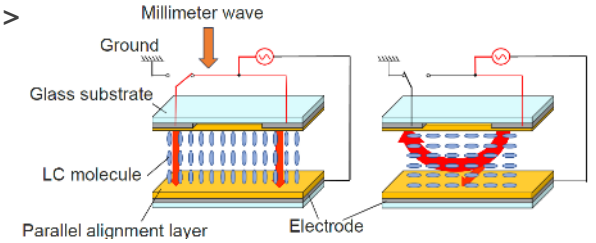


- Millimeter wave is difficult to diffract an obstacle.
- A reflect array can control direction of the millimeter wave arbitrarily.



- Thick liquid crystal layer has **extremly slow response of several ten second**.

< Invention >



・Stripe electrodes ⇒ **Vertical and horizontal electric fields** can be applied!

Electrode pitch / μm	10	50
Vertical driving response / ms	177.3	35
Horizonal driving response / ms	3.0	49

- **High response speed** achieved. (**Less than 500 ms**)
- **Low driving voltage.** (Less than 30 V)

Contact

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