

November 20, 2020

MIRAIT Holdings Corporation**【MIRAIT Corporation】****MIRAIT starts to sell 5G Area Construction Reflector "KLONE™"****applying Metamaterial/Metastructure technology**

**MIRAIT concludes agreement with METAWAVE of the United States of America
on sales of reflector "KLONE™" targeting the deployment of Local 5G Wireless
Area Construction Solutions**

MIRAIT Corporation(Head Office: Koto-ku Tokyo, President: Toshiki Nakayama) a Group company of MIRAIT Holdings Corporation,has entered into a license agreement with Metawave Corporation (Headquartered in Palo Alto, California, CEO: Maha Achour, Metawave), a U.S. start-up and a developer of Metawave "KLONE™" *1 passive reflectors using metamaterial/metastructure technology *2 , which is attracting attention as an effective tool in "Local 5G Wireless Area Construction Solution" and started sales on November 20.

1. Practicality of KLONE reflectors in "Local 5G Wireless Area Construction Solution"

In June 2020, as part of its "Local 5G Wireless Area Construction Solution" MIRAIT began providing support for companies implementing local 5G systems through its construction consultation services including design, construction, and support for license application. Currently, the quasi-millimeter wave band *3, which is assigned to the local 5G, has the problem of being a blind area due to the straight propagation of radio waves. To solve this problem, KLONE reflectors realize efficient and economical wireless area formation.

The KLONE reflector is a product developed by Metawave that uses metamaterial/metastructure technology to enable passive beamforming. Since December 2019, in collaboration with Metawave, MIRAIT has been conducting propagation tests, channel analysis, trial manufacture, and performance evaluation of KLONE reflectors as passive reflectors in constructing a local 5G wireless area. The metamaterial/metastructure technology used in the KLONE reflectarray has reflective properties that are not found in nature and it is expected to be possible to create a wireless area that does not take up space, does not feel oppressive, does not consume any power, does not require permits or licenses, and does not spoil the aesthetics of the area.

2. Future development

MIRAIT will continue to expand and enhance its services of "Local 5G Wireless Area Construction Solution", and contribute to the formation of efficient and detailed 5G service areas using quasi-millimeter waves, which are expected to be widely used not only by telecommunications carriers but also at construction sites, logistics and warehouses, stadiums, hotels, office buildings,

and other facilities aiming to build private networks. In addition to the construction of local 5G wireless areas, MIRAIT aims to provide comprehensive network construction that combines LPWA and Wi-Fi.

For many years, MIRAIT has been engaged in the electrical equipment business, software business, and ICT business, focusing on engineering related to the construction of fixed communications facilities and mobile network facilities for telecommunications carriers. Based on the engineering capabilities that have been refined in various fields, MIRAIT aims to provide new solutions that support a smart society through "Total Engineering & Services".

*1 Reflector applying metamaterial/metastructure technology

Metastructures are structures that behave in response to electromagnetic waves including light, which are not found in nature. Purpose of applying the metamaterial/metastructure reflectors for constructing 5G areas using millimeter waves and quasi-millimeter waves is to expand areas (outdoors / indoors) where otherwise impossible due to the effects of shielding.

*2 KLONE™

KLONE™ is a quasi-millimeter-wave reflector developed by Metawave, which uses metamaterial/metastructure technology.

*3 quasi-millimeter band

Quasi-millimeter wave band in high-frequency radio, a wavelength band whose wavelength is close to millimeters. The area around 20 GHz to 30 GHz is often called a quasi-millimeter wave. Until now, it has not been used in the field of mobile communications, so there is room in the frequency bandwidth, and it is suitable for ultra -high-speed, large-capacity communications. On the other hand, it is highly linear and there is a problem that the amount of attenuation due to rainfall or shielding is large, but this has been solved by utilizing a reflector using metamaterial technology.

※ Company names, product names, system names, etc. described in this article are registered trademarks and trademarks of their respective companies and organizations.

[Reference]

■About Metawave

Company Name: Metawave Corporation

Founded: August 2017

Address: 5993 Avenida Encinas, Carlsbad, CA 92008

President & CEO: Dr. Maha Achour

Business Profile: Development of millimeter wave 5G passive relays and active repeaters as well as radars for automotive and smart city/infrastructure applications



Metawave and KLONE™ logos