**Millimeter wave Large Tile-based Phased Antenna Array and RFIC**

**技術簡介：**

By integration between Ka-band 8x8 tile-based antenna array and 4x4 RFICs, many innovative technologies have been developed: (1) integration miniaturization of high density modules, including antennas, RFICs and feeding networks; (2) low profile antennas; (3) low loss interconnection and (4) wideband antenna/array and RFICs. Nevertheless, some specific technologies have been proposed: (a) The proposed novel wideband ultra-thin magneto-electric dipole antenna has a leading advantage in thickness; (b) The proposed novel mmWave 3D double-curved air cavity patch antenna has a leading advantage in bandwidth; (c) A multi-function mmWave RFIC integration technology has been developed and reduces the cost of mmWave RFIC automatic test equipment (ATE) solutions and (d) A novel frequency reconfigurable switched-type phase shifter maintains low amplitude and low phase variations, which has a leading advantage in operation bandwidth.

The related innovative research results had won **2021 FUTEX Futuretech Award, MOST.**

**技術之產業應用性：**

(a) A multi-function mmWave RFIC integration technology has been developed and reduces the cost of mmWave RFIC automatic test equipment solutions. This joint project has been funded with 4,400,000 NTD by the MOST.

(b) This project has successfully developed a wideband tile-based phased array antenna. We currently work with ITRI to jointly develop a solution of satellite payload antenna array with a funding size of 1,400,000 NTD.

(c) A novel mmWave 3D double-curved air cavity patch antenna has been realized through an industry-academic joint project with PCB manufacturer.

(d) Developed RFICs of CMOS Ku-Ka Band wideband up/down converter and phase shifter, and will carry out technology transfer with a company. Currently, the contract is being signed, and the amount is expected to reach several millions NTD.



