

Circularly Polarized Planar Aperture Antenna with High Gain and Wide Bandwidth for Millimeter-Wave Application

 Communications & Information

 Manufacturing

Computer/AI/Data Processing and Information Technology

Consumer Electronics

Digital Broadcasting, Telecommunication and Optoelectronics

Opportunity

Millimetre waves, a kind of electromagnetic wave with a wavelength around 1 to 10 mm, have been found to possess many promising applications for radar, telecommunications, and security systems technologies, just to name a few. However, the technologies conventionally used for millimetre wave antennas come with some drawbacks. For example, conventional aperture antennas have large sizes and high production costs, making them unsuitable for consumer-level applications. More recent horn-like antenna configurations often experience reduced performance in practical applications. This invention involves a design for a circularly polarized planar aperture antenna, a design that enables the antenna to feature both high gain and high bandwidth.

Technology

This invention is a circularly polarized planar aperture antenna. This means that the antenna is essentially flat, a “plane,” while the millimetre waves are received by a circular device that is located toward the “back” of an open area, like the cross-section of a mouth. This circular device can be fabricated onto the “mouth” using standard printed-circuit-board (PCB) technology. The waves generated by the antenna are transmitted by two sets of pins at the front or “teeth” of the mouth. This setup can then be excited by either a grounded co-planar waveguide (GCPW) or differential feeding techniques, the latter of which can offer benefits for particular applications.

Advantages

- This antenna has lower production costs than other aperture antenna designs.
- This antenna has a low profile, making it less visible.
- This invention can be easily integrated with a variety of circuits.
- This invention can provide higher performance, namely, low back radiation, low cross polarization, and high gain.

IP Status

Patent granted



Technology Readiness Level (TRL) ?

4

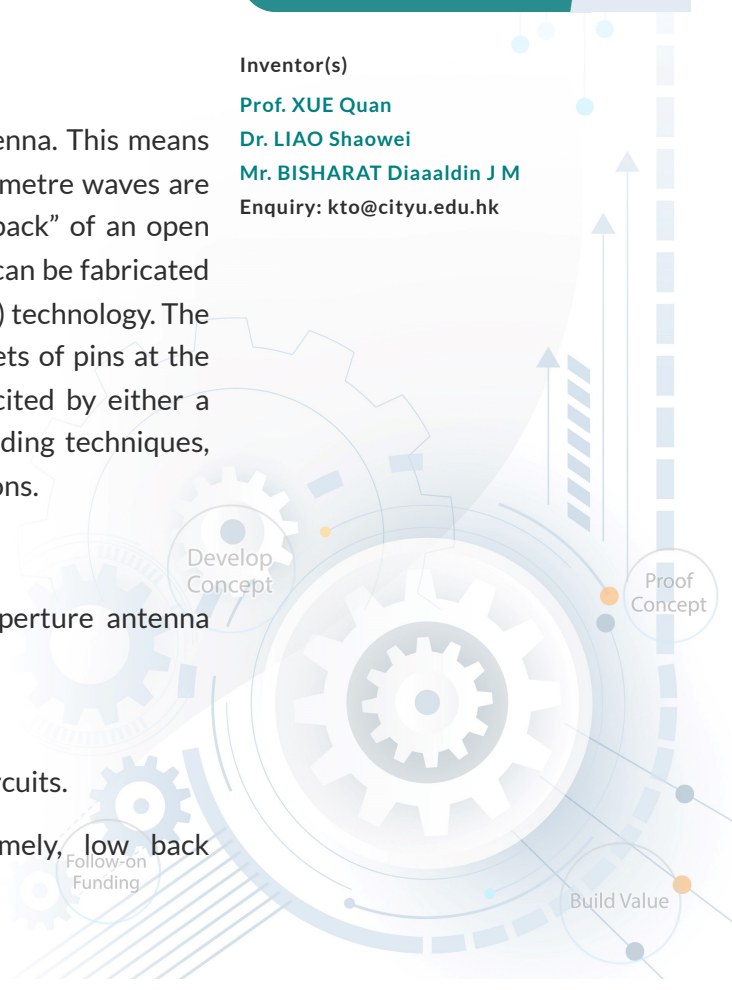
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Applications

- With its low profile, this antenna offers advantages for implementations within security systems.
- The higher performance of this antenna has implications for telecommunications fields that seek to transmit Ultra HD video.
- The low cost of this antenna has implications for consumer technologies that rely on radar, such as adaptive cruise control and emergency braking.

