

A Low-Cost Ka-Band Imaging Phased Array Antenna for 5G Massive MIMO System

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This paper presents an alternative and cost-effective Ka-band array-unit-cell for an imaging phased array antenna for 5G massive MIMO system. The proposed architecture consists of a 1D e-scanned AESA of 8x8 elements that provides e-scanning in elevation and multi-beam capability using beam switching or digital beam-forming in azimuth. The antenna array designed for large scanning range ($\pm 60^\circ$) with full polarization capability to cover a frequency range from 28 GHz to 34 GHz. The array architecture was designed for low-cost production and high reliability. LTCC and LCP was used for 3D system-on-chip design concept. Micro-channeling embedded liquid cooling on LTCC multilayer structure is used to remove the heat dissipated by the electronics. Preliminary measured results of a finite antenna array is presented.

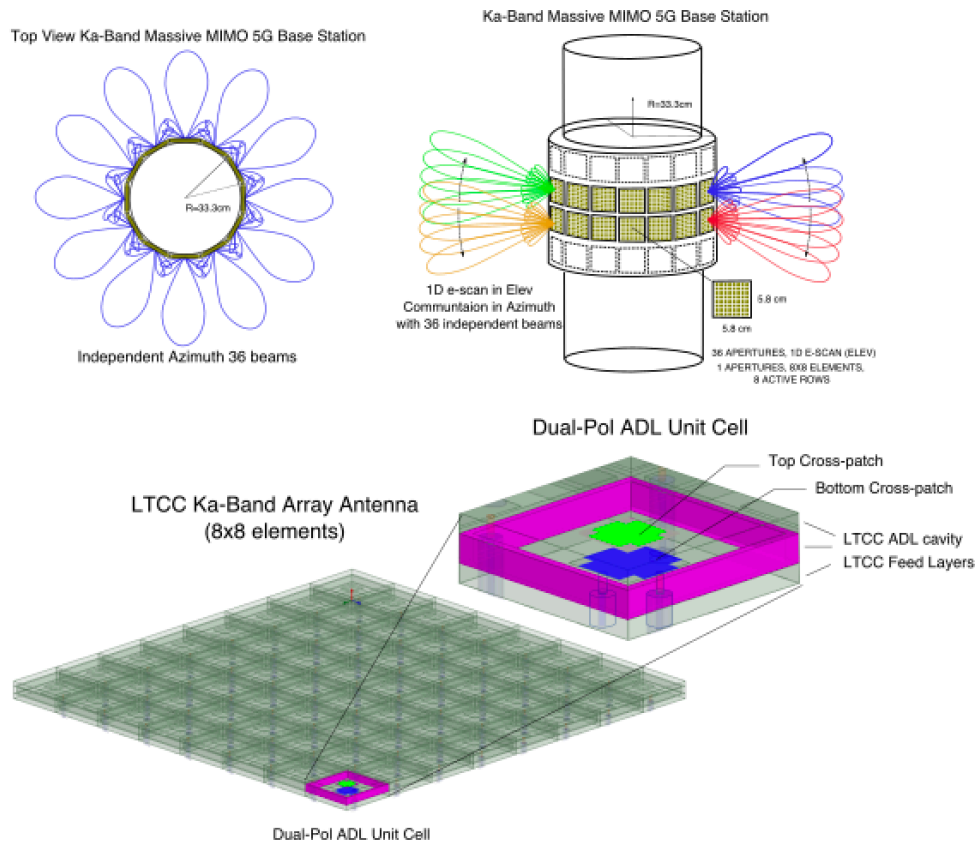


Fig.1. In the top part, a representation of the multibeam (azimuth and elevation) the massive 5G MIMO antenna system. In the bottom part, the geometry of the antenna array of 8x8 antenna elements.