E-band Low-Profile, Wideband 45°
Linearly-Polarized Slot loaded Patch and
Its Array for Millimeter-wave
Communications
ABSTRACT

A series of E-band low-profile wideband antenna arrays with 45° and ±45° dual linear polarizations are presented for high-speed millimeter-wave communication applications. The array element consists of a corner-fed patch with a tilted slot cut at its edge, which suppresses unwanted modes in order to generate the desired 45° linear-polarization. Comparing to a traditional 45° tilted patch, the proposed element gets rid of the bending feedline and realizes a higher isolation level between adjacent patches in the side-by-side arrangement. For proof-of-concept demonstration, a 2×8 array with 45° linear polarization was fabricated and measured, exhibiting a good agreement between simulated and measured results. The proposed array prototype possesses a -10dB impedance bandwidth of 10.6% (74.3~82.5 GHz). Moreover, a dual 1×8 array with ±45° dual-polarization is also presented, showing a bandwidth of 9.7% (74.4~81.9GHz) and a high isolation level of greater than 25dB. The proposed E-band planar arrays own the advantages of low-profile, i.e. ~0.067λ0, single-layer, low fabrication cost, simple structure, wide operational bandwidth, i.e. ~10%, and polarization flexibility. They represent promising candidates for high-speed E-band communications.
EXISTING SYSTEM

- A single-layered low-profile microstrip comb-line arrays were also proposed.
- However, they are only suitable for narrow band application such as automotive radars, due to their travelling wave structures which result in beam squinting.
- In general, it is highly desirable and challenging to design a single-layered array antenna with a low profile, simple structures, low fabrication cost, and 45° polarization in a wide bandwith for mmW communications.
PROPOSED SYSTEM

• A low-profile E-band slot-loaded patch is proposed for wideband mmW wireless communications.

• In order to generate 45° linear polarization, the current path of the undesirable mode is suppressed by a loaded slot cut on the edge of the patch.

• This radiator has superior performance than a traditional 45° tilted patch in that it possesses a higher isolation level between adjacent elements and eliminates the bending microstrip feedline.
SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS:

- Processor - intel core i3
- RAM - 2GB
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS:

- Ansoft HFSS (High Frequency Structure Stimulator)
REFERENCE


