

# Broadband On-Chip antenna array design in CMOS technology for D-band application

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**Abstract**—A patch array antenna working in the D-band is proposed in TSMC's 180 nm CMOS. The antenna structure applies a top metal layer (Metal6) as the patch antenna and a bottom metal layer (Metal1) for the ground. Simulation results demonstrate that the on-chip patch antenna has a peak gain of -5.95 dBi at 141 GHz. The measurement of the proposed antenna demonstrates bandwidth from 140 GHz to 202.5 GHz. The array on-chip patch antenna proposed can use in Smart cities technology and automotive applications.

**Keyword**— Antenna-on-chip, broadband, CMOS, D-band



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