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A CMOS D-Band Power Amplifier in 22FDSOI Technology for 6G Applications

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Abstract : This paper presents the design of power amplifier (PA) for mmWave communication systems. The designed amplifier uses GlobalFoundries 22 FDX technology and works at an operational frequency of 140 GHz in the D-Band. With a supply voltage of 0.8V for the super low threshold voltage transistors, the amplifier is biased in class AB and has a total current consumption of 50 mA. The measured saturated output power from the power amplifier is 5.6 dBm with an output-referred 1dB-compression point of 1.6dBm. The measured gain of PA is 19 dB with 3 dB-bandwidth ranging from 120 GHz to 140 GHz. The chip occupies an area of 795µm × 410µm.

Keywords : mmWave communication system, power amplifiers, 22FDX, D-Band, cross-coupled capacitive neutralization
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