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(57) Abstract :

A compact super wideband two-element multiple-input multiple-output (MIMO) antenna operating in the 5G mm Wave frequency range is designed and experimentally characterized. The antenna achieves an impedance bandwidth of 25.836-32.139GHz(6.3GHZ)and 34.648 - 69.98 GHz(35GHZ), covering the 28 GHz, 37 GHz, and 39 GHz 5G new radio mm Wave bands(n257,n259 bands). At the central resonant frequencies of 28.48 GHz and 40 GHz, the antenna exhibits measured return losses of -26.524 dB and -29.402 dB respectively. The impedance bandwidth is 6.3 GHz in the first band and 35 GHz in the second band. The antenna provides a directional gain of 7.1 dBi at 28.48 GHz and 6.74 dBi at 40 GHz. A high radiation efficiency of 91-94% at 28.4 GHz and 92-94% at 40 GHz is maintained across both operating bands. The compact planar design and consistent performance over an ultrawide bandwidth make it suitable for integration into 5G devices for mm Wave MIMO communication. The simple, low-cost design demonstrates good performance required for 5G MIMO implementation in the mm Wave spectrum and can be integrated into various wireless devices to enable high speed data connectivity.

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