Abstracts

A high-temperature superconducting duplexer for cellular base-station applications

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This paper presents a recent investigation of a high-temperature superconducting (HTS) duplexer for cellular base-station applications. The duplexer consists of two HTS hybrids and two HTS bandstop filters. The principle and design of the duplexer are described, The components of the duplexer were fabricated individually using double-sided YBa/sub 2/Cu/sub 3/O/sub 7/ (YBCO) thin films on LaAlO/sub 3/ (LAO) substrates. The substrate size for each of the hybrids was 0.5/spl times/22.5/spl times/15.5 mm, while each of the bandstop filters had a substrate size of 0.5/spl times/13/spl times/38 mm. Experiments were performed both with a test housing in a liquid-nitrogen cooler at a temperature of 80 K and in an encapsulated RF connector ring in a vacuum cooler at 55 K, The measured insertion loss was less than 0.3 dB both from the antenna to receiver ports over a receive band of 1770-1785 MHz and from the transmitter to antenna ports over a transmit band of 1805-1880 MHz. The isolation between the transmitter and receiver was measured to be greater than 35 dB, Good measured results were also obtained for the encapsulated duplexer with the maximum insertion loss of 1.15 dB, the additional loss being due to the microstrip feed lines actress the vacuum space, and the minimum isolation of about 30 dB.

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