Abstracts

Superconducting quasi-lumped element filter on R-plane sapphire

R.S. Kwok, Dawei Zhang, Qiang Huang, T.S. Kaplan, Jihong Lu and Guo-Chun Liang. "Superconducting quasi-lumped element filter on R-plane sapphire." 1999 Transactions on Microwave Theory and Techniques 47.5 (May 1999 [T-MTT]): 586-591.

Recent advancement in superconducting microwave technology has led to commercial deployment of high-temperature superconducting (HTS) subsystems for wireless communication applications. Commercialization of the HTS thin-film devices lies within, among other factors, the quality and consistency of the HTS film, as well as the overall cost and performance of the subsystem. In this paper, we present the design and performance of a quasi-lumped element filter on sapphire substrate. Centered at 1857 MHz with 0.8% fractional bandwidth, the six-pole Chebyshev filter has an insertion loss of less than 0.2 dB at 60 K, which translated into a realized unload Q of 35000. This is an important step toward the commercialization of superconducting devices using industrial standard wafers. With the continuous improvement of the HTS film quality, YBCO film on sapphire could be an answer to the future.

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