

Cavity antenna used for biomedical research

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Electromagnetic waves have become an indispensable part of all organisms in everyday life on earth. This is due to the ongoing development of telecommunications services. Higher intensity of EMF in the environment can have a variety of unforeseen consequences, hence researchers take the subject of EMF exposure on biological tissues. To provide reliable research with EMF appropriate exposure system is needed. Authors present a novel, dual band antenna used in biomedical application (Fig. 1).

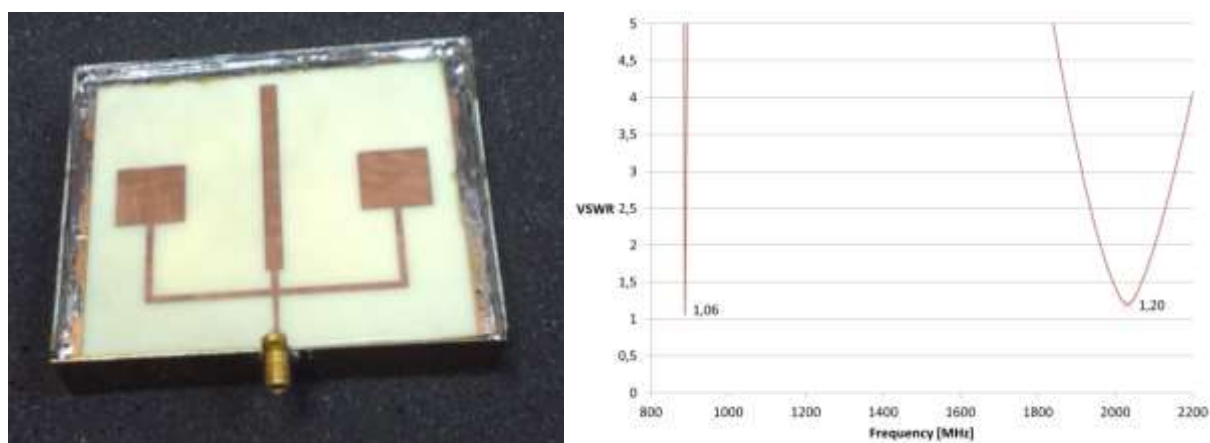


Figure 1. Fabricated dual band cavity antenna(left) and VSWR(right).

Each antenna is characterized by circuit parameter (impedance matching) and fields parameters (gain, radiation pattern, efficiency). Those parameters assay the suitability of selected types of antennas for exposure system. The main problem is constructing small

antennas with low uncertainty of EMF distribution for high frequencies structure ($> 800\text{MHz}$) in near field. Obtained size of the proposed antenna is $100\times 80\times 23\text{mm}$ respectively. Antenna is working for

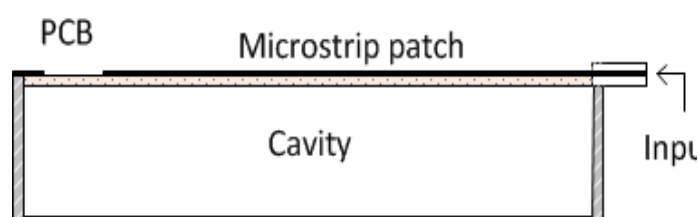


Figure 2. Cross section of the proposed antenna

two bands, GSM900 (9MHz channel at $\text{VSWR}<1.5$) and UMTS (64MHz channel at $\text{VSWR}<1.5$). In addition, antenna were optimized regarding constant EMF distribution on 10 cm from the antenna for Petri dish area. Has been obtained 8% uncertainty of EMF for GSM900 and 12% uncertainty o EMF for UMTS band.