Abstracts

A Microwave Compatible MIC Temperature Electrode for Use in Biological Dielectrics

L.E. Larsen, R.A. Moore, J.H. Jacobi, F.A. Halgas and P.V. Brown. "A Microwave Compatible MIC Temperature Electrode for Use in Biological Dielectrics." 1979 Transactions on Microwave Theory and Techniques 27.7 (Jul. 1979 [T-MTT]): 673-679.

A microwave compatible four-terminal electrode design based on hybrid microwave integrated circuit (MIC) construction is presented. The concept of electrothermal matching is employed to prevent artifact in either of two directions: heat sourcing and heat sinking. The electrode system includes a temperature-encoding electronic package. The electrode is designed for use in the brain at a specific insertion depth. It has been tested by thermographic methods for electromagnetic properties at 2450 MHz and a power density of ~250 mW/cm^2. The system has been thermometrically evaluated for calibration stability and freedom from hysteresis. Stability and artifact has been shown to be within ±15°C independent of temperature cycling and/or thermal history.

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