

Flexible antenna with frequency adjustability based on piezoelectric film material

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Abstract

Flexible antennas can be short, small, light, thin, soft and multifrequency, wide used in various fields including medical, automobile, military and etc., with their frequency adjustability. Realizing continuously-adjustment working frequency and high gain are the hot spots in the field of flexible antennas. In this study, PVDF film was employed to be as flexible antenna's matrix material due to its characteristics of lightness, thinness, flexibility and adjustable dielectric properties by bending stress or bias electric field. The shape and parameters of flexible antenna were obtained by HFSS software simulation. The relationship between bending stress, bias electric field and dielectric constant was obtained via mechanical simulation and dielectric property test under the action of bias electric field. The flexible antenna was fabricated by screen printing technology. Through the simulation and measurement, the working frequency of the flexible antennas could be adjusted and the gain could be improved by controlling the bending deformation or bias electric field.