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Provided is a method of manufacturing a bulk acoustic wave resonator, which includes: providing a piezoelectric substrate for forming a piezoelectric layer; forming a first electrode structure on the portion of the piezoelectric substrate for forming the piezoelectric layer; forming a dielectric layer on the first electrode structure, and performing a patterning process on the dielectric layer to form a patterned dielectric layer comprising a sacrificial dielectric part and a periphery dielectric part; forming a boundary layer on the patterned dielectric layer, the boundary layer covering a surface of the patterned dielectric layer and surrounding the sacrificial dielectric part; thinning the piezoelectric substrate to form the piezoelectric layer, the first electrode structure being located at a first side of the piezoelectric layer; forming a second electrode structure on a second side of the piezoelectric layer; and removing the sacrificial dielectric part to form a resonant cavity.

