

A reconfigurable electrically small capacitively loaded PIFA-as-a-package (PIFA-AAP) is developed to demonstrate the potential utility of reconfigurable antenna technologies to miniature and/or portable UHF wireless devices. The scalable PIFA-AAP concept involves simply integrating the antenna and the device package to maximize the effective area of the antenna given the physical constraints of the application. An elegant approach to frequency-agility is developed using commercial-off-the-shelf solid state switches, overcoming the key weakness of extreme environmental sensitivity inherent to any electrically small antenna. The measured performance of a 25 times 50 times 9-mm PIFA-AAP includes near-contiguous tuning coverage between 407.8 and 463.1 MHz with a total realized gain of better than -10 dBi across the tuning range. The measured bandwidth of our proof-of-concept frequency-agile PIFA-AAP is benchmarked against the Wheeler-Chu-Mclean fundamental limit.