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## Planar Asymmetrically Fed Folded Antenna (Paffa)

### THE PROBLEM

There is a need for a lowcost generalpurpose RFID (RadioFrequency Identifier) tag for the passive UHF RFID (UltraHigh Frequency) systems. To enable the largescale commercial breakthrough of the UHF RFID technology, the tags should be both cheap and applicable in different kinds of environments as well as small in size. So far the cheap UHF tags manufactured using rolltoroll technology have been thin label tags based on dipole antennas and its variations. Their main problem is sensitivity to the environment: any material brought near the tag ruins the impedance matching between the antenna and the IC and thus reduces the reading distance drastically.

### THE INVENTION

Traditional PIFA antennas (Planar Inverted F Antenna) are a technical solution for the problem, but the vias needed between the two conducting layers of the antenna make the structure complex and expensive to manufacture. In PAFFA, some of the vias needed have been replaced by a special folding technique of the antenna substrate and the one via needed at the attachment point of the IC has been replaced by a substitute circuit element. The structure of the PAFFA type antenna makes it also possible to make the tag small and still efficient enabling long reading distances. Cheap plastics can be used as the antenna substrate.

### THE SOLUTION

PAFFA can be attached on any surface, while still maintaining the long reading distance. It is directly matched to the impedance of the tag IC. The invention is cheap and simple to manufacture no complex process steps needed. Various cheap plastics (polyethylene, polystyrene) can be used as substrate material.

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