

Quasi-Isotropic X-Band Inverted-F Antenna for Active RFID Tags

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Abstract—An X-band (10.5 GHz) inverted-F antenna (IFA) for an active radio frequency identification (RFID) tag is presented. The antenna consists of two parts. One part comprises a driven monopole and a ground plane. The second part is a metal casing mounted on the ground plane to provide enclosed space for housing the electronics of the tag. The antenna was studied by means of both numerical simulations and measurements. The numerical simulations reveal that the radiation pattern of the antenna is quasi-isotropic. They also show that the -10 -dB return loss bandwidth of the antenna is nearly 15%. This predicted antenna bandwidth value has been confirmed by experimental measurement.

Index Terms—Active radio frequency identification (RFID) tag, active tag antenna, directive gain, inverted-F antenna (IFA), quasi-isotropic radiation pattern.

