

## A New BTS Antenna for Simultaneous Operation in 900 GSM Frequency Bands and LTE

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### Abstract

A new design of the dual-band and dual-polarized base station antennas for supporting the mobile communication systems operating at the GSM/DCS/PCS/UMTS and LTE frequency bands is presented. A wide input impedance matching bandwidth is achieved due to a trident-shaped feeding technique. Two printed dipoles, which are located perpendicularly to each other and fed by stepped-microstrip lines, establish the proposed antenna. In addition, by locating a low-profile cavity-backed structure, as a metal reflector under the antenna, bidirectional radiations of the dipoles are switched to unidirectional radiations with an increase in the gain of the antenna. results indicate that the proposed antenna is suitable for base station applications at the operating frequencies of 900/1800/1900/2300 MHz. peak gains of 11/47 and 10/40 dBi are attained at port-1 and port-2. The overall dimension of the antenna is  $168 \times 168 \text{ mm}^2$ , which is mounted upon a  $222 \times 222 \text{ mm}^2$  cavity-backed structure with a depth of 42mm.

**Keywords:** Base Station Antenna, Dual-Polarization, Printed Antenna, Trident-Shaped Feeding.

### Highlights

- with the design of this antenna, dual polarization feature is obtained in two frequency bands and several frequency bands related to mobile phone communications are covered.
- The applied triple feeding technique expands the impedance bandwidth of the antenna.
- Using a h-shaped slot to increase profit.
- Very simple design in terms of antenna shape.

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