Triple Band Built-in Antenna for Clamshell Type Mobile Phones

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A planer inverted-F antenna (PIFA) for clamshell type Mobile phones, which operates in the 900, 1800 and 1900MHz bands, has been developed. To achieve the same size triple antenna as dual-band PIFA (3cm^3), the relationship between the bandwidth and the area of ground-plane under the PIFA was studied. Removing a part of the GND plane of the PIFA improves the bandwidth in the 1900MHz band. Moreover, the antenna properties were investigated both “OPEN” and “CLOSED” positions of the clamshell. It appeared that the resonance frequency of the antenna when “CLOSED” depends on the length of the flexible printed circuit (FPC) connecting both circuit boards. Extending the length of FPC reduces interaction of the induced currents on both circuit boards. As result the resonance frequencies of this antenna when “OPEN” can be made to coincide with when “CLOSED”.

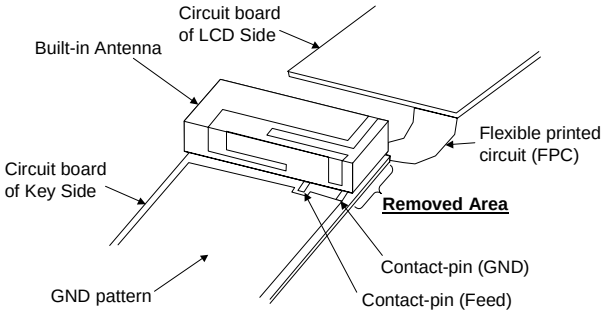

Fig.1 Triple Band Antenna

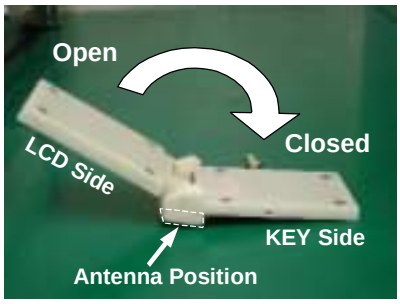

Fig.2 Clamshell type mobile phone

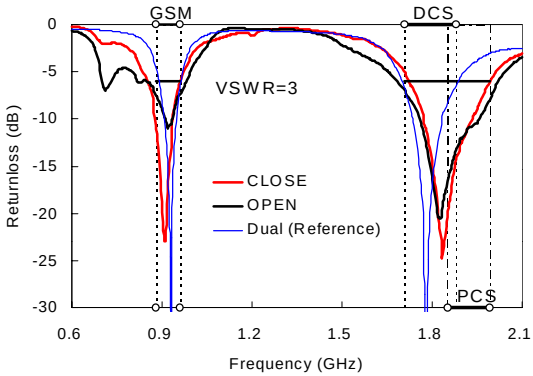

Fig.3 Return-loss of Triple-band Antenna in Clamshell Type Mobile Phone

Information
(1) B1.2. Antennas for wireless communications
(2) Developed antenna structure provides for more stable operation of Clamshell Mobile Phones.