Broadcom PIA Inquiry re Use of
Smartphone-Based Geolocation for 6 GHz Access Points

Geolocation General Description

This is a General Description of the Broadcom "Geolocation Solution" to determine a Standard Power 6GHz Access Point's geographic coordinates and location uncertainty, with a confidence level of 95% per the requirements in 15.407 (k)(9). This document in conjunction with the confidential details in the associated "Geolocation and Justification Report", used for the private FCC KDB Inquiry 137748, will be provided to Broadcom customers to support their TCB submissions and product certifications that use this Broadcom "Geolocation Solution".

Sections II and III include attestations of the 95% location uncertainty and confirmation that a daily AFC confirmation will be performed according to the requirements in KDB 987594 D01 U-NII 6GHz General Requirements v02r02 clause 10.2.1.

The Broadcom Geolocation Solution summarized below enables the use of a consumer smartphone as a geolocation device for AFC-controlled access points that use certain compatible Broadcom components and systems as further detailed in the "Geolocation and Justification" Inquiry.

The measurement campaign performed and resulting uncertainties in this Inquiry are only applicable to residential applications. The PIA approval is only applicable for Broadcom's residential access points and is not authorized in Broadcom's enterprise product line. Furthermore, the licensing agreement for the Broadcom Geolocation Solution is limited for use in only residential applications. Any Commission approvals are dependent upon representations made by Broadcom in the Geolocation and Justification report. Any changes to the proposed product usage or core functionality of the Broadcom Geolocation solution, including any changes to the algorithm applied to achieve the Commission's 95% geolocation uncertainty confidence, will invalidate use of the PIA Inquiry. Manufacturers implementing the Broadcom Geolocation Solution should also take into account any additional restrictions placed upon the equipment by the FCC approval response for this FCC KDB Inquiry 137748.

I. Overview

The proposed Geolocation Solution consists of two interoperable systems:

1) the Broadcom "AFC AP Software," a software package that would run on certain access points incorporating Broadcom components, and

2) the "Geolocation App" running on a compatible smartphone which will allow that smartphone to be used as a geolocation source.

Below, we summarize the functions performed by the AFC AP Software and the Geolocation App:

1) AFC AP Software

The Broadcom AFC AP Software will perform the AFC-related functions required of standard-power 6 GHz access points. In most respects, these functions will be the same as those of other AFC-controlled access points. Broadcom anticipates that those features will be subject to approval using the same procedures as other AFC-controlled 6 GHz devices.

However, the AFC AP Software will have three additional capabilities as further described in the justification report:

1. To communicate with and authenticate smartphone-based geolocation sources running the Geolocation App, using secure techniques.

2. To compute the geolocation accuracy of location data reported by such a geolocation source accounting for the physical separation distance between the access point and smartphone).

3. To use this data to compute a geolocation accuracy value that satisfies the Commission's 95%-confidence requirement.

   Note: Geolocation information in the access point is stored temporarily in memory and is erased when powered down. Upon access point restart, the geolocation from the smartphone app is re-provisioned.

Accordingly, these are the only aspects of 6 GHz standard-power device operations raised in the associated FCC KDB Inquiry.

2) Geolocation App

The Geolocation App, running on a user's smartphone, will provide two key functions to enable a compatible access point to use a smartphone as a geolocation source:

1. Interface with the geolocation API made available by the host smartphone operating system ("OS") to obtain geolocation measurements; and

2. Communicate this information to an access point using a secure wireless connection using industry-standard cryptographic techniques to prevent tampering and to securely identify the smartphone to the access point as an approved geolocation source.

Note: This App will only work when integrated with a Broadcom enabled standard power AP containing the AFC AP Software. It is expected that the App will be distributed under the Brand names of Broadcom's customers.

II. Attestation confirming the location uncertainty with a 95% confidence level

Broadcom Corporation, attest that this "Geolocation Solution" will determine the access-point location and the associated geolocation uncertainty at a 95% confidence level or greater.

III. AFC Confirmation

A daily AFC confirmation will be performed, and after a power cycle operation the Access Point will also perform an AFC confirmation.