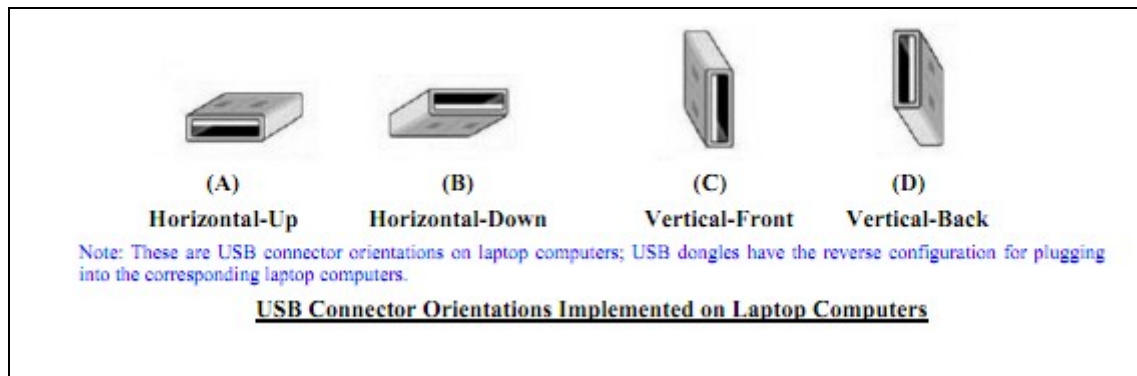


Dear Sir/Madam,

Please help provide PBA guidance for SAR evaluation of WIFI USB dongle. The EUT has two antennas. One is extended swivel antenna and the other is internal antenna. The extended swivel antenna can be locked at 90 degree, 135 degree and 180 degree. And the extended swivel antenna and the internal antenna can't Simultaneous transmits. This project is a Part15C portable device. The USB dongle supports 802.11b/g/n with operating in 2.400GHz to 2.484GHz, and 802.11 n doesn't support MIMO. The conducted power see annex A.

The 802.11b/g bands SAR will be follow KDB 248227, Please kindly give me some advice about the SAR measurement of 802.11 n.

The SAR measurement of internal antenna will follow KDB 447498 D02, and will be tested four positions and the extended swivel antenna will be removed.



About the test position of the extended swivel antenna, Please see Annex C. Please confirm whether the test position is OK.

Sincerely

Jeff Ling

Response:

At this time, the FCC has no specific published procedures for 802.11n. You can use KDB 248227 with some adaptation, but because 802.11n has 40 MHz channels, the channel numbers will be off. In terms of test reduction, for 2.4 GHz only, if the maximum average conducted power for all channels in 802.11n are no more than ¼ dB higher than measured in any of the channels in 802.11b, then OK. This is an interim procedure because we are not comparing exact channels. 802.11n standards have not yet been finalized by IEEE and ad-hoc implementations have to suffice at this time. If you have specific questions, please let us know.

We are assuming that when the external antenna is attached or screwed on to the end of the USB dongle, the internal antenna is somehow disconnected. If this is not the case, please let us know. Otherwise, the following applies:

For the extended swivel antenna, test the *Horizontal Up* and *Horizontal Down* positions of the dongle with the antenna connected in straight mode at a 5mm distance to the SAR phantom. The testing of the antenna tip is not necessary. If the two measured SAR levels are similar, then additionally test the *Horizontal Up* position with the external antenna connected at 90 degrees, perpendicular to the phantom (antenna pointing down and away from the phantom). A 5mm separation distance to the phantom would again apply. With these 3 test positions, SAR testing conditions for the external antenna will be satisfied unless the SAR levels for the *Horizontal Up* and *Horizontal Down* positions are not similar (review the SAR plots for symmetry and similar areas of SAR distribution), then the antenna is not symmetrical and the *Vertical Front* and *Vertical Back* positions in external antenna straight mode will also need to be tested at a 5mm distance to the SAR phantom.

Annex A: conducted power

802.11b mode	
Test channel	Average Output Power (dBm)
Lowest	21.76
Middle	21.58
Highest	21.59
802.11g mode	
Test channel	Average Output Power (dBm)
Lowest	17.76
Middle	17.43
Highest	17.67
802.11n-H20 mode	
Test channel	Average Output Power (dBm)
Lowest	16.67
Middle	16.61
Highest	16.58
802.11n-H40 mode	
Test channel	Average Output Power (dBm)
Lowest	16.06
Middle	16.21
Highest	16.21

Annex B: The EUT Appearances



180 Degree



90 Degree



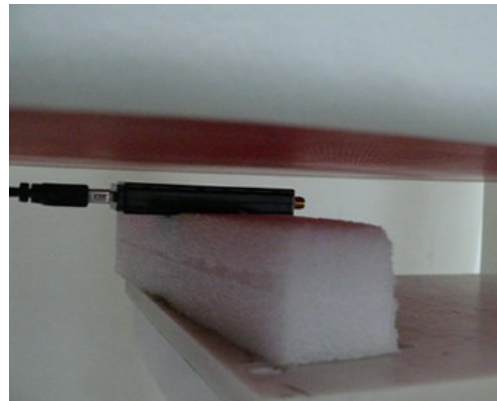
135 Degree

Annex C: Test Configuration

Internal Antenna test position



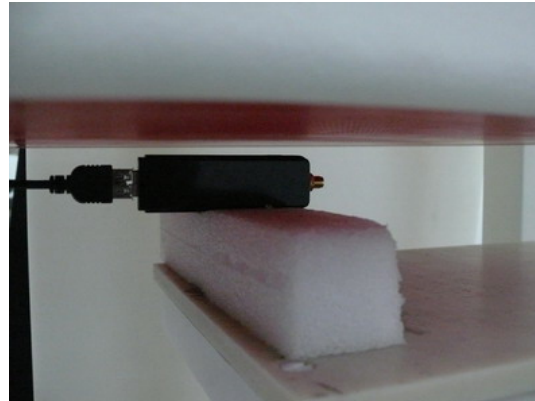
Test position1



Test position2



Test position3



Test position4

Extended Antenna test position



180 Degree



135 Degree



90 Degree

Test position 1(Distance 5mm)



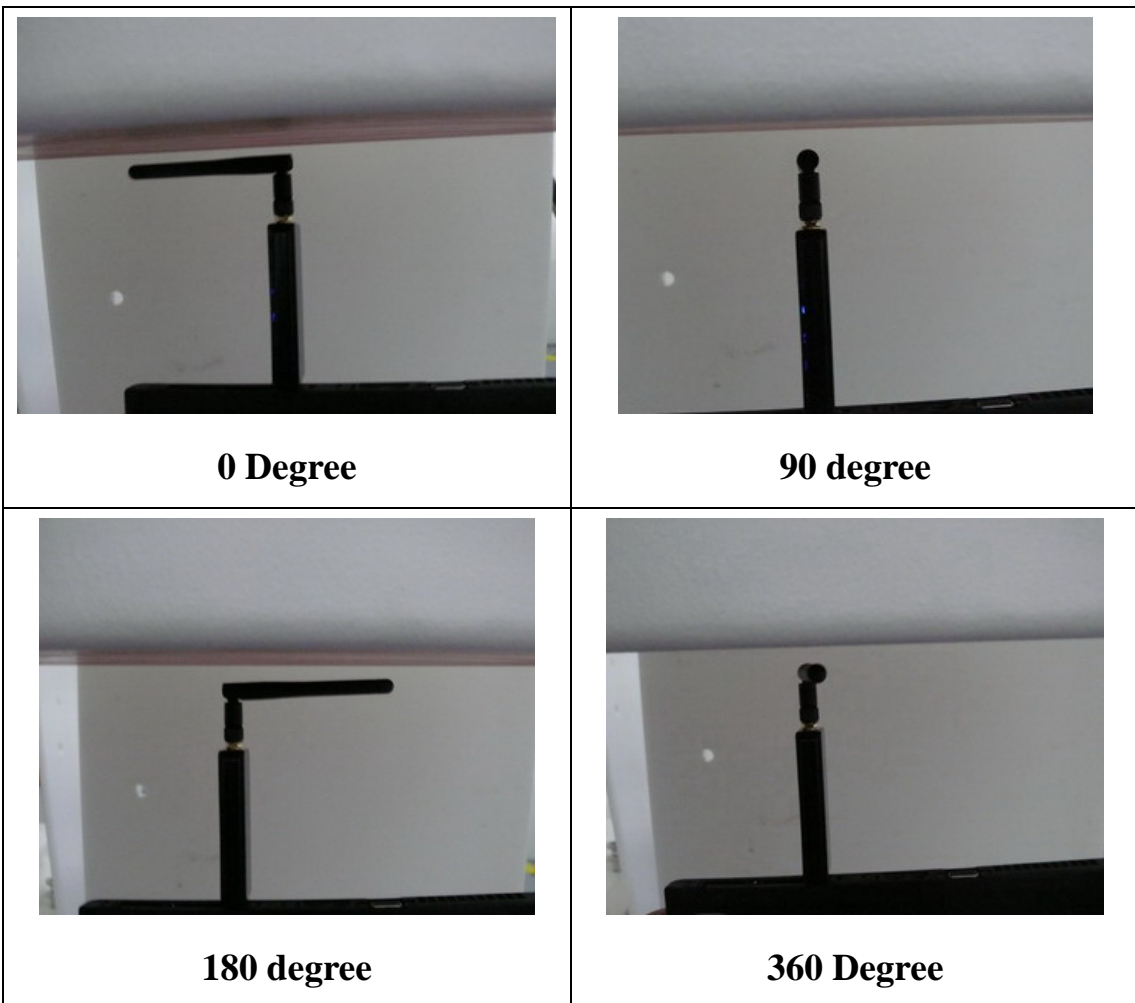
Test position 2(Distance 5mm)



Test position 3(Distance 5mm)



Test position 4(Distance 5mm)



Test position 5(Distance 5mm)