



CB-7.2.1 – Technical Review RT Form

FCC ID: SWX-R5ACL

IC ID:

CT Project: P14a0018

From: Shawn

Date: 2/20/15

1--In the operational description file it reads "In the system, there are 40 Mhz crystals for both U-AME-G1 and QCA9557 and a 25 Mhz crystal for AR8033", however the block diagram only identifies a 40Mhz crystal. Please address.

2/24/15 - Mike: The operational description is correct and the block diagram will have the crystals added for the report.

2--The operational description defines this EUT as an 802.11 a/n/ac however only ac modes were tested per the EMC report.

2/24/15 - Mike: I removed both references to 802.11a/na and described the product as being based on 5 GHz 802.11ac. I removed the bit about being compliant with 802.11ac. We have our own proprietary protocol and also add in non-standard channel widths, so technically it's not compliant with those standards but based on them instead.

3--The user's manual does not contain the information necessary for the professional installers to adjust the power to accommodate the installation of alternative antennas.

2/24/15 - Mike: We have discussed this in some detail and would like feedback before we make the necessary changes.

Background:

1. While this report is for FCC and R5AC-Lite, we use one firmware for all our 11AC AirMax line of products.
2. The power restriction must vary based upon the following parameters: country, product, channel width, antenna, frequency.
3. For a given configuration, the following parameters are fixed: country, product, channel width, antenna.
4. For a given configuration, the following parameters are NOT fixed: frequency.
5. The product must sometimes choose a different operating frequency dynamically. For an AP this occurs when channel selection is set to "auto" or when a DFS event occurs. For a station, this occurs every time it scans, finds an AP, and associates.

Problem:

In order to base our solution on a set of large tables in the manual, the professional installer would need to do one of two things:

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A) set the maximum power level based on the lowest maximum across all frequencies they have selected (or all frequencies, if they have not entered a frequency list)

or B) enter in maximum power levels for every channel center frequency they have selected (or all frequencies, if they have not entered a frequency list)

We do not believe that it is realistic to expect the professional installer to actually enter all this data by hand. Therefore, we propose to allow the professional installer to choose the antenna from a list and have these limits applied automatically. The professional installer would still be allowed to enter cable losses and maximum transmit power. The minimum of antenna power table value or user specified maximum would be used. This allows the installer to pick one antenna and all limit data is automatically used appropriately, regardless of whether the other operating parameters change.

If we do this, we do not believe that we should put these power tables into the QSG. We believe we should merely document the requirement to select the appropriate antenna from the list for legal operation.

Please let me know if this is adequate before I get mockups of the proposed UI changes, and updated manuals for the report.

SM: OK.

4--The specifications in the user's manual does not include operation in the 5150-5250MHz band for USA operations.

3/23/15 - Mike: Revised Manual provided.

5--The RF exposure warning in the user's manual for the required separation necessary is not consistent with the MPE calculations per the EMC report.

3/23/15 - Mike: Revised Manual provided, please check for accuracy.

6--It is unclear as to what the following statement in the user's manual is meant to reflect.

"Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650 5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices."

2/24/15 - Mike: I think it's nonsense. I'll have it removed.

7--The only antenna installation documentation in the user's manual is for a dish antenna. The other antennas need to be documented as well especially when using an outdoor Omni antenna.

2/24/15 - Mike: 8A - Each antenna we sell has a special standard mounting bracket for the Rocket 5 family of products. They all connect the same way.

8B - Each antenna comes with it's own instructions.

8C - The example you see was meant to be an example.

Do we really need to provide more than one example?

3/23/15 – Mike: We haven't discussed this yet. Since we have professional installers and antennas sold separately with their own instructions, I'm thinking this is not necessary. Please advise. If necessary, how many antenna's mounting instructions do we need to copy into the manual for each radio?

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8--The data rates for the output power are not consistent with the data rates for the spectral density for the same channels tested.

SM:

RTs 04/11/2015

UNI-1

1--The output power levels recorded in the EIRP tables at elevations >30 degrees does not match that of the output power tables. Please note that this should be combined power and not per port.

Alex: Updated Test Report

2--It should be noted in the RF exposure portion of the EMC report and the separate attachment that the maximum power density does not exceed the levels recorded when higher gain antennas are used.

Alex: Updated Test Report

3--The power level used to calculate the MPE is inconsistent with the RF power measured. In addition this device although is professionally installed must use general population limits.

Alex: Updated test report

4--The EMC report lists my name as the project engineers. Please correct.

Alex: Updated test report

5--The output power limit for a 13dBi omni antenna is recorded in the RF output power annex as 26dBm however the limit is 30dBm with a maximum gain of 6dBi. For every dB the antenna exceeds 6dB the power and spectral density need to be reduced by the same amount. In addition the limit for PTP is 23dBi. The limit up to 23dBi is 30dBm and then the power and spectral density need to be reduced 1 dB for every dB the gain exceeds that value.

Alex: Power limits have been updated

6--There are no test setup photos provided with this application. Please provide.

DW: Provided.

7--There are several emissions above the radiated limit in the plots provided in the radiated emissions annex. Please provide justification why these emissions are allowed to exceed the limit.

Alex: For the 30 – 1000 MHz radiated emission plots, the emissions are digital emissions and not part of the transmitter circuitry and therefor only need to meet the -27 dBm limit. The only other emissions over the limit are the fundamental transmitter frequencies. , for any peak emission over the restricted band average limit was examined with an average detector and additional plots were supplied.

8--It is difficult to follow the conducted spurious information as some of the titles are missing the power number.

Alex: I assume “power number” is referring to the port (in this case J7 or J8). The annex has been updated

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UNI-3

9--The EMC report lists my name as the project engineer. Please correct.

Alex: Updated test report

10--The output power used to calculate the MPE is not consistent with the recorded power levels.

Alex: Updated test report

11--The output power limit for a 13dBi omni antenna is recorded in the RF output power annex as 26dBm however the limit is 30dBm with a maximum gain of 6dBi. For every dB the antenna exceeds 6dB the power and spectral density need to be reduced by the same amount.

Alex: Updated Test Report

12--There are several emissions above the radiated limit in the plots provided in the radiated emissions annex. Please provide justification why these emissions are allowed to exceed the limit.

Alex: For the 30 – 1000 MHz radiated emission plots, the emissions are digital emissions and not part of the transmitter circuitry and therefore only need to meet the -27 dBm limit. Throughout Annex C, for all plots above 1 GHz, other than the fundamental transmitter frequency, for any peak emission over the restricted band average limit was examined with an average detector and additional plots were supplied.

CT -

Response by:

Submitted by:

Date:

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