FCC Compliance Information for Navini 2.4 GHz P3 BTS

The purpose of this document is to explain Navini Networks 2.4 GHz P3 BTS (PL6-2400-BTS3-R1) meets FCC part 15, Subpart C:

According to FCC CFR47 Part15.247 (c) (1) (i): Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The maximum peak output power limit is 1 watt (30 dBm)

For Sector Antenna:

1- Directional Antenna Gain (gain/element + beam coherence= 16 + 9) =   25   dBi

2- Free Gain allotment of 6 dB => subtract 6 dB   - 6   dB   19

3- Reduce power by 1 dB for every 3 dB of gain is above allotted power:
   a- Divide by 3:   ÷ 3

                                                          6.3 dB

4- The **EMS Tx Power setting** (which is AVE. power/antenna element) =   **22.7 dBm**
   Which is reduced from 1 Watt (30 dBm) limit 7.3 dB > **6.3 dB**.

For OMNI Antenna:

1- Directional Antenna Gain (gain/element + beam coherence= 8 + 9) =   17   dBi

2- Free Gain allotment of 6 dB => subtract 6 dB   - 6   dB   11

3- Reduce power by 1 dB for every 3 dB of gain is above allotted power:
   a- Divide by 3:   ÷ 3

                                                          3.7 dB

4- The **EMS Tx Power setting** (which is AVE. power/antenna element) =   **25.3 dBm**
   Which is reduced from 1 Watt (30 dBm) limit 4.7 dB > **3.7 dB**.

According to FCC CFR47 Part15.247 (c) (2) (ii) (A),(B) The directional antenna gain is calculated as: The highest directional gain of each element + 10 log(8, which is number of array element). For sector antenna, the directional antenna gain is 16+ 10 log (8) = 25 dBi and for Omni antenna, the directional antenna gain is 8+ 10 log (8) = 17 dBi. EMS software will have a maximum cap on the transmitting power for both Sector and Omni antenna.

In CDMA mode, different receiver will receive different walsh code from the base station. And in OFDM mode, different receiver will receive different combination of the sub-channels. Therefore, different information will be transmitted to each receiver, which meets the compliance of FCC CFR47 Part15.247 (c) (2) (i).

The Navini base station does not emit a single beam to the receivers, which meets the compliance of FCC CFR47 Part15.247 (c) (2) (iv)

The total aggregate conducted power across all the antenna elements is 31.7 dBm for the sector antenna when multiple beams are formed simultaneously. According to FCC CFR47 Part15.247 (c) (2) (iii), the conducted power limit for the aggregate conducted power is 38 dBm, which is 8 dB higher than 1 watt. Therefore the deduction from the limit is **6.3 dB,** which still meet Part15.247 (c) (2) (ii)**.**

For the Omni antenna, the total aggregate conducted power across all the antenna elements is 34.3 dBm when multiple beams are formed simultaneously. Therefore the deduction from the limit is **3.7 dB**, which also meets Part15.247 (c) (2) (ii).