

**TUNE-UP PROCEDURE**

There are no user accessible adjustments or tuning in this device.

All necessary adjustments and tuning are performed during manufacture of the product.

Any adjustments or tuning after service or repair are done as part of that process as special equipment is required to perform such adjustments.

**Target Power & Tolerance****WCDMA/LTE - Target Power****(A) WCDMA/HSDPA/HSUPA**

| 3GPP Release Version | Mode  |           |         | Cellular Band (dBm) | AWS Band (dBm) | PCS Band (dBm) | 3GPP MPR (dB) |
|----------------------|-------|-----------|---------|---------------------|----------------|----------------|---------------|
| 99                   | WCDMA | Voice     | Maximum | 23.3                | 23.2           | 23.2           | -             |
|                      |       |           | Nominal | 22.8                | 22.7           | 22.7           |               |
| 5                    | HSDPA | Subtest 1 | Maximum | 23.3                | 23.2           | 23.2           | 0             |
|                      |       |           | Nominal | 22.8                | 22.7           | 22.7           |               |
| 5                    |       | Subtest 2 | Maximum | 23.3                | 23.2           | 23.2           | 0             |
|                      |       |           | Nominal | 22.8                | 22.7           | 22.7           |               |
| 5                    |       | Subtest 3 | Maximum | 22.8                | 22.7           | 22.7           | 0.5           |
|                      |       |           | Nominal | 22.3                | 22.2           | 22.2           |               |
| 5                    |       | Subtest 4 | Maximum | 22.8                | 22.7           | 22.7           | 0.5           |
|                      |       |           | Nominal | 22.3                | 22.2           | 22.2           |               |
| 6                    | HSUPA | Subtest 1 | Maximum | 23.3                | 23.2           | 23.2           | 0             |
|                      |       |           | Nominal | 22.8                | 22.7           | 22.7           |               |
| 6                    |       | Subtest 2 | Maximum | 21.3                | 21.2           | 21.2           | 2             |
|                      |       |           | Nominal | 20.8                | 20.7           | 20.7           |               |
| 6                    |       | Subtest 3 | Maximum | 22.3                | 22.2           | 22.2           | 1             |
|                      |       |           | Nominal | 21.8                | 21.7           | 21.7           |               |
| 6                    |       | Subtest 4 | Maximum | 21.3                | 21.2           | 21.2           | 2             |
|                      |       |           | Nominal | 20.8                | 20.7           | 20.7           |               |
| 6                    |       | Subtest 5 | Maximum | 23.3                | 23.2           | 23.2           | 0             |
|                      |       |           | Nominal | 22.8                | 22.7           | 22.7           |               |

Nominal Power Tolerance: (+0.5 dB~ -1.5 dB)

Note: This device supports HSDPA and HSUPA but the manufacturer declares on the tune-up procedure that the HSDPA and HSUPA transmitter's power will not exceed the R99 maximum transmit power in devices based on Qualcomm's HSPA chipset solution.

(B) LTE

| Band & Mode |         | Modulated Average [dBm] |
|-------------|---------|-------------------------|
| LTE Band 71 | Maximum | 23.70                   |
|             | Nominal | 23.20                   |
| LTE Band 12 | Maximum | 23.70                   |
|             | Nominal | 23.20                   |
| LTE Band 13 | Maximum | 23.70                   |
|             | Nominal | 23.20                   |
| LTE Band 5  | Maximum | 23.70                   |
|             | Nominal | 23.20                   |
| LTE Band 66 | Maximum | 23.50                   |
|             | Nominal | 23.00                   |
| LTE Band 4  | Maximum | 23.50                   |
|             | Nominal | 23.00                   |
| LTE Band 2  | Maximum | 23.70                   |
|             | Nominal | 23.20                   |

Nominal Power Tolerance: (+0.5 dB~ -1.5 dB)

MPR condition

| RB Size | Mod    | MPR | MPR(1.4 MHz Case) |
|---------|--------|-----|-------------------|
| 1       | QPSK   | 0   | 0                 |
| 50%     | QPSK   | 1   | 0                 |
| 100%    | QPSK   | 1   | 1                 |
| 1       | 16-QAM | 1   | 1                 |
| 50%     | 16-QAM | 2   | 1                 |
| 100%    | 16-QAM | 2   | 2                 |

\* MPR Tolerance: +0.5dB/-0.5dB

WLAN - Target Power

(C) 2.4G WLAN (Burst Average Power)

| Band (GHz) | Mode    | Ch   | Modulated Average[dBm] |         |         |         |               |         |
|------------|---------|------|------------------------|---------|---------|---------|---------------|---------|
|            |         |      | Ant.1                  |         | Ant.2   |         | MIMO(CDD/SDM) |         |
|            |         |      | Maximum                | Nominal | Maximum | Nominal | Maximum       | Nominal |
| 2.4        | 802.11b | 1    | 12.0                   | 11.5    | 14.0    | 13.5    | -             | -       |
|            |         | 6    | 13.0                   | 12.5    | 13.0    | 12.5    | -             | -       |
|            |         | 11   | 12.0                   | 11.5    | 13.5    | 13.0    | -             | -       |
|            | 802.11g | 1-11 | 10.0                   | 9.5     | 12.0    | 11.5    | 14.1          | 13.6    |
|            | 802.11n | 1-11 | 9.0                    | 8.5     | 10.0    | 9.5     | 12.5          | 12.0    |

Nominal Power Tolerance: (+0.5 dB~ -1.5 dB)

(D) 5G WLAN (Burst Average Power)

Nominal Power Tolerance: (+0.5 dB~ -1.5 dB)

| Mode         | Freq. (MHz) | Channel | Modulated Average[dBm] |         |         |         |           |         |           |         |
|--------------|-------------|---------|------------------------|---------|---------|---------|-----------|---------|-----------|---------|
|              |             |         | Ant.1                  |         | Ant.2   |         | MIMO(CDD) |         | MIMO(SDM) |         |
|              |             |         | Maximum                | Nominal | Maximum | Nominal | Maximum   | Nominal | Maximum   | Nominal |
| 802.11a (6M) | 5180        | 36      | 12.0                   | 11.5    | 10.0    | 9.5     | 14.1      | 13.6    | -         | -       |
|              | 5200        | 40      | 12.0                   | 11.5    | 9.0     | 8.5     | 13.8      | 13.3    | -         | -       |
|              | 5220        | 44      | 12.0                   | 11.5    | 9.0     | 8.5     | 13.8      | 13.3    | -         | -       |
|              | 5240        | 48      | 12.0                   | 11.5    | 9.0     | 8.5     | 13.8      | 13.3    | -         | -       |
|              | 5260        | 52      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | -         | -       |
|              | 5280        | 56      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | -         | -       |
|              | 5300        | 60      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | -         | -       |
|              | 5320        | 64      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | -         | -       |
|              | 5500        | 100     | 12.6                   | 12.1    | 8.5     | 8.0     | 14.0      | 13.5    | -         | -       |
|              | 5580        | 116     | 12.6                   | 12.1    | 7.0     | 6.5     | 13.7      | 13.2    | -         | -       |
|              | 5660        | 132     | 12.6                   | 12.1    | 6.5     | 6.0     | 13.6      | 13.1    | -         | -       |
|              | 5720        | 144     | 12.6                   | 12.1    | 6.0     | 5.5     | 13.5      | 13.0    | -         | -       |
|              | 5745        | 149     | 12.6                   | 12.1    | 5.0     | 4.5     | 13.3      | 12.8    | -         | -       |
|              | 5785        | 157     | 12.6                   | 12.1    | 5.0     | 4.5     | 13.3      | 12.8    | -         | -       |
|              | 5825        | 165     | 12.6                   | 12.1    | 6.5     | 6.0     | 13.6      | 13.1    | -         | -       |

| Mode                         | Freq.<br>(MHz) | Channel | Modulated Average[dBm] |         |         |         |           |         |           |         |
|------------------------------|----------------|---------|------------------------|---------|---------|---------|-----------|---------|-----------|---------|
|                              |                |         | Ant.1                  |         | Ant.2   |         | MIMO(CDD) |         | MIMO(SDM) |         |
|                              |                |         | Maximum                | Nominal | Maximum | Nominal | Maximum   | Nominal | Maximum   | Nominal |
| 802.11n<br>(HT-20)<br>(MCS0) | 5180           | 36      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                              | 5200           | 40      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                              | 5220           | 44      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                              | 5240           | 48      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                              | 5260           | 52      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                              | 5280           | 56      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                              | 5300           | 60      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                              | 5320           | 64      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                              | 5500           | 100     | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                              | 5580           | 116     | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                              | 5660           | 132     | 12.0                   | 11.5    | 6.5     | 6.0     | 13.1      | 12.6    | 13.1      | 12.6    |
|                              | 5720           | 144     | 12.0                   | 11.5    | 5.5     | 5.0     | 12.9      | 12.4    | 12.9      | 12.4    |
|                              | 5745           | 149     | 12.0                   | 11.5    | 4.0     | 3.5     | 12.6      | 12.1    | 12.6      | 12.1    |
|                              | 5785           | 157     | 12.0                   | 11.5    | 4.0     | 3.5     | 12.6      | 12.1    | 12.6      | 12.1    |
|                              | 5825           | 165     | 12.0                   | 11.5    | 6.0     | 5.5     | 13.0      | 12.5    | 13.0      | 12.5    |

| Mode                           | Freq.<br>(MHz) | Channel | Modulated Average[dBm] |         |         |         |           |         |           |         |
|--------------------------------|----------------|---------|------------------------|---------|---------|---------|-----------|---------|-----------|---------|
|                                |                |         | Ant.1                  |         | Ant.2   |         | MIMO(CDD) |         | MIMO(SDM) |         |
|                                |                |         | Maximum                | Nominal | Maximum | Nominal | Maximum   | Nominal | Maximum   | Nominal |
| 802.11ac<br>(VHT-20)<br>(MCS0) | 5180           | 36      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                                | 5200           | 40      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                                | 5220           | 44      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                                | 5240           | 48      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                                | 5260           | 52      | 12.0                   | 11.5    | 7.5     | 7.0     | 13.3      | 12.8    | 13.3      | 12.8    |
|                                | 5280           | 56      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                                | 5300           | 60      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                                | 5320           | 64      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                                | 5500           | 100     | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                                | 5580           | 116     | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                                | 5660           | 132     | 12.0                   | 11.5    | 6.5     | 6.0     | 13.1      | 12.6    | 13.1      | 12.6    |
|                                | 5720           | 144     | 12.0                   | 11.5    | 5.5     | 5.0     | 12.9      | 12.4    | 12.9      | 12.4    |
|                                | 5745           | 149     | 12.0                   | 11.5    | 4.0     | 3.5     | 12.6      | 12.1    | 12.6      | 12.1    |
|                                | 5785           | 157     | 12.0                   | 11.5    | 4.0     | 3.5     | 12.6      | 12.1    | 12.6      | 12.1    |
|                                | 5825           | 165     | 12.0                   | 11.5    | 6.0     | 5.5     | 13.0      | 12.5    | 13.0      | 12.5    |

| Mode                         | Freq.<br>(MHz) | Channel | Modulated Average[dBm] |         |         |         |           |         |           |         |
|------------------------------|----------------|---------|------------------------|---------|---------|---------|-----------|---------|-----------|---------|
|                              |                |         | Ant.1                  |         | Ant.2   |         | MIMO(CDD) |         | MIMO(SDM) |         |
|                              |                |         | Maximum                | Nominal | Maximum | Nominal | Maximum   | Nominal | Maximum   | Nominal |
| 802.11n<br>(HT-40)<br>(MCS0) | 5190           | 38      | 12.0                   | 11.5    | 8.5     | 8.0     | 13.6      | 13.1    | 13.6      | 13.1    |
|                              | 5230           | 46      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                              | 5270           | 54      | 12.0                   | 11.5    | 7.5     | 7.0     | 13.3      | 12.8    | 13.3      | 12.8    |
|                              | 5310           | 62      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                              | 5510           | 102     | 12.5                   | 12.0    | 8.0     | 7.5     | 13.8      | 13.3    | 13.8      | 13.3    |
|                              | 5550           | 110     | 12.5                   | 12.0    | 7.0     | 6.5     | 13.6      | 13.1    | 13.6      | 13.1    |
|                              | 5670           | 134     | 12.5                   | 12.0    | 6.0     | 5.5     | 13.4      | 12.9    | 13.4      | 12.9    |
|                              | 5710           | 142     | 12.5                   | 12.0    | 5.5     | 5.0     | 13.3      | 12.8    | 13.3      | 12.8    |
|                              | 5755           | 151     | 12.5                   | 12.0    | 5.0     | 4.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                              | 5795           | 159     | 12.5                   | 12.0    | 6.0     | 5.5     | 13.4      | 12.9    | 13.4      | 12.9    |

| Mode                           | Freq.<br>(MHz) | Channel | Modulated Average[dBm] |         |         |         |           |         |           |         |
|--------------------------------|----------------|---------|------------------------|---------|---------|---------|-----------|---------|-----------|---------|
|                                |                |         | Ant.1                  |         | Ant.2   |         | MIMO(CDD) |         | MIMO(SDM) |         |
|                                |                |         | Maximum                | Nominal | Maximum | Nominal | Maximum   | Nominal | Maximum   | Nominal |
| 802.11ac<br>(VHT-40)<br>(MCS0) | 5190           | 38      | 12.0                   | 11.5    | 8.5     | 8.0     | 13.6      | 13.1    | 13.6      | 13.1    |
|                                | 5230           | 46      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                                | 5270           | 54      | 12.0                   | 11.5    | 7.5     | 7.0     | 13.3      | 12.8    | 13.3      | 12.8    |
|                                | 5310           | 62      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                                | 5510           | 102     | 12.5                   | 12.0    | 8.0     | 7.5     | 13.8      | 13.3    | 13.8      | 13.3    |
|                                | 5550           | 110     | 12.5                   | 12.0    | 7.0     | 6.5     | 13.6      | 13.1    | 13.6      | 13.1    |
|                                | 5670           | 134     | 12.5                   | 12.0    | 6.0     | 5.5     | 13.4      | 12.9    | 13.4      | 12.9    |
|                                | 5710           | 142     | 12.5                   | 12.0    | 5.5     | 5.0     | 13.3      | 12.8    | 13.3      | 12.8    |
|                                | 5755           | 151     | 12.5                   | 12.0    | 5.0     | 4.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                                | 5795           | 159     | 12.5                   | 12.0    | 6.0     | 5.5     | 13.4      | 12.9    | 13.4      | 12.9    |

| Mode                           | Freq.<br>(MHz) | Channel | Modulated Average[dBm] |         |         |         |           |         |           |         |
|--------------------------------|----------------|---------|------------------------|---------|---------|---------|-----------|---------|-----------|---------|
|                                |                |         | Ant.1                  |         | Ant.2   |         | MIMO(CDD) |         | MIMO(SDM) |         |
|                                |                |         | Maximum                | Nominal | Maximum | Nominal | Maximum   | Nominal | Maximum   | Nominal |
| 802.11ac<br>(VHT-80)<br>(MCS0) | 5210           | 42      | 12.0                   | 11.5    | 8.0     | 7.5     | 13.5      | 13.0    | 13.5      | 13.0    |
|                                | 5290           | 58      | 12.0                   | 11.5    | 7.0     | 6.5     | 13.2      | 12.7    | 13.2      | 12.7    |
|                                | 5530           | 106     | 12.5                   | 12.0    | 7.0     | 6.5     | 13.6      | 13.1    | 13.6      | 13.1    |
|                                | 5690           | 138     | 12.5                   | 12.0    | 6.0     | 5.5     | 13.4      | 12.9    | 13.4      | 12.9    |
|                                | 5775           | 155     | 12.5                   | 12.0    | 5.5     | 5.0     | 13.3      | 12.8    | 13.3      | 12.8    |

## Bluetooth - Target Power

### (E) BT(Burst Average Power)

| Burst Modulated Average[dBm] |         |     |
|------------------------------|---------|-----|
| Bluetooth<br>1 Mbps          | Maximum | 7.0 |
|                              | Nominal | 6.5 |
| Bluetooth<br>2 Mbps          | Maximum | 4.0 |
|                              | Nominal | 3.5 |
| Bluetooth<br>3 Mbps          | Maximum | 4.0 |
|                              | Nominal | 3.5 |
| Bluetooth<br>LE              | Maximum | 7.7 |
|                              | Nominal | 7.2 |

Nominal Power Tolerance: (+0.5 dB~ -1.5 dB)

| Frame Modulated Average[dBm] |         |      |
|------------------------------|---------|------|
| Bluetooth<br>1 Mbps          | Maximum | 5.85 |
|                              | Nominal | 5.35 |
| Bluetooth<br>2 Mbps          | Maximum | 2.85 |
|                              | Nominal | 2.35 |
| Bluetooth<br>3 Mbps          | Maximum | 2.85 |
|                              | Nominal | 2.35 |
| Bluetooth<br>(LE / 1Mbps)    | Maximum | 7.02 |
|                              | Nominal | 6.52 |
| Bluetooth<br>(LE / 2Mbps)    | Maximum | 5.31 |
|                              | Nominal | 4.81 |

Nominal Power Tolerance: (+0.5 dB~ -1.5 dB)