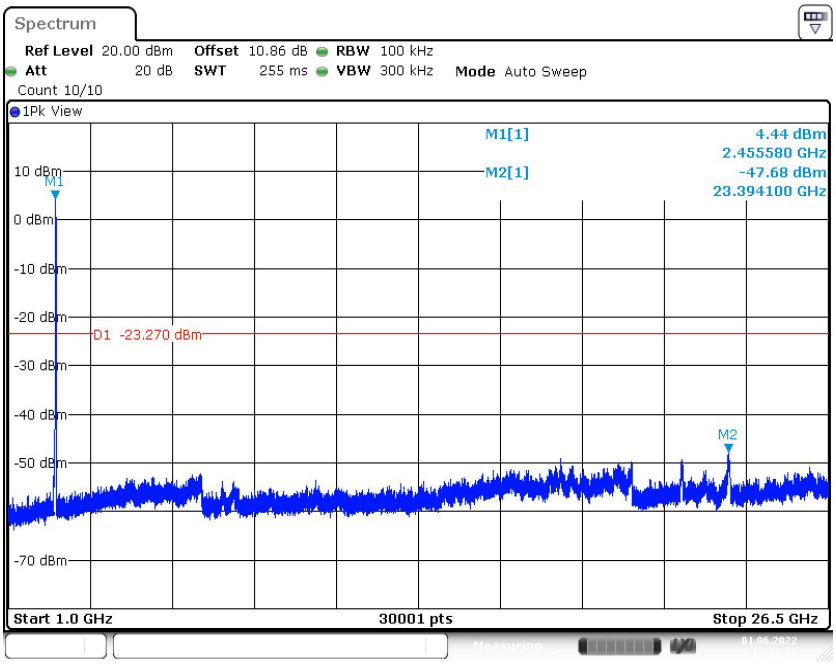


**Fig.51 Conducted Spurious Emission (1GHz-26.5GHz, 802.11n-HT20, CH11)**

## A.6 Radiated Emission

**Method of Measurement: See ANSI C63.10-clause 11.11&11.12**

**Measurement Limit:**

| Standard | Limit (dBm) |
|---|---|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dBm below peak output power |

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

**Limit in restricted band:**

| Frequency of emission (MHz) | Field strength(μV/m) | Measurement distance(meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

**Test Condition:**

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

| Frequency of emission (MHz) | RBW/VBW | Sweep Time(s) |
|---|---|---|
| 30-1000 | 120kHz/300kHz | 5 |
| 1000-4000 | 1MHz/3MHz | 15 |
| 4000-18000 | 1MHz/3MHz | 40 |
| 18000-26500 | 1MHz/3MHz | 20 |

**Note:**

According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band below 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic.

The measurement results include the horizontal polarization and vertical polarization measurements.

**Measurement Results:**

| Mode | Channel | Frequency Range | Test Results | Conclusion |
|---|---|---|---|---|
| 802.11b | CH 1 | 1 GHz ~18 GHz | Fig.52 | P |
| | CH 6 | 1 GHz ~18 GHz | Fig.53 | P |
| | CH 11 | 1 GHz ~18 GHz | Fig.54 | P |
| | Restricted Band (CH1) | 2.38 GHz ~ 2.45 GHz | Fig.55 | P |
| | Restricted Band (CH11) | 2.45 GHz ~ 2.5 GHz | Fig.56 | P |
| 802.11g | CH 1 | 1 GHz ~18 GHz | Fig.57 | P |
| | CH 6 | 1 GHz ~18 GHz | Fig.58 | P |
| | CH 11 | 1 GHz ~18 GHz | Fig.59 | P |
| | Restricted Band (CH1) | 2.38 GHz ~ 2.45 GHz | Fig.60 | P |
| | Restricted Band (CH11) | 2.45 GHz ~ 2.5 GHz | Fig.61 | P |
| 802.11n-HT20 | CH 1 | 1 GHz ~18 GHz | Fig.62 | P |
| | CH 6 | 1 GHz ~18 GHz | Fig.63 | P |
| | CH 11 | 1 GHz ~18 GHz | Fig.64 | P |
| | Restricted Band (CH1) | 2.38 GHz ~ 2.45 GHz | Fig.65 | P |
| | Restricted Band (CH11) | 2.45 GHz ~ 2.5 GHz | Fig.66 | P |
| / | All Channels | 9 kHz ~30 MHz | Fig.67 | P |
| | | 30 MHz ~1 GHz | Fig.68 | P |
| | | 18 GHz ~26.5 GHz | Fig.69 | P |

**Worst-Case Result:**

**802.11b CH6 (1-18GHz)**

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Pol | Corr. (dB/m) |
|---|---|---|---|---|---|
| 4874.100000 | 50.56 | 74.00 | 23.44 | V | 3.7 |
| 10455.000000 | 47.58 | 74.00 | 26.42 | V | 9.0 |
| 12215.571429 | 48.02 | 74.00 | 25.98 | V | 10.9 |
| 14876.142857 | 50.59 | 74.00 | 23.41 | H | 13.0 |
| 16607.142857 | 53.91 | 74.00 | 20.09 | H | 16.9 |
| 17131.714286 | 54.41 | 74.00 | 19.59 | H | 18.4 |

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Pol | Corr. (dB/m) |
|---|---|---|---|---|---|
| 4874.100000 | 42.78 | 54.00 | 11.22 | V | 3.7 |
| 10455.000000 | 35.35 | 54.00 | 18.65 | V | 9.0 |
| 12215.571429 | 35.93 | 54.00 | 18.07 | V | 10.9 |
| 14876.142857 | 38.57 | 54.00 | 15.43 | H | 13.0 |
| 16607.142857 | 41.66 | 54.00 | 12.34 | H | 16.9 |
| 17131.714286 | 42.41 | 54.00 | 11.59 | H | 18.4 |

**802.11g CH6 (1GHz-18GHz)**

| Frequency (MHz) | MaxPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB/m) |
|---|---|---|---|---|---|
| 4569.600000 | 47.27 | 74.00 | 26.73 | V | 4.5 |
| 8892.000000 | 45.46 | 74.00 | 28.54 | V | 6.5 |
| 11133.857143 | 47.95 | 74.00 | 26.05 | H | 9.7 |
| 13392.428572 | 48.69 | 74.00 | 25.31 | H | 11.4 |
| 14944.285714 | 50.76 | 74.00 | 23.24 | V | 12.9 |
| 16778.571429 | 54.67 | 74.00 | 19.33 | H | 17.7 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB/m) |
|---|---|---|---|---|---|
| 4569.600000 | 34.57 | 54.00 | 19.43 | V | 4.5 |
| 8892.000000 | 33.25 | 54.00 | 20.75 | V | 6.5 |
| 11133.857143 | 35.07 | 54.00 | 18.93 | H | 9.7 |
| 13392.428572 | 36.11 | 54.00 | 17.89 | H | 11.4 |
| 14944.285714 | 38.19 | 54.00 | 15.81 | V | 12.9 |
| 16778.571429 | 41.88 | 54.00 | 12.12 | H | 17.7 |

**802.11n-HT20 CH1 (1GHz-18GHz)**

| Frequency (MHz) | MaxPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB/m) |
|---|---|---|---|---|---|
| 4648.500000 | 47.13 | 74.00 | 26.87 | H | 4.6 |
| 8949.857143 | 46.60 | 74.00 | 27.40 | H | 6.5 |
| 10452.428572 | 47.75 | 74.00 | 26.25 | V | 9.0 |
| 12599.142857 | 48.17 | 74.00 | 25.83 | H | 11.3 |
| 14873.571429 | 50.52 | 74.00 | 23.48 | V | 13.0 |
| 16914.000000 | 54.62 | 74.00 | 19.38 | V | 18.1 |

| Frequency (MHz) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Pol | Corr. (dB/m) |
|---|---|---|---|---|---|
| 4648.500000 | 34.65 | 54.00 | 19.35 | H | 4.6 |
| 8949.857143 | 33.26 | 54.00 | 20.74 | H | 6.5 |
| 10452.428572 | 35.18 | 54.00 | 18.82 | V | 9.0 |
| 12599.142857 | 35.97 | 54.00 | 18.03 | H | 11.3 |
| 14873.571429 | 38.54 | 54.00 | 15.46 | V | 13.0 |
| 16914.000000 | 42.25 | 54.00 | 11.75 | V | 18.1 |

**Note:**

A "reference path loss" is established and the $A_{Rpl}$ is the attenuation of “reference path loss”, and Antenna Factor, the gain of the preamplifier, the cable loss. $P_{Mea}$ is the field strength recorded from the instrument. The measurement results are obtained as described below:

Result= $P_{Mea}$ +Cable Loss +Antenna Factor-Gain of the preamplifier.

**See below for test graphs.**

**Conclusion: PASS**

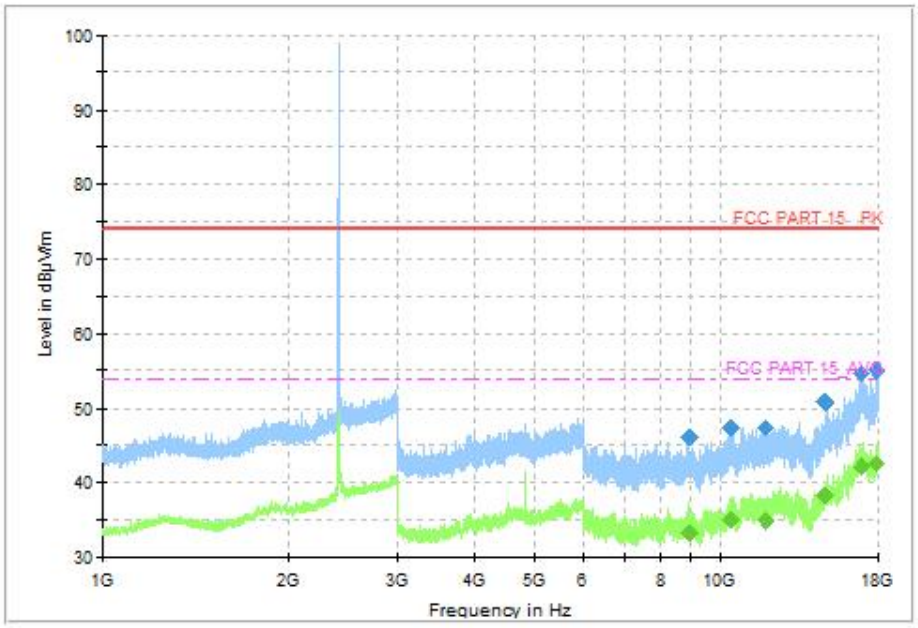


**Fig.52 Radiated Spurious Emission (802.11b, CH1, 1 GHz-18GHz)**

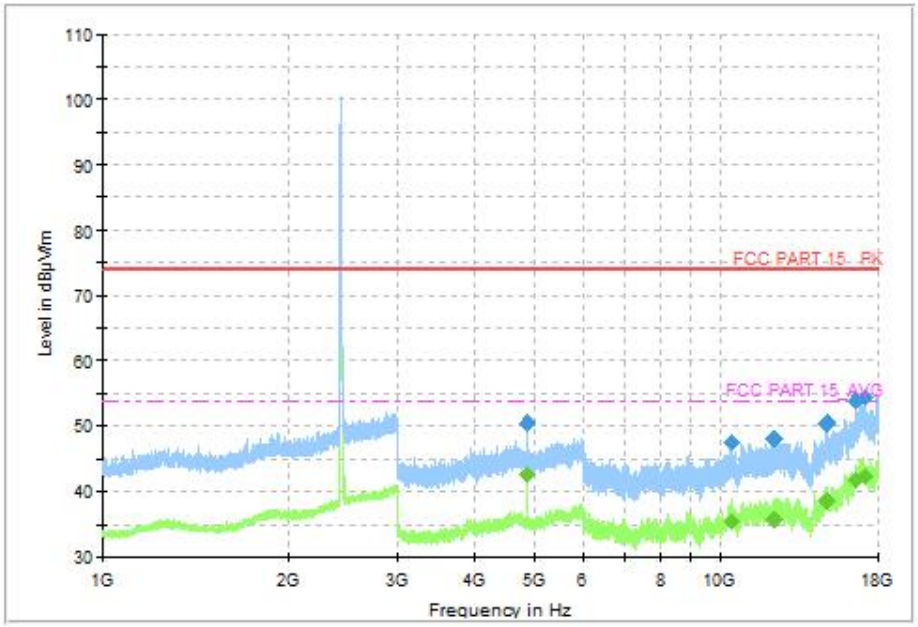


**Fig.53 Radiated Spurious Emission (802.11b, CH6, 1 GHz-18GHz)**

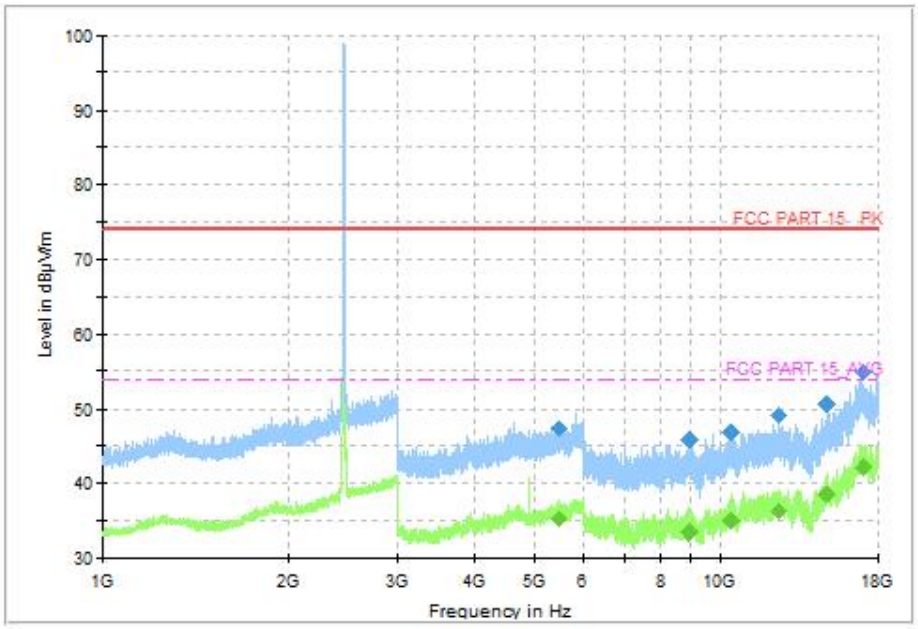


**Fig.54 Radiated Spurious Emission (802.11b, CH11, 1 GHz-18GHz)**

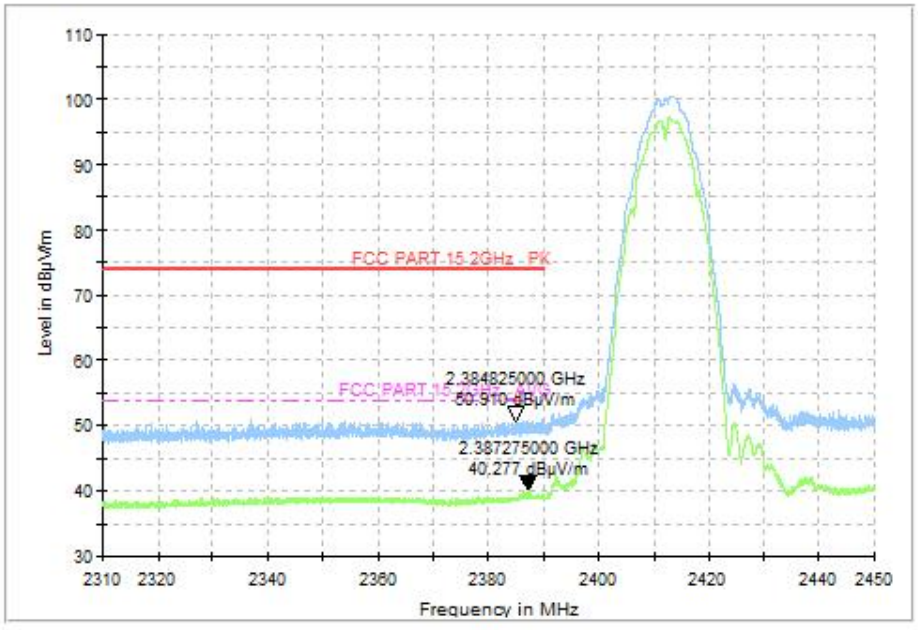


**Fig.55 Radiated Restricted Band (802.11b, CH1, 2.38GHz~2.45GHz)**

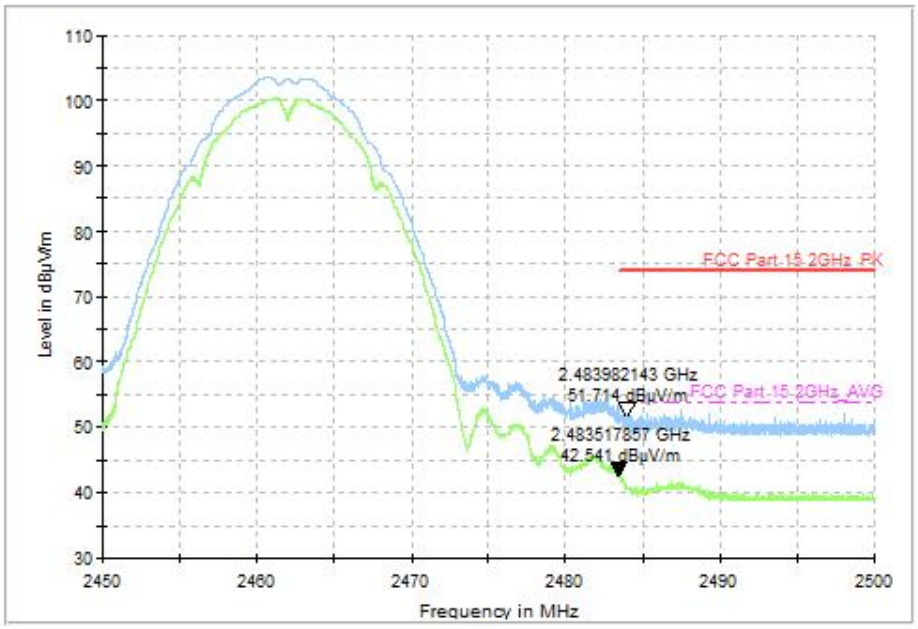


**Fig.56 Radiated Restricted Band (802.11b, CH11, 2.45GHz~2.5GHz)**

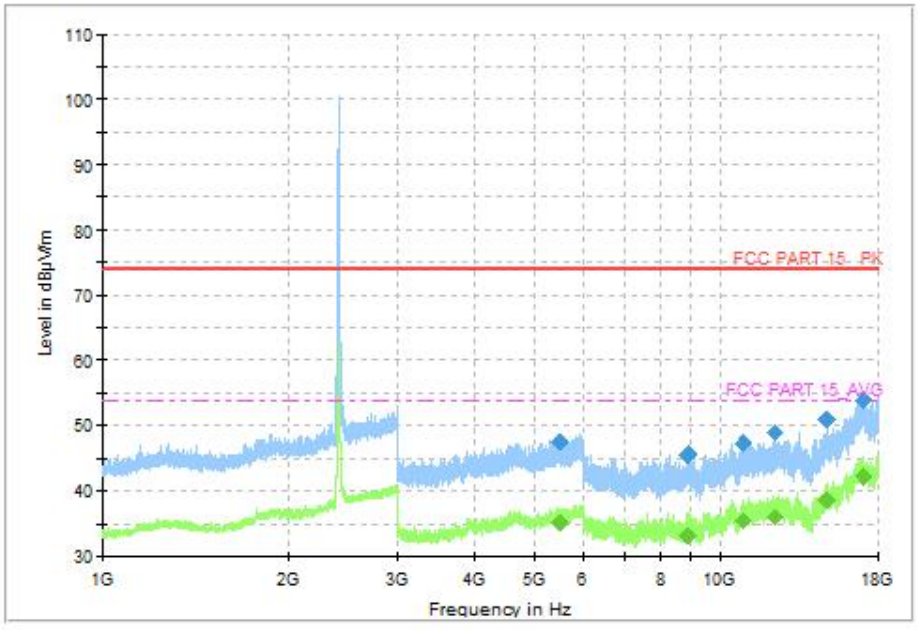


**Fig.57 Radiated Spurious Emission (802.11g, CH1, 1 GHz-18 GHz)**

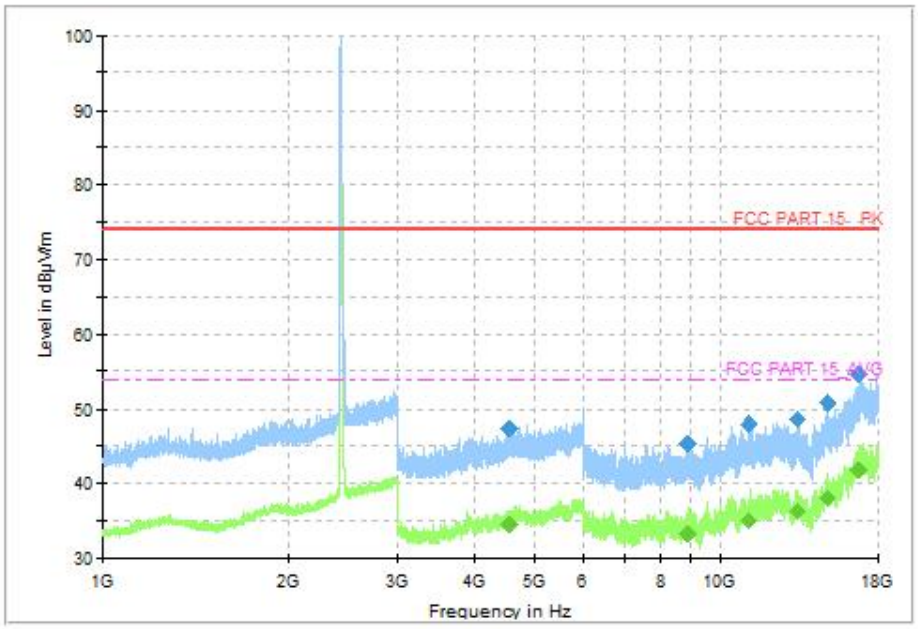


**Fig.58 Radiated Spurious Emission (802.11g, CH6, 1 GHz-18 GHz)**

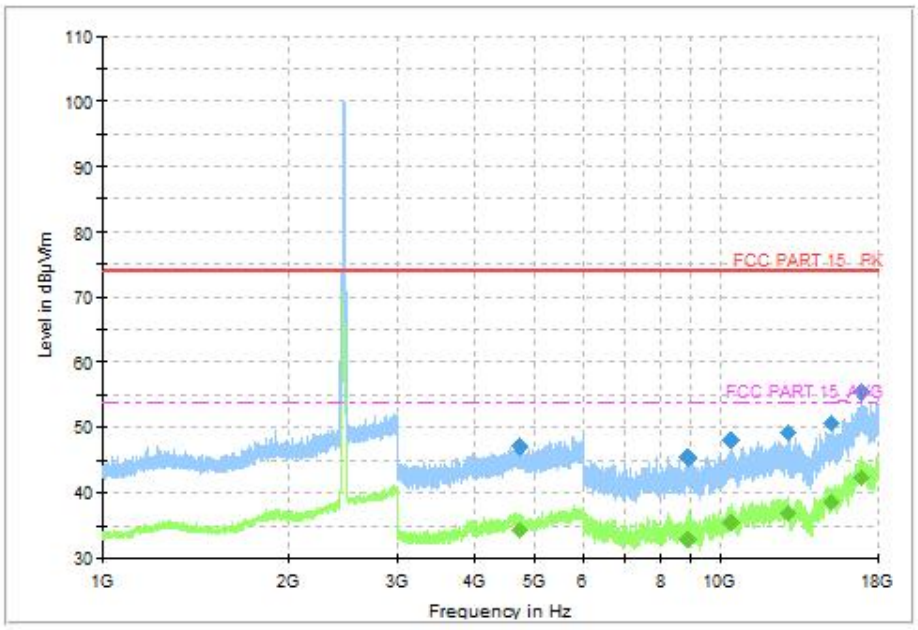


**Fig.59 Radiated Spurious Emission (802.11g, CH11, 1 GHz-18 GHz)**

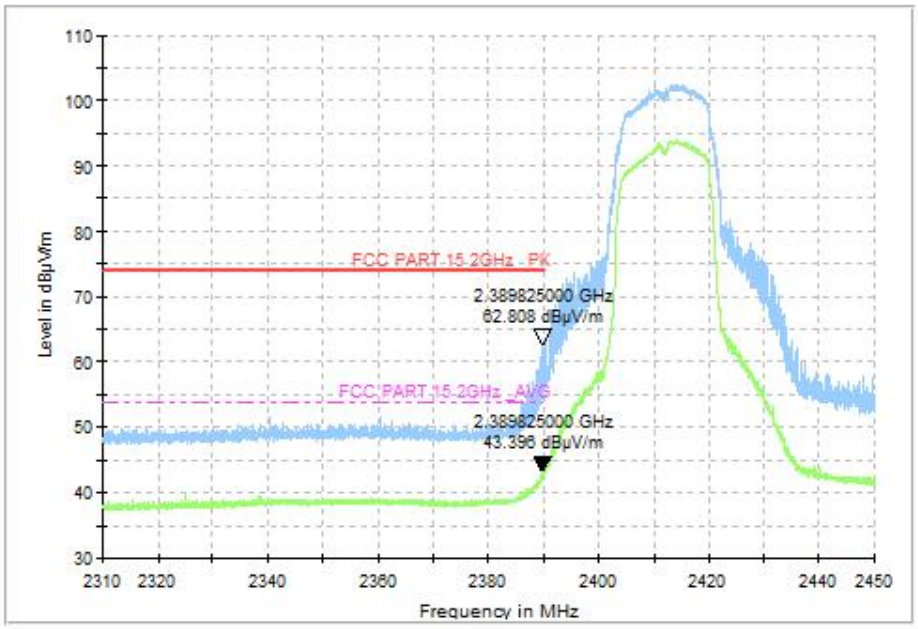


**Fig.60 Radiated Restricted Band (802.11g, CH1, 2.38GHz~2.45GHz)**

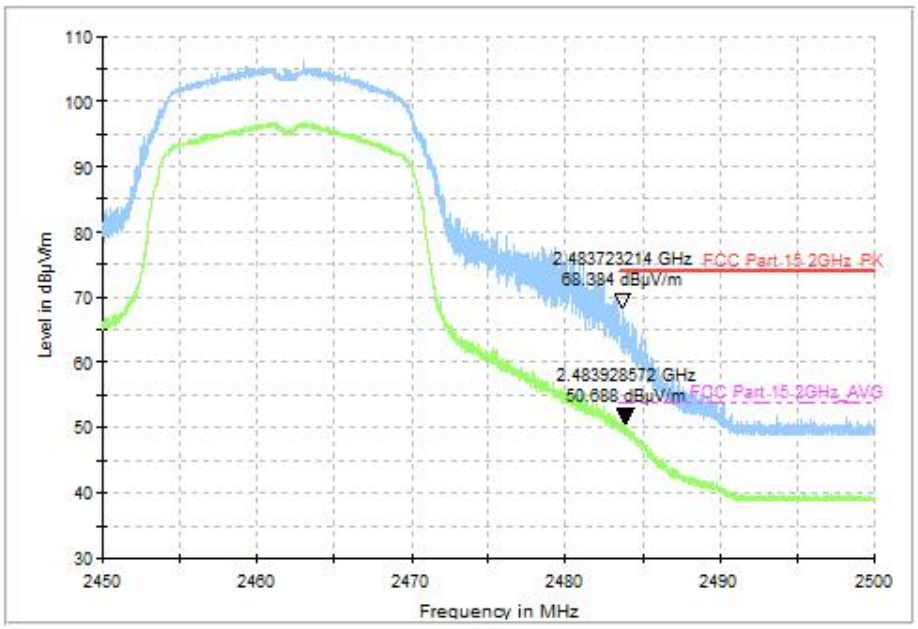


**Fig.61 Radiated Restricted Band (802.11g, CH11, 2.45GHz~2.5GHz)**

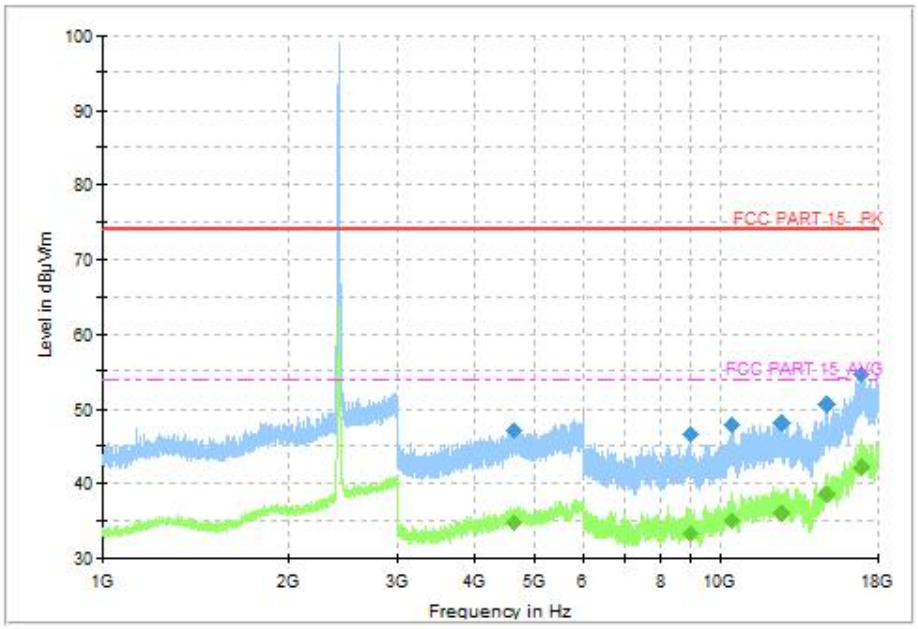


**Fig.62 Radiated Spurious Emission (802.11n-HT20, CH1, 1 GHz-18 GHz)**

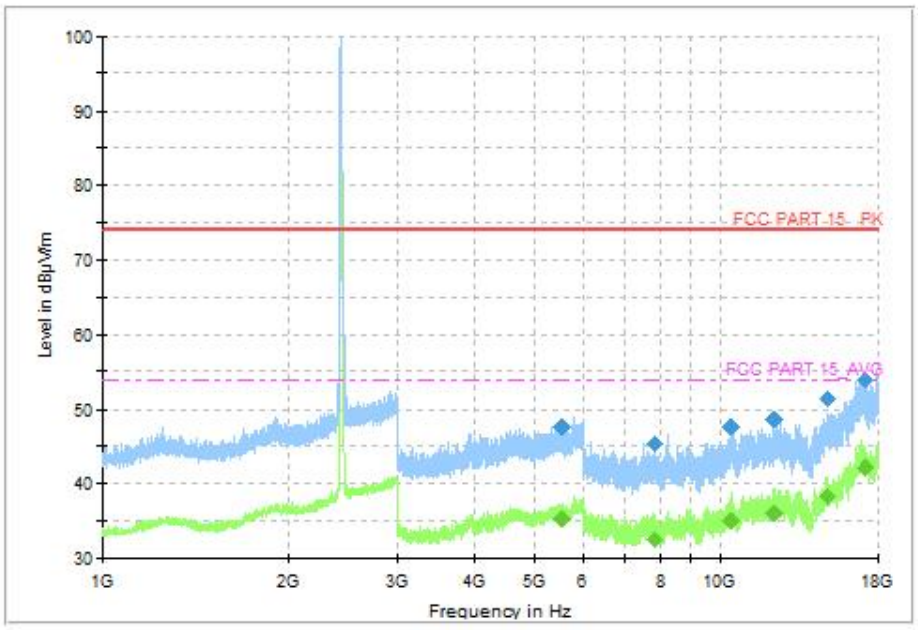


**Fig.63 Radiated Spurious Emission (802.11n-HT20, CH6, 1 GHz-18 GHz)**

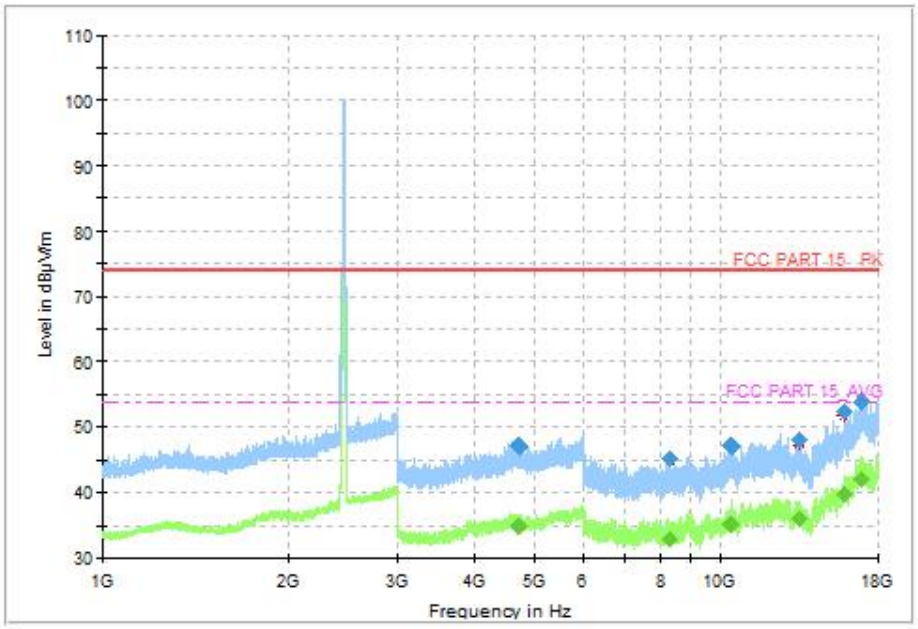


**Fig.64 Radiated Spurious Emission (802.11n-HT20, CH11, 1 GHz-18 GHz)**

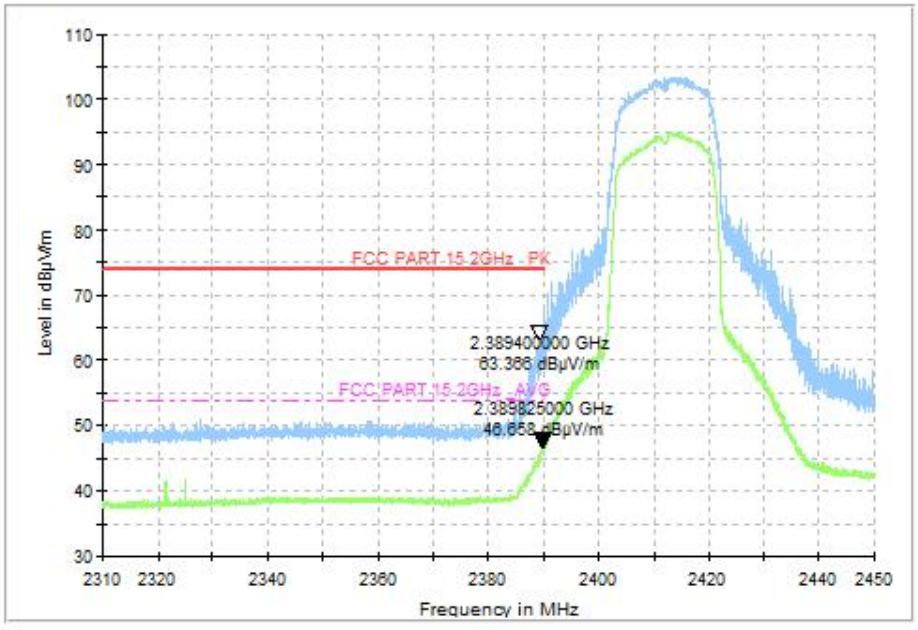


**Fig.65 Radiated Restricted Band (802.11n-HT20, CH1, 2.38GHz~2.45GHz)**

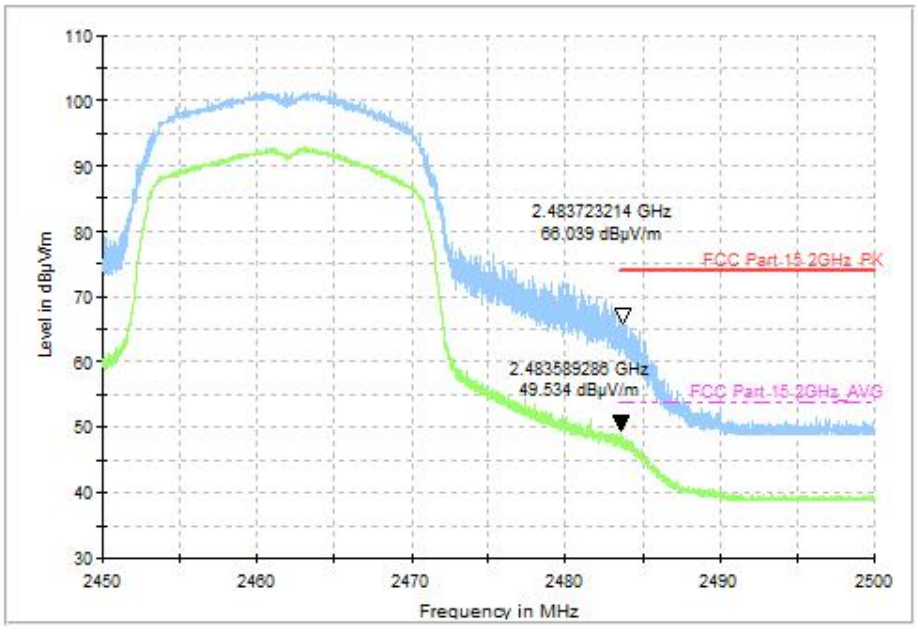


**Fig.66 Radiated Spurious Emission (802.11-HT20, CH11, 2.45GHz~2.5GHz)**

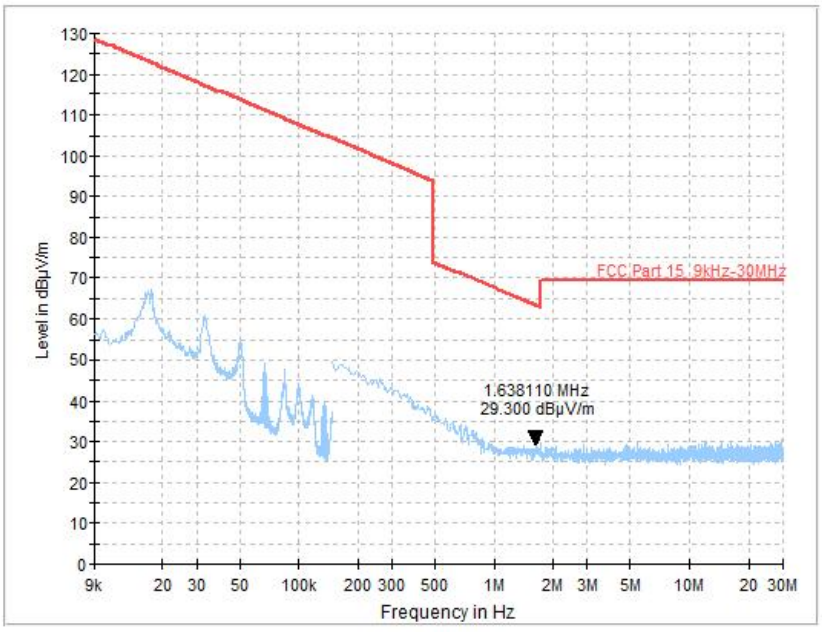


**Fig.67 Radiated Spurious Emission (All channel, 9kHz~30MHz)**

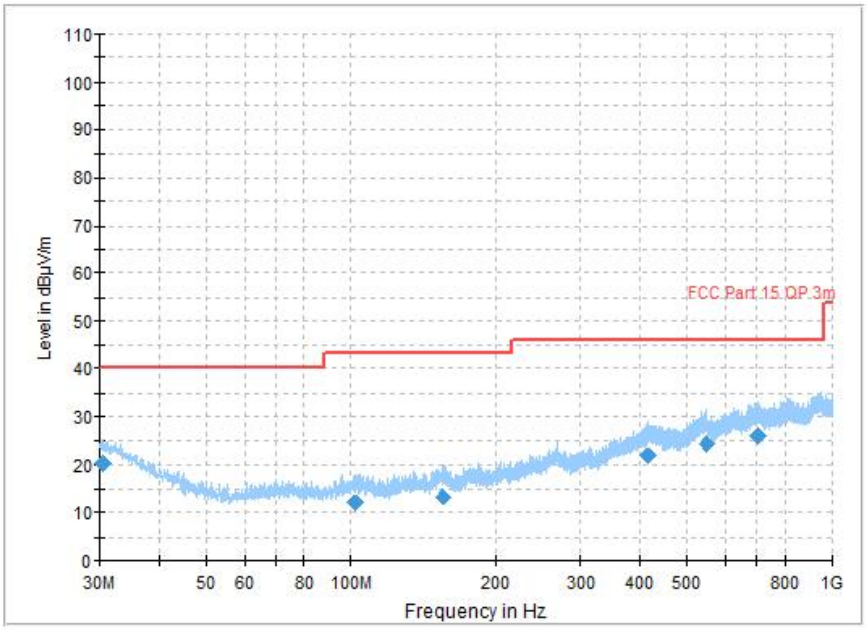


**Fig.68 Radiated Spurious Emission (All channel, 30MHz~1GHz)**

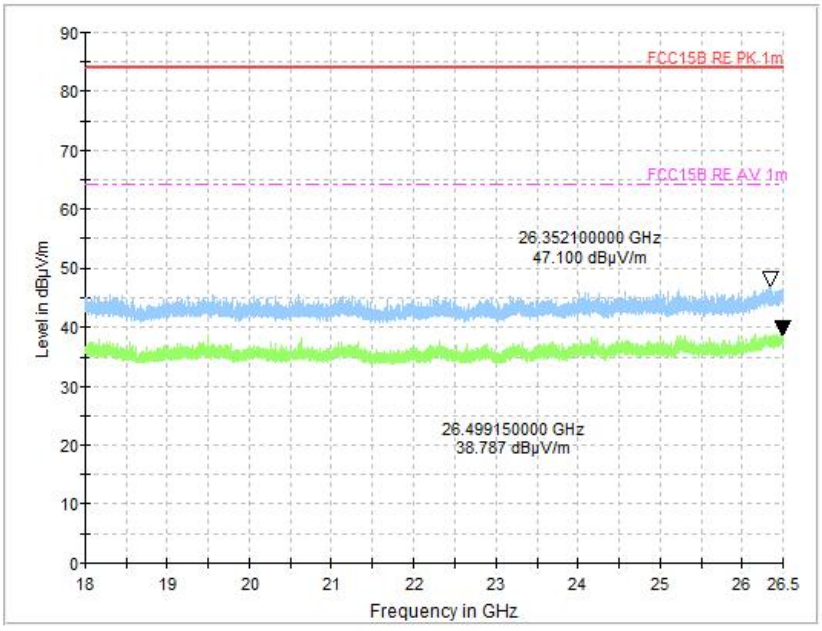


**Fig.69 Radiated Spurious Emission (All channel, 18GHz~26.5GHz)**

## A.7 AC Power line Conducted Emission

**Method of Measurement: See ANSI C63.10-clause 6.2**

**Test Condition:**

| Voltage（V） | Frequency（Hz） |
|---|---|
| 120 | 60 |

**Measurement Result and limit:**

**WLAN 2.4GHz - AE2, AE3**

| Frequency range (MHz) | Quasi-peak Limit (dBμV) | Average-peak Limit (dBμV) | Result (dBμV) | | Conclusion |
|---|---|---|---|---|---|
| | | | Traffic | Idle | |
| 0.15 to 0.5 | 66 to 56 | 56 to 46 | Fig.70 | Fig.71 | P |
| 0.5 to 5 | 56 | 46 | | | |
| 5 to 30 | 60 | 50 | | | |
| NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz. | | | | | |

**Note:** The measurement results include the L1 and N measurements.

**See below for test graphs.**

**Conclusion: PASS**

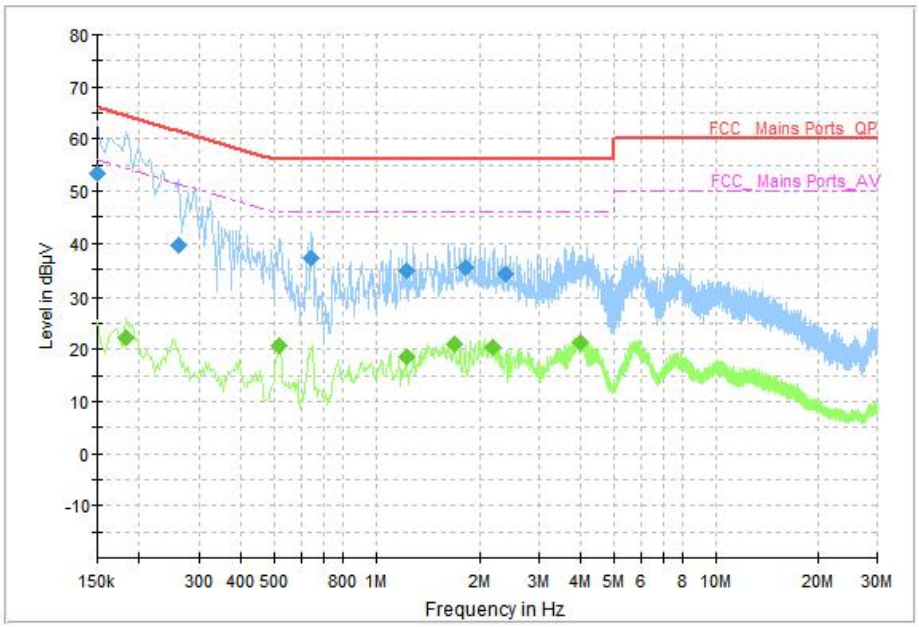


**Fig.70 AC Power line Conducted Emission (Traffic)**

**Measurement Results: Quasi Peak**

| Frequency (MHz) | Quasi Peak (dBµV) | Limit (dBµV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.150000 | 53.53 | 66.00 | 12.47 | L1 | ON | 10 |
| 0.262000 | 39.58 | 61.37 | 21.79 | L1 | ON | 10 |
| 0.646000 | 37.12 | 56.00 | 18.88 | N | ON | 10 |
| 1.230000 | 34.82 | 56.00 | 21.18 | L1 | ON | 10 |
| 1.814000 | 35.36 | 56.00 | 20.64 | N | ON | 10 |
| 2.398000 | 34.28 | 56.00 | 21.72 | N | ON | 10 |

**Measurement Results: Average**

| Frequency (MHz) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.182000 | 22.13 | 54.39 | 32.27 | N | ON | 10 |
| 0.518000 | 20.69 | 46.00 | 25.31 | N | ON | 10 |
| 1.230000 | 18.55 | 46.00 | 27.45 | N | ON | 10 |
| 1.690000 | 21.11 | 46.00 | 24.89 | N | ON | 10 |
| 2.202000 | 20.34 | 46.00 | 25.66 | L1 | ON | 10 |
| 3.962000 | 21.38 | 46.00 | 24.62 | N | ON | 10 |

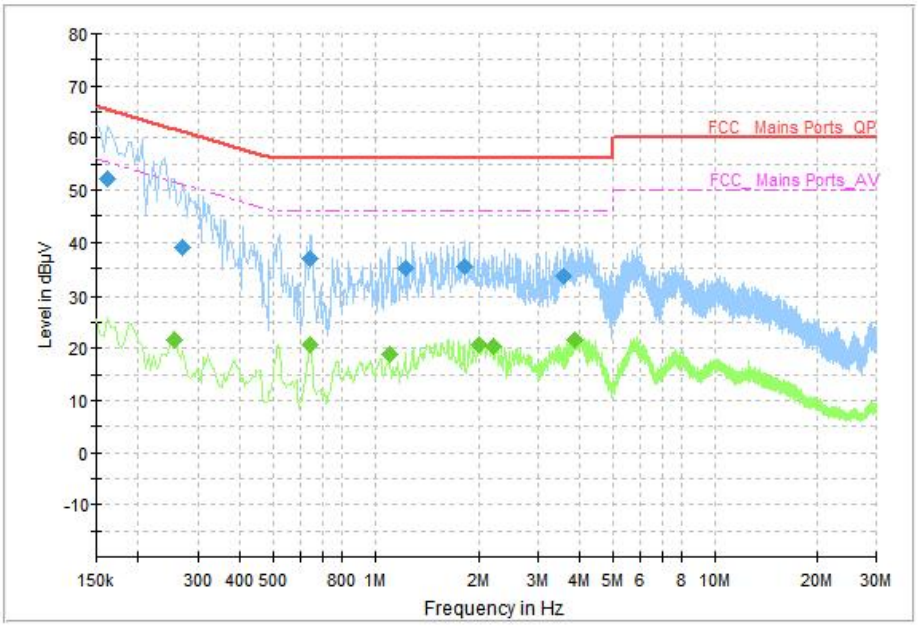


**Fig.71 AC Power line Conducted Emission (Idle)**

**Measurement Results: Quasi Peak**

| Frequency (MHz) | Quasi Peak (dBµV) | Limit (dBµV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.162000 | 52.12 | 65.36 | 13.24 | L1 | ON | 10 |
| 0.270000 | 38.94 | 61.12 | 22.17 | L1 | ON | 10 |
| 0.646000 | 36.84 | 56.00 | 19.16 | L1 | ON | 10 |
| 1.230000 | 34.96 | 56.00 | 21.04 | L1 | ON | 10 |
| 1.814000 | 35.23 | 56.00 | 20.77 | N | ON | 10 |
| 3.562000 | 33.52 | 56.00 | 22.48 | L1 | ON | 10 |

**Measurement Results: Average**

| Frequency (MHz) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.254000 | 21.50 | 51.63 | 30.13 | N | ON | 10 |
| 0.646000 | 20.65 | 46.00 | 25.35 | L1 | ON | 10 |
| 1.102000 | 18.81 | 46.00 | 27.19 | N | ON | 10 |
| 2.002000 | 20.82 | 46.00 | 25.18 | L1 | ON | 10 |
| 2.214000 | 20.23 | 46.00 | 25.77 | L1 | ON | 10 |
| 3.834000 | 21.52 | 46.00 | 24.48 | N | ON | 10 |

*****END OF REPORT*****