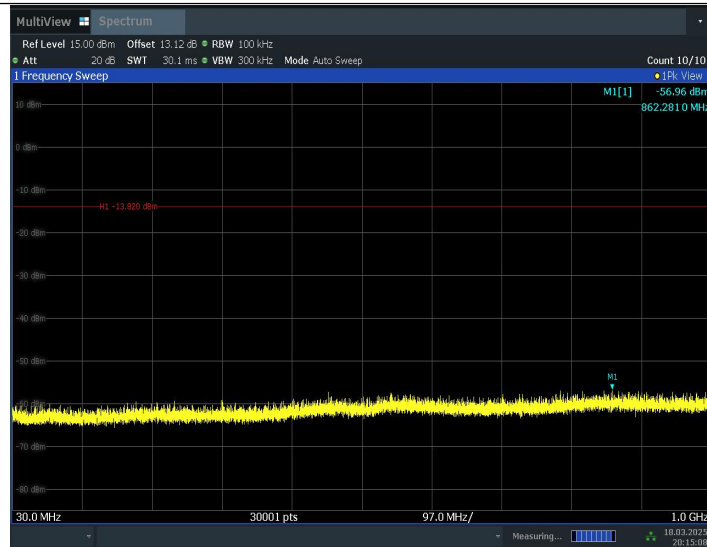
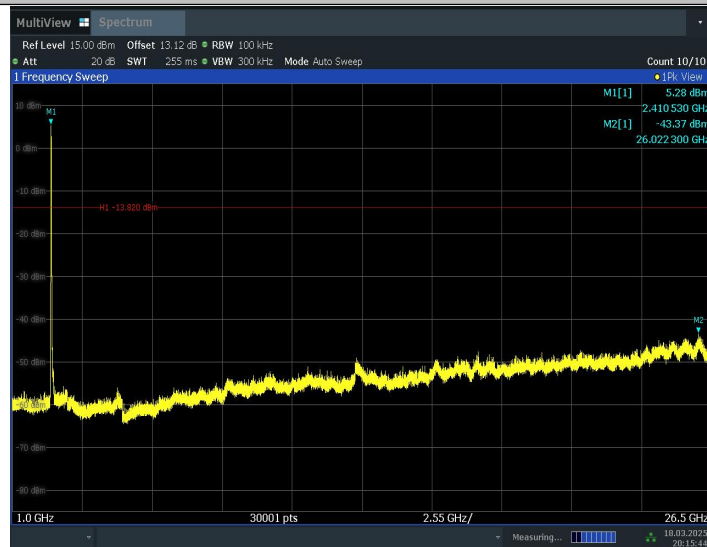




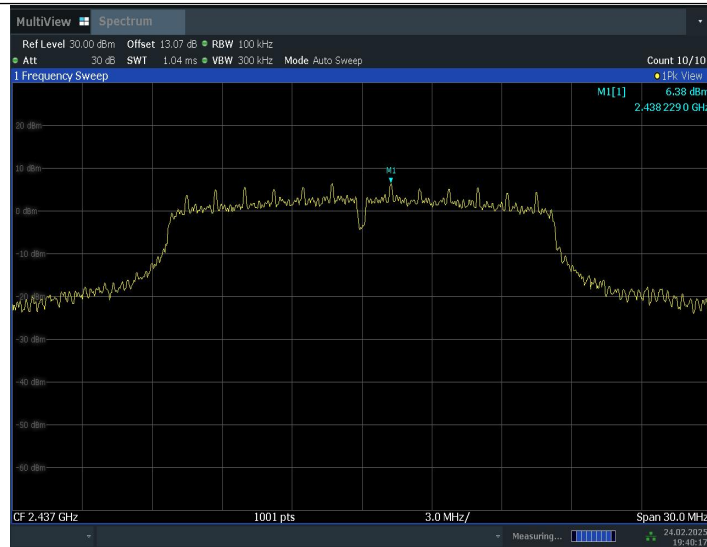
20:15:09 18.03.2025

11G\_2412\_1000~26500



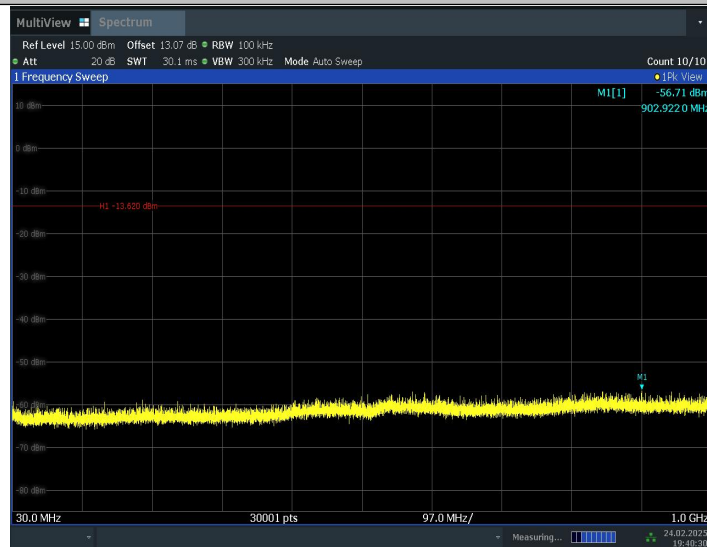
20:15:45 18.03.2025

11G\_2437\_0~Reference



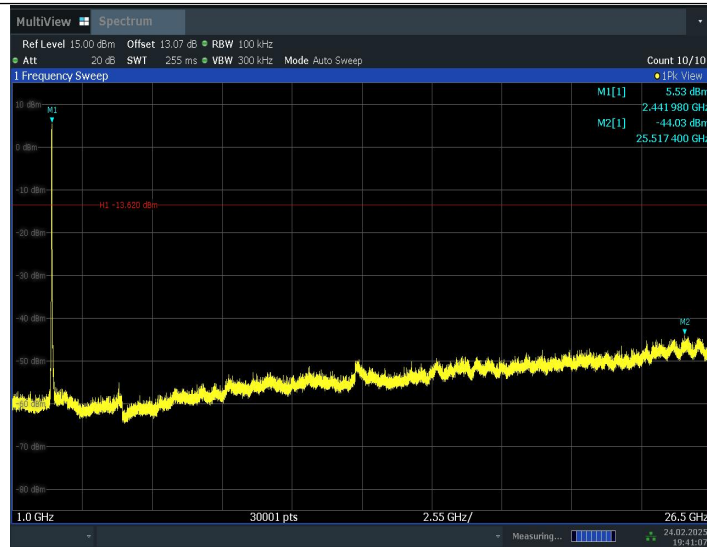
19:40:18 24.02.2025

11G\_2437\_30~1000



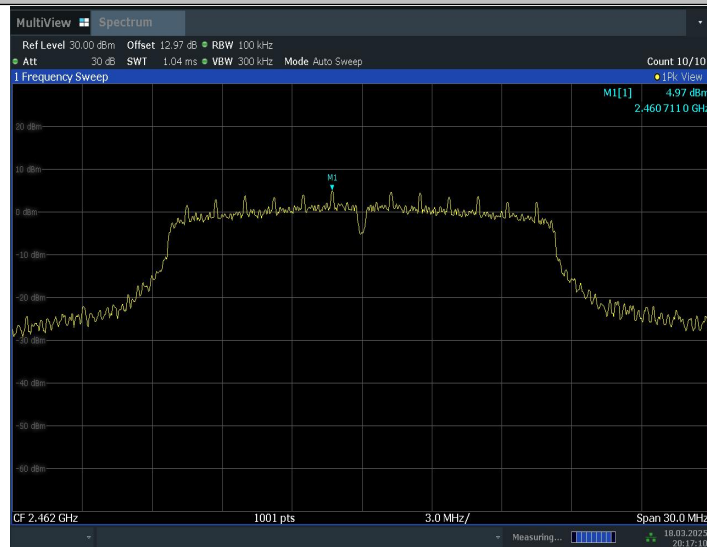
19:40:31 24.02.2025

11G\_2437\_1000~26500



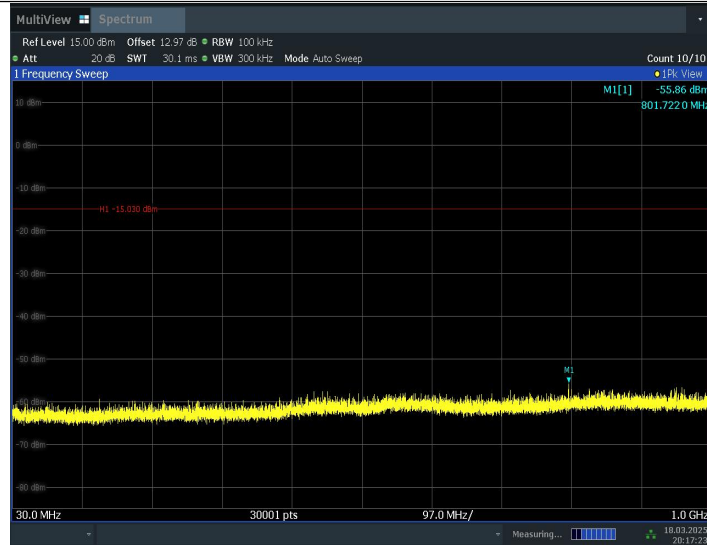
19:41:07 24.02.2025

11G\_2462\_0~Reference



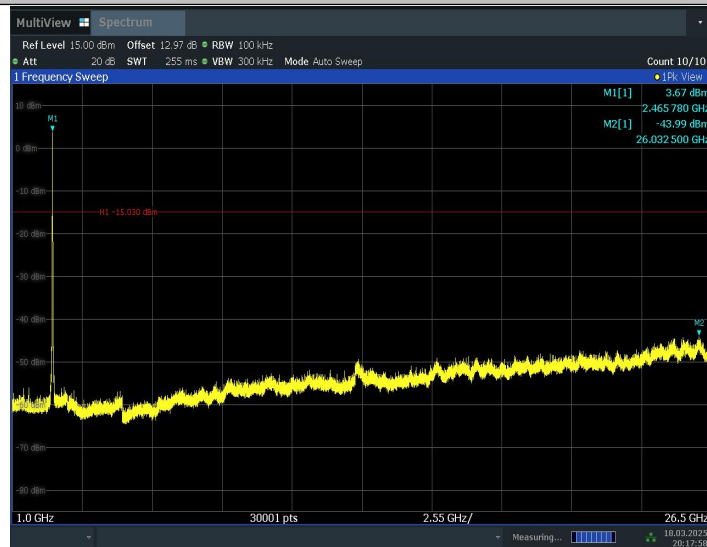
20:17:10 18.03.2025

11G\_2462\_30~1000



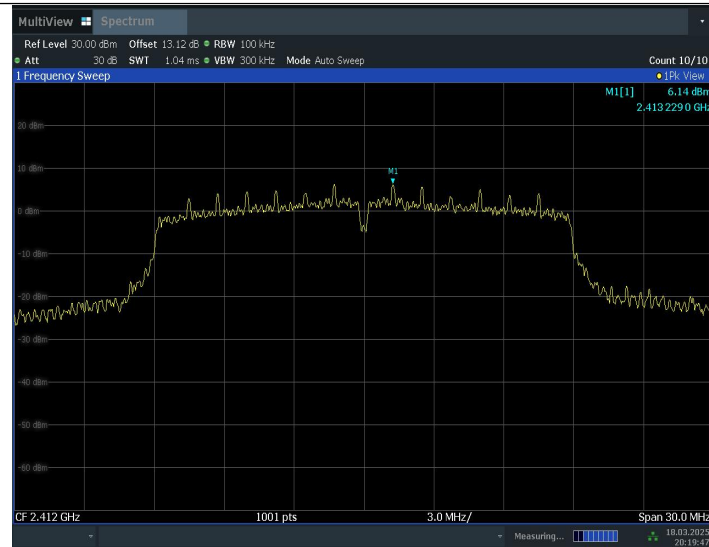
20:17:23 18.03.2025

11G\_2462\_1000~26500



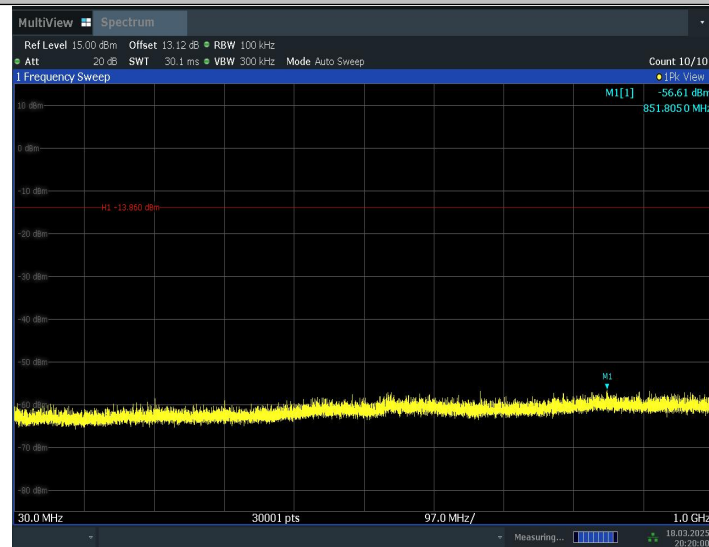
20:17:59 18.03.2025

11N20SISO\_2412\_0~Reference



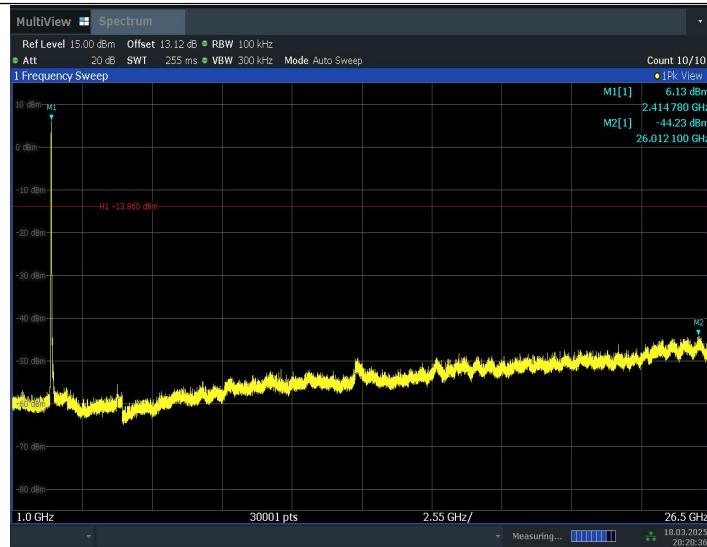
20:19:47 18.03.2025

11N20SISO\_2412\_30~1000



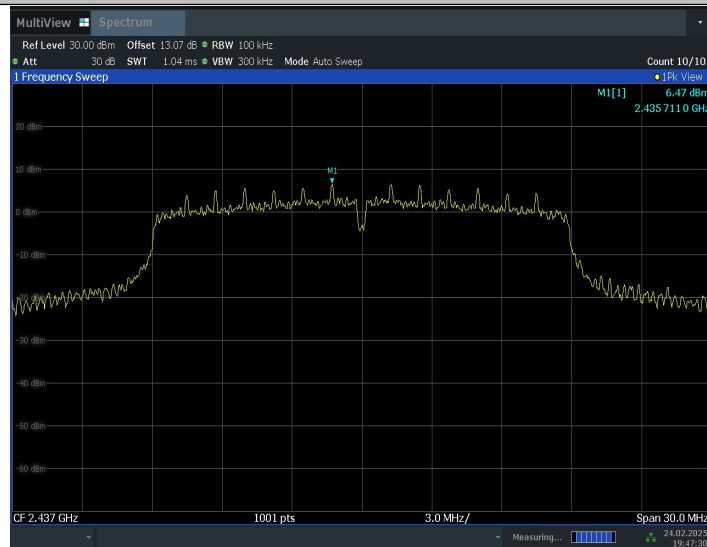
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11N20SISO\_2412\_1000~26500



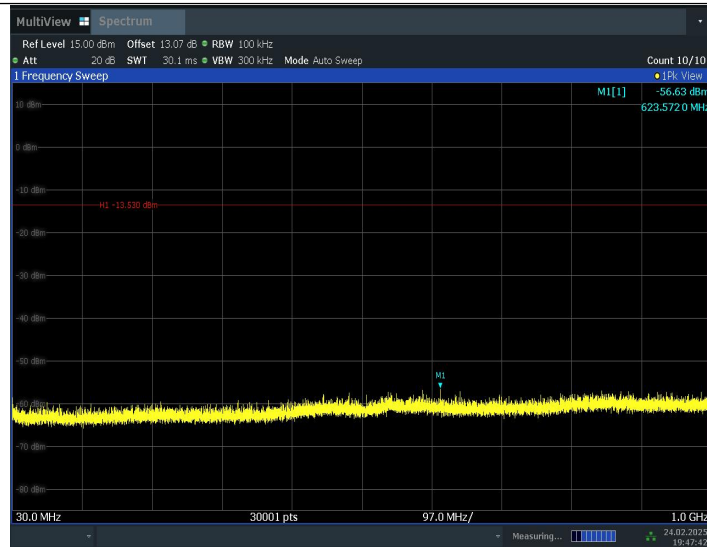
20:20:37 18.03.2025

11N20SISO\_2437\_0~Reference

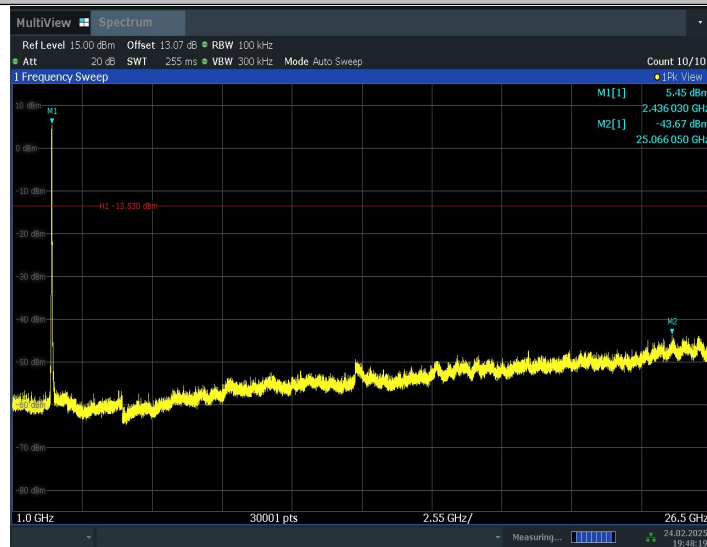


19:47:30 24.02.2025

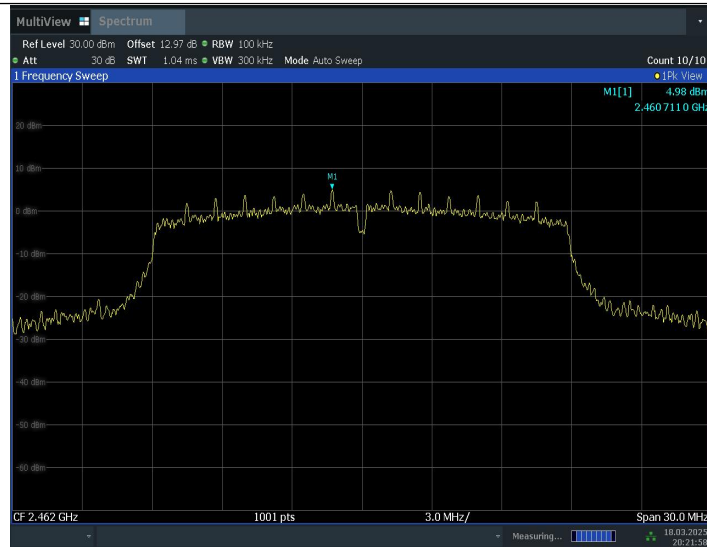
11N20SISO\_2437\_30~1000



11N20SISO\_2437\_1000~26500

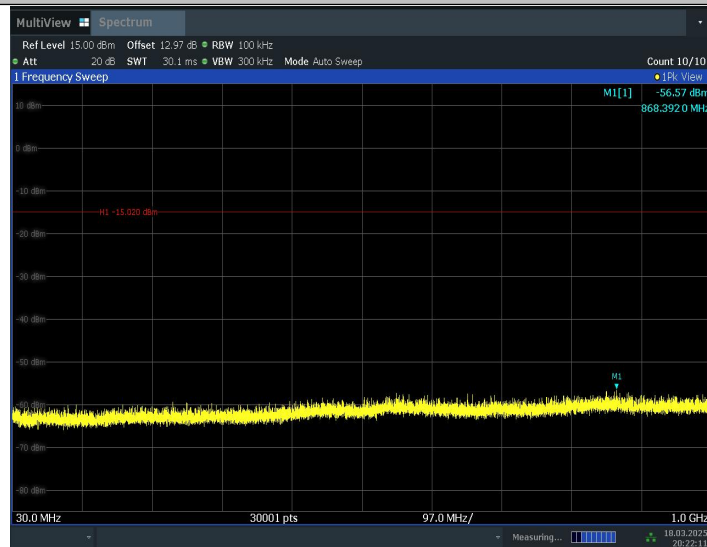


11N20SISO\_2462\_0~Reference



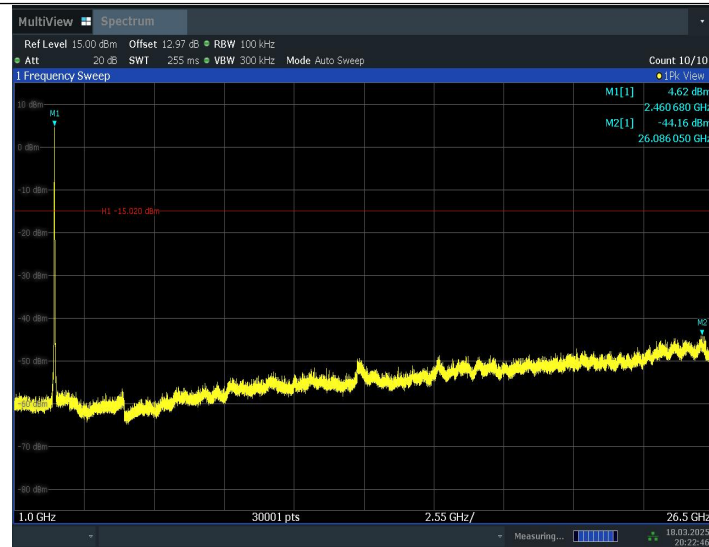
20:21:58 18.03.2025

11N20SISO\_2462\_30~1000



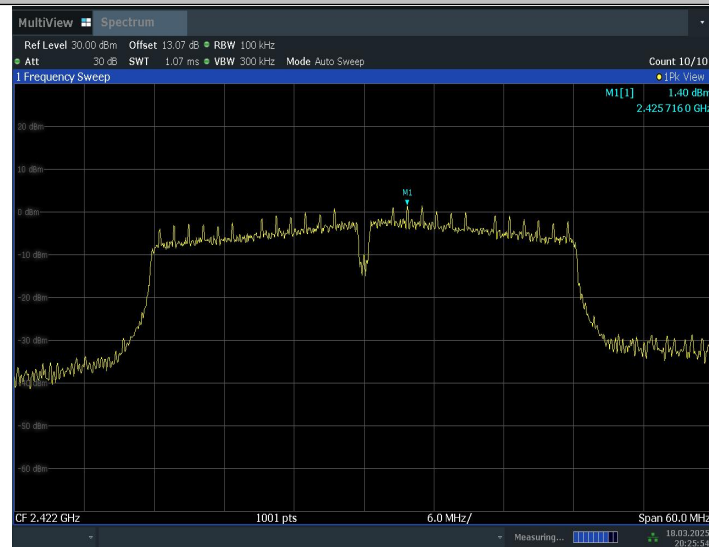
20:22:11 18.03.2025

11N20SISO\_2462\_1000~26500



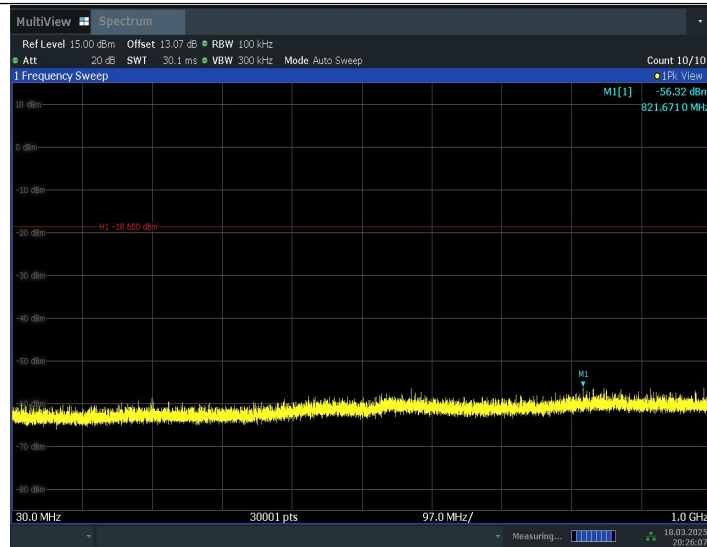
20:22:47 18.03.2025

11N40SISO\_2422\_0~Reference



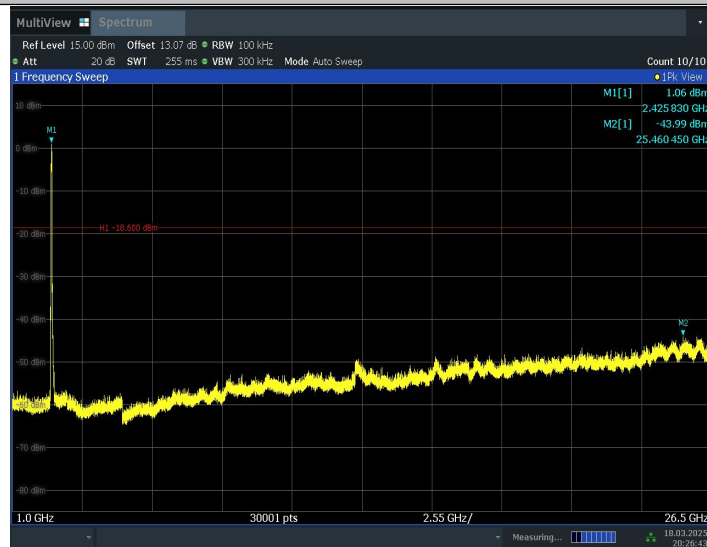
20:25:54 18.03.2025

11N40SISO\_2422\_30~1000



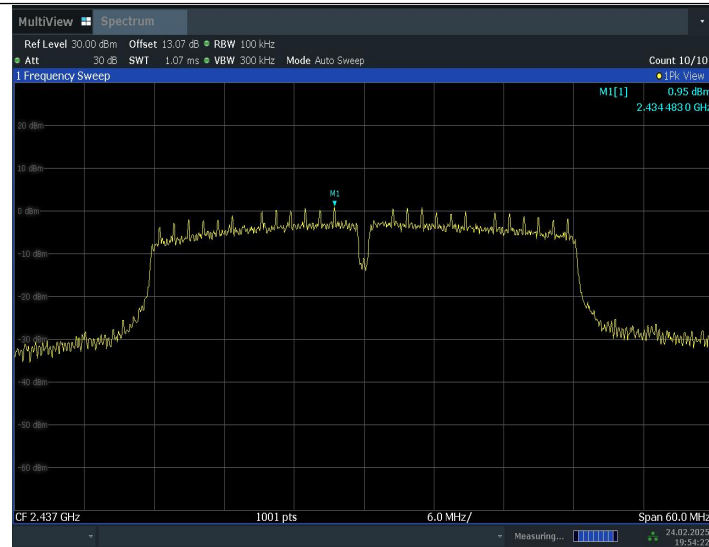
20:26:07 18.03.2025

11N40SISO\_2422\_1000~26500



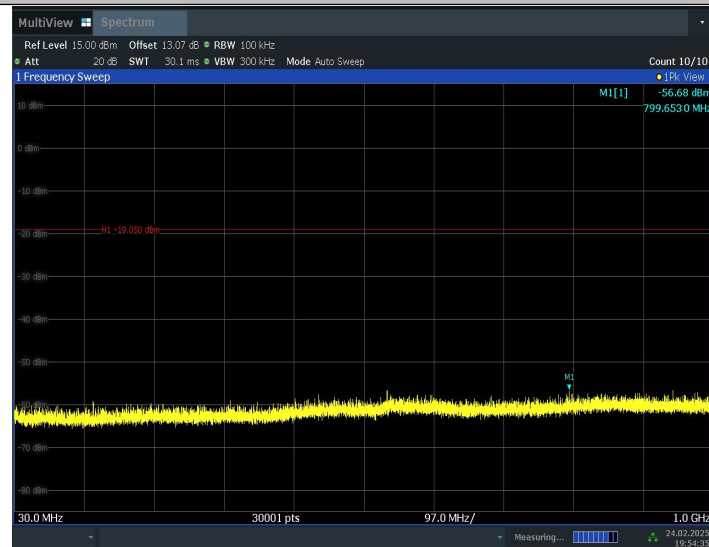
20:26:43 18.03.2025

11N40SISO\_2437\_0~Reference



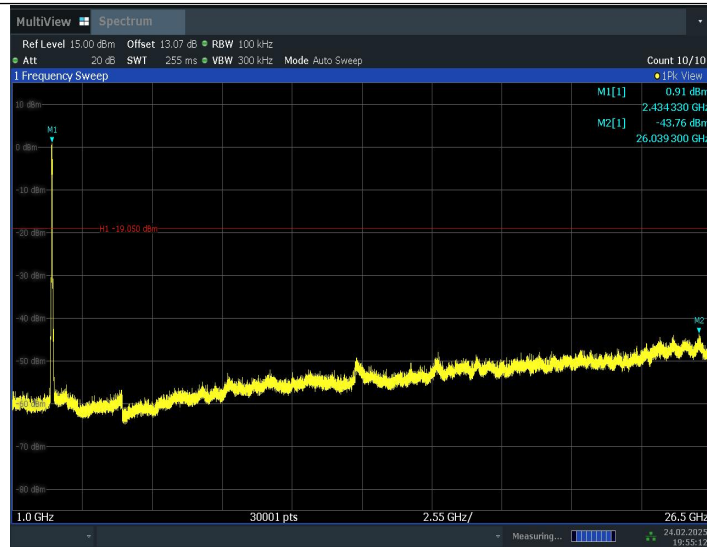
19:54:23 24.02.2025

11N40SISO\_2437\_30~1000



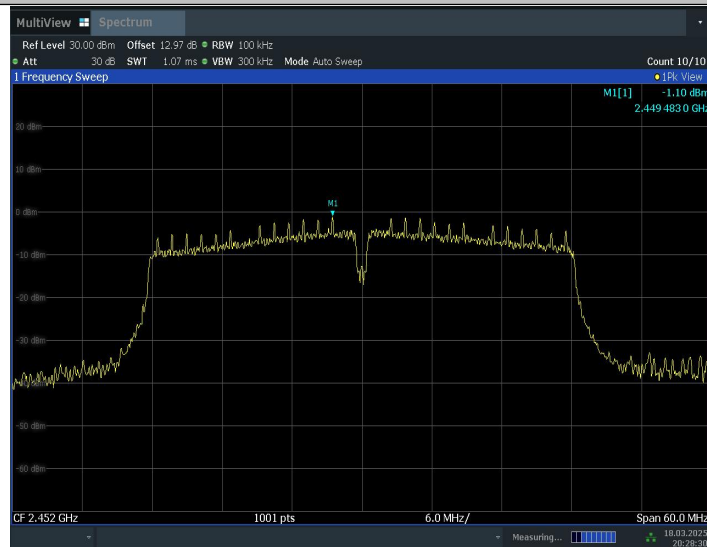
19:54:36 24.02.2025

11N40SISO\_2437\_1000~26500



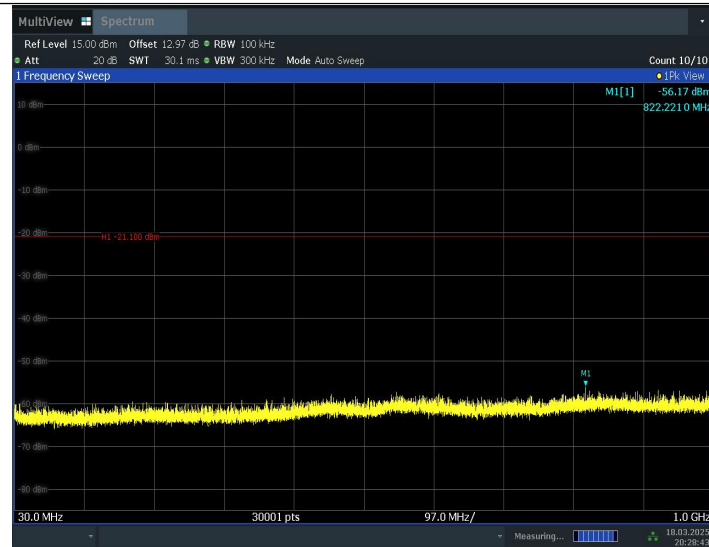
19:55:12 24.02.2025

11N40SISO\_2452\_0~Reference



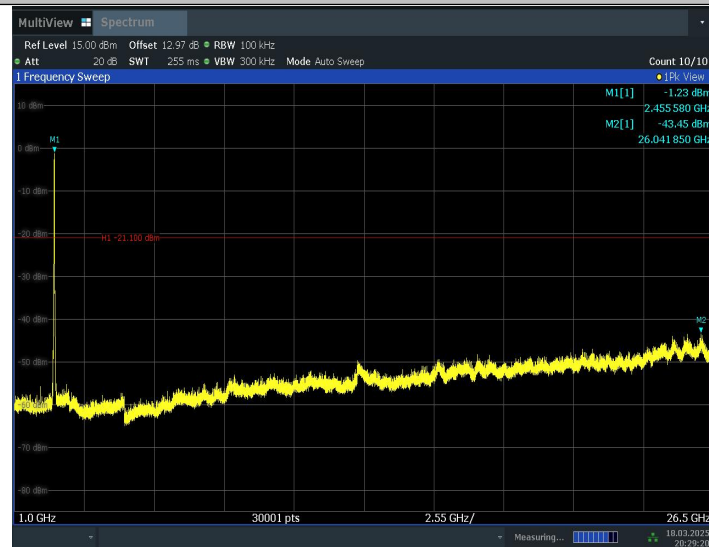
20:28:31 18.03.2025

11N40SISO\_2452\_30~1000



20:28:44 18.03.2025

11N40SISO\_2452\_1000~26500



20:29:20 18.03.2025

**Conclusion: Pass**

## A.7. Radiated Unwanted Emission

### Limits

#### Measurement Limit

| Standard                               | Limit                        |
|----------------------------------------|------------------------------|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dB 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 (MHz) | Field strength( $\mu\text{V/m}$ ) | Measurement distance (m) |
|-----------------|-----------------------------------|--------------------------|
| 0.009 - 0.490   | $2400/F(\text{kHz})$              | 300                      |
| 0.490 - 1.705   | $24000/F(\text{kHz})$             | 30                       |
| 1.705 – 30.0    | 30                                | 30                       |

| Frequency of emission (MHz) | Field strength ( $\mu\text{V/m}$ ) | Field strength (dB $\mu\text{V/m}$ ) | Measurement distance (m) |
|-----------------------------|------------------------------------|--------------------------------------|--------------------------|
| 30-88                       | 100                                | 40                                   | 3                        |
| 88-216                      | 150                                | 43.5                                 | 3                        |
| 216-960                     | 200                                | 46                                   | 3                        |
| Above 960                   | 500                                | 54                                   | 3                        |

Note: When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor.

### Test setup

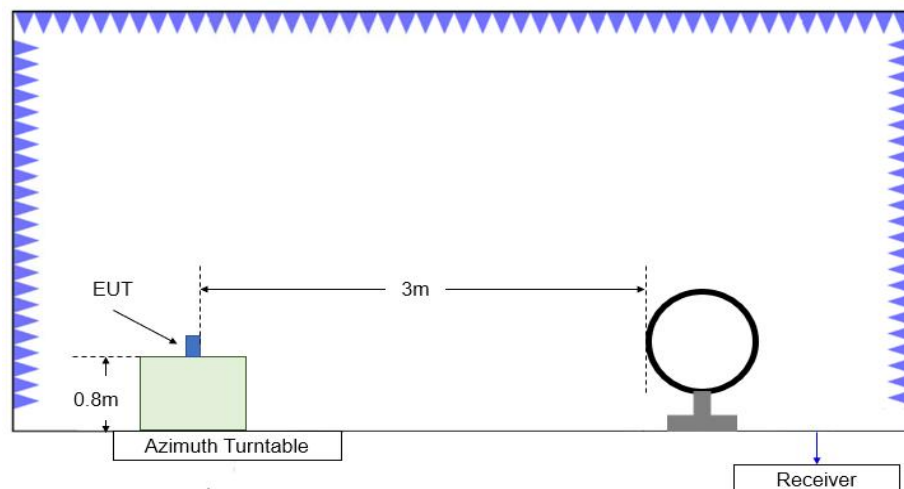
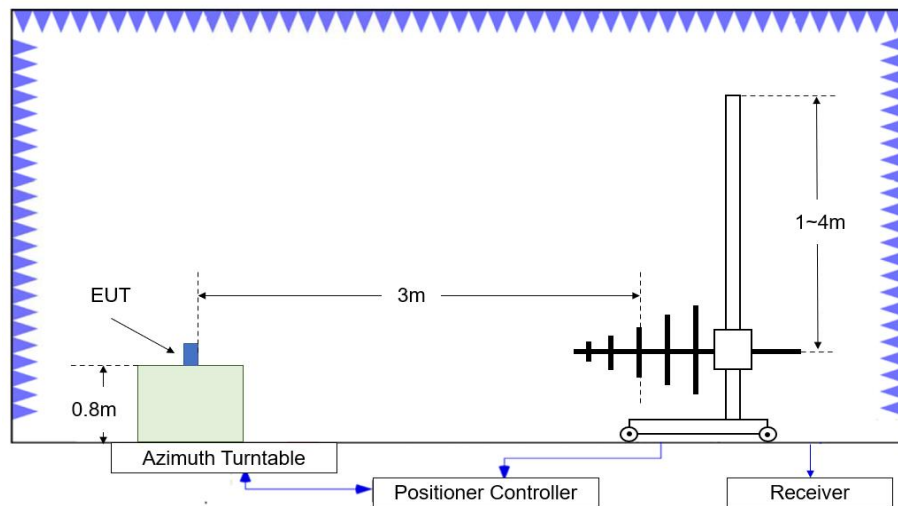
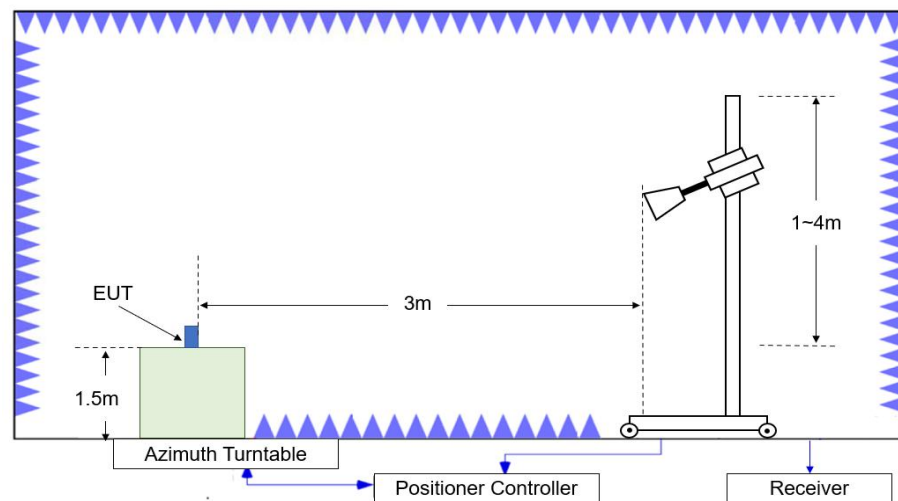


Figure A.2.1. Test Site Diagram (9kHz-30MHz)



**Figure A.2.2. Test Site Diagram (30MHz-1GHz)**



**Figure A.2.3. Test Site Diagram (1GHz-40GHz)**

### Test Procedures

Radiated unwanted emissions from the EUT were measured according to ANSI C63.10.

#### Test setting

| Frequency of emission (MHz) | RBW/VBW       | Sweep Time(s) |
|-----------------------------|---------------|---------------|
| 30-1000                     | 100kHz/300kHz | 5             |
| 1000-3000                   | 1MHz/3MHz     | 15            |
| 3000-18000                  | 1MHz/3MHz     | 40            |
| 18000-26500                 | 1MHz/3MHz     | 20            |

### Sample Calculation

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and including the gain of receive antenna, 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:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + \text{Cable Loss} + \text{Antenna Factor}$$

### Test note

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all modes and modulations/data rates. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.
3. Spurious emissions for all channels were investigated and almost the same below 1GHz. According to FCC 47 CFR §15.31, emission levels are not report much lower than the limit by over 20dB
4. Measurement frequencies were performed from 9 kHz to the 10<sup>th</sup> harmonic of highest fundamental frequency or 40GHz, whichever is lower.

### Test Result

#### **Peak**

#### **802.11b**

##### Ch1

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2387.900        | 54.16                       | -24.78          | 31.95                 | 46.99                   | 74.00          | 19.84       | H                  |
| 2388.200        | 54.51                       | -24.78          | 31.95                 | 47.33                   | 74.00          | 19.49       | H                  |
| 4824.000        | 48.39                       | -31.64          | 34.30                 | 45.73                   | 74.00          | 25.61       | V                  |
| 7236.000        | 42.03                       | -29.88          | 35.60                 | 36.30                   | 74.00          | 31.98       | H                  |
| 9648.000        | 45.36                       | -27.61          | 36.80                 | 36.17                   | 74.00          | 28.64       | V                  |
| 12060.000       | 45.93                       | -26.48          | 38.72                 | 33.69                   | 74.00          | 28.07       | V                  |

##### Ch6

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2410.800        | 55.89                       | -24.93          | 32.04                 | 48.78                   | 74.00          | 18.11       | H                  |
| 2462.000        | 55.55                       | -24.59          | 32.20                 | 47.94                   | 74.00          | 18.45       | V                  |
| 4984.000        | 49.82                       | -31.08          | 34.10                 | 46.80                   | 74.00          | 24.18       | V                  |
| 7311.000        | 41.73                       | -29.59          | 35.78                 | 35.54                   | 74.00          | 32.27       | V                  |
| 9748.000        | 43.69                       | -28.45          | 37.09                 | 35.05                   | 74.00          | 30.31       | H                  |
| 12185.000       | 45.82                       | -26.25          | 38.71                 | 33.35                   | 74.00          | 28.18       | V                  |

##### Ch11

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2483.500        | 54.95                       | -24.56          | 32.20                 | 47.32                   | 74.00          | 19.05       | H                  |
| 2484.250        | 55.13                       | -24.55          | 32.20                 | 47.47                   | 74.00          | 18.87       | H                  |

|           |       |        |       |       |       |       |   |
|-----------|-------|--------|-------|-------|-------|-------|---|
| 4923.500  | 43.00 | -31.10 | 34.15 | 39.94 | 74.00 | 31.00 | V |
| 7386.000  | 41.48 | -29.20 | 35.63 | 35.06 | 74.00 | 32.52 | V |
| 9848.000  | 44.08 | -27.66 | 37.10 | 34.64 | 74.00 | 29.92 | V |
| 12310.000 | 46.97 | -25.89 | 38.79 | 34.07 | 74.00 | 27.03 | V |

## 802.11g

### Ch1

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2389.100        | 68.14                       | -24.77          | 31.96                 | 60.95                   | 74.00          | 5.86        | H                  |
| 2389.600        | 70.01                       | -24.76          | 31.96                 | 62.81                   | 74.00          | 3.99        | H                  |
| 4825.000        | 46.05                       | -31.63          | 34.30                 | 43.37                   | 74.00          | 27.95       | V                  |
| 7236.000        | 43.07                       | -29.88          | 35.60                 | 37.35                   | 74.00          | 30.93       | H                  |
| 9648.000        | 44.92                       | -27.61          | 36.80                 | 35.73                   | 74.00          | 29.08       | V                  |
| 12060.000       | 45.46                       | -26.48          | 38.72                 | 33.22                   | 74.00          | 28.54       | H                  |

### Ch6

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2364.000        | 52.91                       | -25.11          | 31.86                 | 46.16                   | 74.00          | 21.09       | V                  |
| 2502.000        | 52.85                       | -24.72          | 32.21                 | 45.36                   | 74.00          | 21.15       | V                  |
| 4874.000        | 44.96                       | -32.24          | 34.25                 | 42.95                   | 74.00          | 29.04       | H                  |
| 7311.000        | 42.86                       | -29.59          | 35.78                 | 36.67                   | 74.00          | 31.14       | H                  |
| 9748.000        | 43.85                       | -28.45          | 37.09                 | 35.21                   | 74.00          | 30.15       | V                  |
| 12185.000       | 45.54                       | -26.25          | 38.71                 | 33.07                   | 74.00          | 28.46       | V                  |

### Ch11

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2483.500        | 70.33                       | -24.56          | 32.20                 | 62.70                   | 74.00          | 3.67        | H                  |
| 2483.850        | 68.90                       | -24.56          | 32.20                 | 61.25                   | 74.00          | 5.10        | H                  |
| 4921.500        | 42.67                       | -31.30          | 34.16                 | 39.81                   | 74.00          | 31.33       | V                  |
| 7386.000        | 41.63                       | -29.20          | 35.63                 | 35.20                   | 74.00          | 32.38       | H                  |
| 9848.000        | 43.25                       | -27.66          | 37.10                 | 33.81                   | 74.00          | 30.76       | H                  |
| 12310.000       | 46.46                       | -25.89          | 38.79                 | 33.56                   | 74.00          | 27.54       | V                  |

## 802.11n-HT20

### Ch1

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2389.300        | 69.80                       | -24.77          | 31.96                 | 62.60                   | 74.00          | 4.20        | V                  |
| 2389.850        | 71.04                       | -24.76          | 31.96                 | 63.84                   | 74.00          | 2.96        | V                  |
| 4825.000        | 44.76                       | -31.63          | 34.30                 | 42.08                   | 74.00          | 29.25       | V                  |
| 7236.000        | 40.95                       | -29.88          | 35.60                 | 35.23                   | 74.00          | 33.05       | H                  |
| 9648.000        | 45.28                       | -27.61          | 36.80                 | 36.09                   | 74.00          | 28.72       | H                  |
| 12060.000       | 45.41                       | -26.48          | 38.72                 | 33.17                   | 74.00          | 28.59       | H                  |

### Ch6

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2382.000        | 52.43                       | -24.83          | 31.93                 | 45.33                   | 74.00          | 21.57       | H                  |
| 2489.200        | 52.88                       | -24.44          | 32.20                 | 45.12                   | 74.00          | 21.12       | H                  |
| 4874.000        | 43.63                       | -32.24          | 34.25                 | 41.62                   | 74.00          | 30.37       | V                  |
| 7311.000        | 41.62                       | -29.59          | 35.78                 | 35.43                   | 74.00          | 32.38       | V                  |
| 9748.000        | 44.34                       | -28.45          | 37.09                 | 35.70                   | 74.00          | 29.66       | H                  |
| 12185.000       | 46.83                       | -26.25          | 38.71                 | 34.36                   | 74.00          | 27.17       | H                  |

### Ch11

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2483.600        | 71.93                       | -24.56          | 32.20                 | 64.30                   | 74.00          | 2.07        | V                  |
| 2483.850        | 68.69                       | -24.56          | 32.20                 | 61.05                   | 74.00          | 5.31        | H                  |
| 4924.000        | 41.04                       | -31.05          | 34.15                 | 37.94                   | 74.00          | 32.96       | V                  |
| 7386.000        | 42.27                       | -29.20          | 35.63                 | 35.85                   | 74.00          | 31.73       | H                  |
| 9848.000        | 43.97                       | -27.66          | 37.10                 | 34.54                   | 74.00          | 30.03       | H                  |
| 12310.000       | 46.19                       | -25.89          | 38.79                 | 33.29                   | 74.00          | 27.81       | H                  |

**802.11n-HT40**
**Ch3**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2388.050        | 67.19                       | -24.78          | 31.95                 | 60.02                   | 74.00          | 6.81        | V                  |
| 2388.750        | 69.01                       | -24.77          | 31.96                 | 61.82                   | 74.00          | 5.00        | H                  |
| 4844.000        | 40.35                       | -31.09          | 34.30                 | 37.14                   | 74.00          | 33.65       | V                  |
| 7266.000        | 42.83                       | -29.32          | 35.66                 | 36.49                   | 74.00          | 31.17       | V                  |
| 9688.000        | 45.32                       | -27.26          | 36.88                 | 35.70                   | 74.00          | 28.68       | H                  |
| 12110.000       | 44.74                       | -27.07          | 38.79                 | 33.02                   | 74.00          | 29.26       | H                  |

**Ch6**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2368.000        | 52.50                       | -25.10          | 31.87                 | 45.73                   | 74.00          | 21.50       | H                  |
| 2510.800        | 53.15                       | -24.82          | 32.24                 | 45.73                   | 74.00          | 20.85       | V                  |
| 4874.000        | 40.77                       | -32.24          | 34.25                 | 38.76                   | 74.00          | 33.23       | V                  |
| 7311.000        | 41.52                       | -29.59          | 35.78                 | 35.33                   | 74.00          | 32.48       | H                  |
| 9748.000        | 44.83                       | -28.45          | 37.09                 | 36.19                   | 74.00          | 29.17       | H                  |
| 12185.000       | 46.39                       | -26.25          | 38.71                 | 33.92                   | 74.00          | 27.61       | V                  |

**Ch9**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2484.100        | 66.93                       | -24.55          | 32.20                 | 59.28                   | 74.00          | 7.07        | V                  |
| 2485.000        | 68.07                       | -24.53          | 32.20                 | 60.40                   | 74.00          | 5.93        | H                  |
| 4904.000        | 41.67                       | -31.38          | 34.19                 | 38.86                   | 74.00          | 32.33       | H                  |
| 7356.000        | 43.26                       | -29.01          | 35.69                 | 36.58                   | 74.00          | 30.74       | H                  |
| 9808.000        | 42.84                       | -28.28          | 37.02                 | 34.10                   | 74.00          | 31.16       | V                  |
| 12260.000       | 46.64                       | -26.04          | 38.76                 | 33.91                   | 74.00          | 27.36       | H                  |

# Average

## 802.11b

### Ch1

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2384.000        | 44.14                       | -24.81          | 31.94                 | 37.01                   | 54.00          | 9.87        | V                  |
| 2388.000        | 44.91                       | -24.78          | 31.95                 | 37.73                   | 54.00          | 9.09        | V                  |
| 4824.000        | 46.01                       | -31.64          | 34.30                 | 43.35                   | 54.00          | 7.99        | V                  |
| 7236.000        | 32.22                       | -29.88          | 35.60                 | 26.49                   | 54.00          | 21.79       | H                  |
| 9648.000        | 36.33                       | -27.61          | 36.80                 | 27.14                   | 54.00          | 17.67       | H                  |
| 12060.000       | 36.88                       | -26.48          | 38.72                 | 24.64                   | 54.00          | 17.12       | V                  |

### Ch6

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2400.800        | 43.55                       | -24.65          | 32.00                 | 36.19                   | 54.00          | 10.45       | V                  |
| 2478.400        | 43.90                       | -24.65          | 32.20                 | 36.36                   | 54.00          | 10.10       | V                  |
| 4874.000        | 48.08                       | -32.24          | 34.25                 | 46.07                   | 54.00          | 5.92        | V                  |
| 7311.000        | 32.76                       | -29.59          | 35.78                 | 26.57                   | 54.00          | 21.24       | H                  |
| 9748.000        | 34.41                       | -28.45          | 37.09                 | 25.77                   | 54.00          | 19.59       | V                  |
| 12185.000       | 37.05                       | -26.25          | 38.71                 | 24.59                   | 54.00          | 16.95       | V                  |

### Ch11

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2483.600        | 49.11                       | -24.56          | 32.20                 | 41.47                   | 54.00          | 4.89        | V                  |
| 2486.400        | 46.95                       | -24.50          | 32.20                 | 39.25                   | 54.00          | 7.05        | V                  |
| 4923.500        | 38.10                       | -31.10          | 34.15                 | 35.05                   | 54.00          | 15.90       | H                  |
| 7386.000        | 32.10                       | -29.20          | 35.63                 | 25.68                   | 54.00          | 21.90       | H                  |
| 9848.000        | 34.22                       | -27.66          | 37.10                 | 24.78                   | 54.00          | 19.78       | V                  |
| 12310.000       | 37.49                       | -25.89          | 38.79                 | 24.59                   | 54.00          | 16.51       | V                  |

### 802.11g

#### Ch1

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2388.800        | 48.86                       | -24.77          | 31.96                 | 41.68                   | 54.00          | 5.14        | V                  |
| 2389.600        | 51.17                       | -24.76          | 31.96                 | 43.98                   | 54.00          | 2.83        | V                  |
| 4822.500        | 36.03                       | -31.66          | 34.30                 | 33.39                   | 54.00          | 17.97       | H                  |
| 7236.000        | 32.24                       | -29.88          | 35.60                 | 26.52                   | 54.00          | 21.76       | V                  |
| 9648.000        | 36.14                       | -27.61          | 36.80                 | 26.95                   | 54.00          | 17.86       | H                  |
| 12060.000       | 36.53                       | -26.48          | 38.72                 | 24.29                   | 54.00          | 17.47       | V                  |

#### Ch6

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2402.800        | 49.12                       | -24.71          | 32.01                 | 41.81                   | 54.00          | 4.88        | V                  |
| 2471.200        | 49.22                       | -24.71          | 32.20                 | 41.73                   | 54.00          | 4.78        | V                  |
| 4879.000        | 36.12                       | -32.28          | 34.24                 | 34.16                   | 54.00          | 17.88       | V                  |
| 7311.000        | 33.19                       | -29.59          | 35.78                 | 27.00                   | 54.00          | 20.81       | V                  |
| 9748.000        | 34.46                       | -28.45          | 37.09                 | 25.82                   | 54.00          | 19.54       | V                  |
| 12185.000       | 36.96                       | -26.25          | 38.71                 | 24.49                   | 54.00          | 17.04       | V                  |

#### Ch11

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2486.000        | 51.67                       | -24.51          | 32.20                 | 43.98                   | 54.00          | 2.33        | V                  |
| 2486.400        | 50.45                       | -24.50          | 32.20                 | 42.75                   | 54.00          | 3.55        | V                  |
| 4921.500        | 34.16                       | -31.30          | 34.16                 | 31.30                   | 54.00          | 19.84       | H                  |
| 7386.000        | 32.19                       | -29.20          | 35.63                 | 25.76                   | 54.00          | 21.81       | V                  |
| 9848.000        | 34.07                       | -27.66          | 37.10                 | 24.64                   | 54.00          | 19.93       | H                  |
| 12310.000       | 37.15                       | -25.89          | 38.79                 | 24.25                   | 54.00          | 16.85       | H                  |

**802.11n-HT20**
**Ch1**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2388.800        | 51.20                       | -24.77          | 31.96                 | 44.02                   | 54.00          | 2.80        | V                  |
| 2389.600        | 52.29                       | -24.76          | 31.96                 | 45.09                   | 54.00          | 1.72        | V                  |
| 4820.500        | 34.72                       | -31.69          | 34.30                 | 32.11                   | 54.00          | 19.28       | H                  |
| 7236.000        | 32.00                       | -29.88          | 35.60                 | 26.28                   | 54.00          | 22.00       | H                  |
| 9648.000        | 36.12                       | -27.61          | 36.80                 | 26.93                   | 54.00          | 17.88       | V                  |
| 12060.000       | 36.28                       | -26.48          | 38.72                 | 24.03                   | 54.00          | 17.73       | H                  |

**Ch6**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2398.000        | 46.05                       | -24.65          | 31.99                 | 38.71                   | 54.00          | 7.95        | V                  |
| 2478.800        | 45.94                       | -24.65          | 32.20                 | 38.39                   | 54.00          | 8.06        | V                  |
| 4873.000        | 35.06                       | -32.24          | 34.25                 | 33.04                   | 54.00          | 18.94       | V                  |
| 7311.000        | 32.22                       | -29.59          | 35.78                 | 26.03                   | 54.00          | 21.78       | H                  |
| 9748.000        | 34.33                       | -28.45          | 37.09                 | 25.69                   | 54.00          | 19.67       | H                  |
| 12185.000       | 37.29                       | -26.25          | 38.71                 | 24.82                   | 54.00          | 16.71       | H                  |

**Ch11**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2484.800        | 51.06                       | -24.54          | 32.20                 | 43.40                   | 54.00          | 2.94        | V                  |
| 2486.400        | 49.34                       | -24.50          | 32.20                 | 41.64                   | 54.00          | 4.67        | V                  |
| 4921.500        | 34.19                       | -31.30          | 34.16                 | 31.33                   | 54.00          | 19.81       | H                  |
| 7386.000        | 32.46                       | -29.20          | 35.63                 | 26.03                   | 54.00          | 21.54       | V                  |
| 9848.000        | 34.03                       | -27.66          | 37.10                 | 24.59                   | 54.00          | 19.97       | V                  |
| 12310.000       | 36.79                       | -25.89          | 38.79                 | 23.89                   | 54.00          | 17.21       | V                  |

**802.11n-HT40**
**Ch3**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2381.600        | 44.70                       | -24.83          | 31.93                 | 37.60                   | 54.00          | 9.30        | V                  |
| 2469.600        | 45.50                       | -24.71          | 32.20                 | 38.02                   | 54.00          | 8.50        | V                  |
| 4844.000        | 31.97                       | -31.09          | 34.30                 | 28.76                   | 54.00          | 22.04       | V                  |
| 7266.000        | 32.61                       | -29.32          | 35.66                 | 26.27                   | 54.00          | 21.39       | V                  |
| 9688.000        | 35.63                       | -27.26          | 36.88                 | 26.01                   | 54.00          | 18.37       | V                  |
| 12110.000       | 35.71                       | -27.07          | 38.79                 | 23.98                   | 54.00          | 18.30       | H                  |

**Ch6**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2378.400        | 42.92                       | -24.88          | 31.91                 | 35.89                   | 54.00          | 11.08       | V                  |
| 2504.400        | 44.00                       | -24.74          | 32.22                 | 36.52                   | 54.00          | 10.00       | V                  |
| 4874.000        | 31.85                       | -32.24          | 34.25                 | 29.84                   | 54.00          | 22.15       | V                  |
| 7311.000        | 32.16                       | -29.59          | 35.78                 | 25.97                   | 54.00          | 21.84       | V                  |
| 9748.000        | 33.89                       | -28.45          | 37.09                 | 25.25                   | 54.00          | 20.11       | V                  |
| 12185.000       | 36.32                       | -26.25          | 38.71                 | 23.85                   | 54.00          | 17.69       | V                  |

**Ch9**

| Frequency (MHz) | Measurement Result (dBuV/m) | Cable Loss (dB) | Antenna Factor (dB/m) | Receiver Reading (dBuV) | Limit (dBuV/m) | Margin (dB) | Antenna Pol. (H/V) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 2409.600        | 43.08                       | -24.90          | 32.04                 | 35.94                   | 54.00          | 10.92       | V                  |
| 2504.800        | 43.61                       | -24.75          | 32.22                 | 36.14                   | 54.00          | 10.39       | V                  |
| 4904.000        | 31.79                       | -31.38          | 34.19                 | 28.97                   | 54.00          | 22.21       | V                  |
| 7356.000        | 32.61                       | -29.01          | 35.69                 | 25.93                   | 54.00          | 21.40       | H                  |
| 9808.000        | 32.93                       | -28.28          | 37.02                 | 24.19                   | 54.00          | 21.07       | H                  |
| 12260.000       | 36.94                       | -26.04          | 38.76                 | 24.21                   | 54.00          | 17.07       | H                  |

## Band edge compliance

### 802.11b mode

| Mode    | Channel | Frequency Range     | Test Results | Conclusion |
|---------|---------|---------------------|--------------|------------|
| 802.11b | 1       | 2.31GHz~2.43GHz---L | Fig.1        | <b>P</b>   |
|         | 11      | 2.45GHz~2.50GHz---H | Fig.2        | <b>P</b>   |

### 802.11g mode

| Mode    | Channel | Frequency Range     | Test Results | Conclusion |
|---------|---------|---------------------|--------------|------------|
| 802.11g | 1       | 2.31GHz~2.43GHz---L | Fig.3        | <b>P</b>   |
|         | 11      | 2.45GHz~2.50GHz---H | Fig.4        | <b>P</b>   |

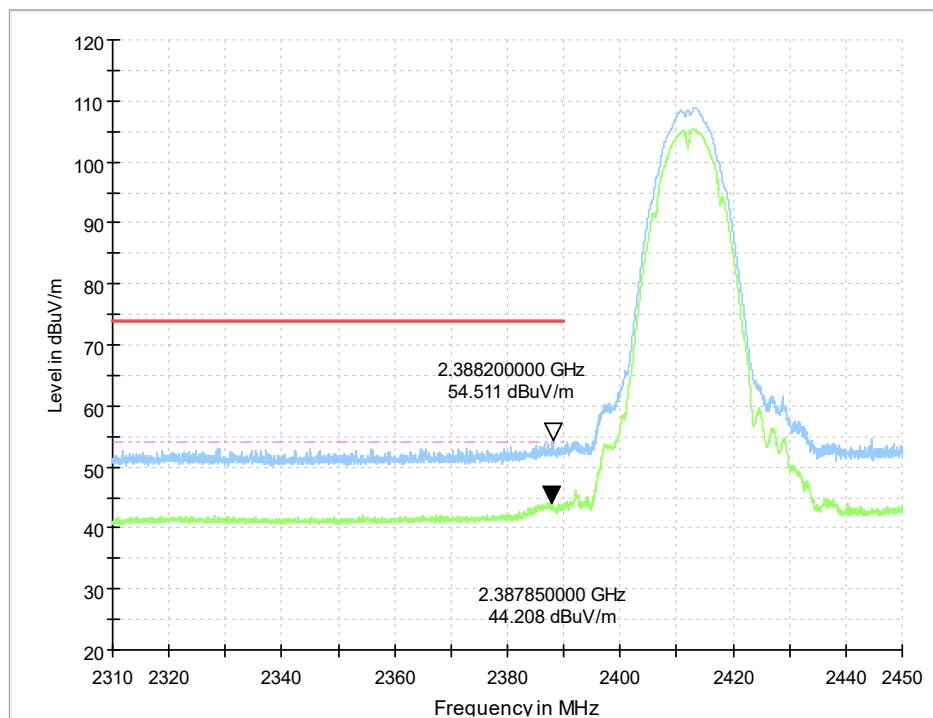
### 802.11n-HT20 mode

| Mode              | Channel | Frequency Range     | Test Results | Conclusion |
|-------------------|---------|---------------------|--------------|------------|
| 802.11n<br>(HT20) | 1       | 2.31GHz~2.43GHz---L | Fig.5        | <b>P</b>   |
|                   | 11      | 2.45GHz~2.50GHz---H | Fig.6        | <b>P</b>   |

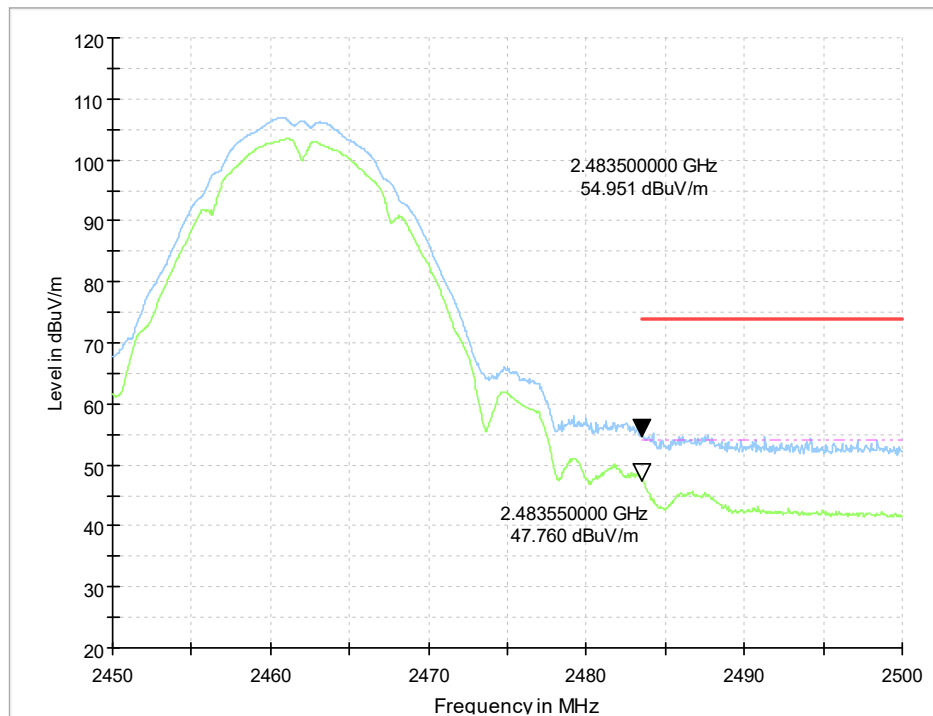
### 802.11n-HT40 mode

| Mode              | Channel | Frequency Range     | Test Results | Conclusion |
|-------------------|---------|---------------------|--------------|------------|
| 802.11n<br>(HT40) | 3       | 2.31GHz~2.43GHz---L | Fig.7        | <b>P</b>   |
|                   | 9       | 2.45GHz~2.50GHz---H | Fig.8        | <b>P</b>   |

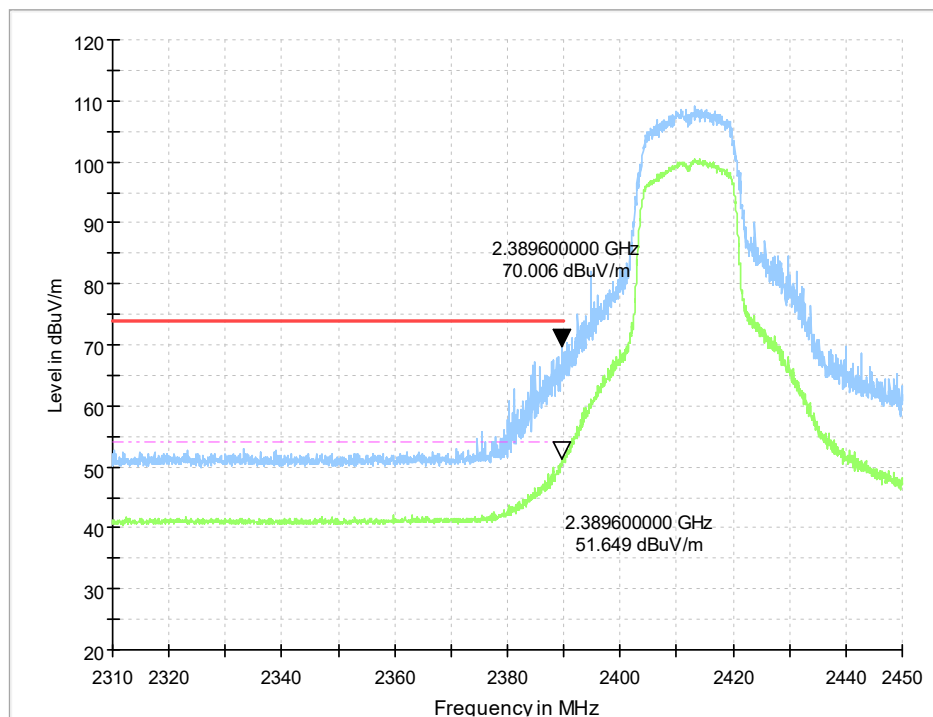
Test graphs as below:



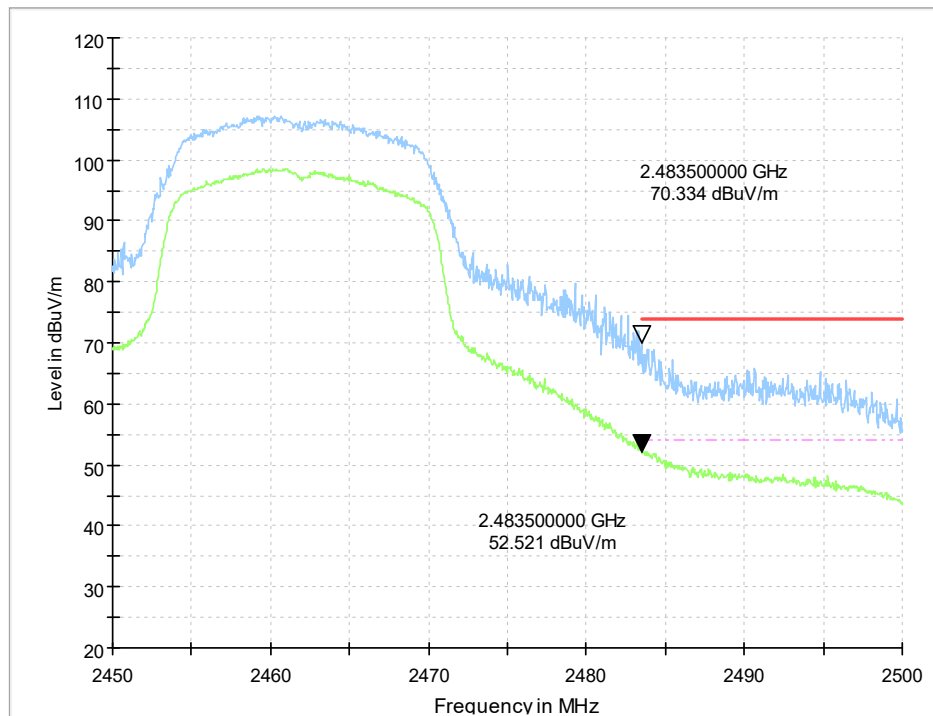
**Fig.1 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch1, 2.31 GHz – 2.43GHz**



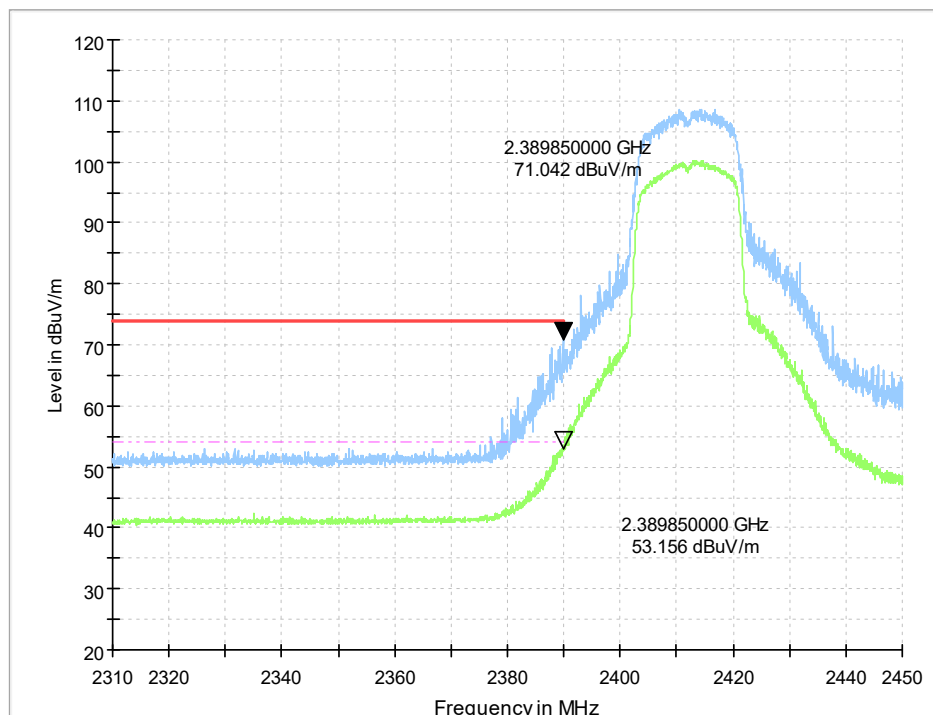
**Fig.2 Transmitter Spurious Emission - Radiated (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz**



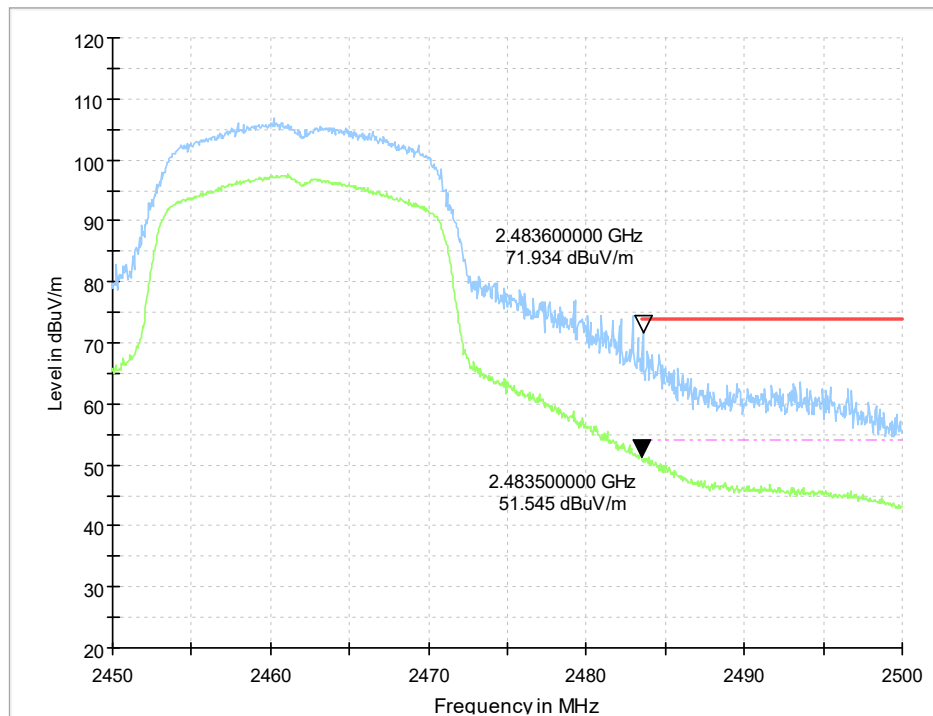
**Fig.3 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch1, 2.31 GHz - 2.43GHz**



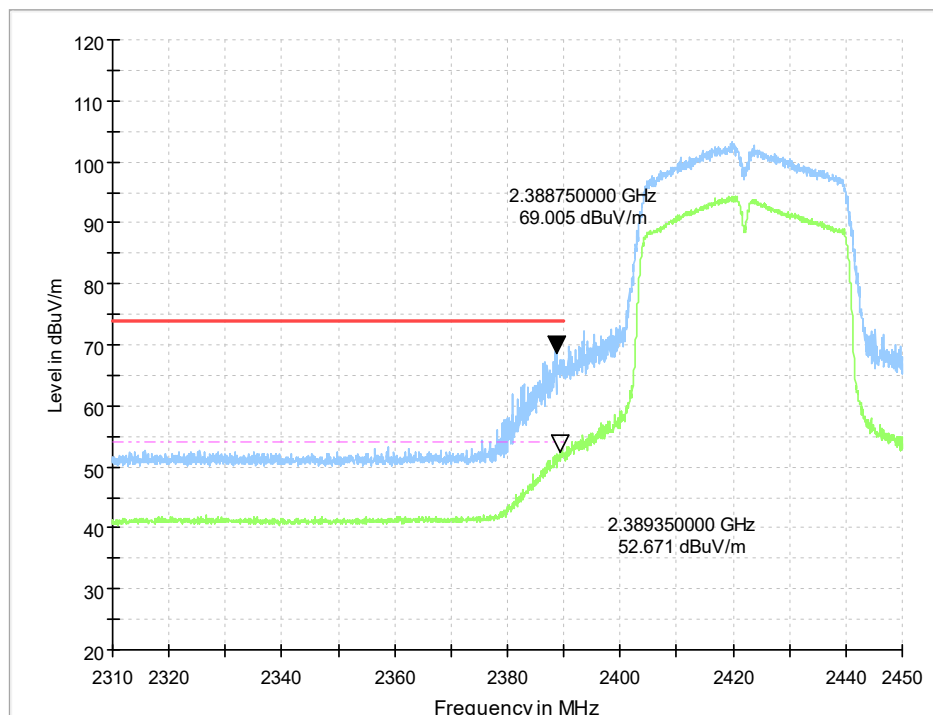
**Fig.4 Transmitter Spurious Emission - Radiated (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz**



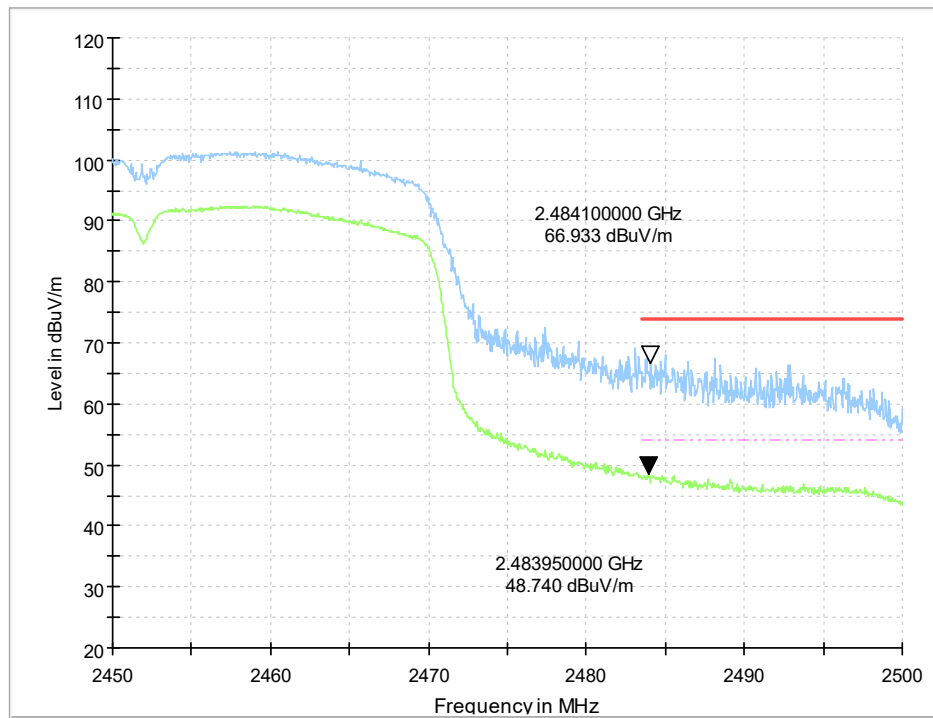
**Fig.5 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch1, 2.31 GHz - 2.43GHz**



**Fig.6 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz**



**Fig.7 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch3, 2.31 GHz - 2.43GHz**



**Fig.8 Transmitter Spurious Emission - Radiated (Power): 802.11n-HT40, ch9, 2.45 GHz - 2.50GHz**

### **A.8. AC Power-line Conducted Emission**

## Summary

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section

**Method of Measurement:**

See Clause 6.2 of ANSI C63.10 specifically.

See Clause 4 and Clause 5 of ANSI C63.10 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver:  
Quasi-Peak / Average Detector.

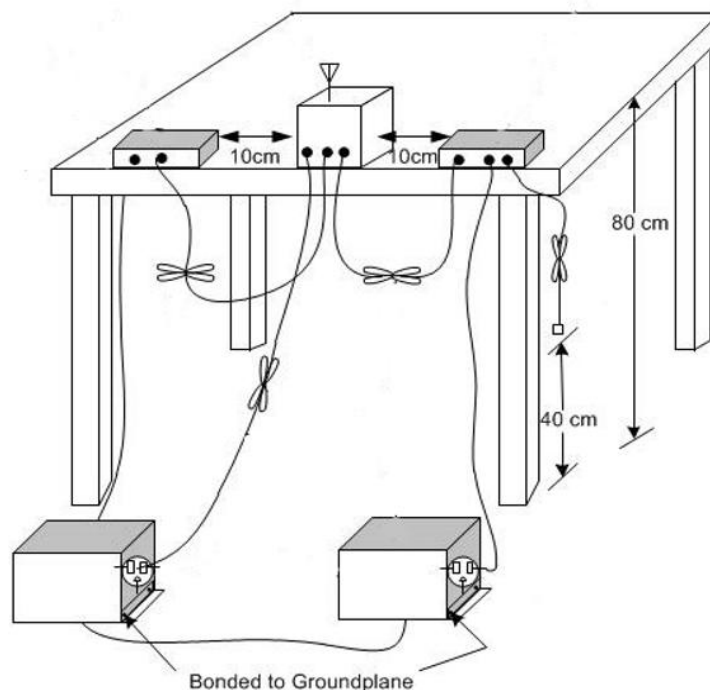
The measurement bandwidth is:

|                             |                  |
|-----------------------------|------------------|
| Frequency of Emission (MHz) | RBW/IF bandwidth |
| 0.15-30                     | 9kHz             |

**Test Condition:**

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

## Test setup



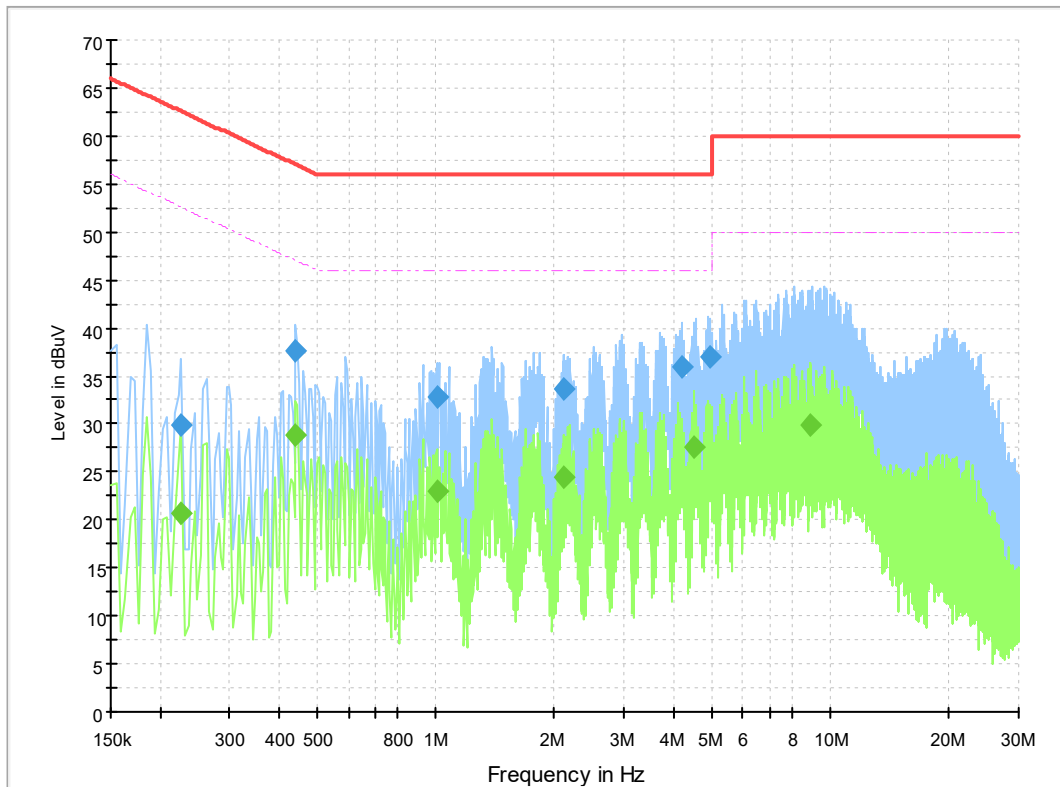
**Measurement Result and limit:**
**WLAN (Quasi-peak Limit)**

| Frequency range<br>(MHz)                                                                                 | Quasi-peak<br>Limit (dBμV) | Result (dBμV) |        | Conclusion |
|----------------------------------------------------------------------------------------------------------|----------------------------|---------------|--------|------------|
|                                                                                                          |                            | With charger  |        |            |
|                                                                                                          |                            | 802.11b       | Idle   |            |
| 0.15 to 0.5                                                                                              | 66 to 56                   | Fig.9         | Fig.10 | P          |
| 0.5 to 5                                                                                                 | 56                         |               |        |            |
| 5 to 30                                                                                                  | 60                         |               |        |            |
| NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz. |                            |               |        |            |

**WLAN (Average Limit)**

| Frequency range<br>(MHz)                                                                                 | Average Limit<br>(dBμV) | Result (dBμV) |        | Conclusion |
|----------------------------------------------------------------------------------------------------------|-------------------------|---------------|--------|------------|
|                                                                                                          |                         | With charger  |        |            |
|                                                                                                          |                         | 802.11b       | Idle   |            |
| 0.15 to 0.5                                                                                              | 56 to 46                | Fig.9         | Fig.10 | P          |
| 0.5 to 5                                                                                                 | 46                      |               |        |            |
| 5 to 30                                                                                                  | 50                      |               |        |            |
| NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz. |                         |               |        |            |

**Conclusion: Pass**
**Test graphs as below:**



**Fig.9 AC Powerline Conducted Emission-802.11b**

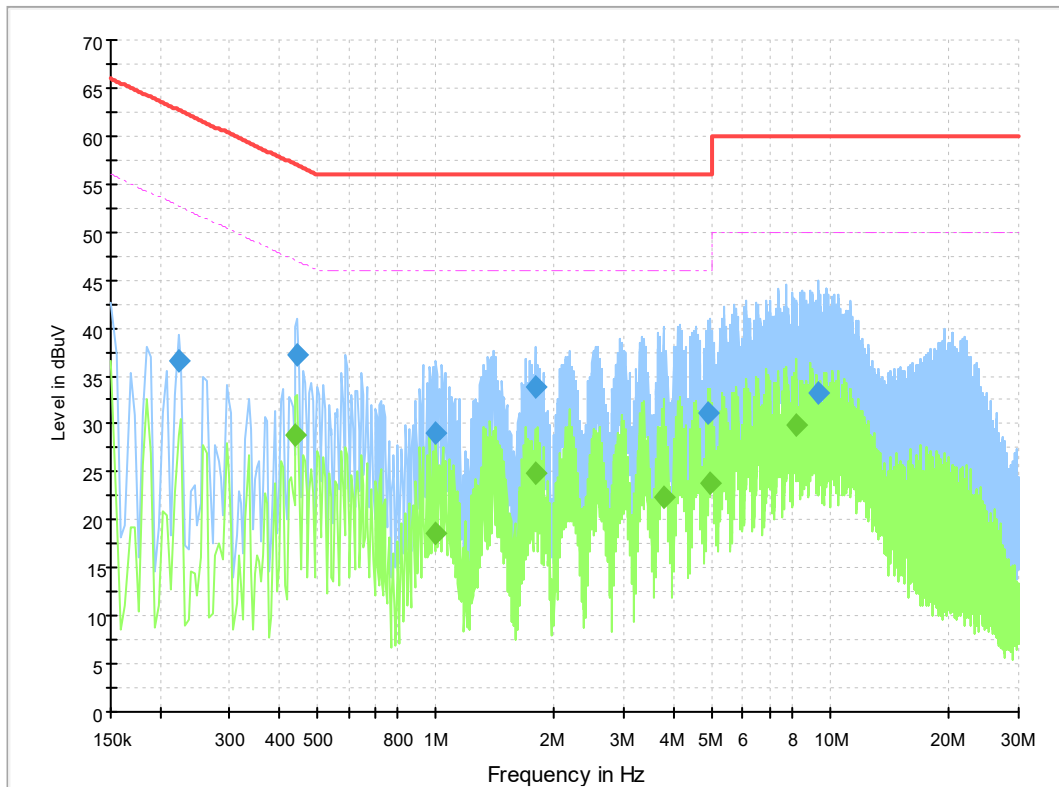
Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

#### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | Meas. Time | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment |
|-----------------|------------------|------------|-----------------|--------|------|------------|-------------|--------------|---------|
| 0.226500        | 29.9             | 2000.0     | 9.000           | On     | N    | 20.0       | 32.7        | 62.6         |         |
| 0.442500        | 37.7             | 2000.0     | 9.000           | On     | L1   | 20.1       | 19.3        | 57.0         |         |
| 1.005000        | 32.9             | 2000.0     | 9.000           | On     | L1   | 19.9       | 23.1        | 56.0         |         |
| 2.116500        | 33.5             | 2000.0     | 9.000           | On     | L1   | 19.8       | 22.5        | 56.0         |         |
| 4.186500        | 35.9             | 2000.0     | 9.000           | On     | L1   | 19.9       | 20.1        | 56.0         |         |
| 4.929000        | 36.9             | 2000.0     | 9.000           | On     | L1   | 19.9       | 19.1        | 56.0         |         |

#### Final Result 2

| Frequency (MHz) | CAverage (dBμV) | Meas. Time | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment |
|-----------------|-----------------|------------|-----------------|--------|------|------------|-------------|--------------|---------|
| 0.226500        | 20.6            | 2000.0     | 9.000           | On     | L1   | 20.0       | 31.9        | 52.6         |         |
| 0.442500        | 28.8            | 2000.0     | 9.000           | On     | L1   | 20.1       | 18.2        | 47.0         |         |
| 1.005000        | 23.1            | 2000.0     | 9.000           | On     | L1   | 19.9       | 22.9        | 46.0         |         |
| 2.112000        | 24.5            | 2000.0     | 9.000           | On     | L1   | 19.8       | 21.5        | 46.0         |         |
| 4.528500        | 27.7            | 2000.0     | 9.000           | On     | L1   | 19.8       | 18.3        | 46.0         |         |
| 8.889000        | 29.8            | 2000.0     | 9.000           | On     | L1   | 19.9       | 20.2        | 50.0         |         |



**Fig.10 AC Powerline Conducted Emission-Idle**

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

**Final Result 1**

| Frequency (MHz) | QuasiPeak (dB $\mu$ V) | Meas. Time | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dB $\mu$ V) | Comment |
|-----------------|------------------------|------------|-----------------|--------|------|------------|-------------|--------------------|---------|
| 0.222000        | 36.6                   | 2000.0     | 9.000           | On     | L1   | 20.0       | 26.2        | 62.7               |         |
| 0.447000        | 37.2                   | 2000.0     | 9.000           | On     | L1   | 20.1       | 19.8        | 56.9               |         |
| 1.000500        | 29.1                   | 2000.0     | 9.000           | On     | N    | 20.0       | 26.9        | 56.0               |         |
| 1.783500        | 33.8                   | 2000.0     | 9.000           | On     | L1   | 19.8       | 22.2        | 56.0               |         |
| 4.897500        | 31.1                   | 2000.0     | 9.000           | On     | N    | 20.0       | 24.9        | 56.0               |         |
| 9.361500        | 33.2                   | 2000.0     | 9.000           | On     | N    | 20.1       | 26.8        | 60.0               |         |

**Final Result 2**

| Frequency (MHz) | CAverage (dB $\mu$ V) | Meas. Time | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dB $\mu$ V) | Comment |
|-----------------|-----------------------|------------|-----------------|--------|------|------------|-------------|--------------------|---------|
| 0.442500        | 28.9                  | 2000.0     | 9.000           | On     | L1   | 20.1       | 18.1        | 47.0               |         |
| 1.000500        | 18.7                  | 2000.0     | 9.000           | On     | N    | 20.0       | 27.3        | 46.0               |         |
| 1.783500        | 24.8                  | 2000.0     | 9.000           | On     | L1   | 19.8       | 21.2        | 46.0               |         |
| 3.781500        | 22.4                  | 2000.0     | 9.000           | On     | N    | 20.0       | 23.6        | 46.0               |         |
| 4.960500        | 23.9                  | 2000.0     | 9.000           | On     | N    | 20.0       | 22.1        | 46.0               |         |
| 8.155500        | 29.9                  | 2000.0     | 9.000           | On     | L1   | 19.9       | 20.1        | 50.0               |         |

### **A.9. Antenna Requirement**

The antenna of the device is permanently attached. There are no provisions for connection to an external antenna.

The unit complies with the requirement of FCC Part 15.203.

### **ANNEX B: EUT parameters**

Disclaimer: The antenna gain and worse case provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

### **ANNEX C: Accreditation Certificate**



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