

Test report No.: KES-RF-17T0041 Page (1) of (53)

# **TEST REPORT**

# Part 15 Subpart C 15.247

Equipment under test Digital Color Camera

Model name SNC-79440BWN

FCC ID NLMSNC79440BWN

Applicant Hanwha Techwin Co., Ltd.

Manufacturer Hanwha Techwin(Tianjin) Co., Ltd

Date of test(s) 2017.03.17 ~ 2017.03.23

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**Issued** to

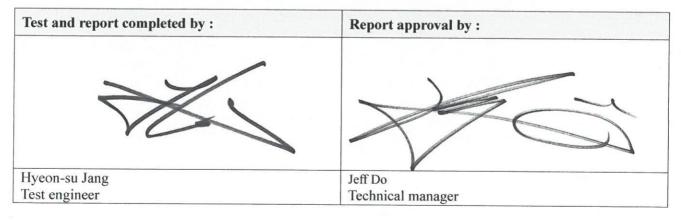
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# **Revision history**

| Revision | Date of issue | Test report No. | Description |
|----------|---------------|-----------------|-------------|
| -        | 2017.03.24    | KES-RF-17T0041  | Initial     |



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# 1. General information

| Applicant:              | Hanwha Techwin Co., Ltd.                       |  |                        |  |  |  |
|-------------------------|--|--|------------------------|--|--|--|
| Applicant address:      | 1204, Changwon-daero, See                      | 1204, Changwon-daero, Seongsan-gu, Changwon-si |                        |  |  |  |
|                         | Gyeongsangnam-do, South                        | Korea  |                        |  |  |  |
| Test site:              | KES Co., Ltd.                                  |  |                        |  |  |  |
| Test site address:      | C-3701, 40, Simin-daero 36                     | 55beon-gil, Dongan-gu, Anyang-                 | si, Gyeonggi-do, Korea |  |  |  |
|                         | 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea |  |                        |  |  |  |
| FCC rule part(s):       | 15.247   |  |                        |  |  |  |
| FCC ID:                 | NLMSNC79440BWN                                 |  |                        |  |  |  |
| Test device serial No.: | Production                                     | Pre-production                                 | Engineering            |  |  |  |

# **1.1. EUT description**

| Equipment under test | Digital Color Camera                    |  |  |  |
|----------------------|---|--|--|--|
| Frequency range      | 2412 MHz ~ 2462 MHz(11b/g/n_HT20)       |  |  |  |
|                      | 2422 MHz ~ 2452 MHz(11n_HT40)           |  |  |  |
| Modulation technique | DSSS, OFDM                              |  |  |  |
| Number of channels   | 2412 MHz ~ 2462 MHz(11b/g/n_HT20): 11ch |  |  |  |
|                      | 2422 MHz ~ 2452 MHz(11n_HT40): 7ch      |  |  |  |
| Antenna type         | Dipole antenna                          |  |  |  |
| Antenna gain         | 1.87 dBi                                |  |  |  |
| Power source         | AC 120 V Adaptor (Output DC 12.0 V)     |  |  |  |

# **1.2.** Test configuration

The <u>Hanwha Techwin Co., Ltd. Digital Color Camera FCC ID: NLMSNC79440BWN</u> was tested per the guidance of KDB 558074 D01 v03r05. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

**1.3.** Device modifications

N/A

1.4. Information about derivative model

N/A



# 1.5. Frequency/channel operations

| Ch. | Frequency (Mz) | Mode             |
|-----|----------------|------------------|
| 01  | 2412           | 802.11b/g/n_HT20 |
| :   |                | -<br>-           |
| 06  | 2437           | 802.11b/g/n_HT20 |
| · . | •              |                  |
| 11  | 2462           | 802.11b/g/n_HT20 |

| Ch. | Frequency (Mz) | Mode         |
|-----|----------------|--------------|
| 03  | 2422           | 802.11n_HT40 |
|     |                |              |
| 06  | 2437           | 802.11n_HT40 |
|     |                |              |
| 09  | 2452           | 802.11n_HT40 |

# 1.6. Worst case data rate

- 1. Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.
- 2. Worst-case data rates were:
  - 802.11b: <u>11 Mbps</u> 802.11g: <u>6 Mbps</u> 802.11n\_HT20: <u>MCS0</u> 802.11n\_HT40: <u>MCS0</u>

# 1.7. Accessory information

| Equipment            | Manufacturer       | Model                 | Serial No. | Power source                             |  |  |  |
|----------------------|--------------------|-----------------------|------------|--|--|--|--|
| SWITCHING<br>ADAPTOR | FUJIA<br>APPLIANCE | FJ-<br>SW1161200500DU | -          | AC 120V<br>(Output : DC 12V /<br>0.5 A ) |  |  |  |



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| 2. Summary of | tests                                     |              |
|---------------|---|--------------|
| Reference     | Parameter                                 | Test results |
| 15.247(a)(2)  | 6 dB bandwidth                            | Pass         |
| 15.247(b)(3)  | Peak output power                         | Pass         |
| 15.247(e)     | Power spectral density                    | Pass         |
| 15.205 15.209 | Radiated restricted band and emission     | Pass         |
| 15.247(d)     | Conducted spurious emission and band edge | Pass         |
| 15.207(a)     | AC conducted emissions                    | Pass         |



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# 3. Test results

# 3.1. 6 dB bandwidth

# Test procedure

KDB 558074 D01 v03r05 – Section 8.1 or 8.2 Used test method is section 8.1.

# Section 8.1

- 1. RBW = 100 kHz.
- 2. VBW  $\geq$  3  $\times$  RBW.
- 3. Detector = peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

# Section 8.2

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz,  $VBW \ge 3 \times RBW$ , peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\ge 6 \text{ dB}$ .

## Limit

According to \$15.247(a)(2), systems using digital modulation techniques may operate  $902 \sim 928$  Mb,  $2400 \sim 2483.5$  Mb, and  $5725 \sim 5850$  Mb bands. The minimum 6 dB bandwidth shall be at least 500 kb.



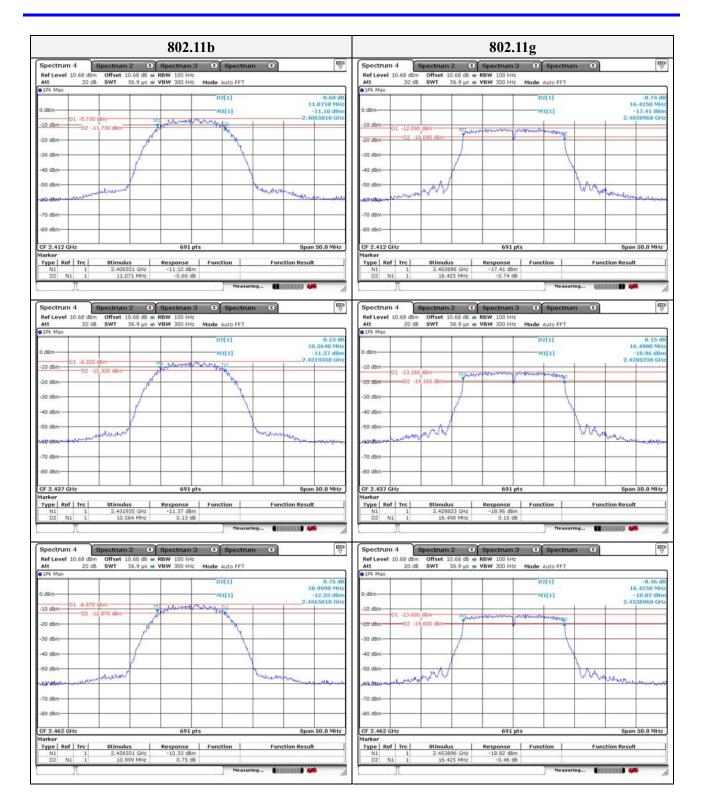
# **Test results**

| 6 dB bandwidth of 20 Mz bandwidth |  |        |        |     |  |  |
|-----------------------------------|--|--------|--------|-----|--|--|
|                                   | Limit(M <sup>1</sup> / <sub>2</sub> )                          |        |        |     |  |  |
| Frequency(Mz)                     | Frequency(MHz)         802.11b         802.11g         802.11n |        |        |     |  |  |
| 2412                              | 11.071   | 16.425 | 17.583 |     |  |  |
| 2437                              | 10.564   | 16.498 | 17.583 | 0.5 |  |  |
| 2462                              | 10.999   | 16.425 | 17.583 |     |  |  |

| 6 dB bandwidth of 40 Mz bandwidth |                                 |     |  |  |  |  |
|-----------------------------------|---------------------------------|-----|--|--|--|--|
| Measured 6 dB bandwidth(Mz)       |                                 |     |  |  |  |  |
| Frequency(Mz)                     | Frequency(Mz) 802.11n Limit(Mz) |     |  |  |  |  |
| 2422                              | 36.350                          |     |  |  |  |  |
| 2437                              | 36.240                          | 0.5 |  |  |  |  |
| 2452                              | 36.350                          |     |  |  |  |  |

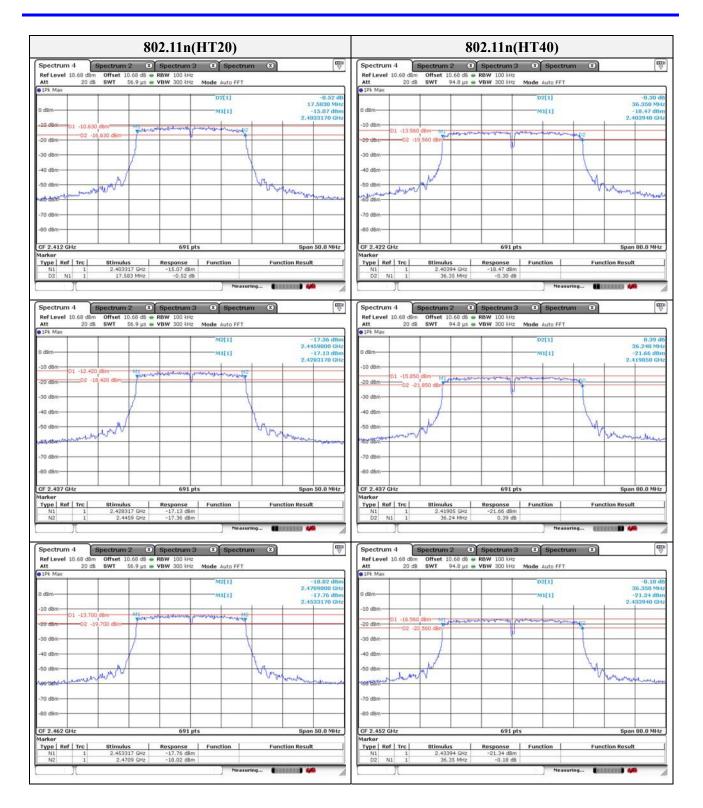


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# 3.2. Output power

**Test procedure** KDB 558074 D01 v03r05 – section 9.1.1 or 9.1.2 Used test method is section 9.1.2.

# Section 9.1.1

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is gr eater than the DTS bandwidth.

- 1. Set the RBW  $\geq$  DTS bandwidth.
- 2. Set VBW  $\geq$  3  $\times$  RBW.
- 3. Set span  $\geq$  3  $\times$  RBW
- 4. Sweep time = auto couple
- 5. Detector = peak
- 6. Trace mode = max hold
- 7. Allow trace to fully stabilize
- 8. Use peak marker function to determine the peak amplitude level

# Section 9.1.2

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS ba ndwidth and shall utilize a fast-responding diode detector.

# Limit

According to \$15.247(b)(3), For systems using digital modulation in the 902~928 MŁ, 2 400~2 483.5 MŁ, and 5 725~5 850 MŁ bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted out-put power. Maximum Conducted Out-put Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to \$15.247(b)(4), The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmit-ting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



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| Test results                |          |         |          |         |          |         |
|-----------------------------|----------|---------|----------|---------|----------|---------|
| Measured output power (dBm) |          |         |          |         |          |         |
| Mada                        | 2412 MHz |         | 2437 MHz |         | 2462 MHz |         |
| Mode                        | Peak     | Average | Peak     | Average | Peak     | Average |
| 11b                         | 13.20    | 10.25   | 12.15    | 9.47    | 11.41    | 9.19    |
| 11g                         | 16.32    | 6.22    | 15.80    | 5.75    | 15.26    | 5.05    |
| 11n_HT 20                   | 15.65    | 5.83    | 15.02    | 5.23    | 14.50    | 4.64    |
| M. J.                       | 242      | 2 MHz   | 243      | 7 MHz   | 245      | 2 MHz   |
| Mode                        | Peak     | Average | Peak     | Average | Peak     | Average |
| 11n_HT 40                   | 14.87    | 5.64    | 14.64    | 5.31    | 13.98    | 4.55    |



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**3.3.** Power spectral density Test procedure KDB 558074 D01 v03r05- section 10.2

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS channel bandwidth.
- 3. Set the RBW : 3 kHz  $\leq$  RBW  $\leq$  100 kHz
- 4. Set the VBW  $\geq$  3  $\times$  RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. If measured value exceeds limit, reduce RBW(no less than 3 kHz) and repeat.

#### Limit

According to \$15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.



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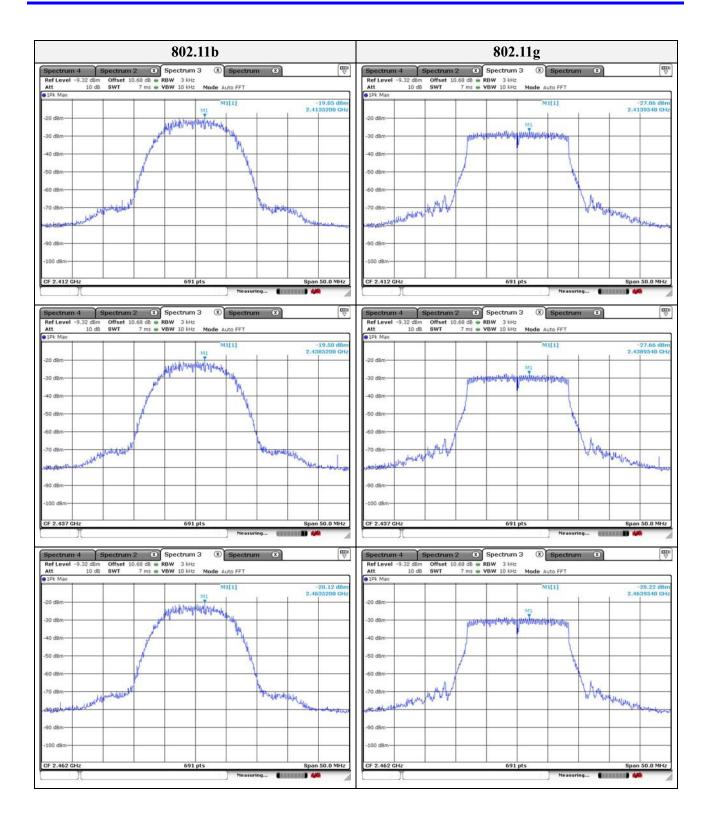
#### **Test results**

| PSD of 20 Mz bandwidth |  |        |        |   |  |  |  |
|------------------------|--|--------|--------|---|--|--|--|
|                        | Limit(dBm)   |        |        |   |  |  |  |
| Frequency(Mbz)         | Frequency(MHz)         802.11b         802.11g         802.11n |        |        |   |  |  |  |
| 2412                   | -19.05   | -27.06 | -25.52 |   |  |  |  |
| 2437                   | -19.50   | -27.66 | -26.73 | 8 |  |  |  |
| 2462                   | -20.12   | -28.22 | -27.69 |   |  |  |  |

| PS                | PSD of 40 Mz bandwidth |   |  |  |  |  |  |  |  |  |  |
|-------------------|------------------------|---|--|--|--|--|--|--|--|--|--|
| Measured PDS(dBm) |                        |   |  |  |  |  |  |  |  |  |  |
| Frequency(Mz)     |                        |   |  |  |  |  |  |  |  |  |  |
| 2422              | -27.13                 |   |  |  |  |  |  |  |  |  |  |
| 2437              | -27.66                 | 8 |  |  |  |  |  |  |  |  |  |
| 2452              | -28.05                 |   |  |  |  |  |  |  |  |  |  |



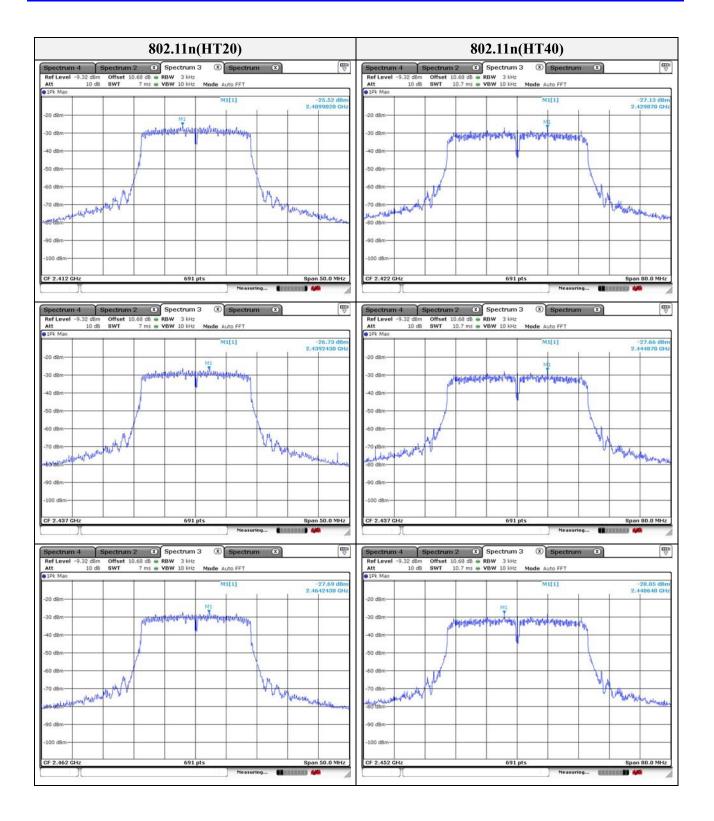
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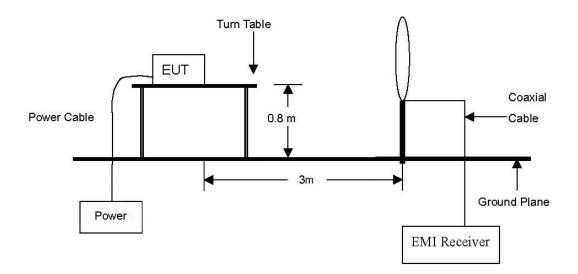




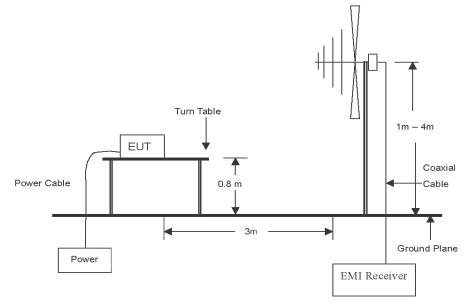
# 3.4. Radiated restricted band and emissions

# Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.

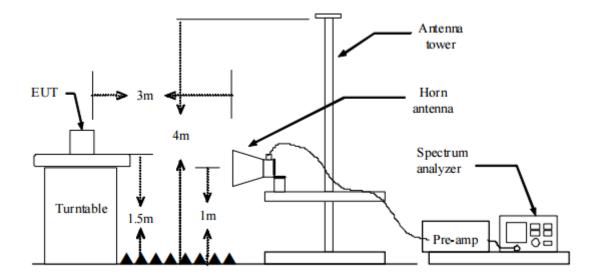


The diagram below shows the test setup that is utilized to make the measurements for emission from 30 Mz to 1 Gz emissions.





The diagram below shows the test setup that is utilized to make the measurements for emission from 1  $\mathbb{G}\mathbb{Z}$  to the tenth harmonic of the highest fundamental frequency or to 40  $\mathbb{G}\mathbb{Z}$  emissions, whichever is lower.



## Test procedure below 30 Mz

- 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
- 3. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 4. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum hold mode.

## Test procedure above 30 MHz

- 1. Spectrum analyzer settings for f < 1 GHz:
  - (1) Span = wide enough to fully capture the emission being measured
  - $\bigcirc$  **RBW** = 100 kHz
  - ③ VBW  $\ge$  RBW
  - ④ Detector = quasi peak
  - (5) Sweep time = auto
  - $\bigcirc$  Trace = max hold
- 2. Spectrum analyzer settings for  $f \ge 1$  GHz: Peak
  - ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
  - 2 RBW = 1 M/z
  - ③ VBW  $\ge$  3 Mz
  - (4) Detector = peak
  - $\bigcirc$  Sweep time = auto
  - 6 Trace = max hold
  - $\bigcirc$  Trace was allowed to stabilize

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- 3. Spectrum analyzer settings for  $f \ge 1$  GHz: Average
  - ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
  - 2 RBW = 1 MHz

  - (4) Detector = RMS, if span/(# of points in sweep)  $\leq$  (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
  - (5) Averaging type = power(i.e., RMS)
    - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
    - 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
  - 6 Sweep = auto
  - $\bigcirc$  Trace = max hold
  - 8 Perform a trace average of at least 100 traces.
  - (9) A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
    - 1) If power averaging (RMS) mode was used in step (5), then the applicable correction factor is  $10 \log(1/x)$ , where x is the duty cycle.
    - 2) If linear voltage averaging mode was used in step (5), then the applicable correction factor is 20 log(1/x), where x is the duty cycle.
    - 3) If a specific emission is demonstrated to be continuous ( $\geq 98$  percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

## Note.

1. f < 30 MHz, extrapolation factor of 40 dB/decade of distance.  $F_d = 40\log(D_m/Ds)$ 

 $f \ge 30$  Mz, extrapolation factor of 20 dB/decade of distance.  $F_d = 20log(D_m/Ds)$  Where:

- $F_d$  = Distance factor in dB
- $D_m$  = Measurement distance in meters
- D<sub>s</sub> = Specification distance in meters
- 3.  $CF(Correction factors(dB)) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d(dB)$
- 4. Field strength( $dB\mu N/m$ ) = Level( $dB\mu N$ ) + CF (dB) + or DCF(dB)
- 5. Margin(dB) = Limit(dB $\mu$ V/m) Field strength(dB $\mu$ V/m)
- 6. Emissions below 18 GHz were measured at a 3 meter test distance while emissions above 18 GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z, it was determined that <u>X orientation</u> was worst-case orientation; therefore, all final radiated testing was performed with the EUT in <u>X orientation</u>.
- 8. The worst-case emissions are reported however emissions whose levels were not within 20 dB of respective limits were not reported.

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# Limit

According to 15.209(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values :

| Frequency (Mz) | Distance (Meters) | Radiated (µV/m) |
|----------------|-------------------|-----------------|
| 0.009 ~ 0.490  | 300               | 2400/F(kHz)     |
| 0.490 ~ 1.705  | 30                | 24000/F(kHz)    |
| 1.705 ~ 30.0   | 30                | 30              |
| 30~88          | 3                 | 100**           |
| 88~216         | 3                 | 150**           |
| 216~960        | 3                 | 200**           |
| Above 960      | 3                 | 500             |

\*\*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands  $54 \sim 72$  Mz,  $76 \sim 88$  Mz,  $174 \sim 216$  Mz or  $470 \sim 806$  Mz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.



# **Duty cycle**

Regarding to KDB 558074 D01\_v03r05, 6.0, the maximum duty cycles of all modes were investigated and set the spectrum analyzer as below.

Set RBW  $\geq$  OBW if possible; otherwise, set RBW to the largest available value. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.

| Test mode     | T <sub>on</sub> time<br>(ms) | Period<br>(ms) | Duty cycle<br>(Linear) | Duty cycle<br>(%) | Duty cycle correction factor<br>(dB) |
|---------------|------------------------------|----------------|------------------------|-------------------|--------------------------------------|
| 802.11b       | 10.00                        | 10.00          | 1                      | 100               | 0                                    |
| 802.11g       | 10.00                        | 10.00          | 1                      | 100               | 0                                    |
| 802.11n(HT20) | 10.00                        | 10.00          | 1                      | 100               | 0                                    |
| 802.11n(HT40) | 10.00                        | 10.00          | 1                      | 100               | 0                                    |

# Duty cycle (Linear) = $T_{on}$ time/Period

DCF(Duty cycle correction factor (dB)) = 10log(1/duty cycle)

| 8(  | 02.11b // Mid  |                  | 802.11g // Middle channel |  |  |  |                            |   |          |          |          |           |           |
|---|--|------------------|---------------------------|--|--|--|----------------------------|---|----------|----------|----------|-----------|-----------|
|   | t 10.68 dB 👄 RBW 10 MHz  | Spectrun         | n 🗷                       |  | Ref Level 30.68 dBm Offset 10.68 dB  RBW 10 MHz  |  |                            |   |          |          |          |           |           |
| Att 40 dB 🖝 SWT<br>SGL  | 10 ms 🖷 VBW 10 MHz   |                  |                           |  | Att  | 40 dB 💩 SWT  | 10 ms 🖷                    | VBW 10 MH                                 | 42       |          |          |           |           |
| 1Pk Max   |  |                  |                           |  | Pk Max   |  |                            |   |          |          |          |           |           |
|   |  |                  |                           |  |  |  |                            | 1   |          |          |          |           |           |
|   |  |                  |                           | _  |  |  | -                          |   |          |          | _        |           |           |
| 20 dBm  |  |                  |                           |  | 20 dBm-  |  |                            |   |          |          |          | 7         |           |
| 10 dBm-   |  |                  |                           |  | 10 d8m   |  |                            |   |          |          |          |           |           |
| 10 000  |  |                  |                           |  | ulsudde  | tobal doubt doubt  | delardelarde               | altrada                                   | andreada | entrutit | nerhould | reliberti | nalitudes |
| 0 d8m   |  |                  | -                         | -  | 0 dBm  |  |                            |   |          |          |          |           |           |
|   |  |                  |                           |  |  |  |                            |   |          |          |          |           |           |
| -10 dBm   | + + +  |                  |                           |  | -10 dBm  |  | -                          | -   |          | -        |          |           |           |
|   |  |                  |                           |  |  |  |                            |   |          |          |          |           |           |
| -20 dBm   |  |                  |                           |  | -20 dBm  |  | -                          |   |          |          |          |           |           |
|   |  |                  |                           |  |  |  |                            |   |          |          |          |           |           |
| -30 dBm   |  |                  |                           |  | -30 dBm  |  |                            |   |          |          |          |           |           |
| -40 dBm   |  |                  |                           |  | -40 d8m  |  |                            |   |          |          |          |           |           |
| - Ho doin   |  |                  |                           |  | 10 upm   |  |                            | 1   |          |          |          | 1         |           |
| -50 dBm   |  |                  |                           |  | -50 dBm-   |  |                            |   |          |          |          | -         |           |
|   |  |                  |                           |  |  |  |                            |   |          |          |          |           |           |
| -60 d8m   |  |                  |                           | -  | -60 d8m  |  | -                          | -   | -        |          |          | -         | -         |
|   |  |                  |                           |  |  |  |                            |   |          |          |          |           |           |
|   |  |                  |                           |  |  |  |                            | 691                                       |          |          |          |           | 1.0 ms/   |
| CF 2.437 GHz  | 691 pt   | Read             |                           | 1.0 ms/  | CF 2.437 GH  | ][   | 1 n/UT                     |   |          | Read     |          | al        |           |
| 802.1   | 1n(HT20) //  | Read<br>Middle c | hannel                    |  | CF 2.437 GH  | 802.1  | n 2 🛛                      | (40) //                                   | / Mid    |          | hann     | -         |           |
| 802.1<br>Spectrum 4 Spectrum<br>Ref Level 30.68 dBm Offse<br>Att 40 dB = SWT<br>SGL   | 1n(HT20) //  | Read<br>Middle c | hannel                    | *  | Spectrum<br>Ref Level 3<br>Att<br>SGL  | 802.11<br>4 Spectrus<br>0.68 dBm Offse                         | n 2 🛛                      | (40) //<br>Spectrum<br>RBW 10 MH          | / Mid    | dle c    | hann     | -         | • //      |
| 802.11<br>Spectrum 4 Spectrum<br>Ref Level 30.65 dBm Offse<br>Att 40 dB = SWT   | 1n(HT20) //  | Read<br>Middle c | hannel                    | *  | Spectrum<br>Ref Level 3<br>Att   | 802.11<br>4 Spectrus<br>0.68 dBm Offse                         | n 2 🛛                      | (40) //<br>Spectrum<br>RBW 10 MH          | / Mid    | dle c    | hann     | -         |           |
| 802.1<br>Spectrum 4 Spectrum<br>Ref Level 30.69 dbm Offsel<br>Att 40 db = SWT<br>SGL  | 1n(HT20) //  | Read<br>Middle c | hannel                    | *  | Spectrum<br>Ref Level 3<br>Att<br>SGL  | 802.11<br>4 Spectrus<br>0.68 dBm Offse                         | n 2 🛛                      | (40) //<br>Spectrum<br>RBW 10 MH          | / Mid    | dle c    | hann     | -         |           |
| 802.1<br>Spectrum 4 Spectrum<br>Ref Level 30.69 dbm Offsel<br>Att 40 db = SWT<br>SGL  | 1n(HT20) //  | Read<br>Middle c | hannel                    | *  | Spectrum<br>Ref Level 3<br>Att<br>SGL  | 802.11<br>4 Spectrus<br>0.68 dBm Offse                         | n 2 🛛                      | (40) //<br>Spectrum<br>RBW 10 MH          | / Mid    | dle c    | hann     | -         |           |
| Spectrum 4         Spectrum           Ref Level 30.69 dbm         Offsel           Att         40 db         SWT           SGL         •1Pk Max         •20 dbm   | 1n(HT20) //  | Read<br>Middle c | hannel                    | *  | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>9 1Pk Max<br>20 dBm   | 802.11<br>4 Spectrus<br>0.68 dBm Offse                         | n 2 🛛                      | (40) //<br>Spectrum<br>RBW 10 MH          | / Mid    | dle c    | hann     | -         |           |
| 802.1           Spectrum 4         Spectrum 6           Ref Level 30.60 dbm         Offser 40 db = sWT           SGL         40 db = sWT           SGL         10 dbm   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>P1Pk Max<br>20 d8m<br>10 d8m  | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| 802.1   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>9 IPk Max<br>20 dBm<br>10 dBm   | 802.11<br>4 Spectrus<br>0.68 dBm Offse                         | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| Spectrum 4         Spectrum           Ref Level 30.66 dbm         Offser           Att         40 db         SWT           SGL         10 dBm         10 dBm  | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>P1Pk Max<br>20 d8m<br>10 d8m  | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| 802.1   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>9 IPk Max<br>20 dBm<br>10 dBm   | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| Spectrum 4         Spectrum           Ref Level 30.60 dbm         Offser           Att         40 db         SWT           GL         40 db         SWT           91Pk Max         10 dBm         10 dBm           10 dBm         Substruction white         0 dBm  | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>10 dBm<br>10 dBm  | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| Spectrum 4         Spectrum           Ref Level 30.66 dbm         Offser           Att         40 db         SWT           SGL         40 db         SWT           9 IPk Max         10 dBm         In the set of the set o | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>10 dBm<br>10 dBm  | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        | <b>₩</b>  |
| Spectrum 4         Spectrum           Ref Level 30.69 dbm         Offsel           Att         40 db         SWT           SGL         91Pk Max         91Pk Max           20 dbm         91Pk Max         910 dbm           10 dbm         9 dbm         910 dbm           -10 dbm         9 dbm         910 dbm   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>10 dBm<br>-10 dBm<br>-10 dBm  | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        | <b>₩</b>  |
| Spectrum 4         Spectrum           Ref Level 30.69 dbm         Offsel           Att         40 db         SWT           SGL         10 km         10 dbm           10 dbm         odbm         -10 dbm   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>10 dBm<br>-10 dBm<br>-10 dBm  | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        | <b>₩</b>  |
| Spectrum 4         Spectrum           Ref Level 30.66 dbm         Offse att 40 db s sWT 5GL           PPP Max           20 dbm           10 dbm           -10 dbm           -20 dbm   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum           Ref Level 3           Att           SGL           9 1% Max           20 dBm           10 dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm                      | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| 802.1           Spectrum 4         Spectrum           Ref Level 30.68 dBm         Offse           Att         40 dB         SWT           5GL         10 HBm         10 dBm           10 dBm  | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>1Pk Max<br>20 dBm<br>10 dBm<br>-10 dBm<br>-20 dBm   | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| Spectrum 4         Spectrum           Ref Level 30.68 dbm         Offser           Att         40 db         SWT           Size         40 db         SWT           20 dbm         10 dbm         10 dbm           10 dbm   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>• 1Pk Max<br>20 dBm<br>10 dBm<br>-10 dBm<br>-20 dBm<br>-30 dBm<br>-30 dBm   | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| Spectrum 4         Spectrum           Ref Level 30.66 dbm         Offser           Att         40 db         SWT           SGL         10 dBm         10 dBm           10 dBm         -10 dBm         -10 dBm           -20 dBm         -30 dBm         -30 dBm   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum           Ref Level 3           Att           SGL           9 1% Max           20 dBm           10 dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm                      | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| 802.1           Spectrum 4         Spectrum           Ref Level 30.68 dBm         Offse           Att         40 dB =         SWT           91Pk Max         0         0           10 dBm         0         0           -10 dBm         -         -           -20 dBm         -         -           -30 dBm         -         -           -40 dBm         -         -   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum           Ref Level 3           Att           SGL           ● 1Pk Max           20 dBm           10 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        |           |
| 802.1           Spectrum 4         Spectrum           Ref Level 30.68 dBm         Offse           Att         40 dB = SWT           50L         B/DF Max           20 dBm         In dBm           10 dBm         In dBm           -10 dBm         In dBm           -20 dBm         In dBm           -30 dBm         In dBm           -50 dBm         In dBm  | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read<br>Middle C | hannel                    | (The second seco | Spectrum<br>Ref Level 3<br>Att<br>SGL<br>• 1Pk Max<br>20 dBm<br>10 dBm<br>-10 dBm<br>-20 dBm<br>-30 dBm<br>-30 dBm   | 802.11<br>5 Spectrum<br>40 db • SWT                            | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH | / Mide   | dle c    | hann     | el        | <b>₩</b>  |
| Spectrum 4         Spectrum           Ref Level 30.68 dbm         Offser           Att         40 db         SWT           Size         40 db         SWT           20 dbm         10 dbm         10 dbm           10 dbm   | 1n(HT20) //<br>m 2 ③ Spectrum 3<br>t 10.68 dB ● RBW 10 MHz<br>10 ms ● VBW 10 MHz | Read             | hannel                    | (The second seco | Spectrum           Ref Level 3           Att           SGL           ● 1Pk Max           20 dBm           10 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm | 802.1:<br><u>4 Spectrus</u><br><u>40 dB Offse</u><br>40 dB SWT | n 2 3)<br>t 10.68 dB 10 ms | <b>Spectrum</b><br>RBW 10 MH<br>VBW 10 MH |          | dle c    | hann     | el        |           |

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| Test results (Below 30 Ma | )               |
|---------------------------|-----------------|
| Mode:                     | 802.11b         |
| Distance of measurement:  | 3 meter         |
| Channel:                  | 01 (Worst case) |
|                           |                 |

| Frequency<br>(MLz) | Level<br>(dBµV) | Ant. Pol.<br>(H/V) | CF<br>(dB)      | F <sub>d</sub><br>(dB) | Field strength (dBµV/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |
|--------------------|-----------------|--------------------|-----------------|------------------------|-------------------------|-------------------|----------------|
|                    | (uDµV)          | (11/ )             | (00)            | (uD)                   | (uDµV/III)              | (uDµv/m)          | (00)           |
|                    |                 | No spurious er     | nissions were d | letected within        | 20 dB of the limit      | t                 |                |

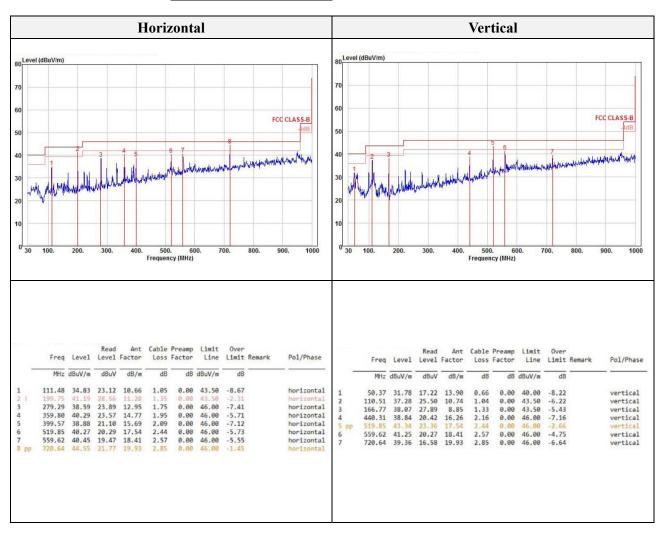
|  | Horizon  | tal                   |                          | Vertical  |  |                           |             |                                  |               |  |  |  |
|--|--|-----------------------|--------------------------|---|--|---------------------------|-------------|----------------------------------|---------------|--|--|--|
|  | 8  |                       |                          |   |  |                           |             |                                  |               |  |  |  |
| Ref Level 57.00 dBμV           Att         10 dB         SWT         13.4 m  | <ul> <li>RBW (6dB) 200 Hz</li> <li>VBW 3 kHz</li> </ul>        | Mode Auto FFT         |                          | Ref Level         57.00 dBµV         @ RBW         (6dB) 200 Hz           Att         10 dB         SWT 13.4 ms @ VBW         3 kHz         Mode Auto FFT   |  |                           |             |                                  |               |  |  |  |
| 1Pk Max  |  |                       |                          | 1Pk Max   |  |                           |             |                                  |               |  |  |  |
| 50 dBuV  |  | M1[1]                 | 8.72 dBpV<br>102.760 kHz | S0 dBuV   |  | M1[1]                     |             | 8.17 dB<br>102.970 k             |               |  |  |  |
|  |  |                       |                          | 50 0001   |  |                           |             | Г Г                              |               |  |  |  |
| 40 dBµV  |  |                       |                          | 40 dBµV   |  |                           | -           |                                  |               |  |  |  |
| 30 dBuV  |  |                       |                          | 30 dBuV   |  |                           |             |                                  |               |  |  |  |
|  |  |                       |                          |   |  |                           |             | тарана (1996)<br>Генерали (1996) |               |  |  |  |
| 20 dBµV  |  |                       |                          | 20 dBµV   |  |                           |             |                                  |               |  |  |  |
| 10 dBµV  |  | M1                    |                          | 10 dBuV-  |  |                           | Mi          |                                  |               |  |  |  |
|  | -antonimment   | an markan             | nummen                   | addien we polled about the  | nouter service and                             | mannorpe                  | mounder     | uppen per                        | munuber       |  |  |  |
| 0 dBµV   |  |                       |                          | 0 dBµV-   |  |                           |             |                                  |               |  |  |  |
| -10 dBµV   |  |                       |                          | -10 dBµV  |  |                           | -           |                                  |               |  |  |  |
| -20 dBuV   |  |                       |                          | -20 dBuV-   |  |                           |             |                                  |               |  |  |  |
| 20 0001  |  |                       |                          | 20 0001   |  |                           |             |                                  |               |  |  |  |
| -30 dBµV   |  |                       |                          | -30 dBµV  |  |                           |             |                                  |               |  |  |  |
| -40 dBuV   |  |                       |                          | -40 dBuV  |  |                           | _           |                                  |               |  |  |  |
| Start 9.0 kHz  | 691 pts  | - L                   | Stop 150.0 kHz           | Start 9.0 kHz   | - L. L.  | 691 pts                   | -           |                                  | Stop 150.0 kH |  |  |  |
| N1 1 102.76 k  | Response         I           Hz         8.72 dBμV              | Function<br>Neasuring | Function Result          | Type         Ref         Trc           N1         1           Spectrum         Spectrum   | Stimulus F<br>102.97 kHz                       | 8.17 dBµV                 | Measuri     | ng <b>48888</b>                  | •••           |  |  |  |
| NI         I         102.76 k           Spectrum         Spectrum 2         (           Ref Level         67.00 dBµV         (   | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Spectrum           Ref Level 67.00 dBμV   | ectrum 2 (R)                                   | (6dB) 9 kHz               |             | ng                               |               |  |  |  |
| NI         I         102.76 k           Spectrum         Spectrum 2         (           Ref Level         67.00 dBµV         Kt         I         10 dB         SWT 2.1 ms   | 8.72 dBμV  |                       | (IIIII) 🇰 🥠              | N1         1           Spectrum         Spectrum           Ref Level 67.00 dBμV   | 102.97 kHz                                     | (6dB) 9 kHz               |             | ng (#####                        |               |  |  |  |
| N1         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level         67.00 dBµV         Att           Att         10 dB         SWT 2.1 ms           1Pk Max         Image: Spectrum 2         (  | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Sp.           Ref Level 67.00 dBµV         10 dB           ● IPk Max         10 dB  | ectrum 2 (R)                                   | (6dB) 9 kHz               |             | ng (#####                        |               |  |  |  |
| NI         I         102.76 k           Spectrum         Spectrum 2         (           Ref Level         67.00 dBµV         Kt         I         10 dB         SWT 2.1 ms   | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Sp.           Ref Level         67.00         dBµV           Att         10 dB  | ectrum 2 (R)                                   | (6dB) 9 kHz               |             | ng                               |               |  |  |  |
| N1         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         Att         10 db           Att         10 db         SWT 2.1 ms           PIPk Max         Image: Spectrum 2         Image: Spectrum 2   | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Sp.           Ref Level 67.00 dBµV         10 dB           ● IPk Max         10 dB  | ectrum 2 (R)                                   | (6dB) 9 kHz               |             | ng                               |               |  |  |  |
| N1         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db         SWT 2.1 ms           Mt         10 db         SWT 2.1 ms           Mt         60 dbµV         50 dbµV   | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Sp           Ref Level 67.00 dbµV         0 db           Att         10 db           ●1Pk Max         60 dbµV           50 dbµV         50 dbµV   | ectrum 2 (R)                                   | (6dB) 9 kHz               |             |                                  |               |  |  |  |
| NI         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dBµV         10 dB         SWT 2.1 ms           B1Pk Max         60 dBµV         60 dBµV   | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Spectrum           Ref Level 67.00 dBµV         10 dB           e1rk Max         60 dBµV  | ectrum 2 (R)                                   | (6dB) 9 kHz               |             |                                  |               |  |  |  |
| N1         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dBµV         Att         10 dB           B1Pk Max         60 dBµV         60 dBµV           50 dBµV         40 dBµV         60 dBµV  | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Sp.           Ref Level 67.00 dBµV         Att           0 dBµV         50 dBµV           40 dBµV         40 dBµV   | ectrum 2 (R)                                   | (6dB) 9 kHz               |             | ng                               |               |  |  |  |
| NI         I         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         Att         10 db           Att         10 db         SWT 2.1 ms           D1Pk Max         60 dbµV         50 dbµV   | 8.72 dBμV  | Neasuring             | (IIIII) 🇰 🥠              | N1         1           Spectrum         Sp           Ref Level 67.00 dbµV         0 db           Att         10 db           ●1Pk Max         60 dbµV           50 dbµV         50 dbµV   | ectrum 2 (R)                                   | (6dB) 9 kHz               |             | ng                               |               |  |  |  |
| NI         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db SWT 2.1 ms           Att         10 db SWT 2.1 ms           \$0 dbµV         10 db SWT 2.1 ms   | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp.           Ref Level 67.00 dBµV         Att           10 dB         10 dB           0 dBµV         50 dBµV           40 dBµV         30 dBµV           20 dBµV         20 dBµV   | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  | [*            |  |  |  |
| NI         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db         SWT 2.1 ms           Mt         10 db         SWT 2.1 ms           10 db yv         40 dbµV         10 db           10 db yv         30 dbµV         10 db           10 db yv         10 db         10 db           10 db yv         10 db         10 db           10 dbµV         10 db         10 db           10 dbµV         10 dbµV         10 dbµV  | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp           Ref Level 67.00 dbµv         0 db           0 1Pk Max         0 dbµv           50 dbµv   | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  | [*            |  |  |  |
| NI         I         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         Att         10 dB           19k Max         10 dB         SWT 2.1 ms           10 dBµV         10 dB         SWT 2.1 ms           10 dBµV         10 dB         SWT 2.1 ms           10 dBµV         10 dB         Implementation           10 dBµV         10 dBµV         10 dBµV   | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp.           Ref Level 67.00 dBµV         Att           10 dB         10 dB           0 dBµV         50 dBµV           40 dBµV         30 dBµV           20 dBµV         20 dBµV   | ectrum 2 (R)                                   | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  |               |  |  |  |
| N1         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db SWT 2.1 ms           1Pk Max         10 db SWT 2.1 ms           10 dbµV         10 dbµV   | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp           Ref Level 67.00 dbµv         0 db           0 1Pk Max         0 dbµv           50 dbµv   | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  |               |  |  |  |
| NI         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db         SWT 2.1 ms           Att         10 db         SWT 2.1 ms           10 db UV         0 dbµV         0           00 dbµV         0         0           10 db UV         0         0           10 dbµV         0         0  | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp           Ref Level 67.00 dBµV         10 dB           0 Hk Max         60 dBµV           50 dBµV         30 dBµV           20 dBµV         30 dBµV           10 dBµV         10 dBµV           0 dBµV         10 dBµV           0 dBµV         10 dBµV           0 dBµV         10 dBµV                         | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  |               |  |  |  |
| N1         1         102.76 k           ipectrum         Spectrum 2         (           icert Level 67.00 dbµ/<br>Nt         10 db         SWT 2.1 ms           0 dbµ/         0 dbµ/         0           0 dbµ/         0         0  | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp.           Ref Level 67.00 dbµV         Att           10 db         10 db           11 k         Max           60 dbµV         40 dbµV           30 dbµV         30 dbµV           20 dbµV         10 dbµV           10 dbµV         10 dbµV   | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  |               |  |  |  |
| NI         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db         SWT 2.1 ms           19k Max         10 db         SWT 2.1 ms           19k Max         10 db         SWT 2.1 ms           10 dbµV         10 db         SWT 2.1 ms           19k Max         10 db         SWT 2.1 ms           10 dbµV         10 db         10 db           10 dbµV         10 dbµV         10 dbµV           10 dbµV         10 dbµV         10 dbµV           10 dbµV         10 dbµV         10 dbµV  | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp.           Ref Level 67.00 dbµV         0 db           0 19k Max         60 dbµV           50 dbµV         -           40 dbµV         -           30 dbµV         -           20 dbµV         -           0 dbµV         -           10 dbµV         -           10 dbµV         -           -10 dbµV         - | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  |               |  |  |  |
| NI         1         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db SWT 2.1 ms           19k Max         10 db SWT 2.1 ms           19k Max         0 dbµV           0 dbµV         0           10 dbµV         10 dbµV  | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp           Ref Level 67.00 dBµV         10 dB           0 Hk Max         60 dBµV           50 dBµV         30 dBµV           20 dBµV         30 dBµV           10 dBµV         10 dBµV           0 dBµV         10 dBµV           0 dBµV         10 dBµV           0 dBµV         10 dBµV                         | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  |               |  |  |  |
| NI         I         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         I         I           Att         10 db wY         I           1Pk Max         I0 db wY         I           I0 dbµV         I         I | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp.           Ref Level 67.00 dbµV         0 db           0 19k Max         60 dbµV           50 dbµV         -           40 dbµV         -           30 dbµV         -           20 dbµV         -           0 dbµV         -           10 dbµV         -           10 dbµV         -           -10 dbµV         - | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  | [*            |  |  |  |
| NI         I         102.76 k           Spectrum         Spectrum 2         (           Ref Level 67.00 dbµV         10 db         SWT 2.1 ms           att         10 db         SWT 2.1 ms           b1Pk Max         60 dbµV         40 dbµV           30 dbµV         20 dbµV         20 dbµV  | B.72 dBµV      BW (6dB) 9 kHz      VBW 100 kHz M      DO kHz M | Neasuring             |                          | N1         1           Spectrum         Sp.           Ref Level 67.00 dbµV         Att           10 db         10 db           9 1Pk Max         60 dbµV           50 dbµV         40 dbµV           30 dbµV         20 dbµV           10 dbµV         0 dbµV           10 dbµV         -10 dbµV           -10 dbµV         -20 dbµV                        | 102.97 kHz<br>ectrum 2 (E)<br>SWT 2.1 ms = VBW | (6d8) 9 kHz<br>100 kHz Me | de Auto FFT |                                  |               |  |  |  |



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| Test results (Below 1 000 | Mb) – Worst case |
|---------------------------|------------------|
| Mode:                     | 802.11b          |

Distance of measurement:3 meterChannel:01 (Worst case)





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# Test results (Above 1 000 MHz)

| Mode:                    | 802.11b |
|--------------------------|---------|
| Distance of measurement: | 3 meter |
| Channel:                 | 01      |

| - Spurio           | us              |             |                    |            |             |                            |                   |                |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mbz) | Level<br>(dBµN) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |
| 1079.60            | 53.30           | Peak        | Н                  | -8.63      | -           | 44.67                      | 74.00             | 29.33          |
| 1374.80            | 49.69           | Peak        | Н                  | -6.74      | -           | 42.95                      | 74.00             | 31.05          |
| 1015.90            | 53.58           | Peak        | V                  | -9.04      | -           | 44.54                      | 74.00             | 29.46          |
| 1736.60            | 53.46           | Peak        | V                  | -3.68      | -           | 49.78                      | 74.00             | 24.22          |

#### Band edge

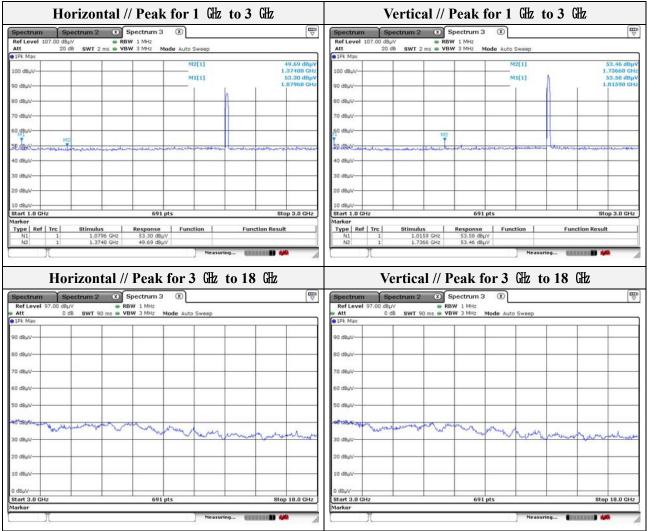
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| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµN/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 2341.07            | 47.68           | Peak        | Н                  | -0.31      | -           | 47.37                      | 74.00             | 26.63          |
| 2352.19            | 46.55           | Peak        | V                  | -0.29      | -           | 46.26                      | 74.00             | 27.74          |

| Spectrum           | S       | ectrum 2 🛛 🛞            | )                         |               |          | ta a a a a a a a a a a a a a a a a a a | Spectrum    | Sp   | ectrum 2 💌           |                          |                      |        |             |            |
|--------------------|---------|-------------------------|---------------------------|---------------|----------|--|-------------|--|----------------------|--------------------------|----------------------|--------|-------------|------------|
| Ref Level 1<br>Att |         |                         | RBW 1 MHz<br>VBW 3 MHz Mo |               |          |  | Ref Level   |  | dB SWT1ms ■ V        | BW 1 MHz                 |                      |        |             |            |
| 1Pk Max            | 10      | OB SWI 1 ms             | VBW 3 MH2 MO              | de Auto Sweep |          |  | 1Pk Max     | 10   | db SWI 1 ms 🖷 V      | BW 3 MH2 MO              | de Auto Sweep        |        |             |            |
|                    |         |                         |                           | M3[1]         | -        | 47.68 d8µV                             |             |  |                      |                          | M3[1]                | -      |             | 46.55 dBp  |
| Vu8b 00            |         |                         |                           |               |          | 2.341070 GHz                           | 100 d8µV    |  |                      | + +                      |                      |        | 2           | 353190-0   |
|                    |         |                         |                           | M1[1]         |          | 43.88 dBpV<br>2.3/0000 GHz             |             |  |                      |                          | M1[1]                |        | 4           | 44.20 dB   |
| dBµV-              |         |                         |                           | 1             | T E      | 2.310000 012                           | 90 dBµV     |  |                      |                          | 1                    | T.     | 1 7         | .310000 G  |
| dBuy               |         |                         |                           |               | _        |  | 80 dBuV     |  |                      |                          |                      | _      |             | _          |
|                    |         |                         |                           |               |          |  |             |  |                      |                          |                      |        | 1 1         |            |
| dBuV               |         |                         |                           |               | _        |  | 70 dBµV     |  |                      |                          |                      | _      |             |            |
| 10000              |         |                         |                           |               |          |  | 10000000    |  |                      |                          |                      |        | 1           |            |
| dBuV               |         |                         |                           |               |          |  | 60 dBµV     |  |                      |                          |                      |        |             |            |
| D dBuV             |         | M3                      |                           |               |          |  | 50 dBuV     |  |                      | M3                       |                      | 1.000  | were        |            |
| MIT                |         | wanter                  | mansammen                 |               | ME       | N                                      | So dop 1    | A Lenning of Control o | and a come when      | un horner                | alisten and a second | manter | 1           |            |
| dBuV               | user of | Trade and the second    |                           |               |          |  | 40 dBµV     |  |                      |                          |                      |        | -           | +          |
| 0.000              |         |                         |                           |               |          |  |             |  |                      |                          |                      |        |             |            |
| dBµV               |         |                         |                           |               |          |  | 30 dBµV     |  |                      |                          |                      |        | -           |            |
| dBuV-              |         |                         |                           |               |          |  | 20 dBuV     |  |                      |                          |                      |        |             |            |
| ophy               |         |                         |                           |               | F2       |  | 20 0000     |  |                      |                          |                      | F2     |             |            |
| dBuV F1            |         |                         |                           |               |          |  | 10 dBuV     |  |                      | + +                      |                      |        |             |            |
| art 2.3 GH         | z       |                         | 691 pt                    | 0             |          | Stop 2.42 GHz                          | Start 2.3 G | Hz   |                      | 691 pts                  | 0                    |        | Ste         | op 2.42 GH |
| rker               |         |                         | 8 <sup>10</sup> 1         | 131           |          |  | Marker      | 84 - 194 -   |                      |                          |                      |        |             |            |
| ype Ref            |         | Stimulus                | Response                  | Function      | Function | on Result                              | Type Ref    |  | Stimulus             | Response                 | Function             | Fu     | nction Resu | ilt        |
| N1 N2              | 1       | 2.31 GHz<br>2.39 GHz    | 43.88 dBµV<br>42.78 dBµV  |               |          |  | N1<br>N2    | 1  | 2.31 GHz<br>2.39 GHz | 44.20 dBµV<br>45.46 dBµV |                      |        |             |            |
| N2<br>N3           | 4       | 2.39 GHz<br>2.34107 GHz | 47.68 dBµV                |               |          |  | N2<br>N3    | 1  | 2.35219 GHz          | 46.55 dBµV               |                      |        |             |            |

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Note.

1. No spurious emission were detected above 3 GHz.

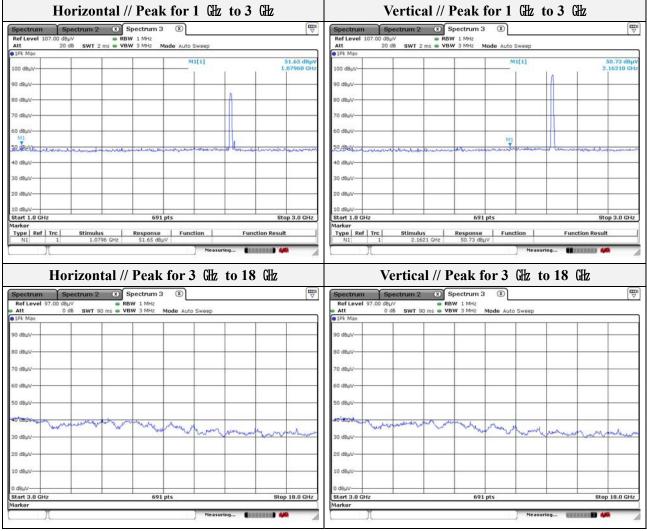


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| Mode:                    | 802.11b |
|--------------------------|---------|
| Distance of measurement: | 3 meter |
| Channel:                 | 06      |

#### - Spurious

| - Spurio          | Jus             |             |                    |            |             |                            |                   |                |
|-------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµN/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
| 1079.60           | 51.65           | Peak        | Н                  | -8.63      | -           | 43.02                      | 74.00             | 30.98          |
| 2162.10           | 50.73           | Peak        | V                  | -0.65      | -           | 50.08                      | 74.00             | 23.92          |



#### Note.

1. No spurious emission were detected above 3 GHz.

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| Mode:                    | 802.11b |
|--------------------------|---------|
| Distance of measurement: | 3 meter |
| Channel:                 | 11      |

#### - Spurious

| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 1079.60            | 53.51           | Peak        | Н                  | -8.63      | -           | 44.88                      | 74.00             | 29.12          |
| 2350.20            | 51.25           | Peak        | V                  |            | -           |                            | 74.00             |                |

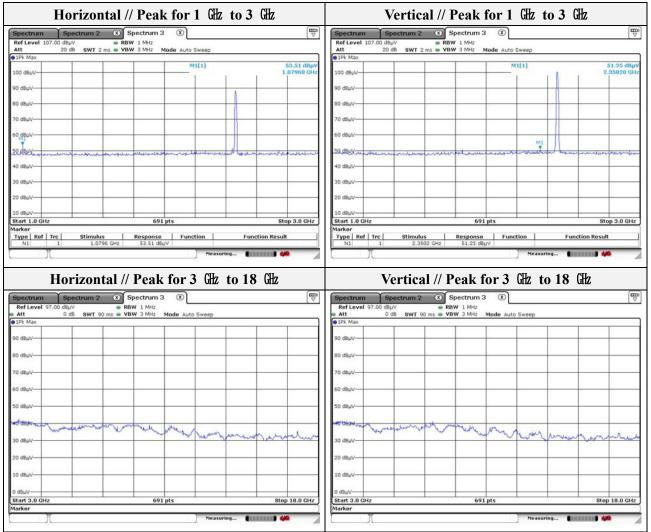
#### - Band edge

| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 2492.01            | 43.96           | Peak        | Н                  | -0.03      | -           | 43.93                      | 74.00             | 30.07          |
| 2484.48            | 45.62           | Peak        | V                  | -0.04      | -           | 45.58                      | 74.00             | 28.42          |

| Spectrum<br>Ref Level 10<br>Att | Spectr    |              |              |               |          |                             | 1.24        |           |               |             |                 |           |                         |
|---------------------------------|-----------|--------------|--------------|---------------|----------|-----------------------------|-------------|-----------|---------------|-------------|-----------------|-----------|-------------------------|
|                                 |           |              |              |               |          |                             |             | n St      | ectrum 2 🛞    | Spectrum 3  | ×               |           |                         |
| Att                             | 7.00 dBµV | - 1          | RBW 1 MHz    |               |          |                             | Ref Leve    | 107.00 dt | auv e         | RBW 1 MHz   |                 |           |                         |
|                                 | 10 dB     | SWT 1 ms .   | VBW 3 MHz Mo | de Auto Sweep |          |                             | Att         | 10        | dB SWT 1 ms . | BW 3 MHz Mo | de Auto Sweep   |           |                         |
| 1Pk Max                         |           |              |              |               |          |                             | IPk Max     |           |               |             |                 |           |                         |
| 100 d8uV-                       |           |              |              | M3[1]         |          | 43.96 dBpV<br>2.4920060 GHz | 100 daw     |           |               |             | M3[1]           |           | 45.62 dt<br>2.4844800 ( |
| 100 0800-                       |           |              |              | M1[1]         |          | 42.26 dBµV                  | 100 0014    | -         |               |             | M1[1]           |           | 2.4844800 0<br>45.61 df |
| 90 dBuV                         |           |              |              | - out 1       |          | 2.4835000 GHz               | 90 dBuV-    | 1         |               |             |                 |           | 2.4835000 0             |
| min                             | -         |              |              | 1 1           | 1        |                             |             |           |               |             | 1               | E 1       |                         |
| Nueb 08                         | 1         |              |              |               |          | -                           | 80 d8µV     |           |               |             |                 |           |                         |
| 252                             |           |              |              |               |          |                             |             |           |               |             |                 |           |                         |
| 70 dBuV                         | 1         |              |              |               |          |                             | 70 dBµV     |           |               |             |                 | -         |                         |
|                                 |           |              |              |               |          |                             | 0.000000000 |           |               |             |                 |           |                         |
| 0 dBµV-                         |           |              |              |               |          | -                           | 60 dBµV     |           |               | -           |                 |           | -                       |
|                                 |           |              |              |               |          |                             |             |           | Juena         |             |                 |           |                         |
| 50 dBµV                         |           | 1            | 141          | M3            | N        | 2                           | 50 dBµV-    | -         |               |             | 2               |           | M2                      |
| 40 dBuV                         |           | manterio     | manuelina    | mennereles    | Mamorane | Lisnewermon                 | 40 d8uV-    |           |               |             | menderandrander | manunchan | mannen                  |
| +U dBUV                         |           |              |              |               |          |                             | 40 08µV     |           |               |             |                 |           |                         |
| 30 dBuV                         |           |              |              |               |          | -                           | 30 dBuV-    | -         |               |             |                 | -         |                         |
| io oupre                        |           |              |              |               |          |                             | 20 0004     |           |               |             |                 |           |                         |
| 20 d8µV                         |           |              |              |               |          |                             | 20 d8µV     |           |               |             |                 |           |                         |
| 10.000                          |           |              |              |               | F        | 2                           | 1000        |           |               | F1          |                 |           | F2                      |
| 10 dBµV                         |           |              | F1           |               |          |                             | 10 dBµ√     |           |               | F1          |                 | -         |                         |
| CF 2.4835 GH                    |           |              | 691 pts      |               |          | Span 50.0 MHz               | CF 2.4835   | GHz       |               | 691 pt      | s               |           | Span 50.0 M             |
| larker                          |           |              |              |               |          |                             | Marker      |           |               |             |                 |           |                         |
| Type   Ref   1                  | inc St    | timulus      | Response     | Function      | Function | n Result                    | Type   Re   | f Trc     | Stimulus      | Response    | Function        | Fund      | tion Result             |
| N1                              | 1         | 2,4835 GHz   | 42.26 dBµV   |               |          |                             | N1          | 1         | 2.4835 GHz    | 45.61 dBµV  |                 |           |                         |
| N2                              | 1         | 2.5 GHz      | 42.73 dBµV   |               |          |                             | N2          | 1         | 2.5 GHz       | 44.53 dBµV  |                 |           |                         |
| N3                              | 1         | 2.492006 GHz | 43.96 dBµV   |               |          |                             | N3          | 1         | 2.48448 GHz   | 45.62 dBµV  |                 |           |                         |

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Note.

1. No spurious emission were detected above 3 GHz.



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| Mode:                    | 802.11g |
|--------------------------|---------|
| Distance of measurement: | 3 meter |
| Channel:                 | 01      |

#### - Spurious

| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 1079.60            | 50.27           | Peak        | Н                  | -8.63      | -           | 41.64                      | 74.00             | 32.36          |
| 1079.60            | 50.34           | Peak        | V                  | -8.63      | -           | 41.71                      | 74.00             | 32.29          |

#### Band edge

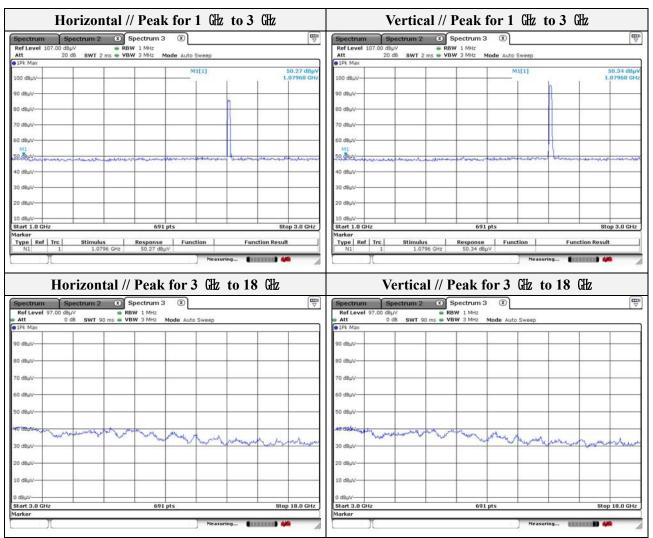
| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµN/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 2341.42            | 45.86           | Peak        | Н                  | -0.31      | -           | 45.55                      | 74.00             | 28.45          |
| 2359.83            | 48.71           | Peak        | V                  | -0.28      | -           | 48.43                      | 74.00             | 25.57          |

| spectrum S  | pectrum 2 🛞             |                 |                            | Spectrum Sp  | pectrum 2 (*)   |                |                     |                | 9                      |
|---|-------------------------|-----------------|----------------------------|--|-----------------|----------------|---------------------|----------------|------------------------|
| Ref Level 107.00 d  |                         |                 |                            | Ref Level 107.00 di  |                 | BW 1 MHz       |                     |                |                        |
|   | dB SWT 1 ms 🖷 VBW 3 MHz | Mode Auto Sweep |                            |  | dð SWT 1 ms 🖷 V | BW 3 MHz Mod   | e Auto Sweep        |                |                        |
| 1Pk Max   |                         |                 |                            | <ul> <li>1Pk Max</li> </ul>  |                 |                |                     |                |                        |
| 00 d8uv   |                         | M3[1]           | 45.86 d8µV<br>2.341420 GHz | 100 d8uV   |                 |                | M3[1]               |                | 48.71 dB<br>2.359830 G |
| UU dahA   |                         | M1[1]           | 42.78 dBµV                 | 100 0804   |                 |                | M1[1]               |                | 2.359830 0             |
| 0 dBuV  |                         | and al          | 2.310000 GHz               | 90 dBuV  |                 |                | seaf 11             |                | 2.310000 G             |
| 0 00011   |                         | E E             | mounter                    | 10 0001  |                 |                | E                   | E E            | 1                      |
| 0 dBuV  |                         |                 | 1                          | 80 dBuV  |                 |                |                     |                |                        |
|   |                         |                 | 1                          | and the second sec |                 |                |                     |                | 1                      |
| dBuV-   |                         |                 |                            | 70 dBµV-   |                 |                |                     |                |                        |
| Lange and the second |                         |                 |                            | COLUMN TO A  |                 |                |                     |                | 1                      |
| dBuV  |                         |                 |                            | 60 d8µV  |                 |                |                     |                | 1                      |
| e anos e  | 1.100                   |                 |                            |  |                 | MB             |                     | and the second |                        |
| 0 dBµV  | T                       |                 | M2 N                       | 50 dBµV  |                 | 1 in the       |                     | THAT I         |                        |
| dBuV  | have made and the mount |                 | -James                     | 40 dBuV  | have been and   | as manufacture | contraction and the | mum            |                        |
| o oppo  |                         |                 |                            | 40 0800  |                 |                |                     |                |                        |
| ) dBuV  |                         |                 |                            | 30 dBuV  |                 |                |                     |                |                        |
| r oopri   |                         |                 |                            | 00 0001  |                 |                |                     |                |                        |
| ) dBµV  |                         |                 |                            | 20 dBµV  |                 | + +            |                     | + + +          |                        |
| E.  |                         |                 | F2                         | 1  |                 |                |                     | F2             |                        |
| dBuV  |                         | + + +           | +                          | 10 dBµV  |                 | + +            |                     |                |                        |
| tart 2.3 GHz  | 69                      | 1 pts           | Stop 2.42 GHz              | Start 2.3 GHz  |                 | 691 pts        | 0                   |                | Stop 2.42 G            |
| orker   |                         | <sup>10</sup>   |                            | Marker   |                 |                | - Wit-              |                | 100 M                  |
| ype Ref Trc   | Stimulus Response       |                 | Function Result            | Type Ref Trc   | Stimulus        | Response       | Function            | Functio        | n Result               |
| N1 1<br>N2 1  | 2.31 GHz 42.78 d        |                 |                            | N1 1   | 2.31 GHz        | 43.78 dBµV     |                     |                |                        |
|   | 2.39 GHz 43.65 d        |                 |                            | N2 1   | 2.39 GHz        | 46.23 dBµV     |                     |                |                        |



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Note.

1. No spurious emission were detected above 3 GHz.

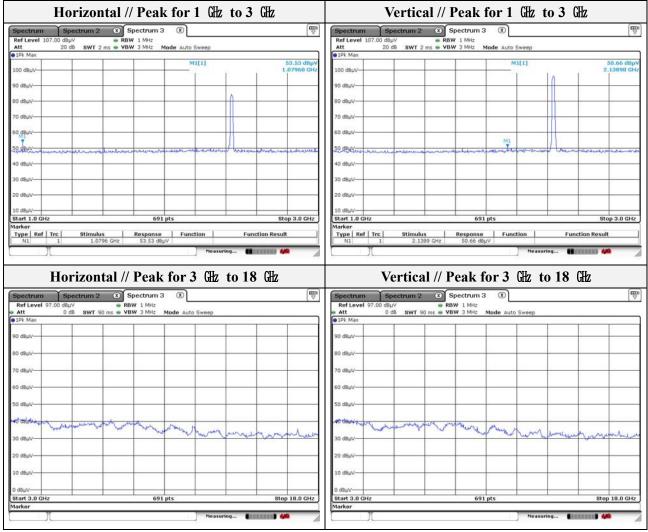


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| Mode:                    | 802.11g |
|--------------------------|---------|
| Distance of measurement: | 3 meter |
| Channel:                 | 06      |

#### - Spurious

| - spurio           | Jus             |             |                    |            |             |                            |                   |                |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
| 1079.60            | 53.53           | Peak        | Н                  | -8.63      | -           | 44.90                      | 74.00             | 29.10          |
| 2138.90            | 50.66           | Peak        | V                  | -0.70      | -           | 49.96                      | 74.00             | 24.04          |



Note.

1. No spurious emission were detected above 3 GHz.

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| Mode:                    | 802.11g |
|--------------------------|---------|
| Distance of measurement: | 3 meter |
| Channel:                 | 11      |

#### - Spurious

| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 1079.60            | 52.99           | Peak        | Н                  | -8.63      | -           | 44.36                      | 74.00             | 29.64          |
| 1340.10            | 49.33           | Peak        | V                  | -6.96      | -           | 42.37                      | 74.00             | 31.63          |

#### - Band edge

| Bana e            |                 |             |                    |            |             |                            |                   |                |
|-------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mb) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
| 2485.71           | 43.71           | Peak        | Н                  | -0.04      | -           | 43.67                      | 74.00             | 30.33          |
| 2485.06           | 50.92           | Peak        | V                  | -0.04      | -           | 50.88                      | 74.00             | 23.12          |

| pectrum          | Spectrum 2 🛞          | Spectrum 3     |            |          |                             | Spectrum    | Sp        | ectrum 2 🛞            | Spectrum 3               | X             |          | ſ                       |
|------------------|-----------------------|----------------|------------|----------|-----------------------------|-------------|-----------|-----------------------|--------------------------|---------------|----------|-------------------------|
| Ref Level 107.00 |                       | RBW 1 MHz      |            |          |                             | Ref Level   | 107.00 dE |                       | BW 1 MHz                 |               |          |                         |
|                  | 10 dB SWT 1 ms 🖷      | VBW 3 MHz Mode | Auto Sweep |          |                             | Att         | 10        | dB SWT 1 ms 🖷 V       | BW 3 MHz Mo              | de Auto Sweep |          |                         |
| 1Pk Max          |                       |                |            |          |                             | 1Pk Max     |           |                       |                          |               |          |                         |
| -Vueb 00         |                       |                | M3[1]      |          | 43.71 d8µV<br>2.4857110 GHz | 100 d8µV    |           |                       |                          | M3[1]         |          | 50.92 d8<br>2.4850590 G |
| 0 dBµV           |                       | _              | M1[1]      |          | 43.27 dBµV<br>2.4835000 GHz | 90 dBµV     |           |                       |                          | M1[1]         |          | 45.90 d8<br>2.4835000 0 |
| 0 dBµV           | m                     |                |            |          |                             | 80 d8µV     |           |                       |                          |               |          |                         |
| 0 dBµV           |                       |                | _          |          |                             | 70 dBµV     |           | 1                     |                          |               |          |                         |
| dBµV             | - \                   | _              | _          |          |                             | 60 dBµV     |           | br                    |                          |               |          |                         |
| ) dBµV           | h                     | Ma Ma          |            | M2       |                             | 50 dBµV     |           | - Un                  | March 1 111              | 13 Indered    |          | Mp                      |
| dBµV             |                       | Ma MI MI       | werename   | marine   | -                           | 40 dBµV     |           |                       |                          | marga whom    | harmound | and the second star     |
| dBµV             |                       |                |            |          |                             | 30 dBµV     |           |                       | -                        |               | -        |                         |
| dBµV             |                       |                | _          | F2       |                             | 20 dBµV     |           |                       |                          |               | -        | F2                      |
| 0 dBµV           |                       | F1             |            |          |                             | 10 dBµV-    |           |                       | F1                       |               |          |                         |
| F 2.4835 GHz     |                       | 691 pts        |            |          | Span 50.0 MHz               | CF 2.4835 0 | Hz        |                       | 691 pt:                  | s             |          | Span 50.0 MH            |
| orker            |                       |                |            |          |                             | Marker      |           |                       |                          |               |          |                         |
| ype Ref Trc      | Stimulus              |                | Function   | Function | Result                      | Type Ref    | Trc       | Stimulus              | Response                 | Function      | Functi   | ion Result              |
| N1 1<br>N2 1     | 2.4835 GHz<br>2.5 GHz |                |            |          |                             | N1<br>N2    | 1         | 2.4835 GHz<br>2.5 GHz | 45.90 dBµV<br>43.57 dBµV |               |          |                         |
| N3 1             | 2.485711 GHz          |                |            |          |                             | N3          | 1         | 2.485059 GHz          | 50.92 dBµV               |               |          |                         |

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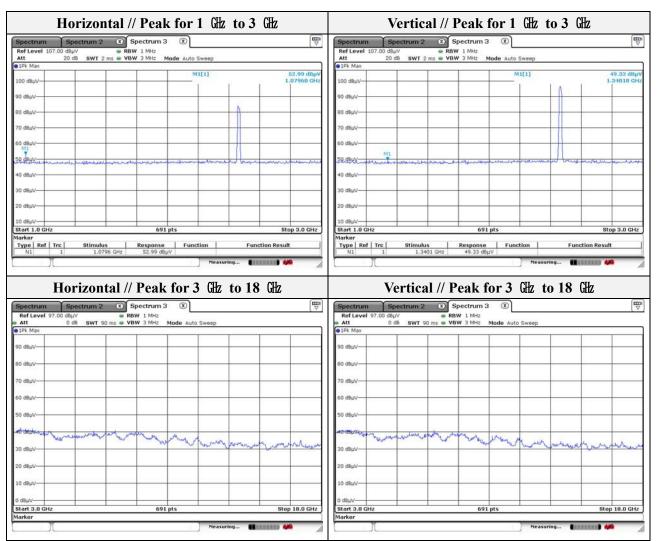


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Test report No.: KES-RF-17T0041 Page (33 ) of (53)



Note.

1. No spurious emission were detected above 3 GHz.



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| Mode:                    | 802.11n(HT20) |
|--------------------------|---------------|
| Distance of measurement: | 3 meter       |
| Channel:                 | 01            |

# - Spurious

| Spurio             | us              |             |                    |            |             |                            |                   |                |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµN/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |
| (1112)             | $(uD\mu i)$     |             | (11/7)             | (00)       | (uD)        | (uDµi/m)                   | (uDµ1/m)          | (00)           |
| 1079.60            | 53.95           | Peak        | Н                  | -8.63      | -           | 45.32                      | 74.00             | 28.68          |

#### - Band edge

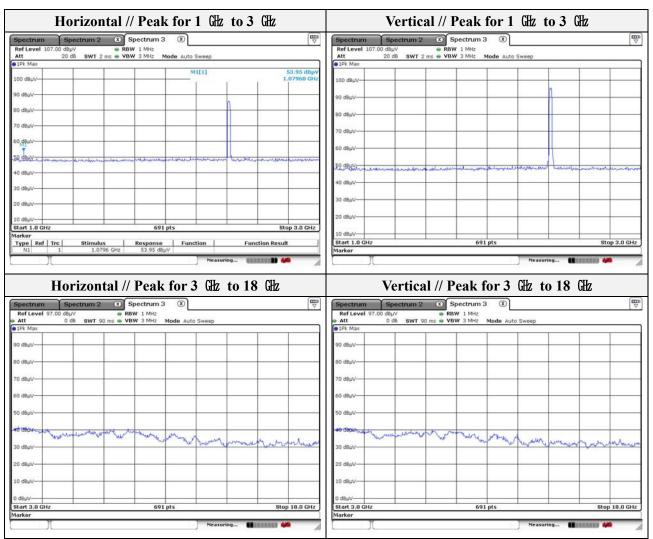
| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 2341.42            | 47.01           | Peak        | Н                  | -0.31      | -           | 46.70                      | 74.00             | 27.30          |
| 2359.83            | 50.25           | Peak        | V                  | -0.28      | -           | 49.97                      | 74.00             | 24.03          |

| Spectrum S  | ectrum 2 🛛 🕱     |   |               | um<br>⊽         | Spectrum S   | pectrum 2 🛛 🙁           |   |                |        |               |
|---|------------------|---|---------------|-----------------|--|-------------------------|---|----------------|--------|---------------|
| Ref Level 107.00 d  |                  | W 1 MHz                                 |               | 10.000 P        | Ref Level 107.00 d   |                         | BW 1 MHz                                |                |        |               |
| Att 10<br>1Pk Max   | dB SWT 1 ms 🖷 VB | W 3 MHz Mod                             | le Auto Sweep |                 | Att 10   | dB SWT 1 ms 🖷 V         | BW 3 MHz Mod                            | e Auto Sweep   |        |               |
| THK MAX   |                  |   | M3[1]         | 47.01 d8µV      | The max  |                         |   | M3[1]          |        | 50.25 dBu     |
| VUED DOL  |                  |   | ma[1]         | 2,341420 GHz    | 100 d8µV   |                         | 1 I I I I I I I I I I I I I I I I I I I | onatri         |        | 2.359830 GH   |
| 00 0000   |                  |   | M1[1]         | 43.01 dBuV      | 100 0004   |                         |   | M1[1]          |        | ANTIS 04 000  |
| O dBuV  |                  | 1 I I I I I I I I I I I I I I I I I I I |               | 2.310000 GHz    | 90 d8uV  |                         | -                                       |                |        | 2.310000 GH   |
| 0.000   |                  | I I                                     | E E           | mound           |  |                         |   |                | T E    |               |
| 0 dBuV  |                  |   |               |                 | 80 dBuV  |                         |   |                |        |               |
| and a second  |                  | I I                                     |               |                 | and the second sec |                         |   |                |        |               |
| 0 dBµV  | <u> </u>         | +                                       |               |                 | 70 dBµV-   | +                       | +                                       |                | + +    |               |
| Constanting of the second s |                  |   |               |                 | 200400202  |                         |   |                |        |               |
| 0 dBµV  |                  |   |               |                 | 60 dBµV  | + +                     |   |                |        | 1             |
| Statute 1   | 145              |   |               |                 | 100 100 10   |                         | MB                                      |                | MR. No | P             |
| i0 dBµV   | 7.               |   |               | MR walk         | 50 dBµV  |                         | 1                                       |                | 1      |               |
| 10 dBuV   | mennenter        | muchander                               | announa man   | merth           | 40 dBuV  | the second register and | marchan a                               | and a superior | Las .  |               |
| 0 0800  |                  |   |               |                 | 40 0800  |                         |   |                |        |               |
| O dBuV  |                  |   |               |                 | 30 dBuV  |                         |   |                |        |               |
| o oppy  |                  |   |               |                 | 30 0004  |                         |   |                |        |               |
| O dBuV  |                  |   |               |                 | 20 dBuV  |                         |   |                |        |               |
|   |                  |   |               | F2              |  |                         |   |                | F2     |               |
| LO dBuy   |                  |   |               |                 | 10 dBµV  |                         |   |                | ++++   |               |
| Start 2.3 GHz   |                  | 691 pts                                 |               | Stop 2.42 GHz   | Start 2.3 GHz  |                         | 691 pts                                 | 0              |        | Stop 2.42 GHz |
| larker  |                  |   | 700           |                 | Marker   |                         |   | - A21          |        |               |
| Type   Ref   Trc  | Stimulus         | Response                                | Function      | Function Result | Type   Ref   Trc   | Stimulus                | Response                                | Function       | Functi | on Result     |
|   | 2.31 GHz         | 43.01 dBµV                              |               |                 | N1 1   | 2.31 GHz                | 43.04 dBµV                              |                |        |               |
| N1 1<br>N2 1  | 2.39 GHz         | 42.78 dBuV                              |               |                 |  | 2.39 GHz                | 48.59 dBuV                              |                |        |               |



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Note.

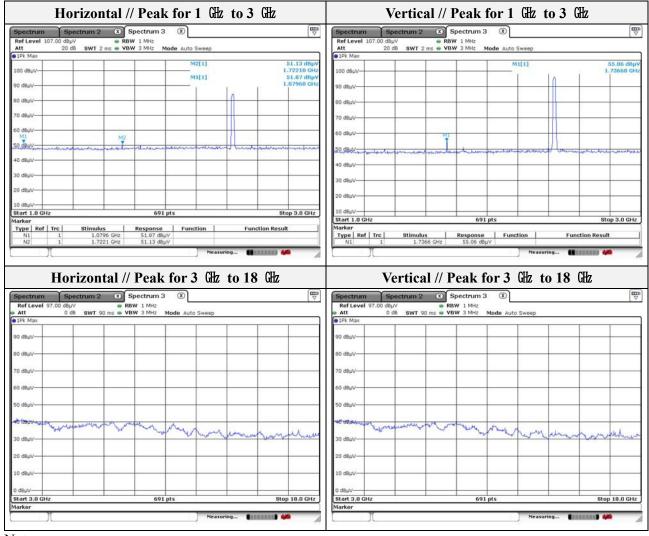
1. No spurious emission were detected above 3 GHz.



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| Mode:                    | 802.11n(HT20) |
|--------------------------|---------------|
| Distance of measurement: | 3 meter       |
| Channel:                 | 06            |

| - Spurio           | us              |             |                    |            |             |                            |                   |                |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mbz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
| 1079.60            | 51.87           | Peak        | Н                  | -8.63      | -           | 43.24                      | 74.00             | 30.76          |
| 1722.10            | 51.13           | Peak        | Н                  | -3.82      | -           | 47.31                      | 74.00             | 26.69          |
| 1736.60            | 55.06           | Peak        | V                  | -3.68      | -           | 51.38                      | 74.00             | 22.62          |



#### Note.

1. No spurious emission were detected above 3 GHz.

2. Average test would be performed if the peak result were greater than the average limit.

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Test report No.: KES-RF-17T0041 Page (37 ) of (53)

| Mode:                    | 802.11n(HT20) |
|--------------------------|---------------|
| Distance of measurement: | 3 meter       |
| Channel:                 | 11            |

# - Spurious

| Frequency<br>(Mz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµN/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |
|-------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 1079.60           | 53.42           | Peak        | Н                  | -8.63      | -           | 44.79                      | 74.00             | 29.21          |
| 1079.60           | 50.32           | Peak        | V                  | -8.63      | -           | 41.69                      | 74.00             | 32.31          |

# - Band edge

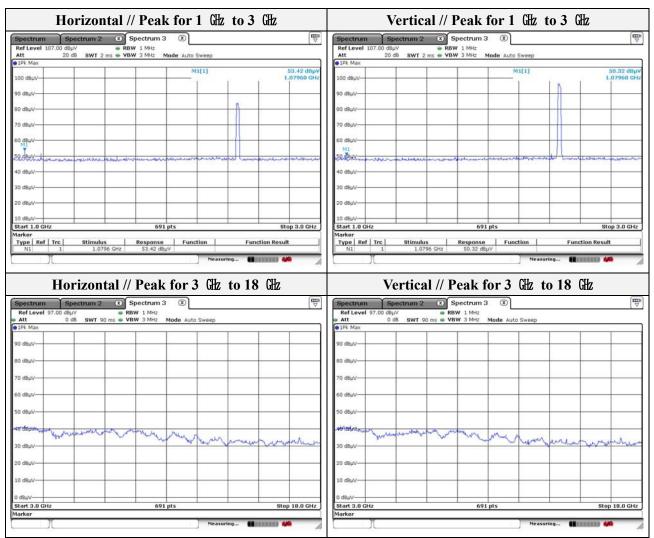
| Bana e            |                 |             |                    |            |             |                            |                   |                |
|-------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mb) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
| 2484.12           | 44.15           | Peak        | Н                  | -0.04      | -           | 44.11                      | 74.00             | 29.89          |
| 2484.63           | 47.23           | Peak        | V                  | -0.04      | -           | 47.19                      | 74.00             | 26.81          |

| Spectrum     | Spectrum  | 2 🗷 5               | pectrum 3                | x              |            |   | Spectrum   | S         | pectrum 2 🛞           | Spectrum 3               | X             |                  | ſ                                   |
|--------------|-----------|---------------------|--------------------------|----------------|------------|---|------------|-----------|-----------------------|--------------------------|---------------|------------------|-------------------------------------|
| Ref Level 10 | .00 dBµV  |                     | W 1 MHz                  |                |            |   | Ref Level  | 107.00 dt |                       | RBW 1 MHz                |               |                  |                                     |
| Att          | 10 dB SW1 | 1 ms 🖷 VB           | W 3 MHz Mor              | de Auto Sweep  |            |   | Att        | 10        | dB SWT 1 ms 🖷         | VBW 3 MHz Mo             | de Auto Sweep |                  |                                     |
| 1Pk Max      |           |                     |                          |                |            |   | 1Pk Max    |           |                       |                          |               |                  |                                     |
| 00 d8µV      |           |                     |                          | M3[1]<br>M1[1] |            | 44.15 dBµV<br>2.4841190 GHz<br>42.86 dBµV | 100 dBµV-  | www       |                       |                          | M3[1]         |                  | 47.23 d8<br>2.4846250 G<br>46.42 d8 |
| 0 dBµV       |           | -                   |                          |                | E          | 2.4835000 GHz                             | 90 dBµV    |           | - M                   | -                        |               | E E              | 2.4835000 G                         |
| 0.00010      | manny     | -                   |                          |                |            |   | 80 dBµV    |           |                       |                          |               |                  |                                     |
| 0 dBµV       |           |                     |                          |                |            |   | 70 dBµV    |           |                       |                          |               |                  |                                     |
| ) dBµV       |           | 1                   |                          |                |            |   | 60 dBµV    |           | and man               | Ayorhammerted            | 3             |                  |                                     |
| ) dBµV       |           | ashowed             | mar the                  |                | Managerees | 2 holomation                              | 40 dBµV    |           |                       | - unnexted               | kunnennen     | and made greated | minerenew                           |
| 0 dBµV       |           | -                   |                          |                |            |   | 30 dBµV    |           |                       |                          |               |                  |                                     |
| 0 dBµV       |           | -                   |                          |                | F2         |   | 20 d8µV    |           |                       | _                        |               |                  | F2                                  |
| 0 dBuV       |           |                     | F1                       |                |            |   | 10 dBuV    |           |                       | F1                       |               | _                | -                                   |
| F 2.4835 GHz | -         |                     | 691 pts                  | 5              |            | Span 50.0 MHz                             | CF 2.4835  | GHz       |                       | 691 pt                   | s             |                  | Span 50.0 MH                        |
| arker        |           |                     |                          | 9790           |            |   | Marker     |           |                       |                          | 000           |                  |                                     |
| ype Ref T    |           |                     | Response                 | Function       | Function   | Result                                    | Type   Ref | Trc       | Stimulus              | Response                 | Function      | Functi           | on Result                           |
| N1 N2        | 1 2.4     | 4835 GHz<br>2.5 GHz | 42.86 dBµV<br>42.58 dBµV |                |            |   | N1<br>N2   | 1         | 2.4835 GHz<br>2.5 GHz | 46.42 dBµV<br>44.68 dBµV |               |                  |                                     |
| N2<br>N3     | 1         | 2.5 GHz<br>119 GHz  | 44.15 dBµV               |                |            |   | N2<br>N3   | 1         | 2.5 GHz               | 44.68 dBµV<br>47.23 dBµV |               |                  |                                     |



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Note.

1. No spurious emission were detected above 3 GHz.



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| Mode:                    | 802.11n(HT40) |
|--------------------------|---------------|
| Distance of measurement: | 3 meter       |
| Channel:                 | 03            |

# Spurious

| Frequency<br>(Mz) | Level<br>(dBµN) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµN/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|-------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 1079.60           | 52.62           | Peak        | Н                  | -8.63      | -           | 43.99                      | 74.00             | 30.01          |
| 1739.50           | 52.30           | Peak        | Н                  | -3.66      | -           | 48.64                      | 74.00             | 25.36          |
| 1736.60           | 52.49           | Peak        | V                  | -3.68      | -           | 48.81                      | 74.00             | 25.19          |

# **Band** edge

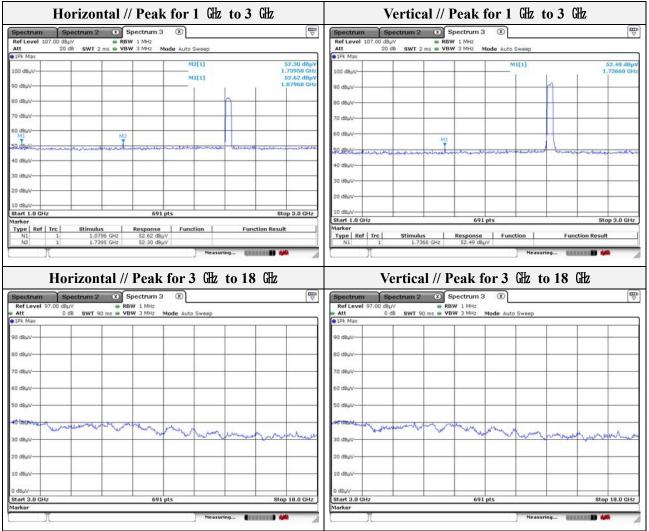
\_

| Frequency<br>(Mb) | Level<br>(dBµN) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|-------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 2352.01           | 44.94           | Peak        | Н                  | -0.29      | -           | 44.65                      | 74.00             | 29.35          |
| 2386.40           | 51.87           | Peak        | V                  | -0.23      | -           | 51.64                      | 74.00             | 22.36          |

| pectrum Sp          | ectrum 2 🛛 🛞   |  |              |      |                 | Spec          | trum    | Sp       | ectrum 2 🛛 🛞     |                        |                       |       |            | 9           |
|---------------------|--|--|--------------|------|-----------------|---------------|---------|----------|------------------|------------------------|-----------------------|-------|------------|-------------|
| Ref Level 107.00 di |  | BW 1 MHz   |              |      |                 |               | evel 1  | 07.00 dB |                  | BW 1 MHz               |                       |       |            |             |
| Att 10<br>1Pk Max   | dB SWT 1 ms 🖷 V  | BW 3 MHz Mod   | e Auto Sweep |      |                 | Att     IPk N |         | 10       | dB SWT 1 ms 🖷 V  | BW 3 MHz Mo            | de Auto Sweep         |       |            |             |
| тык мах             |  |  |              |      | 44.94           |               | tax     |          |                  |                        |                       |       |            |             |
| Vueb 00             |  | 1  | M3[1]        |      | 2,352010        |               | 100     |          |                  |                        | M3[1]                 |       |            | 51.87 dB    |
| 00 0004             |  |  | M1[1]        |      | 43.36           |               | 44      |          |                  |                        | M1[1]                 |       |            | 44.29 dB    |
| 0 dBuV              |  |  |              |      | 2.310000        |               | N       |          |                  |                        |                       |       |            | 2.310000 C  |
| 100000              |  |  | 1            | T I  | weren           | 1000          | 8       |          |                  |                        | 1                     | T I   | 1          | 1           |
| 0 dBuV              |  |  |              |      | prenter         | 80 dBu        | N-      |          |                  |                        |                       |       |            | 1           |
| 22.5                |  |  |              |      |                 |               |         |          |                  |                        |                       |       |            | 1           |
| dBµV                |  |  |              |      |                 | 70 dBµ        | N       |          |                  | + +                    |                       | +-+   | 1          |             |
| 1000                |  |  |              |      |                 |               |         |          |                  | 1 1                    |                       |       | 1          |             |
| ) dBµV              |  |  |              |      | 1               | 60 dBµ        | V III   |          | usur marine      | -                      |                       | M3    | A          |             |
| 0 dBuV              |  | 1000   |              | 0.00 |                 | 50 dbu        | 11      |          |                  |                        |                       | T S   | the        |             |
| CODE MIL            | munum  | The second secon |              | man  | 1 SW            | 50 000        | 1011    | well .   | ence an exchange | a design of the second | aluce whether         | ANNUN |            |             |
| ) dBuV              | and the second s | manuferman   | ernmenner    |      | -               | 40 dBu        | V       |          |                  |                        | and the second second | -     | _          |             |
| 0.000               |  |  |              |      |                 | 100000        |         |          |                  |                        |                       |       |            |             |
| ) dBµV              |  |  |              |      |                 | 30 dBµ        | N-      |          |                  |                        |                       | +-+   |            |             |
| 100-00              |  |  |              |      |                 |               | 0       |          |                  | 1 1                    |                       |       |            |             |
| ) dBµV              |  | -  | -            | F2   |                 | 20 dBµ        | N-      |          |                  | -                      | -                     | F2    |            |             |
| FI                  |  |  |              | 12   |                 |               | FI      |          |                  |                        |                       | 12    |            |             |
| art 2.3 GHz         |  | 691 pts  |              |      | Stop 2.42       | 10 dBp        | 2.3 GH2 |          |                  | 691 pt                 |                       |       |            | Stop 2.42 G |
| rker                |  | 091 prs  |              |      | atop 2.42       | Marker        |         |          |                  | 091 pt                 | ,                     |       |            | 3(0p 2.42 G |
| ype   Ref   Trc     | Stimulus   | Response   | Function     | Eur  | nction Result   |               | Ref     | Tec I    | Stimulus         | Response               | Function              | 1     | Function F | Posult      |
| N1 1                | 2.31 GHz   | 43.36 dBuV   | runction     | Fui  | income we start | NI            | roll    | 1        | 2.31 GHz         | 44.29 dBuV             | runction              |       | unction    | want.       |
| N2 1                | 2.39 GHz   | 43.87 dBµV   |              |      |                 | N2            | -       | 1        | 2.39 GHz         | 50.14 dBµV             |                       |       |            |             |
| N3 1                | 2.35201 GHz  | 44.94 dBµV   |              |      |                 | N3            |         |          | 2.3864 GHz       | 51.87 dBµV             |                       |       |            |             |



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Note.

1. No spurious emission were detected above 3 GHz.

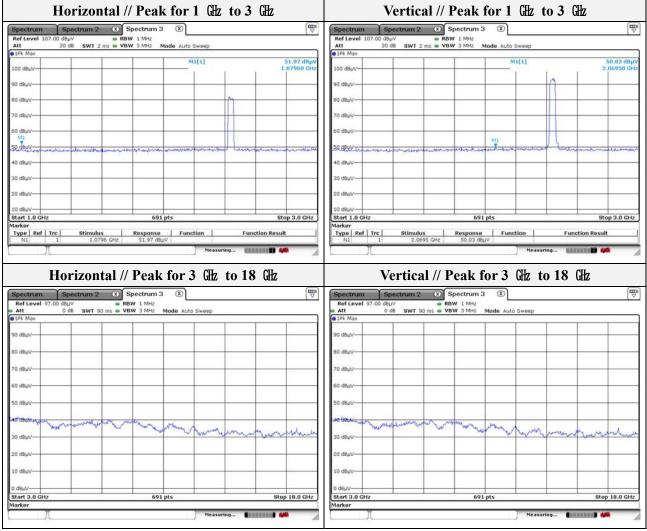


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| Mode:                    | 802.11n(HT40) |
|--------------------------|---------------|
| Distance of measurement: | 3 meter       |
| Channel:                 | 06            |

## - Snurious

| - spurio           | Jus             |             |                    |            |             |                            |                   |                |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mtz) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |
| 1079.60            | 51.97           | Peak        | Н                  | -8.63      | -           | 43.34                      | 74.00             | 30.66          |
| 2069.50            | 50.03           | Peak        | V                  | -0.83      | -           | 49.20                      | 74.00             | 24.80          |



#### Note.

1. No spurious emission were detected above 3 GHz.

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| Mode:                    | 802.11n(HT40) |
|--------------------------|---------------|
| Distance of measurement: | 3 meter       |
| Channel:                 | 09            |

# - Spurious

| Frequency<br>(Mb) | Level<br>(dBµV) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµN/m) | Margin<br>(dB) |
|-------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| 1079.60           | 52.20           | Peak        | Н                  | -8.63      | -           | 43.57                      | 74.00             | 30.43          |
| 2538.40           | 51.11           | Peak        | V                  | 0.12       | -           | 51.23                      | 74.00             | 22.77          |

# - Band edge

| Duna               |                 |             |                    |            |             |                            |                   |                |
|--------------------|-----------------|-------------|--------------------|------------|-------------|----------------------------|-------------------|----------------|
| Frequency<br>(Mbz) | Level<br>(dBµN) | Detect mode | Ant. Pol.<br>(H/V) | CF<br>(dB) | DCF<br>(dB) | Field strength<br>(dBµV/m) | Limit<br>(dBµV/m) | Margin<br>(dB) |
| 2486.00            | 44.02           | Peak        | Н                  | -0.04      | -           | 43.98                      | 74.00             | 30.02          |
| 2487.52            | 52.09           | Peak        | V                  | -0.04      | -           | 52.05                      | 74.00             | 21.95          |

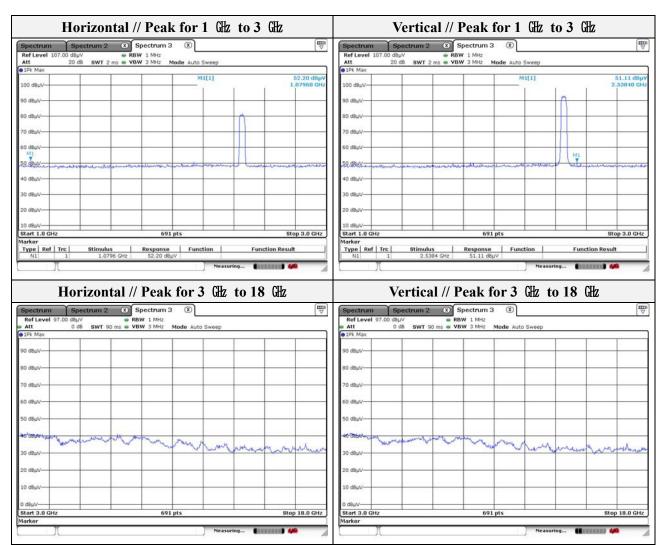
| Spectrum                | Spectrum 2 | 2 🗷 Spectru     | m 3 🛞       |           |             | B                           | Spectrum           | Sp        | ectrum 2 🛞    | Spectrum 3   | x             |        | (                       |
|-------------------------|------------|-----------------|-------------|-----------|-------------|-----------------------------|--------------------|-----------|---------------|--------------|---------------|--------|-------------------------|
| Ref Level 10            | 7.00 dBµV  | RBW 1 MH        |             |           |             | 1.1                         | Ref Level          | 107.00 dB |               | RBW 1 MHz    |               |        |                         |
| Att                     | 10 dB SWT  | 1 ms 🖷 VBW 3 MH | z Mode Auto | Sweep     |             |                             | Att                | 10        | dB SWT 1 ms 🖷 | VBW 3 MHz Mo | de Auto Sweep |        |                         |
| 1Pk Max                 |            |                 |             |           |             |                             | IPk Max            |           |               |              |               |        |                         |
| 00 d8µV                 |            |                 |             | 3[1]      |             | 44.02 dBµV<br>2.4860000 GHz | 100 d8µV           |           |               |              | M3[1]         |        | 52.09 d8<br>2.4875200 G |
| 0 dBµV                  | -          |                 | M           | 1[1]      |             | 43.79 dBpV<br>2.4835000 GHz | 90 dBµV            |           | ~             | -            | M1[1]         | E E    | 49.22 d8<br>2.4835000 0 |
| 0 0814                  |            |                 | _           |           |             |                             | 80 dBµV            |           | 1             | _            |               |        |                         |
| 0 dBµV                  |            |                 |             |           |             |                             | 70 dBµV            |           |               |              |               | -      |                         |
| 0 dBµV                  |            |                 |             | · · · · · |             |                             | 60 dBµV            |           | July          |              | M3            |        |                         |
| 0 dBµV                  |            | Lamore          | MI MB       |           | MZ          | manun                       | 50 dBµV            |           |               | man the      | mentionen     | manhan | 12 Marian               |
| 0 dBµV                  |            |                 |             |           |             |                             | 40 dBµV            |           |               |              |               |        |                         |
| 0 dBµV                  |            |                 |             |           |             |                             | 30 dBµV            |           |               |              |               |        |                         |
| 0 dBµV                  |            |                 | F1          |           | F2          |                             | 20 d8µV            |           |               | F1           |               |        | F2                      |
| 0 dBµV                  |            |                 | 1           |           |             |                             | 10 dBµV-           |           |               | 1 1          |               |        |                         |
| F 2.4835 GHz            |            |                 | 691 pts     | 20        | 5           | pan 50.0 MHz                | CF 2.4835 0        | HZ        |               | 691 pt       | 5             |        | Span 50.0 Mł            |
| arker<br>Type   Ref   T | rc Stimul  | us Respo        | nse Func    | tion 1    | Function Re |                             | Marker<br>Type Ref | I Tread   | Stimulus      | Response     | Function      | Frankl | on Result               |
| N1 N1                   |            |                 | 9 dBuV      | tion      | Function Re | suit                        | N1                 | 1         | 2.4835 GHz    | 49.22 dBuV   | Function      | Functi | on Result               |
| N2                      |            |                 | 6 dBµV      |           |             |                             | N2                 | 1         | 2.5 GHz       | 46.03 dBµV   |               |        |                         |
| N3                      |            |                 | 2 dBµV      |           |             |                             | N3                 |           | 2.48752 GHz   | 52.09 dBµV   |               |        |                         |



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Note.

1. No spurious emission were detected above 3 GHz.



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| Test results (18 GHz to 30 | (Hz) – Worst case |
|----------------------------|-------------------|
| Mode:                      | 802.11b           |
| Distance of measurement:   | 3 meter           |
| Channel:                   | 01 (Worst case)   |

| Horizontal   |           |             |            |                 |                 | Vertical         |  |                |              |            |                        |   |
|--|-----------|-------------|------------|-----------------|-----------------|------------------|--|----------------|--------------|------------|------------------------|---|
| Spectrum         Image: Spectrum           Ref Level 97.00 dBµV         ● RBW 1 MHz           Att         0 db         SWT 36 ms ● VBW 3 MHz |           |             |            |                 |                 |                  | Spectrum         mmi           Ref Level 97.00 d8µV         ■ RBW 1 MHz           ● Att         0 d8         SWT 36 ms         ● NBW 3 MHz |                |              |            |                        |   |
| Att     IPk View   | 0 dB SWT  | 36 ms 🖷 VBW | V 3 MHz Mo | de Auto Sweep   |                 |                  | Att 0 dB     IPk View  | SWT 36 ms 🖷 VB | W 3 MHz Mode | Auto Sweep |                        |   |
| 90 dBµV  |           |             |            |                 |                 |                  | 90 dBµV  |                |              |            | 2                      | -   |
| 80 dBµV  |           | -           |            |                 |                 |                  | 80 d8µV  |                |              |            |                        |   |
| 70 dBµV  | -         |             |            | -               |                 |                  | 70 dBµV  |                |              |            | 0                      | -   |
| 60 dBµV  |           |             |            |                 |                 |                  | 60 dBµV  |                |              |            |                        |   |
| 50 d8µV  |           |             |            |                 |                 |                  | 50 d8µV  |                |              |            |                        | +   |
| 40 deur  | Rectivena | whereven    | Lasher mar | ung any section | monum           | -Allohunghar and | 40 dBUV  | where where    | wheether     | marchenter | Manana                 | - moren                                   |
| 20 dBuV  |           |             |            |                 |                 |                  | 20 dBµV  |                |              |            |                        |   |
| 10 dBµV  | _         |             |            |                 |                 |                  | 10 d8µV  |                |              | _          |                        |   |
| 0 dBuV   |           |             |            |                 |                 |                  | 0 dBuV-  |                |              |            |                        |   |
| Start 18.0 GHz<br>Marker   | N/        |             | 691 pts    | 5               |                 | Stop 30.0 GHz    | Start 18.0 GHz<br>Marker   | 19-10<br>1     | 691 pts      |            | Sto                    | op 30.0 GHz                               |
|  |           |             |            | Measur          | ing <b>WAXA</b> |                  |  |                |              | Measuring. | . <b>(1</b> 1111111) 4 | in an |

Note.

1. No spurious emission were detected above 18 GHz.



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# 3.5. Conducted spurious emissions & band edge Test procedure

# Pand adga

# Band edge

KDB 558074 D01 v03r05 - Section 11.3

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW = 100 kHz
- 4. VBW = 300 kHz
- 5. Detector = Peak
- 6. Number of sweep points  $\geq$  2 × Span/RBW
- 7. Trace mode = max hold
- 8. Sweep time = auto
- 9. The trace was allowed to stabilize

# Out of band emissions

KDB 558074 D01 v03r05 - Section 11.3

- 1. Start frequency was set to 30 MHz and stop frequency was set to 25 GHz for 2.4 GHz frequencies and 40 GHz for 5 GHz frequencies
- 2. RBW = 100 kHz
- 3. VBW = 300 kHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

### Limit

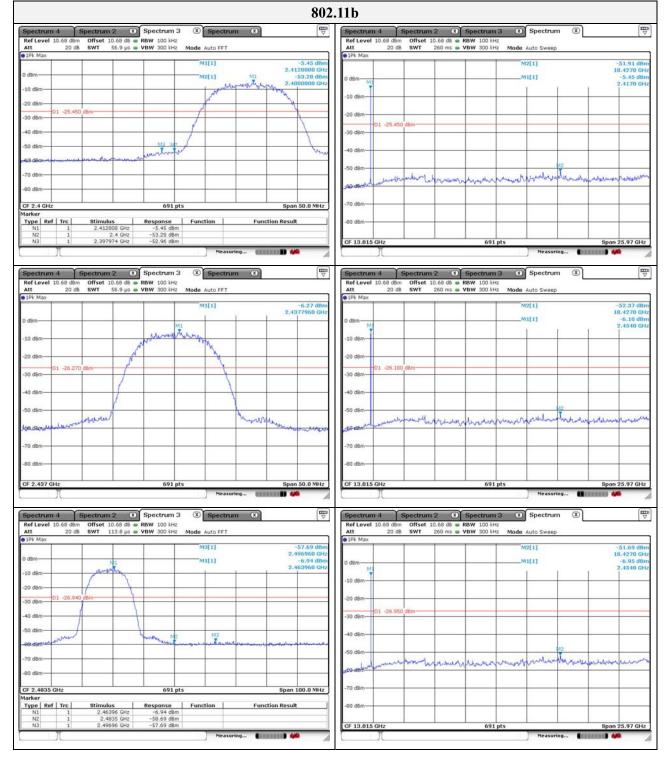
According to 15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph(b)(3) of this section , the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in section 15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section 15.205(a), must also comply the radiated emission limits specified in section 15.209(a) (see section 15.205(c))



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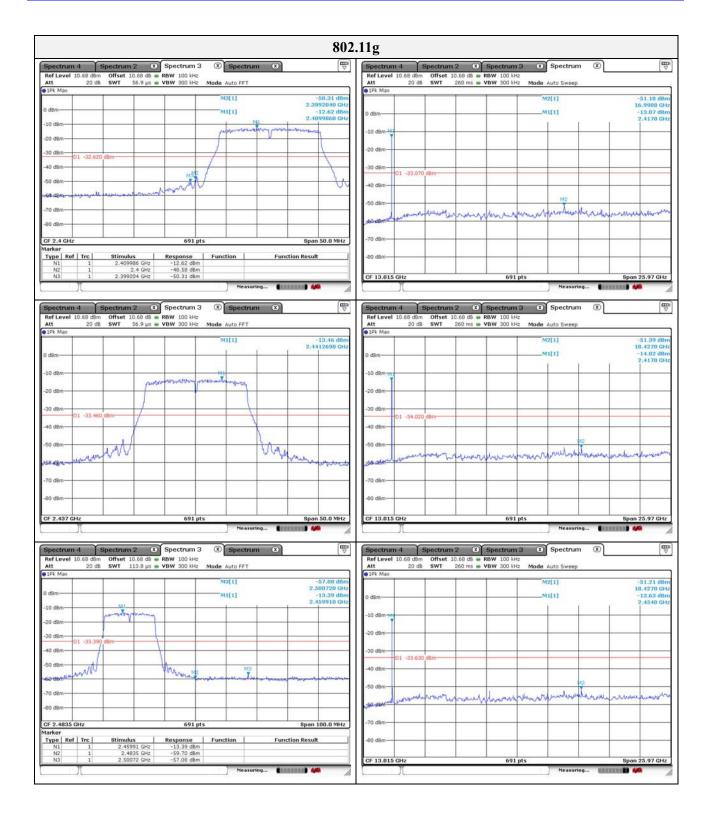
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# Test results



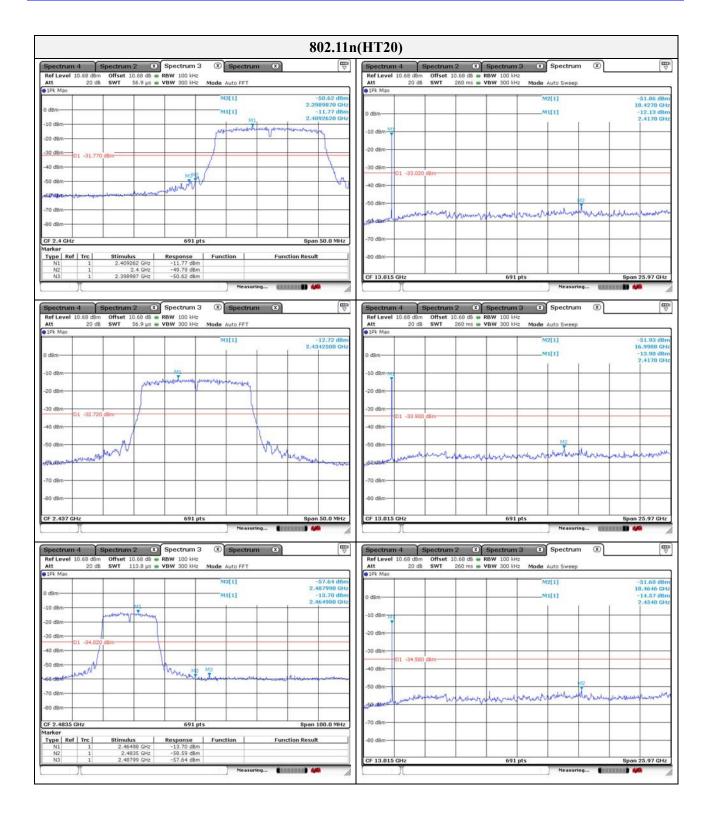


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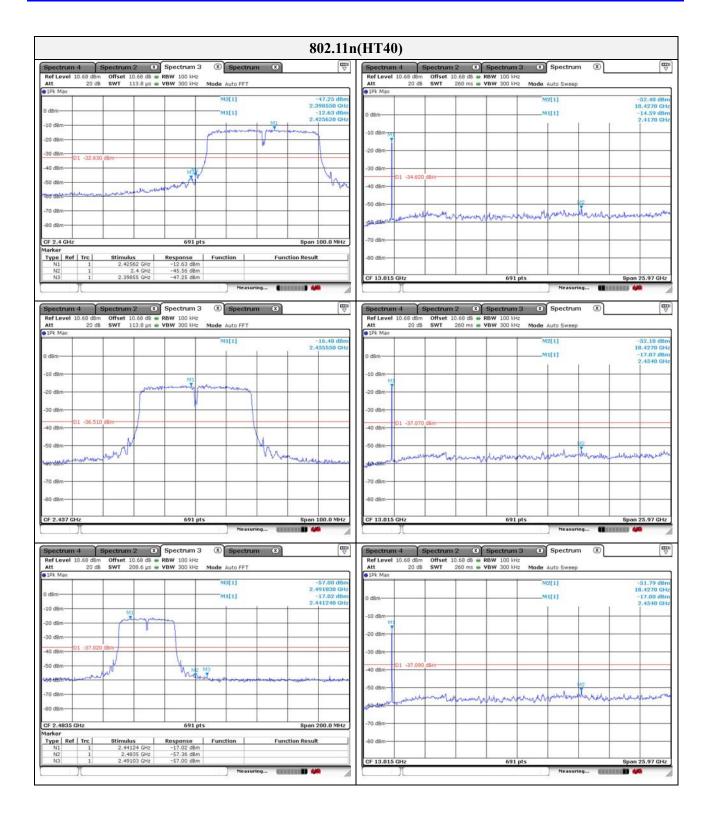


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# **3.6.** AC conducted emissions

# Limit

According to 15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

| Encaused of Emission (Mg)  | Conducted limit (dBµN/m) |          |  |  |  |  |
|----------------------------|--------------------------|----------|--|--|--|--|
| Frequency of Emission (Mb) | Quasi-peak               | Average  |  |  |  |  |
| 0.15 - 0.50                | 66 - 56*                 | 56 - 46* |  |  |  |  |
| 0.50 - 5.00                | 56                       | 46       |  |  |  |  |
| 5.00 - 30.0                | 60                       | 50       |  |  |  |  |

# Note.

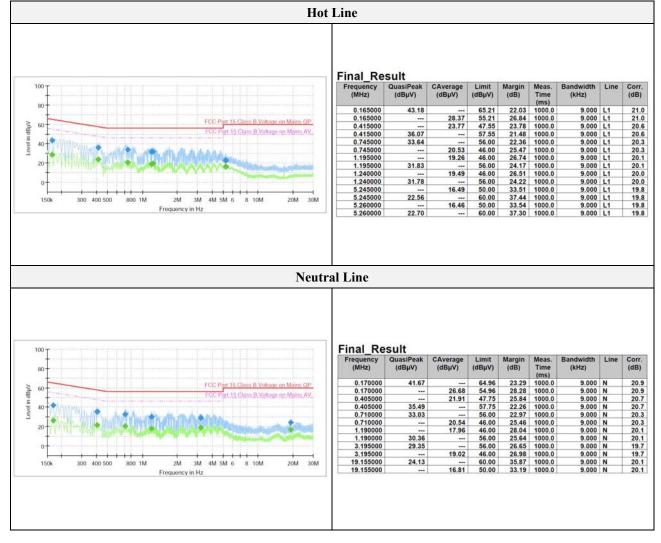
1. All AC line conducted spurious emission are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and the appropriate frequencies. All data rates and modes were investigated for conducted spurious emission. Only the conducted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

3. Both Cable loss and LISN factor are included in measurement level (QP Level or AV Level).



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# Test results





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# Appendix A. Measurement equipment

| Equipment                              | Manufacturer             | Model                   | Serial No.  | Calibration<br>interval | Calibration<br>due. |
|--|--------------------------|-------------------------|-------------|-------------------------|---------------------|
| Spectrum Analyzer                      | R&S                      | FSV30                   | 100736      | 1 year                  | 2017.07.06          |
| Spectrum Analyzer                      | R&S                      | FSV40                   | 101002      | 1 year                  | 2017.07.06          |
| 8360B Series Swept<br>Signal Generator | HP                       | 83630B                  | 3844A00786  | 1 year                  | 2018.01.23          |
| Power Meter                            | Anritsu                  | ML2495A                 | 1438001     | 1 year                  | 2018.01.23          |
| Pluse Power Sensor                     | Anritsu                  | MA2411B                 | 1339205     | 1 year                  | 2018.01.23          |
| Attenuator                             | Keysight                 | 8493C                   | 82506       | 1 year                  | 2018.01.23          |
| Loop Antenna                           | ETS-LINDGREN             | 6502                    | 00148046    | 2 years                 | 2019.01.05          |
| Trilog-broadband<br>antenna            | SCHWARZBECK              | VULB 9163               | 9168-713    | 2 years                 | 2017.05.15          |
| Horn Antenna                           | A.H.                     | SAS-571                 | 781         | 2 years                 | 2019.02.15          |
| Horn Antenna                           | SCHWARZBECK              | BBHA9170                | BBHA9170550 | 2 years                 | 2017.04.30          |
| High Pass Filter                       | WAINWRIGHT<br>INSTRUMENT | WHJS3000-10TT           | 1           | 1 year                  | 2017.07.04          |
| Low Pass Filter                        | WEINSCHEL                | WLK1.0/18G-10TT         | 1           | 1 year                  | 2017.07.04          |
| Preamplifier                           | HP                       | 8449B                   | 3008A00538  | 1 year                  | 2017.07.05          |
| Preamplifier                           | SCHWARZBECK              | BBV-9718                | 9718-246    | 1 year                  | 2017.10.14          |
| EMI Test Receiver                      | R&S                      | ESR3                    | 101781      | 1 year                  | 2017.05.03          |
| EMI Test Receiver                      | R&S                      | ESU26                   | 100552      | 1 year                  | 2017.04.24          |
| EMI Test Receiver                      | R&S                      | ESR3                    | 101783      | 1 year                  | 2017.05.03          |
| Pulse Limiter                          | R&S                      | ESH3-Z2<br>0357.8810.54 | 101914      | 1 year                  | 2017.12.13          |
| LISN                                   | R&S                      | ENV216                  | 101137      | 1 year                  | 2018.02.03          |

# **Peripheral devices**

| Device            | Device Manufacturer           |               | Serial No.     |
|-------------------|-------------------------------|---------------|----------------|
| Notebook Computer | Samsung Electronics Co., Ltd. | NT-RV518-AD6S | HTK99NC600207R |
| Test Board        | N/A                           | N/A           | N/A            |