

TEST REPORT

FCC/ISED DTS Test for VT2600TAN&VT2500TKN Certification

APPLICANT HYUNDAI MOBIS CO., LTD.

REPORT NO. HCT-RF-2105-FI007-R1

DATE OF ISSUE June 10, 2021

> Tested by Chang Hee Hwang

Hu

Technical Manager Jong Seok Lee

HCT CO., LTD. Bongjai Huh Bongjai Huh / CEO

HCT CO., LTD. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA Tel. +82 31 634 6300 F ax. +82 31 645 6401

F-TP22-03(Rev.03)



HCT Co., Ltd.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA Tel. +82 31 634 6300 Fax. +82 31 645 6401

| | REPORT NO. HCT-RF-2105-FI007-R1 |
|--|---|
| TEST REPORT | DATE OF ISSUE June 10, 2021 |
| FCC/ISED DTS Test for VT2600TAN& VT2500TKN | Additional Model FCC : VT2620TAN, VT2610TAN, VT260TOAN, VT2500TAN, VT2520TAN, VT2510TAN, VT250TOAN, VT2530TAN, VT2630TAN, VT251TOAN, VT261TOAN ISED : VT2600TKN, VT2620TKN, VT2610TKN, VT260TOKN, VT2520TKN, |
| | VT2510TKN, VT250TOKN, VT2530TKN, VT2630TKN, VT251TOKN, VT261TOKN |
| Applicant | HYUNDAI MOBIS CO., LTD. 203, Teheran-ro, Gangnam-gu, Seoul, 135-977, South Korea |
| Eut Type FCC Model Name | CAR AUDIO SYSTEM VT2600TAN |
| ISED Model Name | VT2500TKN |
| FCC ID IC | TQ8-VT2600TAN 5074A-VT2500TKN |
| Max. RF Output Power | 802.11b : 13.48 dBm / 802.11g : 17.08 dBm / 802.11n(HT20) : 16.29 dBm |
| Modulation type | CCK/DSSS/OFDM |
| FCC Classification | Digital Transmission System(DTS) |
| FCC Rule Part(s) ISED Rule Part(s) | Part 15.247 RSS-247 Issue 2 (February 2017) RSS-Gen Issue 5_Amendment 1 (March 2019) |
| | The result shown in this test report refer only to the sample(s) tested unless |

otherwise stated.

This test results were applied only to the test methods required by the standard.



REVISION HISTORY

The revision history for this test report is shown in table.

| Revision No. | Date of Issue | Description |
|--------------|---------------|--|
| 0 | June 01, 2021 | Initial Release |
| 1 | June 10, 2021 | - Added the Additional Model on Page 2, 5 - Revised PMN, HVIN on Page.5 |

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC / ISED Rules under normal use and maintenance

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1. EUT DESCRIPTION

| FCC Model | VT2600TAN |
|---|---|
| ISED Model | VT2500TKN |
| FCC Additional Model | VT2620TAN, VT2610TAN, VT260TOAN, VT2500TAN, VT2520TAN, VT2510TAN, VT250TOAN, VT2530TAN, VT2630TAN, VT251TOAN, VT261TOAN |
| ISED Additional Model | VT2600TKN, VT2620TKN, VT2610TKN, VT260TOKN, VT2520TKN, VT2510TKN, VT250TOKN, VT2530TKN, VT2630TKN, VT251TOKN, VT261TOKN |
| EUT Type | CAR AUDIO SYSTEM |
| Power Supply | DC 14.4 V |
| Frequency Range | 2 412 MHz ~ 2 462 MHz |
| Max. RF Output Power | Peak Power 802.11b : 13.48 dBm 802.11g : 17.08 dBm 802.11n(HT20) : 16.29 dBm Average Power 802.11b : 7.58 dBm 802.11g : 9.40 dBm 802.11n(HT20) : 8.24 dBm |
| Modulation Type | DSSS/CCK : 802.11b OFDM : 802.11g, 802.11n |
| Number of Channels | 11 Channels |
| Antenna Specification | Antenna type: Dual Bands Wi-Fi ANT Peak Gain : -1.19 dBi |
| Date(s) of Tests | April 15, 2021 ~ May 26, 2021 |
| PMN (Product Marketing Number) | VT2600TKN, VT2620TKN, VT2610TKN, VT260TOKN, VT2520TKN, VT2510TKN, VT250TOKN, VT2530TKN, VT2630TKN, VT251TOKN, VT261TOKN |
| HVIN (Hardware Version Identification Number) | VT2600TKN, VT2620TKN, VT2610TKN, VT260TOKN, VT2520TKN, VT2510TKN, VT250TOKN, VT2530TKN, VT2630TKN, VT251TOKN, VT261TOKN |
| FVIN (Firmware Version Identification Number) | SG2HEV.USA.0000.V039.001.210216 |
| HMN (Host Marketing Name) | N/A |
| EUT serial numbers | Conducted : 96560-AT130 (FCC), 96560-AT120 ISED) Radiated : 96560-AT130 (FCC), 96560-AT120 (ISED) |





2. TEST METHODOLOGY

FCC KDB 558074 D01 15.247 Meas Guidance v05r02 dated April 02, 2019 entitled "guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices and the measurement procedure described in ANSI C63.10(Version : 2013) 'the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices'.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C. / RSS-Gen issue 5, RSS-247 issue 2.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)



DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radi ated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of A NSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

For ISED, test facility was accepted dated February 14, 2019 (CAB identifier: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



5. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of § 15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of

ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

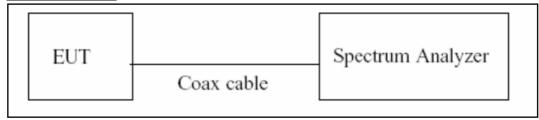
| Parameter | Expanded Uncertainty (\pm dB) | |
|--|----------------------------------|--|
| Conducted Disturbance (150 kHz ~ 30 MHz) | 1.82 | |
| Radiated Disturbance (9 kHz ~ 30 MHz) | 3.40 | |
| Radiated Disturbance (30 MHz ~ 1 GHz) | 4.80 | |
| Radiated Disturbance (1 GHz ~ 18 GHz) | 5.70 | |
| Radiated Disturbance (18 GHz ~ 40 GHz) | 5.05 | |



7. DESCRIPTION OF TESTS

7.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to the zero-span measurement method.

The largest available value of RBW is 8 MHz and VBW is 50 MHz.

The zero-span method of measuring duty cycle shall not be used if T \leq 6.25 microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/T.

- 1. RBW = 8 MHz (the largest available value)
- 2. VBW = 8 MHz (\geq RBW)
- 3. SPAN = 0 Hz
- 4. Detector = Peak
- 5. Number of points in sweep > 100
- 6. Trace mode = Clear write
- 7. Measure T_{total} and T_{on}
- 8. Calculate Duty Cycle = T_{on}/T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

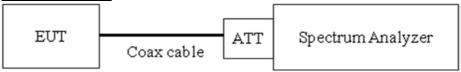


7.2. 6dB Bandwidth & 99 % Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (Procedure 11.8.1 in ANSI 63.10-2013)

- 1) RBW = 100 kHz
- 2) VBW \geq 3 x RBW
- 3) Detector = Peak
- 4) Trace mode = max hold
- 5) Sweep = auto couple
- 6) Allow the trace to stabilize
- 7) We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

Test Procedure (99 % Bandwidth for ISED)

The transmitter output is connected to the spectrum analyzer.

RBW = $1\% \sim 5\%$ of the occupied bandwidth VBW $\Rightarrow 3 \times$ RBW Detector = Peak Trace mode = max hold Sweep = auto couple Allow the trace to stabilize

Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

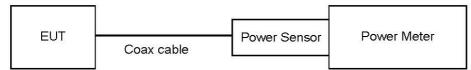


7.3. Output Power

Limit

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

- Peak Power (Procedure 11.9.1.3 in ANSI 63.10-2013)
 - : Measure the peak power of the transmitter.

• Average Power (Procedure 11.9.2.3 in ANSI 63.10-2013)

- 1) Measure the duty cycle.
- 2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- 3) Add 10 $\log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

- Conducted Output Power(Peak) = Reading Value + ATT loss + Cable loss
- Conducted Output Power(Average) = Reading Value + ATT loss + Cable loss + Duty Cycle Factor

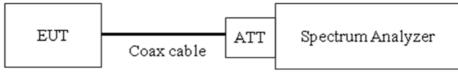


7.4. Power Spectral Density

Limit

The transmitter power density average over 1-second interval shall not be greater than 8dBm in any 3kHz BW.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure 8.4 in KDB 558074 v05r02, Procedure 11.10 in ANSI 63.10-2013.

The spectrum analyzer is set to :

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

Sample Calculation

• Power Spectral Density = Reading Value + ATT loss + Cable loss

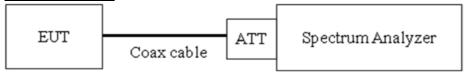


7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

Limit

The maximum conducted (Peak) output power was used to demonstrate compliance, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz. [Conducted > 20 dBc]

Test Configuration



Test Procedure

The transmitter output is connected to the spectrum analyzer.

(Procedure 11.11 in ANSI 63.10-2013)

- 1) RBW = 100 kHz
- 2) VBW \geq 3 x RBW
- 3) Set span to encompass the spectrum to be examined
- 4) Detector = Peak
- 5) Trace Mode = max hold
- 6) Sweep time = auto couple
- 7) Ensure that the number of measurement points $\geq 2 \times \text{Span/RBW}$
- 8) Allow trace to fully stabilize.
- 9) Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 25 GHz range with the transmitter set to the lowest, middle, and highest channels.

Factors for frequency

| Freq(MHz) | Factor(dB) |
|-----------|----------------|
| 30 | 20.59 |
| 100 | 20.62 |
| 200 | 20.67 |
| 300 | 20.72 |
| 400 | 20.75 |
| 500 | 20.76 |
| 600 | 20.76 |
| 700 | 20.78 |
| 800 | 20.79 |
| 900 | 20.81 |
| 1000 | 20.82 |
| 2000 | 20.96 |
| 2400 | 21.00 |
| 2480 | 21.02 |
| 2500 | 21.02 |
| 3000 | 21.15 |
| 4000 | 21.26 |
| 5000 | 21.52 |
| 5150 | 21.52 |
| 5850 | 21.98 |
| 6000 | 21.98 |
| 7000 | 22.35 |
| 8000 | 22.33 |
| 9000 | |
| 10000 | 22.46 22.52 |
| | |
| 11000 | 22.57 |
| 12000 | 22.65 |
| 13000 | 22.74 |
| 14000 | 22.71 |
| 15000 | 22.76 |
| 16000 | 23.77 |
| 17000 | 23.80 |
| 18000 | 23.85 |
| 19000 | 23.87 |
| 20000 | 23.91 |
| 21000 | 24.03 |
| 22000 | 24.10 |
| 23000 | 24.10 |
| 24000 | 24.14 |
| 25000 | 24.23 |
| 26000 | 24.24 |

Note : 1. 2400 ~ 2500 MHz is fundamental frequency range.

2. Factor = Attenuator loss(20 dB) + Cable loss(1ea) + EUT Cable(For Conducted)







7.6. Radiated Test

FCC

| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009 - 0.490 | 2400/F(kHz) | 300 |
| 0.490 - 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30 | 30 | 30 |

ISED

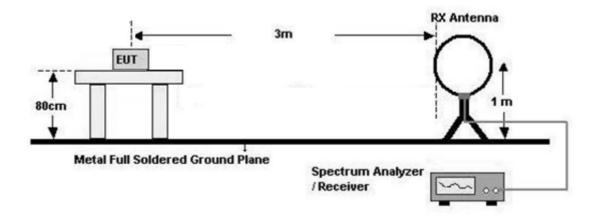
| Frequency (MHz) | Field Strength (uA/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009 - 0.490 | 6.37/F(kHz) | 300 |
| 0.490 - 1.705 | 63.7/F(kHz) | 30 |
| 1.705 – 30 | 0.08 | 30 |

FCC&ISED

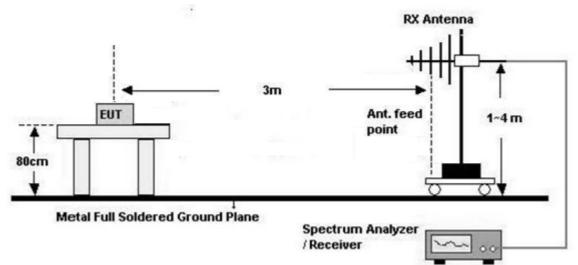
| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) | |
|-----------------|-----------------------|--------------------------|--|
| 30-88 | 100 | 3 | |
| 88-216 | 150 | 3 | |
| 216-960 | 200 | 3 | |
| Above 960 | 500 | 3 | |

Test Configuration

Below 30 MHz



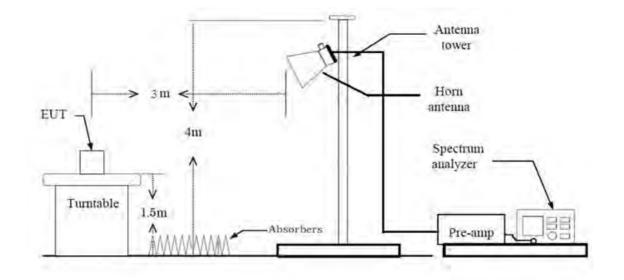
30 MHz - 1 GHz







Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

- 1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2. The loop antenna was placed at a location 3m from the EUT
- 3. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.

5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

- 6. Distance Correction Factor(0.009 MHz 0.490 MHz) = $40\log(3 \text{ m}/300 \text{ m})$ = 80 dB
 - Measurement Distance : 3 m
- 7. Distance Correction Factor(0.490 MHz 30 MHz) = $40\log(3 \text{ m}/30 \text{ m})$ = 40 dB

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Measurement Distance : 3 m
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- 8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW \geq 3 x RBW
- 9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
- 10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific





emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.



- Test Procedure of Radiated spurious emissions(Below 1GHz)
- 1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

- 6. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
 - %In general, (1) is used mainly
- 7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
- 8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

- 1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. The unit was tested with its standard battery.





- 8. Spectrum Setting (Method 8.6 in KDB 558074 v05r02, Procedure 11.12 in ANSI 63.10-2013)
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Average): Duty cycle \geq 98%
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = RMS
 - Averaging type = power (*i.e.*, RMS)
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).
 - (3) Measurement Type(Average): Duty cycle < 98%, duty cycle variations are less than $\pm 2\%$
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = RMS
 - Averaging type = power (*i.e.*, RMS)
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).
 - 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.
 - Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.
- 9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
- 11. Total(Measurement Type : Peak)
 - = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G) + Distance Factor(D.F)



- Total(Measurement Type : Average, Duty cycle \geq 98%)
- = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G) + Distance Factor(D.F)

Total(Measurement Type : Average, Duty cycle < 98%)

- = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G) + Distance Factor(D.F)
- + Duty Cycle Factor



Test Procedure of Radiated Restricted Band Edge

- 1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. The unit was tested with its standard battery.
- 8. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 2310 MHz \sim 2390 MHz/ 2483.5 MHz \sim 2500 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Average): Duty cycle \geq 98%,
 - Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
 - Detector = RMS
 - Averaging type = power (*i.e.*, RMS)
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).
 - (3) Measurement Type(Average): Duty cycle < 98%, duty cycle variations are less than $\pm 2\%$
 - Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
 - Detector = RMS
 - Averaging type = power (*i.e.*, RMS)
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).
 - 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.

- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.
- 9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
- 11. Total(Measurement Type : Peak)

= Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

Total(Measurement Type : Average, Duty cycle \geq 98%)

= Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

Total(Measurement Type : Average, Duty cycle < 98%)

```
= Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)
```

+ Duty Cycle Factor



7.7. AC Power line Conducted Emissions

<u>Limit</u>

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 50μ H/50 ohms line impedance stabilization network (LISN).

| | Limits (dBµV) | | |
|-----------------------|-------------------------|-------------------------|--|
| Frequency Range (MHz) | Quasi-peak | Average | |
| 0.15 to 0.50 | 66 to 56 ^(a) | 56 to 46 ^(a) | |
| 0.50 to 5 | 56 | 46 | |
| 5 to 30 | 60 | 50 | |

^(a)Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

- 1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
- 2. The EUT is connected via LISN to a test power supply.
- 3. The measurement results are obtained as described below:
- 4. Detectors : Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor



7.8. Receiver Spurious Emissions

Limit

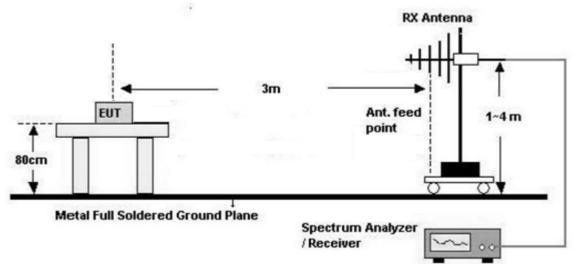
| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Note:

Measurements for compliance with the limits in table may be performed at distances other than 3 meters.

Test Configuration

30 MHz - 1 GHz





Test Procedure of Receiver Spurious Emissions (Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.

2. The EUT is placed on a turntable, which is 0.8m above ground plane.

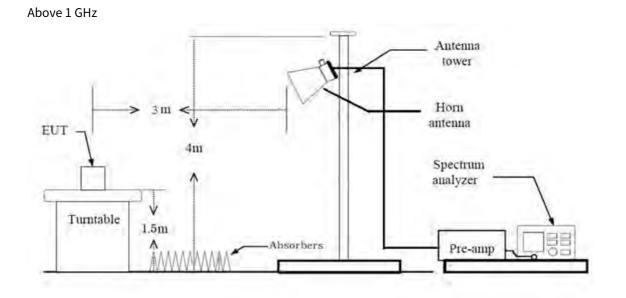
3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.

4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

- 6. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
- 7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)





Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.

2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

- 4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. The unit was tested with its standard battery.
- 8. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \geq 3 x RBW



- (2) Measurement Type(Average):
 - We performed using a reduced video BW method was done with the analyzer in linear mode
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
- 10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G)



7.9. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.

- Mode : Stand alone, Stand alone + Shark Antenna
- Worst case : Stand alone + Shark Antenna
- 2. EUT Axis
 - Radiated Spurious Emissions : X
 - Radiated Restricted Band Edge : X
- 3. Duty cycle factor applies only 802.11g/n(Duty cycle < 98%).
- 4. All data rate of operation were investigated and the test results are worst case in lowest datarate of each mode.
 - 802.11b : 1Mbps
 - -802.11g:6Mbps
 - 802.11n_HT20 : MCS0
- 5. All position of loop antenna were investigated and the test result is a no critical peak found at all

positions.

- Position : Horizontal, Vertical, Parallel to the ground plane
- 6. VT2600TAN(FCC)& VT2500TKN(ISED), Additional Model were tested and the worst case results are reported.

(Worst case : VT2600TAN(FCC)& VT2500TKN(ISED))

AC Power line Conducted Emissions

1. We don't perform powerline conducted emission test. Because this EUT is used with vehicle.

Conducted test

1. The EUT was configured with data rate of highest power.

2.VT2600TAN(FCC)& VT2500TKN(ISED), Additional Model were tested and the worst case results are reported.

(Worst case : VT2600TAN(FCC)& VT2500TKN(ISED))





8. SUMMARY TEST OF RESULTS

FCC Part

| Test Description | FCC Part Section(s) | Test Limit | Test Condition | Test Result |
|---|-----------------------------------|----------------------|-------------------|-----------------|
| 6 dB Bandwidth | § 15.247(a)(2) | > 500 kHz | Conducted | PASS |
| Conducted Maximum Output Power | § 15.247(b)(3) | < 1 Watt | | PASS |
| Power Spectral Density | § 15.247(e) | < 8 dBm / 3 kHz Band | | PASS |
| Band Edge (Out of Band Emissions) | § 15.247(d) | Conducted > 20 dBc | | PASS |
| AC Power line Conducted Emissions | § 15.207 | cf. Section 7.7 | | N/A (#Note1) |
| Radiated Spurious Emissions | § 15.247(d), 15.205, 15.209 | cf. Section 7.6 | Radiated | PASS |
| Radiated Restricted Band Edge | § 15.247(d), 15.205, 15.209 | cf. Section 7.6 | | PASS |

#Note1 : Not Tested





ISED Part

| | ISED Part | Test Limit | Test Condition | Test |
|--|---------------|-------------------------------|----------------|-----------------|
| Test Description | Section(s) | Test Limit | Test Condition | Result |
| 6 dB Bandwidth | RSS-247, 5.2 | > 500 kHz | | PASS |
| 99% Bandwidth | RSS-GEN, 6.7 | N/A | | PASS |
| Conducted Maximum Peak Output Power And e.i.r.p. | RSS-247, 5.4. | < 1 Watt <4 Watt(e.i.r.p.) | Conducted | PASS |
| Power Spectral Density | RSS-247, 5.2 | < 8 dBm / 3 kHz Band | | PASS |
| Band Edge(Out of Band Emissions) | RSS-247, 5.5 | Conducted > 20 dBc | | PASS |
| AC Power line Conducted Emissions | RSS-GEN, 8.8 | cf. Section 7.7 | | N/A (#Note1) |
| Radiated Spurious Emissions | RSS-GEN, 8.9 | cf. Section 7.6 | | PASS |
| Receiver Spurious Emissions | RSS-GEN, 7 | cf. Section 7.8 | Radiated | PASS |
| Radiated Restricted Band Edge | RSS-GEN, 8.10 | cf. Section 7.6 | | PASS |

#Note1 : Not Tested





9. TEST RESULT

9.1 DUTY CYCLE

| Mode | Data Rate | Ton | T_{total} | Duty Cycle | Duty Cycle Factor |
|---------|-------------|-------|-------------|------------|-------------------|
| моде | (Mbps) | (ms) | (ms) | Duty Cycle | (dB) |
| | 1 | 8.609 | 8.709 | 0.988 | 0.050 |
| 802.11b | 2 | 4.300 | 4.396 | 0.978 | 0.097 |
| 002.110 | 5.5 | 1.627 | 1.721 | 0.946 | 0.243 |
| | 11 | 0.862 | 0.956 | 0.902 | 0.448 |
| | 6 | 1.429 | 1.529 | 0.934 | 0.295 |
| | 9 | 0.959 | 1.060 | 0.904 | 0.436 |
| | 12 | 0.723 | 0.825 | 0.877 | 0.569 |
| 802.11g | 18 | 0.493 | 0.594 | 0.830 | 0.808 |
| 802.11g | 24 | 0.371 | 0.473 | 0.785 | 1.051 |
| | 36 | 0.256 | 0.357 | 0.715 | 1.454 |
| | 48 | 0.197 | 0.298 | 0.659 | 1.810 |
| | 54 | 0.180 | 0.282 | 0.639 | 1.943 |
| | 6.5 (MCS0) | 1.336 | 1.436 | 0.930 | 0.315 |
| | 13 (MCS1) | 0.688 | 0.789 | 0.872 | 0.596 |
| | 19.5 (MCS2) | 0.472 | 0.573 | 0.824 | 0.843 |
| 802.11n | 26 (MCS3) | 0.364 | 0.466 | 0.781 | 1.073 |
| (HT20) | 39 (MCS4) | 0.256 | 0.358 | 0.716 | 1.452 |
| | 52 (MCS5) | 0.200 | 0.301 | 0.665 | 1.775 |
| | 58.5 (MCS6) | 0.184 | 0.286 | 0.644 | 1.908 |
| | 65 (MCS7) | 0.168 | 0.270 | 0.624 | 2.051 |

Test Plots

| Center Freq 2.412000000 | GHz PNO: Fast | Trig: Free Run Atten: 14 dB | #Avg | Type: RMS | 07:05:18 PM Apr 20, 202 TRACE 1 2 1 4 5 TYPE W | Frequency |
|--|--|---------------------------------|----------|----------------|--|------------------------------|
| Ref Offset 21.02 dB IO dB/div Ref 25.00 dBm | I Galiteow | | | Δ | Mkr3 8.709 ms 0.24 dE | |
| -og 15.0 5.00 | Xa | | | | 3Δ4 | Center Fre 2.412000000 GH |
| 15.0 25.0 35.0 | | | | | | Start Fre 2.412000000 GH |
| 45.0 55.0 85.0 | | | | | | Stop Fre 2.412000000 GH |
| Center 2.412000000 GHz Res BW 8 MHz | #VBW 8 | | | | Span 0 Ha 0.05 ms (1000 pts | |
| | | | | | | |
| MKR MODE TRC SCL X | 8.609 ms (Δ) | 0.50 dB | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE | 1 |
| MKR MODE TRC SCL X | 8.609 ms (Δ) 7.264 ms 8.709 ms (Δ) 7.264 ms | | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE | |
| MKR MODE TRC SCL X 1 Δ2 1 t (Δ) 2 F 1 t | 7.264 ms 8.709 ms (Δ) | 0.50 dB 11.27 dBm 0.24 dB | FUNCTION | PURCIUM WIDTH | FUNCTION VALUE | Freq Offse |

Duty cycle plot (802.11b(1Mbps))

Duty cycle plot (802.11g(6Mbps))

| | | Analyzer - Swep | | | | | | | | | | | 0 6 |
|---|------------|-----------------|-------------|----------------------|------------|----------------------|-----------|-------------|---------|-----------------|-----------|------------------------|---------------------------|
| enter F | Freq | 2.41200 | | PNO: Fast | | | | #Avg T | | M ALITO MS | TRA | PM Apr 20, 202 | Frequency |
| 0 dB/div | | f Offset 21 | | IFGain:Lov | / | Atten: 14 c | 10 | | | Δ | | .529 ms 0.31 dE | Auto Tu |
| 0 g 15.0 v a 1 5.00 | rquben | uli-terline | X | erter Marande d | whethe | WernerMilleope | querquita | alurand-inh | 103 | ∆4 munchalid | sa synada | remember | Center F 2.412000000 (|
| 15.0 25.0 35.0 | | | | | | | | | | | | | Start F |
| 50 50 50 | | | 44 X | | | | | | ~~~ | | | | Stop F 2.412000000 0 |
| enter 2 tes BW | | 000000 G | SHz | #V | BW | 8.0 MHz | | | Sw | eep 3. | | Span 0 Hz (1000 pts | 8.000000 M |
| IKR MODE 1 | | | × | | 1.5 | Y | | CTION | FUNCTIO | N WIDTH | FUNCT | ION VALUE | Auto |
| 1 42 | 1 t 1 t | | | 1.429 ms 686.2 µs | <u>(Δ)</u> | -1.55 d 10.57 dBr | | | | | | | |
| 3 Δ4 4 F 5 | | (Δ) | | 1.529 ms 686.2 µs | (Δ) | 0.31 d 10.57 dBr | в | | | | | | FreqOff |
| 6 7 8 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |
| () | | * | | | | (W) | | | | | | 1 | ¥ |
| is Poi | nts ch | anged; all | traces cl | eared | - | | | | 0 | STATUS | - | | |







| RL Center | Fre | RF q 2.4 | 50 Q 4 | 000 GHz PNO: Fa IFGain:L | | Trig: Free Ru Atten: 14 dB | #Avg | | e: RMS | TRA | PM Apr 20, 2021 CE 1 2 3 4 5 PE W 100 100 100 100 100 100 100 100 100 1 | Frequency |
|---------------------------------|------|--------------------------|---------------------|--|------------|--|-------------------|------|---------|----------------------------|---|----------------------------------|
| 0 dB/div | | | set 21.02 .00 dB | | | | | | Δ | | .436 ms 0.75 dB | Auto Tune |
| 15.0 15.00 | nhi | a.Altrasp. | *) X3 | Martine Are Albert | lowed the | Adminiation | thereproved where | 1∆ | | sjæl _{et m} inder | mantahalulu | Center Free 2.412000000 GH |
| -16.0 25.0 36.0 | | | | | | | | | | | | Start Fre 2.412000000 GH |
| 45.0 66.0 | | | HMA | | | | | MAN. | | | | Stop Fre 2.412000000 GH |
| Center Res BW | 8 1 | ИНz | 000 GH | | VBW | 8.0 MHz | FUNCTION | _ | Sweep 2 | .864 ms | Span 0 Hz (1000 pts) | CF Ste 8.000000 MH Auto Ma |
| 1 Δ2 2 F 3 Δ4 4 F 5 | 1111 | t (Δ) t t (Δ) t | | 1.336 m 561.9 u 1.436 m 561.9 u | s s (Δ) | 2.61 dB 9.19 dBm -10.75 dB 9.19 dBm | | | | | | Freq Offse 0 H |
| 6 7 8 9 10 | | | | | | | | | | | | |
| | _ | | | | | | | - | | | | 1 |

Duty cycle plot (802.11n(MCS0))

Note:

In order to simplify the report, attached plots were only the most lowest data rate.



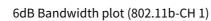
9.2 6dB BANDWIDTH & 99 % BANDWIDTH

FCC

| 802.11 | b Mode | Measured | OBW Bandwidth | Minimum | |
|--------------------|-------------|-----------------|---------------|-----------------|--|
| Frequency [MHz] | Channel No. | Bandwidth [MHz] | [MHz] | Bandwidth [MHz] | |
| 2412 | 1 | 7.097 | 10.111 | 0.5 | |
| 2437 | 6 | 7.113 | 10.101 | 0.5 | |
| 2462 | 11 | 7.109 | 10.095 | 0.5 | |

| 802.11 | g Mode | Measured | OBW Bandwidth | Minimum | |
|--------------------|-------------|-----------------|---------------|-----------------|--|
| Frequency [MHz] | Channel No. | Bandwidth [MHz] | [MHz] | Bandwidth [MHz] | |
| 2412 | 1 | 16.318 | 16.406 | 0.5 | |
| 2437 | 6 | 16.080 | 16.412 | 0.5 | |
| 2462 | 11 | 16.097 | 16.420 | 0.5 | |

| 802.11 | n Mode | Measured | OBW Bandwidth | Minimum | |
|--------------------|-------------|-----------------|---------------|-----------------|--|
| Frequency [MHz] | Channel No. | Bandwidth [MHz] | [MHz] | Bandwidth [MHz] | |
| 2412 | 1 | 17.569 | 17.598 | 0.5 | |
| 2437 | 6 | 17.192 | 17.603 | 0.5 | |
| 2462 | 11 | 17.336 | 17.610 | 0.5 | |



Center Freq: 2.412000000 GHz Trig: Free Run Avg|Hold: 1/1 #Atten: 20 dB

MARIE

#VBW 300 kHz Total Power

x dB

OBW Power

ALIGN #

06:28:02 PM Apr 20, 2021 Radio Std: None

Radio Device: BTS

Span 40 MHz Sweep 3.867 ms

15.2 dBm

99.00 %

-6.00 dB

STATUS

Frequency

Center Freq

CF Step 4.000000 MHz

Freq Offset

Mar

0 Hz

Auto

2.412000000 GHz

밀

Report No. HCT-RF-2105-FI007-R1

6dB Bandwidth plot (802.11g-CH 6)







P

Center Freq 2.412000000 GHz

Center 2.412 GHz #Res BW 100 kHz

Occupied Bandwidth

Points changed; all traces cleared

Transmit Freq Error

x dB Bandwidth

Ref Offset 21.02 dB Ref 15.00 dBm

#IFGain:Low

10.111 MHz 11.784 kHz

7.097 MHz

mmy





| RL RF 50 Ω AC Center Freq 2.437000000 | Trig: | SENSE:INT r Freq: 2.437000000 GHz Free Run Avg Hold n: 20 dB | Radio St d: 1/1 | 0 PM Apr 20, 2021 d: None avice: BTS | Frequency |
|--|-------------------------|---|---------------------|--|--|
| Ref Offset 21.02 c Ref 15.00 dBm | | | | | |
| - • g 5 00 15 0 | midantantantan | un protocolour low low | hny | | Center Fred 2.437000000 GH: |
| 250 250 350 | | | Manageretan | | |
| 65 0 65 0 | | | | | |
| Center 2.437 GHz #Res BW 100 kHz | # | VBW 300 kHz | | an 40 MHz 3.867 ms | CF Step 4.000000 MH: <u>Auto</u> Mar |
| Occupied Bandwidt 17 | h 7.603 MHz | Total Power | 15.3 dBm | | Freq Offsel 0 Hz |
| Transmit Freq Error x dB Bandwidth | 15.563 kHz 17.19 MHz | OBW Power x dB | 99.00 % -6.00 dB | | |
| ASG 🧼 Points changed; all traces of | leared | | STATUS | | |

6dB Bandwidth plot (802.11n_HT20-CH 6)

Note:

In order to simplify the report, attached plots were only the most narrow 6 dB BW channel.





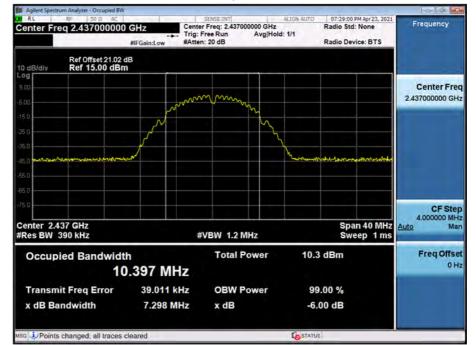
99% Bandwidth Measurements(ISED)

| 802.11b M | OBW | Limit | | |
|--------------------|-------------|--------------------|-------|--|
| Frequency [MHz] | Channel No. | Bandwidth [MHz] | [MHz] | |
| 2412 | 1 | 10.377 | N/A | |
| 2437 | 6 | 10.397 | N/A | |
| 2462 | 11 | 10.377 | N/A | |

| 802.11g M | OBW | Limit | | |
|--------------------|-------------|--------------------|-------|--|
| Frequency [MHz] | Channel No. | Bandwidth [MHz] | [MHz] | |
| 2412 | 1 | 17.145 | N/A | |
| 2437 | 6 | 17.139 | N/A | |
| 2462 | 11 | 17.127 | N/A | |

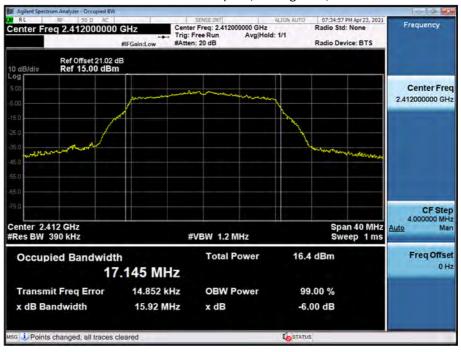
| 802.11n(HT20 | OBW | Limit | | |
|--------------|-------------|-----------|-------|--|
| Frequency | Channel No. | Bandwidth | [MHz] | |
| [MHz] | | [MHz] | | |
| 2412 | 1 | 18.168 | N/A | |
| 2437 | 6 | 18.187 | N/A | |
| 2462 | 11 | 18.118 | N/A | |

Test Plots



99% Bandwidth plot (802.11b-CH 6)

99% Bandwidth plot (802.11g-CH 1)









| RL RF 50 Ω 4C Center Freq 2.437000000 | Trig | SENSE:INT Iter Freq: 2.437000000 GHz I; Free Run Avg Hole ten: 20 dB | d:>1/1 | 07:38:05 PM Apr 23, 2021 adio Std: None adio Device: BTS | Frequency |
|--|-------------------------|---|---------------|--|--------------------------------|
| Ref Offset 21.02 d 10 dB/div Ref 15.00 dBm Log | | | _ | | |
| 500 | | and the second second | - | | Center Fred 2.437000000 GH: |
| 150 250 350 45.0 | | | No No No | Manufalana | |
| 65 0 65 0 | | | | | CF Step 4.000000 MHz |
| Center 2.437 GHz #Res BW 390 kHz | | #VBW 1.2 MHz | | Span 40 MHz Sweep 1 ms | <u>Auto</u> Mar |
| Occupied Bandwidtl | n .187 MHz | Total Power | 15.2 d | Bm | Freq Offset 0 Hz |
| Transmit Freq Error x dB Bandwidth | 11.523 kHz 17.27 MHz | OBW Power x dB | 99.0 -6.00 | | |
| ISG 🧼 Points changed; all traces of | leared | | STATUS | | |

99% Bandwidth plot (802.11n_HT20-CH 6)

Note:

In order to simplify the report, attached plots were only the most wide 99% Bandwidth channel.



9.3 OUTPUT POWER

Peak Power

Power Meter offset = Attenuator loss(20 dB) + Cable loss(1ea) + EUT Cable(For Conducted)
 We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
 So, 21.02 dB is offset for 2.4 GHz Band

| 802.11b | Mode | | Measured | Limit |
|----------------|-------------|-------------|------------|-------|
| Frequency[MHz] | Channel No. | Rate (Mbps) | Power(dBm) | (dBm) |
| | | 1 | 10.00 | 30.00 |
| 2412 | 1 | 2 | 10.25 | 30.00 |
| 2412 | 1 | 5.5 | 11.81 | 30.00 |
| | | 11 | 13.48 | 30.00 |
| | | 1 | 9.79 | 30.00 |
| 2427 | <u>,</u> | 2 | 10.01 | 30.00 |
| 2437 | 6 | 5.5 | 11.44 | 30.00 |
| | | 11 | 13.24 | 30.00 |
| | | 1 | 10.02 | 30.00 |
| 2462 | 11 | 2 | 9.91 | 30.00 |
| 2462 | 11 | 5.5 | 11.80 | 30.00 |
| | | 11 | 13.46 | 30.00 |



| 802.11g Mode | | | Measured | Limit |
|----------------|-------------|-------------|------------|-------|
| Frequency[MHz] | Channel No. | Rate (Mbps) | Power(dBm) | (dBm) |
| | | 6 | 17.07 | 30.00 |
| | | 9 | 17.01 | 30.00 |
| | | 12 | 16.83 | 30.00 |
| 2412 | 1 | 18 | 16.45 | 30.00 |
| 2412 | T | 24 | 16.97 | 30.00 |
| | | 36 | 16.69 | 30.00 |
| | | 48 | 17.08 | 30.00 |
| | | 54 | 17.07 | 30.00 |
| | 6 | 6 | 16.52 | 30.00 |
| | | 9 | 16.46 | 30.00 |
| | | 12 | 16.30 | 30.00 |
| 2437 | | 18 | 15.90 | 30.00 |
| 2437 | | 24 | 16.04 | 30.00 |
| | | 36 | 16.12 | 30.00 |
| | | 48 | 16.19 | 30.00 |
| | | 54 | 16.49 | 30.00 |
| | | 6 | 16.89 | 30.00 |
| | | 9 | 16.73 | 30.00 |
| 2462 | | 12 | 16.59 | 30.00 |
| | - | 18 | 15.96 | 30.00 |
| 2462 | 11 | 24 | 16.30 | 30.00 |
| | | 36 | 16.37 | 30.00 |
| | | 48 | 16.46 | 30.00 |
| | | 54 | 16.43 | 30.00 |



| 802.11n(HT20) Mode | | | Measured | Limit |
|--------------------|-------------|-----------|------------|-------|
| Frequency[MHz] | Channel No. | MCS Index | Power(dBm) | (dBm) |
| | | 0 | 16.02 | 30.00 |
| | | 1 | 16.11 | 30.00 |
| | | 2 | 16.10 | 30.00 |
| 2412 | 1 | 3 | 16.20 | 30.00 |
| 2412 | 1 | 4 | 16.18 | 30.00 |
| | | 5 | 16.24 | 30.00 |
| | | 6 | 16.29 | 30.00 |
| | | 7 | 16.20 | 30.00 |
| | 6 | 0 | 15.88 | 30.00 |
| | | 1 | 15.73 | 30.00 |
| | | 2 | 15.84 | 30.00 |
| 2427 | | 3 | 15.96 | 30.00 |
| 2437 | | 4 | 15.91 | 30.00 |
| | | 5 | 15.71 | 30.00 |
| | | 6 | 15.94 | 30.00 |
| | | 7 | 15.89 | 30.00 |
| | | 0 | 15.86 | 30.00 |
| | | 1 | 15.90 | 30.00 |
| | | 2 | 15.92 | 30.00 |
| 2462 | 11 | 3 | 16.20 | 30.00 |
| 2462 | 11 | 4 | 16.12 | 30.00 |
| | | 5 | 16.16 | 30.00 |
| | | 6 | 16.24 | 30.00 |
| | = | 7 | 16.16 | 30.00 |



Average Power

- 1. Power Meter offset = Attenuator loss(20 dB) + Cable loss(1ea) + EUT Cable(For Conducted)
- 2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
- So, 21.02 dB is offset for 2.4 GHz Band.

| 802.11b Mode | | | Measured | | Measured Power(dBm) | |
|--------------------|----------------|-------------|----------------|----------------------|---------------------------|----------------|
| Frequency [MHz] | Channel No. | Rate (Mbps) | Power (dBm) | Duty Cycle Factor | + Duty Cycle Factor | Limit (dBm) |
| | | 1 | 7.53 | 0.050 | 7.58 | 30.00 |
| 2412 | 1 | 2 | 7.31 | 0.097 | 7.41 | 30.00 |
| 2412 | 1 | 5.5 | 7.21 | 0.243 | 7.45 | 30.00 |
| | | 11 | 6.95 | 0.448 | 7.40 | 30.00 |
| | | 1 | 7.12 | 0.050 | 7.17 | 30.00 |
| 2427 | C | 2 | 6.97 | 0.097 | 7.07 | 30.00 |
| 2437 | 6 | 5.5 | 6.78 | 0.243 | 7.03 | 30.00 |
| | | 11 | 6.71 | 0.448 | 7.16 | 30.00 |
| | | 1 | 7.36 | 0.050 | 7.41 | 30.00 |
| 2462 | 11 | 2 | 7.16 | 0.097 | 7.26 | 30.00 |
| 2462 | 11 | 5.5 | 6.97 | 0.243 | 7.21 | 30.00 |
| | | 11 | 6.86 | 0.448 | 7.30 | 30.00 |

HCT

| 802.11g Mode | | | | | Measured | |
|--------------------|----------------|-------------|----------------------------|----------------------|---|----------------|
| Frequency [MHz] | Channel No. | Rate (Mbps) | Measured Power (dBm) | Duty Cycle Factor | Power(dBm) + Duty Cycle Factor | Limit (dBm) |
| | | 6 | 9.05 | 0.295 | 9.34 | 30.00 |
| | | 9 | 8.93 | 0.436 | 9.37 | 30.00 |
| | | 12 | 8.84 | 0.569 | 9.40 | 30.00 |
| 2412 | 1 | 18 | 8.14 | 0.808 | 8.95 | 30.00 |
| 2412 | 1 - | 24 | 7.92 | 1.051 | 8.97 | 30.00 |
| | - | 36 | 7.42 | 1.454 | 8.87 | 30.00 |
| | - | 48 | 7.30 | 1.810 | 9.11 | 30.00 |
| | - | 54 | 7.14 | 1.943 | 9.08 | 30.00 |
| | | 6 | 8.51 | 0.295 | 8.81 | 30.00 |
| | - | 9 | 8.40 | 0.436 | 8.83 | 30.00 |
| | = | 12 | 8.31 | 0.569 | 8.88 | 30.00 |
| | | 18 | 7.62 | 0.808 | 8.43 | 30.00 |
| 2437 | 6 | 24 | 7.30 | 1.051 | 8.36 | 30.00 |
| | | 36 | 6.92 | 1.454 | 8.37 | 30.00 |
| | | 48 | 6.70 | 1.810 | 8.51 | 30.00 |
| | | 54 | 6.72 | 1.943 | 8.66 | 30.00 |
| | | 6 | 8.72 | 0.295 | 9.02 | 30.00 |
| | | 9 | 8.59 | 0.436 | 9.03 | 30.00 |
| | | 12 | 8.52 | 0.569 | 9.09 | 30.00 |
| 2462 | | 18 | 7.69 | 0.808 | 8.50 | 30.00 |
| 2462 | 11 - | 24 | 7.56 | 1.051 | 8.61 | 30.00 |
| | | 36 | 7.16 | 1.454 | 8.62 | 30.00 |
| | | 48 | 7.00 | 1.810 | 8.81 | 30.00 |
| | | 54 | 6.65 | 1.943 | 8.59 | 30.00 |



| 802.11n Mode | | | | | Measured | |
|--------------------|----------------|-----------|----------------------------|----------------------|---|----------------|
| Frequency [MHz] | Channel No. | MCS Index | Measured Power (dBm) | Duty Cycle Factor | Power(dBm) + Duty Cycle Factor | Limit (dBm) |
| | | 0 | 7.90 | 0.315 | 8.22 | 30.00 |
| | | 1 | 7.65 | 0.596 | 8.24 | 30.00 |
| | | 2 | 7.39 | 0.843 | 8.23 | 30.00 |
| 2412 | 1 | 3 | 6.81 | 1.073 | 7.88 | 30.00 |
| 2412 | 1 | 4 | 6.45 | 1.452 | 7.90 | 30.00 |
| | | 5 | 6.22 | 1.775 | 7.99 | 30.00 |
| | | 6 | 6.10 | 1.908 | 8.01 | 30.00 |
| | | 7 | 5.90 | 2.051 | 7.96 | 30.00 |
| | | 0 | 7.70 | 0.315 | 8.02 | 30.00 |
| | | 1 | 7.36 | 0.596 | 7.95 | 30.00 |
| | | 2 | 7.12 | 0.843 | 7.97 | 30.00 |
| 2427 | | 3 | 6.57 | 1.073 | 7.64 | 30.00 |
| 2437 | 6 | 4 | 6.22 | 1.452 | 7.67 | 30.00 |
| | | 5 | 5.78 | 1.775 | 7.56 | 30.00 |
| | - | 6 | 5.72 | 1.908 | 7.63 | 30.00 |
| | | 7 | 5.64 | 2.051 | 7.69 | 30.00 |
| | | 0 | 7.74 | 0.315 | 8.05 | 30.00 |
| | - | 1 | 7.49 | 0.596 | 8.09 | 30.00 |
| | | 2 | 7.32 | 0.843 | 8.17 | 30.00 |
| 2462 | 11 | 3 | 6.77 | 1.073 | 7.84 | 30.00 |
| | 11 | 4 | 6.41 | 1.452 | 7.86 | 30.00 |
| | | 5 | 6.10 | 1.775 | 7.88 | 30.00 |
| | | 6 | 6.02 | 1.908 | 7.93 | 30.00 |
| | | 7 | 5.88 | 2.051 | 7.93 | 30.00 |





9.4 POWER SPECTRAL DENSITY

| | _ | | Test Result | | |
|---------|--------------------|-------------|--------------------------|----------------|--|
| Mode | Frequency (MHz) | Channel No. | Measured PSD (dBm) | Limit (dBm) | |
| | 2412 | 1 | 0.658 | 8 | |
| 802.11b | 2437 | 6 | 0.574 | 8 | |
| | 2462 | 11 | 0.828 | 8 | |
| | 2412 | 1 | -1.720 | 8 | |
| 802.11g | 2437 | 6 | -2.497 | 8 | |
| | 2462 | 11 | -2.125 | 8 | |
| 802.11n | 2412 | 1 | -3.018 | 8 | |
| | 2437 | 6 | -3.304 | 8 | |
| | 2462 | 11 | -2.988 | 8 | |

Note :

1. Spectrum reading values are not plot data.

The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.

- 2. Spectrum offset = Attenuator loss(20 dB) + Cable loss(1ea) + EUT Cable(For Conducted)
- 3. 21.02 dB is offset for 2.4 GHz Band.



Power Spectral Density (802.11g-CH 1)

D I 41:01 PM Apr 20, 2021 TRACE 2 3 4 5 TYPE MWWWWW DET PPPPP Frequency Center Freq 2.412000000 GHz PN0: Fast ----IFGain:Low Trig: Free Run Atten: 6 dB #Avg Type: RMS Avg|Hold: 1/1 Auto Tune Mkr1 2.413 297 GHz -1.720 dBm Ref Offset 21.02 dB Ref 5.00 dBm 0 dB/d Center Freq tymh 2.412000000 GHz NW AM Start Freq 2.399761597 GHz Stop Freq 2.424238403 GHz CF Step 2.447681 MHz Man Auto Freq Offset 0 Hz Center 2.41200 GHz #Res BW 100 kHz Span 24.48 MHz Sweep 2.400 ms (1001 pts) #VBW 300 kHz In ST

Test Plots









| RL RF 50Ω AC Center Freq 2.412000000 | GHZ PNO: Fast +++ IFGain:Low Atten: 6 dB | #Avg Type: RMS Avg Hold: 1/1 | 07:19:19 PM Apr 20, 2021 TRACE 1 2 3 4 5 TYPE M DET P P P P P | Frequency |
|---|--|---------------------------------|--|----------------------------------|
| Ref Offset 21.02 dB | IFGain:Low Attent 0 05 | Mkr1 | 2.413 291 GHz -3.018 dBm | Auto Tune |
| 5.00 Winhvy | had have been and | 1 huthollowburk | m | Center Free 2.412000000 GH: |
| 150 25.0 | | | - Look | Start Fre 2.398823595 GH |
| 45,0 | | | | Stop Fre 2.425176405 GH |
| 55 0 | | | | CF Ste 2.635281 MH Auto Ma |
| 750 | | | | Freq Offse 0 H |
| 65 0 Center 2,41200 GHz | | | Span 26.35 MHz | |
| #Res BW 100 kHz | #VBW 300 kHz | Sweep 2 | .533 ms (1001 pts) | |

Power Spectral Density (802.11n_HT20 -CH 11)

Note :

In order to simplify the report, attached plots were only the worst case PSD channel.



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Report No. HCT-RF-2105-FI007-R1

9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below. In order to simplify the report, attached plots were only the worst case channel and data rate.

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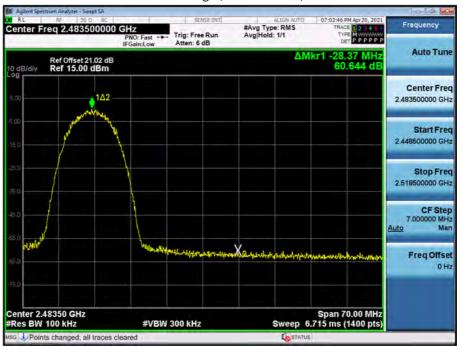
CUSTOMER SECRET

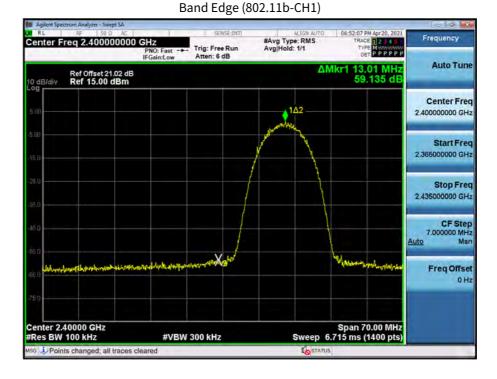
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Test Plots(BandEdge)

Band Edge (802.11b-CH11)







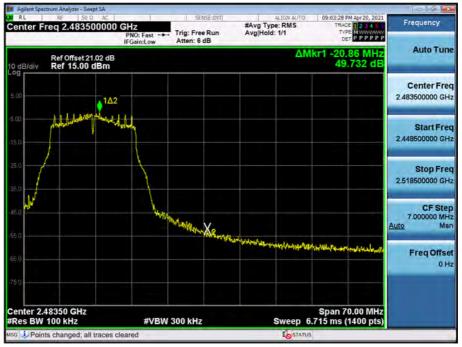




| Center Freq 2. | | NO: Fast | Trig: Free Atten: 6 d | | #Avg Type: F Avg Hold: 1/ | RMS | 7:41:18 PM Apr 20, 2 TRACE 1 2 3 4 TYPE M WWW DET P P P P | Frequency |
|------------------------|---|-------------------|--------------------------|--------|------------------------------|----------|--|----------------------------------|
| Ref C IO dB/div Ref | ffset 21.02 dB 15.00 dBm | Sanne Str | | | | ΔMkr | 1 16.26 MH 44.462 d | Auto Tun |
| 5.00 | | | | | ↓ 12 | 12 | | Center Fre 2.400000000 GH |
| 5.00 | | | | aller, | nhalt-halta palacha | Artonhal | | Start Fre 2.365000000 GH |
| 25.0 | | | | / | | | | Stop Fre 2.435000000 GH |
| 45.0 | - s 1 dused august th | marialelliseriell | NHURAN | | | | malinamental | CF Ste 7.000000 MH Auto Ma |
| 55,0 66,0 | and the second secon | | | | | | | Freq Offse 0 H |
| 75.0 Center 2.40000 | | | 200 111- | | | S | pan 70.00 MI | Hz |
| Res BW 100 k | ged; all traces clea | | 300 kHz | | | STATUS | 5 ms (1400 pt | (s) |

Band Edge (802.11g-CH1)

Band Edge (802.11g-CH11)



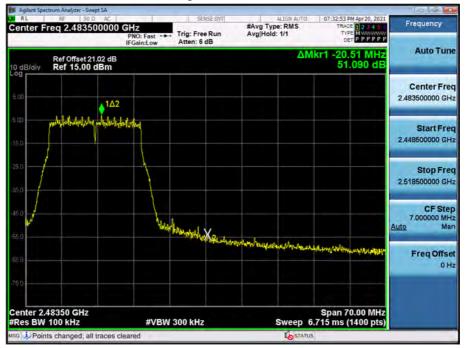




| Agilent Spectrum Analyzer - Swept 5A RL RF 50 Ω AC | SENSE:17 | (T) ALIGN AUTO | 07:19:36 PM Apr 20, 2021 | 0 9 2 |
|---|--|------------------------------------|--|----------------------------------|
| Center Freq 2.40000000 | PNO: Fast +++ Trig: Free Run IFGain:Low Atten: 6 dB | #Avg Type: RMS Avg Hold: 1/1 | TRACE 2345 TYPE MWWWWW DET PPPPP | Frequency |
| Ref Offset 21.02 dB 0 dB/div Ref 15.00 dBm | | Δ | Mkr1 13.26 MHz 43.475 dB | Auto Tun |
| 5.00 | | 162 | | Center Fre 2.40000000 GH |
| 5 lili) | | pola kolosini shq prindratadimi da | | Start Fre 2.365000000 GH |
| 25.0 | | | | Stop Fre 2.435000000 GH |
| 45.0 56.0 | her you had all all and a long the start of the | | Allertogradestrond | CF Ste 7.000000 MH Auto Ma |
| 66.0 | | | | Freq Offs 0 F |
| 250 Center 2.40000 GHz | | | Span 70.00 MHz | |
| Res BW 100 kHz | #VBW 300 kHz | Sweep | 6.715 ms (1400 pts) | |

Band Edge (802.11n(HT20)-CH1)

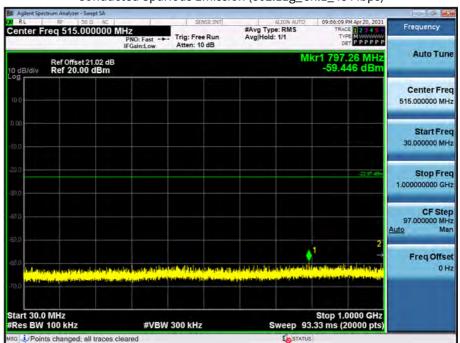
Band Edge (802.11n(HT20)-CH11)





Test Plots(Conducted Spurious Emission)

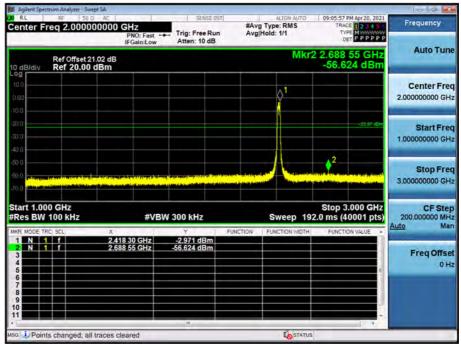
30 MHz ~ 1 GHz



Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)

1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)



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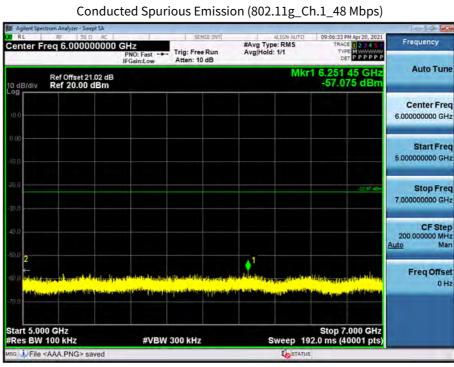
밀

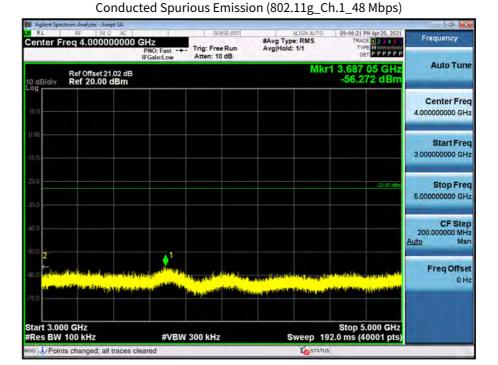
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3 GHz ~ 5 GHz

5 GHz ~ 7 GHz

F-TP22-03 (Rev. 03)



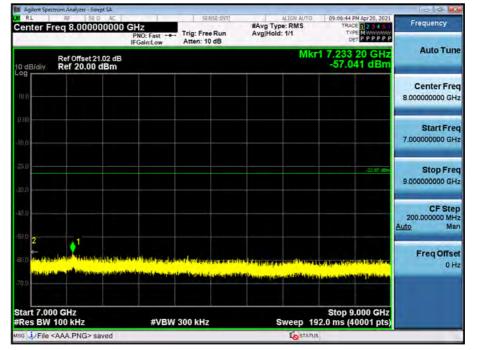




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Report No. HCT-RF-2105-FI007-R1

$7 \text{ GHz} \sim 9 \text{ GHz}$



Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)

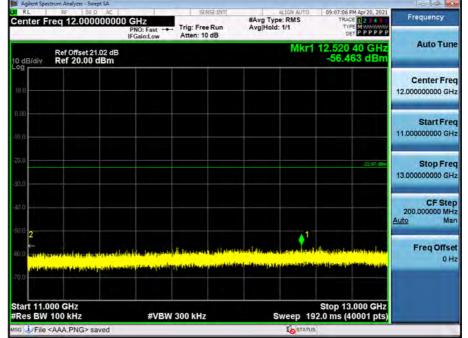
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)

r - Swept SA Agi Apr 20, 202 Frequency Center Freq 10.000000000 GHz PNO: Fast IFGain:Low #Avg Type: RMS Avg|Hold: 1/1 Trig: Free Run Atten: 10 dB ACE 12345 TYPE MWWWWWW Auto Tune 0.696 65 GHz -57.389 dBm Mkr Ref Offset 21.02 dB Ref 20.00 dBm IO dB/ Center Freq 10.00000000 GHz Start Freq 9.00000000 GHz Stop Freq 11.00000000 GHz CF Step 200.000000 MHz to Man uto 0 Freq Offset 0 Hz Start 9.000 GHz #Res BW 100 kHz Stop 11.000 GHz Sweep 192.0 ms (40001 pts) #VBW 300 kHz File <AAA.PNG> saved 1



11 GHz ~ 13 GHz



Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)

13 GHz ~ 15 GHz

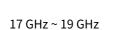
Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)

| 09 | 09:07:18 PM Apr 20, 2021 | ALIGN AUTO | ISE:INT | den . | | zer - Swept SA 50 Ω AC | gilent Spectrum Ana RL RF |
|------------------------------------|--|--|--------------------------------|--------------------------------------|-----------------------------------|---|------------------------------|
| Frequency | TRACE 2 2 4 5 TYPE MWWWW DET P P P P P P | Type: RMS Hold: 1/1 | Run | | GHz PNO: Fast | .000000000 | |
| Auto Tun | 14.668 50 GHz -55.620 dBm | Mkr1 | | | | fset 21.02 dB 0.00 dBm | |
| Center Fre 14.000000000 GH | | | | | | | |
| Start Fre 13.000000000 GH | | | | | | |) |
| Stop Fre 15.00000000 GH | -22.97 (6% | | | | | | |
| CF Ste 200.000000 MH Auto Ma | | | | | | | |
| Freq Offs 0 F | and the language of the last of the last | handarihakini kang Marina kang kanala | angels an dit na nga pagaan | na radi Miladi ja Miladigi Manika | na natikanian Marina Prinatira | ta Antone polo de alta esta d A tangan esta de alta esta d | 2 Ministria es della fer |
| | Stop 15.000 GHz 2.0 ms (40001 pts) | Sweep 19 | | 300 kHz | #VBW | | rt 13.000 GH es BW 100 k |
| | | STATUS | | | | | File <aaa.p< td=""></aaa.p<> |



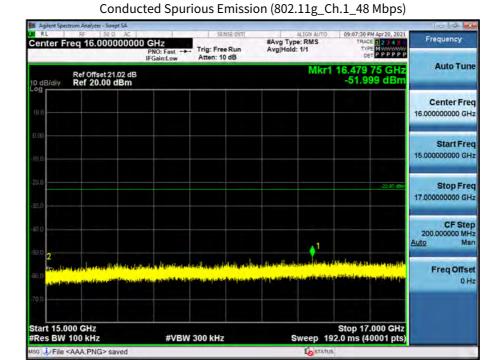
ъ

15 GHz ~ 17 GHz



Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)

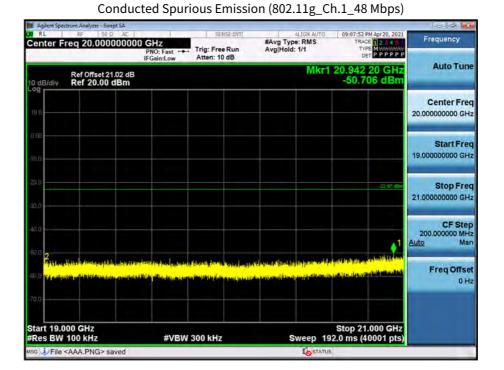
| 093 | | | | | trum Analyzer - Swept SA | |
|---------------------------------------|--|--|--------------|--|---|--------------------------|
| Frequency | 09:07:41 PM Apr 20, 2021 TRACE 2 3 4 5 4 TVPE MWWWWWW DET P P P P P P | #Avg Type: RMS Avg Hold: 1/1 | SENSE:INT | OGHZ | RF 50.0 AC | Center F |
| Auto Tune | 18.904 40 GHz -52.101 dBm | Mkr1 | Atten: 10 dB | IFGain:Low | Ref Offset 21.02 dB Ref 20.00 dBm | 10 dB/div |
| Center Freq 18.000000000 GHz | | | | | | 10.0 |
| Start Freq 17.000000000 GHz | | | | | | 0.00 |
| Stop Freq 19.000000000 GHz | -22.97 (84) | | | | | ao,o ao,o |
| CF Step 200.000000 MHz Auto Man | t | | | | | -40.0 |
| Freq Offset 0 Hz | ninterner almitellation Niewerskiegeneration Niewerskiegeneration | anse (kulosov, maj letelle - Ramenica programpi namen | | uyu dini ki piyu din si ni kuru ti dagi njaya ngo | andan na da | -60.0 <mark>W-MA-</mark> |
| | Stop 19.000 GHz 2.0 ms (40001 pts) | Sweep 19 | 800 kHz | #VBW 3 | | Start 17.0 |
| | | Lo STATUS | | _ | <aaa.png> saved</aaa.png> | usg 🧼 File · |





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Report No. HCT-RF-2105-FI007-R1



21 GHz ~ 23 GHz



| | AC | SENSE:INT | ALIGN ALITO | 09:08:03 PM Apr 20, 2021 | 0.9 |
|--|-----------------------------|--------------------------------|---|---------------------------------------|---|
| Center Freq 22.0000 | PNO: Fast +++ IFGain:Low | Trig: Free Run Atten: 10 dB | #Avg Type: RMS Avg Hold: 1/1 | TYPE MWWWWW DET PPPPP | Frequency |
| Ref Offset 21.0 0 dB/div Ref 20.00 dl | | | Mkr1 | 21.663 15 GHz -49.003 dBm | Auto Tun |
| 10.0 | | | | | Center Fre 22.000000000 GH |
| 000 | | | | | Start Fre 21.000000000 GF |
| 10,0 | | | | -22.97 (En | Stop Fre 23.00000000 G |
| 0.0 | ∮ ¹ | | | | CF Sto 200.000000 M <u>Auto</u> M |
| ing and a second se | | | and particulation and an and a second se An an | | Freq Offs 0 |
| tart 21.000 GHz Res BW 100 kHz | #VBW | 300 kHz | Sweep 19 | Stop 23.000 GHz 2.0 ms (40001 pts) | |
| G JFile <aaa.png> say</aaa.png> | | | STATUS | | |



23 GHz ~ 25 GHz

| Frequency | 09:08:15 PM Apr 20, 2021 TRACE 1 2 3 4 5 | #Avg Type: RMS | SENSEIINT | 50 Ω AC | |
|---------------------------------------|---|--|--------------------------------|-------------------------------------|--|
| | DET P P P P P P | Avg Hold: 1/1 | Trig: Free Run Atten: 10 dB | PNO: Fast +++ IFGain:Low | enter Freq 24.0 |
| Auto Tune | 24.395 20 GHz -47.316 dBm | Mkr1 | | set 21.02 dB 0.00 dBm | |
| Center Free 24.000000000 GH: | | | | | 100 |
| Start Free 23.000000000 GH: | | | | | 0.00 |
| Stop Free 25.000000000 GH | -22.97 abri | | | | zu.0 |
| CF Step 200.000000 MH: Auto Mar | anno a Dallana (m. 10.4 | 1 1 | wathdow of Art | alian at Lands at Males and Alesian | 10 D |
| Freq Offse 0 H | 1999-1996 pour sugar bille | <mark>oy Halenaal In Bouwerk</mark> pijd | | | ana <mark>Paragal bi padata d</mark> an di |
| | | | | | 70.0 |
| | Stop 25.000 GHz 2.0 ms (40001 pts) | Sweep 19 | 300 kHz | #VBW | tart 23.000 GHz Res BW 100 kHz |

Conducted Spurious Emission (802.11g_Ch.1_48 Mbps)





9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30MHz

| Frequency | Reading | Ant. factor | Cable loss | Ant. POL | Total | Limit | Margin |
|-----------|-------------------------|-------------|------------|----------|--------|--------|--------|
| MHz | dBuV/m | dBm/m | dBm | (H/V) | dBuV/m | dBuV/m | dB |
| | No Critical peaks found | | | | | | |

Note:

1. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.

- 2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
- 3. Limit line = specific Limits (dBuV) + Distance extrapolation factor

Frequency Range : Below 1 GHz

| Frequency | Reading | Ant. factor | Cable loss | Ant. POL | Total | Limit | Margin |
|-----------|-------------------------|-------------|------------|----------|--------|--------|--------|
| MHz | dBuV/m | dBm/m | dBm | (H/V) | dBuV/m | dBuV/m | dB |
| | No Critical peaks found | | | | | | |

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made

with an instrument using Quasi peak detector mode.



Frequency Range : Above 1 GHz

| Operation Mode: | 802.11b |
|---------------------|----------|
| Transfer Rate: | 1 Mbps |
| Operating Frequency | 2412 MHz |
| Channel No. | 01 Ch |

| Frequency | Reading | A.F+CL- A.G +D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|------------------|----------|----------|----------|--------|--------|
| [MHz] | [dBuV] | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | Detect |
| 4824 | 42.15 | 3.46 | V | 45.61 | 73.98 | 28.37 | PK |
| 4824 | 30.32 | 3.46 | V | 33.78 | 53.98 | 20.20 | AV |
| 7236 | 40.44 | 12.51 | V | 52.95 | 73.98 | 21.03 | PK |
| 7236 | 31.42 | 12.51 | V | 43.93 | 53.98 | 10.05 | AV |
| 4824 | 41.32 | 3.46 | Н | 44.78 | 73.98 | 29.20 | PK |
| 4824 | 29.42 | 3.46 | Н | 32.88 | 53.98 | 21.10 | AV |
| 7236 | 41.74 | 12.51 | Н | 54.25 | 73.98 | 19.73 | PK |
| 7236 | 32.62 | 12.51 | Н | 45.13 | 53.98 | 8.85 | AV |

| Operation Mode: | 802.11b |
|---------------------|----------|
| Transfer Rate: | 1 Mbps |
| Operating Frequency | 2437 MHz |
| Channel No. | 06 Ch |

| Frequency | Reading | A.F+CL-A.G+D.F | ANT. POL | Total | Limit | Margin | Dotoct |
|-----------|---------|----------------|----------|----------|----------|--------|--------|
| [MHz] | [dBuV] | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | Detect |
| 4874 | 42.23 | 3.42 | V | 45.65 | 73.98 | 28.33 | PK |
| 4874 | 30.31 | 3.42 | V | 33.73 | 53.98 | 20.25 | AV |
| 7311 | 41.22 | 11.76 | V | 52.98 | 73.98 | 21.00 | PK |
| 7311 | 30.12 | 11.76 | V | 41.88 | 53.98 | 12.10 | AV |
| 4874 | 41.98 | 3.42 | Н | 45.40 | 73.98 | 28.58 | PK |
| 4874 | 30.12 | 3.42 | Н | 33.54 | 53.98 | 20.44 | AV |
| 7311 | 41.96 | 11.76 | Н | 53.72 | 73.98 | 20.26 | PK |
| 7311 | 30.52 | 11.76 | Н | 42.28 | 53.98 | 11.70 | AV |



| Operation Mode: | 802.11b |
|---------------------|----------|
| Transfer Rate: | 1 Mbps |
| Operating Frequency | 2462 MHz |
| Channel No. | 11 Ch |
| | |

| Frequency | Reading | A.F+CL-A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|----------------|----------|----------|----------|--------|--------|
| [MHz] | [dBuV] | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | Detect |
| 4924 | 42.09 | 4.55 | V | 46.64 | 73.98 | 27.34 | PK |
| 4924 | 29.45 | 4.55 | V | 34.00 | 53.98 | 19.98 | AV |
| 7386 | 38.85 | 12.13 | V | 50.98 | 73.98 | 23.00 | PK |
| 7386 | 27.77 | 12.13 | V | 39.90 | 53.98 | 14.08 | AV |
| 4924 | 41.85 | 4.55 | Н | 46.40 | 73.98 | 27.58 | PK |
| 4924 | 29.38 | 4.55 | Н | 33.93 | 53.98 | 20.05 | AV |
| 7386 | 39.02 | 12.13 | Н | 51.15 | 73.98 | 22.83 | PK |
| 7386 | 27.85 | 12.13 | Н | 39.98 | 53.98 | 14.00 | AV |



| Operation Mode: | 802.11g |
|---------------------|----------|
| Transfer Rate: | 6 Mbps |
| Operating Frequency | 2412 MHz |
| Channel No. | 01 Ch |
| | |

| Frequency | Reading | Duty Cycle | A.F+CL- A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|---------------|--------------------|----------|----------|----------|--------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 4824 | 41.55 | 0.00 | 3.46 | V | 45.01 | 73.98 | 28.97 | PK |
| 4824 | 29.85 | 0.30 | 3.46 | V | 33.61 | 53.98 | 20.38 | AV |
| 7236 | 48.22 | 0.00 | 12.51 | V | 60.73 | 73.98 | 13.25 | PK |
| 7236 | 29.32 | 0.30 | 12.51 | V | 42.13 | 53.98 | 11.86 | AV |
| 4824 | 40.62 | 0.00 | 3.46 | Н | 44.08 | 73.98 | 29.90 | PK |
| 4824 | 28.75 | 0.30 | 3.46 | Н | 32.51 | 53.98 | 21.48 | AV |
| 7236 | 49.24 | 0.00 | 12.51 | Н | 61.75 | 73.98 | 12.23 | PK |
| 7236 | 30.43 | 0.30 | 12.51 | Н | 43.24 | 53.98 | 10.75 | AV |

| Operation Mode: | 802.11g |
|---------------------|----------|
| Transfer Rate: | 6 Mbps |
| Operating Frequency | 2437 MHz |
| Channel No. | 06 Ch |
| | |

| Frequency | Reading | Duty Cycle | A.F+CL- A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|---------------|--------------------|----------|----------|----------|--------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 4874 | 42.32 | 0.00 | 3.42 | V | 45.74 | 73.98 | 28.24 | PK |
| 4874 | 30.42 | 0.30 | 3.42 | V | 34.14 | 53.98 | 19.85 | AV |
| 7311 | 46.12 | 0.00 | 11.76 | V | 57.88 | 73.98 | 16.10 | PK |
| 7311 | 28.52 | 0.30 | 11.76 | V | 40.58 | 53.98 | 13.41 | AV |
| 4874 | 42.11 | 0.00 | 3.42 | Н | 45.53 | 73.98 | 28.45 | PK |
| 4874 | 30.22 | 0.30 | 3.42 | Н | 33.94 | 53.98 | 20.05 | AV |
| 7311 | 46.46 | 0.00 | 11.76 | Н | 58.22 | 73.98 | 15.76 | PK |
| 7311 | 28.92 | 0.30 | 11.76 | Н | 40.98 | 53.98 | 13.01 | AV |



| Operation Mode: | 802.11g |
|---------------------|----------|
| Transfer Rate: | 6 Mbps |
| Operating Frequency | 2462 MHz |
| Channel No. | 11 Ch |
| | |

| Frequency | Reading | Duty Cycle | A.F+CL- A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|---------------|--------------------|----------|----------|----------|--------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 4924 | 41.02 | 0.00 | 4.55 | V | 45.57 | 73.98 | 28.41 | PK |
| 4924 | 29.35 | 0.30 | 4.55 | V | 34.20 | 53.98 | 19.79 | AV |
| 7386 | 43.85 | 0.00 | 12.13 | V | 55.98 | 73.98 | 18.00 | PK |
| 7386 | 27.12 | 0.30 | 12.13 | V | 39.55 | 53.98 | 14.44 | AV |
| 4924 | 40.98 | 0.00 | 4.55 | Н | 45.53 | 73.98 | 28.45 | PK |
| 4924 | 29.22 | 0.30 | 4.55 | Н | 34.07 | 53.98 | 19.92 | AV |
| 7386 | 43.92 | 0.00 | 12.13 | Н | 56.05 | 73.98 | 17.93 | PK |
| 7386 | 27.38 | 0.30 | 12.13 | Н | 39.81 | 53.98 | 14.18 | AV |



| Operation Mode: | 802.11n (HT20) |
|---------------------|----------------|
| Transfer MCS Index: | 0 |
| Operating Frequency | 2412 MHz |
| Channel No. | 01 Ch |
| | |

| Frequency | Reading | Duty Cycle | A.F+CL- A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|---------------|--------------------|----------|----------|----------|--------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 4824 | 41.64 | 0.00 | 3.46 | V | 45.10 | 73.98 | 28.88 | PK |
| 4824 | 29.75 | 0.32 | 3.46 | V | 33.53 | 53.98 | 20.46 | AV |
| 7236 | 48.12 | 0.00 | 12.51 | V | 60.63 | 73.98 | 13.35 | PK |
| 7236 | 29.42 | 0.32 | 12.51 | V | 42.25 | 53.98 | 11.74 | AV |
| 4824 | 40.52 | 0.00 | 3.46 | Н | 43.98 | 73.98 | 30.00 | PK |
| 4824 | 28.71 | 0.32 | 3.46 | Н | 32.49 | 53.98 | 21.50 | AV |
| 7236 | 51.42 | 0.00 | 12.51 | Н | 63.93 | 73.98 | 10.05 | PK |
| 7236 | 29.42 | 0.32 | 12.51 | Н | 42.25 | 53.98 | 11.74 | AV |

| Operation Mode: | 802.11n (HT20) |
|---------------------|----------------|
| Transfer MCS Index: | 0 |
| Operating Frequency | 2437 MHz |
| Channel No. | 06 Ch |
| | |

| Frequency | Reading | Duty Cycle | A.F+CL- A.G+D.F | ANT. POL Total | | Limit | Margin | Detect |
|-----------|---------|---------------|--------------------|----------------|----------|----------|--------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 4874 | 42.42 | 0.00 | 3.42 | V | 45.84 | 73.98 | 28.14 | PK |
| 4874 | 30.33 | 0.32 | 3.42 | V | 34.07 | 53.98 | 19.92 | AV |
| 7311 | 48.88 | 0.00 | 11.76 | V | 60.64 | 73.98 | 13.34 | PK |
| 7311 | 28.12 | 0.32 | 11.76 | V | 40.20 | 53.98 | 13.79 | AV |
| 4874 | 42.22 | 0.00 | 3.42 | Н | 45.64 | 73.98 | 28.34 | PK |
| 4874 | 30.18 | 0.32 | 3.42 | Н | 33.92 | 53.98 | 20.07 | AV |
| 7311 | 48.93 | 0.00 | 11.76 | Н | 60.69 | 73.98 | 13.29 | PK |
| 7311 | 28.32 | 0.32 | 11.76 | Н | 40.40 | 53.98 | 13.59 | AV |



| Operation Mode: | 802.11n (HT20) |
|---------------------|----------------|
| Transfer MCS Index: | 0 |
| Operating Frequency | 2462 MHz |
| Channel No. | 11 Ch |
| | |

| Frequency | Reading | Duty Cycle | A.F+CL- A.G+D.F | ANT. POL Total | | Total Limit | | Detect |
|-----------|---------|---------------|--------------------|----------------|----------|-------------|-------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 4924 | 41.29 | 0.00 | 4.55 | V | 45.84 | 73.98 | 28.14 | PK |
| 4924 | 29.42 | 0.32 | 4.55 | V | 34.29 | 53.98 | 19.70 | AV |
| 7386 | 45.52 | 0.00 | 12.13 | V | 57.65 | 73.98 | 16.33 | PK |
| 7386 | 26.99 | 0.32 | 12.13 | V | 39.44 | 53.98 | 14.55 | AV |
| 4924 | 41.12 | 0.00 | 4.55 | Н | 45.67 | 73.98 | 28.31 | PK |
| 4924 | 29.33 | 0.32 | 4.55 | Н | 34.20 | 53.98 | 19.79 | AV |
| 7386 | 45.67 | 0.00 | 12.13 | Н | 57.80 | 73.98 | 16.18 | PK |
| 7386 | 27.12 | 0.32 | 12.13 | Н | 39.57 | 53.98 | 14.42 | AV |



Test Plots

Spectrum Spectrum 2 () Ref Level 77.00 dBµV RBW 1 MHz SWT 4 ms - VBW 3 MHz Mode Sweep Att 0 dB Count 200/200 MILLI 32.62 dBp 7.2346980 GH 70 dBuV 60 dBuV 50 dBuV 40 dBuV and the second and a hereber hereben with the present of the second s 20 dBµV 10 dBµV-0 dBµV--10 dBuV -20 dBuV-CF 7.236 GHz 691 pts Span 50.0 MHz

Radiated Spurious Emissions plot – Average Reading (802.11b, Ch.1 3rd Harmonic, X-H)

Radiated Spurious Emissions plot – Peak Reading (802.11b, Ch.1 3rd Harmonic, X-H)

| Spectrum | Spectrum | 2 🕱 | | | | | | | | |
|---|----------------------------|-----------------|------------------|----------------|-------------------|------------------|-------------------|-----------------------------|--|--|
| Ref Level 77.00 Att Count 200/200 | | 4 ms S VBW | 1 MHz 3 MHz N | lode Sweep | þ | | | | | |
| ● 1Pk View●2Pk Cl | rw | | | | | | | | | |
| 70 dBµV | | | | M | 1[1] | | | 41.74 dBµV 7.2344800 GHz | | |
| | 1 1 | | | | | | | | | |
| 60 dBµV | - | - | | | | | | | | |
| 50 dBµV | - | - | | | | | | | | |
| 40 dBµV | | | MI | and the second | | | | | | |
| 40 dBUV | La And Viralia (Mithewite) | Internet states | white may | 11 mary alle | Mahalal Lata Di P | Lodul Jahura and | W. Jun Athle at J | k national have and | | |
| ,3000 Https://www.alline.com | housh after | -h-aha a -at -h | , | | ₩ ₩1 XX ₩1= | L | | <u>ես Աստես գիրերանը։ Ո</u> | | |
| 20 dBµV | | | | | | | | | | |
| 10 dBµV | | | | | | | | | | |
| 0 dBµV | | | | | | | | | | |
| -10 dBµV | | | | | | | | | | |
| 10 dopt | | | | | | | | | | |
| -20 dBµV | | | | | | | | | | |
| CF 7.236 GHz | | | 691 | pts | | | Span | 50.0 MHz | | |

Note:

Plot of worst case are only reported.





9.7 RADIATED RESTRICTED BAND EDGES

| Operation Mode: | 802.11b | | |
|---------------------|--------------------|--|--|
| Transfer Rate: | 1 Mbps | | |
| Operating Frequency | 2412 MHz, 2462 MHz | | |
| Channel No. | 01 Ch, 11 Ch | | |

| | 1 | r | 1 | 1 | 1 | | · · · · · · · · · · · · · · · · · · · |
|-----------|---------|---------------------|----------|----------|----------|--------|---------------------------------------|
| Frequency | Reading | A.F.+CL+ATT-A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
| [MHz] | [dBuV] | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | Deleci |
| 2390.0 | 48.03 | 1.94 | Н | 49.97 | 73.98 | 24.01 | PK |
| 2390.0 | 35.01 | 1.94 | Н | 36.95 | 53.98 | 17.03 | AV |
| 2390.0 | 48.14 | 1.94 | V | 50.08 | 73.98 | 23.90 | PK |
| 2390.0 | 35.23 | 1.94 | V | 37.17 | 53.98 | 16.81 | AV |
| 2483.5 | 46.87 | 2.74 | Н | 49.61 | 73.98 | 24.37 | PK |
| 2483.5 | 34.95 | 2.74 | Н | 37.69 | 53.98 | 16.29 | AV |
| 2483.5 | 46.65 | 2.74 | V | 49.39 | 73.98 | 24.59 | PK |
| 2483.5 | 34.78 | 2.74 | V | 37.52 | 53.98 | 16.46 | AV |

Operation Mode: Transfer Rate: Operating Frequency Channel No.

| 802.11g |
|--------------------|
| 6 Mbps |
| 2412 MHz, 2462 MHz |
| 01 Ch, 11 Ch |

| Frequency | Reading | Duty Cycle | A.F.+CL+ATT- A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|---------------|-------------------------|-------------|----------|----------|--------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 2390.0 | 53.99 | 0.00 | 1.94 | Н | 55.93 | 73.98 | 18.05 | PK |
| 2390.0 | 40.98 | 0.30 | 1.94 | Н | 43.22 | 53.98 | 10.77 | AV |
| 2390.0 | 54.14 | 0.00 | 1.94 | V | 56.08 | 73.98 | 17.90 | PK |
| 2390.0 | 41.09 | 0.30 | 1.94 | V | 43.33 | 53.98 | 10.66 | AV |
| 2483.5 | 49.48 | 0.00 | 2.74 | Н | 52.22 | 73.98 | 21.76 | PK |
| 2483.5 | 36.78 | 0.30 | 2.74 | Н | 39.82 | 53.98 | 14.17 | AV |
| 2483.5 | 49.22 | 0.00 | 2.74 | V | 51.96 | 73.98 | 22.02 | PK |
| 2483.5 | 36.55 | 0.30 | 2.74 | V | 39.59 | 53.98 | 14.40 | AV |

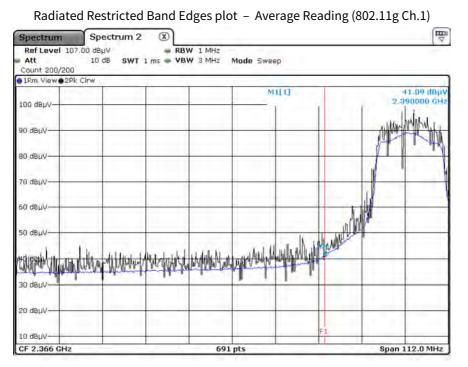
| Operation Mode: | 802.11n (HT20) |
|---------------------|--------------------|
| Transfer MCS Index: | 0 |
| Operating Frequency | 2412 MHz, 2462 MHz |
| Channel No. | 01 Ch, 11 Ch |

| Frequency | Reading | Duty Cycle | A.F.+CL+ATT- A.G+D.F | ANT. POL | Total | Limit | Margin | Detect |
|-----------|---------|---------------|-------------------------|-------------|----------|----------|--------|--------|
| [MHz] | [dBuV] | Factor | [dB] | [H/V] | [dBuV/m] | [dBuV/m] | [dB] | |
| 2390.0 | 56.78 | 0.00 | 1.94 | Н | 58.72 | 73.98 | 15.26 | PK |
| 2390.0 | 40.58 | 0.32 | 1.94 | Н | 42.84 | 53.98 | 11.15 | AV |
| 2390.0 | 56.99 | 0.00 | 1.94 | V | 58.93 | 73.98 | 15.05 | PK |
| 2390.0 | 40.75 | 0.32 | 1.94 | V | 43.01 | 53.98 | 10.98 | AV |
| 2483.5 | 49.34 | 0.00 | 2.74 | Н | 52.08 | 73.98 | 21.90 | PK |
| 2483.5 | 36.21 | 0.32 | 2.74 | Н | 39.27 | 53.98 | 14.72 | AV |
| 2483.5 | 49.15 | 0.00 | 2.74 | V | 51.89 | 73.98 | 22.09 | PK |
| 2483.5 | 36.12 | 0.32 | 2.74 | V | 39.18 | 53.98 | 14.81 | AV |

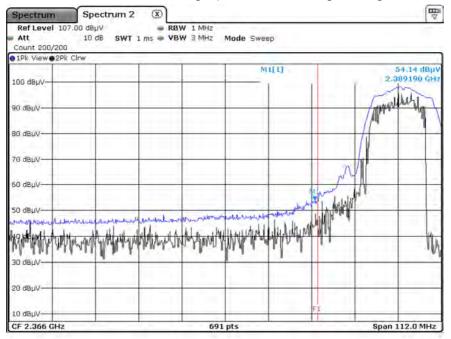




Test Plots (Worst case : X-V)



Radiated Restricted Band Edges plot – Peak Reading (802.11g Ch.1)



Note:

Plot of worst case are only reported.



9.8 RECEIVER SPURIOUS EMISSIONS

Frequency Range : Below 1 GHz

| Frequency | Reading | Ant. factor | Cable loss | Ant. POL | Total | Limit | Margin |
|-----------|---------|-------------|---------------|------------|--------|--------|--------|
| MHz | dBuV/m | dBm/m | dBm | (H/V) | dBuV/m | dBuV/m | dB |
| | | · | No Critical p | eaks found | | | |

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.

Frequency Range : Above 1 GHz

| Frequency | Reading | Ant. factor | Cable loss | Ant. POL | Total | Limit | Margin | | |
|-----------|-------------------------|-------------|------------|----------|--------|--------|--------|--|--|
| MHz | dBuV/m | dBm/m | dBm | (H/V) | dBuV/m | dBuV/m | dB | | |
| | No Critical peaks found | | | | | | | | |





10. LIST OF TEST EQUIPMENT

| Conducted Test | | | | |
|-----------------|---|---------------------|-------------------------|------------|
| Manufacturer | Model / Equipment | Calibration Date | Calibration Interval | Serial No. |
| Rohde & Schwarz | ENV216 / LISN | 09/04/2020 | Annual | 102245 |
| Rohde & Schwarz | ESR / EMI Test Receiver | 09/16/2020 | Annual | 101910 |
| ESPAC | SU-642 /Temperature Chamber | 03/15/2021 | Annual | 0093008124 |
| Agilent | N9030A / Signal Analyzer | 01/11/2021 | Annual | MY49431210 |
| Rohde & Schwarz | OSP 120 / Power Measurement Set | 07/02/2020 | Annual | 101231 |
| Agilent | N1911A / Power Meter | 04/08/2021 | Annual | MY45100523 |
| Keysight | N1921A / Power Sensor | 04/08/2021 | Annual | MY57820067 |
| Agilent | 87300B / Directional Coupler | 11/10/2020 | Annual | 3116A03621 |
| Hewlett Packard | 11667B / Power Splitter | 02/09/2021 | Annual | 10545 |
| Hewlett Packard | E3632A / DC Power Supply | 06/12/2020 | Annual | KR75303960 |
| Agilent | 8493C / Attenuator(10 dB) | 06/26/2020 | Annual | 07560 |
| Rohde & Schwarz | EMC32 / Software | N/A | N/A | N/A |
| HCT CO., LTD. | FCC WLAN&BT&BLE Conducted Test Software v3.0 | N/A | N/A | N/A |

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.

2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.





| Radiated Test | | | | | |
|---------------------------|--|---------------------|-------------------------|-------------|--|
| Manufacturer | Model / Equipment | Calibration Date | Calibration Interval | Serial No. | |
| Innco system | CO3000 / Controller(Antenna mast) | N/A | N/A | CO3000-4p | |
| Innco system | MA4640/800-XP-EP / Antenna Position Tower | N/A | N/A | N/A | |
| Audix | EM1000 / Controller | N/A | N/A | 060520 | |
| Audix | Turn Table | N/A | N/A | N/A | |
| Rohde & Schwarz | Loop Antenna | 05/18/2020 | Biennial | 1513-175 | |
| Schwarzbeck | VULB 9168 / Hybrid Antenna | 02/22/2021 | Biennial | 760 | |
| Schwarzbeck | BBHA 9120D / Horn Antenna | 02/17/2021 | Biennial | 9120D-937 | |
| Schwarzbeck | BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz) | 11/29/2019 | Biennial | BBHA9170541 | |
| Rohde & Schwarz | FSV40-N / Spectrum Analyzer | 07/28/2020 | Annual | 102168 | |
| Agilent | N9030A / Signal Analyzer | 01/11/2021 | Annual | MY49431210 | |
| Wainwright Instruments | WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter | 01/06/2021 | Annual | 2 | |
| Wainwright Instruments | WRCJV5100/5850-40/50-8EEK / Band Reject Filter | 02/08/2021 | Annual | 1 | |
| Wainwright Instruments | WHK3.0/18G-10EF / High Pass Filter | 02/03/2021 | Annual | 8 | |
| Wainwright Instruments | WHKX8-6090-7000-18000-40SS/ High Pass Filter | 02/03/2021 | Annual | 25 | |
| Api tech. | 18B-03 / Attenuator (3 dB) | 02/03/2021 | Annual | 1 | |
| Agilent | 8493C-10 / Attenuator(10 dB) | 02/03/2021 | Annual | 08285 | |
| CERNEX | CBLU1183540 / Power Amplifier | 02/03/2021 | Annual | 22964 | |
| CERNEX | CBL06185030 / Power Amplifier | 02/03/2021 | Annual | 22965 | |
| CERNEX | CBL18265035 / Power Amplifier | 12/04/2020 | Annual | 22966 | |
| CERNEX | CBL26405040 / Power Amplifier | 03/23/2021 | Annual | 25956 | |
| | , , | , , | | | |

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.

2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).



11. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

| No. | Description | |
|-----|---------------------|--|
| 1 | HCT-RF-2105-FI007-P | |