MEASUREMENT REPORT

FCC PART 15 Subpart C WLAN 802.11b/g/n

FCC ID:	HD5-EDA50211
APPLICANT:	Honeywell International Inc Honeywell Sensing & Productivity Solutions
Application Type:	Class II Permissive Change
Product:	Mobile Computer
Model No.:	EDA50-211
Brand Name:	Honeywell
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
Test Procedure(s):	ANSI C63.10-2013, KDB 558074 D01v04
Test Date:	July 24 ~ August 08, 2017

Reviewed By : Jame Yuan
(Jame Yuan)

Approved By : Marlin Chen
(Marlin Chen)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01v04. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1707RSU02601	Rev. 01	Initial report	08-10-2017	Valid

Note: This test report was based on MRT original report number: 1704RSU05701. The EUT change the all antennas of BT/Wi-Fi/NFC/GSM/WCDMA/LTE, and we have assessed the part of radiation emission testing.

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§2.1033 General Information

Applicant:	Honeywell International Inc Honeywell Sensing & Productivity Solutions
Applicant Address:	9680 Old Bailes Rd. Fort Mill, SC 29707 United States
Manufacturer:	Honeywell International Inc Honeywell Sensing & Productivity Solutions
Manufacturer Address:	9680 Old Bailes Rd. Fort Mill, SC 29707 United States
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT Registration No.:	893164
FCC Rule Part(s):	Part 15.247
Model No.:	EDA50-211
FCC ID:	HD5-EDA50211
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Digital Transmission System (DTS)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Reg. No. 893164) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.**

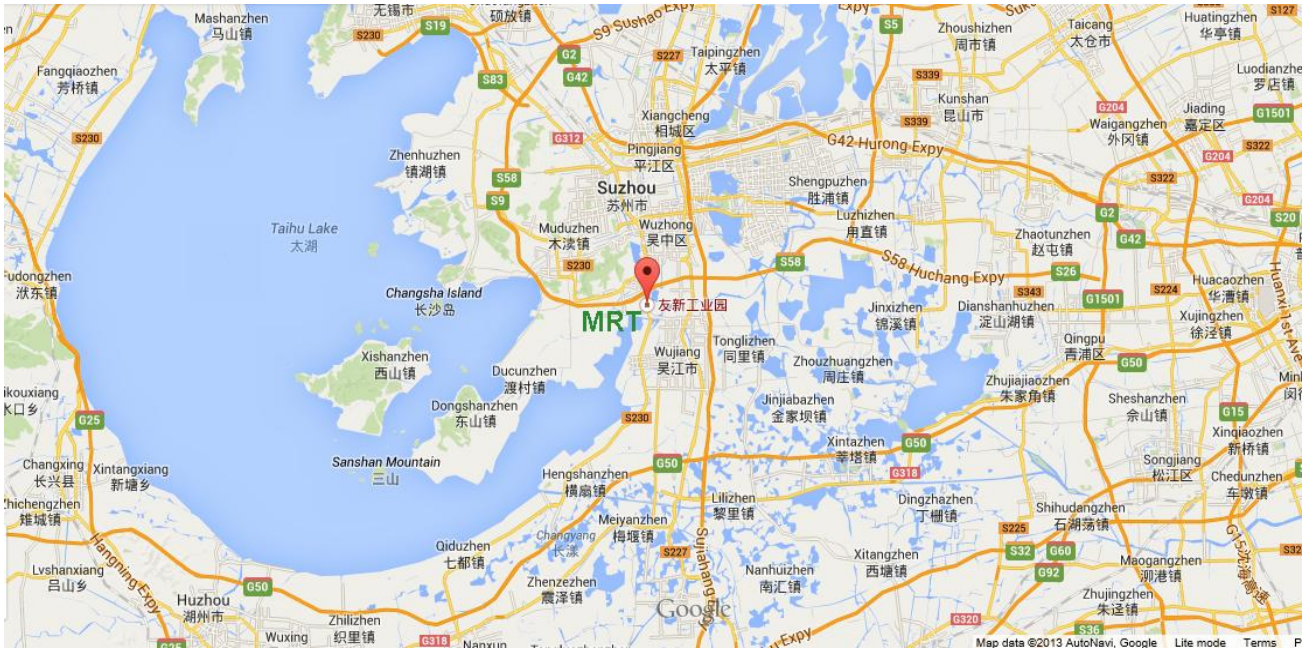
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	Mobile Computer
Model No.:	EDA50-211
Brand Name:	Honeywell
Hardware Version:	V2.0
Software Version:	205.01.00.0006.eng
IMEI:	356074080038511
Wi-Fi Specification:	802.11a/b/g/n
Bluetooth Specification:	v4.0 dual mode
GSM Operation Band (s):	E-GSM 850 / DCS 1900
WCDMA Operation Band (s):	Band II / V
LTE Operation Band (s):	FDD Band 2/4/7
NFC:	13.56MHz
GPS:	1575.42MHz
Components	
Adapter	Model No.: ADS-12B-06 05010E Input Power: 100 - 240V ~ 50/60Hz, Max. 0.3A Output Power: 5VDC 2.0A

2.2. Product Specification Subjective to this Report

Frequency Range:	802.11b/g/n-HT20: 2412 ~ 2462MHz 802.11n-HT40: 2422 ~ 2452MHz
Channel Number:	802.11b/g/n-HT20: 11 802.11n-HT40: 7
Type of Modulation:	802.11b: DSSS 802.11g/n: OFDM
Data Rate:	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 72.2Mbps
Antenna Type / Antenna Gain:	FPC Antenna / 2.1dBi
Maximum Output Power:	802.11b: 20.57dBm 802.11g: 21.67dBm 802.11n-HT20: 20.95dBm

Note: For other features of this EUT, test report will be issued separately.

2.3. Operating Frequency and Channel List

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	--	--

2.4. Test Mode

Test Mode	Mode 1: Transmit by 802.11b
	Mode 2: Transmit by 802.11g
	Mode 3: Transmit by 802.11n-HT20

2.5. Description of Test Software

The test utility software used during testing was “QRCT Version3.0.105.0”.

Power Parameter Value

Test Mode	Channel No.	Test Frequency (MHz)	Power Parameter Value
802.11b	01	2412	15.0
	06	2437	15.0
	11	2462	16.5
802.11g	01	2412	14.0
	06	2437	13.5
	11	2462	11.5
802.11n-HT20	01	2412	11.5
	06	2437	11.5
	11	2462	12.0

2.6. Device Capabilities

This device contains the following capabilities:
2.4GHz WLAN (DTS), 5GHz WLAN (UNII), Bluetooth (v4.0 dual mode), NFC, GSM 850/1900 WCDMA Band II/V, LTE FDD Band 2/4/7
Note: 2.4GHz WLAN (DTS) operation is possible in 20MHz, and 40MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Test Mode	Duty Cycle
802.11b	97.72%
802.11g	89.16%
802.11n-HT20	89.20%

2.7. Test Configuration

The **Mobile Computer FCC ID: HD5-EDA50211** was tested per the guidance of KDB 558074 D01v04. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.8. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.9. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19
The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION of TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 558074 D01v04 were used in the measurement of the **Mobile Computer.**

Deviation from measurement procedure…….....None

3.2. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable

containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, which produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"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."

- The antenna of the **Mobile Computer** is **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **Mobile Computer FCC ID: HD5-EDA50211** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Radiated Emissions - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9038A	MRTSUE06125	1 year	2017/08/19
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2018/06/21
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2018/04/15
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2017/11/21
TRILOG Antenna	Schwarzbeck	VULB9168	MRTSUE06172	1 year	2017/11/19
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2017/11/19
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2017/12/30
Digital Thermometer & Hygrometer	Minggao	N/A	MRTSUE06170	1 year	2017/12/14
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2018/05/10

Software	**Version**	**Function**
e3	V 8.3.5	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB

7. TEST RESULT

7.1. Summary

Product Name: **Mobile Computer**
FCC ID: **HD5-EDA50211**
FCC Classification: **Digital Transmission System (DTS)**
Data Rate / MCS Tested: **1Mbps for 802.11b; 6Mbps for 802.11g; MCS7 for 802.11n-HT20;**

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.205, 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.2 & 7.3

Notes:

1) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.re
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
4) For the “Radiated Restricted Band Edge Measurement”, only the worst test channel has been shown.

7.2. Radiated Spurious Emission Measurement

7.2.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.2.2. Test Procedure Used

KDB 558074 D01v04 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v04 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v04 - Section 12.2.5 (average power measurements)

7.2.3. Test Setting

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple

6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

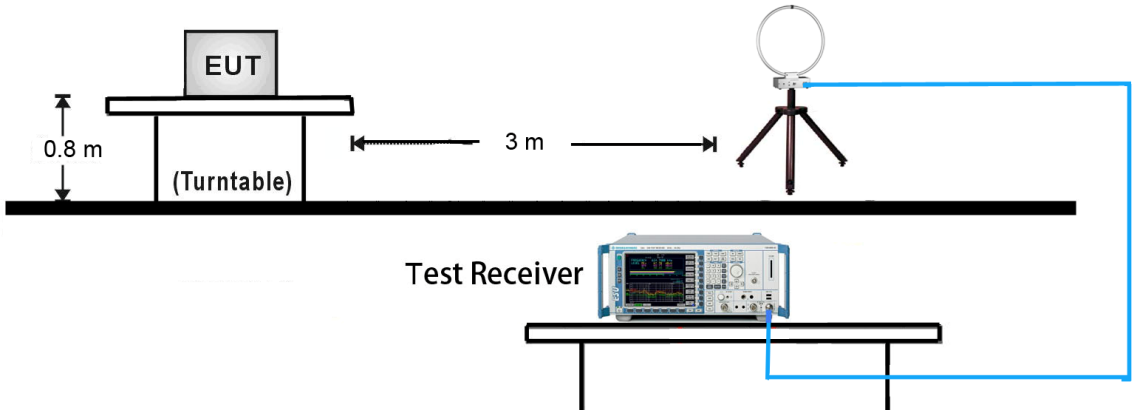
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

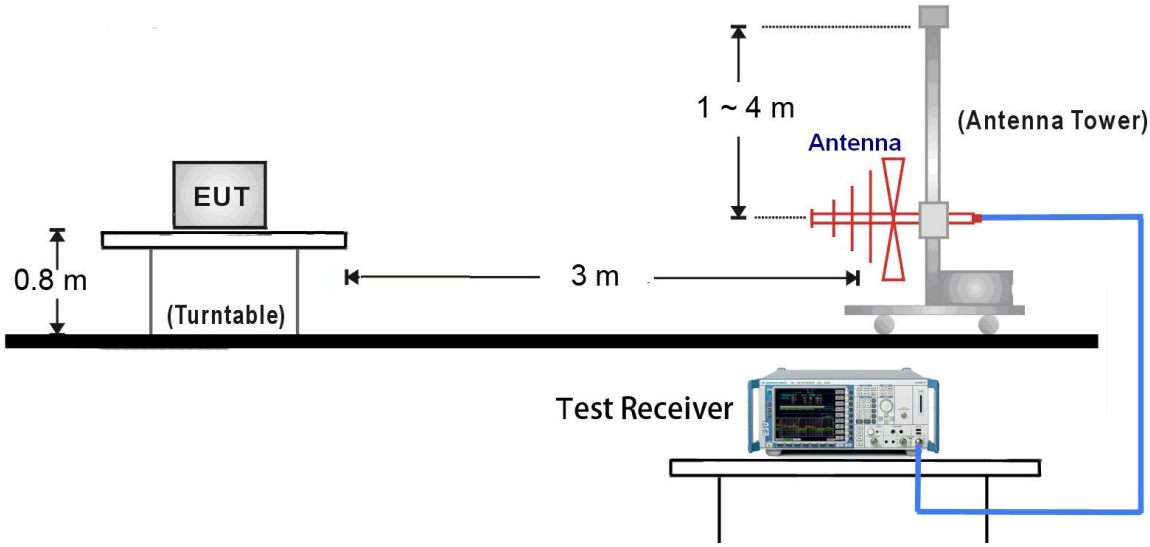
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.2.4. Test Setup

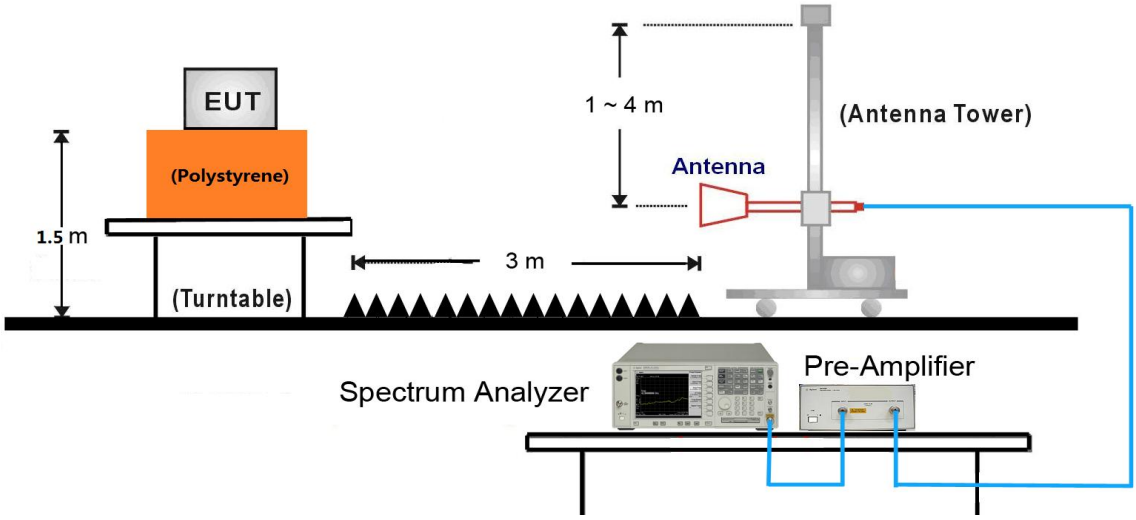
9kHz ~ 30MHz Test Setup:



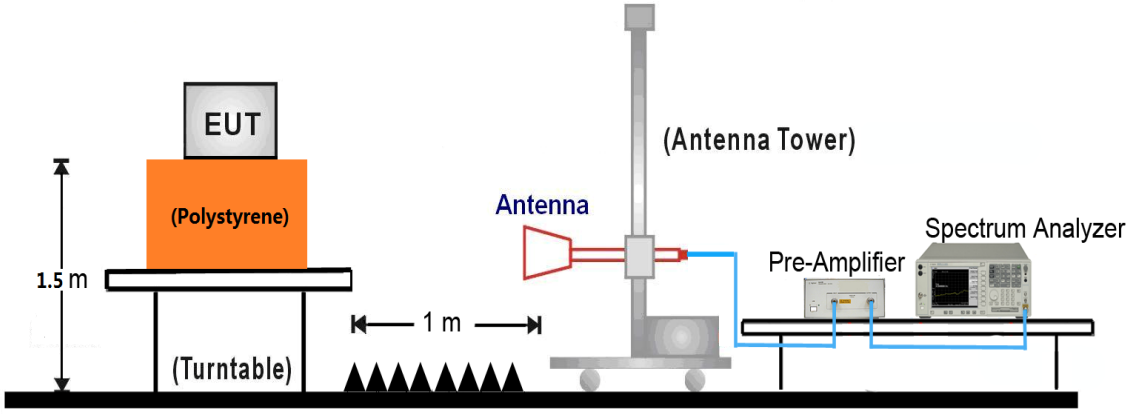
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



7.2.5. Test Result

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11b	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	44.3	2.6	46.9	74.0	-27.1	Peak	Horizontal
	7579.0	33.6	10.8	44.4	74.0	-29.6	Peak	Horizontal
	10248.0	32.2	14.3	46.5	74.0	-27.5	Peak	Horizontal
	13418.5	31.9	19.5	51.4	74.0	-22.6	Peak	Horizontal
	4816.5	35.9	2.6	38.5	74.0	-35.5	Peak	Vertical
	7579.0	33.2	10.8	44.0	74.0	-30.0	Peak	Vertical
	9602.0	32.8	12.6	45.4	74.0	-28.6	Peak	Vertical
	13452.5	31.2	19.7	50.9	74.0	-23.1	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11b	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4859.0	42.0	2.5	44.5	74.0	-29.5	Peak	Horizontal
	8063.5	32.6	10.9	43.5	74.0	-30.5	Peak	Horizontal
	9942.0	34.0	13.3	47.3	74.0	-26.7	Peak	Horizontal
	13095.5	32.2	17.9	50.1	74.0	-23.9	Peak	Horizontal
	4876.0	38.1	2.6	40.7	74.0	-33.3	Peak	Vertical
	7468.5	32.9	11.0	43.9	74.0	-30.1	Peak	Vertical
	10205.5	33.1	14.0	47.1	74.0	-26.9	Peak	Vertical
	12959.5	32.0	17.4	49.4	74.0	-24.6	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11b	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4867.5	45.7	2.6	48.3	74.0	-25.7	Peak	Horizontal
	7553.5	32.5	10.9	43.4	74.0	-30.6	Peak	Horizontal
	10469.0	32.7	14.9	47.6	74.0	-26.4	Peak	Horizontal
	13444.0	31.0	19.5	50.5	74.0	-23.5	Peak	Horizontal
	4867.5	37.5	2.6	40.1	74.0	-33.9	Peak	Vertical
	8055.0	32.5	10.8	43.3	74.0	-30.7	Peak	Vertical
	10256.5	32.3	14.3	46.6	74.0	-27.4	Peak	Vertical
	13146.5	31.5	17.9	49.4	74.0	-24.6	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11g	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4884.5	43.7	2.7	46.4	74.0	-27.6	Peak	Horizontal
	7256.0	32.7	10.7	43.4	74.0	-30.6	Peak	Horizontal
	10316.0	32.1	14.7	46.8	74.0	-27.2	Peak	Horizontal
	13818.0	31.9	20.5	52.4	74.0	-21.6	Peak	Horizontal
	4638.0	35.3	2.4	37.7	74.0	-36.3	Peak	Vertical
	7324.0	32.8	10.6	43.4	74.0	-30.6	Peak	Vertical
	10299.0	32.0	14.8	46.8	74.0	-27.2	Peak	Vertical
	13427.0	30.7	19.4	50.1	74.0	-23.9	Peak	Vertical

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11g	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4850.5	42.4	2.7	45.1	74.0	-28.9	Peak	Horizontal
	7460.0	33.0	11.1	44.1	74.0	-29.9	Peak	Horizontal
	9627.5	33.3	12.7	46.0	74.0	-28.0	Peak	Horizontal
	12883.0	31.8	17.3	49.1	74.0	-24.9	Peak	Horizontal
	4876.0	38.4	2.6	41.0	74.0	-33.0	Peak	Vertical
	7273.0	32.4	10.6	43.0	74.0	-31.0	Peak	Vertical
	9908.0	32.7	13.5	46.2	74.0	-27.8	Peak	Vertical
	13036.0	32.4	17.5	49.9	74.0	-24.1	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11g	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4910.0	44.4	2.5	46.9	74.0	-27.1	Peak	Horizontal
	10928.0	32.3	16.4	48.7	74.0	-25.3	Peak	Horizontal
	13019.0	31.9	17.7	49.6	86.1	-36.5	Peak	Horizontal
	14566.0	32.6	20.7	53.3	86.1	-32.8	Peak	Horizontal
	4910.0	43.2	2.5	45.7	74.0	-28.3	Peak	Vertical
	7477.0	33.2	10.8	44.0	74.0	-30.0	Peak	Vertical
	9627.5	32.5	12.7	45.2	86.1	-40.9	Peak	Vertical
	13095.5	31.2	17.9	49.1	86.1	-37.0	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11h-HT20	Test Channel:	01
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4952.5	42.2	2.7	44.9	74.0	-29.1	Peak	Horizontal
	7494.0	32.7	11.0	43.7	74.0	-30.3	Peak	Horizontal
	9610.5	33.1	12.5	45.6	74.0	-28.4	Peak	Horizontal
	13469.5	30.9	19.7	50.6	74.0	-23.4	Peak	Horizontal
	4884.5	42.8	2.7	45.5	74.0	-28.5	Peak	Vertical
	7562.0	33.1	10.9	44.0	74.0	-30.0	Peak	Vertical
	9364.0	33.6	12.8	46.4	74.0	-27.6	Peak	Vertical
	12883.0	31.6	17.3	48.9	74.0	-25.1	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11n-HT20	Test Channel:	06
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

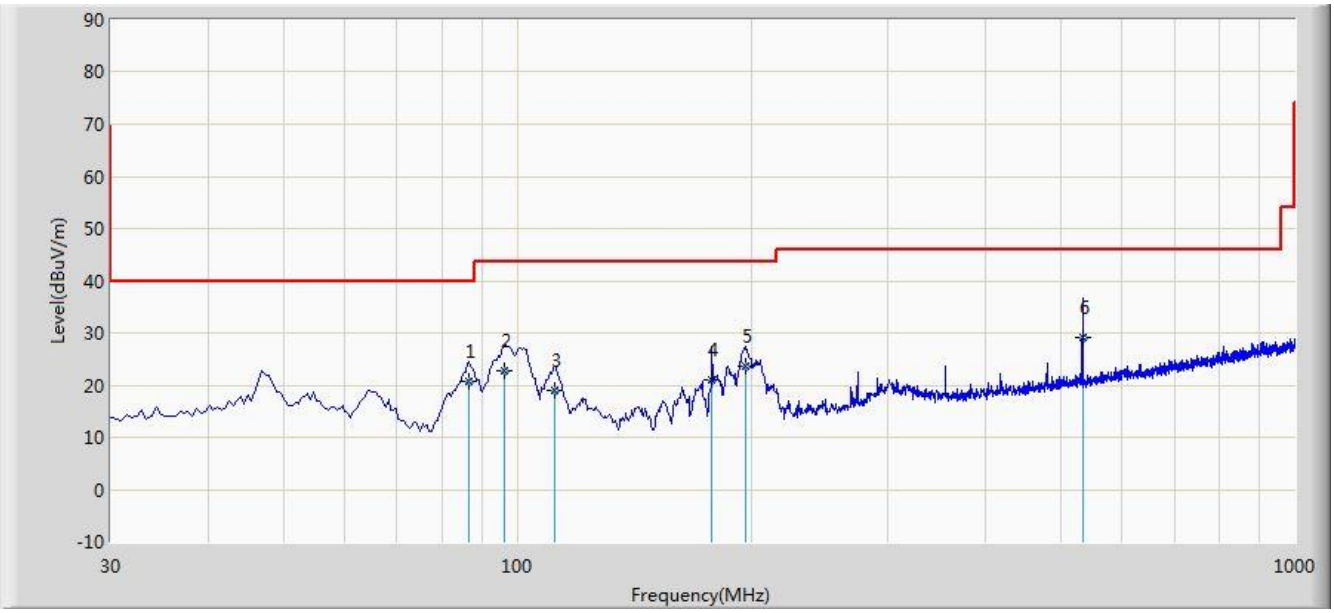
Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4867.5	43.0	2.6	45.6	74.0	-28.4	Peak	Horizontal
	7545.0	33.4	10.9	44.3	74.0	-29.7	Peak	Horizontal
	10324.5	32.8	14.7	47.5	74.0	-26.5	Peak	Horizontal
	14523.5	32.7	20.9	53.6	74.0	-20.4	Peak	Horizontal
	5071.5	35.4	3.1	38.5	74.0	-35.5	Peak	Vertical
	7553.5	32.7	10.9	43.6	74.0	-30.4	Peak	Vertical
	10061.0	33.0	13.7	46.7	74.0	-27.3	Peak	Vertical
	13503.5	30.9	19.6	50.5	74.0	-23.5	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

Product:	Mobile Computer	Temperature:	25°C
Test Engineer:	Snake Ni	Relative Humidity:	51 ~ 56%
Test Site:	AC2	Test data:	2017/07/28
Test Mode:	802.11n-HT20	Test Channel:	11
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4842.0	45.1	2.9	48.0	74.0	-26.0	Peak	Horizontal
	7392.0	32.9	10.7	43.6	74.0	-30.4	Peak	Horizontal
	9245.0	32.2	12.7	44.9	74.0	-29.1	Peak	Horizontal
	13095.5	32.1	17.9	50.0	74.0	-24.0	Peak	Horizontal
	4867.5	38.6	2.6	41.2	74.0	-32.8	Peak	Vertical
	7417.5	32.5	10.8	43.3	74.0	-30.7	Peak	Vertical
	10095.0	33.3	13.4	46.7	74.0	-27.3	Peak	Vertical
	13019.0	31.8	17.7	49.5	74.0	-24.5	Peak	Vertical
Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

The worst case of Radiated Emission:

Site: AC2	Time: 2017/08/06 - 03:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: Mobile Computer	Power: AC 120V/60Hz
Worst Mode: Transmit by 802.11b at channel 2462MHz	



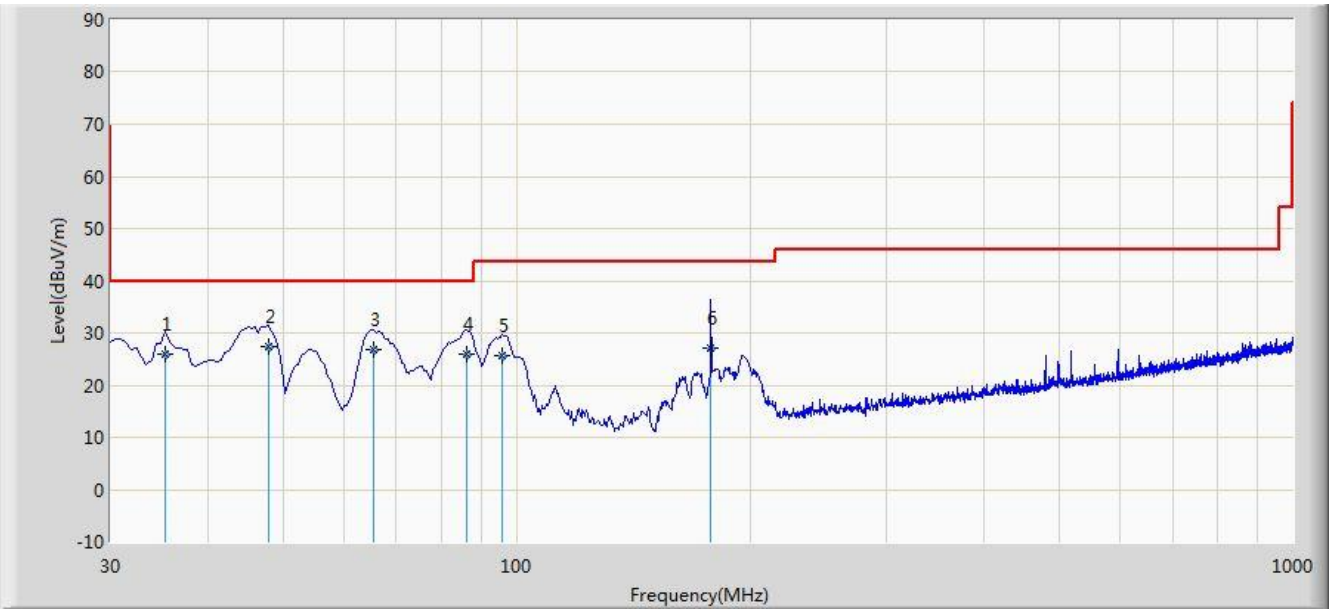
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			86.745	20.726	10.290	-19.274	40.000	10.437	QP
2			96.445	22.643	10.119	-20.857	43.500	12.524	QP
3			111.965	19.070	6.475	-24.430	43.500	12.595	QP
4			177.925	20.934	10.157	-22.566	43.500	10.776	QP
5			196.840	23.662	11.464	-19.838	43.500	12.198	QP
6		*	533.430	29.045	10.214	-16.955	46.000	18.832	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC2	Time: 2017/08/06 - 03:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: Mobile Computer	Power: AC 120V/60Hz
Worst Mode: Transmit by 802.11b at channel 2462MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			35.335	26.072	13.070	-13.928	40.000	13.001	QP
2		*	47.945	27.486	12.517	-12.514	40.000	14.969	QP
3			65.405	26.735	14.313	-13.265	40.000	12.422	QP
4			86.260	25.965	15.649	-14.035	40.000	10.316	QP
5			95.960	25.577	13.117	-17.923	43.500	12.460	QP
6			177.925	27.126	16.349	-16.374	43.500	10.776	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

7.3. Radiated Restricted Band Edge Measurement

7.3.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1] 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.25 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41	--	--	--

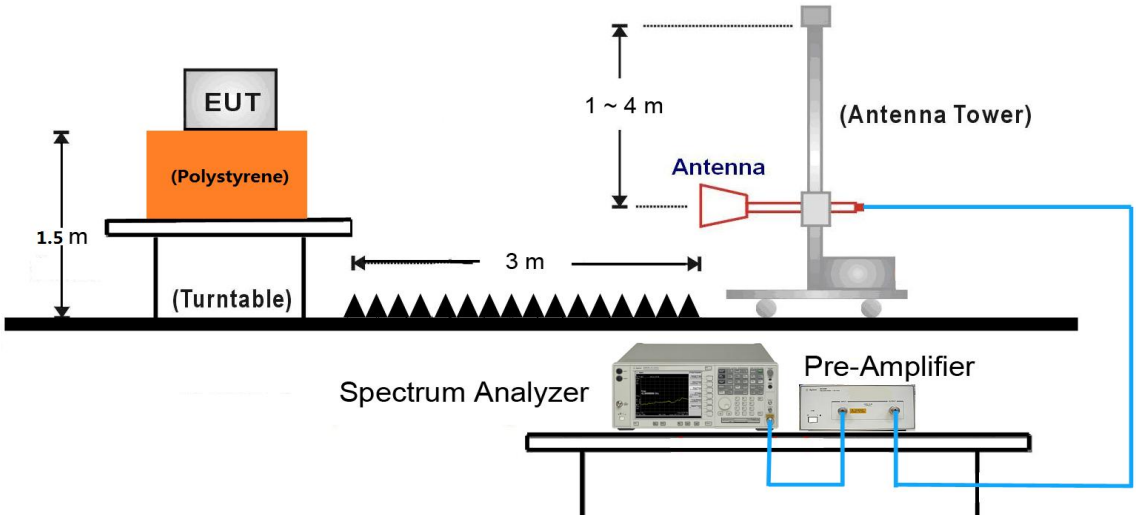
All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits per Section FCC 15.209.

7.3.2. Test Procedure Used

KDB 558074 D01v04 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v04 - Section 12.2.5 (average power measurements)

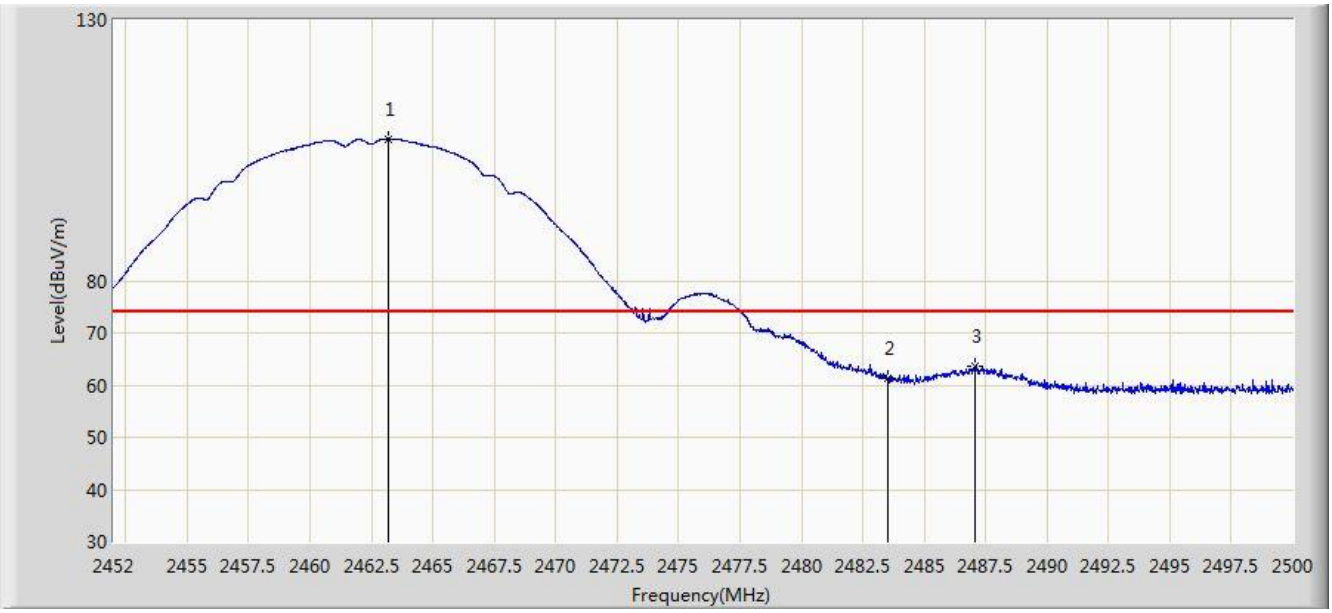
7.3.3. Test Setup



7.3.4. Test Result

Worst-case Mode Verification

Site: AC2	Time: 2017/08/06 - 06:36
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Mobile Computer	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2463.184	107.226	74.987	N/A	N/A	32.239	PK
2			2483.500	61.404	29.123	-12.596	74.000	32.282	PK
3			2487.088	63.499	31.205	-10.501	74.000	32.293	PK

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

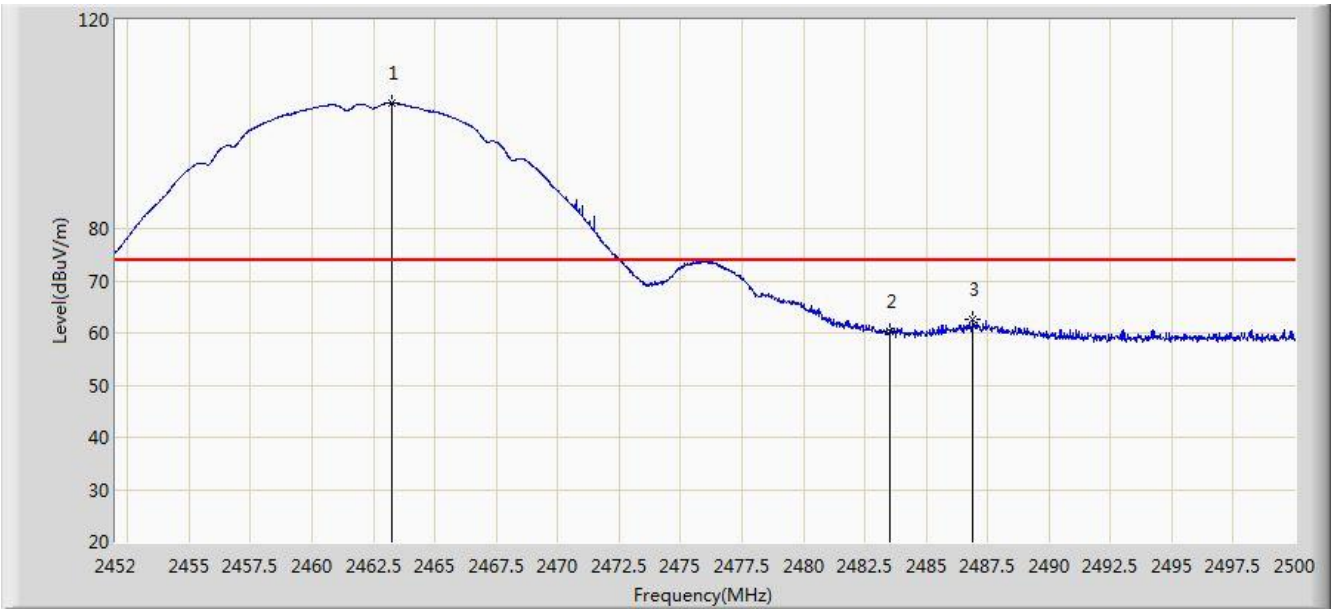
Site: AC2	Time: 2017/08/06 - 06:39
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Mobile Computer	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2462.728	102.783	70.544	N/A	N/A	32.239	AV
2			2483.500	50.362	18.081	-3.638	54.000	32.282	AV
3			2487.280	53.087	20.793	-0.913	54.000	32.294	AV

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2017/08/06 - 06:40
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Mobile Computer	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	

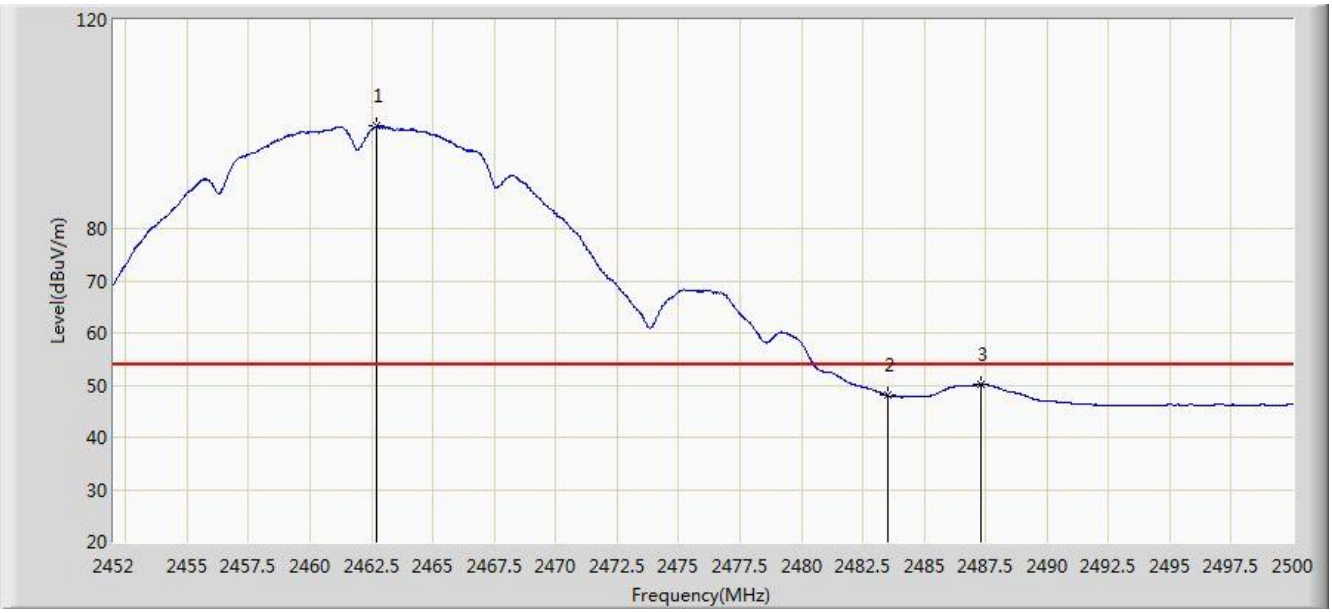


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2463.256	104.021	71.782	N/A	N/A	32.240	PK
2			2483.500	60.252	27.971	-13.748	74.000	32.282	PK
3			2486.896	62.639	30.346	-11.361	74.000	32.293	PK

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC2	Time: 2017/08/06 - 06:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Snake Ni
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Mobile Computer	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2462.680	99.582	67.343	N/A	N/A	32.239	AV
2			2483.500	48.067	15.786	-5.933	54.000	32.282	AV
3			2487.280	50.060	17.766	-3.940	54.000	32.294	AV

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **Mobile Computer FCC ID:**

HD5-EDA50211 is in compliance with Part 15C of the FCC Rules.

The End