FCC RF Test Report

APPLICANT	:	Compal Electronics, INC.
EQUIPMENT	:	VOICE HUB GATEWAY
BRAND NAME	:	Compal
MODEL NAME	:	DBX81
MARKETING NAME	:	VOICE HUB GATEWAY
FCC ID	:	GKR-DBX81WBZ
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Nov. 21, 2017 and testing was completed on Mar. 28, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR7N2101D	Rev. 01	Initial issue of report	Jan. 18, 2018
FR7N2101D	Rev. 02	Updating FCC ID	Apr. 03, 2018

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	15.247(b)(3)	Peak Output Power	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.15 dB at 38.970 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.30 dB at 0.150 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Compal Electronics, INC.
No. 581 ruiguang rd., Neihu District, Taipei City 11492, Taiwan (R.O.C.)

1.2 Manufacturer

Compal Electronics, Inc. Pingzhen plant
3-4F., No. 8-1 & No. 8, Nandong Rd., Pingzhen Dist., Taoyuan City, 32455, Taiwan (R.O.C.)

1.3 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, and Zigbee

Product Specification subjective to this standard	
Sample 1	Sample with 1st antenna (SN:DC33002250U/ T-543-9231116-1)
Sample 2	Sample with 2nd antenna (SN:DC33002600U/ ANTA0ZC12651WLAN1)
Antenna Type	WLAN: PIFA Antenna Bluetooth: PIFA Antenna Zigbee: PIFA Antenna

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	**Sporton Site No.**		
	TH05-HY	CO05-HY	03CH07-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

1.6 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

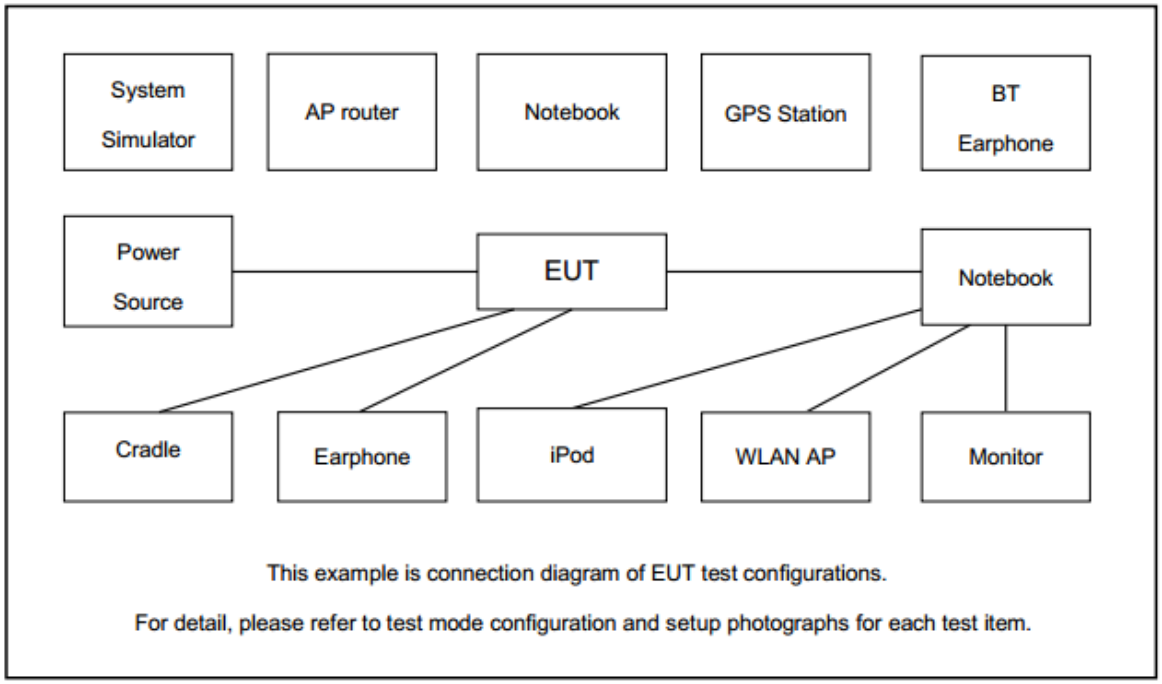
a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (X plane as worst plane) from all possible combinations.

b. AC power line Conducted Emission was tested under maximum output power.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	**Data Rate / Modulation**
	250kbps / Zigbee
Conducted TCs	Mode 1: Zigbee Tx CH11_2405 MHz Mode 2: Zigbee Tx CH18_2440 MHz Mode 3: Zigbee Tx CH25_2475 MHz
Radiated TCs	Mode 1: Zigbee Tx CH11_2405 MHz Mode 2: Zigbee Tx CH18_2440 MHz Mode 3: Zigbee Tx CH25_2475 MHz
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Tx + Cable (Charging from Adapter) for Sample 1 Mode 2 :Bluetooth Tx + Cable (Charging from Adapter) for Sample 1 Mode 3 :Zigbee Tx + Cable (Charging from Adapter) for Sample 1
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.4 EUT Operation Test Setup

The RF test items, utility “SmartRF” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

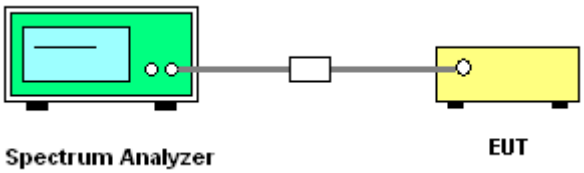
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 30kHz and set the Video bandwidth (VBW) = 100kHz.
6. Measure and record the results in the test report.

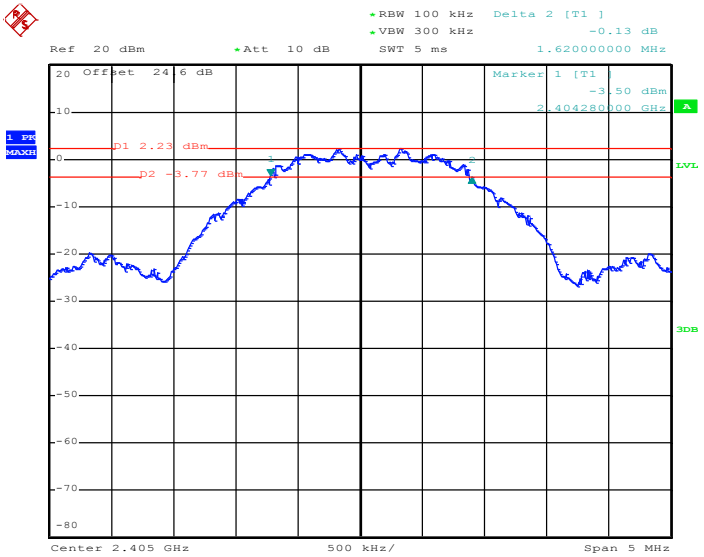
3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

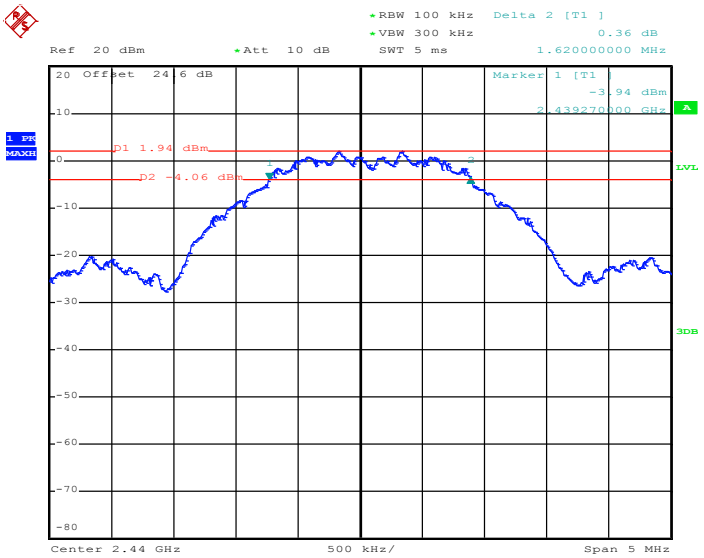
Test data refer to Appendix A.

6 dB Bandwidth Plot on Channel 11



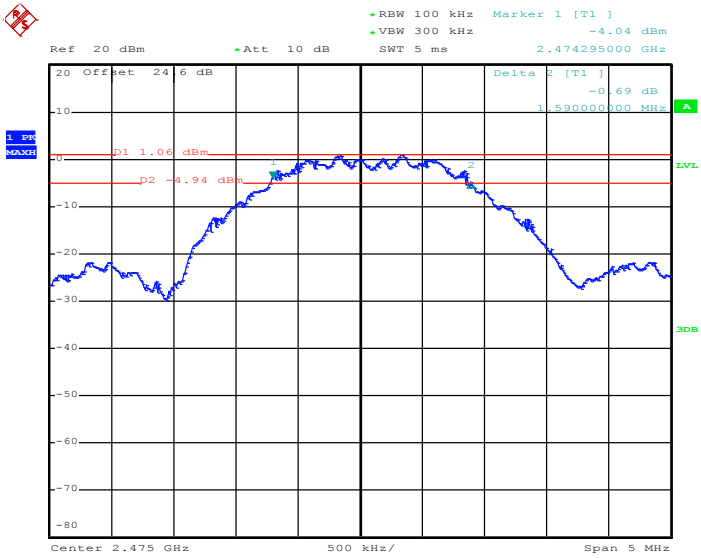
Date: 13.JAN.2018 15:46:27

6 dB Bandwidth Plot on Channel 18



Date: 13.JAN.2018 15:58:06

6 dB Bandwidth Plot on Channel 25



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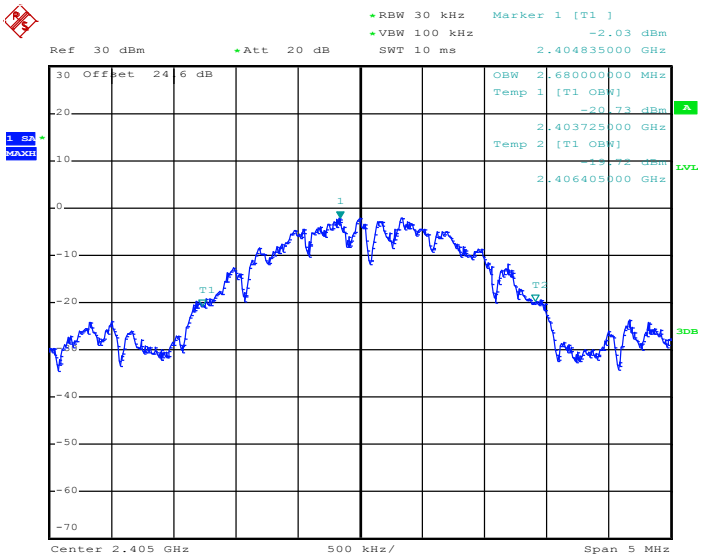
3.1.6 Test Result of 99% Occupied Bandwidth

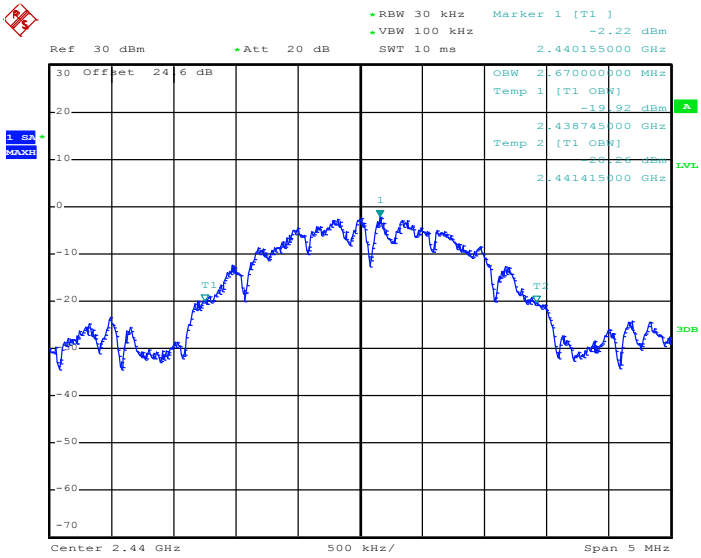
Test data refer to Appendix A.

99% Bandwidth Plot on Channel 11



Date: 13.JAN.2018 15:53:09

99% Occupied Bandwidth Plot on Channel 18



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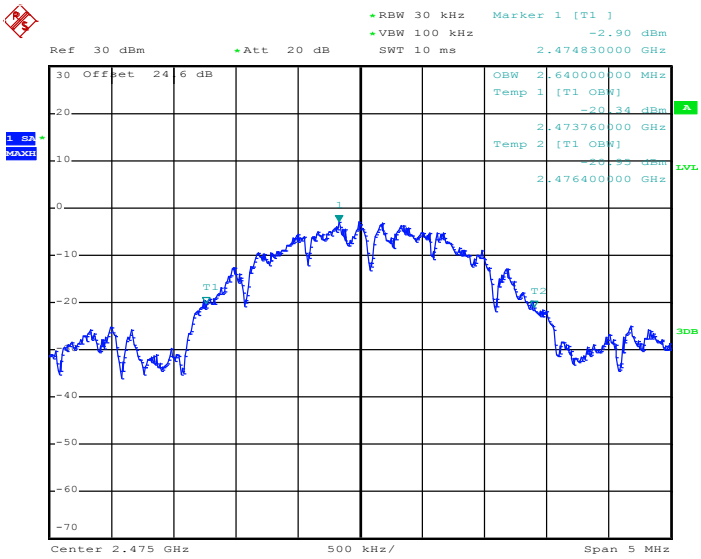
99% Occupied Bandwidth Plot on Channel 25



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Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

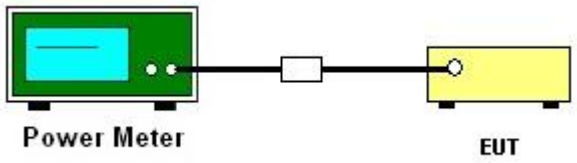
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.3 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

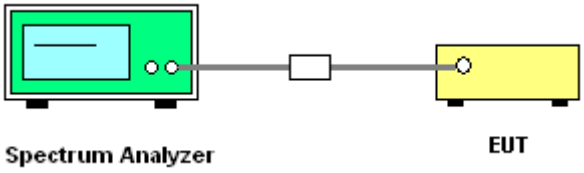
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup

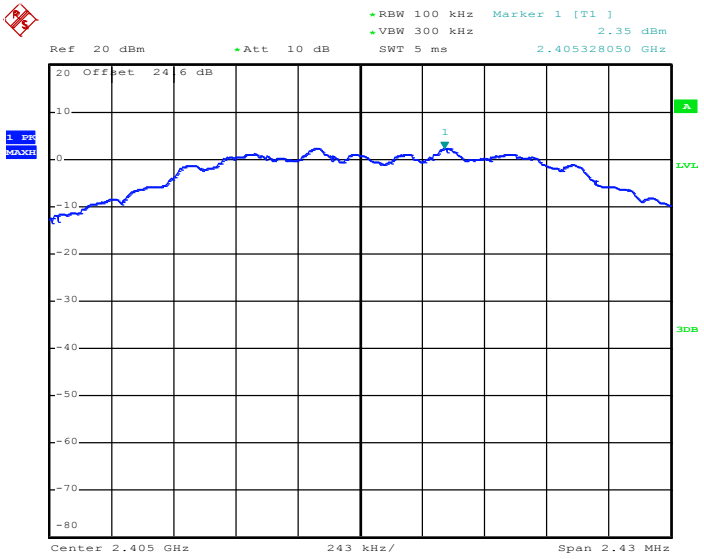


3.3.5 Test Result of Power Spectral Density

Test data refers to Appendix A.

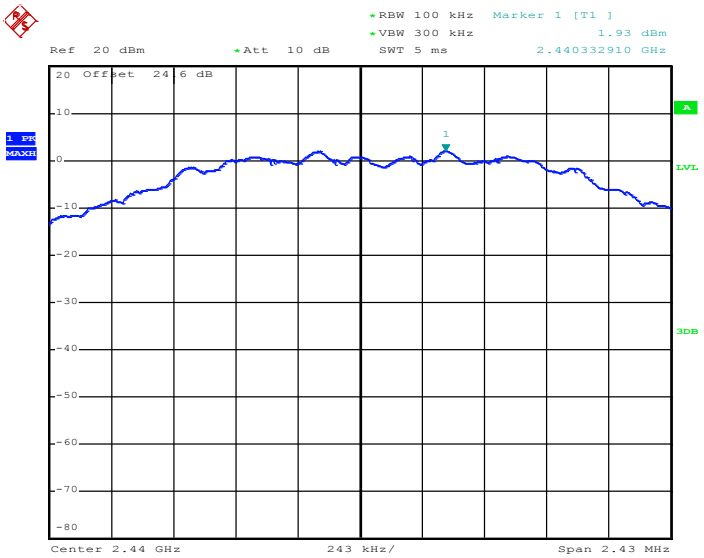
3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on Channel 11



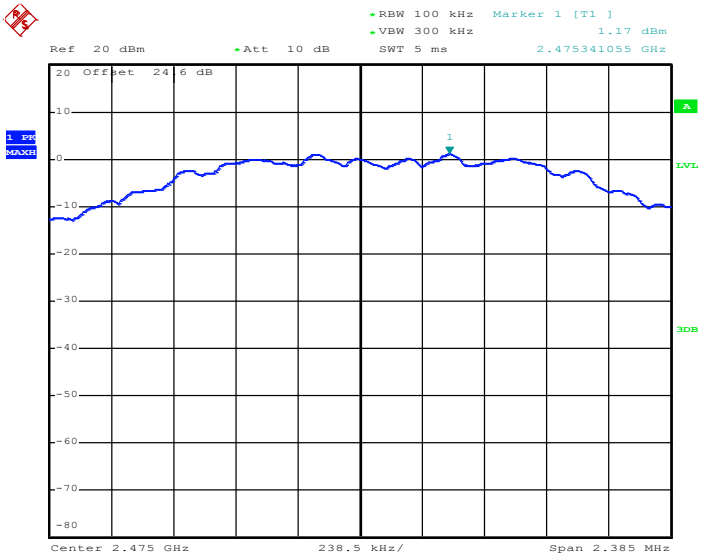
Date: 13.JAN.2018 15:49:07

PSD 100kHz Plot on Channel 18



Date: 13.JAN.2018 16:07:05

PSD 100kHz Plot on Channel 25



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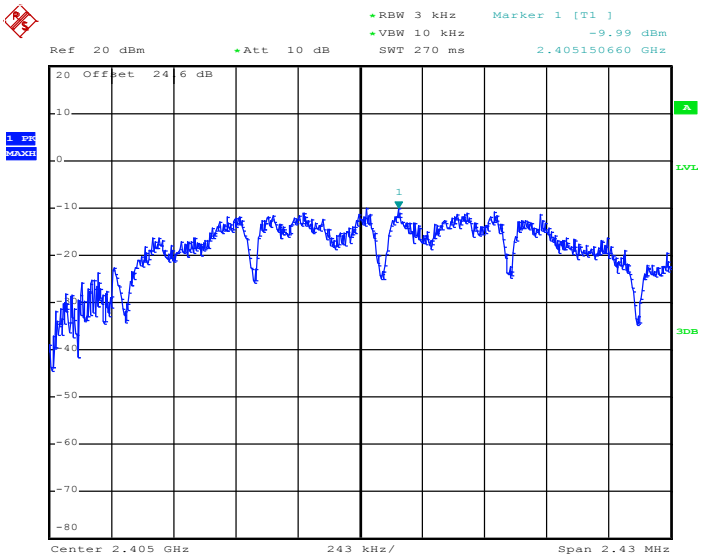
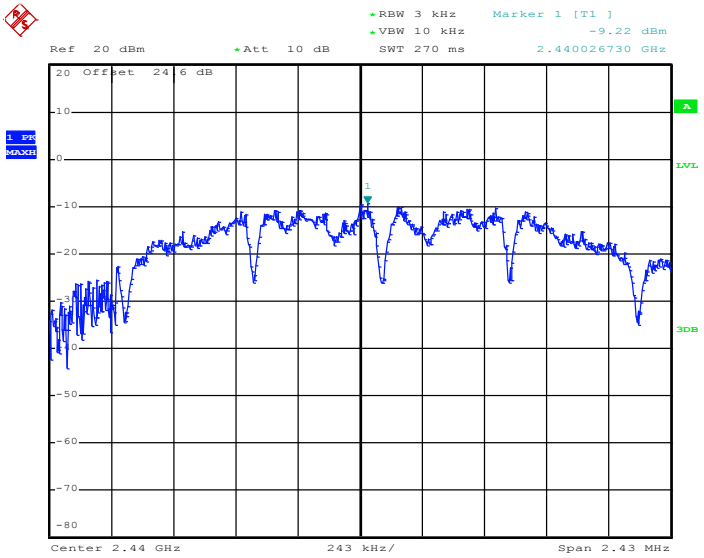
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on Channel 11



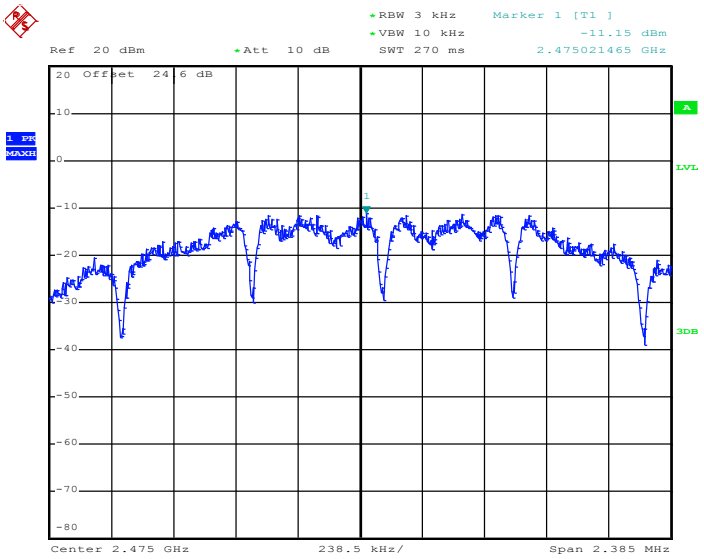
Date: 13.JAN.2018 15:47:42

PSD 3kHz Plot on Channel 18



Date: 13.JAN.2018 15:59:56

PSD 3kHz Plot on Channel 25



Date: 13.JAN.2018 16:44:20

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

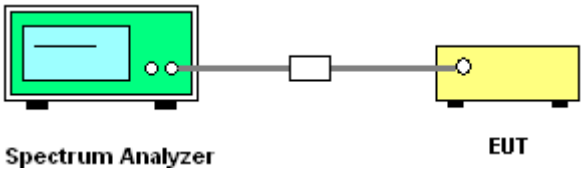
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedure

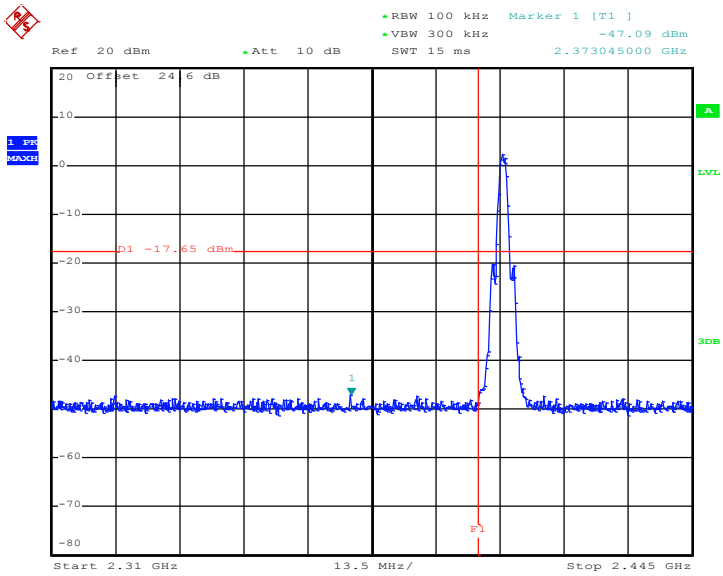
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured 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 when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges Plots

Low Band Edge Plot on Channel 11



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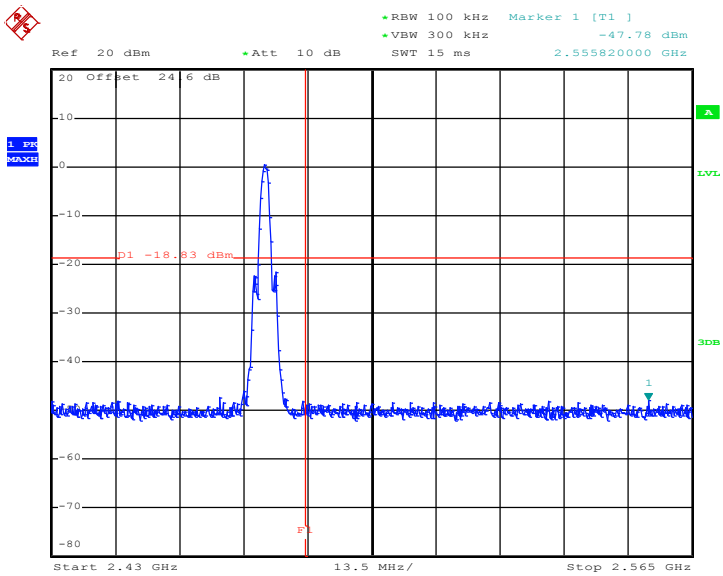
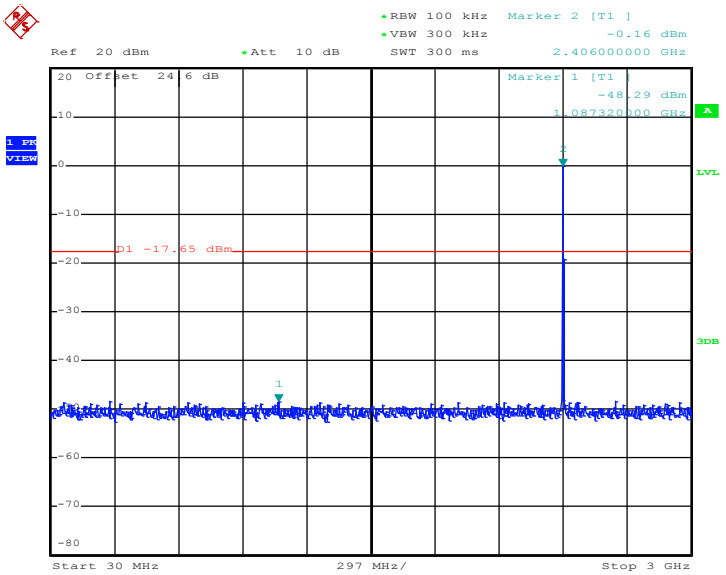
High Band Edge Plot on Channel 25



Date: 15.JAN.2018 20:05:43

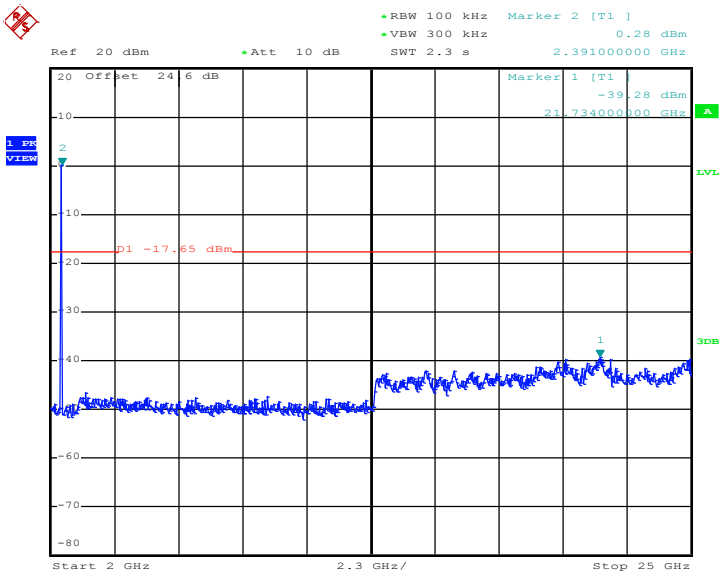
3.4.6 Test Result of Conducted Spurious Emission Plots

Conducted Spurious Emission Plot on Zigbee Channel 11



Date: 13.JAN.2018 15:51:41

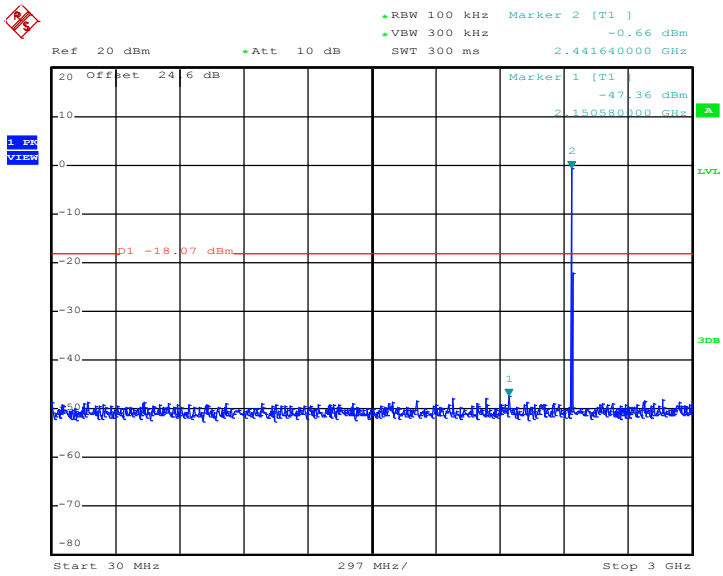
Conducted Spurious Emission Plot on Zigbee Channel 11



Date: 13.JAN.2018 15:51:49

Conducted Spurious Emission Plot on Zigbee

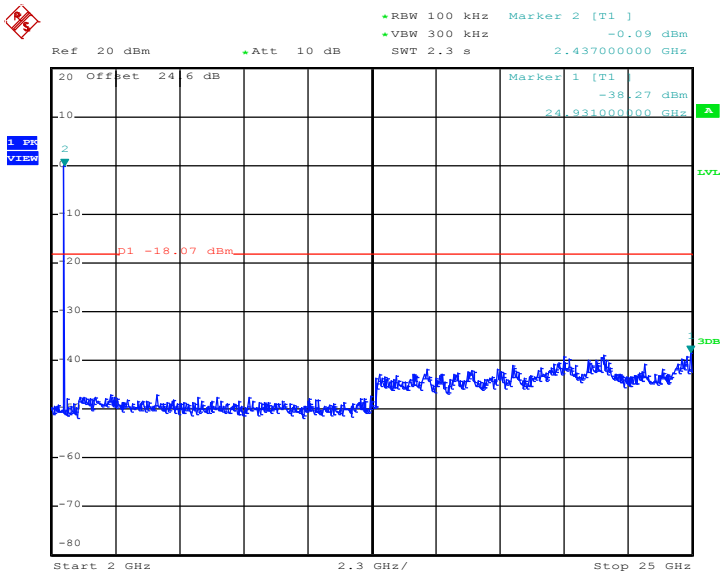
Channel 18



Date: 13.JAN.2018 16:08:17

Conducted Spurious Emission Plot on Zigbee

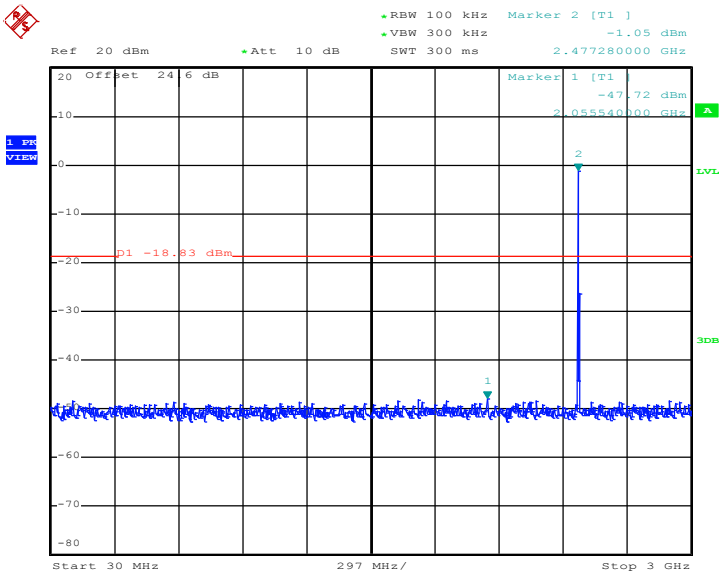
Channel 18



Date: 13.JAN.2018 16:08:25

Conducted Spurious Emission Plot on Zigbee

Channel 25



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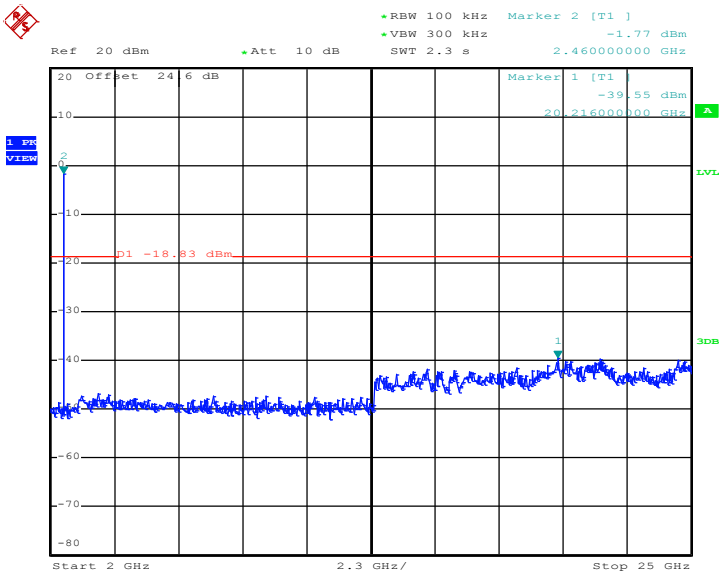
Conducted Spurious Emission Plot on Zigbee

Channel 25



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3.5 Spurious Emission Measurement in the Restricted Band

3.5.1 Limit of Spurious Emission Measurement in the Restricted Band

Emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

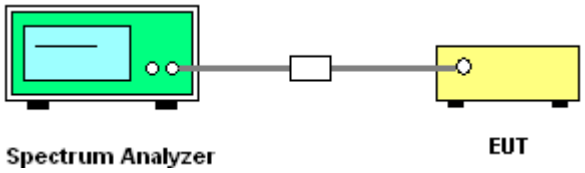
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

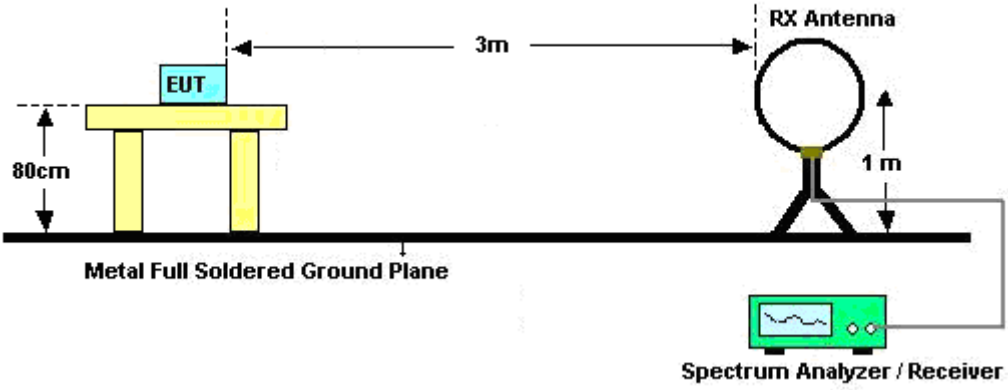
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For conducted spurious emission measurement in the restricted band, the RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
7. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

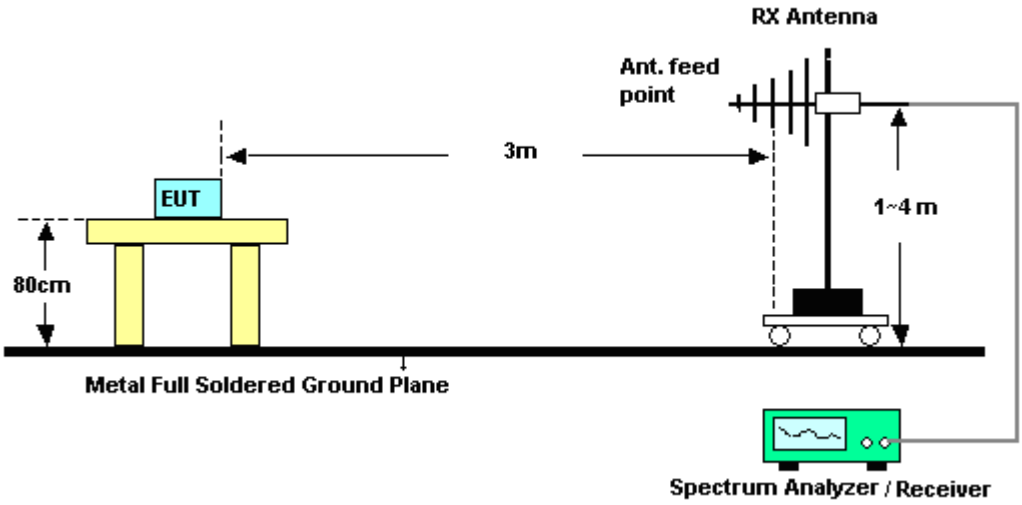
For Conducted Measurement:



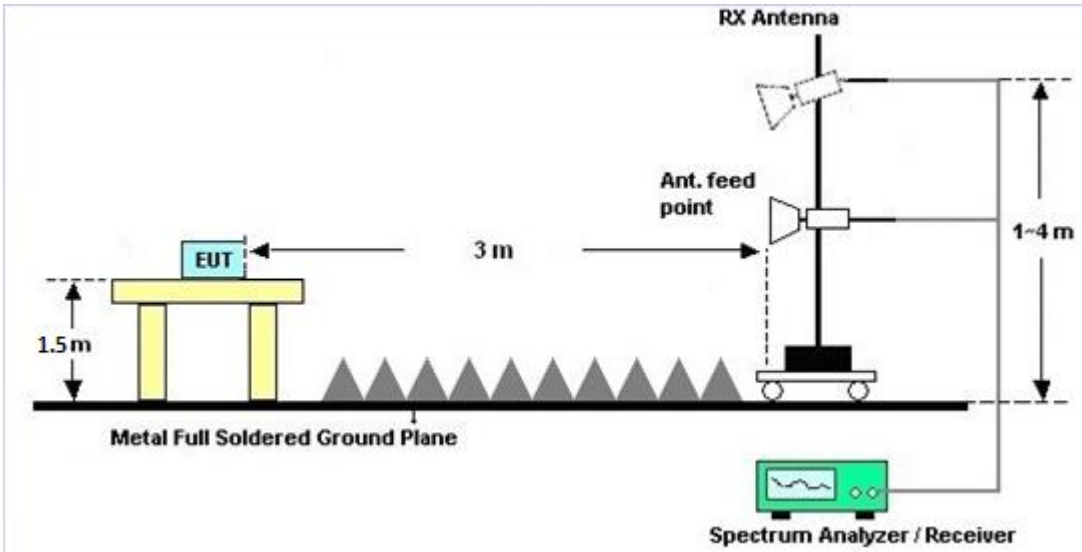
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment 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.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

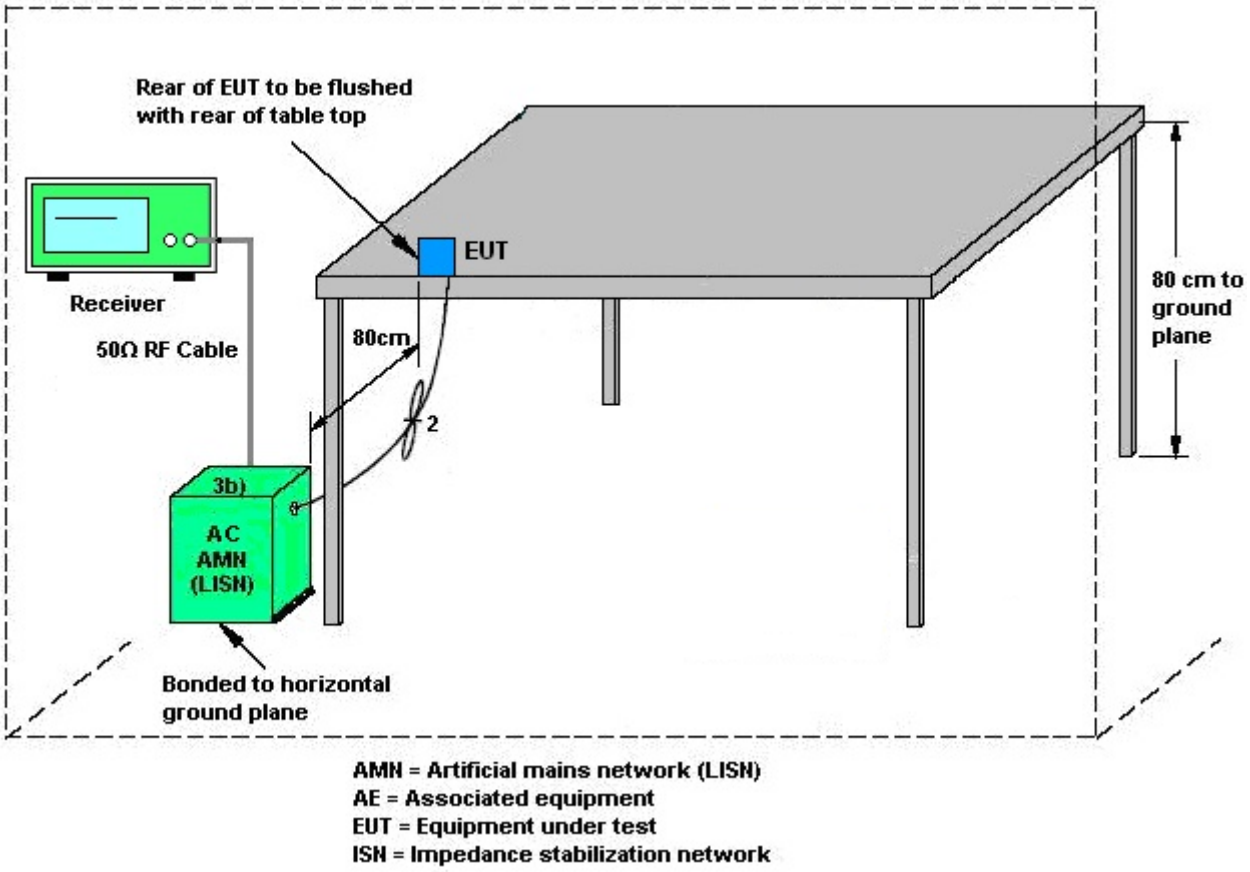
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 26, 2017	Dec. 14, 2017~ Jan. 15, 2018	Sep. 25, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz	Sep. 26, 2017	Dec. 14, 2017~ Jan. 15, 2018	Sep. 25, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 13, 2017	Dec. 14, 2017~ Jan. 15, 2018	Nov. 12, 2018	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Dec. 18, 2017~ Dec. 19, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 20, 2017	Dec. 18, 2017~ Dec. 19, 2017	Sep. 19, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Dec. 18, 2017~ Dec. 19, 2017	Nov. 29, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 08, 2017	Dec. 18, 2017~ Dec. 19, 2017	Dec. 07, 2018	Conduction (CO05-HY)
<Radiated Band Edges and Spurious Emission Measurement for sample 1>								
Bilog Antenna	TESEQ	CBL 6111D&00800N1D01N-06	35419&03	30MHz to 1GHz	Jan. 07, 2017	Dec. 14, 2017~ Dec. 28, 2017	Jan. 06, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 23, 2017	Dec. 14, 2017~ Dec. 28, 2017	Aug. 22, 2018	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Nov. 10, 2017	Dec. 14, 2017~ Dec. 28, 2017	Nov. 09, 2019	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590075	1GHz ~ 18GHz	Apr. 25, 2017	Dec. 14, 2017~ Dec. 28, 2017	Apr. 24, 2018	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 14, 2017	Dec. 14, 2017~ Dec. 28, 2017	Mar. 13, 2018	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Oct. 30, 2017	Dec. 14, 2017~ Dec. 28, 2017	Oct. 29, 2018	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Apr. 17, 2017	Dec. 14, 2017~ Dec. 28, 2017	Apr. 16, 2018	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Dec. 14, 2017~ Dec. 28, 2017	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Dec. 14, 2017~ Dec. 28, 2017	N/A	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Dec. 14, 2017~ Dec. 28, 2017	Jul. 17, 2018	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz to 26.5GHz	Jan. 12, 2017	Dec. 14, 2017~ Dec. 28, 2017	Jan. 11, 2018	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	Dec. 14, 2017~ Dec. 28, 2017	Nov. 26, 2018	Radiation (03CH07-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
<Radiated Band Edges and Spurious Emission Measurement for sample 2>								
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&03	30MHz to 1GHz	Dec. 18, 2017	Mar. 22, 2018~ Mar. 28, 2018	Dec. 17, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 23, 2017	Mar. 22, 2018~ Mar. 28, 2018	Aug. 22, 2018	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Nov. 10, 2017	Mar. 22, 2018~ Mar. 28, 2018	Nov. 09, 2018	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A023 62	1GHz~ 26.5GHz	Oct. 30, 2017	Mar. 22, 2018~ Mar. 28, 2018	Oct. 29, 2018	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY534701 18	10Hz~44GHz	Apr. 17, 2017	Mar. 22, 2018~ Mar. 28, 2018	Apr. 16, 2018	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Mar. 22, 2018~ Mar. 28, 2018	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Mar. 22, 2018~ Mar. 28, 2018	N/A	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Mar. 22, 2018~ Mar. 28, 2018	Jul. 17, 2018	Radiation (03CH07-HY)
Test Software	Audix	E3 6.2009-8-24	N/A	N/A	N/A	Mar. 22, 2018~ Mar. 28, 2018	N/A	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY532900 53	20Hz to 26.5GHz	Jan. 16, 2018	Mar. 22, 2018~ Mar. 28, 2018	Jan. 15, 2019	Radiation (03CH07-HY)
Amplifier	SONOMA	310N	187231	9kHz~1GHz	Jan. 08, 2018	Mar. 22, 2018~ Mar. 28, 2018	Jan. 07, 2019	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Nov. 27, 2017	Mar. 22, 2018~ Mar. 28, 2018	Nov. 26, 2018	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.70

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.70

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.50

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.20

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Ethan Lin / Luffy Lin	Temperature:	21~25	°C
Test Date:	2017/12/14 ~ 2018/01/15	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
zigbee	1Mbps	1	11	2405	2.68	1.62	0.50	Pass
zigbee	1Mbps	1	18	2440	2.67	1.62	0.50	Pass
zigbee	1Mbps	1	25	2475	2.64	1.59	0.50	Pass

TEST RESULTS DATA
Peak Power Table

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
zigbee	1Mbps	1	11	2405	5.17	30.00	-2.08	3.09	36.00	Pass
zigbee	1Mbps	1	18	2440	5.49	30.00	-2.08	3.41	36.00	Pass
zigbee	1Mbps	1	25	2475	4.80	30.00	-2.08	2.72	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
zigbee	1Mbps	1	11	2405	0.00	5.26
zigbee	1Mbps	1	18	2440	0.00	5.11
zigbee	1Mbps	1	25	2475	0.00	4.74

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
zigbee	1Mbps	1	11	2405	2.35	-9.99	-2.08	8.00	Pass
zigbee	1Mbps	1	18	2440	1.93	-9.22	-2.08	8.00	Pass
zigbee	1Mbps	1	25	2475	1.17	-11.15	-2.08	8.00	Pass

Note: PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 20dBc limit.

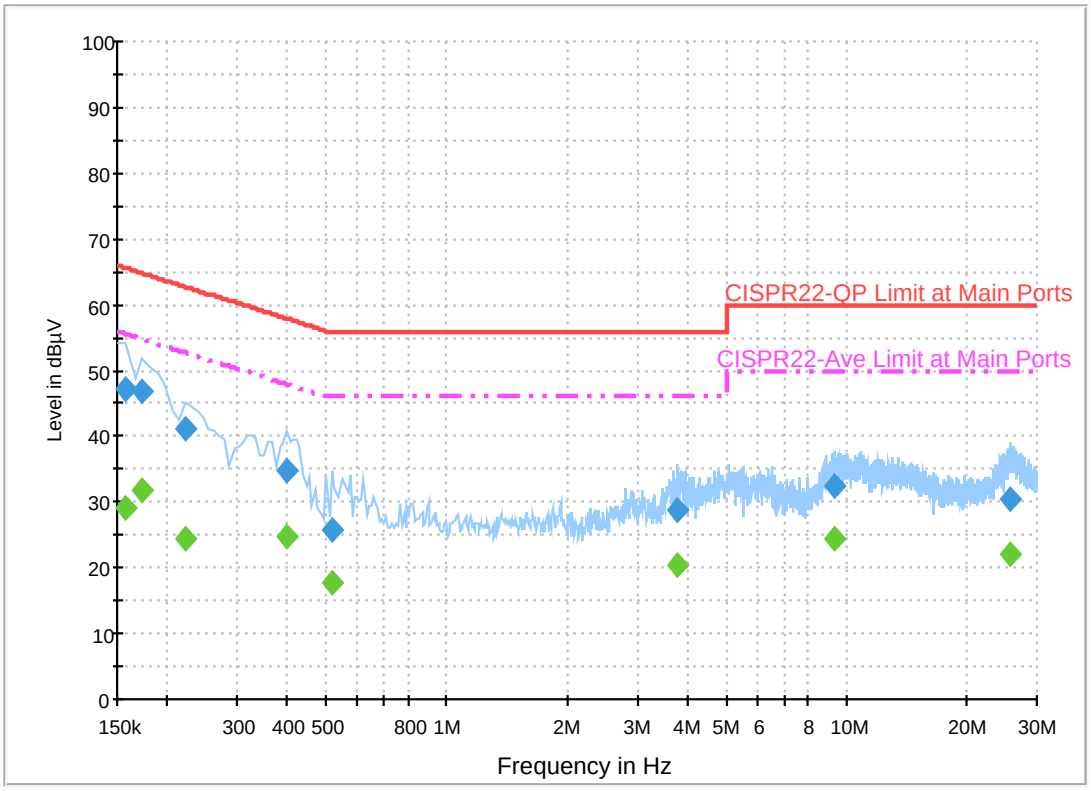
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Shareef Yu	**Temperature :**	23~25℃
		Relative Humidity :	50~51%

EUT Information

Report NO :	7N2101
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

ENV216 Auto Test FCC Power Bar - L



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	47.1	Off	L1	19.5	18.5	65.6
0.174000	46.9	Off	L1	19.5	17.9	64.8
0.222000	41.1	Off	L1	19.5	21.6	62.7
0.398000	34.7	Off	L1	19.5	23.2	57.9
0.518000	25.8	Off	L1	19.5	30.2	56.0
3.798000	28.8	Off	L1	19.5	27.2	56.0
9.366000	32.6	Off	L1	19.7	27.4	60.0
25.726000	30.4	Off	L1	19.8	29.6	60.0

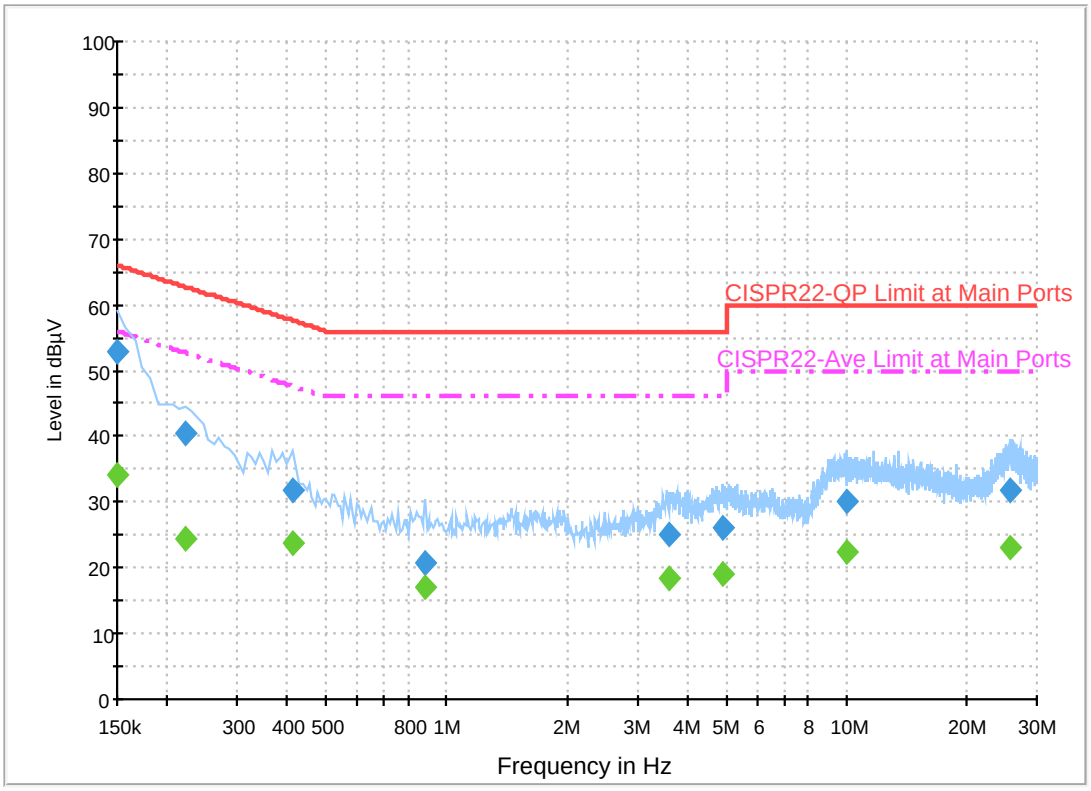
Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	29.0	Off	L1	19.5	26.6	55.6
0.174000	31.7	Off	L1	19.5	23.1	54.8
0.222000	24.5	Off	L1	19.5	28.2	52.7
0.398000	24.8	Off	L1	19.5	23.1	47.9
0.518000	17.7	Off	L1	19.5	28.3	46.0
3.798000	20.4	Off	L1	19.5	25.6	46.0
9.366000	24.3	Off	L1	19.7	25.7	50.0
25.726000	22.1	Off	L1	19.8	27.9	50.0

EUT Information

Report NO :	7N2101
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

ENV216 Auto Test FCC Power Bar - N



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	52.7	Off	N	19.5	13.3	66.0
0.222000	40.5	Off	N	19.5	22.2	62.7
0.414000	31.8	Off	N	19.5	25.8	57.6
0.886000	20.7	Off	N	19.5	35.3	56.0
3.606000	25.0	Off	N	19.5	31.0	56.0
4.894000	26.0	Off	N	19.6	30.0	56.0
10.046000	30.0	Off	N	19.7	30.0	60.0
25.702000	31.7	Off	N	20.0	28.3	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	33.9	Off	N	19.5	22.1	56.0
0.222000	24.4	Off	N	19.5	28.3	52.7
0.414000	23.8	Off	N	19.5	23.8	47.6
0.886000	17.1	Off	N	19.5	28.9	46.0
3.606000	18.4	Off	N	19.5	27.6	46.0
4.894000	19.0	Off	N	19.6	27.0	46.0
10.046000	22.3	Off	N	19.7	27.7	50.0
25.702000	23.0	Off	N	20.0	27.0	50.0

Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh, and James Chiu	Temperature :	22~24°C
		Relative Humidity :	51~53%

<For Sample 1>

2.4GHz 2400~2483.5MHz
Zigbee(Band Edge @ 3m)

BLE	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
Zigbee CH 11 2405MHz		2388.855	55.45	-18.55	74	40.31	31.95	8.24	35.04	102	82	P	H
		2389.59	44.56	-9.44	54	29.42	31.95	8.24	35.04	102	82	A	H
	*	2405	101.72	-	-	86.55	31.99	8.24	35.05	102	82	P	H
	*	2405	99.68	-	-	84.51	31.99	8.24	35.05	102	82	A	H
													H
													H
		2388.33	55.14	-18.86	74	40	31.95	8.24	35.04	151	312	P	V
		2389.065	44.55	-9.45	54	29.41	31.95	8.24	35.04	151	312	A	V
	*	2405	98.63	-	-	83.46	31.99	8.24	35.05	151	312	P	V
	*	2405	96.67	-	-	81.5	31.99	8.24	35.05	151	312	A	V
													V
													V
Zigbee CH 18 2440MHz		2328.9	55.76	-18.24	74	40.72	31.79	8.28	35.02	100	82	P	H
		2386.72	44.59	-9.41	54	29.45	31.95	8.24	35.04	100	82	A	H
	*	2440	102.09	-	-	86.81	32.08	8.27	35.06	100	82	P	H
	*	2440	99.92	-	-	84.64	32.08	8.27	35.06	100	82	A	H
		2497.83	55.76	-18.24	74	40.35	32.2	8.3	35.08	100	82	P	H
		2489.64	44.85	-9.15	54	29.43	32.2	8.3	35.07	100	82	A	H
		2381.68	55.34	-18.66	74	40.24	31.91	8.24	35.04	150	310	P	V
		2389.38	44.57	-9.43	54	29.43	31.95	8.24	35.04	150	310	A	V
	*	2440	98.41	-	-	83.13	32.08	8.27	35.06	150	310	P	V
	*	2440	96.42	-	-	81.14	32.08	8.27	35.06	150	310	A	V
		2492.79	56.14	-17.86	74	40.73	32.2	8.3	35.08	150	310	P	V
		2490.13	44.82	-9.18	54	29.4	32.2	8.3	35.07	150	310	A	V

Zigbee CH 25 2475MHz	*	2475	102.54	-	-	87.16	32.16	8.3	35.07	103	80	P	H
	*	2475	100.6	-	-	85.22	32.16	8.3	35.07	103	80	A	H
		2495.08	55.9	-18.1	74	40.49	32.2	8.3	35.08	103	80	P	H
		2483.76	45.1	-8.9	54	29.72	32.16	8.3	35.07	103	80	A	H
													H
													H
	*	2475	98.68	-	-	83.3	32.16	8.3	35.07	165	313	P	V
	*	2475	96.75	-	-	81.37	32.16	8.3	35.07	165	313	A	V
		2485	55.6	-18.4	74	40.22	32.16	8.3	35.07	165	313	P	V
		2483.68	44.87	-9.13	54	29.49	32.16	8.3	35.07	165	313	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

Zigbee (Harmonic @ 3m)

BLE	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
Zigbee CH 11 2405MHz		4810	44.22	-29.78	74	56.84	34.24	11.96	59.4	100	0	P	H
													H
													H
													H
		4810	44.3	-29.7	74	57.5	34.24	11.96	59.4	100	0	P	V
													V
													V
													V
Zigbee CH 18 2440MHz		4880	44.77	-29.23	74	57.38	34.22	11.9	59.29	100	0	P	H
		7320	44.35	-29.65	74	51.35	35.7	14.94	58.06	100	0	P	H
													H
													H
		4880	45.63	-28.37	74	58.8	34.22	11.9	59.29	100	0	P	V
		7320	46.55	-27.45	74	53.97	35.7	14.94	58.06	100	0	P	V
													V
													V
Zigbee CH 25 2475MHz		4950	46.7	-27.3	74	59.28	34.21	11.84	59.18	100	0	P	H
		7425	46.7	-27.3	74	53.71	35.64	15.1	58.14	100	0	P	H
													H
													H
		4950	45.86	-28.14	74	58.99	34.21	11.84	59.18	100	0	P	V
		7425	47.78	-26.22	74	55.18	35.64	15.1	58.14	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz Zigbee (LF)

BLE	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz Zigbee LF		38.91	26.22	-13.78	40	36.01	19.94	1.71	31.47	-	-	P	H
		209.01	36.35	-7.15	43.5	49.93	15.07	2.72	31.44	-	-	P	H
		237.09	33.54	-12.46	46	45.03	16.8	3.03	31.4	-	-	P	H
		323.8	42.58	-3.42	46	50.79	19.49	3.43	31.26	100	0	P	H
		626.9	33.83	-12.17	46	33.89	25.98	4.59	30.79	-	-	P	H
		797.7	37.88	-8.12	46	35.34	27.94	4.98	30.59	-	-	P	H
													H
													H
													H
													H
													H
													H
		39.72	38.32	-1.68	40	48.66	19.4	1.71	31.48	100	122	QP	V
		209.01	40.07	-3.43	43.5	53.65	15.07	2.72	31.44	-	-	P	V
		299.73	30.86	-15.14	46	39.55	19.22	3.28	31.3	-	-	P	V
		323.8	42.6	-3.4	46	50.81	19.49	3.43	31.26	-	-	P	V
		626.9	36.34	-9.66	46	36.4	25.98	4.59	30.79	-	-	P	V
		797.7	37.47	-8.53	46	34.93	27.94	4.98	30.59	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

<For Sample 2>

2.4GHz 2400~2483.5MHz

Zigbee (Band Edge @ 3m)

Zigbee	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
Zigbee CH 25 2475MHz	*	2475	101.46	-	-	86.82	32.16	17.55	35.07	325	84	P	H
	*	2475	99.53	-	-	84.89	32.16	17.55	35.07	325	84	A	H
		2491.32	55.11	-18.89	74	40.43	32.2	17.55	35.07	325	84	P	H
		2483.72	43.95	-10.05	54	29.31	32.16	17.55	35.07	325	84	A	H
													H
													H
	*	2475	100.13	-	-	85.49	32.16	17.55	35.07	297	354	P	V
	*	2475	98.11	-	-	83.47	32.16	17.55	35.07	297	354	A	V
		2485.64	54.57	-19.43	74	39.93	32.16	17.55	35.07	297	354	P	V
		2483.72	43.97	-10.03	54	29.33	32.16	17.55	35.07	297	354	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

Zigbee (Harmonic @ 3m)

Zigbee	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
Zigbee CH 25 2475MHz		4950	45.93	-28.07	74	59.64	34.21	11.26	59.18	100	0	P	H
		7425	43.84	-30.16	74	52.63	35.64	13.71	58.14	100	0	P	H
													H
													H
		4950	47.69	-26.31	74	61.4	34.21	11.26	59.18	100	0	P	V
		7425	44.76	-29.24	74	53.55	35.64	13.71	58.14	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz Zigbee (LF)

Zigbee	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz Zigbee LF		30.27	28.91	-11.09	40	34.94	24.6	1.2	31.83	-	-	P	H
		39.45	28.28	-11.72	40	39.57	19.33	1.2	31.82	-	-	P	H
		216.03	32.44	-13.56	46	46.69	15.24	2.18	31.67	-	-	P	H
		323.1	42.78	-3.22	46	52.14	19.5	2.76	31.62	100	0	P	H
		394.5	35.84	-10.16	46	42.94	21.49	3.05	31.64	-	-	P	H
		948.2	33.2	-12.8	46	29.14	30.28	4.71	30.93	-	-	P	H
													H
													H
													H
													H
													H
													H
		38.97	38.85	-1.15	40	49.59	19.88	1.2	31.82	100	237	QP	V
		71.31	33.76	-6.24	40	51.49	12.5	1.55	31.78	-	-	P	V
		216.03	34.52	-11.48	46	48.77	15.24	2.18	31.67	-	-	P	V
		320.3	42.23	-3.77	46	51.68	19.41	2.76	31.62	-	-	P	V
		398.7	35.93	-10.07	46	42.89	21.63	3.05	31.64	-	-	P	V
		948.2	32.45	-13.55	46	28.39	30.28	4.71	30.93	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.

Appendix D. Radiated Spurious Emission Plots

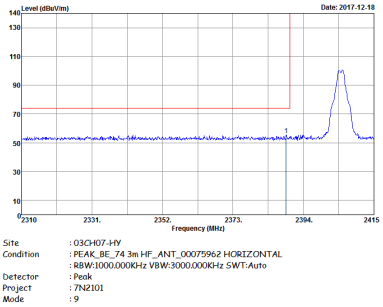
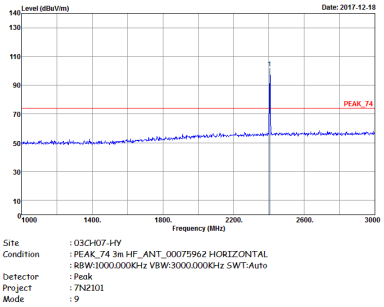
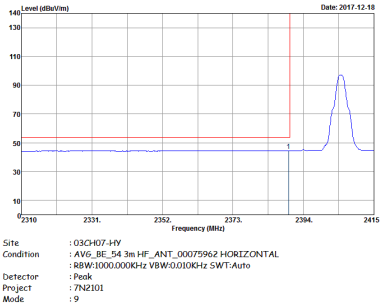
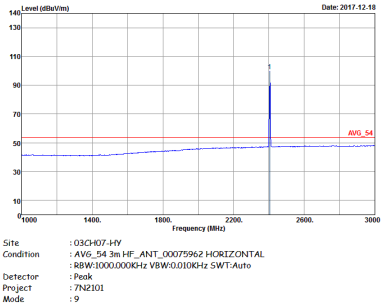
Test Engineer :	Jesse Wang, Stan Hsieh, and James Chiu	**Temperature :**	22~24°C
		Relative Humidity :	51~53%

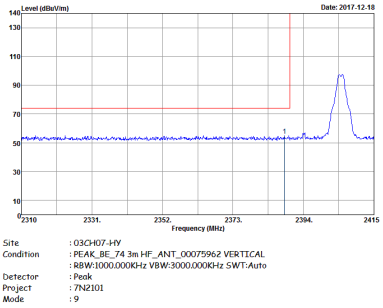
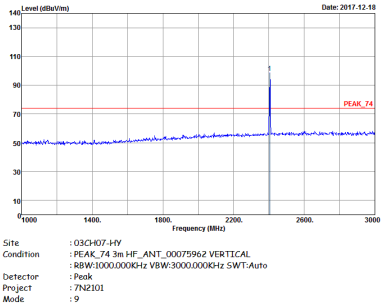
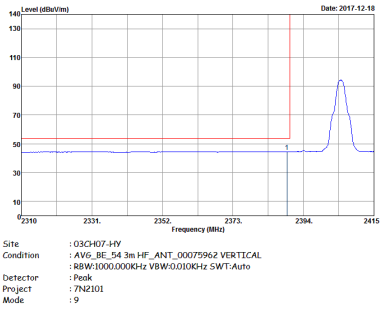
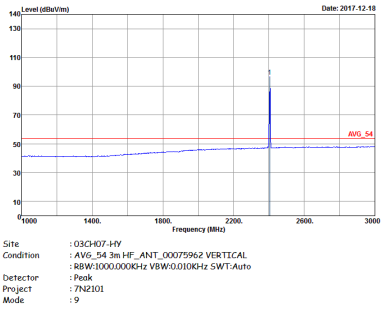
Note symbol

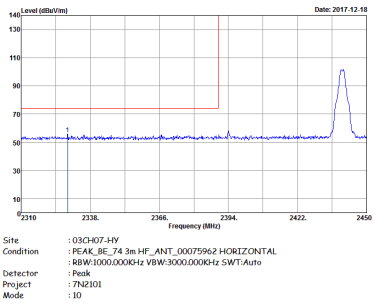
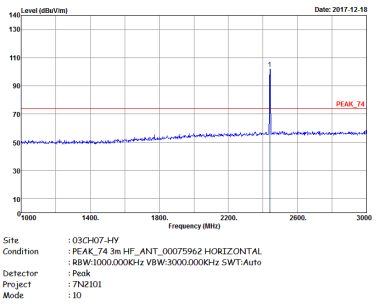
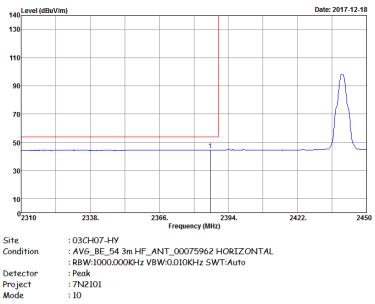
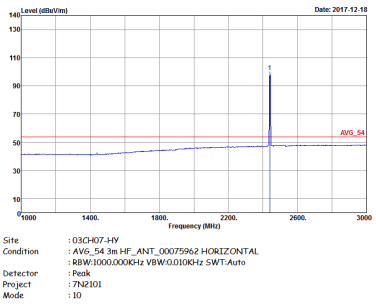
-L	**Low channel location**
-R	**High channel location**

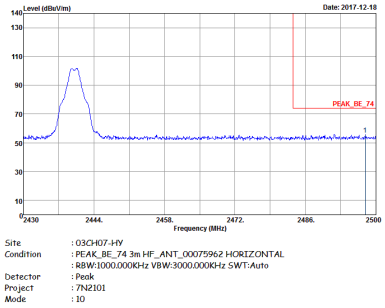
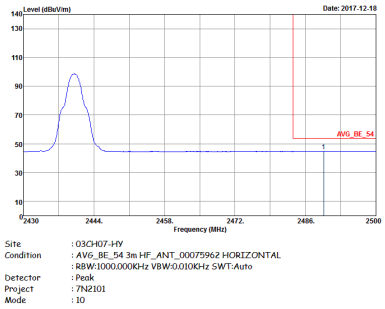
<For Sample 1>

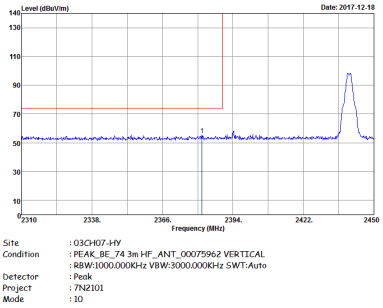
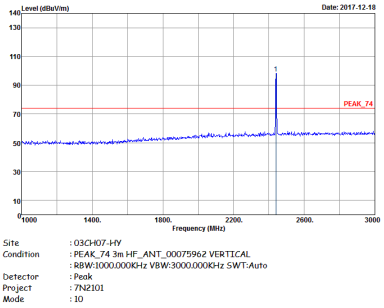
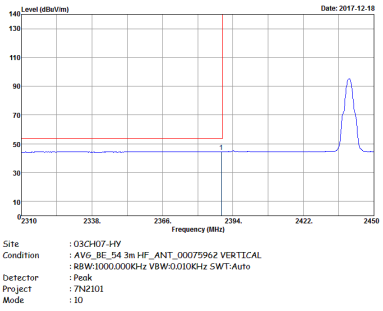
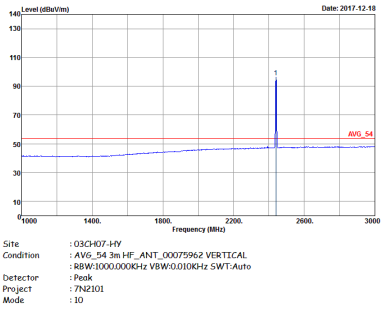
2.4GHz 2400~2483.5MHz
Zigbee (Band Edge @ 3m)

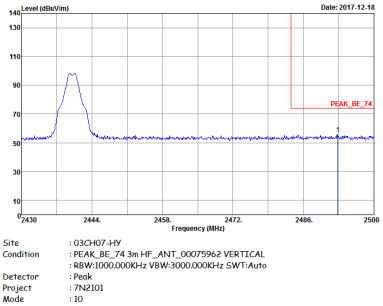
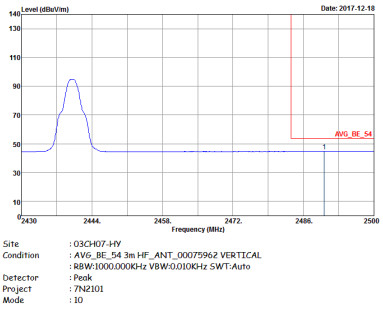
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH11 2405MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

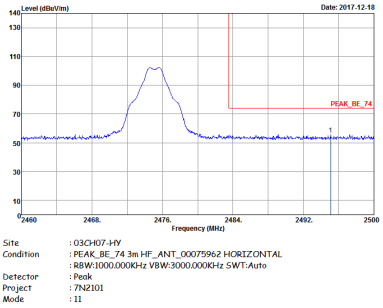
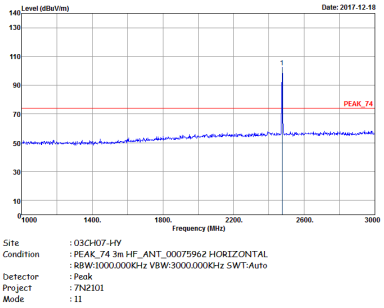
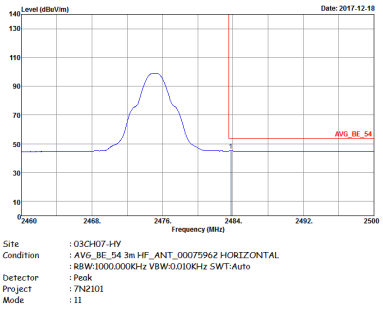
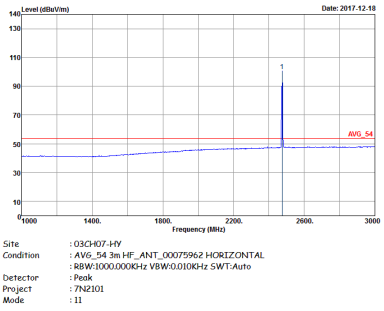
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH11 2405MHz	
1	Vertical	Fundamental
Peak		
Avg		

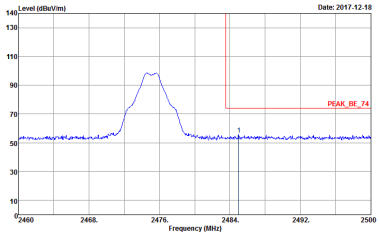
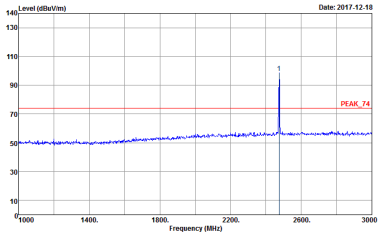
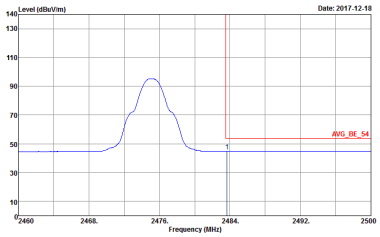
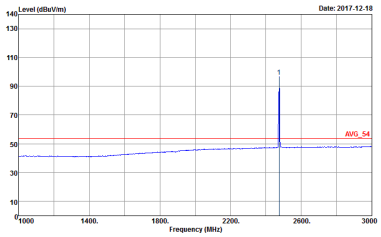
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH18 2440MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH18 2440MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH18 2440MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

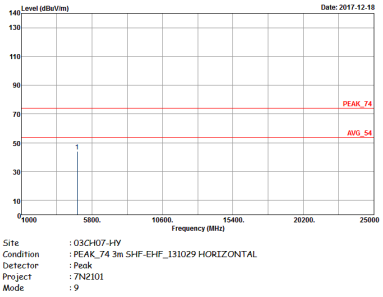
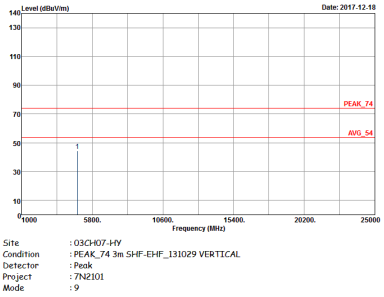
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH18 2440MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

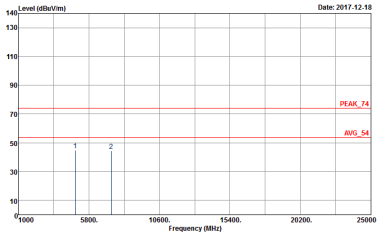
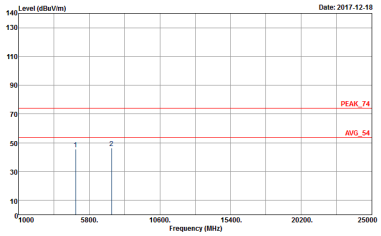
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH25 2475MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

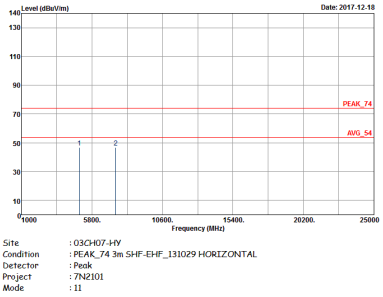
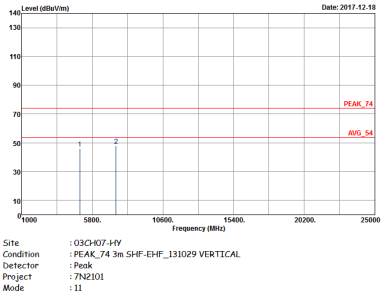
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH25 2475MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH07-HY Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 11	 Site : 03CH07-HY Condition : PEAK_74 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 11
Avg.	 Site : 03CH07-HY Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 11	 Site : 03CH07-HY Condition : AVG_54 3m HF_ANT_00075962 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 7N2101 Mode : 11

2.4GHz 2400~2483.5MHz

Zigbee (Harmonic @ 3m)

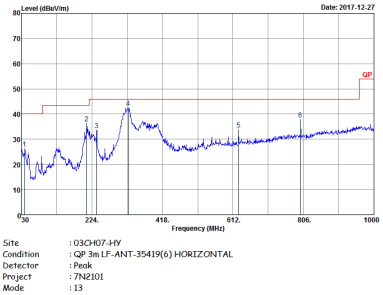
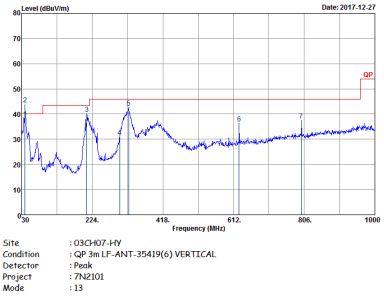
Zigbee	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	Zigbee CH11 2405MHz	
1	Horizontal	Vertical
Peak Avg.		

Zigbee	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	Zigbee CH18 2440MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 10	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 10

Zigbee	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	Zigbee CH25 2475MHz	
1	Horizontal	Vertical
Peak		

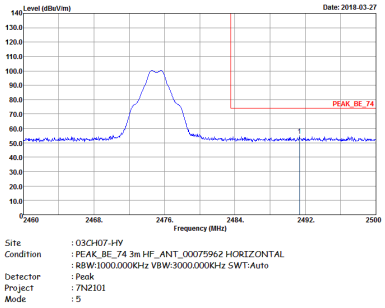
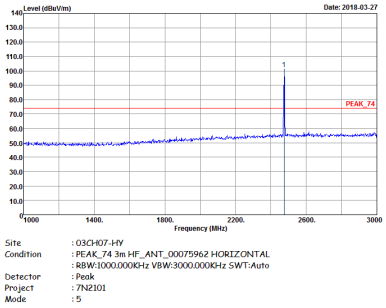
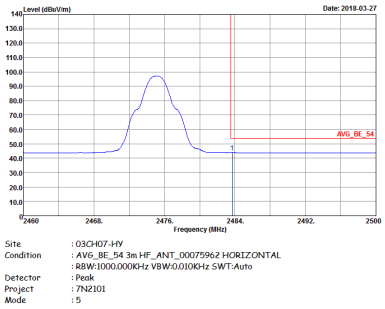
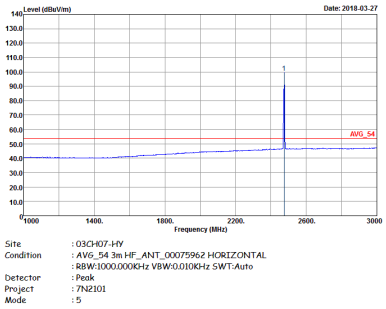
Emission below 1GHz

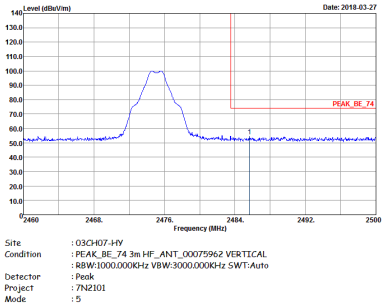
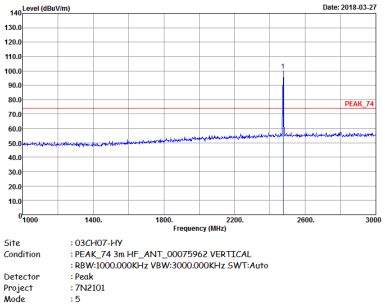
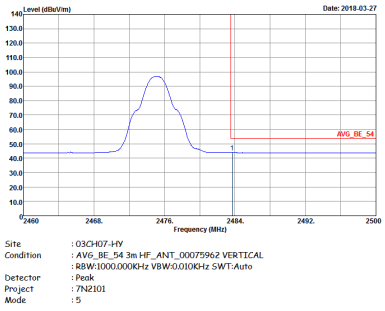
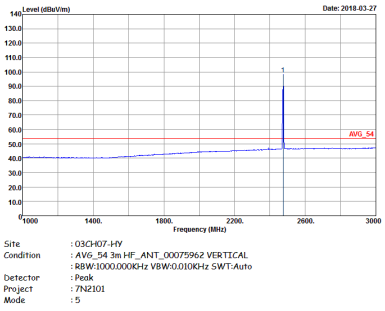
2.4GHz Zigbee (LF)

Zigbee	2.4GHz 2400~2483.5MHz	
ANT	Zigbee LF	
1	Horizontal	Vertical
QP / Peak		

<For Sample 2>

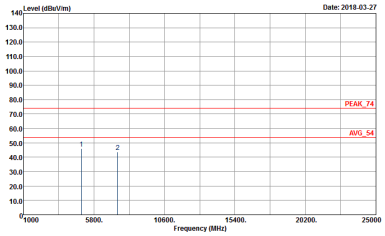
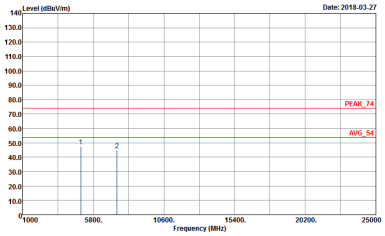
2.4GHz 2400~2483.5MHz
Zigbee (Band Edge @ 3m)

Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH25 2475MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	Zigbee CH25 2475MHz	
1	Vertical	Fundamental
Peak		
Avg.		

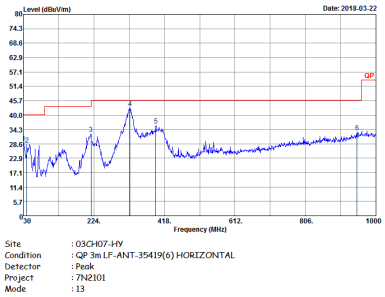
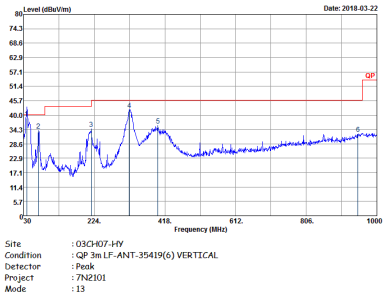
2.4GHz 2400~2483.5MHz

Zigbee (Harmonic @ 3m)

Zigbee	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	Zigbee CH25 2475MHz	
1	Horizontal	Vertical
Peak	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 7N2101 Mode : 5	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 7N2101 Mode : 5

Emission below 1GHz

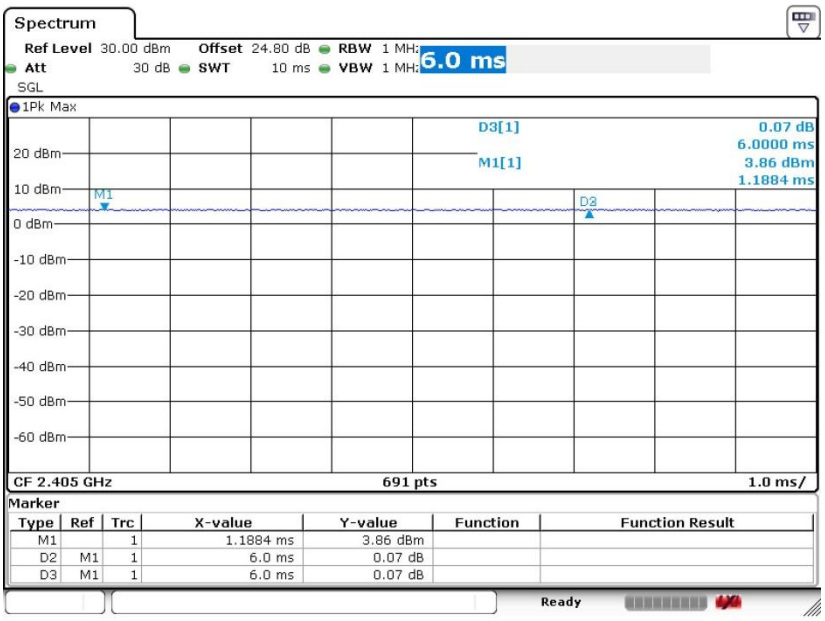
2.4GHz Zigbee (LF)

Zigbee	2.4GHz 2400~2483.5MHz	
ANT	Zigbee LF	
1	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
Zigbee	100.00	-	-	10Hz

Zigbee



Date: 14.DEC.2017 16:59:42