



FCC RF Test Report

APPLICANT : Compal Electronics, INC.
EQUIPMENT : Smart Socket Gateway
BRAND NAME : Compal
MODEL NAME : Edison L1
FCC ID : GKR-DBX71WBZ
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jan. 17, 2018 and testing was completed on Apr. 20, 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



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.



TABLE OF CONTENTS

SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION.....	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Product Feature of Equipment Under Test	5
1.4 Modification of EUT	5
1.5 Testing Location	6
1.6 Applicable Standards.....	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST.....	7
2.1 Descriptions of Test Mode	7
2.2 Connection Diagram of Test System	8
2.3 EUT Operation Test Setup	8
2.4 Measurement Results Explanation Example.....	9
3 TEST RESULT	10
3.1 6dB and 99% Bandwidth Measurement.....	10
3.2 Output Power Measurement.....	15
3.3 Power Spectral Density Measurement.....	16
3.4 Conducted Band Edges and Spurious Emission Measurement	21
3.5 Spurious Emission Measurement in the Restricted Band	26
3.6 AC Conducted Emission Measurement	30
3.7 Antenna Requirements.....	32
4 LIST OF MEASURING EQUIPMENT	33
5 UNCERTAINTY OF EVALUATION.....	35
APPENDIX A. CONDUCTED TEST RESULTS	
APPENDIX B. AC CONDUCTED EMISSION TEST RESULT	
APPENDIX C. RADIATED SPURIOUS EMISSION	
APPENDIX D. RADIATED SPURIOUS EMISSION PLOTS	
APPENDIX E. DUTY CYCLE PLOTS	
APPENDIX F. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR811720D	Rev. 01	Initial issue of report	Aug. 07, 2018
FR811720D	Rev. 02	Update antenna information.	Aug. 15, 2018

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	15.247(b)(3)	Peak Output Power	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm/3kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 2.68 dB at 4810.000 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.72 dB at 0.442 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Compal Electronics, INC.

No. 581 & 581-1, 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, and Zigbee.

Product Specification subjective to this standard	
Antenna Type	WLAN: Coupling Antenna Bluetooth: Coupling 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 and TW0007 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 1 st 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

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

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH11-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

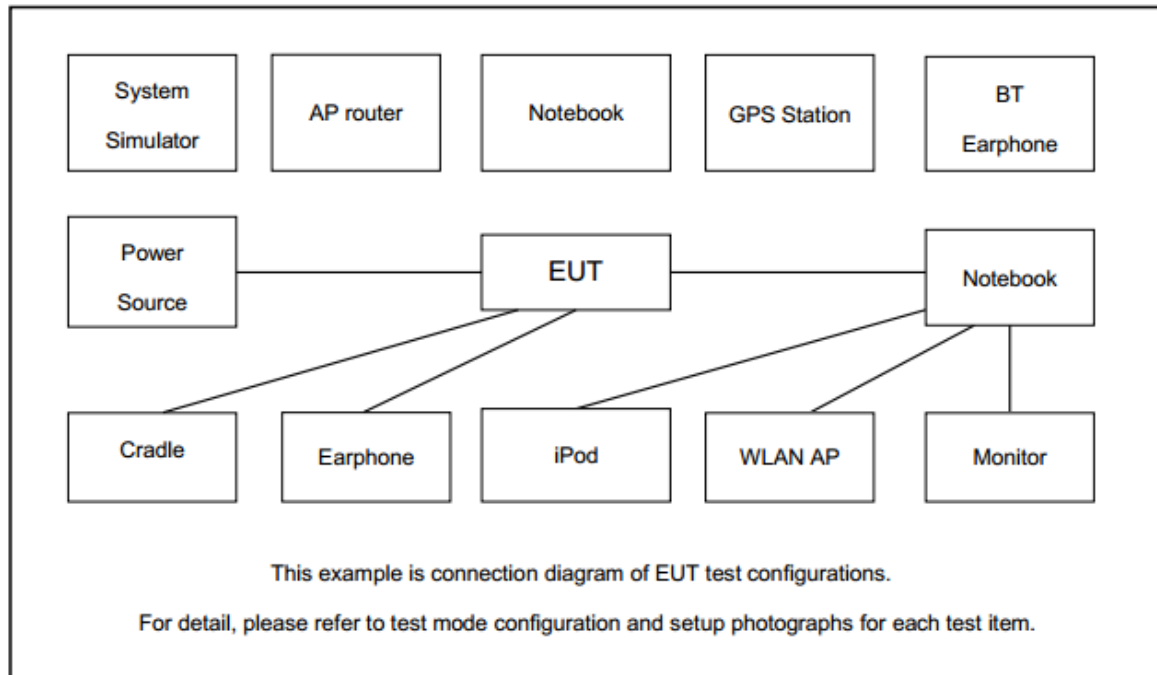
2.1 Descriptions of Test Mode

- 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
	Mode 2 :Bluetooth Tx
	Mode 3 :Zigbee Tx
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	

2.2 Connection Diagram of Test System



2.3 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.



2.4 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.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

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.

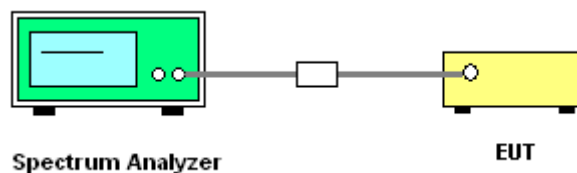
3.1.2 Measuring Instruments

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

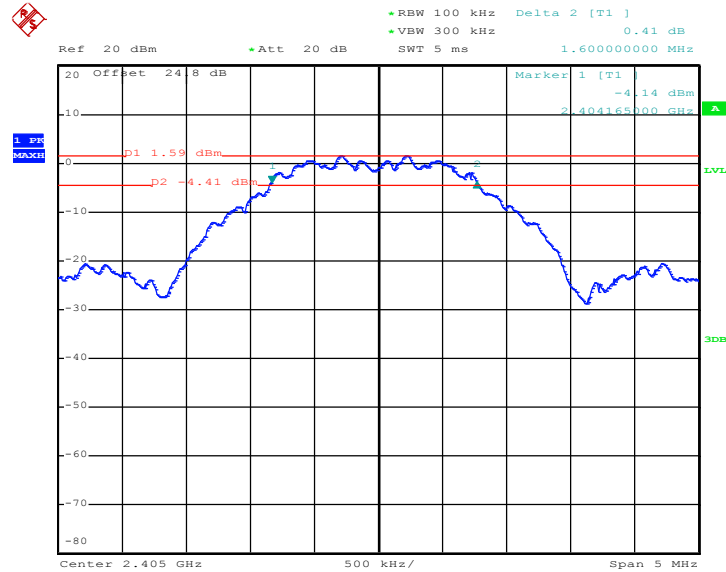




3.1.5 Test Result of 6dB Bandwidth

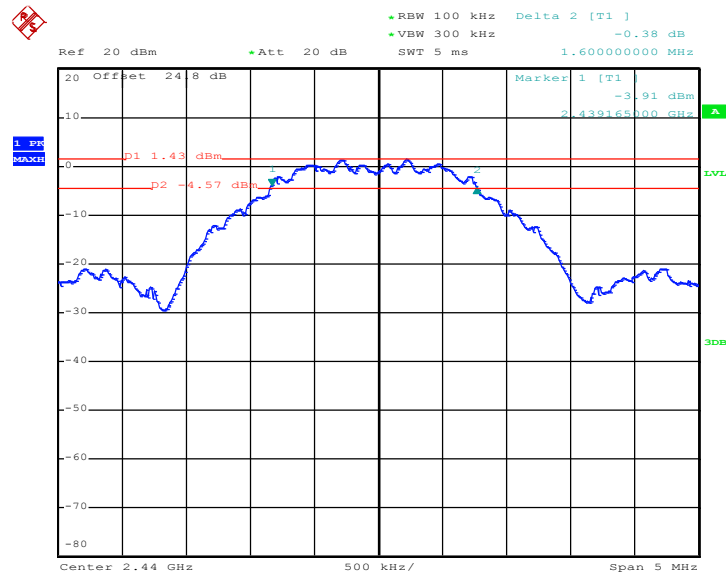
Test data refer to Appendix A.

6 dB Bandwidth Plot on Channel 11



Date: 7.FEB.2018 01:39:47

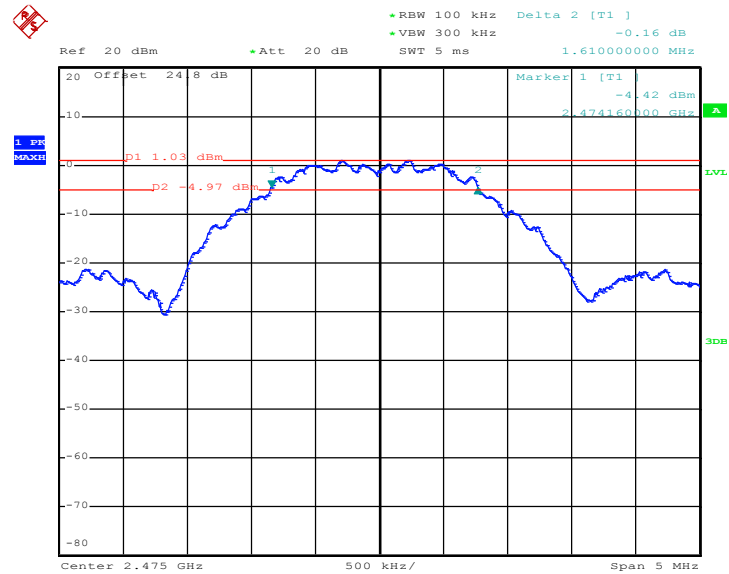
6 dB Bandwidth Plot on Channel 18



Date: 7.FEB.2018 02:09:37



6 dB Bandwidth Plot on Channel 25



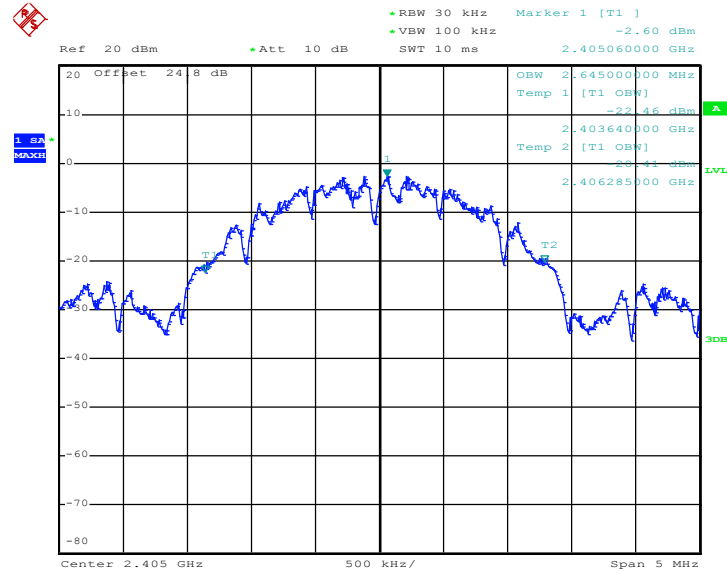
Date: 7.FEB.2018 02:17:06



3.1.6 Test Result of 99% Occupied Bandwidth

Test data refer to Appendix A.

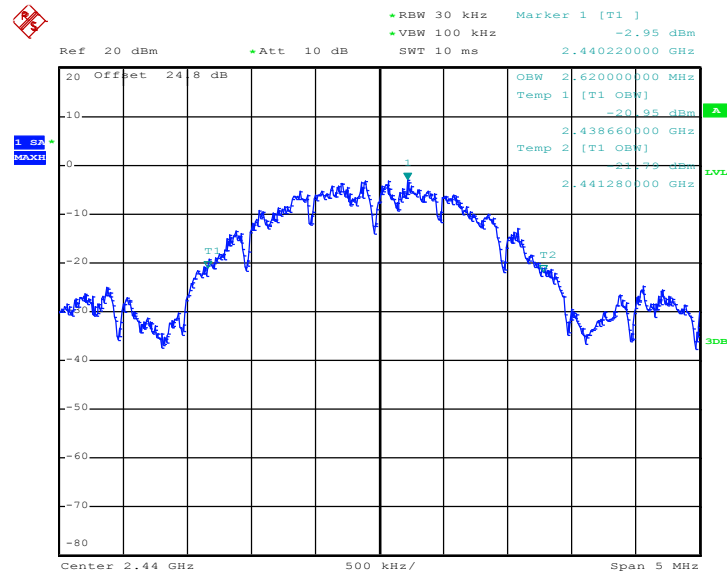
99% Bandwidth Plot on Channel 11



Date: 7.FEB.2018 01:58:39

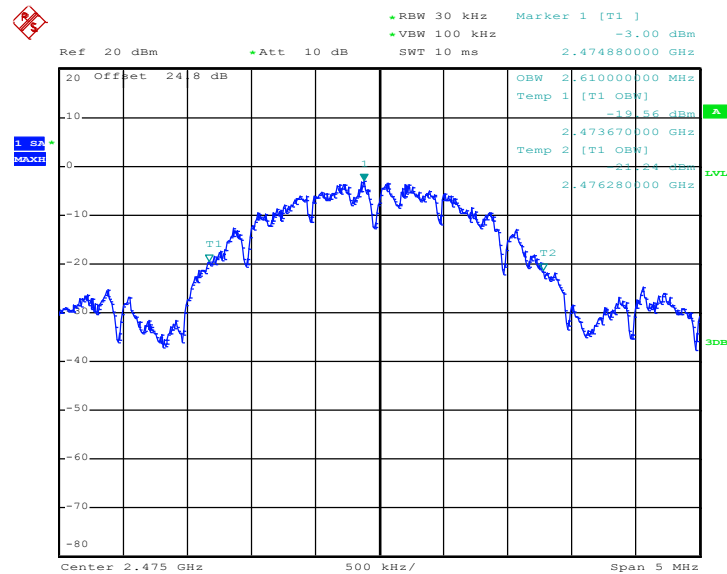


99% Occupied Bandwidth Plot on Channel 18



Date: 7.FEB.2018 02:12:31

99% Occupied Bandwidth Plot on Channel 25



Date: 7.FEB.2018 02:33:55

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.

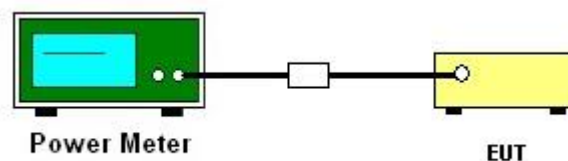
3.2.2 Measuring Instruments

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.

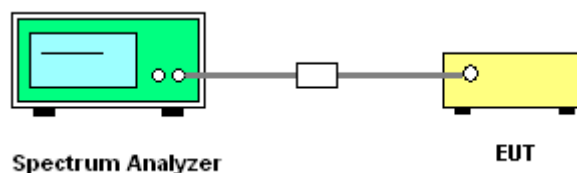
3.3.2 Measuring Instruments

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



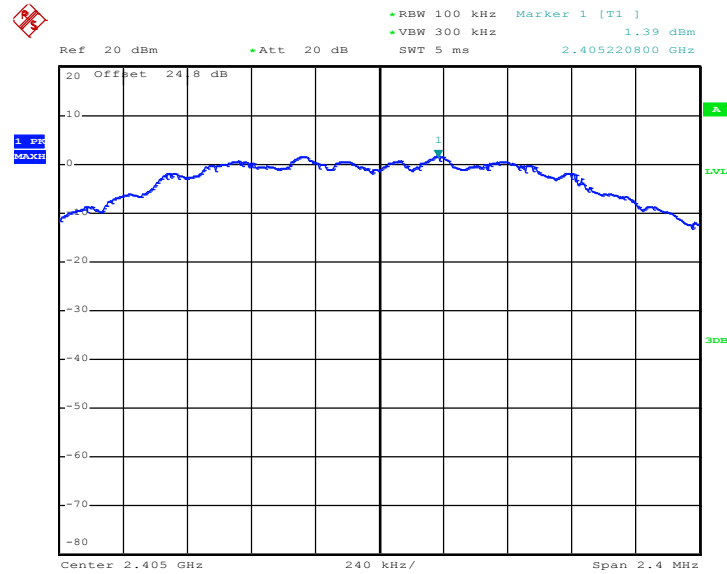
3.3.5 Test Result of Power Spectral Density

Test data refers to Appendix A.



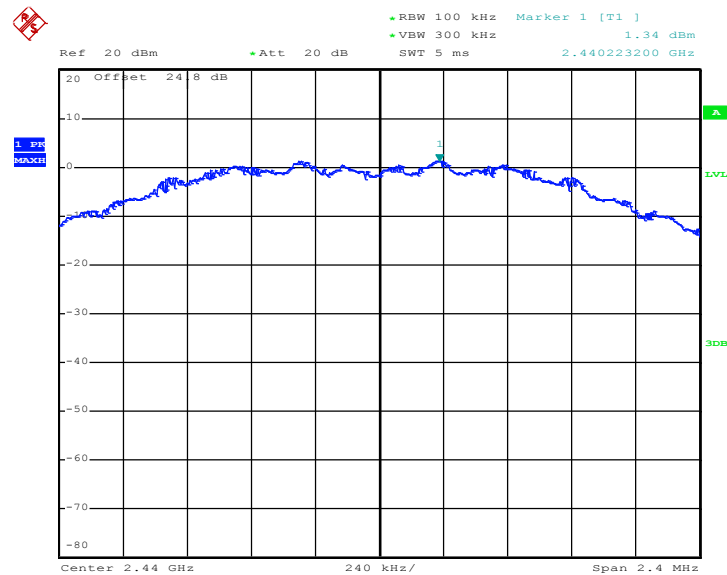
3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on Channel 11



Date: 7.FEB.2018 01:44:54

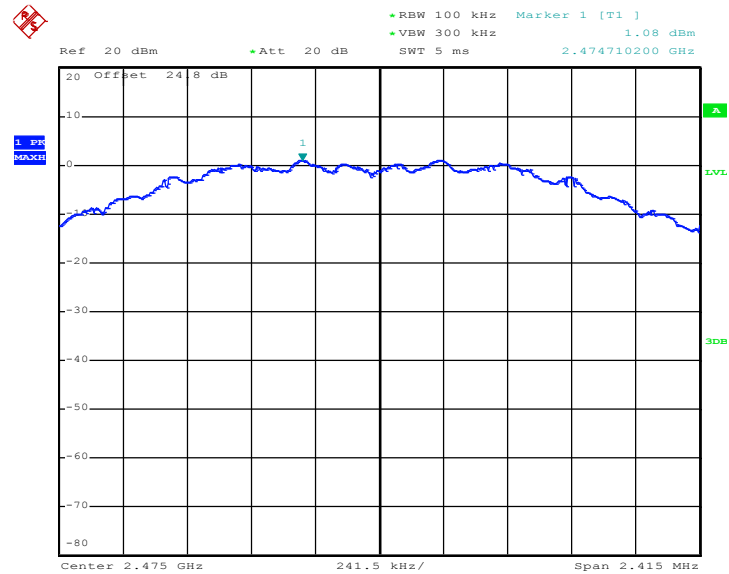
PSD 100kHz Plot on Channel 18



Date: 7.FEB.2018 02:10:43



PSD 100kHz Plot on Channel 25

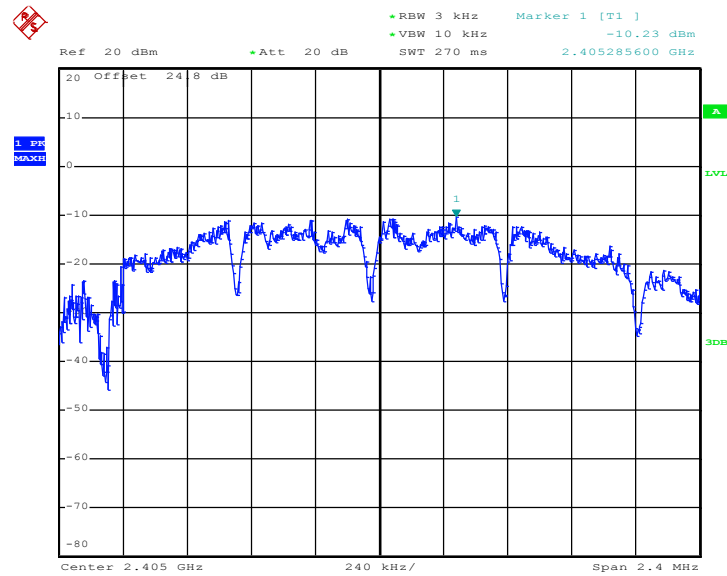


Date: 7.FEB.2018 02:18:22



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

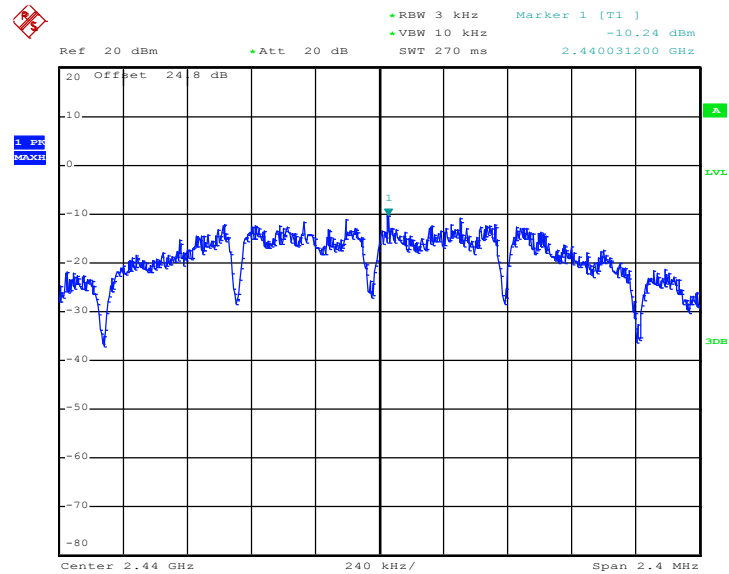
PSD 3kHz Plot on Channel 11



Date: 7.FEB.2018 01:41:39

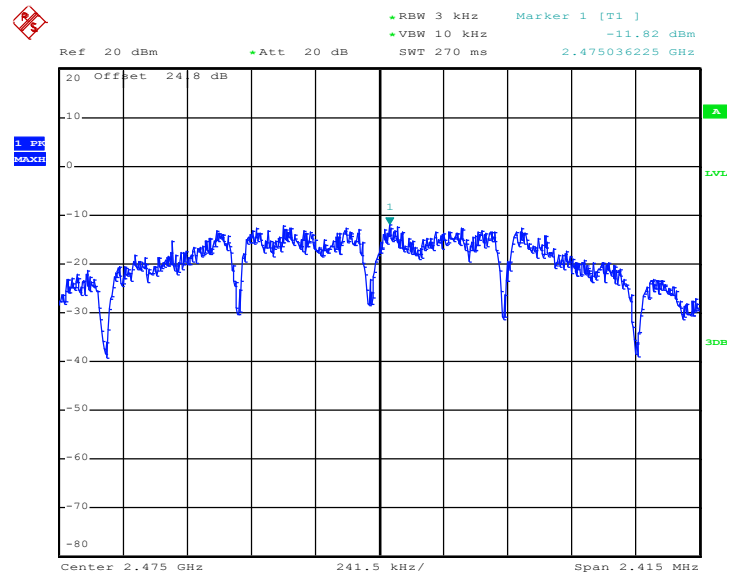


PSD 3kHz Plot on Channel 18



Date: 7.FEB.2018 02:10:23

PSD 3kHz Plot on Channel 25



Date: 7.FEB.2018 02:17:54

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.

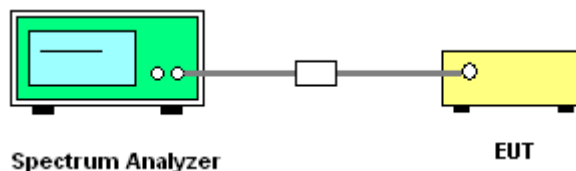
3.4.2 Measuring Instruments

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.

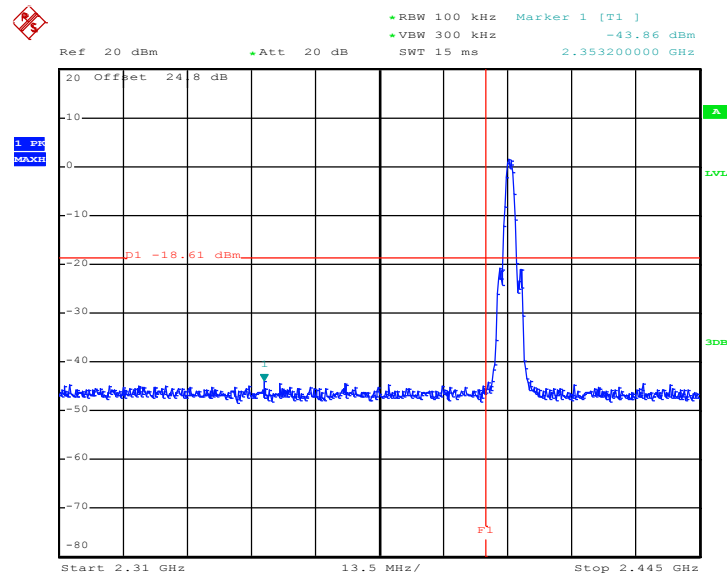
3.4.4 Test Setup





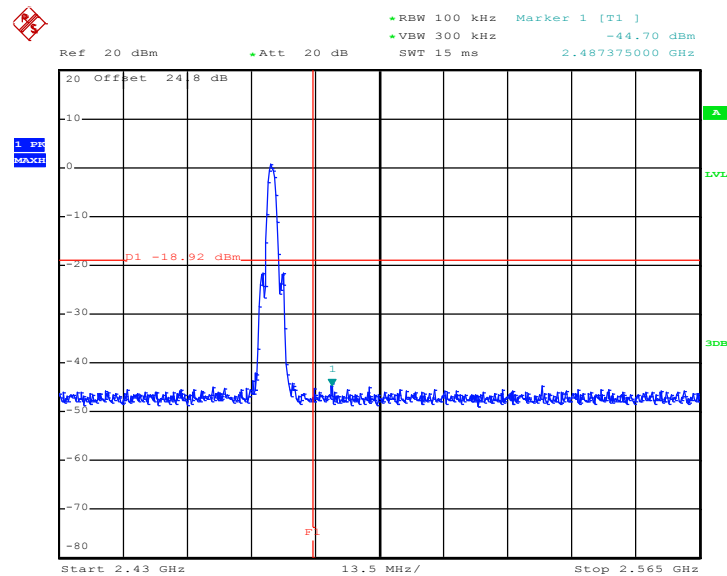
3.4.5 Test Result of Conducted Band Edges Plots

Low Band Edge Plot on Channel 11



Date: 7.FEB.2018 02:05:34

High Band Edge Plot on Channel 25

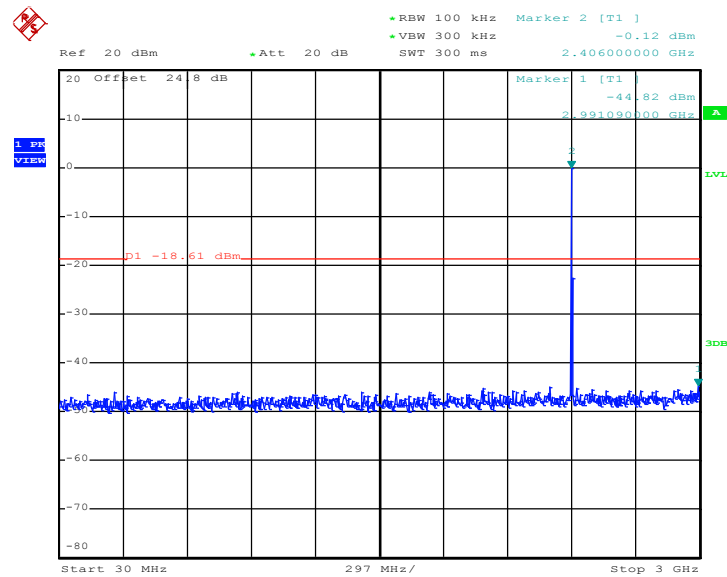


Date: 7.FEB.2018 02:30:43



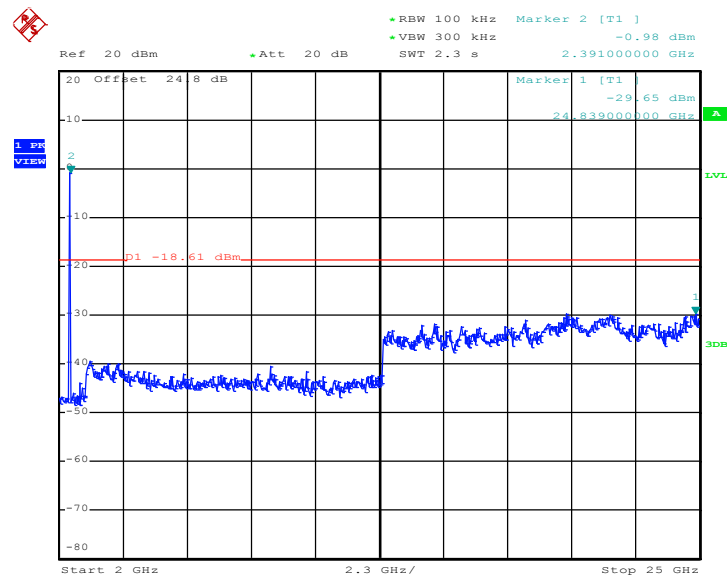
3.4.6 Test Result of Conducted Spurious Emission Plots

Conducted Spurious Emission Plot on Zigbee Channel 11



Date: 7.FEB.2018 01:56:38

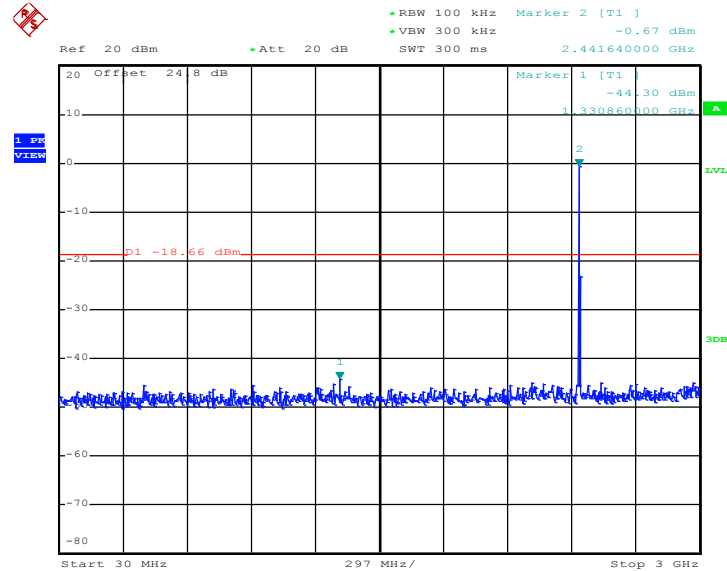
Conducted Spurious Emission Plot on Zigbee Channel 11



Date: 7.FEB.2018 01:56:47

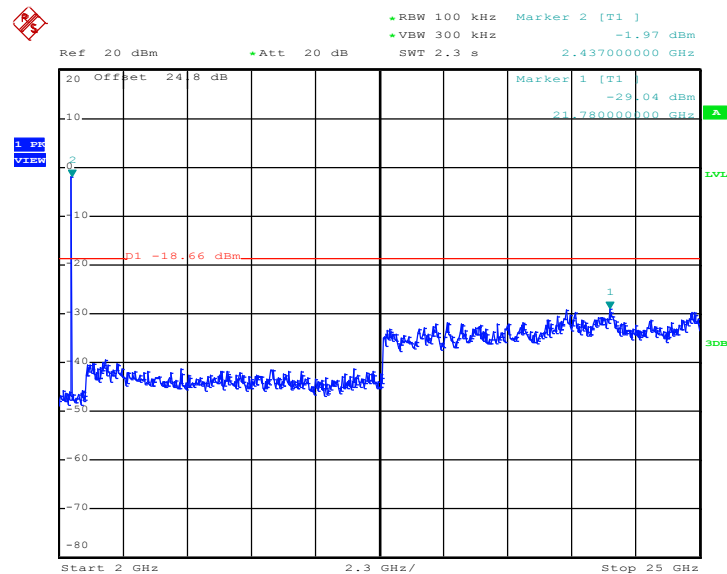


Conducted Spurious Emission Plot on Zigbee Channel 18



Date: 7.FEB.2018 02:10:57

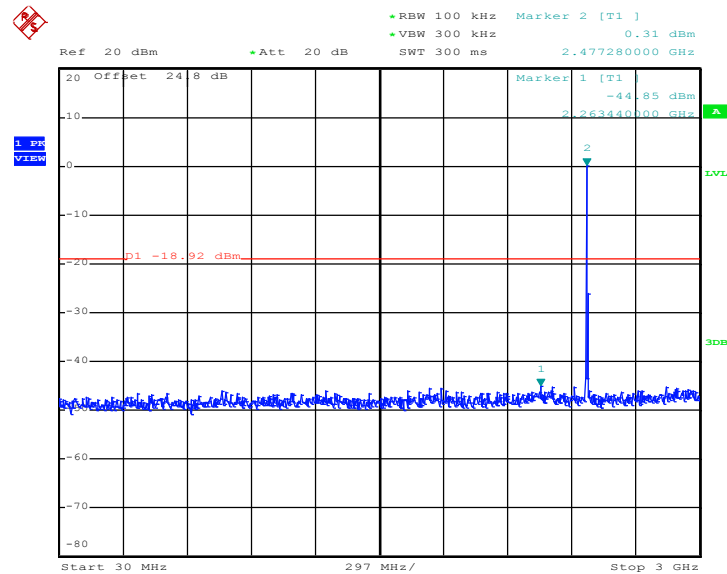
Conducted Spurious Emission Plot on Zigbee Channel 18



Date: 7.FEB.2018 02:11:06

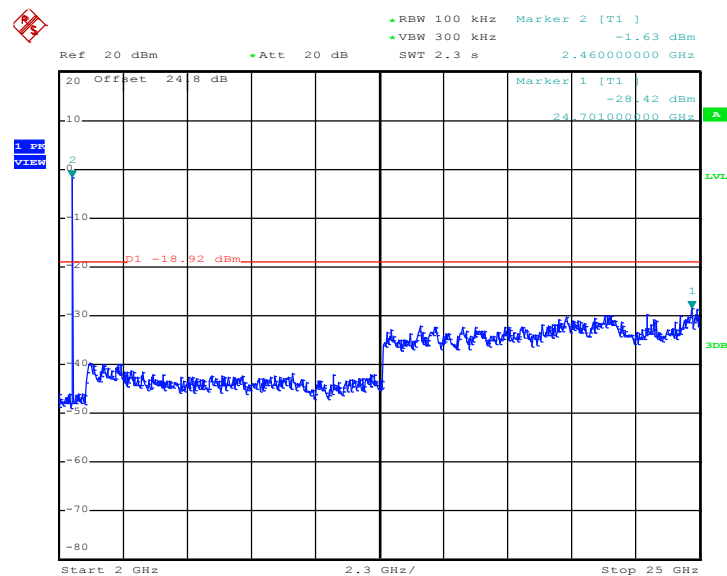


Conducted Spurious Emission Plot on Zigbee Channel 25



Date: 7.FEB.2018 02:31:53

Conducted Spurious Emission Plot on Zigbee Channel 25



Date: 7.FEB.2018 02:32:02



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.

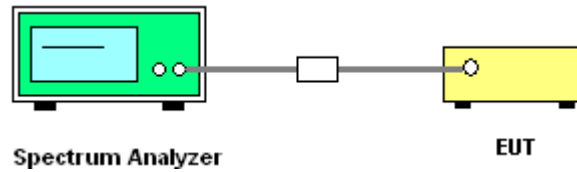


3.5.3 Test Procedures

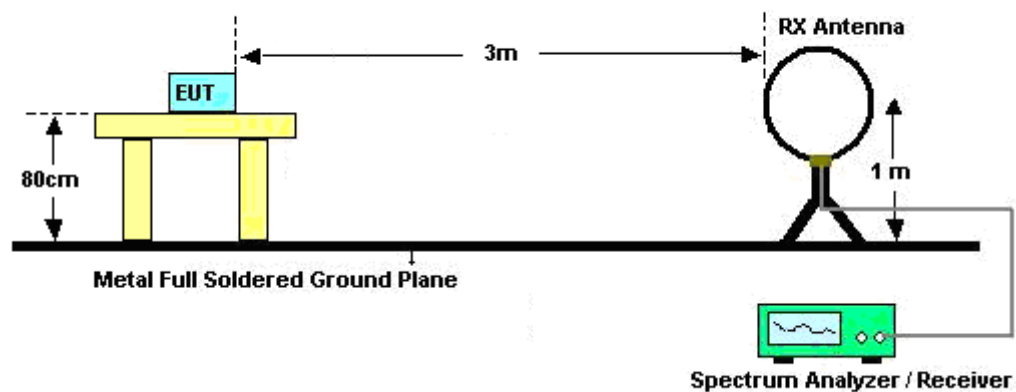
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, 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

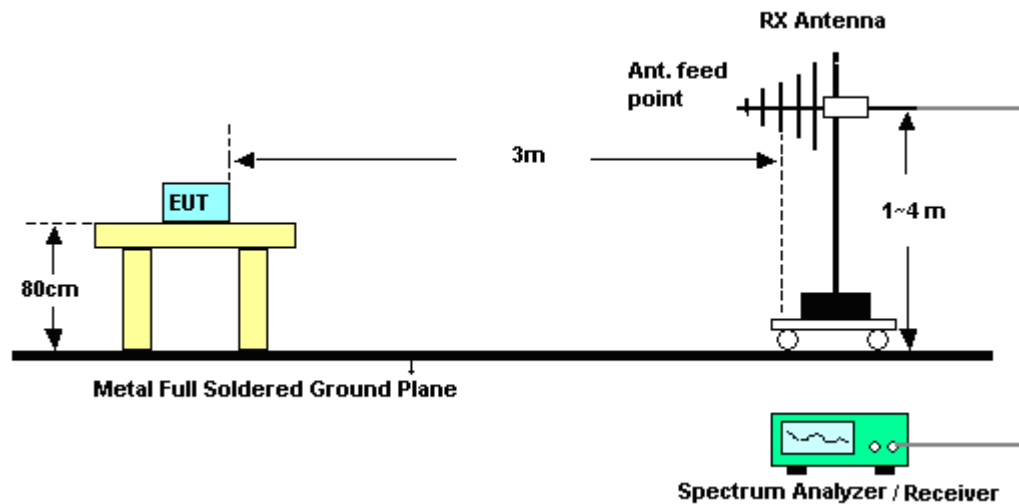
For Conducted Measurement:



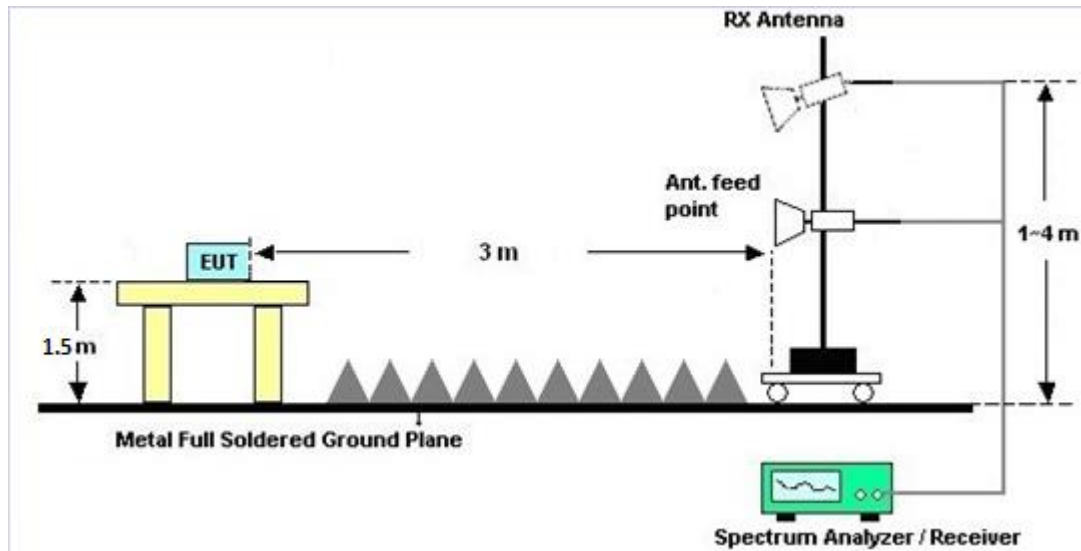
For radiated emissions below 30MHz



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.

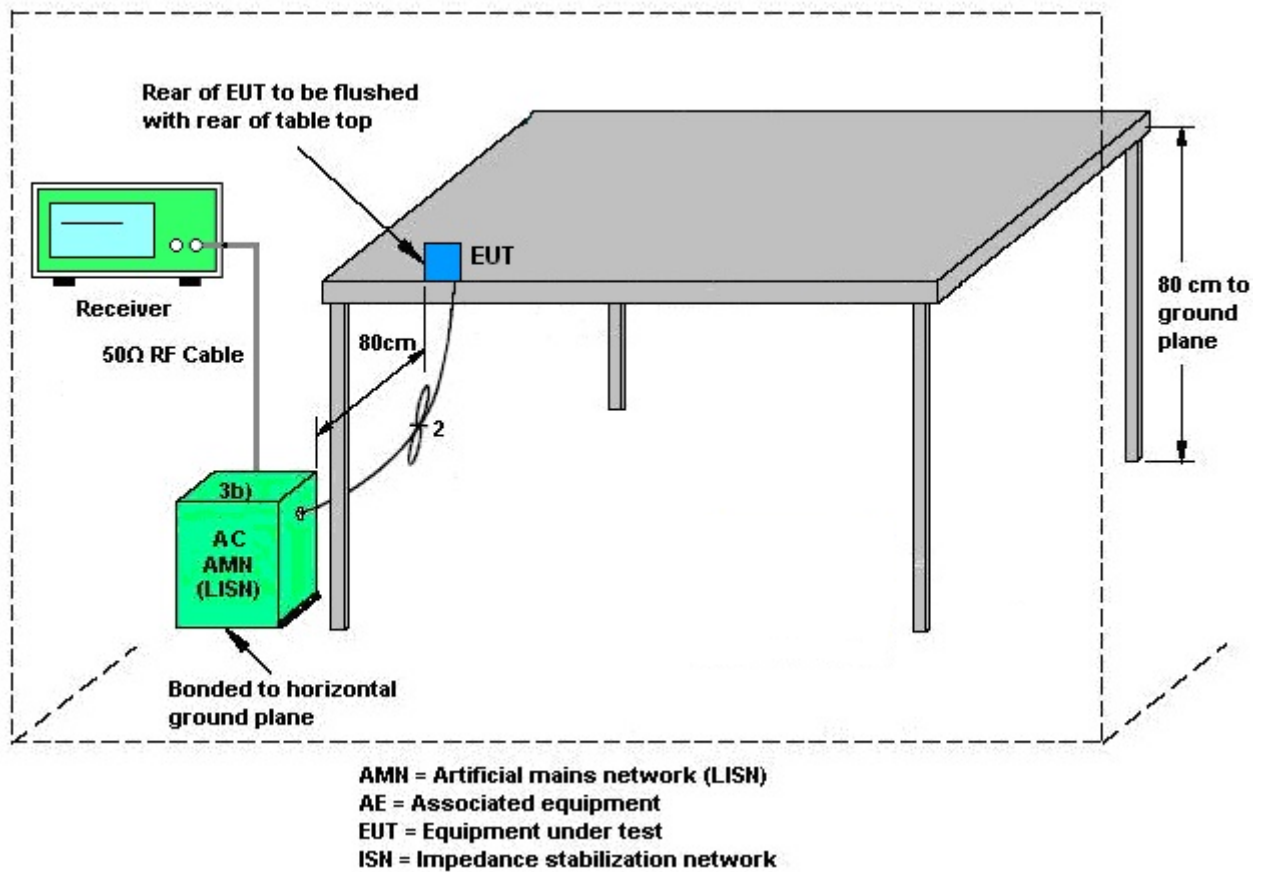
3.6.2 Measuring Instruments

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	Agilent	E4416A	GB412923 44	N/A	Dec. 20, 2017	Jan. 26, 2018~ Feb. 07, 2018	Dec. 19, 2018	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US404415 48	50MHz~18GHz	Dec. 20, 2017	Jan. 26, 2018~ Feb. 07, 2018	Dec. 19, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 20, 2017	Jan. 26, 2018~ Feb. 07, 2018	Jun. 19, 2018	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Apr. 17, 2018~ Apr. 20, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	3.6GHz	Dec. 08, 2017	Apr. 17, 2018~ Apr. 20, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Apr. 17, 2018~ Apr. 20, 2018	Nov. 29, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Apr. 17, 2018~ Apr. 20, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Apr. 17, 2018~ Apr. 20, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Apr. 17, 2018~ Apr. 20, 2018	Jan. 02, 2019	Conduction (CO05-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4,MY2865 5/4	9KHz~30MHz	Jan. 02, 2018	Mar. 14, 2018~ Apr. 03, 2018	Jan. 01, 2019	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28417/4, MY24971/4,MY2865 5/4	30MHz~1GHz	Jan. 02, 2018	Mar. 14, 2018~ Apr. 03, 2018	Jan. 01, 2019	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28417/4, MY24971/4,MY2865 5/4	1GHz~26GHz	Jan. 02, 2018	Mar. 14, 2018~ Apr. 03, 2018	Jan. 01 2019	Radiation (03CH11-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Mar. 14, 2018~ Apr. 03, 2018	Jul. 17, 2018	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Jan. 16, 2018	Mar. 14, 2018~ Apr. 03, 2018	Jan. 15, 2019	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-06	35414&AT-N0602	30MHz~1GHz	Oct. 14, 2017	Mar. 14, 2018~ Apr. 03, 2018	Oct. 13, 2018	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 16, 2017	Mar. 14, 2018~ Apr. 03, 2018	Oct. 15, 2018	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Mar. 14, 2018~ Apr. 03, 2018	Nov. 22, 2018	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Jan. 16, 2018	Mar. 14, 2018~ Apr. 03, 2018	Jan. 15, 2020	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHz	Oct. 19, 2017	Mar. 14, 2018~ Apr. 03, 2018	Oct. 18, 2018	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000-60SS	SN3	2.7G High Pass	Sep. 18, 2017	Mar. 14, 2018~ Apr. 03, 2018	Sep. 17, 2018	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Mar. 14, 2018~ Apr. 03, 2018	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Mar. 14, 2018~ Apr. 03, 2018	N/A	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	Mar. 14, 2018~ Apr. 03, 2018	Nov. 26, 2018	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN11	1G Low Pass	Sep. 18, 2017	Mar. 14, 2018~ Apr. 03, 2018	Sep. 17, 2018	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 22, 2017	Mar. 14, 2018~ Apr. 03, 2018	May 21, 2018	Radiation (03CH11-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% ($U = 2Uc(y)$)	5.20
--	------

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:	Shiming Liu	Temperature:	21~25	°C
Test Date:	2018/1/26~2018/2/7	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
Zigbee	1Mbps	1	11	2405	2.645	1.600	0.50	Pass
Zigbee	1Mbps	1	18	2440	2.620	1.600	0.50	Pass
Zigbee	1Mbps	1	25	2475	2.610	1.610	0.50	Pass

TEST RESULTS DATA
Peak Power Table

Mod.	Data Rate	NTx	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	5.93	30.00	1.64	7.57	36.00	Pass
Zigbee	1Mbps	1	18	2440	5.92	30.00	1.64	7.56	36.00	Pass
Zigbee	1Mbps	1	25	2475	5.85	30.00	1.64	7.49	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
Zigbee	1Mbps	1	11	2405	0.00	5.27
Zigbee	1Mbps	1	18	2440	0.00	5.17
Zigbee	1Mbps	1	25	2475	0.00	5.13

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	NTx	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	1.39	-10.23	1.64	8.00	Pass
Zigbee	1Mbps	1	18	2440	1.34	-10.24	1.64	8.00	Pass
Zigbee	1Mbps	1	25	2475	1.08	-11.82	1.64	8.00	Pass

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



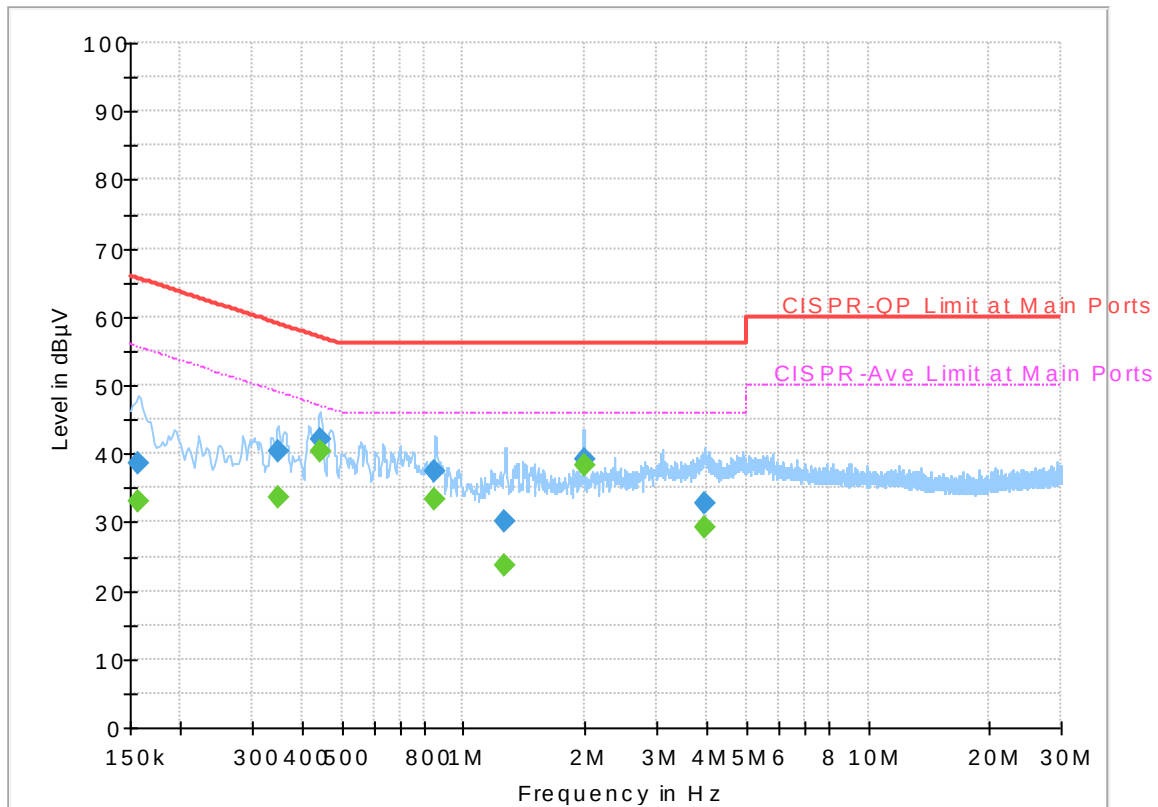
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Blue Lan	Temperature :	25~26℃
		Relative Humidity :	45~46%

EUT Information

Report NO : 811720
Test Mode : Mode 2
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



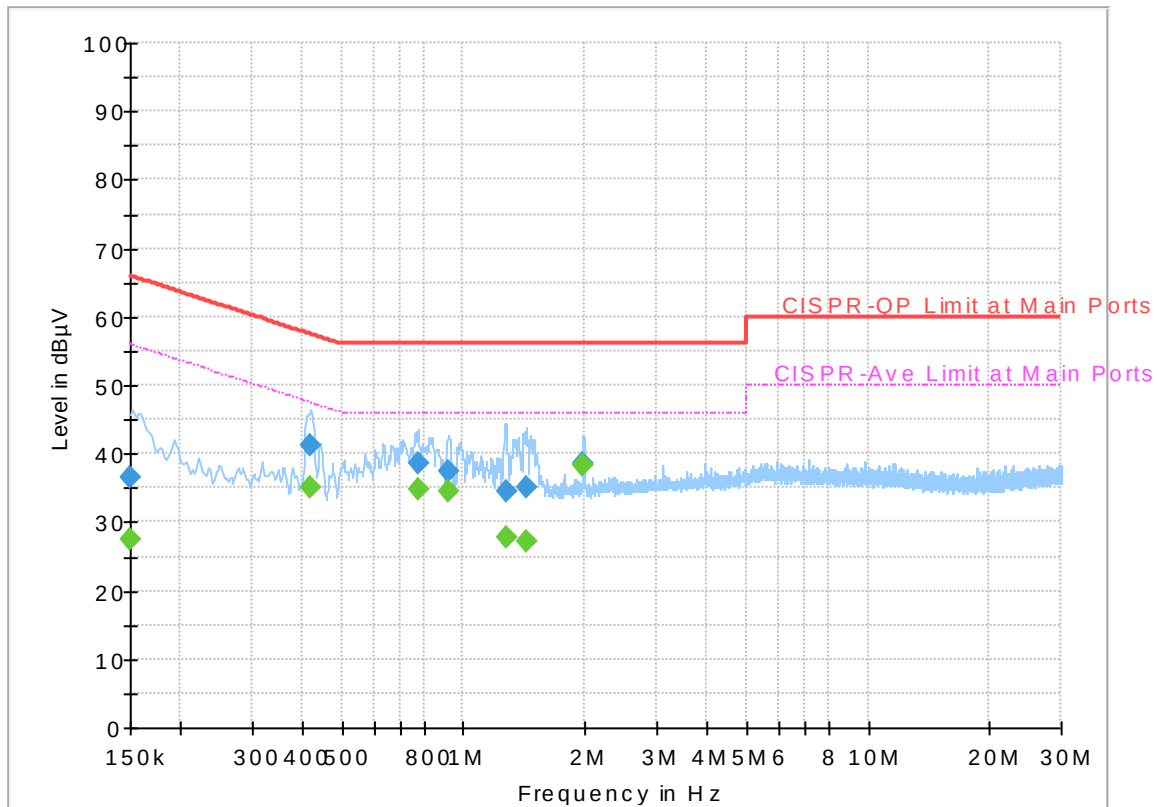
Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.156750	---	32.98	55.63	22.65	L1	OFF	19.5
0.156750	38.70	---	65.63	26.93	L1	OFF	19.5
0.348000	---	33.62	49.01	15.39	L1	OFF	19.5
0.348000	40.39	---	59.01	18.62	L1	OFF	19.5
0.442500	---	40.30	47.02	6.72	L1	OFF	19.5
0.442500	42.23	---	57.02	14.79	L1	OFF	19.5
0.852000	---	33.29	46.00	12.71	L1	OFF	19.6
0.852000	37.30	---	56.00	18.70	L1	OFF	19.6
1.268250	---	23.75	46.00	22.25	L1	OFF	19.6
1.268250	30.20	---	56.00	25.80	L1	OFF	19.6
1.981500	---	38.32	46.00	7.68	L1	OFF	19.6
1.981500	39.06	---	56.00	16.94	L1	OFF	19.6
3.959250	---	29.30	46.00	16.70	L1	OFF	19.6
3.959250	32.68	---	56.00	23.32	L1	OFF	19.6

EUT Information

Report NO : 811720
Test Mode : Mode 2
Test Voltage : 120Vac/60Hz
Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	27.60	56.00	28.40	N	OFF	19.5
0.150000	36.49	---	66.00	29.51	N	OFF	19.5
0.420000	---	35.08	47.45	12.37	N	OFF	19.5
0.420000	41.25	---	57.45	16.20	N	OFF	19.5
0.773250	---	34.92	46.00	11.08	N	OFF	19.5
0.773250	38.73	---	56.00	17.27	N	OFF	19.5
0.917250	---	34.36	46.00	11.64	N	OFF	19.5
0.917250	37.57	---	56.00	18.43	N	OFF	19.5
1.270500	---	27.85	46.00	18.15	N	OFF	19.5
1.270500	34.45	---	56.00	21.55	N	OFF	19.5
1.428000	---	27.20	46.00	18.80	N	OFF	19.5
1.428000	35.17	---	56.00	20.83	N	OFF	19.5
1.979250	---	38.44	46.00	7.56	N	OFF	19.6
1.979250	38.64	---	56.00	17.36	N	OFF	19.6



Appendix C. Radiated Spurious Emission

Test Engineer :	Ken Wu, Jacky Hung, and Hao Hsu	Temperature :	22~24°C
		Relative Humidity :	48~52%

2.4GHz 2400~2483.5MHz

ZIGBEE (Band Edge @ 3m)

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)
ZIGBEE CH 11 2405MHz		2369.22	51.44	-22.56	74	41.73	27.09	16.22	33.6	265	322	P	H
		2388.54	41.04	-12.96	54	31.22	27.13	16.29	33.6	265	322	A	H
	*	2405	97.38	-	-	87.5	27.18	16.29	33.59	265	322	P	H
	*	2405	95.47	-	-	85.59	27.18	16.29	33.59	265	322	A	H
													H
													H
		2344.44	52.24	-21.76	74	42.69	27	16.15	33.6	242	192	P	V
		2390	41.08	-12.92	54	31.25	27.13	16.29	33.59	242	192	A	V
	*	2405	101.05	-	-	91.17	27.18	16.29	33.59	242	192	P	V
	*	2405	99.14	-	-	89.26	27.18	16.29	33.59	242	192	A	V
													V
													V
ZIGBEE CH 18 2440MHz		2334.8	51.93	-22.07	74	42.39	27	16.15	33.61	252	323	P	H
		2385.84	41.04	-12.96	54	31.22	27.13	16.29	33.6	252	323	A	H
	*	2440	99.12	-	-	89.13	27.27	16.31	33.59	252	323	P	H
	*	2440	97.19	-	-	87.2	27.27	16.31	33.59	252	323	A	H
		2490.96	51.79	-22.21	74	41.65	27.4	16.32	33.58	252	323	P	H
		2493.44	41.36	-12.64	54	31.21	27.4	16.32	33.57	252	323	A	H
		2364.24	51.16	-22.84	74	41.5	27.04	16.22	33.6	272	195	P	V
		2384.24	41.04	-12.96	54	31.26	27.09	16.29	33.6	272	195	A	V
	*	2440	102.1	-	-	92.11	27.27	16.31	33.59	272	195	P	V
	*	2440	100.17	-	-	90.18	27.27	16.31	33.59	272	195	A	V
		2484.88	51.71	-22.29	74	41.61	27.36	16.32	33.58	272	195	P	V
		2487.68	41.41	-12.59	54	31.27	27.4	16.32	33.58	272	195	A	V



ZIGBEE CH 25 2475MHz	*	2475	99.57	-	-	89.48	27.36	16.31	33.58	276	319	P	H
	*	2475	97.11	-	-	87.02	27.36	16.31	33.58	276	319	A	H
		2488.6	52.69	-21.31	74	42.55	27.4	16.32	33.58	276	319	P	H
		2483.6	41.76	-12.24	54	31.67	27.36	16.31	33.58	276	319	A	H
													H
													H
	*	2475	102.21	-	-	92.12	27.36	16.31	33.58	332	186	P	V
	*	2475	100.34	-	-	90.25	27.36	16.31	33.58	332	186	A	V
		2483.6	52.41	-21.59	74	42.32	27.36	16.31	33.58	332	186	P	V
		2483.68	42.09	-11.91	54	32	27.36	16.31	33.58	332	186	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 11 2405MHz		3900	43.19	-30.81	74	62.76	29.51	8.95	58.03	100	0	P	H
		4200	54.2	-19.8	74	73.21	30.1	8.83	57.94	385	318	P	H
		4200	40.26	-13.74	54	59.27	30.1	8.83	57.94	385	318	A	H
		4500	45.26	-28.74	74	63.15	30.7	9.11	57.7	100	0	P	H
		4810	55.54	-18.46	74	71.52	31.26	10.03	57.27	237	88	P	H
		4810	51.32	-2.68	54	67.3	31.26	10.03	57.27	237	88	A	H
		5100	43.14	-30.86	74	58.2	31.7	10.02	56.78	100	0	P	H
		5400	56.66	-17.34	74	70.63	32	10.15	56.12	389	56	P	H
		5400	47.31	-6.69	54	61.28	32	10.15	56.12	389	56	A	H
		7215	44.18	-29.82	74	53.37	36.09	11.89	57.17	100	0	P	H
													H
													H
													H
		3900	49.88	-24.12	74	69.45	29.51	8.95	58.03	100	0	P	V
		4200	60.51	-13.49	74	79.52	30.1	8.83	57.94	131	194	P	V
		4200	46.35	-7.65	54	65.36	30.1	8.83	57.94	131	194	A	V
		4500	55.46	-18.54	74	73.35	30.7	9.11	57.7	252	36	P	V
		4500	40.78	-13.22	54	58.67	30.7	9.11	57.7	252	36	A	V
		4810	53.67	-20.33	74	69.65	31.26	10.03	57.27	114	138	P	V
		4810	48.95	-5.05	54	64.93	31.26	10.03	57.27	114	138	A	V
		5100	47.13	-26.87	74	62.19	31.7	10.02	56.78	100	0	P	V
		5400	57.17	-16.83	74	71.14	32	10.15	56.12	324	351	P	V
		5400	42.28	-11.72	54	56.25	32	10.15	56.12	324	351	A	V
		7215	49.13	-24.87	74	58.32	36.09	11.89	57.17	100	0	P	V
													V
													V



ZIGBEE CH 18 2440MHz		3900	44.63	-29.37	74	64.2	29.51	8.95	58.03	100	0	P	H
		4200	53.67	-20.33	74	72.68	30.1	8.83	57.94	378	319	P	H
		4200	40.92	-13.08	54	59.93	30.1	8.83	57.94	378	319	A	H
		4500	44.36	-29.64	74	62.25	30.7	9.11	57.7	100	0	P	H
		4880	53.97	-20.03	74	69.77	31.38	9.99	57.17	222	85	P	H
		4880	50.77	-3.23	54	66.57	31.38	9.99	57.17	222	85	A	H
		5100	42.04	-31.96	74	57.1	31.7	10.02	56.78	100	0	P	H
		5400	55.27	-18.73	74	69.24	32	10.15	56.12	393	63	P	H
		5400	47.14	-6.86	54	61.11	32	10.15	56.12	393	63	A	H
		7320	43.42	-30.58	74	52.62	36.32	11.77	57.29	100	0	P	H
													H
													H
													H
		3900	49.76	-24.24	74	69.33	29.51	8.95	58.03	100	0	P	V
		4200	62.15	-11.85	74	81.16	30.1	8.83	57.94	139	204	P	V
		4200	44.92	-9.08	54	63.93	30.1	8.83	57.94	139	204	A	V
		4500	55.36	-18.64	74	73.25	30.7	9.11	57.7	245	41	P	V
		4500	41.35	-12.65	54	59.24	30.7	9.11	57.7	245	41	A	V
		4880	54.12	-19.88	74	69.92	31.38	9.99	57.17	194	148	P	V
		4880	49.48	-4.52	54	65.28	31.38	9.99	57.17	194	148	A	V
		5100	47.02	-26.98	74	62.08	31.7	10.02	56.78	100	0	P	V
		5400	56.47	-17.53	74	70.44	32	10.15	56.12	319	333	P	V
		5400	48.37	-5.63	54	62.34	32	10.15	56.12	319	333	A	V
		7320	45.6	-28.4	74	54.8	36.32	11.77	57.29	100	0	P	V
													V
													V



ZIGBEE CH 25 2475MHz		3900	43.45	-30.55	74	63.02	29.51	8.95	58.03	100	0	P	H
		4200	54.87	-19.13	74	73.88	30.1	8.83	57.94	388	322	P	H
		4200	39.5	-14.5	54	58.51	30.1	8.83	57.94	388	322	A	H
		4500	43.26	-30.74	74	61.15	30.7	9.11	57.7	100	0	P	H
		4950	52.49	-21.51	74	68.08	31.51	9.97	57.07	227	89	P	H
		4950	48.7	-5.3	54	64.29	31.51	9.97	57.07	227	89	A	H
		5400	56.69	-17.31	74	70.66	32	10.15	56.12	391	52	P	H
		5400	47.55	-6.45	54	61.52	32	10.15	56.12	391	52	A	H
		7425	42.03	-31.97	74	51.19	36.55	11.71	57.42	100	0	P	H
													H
													H
													H
													H
		3900	53	-21	74	72.57	29.51	8.95	58.03	116	218	P	V
		3900	34.54	-19.46	54	54.11	29.51	8.95	58.03	116	218	A	V
		4200	61.38	-12.62	74	80.39	30.1	8.83	57.94	144	210	P	V
		4200	45.99	-8.01	54	65	30.1	8.83	57.94	144	210	A	V
		4500	56.89	-17.11	74	74.78	30.7	9.11	57.7	251	37	P	V
		4500	38.86	-15.14	54	56.75	30.7	9.11	57.7	251	37	A	V
		4950	53.46	-20.54	74	69.05	31.51	9.97	57.07	105	124	P	V
		4950	48.98	-5.02	54	64.57	31.51	9.97	57.07	105	124	A	V
		5400	57.48	-16.52	74	71.45	32	10.15	56.12	319	346	P	V
		5400	41.33	-12.67	54	55.3	32	10.15	56.12	319	346	A	V
		7425	41.82	-32.18	74	50.98	36.55	11.71	57.42	100	0	P	V
													V
													V
Remark	1.												

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		124.23	36.34	-7.16	43.5	50.02	17.23	1.55	32.46	-	-	P	H
		192	31.21	-12.29	43.5	47.22	14.63	1.76	32.4	-	-	P	H
		259.77	34.43	-11.57	46	44.85	19.79	2.17	32.38	-	-	P	H
		325.2	40.49	-5.51	46	51.08	19.39	2.38	32.36	100	0	P	H
		375.6	39.4	-6.6	46	48.4	20.81	2.53	32.34	-	-	P	H
		899.9	40.13	-5.87	46	38.93	28.97	3.89	31.66	-	-	P	H
													H
													H
													H
													H
													H
													H
		40.8	29.93	-10.07	40	42.91	18.68	0.83	32.49	-	-	P	V
		124.23	30.11	-13.39	43.5	43.79	17.23	1.55	32.46	-	-	P	V
		259.77	34.29	-11.71	46	44.71	19.79	2.17	32.38	-	-	P	V
		404.3	41.96	-4.04	46	49.79	21.88	2.62	32.33	100	0	P	V
		550.6	38.58	-7.42	46	42.78	25.15	3.07	32.42	-	-	P	V
		815.9	38.41	-7.59	46	38.99	27.83	3.69	32.1	-	-	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:

BLE	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)
BLE CH 00 2402MHz		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. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path 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) + Path 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 :	Ken Wu, Jacky Hung, and Hao Hsu	Temperature :	22~24°C
		Relative Humidity :	48~52%

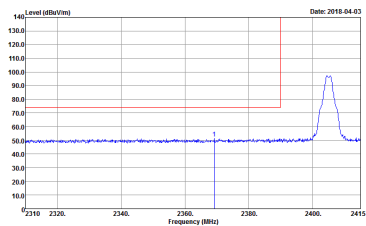
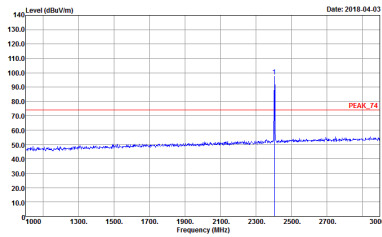
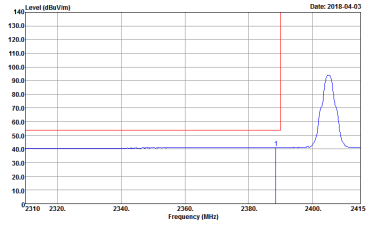
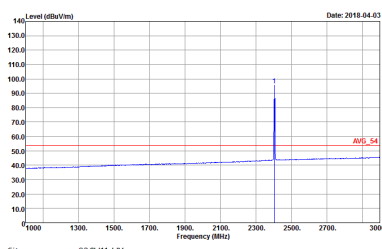
Note symbol

-L	Low channel location
-R	High channel location

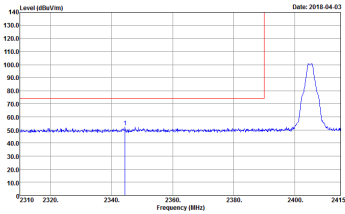
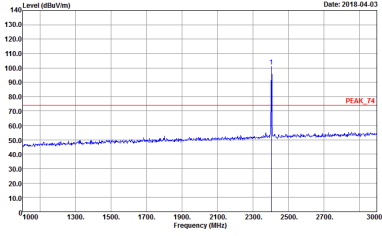
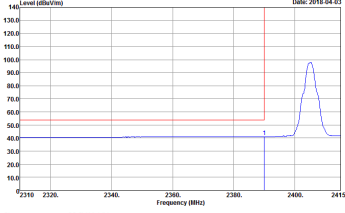
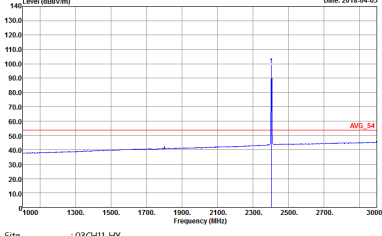


2.4GHz 2400~2483.5MHz

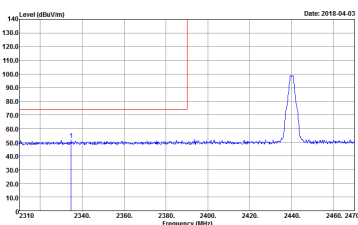
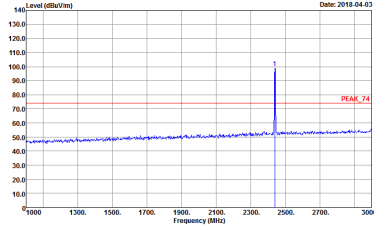
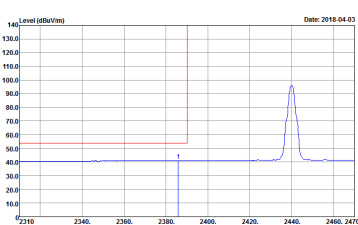
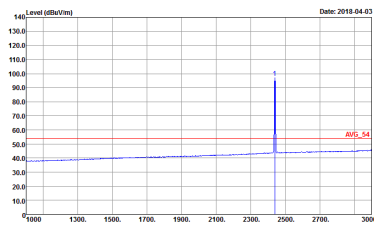
ZIGBEE (Band Edge @ 3m)

ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH11 2405MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720
Avg.	 Site : 03CH11-HY Condition : AV6_BE_54 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : AV6_54 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720

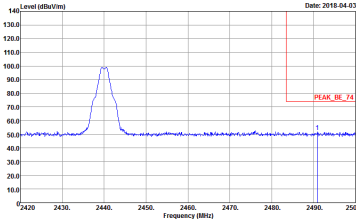
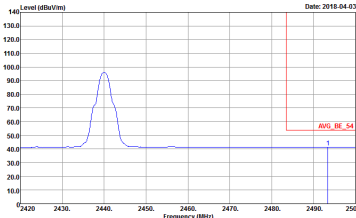


ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH11 2405MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_8E_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 811720
	 Site : 03CH11-HY Condition : AVG_8E_54 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 811720

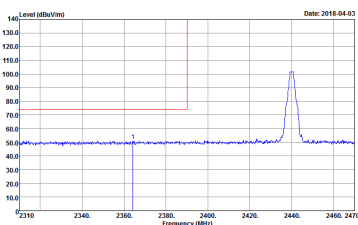
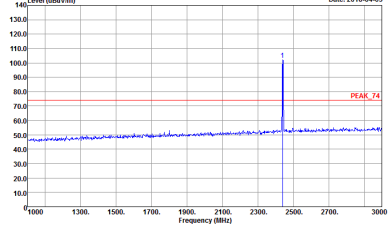
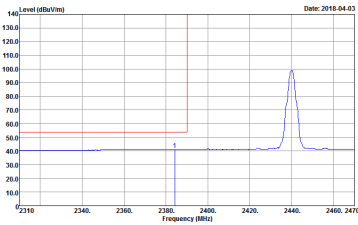


ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH18 2440MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720
Avg.	 Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720

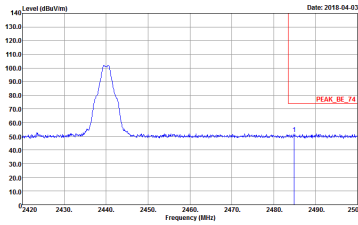
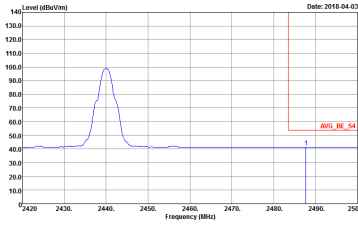


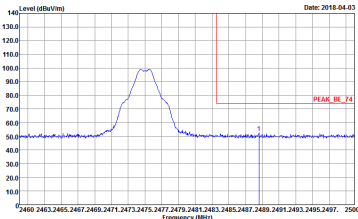
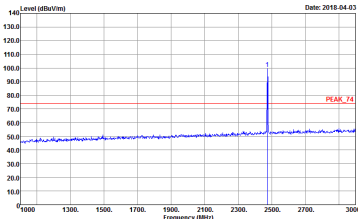
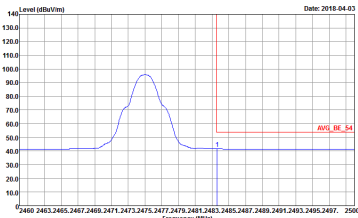
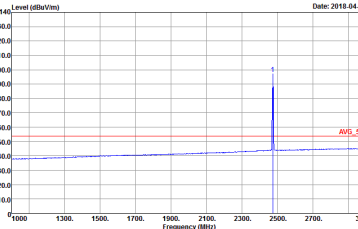
ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH18 2440MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	Left blank
Avg.	 Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	Left blank

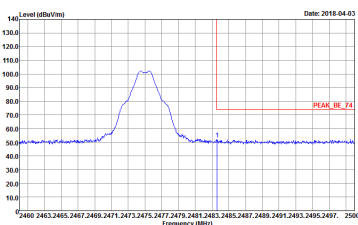
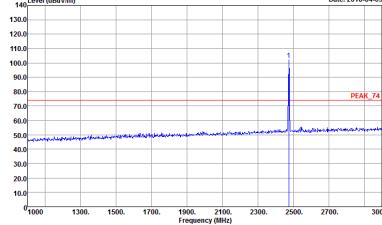
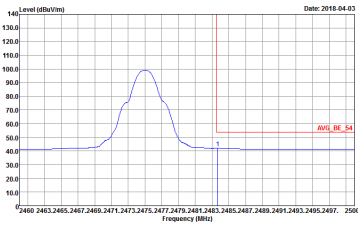
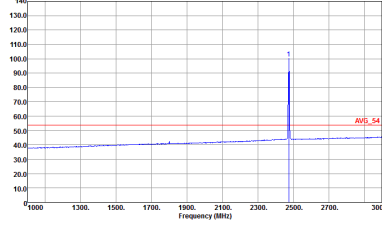


ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH18 2440MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720
	 Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720



ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH18 2440MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	Left blank
Avg.	 Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	Left blank

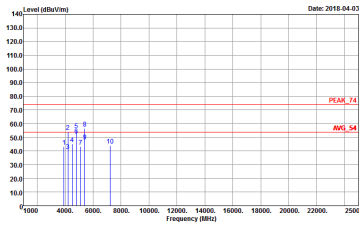
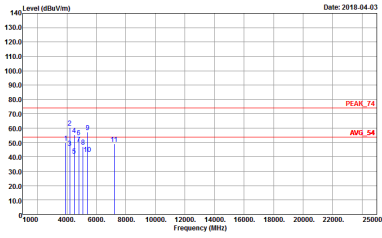
ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH25 2475MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720
	 Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720

ZIGBEE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	ZIGBEE CH25 2475MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 811720
	 Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 811720

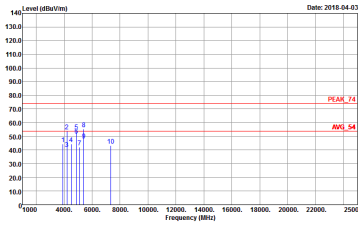
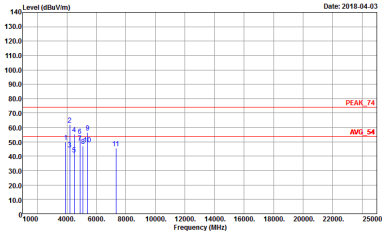


2.4GHz 2400~2483.5MHz

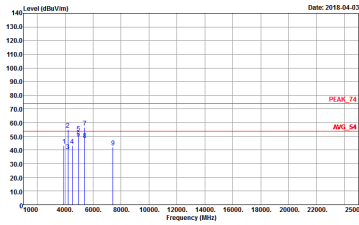
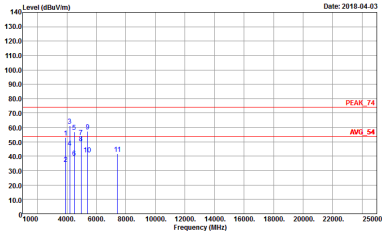
ZIGBEE (Harmonic @ 3m)

ZIGBEE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	ZIGBEE CH11 2405MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Project : 811720

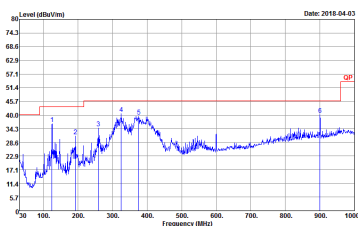
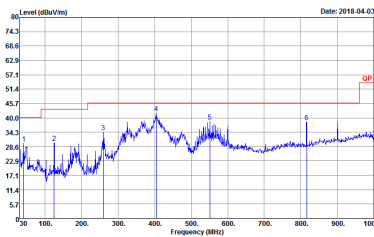


ZIGBEE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	ZIGBEE CH18 2440MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Project : 811720



ZIGBEE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	ZIGBEE CH25 2475MHz	
1	Horizontal	Vertical
Peak	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF HORIZONTAL Project : 811720	 Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF VERTICAL Project : 811720

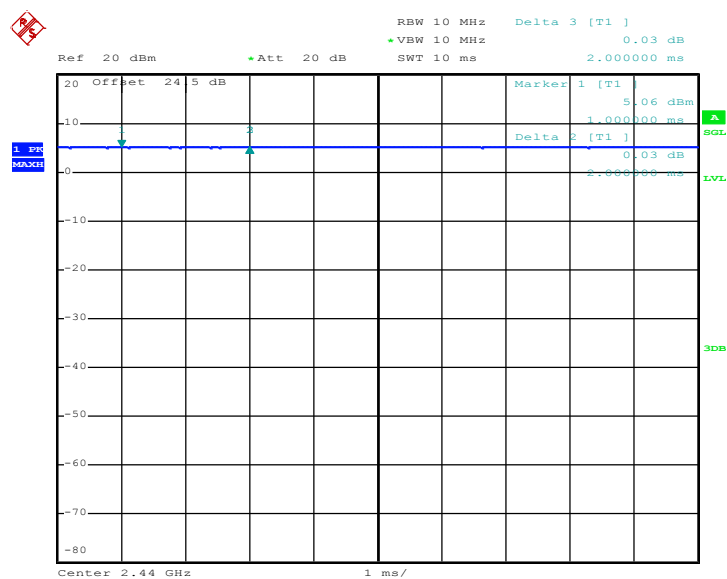
Emission below 1GHz
2.4GHz ZIGBEE (LF)

ZIGBEE	2.4GHz 2400~2483.5MHz	
ANT	ZIGBEE LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH11-HY Condition : QP 3m BE-LOG 6111D-LF_ETC HORIZONTAL Detector : Peak Project : 811720	 Site : 03CH11-HY Condition : QP 3m BE-LOG 6111D-LF_ETC VERTICAL Detector : Peak Project : 811720

Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
Zigbee	100	-	-	10Hz	0.00

Zigbee



Date: 26.JAN.2018 22:06:14