FCC RADIO TEST REPORT

FCC ID	:	**2AOAI-5432**
Equipment	:	**Digital Media Receiver**
Model Name	:	**L9D29R**
Applicant	:	**Reny7 LLC** **6701 Democracy Blvd. Suite 300** **Bethesda, Maryland, 20817**
Standard	:	**FCC Part 15 Subpart C §15.247**

The testing was completed on Jul. 12, 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

Approved by: Jones Tsai

SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR830922-01D	01	Initial issue of report	Jul. 17, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	15.247(a)(2)	6dB Bandwidth	Pass
3.1	2.1049	99% Occupied Bandwidth	Reporting only
3.2	15.247(b)(3)	Peak Output Power	Pass
3.3	15.247(e)	Power Spectral Density	Pass
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	Pass
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	Pass
3.6	15.207	AC Conducted Emission	Pass
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass

Reviewed by: Joseph Lin

Report Producer: Polly Tsai

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Digital Media Receiver
Model Name	L9D29R
FCC ID	2AOAI-5432
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE Zigbee

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2405 MHz ~ 2480 MHz
Number of Channels	16
Channel Spacing	5 MHz
Maximum Output Power to Antenna	18.43 dBm (0.0697 W)
99% Occupied Bandwidth	2.240MHz
Antenna Type / Gain	Fixed Internal Antenna type with gain 7.34 dBi
Type of Modulation	250 kbps

1.3 Modification of EUT

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

1.4 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, Huaya 1st Rd., Guishan Dist., Taoyuan 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.**
	03CH12-HY

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

1.5 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 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	11	2405	19	2445
	12	2410	20	2450
	13	2415	21	2455
	14	2420	22	2460
	15	2425	23	2465
	16	2430	24	2470
	17	2435	25	2475
	18	2440	26	2480

2.2 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).

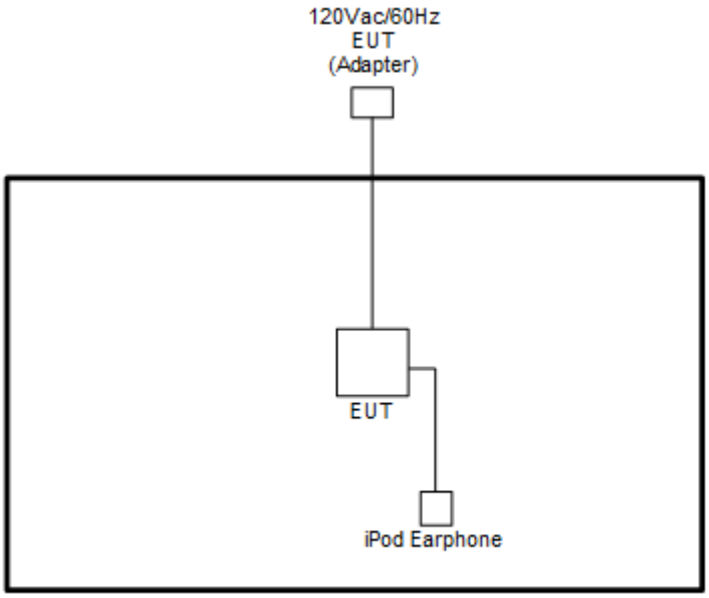
b. AC power line Conducted Emission was tested under maximum output power.

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

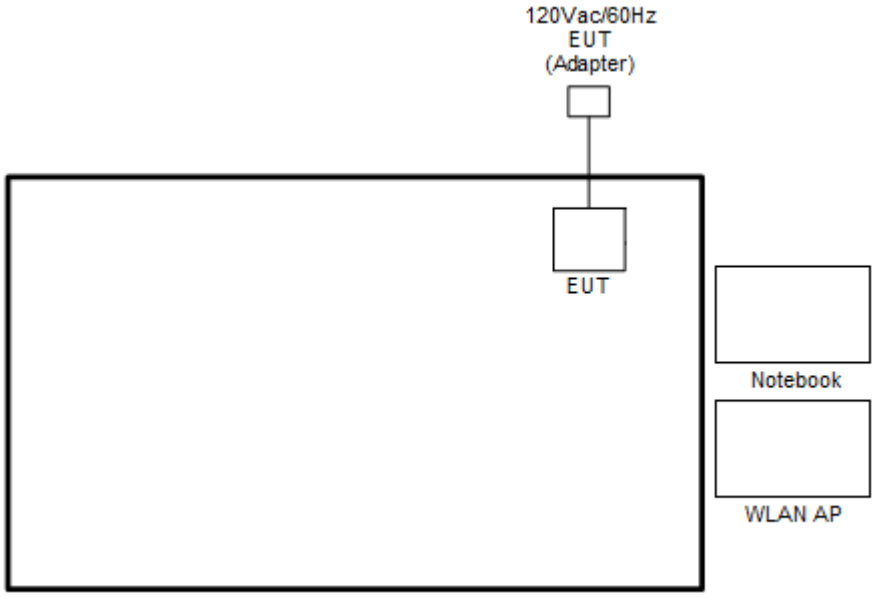
Summary table of Test Cases	
Test Item	**Data Rate / Modulation**
	Bluetooth – LE / GFSK
Conducted Test Cases	Mode 1: Zigbee Tx CH11_2405 MHz Mode 2: Zigbee Tx CH17_2435 MHz Mode 3: Zigbee Tx CH25_2475 MHz Mode 4: Zigbee Tx CH26_2480 MHz
Radiated Test Cases	Mode 1: Zigbee Tx CH11_2405 MHz Mode 2: Zigbee Tx CH17_2435 MHz Mode 3: Zigbee Tx CH25_2475 MHz Mode 4: Zigbee Tx CH26_2480 MHz
AC Conducted Emission	Mode 1 :WLAN (2.4GHz) Link + Play News + Adapter Mode 2 :Bluetooth Link + Play MP3 + Adapter
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	

2.3 Connection Diagram of Test System

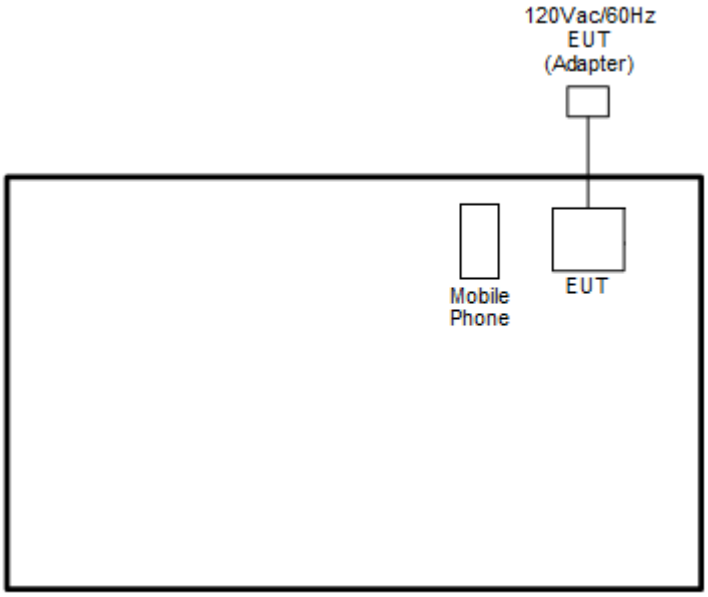
<Zigbee Tx Mode>



<AC Conducted Emission Mode for Notebook Playing News>



<AC Conducted Emission Mode for Mobile Phone Playing MP3>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	Smart Phone	Acer	Z530	HLZDMZ530	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “Compliance.exe” 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.

2.6 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.

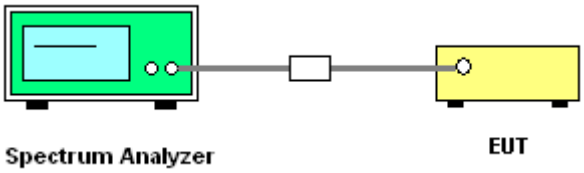
3.1.2 Measuring Instruments

See list of measuring equipment 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 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
6. Measure and record the results in the test report.

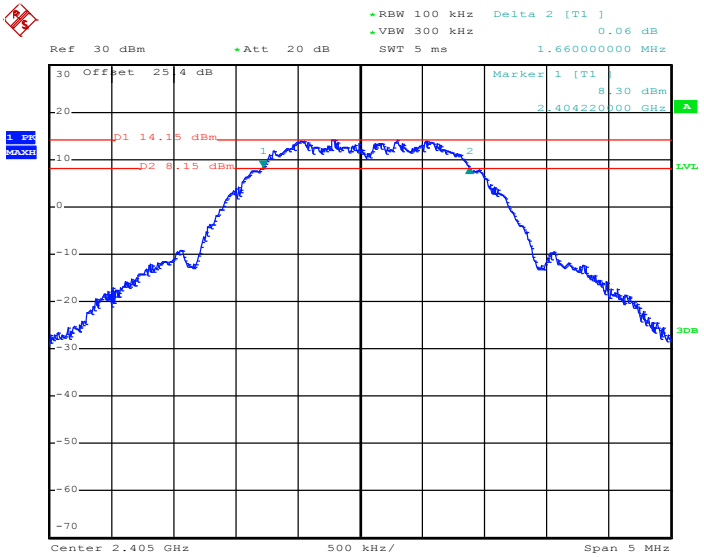
3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

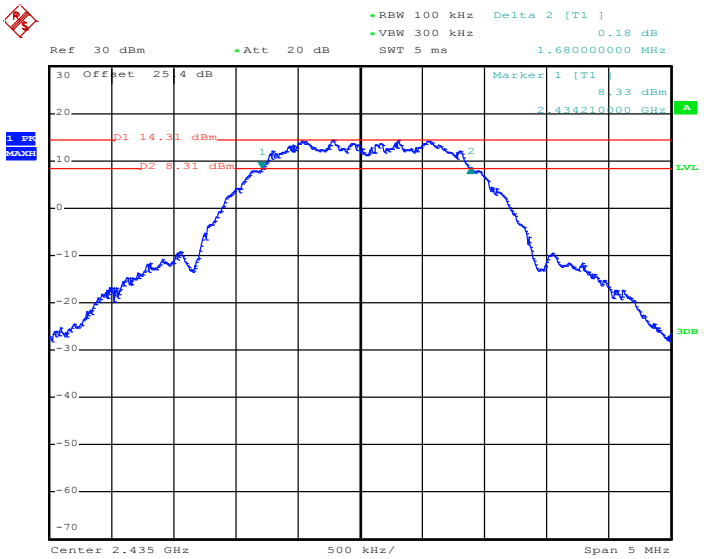
Please refer to Appendix A.

6 dB Bandwidth Plot on Channel 11



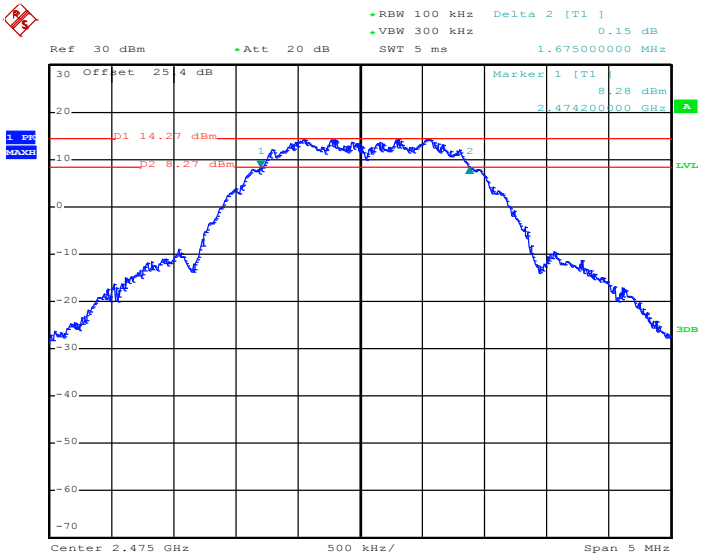
Date: 6.JUL.2018 07:33:05

6 dB Bandwidth Plot on Channel 17



Date: 6.JUL.2018 07:41:34

6 dB Bandwidth Plot on Channel 25



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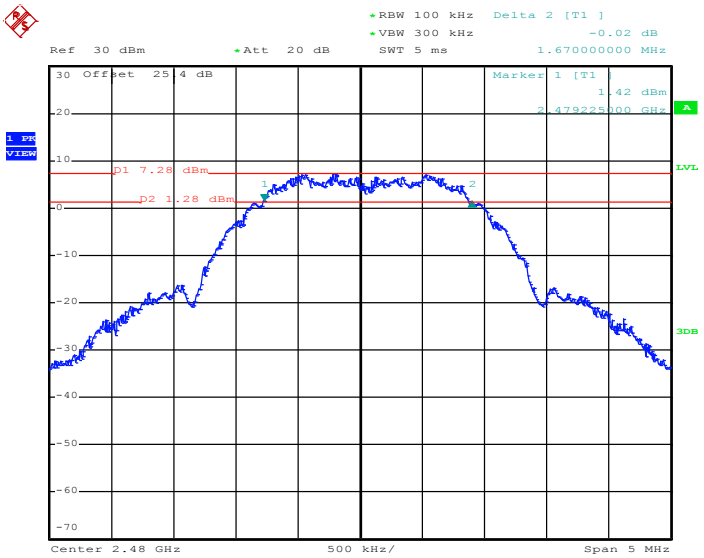
6 dB Bandwidth Plot on Channel 26

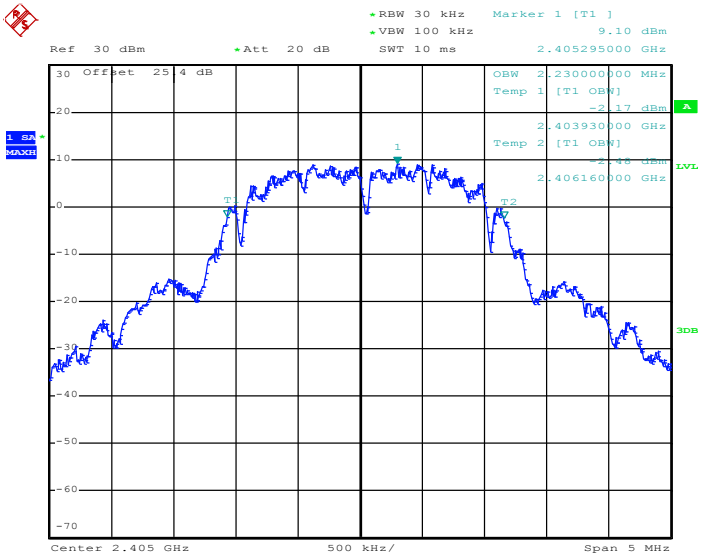


Date: 6.JUL.2018 08:05:06

3.1.6 Test Result of 99% Occupied Bandwidth

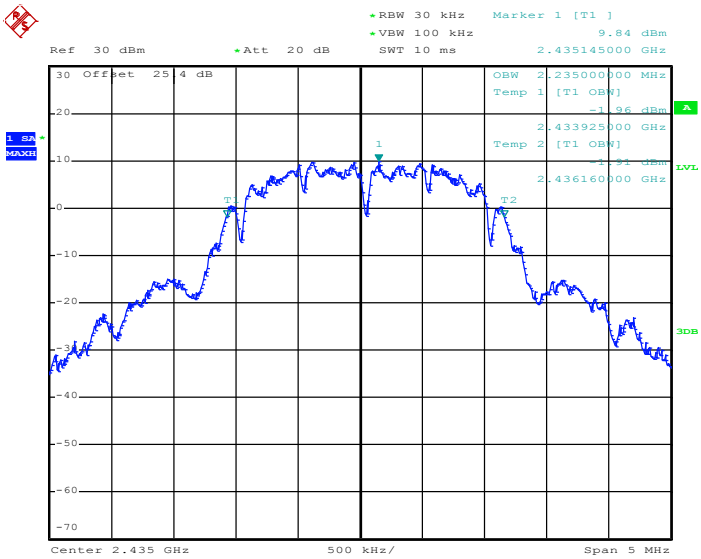
Please refer to Appendix A.

99% Occupied Bandwidth Plot on Channel 11



Date: 6.JUL.2018 07:39:19

99% Occupied Bandwidth Plot on Channel 17



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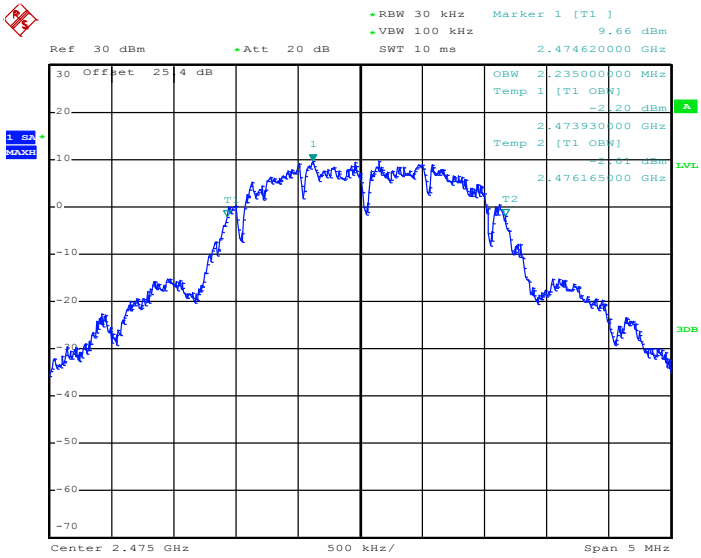
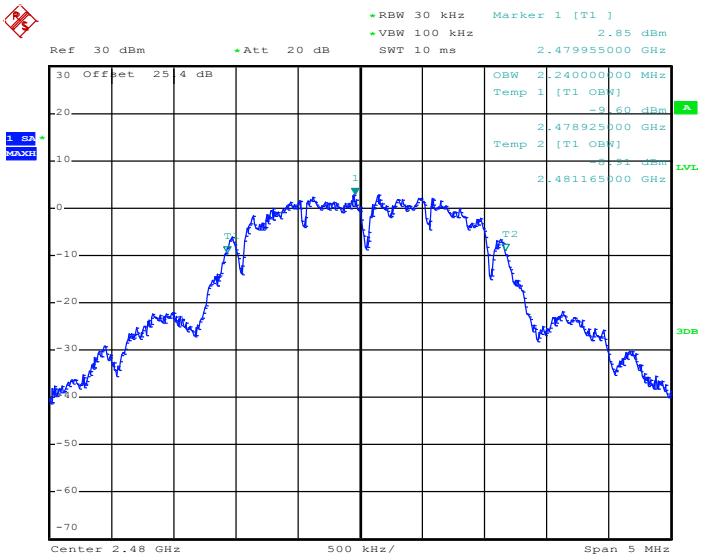
99% Occupied Bandwidth Plot on Channel 25



Date: 6.JUL.2018 08:00:11

99% Occupied Bandwidth Plot on Channel 26



Date: 6.JUL.2018 08:09:30

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.

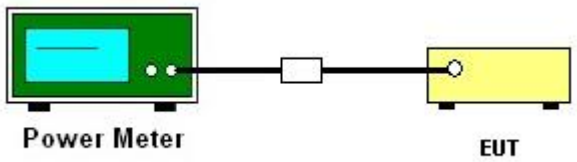
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Peak Power, 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. For Average Power, the testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.2.3.1 Method AVGPM.
3. The RF output of EUT was connected to the power meter by RF cable and attenuator.
4. The path loss was compensated to the results for each measurement.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. 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.

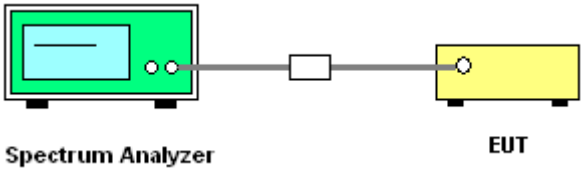
3.3.2 Measuring Instruments

See list of measuring equipment 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

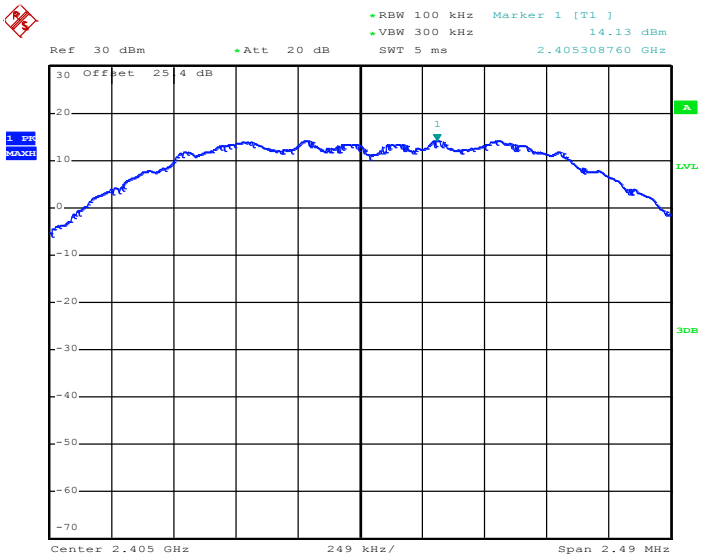


3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

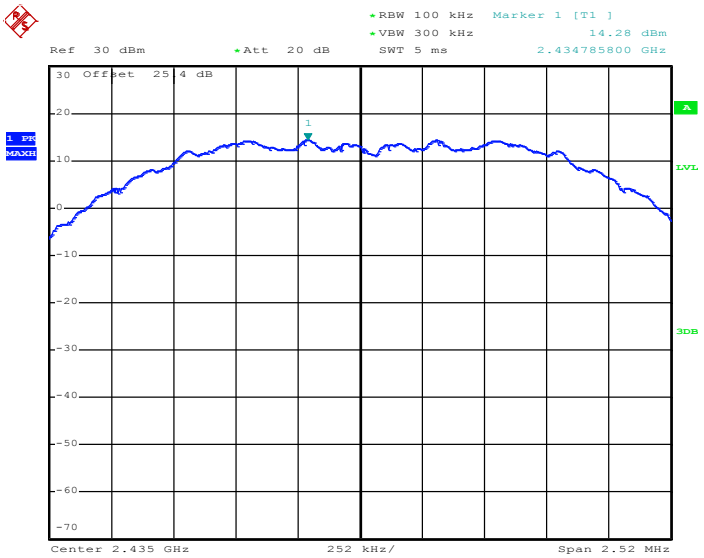
3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on Channel 11



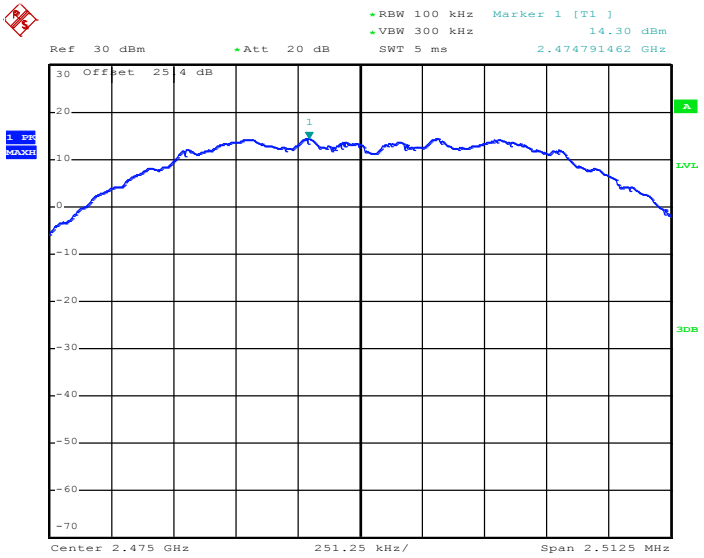
Date: 6.JUL.2018 07:35:55

PSD 100kHz Plot on Channel 17



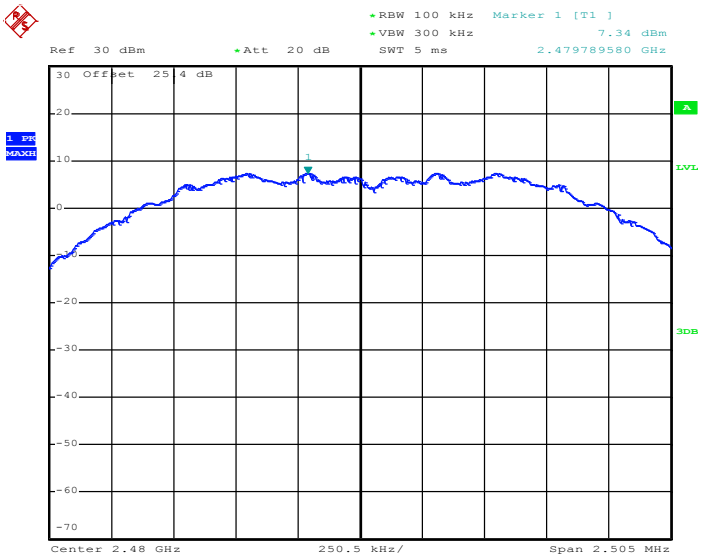
Date: 6.JUL.2018 07:43:10

PSD 100kHz Plot on Channel 25



Date: 6.JUL.2018 07:52:35

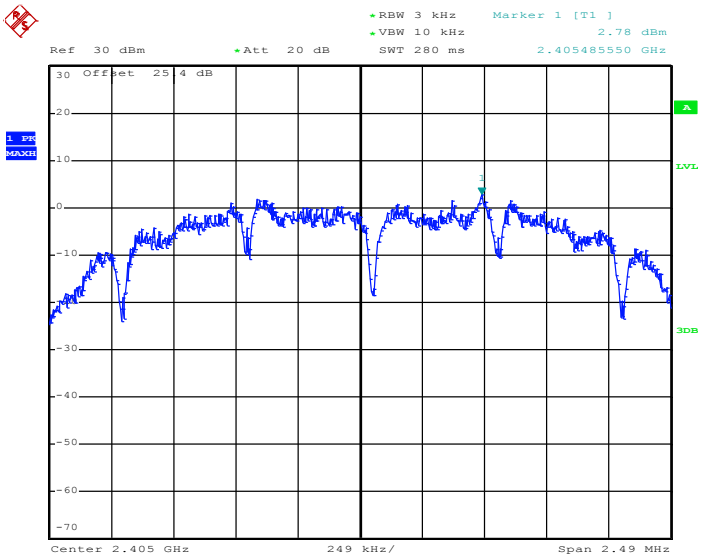
PSD 100kHz Plot on Channel 26



Date: 6.JUL.2018 08:06:41

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

PSD 3kHz Plot on Channel 11



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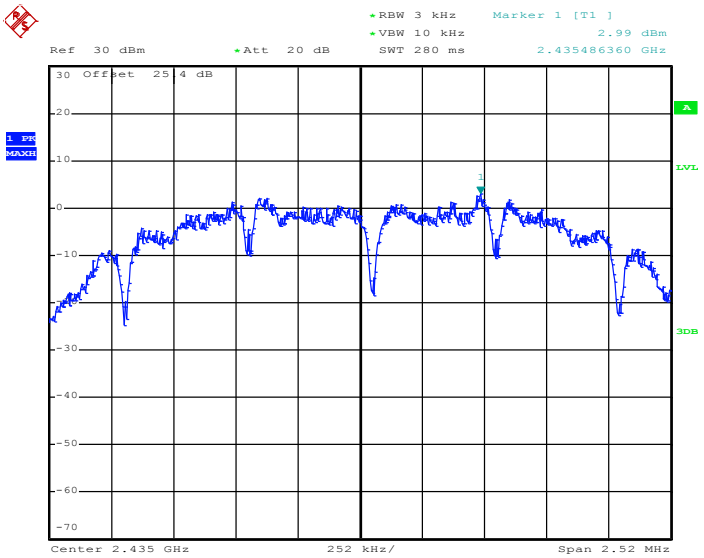
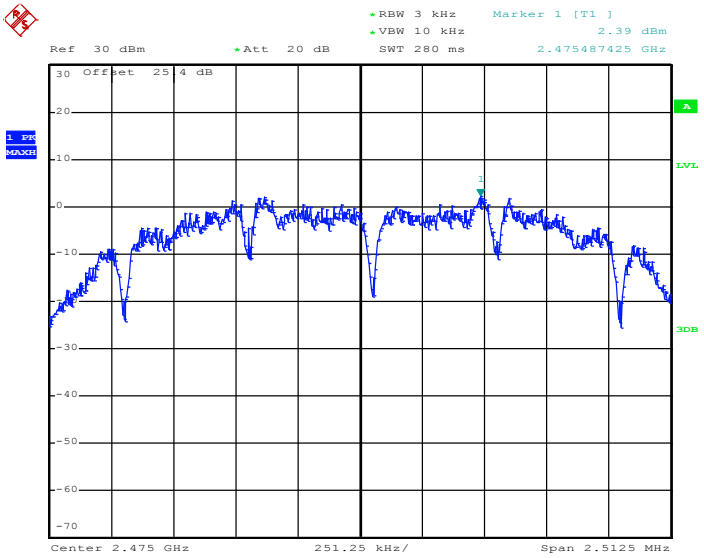
PSD 3kHz Plot on Channel 17



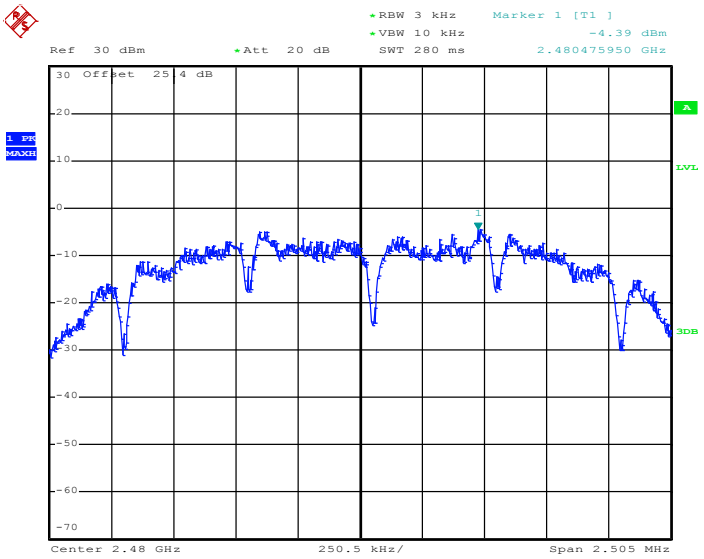
Date: 6.JUL.2018 07:42:24

PSD 3kHz Plot on Channel 25



Date: 6.JUL.2018 07:51:30

PSD 3kHz Plot on Channel 26



Date: 6.JUL.2018 08:06:18

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.

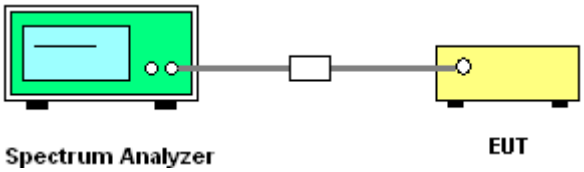
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedure

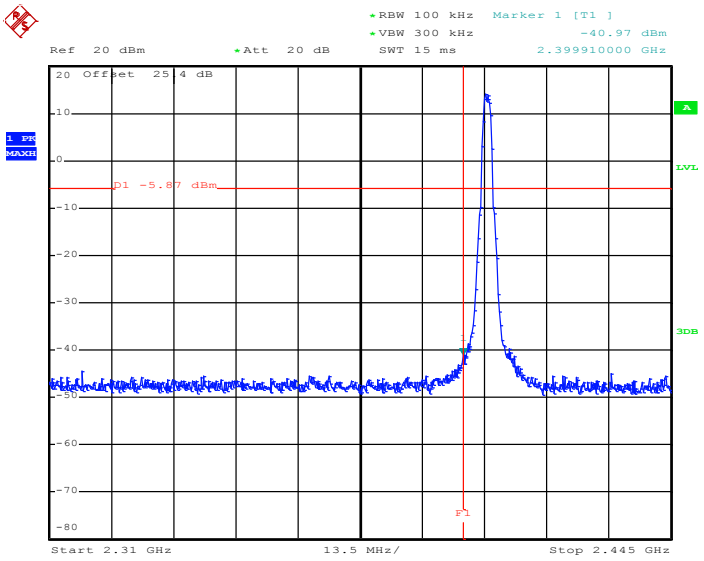
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit 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



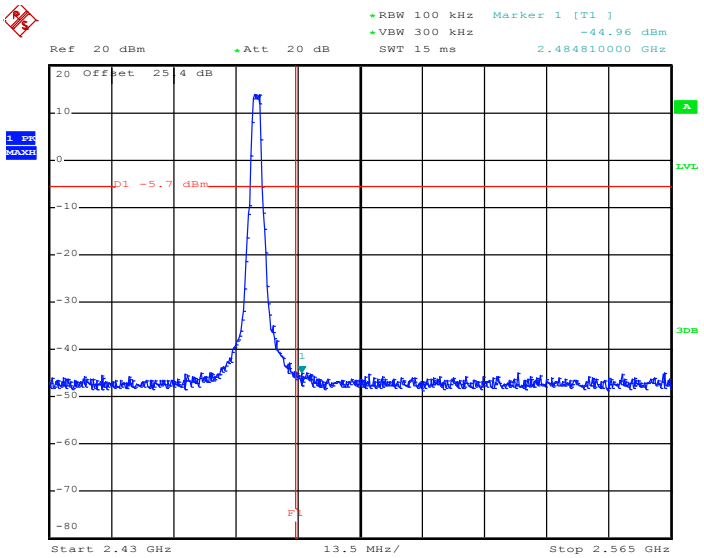
3.4.5 Test Result of Conducted Band Edges Plots

Low Band Edge Plot on Channel 11



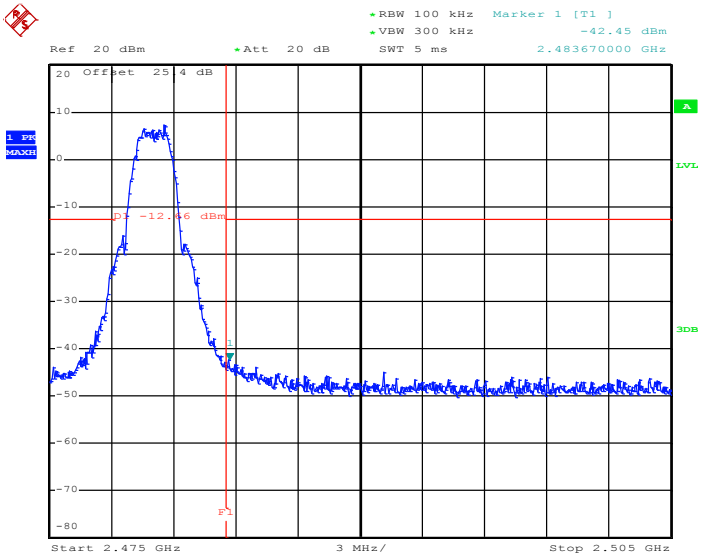
Date: 6.JUL.2018 07:36:44

High Band Edge Plot on Channel 25



Date: 6.JUL.2018 08:01:33

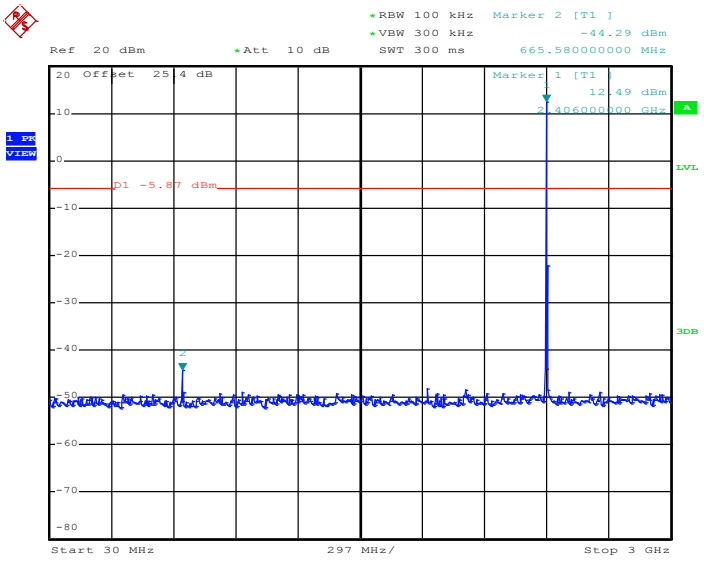
High Band Edge Plot on Channel 26



Date: 6.JUL.2018 08:07:14

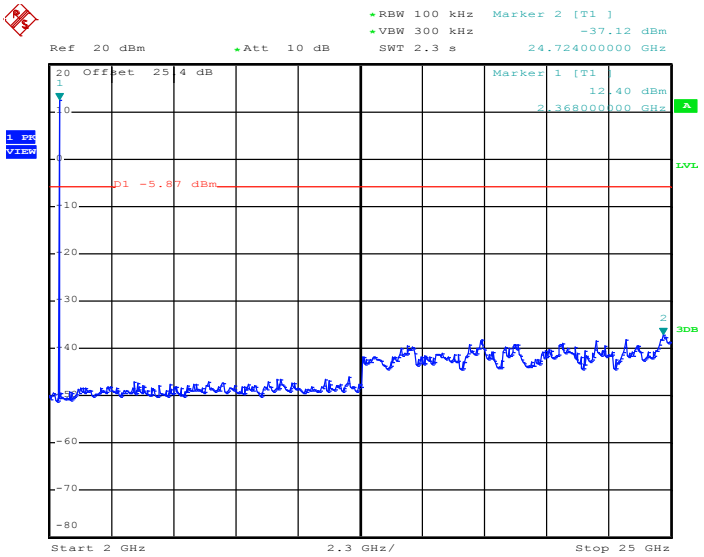
3.4.6 Test Result of Conducted Spurious Emission Plots

Conducted Spurious Emission Plot on Zigbee Channel 11



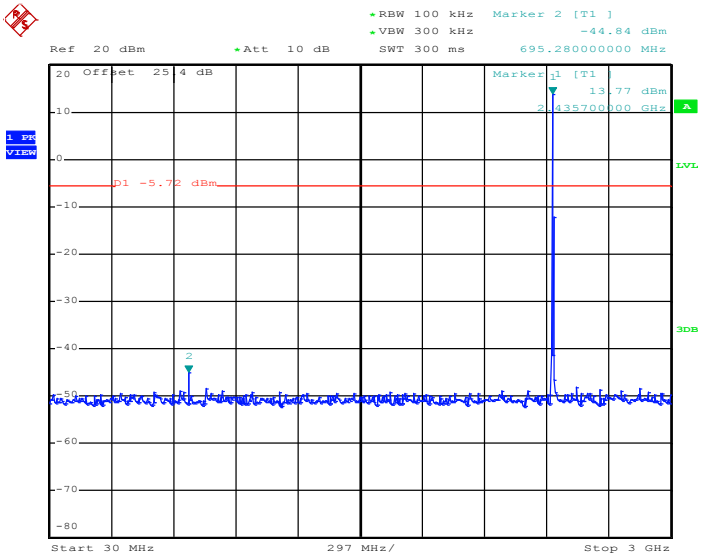
Date: 6.JUL.2018 07:37:58

Conducted Spurious Emission Plot on Zigbee Channel 11



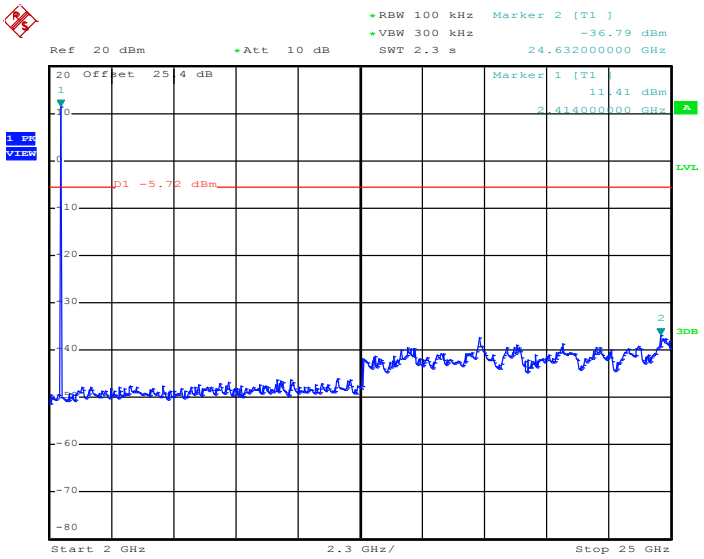
Date: 6.JUL.2018 07:38:12

Conducted Spurious Emission Plot on Zigbee Channel 17



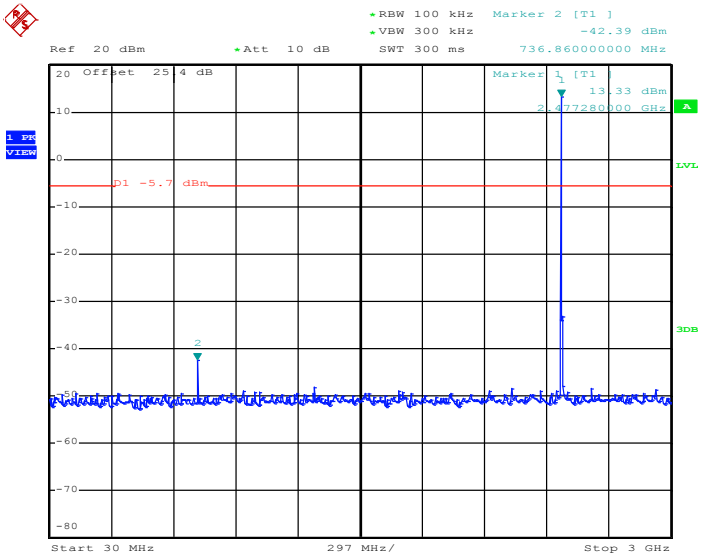
Date: 6.JUL.2018 07:43:38

Conducted Spurious Emission Plot on Zigbee Channel 17



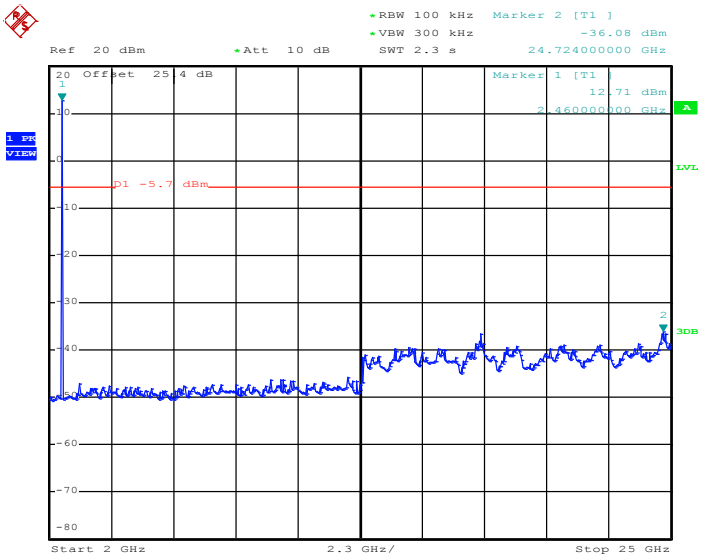
Date: 6.JUL.2018 07:44:15

Conducted Spurious Emission Plot on Zigbee Channel 25



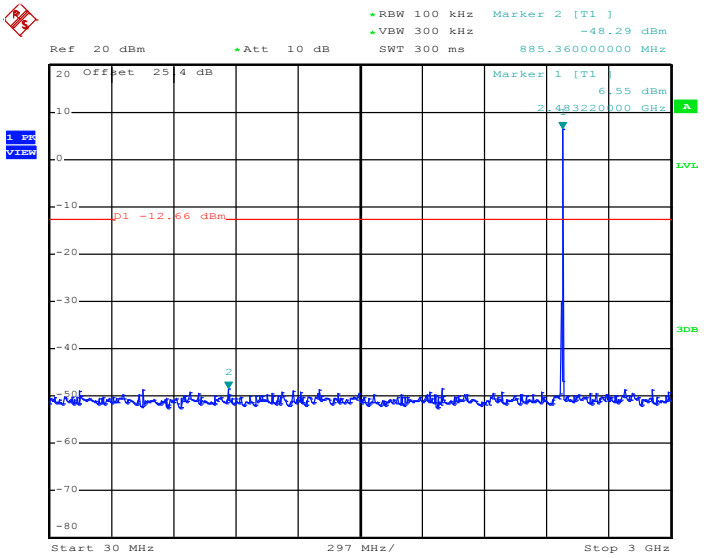
Date: 6.JUL.2018 07:59:07

Conducted Spurious Emission Plot on Zigbee Channel 25



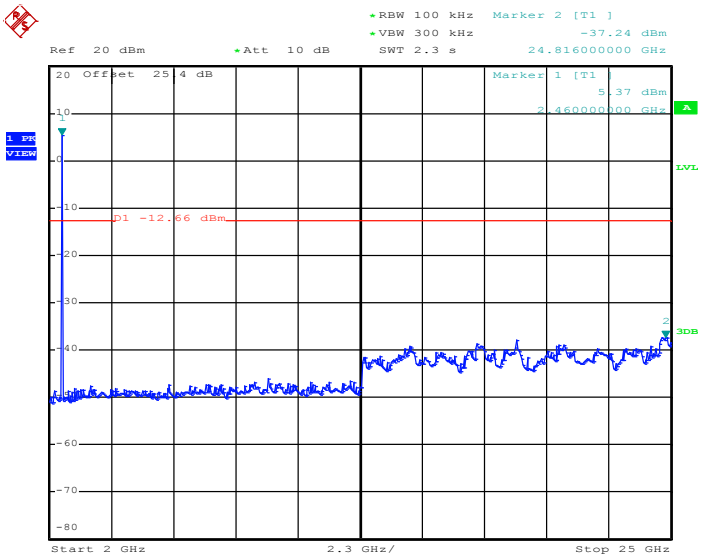
Date: 6.JUL.2018 07:59:27

Conducted Spurious Emission Plot on Zigbee Channel 26



Date: 6.JUL.2018 08:08:40

Conducted Spurious Emission Plot on Zigbee Channel 26



Date: 6.JUL.2018 08:09:00

3.5 Spurious Emission Measurement

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

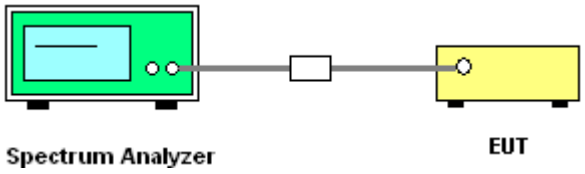
See list of measuring equipment of this test report.

3.5.3 Test Procedures

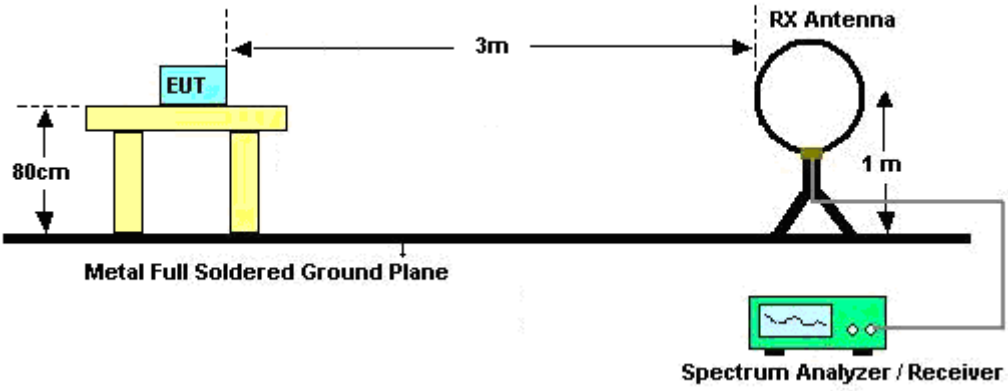
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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

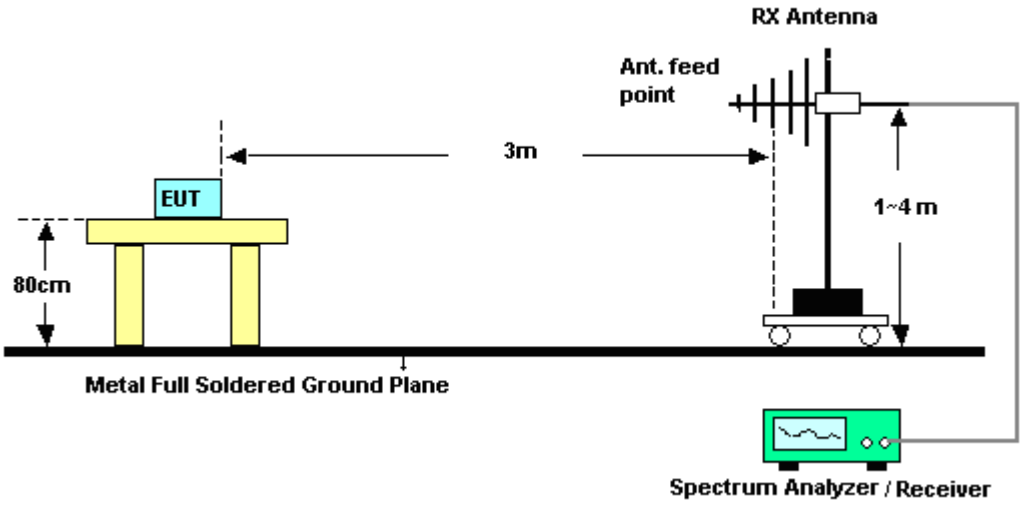
For Conducted Measurement:



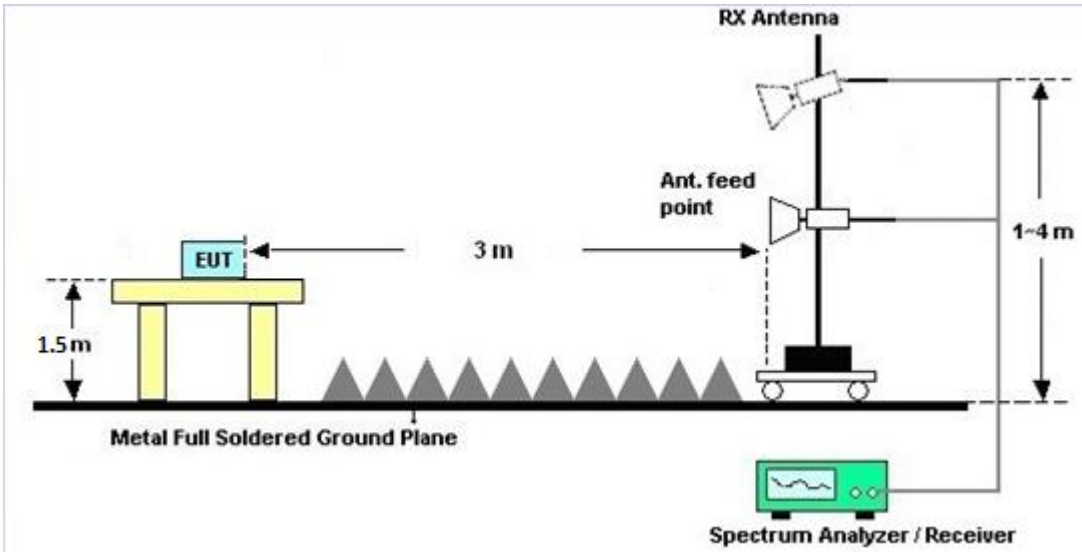
For radiated emissions below 30MHz



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.

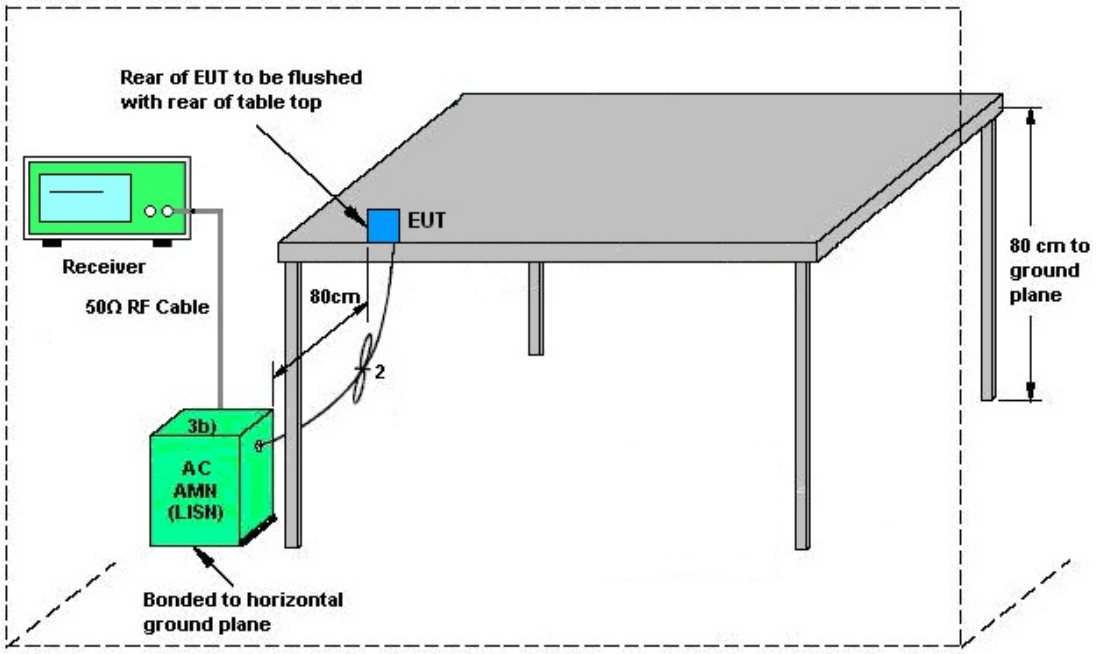
3.6.2 Measuring Instruments

See list of measuring equipment 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



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

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	GB41292344	N/A	Dec. 20, 2017	Jun. 14, 2018~ Jul. 06, 2018	Dec. 19, 2018	Conducted (TH05-HY)
Power Sensor	Agilent	E9327A	US40441548	50MHz~18GHz	Dec. 20, 2017	Jun. 14, 2018~ Jul. 06, 2018	Dec. 19, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 13, 2017	Jun. 14, 2018~ Jul. 06, 2018	Nov. 12, 2018	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Mar. 01, 2018	Jun. 14, 2018~ Jul. 06, 2018	Feb. 28, 2019	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 24, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	3.6GHz	Dec. 08, 2017	Jun. 24, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Jun. 24, 2018	Nov. 29, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jun. 24, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Jun. 24, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Jun. 24, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Jun. 18, 2018~ Jul. 12, 2018	Nov. 22, 2018	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 14, 2017	Jun. 18, 2018~ Jul. 12, 2018	Oct. 13, 2018	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1328	1GHz ~ 18GHz	Oct. 20, 2017	Jun. 18, 2018~ Jul. 12, 2018	Oct. 19, 2018	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz ~ 40GHz	Nov. 27, 2017	Jun. 18, 2018~ Jul. 12, 2018	Nov. 26, 2018	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 26, 2018	Jun. 18, 2018~ Jul. 12, 2018	Mar. 25, 2019	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY53270148	1GHz~26.5GHz	Jan. 15, 2018	Jun. 18, 2018~ Jul. 12, 2018	Jan. 14, 2019	Radiation (03CH12-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	1GHz~18GHz	May 21, 2018	Jun. 18, 2018~ Jul. 12, 2018	May 20, 2019	Radiation (03CH12-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Jun. 18, 2018~ Jul. 12, 2018	Jul. 17, 2018	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 25, 2017	Jun. 18, 2018~ Jul. 12, 2018	Dec. 24, 2018	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12SS	SN2	1.2G Low Pass	Jul. 17, 2017	Jun. 18, 2018~ Jul. 12, 2018	Jul. 16, 2018	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3 GHz Highpass	Jul. 17, 2017	Jun. 18, 2018~ Jul. 12, 2018	Jul. 16, 2018	Radiation (03CH12-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 14, 2018	Jun. 18, 2018~ Jul. 12, 2018	Mar. 13, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 17, 2017	Jun. 18, 2018~ Jul. 12, 2018	Oct. 16, 2018	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 17, 2017	Jun. 18, 2018~ Jul. 12, 2018	Oct. 16, 2018	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 18, 2018~ Jul. 12, 2018	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jun. 18, 2018~ Jul. 12, 2018	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jun. 18, 2018~ Jul. 12, 2018	N/A	Radiation (03CH12-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.7

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.2

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.7

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Rebecca Li/Shiming Liu	Temperature:	21~25	°C
Test Date:	2018/6/14~2018/7/6	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	250K	1	11	2405	2.230	1.660	0.50	Pass
Zigbee	250K	1	17	2435	2.235	1.680	0.50	Pass
Zigbee	250K	1	25	2475	2.235	1.675	0.50	Pass
Zigbee	250K	1	26	2480	2.240	1.670	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	250K	1	11	2405	18.39	28.66	7.34	25.73	36.00	Pass
Zigbee	250K	1	17	2435	18.40	28.66	7.34	25.74	36.00	Pass
Zigbee	250K	1	25	2475	18.43	28.66	7.34	25.77	36.00	Pass
Zigbee	250K	1	26	2480	11.44	28.66	7.34	18.78	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	250K	1	11	2405	0.00	18.35
Zigbee	250K	1	17	2435	0.00	18.36
Zigbee	250K	1	25	2475	0.00	18.39
Zigbee	250K	1	26	2480	0.00	11.34

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	250K	1	11	2405	14.13	2.78	7.34	6.66	Pass
Zigbee	250K	1	17	2435	14.28	2.99	7.34	6.66	Pass
Zigbee	250K	1	25	2475	14.30	2.39	7.34	6.66	Pass
Zigbee	250K	1	26	2480	7.34	-4.39	7.34	6.66	Pass

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

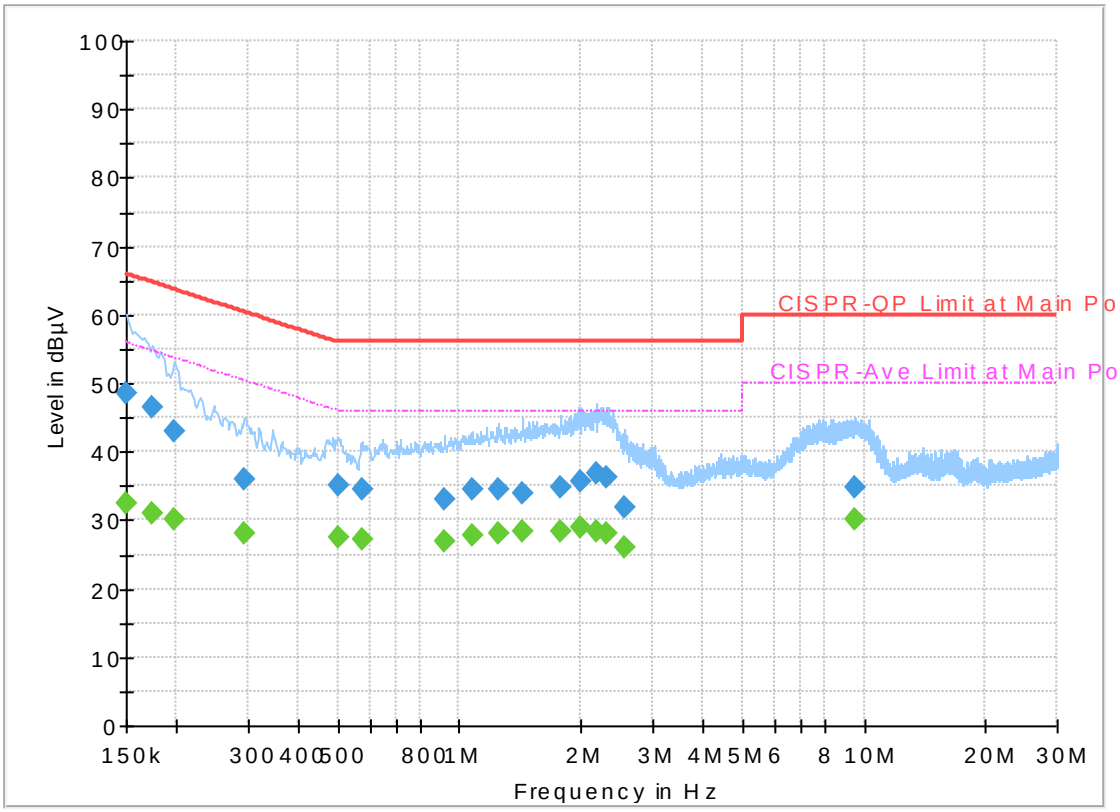
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Kai-Chun Chu	**Temperature :**	25~27℃
		Relative Humidity :	50~52%

EUT Information

Report NO :	830922-01
Test Mode :	Mode 2
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



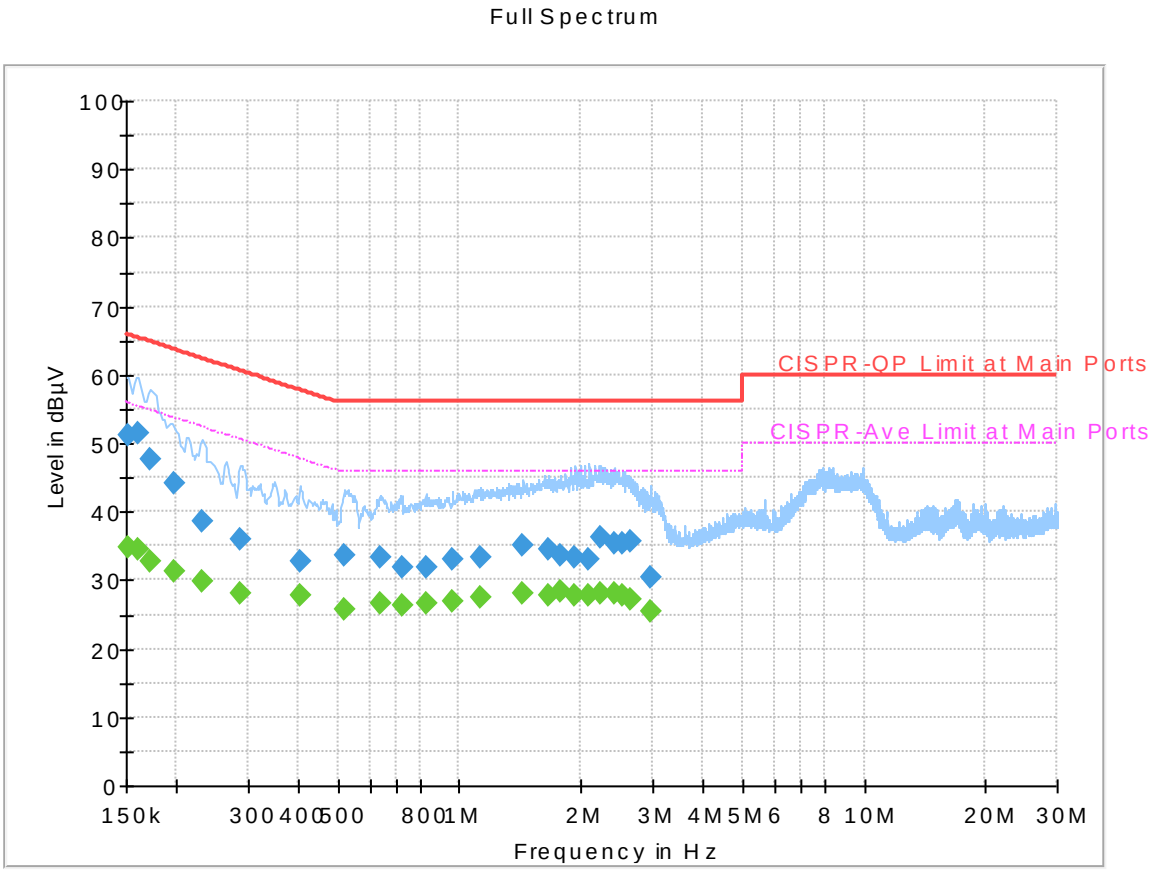
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	32.58	56.00	23.42	L1	OFF	19.5
0.150000	48.64	---	66.00	17.36	L1	OFF	19.5
0.174750	---	31.04	54.73	23.69	L1	OFF	19.5
0.174750	46.35	---	64.73	18.38	L1	OFF	19.5
0.197250	---	30.07	53.73	23.66	L1	OFF	19.5
0.197250	42.92	---	63.73	20.81	L1	OFF	19.5
0.294000	---	28.05	50.41	22.36	L1	OFF	19.5
0.294000	36.00	---	60.41	24.41	L1	OFF	19.5
0.503250	---	27.53	46.00	18.47	L1	OFF	19.5
0.503250	35.12	---	56.00	20.88	L1	OFF	19.5
0.573000	---	27.06	46.00	18.94	L1	OFF	19.5
0.573000	34.58	---	56.00	21.42	L1	OFF	19.5
0.917250	---	26.91	46.00	19.09	L1	OFF	19.6
0.917250	33.02	---	56.00	22.98	L1	OFF	19.6
1.072500	---	27.91	46.00	18.09	L1	OFF	19.6
1.072500	34.46	---	56.00	21.54	L1	OFF	19.6
1.250250	---	28.04	46.00	17.96	L1	OFF	19.6
1.250250	34.64	---	56.00	21.36	L1	OFF	19.6
1.428000	---	28.35	46.00	17.65	L1	OFF	19.6
1.428000	33.92	---	56.00	22.08	L1	OFF	19.6
1.783500	---	28.40	46.00	17.60	L1	OFF	19.6

1.783500	34.89	---	56.00	21.11	L1	OFF	19.6
2.001750	---	28.85	46.00	17.15	L1	OFF	19.6
2.001750	35.73	---	56.00	20.27	L1	OFF	19.6
2.175000	---	28.43	46.00	17.57	L1	OFF	19.5
2.175000	36.87	---	56.00	19.13	L1	OFF	19.5
2.319000	---	28.01	46.00	17.99	L1	OFF	19.5
2.319000	36.35	---	56.00	19.65	L1	OFF	19.5
2.566500	---	26.10	46.00	19.90	L1	OFF	19.6
2.566500	31.86	---	56.00	24.14	L1	OFF	19.6
9.465000	---	30.24	50.00	19.76	L1	OFF	19.9
9.465000	34.76	---	60.00	25.24	L1	OFF	19.9

EUT Information

Report NO :	830922-01
Test Mode :	Mode 2
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	34.79	55.88	21.09	N	OFF	19.5
0.152250	51.26	---	65.88	14.62	N	OFF	19.5
0.161250	---	34.37	55.40	21.03	N	OFF	19.5
0.161250	51.37	---	65.40	14.03	N	OFF	19.5
0.172500	---	32.70	54.84	22.14	N	OFF	19.5
0.172500	47.74	---	64.84	17.10	N	OFF	19.5
0.197250	---	31.37	53.73	22.36	N	OFF	19.5
0.197250	44.07	---	63.73	19.66	N	OFF	19.5
0.231000	---	29.94	52.41	22.47	N	OFF	19.5
0.231000	38.51	---	62.41	23.90	N	OFF	19.5
0.287250	---	28.11	50.60	22.49	N	OFF	19.5
0.287250	35.90	---	60.60	24.70	N	OFF	19.5
0.402000	---	27.73	47.81	20.08	N	OFF	19.5
0.402000	32.70	---	57.81	25.11	N	OFF	19.5
0.521250	---	25.86	46.00	20.14	N	OFF	19.5
0.521250	33.75	---	56.00	22.25	N	OFF	19.5
0.636000	---	26.64	46.00	19.36	N	OFF	19.6
0.636000	33.24	---	56.00	22.76	N	OFF	19.6
0.719250	---	26.24	46.00	19.76	N	OFF	19.6
0.719250	31.81	---	56.00	24.19	N	OFF	19.6
0.825000	---	26.55	46.00	19.45	N	OFF	19.6

0.825000	31.82	---	56.00	24.18	N	OFF	19.6
0.960000	---	27.03	46.00	18.97	N	OFF	19.6
0.960000	33.14	---	56.00	22.86	N	OFF	19.6
1.126500	---	27.58	46.00	18.42	N	OFF	19.6
1.126500	33.34	---	56.00	22.66	N	OFF	19.6
1.439250	---	28.17	46.00	17.83	N	OFF	19.6
1.439250	35.00	---	56.00	21.00	N	OFF	19.6
1.666500	---	27.76	46.00	18.24	N	OFF	19.6
1.666500	34.64	---	56.00	21.36	N	OFF	19.6
1.774500	---	28.29	46.00	17.71	N	OFF	19.6
1.774500	33.67	---	56.00	22.33	N	OFF	19.6
1.934250	---	27.72	46.00	18.28	N	OFF	19.6
1.934250	33.26	---	56.00	22.74	N	OFF	19.6
2.094000	---	27.82	46.00	18.18	N	OFF	19.4
2.094000	33.15	---	56.00	22.85	N	OFF	19.4
2.222250	---	28.20	46.00	17.80	N	OFF	19.5
2.222250	36.14	---	56.00	19.86	N	OFF	19.5
2.406750	---	27.95	46.00	18.05	N	OFF	19.6
2.406750	35.41	---	56.00	20.59	N	OFF	19.6
2.530500	---	27.70	46.00	18.30	N	OFF	19.6
2.530500	35.40	---	56.00	20.60	N	OFF	19.6
2.661000	---	27.05	46.00	18.95	N	OFF	19.6
2.661000	35.80	---	56.00	20.20	N	OFF	19.6
2.969250	---	25.36	46.00	20.64	N	OFF	19.6
2.969250	30.39	---	56.00	25.61	N	OFF	19.6

Appendix C. Radiated Spurious Emission

Test Engineer :	Jack Jheng and Peter Liao	Temperature :	22~25°C
		Relative Humidity :	58~67%

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		2367.645	56.32	-17.68	74	44.18	27.07	16.65	31.58	167	188	P	H
		2367.33	45.34	-8.66	54	33.2	27.07	16.65	31.58	167	188	A	H
	*	2405	115.24	-	-	102.91	27.19	16.71	31.57	167	188	P	H
	*	2405	112.38	-	-	100.05	27.19	16.71	31.57	167	188	A	H
		2386.125	55.95	-18.05	74	43.7	27.15	16.68	31.58	143	182	P	V
		2367.33	45.33	-8.67	54	33.19	27.07	16.65	31.58	143	182	A	V
	*	2405	116.27	-	-	103.94	27.19	16.71	31.57	143	182	P	V
	*	2405	113.47	-	-	101.14	27.19	16.71	31.57	143	182	A	V
Zigbee CH 17 2435MHz		2359.14	56.36	-17.64	74	44.23	27.07	16.64	31.58	264	207	P	H
		2381.68	43.83	-10.17	54	31.63	27.11	16.67	31.58	264	207	A	H
	*	2435	114.72	-	-	102.31	27.23	16.75	31.57	264	207	P	H
	*	2435	111.91	-	-	99.5	27.23	16.75	31.57	264	207	A	H
		2492.86	56.71	-17.29	74	44.03	27.4	16.83	31.55	264	207	P	H
		2498.74	44.09	-9.91	54	31.4	27.4	16.84	31.55	264	207	A	H
		2368.38	55.9	-18.1	74	43.76	27.07	16.65	31.58	100	183	P	V
		2374.68	43.82	-10.18	54	31.63	27.11	16.66	31.58	100	183	A	V
	*	2435	115.79	-	-	103.38	27.23	16.75	31.57	100	183	P	V
	*	2435	112.9	-	-	100.49	27.23	16.75	31.57	100	183	A	V
		2499.79	56.3	-17.7	74	43.61	27.4	16.84	31.55	100	183	P	V
		2496.08	44.21	-9.79	54	31.52	27.4	16.84	31.55	100	183	A	V

Zigbee CH 25 2475MHz	*	2475	114.35	-	-	101.74	27.36	16.81	31.56	102	197	P	H
	*	2475	111.5	-	-	98.89	27.36	16.81	31.56	102	197	A	H
		2484.08	57.48	-16.52	74	44.86	27.36	16.82	31.56	102	197	P	H
		2483.52	46.83	-7.17	54	34.21	27.36	16.82	31.56	102	197	A	H
	*	2475	116.51	-	-	103.9	27.36	16.81	31.56	100	183	P	V
	*	2475	113.74	-	-	101.13	27.36	16.81	31.56	100	183	A	V
		2484.32	60.14	-13.86	74	47.52	27.36	16.82	31.56	100	183	P	V
		2483.52	47.86	-6.14	54	35.24	27.36	16.82	31.56	100	183	A	V
Zigbee CH 26 2480MHz	*	2480	107.46	-	-	94.84	27.36	16.82	31.56	146	199	P	H
	*	2480	104.72	-	-	92.1	27.36	16.82	31.56	146	199	A	H
		2483.6	62.76	-11.24	74	50.14	27.36	16.82	31.56	146	199	P	H
		2483.52	51.78	-2.22	54	39.16	27.36	16.82	31.56	146	199	A	H
	*	2480	108.91	-	-	96.29	27.36	16.82	31.56	133	188	P	V
	*	2480	106.13	-	-	93.51	27.36	16.82	31.56	133	188	A	V
		2483.64	63.97	-10.03	74	51.35	27.36	16.82	31.56	133	188	P	V
		2483.52	53.27	-0.73	54	40.65	27.36	16.82	31.56	133	188	A	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		4810	43.59	-30.41	74	59.42	31.32	10.43	57.58	100	0	P	H
		4810	46.55	-27.45	74	62.38	31.32	10.43	57.58	100	0	P	V
Zigbee CH 17 2435MHz		4870	42.82	-31.18	74	58.36	31.46	10.46	57.46	100	0	P	H
		7305	46.12	-27.88	74	54.48	36.11	12.8	57.27	100	0	P	H
		4870	44.04	-29.96	74	59.58	31.46	10.46	57.46	100	0	P	V
		7305	46.12	-27.88	74	54.48	36.11	12.8	57.27	100	0	P	V
Zigbee CH 25 2475MHz		4950	41.43	-32.57	74	56.62	31.6	10.51	57.3	100	0	P	H
		7425	46.29	-27.71	74	54.51	36.42	12.77	57.41	100	0	P	H
		4950	42.05	-31.95	74	57.24	31.6	10.51	57.3	100	0	P	V
		7425	46.56	-27.44	74	54.78	36.42	12.77	57.41	100	0	P	V
Zigbee CH 26 2480MHz		4960	41.15	-32.85	74	56.29	31.63	10.51	57.28	100	0	P	H
		7440	45.7	-28.3	74	53.86	36.47	12.8	57.43	100	0	P	H
		4960	42.49	-31.51	74	57.63	31.63	10.51	57.28	100	0	P	V
		7440	45.94	-28.06	74	54.1	36.47	12.8	57.43	100	0	P	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		31.35	24.57	-15.43	40	30.01	24.05	0.72	30.21	-	-	P	H
		117.75	23.58	-19.92	43.5	35.33	17.15	1.51	30.41	-	-	P	H
		258.42	21.36	-24.64	46	29.6	19.63	2.34	30.21	-	-	P	H
		722.1	34.42	-11.58	46	33.07	27.07	3.75	29.47	-	-	P	H
		895.7	38.24	-7.76	46	34.23	28.92	4.24	29.15	100	0	P	H
		963.6	36.42	-17.58	54	30.01	30.92	4.45	28.96	-	-	P	H
		30.27	28.2	-11.8	40	33.11	24.57	0.7	30.18	-	-	P	V
		89.67	25.56	-17.94	43.5	40.01	14.64	1.35	30.44	-	-	P	V
		259.23	22.81	-23.19	46	30.89	19.78	2.35	30.21	-	-	P	V
		624.1	37.27	-8.73	46	37.48	25.89	3.5	29.6	100	0	P	V
		832	34.17	-11.83	46	31.4	27.97	4.04	29.24	-	-	P	V
		974.1	36.47	-17.53	54	30.15	30.77	4.47	28.92	-	-	P	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:

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		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

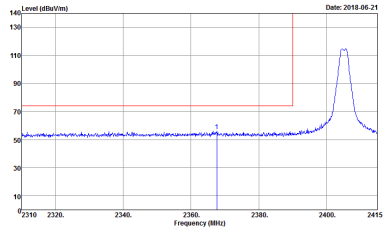
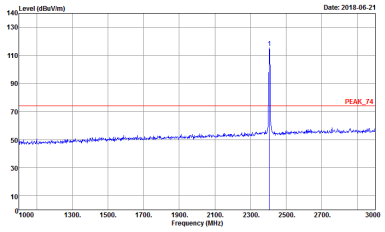
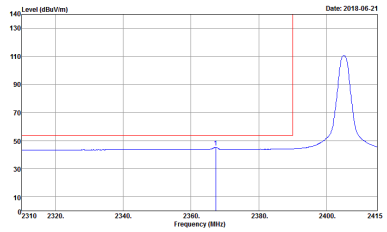
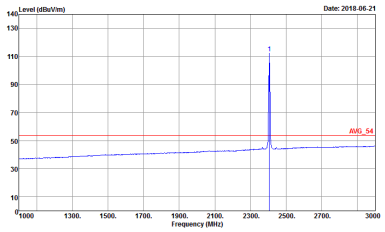
Test Engineer :	Jack Jheng and Peter Liao	**Temperature :**	22~25°C
		Relative Humidity :	58~67%

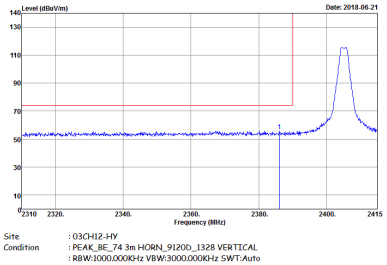
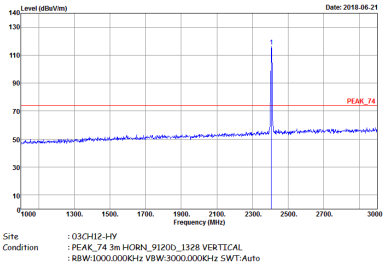
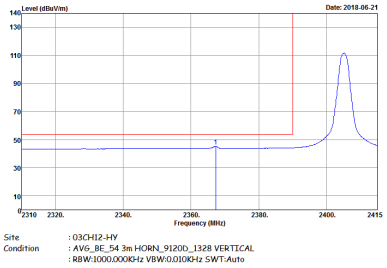
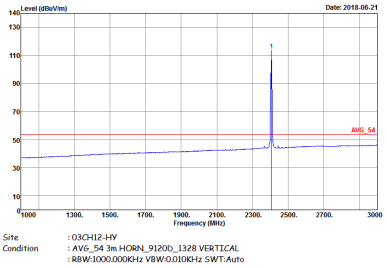
Note symbol

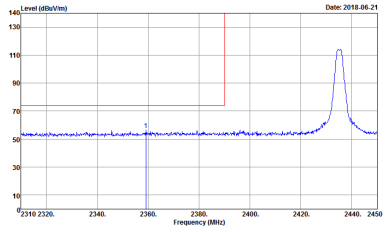
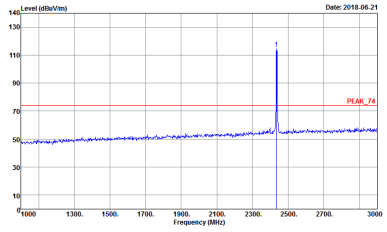
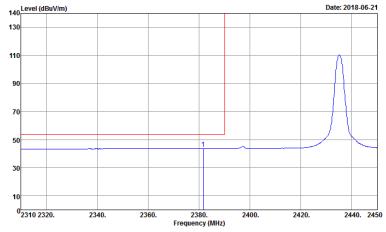
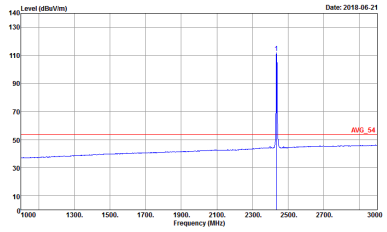
-L	**Low channel location**
-R	**High channel location**

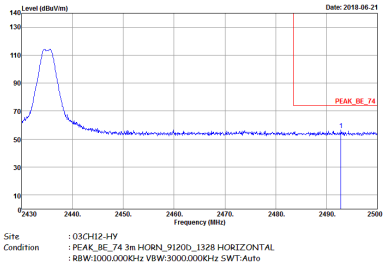
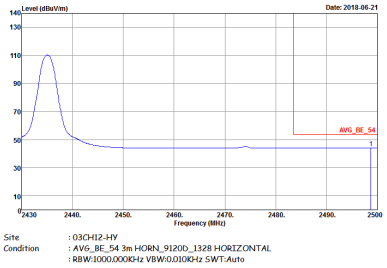
2.4GHz 2400~2483.5MHz

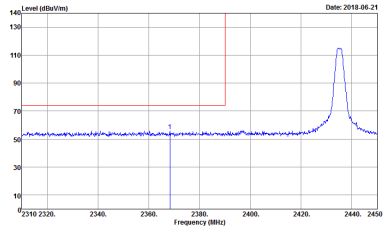
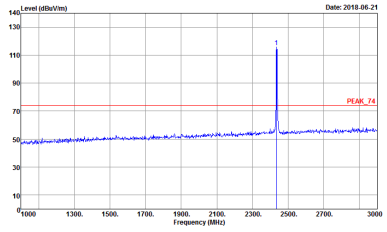
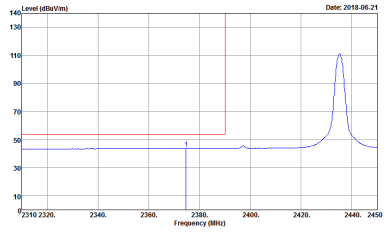
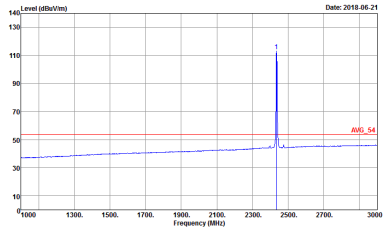
Zigbee (Band Edge @ 3m)

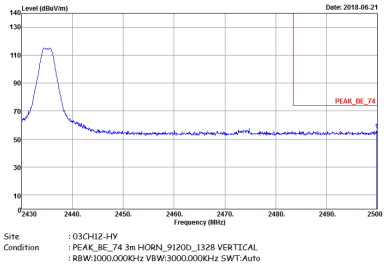
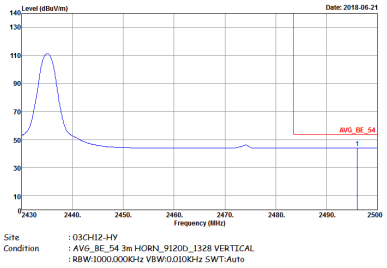
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH11 2405MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

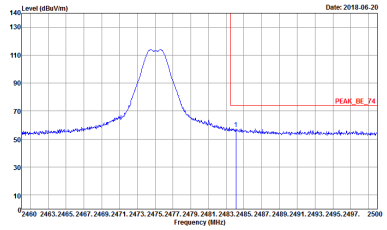
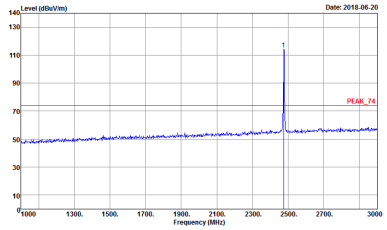
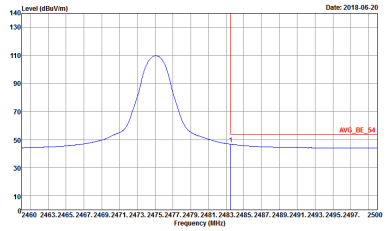
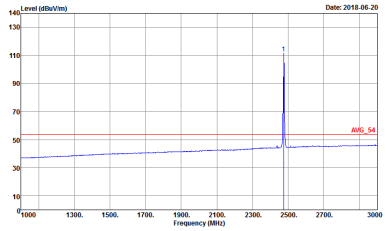
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH11 2405MHz	
	Vertical	Fundamental
Peak		
Avg		

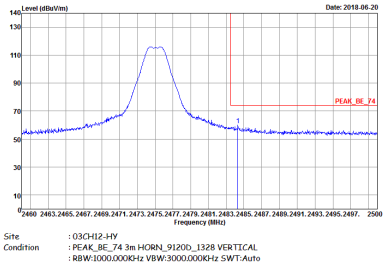
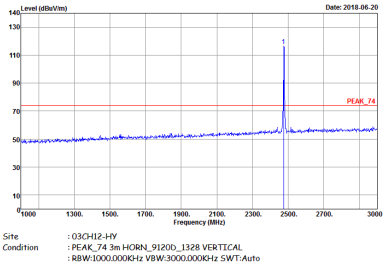
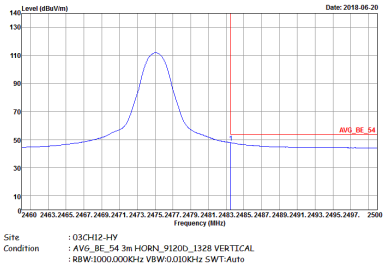
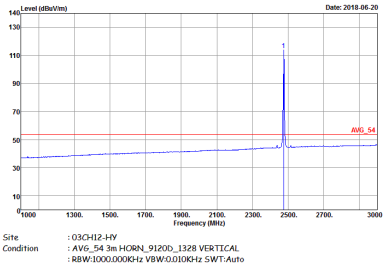
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH17 2435MHz - L	
	Horizontal	Fundamental
Peak		
Avg.		

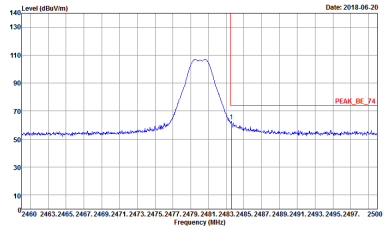
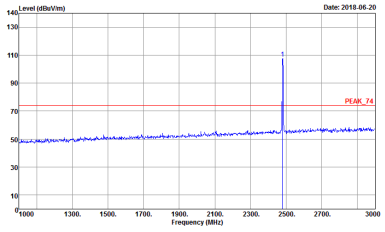
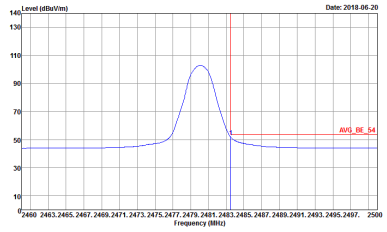
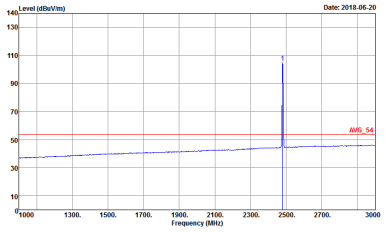
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH17 2435MHz - R	
	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

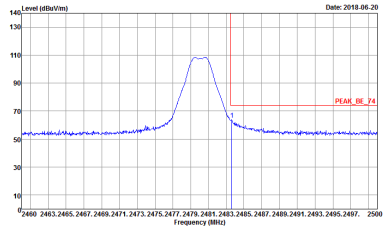
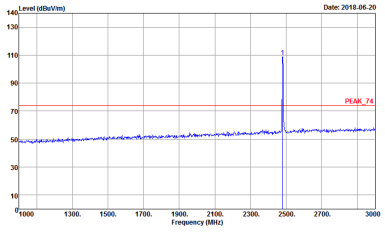
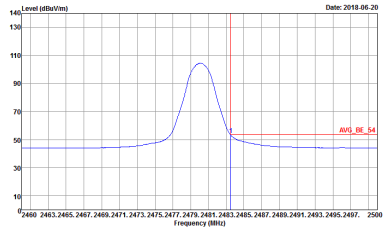
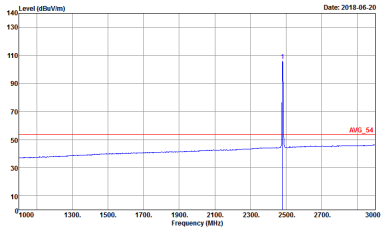
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH17 2435MHz - L	
	Vertical	Fundamental
Peak		
Avg.		

Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH17 2435MHz - R	
	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH25 2475MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

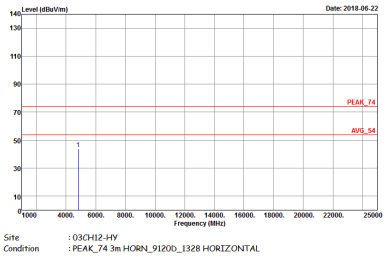
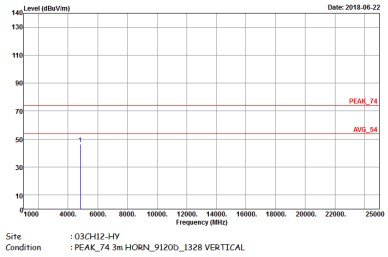
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH25 2475MHz	
	Vertical	Fundamental
Peak		
Avg.		

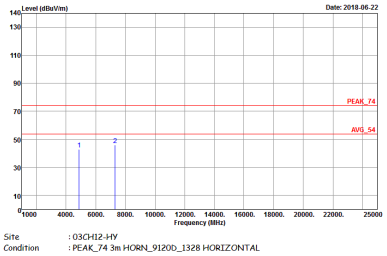
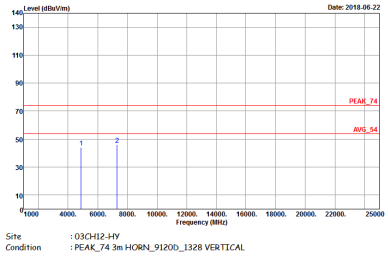
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH26 2480MHz	
	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

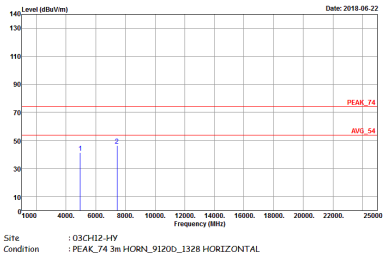
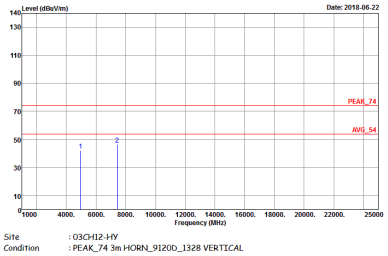
Zigbee	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	Zigbee CH26 2480MHz	
	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

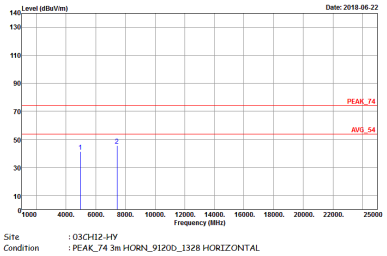
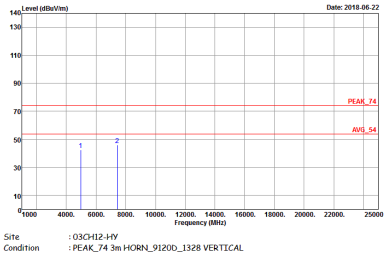
2.4GHz 2400~2483.5MHz

Zigbee (Harmonic @ 3m)

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

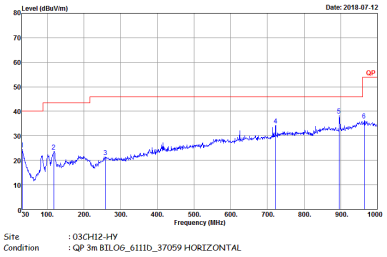
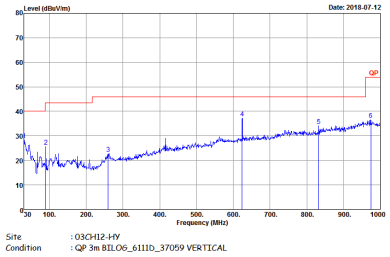
Zigbee	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	Zigbee CH17 2435MHz	
	Horizontal	Vertical
Peak		

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

Zigbee	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	Zigbee CH26 2480MHz	
	Horizontal	Vertical
Peak		

Emission below 1GHz

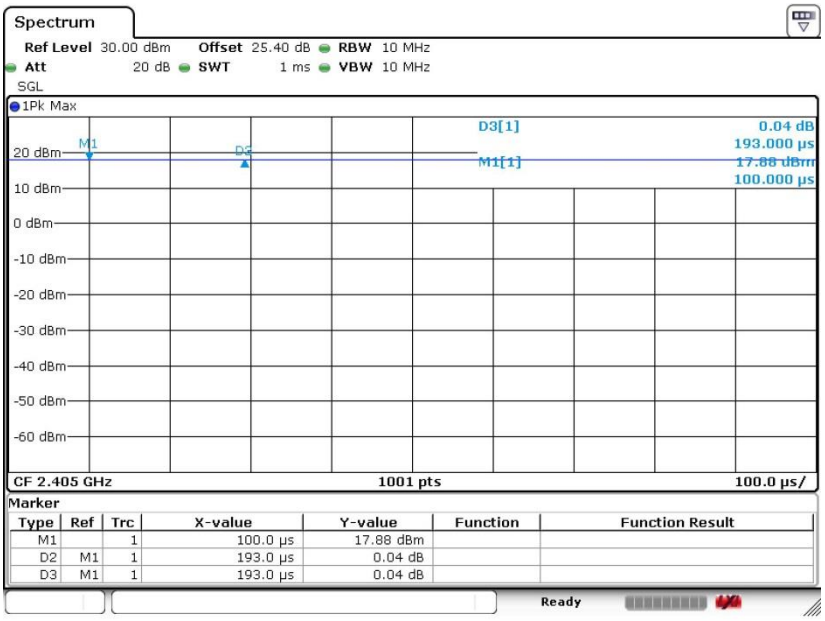
2.4GHz Zigbee (LF)

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

Appendix E. Duty Cycle Plots

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

Zigbee



———THE END———