



FCC ID: 2ALSZ-CL4100T
Report No.: T190212E01-RP

ISED: 22787-CL4100T

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Rev.: 00

RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.247 IC RSS-247 issue 2 and IC RSS-GEN issue 5
Product name	Photocontroller
Brand Name	CIMCON
Model	iSLC4100-7P-T
Test Result	Pass

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:

Tested by:

Kevin Tsai
Deputy Manager

Dally Hong
Engineer

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
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Revision History

Rev.	Issue Date	Revisions	Revised By
00	March 27, 2019	Initial Issue	Allison Chen

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	CIMCON Lighting, Inc. 35 Crosby Drive, Bedford, MA 01730, USA
Manufacturer	CIMCON Lighting, Inc. 35 Crosby Drive, Bedford, MA 01730, USA
Equipment	Photocontroller
Model No.	iSLC4100-7P-T
Model Discrepancy	N/A
Trade Name	CIMCON
Received Date	February 12, 2019
Date of Test	February 14 ~ March 20, 2019
Output Power(W)	Zigbee: 0.0685
Power Operation	120Vac, 60Hz

1.2 EUT CHANNEL INFORMATION

Frequency Range	Zigbee: 2405~2480MHz
Modulation Type	Zigbee: OQPSK (Offset Quadrature Phase Shift Keyed)
Number of channels	Zigbee: 14 Channels

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 and RSS-GEN Table A1 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
<input type="checkbox"/> 1 MHz or less	1	Middle
<input type="checkbox"/> 1 MHz to 10 MHz	2	1 near top and 1 near bottom
<input checked="" type="checkbox"/> More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	<input type="checkbox"/> PIFA <input type="checkbox"/> PCB <input type="checkbox"/> Dipole <input type="checkbox"/> Coils <input checked="" type="checkbox"/> Monopole Antenna
Antenna Gain	1.5 dBi
Antenna Connector	I-PEX

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Dally Hong	-
Radiation	Dally Hong	-
RF Conducted	Dally Hong	-

Remark: The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Meter	Anritsu	ML2495A	1149001	02/12/2019	02/11/2020
Power Seneor	Anritsu	MA2491A	030982	02/12/2019	02/11/2020
Signal Analyzer	R&S	FSV 40	101073	09/27/2018	09/26/2019

Wugu 966 Chamber A					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/26/2019	02/25/2020
Bilog Antenna	Sunol Sciences	JB3	A030105	07/13/2018	07/12/2019
Cable	HUBER SUHNER	SUCOFLE X 104PEA	25157	02/26/2019	02/25/2020
Cable	HUBER SUHNER	SUCOFLE X 104PEA	20995	02/26/2019	02/25/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	08/20/2018	08/19/2019
Loop Ant	COM-POWER	AL-130	121051	03/21/2018	03/20/2019
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/31/2018	05/30/2019
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 6.11-20180413				

Remark: Each piece of equipment is scheduled for calibration once a year.

Conducted Emission Room # B					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
CABLE	EMCI	CFD300-NL	CERF	06/29/2018	06/28/2019
EMI Test Receiver	R&S	ESCI	100064	07/24/2018	07/23/2019
LISN	SCHWARZBECK	NSLK 8127	8127-541	01/31/2019	01/30/2020
LISN	SCHAFFNER	NNB 41	03/10013	02/13/2019	02/12/2020

Remark: Each piece of equipment is scheduled for calibration once a year.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
	N/A				

Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(B)	Toshiba	PORTEGE R30-A	N/A	PD97260H

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, KDB 558074 D01, RSS-247 Issue 2 and RSS-GEN Issue 5

2. TEST SUMMERY

FCC Standard Section	ISED Standard Section	Chapter	Test Item	Result
15.203	-	1.3	Antenna Requirement	Pass
15.207	RSS-GEN 8.8	4.1	AC Conducted Emission	Pass
15.247(a)(2)	RSS-247(5.2)(a)	4.2	6 dB Bandwidth	Pass
-	RSS-GEN 6.7	4.2	Occupied Bandwidth (99%)	-
15.247(b)	RSS-247(5.4)(d)	4.3	Output Power Measurement	Pass
15.247(e)	RSS-247(5.2)(b)	4.4	Power Spectral Density	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Band Edge	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Emission	Pass
15.247(d)	RSS-247(5.5)	4.6	Radiation Band Edge	Pass
15.247(d)	RSS-247(5.5)	4.6	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	Zigbee
Test Channel Frequencies	Zigbee: 1. Lowest Channel : 2405MHz 2. Middle Channel : 2440MHz 3. Highest Channel : 2480MHz

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Power supply Mode	Mode 1:EUT power by AC.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Power supply Mode	Mode 1:EUT power by AC.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Worst Position	<input type="checkbox"/> Placed in fixed position. <input checked="" type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)
Worst Polarity	<input type="checkbox"/> Horizontal <input checked="" type="checkbox"/> Vertical

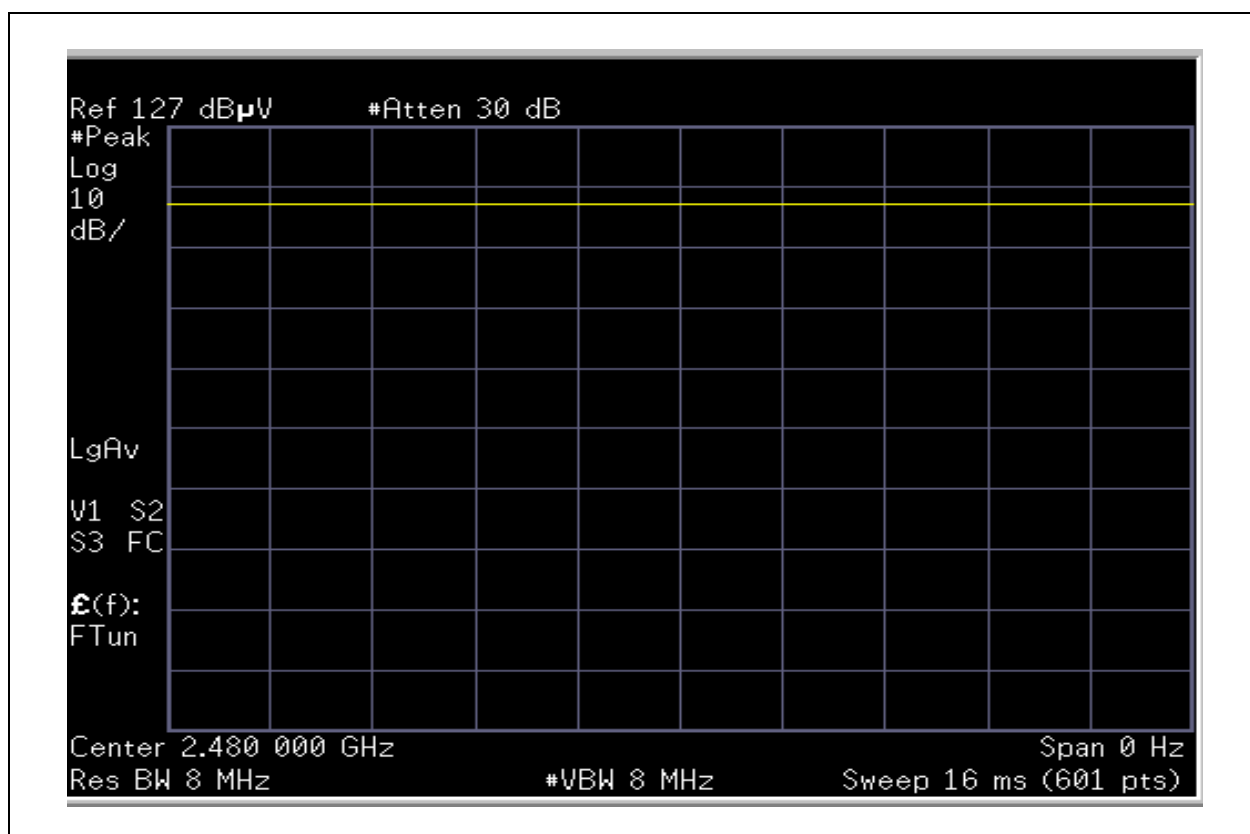
Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1:EUT power by AC.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(X-Plane and Vertical) were recorded in this report
3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

3.3 EUT DUTY CYCLE

Duty Cycle			
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)
Zigbee	1.0000	1.0000	100.00%



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a)(2) and RSS-GEN section 8.8,

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

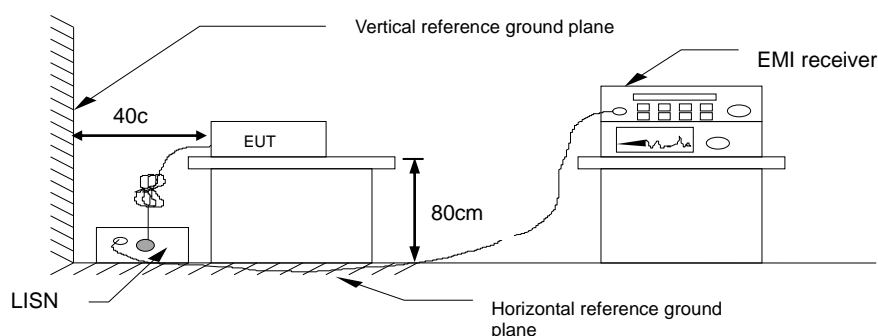
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

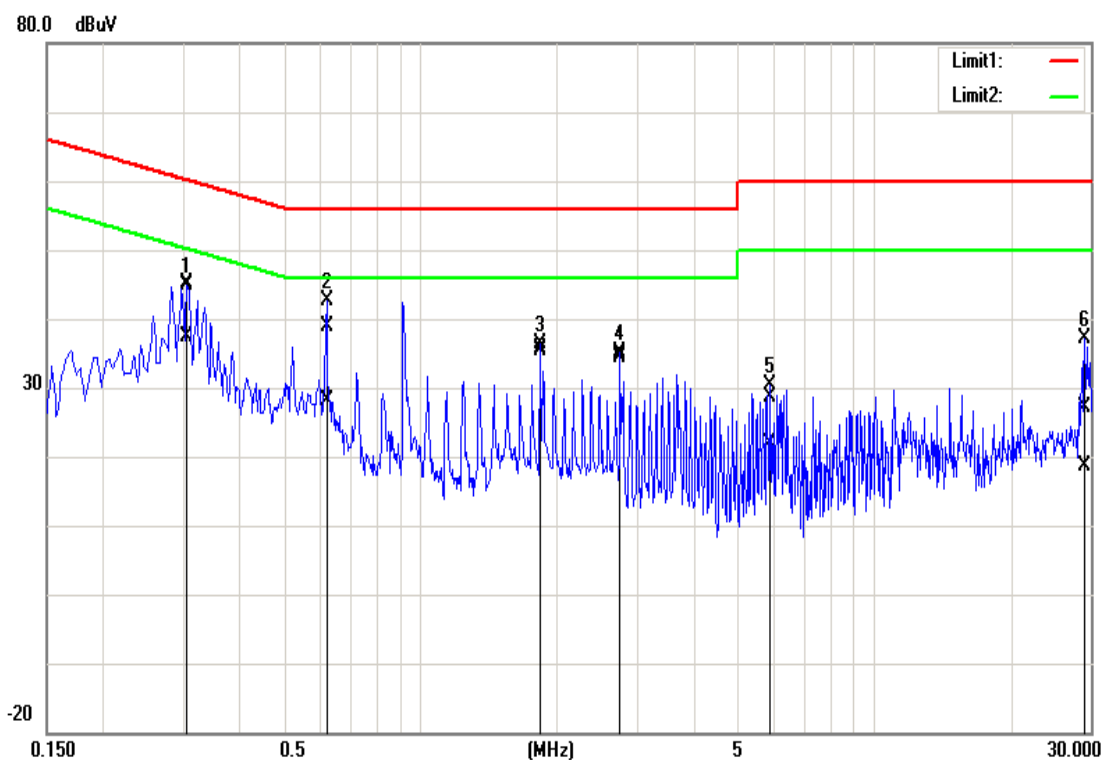


4.1.4 Test Result

Pass.

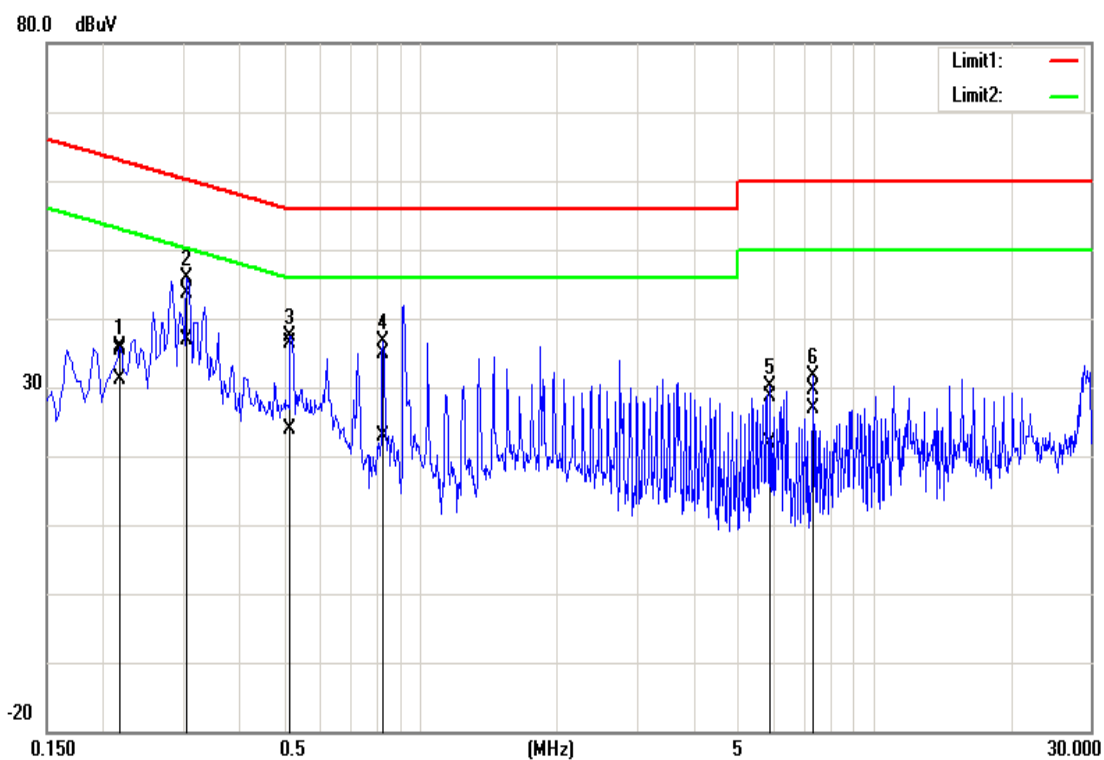
Test Data

Test Mode:	Mode 1	Temp/Hum	24(°C)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2019/03/14
Phase:	Line	Test Engineer	Dally Hong



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.3060	44.89	37.31	0.16	45.05	37.47	60.08	50.08	-15.03	-12.61	Pass
2	0.6220	38.72	27.91	0.16	38.88	28.07	56.00	46.00	-17.12	-17.93	Pass
3*	1.8380	35.29	35.23	0.22	35.51	35.45	56.00	46.00	-20.49	-10.55	Pass
4	2.7580	34.27	34.03	0.24	34.51	34.27	56.00	46.00	-21.49	-11.73	Pass
5	5.9100	28.42	21.51	0.33	28.75	21.84	60.00	50.00	-31.25	-28.16	Pass
6	29.1620	26.15	17.63	0.96	27.11	18.59	60.00	50.00	-32.89	-31.41	Pass

Test Mode:	Mode 1	Temp/Hum	24(°C)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2019/03/14
Phase:	Neutral	Test Engineer	Dally Hong



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2180	35.21	31.00	0.10	35.31	31.10	62.89	52.89	-27.58	-21.79	Pass
2*	0.3060	43.59	36.76	0.11	43.70	36.87	60.08	50.08	-16.38	-13.21	Pass
3	0.5180	36.22	23.79	0.11	36.33	23.90	56.00	46.00	-19.67	-22.10	Pass
4	0.8300	34.84	22.64	0.13	34.97	22.77	56.00	46.00	-21.03	-23.23	Pass
5	5.9100	28.48	21.57	0.27	28.75	21.84	60.00	50.00	-31.25	-28.16	Pass
6	7.3620	29.24	26.69	0.30	29.54	26.99	60.00	50.00	-30.46	-23.01	Pass

4.2 6dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

4.2.1 Test Limit

According to §15.247(a)(2) and RSS-247 section 5.2(a), RSS-GEN 6.7,

6 dB Bandwidth :

Limit	Shall be at least 500kHz
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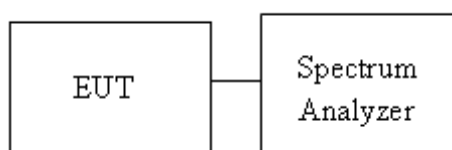
Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 558074 D01 and ANSI C63.10: 2013 clause 6.9.2,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth.
4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
5. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth in the test report.

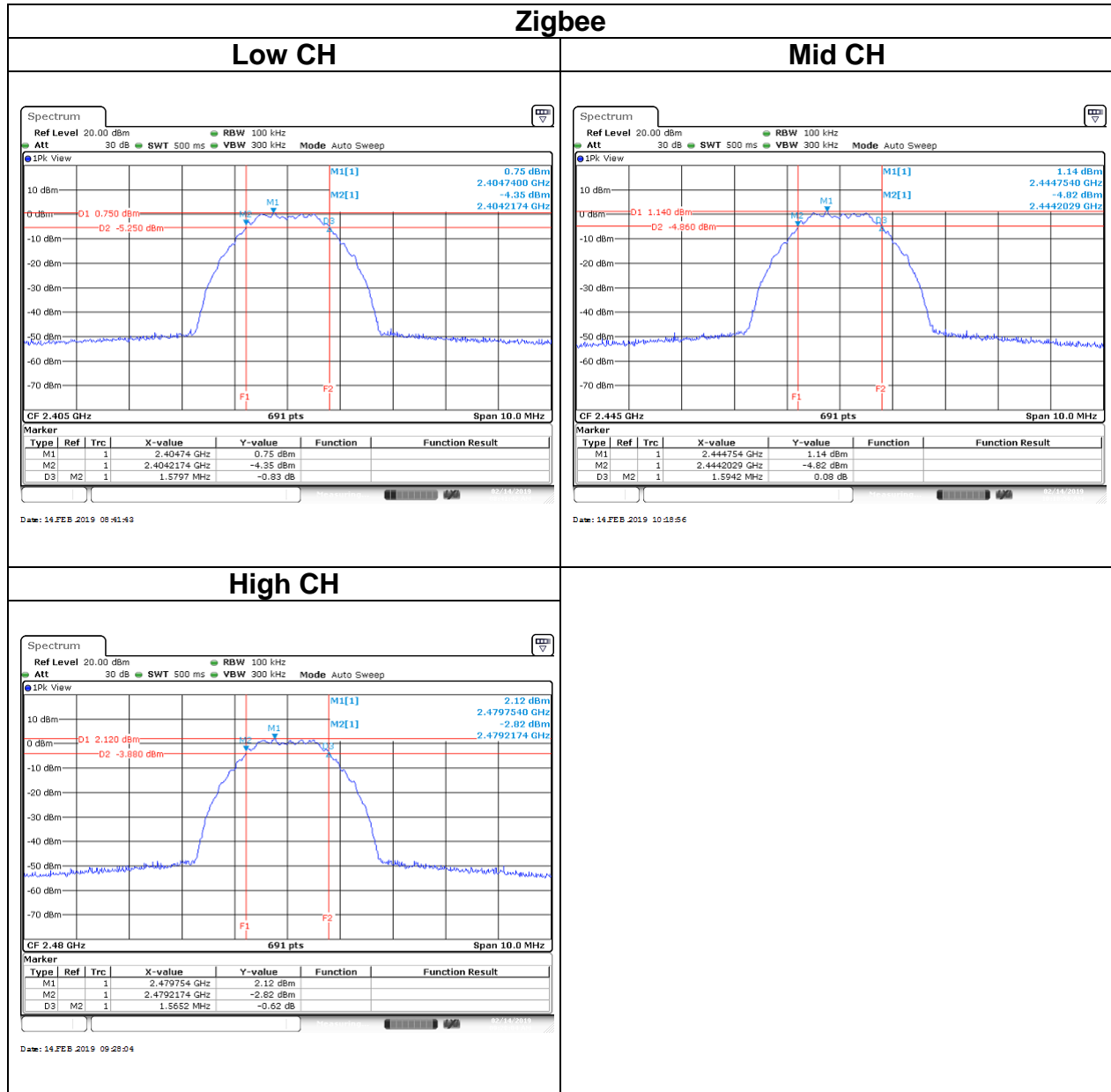
4.2.3 Test Setup



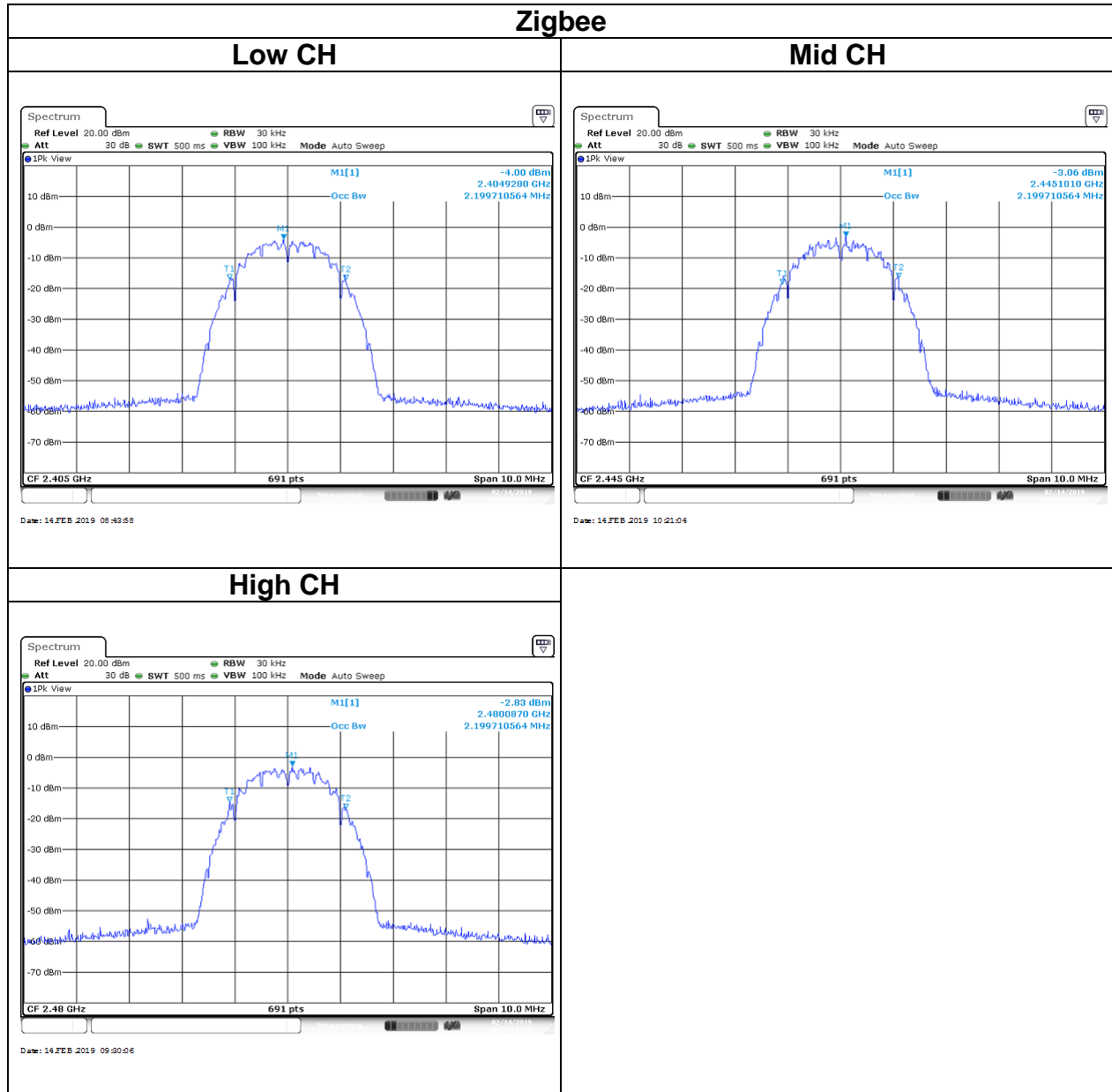
4.2.4 Test Result

Test mode: Zigbee / 2405-2480 MHz				
Channel	Frequency (MHz)	OBW (99%) (MHz)	6dB BW (MHz)	6dB limit (kHz)
Low	2405	2.1997	1.5797	≥500
Mid	2445	2.1997	1.5942	
High	2480	2.1997	1.5652	

Test Data 6dB BANDWIDTH



Test Data BANDWIDTH (99%)



4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b) and RSS-247 section 5.4(d),

Peak output power :

For systems using digital modulation in the 2400-2483.5 MHz: 1 Watt(30 dBm), base on the use of antennas with directional gain not exceed 6 dBi If transmitting antennas of directional gain greater than 6dBi are used the peak output power the conducted output power from the intentional radiator shall be reduced 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 3 dB that the directional gain of the antenna exceeds 6 dBi.

Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 30dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)] <input type="checkbox"/> Point-to-point operation :
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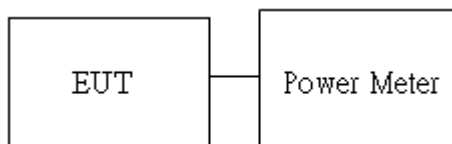
Average output power : For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as KDB 558074 D01.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power in the test report.

4.3.3 Test Setup



4.3.4 Test Result

Peak output power :

Zigbee							
Config.	Freq. (MHz)	Power Setting	PK Power (dBm)	EIRP PK Power (dBm)	PK Power (W)	EIRP PK Power (W)	Limit (dBm)
Zigbee	2405	15	17.26	18.76	0.0532	0.0752	30
	2445	15	17.83	19.33	0.0607	0.0857	
	2480	15	18.36	19.86	0.0685	0.0968	

Average output power :

Zigbee			
Config.	Freq. (MHz)	Power Setting	AV Power (dBm)
Zigbee	2405	15	16.07
	2440	15	16.65
	2480	15	17.05

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e), RSS-247 section 5.2(b),

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Limit	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 8dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi [Limit = 8 – (DG – 6)] <input type="checkbox"/> Point-to-point operation :
-------	--

4.4.2 Test Procedure

Test method Refer as KDB 558074 D01.

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 30kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss and Duty Factor were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

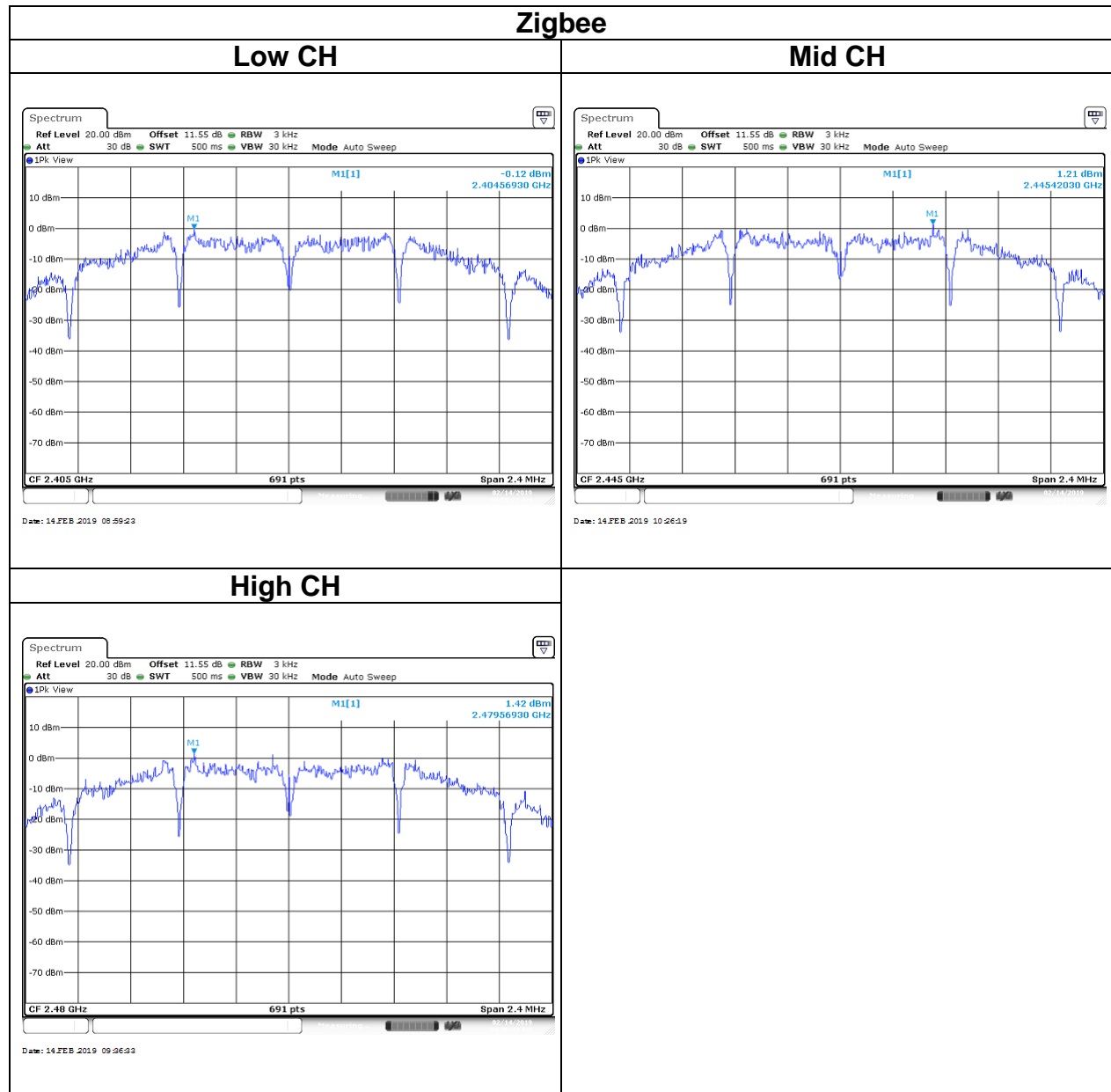
4.4.3 Test Setup



4.4.4 Test Result

Test mode: Zigbee			
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)
Low	2405	-0.12	8
Mid	2445	1.21	
High	2480	1.42	

Test Data



4.5 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d) and RSS-247 section 5.5,

In any 100 kHz bandwidth outside the authorized frequency band,

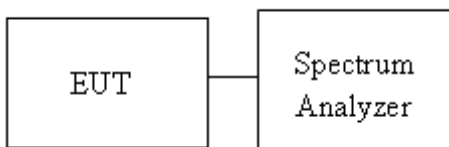
Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

4.5.2 Test Procedure

Test method Refer as KDB 558074 D01

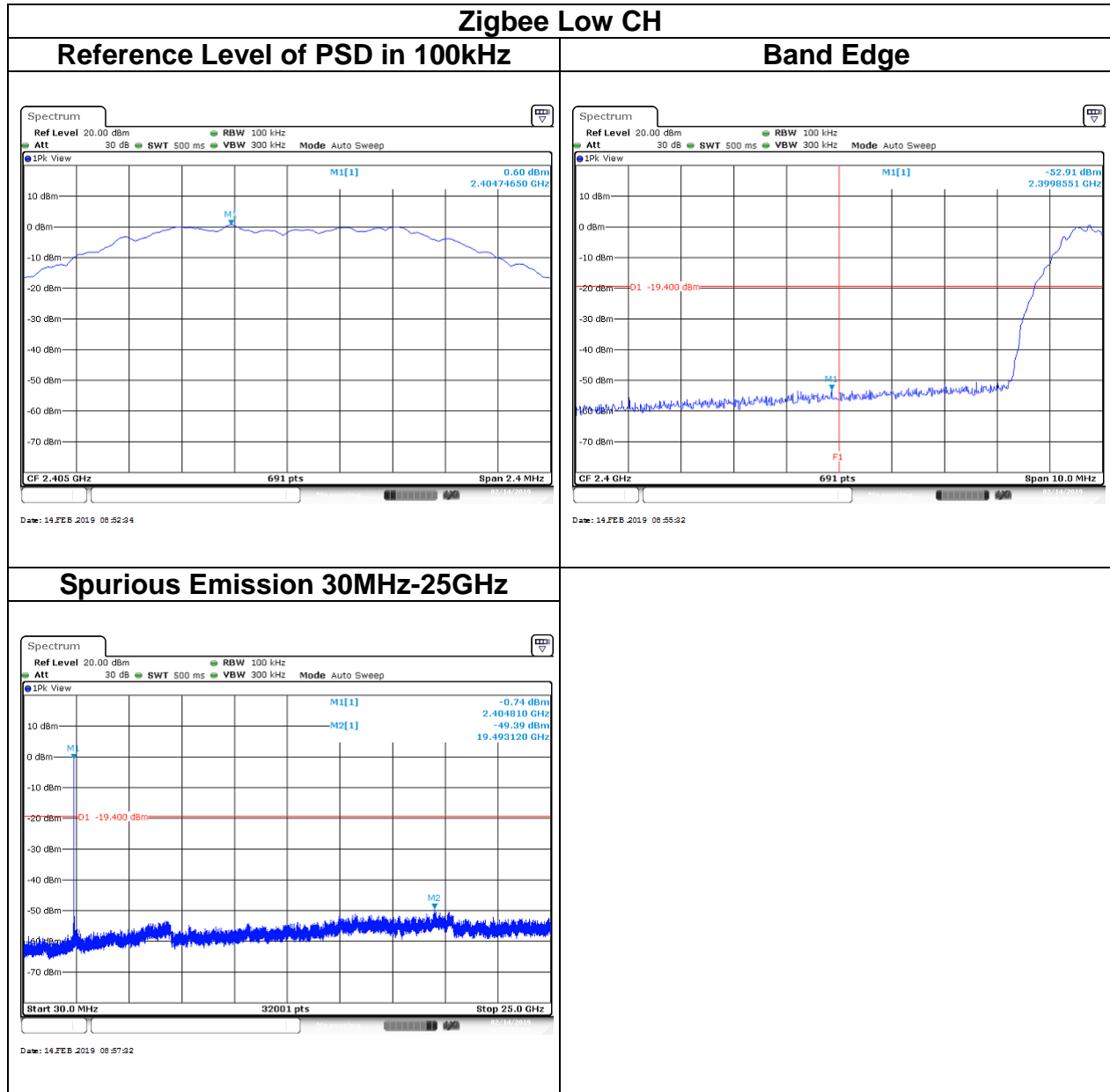
1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.
2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted 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.

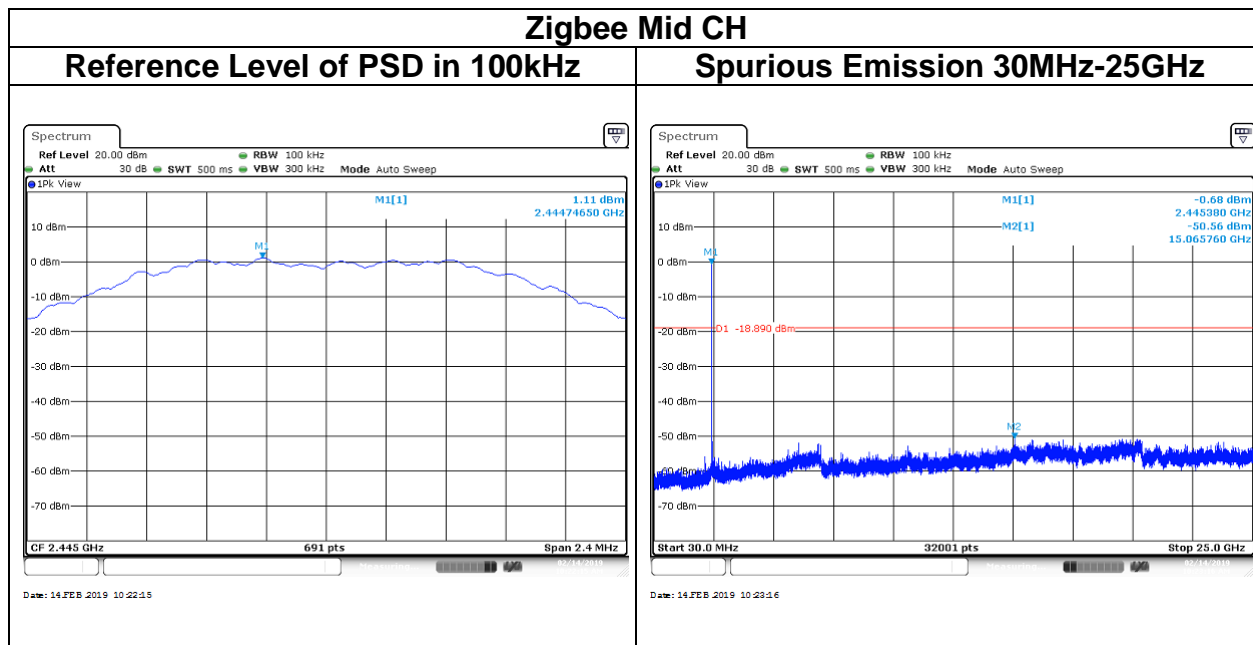
4.5.3 Test Setup

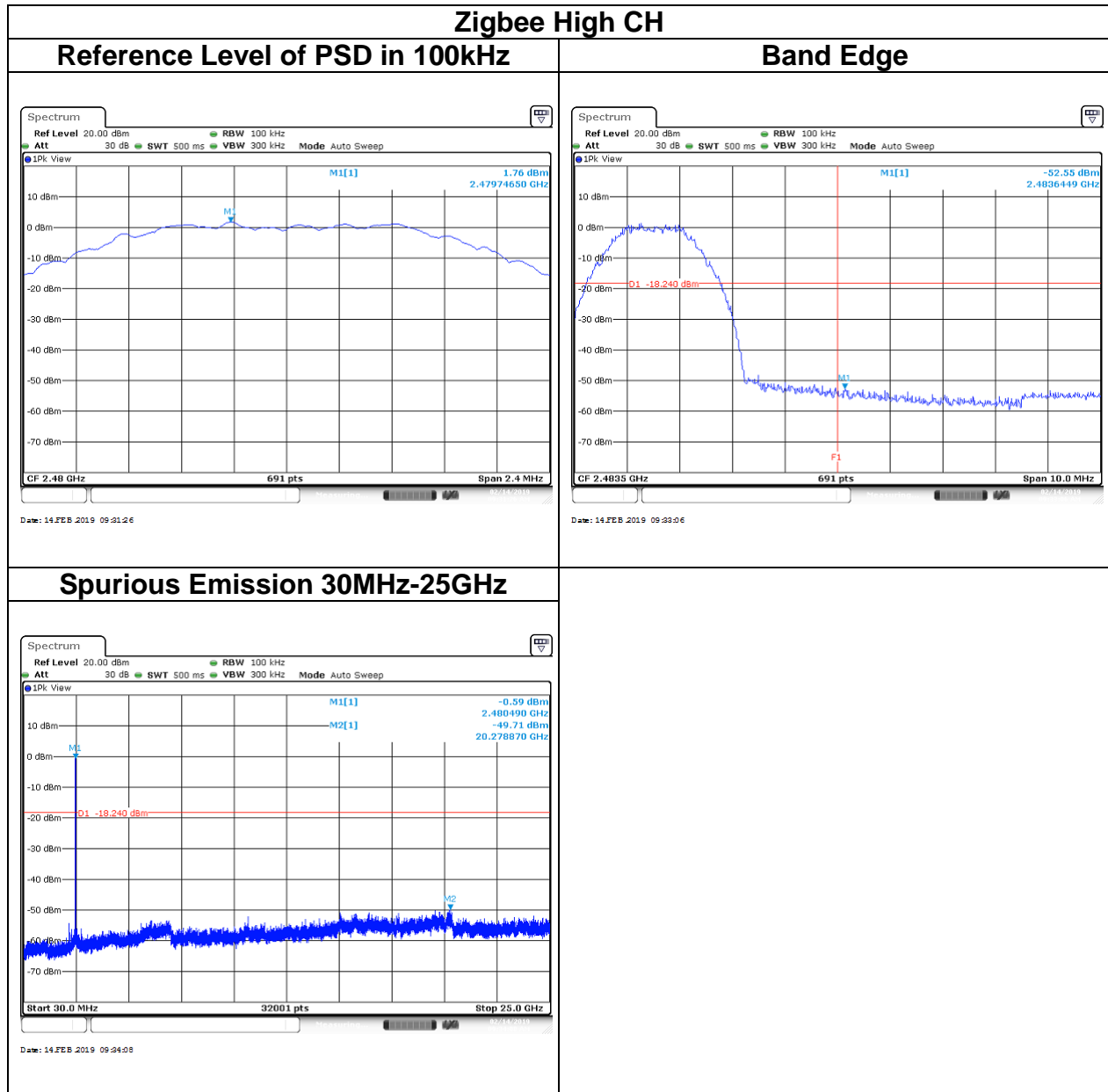


4.5.4 Test Result

Test Data







4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205

IC according to RSS-247 section 5.5, RSS-Gen, Section 8.9 and 8.10,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field.

RSS-Gen Table 3 and Table 5 – General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz ^(Note)

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: Measurements for compliance with the limits in table 3 may be performed at distances other than 3 metres, in accordance with Section 6.6.

RSS-Gen Table 6: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

Frequency	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (m)
9-490 kHz ^{Note}	6.37/F (F in kHz)	300
490-1,705 kHz	63.7/F (F in kHz)	30
1.705-30 MHz	0.08	30

Note: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector..

4.6.2 Test Procedure

Test method Refer as KDB 558074 D01.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 30MHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

4. The SA setting following :

(1) Below 1G : RBW = 100kHz, VBW \geq 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G :

(2.1) For Peak measurement : RBW = 1MHz, VBW \geq 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2.2) For Average measurement : RBW = 1MHz, VBW

·If Duty Cycle \geq 98%, VBW=10Hz.

·If Duty Cycle < 98%, VBW \geq 1/T.

Configuration	Duty Cycle (%)	T(ms)	1/T (kHz)	VBW Setting
Zigbee	100%	1.0000	-	10Hz

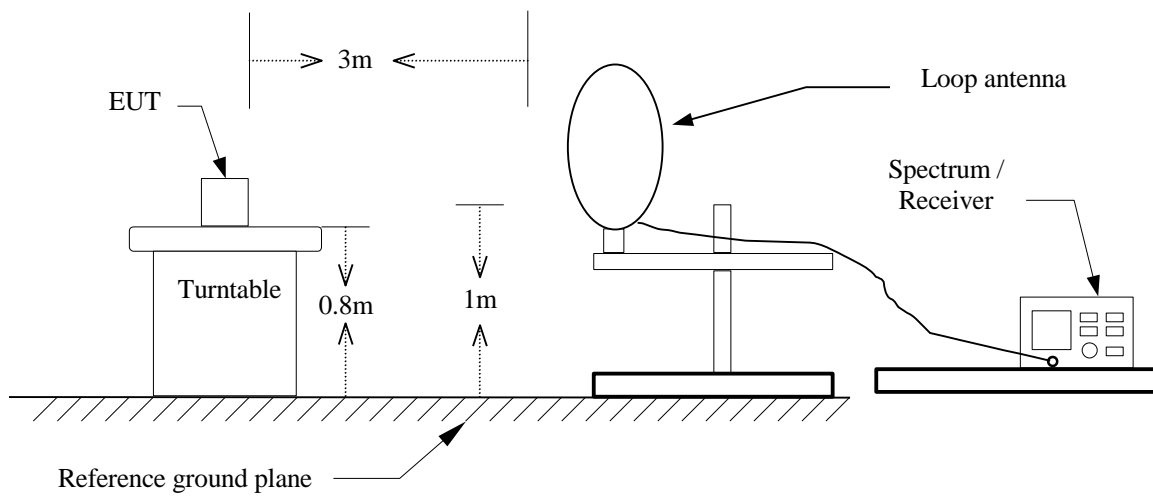
Remark:

1. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

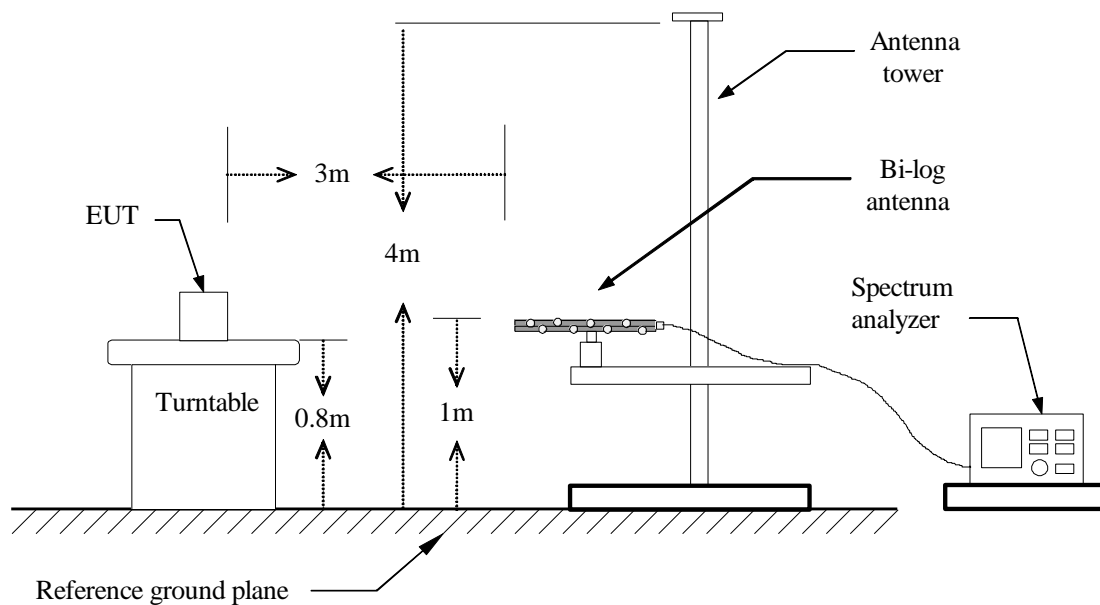
2. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

4.6.3 Test Setup

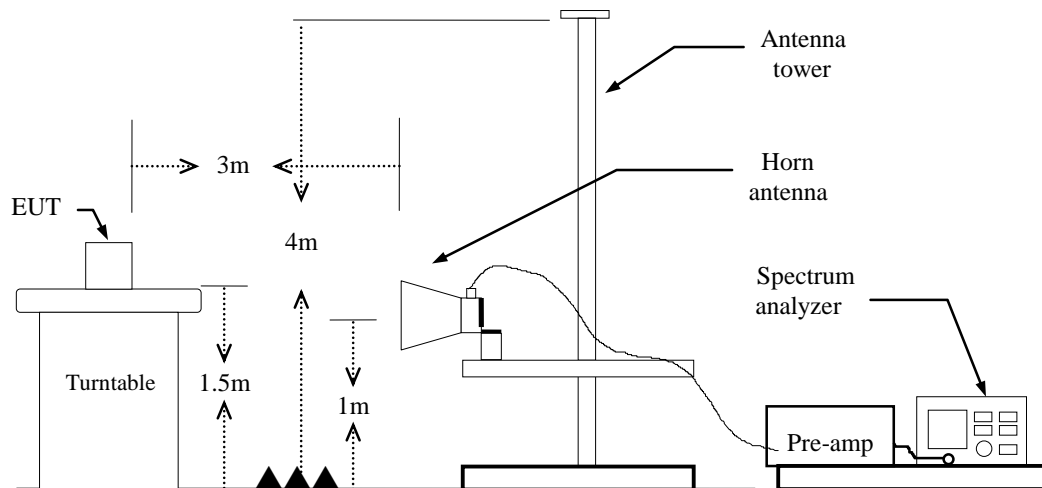
9kHz ~ 30MHz



30MHz ~ 1GHz



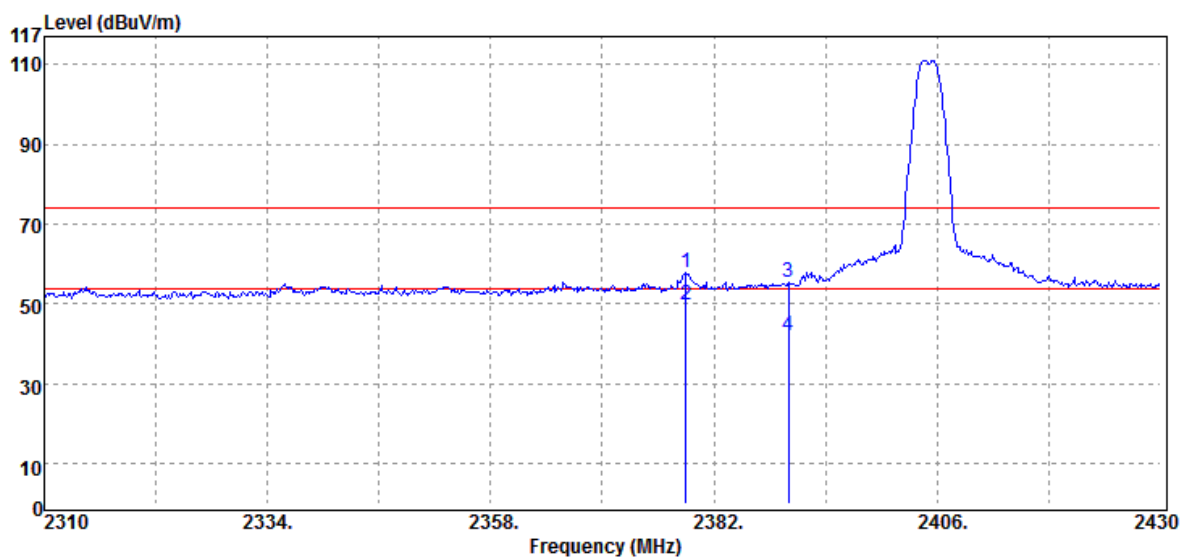
Above 1 GHz



4.6.4 Test Result

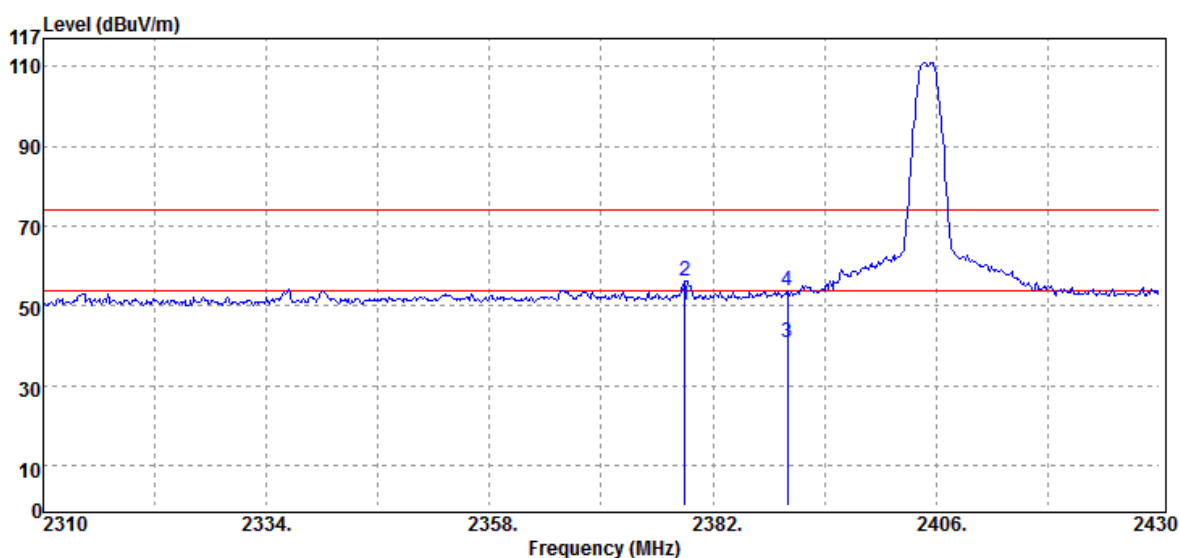
Band Edge Test Data

Test Mode	Zigbee Low CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Band Edge	Test Date	March 7, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Average		



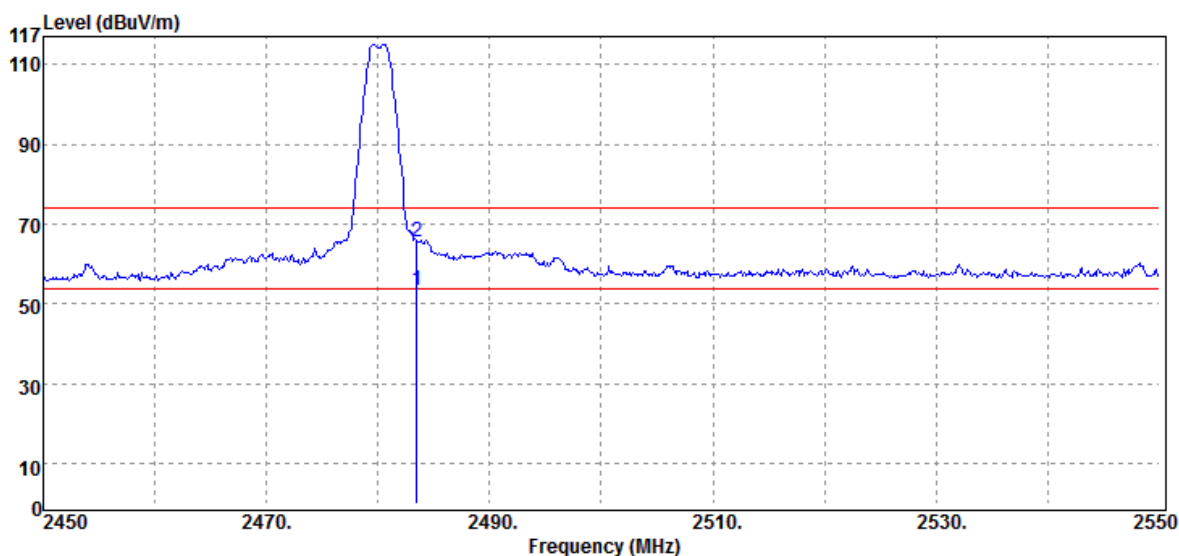
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2379.00	61.04	-3.32	57.72	74.00	-16.28	peak
2379.00	53.09	-3.32	49.77	54.00	-4.23	AVG
2390.00	58.83	-3.33	55.50	74.00	-18.50	peak
2390.00	45.34	-3.33	42.01	54.00	-11.99	AVG

Test Mode	Zigbee Low CH	Temperature:	22(°C)/ 67%RH
Test Item	Band Edge	Test Date	March 7, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Average		



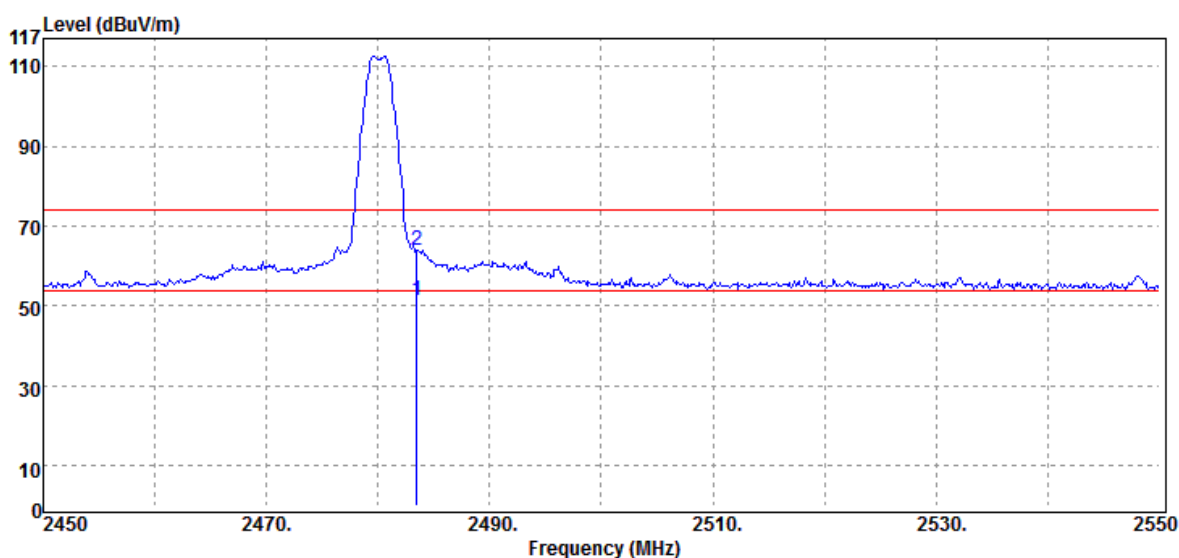
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2379.00	53.52	-3.32	50.20	54.00	-3.80	peak
2379.00	59.65	-3.32	56.33	74.00	-17.67	AVG
2390.00	44.21	-3.33	40.88	54.00	-13.12	peak
2390.00	57.10	-3.33	53.77	74.00	-20.23	AVG

Test Mode	Zigbee High CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Band Edge	Test Date	March 7, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Average		



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.50	56.25	-2.72	53.53	54.00	56.25	AVG
2483.50	68.31	-2.72	65.59	74.00	68.31	peak

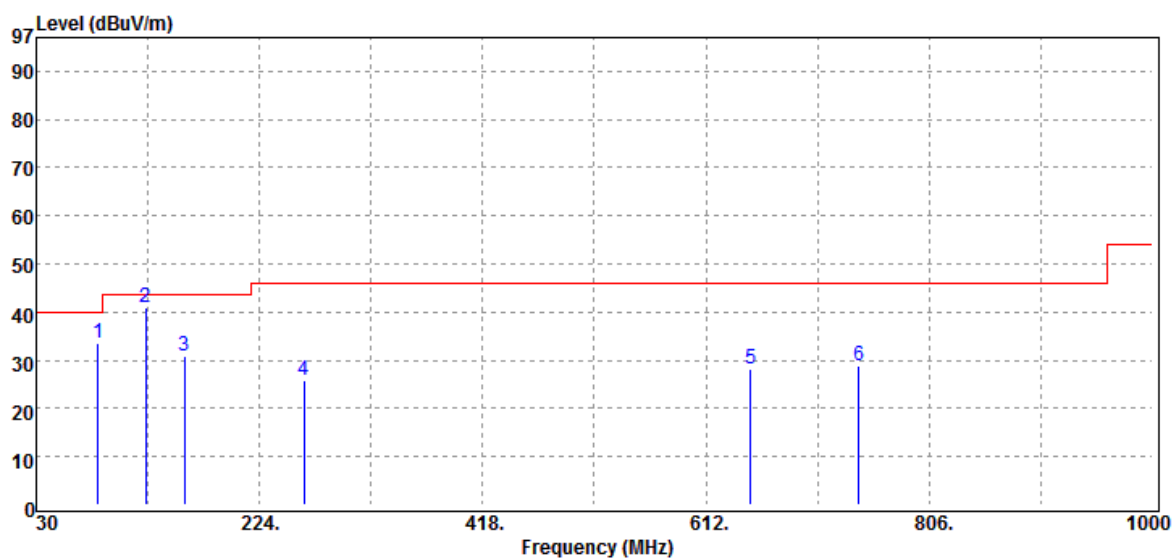
Test Mode	Zigbee High CH	Temperature:	22(°C)/ 67%RH
Test Item	Band Edge	Test Date	March 7, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Average		



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.50	53.98	-2.72	51.26	54.00	-2.74	AVG
2483.50	66.72	-2.72	64.00	74.00	-10.00	peak

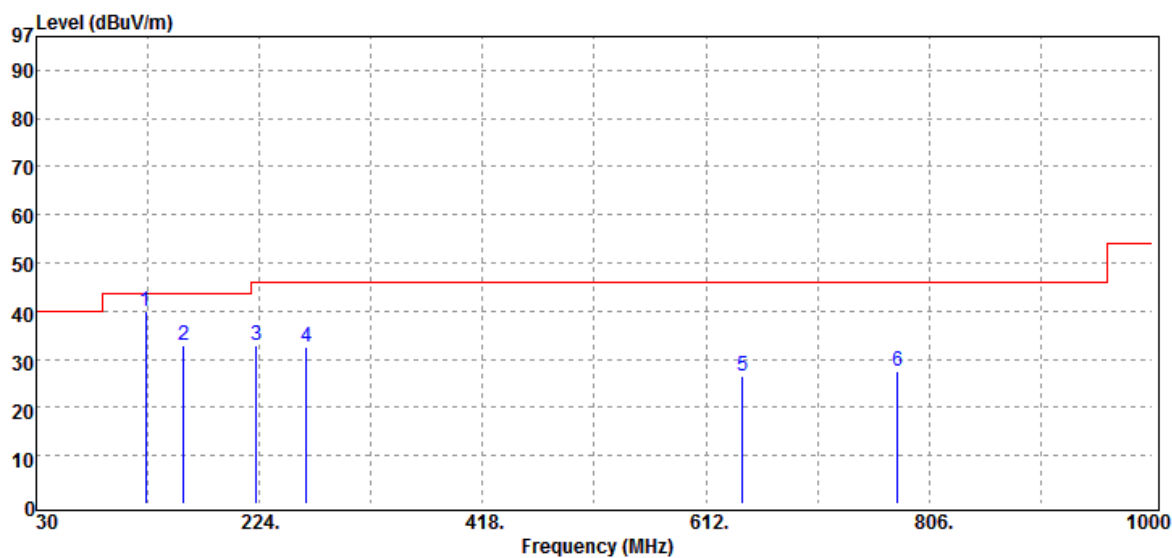
Below 1GHz

Test Mode	Zigbee Low CH	Temp/Hum	22(°C)/ 67%RH
Test Item	30MHz-1GHz	Test Date	March 7, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Quasi-peak		



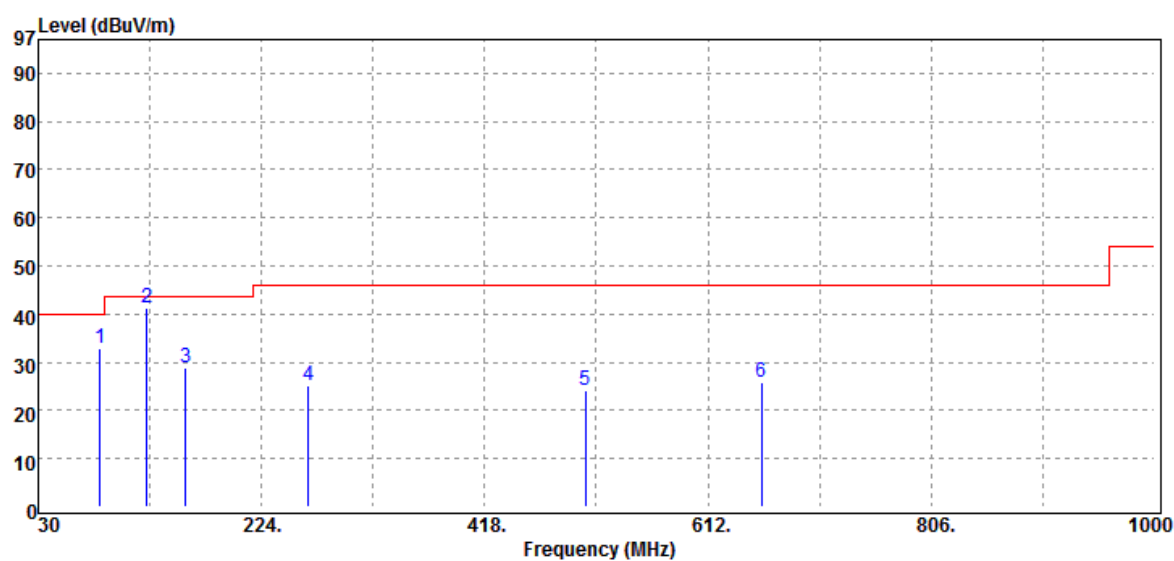
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
83.35	48.54	-15.00	33.54	40.00	-6.46	Peak
125.06	49.22	-8.29	40.93	43.50	-2.57	QP
159.01	40.34	-9.36	30.98	43.50	-12.52	Peak
262.80	34.33	-8.59	25.74	46.00	-20.26	Peak
650.80	27.23	0.99	28.22	46.00	-17.78	Peak
744.89	26.60	2.26	28.86	46.00	-17.14	Peak

Test Mode	Zigbee Low CH	Temp/Hum	22(°C)/ 67%RH
Test Item	30MHz-1GHz	Test Date	March 7, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Quasi-peak		



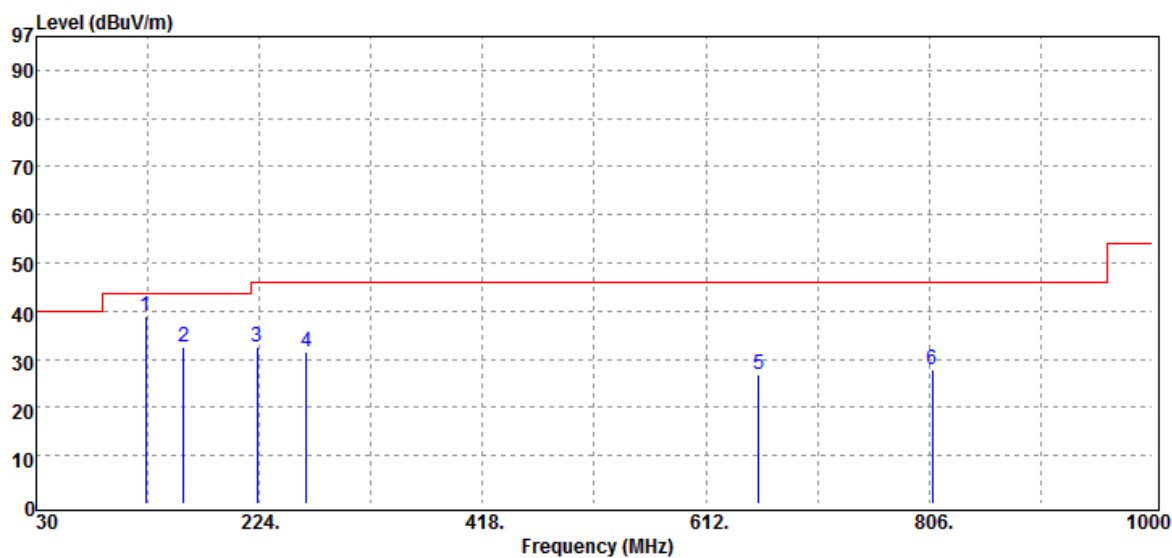
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
125.06	48.35	-8.29	40.06	43.50	-3.44	QP
158.04	42.14	-9.38	32.76	43.50	-10.74	Peak
221.09	43.40	-10.64	32.76	46.00	-13.24	Peak
264.74	40.81	-8.25	32.56	46.00	-13.44	Peak
644.01	25.60	0.90	26.50	46.00	-19.50	Peak
778.84	24.97	2.68	27.65	46.00	-18.35	Peak

Test Mode	Zigbee Mid CH	Temp/Hum	22(°C)/ 67%RH
Test Item	30MHz-1GHz	Test Date	March 7, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Quasi-peak		



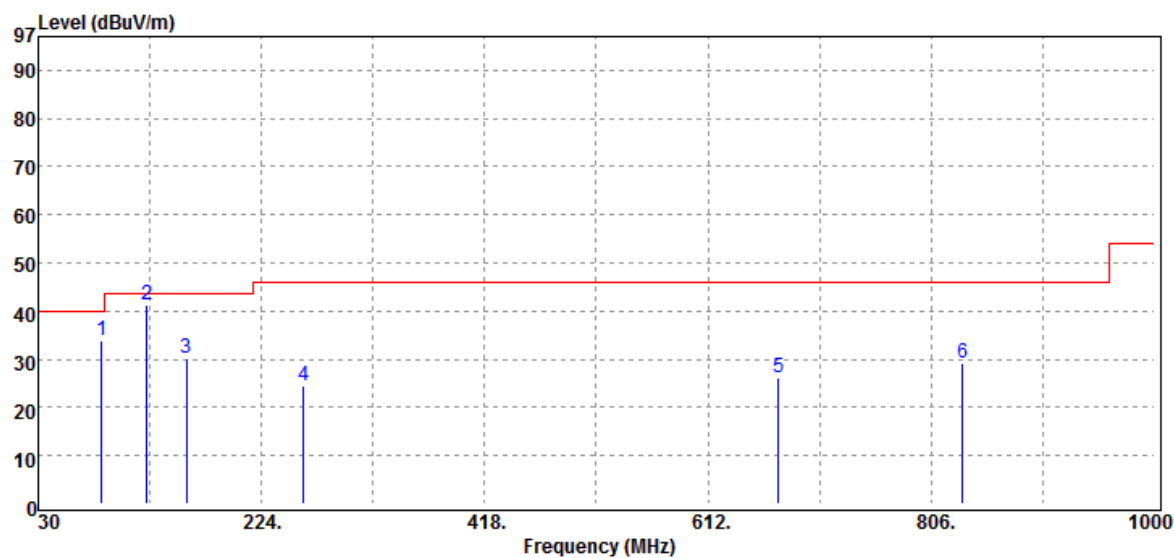
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
83.35	48.03	-15.00	33.03	40.00	-6.97	Peak
124.09	49.54	-8.37	41.17	43.50	-2.33	QP
158.04	38.34	-9.38	28.96	43.50	-14.54	Peak
264.74	33.31	-8.25	25.06	46.00	-20.94	Peak
505.30	26.22	-2.09	24.13	46.00	-21.87	Peak
658.56	25.28	0.72	26.00	46.00	-20.00	Peak

Test Mode	Zigbee Mid CH	Temp/Hum	22(°C)/ 67%RH
Test Item	30MHz-1GHz	Test Date	March 7, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Quasi-peak		



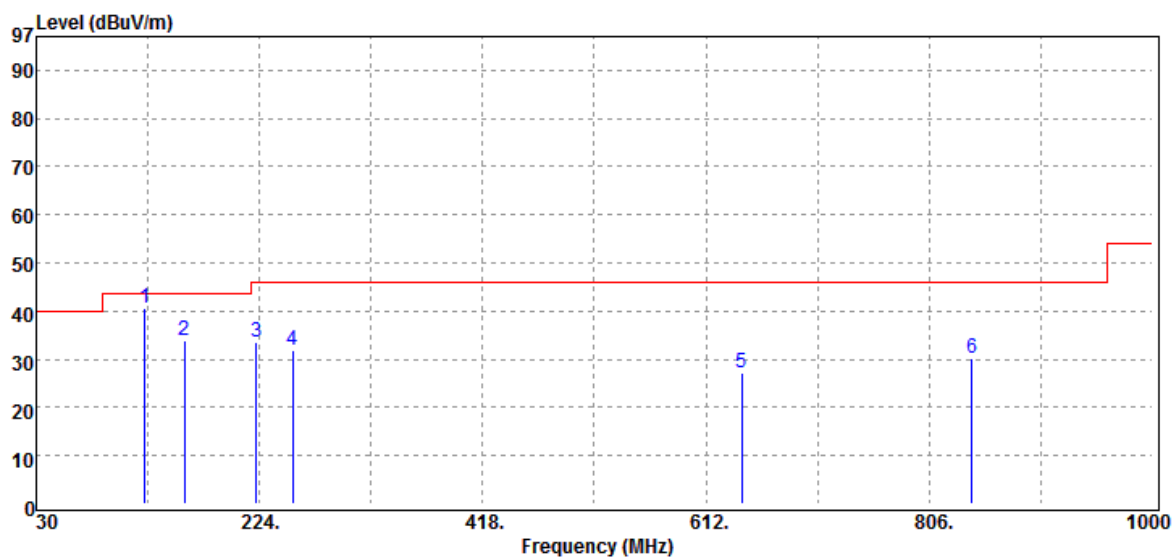
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
125.06	47.35	-8.29	39.06	43.50	-4.44	QP
158.04	41.91	-9.38	32.53	43.50	-10.97	Peak
222.06	43.18	-10.59	32.59	46.00	-13.41	Peak
264.74	39.76	-8.25	31.51	46.00	-14.49	Peak
657.59	26.11	0.76	26.87	46.00	-19.13	Peak
808.91	24.57	3.31	27.88	46.00	-18.12	Peak

Test Mode	Zigbee High CH	Temp/Hum	22(°C)/ 67%RH
Test Item	30MHz-1GHz	Test Date	March 7, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Quasi-peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
85.29	48.97	-15.08	33.89	40.00	-6.11	Peak
124.09	49.74	-8.37	41.37	43.50	-2.13	QP
159.01	39.73	-9.36	30.37	43.50	-13.13	Peak
260.86	33.27	-8.92	24.35	46.00	-21.65	Peak
673.11	25.02	1.05	26.07	46.00	-19.93	Peak
833.16	24.84	4.45	29.29	46.00	-16.71	Peak

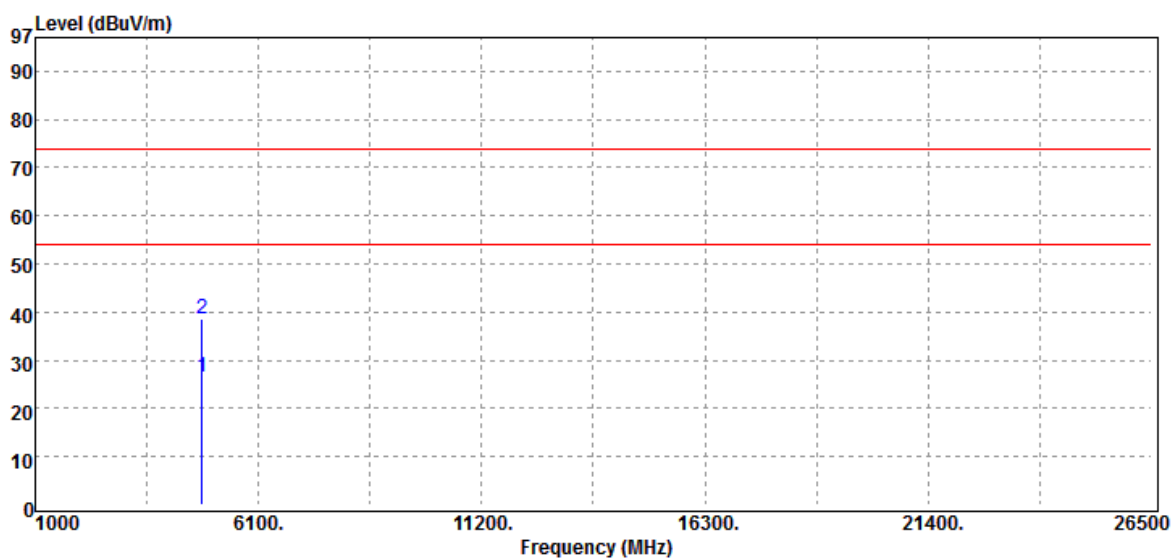
Test Mode	Zigbee High CH	Temp/Hum	22(°C)/ 67%RH
Test Item	30MHz-1GHz	Test Date	March 7, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Quasi-peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
124.09	48.97	-8.37	40.60	43.50	-2.90	QP
159.01	43.25	-9.36	33.89	43.50	-9.61	Peak
221.09	44.09	-10.64	33.45	46.00	-12.55	Peak
253.10	41.50	-9.71	31.79	46.00	-14.21	Peak
643.04	26.39	0.87	27.26	46.00	-18.74	Peak
842.86	25.62	4.55	30.17	46.00	-15.83	Peak

Above 1 GHz

Test Mode	Zigbee Low CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Harmonic	Test Date	March 20, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Average		

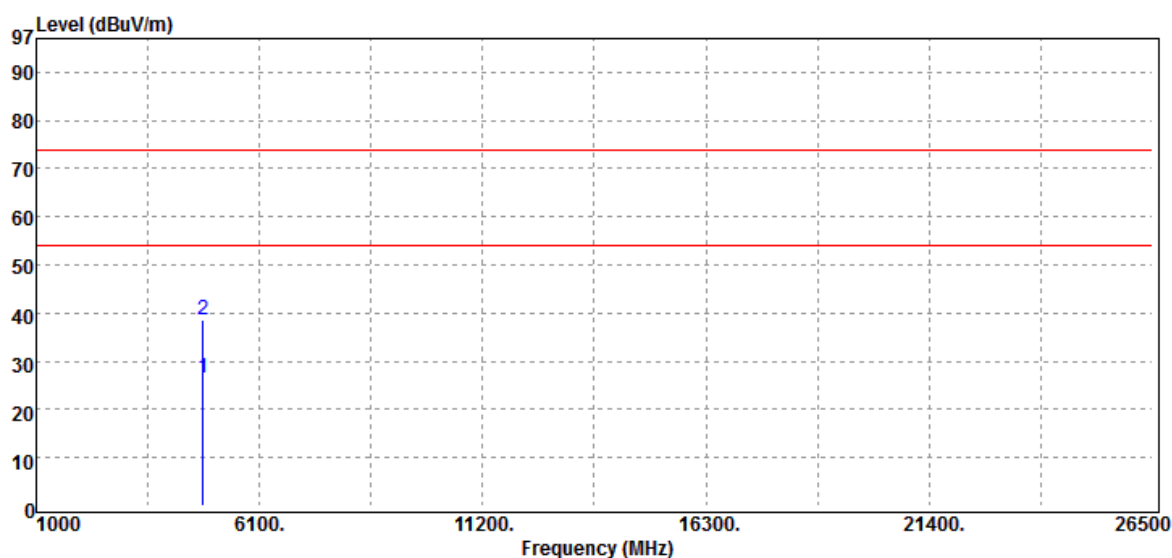


Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4810.00	23.37	3.08	26.45	54.00	-27.55	Average
4810.00	35.42	3.08	38.50	74.00	-35.50	Peak
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	Zigbee Low CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Harmonic	Test Date	March 20, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Average		

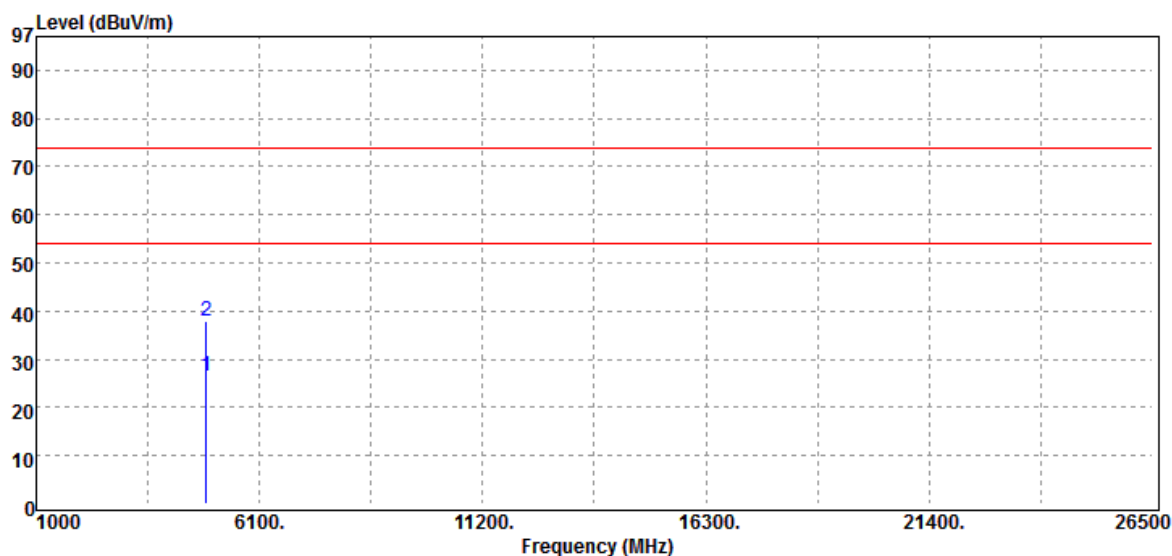


Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4810.00	23.41	3.08	26.49	54.00	-27.51	Average
4810.00	35.55	3.08	38.63	74.00	-35.37	Peak
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	Zigbee Mid CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Harmonic	Test Date	March 20, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Average		

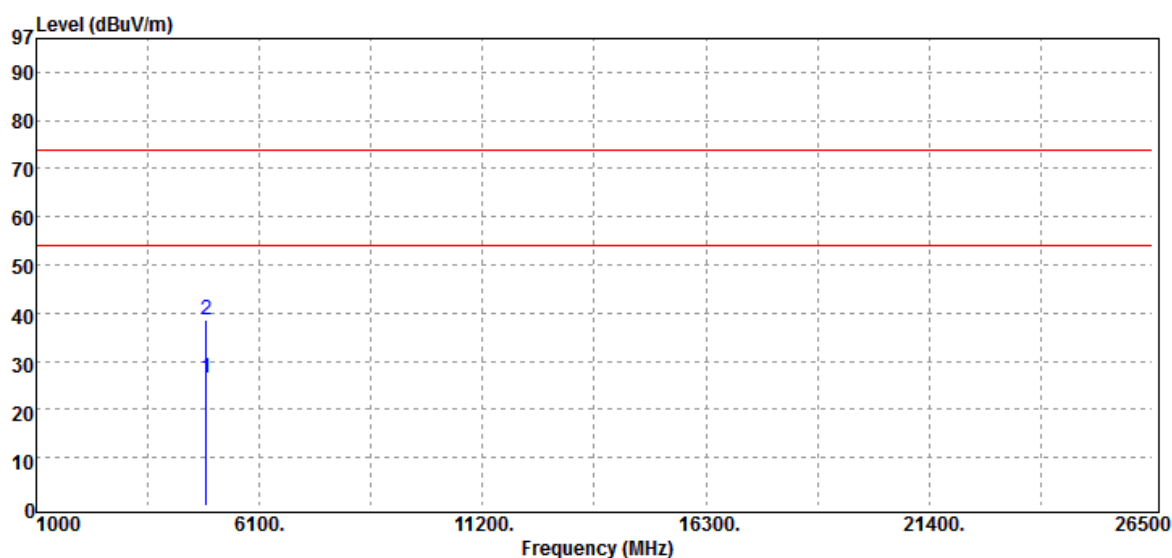


Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4890.00	22.96	3.51	26.47	54.00	-27.53	Average
4890.00	34.38	3.51	37.89	74.00	-36.11	Peak
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	Zigbee Mid CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Harmonic	Test Date	March 20, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Average		

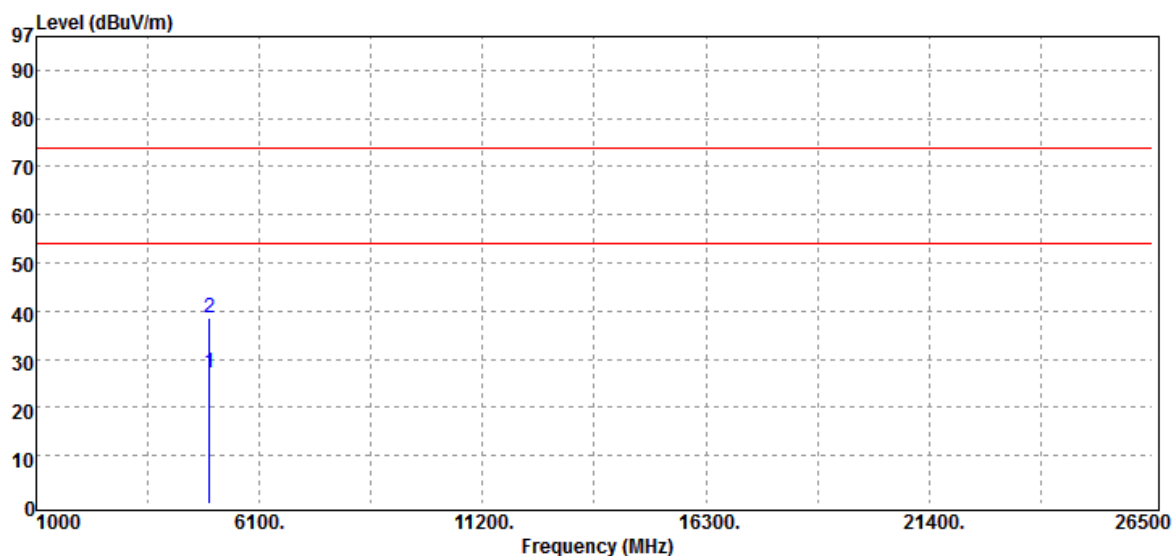


Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4890.00	23.12	3.51	26.63	54.00	-27.37	Average
4890.00	35.00	3.51	38.51	74.00	-35.49	Peak
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	Zigbee High CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Harmonic	Test Date	March 20, 2019
Polarize	Vertical	Test Engineer	Dally Hong
Detector	Peak and Average		

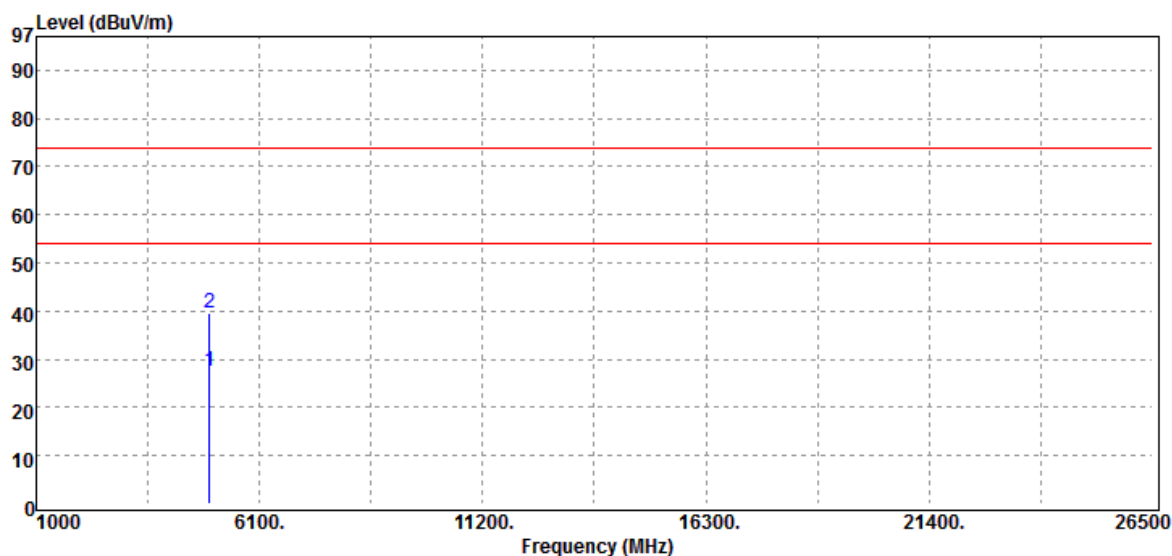


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.00	22.80	4.48	27.28	54.00	-26.72	Average
4960.00	34.23	4.48	38.71	74.00	-35.29	Peak
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Test Mode	Zigbee High CH	Temp/Hum	22(°C)/ 67%RH
Test Item	Harmonic	Test Date	March 20, 2019
Polarize	Horizontal	Test Engineer	Dally Hong
Detector	Peak and Average		



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.00	22.95	4.48	27.43	54.00	-26.57	Average
4960.00	34.96	4.48	39.44	74.00	-34.56	Peak
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

--End of Report--