TEST REPORT

Reference No.	:	WTD15S0323316E
FCC ID	:	2AECRANKR
Applicant	:	Bleon LLC
Address	:	1312 5th Ave.N.,Suite 104 Nashville,TN 37208 USA
Manufacturer	:	Dongguan Longjoin Electronics Co.,LTD
Address	:	Gong Ye Da Dao, Shui Lang Village, Dalingshan Town, Dongguan City, Guangdong Province, China
Product Name	:	ANKR 1
Model No.	:	ANKR Chalk/ANKR Slate
Standards	:	FCC CFR47 Part 15 Section 15.247:2014
Date of Receipt sample	:	Mar.02, 2015
Date of Test	:	Mar.03~Apr.17, 2015
Date of Issue	:	May. 21, 2015
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Compiled by:

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Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.205(a) 15.209(a)	PASS
Conducted Emissions	15.207(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3),(4)	PASS
Power Spectral Density	15.247(e)	PASS
Band Edge	15.247(d)	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

3 Contents

4 General Information

4.1 General Description of E.U.T.

Product Name:	ANKR 1
Model No.:	ANKR Chalk, ANKR Slate
Model Difference:	The different is the color.
Operation Frequency:	2402MHz ~ 2480MHz, separated by 2MHz,40 channels in total
The lowest oscillator:	16 MHz
Type of modulation:	GFSK(BLE only)

4.2 Details of E.U.T.

Technical Data	Batteries DC3V

4.3 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	1	2404	2	2406	3	2408
4	2410	5	2412	6	2414	7	2416
8	2418	9	2420	10	2422	11	2424
12	2426	13	2428	14	2430	15	2432
16	2434	17	2436	18	2438	19	2440
20	2442	21	2444	22	2446	23	2448
24	2450	25	2452	26	2454	27	2456
28	2458	29	2460	30	2462	31	2464
32	2466	33	2468	34	2470	35	2472
36	2474	37	2476	38	2478	39	2480

4.4 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Table 1 Tests Carried Out Under FCC part 15.247

Test mode	Low channel	Middle channel	High channel
Transmitting	2402MHz	2440MHz	2480MHz

Table 2 Tests Carried Out Under FCC part 15.209

Test Item	Test Mode
Radiated Emissions	Communication

4.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

  Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, July 12, 2012.

- **FCC Test Site 1#– Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions Test site 1#(30MHz-25GHz)						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2014	Sep.14,2015
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.19,2014	Apr.18,2015
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2014	Sep.14,2015
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.19,2014	Apr.18,2015
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.19,2014	Apr.18,2015
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2015	Mar.16,2016
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.10,2015	Apr.09,2016
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#(9KHz-30MHz)						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	Sep.15,2014	Sep.14,2015
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.15,2014	Sep.14,2015
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.15,2014	Sep.14,2015
4	Cable	HUBER+SUHNER	CBL2	525178	Sep.15,2014	Sep.14,2015
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2014	Sep.14,2015
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2014	Sep.14,2015
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2014	Sep.14,2015

5.2 Measurement Uncertainty

Parameter	**Uncertainty**

Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Conducted Emissions

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	N/A
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

Remark: This is a battery powered device. This test is not applicable.

7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.4:2003

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

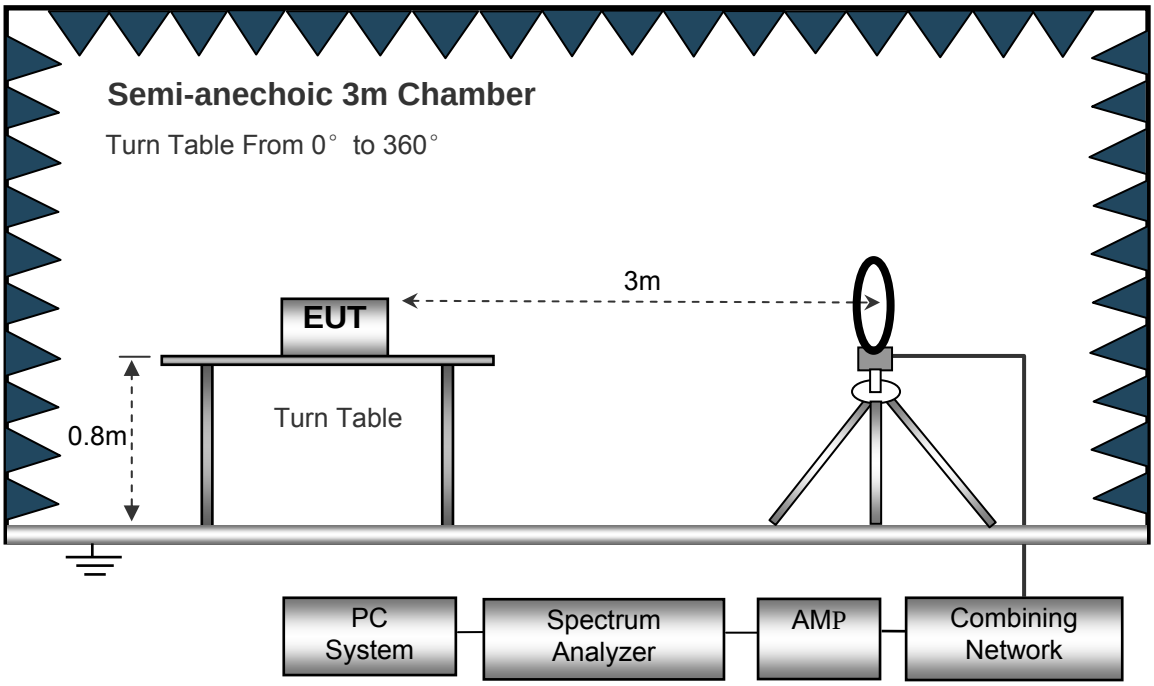
Atmospheric Pressure: 1016 mbar

EUT Operation:

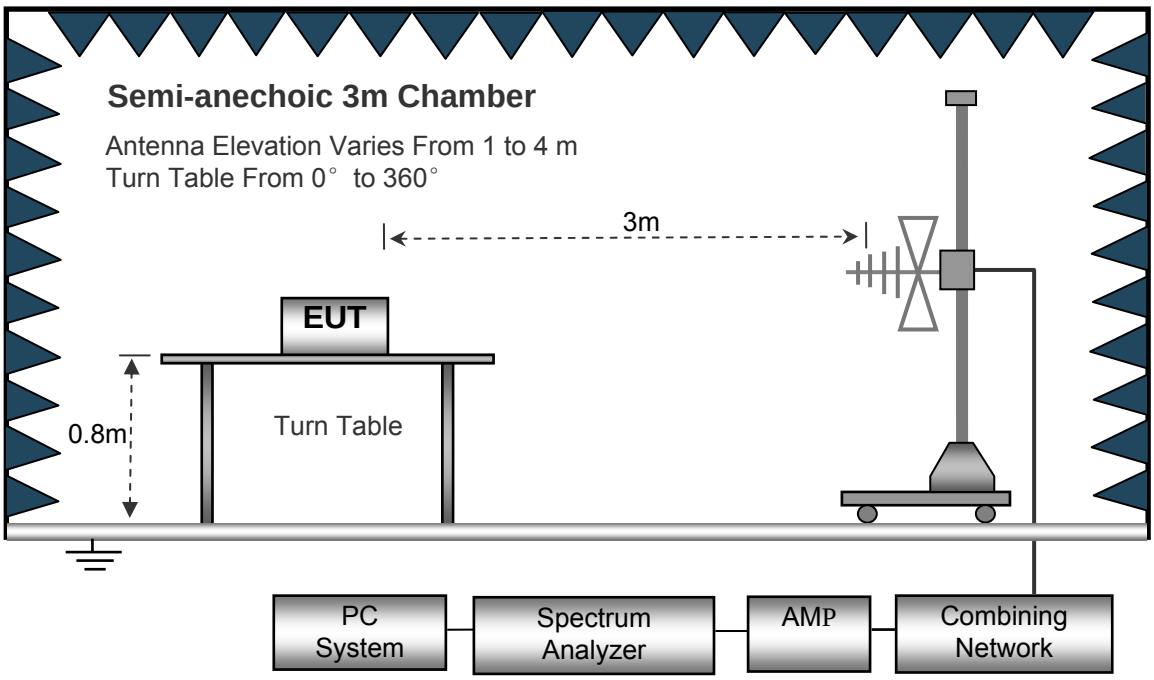
The test was performed in transmitting mode, the test data were shown in the report.

7.2 Test Setup

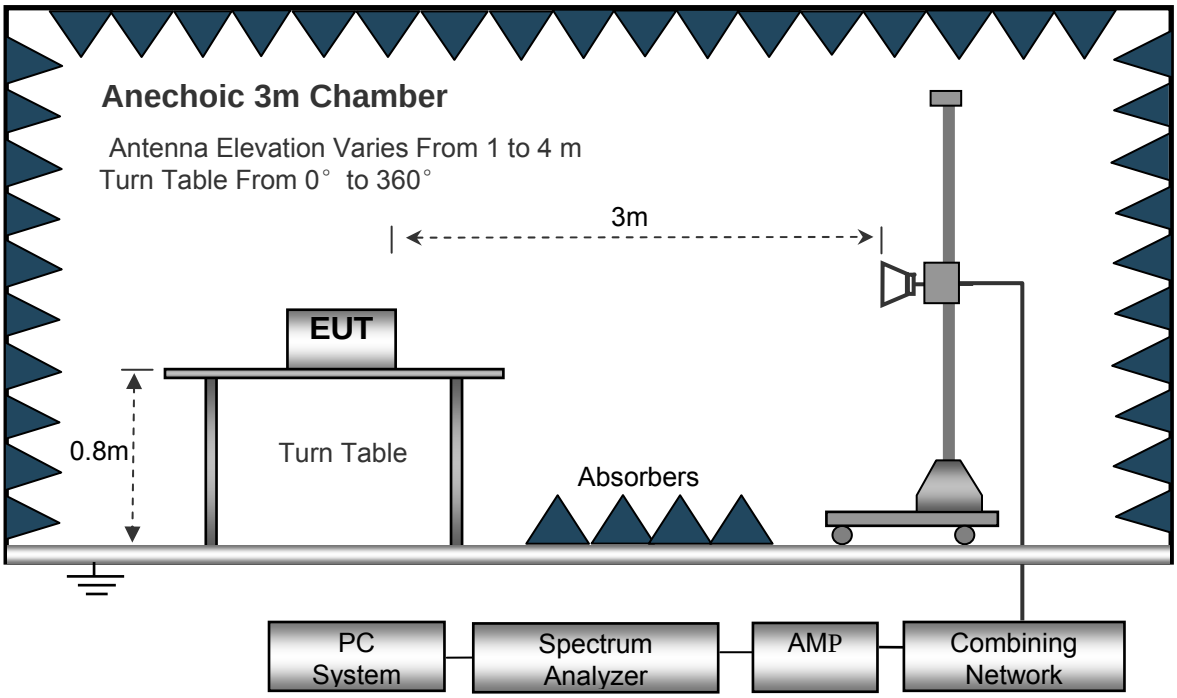
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz

Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.

7.5 Summary of Test Results

Test Frequency: 16MHz~30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 18GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK Low Channel									
175.63	20.68	QP	102	1.4	H	10.55	31.23	43.55	-12.32
175.63	18.19	QP	121	1.5	V	10.55	28.74	43.55	-14.81
4804.00	54.17	PK	56	1.4	V	-1.05	53.12	74.00	-20.88
4804.00	41.32	Ave	56	1.4	V	-1.05	40.27	54.00	-13.73
7206.00	54.23	PK	320	1.5	H	1.33	55.56	74.00	-18.44
7206.00	44.14	Ave	320	1.5	H	1.33	45.47	54.00	-8.53
2316.75	45.79	PK	8	1.2	V	-13.19	32.60	74.00	-41.40
2316.75	37.55	Ave	8	1.2	V	-13.19	24.36	54.00	-29.64
2359.27	44.03	PK	317	1.3	H	-13.15	30.88	74.00	-43.12
2359.27	36.18	Ave	317	1.3	H	-13.15	23.03	54.00	-30.97
2487.66	43.79	PK	311	1.9	V	-13.08	30.71	74.00	-43.29
2487.66	36.32	Ave	311	1.9	V	-13.08	23.24	54.00	-30.76

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK Middle Channel									
175.63	22.10	QP	154	1.7	H	10.55	32.65	43.55	-10.90
175.63	19.29	QP	295	2.0	V	10.55	29.84	43.55	-13.71
4882.00	51.71	PK	80	1.5	V	-0.61	51.10	74.00	-22.90
4882.00	41.29	Ave	80	1.5	V	-0.61	40.68	54.00	-13.32
7323.00	51.74	PK	276	1.2	H	2.23	53.97	74.00	-20.03
7323.00	44.47	Ave	276	1.2	H	2.23	46.70	54.00	-7.30
2344.59	46.58	PK	300	1.3	V	-13.19	33.39	74.00	-40.61
2344.59	37.78	Ave	300	1.3	V	-13.19	24.59	54.00	-29.41
2354.83	42.30	PK	40	1.2	H	-13.15	29.15	74.00	-44.85
2354.83	37.61	Ave	40	1.2	H	-13.15	24.46	54.00	-29.54
2498.18	42.87	PK	234	1.5	V	-13.08	29.79	74.00	-44.21
2498.18	36.24	Ave	234	1.5	V	-13.08	23.16	54.00	-30.84

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK High Channel									
175.63	20.59	QP	196	1.1	H	10.55	31.14	43.55	-12.41
175.63	20.98	QP	168	2.0	V	10.55	31.53	43.55	-12.02
4960.00	54.28	PK	2	1.3	V	-0.24	54.04	74.00	-19.96
4960.00	43.34	Ave	2	1.3	V	-0.24	43.10	54.00	-10.90
7440.00	52.72	PK	106	1.3	H	2.85	55.57	74.00	-18.43
7440.00	43.08	Ave	106	1.3	H	2.85	45.93	54.00	-8.07
2321.03	46.20	PK	153	1.2	V	-13.19	33.01	74.00	-40.99
2321.03	38.84	Ave	153	1.2	V	-13.19	25.65	54.00	-28.35
2378.81	44.36	PK	270	1.9	H	-13.14	31.22	74.00	-42.78
2378.81	38.73	Ave	270	1.9	H	-13.14	25.59	54.00	-28.41
2484.02	42.60	PK	276	1.2	V	-13.07	29.53	74.00	-44.47
2484.02	37.22	Ave	276	1.2	V	-13.07	24.15	54.00	-29.85

Test Frequency: 18GHz~25GHz

The measurements were more than 20 dB below the limit and not reported

8 Band Edge Measurement

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) and 15.205(c).
Test Method:	KDB558074 D01 DTS Meas Guidance v03r02
Test Mode:	Transmitting

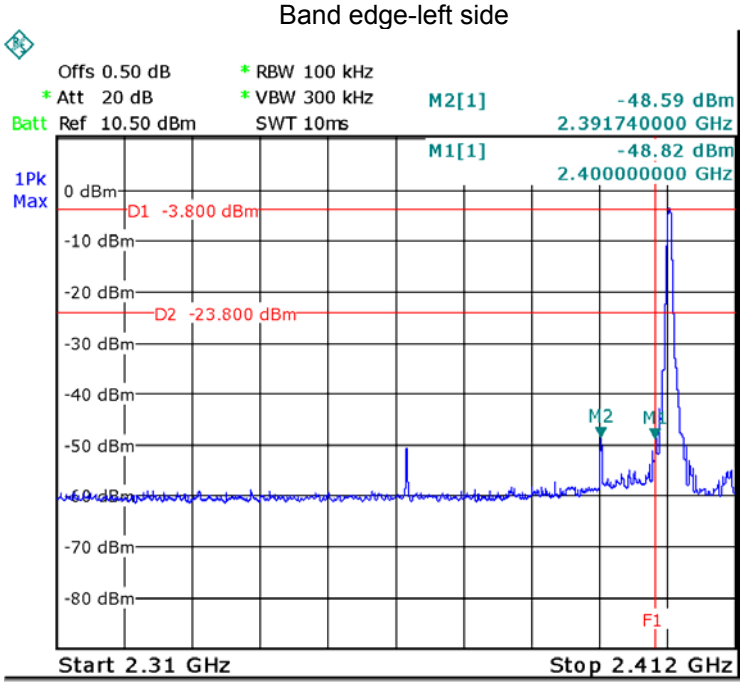
8.1 Test Produce

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto

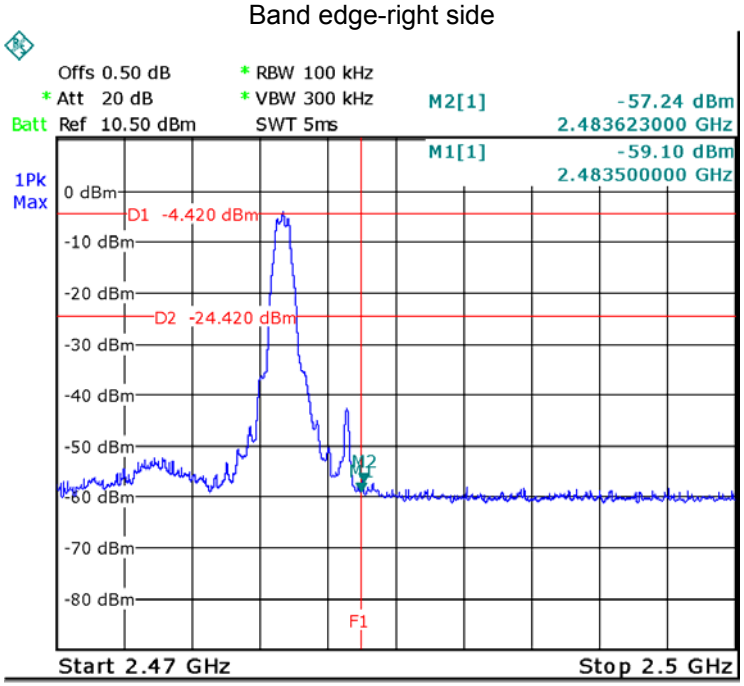
   Detector function = peak, Trace = max hold
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

8.2 Test Result

Band edge-left side



Band edge-right side



9 6 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 DTS Meas Guidance v03r02

9.1 Test Procedure

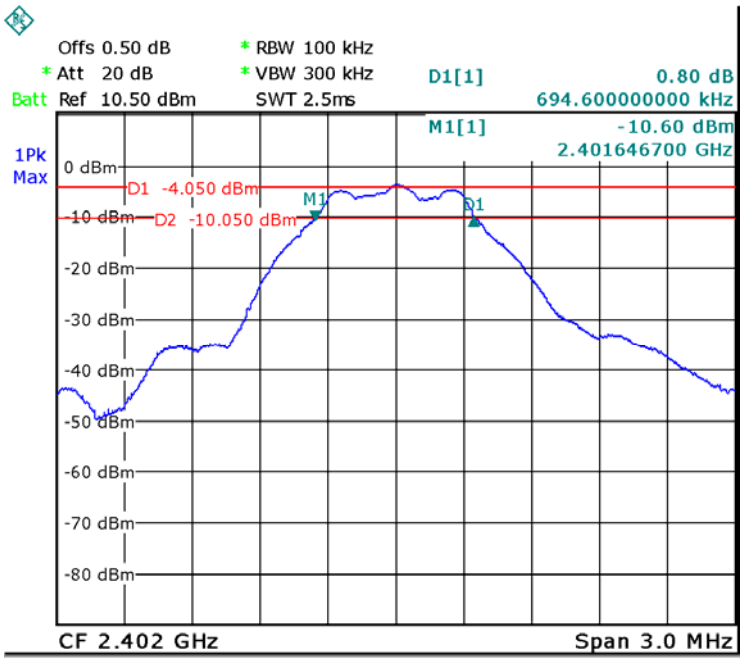
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

9.2 Test Result

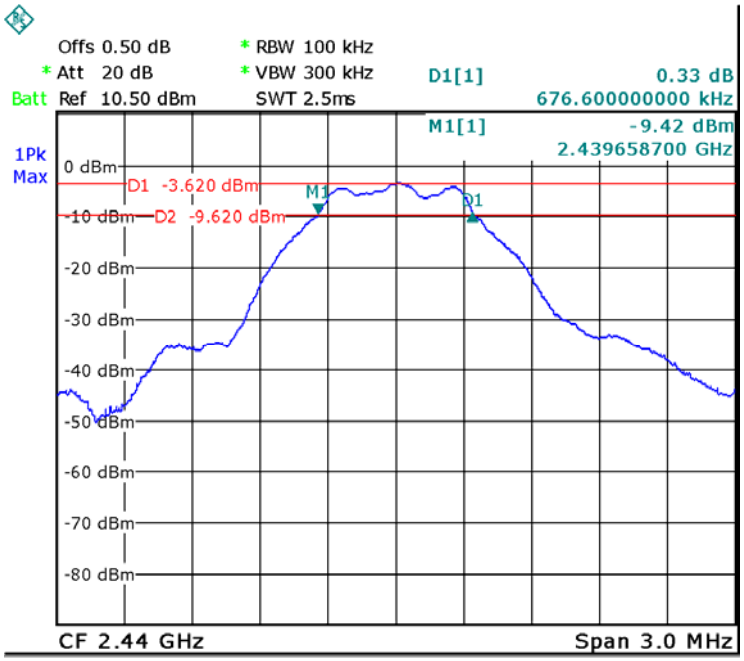
Operation mode	Bandwidth (MHz)
Low channel	0.695
Middle channel	0.677
High channel	0.677

Test result plot as follows:

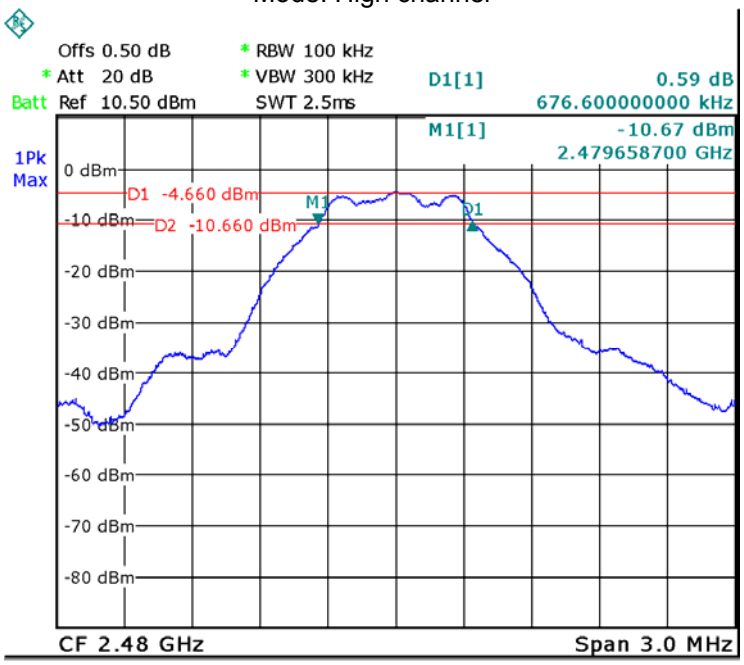
Mode: Low channel



Mode: Middle channel



Mode: High channel



10 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 DTS Meas Guidance v03r02

10.1 Test Procedure

KDB558074 D01 DTS Meas Guidance v03r02 section 8.1.2 Option 2

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

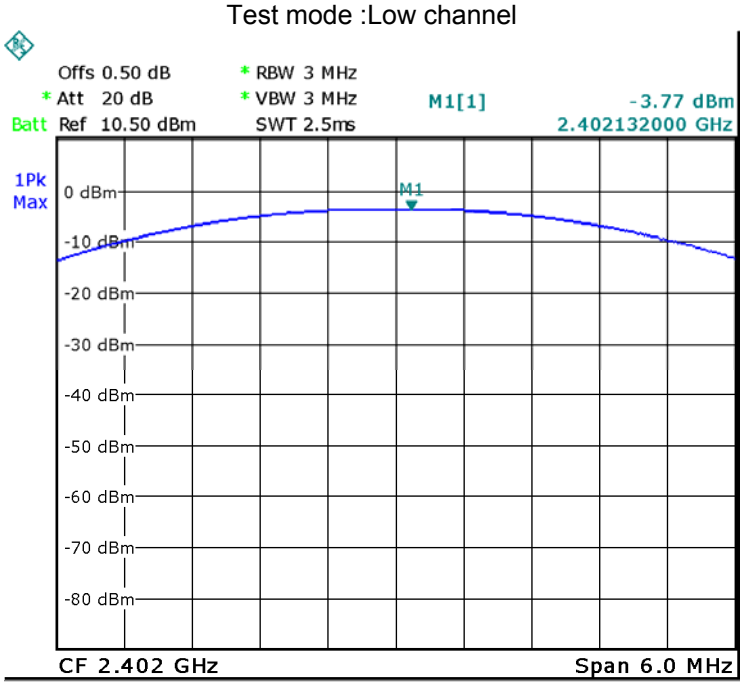
2. Set the spectrum analyzer: RBW = 3MHz. VBW = 3MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the DTS bandwidth.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

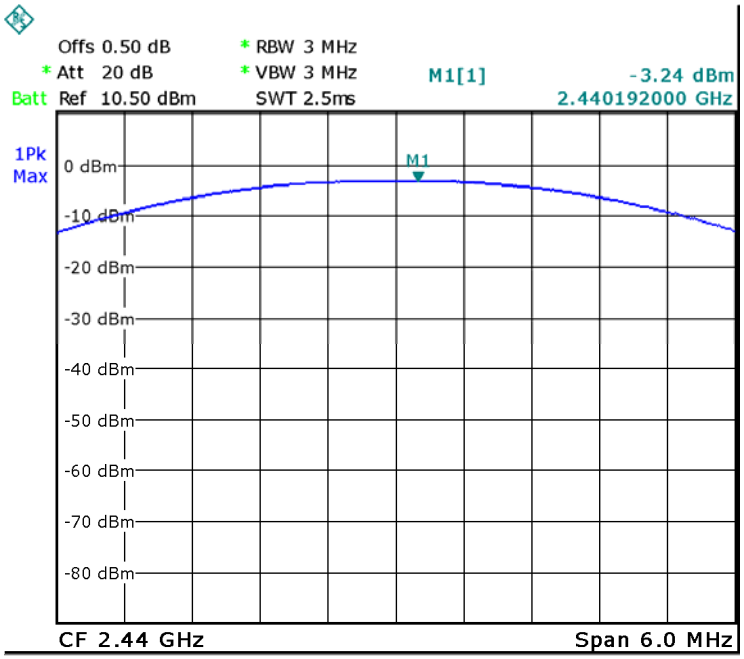
10.2 Test Result

Maximum Peak Output Power (dBm)		
Low channel	Middle channel	High channel
-3.77	-3.24	-4.35
Limit		
1W/30dBm		

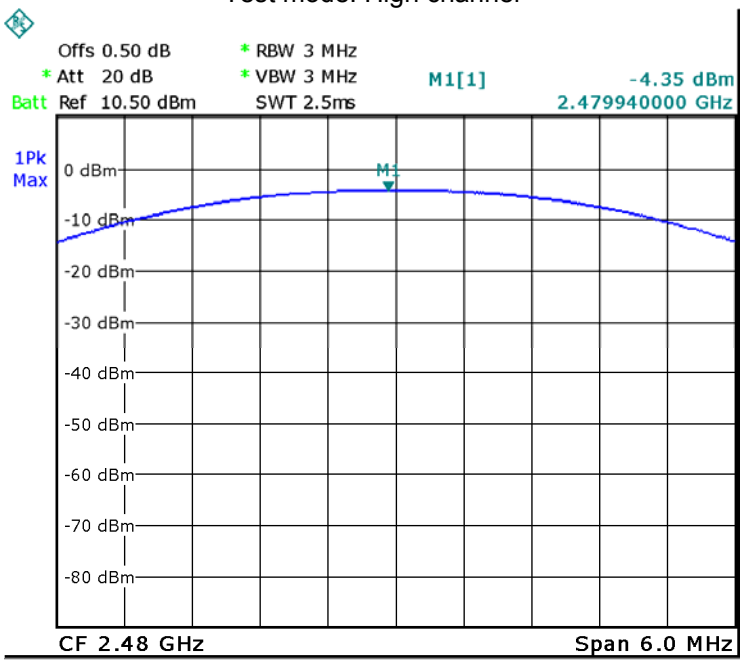
Test mode :Low channel



Test mode :Middle channel



Test mode: High channel



11 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 DTS Meas Guidance v03r02

11.1 Test Procedure

KDB558074 D01 DTS Meas Guidance v03r02 section 9.1 Option 1

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

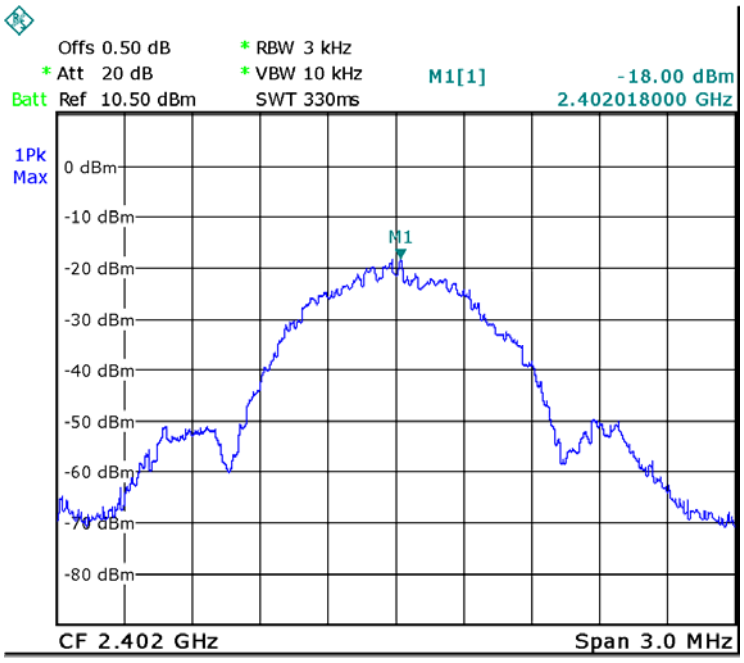
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

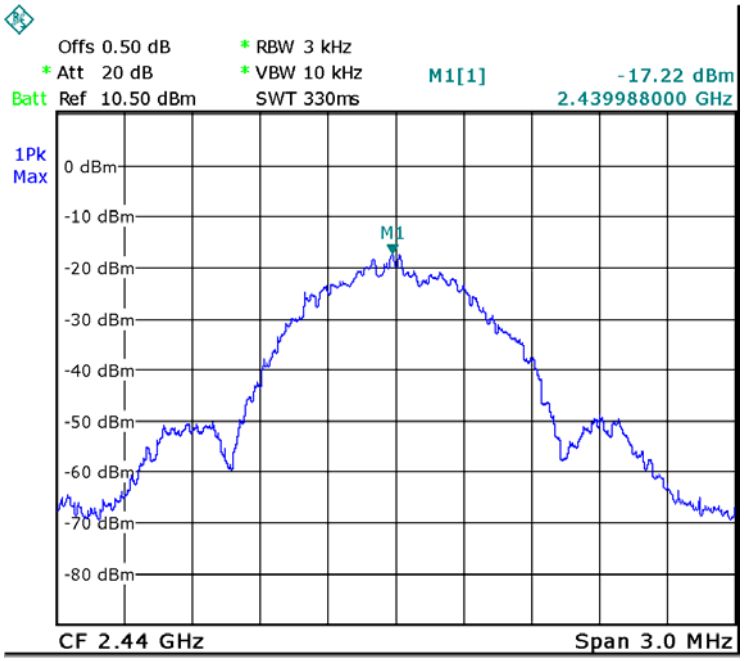
11.2 Test Result

Power Spectral Density		
Low channel	Middle channel	High channel
-18.00	-17.22	-18.11
Limit		
8dBm per 3kHz		

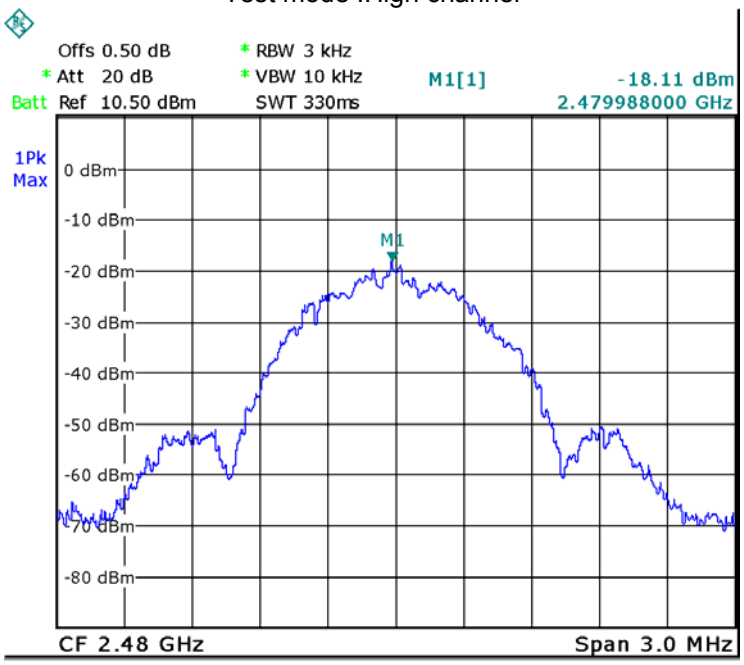
Test mode :Low channel



Test mode : Middle channel



Test mode :High channel



12 Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.This product has a PCB printed antenna, fulfill the requirement of this section.

13 RF Exposure

Test Requirement: FCC Part 2.1093

Test Mode: KDB 447498 D01 General RF Exposure Guidance v05r02

13.1 Requirements

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)] ≤3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR where

1. f(GHz) is the RF channel transmit frequency in GHz
2. Power and distance are rounded to the nearest mW and mm before calculation
3. The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

13.2 The procedures / limit

Conducted Peak power(dBm)	Conducted Peak power(mW)	Source-based time-averaged maximum conducted output power(mW)	Minimum test separation distance required for the exposure conditions (mm)	SAR Test Exclusion Thresholds(mW)
-3.24	0.47	0.47	5	10

Remark: Max. duty factor is 100%

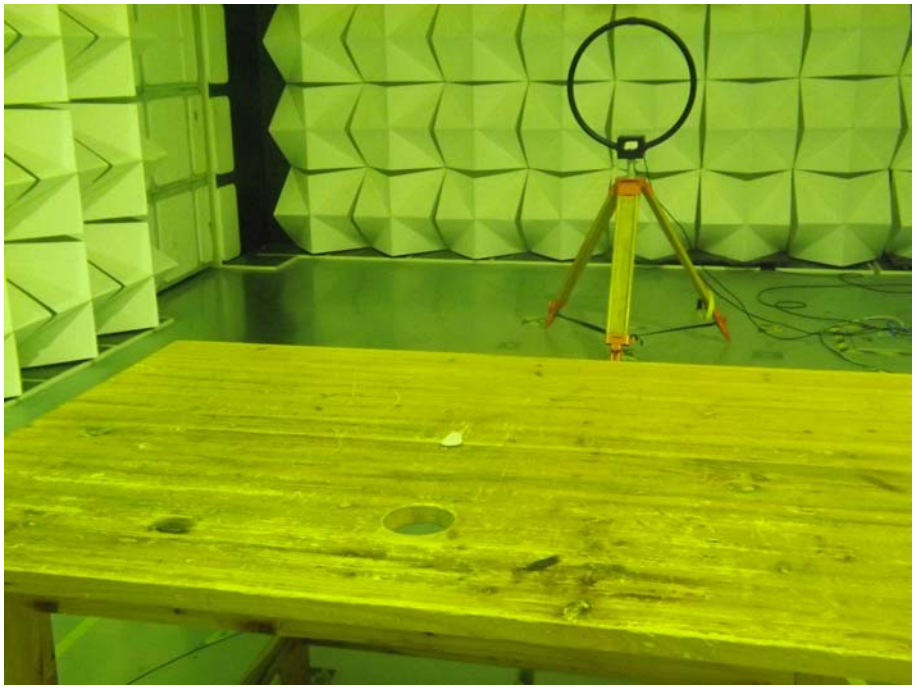
Calculation formula: Source-based time-averaged maximum conducted output power(mW) =Conducted peak power(mW)*Duty factor

Duty factor is 100%.

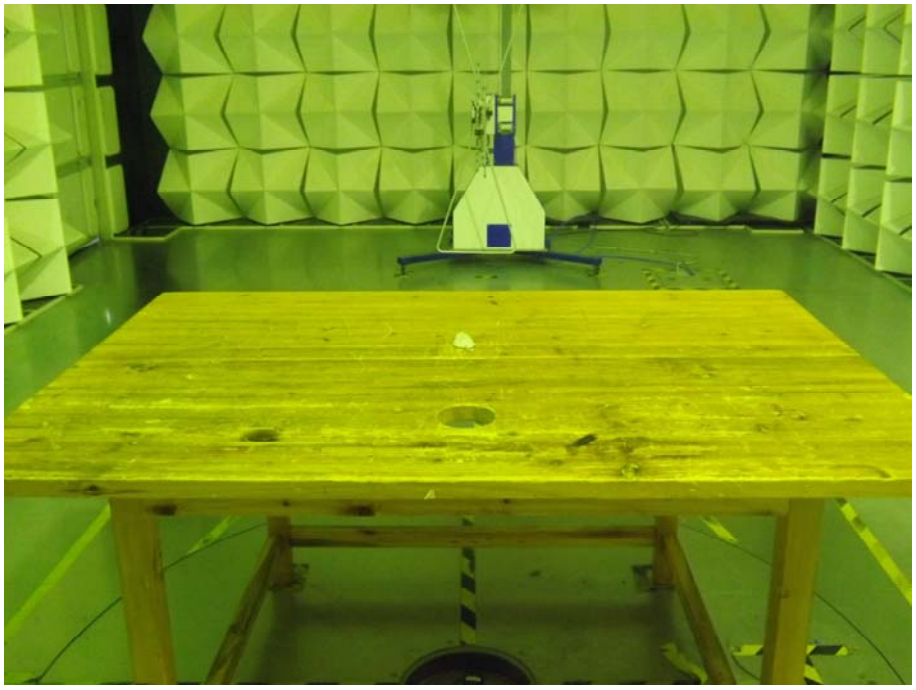
14 Photographs – Model ANKR Chalk Test Setup

14.1 Radiated Emission

Test frequency Below 30MHz Test Site 2#



Test frequency from 30MHz to 1GHz Test Site 2#



Test frequency above 1GHz Test Site 1#

15 Photographs - Constructional Details

15.1 External View

ANKR Slate


61
62
63
64
65
66
67
68
69
70
1cm
2
3
4
5
6
7
8
9


61
62
63
64
65
66
67
68
69
70
1cm
2
3
4
5
6
7
8
9


61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8


61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8

ANKR Chalk


61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8 9 10


61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8 9 10


61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8 9 10 11


61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8 9

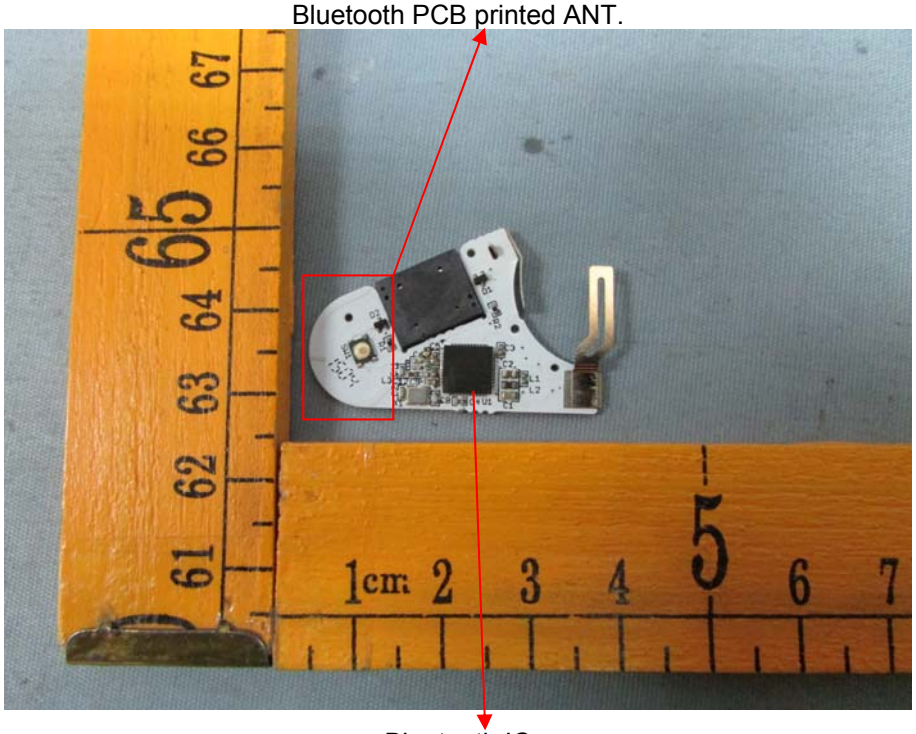

61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8


61 62 63 64 65 66 67 68 69 70
1cm 2 3 4 5 6 7 8

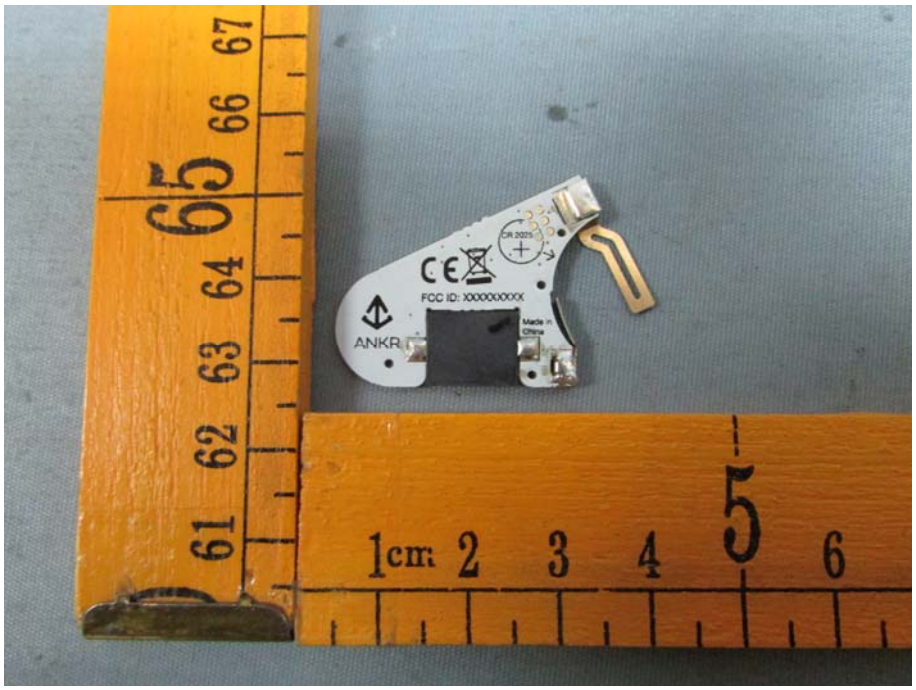
15.2 MInternal View

ANKR Slate

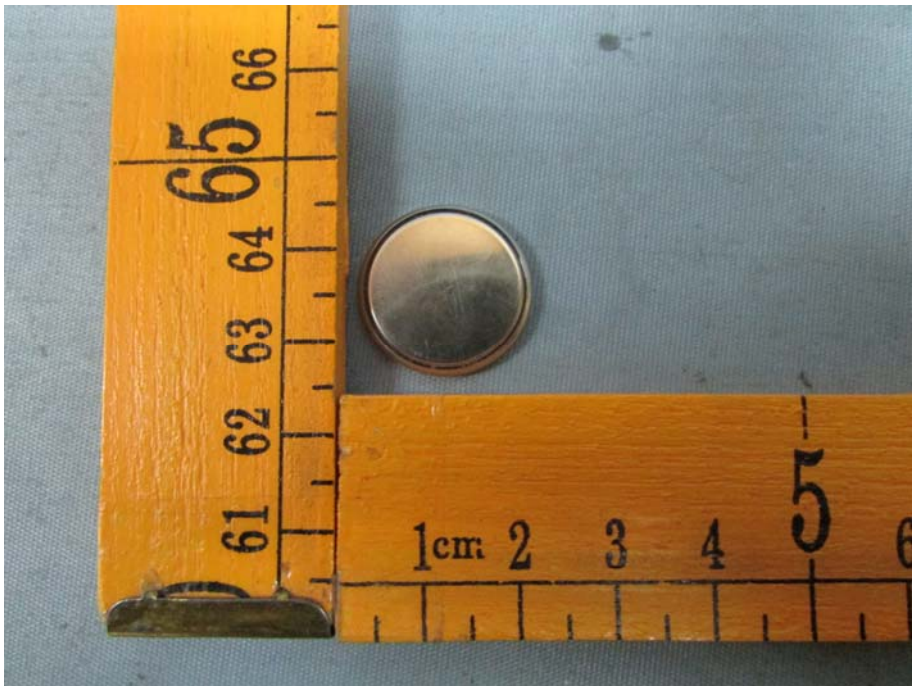
Bluetooth PCB printed ANT.



Bluetooth IC


CR 2025
FCC ID: XXXXXXXXX
ANKR
Made in China
1cm 2 3 4 5 6
61 62 63 64 65 66 67


maxell
CR2025
3V
Hitachi Maxell, Ltd. Japan
1cm 2 3 4 5 6
61 62 63 64 65 66 67



======End of Report======