FCC Test Report

Product Name	:	freeRAN IoT Base Station
Brand Name	:	UBIIK
Model No.	:	BS1AL-EO9100-US
FCC ID	:	2AXTDBS1ALEO9100US
Applicant	:	Ubiik Inc.
Address	:	19F., No. 17, Sec. 1, Chengde Rd., Datong Dist., Taipei City 103, Taiwan (R.O.C.)
Date of Receipt	:	Dec. 21, 2022
Issued Date	:	Mar. 29, 2023
Report No.	:	22C0676R-RFUSV01S-A
Report Version	:	V3.0

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.
This report must not be used to claim product endorsement by TAF or any agency of the government.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Product Name	:	freeRAN IoT Base Station
Applicant	:	Ubiik Inc.
Address	:	19F., No. 17, Sec. 1, Chengde Rd., Datong Dist., Taipei City 103, Taiwan (R.O.C.)
Manufacturer	:	Ubiik Inc.
Address	:	19F., No. 17, Sec. 1, Chengde Rd., Datong Dist., Taipei City 103, Taiwan (R.O.C.)
Brand Name	:	UBIIK
Model No.	:	BS1AL-EO9100-US
FCC ID	:	2AXTDBS1ALEO9100US
EUT Voltage	:	DC 56V (PoE)
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10: 2013
Laboratory Name	:	DEKRA Testing and Certification Co., Ltd. Hsin Chu Laboratory
Address	:	No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan, R.O.C.
Test Result	:	Complied

Documented By : Hailey Peng

(Hailey Peng / Senior Engineer)

Approved By : Rueyyan Lin

(Rueyyan Lin / Supervisor)

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of DEKRA Testing and Certification Co., Ltd.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	Mar. 03, 2023
V2.0	1. Changing the FCC ID to “2AXTDBS1ALEO9100US”. 2. Changing the antenna model numbers of 926.3 MHz to “C1991-690054-A(SRF2023215) and C1991-690053-A(SRF2023215)”. 3. Changing the antenna gain of 926.3 MHz Antenna 1 to “1.20 dBi”.	Mar. 15, 2023
V3.0	Update section 1.1 926.3 MHz antenna description.	Mar. 29, 2023

TABLE OF CONTENTS

1. General Information

1.1 EUT Description

Product Name	freeRAN IoT Base Station
Brand Name	UBIIK
Model No.	BS1AL-EO9100-US
Frequency	926.3 MHz
Channel Number	1 Channel
Type of Modulation	OFDMA 16QAM

Accessories Information				
No.	Equipment Name	Brand Name	Model No.	Rating
1	PoE	PHIHONG	POE60U-BTA	INPUT: AC 100~240V, 1.5A, 50~60Hz OUTPUT 1: DC 56V, 0.535A, 30W PIN 3,6 + PIN 1,2 Return OUTPUT 2: DC 56V, 0.535A, 30W PIN 4,5 + PIN 7,8 Return
No.	Equipment Name	Description		
2	Power Cable	Non-Shielded, 1.8m		

For 926.3 MHz Function:

Antenna Information				
Ant.	Brand Name	Model No.	Type	Gain (dBi)
0	M.gear	C1991-690054-A(SRF2023215)	Dipole	2.65
1	M.gear	C1991-690053-A(SRF2023215)	Dipole	1.20

The EUT supports the 1TX/1RX function.

Since antenna 0 and antenna 1 are of the same type, choose antenna 0 with higher gain for testing.

For WWAN Function:

Antenna Information						
Ant.	Brand Name	Model No.	Type	Gain (dBi)		
				LTE Band 2	LTE Band 4	LTE Band 13
0	Grand-Tek	OA-LTEWB-035-C0-UB	OMNI	1.8	0.6	1.4

For GNSS Function:

Antenna Information				
Ant.	Brand Name	Model No.	Type	Gain (dBi)
0	Jinchang	JCA225-N	RHCP	5

EUT Operational Condition	
Testing Voltage	AC 120V/60Hz

Working Frequency of Each Channel	
Channel	Frequency
01	926.3 MHz

Note: The above EUT information is declared by the manufacturer.

1.2 Test Mode

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Test Mode	Mode 1: Transmit

Test Items	Test Mode	Modulation	Result
AC Power Line Conducted Emission	Mode 1	OFDMA 16QAM	Pass
Maximum Conducted Output Power	Mode 1	OFDMA 16QAM	Pass
Radiated Emission	Mode 1	OFDMA 16QAM	Pass
Antenna Port Conducted Emission	Mode 1	OFDMA 16QAM	Pass
Radiated Emission Band Edge	Mode 1	OFDMA 16QAM	Pass
Occupied Bandwidth & DTS Bandwidth	Mode 1	OFDMA 16QAM	Pass
Maximum Power Spectral Density	Mode 1	OFDMA 16QAM	Pass

Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The EUT contains a WWAN module (brand name: UBIIK, model: RC7611-1, FCC ID: 2AXTDRC76B).
3. The EUT could be applied with 926.3 MHz + WWAN LTE function; therefore Co-location Maximum Permissible Exposure (Please refer to DEKRA Report No.: 22C0676R-RFUSV17S-A) and Radiated Emission Co-location (Please refer to Appendix A) tests are added for simultaneously transmit with 926.3 MHz + WWAN LTE function.

1.3 Comments and Remarks

The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

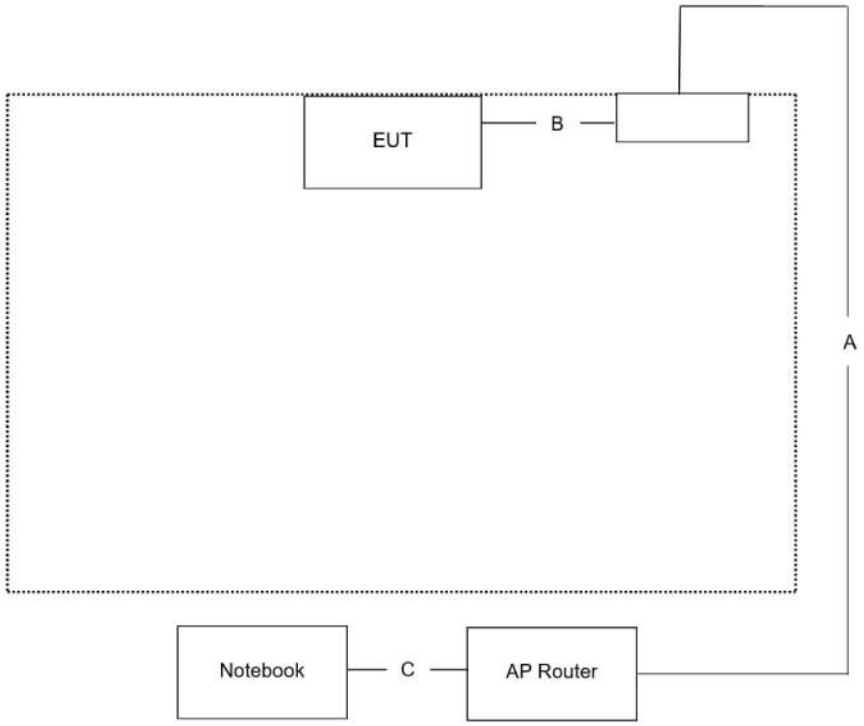
1.4 Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system.

	Product	Manufacturer	Model No.	Serial No.
1	Notebook	DELL	Latitude E6320	8208580717
2	AP Router	ASUS	AX88	N/A

1.5 Configuration of tested System

Connection Diagram



	Signal Cable Type	Signal cable Description
A	Ethernet Cable	Non-Shielded, 10m
B	Ethernet Cable	Non-Shielded, 3m
C	Ethernet Cable	Non-Shielded, 2.5m

1.6 EUT Operation of during Test

1	Execute control command by software “TeraTerm v4.75”.
2	Configure the test mode, the test channel, and the data rate.
3	Press “Start TX” to start the continuous transmitting.
4	Verify that the EUT works properly.

1.7 Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Actually	Tested by	Test Date	Test Site
Temperature (°C)	AC power Line Conducted Emission	21	Cyril Chen	2023/02/01	HC-SR02
Humidity (%RH)		59			
Temperature (°C)	Maximum Peak Conducted Output Power	20	Clemens Fang	2023/02/01	HC-SR12
Humidity (%RH)		64			
Temperature (°C)	Radiated Emission	20.1 ~ 21	Scott Chang	2023/02/01 ~ 2023/02/15	HC-CB04
Humidity (%RH)		56 ~ 62			
Temperature (°C)	Antenna Port Conducted Emission	20	Clemens Fang	2023/02/01	HC-SR12
Humidity (%RH)		64			
Temperature (°C)	Radiated Emission Band Edge	21	Scott Chang	2023/02/01	HC-CB04
Humidity (%RH)		62			
Temperature (°C)	Occupied Bandwidth & DTS Bandwidth	20	Clemens Fang	2023/02/01	HC-SR12
Humidity (%RH)		64			
Temperature (°C)	Maximum Power Spectral Density	20	Clemens Fang	2023/02/01	HC-SR12
Humidity (%RH)		64			

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA	**:**	**FCC Registration Number: TW3024**
Canada	**:**	**CAB identifier : TW3024**

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-582-8001 2. +886-3-582-8001
Fax number	1. +886-3-582-8958 2. +886-3-582-8958
Email address	info.tw@dekra.com
Website	http://www.dekra.com.tw
Note: Test site number for address 1 includes HC-SR02. Test site number for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.	

1.8 List of Test Equipment

HC-SR02

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2022/12/19	2023/12/18
EMI Test Receiver	R&S	ESR3	102608	2022/05/30	2023/05/29
LISN	R&S	ENV216	100092	2022/04/29	2023/04/28
Coaxial Cable(9m)	Harbour	RG-400	HC-SR02	2022/08/15	2023/08/14
DEKRA Testing System	DEKRA	Version 2.0	HC-SR02	N/A	N/A

HC-SR12

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2022/11/02	2023/11/01
Pulse Power Sensor	Anritsu	MA2411B	1531043	2022/11/02	2023/11/01
Pulse Power Sensor	Anritsu	MA2411B	1531044	2022/11/02	2023/11/01
Signal and Spectrum Analyzer	R&S	FSVA40	101435	2022/05/30	2023/05/29

HC-CB04

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2022/09/29	2023/09/28
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1209	2022/06/14	2023/06/13
Double Ridged Horn Antenna	RF SPIN	DRH18-E	211212A18EN	2022/11/15	2023/11/14
Pre-Amplifier	EMCI	EMC01820I	980364	2022/06/10	2023/06/09
Pre-Amplifier	EMEC	EM01G18GA	060835	2022/07/04	2023/07/03
EMI Test Receiver	R&S	ESR7	102260	2022/12/01	2023/11/30
Magnetic Loop Antenna	Teseq	HLA 6121	44287	2022/10/21	2023/10/20
Coaxial Cable(10m)	Suhner	SF102_SF104	HC-CB04	2022/08/08	2023/08/07
Radiated Software	AUDIX	e3 V9	HC-CB04_1	N/A	N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

1.9 Measurement Uncertainty

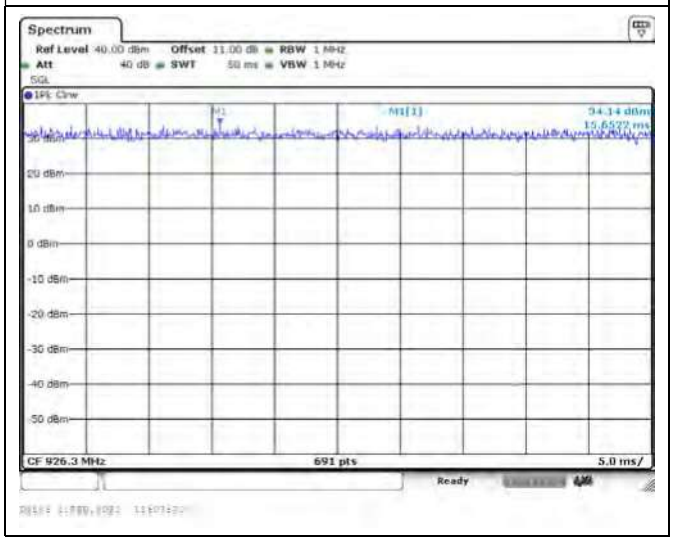
Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2).

Test item	Uncertainty
AC Power Line Conducted Emission	± 2.34 dB
Maximum Conducted Output Power	± 1.16 dB
Radiated Emission	± 3.52 dB below 1 GHz ± 3.56 dB above 1 GHz
Antenna Port Conducted Emission	± 2.47 dB
Radiated Emission Band Edge	± 3.52 dB
Occupied Bandwidth & DTS Bandwidth	± 282.55 Hz
Maximum Power Spectral Density	± 2.47 dB

1.10 Duty Cycle

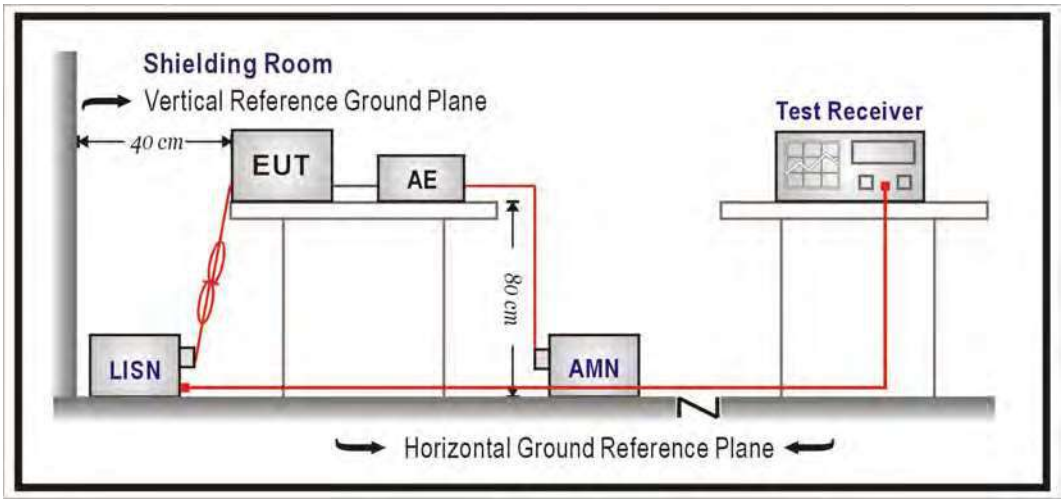
Duty cycle of test signal is ≥ 98 %, duty factor is not required.

926.3 MHz



2. AC Power Line Conducted Emission

2.1 Test Setup



2.2 Test Limit

Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3 Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/50 uH coupling impedance with 50 ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.

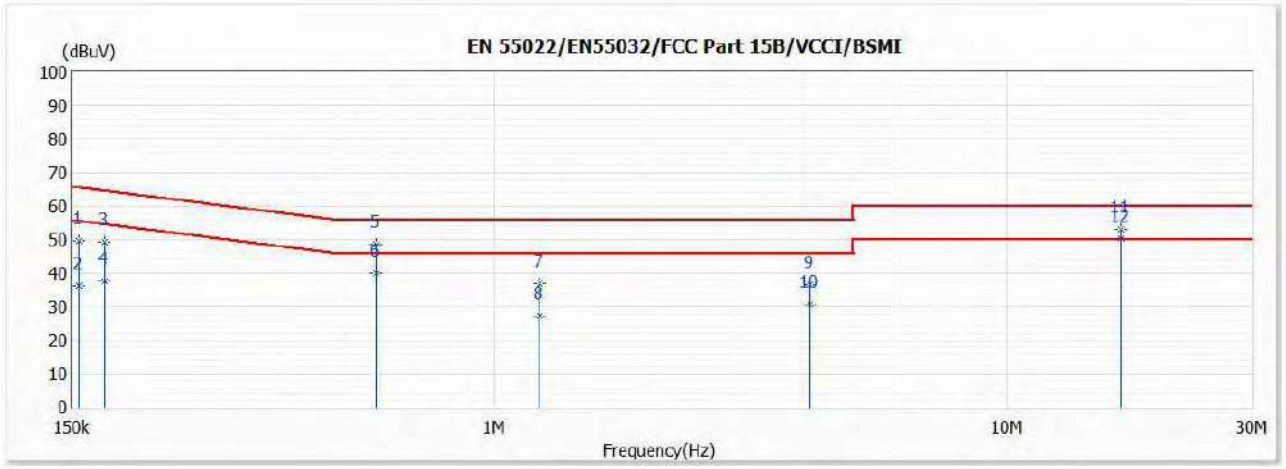
AC Power Line Conducted Emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

2.4 Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207.

2.5 Test Result of AC Power Line Conducted Emission

Test Condition	926.3 MHz	Phase	Line

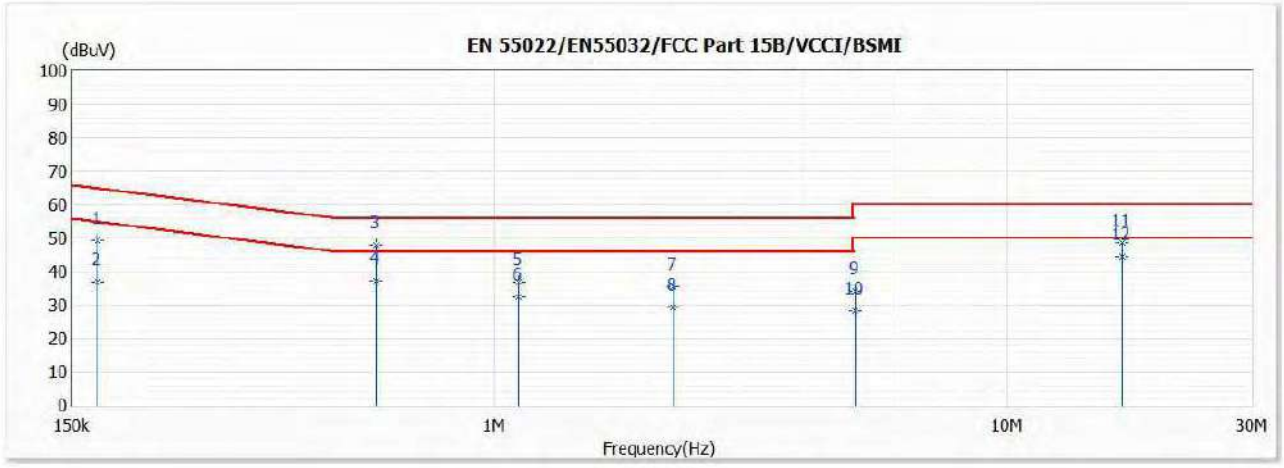


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.155	49.80	65.73	-15.93	40.16	9.64	QP
2	0.155	36.14	55.73	-19.59	26.50	9.64	AV
3	0.173	49.30	64.80	-15.50	39.66	9.64	QP
4	0.173	37.55	54.80	-17.25	27.91	9.64	AV
5	0.587	48.60	56.00	-7.40	38.92	9.68	QP
6	0.587	39.86	46.00	-6.14	30.18	9.68	AV
7	1.224	37.02	56.00	-18.98	27.29	9.73	QP
8	1.224	27.40	46.00	-18.60	17.67	9.73	AV
9	4.128	36.45	56.00	-19.55	26.58	9.87	QP
10	4.128	30.69	46.00	-15.31	20.82	9.87	AV
11	16.670	53.21	60.00	-6.79	42.98	10.23	QP
*12	16.670	49.88	50.00	-0.12	39.65	10.23	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Test Condition	926.3 MHz	Phase	Neutral



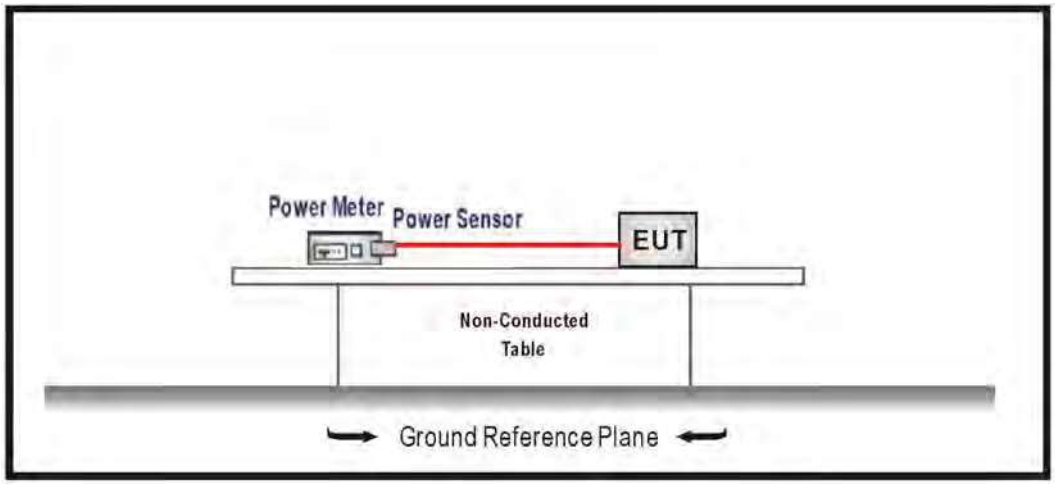
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.168	49.15	65.05	-15.90	39.52	9.63	QP
2	0.168	36.77	55.05	-18.28	27.14	9.63	AV
3	0.589	47.90	56.00	-8.10	38.23	9.67	QP
4	0.589	37.41	46.00	-8.59	27.74	9.67	AV
5	1.112	36.80	56.00	-19.20	27.08	9.72	QP
6	1.112	32.44	46.00	-13.56	22.72	9.72	AV
7	2.228	35.57	56.00	-20.43	25.79	9.78	QP
8	2.228	29.25	46.00	-16.75	19.47	9.78	AV
9	5.060	34.05	60.00	-25.95	24.14	9.91	QP
10	5.060	28.33	50.00	-21.67	18.42	9.91	AV
11	16.760	48.48	60.00	-11.52	38.18	10.30	QP
*12	16.760	44.56	50.00	-5.44	34.26	10.30	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

3. Maximum Conducted Output Power

3.1 Test Setup



3.2 Test Limit

The Maximum Conducted Output Power shall be less 1 Watt.

3.3 Test procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB 558074 D01 v05r02 for compliance to FCC 47CFR 15.247 requirements.

3.4 Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

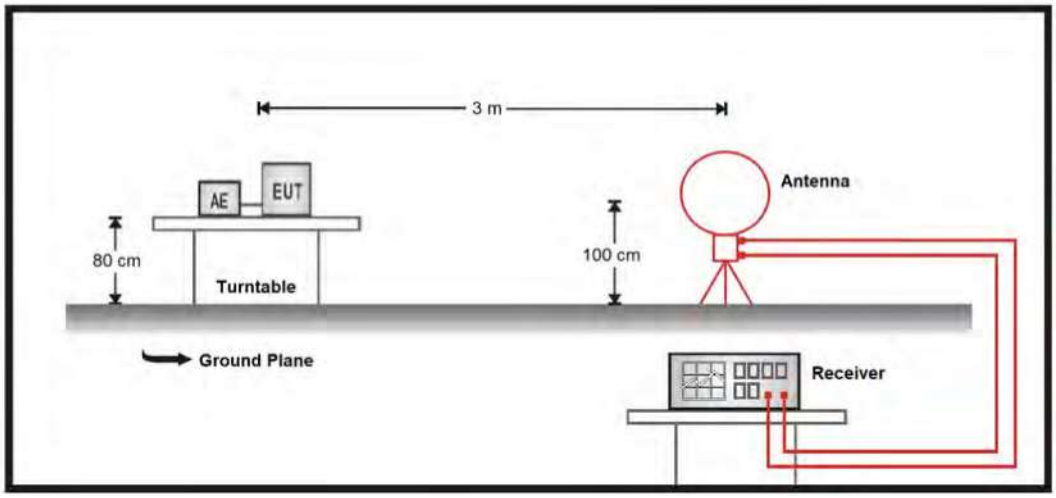
3.5 Test Result of Maximum Conducted Output Power

Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
926.3	29.48	≦30.00	Pass

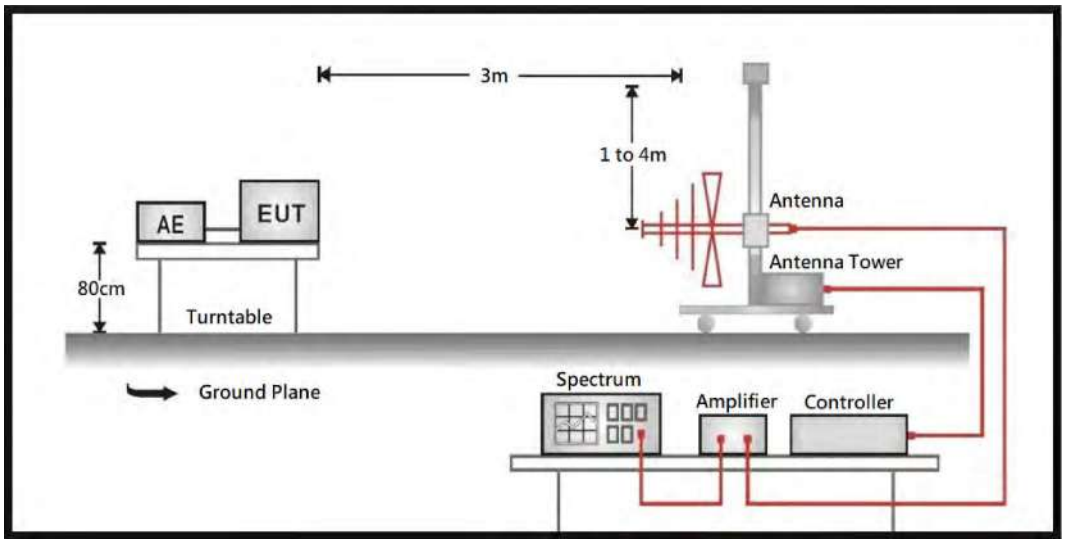
4. Radiated Emission

4.1 Test Setup

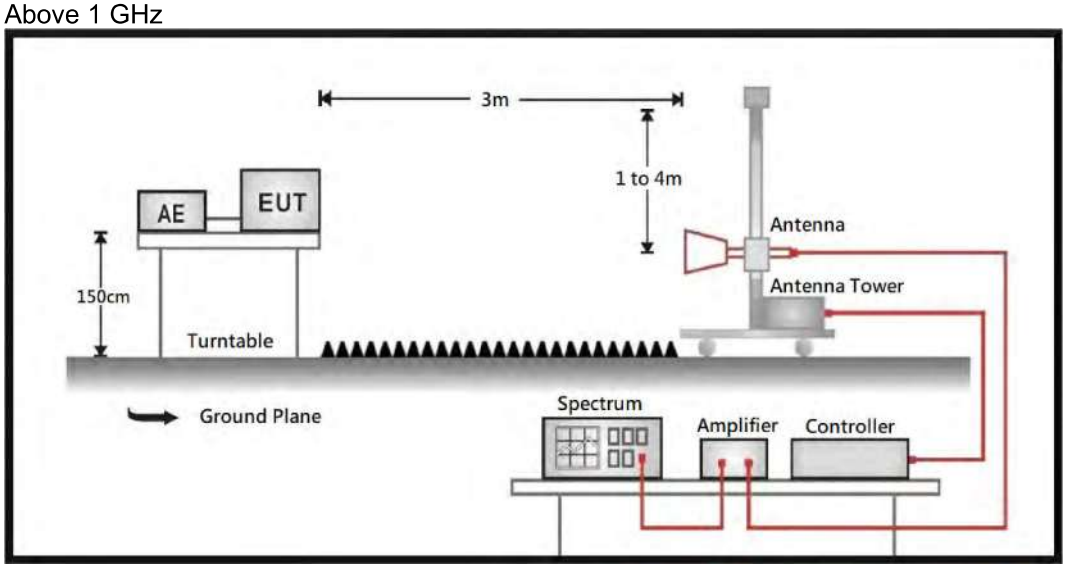
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



4.2 Test Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20 dB below the level of the fundamental or to the general radiated emission limit in paragraph 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	20 log (2400/F(kHz))	300
0.490 – 1.705	24000/F(kHz)	20 log (24000/F(kHz))	30
1.705 - 30	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Remarks:

1. Field strength (dBuV/m) = 20 log Field strength (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

4.3 Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB 558074 D01V05r02 for compliance to FCC 47CFR 15.247 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

On any frequency or frequencies form 9 kHz(inculde The the lowest oscillator frequency generated within the device up to the 10th harmonic) to 1000 MHz, the limit shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limit shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

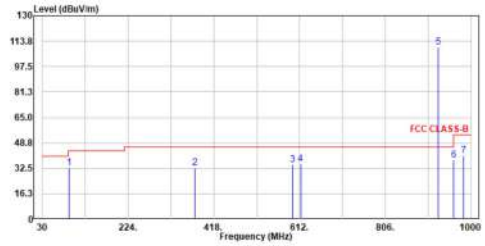
The bandwidth below 1 GHz setting on the field strength meter is 120 kHz and above 1 GHz is 1MHz.

4.4 Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

4.5 Test Result of Radiated Emissions (30 MHz ~ 1 GHz)

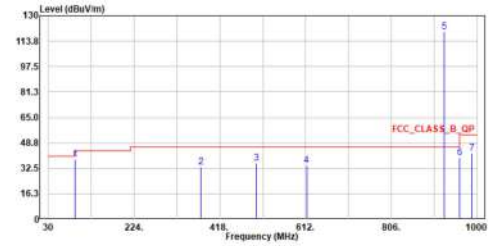
Site :HC-CB04
Condition :3m Horizontal
Mode :TX_926.3MHz
Test By :scott



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	90.625	32.66	43.50	-10.84	41.36	-8.70	QP
2	374.835	32.66	46.00	-13.34	33.11	-0.45	QP
3	595.995	34.64	46.00	-11.36	29.64	5.00	QP
4	614.000	35.16	46.00	-10.84	29.93	5.23	QP
5	925.795	110.02	------	------	100.50	9.52	QP
6	960.000	37.96	46.00	-8.04	27.91	10.05	QP
7	983.510	40.93	54.00	-13.07	30.88	10.05	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Vertical
Mode :TX_926.3MHz
Test By :scott

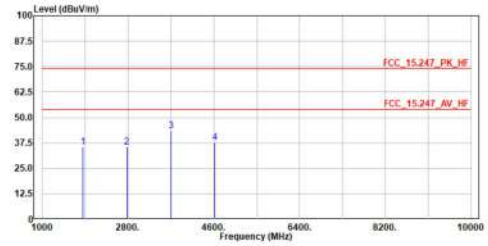


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	90.625	38.05	43.50	-5.45	46.75	-8.70	QP
2	374.835	33.20	46.00	-12.80	33.65	-0.45	QP
3	499.965	35.75	46.00	-10.25	33.16	2.59	QP
4	614.000	34.45	46.00	-11.55	29.22	5.23	QP
5	926.280	119.82	------	------	110.30	9.52	QP
6	960.000	39.22	46.00	-6.78	29.17	10.05	QP
7	988.360	42.03	54.00	-11.97	31.89	10.14	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.
5. The other emission levels were very low against the limit.

4.6 Test Result of Radiated Emissions (1 GHz ~ 10th Harmonic)

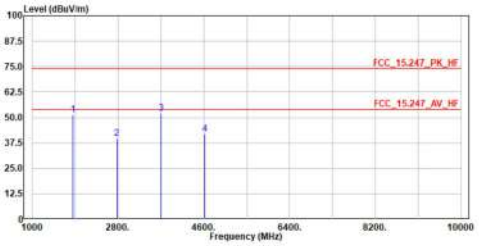
Site :HC-CB04
Condition :3m ,Horizontal
Mode :TX_926.3MHz
Test By :scott



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	1852.600	35.41	74.00	-38.59	59.78	-24.37	Peak
2	2778.900	35.65	74.00	-38.35	57.28	-21.63	Peak
3	3705.200	43.33	74.00	-30.67	62.47	-19.14	Peak
4	4631.500	37.70	74.00	-36.30	54.25	-16.55	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m ,Vertical
Mode :TX_926.3MHz
Test By :scott

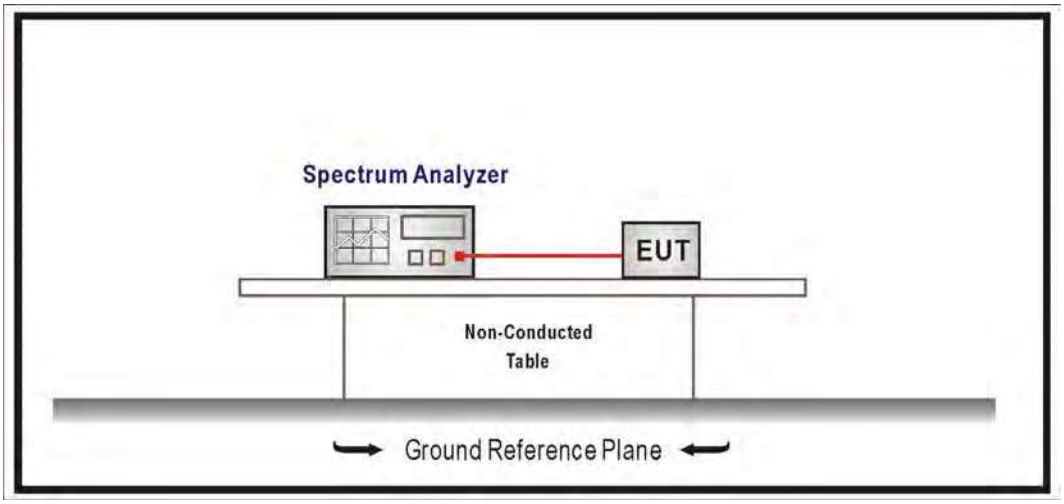


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	1852.600	51.20	74.00	-22.80	75.27	-24.07	Peak
2	2778.900	39.68	74.00	-34.32	60.61	-20.93	Peak
3	3705.200	52.25	74.00	-21.75	71.72	-19.47	Peak
4	4631.500	41.74	74.00	-32.26	59.04	-17.30	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

5. Antenna Port Conducted Emission

5.1 Test Setup



5.2 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limit. If the transmitter complies with the conducted power limit 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. Attenuation below the general limit specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limit specified in §15.209(a) (see §15.205(c)).

5.3 Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB 558074 D01 V05r02 for compliance to FCC 47CFR 15.247 requirements.

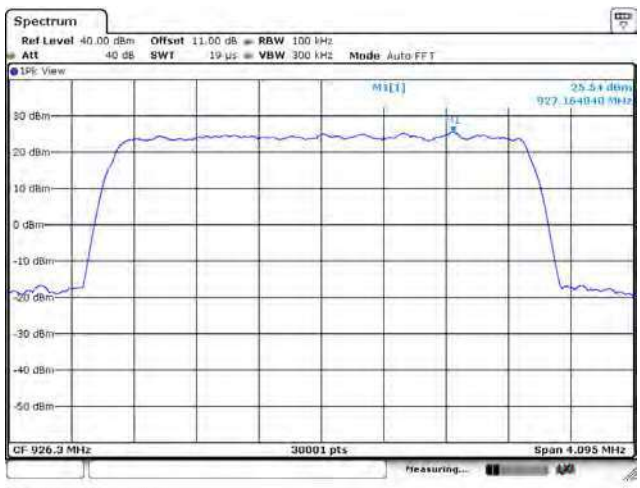
Set RBW = 100 kHz, Set VBW> RBW, scan up through 10^{th} harmonic.

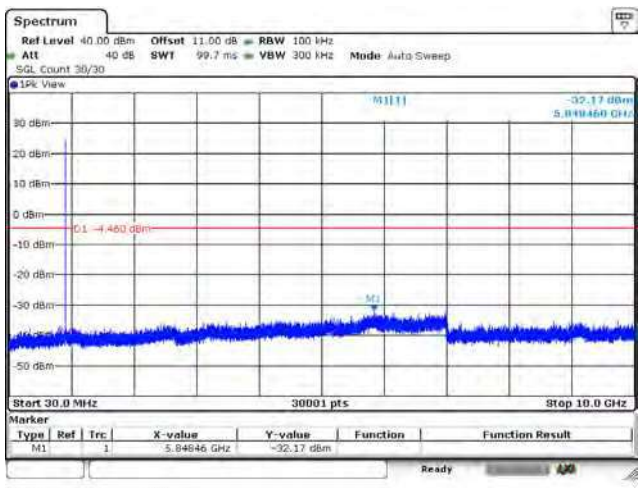
5.4 Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

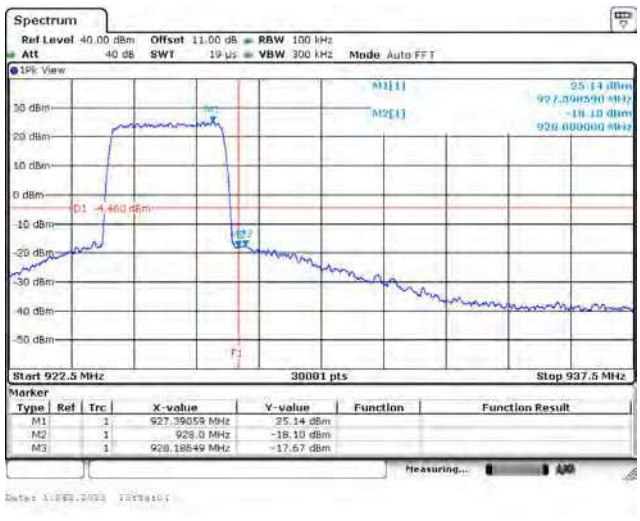
5.5 Test Result of Antenna Port Conducted Emission

926.3 MHz



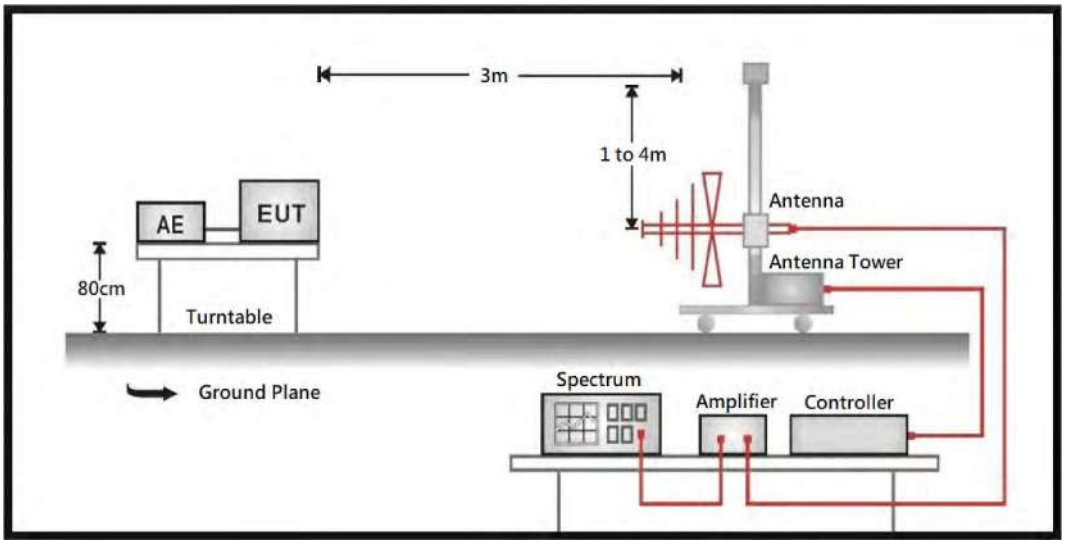


926.3 MHz (Band Edge)



6. Radiated Emission Band Edge

6.1 Test Setup



6.2 Test Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20 dB below the level of the fundamental or to the general radiated emission limit in paragraph 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Remarks:

1. Field strength (dBuV/m) = 20 log Field strength (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

6.3 Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to the FCC KDB 558074 D01 v05r02 for compliance to FCC 47CFR 15.247 requirements.

The EUT and its simulators are placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

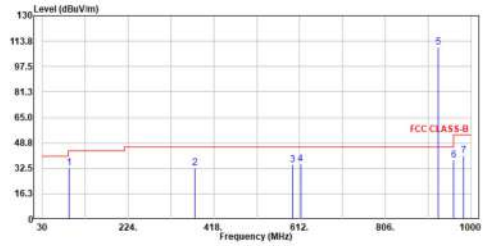
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

6.4 Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

6.5 Test Result of Radiated Emission Band Edge

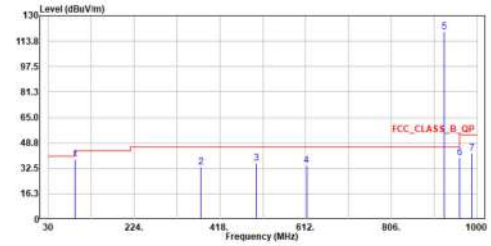
Site :HC-CB04
Condition :3m Horizontal
Mode :TX_926.3MHz
Test By :scott



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	90.625	32.66	43.50	-10.84	41.36	-8.70	QP
2	374.835	32.66	46.00	-13.34	33.11	-0.45	QP
3	595.995	34.64	46.00	-11.36	29.64	5.00	QP
4	614.000	35.16	46.00	-10.84	29.93	5.23	QP
5	925.795	110.02	------	------	100.50	9.52	QP
6	960.000	37.96	46.00	-8.04	27.91	10.05	QP
7	983.510	40.93	54.00	-13.07	30.88	10.05	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.
5. The other emission levels were very low against the limit.

Site :HC-CB04
Condition :3m Vertical
Mode :TX_926.3MHz
Test By :scott

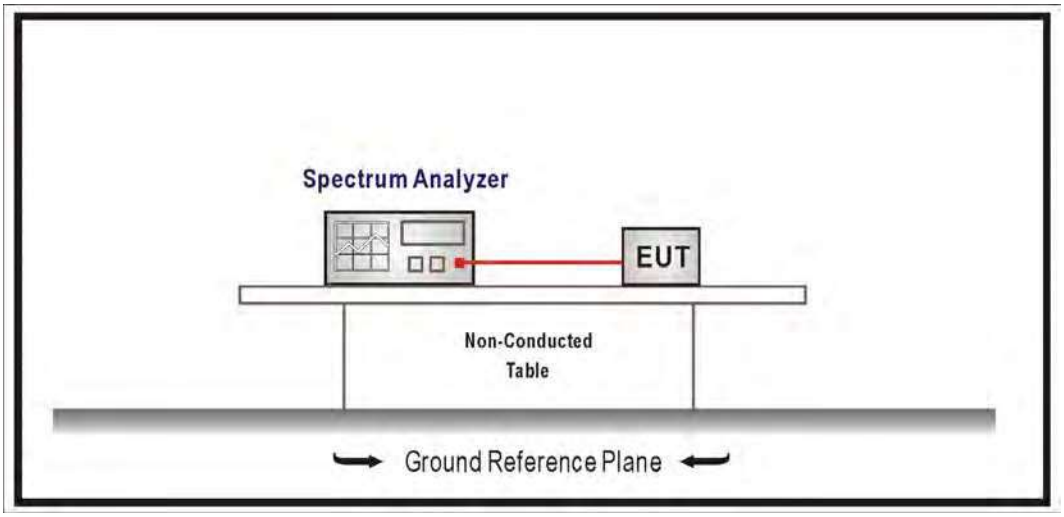


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	90.625	38.05	43.50	-5.45	46.75	-8.70	QP
2	374.835	33.20	46.00	-12.80	33.65	-0.45	QP
3	499.965	35.75	46.00	-10.25	33.16	2.59	QP
4	614.000	34.45	46.00	-11.55	29.22	5.23	QP
5	926.280	119.82	------	------	110.30	9.52	QP
6	960.000	39.22	46.00	-6.78	29.17	10.05	QP
7	988.360	42.03	54.00	-11.97	31.89	10.14	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.
5. The other emission levels were very low against the limit.

7. Occupied Bandwidth & DTS Bandwidth

7.1 Test Setup



7.2 Test Limit

The 6 dB bandwidth: ≧ 500 kHz.

Occupied Bandwidth: NA

7.3 Test Procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB 558074 D01 V05r02 for compliance to FCC 47CFR 15.247 requirements.

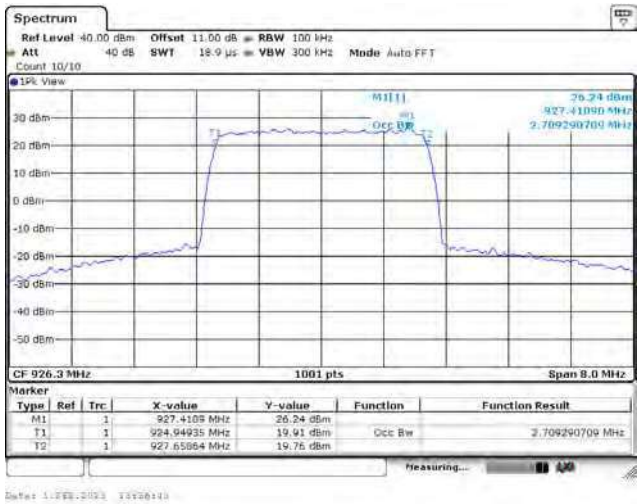
7.4 Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247.

7.5 Test Result of Occupied Bandwidth

Frequency (MHz)	Measure Level (MHz)	Limit (MHz)
926.3	2.709	-

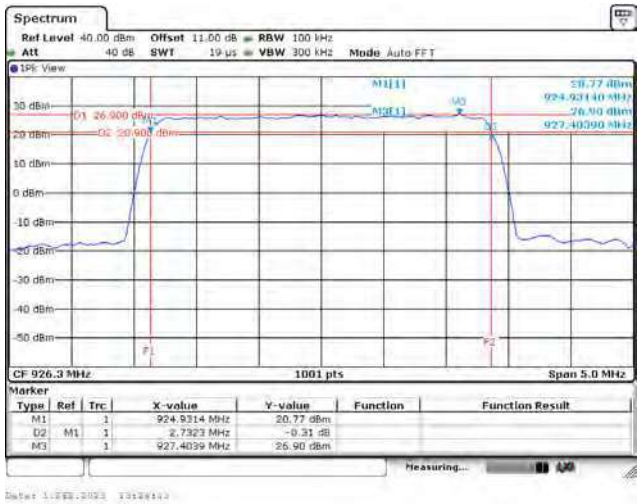
926.3 MHz



7.6 Test Result of DTS Bandwidth

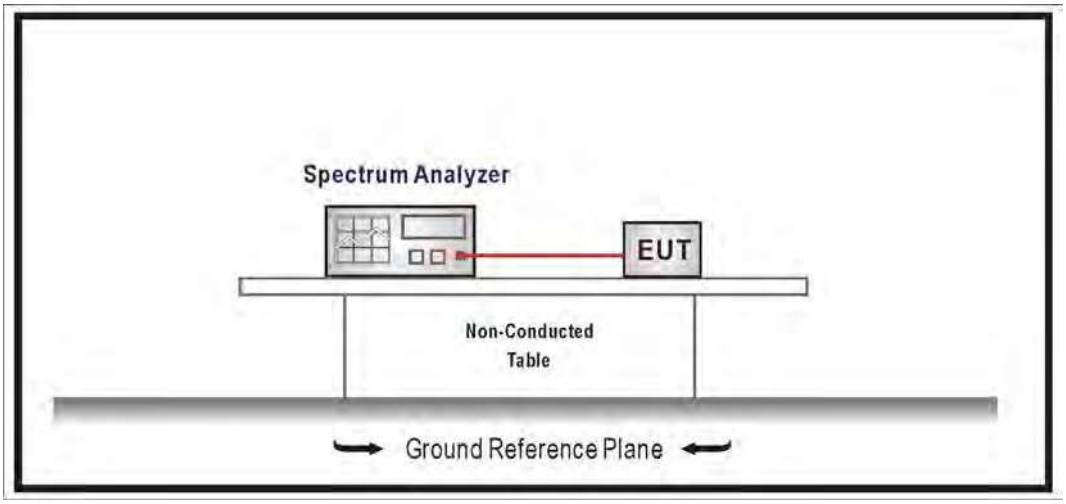
Frequency (MHz)	Measure Level (MHz)	Limit (MHz)	Result
926.3	2.732	≧0.500	Pass

926.3 MHz



8. Maximum Power Spectral Density

8.1 Test Setup



8.2 Test Limit

The peak power spectral density conducted from the intentional radiated to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.3 Test Procedures

The EUT was setup according to ANSI C63.10: 2013; tested according to DTS test procedure of KDB 558074 D01 V05r02 for compliance to FCC 47CFR 15.247 requirements.

8.4 Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247

8.5 Test Result of Maximum Power Spectral Density

Frequency (MHz)	Measure Value (dBm/3kHz)	Limit (dBm/3kHz)	Result
926.3	7.740	≦8.000	Pass

926.3 MHz

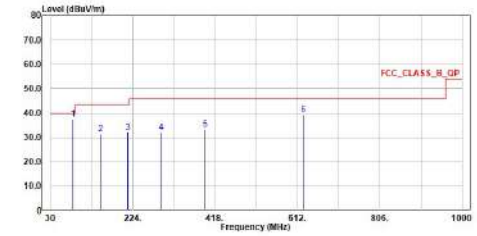
Appendix A

➢ Test Result of Radiated Emissions Co-location

926.3 MHz + WWAN LTE function

30 MHz ~ 1 GHz:

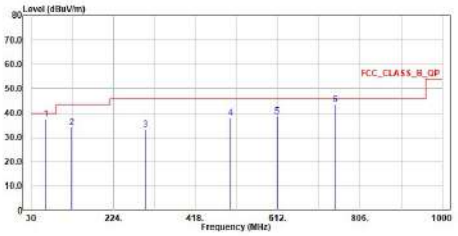
Site :HC-C804
Condition :3m ,Horizontal
Mode :TX_926.3MHz+LTE
Test By :Scott



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	84.029	37.45	40.00	-2.55	45.37	-7.92	QP
2	147.758	31.54	43.50	-11.96	34.58	-3.04	QP
3	211.778	32.13	43.50	-11.37	38.63	-6.50	QP
4	298.348	32.02	46.00	-13.98	34.48	-2.46	QP
5	394.623	33.32	46.00	-12.68	33.30	0.02	QP
6	624.901	39.34	46.00	-6.66	33.99	5.35	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-C804
Condition :3m ,Vertical
Mode :TX_926.3MHz+LTE
Test By :Scott

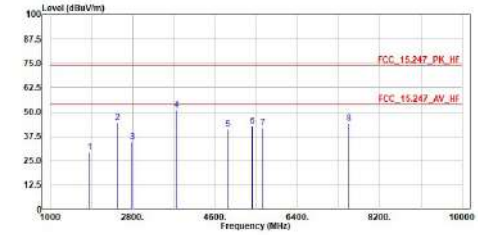


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	63.853	37.30	40.00	-2.70	40.66	-3.36	QP
2	125.254	34.22	43.50	-9.28	38.87	-4.65	QP
3	298.302	33.07	46.00	-12.93	35.50	-2.43	QP
4	500.062	38.03	46.00	-7.97	35.44	2.59	QP
5	610.254	38.56	46.00	-7.44	33.35	5.21	QP
6	747.024	43.40	46.00	-2.60	35.86	7.54	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Above 1 GHz:

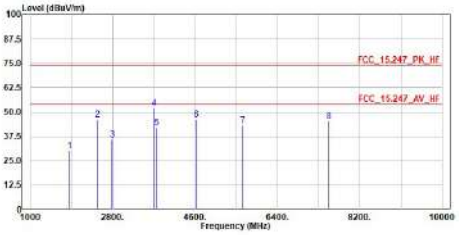
Site :HC-C804
Condition :3m ,Horizontal
Mode :TX_926.3MHz+LTE
Test By :Scott



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	1852.600	29.60	74.00	-44.40	53.97	-24.37	Peak
2	2460.300	44.56	74.00	-29.44	67.13	-22.57	Peak
3	2778.900	34.73	74.00	-39.27	56.36	-21.63	Peak
4	3760.000	50.86	74.00	-23.14	69.72	-18.86	Peak
5	4878.550	41.30	74.00	-32.70	56.96	-15.66	Peak
6	5413.200	42.48	74.00	-31.52	57.85	-15.37	Peak
7	5640.000	41.76	74.00	-32.24	56.77	-15.01	Peak
8	7520.000	44.05	74.00	-29.95	53.95	-9.90	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.

Site :HC-C804
Condition :3m ,Vertical
Mode :TX_926.3MHz+LTE
Test By :Scott



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	1852.600	30.17	74.00	-43.83	54.54	-24.37	Peak
2	2462.000	45.91	74.00	-28.09	68.48	-22.57	Peak
3	2778.900	36.03	74.00	-37.97	57.66	-21.63	Peak
4	3705.200	52.07	74.00	-21.93	71.21	-19.14	Peak
5	3760.000	42.00	74.00	-32.00	60.86	-18.86	Peak
6	4630.350	46.17	74.00	-27.83	62.72	-16.55	Peak
7	5640.000	43.01	74.00	-30.99	58.02	-15.01	Peak
8	7520.000	45.38	74.00	-28.62	55.28	-9.90	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
5. The other emission levels were very low against the limit.