

TEST REPORT

Applicant:	Skullduggery, Inc.
Address:	5433 E La Palma Avenue Anaheim, CA 92807

Manufacturer or Supplier	Skullduggery, Inc.
Address	5433 E La Palma Avenue Anaheim, CA 92807
Product:	RC Knuckle-Headz
Brand Name:	N/A
Model:	08110
Additional Model & Model Difference	N/A
Date of tests:	Dec. 26, 2019 ~ Jan. 14, 2020

the tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.249**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Ryan Lu Project Engineer / EMC Department	Approved by Breeze Jiang Senior project engineer / EMC Department
	 Date: Apr. 13, 2020

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

TABLE OF CONTENTS

RELEASE CONTROL RECORD	3
1 SUMMARY OF TEST RESULTS.....	4
2 MEASUREMENT UNCERTAINTY	4
3 GENERAL INFORMATION	5
3.1 GENERAL DESCRIPTION OF EUT	5
3.2 DESCRIPTION OF TEST MODES.....	6
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	7
3.4 DESCRIPTION OF SUPPORT UNITS.....	7
4. TEST TYPES AND RESULTS.....	8
4.1 RADIATED EMISSION MEASUREMENT	8
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT	8
4.1.2 TEST INSTRUMENTS.....	9
4.1.3 TEST PROCEDURES	10
4.1.4 DEVIATION FROM TEST STANDARD	10
4.1.5 TEST SETUP.....	11
4.1.6 EUT OPERATING CONDITIONS	12
4.1.7 TEST RESULTS	13
4.2 20dB BANDWIDTH MEASUREMENT	20
4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT	20
4.2.2 TEST INSTRUMENTS	20
4.2.3 TEST PROCEDURE	21
4.2.4 DEVIATION FROM TEST STANDARD.....	21
4.2.5 TEST SETUP	21
4.2.6 EUT OPERATING CONDITIONS	21
4.2.7 TEST RESULTS.....	22
5. PHOTOGRAPHS OF THE TEST CONFIGURATION.....	24
6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	25



Test Report No.: RF191226N014

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF191226N014	Original release	Apr. 13, 2020

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	N/A	Powered from battery
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.99dB
	1GHz ~ 18GHz	4.62dB
	18GHz ~ 40GHz	5.00dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	RC Knuckle-Headz
MODEL NO.	08110
ADDITIONAL MODEL	N/A
FCC ID	2AVNWRCKH8110
NOMINAL VOLTAGE	DC 6V(4*AAA*1.5V) from Battery
MODULATION TECHNOLOGY	GFSK
OPERATING FREQUENCY	2430-2453MHz
ANTENNA TYPE	Wire Antenna, with 1dBi gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	Remote control DC Line: Unshielded, Non-detachable 0.05m

NOTES:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 191226N014) for detailed product photo.

3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on X axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	-	√	DC 6V from New Battery

Where **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz
BW: 20db bandwidth

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

Following channel(s) was (were) selected for the test as listed below.

TESTED CHANNEL	TESTED FREQUENCY
Low	2430 MHz
Middle	2442 MHz
High	2453 MHz

Channel List

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2430	11	2440	21	2450
2	2431	12	2441	22	2451
3	2432	13	2442	23	2452
4	2433	14	2443	24	2453
5	2434	15	2444		
6	2435	16	2445		
7	2436	17	2446		
8	2437	18	2447		
9	2438	19	2448		
10	2439	20	2449		

Note: The more detailed channel, please refer to the product specifications

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	25deg. C, 55%RH	DC 6V from New Battery	Hu
BW	25deg. C, 55%RH	DC 6V from New Battery	Sen
PLC	-	-	-

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.249

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together without any other necessary accessories or support units

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 12,19	Mar. 11,20
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	May 22,19	May 21,20
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May 28,19	May 27,20
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Apr. 21,19	Apr. 20,20
Bilog Antenna (20MHz -2GHz)	Teseq	CBL 6111D	30643	Jun. 23,19	Jun. 22,20
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	Jun. 23,19	Jun. 22,20
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	May 05,19	May 04,20
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Apr. 21,19	Apr. 20,20
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Apr. 21,19	Apr. 20,20
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 09,19	Nov. 08,20
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A

NOTES:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 749762.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTES:

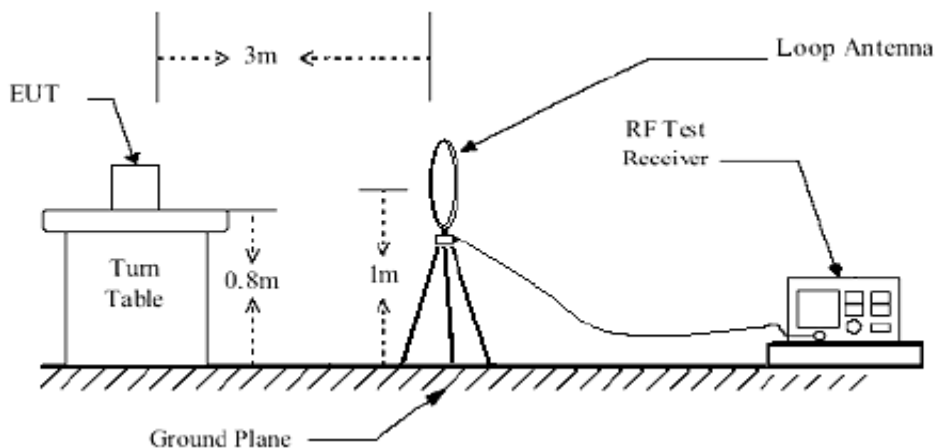
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

4.1.4 DEVIATION FROM TEST STANDARD

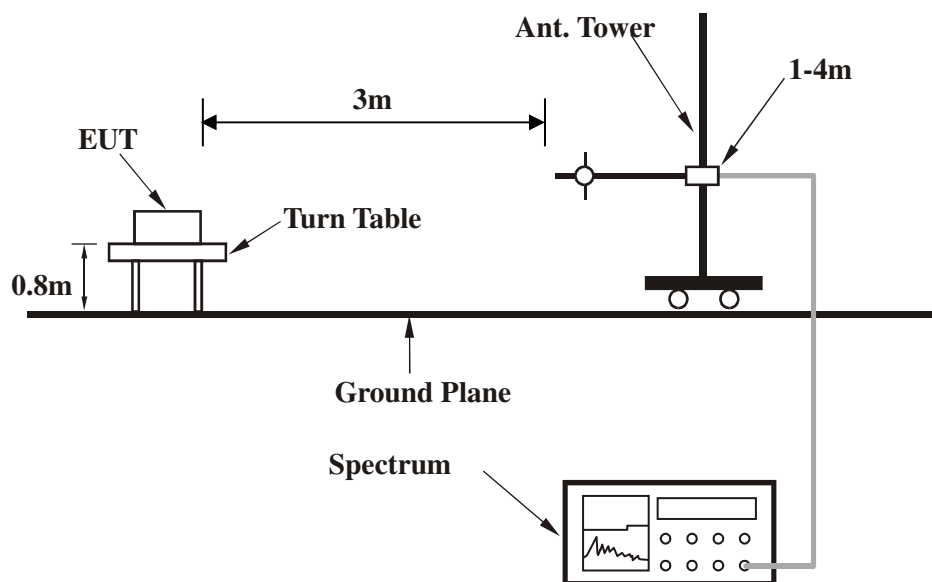
No deviation.

4.1.5 TEST SETUP

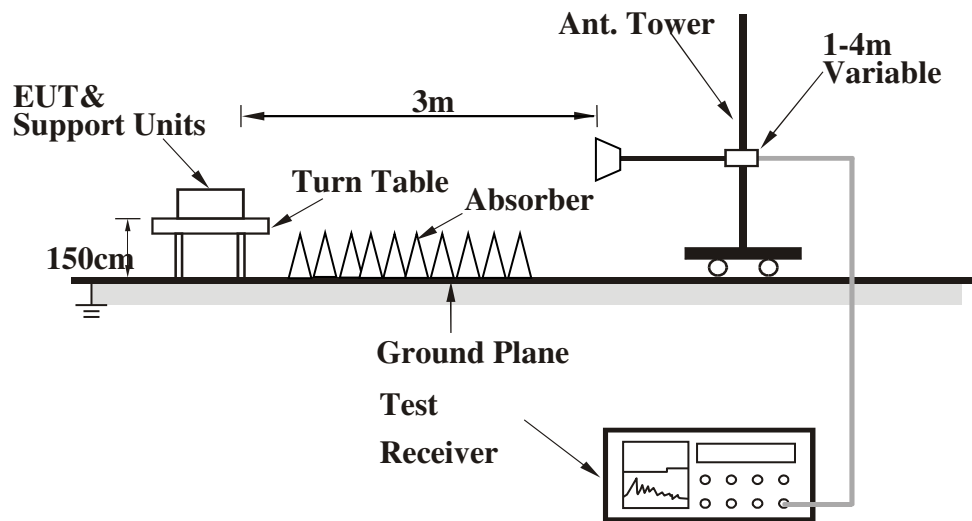
Below 30MHz test setup



Below 1GHz test setup



Above 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Turned on the power of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.1.7 TEST RESULTS

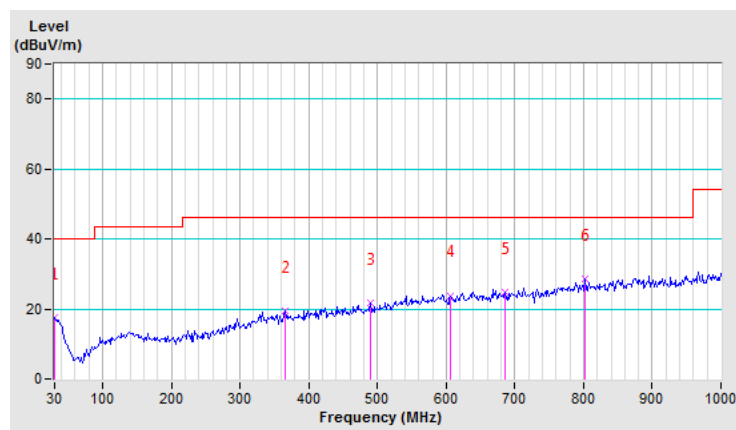
BELOW 1GHz WORST-CASE DATA

CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	17.58 QP	40.00	-22.42	1.00 H	158	28.78	-11.20
2	365.77	19.57 QP	46.00	-26.43	1.00 H	103	29.80	-10.23
3	490.13	21.56 QP	46.00	-24.44	1.00 H	185	29.13	-7.57
4	606.71	23.80 QP	46.00	-22.20	1.00 H	65	28.54	-4.74
5	685.99	24.82 QP	46.00	-21.18	1.00 H	144	28.64	-3.82
6	802.58	28.45 QP	46.00	-17.55	1.00 H	175	29.91	-1.46

REMARK:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.

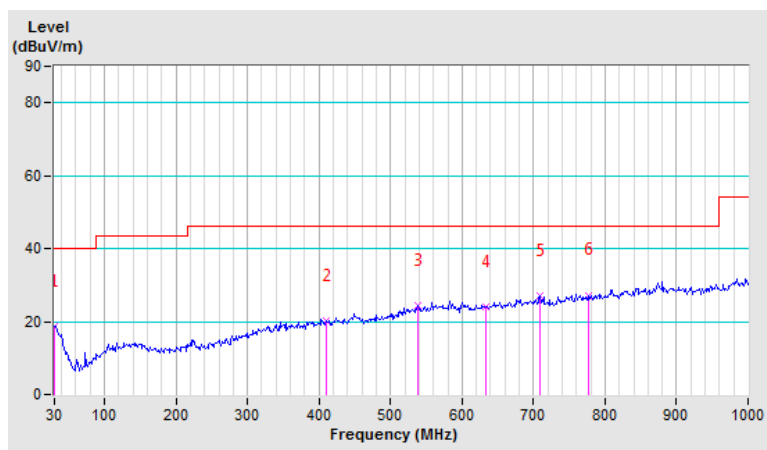


CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	18.81 QP	40.00	-21.19	1.00 V	16	30.01	-11.20
2	410.85	20.33 QP	46.00	-25.67	1.00 V	129	29.37	-9.04
3	538.32	24.28 QP	46.00	-21.72	1.00 V	55	30.02	-5.74
4	633.14	24.16 QP	46.00	-21.84	1.00 V	142	28.34	-4.18
5	709.31	27.17 QP	46.00	-18.83	1.00 V	114	30.33	-3.16
6	776.15	27.25 QP	46.00	-18.75	1.00 V	100	29.43	-2.18

REMARK:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA:

CHANNEL	TX Low Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

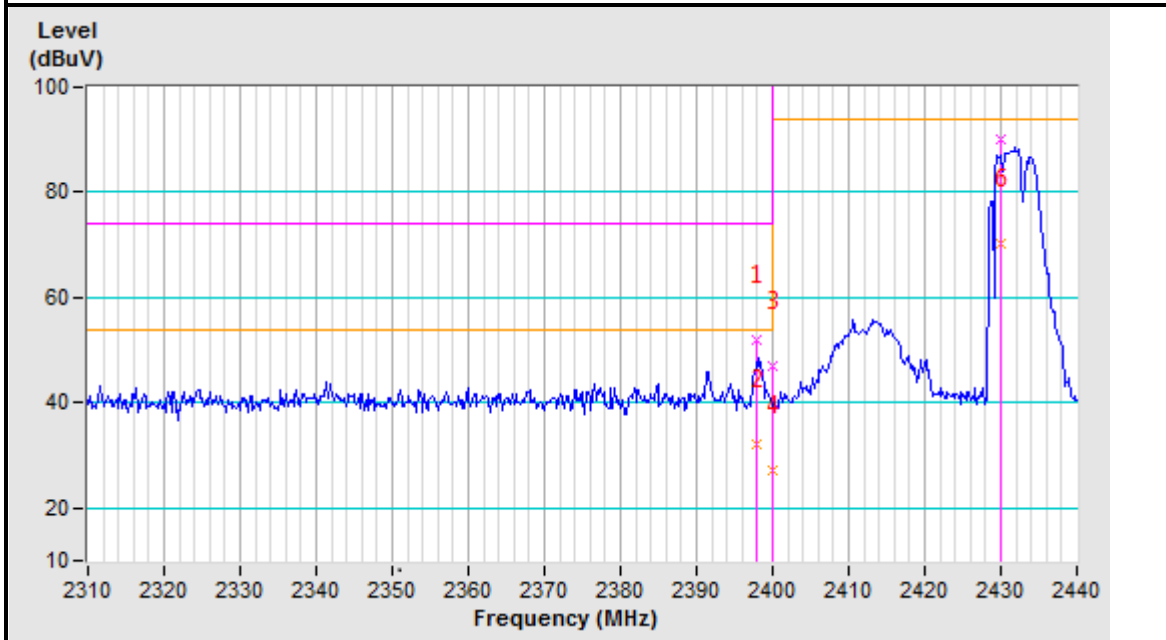
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2394.00	51.88 PK	74.00	-22.12	1.00 H	166	49.01	2.87
2	2394.00	32.07 AV	54.00	-21.93	1.00 H	166	29.20	2.87
3	2400.00	47.01 PK	74.00	-26.99	1.00 H	166	44.13	2.88
4	2400.00	27.20 AV	54.00	-26.80	1.00 H	166	24.32	2.88
5	*2430.00	90.06 PK	114.00	-23.94	1.00 H	166	87.07	2.99
6	*2430.00	70.25 AV	94.00	-23.75	1.00 H	166	67.26	2.99
7	4860.00	48.73 PK	74.00	-25.27	1.00 H	0	43.38	5.35
8	4860.00	25.92 AV	54.00	-28.08	1.00 H	0	20.57	5.35
9	7290.00	52.11 PK	74.00	-21.89	1.00 H	0	42.77	9.34
10	7290.00	32.30 AV	54.00	-21.70	1.00 H	0	22.96	9.34
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2394.00	57.42 PK	74.00	-16.58	1.00 V	117	54.56	2.86
2	2394.00	37.61 AV	54.00	-16.39	1.00 V	117	34.75	2.86
3	2400.00	53.84 PK	74.00	-20.16	1.00 V	117	50.96	2.88
4	2400.00	34.03 AV	54.00	-19.97	1.00 V	117	31.15	2.88
5	*2430.00	93.59 PK	114.00	-20.41	1.00 V	117	90.60	2.99
6	*2430.00	73.78 AV	94.00	-20.22	1.00 V	117	70.79	2.99
7	4860.00	54.33 PK	74.00	-19.67	1.00 V	0	48.98	5.35
8	4860.00	34.52 AV	54.00	-19.48	1.00 V	0	29.17	5.35
9	7290.00	51.92 PK	74.00	-22.08	1.00 V	0	42.58	9.34
10	7290.00	32.11 AV	54.00	-21.89	1.00 V	0	22.77	9.34

REMARK:

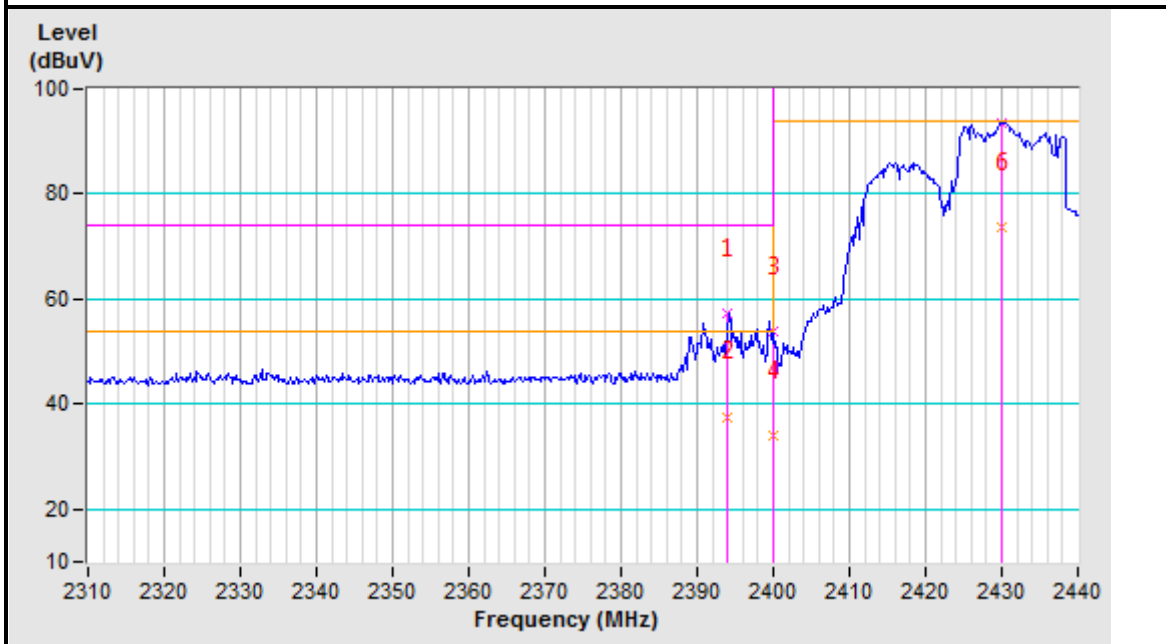
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

Band edge Plot

2430MHz Horizontal



2430MHz Vertical



CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	92.40 PK	114.00	-21.60	1.00 H	104	89.37	3.03
2	*2442.00	72.59 AV	94.00	-21.41	1.00 H	104	69.56	3.03
3	4884.00	49.28 PK	74.00	-24.72	1.00 H	0	43.89	5.39
4	4884.00	29.47 AV	54.00	-24.53	1.00 H	0	24.08	5.39
5	7326.00	53.54 PK	74.00	-20.46	1.00 H	0	44.18	9.36
6	7326.00	33.73 AV	54.00	-20.27	1.00 H	0	24.37	9.36
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2442.00	94.93 PK	114.00	-19.07	1.00 V	156	91.90	3.03
2	*2442.00	75.12 AV	94.00	-18.88	1.00 V	156	72.09	3.03
3	4884.00	56.61 PK	74.00	-17.39	1.00 V	0	51.22	5.39
4	4884.00	36.80 AV	54.00	-17.20	1.00 V	0	31.41	5.39
5	7326.00	52.67 PK	74.00	-21.33	1.00 V	0	43.31	9.36
6	7326.00	32.86 AV	54.00	-21.14	1.00 V	0	23.50	9.36

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX High Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

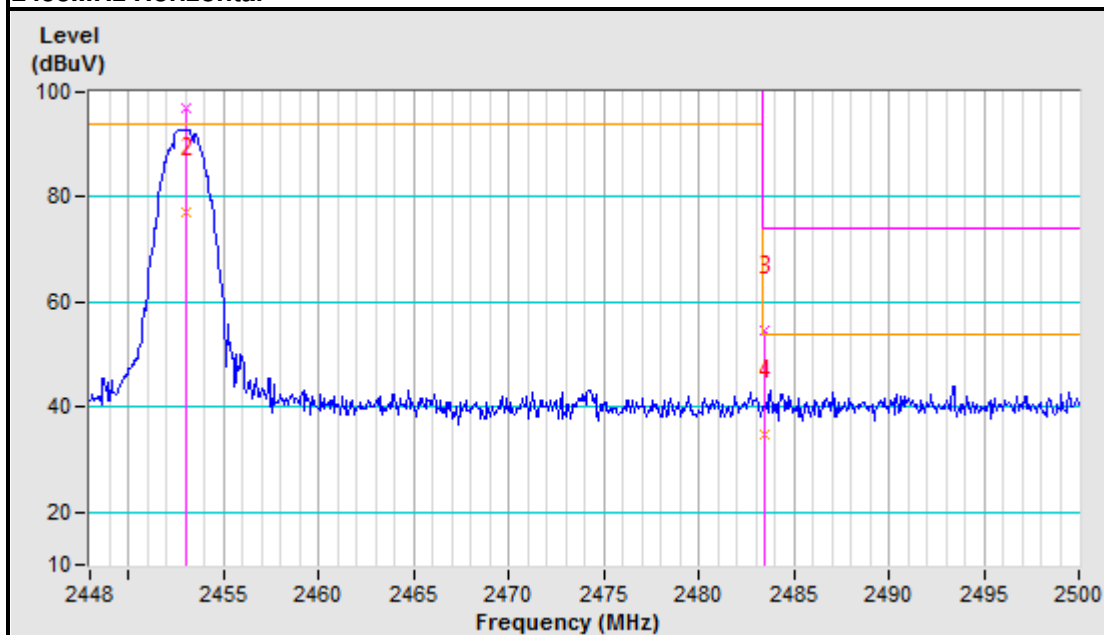
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2453.00	96.93 PK	114.00	-17.07	1.00 H	130	93.85	3.08
2	*2453.00	77.12 AV	94.00	-16.88	1.00 H	130	74.04	3.08
3	2483.50	54.59 PK	74.00	-19.41	1.00 H	130	51.40	3.19
4	2483.50	34.78 AV	54.00	-19.22	1.00 H	130	31.59	3.19
5	4906.00	50.09 PK	74.00	-23.91	1.00 H	0	44.67	5.42
6	4906.00	30.28 AV	54.00	-23.72	1.00 H	0	24.86	5.42
7	7359.00	52.69 PK	74.00	-21.31	1.00 H	0	43.31	9.38
8	7359.00	32.88 AV	54.00	-21.12	1.00 H	0	23.50	9.38
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2453.00	95.02 PK	114.00	-18.98	1.00 V	0	91.94	3.08
2	*2453.00	75.21 AV	94.00	-18.79	1.00 V	0	72.13	3.08
3	2483.50	51.18 PK	74.00	-22.82	1.00 V	0	47.99	3.19
4	2483.50	31.37 AV	54.00	-22.63	1.00 V	0	28.18	3.19
5	4906.00	55.52 PK	74.00	-18.48	1.00 V	0	50.10	5.42
6	4906.00	35.71 AV	54.00	-18.29	1.00 V	0	30.29	5.42
7	7359.00	53.26 PK	74.00	-20.74	1.00 V	0	43.88	9.38
8	7359.00	33.45 AV	54.00	-20.55	1.00 V	0	24.07	9.38

REMARKS:

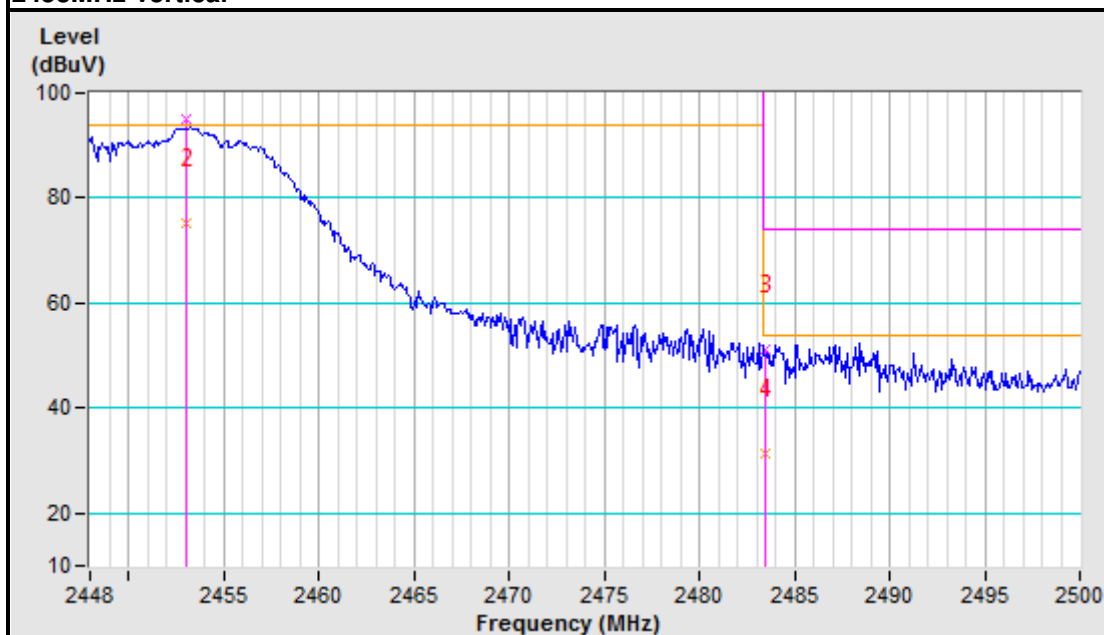
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

Band edge Plot

2453MHz Horizontal



2453MHz Vertical



4.2 20dB BANDWIDTH MEASUREMENT

4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 22,19	May 21,20
Power Sensor	Keysight	U2021XA	MY55060018	May 22,19	May 21,20
Power Meter	Anritsu	ML2495A	1139001	Mar. 12,19	Mar. 11,20
Power Sensor	Anritsu	MA2411B	1531155	Mar. 12,19	Mar. 11,20
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 17, 19	Oct.16, 20
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Nov.15,19	Nov. 14,20
Oscilloscope	Agilent	DSO9254A	MY51260160	Sep. 18,19	Sep. 17,20
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Mar. 13,19	Mar. 12,20
Signal Generator	Agilent	N5183A	MY50140980	Sep. 19,19	Sep. 18,20
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Sep. 12,19	Sep. 11,20
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

NOTE:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

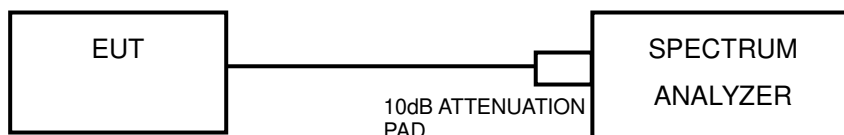
4.2.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



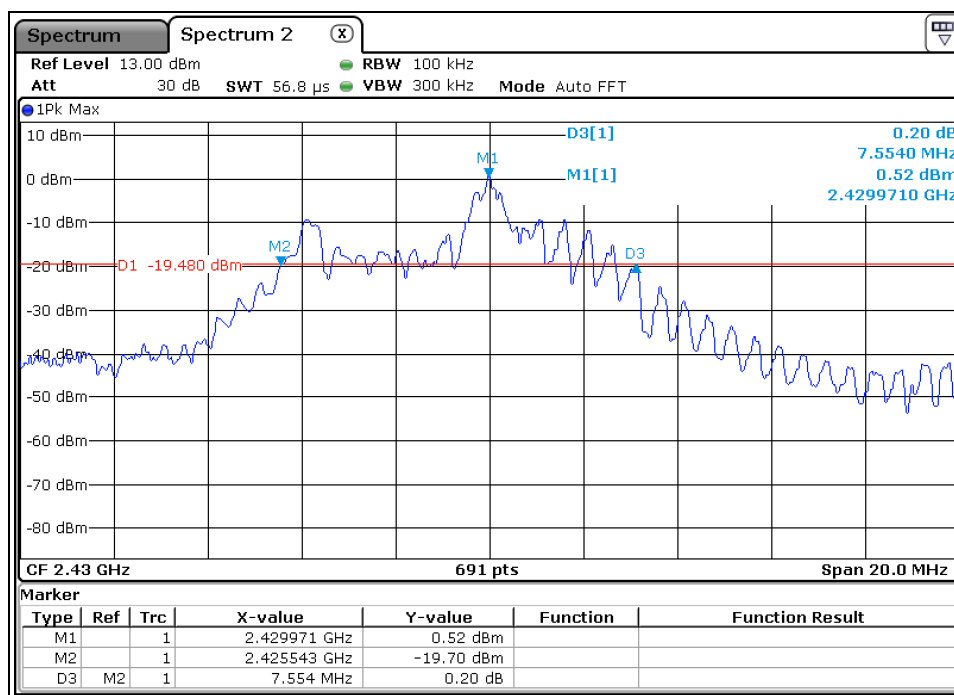
4.2.6 EUT OPERATING CONDITIONS

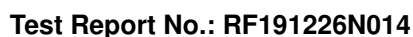
- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2430	7.5540
Middle	2442	7.7860
High	2453	7.3810

Test Data: Low channel





Spectrum **Spectrum 2** (X) dBm

Ref Level 13.00 dBm RBW 100 kHz
 Att 30 dB SWT 56.8 μ s VBW 300 kHz Mode Auto FFT

1Pk Max

10 dBm
 0 dBm
 -10 dBm
 -20 dBm
 -30 dBm
 -40 dBm
 -50 dBm
 -60 dBm
 -70 dBm
 -80 dBm

D3[1] 2.10 dB
 7.7860 MHz
 0.57 dBm
 2.4419710 GHz

M1
 M1[1]

D3

D1 -19.430 dBm

CF 2.442 GHz 691 pts Span 20.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.441971 GHz	0.57 dBm		
M2		1	2.437832 GHz	-20.52 dBm		
D3	M2	1	7.786 MHz	2.10 dB		

Spectrum **Spectrum 2** (X)

Ref Level 13.00 dBm RBW 100 kHz
 Att 30 dB SWT 56.8 μ s VBW 300 kHz Mode Auto FFT

1Pk Max

10 dBm
 0 dBm
 -10 dBm
 -20 dBm
 -30 dBm
 -40 dBm
 -50 dBm
 -60 dBm
 -70 dBm
 -80 dBm

D3[1] -0.81 dB
 7.3810 MHz
 1.25 dBm
 2.4529710 GHz

M1[1]

M2

D1 -18.750 dBm

CF 2.453 GHz 691 pts Span 20.0 MHz

Marker	Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1			1	2.452971 GHz	1.25 dBm		
M2			1	2.449179 GHz	-18.24 dBm		
D3	M2		1	7.381 MHz	-0.81 dB		



Test Report No.: RF191226N014

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---