

TEST REPORT

Applicant:	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
Address:	NO.2 West Xingye Road Laimei Industrial Area Chenghai Shantou Guangdong China

Manufacturer or Supplier	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
Address	NO.2 West Xingye Road Laimei Industrial Area Chenghai Shantou Guangdong China
Product:	DRONE
Brand Name:	Syma
Model:	Z4W
Additional Models & Model Difference	Z5W, see item 3.1
Date of tests:	Apr. 28, 2023 ~ May 05, 2023

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 Eric Fang Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	 Date: Jun. 14, 2023

This report is governed by, and incorporates by reference, the Conditions of Testing 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. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. 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	8
3.4 DESCRIPTION OF SUPPORT UNITS	8
3.5 CONFIGURATION OF SYSTEM UNDER TEST.....	8
3.6 DUTY CYCLE OF TESET SIGNAL	9
4. TEST TYPES AND RESULTS.....	10
4.1 RADIATED EMISSION MEASUREMENT	10
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT	10
4.1.2 TEST INSTRUMENTS.....	11
4.1.3 TEST PROCEDURES	12
4.1.4 DEVIATION FROM TEST STANDARD	12
4.1.5 TEST SETUP.....	13
4.1.6 EUT OPERATING CONDITIONS	14
4.1.7 TEST RESULTS	15
4.2 20DB BANDWIDTH MEASUREMENT.....	22
4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT	22
4.2.2 TEST INSTRUMENTS	22
4.2.3 TEST PROCEDURE	23
4.2.4 DEVIATION FROM TEST STANDARD	23
4.2.5 TEST SETUP	23
4.2.6 EUT OPERATING CONDITIONS.....	23
4.2.7 TEST RESULTS.....	24
5. PHOTOGRAPHS OF THE TEST CONFIGURATION.....	26
6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	27

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2303WDG0185-1	Original release	Jun. 14, 2023

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	2.80dB
	30MHz ~ 1GMHz	4.24dB
	1GHz ~ 18GHz	4.76dB
	18GHz ~ 40GHz	4.50dB
20dB Bandwidth	1GHz ~ 18GHz	1.132x10 ⁻⁴ %

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	DRONE
MODEL NO.	Z4W
ADDITIONAL MODEL	Z5W
FCC ID	QV7-GC88752-83
NOMINAL VOLTAGE	Remote control: DC 6V (1.5V AA Size*4)From Battery
MODULATION TECHNOLOGY	GFSK
OPERATING FREQUENCY	2409MHz -2481MHz
ANTENNA TYPE	Wire Antenna, with 1.0dBi gain
I/O PORTS	N/A
CABLE SUPPLIED	USB Line: Unshielded, Detachable, 0.6m

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.: 2303WDG0185-1) for detailed product photo.
4. Additional model Z5W is identical with the test model Z4W except the appearance and model number for trading purpose.
5. Z4W and Z5W are the model sold in combination with airplane and remote control, and EUT refers to remote control in this report

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	2409 MHz
Middle	2445 MHz
High	2481 MHz

Channel List

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2409	20	2428	39	2447	58	2466
2	2410	21	2429	40	2448	59	2467
3	2411	22	2430	41	2449	60	2468
4	2412	23	2431	42	2450	61	2469
5	2413	24	2432	43	2451	62	2470
6	2414	25	2433	44	2452	63	2471
7	2415	26	2434	45	2453	64	2472
8	2416	27	2435	46	2454	65	2473
9	2417	28	2436	47	2455	66	2474
10	2418	29	2437	48	2456	67	2475
11	2419	30	2438	49	2457	68	2476
12	2420	31	2439	50	2458	69	2477
13	2421	32	2440	51	2459	70	2478
14	2422	33	2441	52	2460	71	2479
15	2423	34	2442	53	2461	72	2480
16	2424	35	2443	54	2462	73	2481
17	2425	36	2444	55	2463		
18	2426	37	2445	56	2464		
19	2427	38	2446	57	2465		

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 Battery	Vincent
BW	25deg. C, 56%RH	DC 6V from Battery	Vincent
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

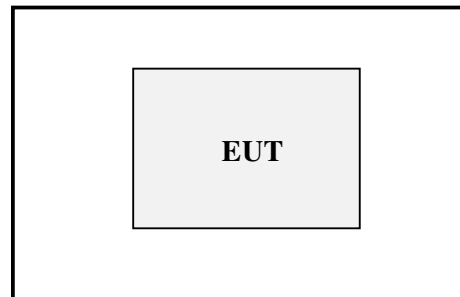
ANSI C63.10-2013

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

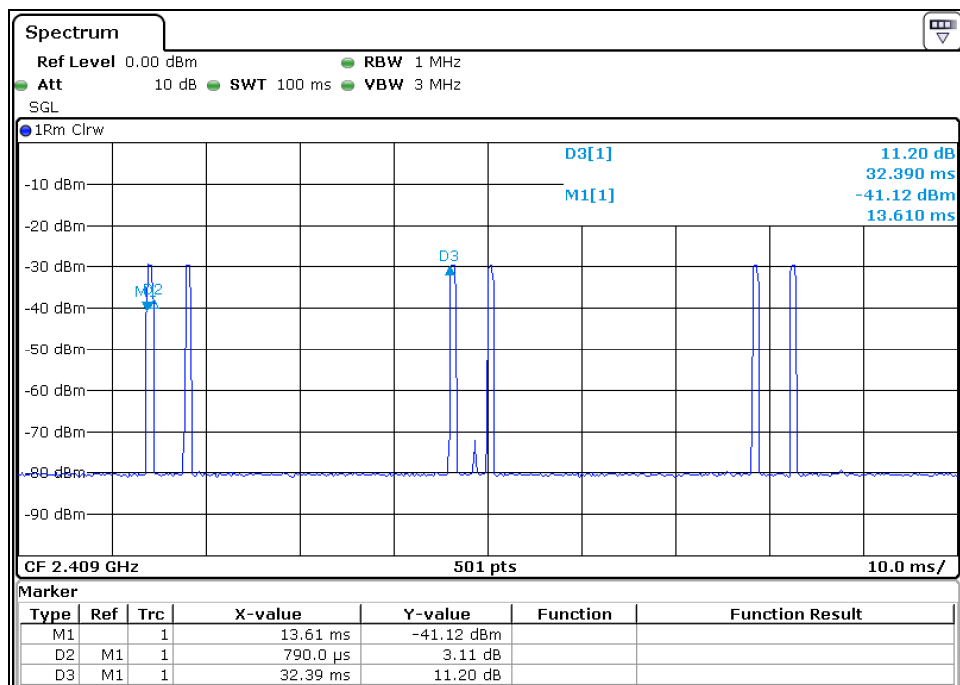
3.5 CONFIGURATION OF SYSTEM UNDER TEST



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

3.6 DUTY CYCLE OF TESET SIGNAL

Test Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	1/T Min. VBW (KHz)	VBW Setting
Wireless 2.4GHz	1.58	32.39	4.88	0.633	1KHz



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.

NOTES:

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.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Jan. 10, 24
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	May. 09, 23
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	Apr. 27, 24
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Mar. 06, 24
Trilog-Broadband Antenna(20M-2G)	SCHWARZBECK	VULB 9168	01282	Aug. 21, 23
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	Apr. 27, 24
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	Apr. 28, 24
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	May 22, 23
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	Apr. 26, 24
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Jan. 16, 24
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	N/A

- NOTES:**
1. The test was performed at 966 Chamber (a 3m Semi-anechoic chamber).
 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.
 3. 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 1.3m 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:

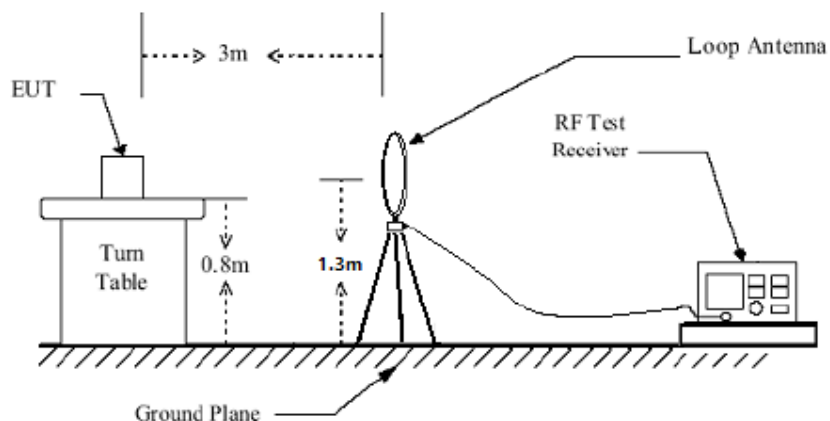
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) 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

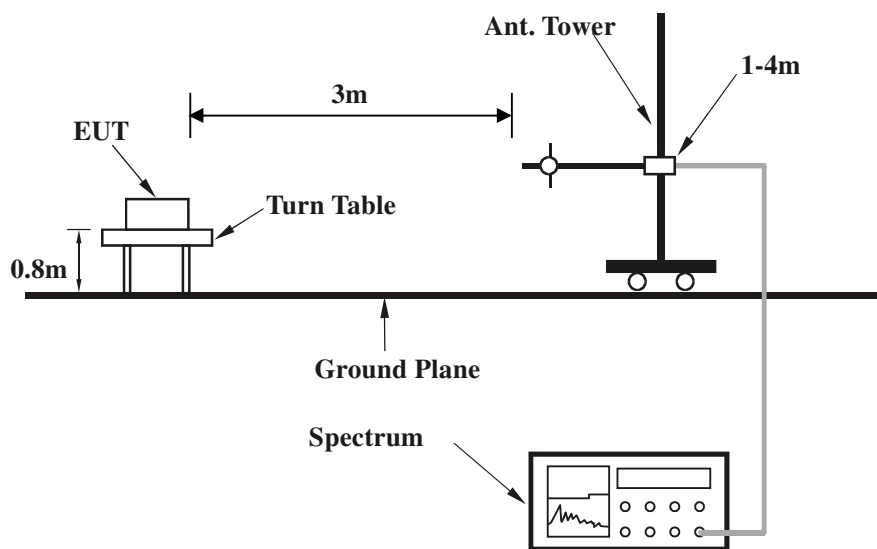
No deviation.

4.1.5 TEST SETUP

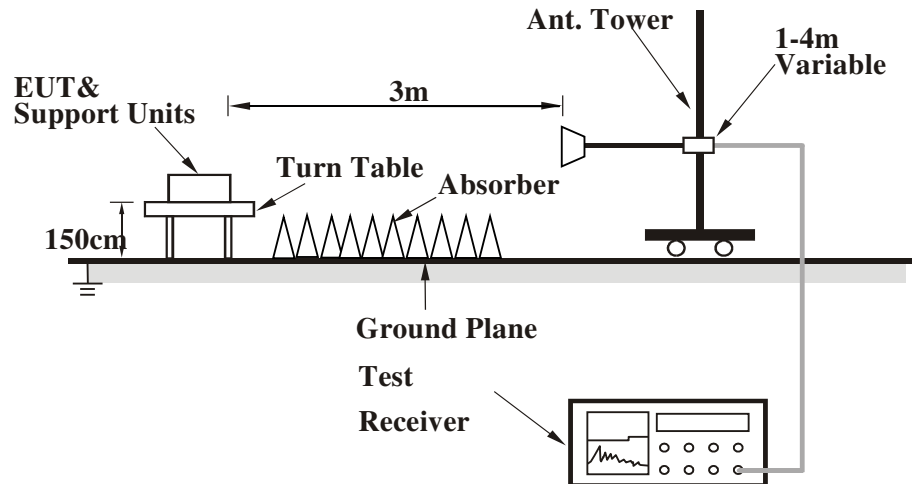
Below 30MHz test setup



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

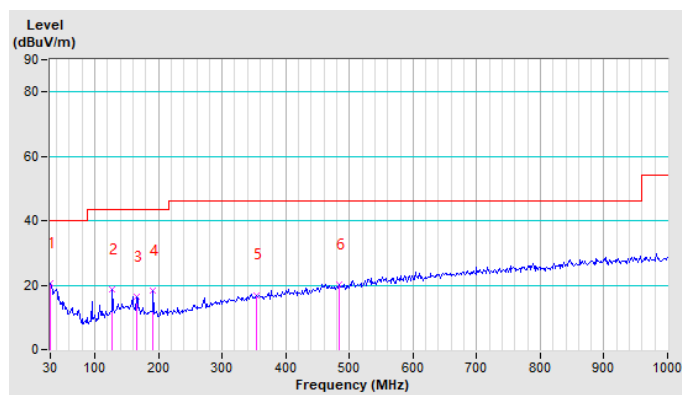
BELOW 1GHz WORST-CASE DATA

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	20.6 QP	40.0	-19.4	1.56 H	304	38.7	-18.1
2	127.93	18.5 QP	43.5	-25.0	1.40 H	319	35.5	-17.0
3	165.24	16.5 QP	43.5	-27.0	1.26 H	333	32.8	-16.3
4	191.67	18.4 QP	43.5	-25.1	1.12 H	346	35.7	-17.2
5	354.89	17.0 QP	46.0	-29.1	1.02 H	358	29.5	-12.5
6	483.91	20.2 QP	46.0	-25.8	1.00 H	255	29.4	-9.3

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. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.

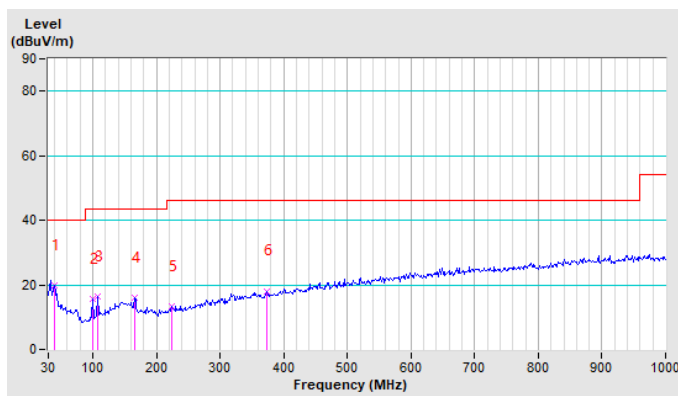


CHANNEL	TX Middle Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

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	39.33	19.9 QP	40.0	-20.1	1.00 V	233	36.4	-16.5
2	99.95	15.5 QP	43.5	-28.0	1.00 V	226	35.5	-20.0
3	107.72	16.4 QP	43.5	-27.1	1.00 V	216	35.3	-18.9
4	165.24	15.9 QP	43.5	-27.6	1.00 V	221	32.2	-16.3
5	224.31	13.4 QP	46.0	-32.6	1.00 V	214	30.7	-17.3
6	373.54	18.1 QP	46.0	-27.9	1.00 V	246	30.2	-12.1

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. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.



ABOVE 1GHz WORST-CASE DATA:

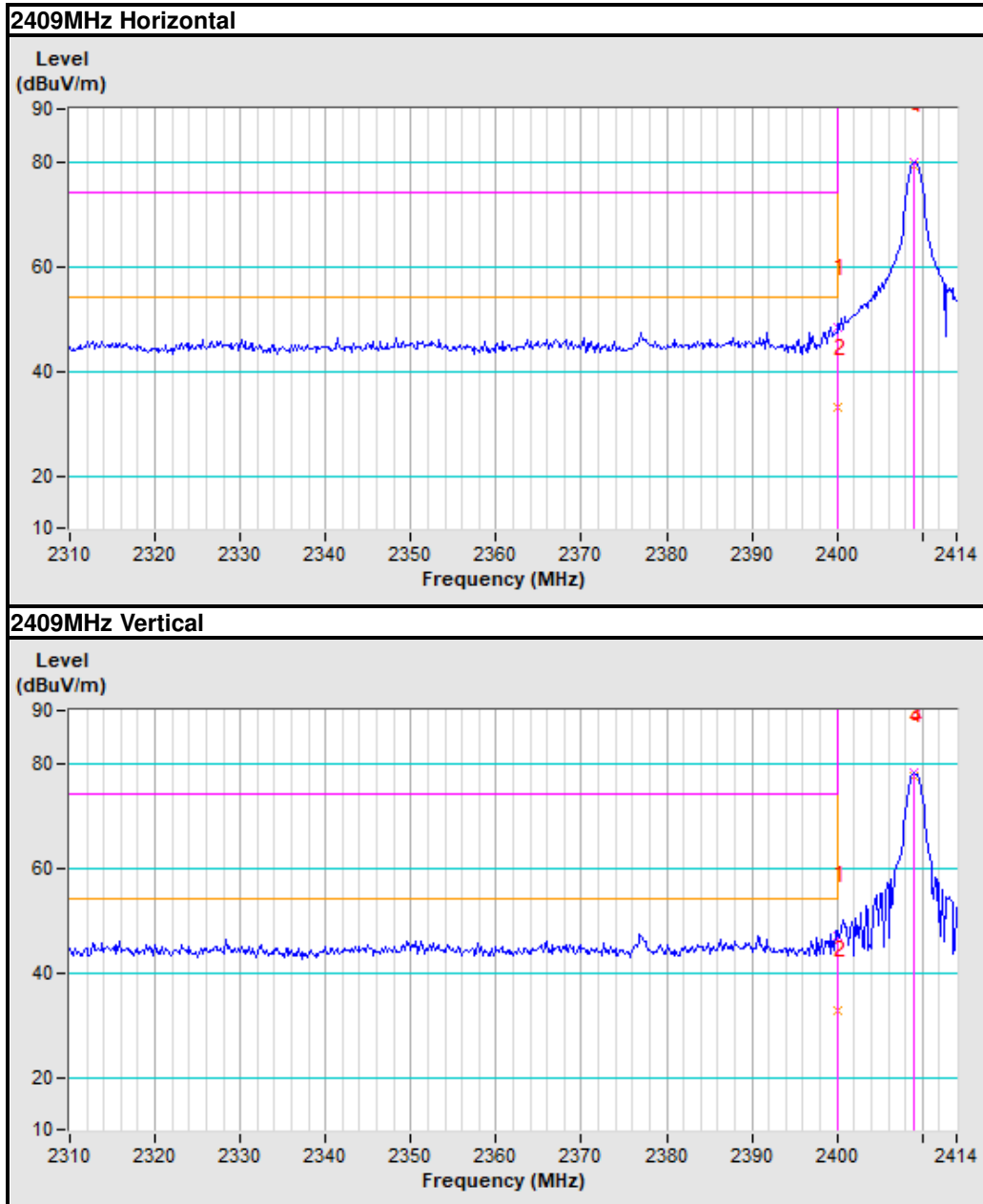
CHANNEL	TX Low Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2400.00	48.1 PK	74.0	-25.9	3.00 H	270	45.3	2.8
2	2400.00	33.0 AV	54.0	-21.0	3.00 H	270	30.1	2.8
3	*2409.00	79.7 PK	114.0	-34.3	3.00 H	270	76.8	2.9
4	*2409.00	79.3 AV	94.0	-14.7	3.00 H	270	76.4	2.9
5	4818.00	50.0 PK	74.0	-24.0	1.50 H	307	42.8	7.2
6	4818.00	39.0 AV	54.0	-15.0	1.50 H	307	31.8	7.2
7	7227.00	49.6 PK	74.0	-24.4	1.98 H	149	39.6	10.0
8	7227.00	38.5 AV	54.0	-15.5	1.98 H	149	28.5	10.0
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	2400.00	47.1 PK	74.0	-26.9	1.60 V	304	44.3	2.8
2	2400.00	32.9 AV	54.0	-21.1	1.60 V	304	30.0	2.8
3	*2409.00	78.0 PK	114.0	-36.0	1.60 V	304	75.1	2.9
4	*2409.00	77.6 AV	94.0	-16.4	1.60 V	304	74.7	2.9
5	4818.00	49.0 PK	74.0	-25.0	1.95 V	22	41.8	7.2
6	4818.00	37.2 AV	54.0	-16.8	1.95 V	22	30.0	7.2
7	7227.00	48.9 PK	74.0	-25.1	1.64 V	250	39.0	10.0
8	7227.00	37.2 AV	54.0	-16.8	1.64 V	250	27.2	10.0

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



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	*2445.00	80.2 PK	114.0	-33.8	1.35 H	304	77.2	3.0
2	*2445.00	79.9 AV	94.0	-14.1	1.35 H	304	76.9	3.0
3	4890.00	51.1 PK	74.0	-22.9	1.35 H	217	43.4	7.7
4	4890.00	39.4 AV	54.0	-14.6	1.35 H	217	31.7	7.7
5	7335.00	51.3 PK	74.0	-22.7	1.95 H	22	41.2	10.1
6	7335.00	40.4 AV	54.0	-13.6	1.95 H	22	30.2	10.1
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	*2445.00	79.3 PK	114.0	-34.7	3.00 V	271	76.3	3.0
2	*2445.00	79.0 AV	94.0	-15.0	3.00 V	271	76.0	3.0
3	4890.00	49.7 PK	74.0	-24.3	1.04 V	95	42.0	7.7
4	4890.00	38.1 AV	54.0	-15.9	1.04 V	95	30.4	7.7
5	7335.00	51.2 PK	74.0	-22.8	1.65 V	254	41.1	10.1
6	7335.00	41.2 AV	54.0	-12.8	1.65 V	254	31.1	10.1

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)

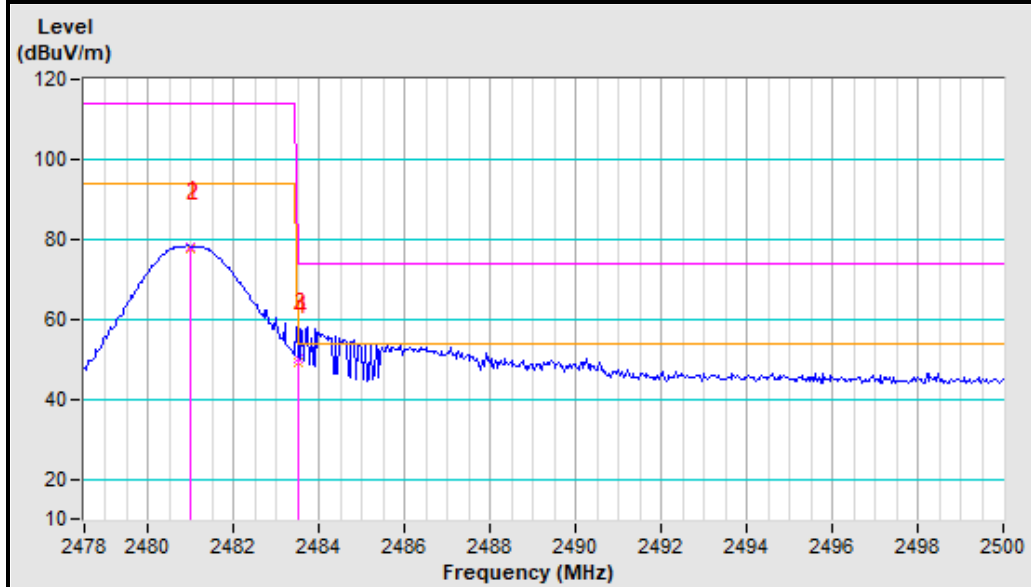
ANTENNA POLARITY & TEST DISTANCE : HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2481.00	78.2 PK	114.0	-35.8	1.50 H	268	75.1	3.1
2	*2481.00	77.8 AV	94.0	-16.2	1.50 H	268	74.7	3.1
3	2483.50	50.2 PK	74.0	-23.8	1.50 H	268	47.1	3.1
4	2483.50	49.2 AV	54.0	-4.8	1.50 H	268	46.1	3.1
5	4962.00	49.8 PK	74.0	-24.2	1.74 H	51	41.6	8.2
6	4962.00	38.8 AV	54.0	-15.2	1.74 H	51	30.6	8.2
7	7443.00	51.3 PK	74.0	-22.7	1.95 H	232	41.0	10.3
8	7443.00	42.0 AV	54.0	-12.0	1.95 H	232	31.7	10.3
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	*2481.00	77.4 PK	114.0	-36.6	2.50 V	307	74.3	3.1
2	*2481.00	77.1 AV	94.0	-16.9	2.50 V	307	74.0	3.1
3	2483.50	50.0 PK	74.0	-24.0	2.50 V	307	46.9	3.1
4	2483.50	40.2 AV	54.0	-13.8	2.50 V	307	37.1	3.1
5	4962.00	48.9 PK	74.0	-25.1	1.65 V	259	40.7	8.2
6	4962.00	36.7 AV	54.0	-17.3	1.65 V	259	28.5	8.2
7	7443.00	49.6 PK	74.0	-24.4	1.65 V	340	39.4	10.3
8	7443.00	40.3 AV	54.0	-13.7	1.65 V	340	30.0	10.3

REMARKS:

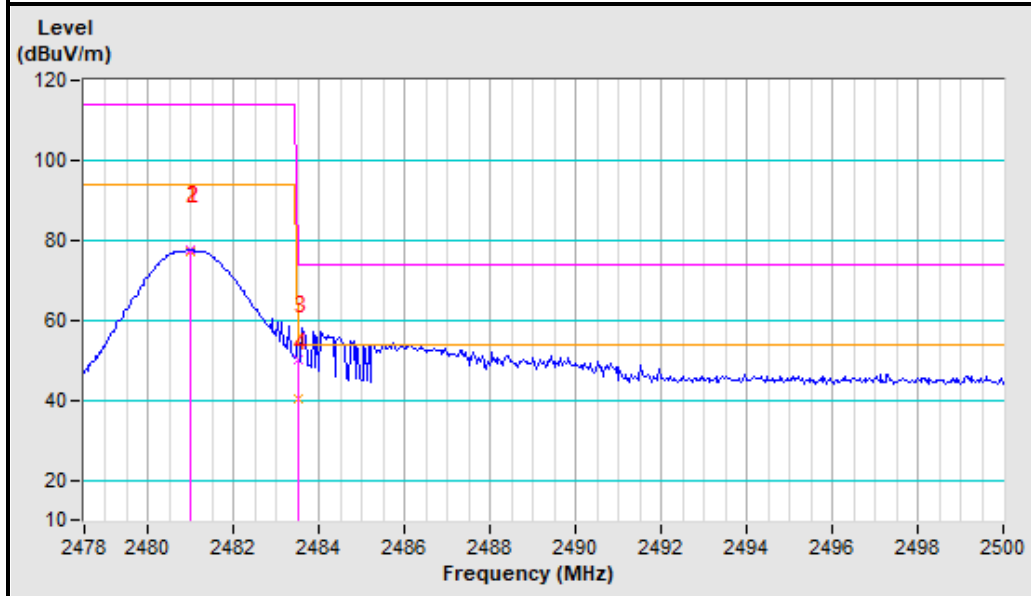
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

Band edge Plot

2481MHz Horizontal



2481MHz 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.	Next Cal.
Power Sensor	Keysight	U2021XA	MY57320002	Jan. 11, 24
Power Meter	Anritsu	ML2495A	1139001	Aug. 22, 23
Power Sensor	Anritsu	MA2411B	1531155	Aug. 22, 23
Digital Multimeter	FLUKE	15B	A1220010DG	N/A
Humid & Temp Programmable Tester	Haida	HD-225T	110807201	Nov. 02, 23
Oscilloscope	Agilent	DSO9254A	MY51260160	Jul. 27, 23
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Jan. 11, 24
Signal Generator	Agilent	N5183A	MY50140980	Jul. 20, 23
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Jul. 20, 23
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	N/A
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Keysight	E3642A	MY56146098	N/A
Test software	ADT	ADT_RF Test Software V6.6.5.3	N/A	N/A

NOTES:

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

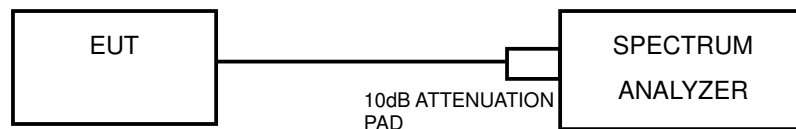
4.2.3 TEST PROCEDURE

- 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



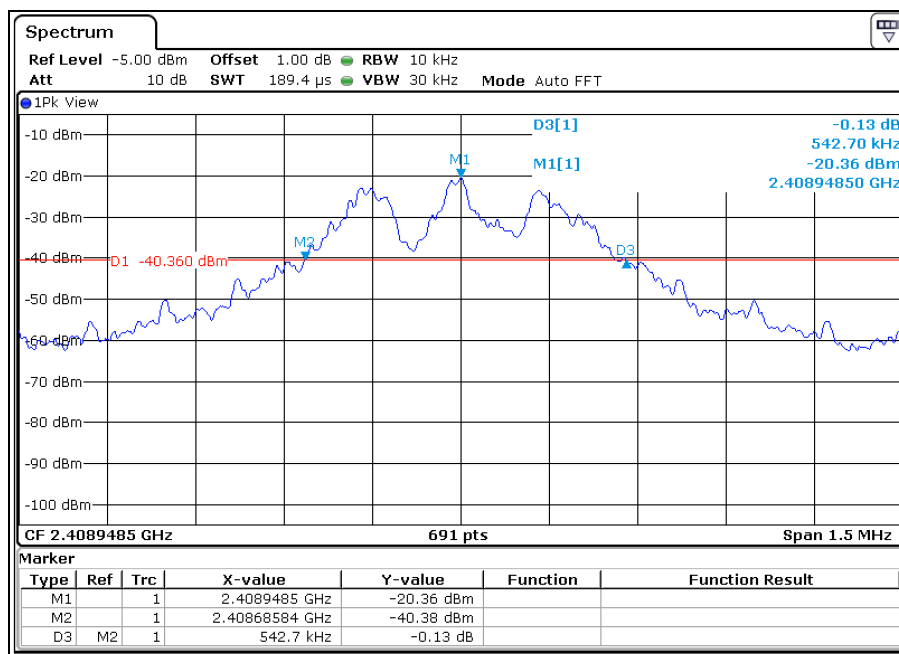
4.2.6 EUT OPERATING CONDITIONS

- 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	2409	0.5427
Middle	2445	0.5731
High	2481	0.5232

Test Data: Low channel





Spectrum

Ref Level -5.00 dBm Offset 1.00 dB RBW 10 kHz
 Att 10 dB SWT 189.4 μ s VBW 30 kHz Mode Auto FFT

1Pk Max

CF 2.4449479 GHz 691 pts Span 1.5 MHz

Marker Data:

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4449479 GHz	-20.06 dBm		
M2		1	2.44465485 GHz	-40.21 dBm		
D3	M2	1	573.1 kHz	-0.35 dB		

Spectrum

Ref Level -5.00 dBm Offset 1.00 dB RBW 10 kHz
 Att 10 dB SWT 189.4 μ s VBW 30 kHz Mode Auto FFT

1Pk View

CF 2.4809457 GHz 691 pts Span 1.5 MHz

Markers:

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4809457 GHz	-20.46 dBm		
M2		1	2.48068521 GHz	-40.36 dBm		
D3	M2	1	523.2 kHz	-0.12 dB		

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---