TEST REPORT

Reference No.	:	WTX24X03052443W
FCC ID	:	2ABK2-173065
Applicant	:	Jade Electronics Co., Ltd
Address	:	Jade Industrial Park, East 24th Xiaochi Road, Development District, Ganzhou, China
Manufacturer	:	The same as Applicant
Address	:	The same as Applicant
Product Name	:	ACCESS CONTROL MODULE
Model No.	:	1730/65
Standards	:	FCC Part 15C
Date of Receipt sample	:	2024-03-15
Date of Test	:	2024-03-18 to 2024-04-01
Date of Issue	:	2024-04-01
Test Report Form No.	:	WTX_Part 15CW
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.

Prepared By:

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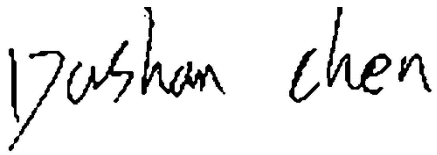
Tested by:



Dashan Chen

Approved by:

Jason Su

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Report version

Version No.	Date of issue	Description
Rev.00	2024-04-01	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	ACCESS CONTROL MODULE
Trade Name:	JADE
Model No.:	1730/65
Adding Model:	/
Battery Capacity	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	125kHz
Modulation Type:	BPSK
Antenna Type:	Coil Antenna
Antenna Gain	0dBi
Rated Voltage:	DC 5V
Rated Current:	/
Rated Power:	/
Note The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

FCC Part 15 Subpart C: Intentional Radiators.
FCC Rules Part 15.207: Conducted limits.
FCC Rules Part 15.209: Radiated emission limits; general requirements.
FCC Rules Part 15.215: Additional provisions to the general radiated emission limitations.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (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 mai ntained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark	Power Supply Mode
TM1	Transmit/ Receiving	125kHz	DC5V

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Adapter	RWX	RWX-AA-050100C	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC Cable	1.0	Unshielded	Without Ferrite

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

1.7 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1004A1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2024-02-27	2025-02-26
☐ Chamber A: Below 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2024-02-24	2025-02-23
WTXE1001A1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2024-02-24	2025-02-23
WTXE1007A1001	Amplifier	HP	8447F	2805A03475	2024-02-24	2025-02-23
WTXE1010A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2025-02-25
WTXE1010A1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2024-02-24	2025-02-23
☐ Chamber A: Above 1GHz						
WTXE1005A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2024-02-24	2025-02-23
WTXE1001A1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2024-02-24	2025-02-23
WTXE1065A1001	Amplifier	C&D	PAP-1G18	2002	2024-02-27	2025-02-26
WTXE1010A1005	Horn Antenna	ETS	3117	00086197	2024-02-26	2025-02-25
WTXE1010A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2025-03-16
WTXE1003A1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2024-02-29	2025-02-28
☐ Chamber B:Below 1GHz						
WTXE1010A1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2024-02-24	2025-02-23
WTXE1038A1001	Amplifier	Agilent	8447D	2944A10457	2021-04-09	2024-04-08
WTXE1001A1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2024-02-24	2025-02-23
☒ Chamber C:Below 1GHz						
WTXE1093A1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2024-02-27	2025-02-26
WTXE1010A	Trilog	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27

1013-1	Broadband Antenna					
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2025-02-25
WTXE1007A 1002	Amplifier	HP	8447F	2944A03869	2024-02-24	2025-02-23
☒ Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2024-02-27	2025-02-26
WTXE1103A 1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806235	2024-02-27	2025-02-26
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2025-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2024-02-29	2025-02-28
☐ Conducted Room 1#						
WTXE1104A 1029	EMI Test Receiver	Rohde & Schwarz	ESCI	100525	2023-12-12	2024-12-11
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2024-02-24	2025-02-23
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2024-02-24	2025-02-23
☒ Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2024-02-24	2025-02-23
WTXE1003A 1003	LISN	Rohde & Schwarz	ENV 216	100097	2024-02-24	2025-02-23

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.207(a) Conducted Emission	Compliant
§15.209(a) Radiated Emission	Compliant
§15.215 20dB Emission Bandwidth	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to§1.1307 and §2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

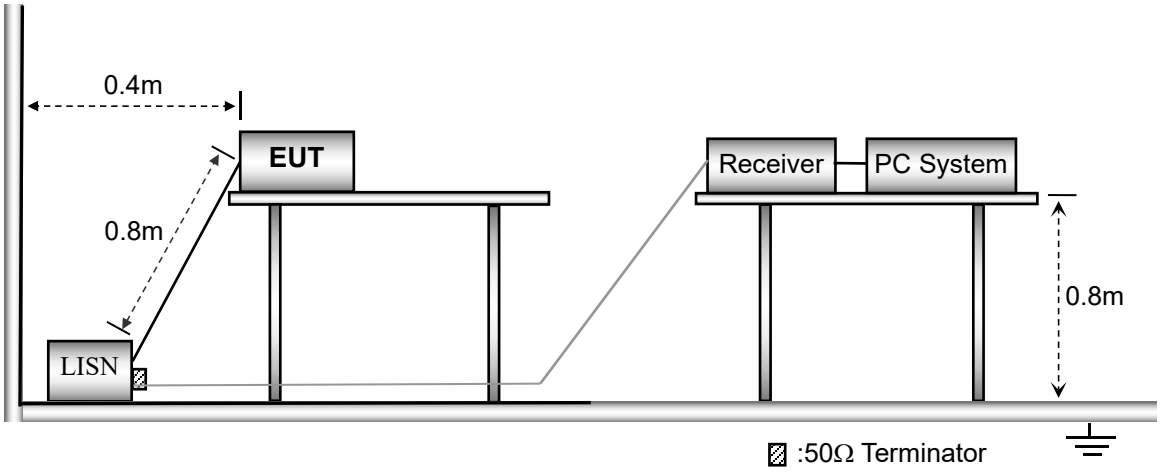
This product has a Coil antenna, fulfill the requirement of this section.

5. Conducted Emissions

5.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

5.2 Basic Test Setup Block Diagram



5.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	45%
ATM Pressure:	1012 mbar

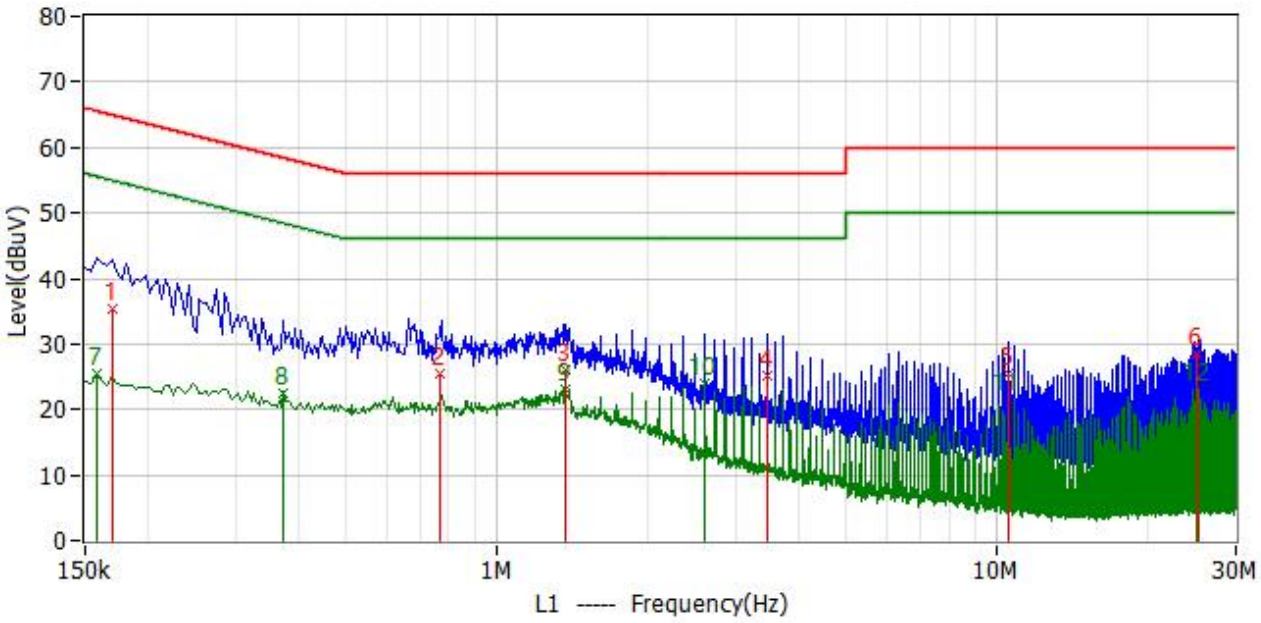
5.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency..... 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed.....Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth..... 9 kHz
Quasi-Peak Adapter Mode.....Normal

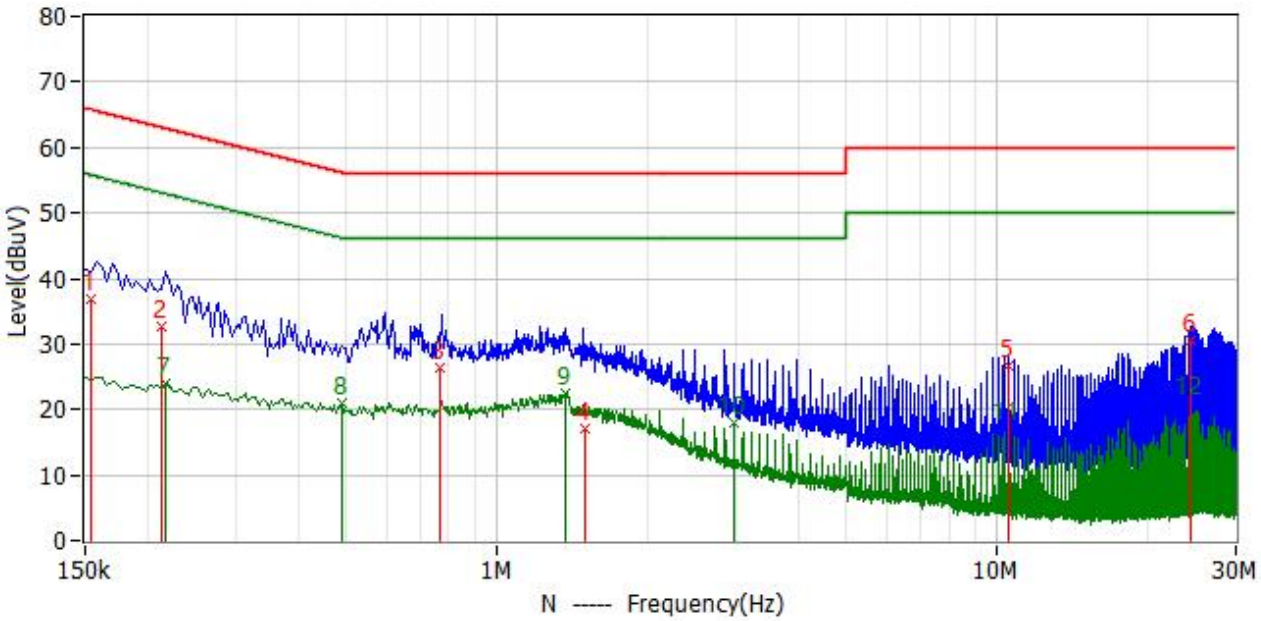
5.5 Summary of Test Results/Plots

Test mode:	TM1	Polarity:	Line



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	170.000kHz	25.5	9.8	35.3	65.0	-29.7	QP
2	766.000kHz	15.8	9.8	25.6	56.0	-30.4	QP
3	1.366MHz	16.2	9.8	26.0	56.0	-30.0	QP
4	3.478MHz	15.2	9.9	25.1	56.0	-30.9	QP
5	10.542MHz	15.7	9.8	25.5	60.0	-34.5	QP
6	25.062MHz	18.3	10.1	28.4	60.0	-31.6	QP
7*	158.000kHz	15.7	9.9	25.6	55.6	-30.0	AV
8*	374.000kHz	12.7	9.9	22.6	48.4	-25.8	AV
9*	1.366MHz	13.2	9.8	23.0	46.0	-23.0	AV
10*	2.606MHz	14.2	9.9	24.1	46.0	-21.9	AV
11*	10.546MHz	11.8	9.8	21.6	50.0	-28.4	AV
12*	25.310MHz	13.0	10.1	23.1	50.0	-26.9	AV

Test mode:	TM1	Polarity:	Neutral



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	154.000kHz	27.1	9.7	36.8	65.8	-28.9	QP
2	214.000kHz	23.0	9.8	32.8	63.0	-30.3	QP
3	770.000kHz	16.8	9.7	26.5	56.0	-29.5	QP
4	1.498MHz	7.4	9.7	17.1	56.0	-38.9	QP
5	10.546MHz	16.9	9.9	26.8	60.0	-33.2	QP
6	24.318MHz	20.4	10.3	30.7	60.0	-29.3	QP
7*	218.000kHz	14.3	9.8	24.1	52.9	-28.8	AV
8*	490.000kHz	11.4	9.7	21.1	46.2	-25.1	AV
9*	1.370MHz	12.8	9.7	22.5	46.0	-23.5	AV
10*	2.978MHz	8.2	9.8	18.0	46.0	-28.0	AV
11*	10.546MHz	7.3	9.9	17.2	50.0	-32.8	AV
12*	24.318MHz	10.7	10.3	21.0	50.0	-29.0	AV

6. Field Strength of Spurious Emissions

6.1 Standard Applicable

According to §15.209(a), Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:.

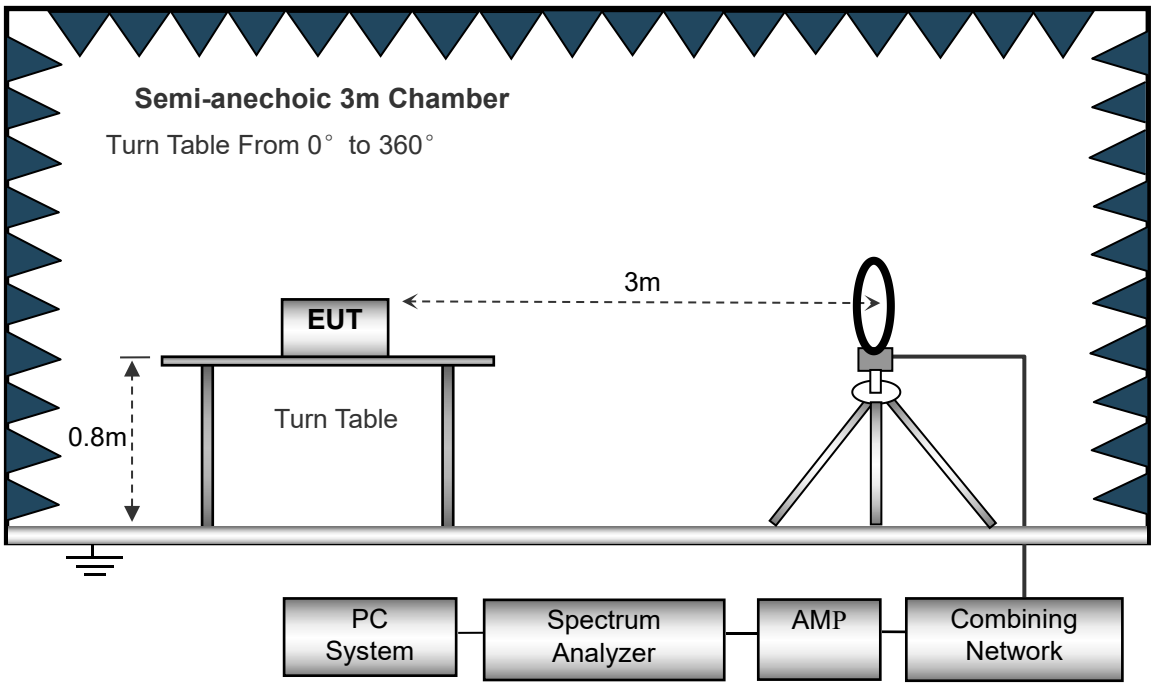
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

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. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

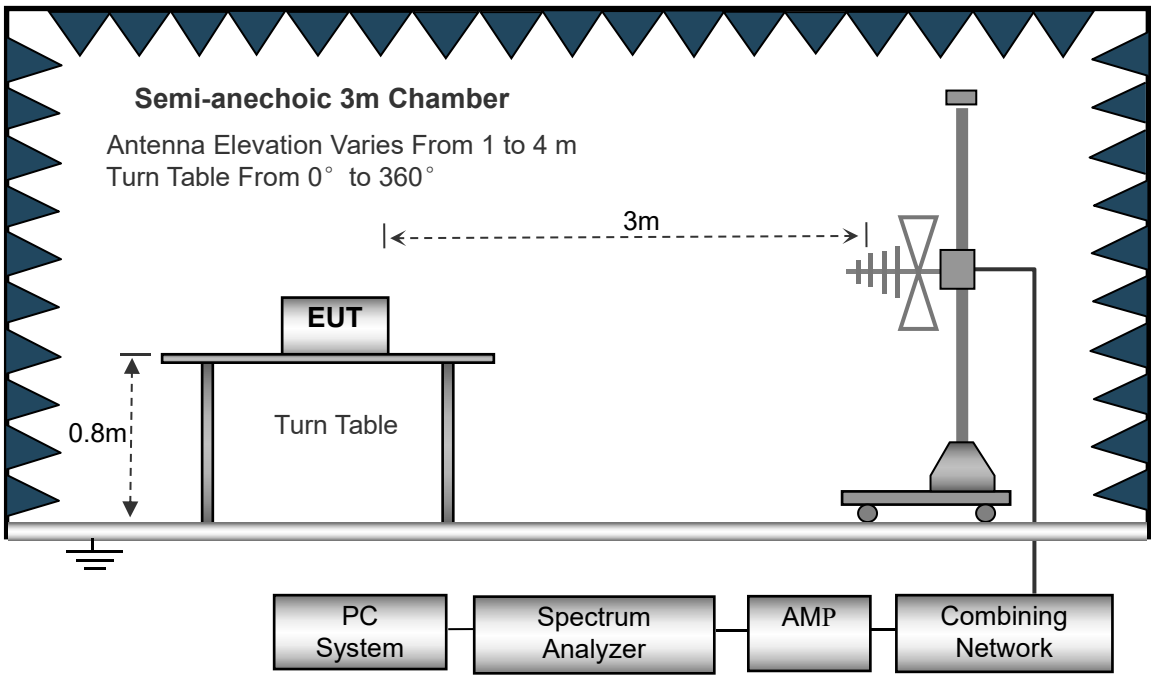
6.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

The test setup for emission measurement below 30MHz..



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



Frequency :9kHz-30MHz
RBW=10KHz
VBW =30KHz
Sweep time= Auto
Trace = max hold
Detector function = peak

Frequency :30MHz-1GHz
RBW=120KHz,
VBW=300KHz
Sweep time= Auto
Trace = max hold
Detector function = peak, QP

6.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

6.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

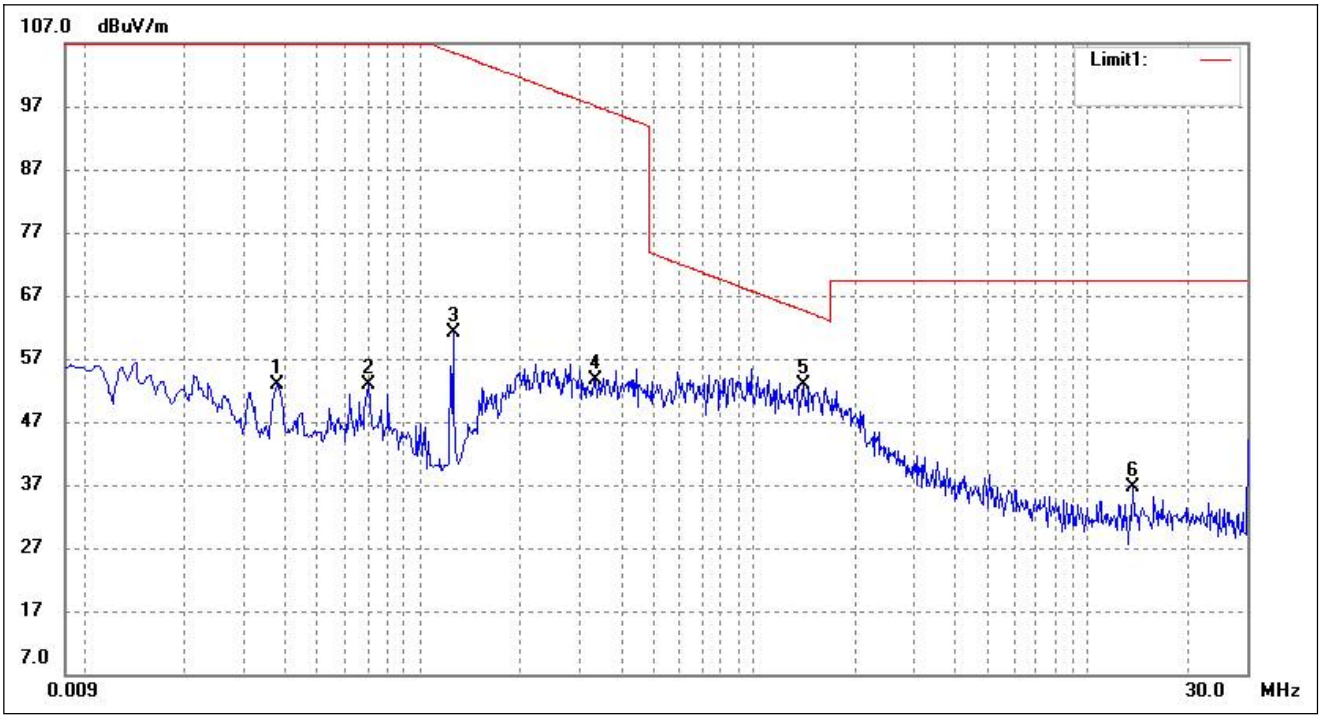
6. Reference Measurement at open field site

The measurement was performed with set-up consisting of a single turn loop antenna with a diameter of 0.15 m, feeded by a signal generator. The loop dimension was chosen to simulate the EUT as far as possible. The signal generator was set to a fixed output level with an unmodulated 10 kHz and 14 kHz sinusoidal signal.
The radiated H fieldstrength at 10 kHz and 14 kHz generated by this set-up was measured with the same test setup as used in the SAC in 3 m distance first, and then repeated at the open field site in 3 m and 10 m distance

6.5 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

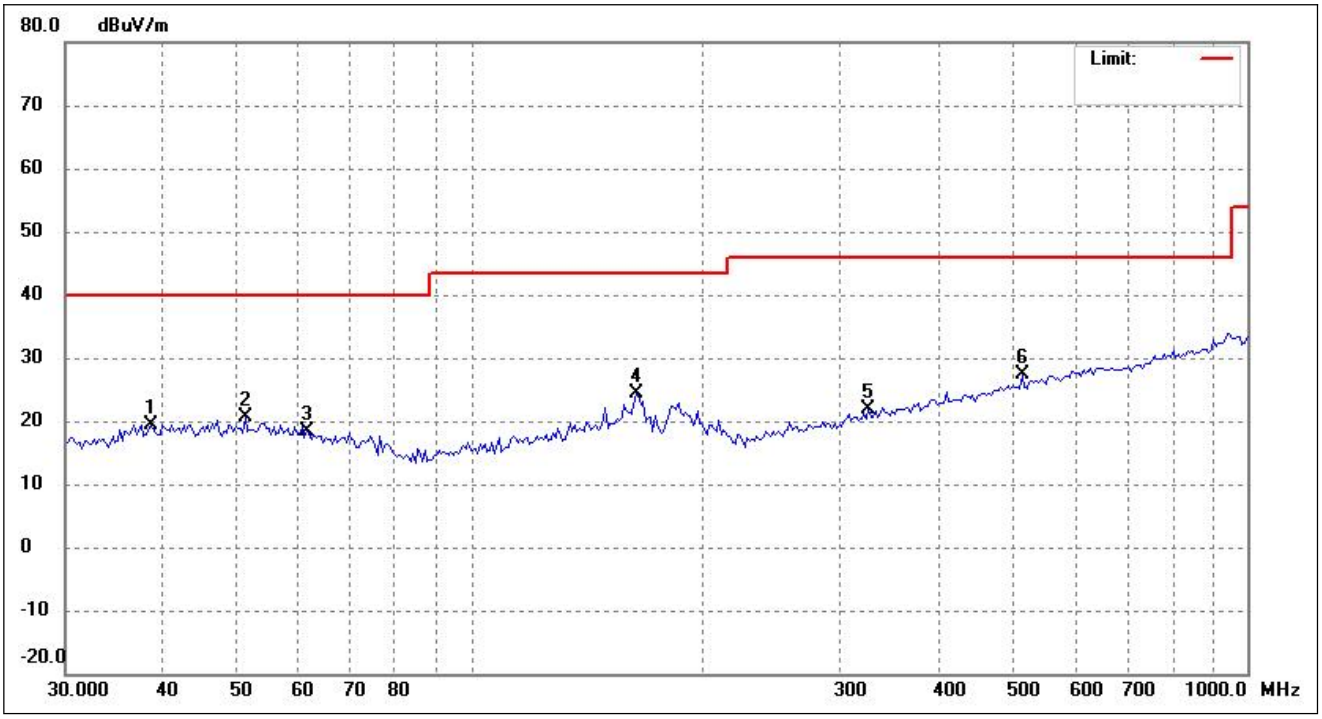
Radiated Emissions Test Data (Below 30MHz)(Worst case EUT X axis)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	0.0376	58.95	-6.10	52.85	116.09	-63.24	-	-	peak
2	0.0709	59.24	-6.27	52.97	110.58	-57.61	-	-	peak
3	0.1265	67.71	-6.46	61.25	105.56	-44.31	-	-	peak
4	0.3373	61.46	-7.78	53.68	97.04	-43.36	-	-	peak
5	1.4032	59.12	-6.15	52.97	64.69	-11.72	-	-	peak
6	13.6228	41.68	-4.94	36.74	69.50	-32.76	-	-	peak

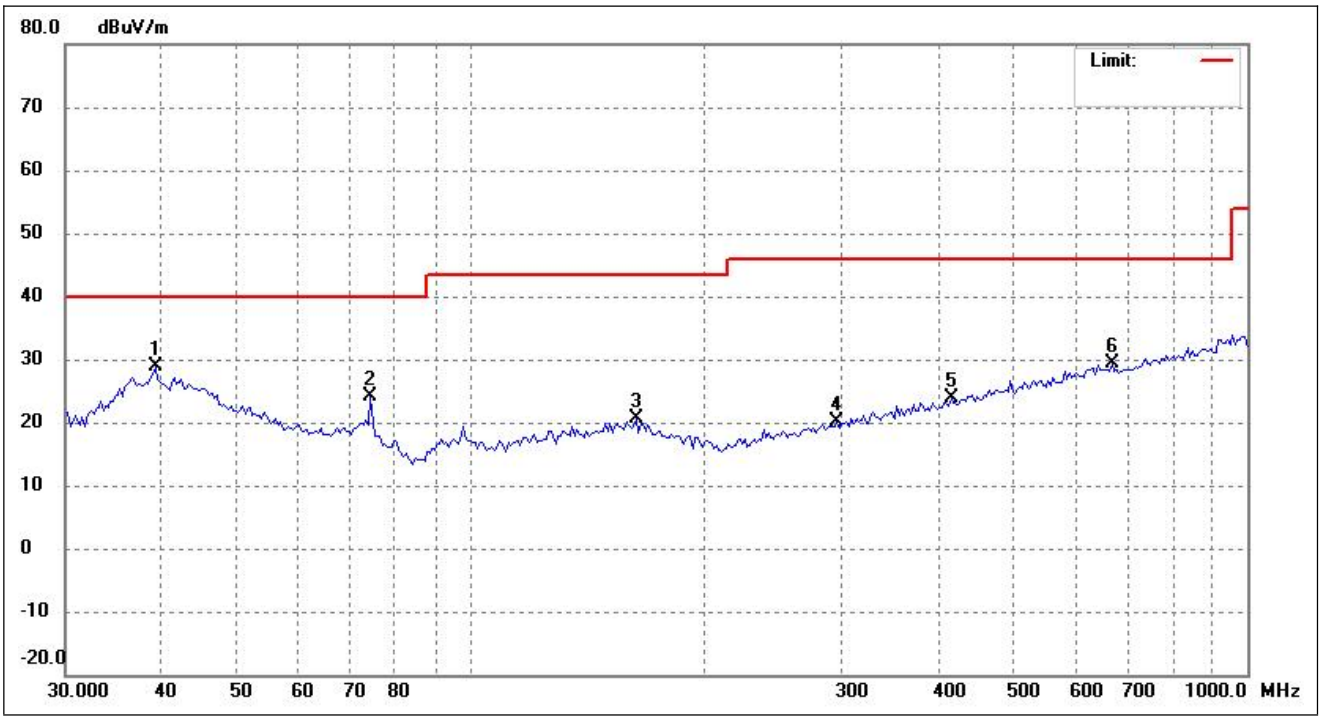
Plot of Radiated Emissions Test Data (Above 30MHz)

Test mode:	TM1	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.6357	28.24	-8.78	19.46	40.00	-20.54	-	-	peak
2	51.1756	28.79	-8.22	20.57	40.00	-19.43	-	-	peak
3	61.4343	27.68	-9.20	18.48	40.00	-21.52	-	-	peak
4	163.1623	32.96	-8.70	24.26	43.50	-19.24	-	-	peak
5	324.8645	29.48	-7.55	21.93	46.00	-24.07	-	-	peak
6	512.9478	30.96	-3.70	27.26	46.00	-18.74	-	-	peak

Test mode:	TM1	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	39.1825	37.63	-8.65	28.98	40.00	-11.02	-	-	peak
2	74.2696	35.90	-11.70	24.20	40.00	-15.80	-	-	peak
3	163.1623	29.35	-8.70	20.65	43.50	-22.85	-	-	peak
4	296.5023	28.58	-8.38	20.20	46.00	-25.80	-	-	peak
5	415.4486	29.51	-5.54	23.97	46.00	-22.03	-	-	peak
6	669.9523	30.57	-1.27	29.30	46.00	-16.70	-	-	peak

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

7. 20dB Emission bandwidth.

7.1 Standard Applicable

According to 15.215, 20dB emission bandwidth.

7.2 Test Procedure

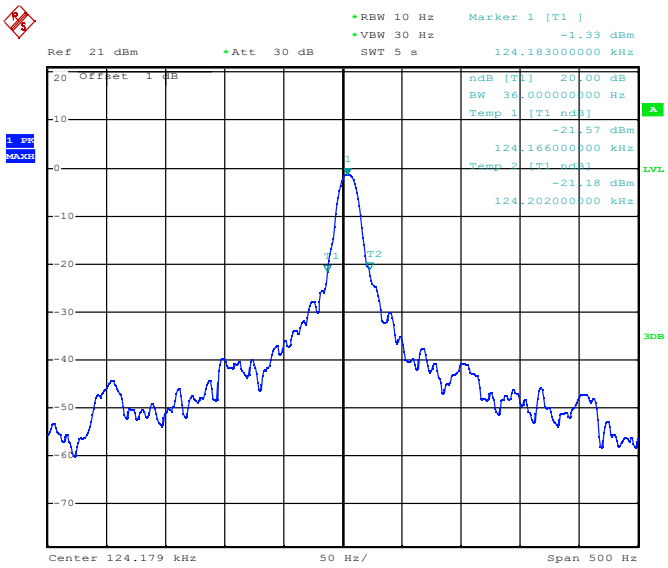
• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
• The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

7.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

7.4 Summary of Test Results/Plots

Test Channel(kHz)	20dB Emission Bandwidth(kHz)
124.179	36.00



Note: The RBW of the analyzer measuring Bandwidth cannot be adjusted to 1%-5% occupied bandwidth, the RBW of the test setting is the closest value.

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

******* END OF REPORT *******