

FCC TEST REPORT

FCC ID: 2BERQHC24032GT

Product : F1
Model Name : HC-8058, HC-8058-1
Brand : N/A
Report No. : NCT24049014E

Prepared for

Shantou City Chenghai District Haocan Toys Factory

Zone A, 8th Floor, No. 2 Meidai Meijiang Road West 2nd Lane, Chenghua Street, Chenghai District, Shantou City, Guangdong Province, China

Prepared by

Shenzhen NCT Testing Technology Co., Ltd.

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1 TEST RESULT CERTIFICATION

Applicant's name : Shantou City Chenghai District Haocan Toys Factory
Address : Zone A, 8th Floor, No. 2 Meidai Meijiang Road West 2nd Lane,
Chenghua Street, Chenghai District, Shantou City, Guangdong
Province, China
Manufacture's name : Shantou City Chenghai District Haocan Toys Factory
Address : Zone A, 8th Floor, No. 2 Meidai Meijiang Road West 2nd Lane,
Chenghua Street, Chenghai District, Shantou City, Guangdong
Province, China
Product name : F1
Model name : HC-8058, HC-8058-1
Standards : FCC CFR47 Part 15 Section 15.249
Test procedure : ANSI C63.10:2013
Date of test : Nov. 13, 2024- Nov. 29, 2024
Date of Issue : Nov. 29, 2024

This device described above has been tested by NCT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

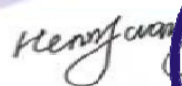
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Test Engineer:



Keven Wu / Engineer

Technical Manager:



Henry Wang / Manager



Contents

	Page
1 TEST RESULT CERTIFICATION.....	2
2 TEST SUMMARY.....	4
2.1 TEST SITE.....	5
3 GENERAL INFORMATION.....	6
3.1 GENERAL DESCRIPTION OF E.U.T.....	6
3.2 CHANNEL LIST	7
3.3 TEST SETUP CONFIGURATION	8
3.4 TEST MODE	8
4 EQUIPMENT DURING TEST.....	9
4.1 EQUIPMENTS LIST	9
4.2 MEASUREMENT UNCERTAINTY	11
4.3 DESCRIPTION OF SUPPORT UNITS.....	11
5 CONDUCTED EMISSION.....	12
6 RADIATED EMISSION AND BAND EDGES.....	14
7 20DB BANDWIDTH MEASUREMENT.....	23
8 ANTENNA APPLICATION.....	26
8.1 ANTENNA REQUIREMENT	26
8.2 RESULT	26
9 TEST SETUP PHOTOS AND EUT PHOTOS	27

2 Test Summary

Test Items	Test Requirement	Result
Field Strength of Fundamental	FCC Part 15.249(a)	PASS
Spurious Emission	FCC Part 15.209	PASS
Band edge	FCC Part 15.209	PASS
20dB bandwidth	FCC Part 15.215(c)	PASS
Conducted Emission	FCC Part 15.207	N/A
Antenna Requirement	FCC Part 15.203	PASS

Remark:

1. "N/A" denotes test is not applicable in this Test Report.

2.1 Test Site

Site Description

EMC Lab. : Accredited by CNAS, 2022-09-27

The certificate is valid until 2028.01.07

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)

The Certificate Registration Number is L8251

Designation Number: CN1347

Test Firm Registration Number: 894804

Accredited by A2LA, June 14, 2023

The Certificate Registration Number is 6837.01

Accredited by Industry Canada, November 09, 2018

The Conformity Assessment Body Identifier is CN0150

Company Number: 30806

Name of Firm : Shenzhen NCT Testing Technology Co., Ltd.

Site Location : A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District, Shenzhen, People's Republic of China

3 General Information

3.1 General Description of E.U.T.

Product Name	:	F1
Model Name	:	HC-8058
Sample ID	:	NCT24049014A-001
Sample(s) Status:	:	Engineer sample
Series Model	:	HC-8058-1
Model Different.:	:	All the same except the model number.
Operating frequency	:	2405.35-2478.35MHz
Number of Channels	:	20 channels
Type of Modulation	:	GFSK
Antenna installation	:	Monopole Antenna
Antenna Gain	:	3dBi
Power supply	:	DC 3.0V from 2pc 1.5V AA batteries
Remark: the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.		

3.2 Channel List

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The details of test channels and bandwidth were for RF conductive measurement.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2405.35	1	2406.35	2	2410.35	3	2414.35
4	2418.35	5	2422.35	6	2426.35	7	2430.35
8	2434.35	9	2438.35	10	2442.35	11	2446.35
12	2450.35	13	2454.35	14	2458.35	15	2462.35
16	2466.35	17	2470.35	18	2474.35	19	2478.35
--	--	--	--	--	--	--	--

Note:

1. Test of channel was included the lowest, middle and highest frequency in highest data rate and to perform the test, then record on this report.

3.3 Test Setup Configuration

Radiated Emission(30MHz-1GHz)

EUT

Radiated Emission(above 1GHz)

EUT

Conducted Spurious

EUT

Spectrum
Analyzer

3.4 Test Mode

Transmitting mode

Keep the EUT in continuously transmitting mode.

	Channel	Frequency(MHz)
Low Channel	0	2405.35
Mid Channel	10	2442.35
High Channel	19	2478.35

4 Equipment During Test

4.1 Equipments List

Conducted emission Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	944 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESPI	101604	Rohde & Schwarz	2024/6/21	2025/6/20
LISN	ENV 216	102796	Rohde & Schwarz	2024/6/21	2025/6/20
LISN	VN1-13S	004023	CRANAGE	2024/6/21	2025/6/20
Cable	RG223-1500MM	NA	RG	2024/6/21	2025/6/20

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESCI	101178	Rohde & Schwarz	2024/6/21	2025/6/20
Amplifier (30MHz-1GHz)	BBV 9743 B	00374	SCHNWARZBECK	2024/6/21	2025/6/20
Bilog Antenna (30MHz-1GHz)	VULB9162	00473	SCHNWARZBECK	2023/3/19	2025/3/18
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHNWARZBECK	2023/3/19	2025/3/18
Preamplifier (1GHz-18GHz)	BBV 9718D	0024	SCHNWARZBECK	2024/6/21	2025/6/20
Spectrum Analyzer (10Hz-40GHz)	FSV 40	100952	Rohde & Schwarz	2024/6/21	2025/6/20
Preamplifier (18GHz-40GHz)	BBV 9721	0056	SCHNWARZBECK	2024/6/21	2025/6/20
Double Ridge Guide Horn Antenna (18GHz-40GHz)	SAS-574	588	A.H.System	2023/3/19	2025/3/18
Loop Antenna (9KHz-30MHz)	FMZB1519B	014	SCHNWARZBECK	2024/6/21	2025/6/20

Amplifier (9KHz-30MHz)	CVP 9222 C	00109	CHNWARZBECK	2024/6/21	2025/6/20
MXG Signal Analyzer	N9020A	MY50510202	Agilent	2024/6/21	2025/6/20
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2024/6/21	2025/6/20
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2024/6/21	2025/6/20
Power Sensor	TR1029-2	512364	Techoy	2024/6/21	2025/6/20
RF Swith	TR1029-1	512364	Techoy	2024/6/21	2025/6/20
Cable	DA800- 4000MM	NA	DA	2024/6/21	2025/6/20
Cable	DA800- 11000MM	NA	DA	2024/6/21	2025/6/20

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	AUDIX	e3	6.120718
2	EMC radiation test system	AUDIX	e3	6.120718
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9kHz~30MHz)	±4.51dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Radiated Emission(25GHz~40GHz)	±3.38dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

4.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

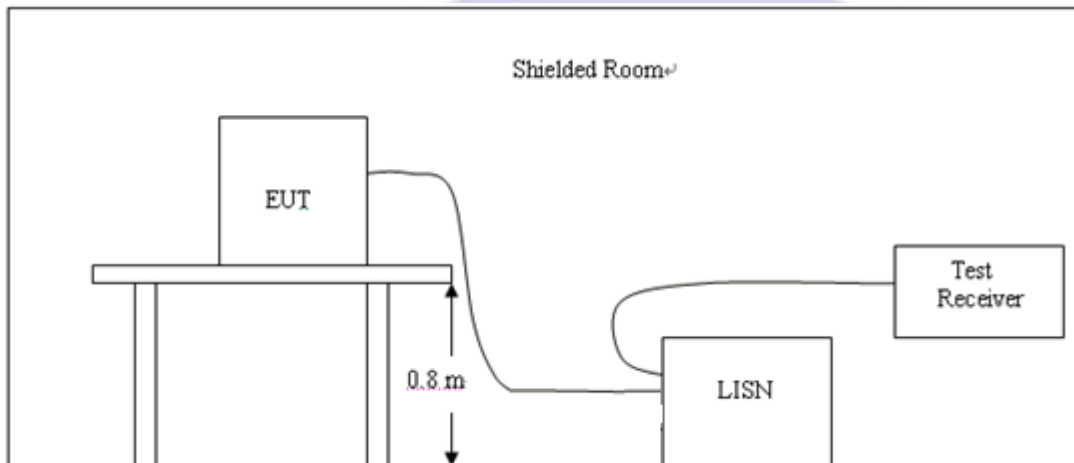
Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	F1	N/A	HC-8058	N/A	EUT

Note: (1)The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

5 Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.

7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following :

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

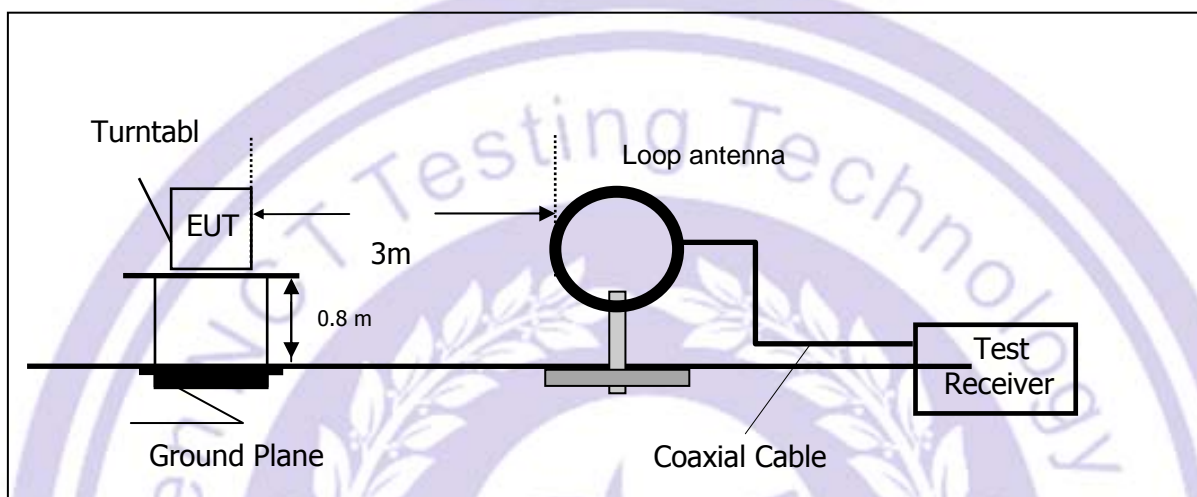
TEST RESULTS

N/A

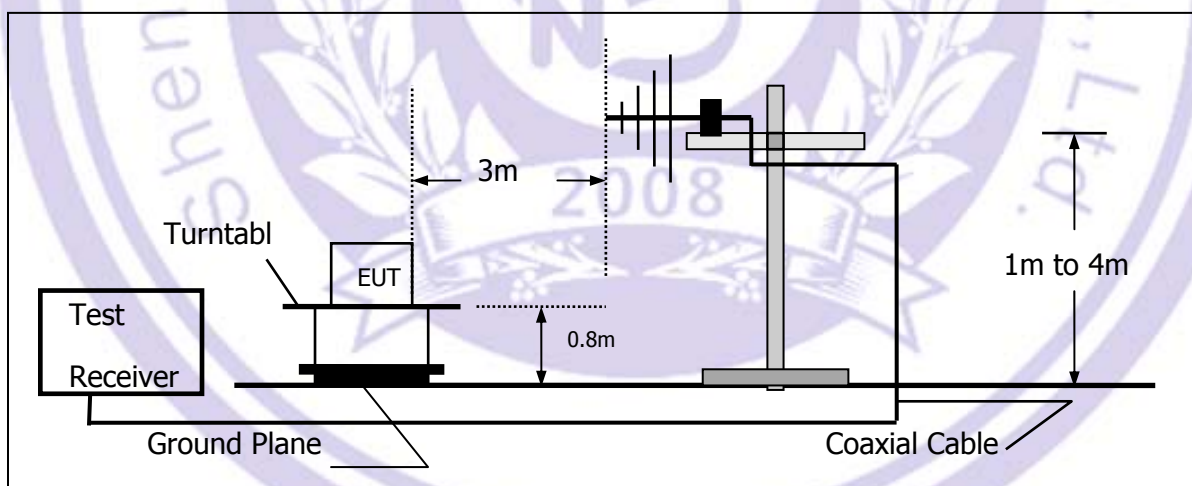
6 Radiated Emission and Band Edges

TEST CONFIGURATION

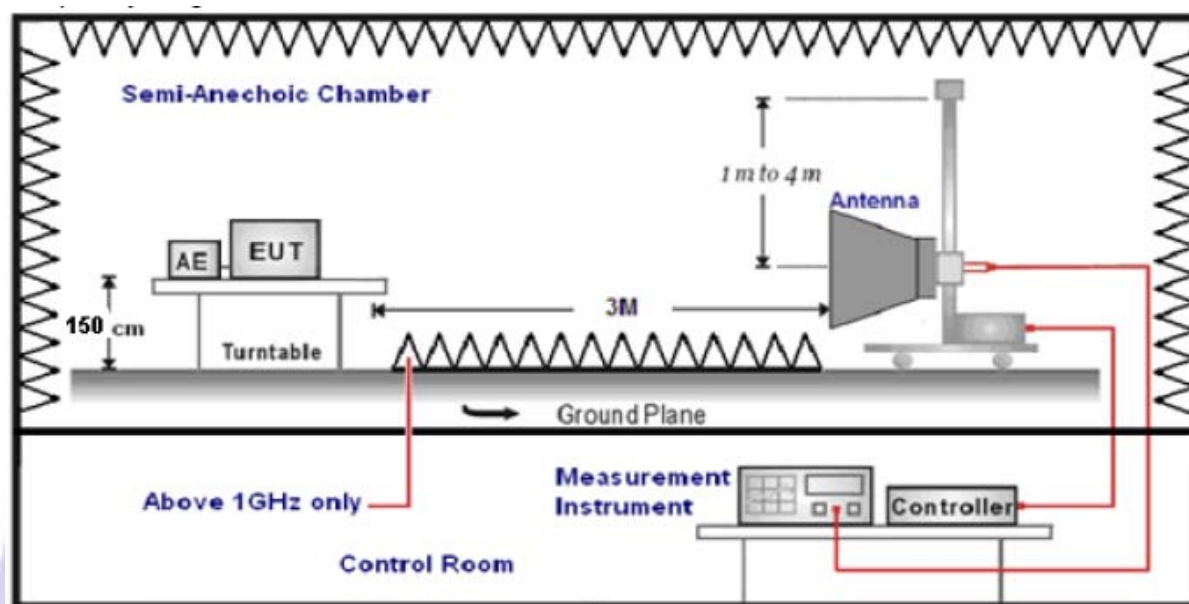
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 26MHz and maximum operation frequency was 1910MHz. so radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3

30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Antenna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

$$Transd=AF +CL-AG$$

RADIATION LIMIT

According 15.249, the field strength of emissions from intentional radiators operated within 2400MHz-2483.5 MHz shall not exceed 94dB μ V/m (50mV/m):

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

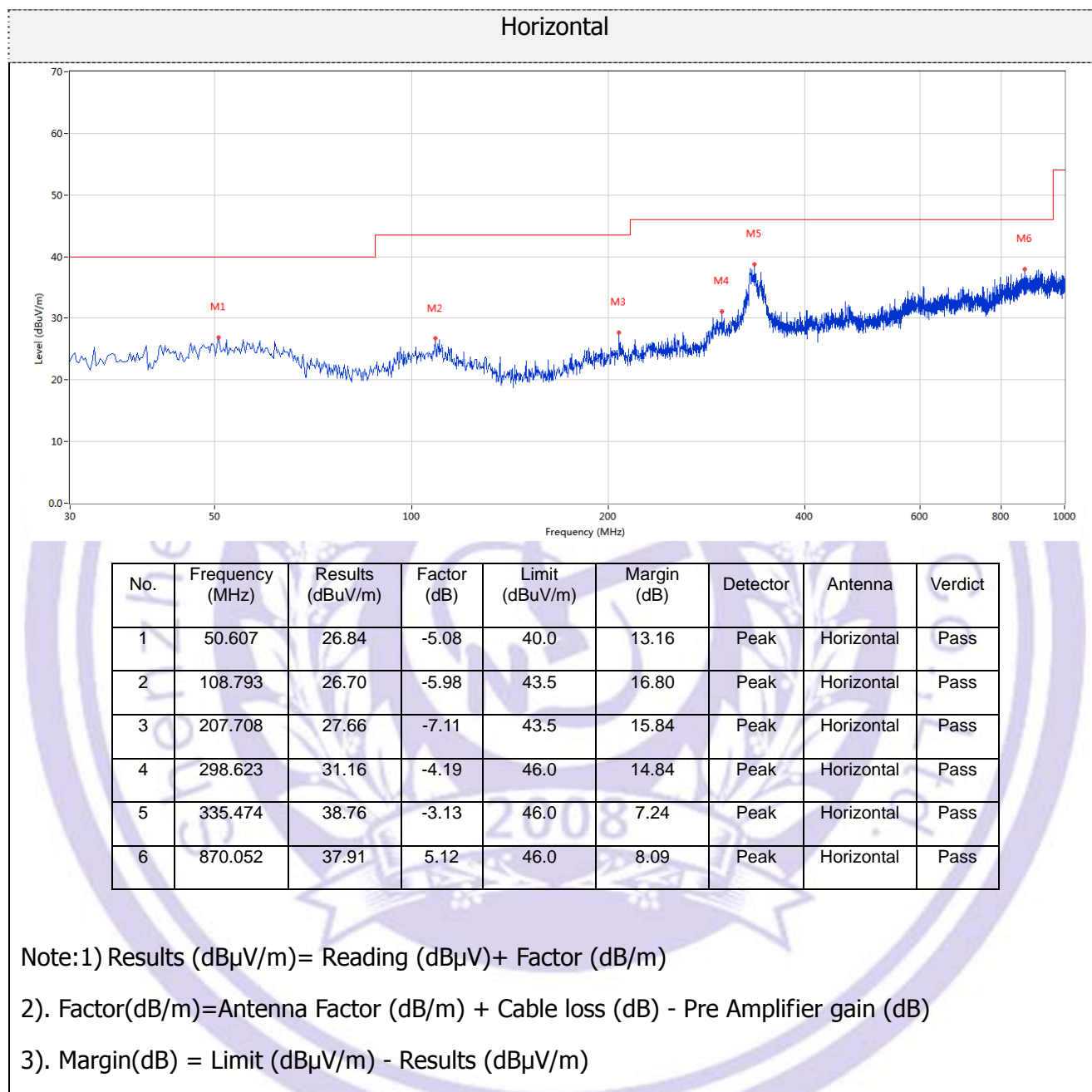
TEST RESULTS

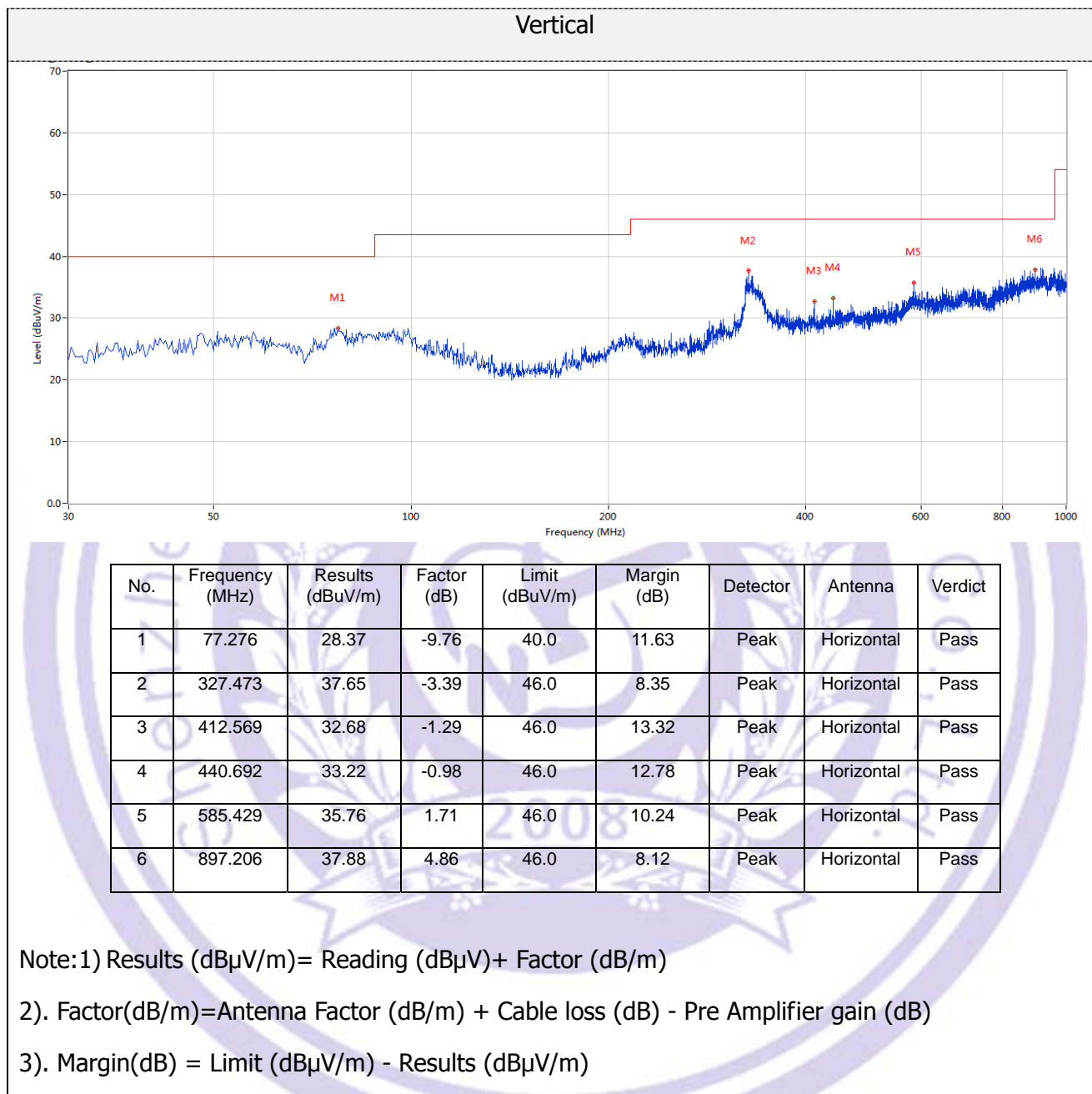
Remark:

1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.

Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz





For 1GHz to 25GHz

GFSK (above 1GHz)

CH Low (2405.35MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2405.35	76.32(PK)	H	114(Peak)/ 94(AV)
2405.35	65.38(PK)	V	114(Peak)/ 94(AV)
4810.70	49.52(PK)	H	74(Peak)/ 54(AV)
4810.70	41.28(PK)	V	74(Peak)/ 54(AV)
7216.05	--	H/V	74(Peak)/ 54(AV)
9621.40	--	H/V	74(Peak)/ 54(AV)
12026.75	--	H/V	74(Peak)/ 54(AV)
14432.10	--	H/V	74(Peak)/ 54(AV)
16837.45	--	H/V	74(Peak)/ 54(AV)
19242.80	--	H/V	74(Peak)/ 54(AV)
21648.15	--	H/V	74(Peak)/ 54(AV)
24053.50	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp
2. Remark "---" means that the emissions level is too low to be measured

CH Middle (2442.35MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2442.35	78.52(PK)	H	114(Peak)/ 94(AV)
2442.35	66.71(PK)	V	114(Peak)/ 94(AV)
4884.70	52.16(PK)	H	74(Peak)/ 54(AV)
4884.70	43.58(PK)	V	74(Peak)/ 54(AV)
7327.05	--	H/V	74(Peak)/ 54(AV)
9769.40	--	H/V	74(Peak)/ 54(AV)
12211.75	--	H/V	74(Peak)/ 54(AV)
14654.10	--	H/V	74(Peak)/ 54(AV)
17096.45	--	H/V	74(Peak)/ 54(AV)
19538.80	--	H/V	74(Peak)/ 54(AV)
21981.15	--	H/V	74(Peak)/ 54(AV)
24423.50	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp
2. Remark "---" means that the emissions level is too low to be measured

CH High (2478.35MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2478.35	75.81(PK)	H	114(Peak)/ 94(AV)
2478.35	66.34(PK)	V	114(Peak)/ 94(AV)
4956.70	49.51(PK)	H	74(Peak)/ 54(AV)
4956.70	43.19(PK)	V	74(Peak)/ 54(AV)
7435.05	--	H/V	74(Peak)/ 54(AV)
9913.40	--	H/V	74(Peak)/ 54(AV)
12391.75	--	H/V	74(Peak)/ 54(AV)
14870.10	--	H/V	74(Peak)/ 54(AV)
17348.45	--	H/V	74(Peak)/ 54(AV)
19826.80	--	H/V	74(Peak)/ 54(AV)
22305.15	--	H/V	74(Peak)/ 54(AV)
24783.50	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp
2. Remark "---" means that the emissions level is too low to be measured

Results of Band Edges Test (Radiated)

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Detec tor Type	Result
GFSK	Low Channel: 2405.35MHz									
	H	2310.00	55.76	35.17	3.48	27.49	50.57	74.00	PK	PASS
	H	2310.00	48.21	35.17	3.48	27.49	43.38	54.00	AV	PASS
	H	2390.00	58.09	35.17	3.48	27.49	53.27	74.00	PK	PASS
	H	2390.00	51.17	35.17	3.48	27.49	46.84	54.00	AV	PASS
	H	2400.00	60.45	35.16	3.49	27.52	55.94	74.00	PK	PASS
	H	2400.00	52.66	35.16	3.49	27.52	48.07	54.00	AV	PASS
	V	2310.00	55.17	35.17	3.48	27.49	50.82	74.00	PK	PASS
	V	2310.00	46.09	35.17	3.48	27.49	41.58	54.00	AV	PASS
	V	2390.00	57.78	35.17	3.48	27.49	52.68	74.00	PK	PASS
	V	2390.00	52.18	35.17	3.48	27.49	47.90	54.00	AV	PASS
	V	2400.00	59.54	35.16	3.49	27.52	54.85	74.00	PK	PASS
	V	2400.00	52.09	35.16	3.49	27.52	47.17	54.00	AV	PASS
	High Channel: 2478.35MHz									
	H	2483.50	57.64	35.11	3.56	27.75	53.84	74.00	PK	PASS
	H	2483.50	50.38	35.11	3.56	27.75	46.58	54.00	AV	PASS
	H	2500.00	58.16	35.1	3.57	27.8	54.43	74.00	PK	PASS
	H	2500.00	50.09	35.1	3.57	27.8	46.36	54.00	AV	PASS
	V	2483.50	58.63	35.11	3.56	27.75	54.83	74.00	PK	PASS
	V	2483.50	48.89	35.11	3.56	27.75	45.09	54.00	AV	PASS
	V	2500.00	57.45	35.1	3.57	27.8	53.72	74.00	PK	PASS
	V	2500.00	49.18	35.1	3.57	27.8	45.45	54.00	AV	PASS
Remark: Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit										

7 20dB Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30KHz RBW and 100KHz VBW.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

LIMIT

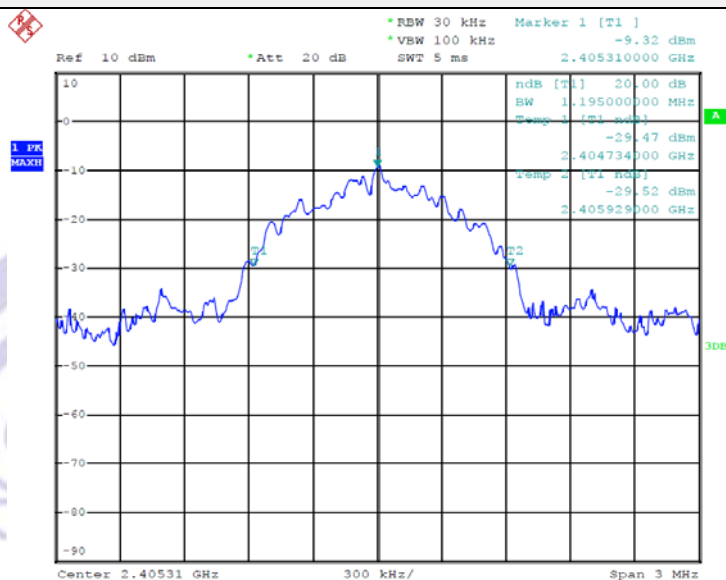
N/A

TEST RESULTS

Modulation	Channel	20dB bandwidth (MHz)	Result
GFSK	2405.35MHz	1.195	PASS
	2442.35MHz	1.204	
	2478.35MHz	1.245	

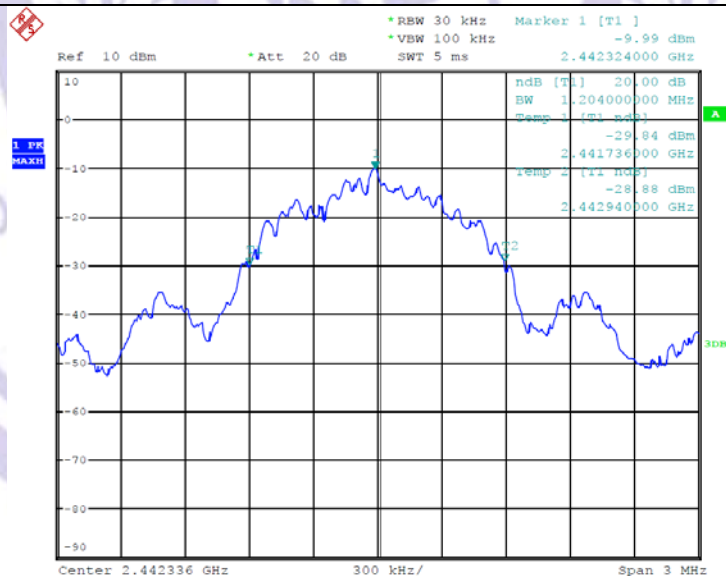
Note: 1.The test results including the cable lose.

Low ch



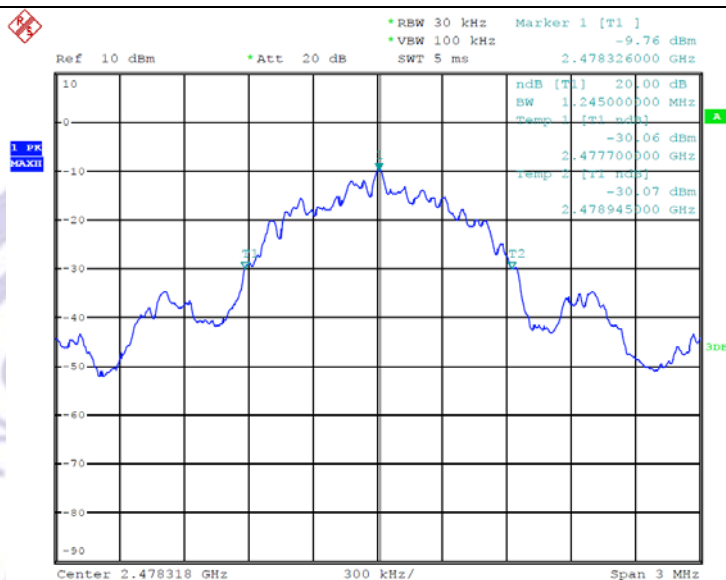
Date: 25.Nov.2024 12:36:45

Mid ch



Date: 25.Nov.2024 11:40:42

High ch



Date: 25.Nov.2024 11:43:13

8 Antenna Application

8.1 Antenna Requirement

15.203 requirement:

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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

8.2 Result

The antenna is monopole Antenna, the best case gain of the antennas is 3dBi, reference to the attachment for details.

9 Test Setup Photos and EUT Photos

Please see the attachment for details.

*****THE END REPORT*****

