

APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Haiping Industry Co., Ltd.

Bluetooth Turntable

Model No.: HP-H005, 1-AD07US01, SN35

FCC ID: 2AQ4R-HP-H005

Prepared for : Haiping Industry Co., Ltd.
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TABLE OF CONTENTS

Description	Page
Test Report Certification	
TABLE OF CONTENTS	2
1. GENERAL INFORMATION	5
1.1. Description of Device (EUT)	5
1.2. Accessory and Auxiliary Equipment	5
1.3. Description of Test Facility	6
1.4. Measurement Uncertainty	6
2. MEASURING DEVICE AND TEST EQUIPMENT	7
3. OPERATION OF EUT DURING TESTING	8
3.1. Operating Mode	8
3.2. Configuration and peripherals	8
4. TEST PROCEDURES AND RESULTS	9
5. 20DB BANDWIDTH TEST	10
5.1. Block Diagram of Test Setup	10
5.2. The Requirement For Section 15.247(a)(1)	10
5.3. EUT Configuration on Measurement	10
5.4. Operating Condition of EUT	10
5.5. Test Procedure	10
5.6. Test Result	11
6. CARRIER FREQUENCY SEPARATION TEST	15
6.1. Block Diagram of Test Setup	15
6.2. The Requirement For Section 15.247(a)(1)	15
6.3. EUT Configuration on Measurement	15
6.4. Operating Condition of EUT	15
6.5. Test Procedure	16
6.6. Test Result	16
7. NUMBER OF HOPPING FREQUENCY TEST	20
7.1. Block Diagram of Test Setup	20
7.2. The Requirement For Section 15.247(a)(1)(iii)	20
7.3. EUT Configuration on Measurement	20
7.4. Operating Condition of EUT	20
7.5. Test Procedure	20
7.6. Test Result	21
8. DWELL TIME TEST	23
8.1. Block Diagram of Test Setup	23
8.2. The Requirement For Section 15.247(a)(1)(iii)	23
8.3. EUT Configuration on Measurement	23
8.4. Operating Condition of EUT	23
8.5. Test Procedure	23
8.6. Test Result	24
9. MAXIMUM PEAK OUTPUT POWER TEST	28
9.1. Block Diagram of Test Setup	28

9.2.	The Requirement For Section 15.247(b)(1).....	28
9.3.	EUT Configuration on Measurement	28
9.4.	Operating Condition of EUT	28
9.5.	Test Procedure	28
9.6.	Test Result	29
10.	RADIATED EMISSION TEST	33
10.1.	Block Diagram of Test Setup.....	33
10.2.	The Limit For Section 15.247(d)	34
10.3.	Restricted bands of operation	36
10.4.	Configuration of EUT on Measurement	36
10.5.	Operating Condition of EUT	37
10.6.	Test Procedure	37
10.7.	Data Sample.....	38
10.8.	Tetst Results.....	38
11.	BAND EDGE COMPLIANCE TEST	51
11.1.	Block Diagram of Test Setup.....	51
11.2.	The Requirement For Section 15.247(d)	51
11.3.	EUT Configuration on Measurement	51
11.4.	Operating Condition of EUT	51
11.5.	Test Procedure	52
11.6.	Test Result	52
12.	AC POWER LINE CONDUCTED EMISSION TEST	62
12.1.	Block Diagram of Test Setup.....	62
12.2.	Power Line Conducted Emission Measurement Limits.....	63
12.3.	Configuration of EUT on Measurement	63
12.4.	Operating Condition of EUT	63
12.5.	Test Procedure	63
12.6.	Data Sample.....	64
12.7.	Test Results.....	64
13.	ANTENNA REQUIREMENT.....	69
13.1.	The Requirement	69
13.2.	Antenna Construction	69

Test Report Certification

Applicant : Haiping Industry Co., Ltd.
Manufacturer : Haiping Industry Co., Ltd.
EUT : Bluetooth Turntable
Model No. : HP-H005, 1-AD07US01, SN35

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

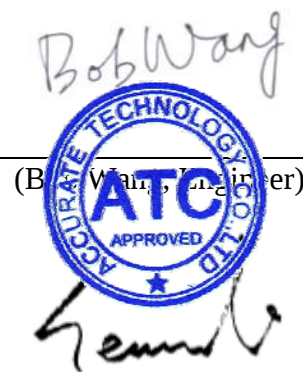
The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : April 28, 2019
Date of Report : April 29, 2019

Prepared by : (Bob Wang, Engineer)

Approved & Authorized Signer : (Sean Liu, Manager)



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Model Number	:	HP-H005, 1-AD07US01, SN35 (Note: Above models are identical in schematic, structure and critical components except for model name different, So we prepare HP-H005 for test.)
Bluetooth version	:	V4.2
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	-0.58dBi
Antenna type	:	PCB Antenna
Modulation mode	:	GFSK, $\pi/4$ DQPSK
Power Supply	:	DC 12V (Power by Adapter)
Adapter	:	Model: SW1200500-F04 Input: AC 100-240V; 50/60Hz Output: DC 12V; 500mA
Applicant	:	Haiping Industry Co., Ltd.
Address	:	3F, Building C, NO.68, Hongshi Road, Buxin, Fenggang Town, Dongguan, Guangdong, China
Manufacturer	:	Haiping Industry Co., Ltd.
Address	:	3F, Building C, NO.68, Hongshi Road, Buxin, Fenggang Town, Dongguan, Guangdong, China

1.2. Accessory and Auxiliary Equipment

n.a.

1.3. Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.4. Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	1 Year
EMI Test Receiver	Rohde& Schwarz	ESR	101817	Jan. 05, 2019	1 Year
Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Jan. 05, 2019	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 05, 2019	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10S S	N/A	Jan. 05, 2019	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2 375/2510-60/11SS	N/A	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.3	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.4	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.5	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.6	Jan. 05, 2019	1 Year
Temporary antenna connector	NTGS	14AE	N/A	Jan. 21, 2019	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

3. OPERATION OF EUT DURING TESTING

3.1. Operating Mode

The mode is used: Transmitting mode

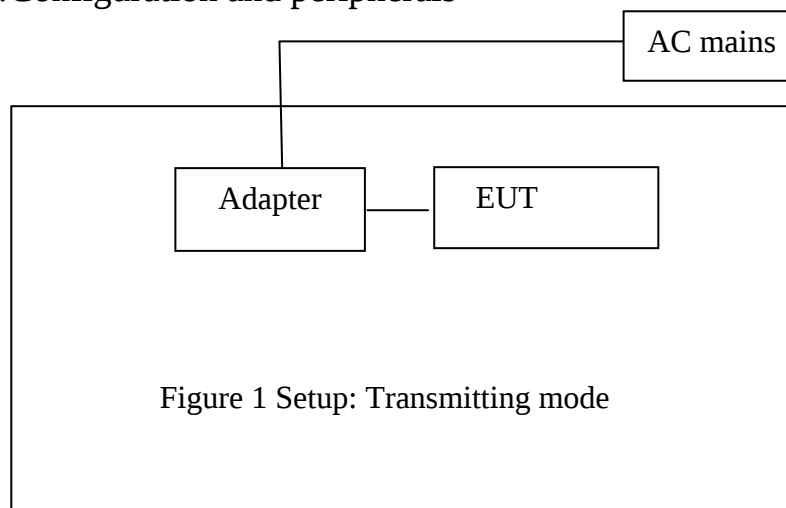
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2. Configuration and peripherals



4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.207	AC Power Line Conducted Emissions Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

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

5.6. Test Result

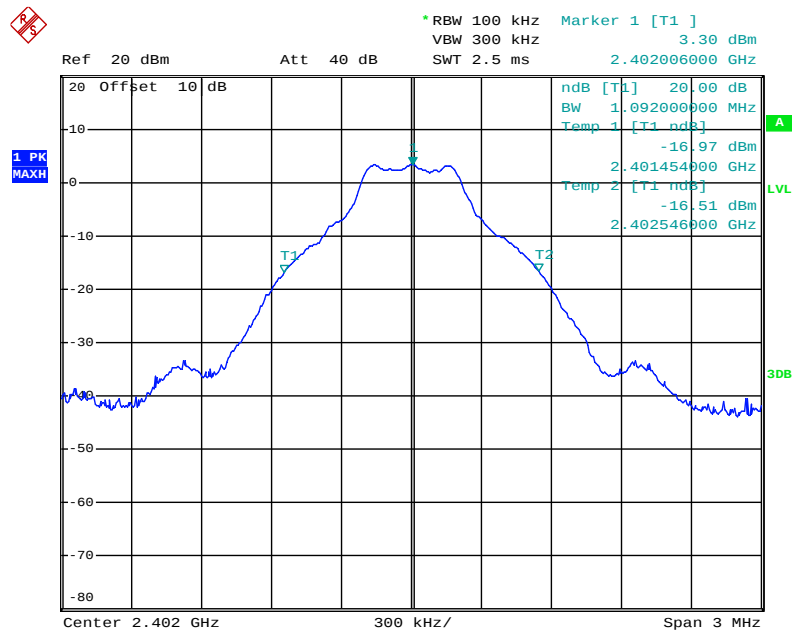
Test Lab: Shielding room

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	$\Pi/4$ -DQPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.092	1.374	Pass
Middle	2441	1.086	1.374	Pass
High	2480	1.086	1.368	Pass

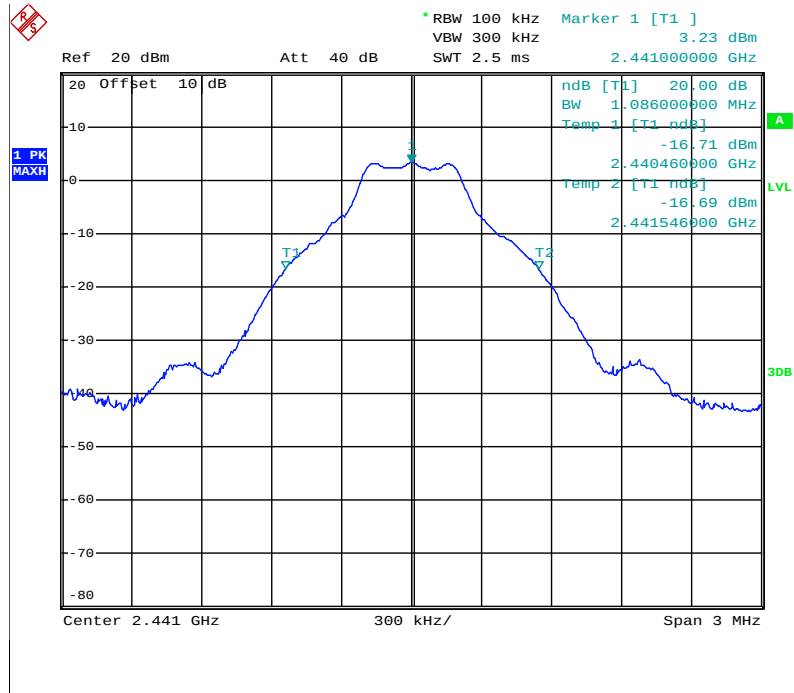
The spectrum analyzer plots are attached as below.

GFSK Mode

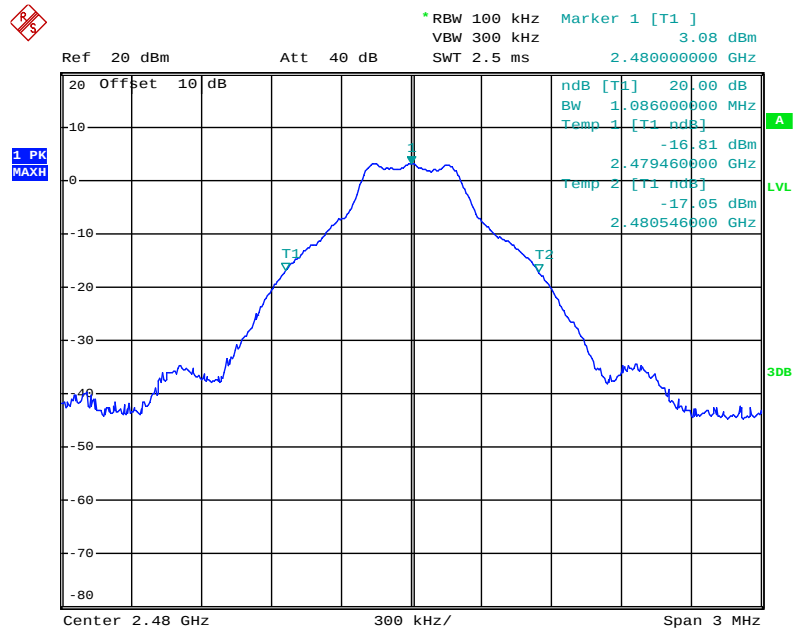
Low channel



Middle channel

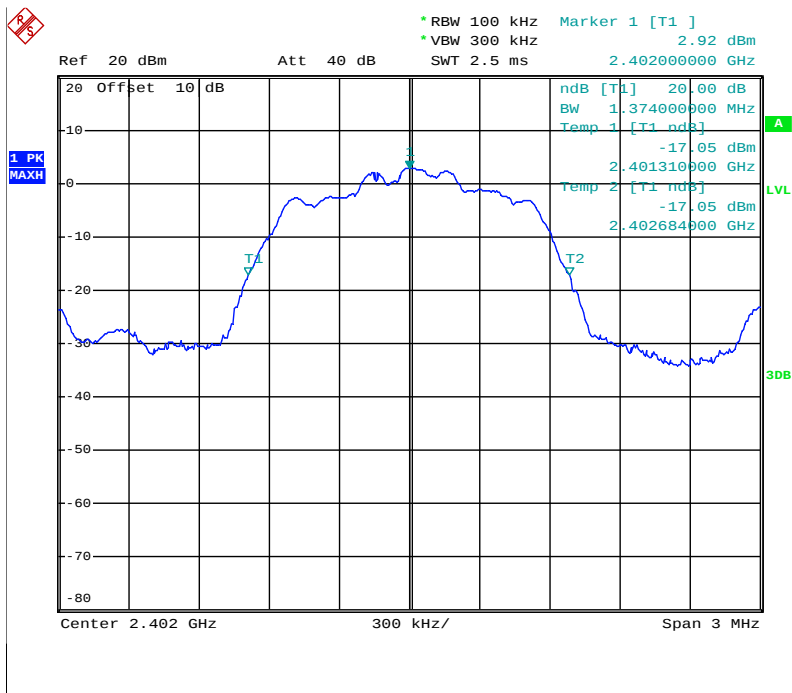


High channel

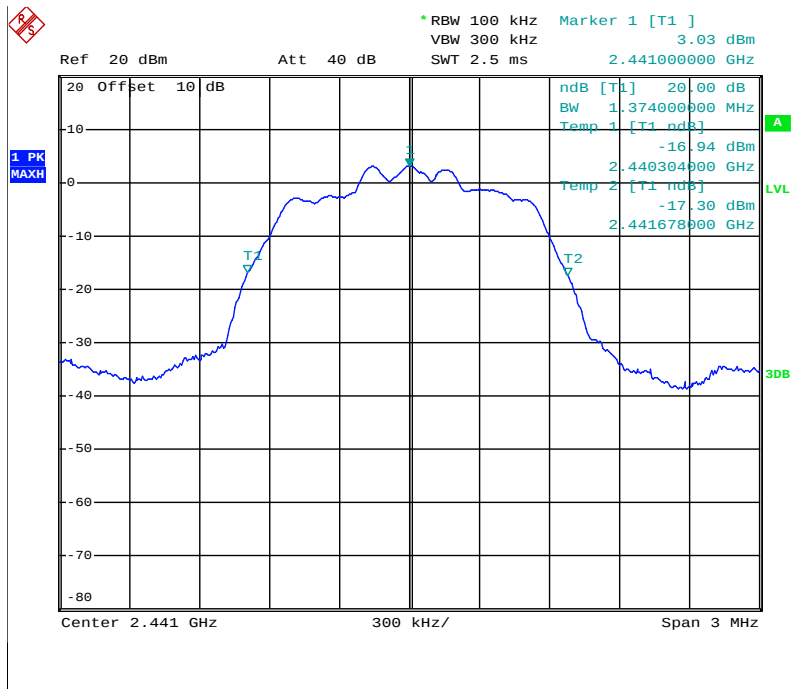


Π/4-DQPSK Mode

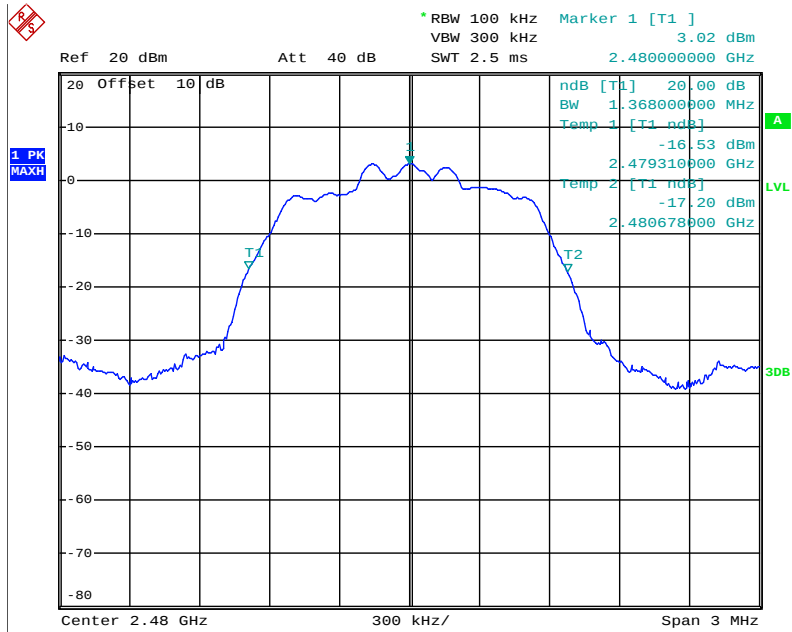
Low channel



Middle channel

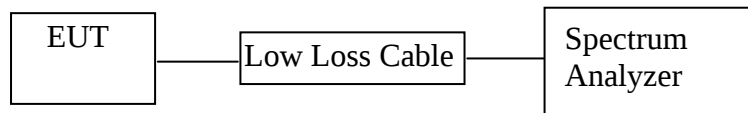


High channel



6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

6.5. Test Procedure

6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

6.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz. Adjust Span to 3 MHz.

6.5.3. Set the adjacent channel of the EUT Maxhold another trace.

6.5.4. Measurement the channel separation

6.6. Test Result

Test Lab: Shielding room

GFSK

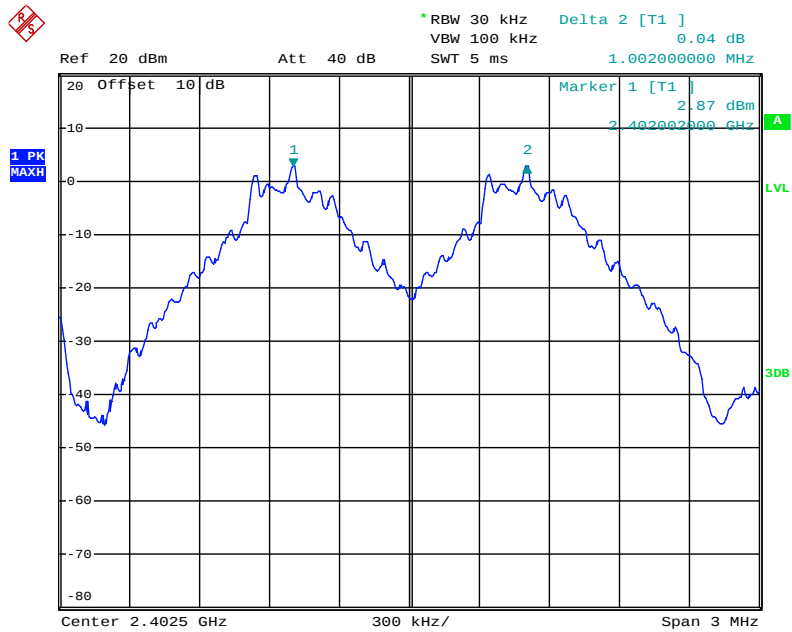
Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

II/4-DQPSK

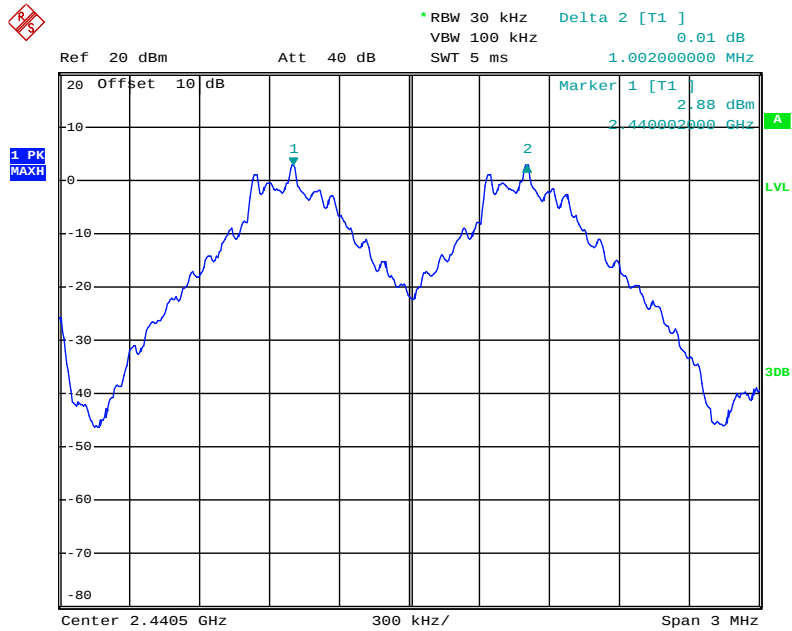
Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.008	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

GFSK Mode

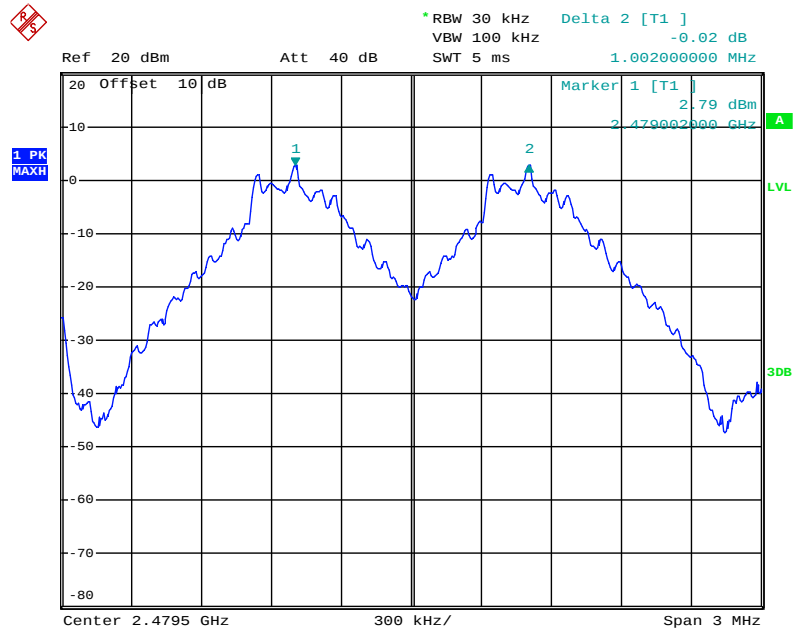
Low channel



Middle channel

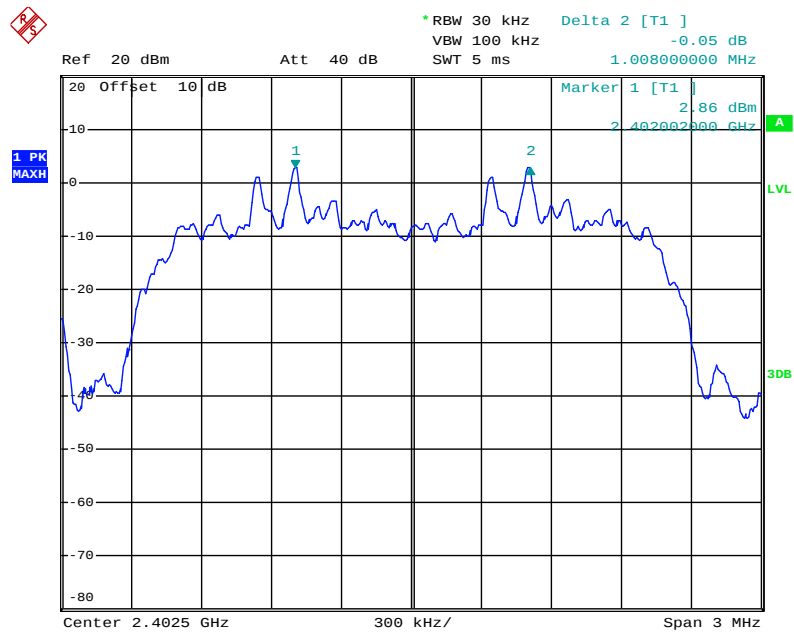


High channel

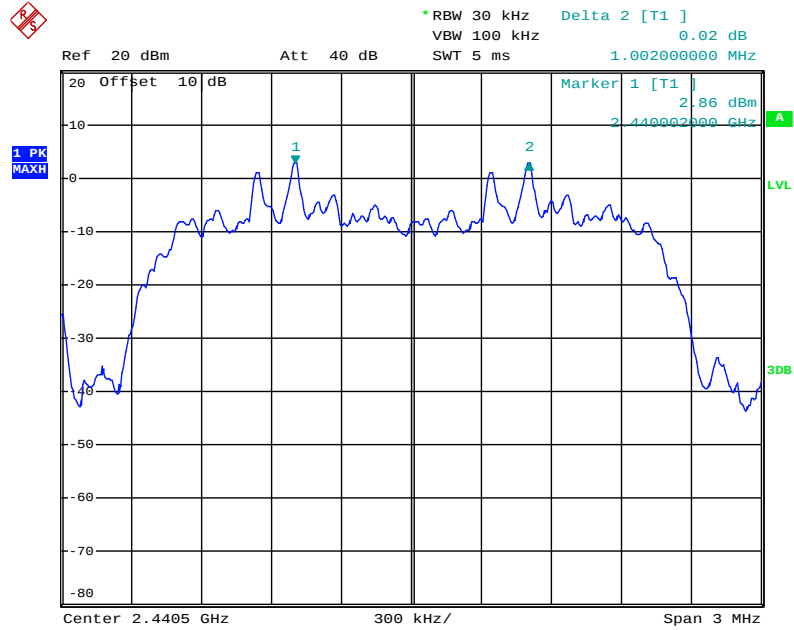


Π/4-DQPSK Mode

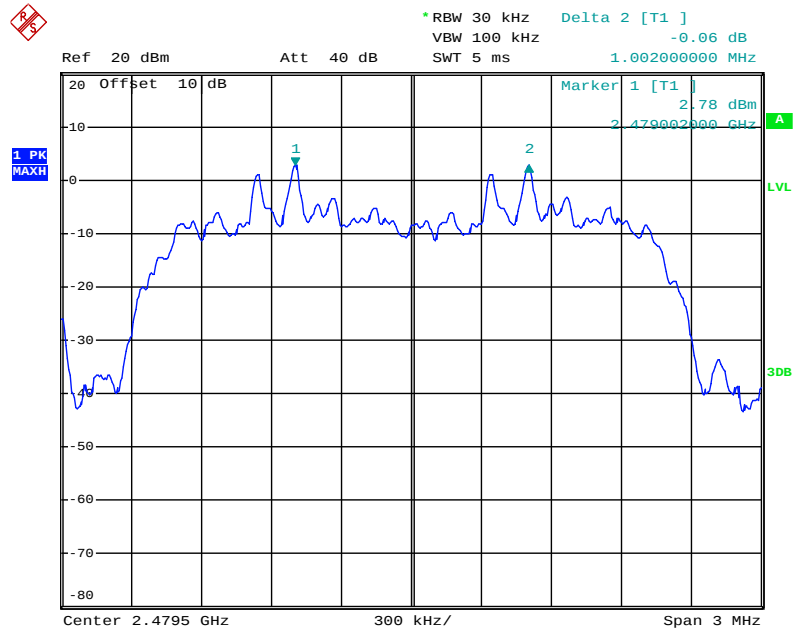
Low channel



Middle channel

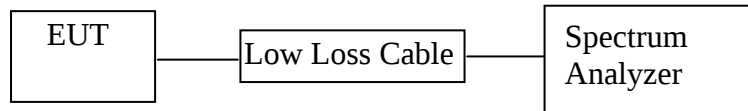


High channel



7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

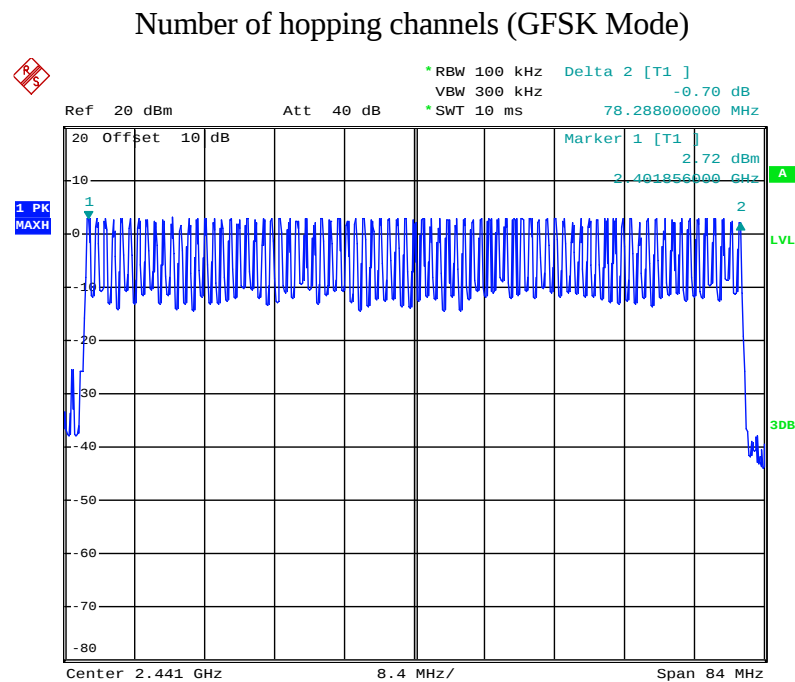
7.5.3. Max hold, view and count how many channel in the band.

7.6.Test Result

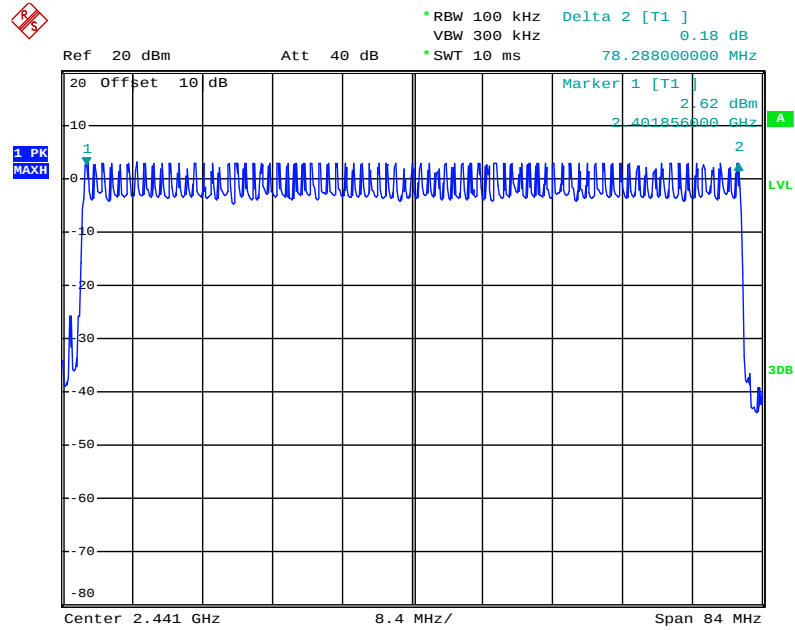
Test Lab: Shielding room

Total number of hopping channel	Measurement result(CH)	Limit(CH)	Result
	79	≥ 15	Pass

The spectrum analyzer plots are attached as below.

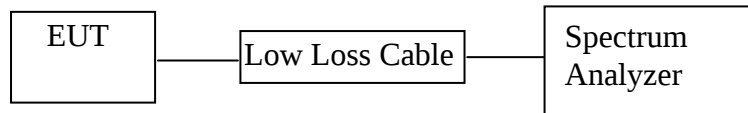


Number of hopping channels ($\Pi/4$ -DQPSK Mode)



8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3. EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

8.5. Test Procedure

8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2. Set center frequency of spectrum analyzer = operating frequency.

8.5.3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=5ms, 10ms, 15ms. Get the pulse time.

8.5.4. Repeat above procedures until all frequency measured were complete.

8.6.Test Result

Test Lab: Shielding room

GFSK Mode (Worst case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.44	140.8	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2441	1.71	273.6	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2441	3.01	321.1	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

$\Pi/4$ -DQPSK (Worst case)

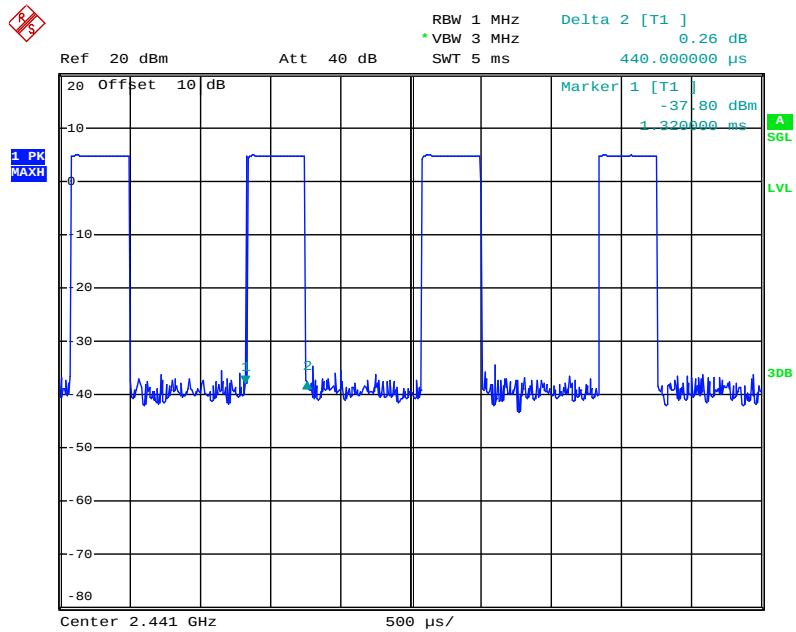
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.45	144.0	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2441	1.73	276.8	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2441	3.02	322.1	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

Note: We tested GFSK mode and $\Pi/4$ -DQPSKmode the low, middle and high channel and recorded the Worse case data for all test mode.

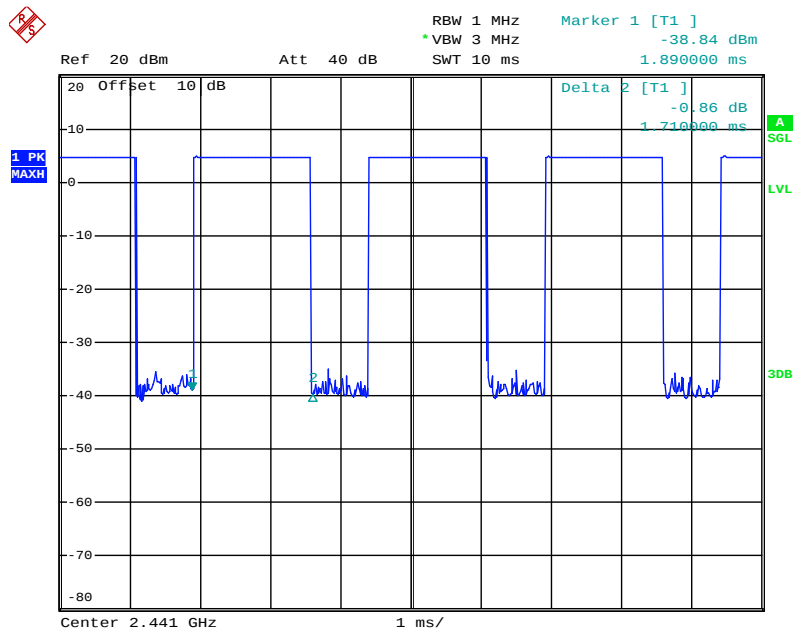
The spectrum analyzer plots are attached as below.

GFSK Mode

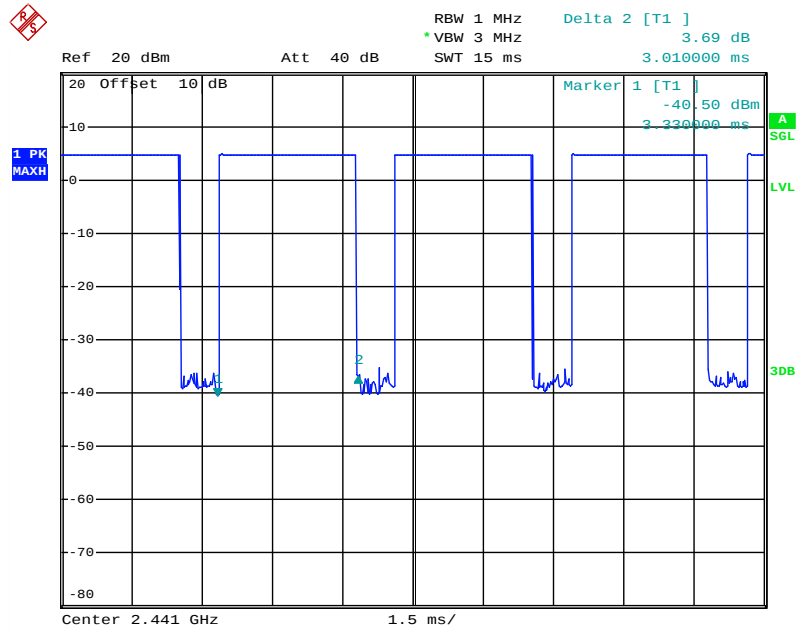
DH1 Middle channel



DH3 Middle channel

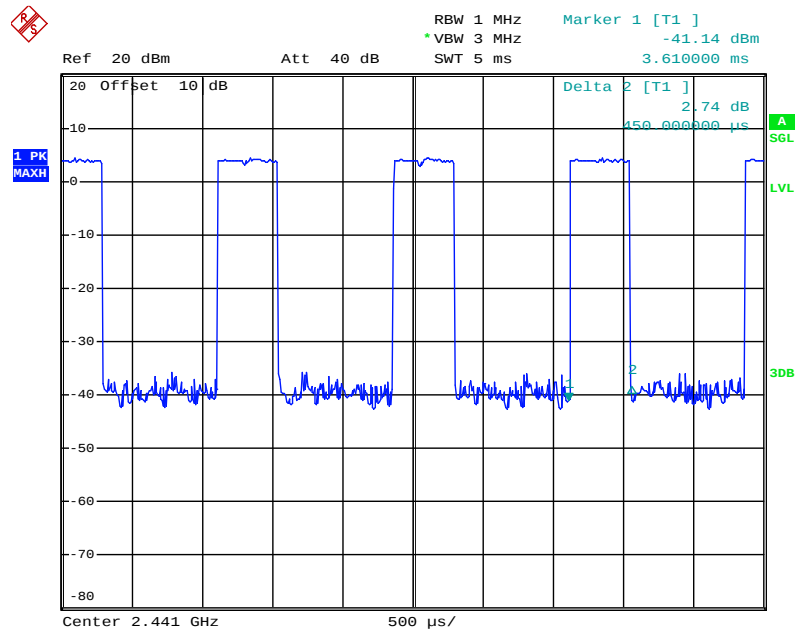


DH5 Middle channel

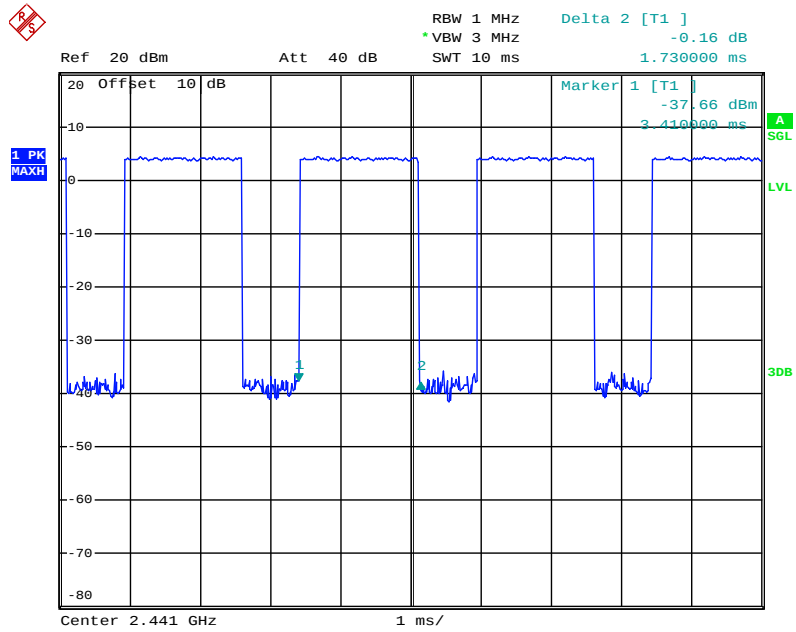


Π/4-DQPSK Mode

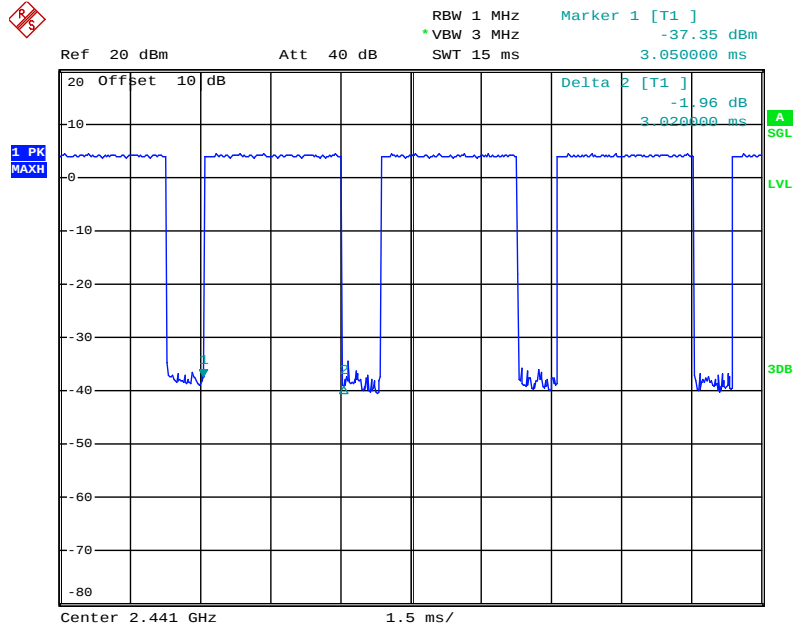
2DH1 Middle channel



2DH3 Middle channel

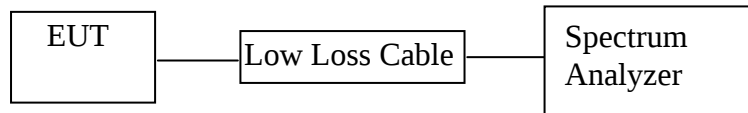


2DH5 Middle channel



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz.

9.5.3. Measurement the maximum peak output power.

9.6. Test Result

Test Lab: Shielding room

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	2.87/0.0019	21 / 0.125
Middle	2441	2.87/0.0019	21 / 0.125
High	2480	3.88/0.0024	21 / 0.125

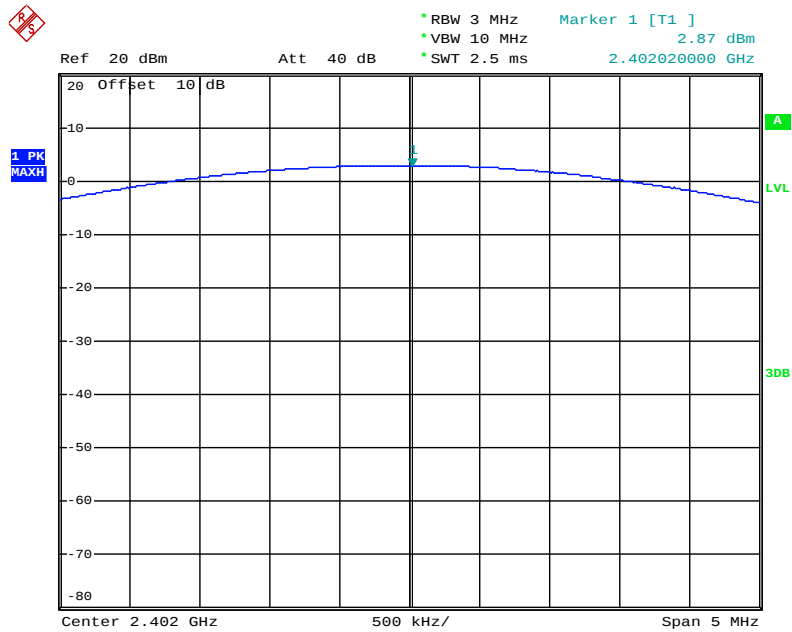
II/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	2.87/0.0019	21 / 0.125
Middle	2441	4.09/0.0026	21 / 0.125
High	2480	4.03/0.0025	21 / 0.125

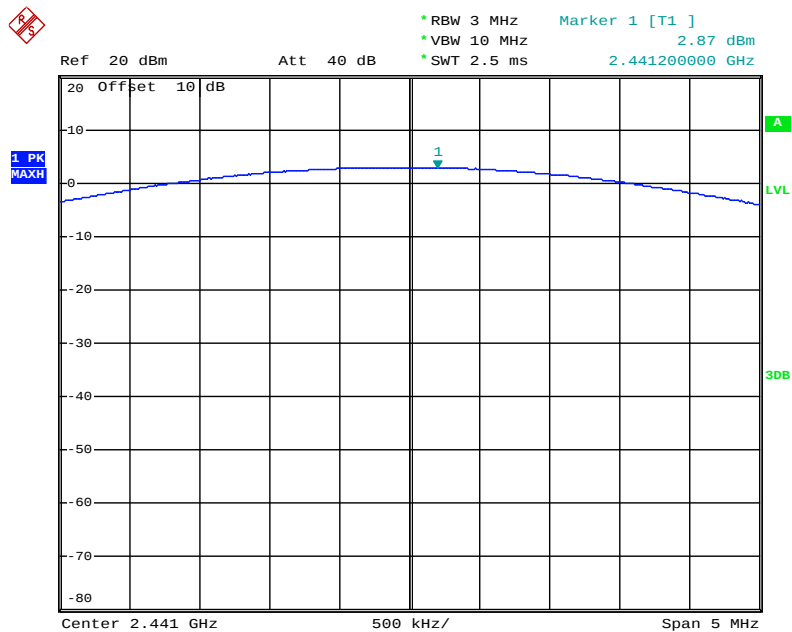
The spectrum analyzer plots are attached as below.

GFSK Mode

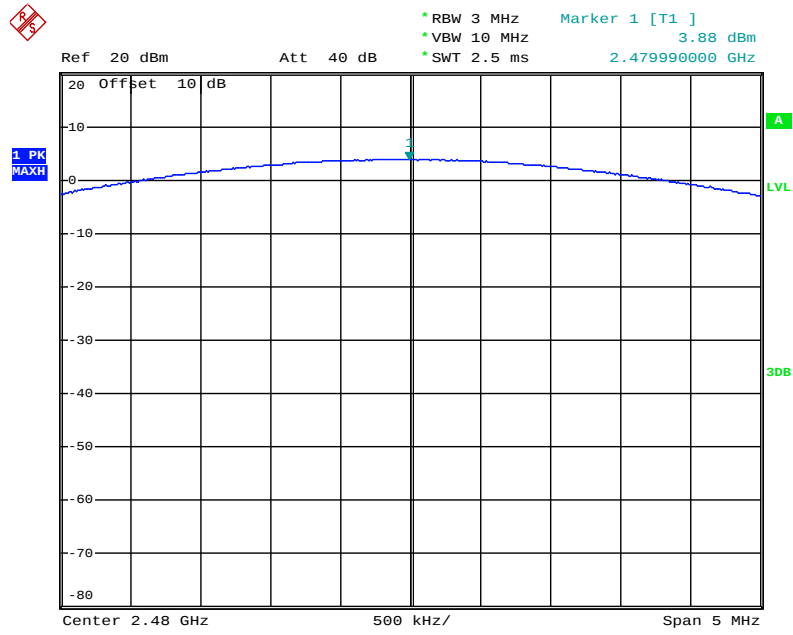
Low channel



Middle channel

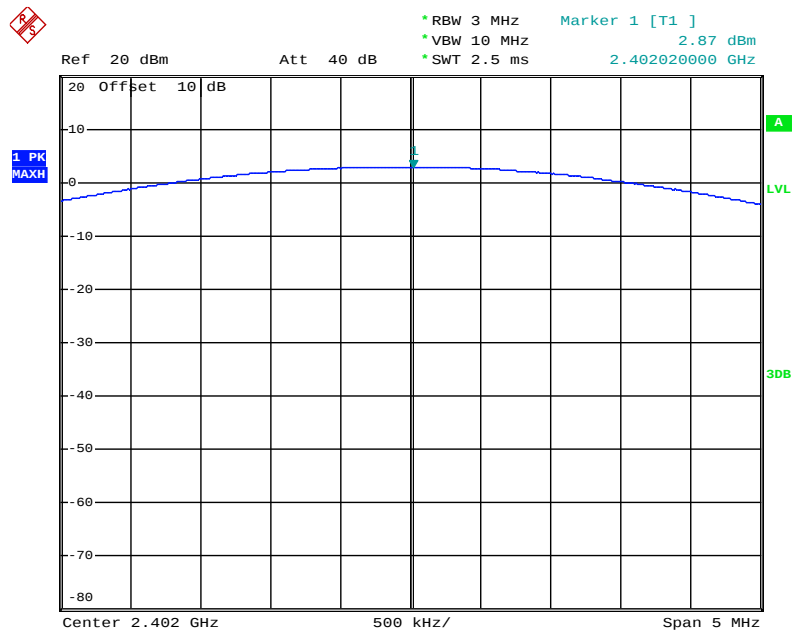


High channel

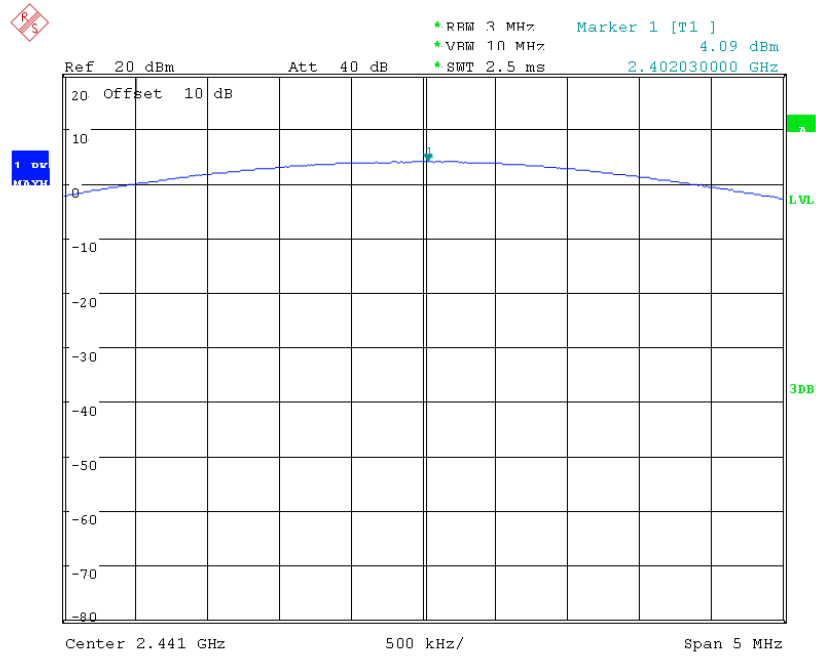


$\Pi/4$ -DQPSK Mode

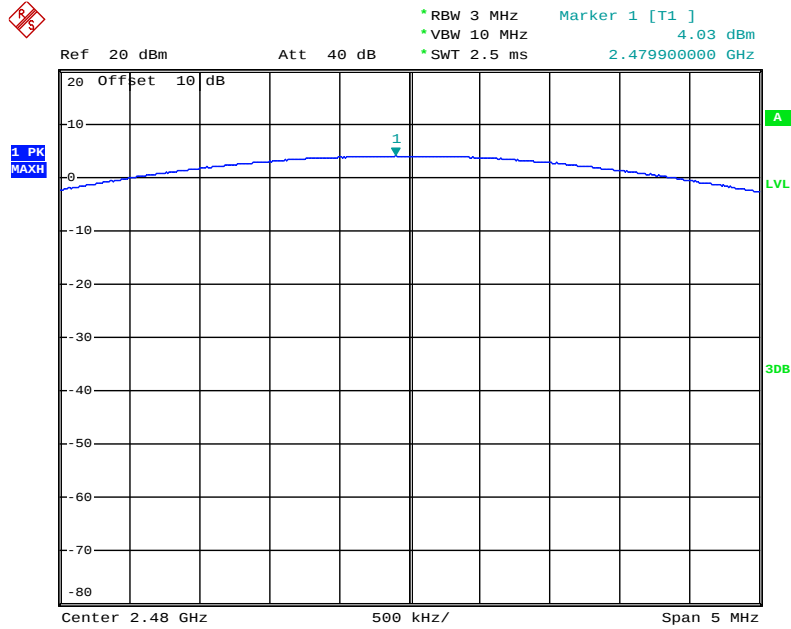
Low channel



Middle channel



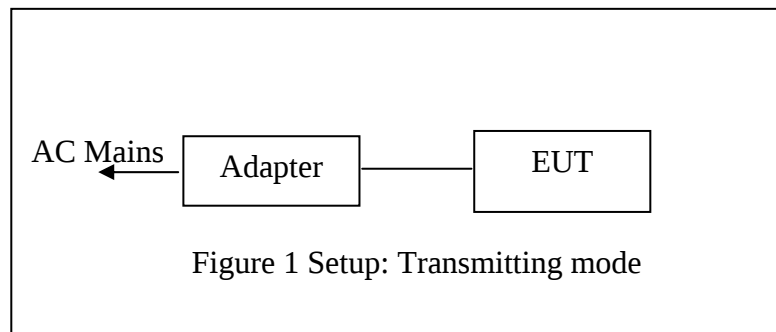
High channel



10.RADIATED EMISSION TEST

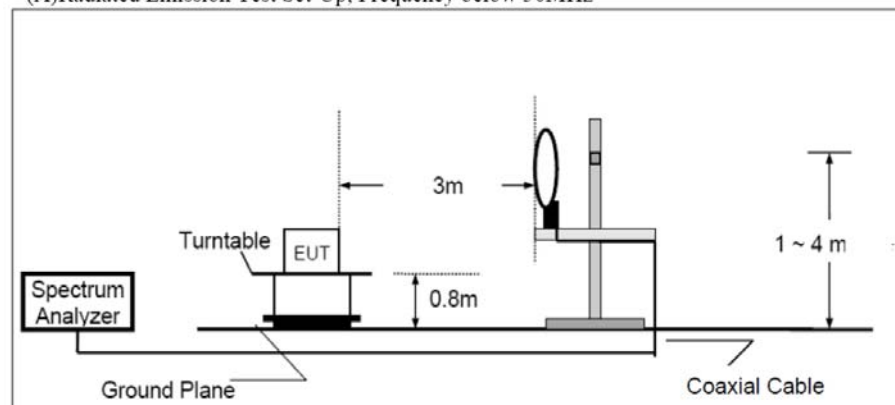
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

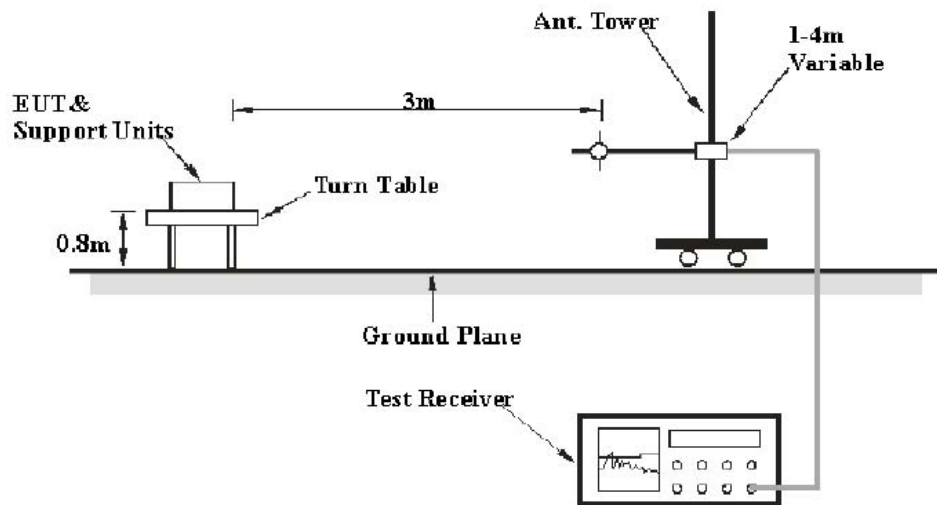


10.1.2.Semi-Anechoic Chamber Test Setup Diagram

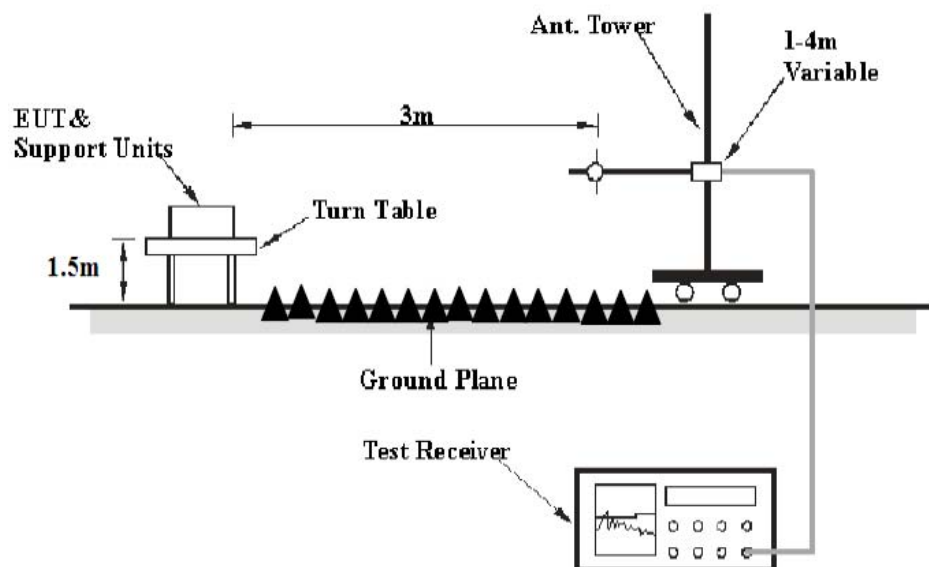
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



10.2.The Limit For Section 15.247(d)

Section 15.247(d): 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 limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the

general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.5. Operating Condition of EUT

10.5.1. Setup the EUT and simulator as shown as Section 10.1.

10.5.2. Turn on the power of all equipment.

10.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

10.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the Worse case position data was reported.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

10.7.Data Sample

Frequency (MHz)	Reading (dB μ v)	Factor (dB/m)	Result (dB μ v/m)	Limit (dB μ v/m)	Margin (dB)	Remark
X.XX	28.66	-15.19	13.47	40.0	-26.53	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB μ v) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB μ v/m) = Reading(dB μ v) + Factor(dB/m)

Limit (dB μ v/m) = Limit stated in standard

Margin (dB) = Result(dB μ v/m) - Limit (dB μ v/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB μ V/m)–Limit(dB μ V/m)

Result(dB μ V/m)= Reading(dB μ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

10.8.Tetst Results

Pass.

Test Lab: 3m Anechoic chamber

Note: 1.We tested GFSK mode, $\Pi/4$ -DQPSK mode and recorded the Worse case data (GFSK mode) for all test mode.

2. Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and 18 to 26.5GHz.

The spectrum analyzer plots are attached as below.

Below 1GHz



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Job No.: jp1 #77

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2402MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Vertical

Power Source: AC 120V/60Hz

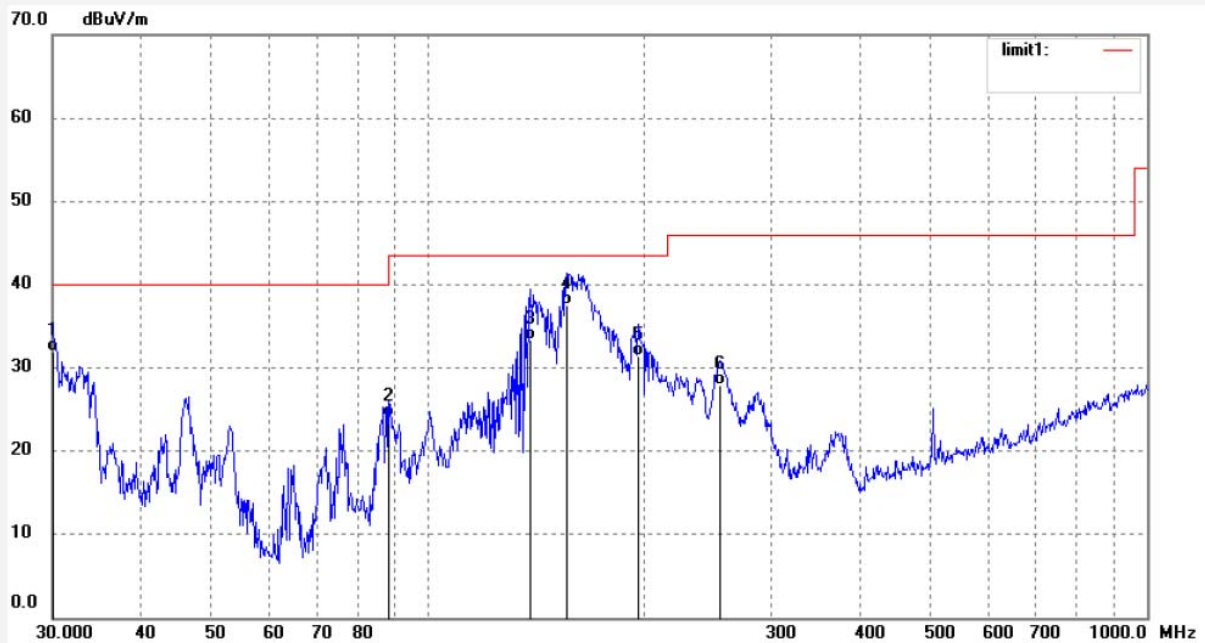
Date: 19/04/28/

Time: 11/02/43

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.0000	52.10	-20.20	31.90	40.00	-8.10	QP	100	216	
2	88.2229	51.44	-27.44	24.00	43.50	-19.50	QP	100	245	
3	138.8120	61.23	-27.93	33.30	43.50	-10.20	QP	100	203	
4	155.8771	65.12	-27.52	37.60	43.50	-5.90	QP	100	196	
5	195.8701	56.09	-24.59	31.50	43.50	-12.00	QP	100	185	
6	254.9253	51.25	-23.35	27.90	46.00	-18.10	QP	100	163	



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Job No.: jp1 #78

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2402MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Horizontal

Power Source: AC 120V/60Hz

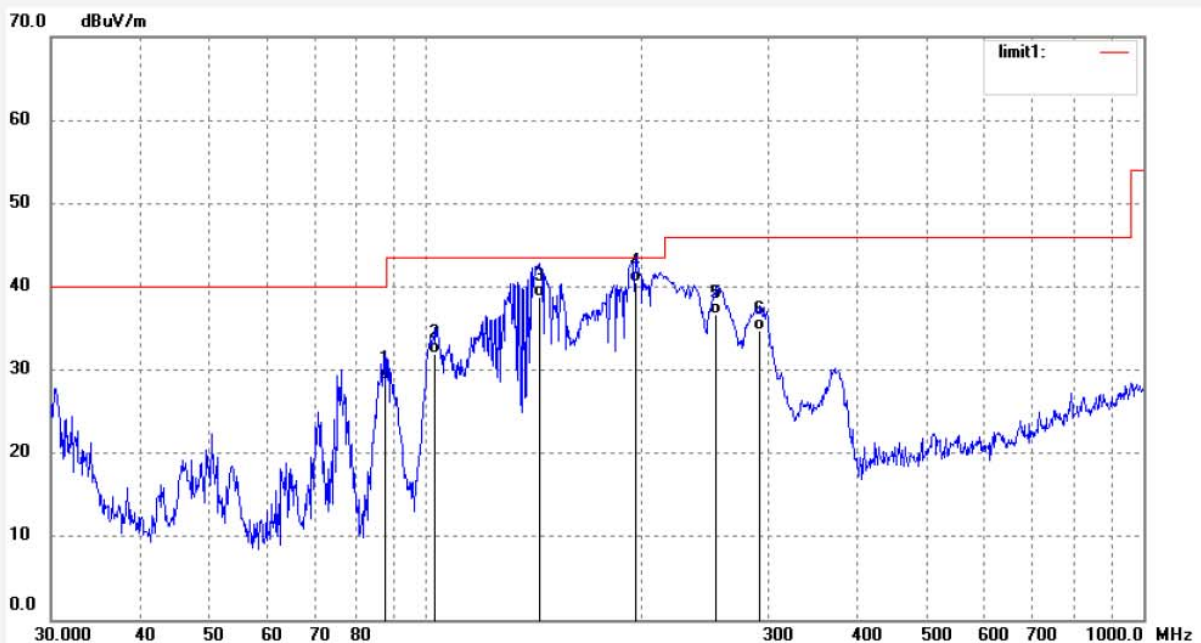
Date: 19/04/28/

Time: 11/05/12

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	87.6052	56.24	-27.44	28.80	40.00	-11.20	QP	100	185	
2	102.9729	60.10	-28.10	32.00	43.50	-11.50	QP	100	263	
3	143.7760	66.83	-28.03	38.80	43.50	-4.70	QP	100	215	
4	195.8701	65.09	-24.59	40.50	43.50	-3.00	QP	100	185	
5	254.0312	60.11	-23.41	36.70	46.00	-9.30	QP	100	163	
6	292.3643	56.26	-21.56	34.70	46.00	-11.30	QP	100	236	



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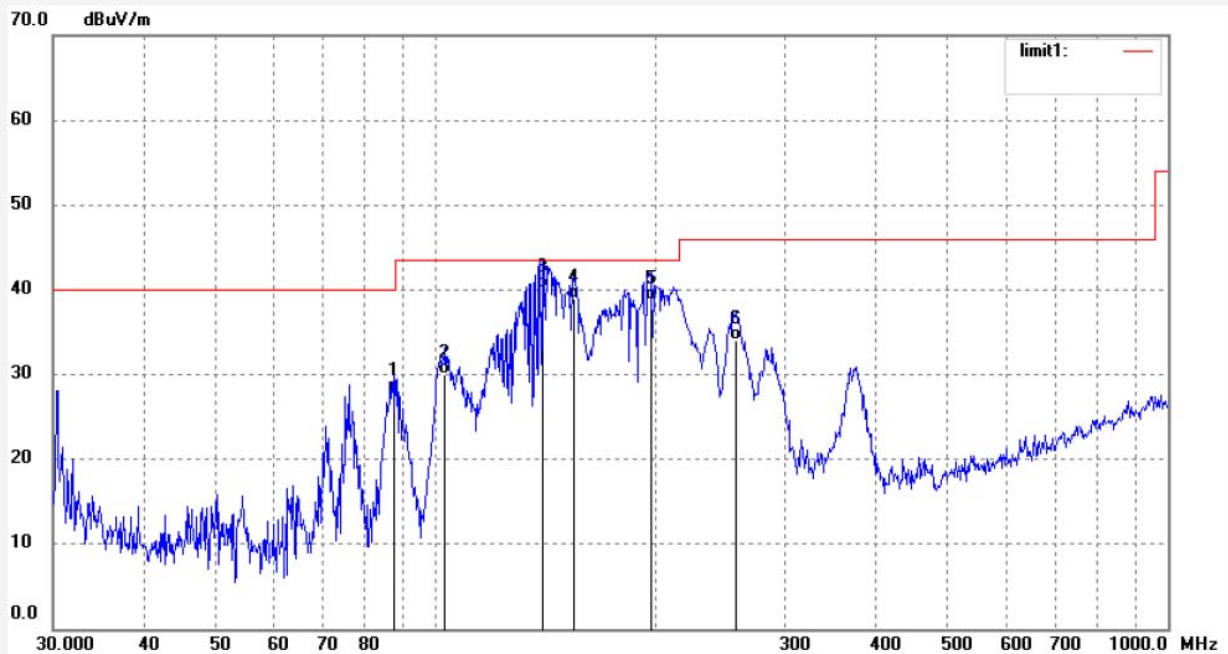
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
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Fax:+86-0755-26503396

Job No.: jp1 #79
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: TX 2441MHz
Model: HP-H005
Manufacturer: Haiping

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 11/08/53
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	87.6052	55.44	-27.44	28.00	40.00	-12.00	QP	100	125	
2	102.9729	58.10	-28.10	30.00	43.50	-13.50	QP	100	168	
3	139.7909	68.14	-27.94	40.20	43.50	-3.30	QP	100	195	
4	154.2428	66.58	-27.68	38.90	43.50	-4.60	QP	100	174	
5	196.5595	63.26	-24.56	38.70	43.50	-4.80	QP	100	256	
6	257.6266	57.19	-23.19	34.00	46.00	-12.00	QP	100	236	



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Job No.: jp1 #80

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2441MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Vertical

Power Source: AC 120V/60Hz

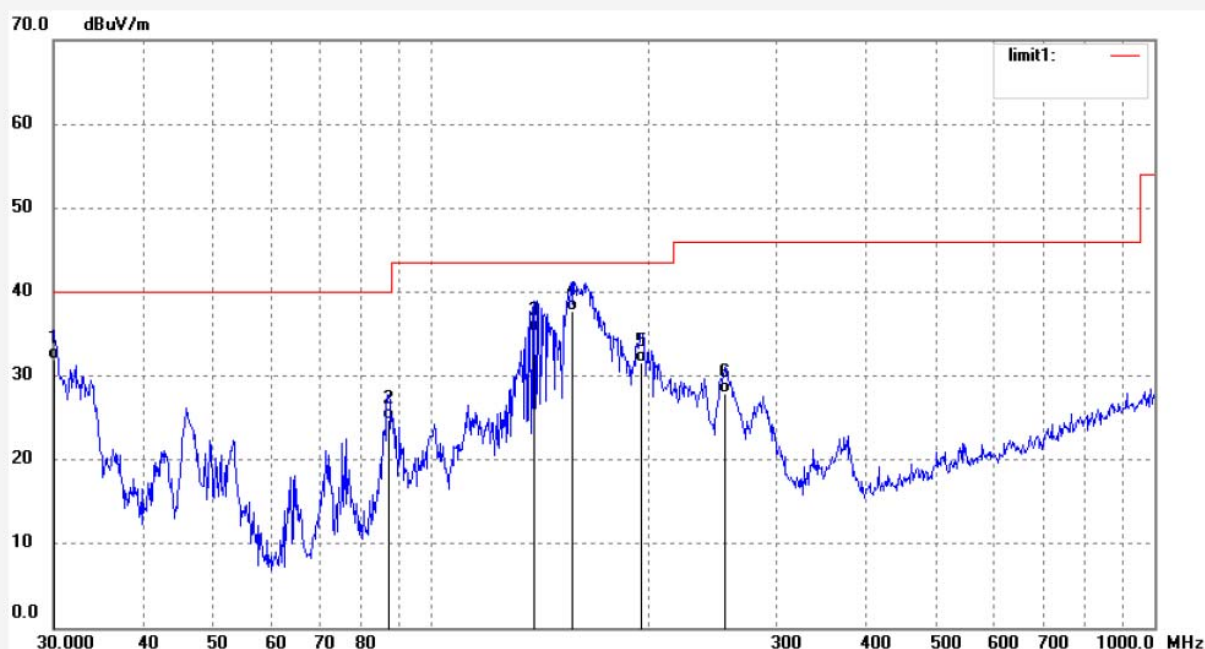
Date: 19/04/28/

Time: 11/11/01

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.0000	52.10	-20.20	31.90	40.00	-8.10	QP	100	123	
2	87.2980	52.14	-27.44	24.70	40.00	-15.30	QP	100	165	
3	138.8120	63.23	-27.93	35.30	43.50	-8.20	QP	100	185	
4	156.4259	65.16	-27.46	37.70	43.50	-5.80	QP	100	256	
5	195.1831	56.22	-24.62	31.60	43.50	-11.90	QP	100	278	
6	254.9253	51.25	-23.35	27.90	46.00	-18.10	QP	100	136	



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Job No.: jp1 #81

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2480MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Vertical

Power Source: AC 120V/60Hz

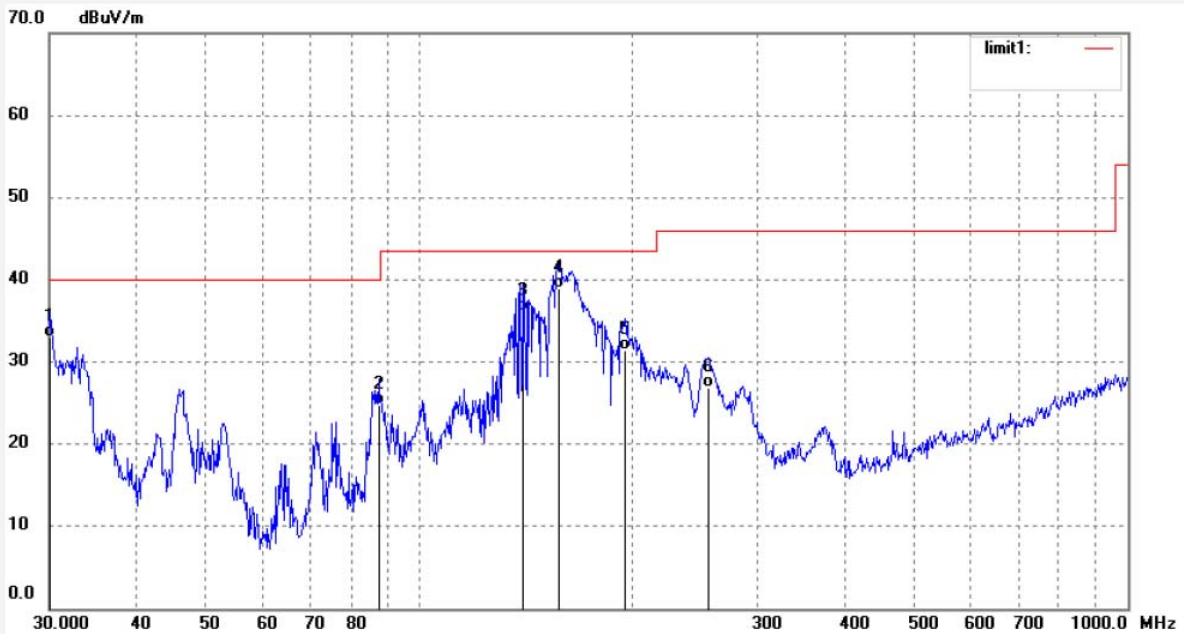
Date: 19/04/28/

Time: 11/14/48

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	30.0000	53.20	-20.20	33.00	40.00	-7.00	QP	100	123	
2	87.6052	52.14	-27.44	24.70	40.00	-15.30	QP	100	256	
3	139.7909	64.14	-27.94	36.20	43.50	-7.30	QP	100	185	
4	157.5290	66.24	-27.34	38.90	43.50	-4.60	QP	100	174	
5	195.1831	56.12	-24.62	31.50	43.50	-12.00	QP	100	265	
6	255.8226	50.10	-23.30	26.80	46.00	-19.20	QP	100	175	



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Job No.: jp1 #82

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2480MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Horizontal

Power Source: AC 120V/60Hz

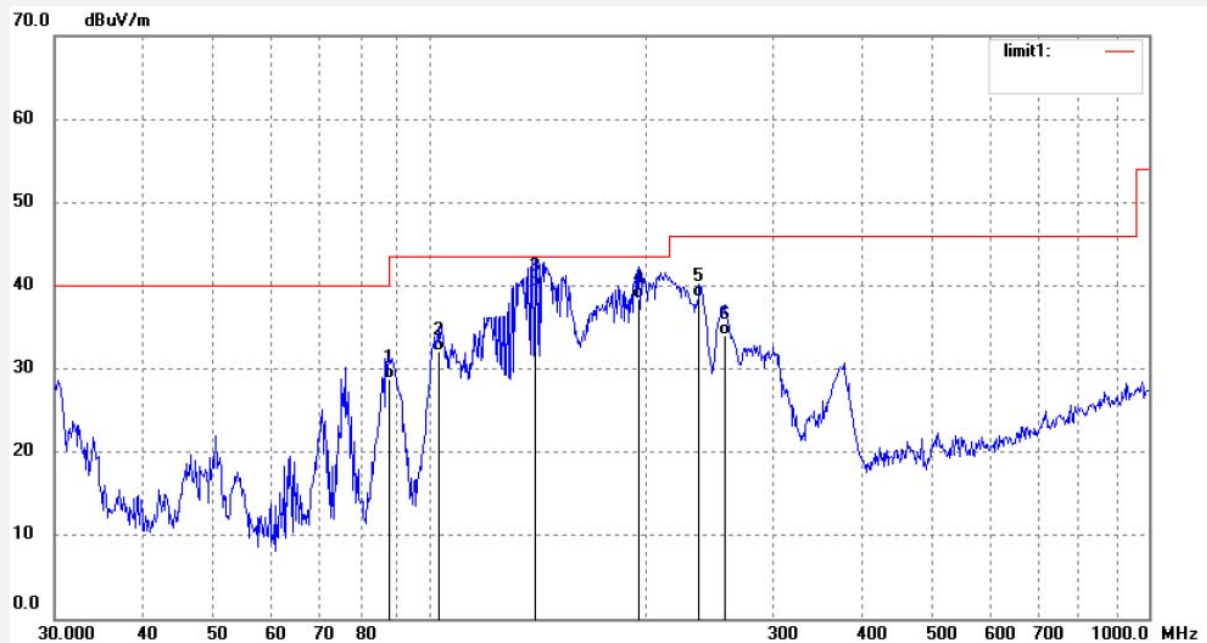
Date: 19/04/28/

Time: 11/17/02

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	87.6052	56.24	-27.44	28.80	40.00	-11.20	QP	100	123	
2	102.9729	60.20	-28.10	32.10	43.50	-11.40	QP	100	156	
3	139.7909	67.84	-27.94	39.90	43.50	-3.60	QP	100	236	
4	195.1831	63.12	-24.62	38.50	43.50	-5.00	QP	100	256	
5	236.7928	62.38	-23.78	38.60	46.00	-7.40	QP	100	185	
6	256.7230	57.25	-23.25	34.00	46.00	-12.00	QP	100	196	

Above 1GHz



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Job No.: jp1 #83

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2402MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Horizontal

Power Source: AC 120V/60Hz

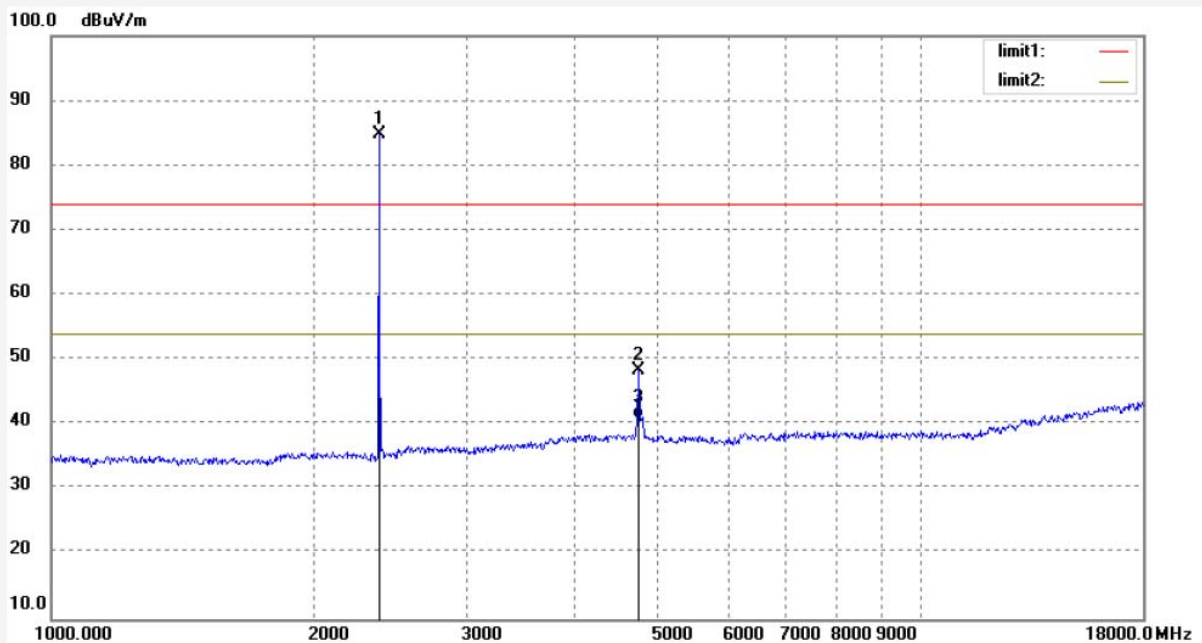
Date: 19/04/28/

Time: 11/28/45

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	91.26	-6.37	84.89	74.00	-25.53	peak	100	245	
2	4804.000	47.77	0.70	48.47	54.00	-13.10	peak	100	136	
3	4804.000	40.20	0.70	40.90	54.00	-13.10	AVG	100	136	



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Job No.: jp1 #84

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2402MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Vertical

Power Source: AC 120V/60Hz

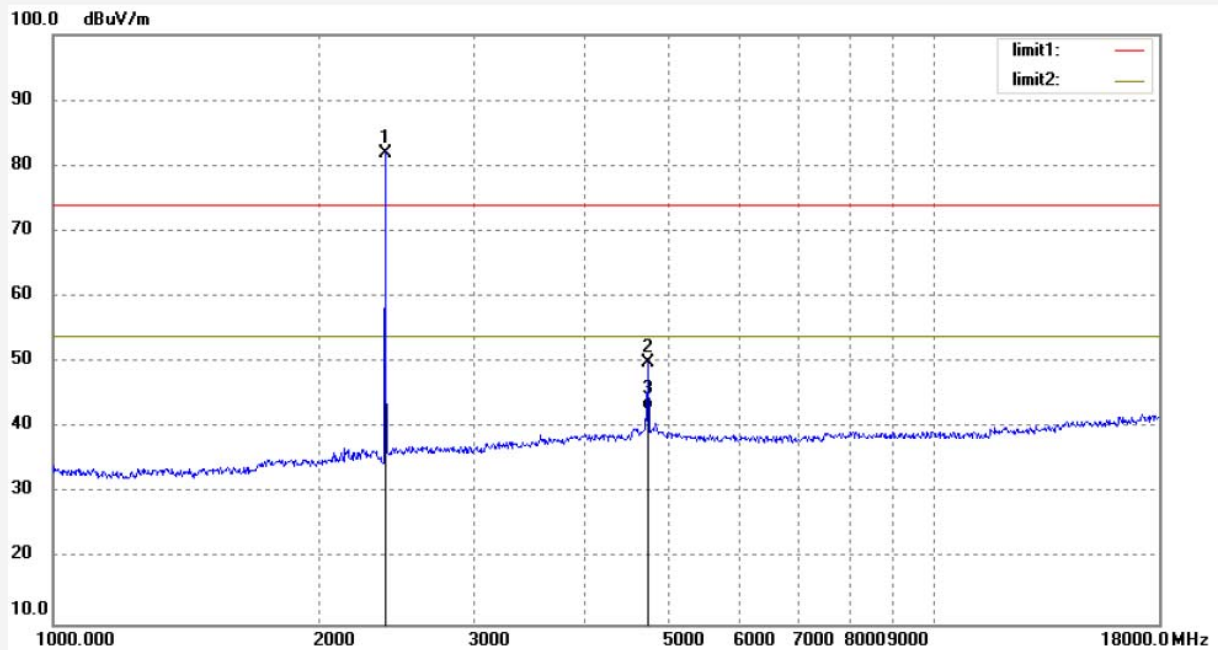
Date: 19/04/28/

Time: 11/35/33

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	88.37	-6.37	82.00			peak	100	111	
2	4804.000	49.26	0.70	49.96	74.00	-24.04	peak	100	236	
3	4804.000	42.00	0.70	42.70	54.00	-11.30	AVG	100	236	



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Job No.: jp1 #85

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2441MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Vertical

Power Source: AC 120V/60Hz

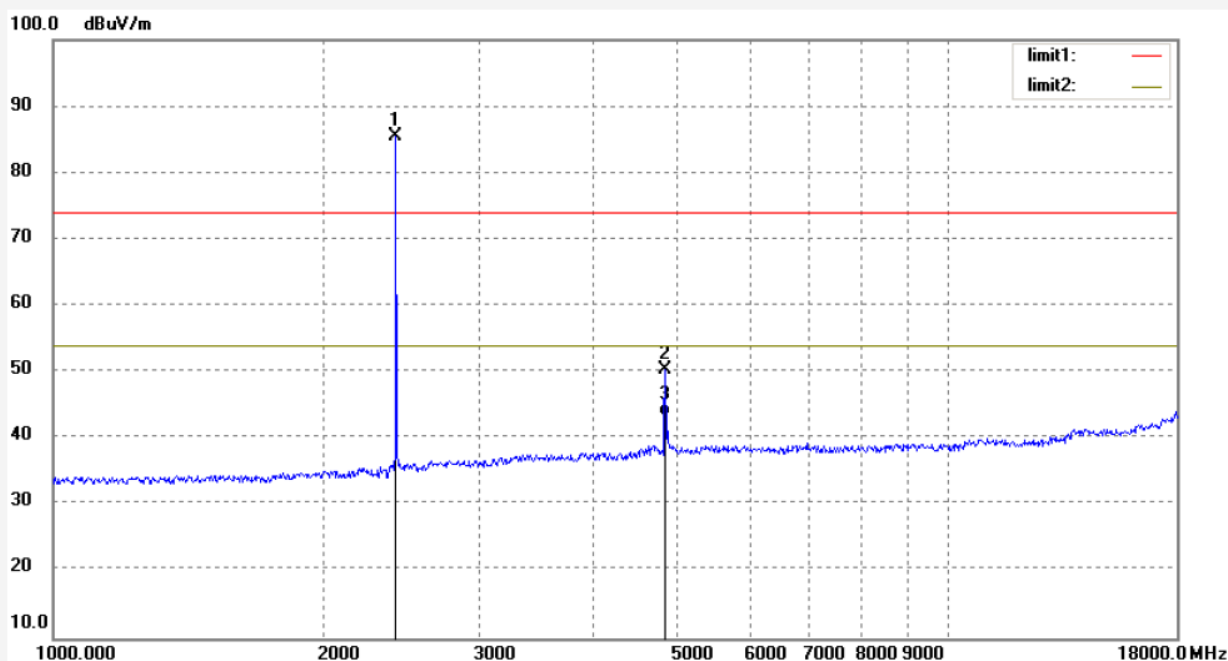
Date: 19/04/28/

Time: 11/38/33

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.000	91.67	-6.20	85.47			peak	100	245	
2	4882.000	49.26	1.13	50.39	74.00	-23.61	peak	100	285	
3	4882.000	42.27	1.13	43.40	54.00	-10.60	AVG	100	285	



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Site: 1# Chamber

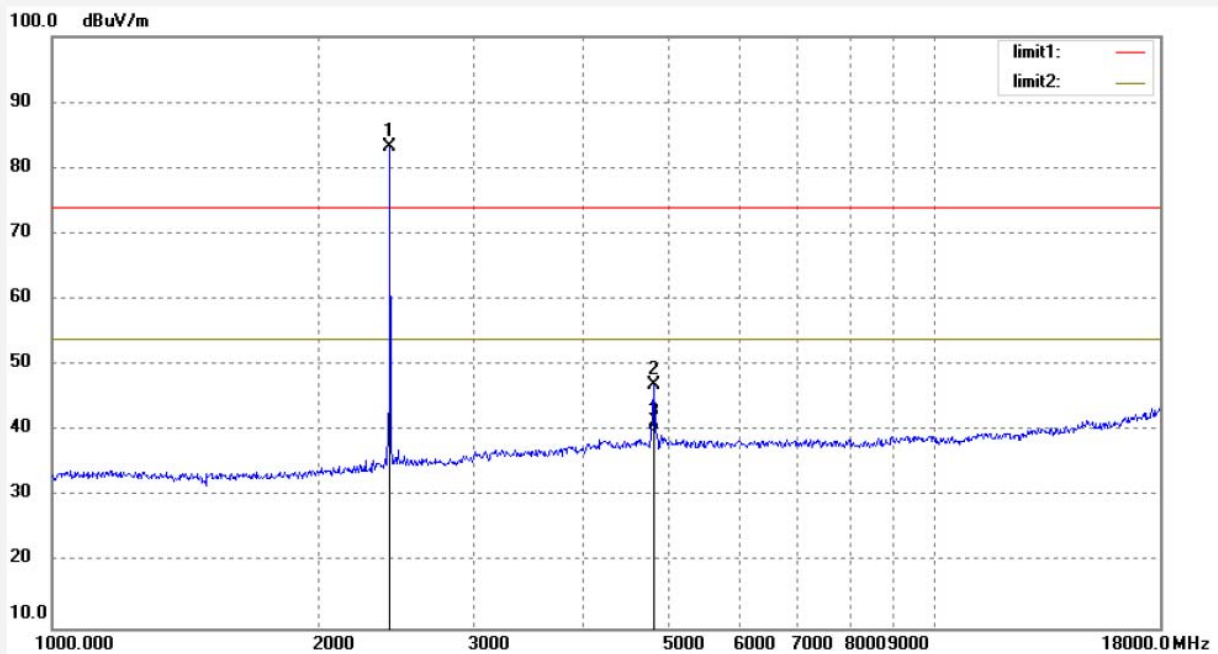
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #86
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: TX 2441MHz
Model: HP-H005
Manufacturer: Haiping

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 11/41/46
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.000	89.46	-6.20	83.26			peak	100	26	
2	4882.000	45.95	1.00	46.95	74.00	-27.05	peak	100	165	
3	4882.000	38.70	1.00	39.70	54.00	-14.30	AVG	100	165	



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Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #87

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Bluetooth Turntable

Mode: TX 2480MHz

Model: HP-H005

Manufacturer: Haiping

Polarization: Horizontal

Power Source: AC 120V/60Hz

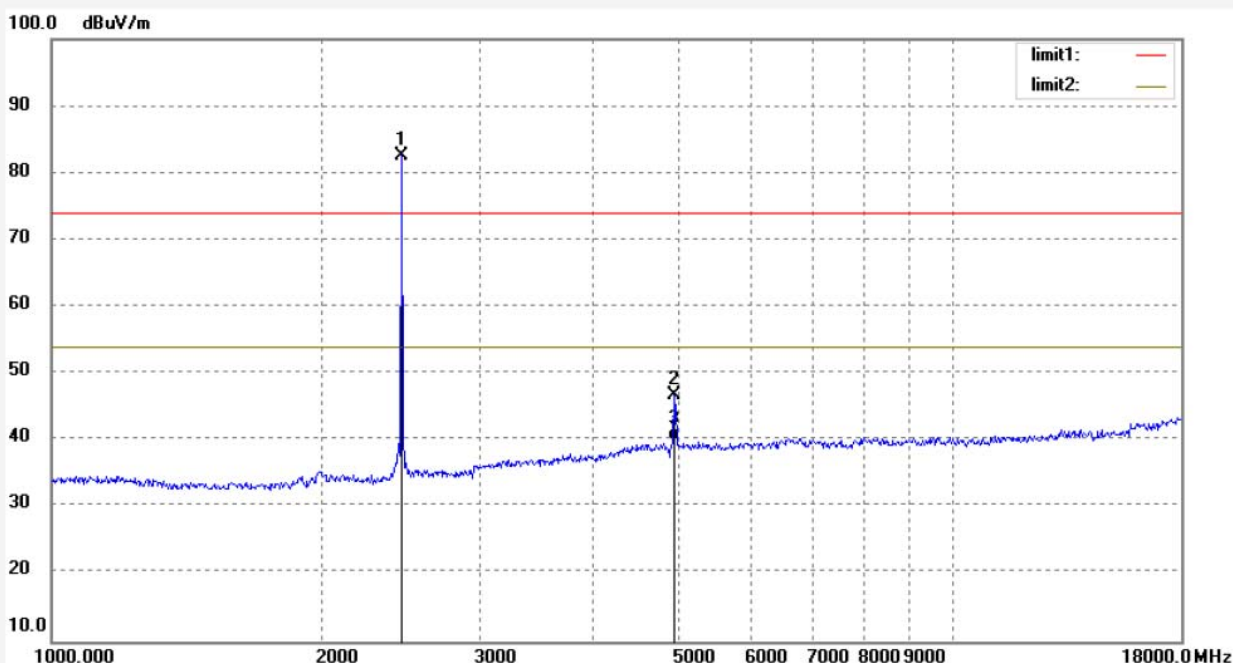
Date: 19/04/28/

Time: 11/44/46

Engineer Signature: Nick

Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	88.60	-6.04	82.56			peak	100	145	
2	4960.000	45.28	1.50	46.78	74.00	-27.22	peak	100	215	
3	4960.000	38.60	1.50	40.10	54.00	-13.90	AVG	100	215	



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Site: 1# Chamber

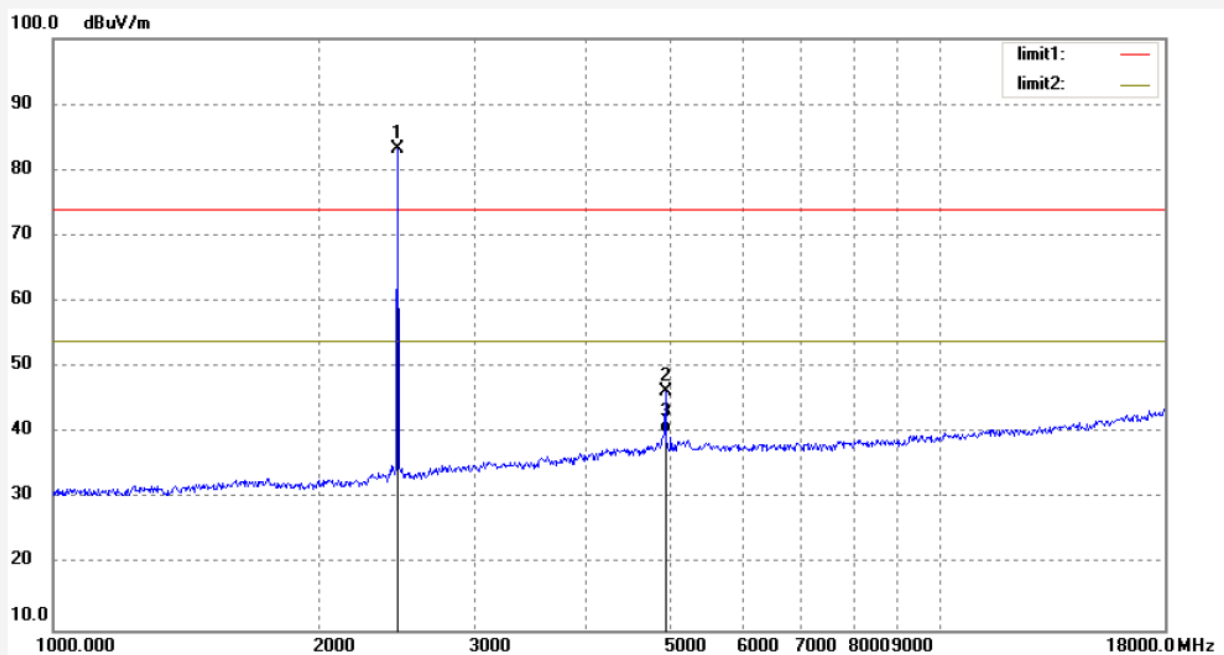
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #88
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: TX 2480MHz
Model: HP-H005
Manufacturer: Haiping

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 11/47/54
Engineer Signature: Nick
Distance: 3m

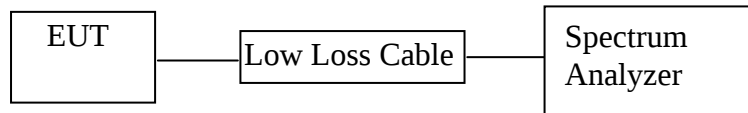
Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	89.28	-6.04	83.24			peak	100	245	
2	4960.000	44.94	1.50	46.44	74.00	-27.56	peak	100	145	
3	4960.000	38.50	1.50	40.00	54.00	-14.00	AVG	100	145	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



11.2.The Requirement For Section 15.247(d)

Section 15.247(d): 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 limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

11.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

11.5. Test Procedure

11.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

11.6. Test Result

Test Lab: Shielding room

Note: Both hopping-on mode and hopping-off mode had been pre-tested, and only the Worse case was recorded in the test report.

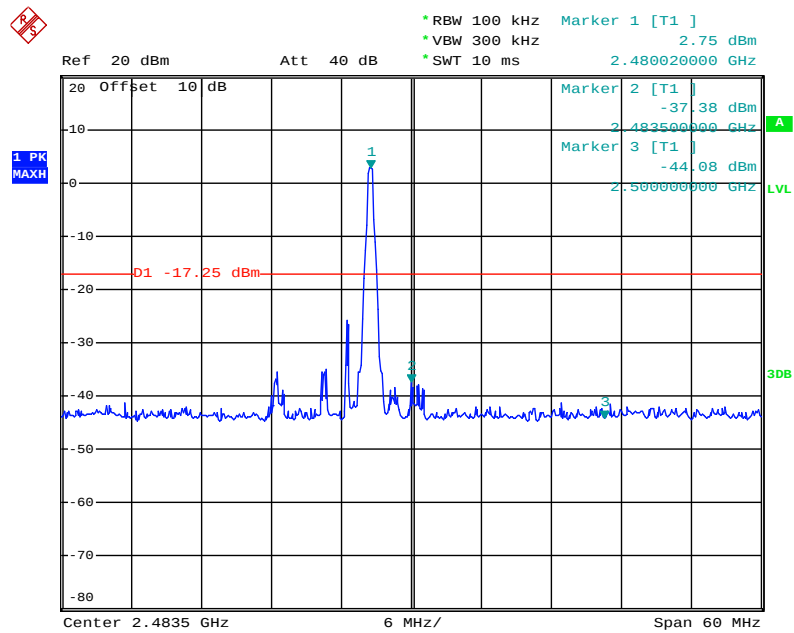
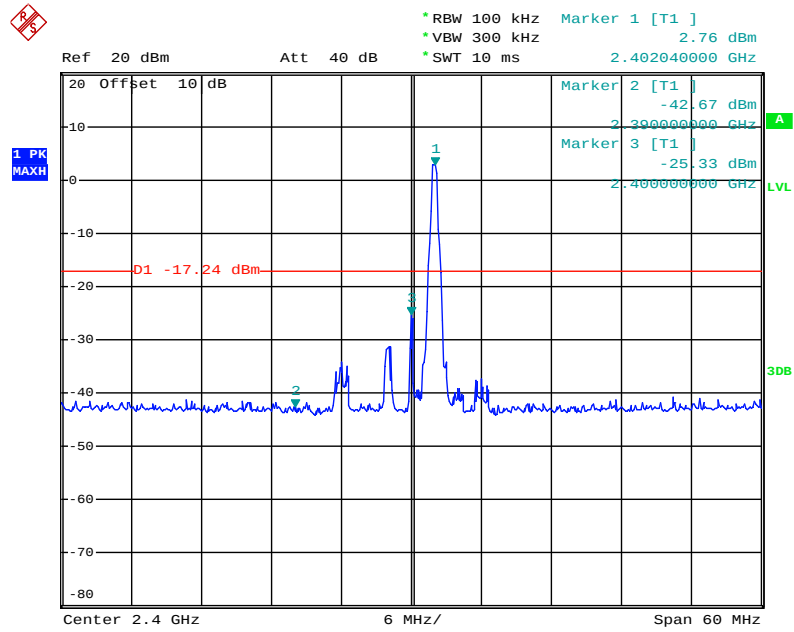
Conducted Band Edge Result

Non-hopping mode

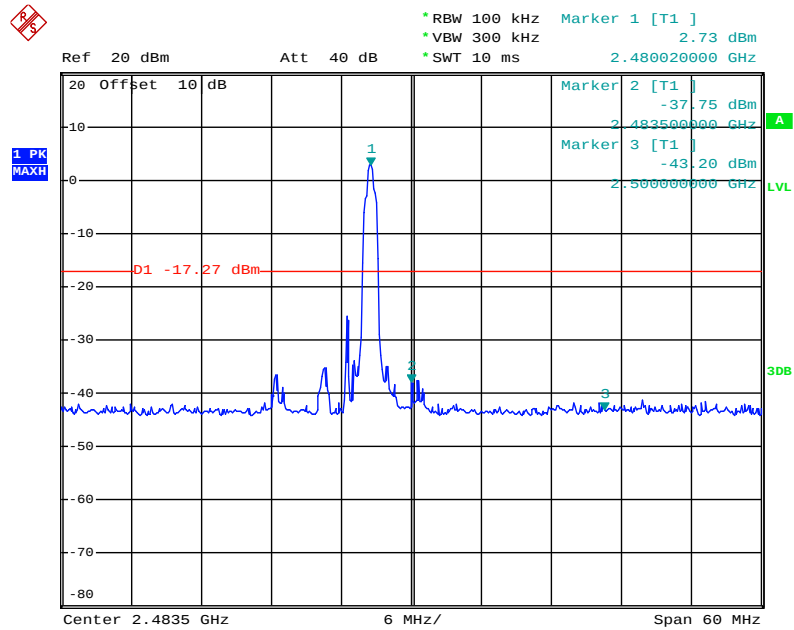
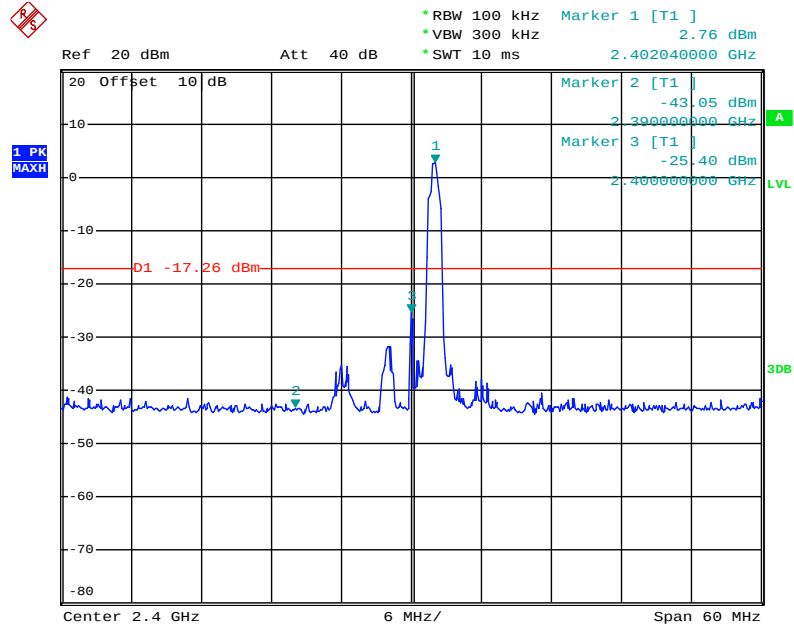
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK Mode		
2400.00	22.57	> 20dBc
2483.50	34.63	> 20dBc
Π/4-DQPSK Mode		
2400.00	22.64	> 20dBc
2483.50	35.02	> 20dBc

The spectrum analyzer plots are attached as below.

GFSK Mode



Π/4-DQPSK Mode



Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX (Hopping off, Hopping on) modes measure it.
We select 2402MHz, 2480MHz TX frequency to transmit(Hopping off mode).
We select 2402-2480MHz TX frequency to transmit(Hopping on mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:

- 1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 3.All modes of operation were investigated and the worse case (GFSK Mode) emissions are reported.

Test Lab: 3m Anechoic chamber

The spectrum analyzer plots are attached as below.

Non-hopping mode



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Site: 1# Chamber

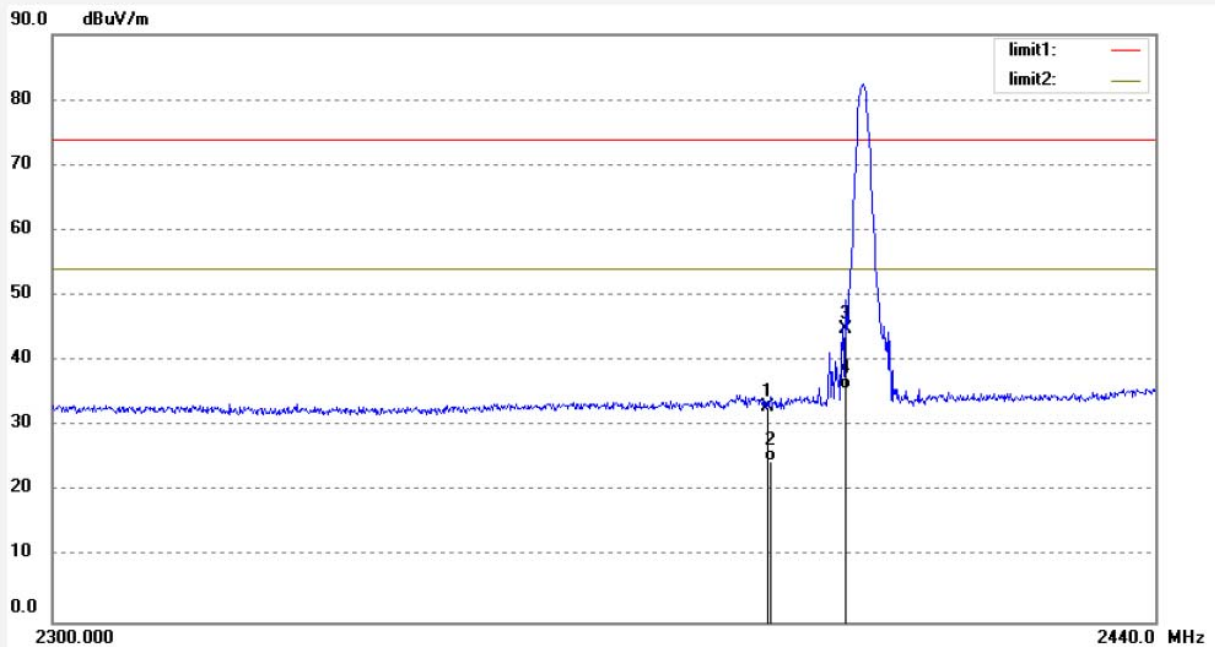
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #92
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: TX 2402MHz(GFSK)
Model: HP-H005
Manufacturer: Haiping

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 11/59/29
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	39.29	-6.32	32.97	74.00	-41.03	peak	100	263	
2	2390.000	30.85	-6.32	24.53	54.00	-29.47	AVG	100	263	
3	2400.000	51.05	-6.27	44.78	74.00	-29.22	peak	100	247	
4	2400.000	41.85	-6.27	35.58	54.00	-18.42	AVG	100	247	

Note: Average measurement with peak detection at No.2&4



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Site: 1# Chamber

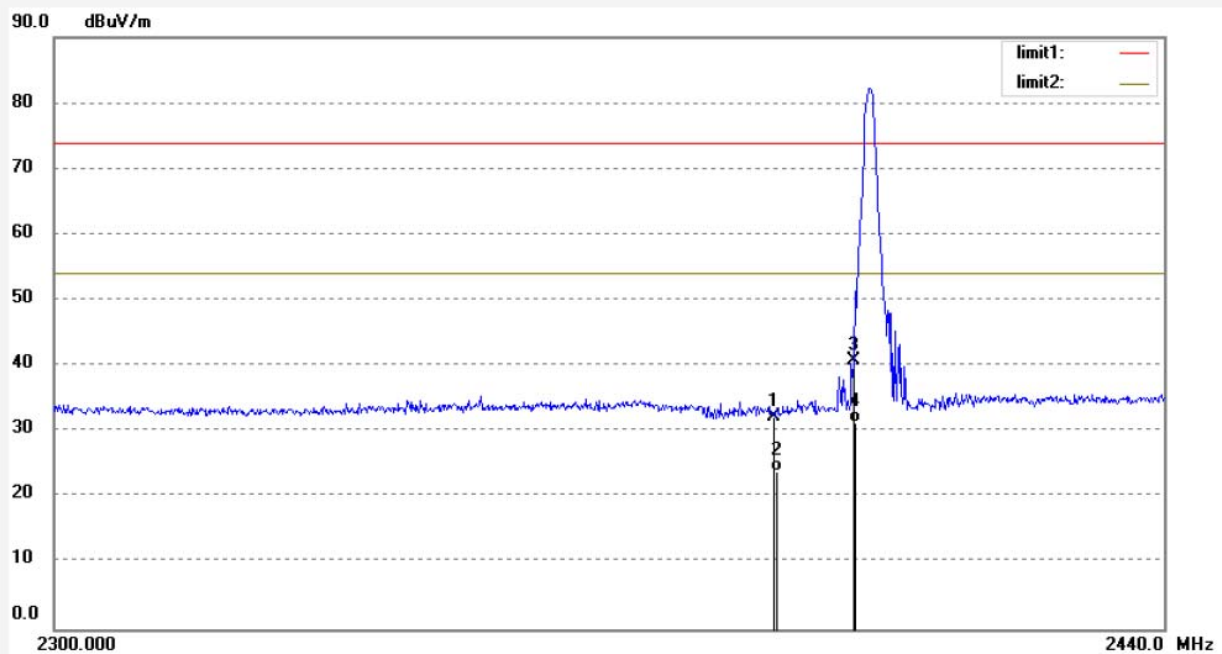
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #91
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: TX 2402MHz(GFSK)
Model: HP-H005
Manufacturer: Haiping

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 11/56/37
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	38.60	-6.32	32.28	74.00	-41.72	peak	100	196	
2	2390.000	30.25	-6.32	23.93	54.00	-30.07	AVG	100	196	
3	2400.000	47.04	-6.27	40.77	74.00	-33.23	peak	100	236	
4	2400.000	37.56	-6.27	31.29	54.00	-22.71	AVG	100	236	

Note: Average measurement with peak detection at No.2&4



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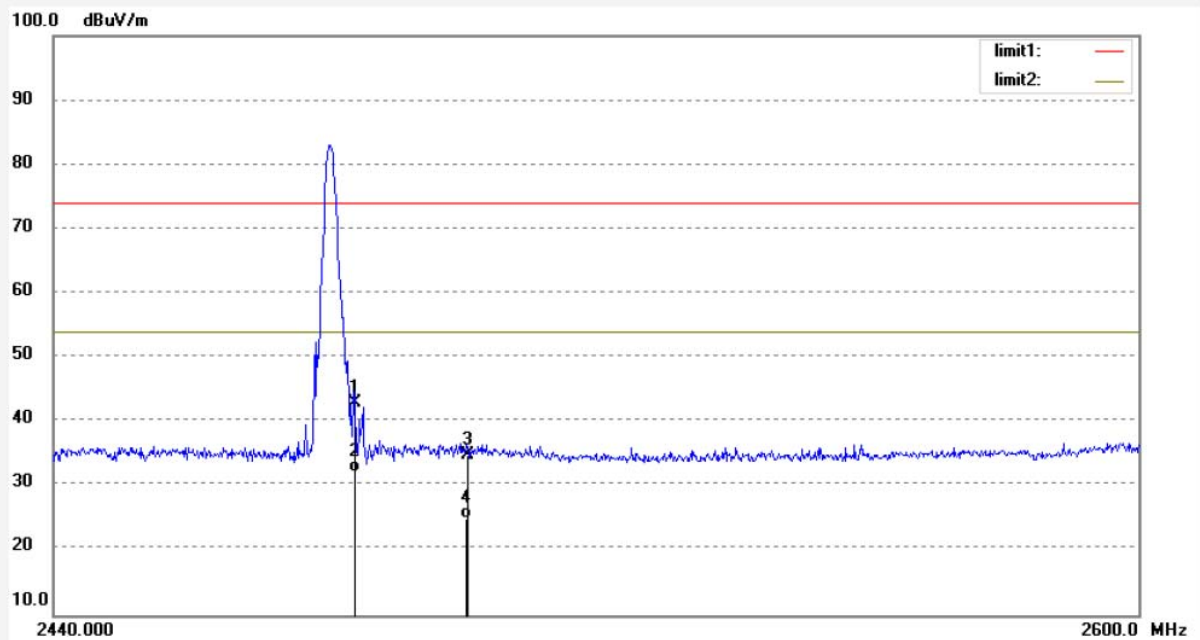
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: jp1 #90
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: TX 2480MHz(GFSK)
Model: HP-H005
Manufacturer: Haiping

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 11/53/11
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.78	-5.89	42.89	74.00	-31.11	peak	100	187	
2	2483.500	38.00	-5.89	32.11	54.00	-21.89	AVG	100	187	
3	2500.000	40.67	-5.81	34.86	74.00	-39.14	peak	100	256	
4	2500.000	30.75	-5.81	24.94	54.00	-29.06	AVG	100	256	

Note: Average measurement with peak detection at No.2&4



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Site: 1# Chamber

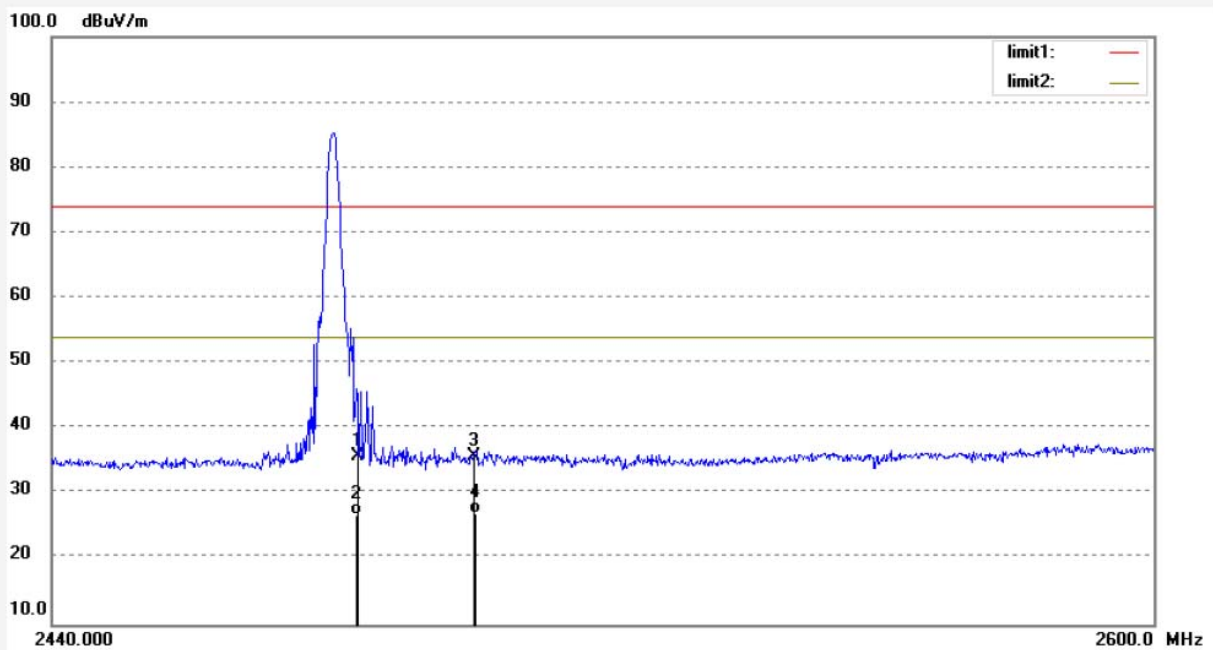
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #89
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: TX 2480MHz(GFSK)
Model: HP-H005
Manufacturer: Haiping

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 11/50/08
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	41.66	-5.89	35.77	74.00	-38.23	peak	100	165	
2	2483.500	32.56	-5.89	26.67	54.00	-27.33	AVG	100	165	
3	2500.000	41.66	-5.81	35.85	74.00	-38.15	peak	100	123	
4	2500.000	32.75	-5.81	26.94	54.00	-27.06	AVG	100	123	

Note: Average measurement with peak detection at No.2&4

Hopping mode



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Site: 1# Chamber

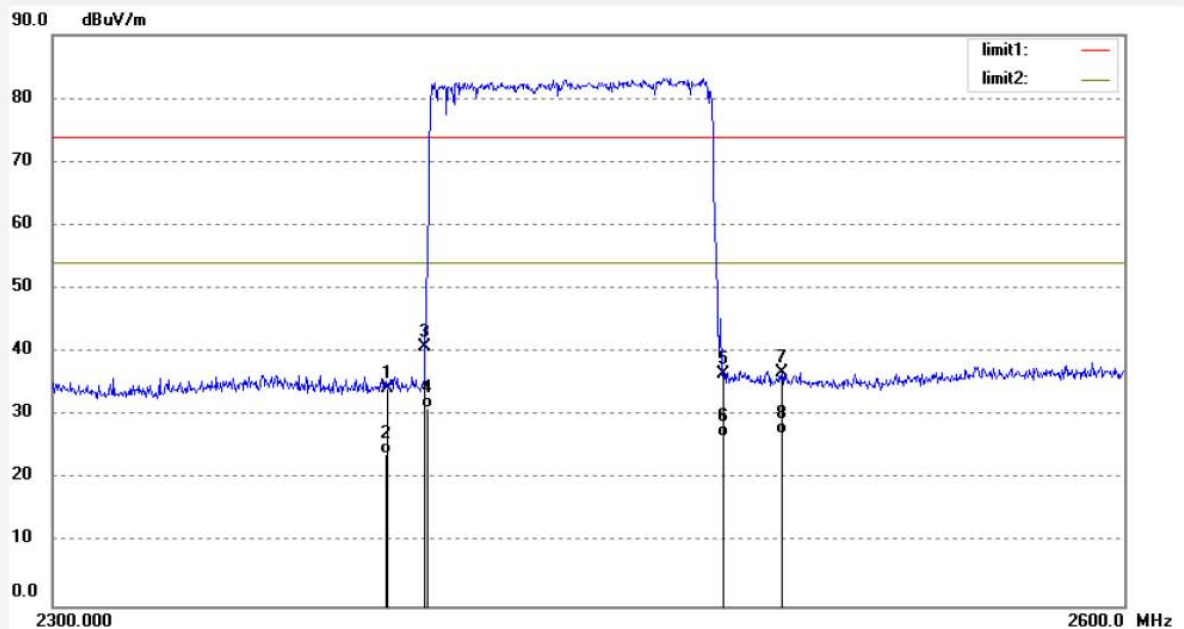
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #93
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: HOPPING(GFSK)
Model: HP-H005
Manufacturer: Haiping

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 12/03/07
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	40.58	-6.32	34.26	74.00	-39.74	peak	100	136	
2	2390.000	30.25	-6.32	23.93	54.00	-30.07	AVG	100	136	
3	2400.000	47.03	-6.27	40.76	74.00	-33.24	peak	100	256	
4	2400.000	37.46	-6.27	31.19	54.00	-22.81	AVG	100	256	
5	2483.500	42.38	-5.89	36.49	74.00	-37.51	peak	100	123	
6	2483.500	32.45	-5.89	26.56	54.00	-27.44	AVG	100	123	
7	2500.000	42.56	-5.81	36.75	74.00	-37.25	peak	100	246	
8	2500.000	32.96	-5.81	27.15	54.00	-26.85	AVG	100	246	

Note: Average measurement with peak detection at No.2&4&6&8



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Site: 1# Chamber

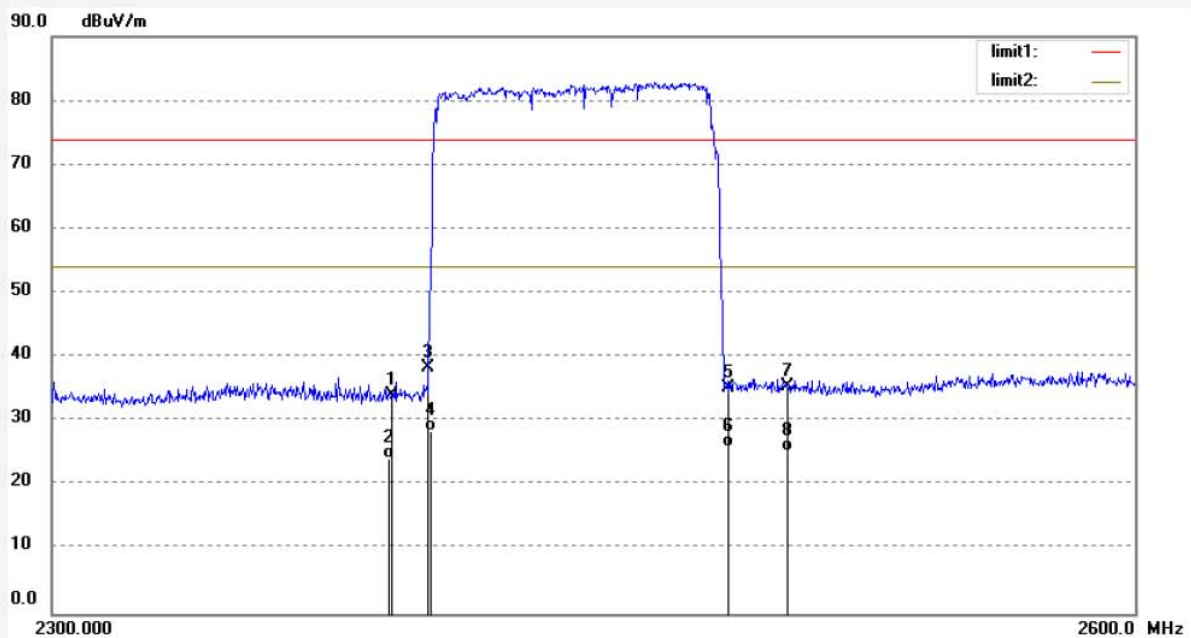
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp1 #94
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Turntable
Mode: HOPPING(GFSK)
Model: HP-H005
Manufacturer: Haiping

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/04/28/
Time: 12/06/13
Engineer Signature: Nick
Distance: 3m

Note: Report NO.:ATE20190553



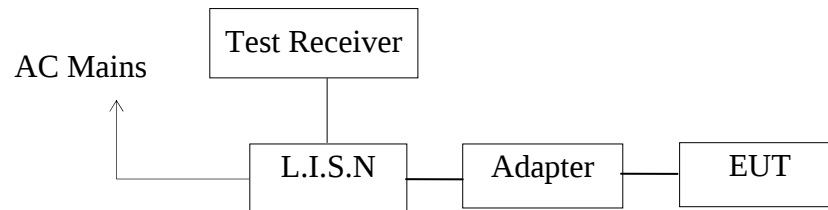
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	40.36	-6.32	34.04	74.00	-39.96	peak	100	236	
2	2390.000	30.52	-6.32	24.20	54.00	-29.80	AVG	100	236	
3	2400.000	44.53	-6.27	38.26	74.00	-35.74	peak	100	185	
4	2400.000	34.75	-6.27	28.48	54.00	-25.52	AVG	100	185	
5	2483.500	41.02	-5.89	35.13	74.00	-38.87	peak	100	285	
6	2483.500	31.96	-5.89	26.07	54.00	-27.93	AVG	100	285	
7	2500.000	41.25	-5.81	35.44	74.00	-38.56	peak	100	175	
8	2500.000	31.15	-5.81	25.34	54.00	-28.66	AVG	100	175	

Note: Average measurement with peak detection at No.2&4&6&8

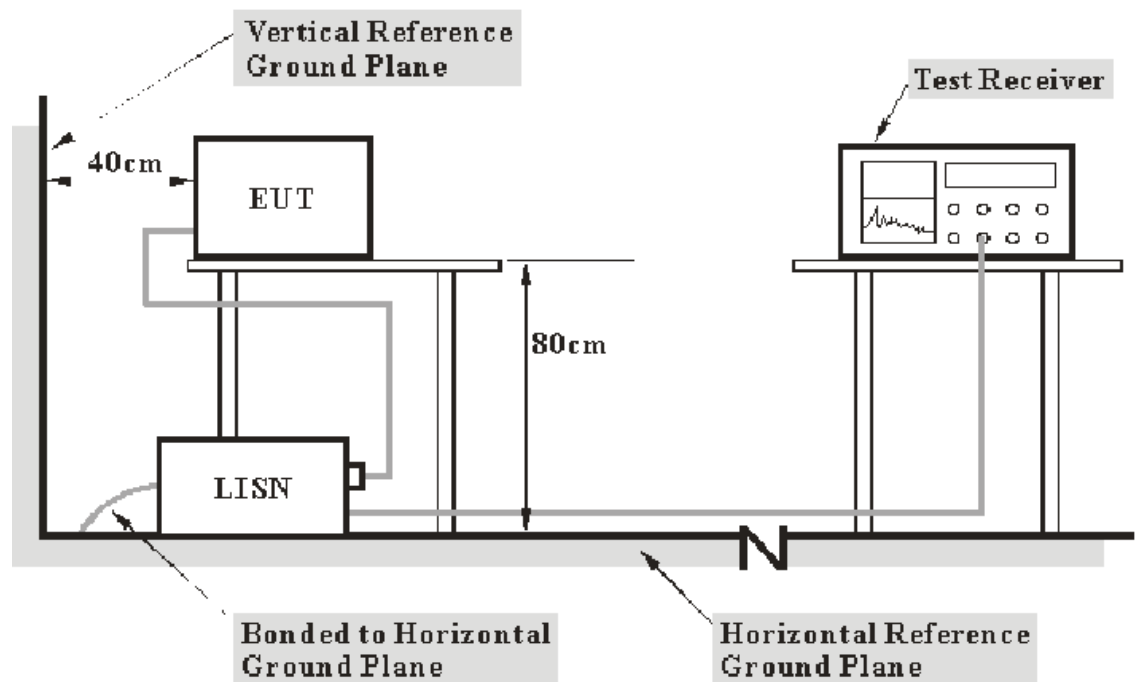
12.AC POWER LINE CONDUCTED EMISSION TEST

12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators



12.1.2.Test System Setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

12.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μ V)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies.		
NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

12.3.Configuration of EUT on Measurement

The equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 12.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in test mode and measure it.

12.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.

The bandwidth of test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

12.6.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dBμV)	Average Level (dBμV)	QuasiPeak Limit (dBμV)	Average Limit (dBμV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.6	25.3	17.0	59.0	49.0	33.4	31.7	Pass

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dBμV) = Limit stated in standard

Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:

Margin = Limit (dBμV) - Level (dBμV)

12.7.Test Results

Pass.

Test Lab: 3m Anechoic chamber

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.
Emissions attenuated more than 20 dB below the permissible value are not reported.

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

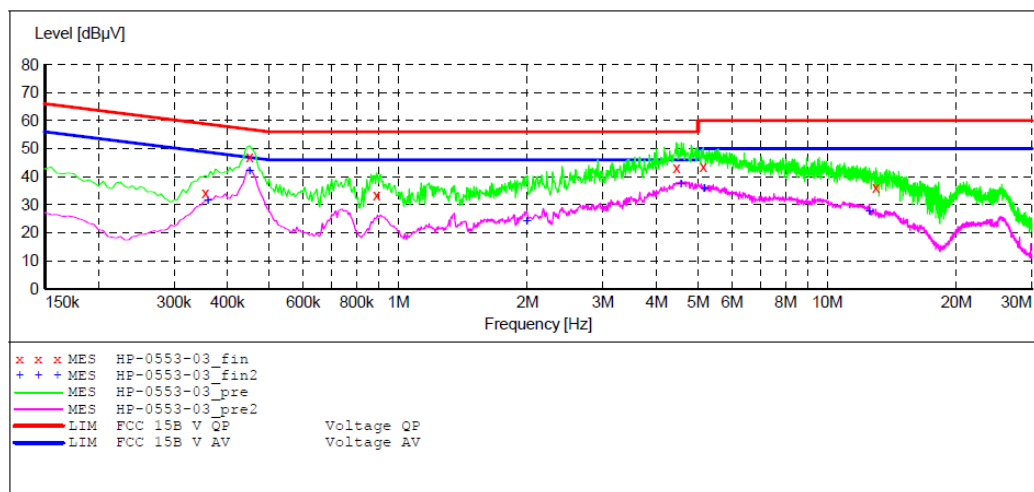
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: Bluetooth Turntable M/N:HP-H005
 Manufacturer: Haiping
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: CHARLEY
 Test Specification: N 120V/60Hz
 Comment: Report NO.:ATE20190553
 Start of Test: 4/28/2019 / 8:53:30AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "HP-0553-03_fin"

4/28/2019 8:56AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.355000	34.20	10.6	59	24.6	QP	N	GND
0.450000	47.10	10.7	57	9.8	QP	N	GND
0.890000	33.50	10.8	56	22.5	QP	N	GND
4.450000	43.30	11.1	56	12.7	QP	N	GND
5.140000	43.40	11.2	60	16.6	QP	N	GND
12.985000	35.90	11.3	60	24.1	QP	N	GND

MEASUREMENT RESULT: "HP-0553-03_fin2"

4/28/2019 8:56AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	31.30	10.6	49	17.4	AV	N	GND
0.450000	42.00	10.7	47	4.9	AV	N	GND
1.995000	24.10	11.0	46	21.9	AV	N	GND
4.560000	37.40	11.1	46	8.6	AV	N	GND
5.170000	35.60	11.2	50	14.4	AV	N	GND
12.550000	27.70	11.3	50	22.3	AV	N	GND

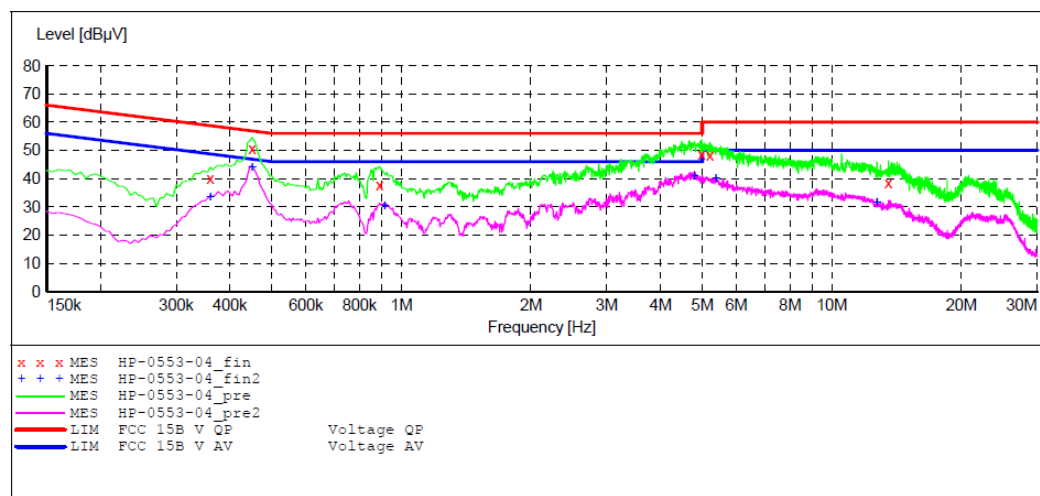
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: Bluetooth Turntable M/N:HP-H005
 Manufacturer: Haiping
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: CHARLEY
 Test Specification: L 120V/60Hz
 Comment: Report NO.:ATE20190553
 Start of Test: 4/28/2019 / 8:57:33AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "HP-0553-04_fin"

4/28/2019 9:01AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	39.90	10.6	59	18.8	QP	L1	GND
0.450000	50.60	10.7	57	6.3	QP	L1	GND
0.890000	37.60	10.8	56	18.4	QP	L1	GND
4.980000	48.70	11.2	56	7.3	QP	L1	GND
5.210000	48.10	11.2	60	11.9	QP	L1	GND
13.555000	38.60	11.3	60	21.4	QP	L1	GND

MEASUREMENT RESULT: "HP-0553-04_fin2"

4/28/2019 9:01AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	33.40	10.6	49	15.3	AV	L1	GND
0.450000	44.10	10.7	47	2.8	AV	L1	GND
0.915000	30.30	10.8	46	15.7	AV	L1	GND
4.800000	40.80	11.1	46	5.2	AV	L1	GND
5.380000	39.90	11.2	50	10.1	AV	L1	GND
12.730000	31.60	11.3	50	18.4	AV	L1	GND

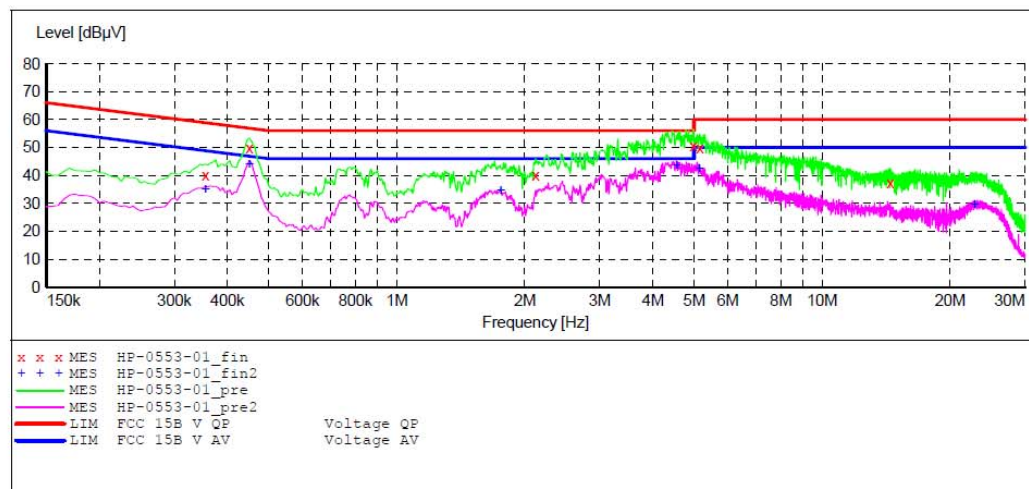
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: Bluetooth Turntable M/N:HP-H005
 Manufacturer: Haiping
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: CHARLEY
 Test Specification: L 240V/60Hz
 Comment: Report NO.:ATE20190553
 Start of Test: 4/28/2019 / 8:45:08AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "HP-0553-01_fin"

4/28/2019 8:48AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.355000	40.10	10.6	59	18.7	QP	L1	GND
0.450000	49.60	10.7	57	7.3	QP	L1	GND
2.120000	40.10	11.0	56	15.9	QP	L1	GND
4.980000	50.60	11.2	56	5.4	QP	L1	GND
5.160000	49.80	11.2	60	10.2	QP	L1	GND
14.470000	37.40	11.4	60	22.6	QP	L1	GND

MEASUREMENT RESULT: "HP-0553-01_fin2"

4/28/2019 8:48AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.355000	35.10	10.6	49	13.7	AV	L1	GND
0.450000	43.90	10.7	47	3.0	AV	L1	GND
1.755000	34.50	11.0	46	11.5	AV	L1	GND
4.550000	43.50	11.1	46	2.5	AV	L1	GND
5.140000	42.30	11.2	50	7.7	AV	L1	GND
22.840000	29.60	11.4	50	20.4	AV	L1	GND

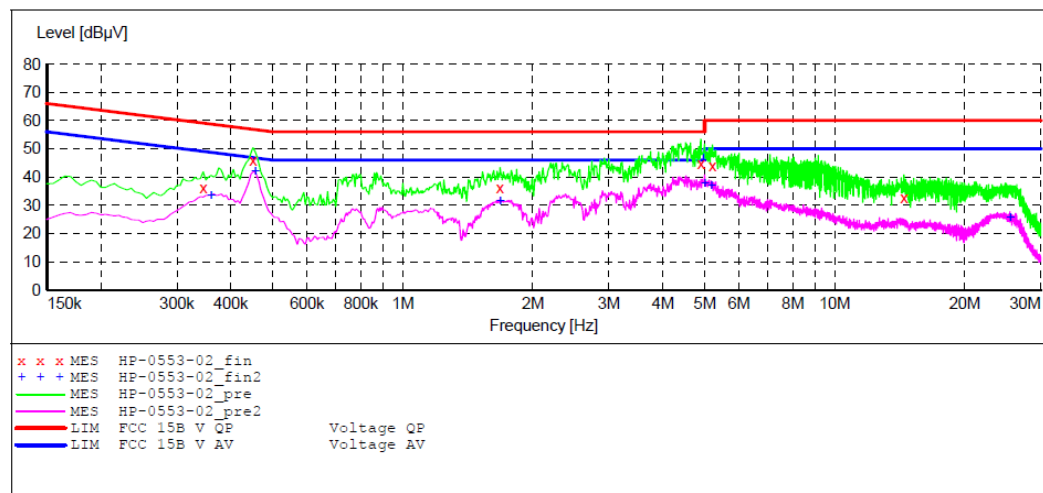
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: Bluetooth Turntable M/N:HP-H005
 Manufacturer: Haiping
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: CHARLEY
 Test Specification: N 240V/60Hz
 Comment: Report NO.:ATE20190553
 Start of Test: 4/28/2019 / 8:49:26AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "HP-0553-02_fin"

4/28/2019 8:52AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.345000	36.10	10.6	59	23.0	QP	N	GND
0.450000	45.80	10.7	57	11.1	QP	N	GND
1.680000	36.00	10.9	56	20.0	QP	N	GND
4.900000	44.50	11.2	56	11.5	QP	N	GND
5.210000	44.00	11.2	60	16.0	QP	N	GND
14.470000	32.60	11.4	60	27.4	QP	N	GND

MEASUREMENT RESULT: "HP-0553-02_fin2"

4/28/2019 8:52AM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.360000	33.30	10.6	49	15.4	AV	N	GND
0.455000	41.80	10.7	47	5.0	AV	N	GND
1.680000	31.30	10.9	46	14.7	AV	N	GND
5.000000	37.60	11.2	46	8.4	AV	N	GND
5.180000	37.00	11.2	50	13.0	AV	N	GND
25.465000	25.60	11.5	50	24.4	AV	N	GND

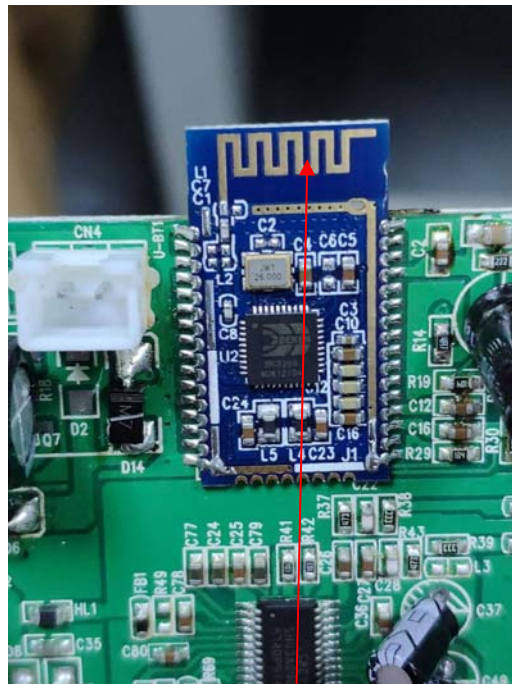
13.ANTENNA REQUIREMENT

13.1.The Requirement

According to Section 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.

13.2.Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is -0.58dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

***** End of Test Report *****