APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Koss Corporation

Bluetooth Headset
Model No.: KOSS KPH7 Wireless

FCC ID: L76-KPH7BT

Prepared for	:	Koss Corporation
Address	:	4129 N. Port Washington Avenue, Milwaukee, Wisconsin, United States
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
Address	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China
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Report No.	:	ATE20191589
Date of Test	:	November 5-8, 2019
Date of Report	:	November 11, 2019

TABLE OF CONTENTS

Description Page

Test Report Certification

Applicant	:	Koss Corporation
Manufacturer	:	Dongguan Baizhenrong Limited
Product	:	Bluetooth Headset
Model No.	:	KOSS KPH7 Wireless

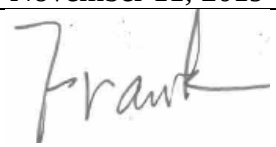
Measurement Procedure Used:

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.

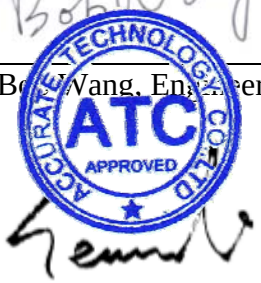
This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : November 5-8, 2019
Date of Report : November 11, 2019



Test Engineer : _____
(Frank, Engineer)

Prepared by : _____
(Bob Wang, Engineer)



Approved & Authorized Signer : _____
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

Model Number	:	KOSS KPH7 Wireless
Bluetooth version	:	V5.0
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	1.2dBi
Antenna type	:	PCB Antenna
Modulation mode	:	GFSK, π/4 DQPSK, 8DPSK
Trade Mark	:	KOSS
Power supply	:	DC 3.7V & DC 5V(Power by USB Port)
Applicant	:	Koss Corporation
Address	:	4129 N. Port Washington Avenue, Milwaukee, Wisconsin, United States
Manufacturer	:	Dongguan Baizhenrong Limited
Address	:	3 Xin Yuan Street, Ju-zhou No.2 Industrial Zone, Shijie Town, DongGuan, GuangDong Province, P.R.C

1.2.Accessory and Auxiliary Equipment

AC/DC Power Adapter (provided by laboratory)	:	Model:BEK-QC-001 INPUT: 120V~60Hz OUTPUT:5V/1A

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 (ISEDC) 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

Radiated Emission Expanded Uncertainty (9kHz-30MHz)	:	U=2.66dB, k=2
Radiated Emission Expanded Uncertainty (30MHz-1000MHz)	:	U=4.28dB, k=2
Radiated Emission Expanded Uncertainty (1G-18GHz)	:	U=4.98dB, k=2
Radiated Emission Expanded Uncertainty (18G-26.5GHz)	:	U=5.06dB, k=2
Conduction Emission Expanded Uncertainty (Mains ports, 9kHz-30MHz)	:	U=2.72dB, 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	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	One Year
EMI Test Receiver	Rohde&Schwarz	ESR	101817	Jan. 05, 2019	One Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 05, 2019	One Year
Pre-Amplifier (Radiated Emission)	Compliance Direction	RSU-M2	38322	Jan. 05, 2019	One Year
Pre-Amplifier (Radiated Emission)	Agilent	8447D	294A10619	Jan. 05, 2019	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 05, 2019	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 05, 2019	One Year
RF Coaxial Cable (Conducted Emission)	SUHNER	N-2m	No.2	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-5m	NO.3	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-5m	NO.4	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-1m	NO.5	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-1m	NO.6	Jan. 05, 2019	One Year
Conducted Emission Measurement Software: ES-K1 V1.71					
Radiated Emission Measurement Software: EZ_EMC V1.1.4.2					

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

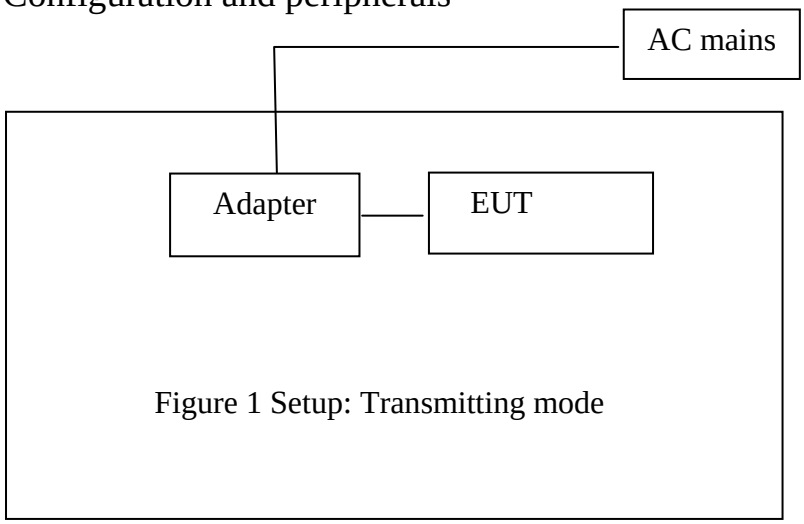


Figure 1 Setup: Transmitting mode

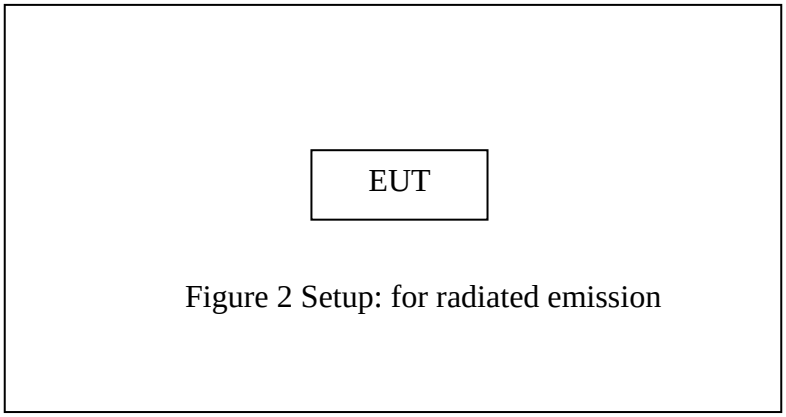


Figure 2 Setup: for radiated emission

4. FREQUENCY HOPPING SYSTEM REQUIREMENTS

RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHZ,In every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection(e.g. single of multislot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE

Example of a 79 hopping sequence in data mode:
40,21,44,23,42,53,46,55,48,33,52,35,50,65,54,67
56,37,60,39,58,69,62,71,64,25,68,27,66,57,70,59
72,29,76,31,74,61,78,63,01,41,05,43,03,73,07,75
09,45,13,47,11,77,15,00,64,49,66,53,68,02,70,06
01, 51, 03, 55, 05, 04

EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values:
1. LAP/UAP of the master of the connection.
2. Internal master clock

The LAP(lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP(upper address part) are the 24MSB's of the 48BD_ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For ehavior zation with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us.The clock has a cycle of about one day(23h30).In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire. LAP(24 bits),4LSB's(4bits)(Input 1) and the 27MSB's of the clock(Input 2) are used. With this input values different mathematical procedures(permutations, additions, XOR-operations)are performed to generate te Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following ehavior:

The first connection between the two devices is established, a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended.

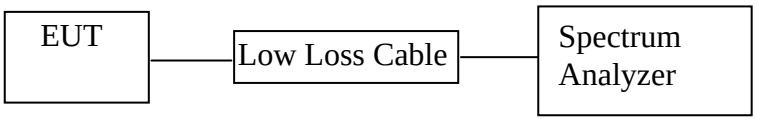
The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmission is longer(and it Cannot be shorter) than the minimum resolution of the clock(312.5us).The hopping sequence will always Differ from the first one.

5. 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 Limits Test	Compliant
Section 15.203	Antenna Requirement	Compliant

6. 20DB BANDWIDTH TEST

6.1.Block Diagram of Test Setup



6.2.The Requirement For 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.

6.3.EUT Configuration on Test

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 off) 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.The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW.

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

6.6.Test Result

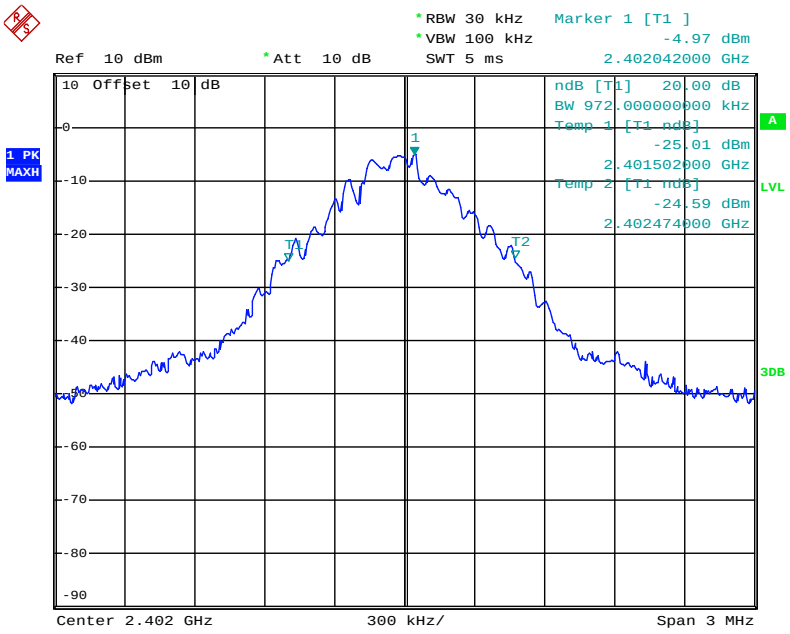
Test Lab: Shielding room
Test Engineer: Frank

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	0.972	1.362	1.350	Pass
Middle	2441	0.990	1.356	1.350	Pass
High	2480	0.984	1.356	1.350	Pass

The spectrum analyzer plots are attached as below.

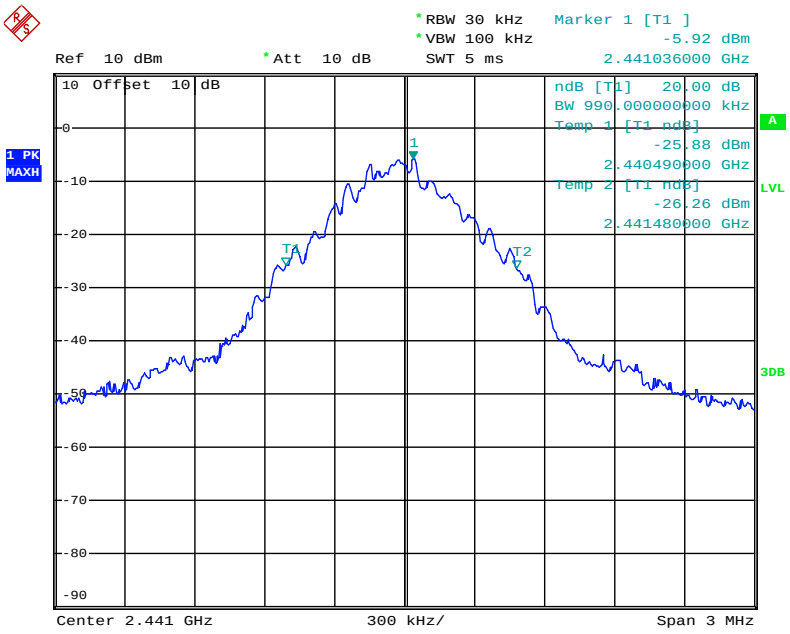
GFSK Mode

Low channel



Date: 8.NOV.2019 15:58:20

Middle channel



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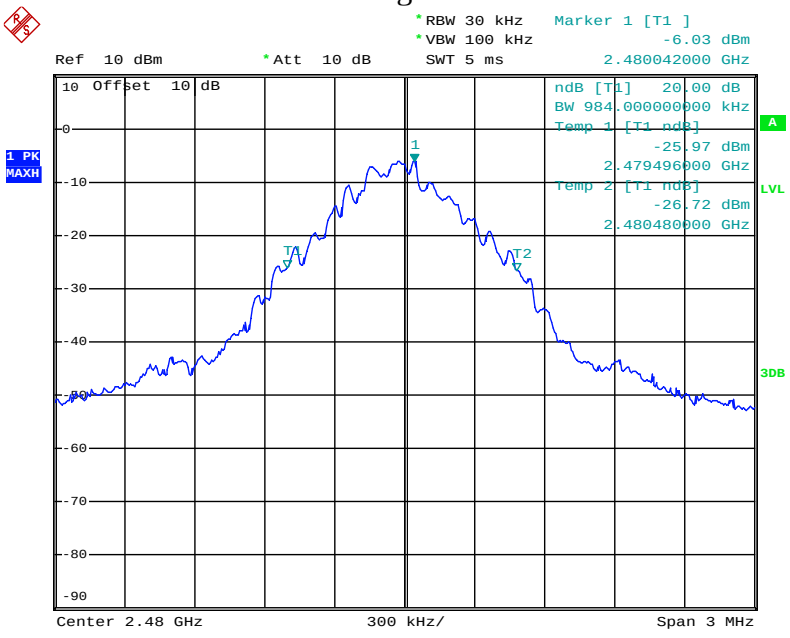
High channel



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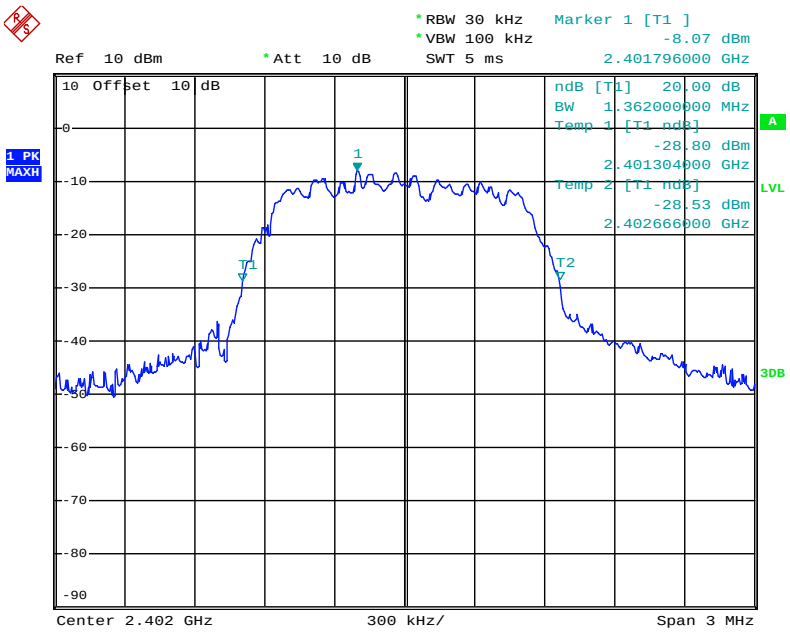
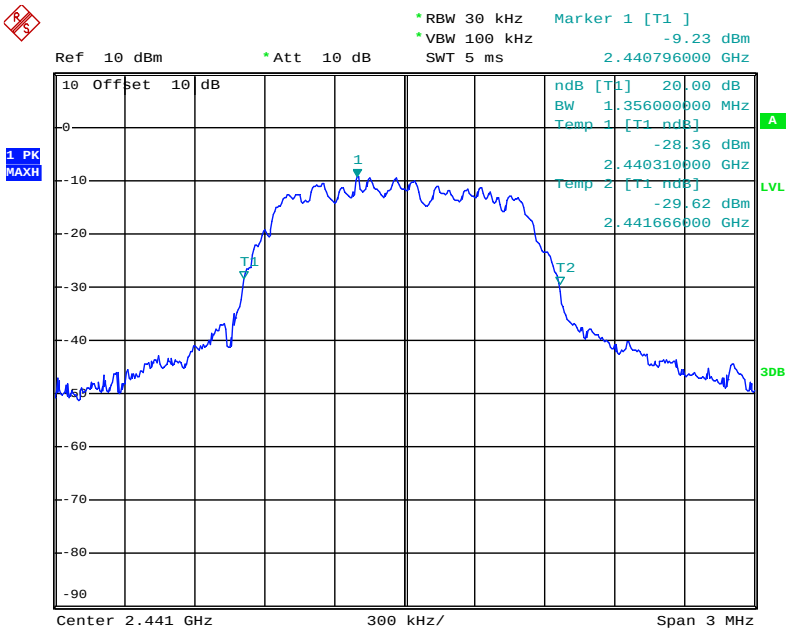
Π/4-DQPSK Mode

Low channel



Date: 8.NOV.2019 16:01:03

Middle channel



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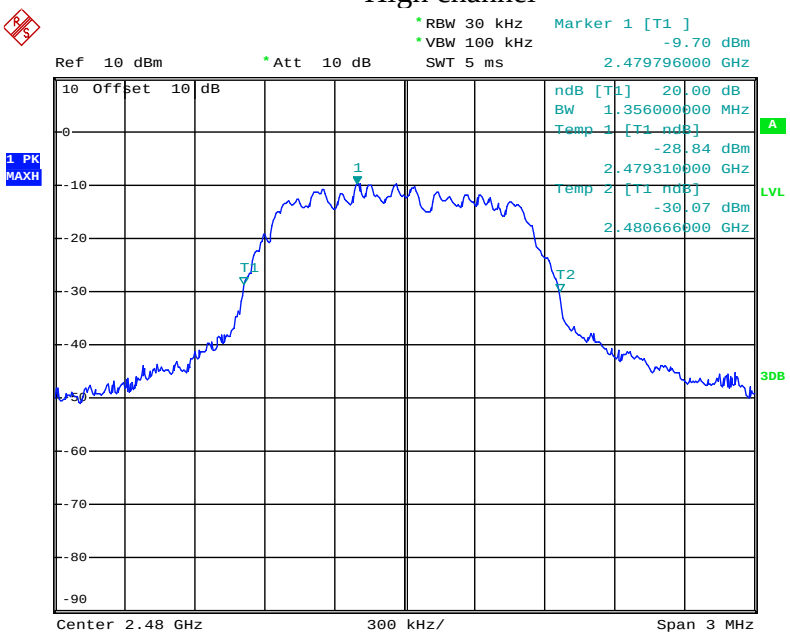
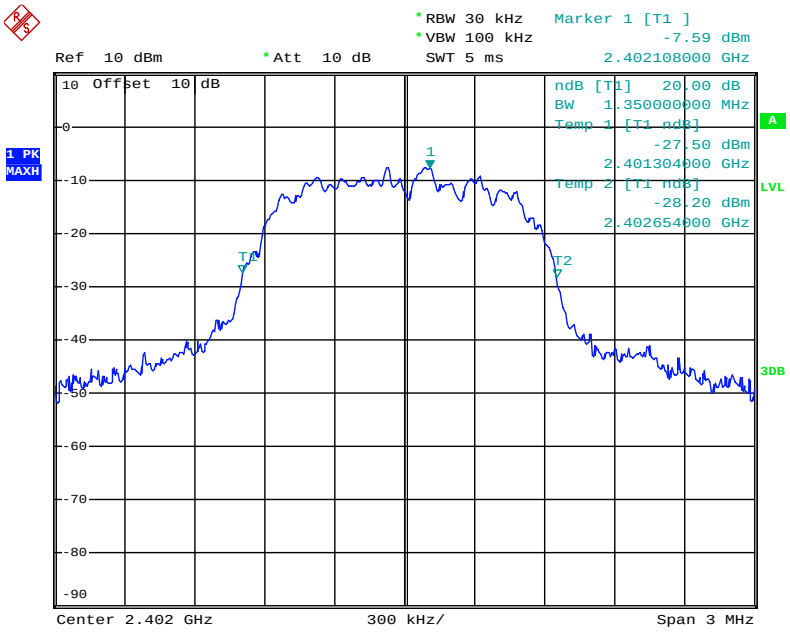
High channel



Date: 8.NOV.2019 15:59:57

8DPSK Mode

Low channel



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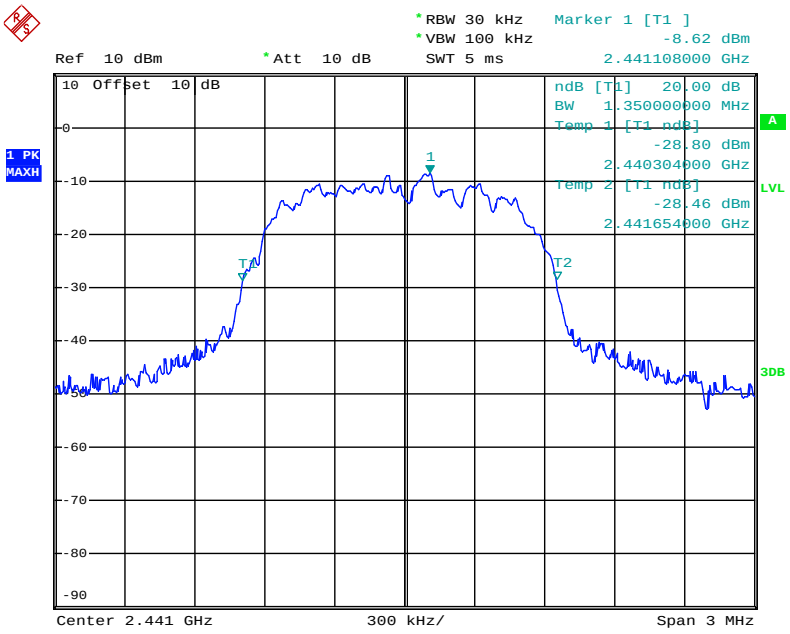
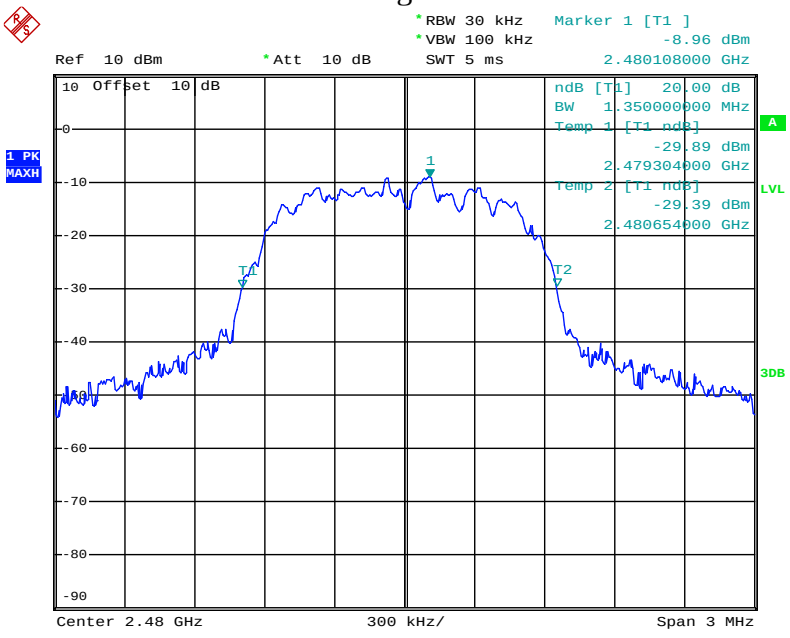
Middle channel



Date: 8.NOV.2019 16:02:17

High channel



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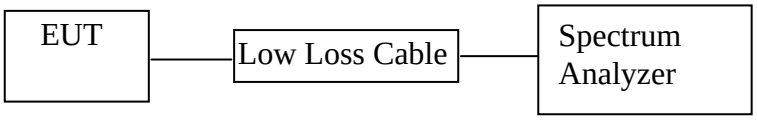
7. CARRIER FREQUENCY SEPARATION TEST

7.1.Block Diagram of Test Setup



7.2.The Requirement For 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.

7.3.EUT Configuration on Test

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. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

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

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

7.5.4.Measurement the channel separation

7.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank
GFSK Mode

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.996	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			

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	0.948	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

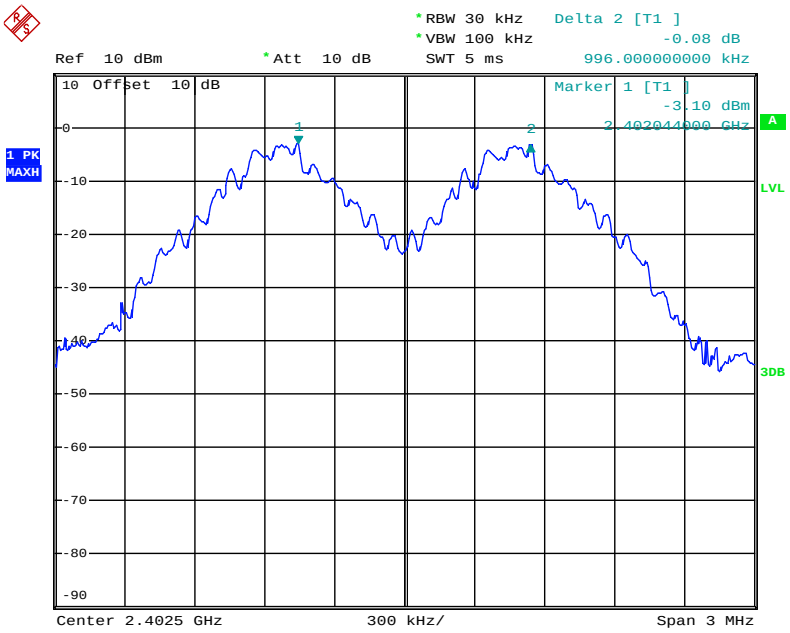
8DPSK Mode

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.920	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.020	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	0.996	25KHz or 2/3*20dB bandwidth	Pass
	2480			

The spectrum analyzer plots are attached as below.

GFSK Mode

Low channel



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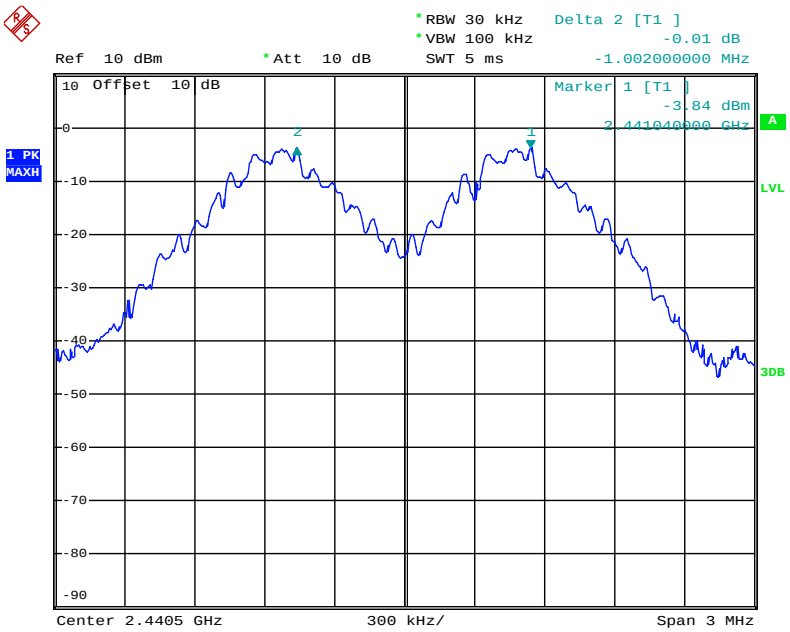
Middle channel



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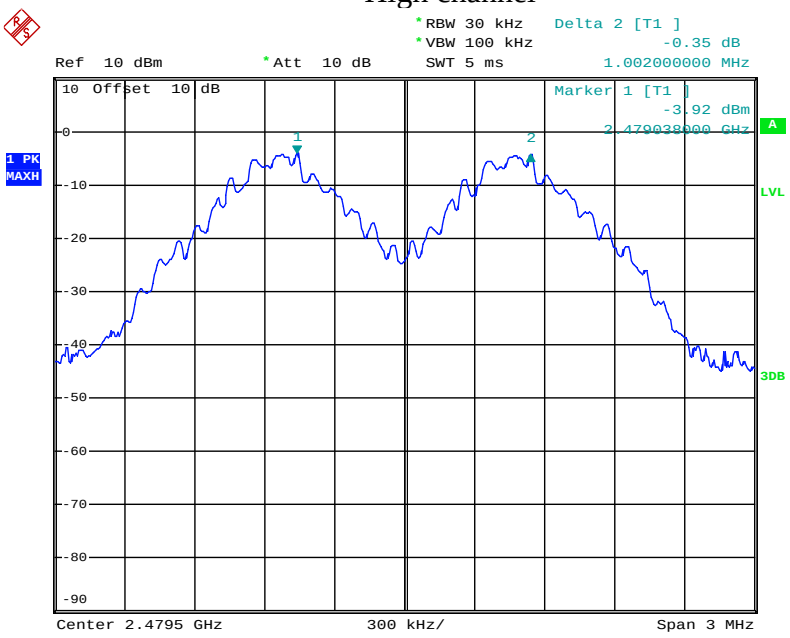
High channel



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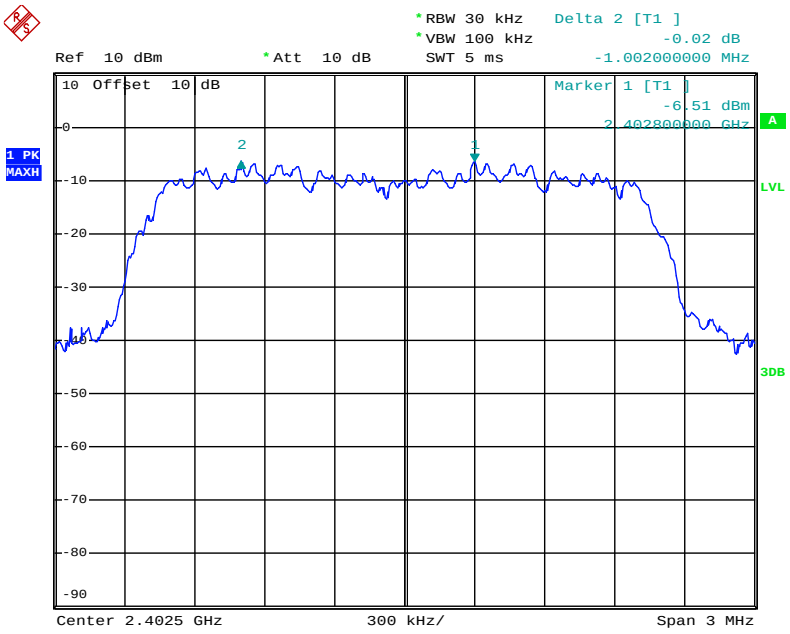
Π/4-DQPSK Mode

Low channel



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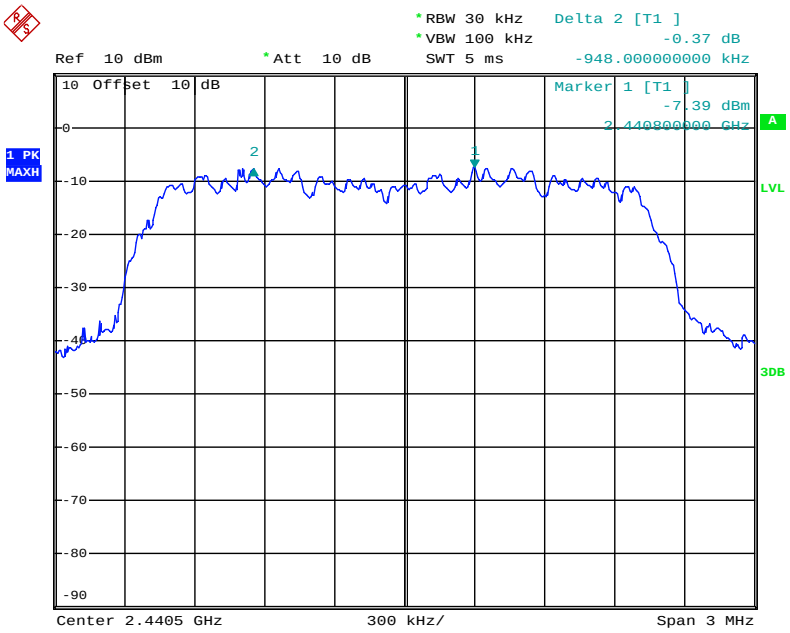
Middle channel



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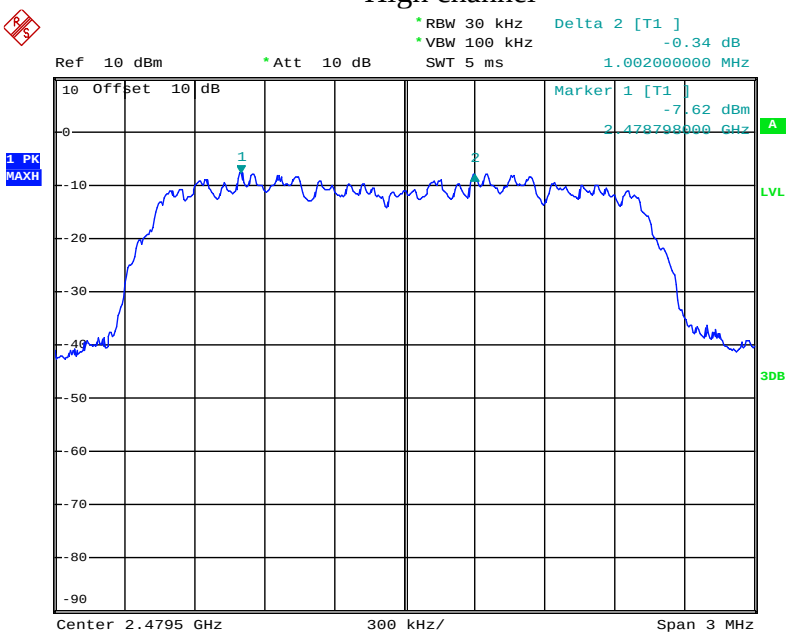
High channel



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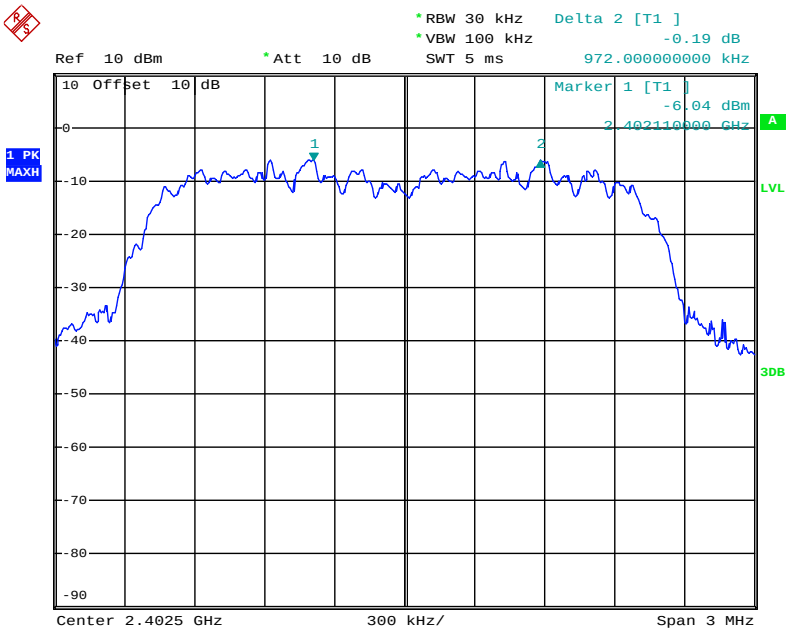
8DPSK Mode

Low channel



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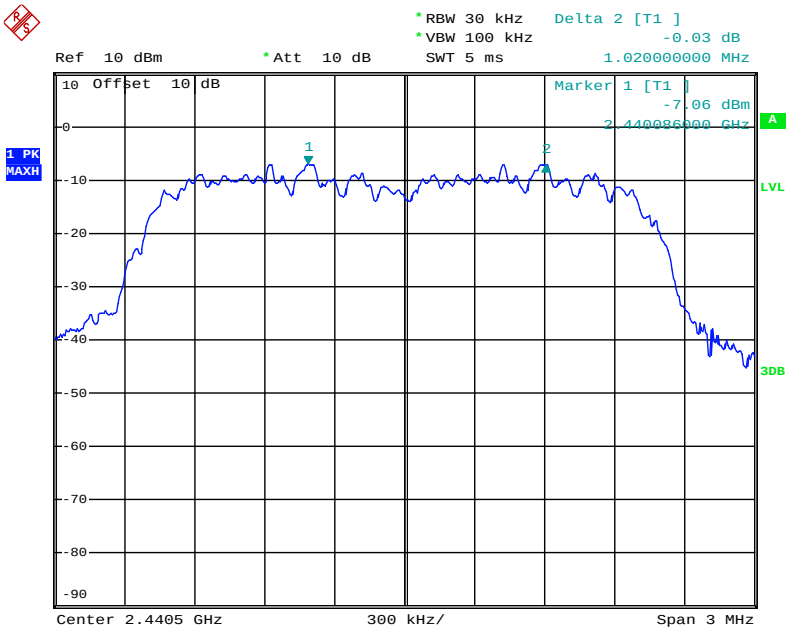
Middle channel



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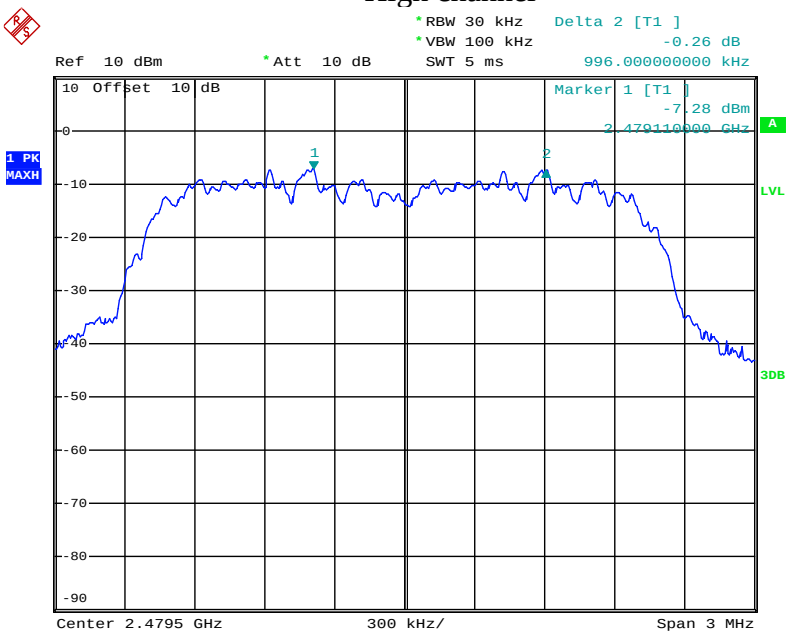
High channel



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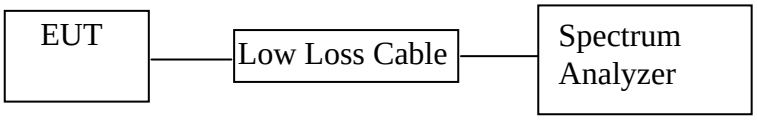
8. NUMBER OF HOPPING FREQUENCY TEST

8.1.Block Diagram of Test Setup



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

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

8.3.EUT Configuration on Test

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.

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

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

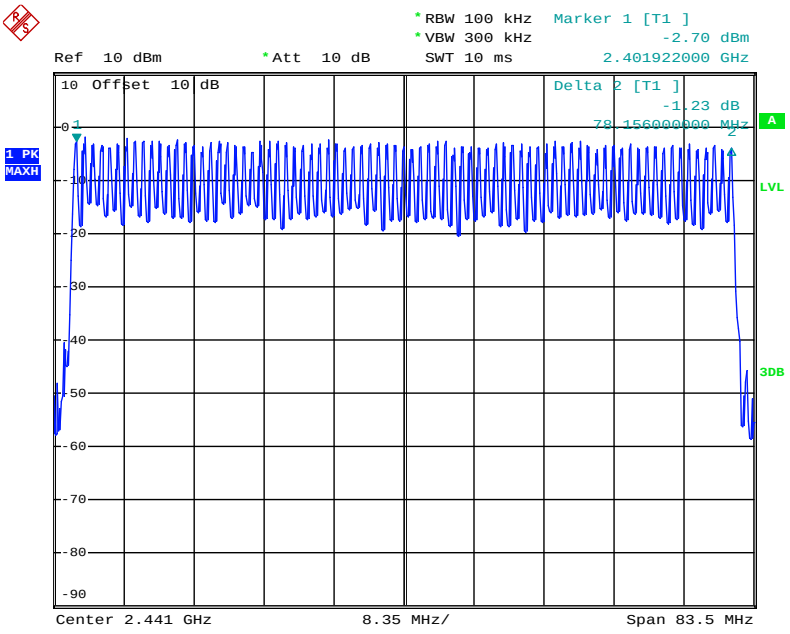
8.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank

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

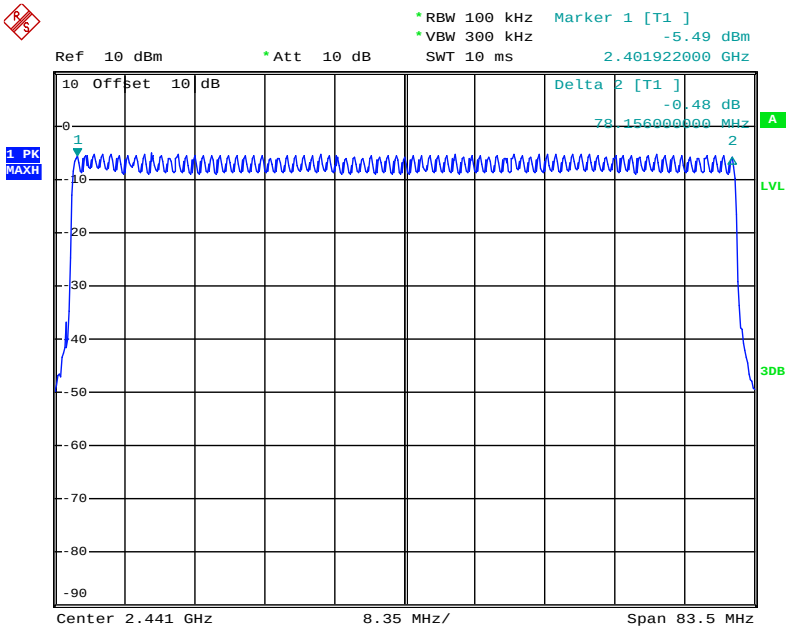
The spectrum analyzer plots are attached as below.

Number of hopping channels (GFSK Mode)



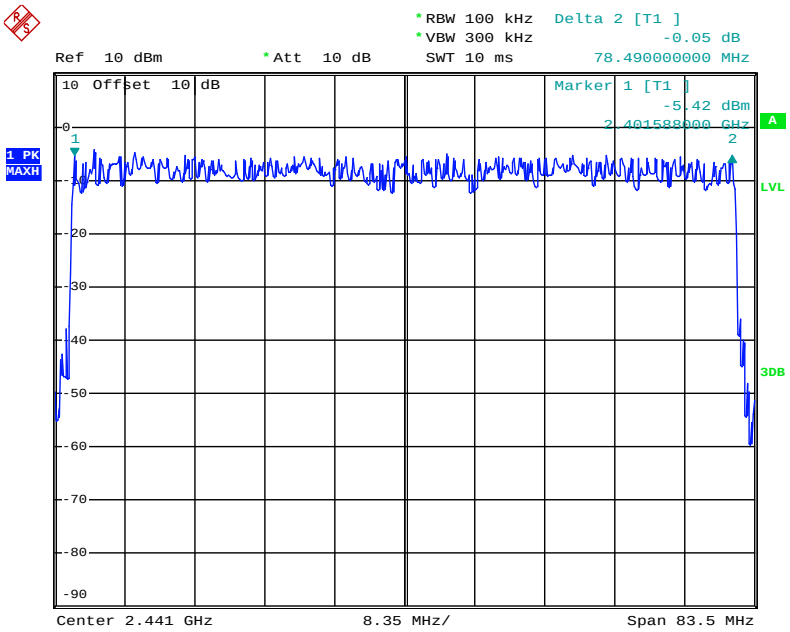
Date: 8.NOV.2019 16:45:45

Number of hopping channels (Π/4-DQPSK Mode)



Date: 8.NOV.2019 16:43:32

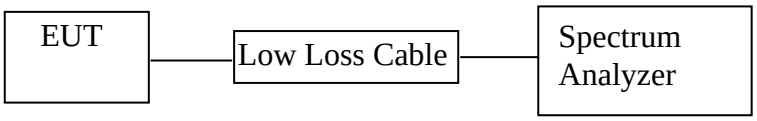
Number of hopping channels (8DPSK Mode)



Date: 8.NOV.2019 16:22:32

9. DWELL TIME TEST

9.1.Block Diagram of Test Setup



9.2.The Requirement For 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.

9.3.EUT Configuration on Test

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 on) 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 center frequency of spectrum analyzer = operating frequency.

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

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

9.6.Test Result

Pass.

Test Lab: Shielding room

Test Engineer: Frank

GFSK Mode (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.420	134.4	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
DH3	2441	1.710	273.6	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
DH5	2441	2.990	318.9	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

Π/4-DQPSK Mode (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.410	131.2	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
DH3	2441	1.700	272.0	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
DH5	2441	2.960	315.7	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

8DPSK Mode (Worse case)

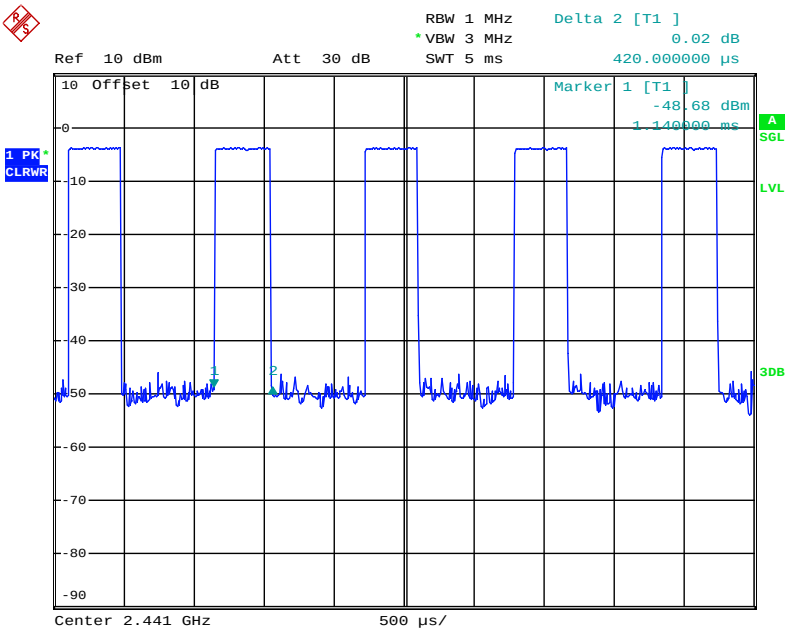
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.420	134.4	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
DH3	2441	1.700	272.0	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
DH5	2441	2.980	317.9	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

Note: We tested GFSK mode and Π/4-DQPSK & 8DPSK mode the low, middle and high channel and recorded the Worse case data for all test mode.

The spectrum analyzer plots are attached as below.

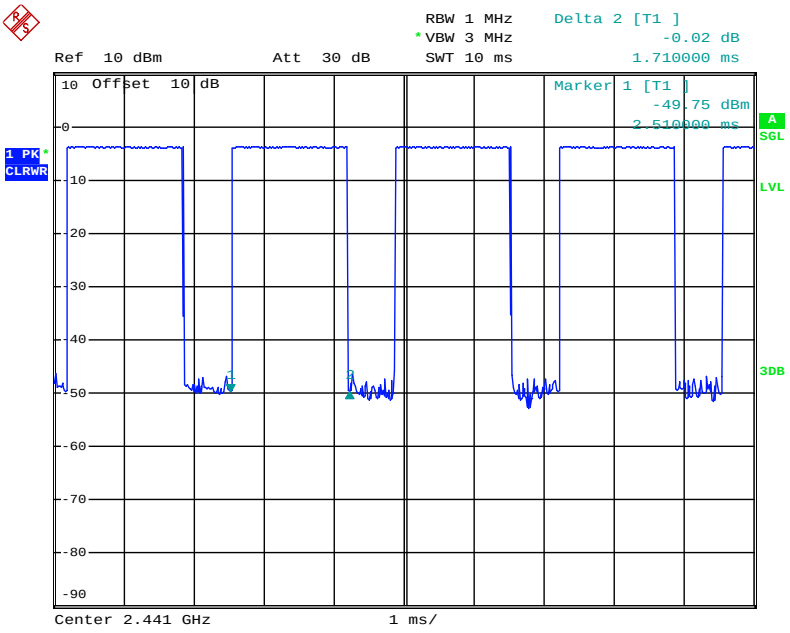
GFSK Mode

DH1 Middle channel



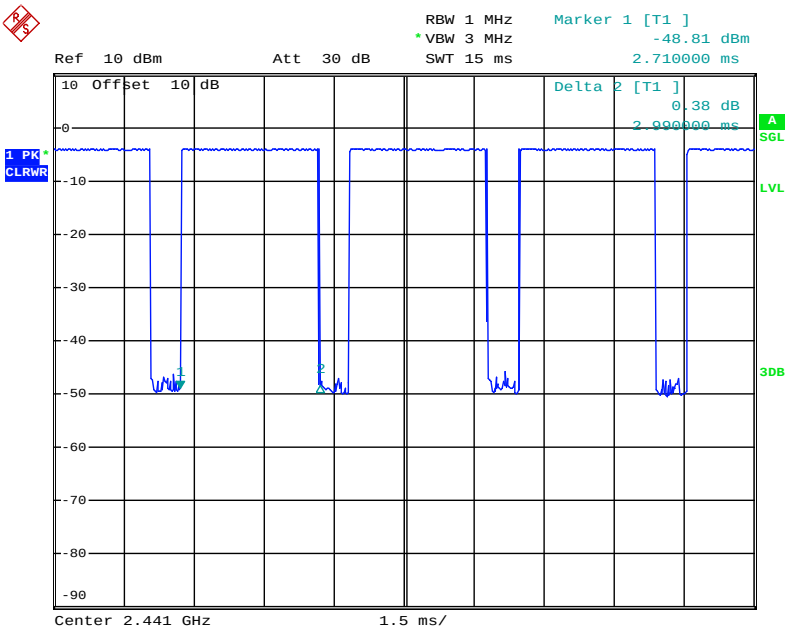
Date: 8.NOV.2019 16:56:06

DH3 Middle channel



Date: 8.NOV.2019 16:55:34

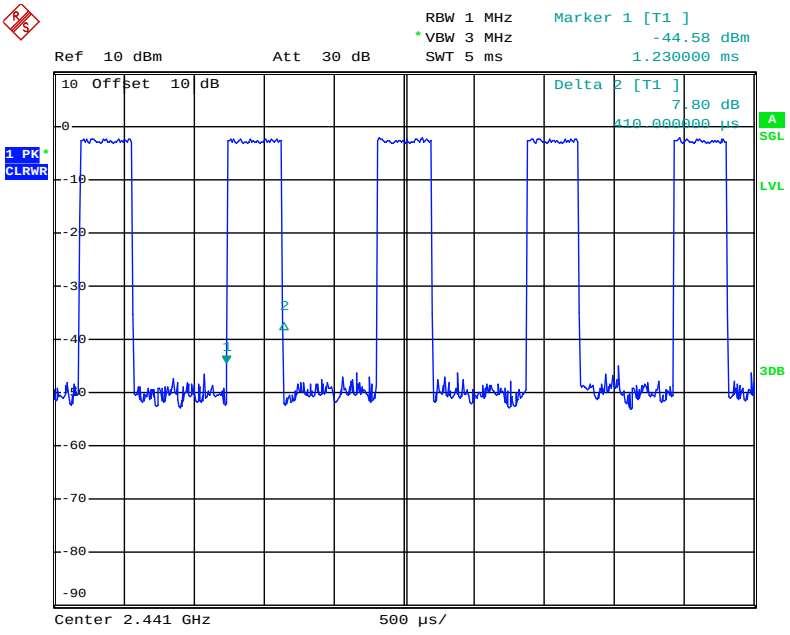
DH5 Middle channel



Date: 8.NOV.2019 16:55:10

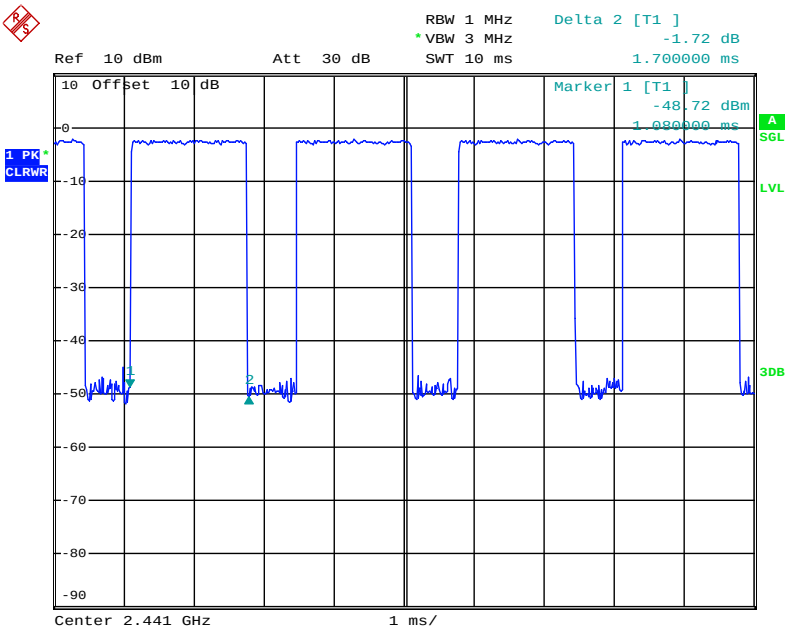
Π/4-DQPSK Mode

2-DH1 Middle channel



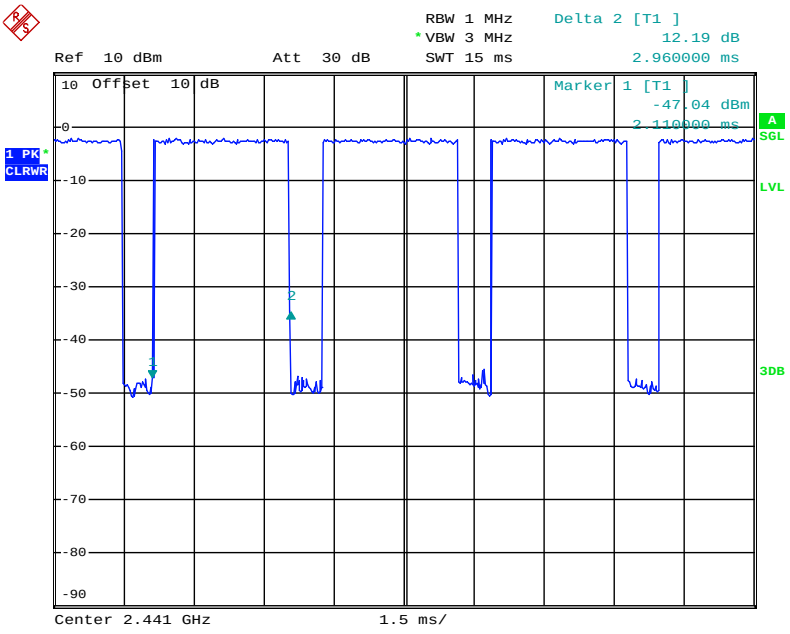
Date: 8.NOV.2019 17:00:45

2-DH3 Middle channel



Date: 8.NOV.2019 17:00:13

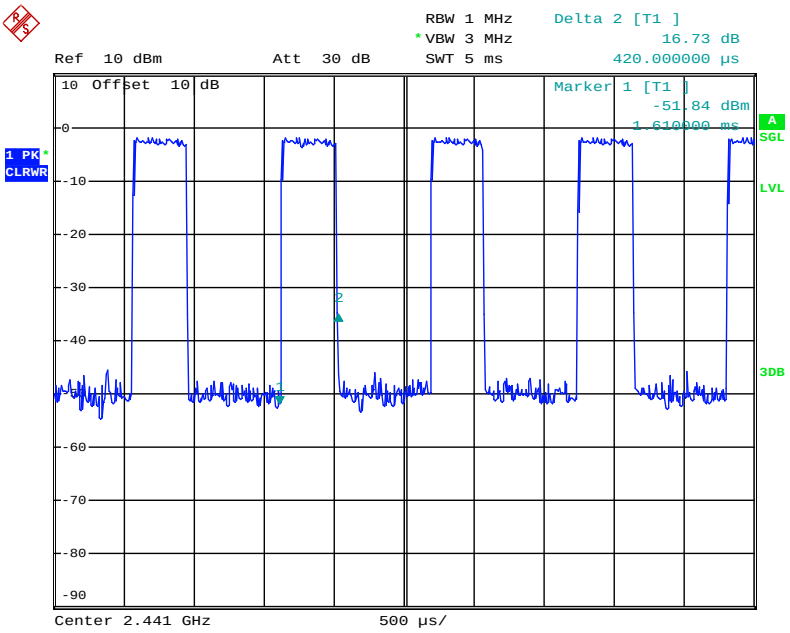
2-DH5 Middle channel



Date: 8.NOV.2019 16:59:46

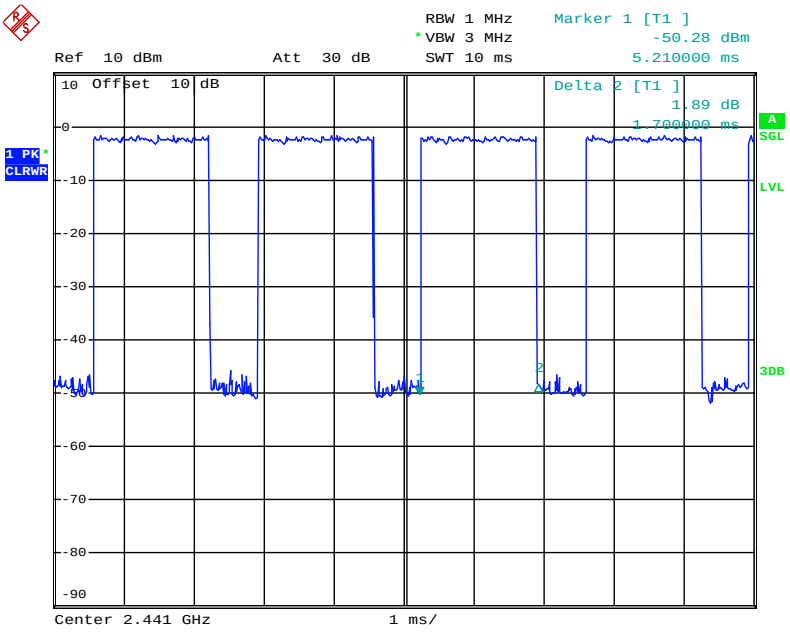
8DPSK Mode

3-DH1 Middle channel



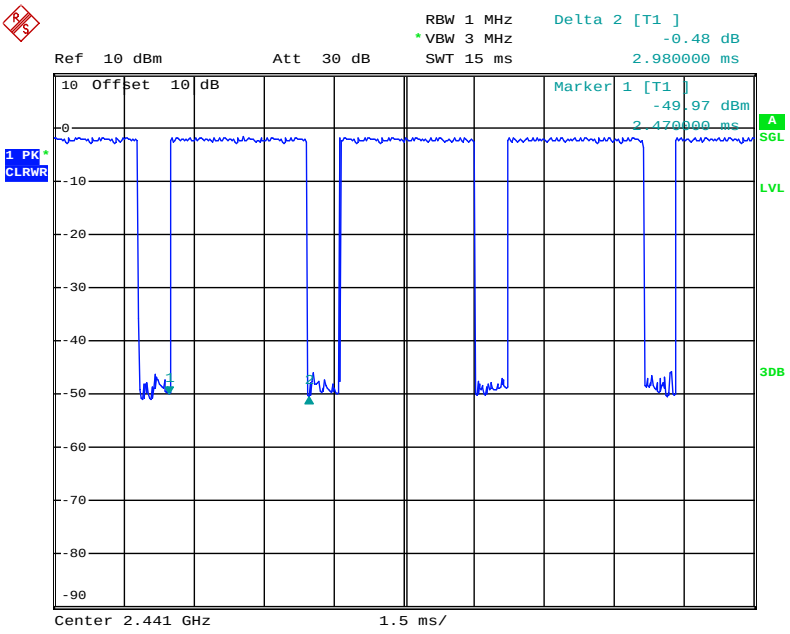
Date: 8.NOV.2019 17:05:11

3-DH3 Middle channel



Date: 8.NOV.2019 17:04:42

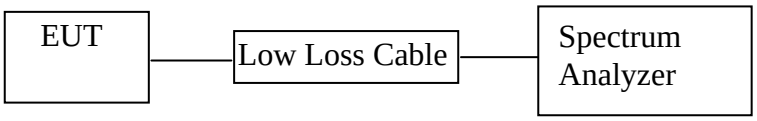
3-DH5 Middle channel



Date: 8.NOV.2019 17:04:00

10.MAXIMUM PEAK OUTPUT POWER TEST

10.1.Block Diagram of Test Setup



10.2.The Requirement For 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.

10.3.EUT Configuration on Test

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.

10.4.Operating Condition of EUT

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

10.4.2.Turn on the power of all equipment.

10.4.3.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.

10.5.Test Procedure

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

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

10.5.3.Measurement the maximum peak output power.

10.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits (dBm/W)	Result
Low	2402	-1.68/0.0007	21 / 0.125	Pass
Middle	2441	-2.99/0.0005	21 / 0.125	Pass
High	2480	-3.33/0.0005	21 / 0.125	Pass

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits (dBm/W)	Result
Low	2402	0.72/0.0012	21 / 0.125	Pass
Middle	2441	-0.19/0.0010	21 / 0.125	Pass
High	2480	-0.68/0.0009	21 / 0.125	Pass

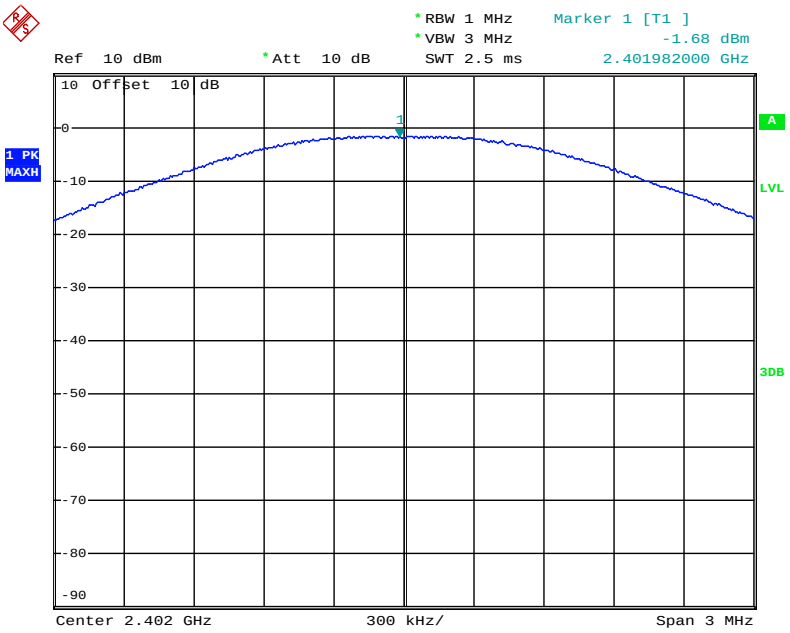
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits (dBm/W)	Result
Low	2402	0.23/0.0011	21 / 0.125	Pass
Middle	2441	-0.01/0.0010	21 / 0.125	Pass
High	2480	-0.25/0.0009	21 / 0.125	Pass

The spectrum analyzer plots are attached as below.

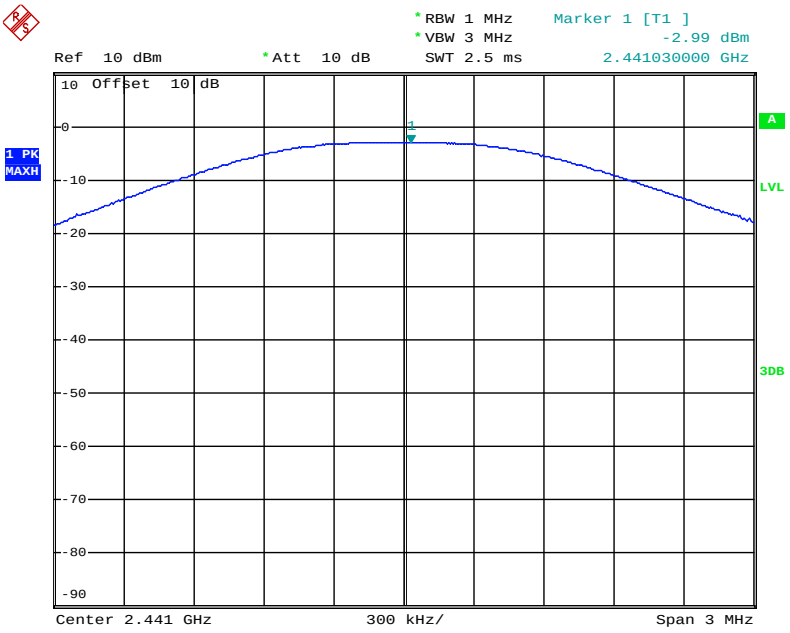
GFSK Mode

Low channel



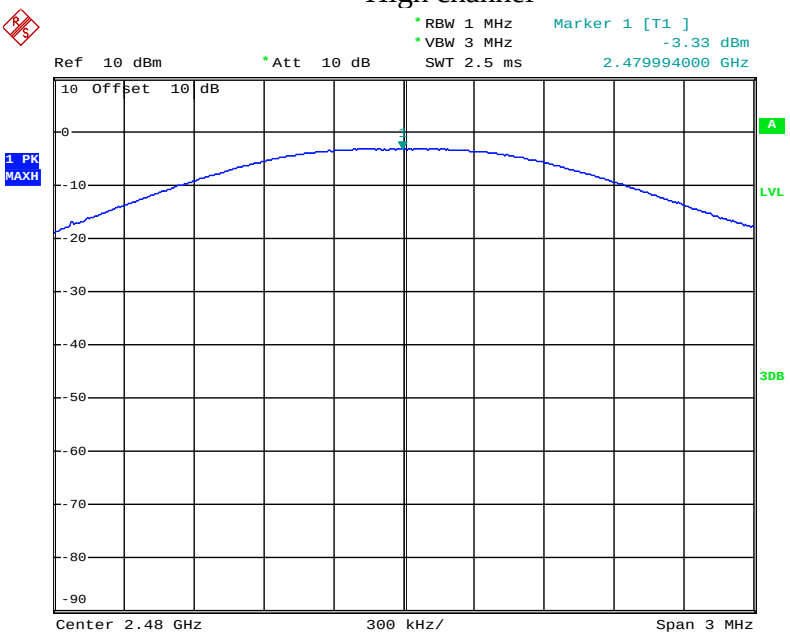
Date: 8.NOV.2019 16:47:22

Middle channel



Date: 8.NOV.2019 16:47:49

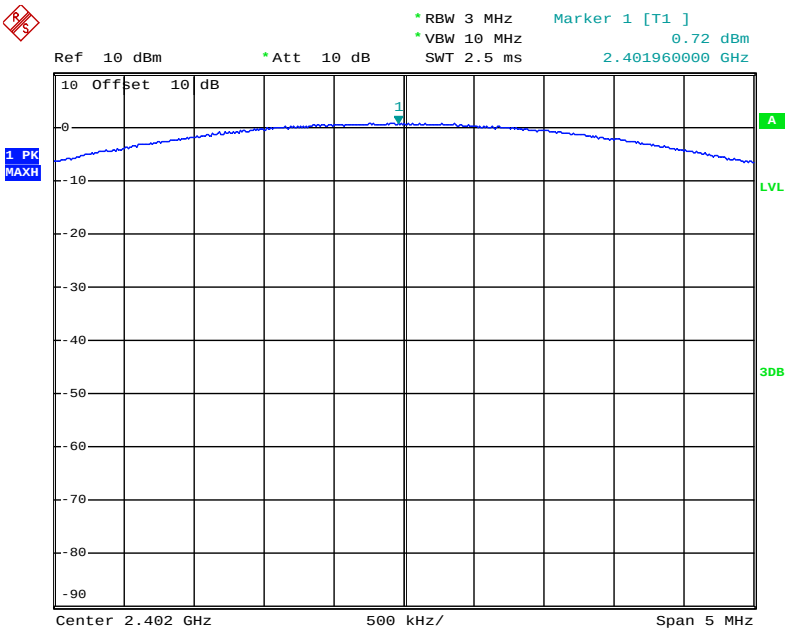
High channel



Date: 8.NOV.2019 16:48:15

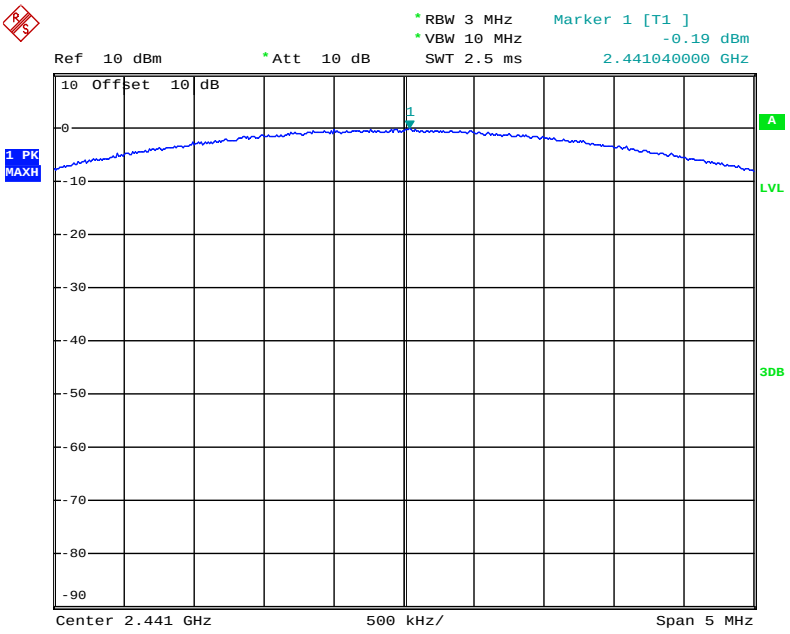
Π/4-DQPSK Mode

Low channel



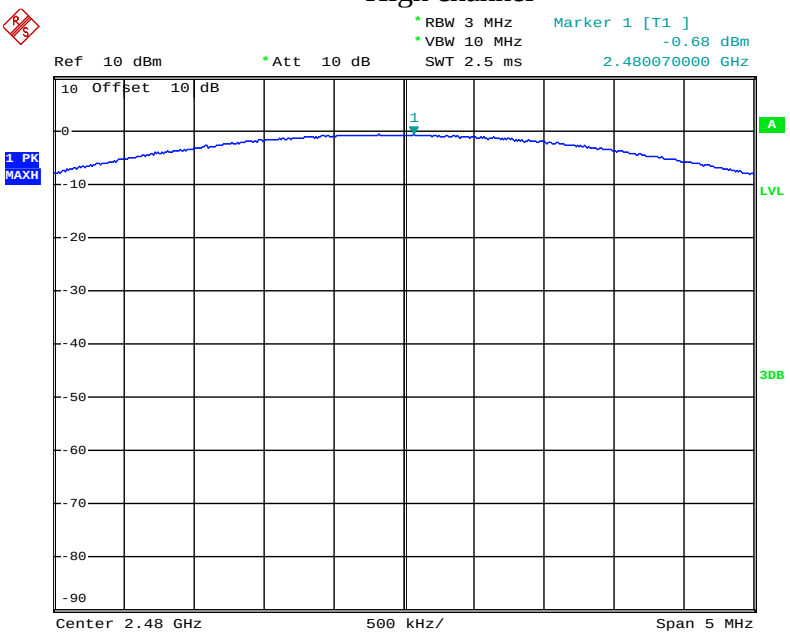
Date: 8.NOV.2019 16:49:29

Middle channel



Date: 8.NOV.2019 16:49:09

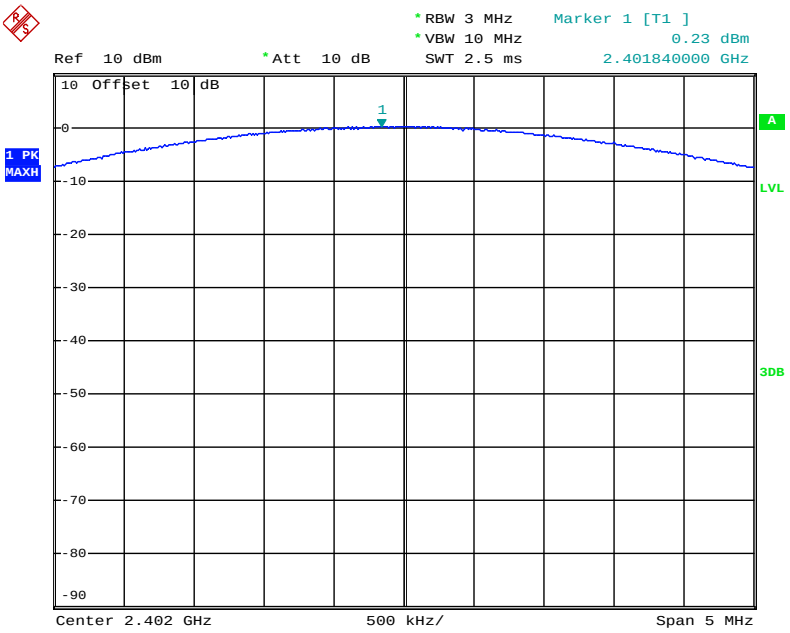
High channel



Date: 8.NOV.2019 16:48:47

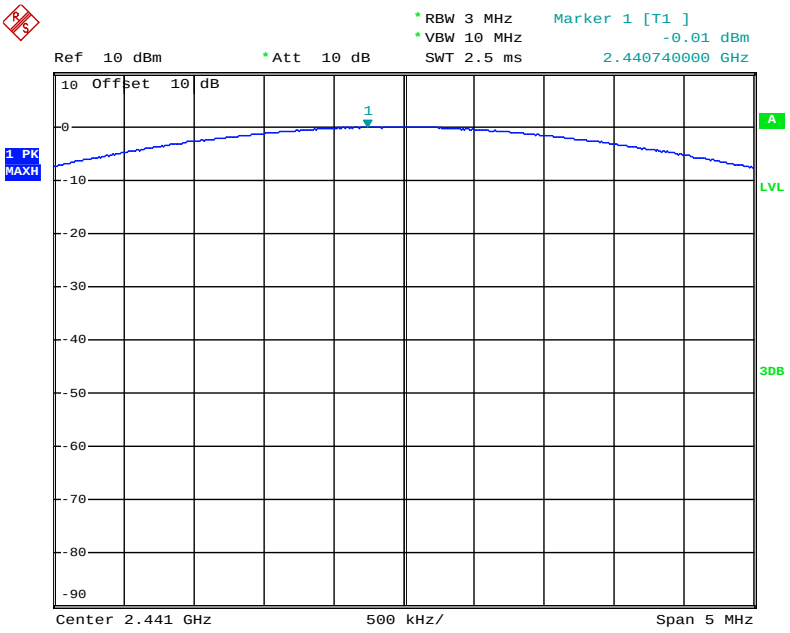
8DPSK Mode

Low channel



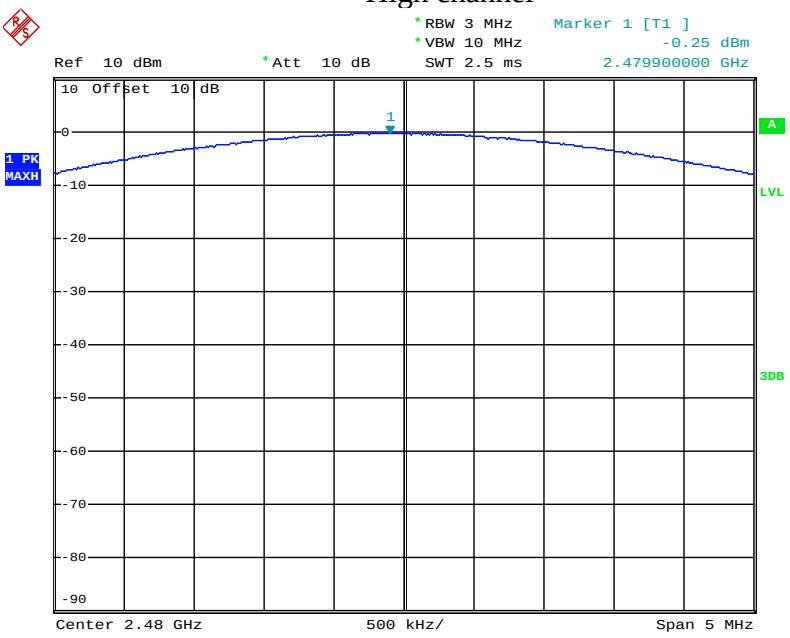
Date: 8.NOV.2019 16:50:08

Middle channel



Date: 8.NOV.2019 16:51:23

High channel

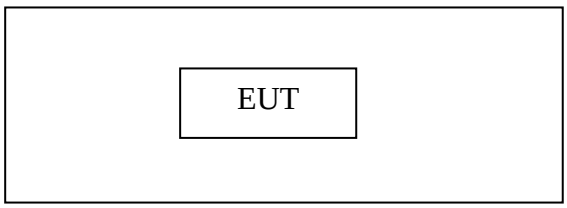


Date: 8.NOV.2019 16:50:53

11.RADIATED EMISSION TEST

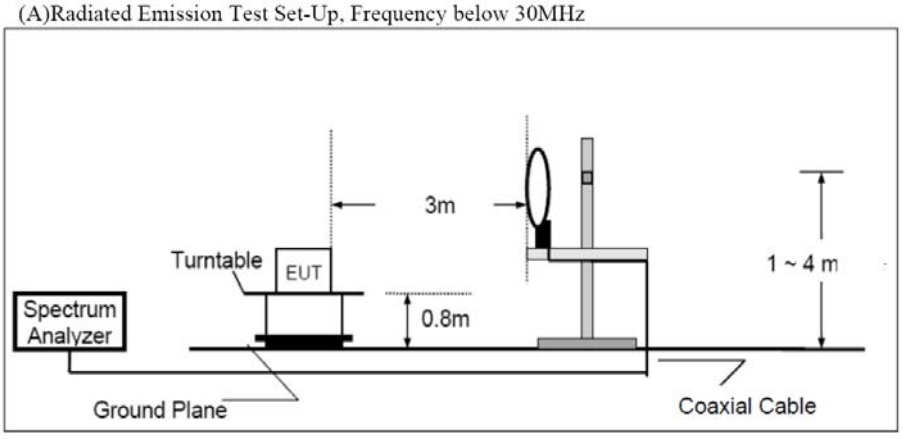
11.1.Block Diagram of Test Setup

11.1.1.Block diagram of connection between the EUT and peripherals

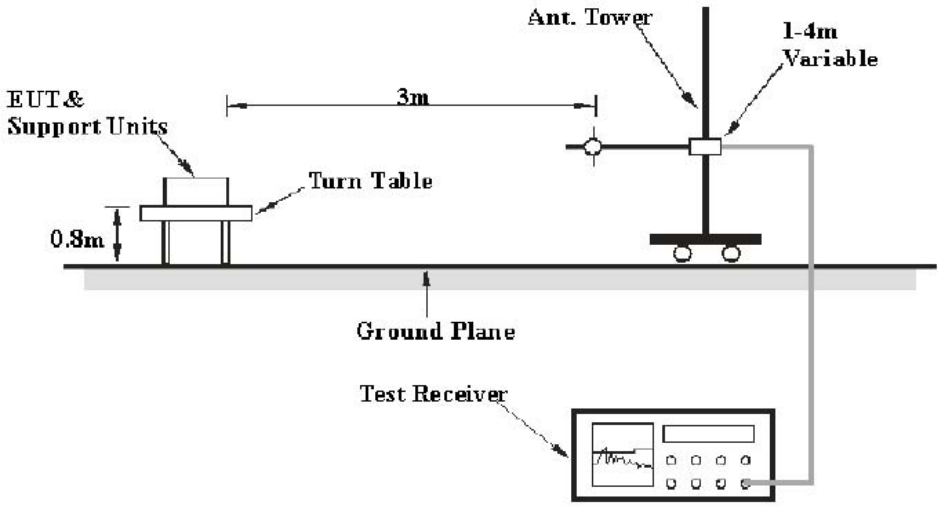


11.1.2.Semi-Anechoic Chamber Test Setup Diagram

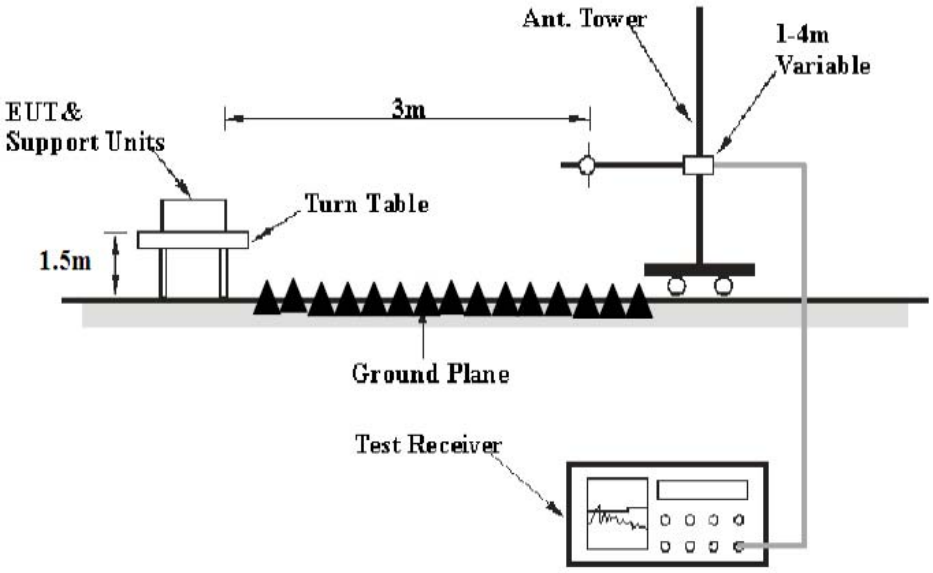
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



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



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



11.2.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).

11.3.Restricted bands of operation

11.3.1.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			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 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 Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

11.4.EUT Configuration on Test

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.

11.5. Operating Condition of EUT

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

11.5.2. Turn on the power of all equipment.

11.5.3. 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.

11.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. 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 worse case emissions are reported.

11.7.Data Sample

Frequency (MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
X.XX	48.69	-13.35	35.34	46	-10.66	QP

Frequency(MHz) = Emission frequency in MHz
Reading(dBμv) = Uncorrected Analyzer/Receiver reading
Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain
Result(dBμv/m) = Reading(dBμv) + Factor(dB/m)
Limit (dBμv/m) = Limit stated in standard
Margin (dB) = Result(dBμv/m) - Limit (dBμv/m)
QP = Quasi-peak Reading

Calculation Formula:
Margin(dB) = Result (dBμV/m)–Limit(dBμV/m)
Result(dBμV/m)= Reading(dBμV)+ 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.

11.8.Test Results

Test Lab: 3m Anechoic chamber
Test Engineer: Frank
Pass.

Note: 1.We tested GFSK mode, Π/4-DQPSK & 8DPSK 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.

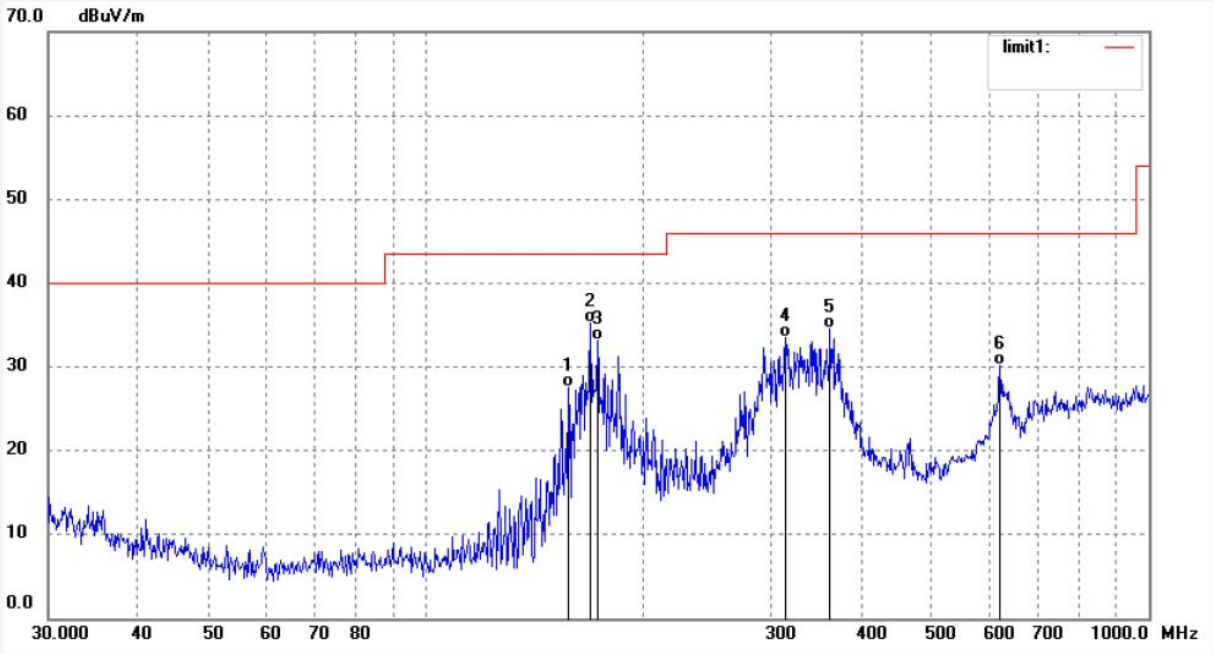
Below 1GHz

ACCURATE TECHNOLOGY CO., LTD.
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.: FRANK2019-BT #474
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2402MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/05/
Time: 17/24/18
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	157.5288	54.87	-27.34	27.53	43.50	-15.97	QP	200	44	
2	168.9970	61.43	-26.11	35.32	43.50	-8.18	QP	200	201	
3	172.5974	59.42	-26.27	33.15	43.50	-10.35	QP	200	221	
4	313.6482	54.33	-20.84	33.49	46.00	-12.51	QP	200	93	
5	362.2479	53.50	-18.88	34.62	46.00	-11.38	QP	200	219	
6	622.2993	43.45	-13.21	30.24	46.00	-15.76	QP	200	103	

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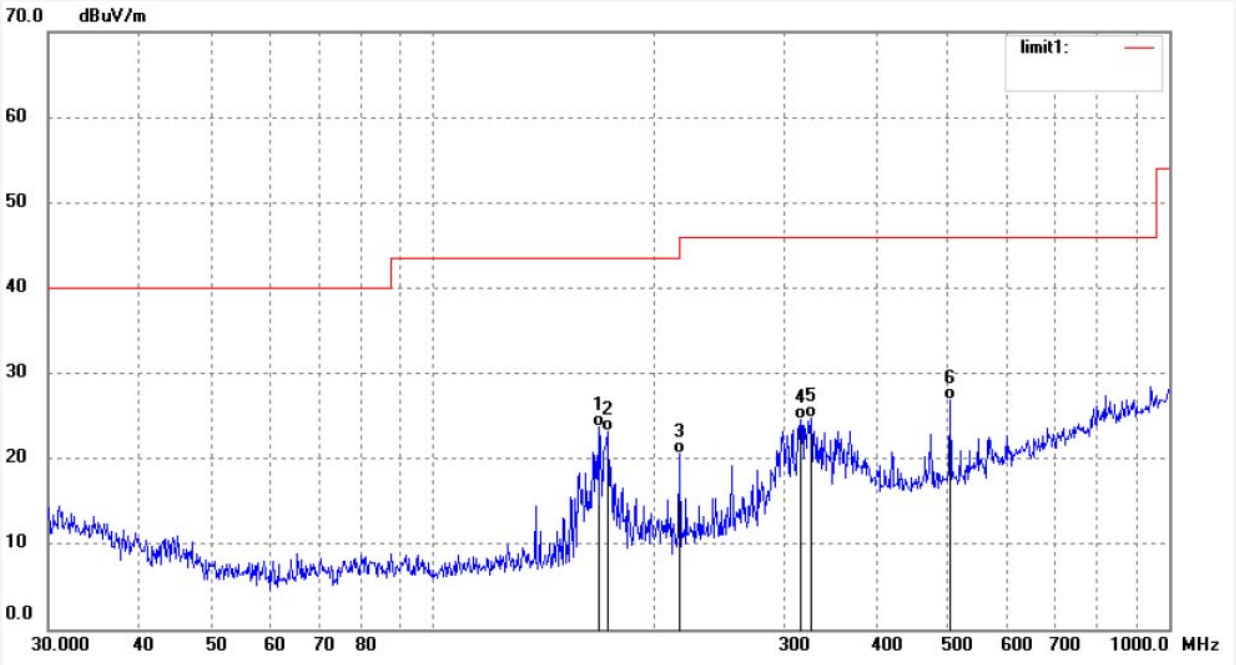
Job No.: FRANK2019-BT #473	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/11/05/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 17/22/40
EUT: Bluetooth Headset	Engineer Signature:
Mode: TX2402MHz	Distance: 3m
Model: KOSS KPH7 Wireless	
Manufacturer: Dongguan Baizhenrong Limited	

Note: Report NO.:ATE20191589



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	168.4043	49.95	-26.17	23.78	43.50	-19.72	QP	100	129	
2	172.5975	49.44	-26.27	23.17	43.50	-20.33	QP	100	52	
3	216.1196	44.66	-24.05	20.61	46.00	-25.39	QP	100	321	
4	315.8599	45.42	-20.76	24.66	46.00	-21.34	QP	100	66	
5	326.0079	45.16	-20.35	24.81	46.00	-21.19	QP	100	119	
6	504.0151	42.99	-16.19	26.80	46.00	-19.20	QP	100	107	

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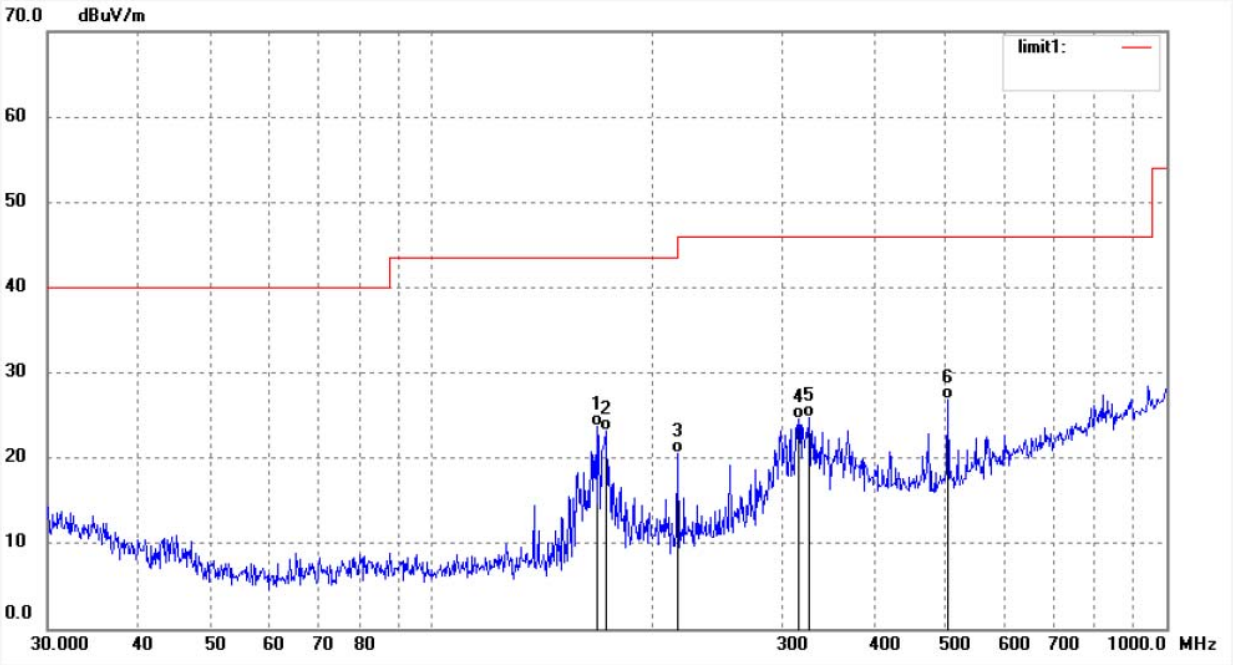
Job No.: FRANK2019-BT #472
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2441MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/05/
Time: 17/20/28
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	168.4043	49.95	-26.17	23.78	43.50	-19.72	QP	100	93	
2	172.5975	49.44	-26.27	23.17	43.50	-20.33	QP	100	215	
3	216.1196	44.66	-24.05	20.61	46.00	-25.39	QP	100	116	
4	315.8599	45.42	-20.76	24.66	46.00	-21.34	QP	100	52	
5	326.0079	45.16	-20.35	24.81	46.00	-21.19	QP	100	331	
6	504.0151	42.99	-16.19	26.80	46.00	-19.20	QP	100	109	

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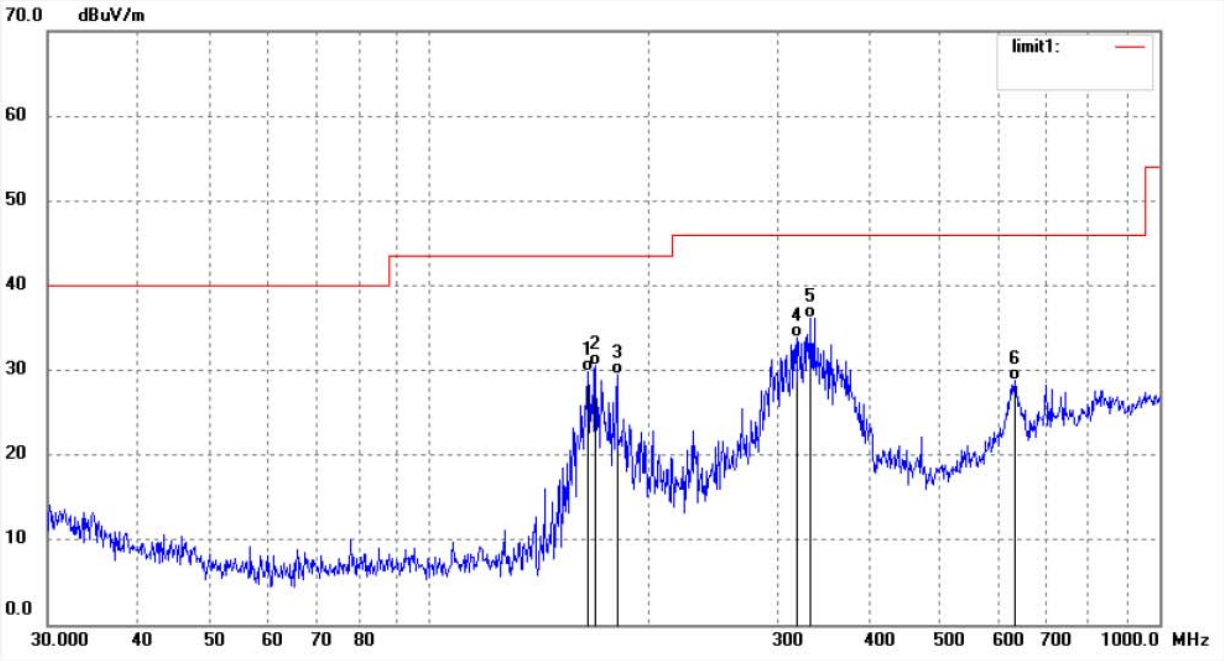
Job No.: FRANK2019-BT #471
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2441MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/05/
Time: 17/18/43
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	164.8911	56.44	-26.55	29.89	43.50	-13.61	QP	200	211	
2	168.9970	56.61	-26.11	30.50	43.50	-13.00	QP	200	322	
3	180.6640	55.48	-25.97	29.51	43.50	-13.99	QP	200	249	
4	319.2071	54.49	-20.65	33.84	46.00	-12.16	QP	200	351	
5	332.9534	56.15	-19.99	36.16	46.00	-9.84	QP	200	119	
6	633.3284	41.74	-13.00	28.74	46.00	-17.26	QP	200	102	

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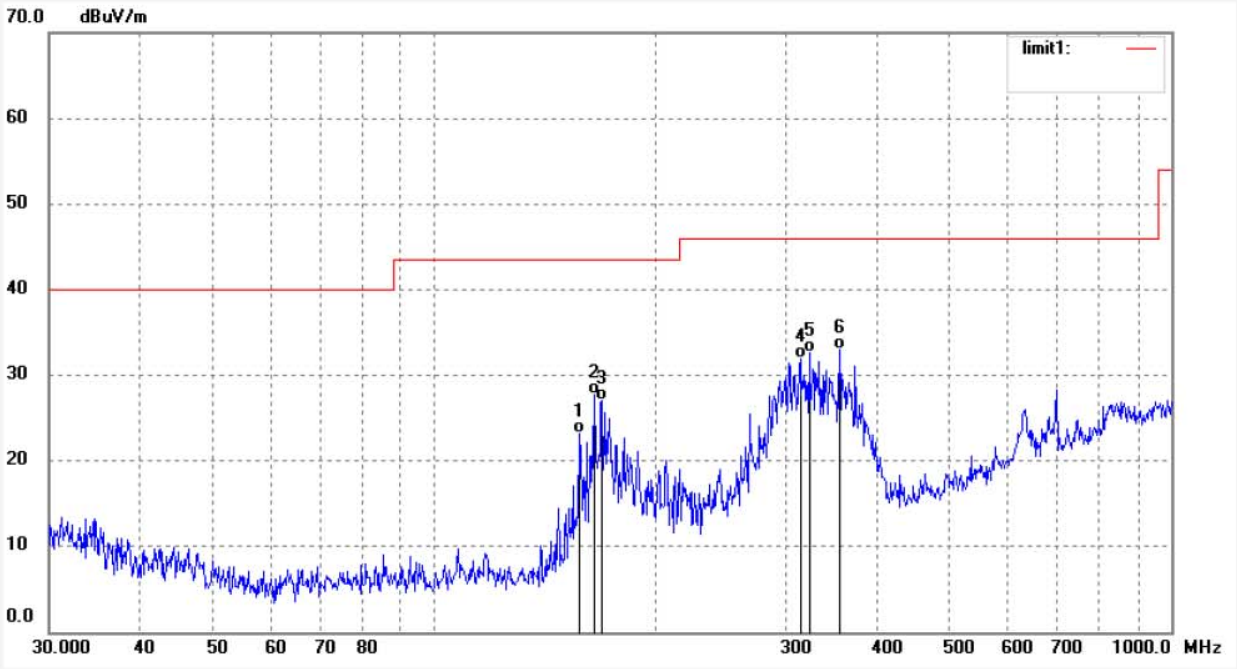
Job No.: FRANK2019-BT #470
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2480MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/05/
Time: 17/16/23
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	157.5288	50.54	-27.34	23.20	43.50	-20.30	QP	200	121	
2	164.8910	54.22	-26.55	27.67	43.50	-15.83	QP	200	93	
3	168.9970	53.07	-26.11	26.96	43.50	-16.54	QP	200	89	
4	313.6482	52.80	-20.84	31.96	46.00	-14.04	QP	200	201	
5	322.5896	53.18	-20.50	32.68	46.00	-13.32	QP	200	332	
6	354.6911	52.09	-19.14	32.95	46.00	-13.05	QP	200	109	

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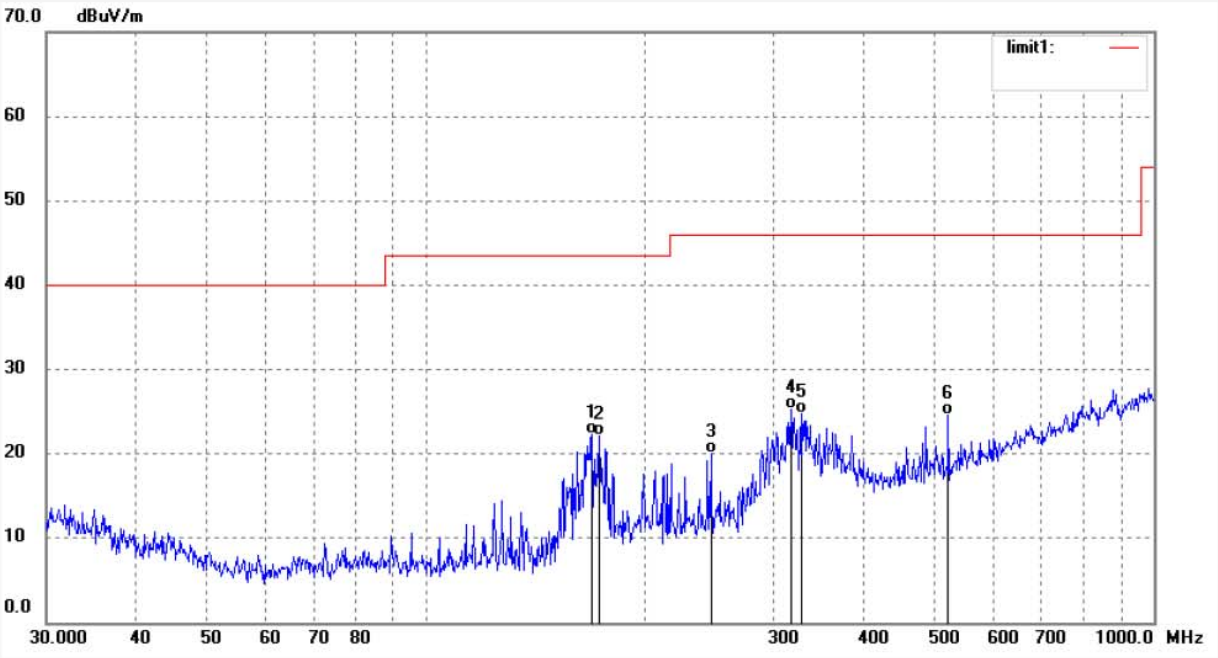
Job No.: FRANK2019-BT #469
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2480MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/05/
Time: 17/14/01
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	168.9970	48.34	-26.11	22.23	43.50	-21.27	QP	100	183	
2	172.5975	48.36	-26.27	22.09	43.50	-21.41	QP	100	243	
3	246.1237	43.63	-23.67	19.96	46.00	-26.04	QP	100	66	
4	316.9717	46.11	-20.74	25.37	46.00	-20.63	QP	100	198	
5	327.1553	45.02	-20.31	24.71	46.00	-21.29	QP	100	323	
6	522.0389	40.27	-15.64	24.63	46.00	-21.37	QP	100	103	

Above 1GHz

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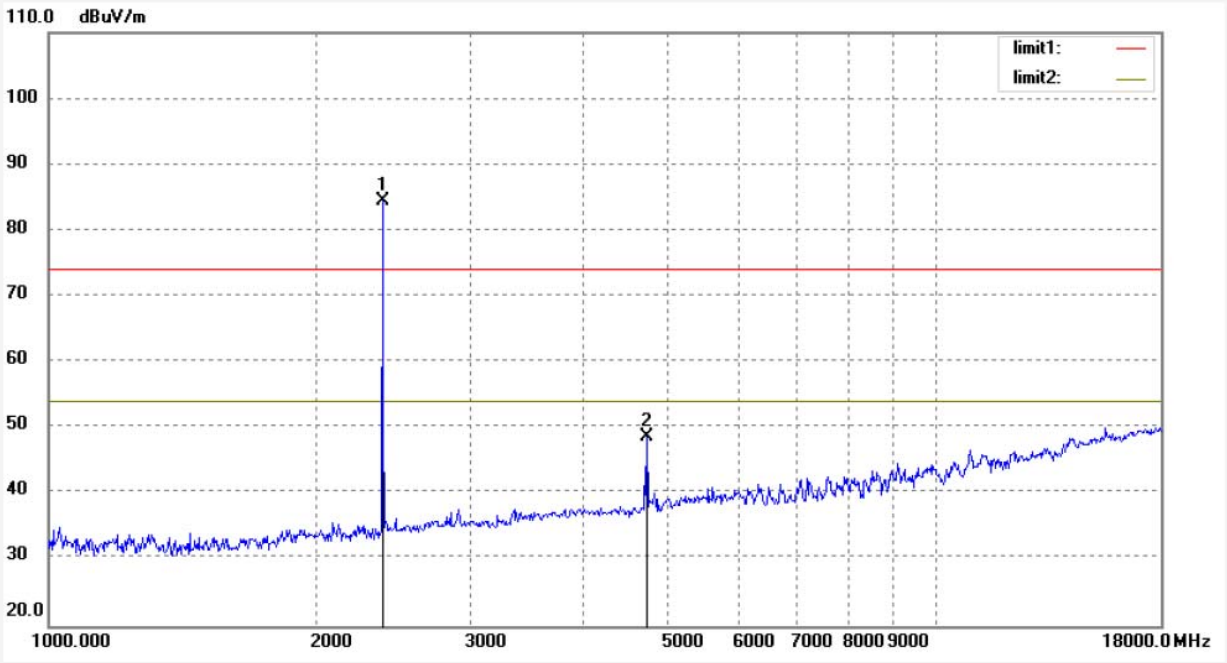
Job No.: FRANK2019-BT #475
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2402MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/08/
Time: 9/39/31
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	90.88	-6.37	84.51			peak	200	93	
2	4804.000	47.99	0.70	48.69	74.00	-25.31	peak	200	106	

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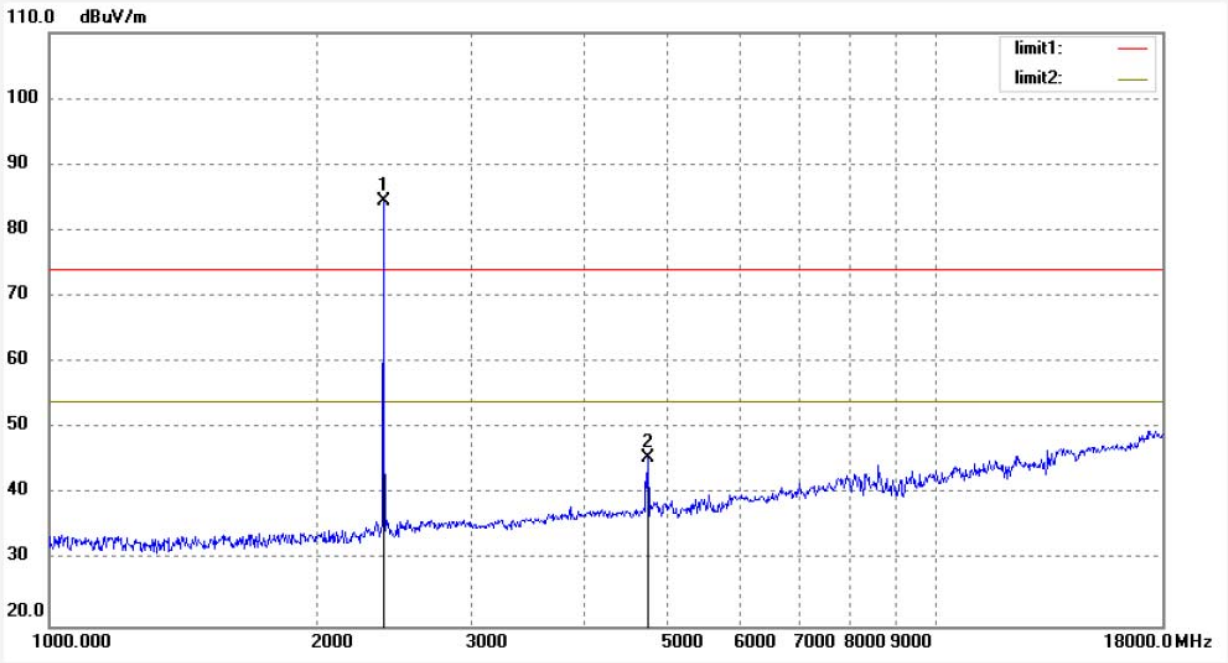
Job No.: FRANK2019-BT #476
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2402MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/08/
Time: 9/41/42
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	90.83	-6.37	84.46			peak	150	221	
2	4804.000	44.89	0.70	45.59	74.00	-28.41	peak	150	198	

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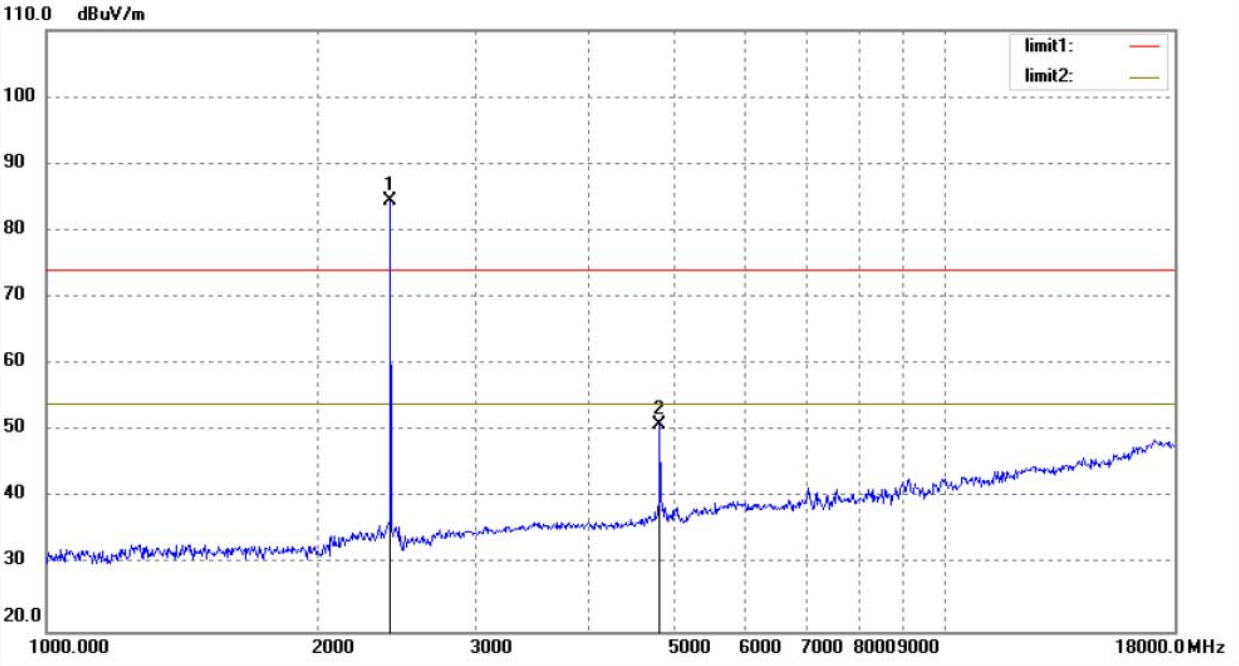
Job No.: FRANK2019-BT #477
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2441MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/08/
Time: 9/43/46
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	90.70	-6.20	84.50			peak	150	96	
2	4882.000	49.92	1.07	50.99	74.00	-23.01	peak	150	108	

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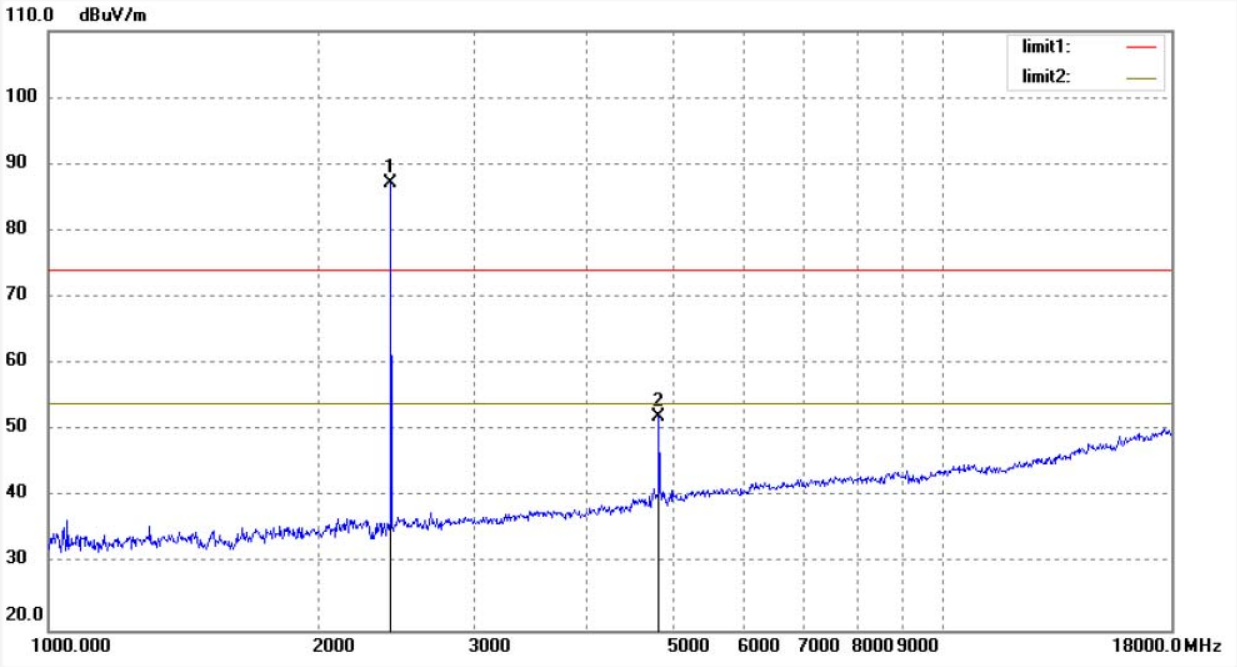
Job No.: FRANK2019-BT #478	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/11/08/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/45/04
EUT: Bluetooth Headset	Engineer Signature:
Mode: TX2441MHz	Distance: 3m
Model: KOSS KPH7 Wireless	
Manufacturer: Dongguan Baizhenrong Limited	

Note: Report NO.:ATE20191589



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	93.42	-6.20	87.22			peak	200	33	
2	4882.000	51.06	1.07	52.13	74.00	-21.87	peak	200	108	

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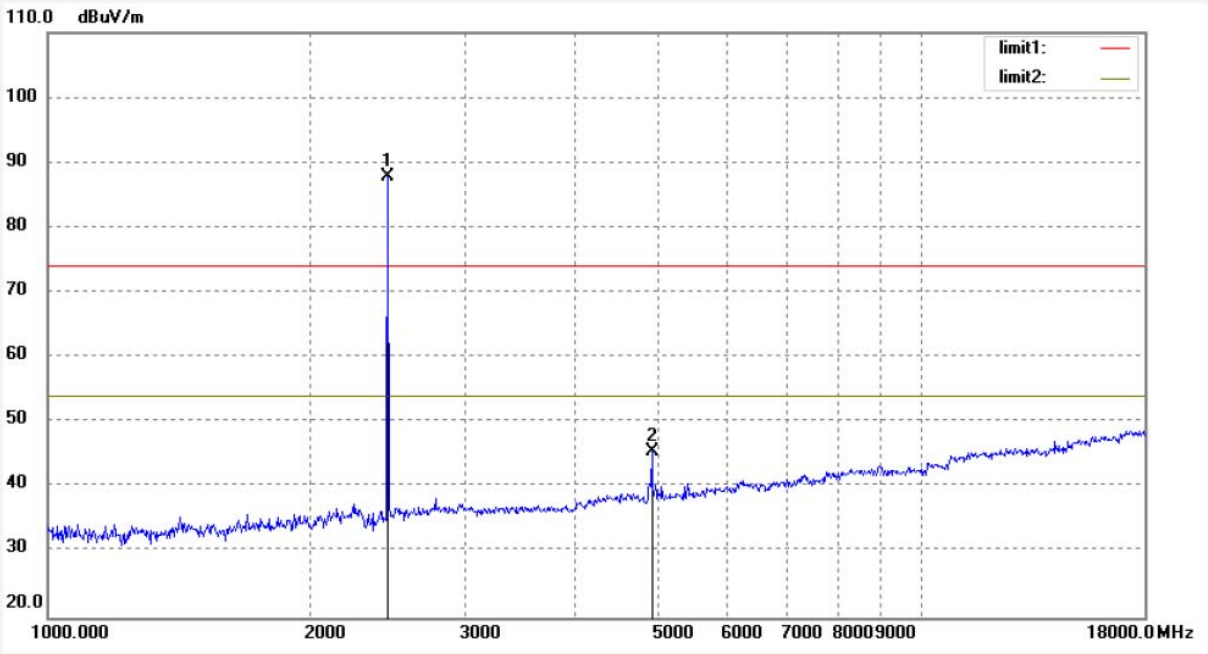
Job No.: FRANK2019-BT #479
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2480MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/08/
Time: 9/47/22
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	93.79	-6.04	87.75			peak	200	63	
2	4960.000	44.08	1.50	45.58	74.00	-28.42	peak	200	175	

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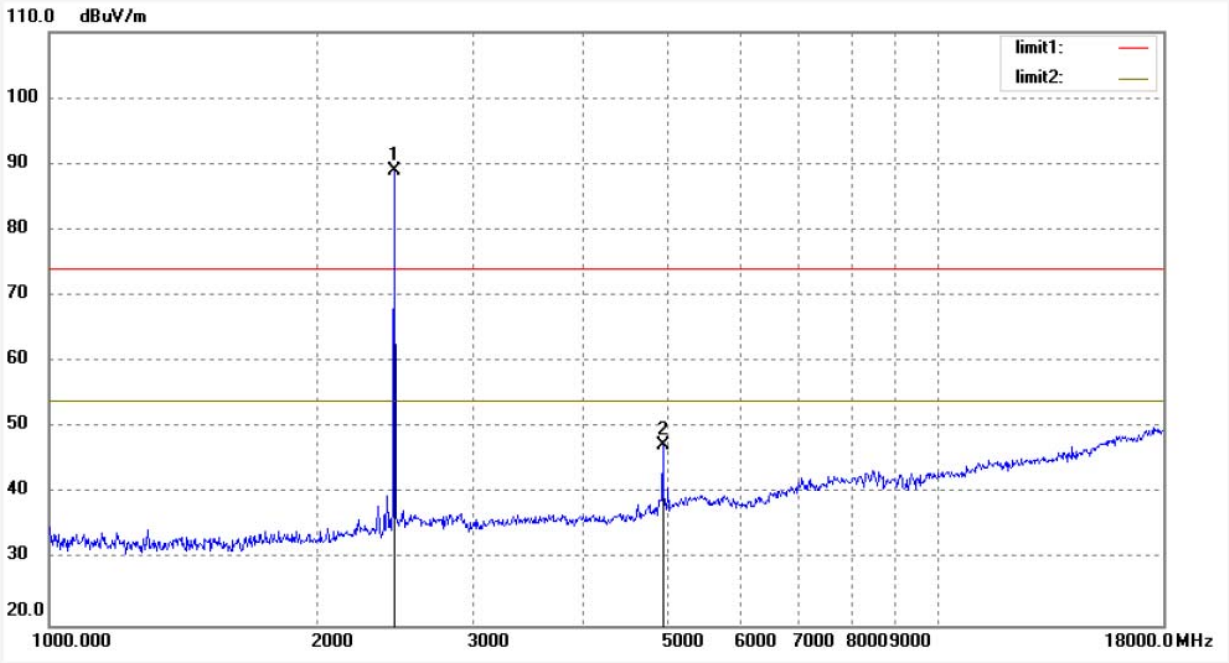
Job No.: FRANK2019-BT #480
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2480MHz
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/08/
Time: 10/00/49
Engineer Signature:
Distance: 3m

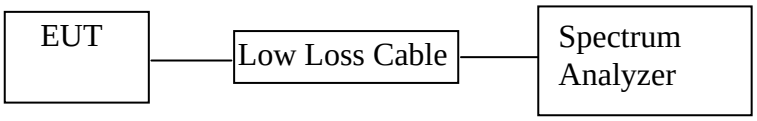
Note: Report NO.:ATE20191589



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	94.90	-6.04	88.86			peak	150	66	
2	4960.000	45.91	1.50	47.41	74.00	-26.59	peak	150	193	

12.BAND EDGE COMPLIANCE TEST

12.1.Block Diagram of Test Setup



12.2.The Requirement For 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).

12.3.EUT Configuration on Test

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.

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 TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

12.5.Test Procedure

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

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

12.5.3.The band edges was measured and recorded.

12.6.Test Result

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

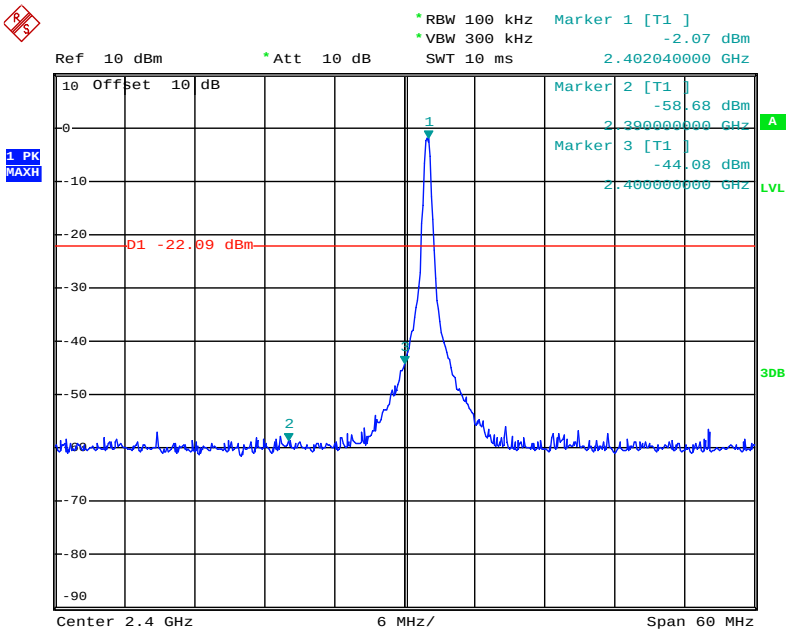
Conducted Band Edge Result

Non-hopping mode

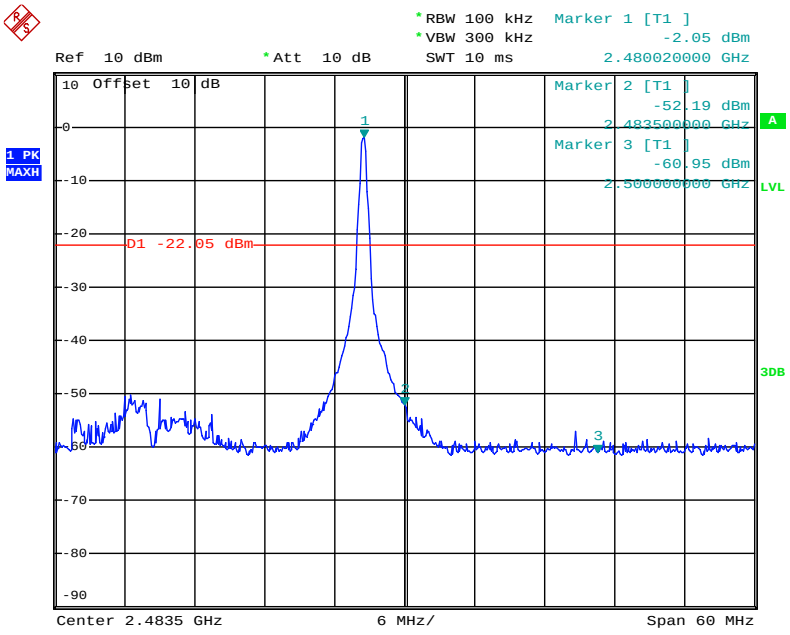
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)	Result
GFSK Mode			
2400.00	46.15	> 20dBc	Pass
2483.50	54.24	> 20dBc	Pass
Π/4-DQPSK Mode			
2400.00	46.94	> 20dBc	Pass
2483.50	55.79	> 20dBc	Pass
8DPSK Mode			
2400.00	45.52	> 20dBc	Pass
2483.50	58.30	> 20dBc	Pass

The spectrum analyzer plots are attached as below.

GFSK Mode

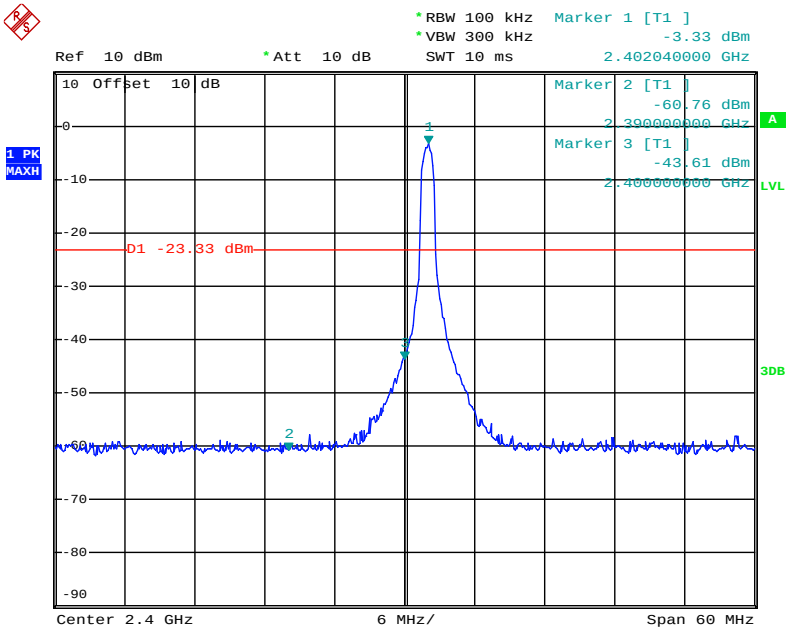


Date: 8.NOV.2019 16:10:38



Date: 8.NOV.2019 16:14:06

Π/4-DQPSK Mode



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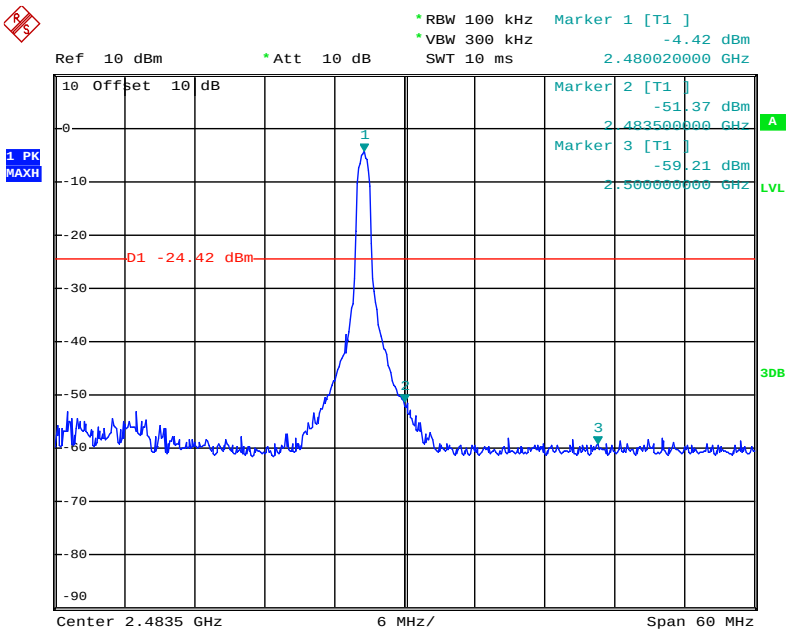
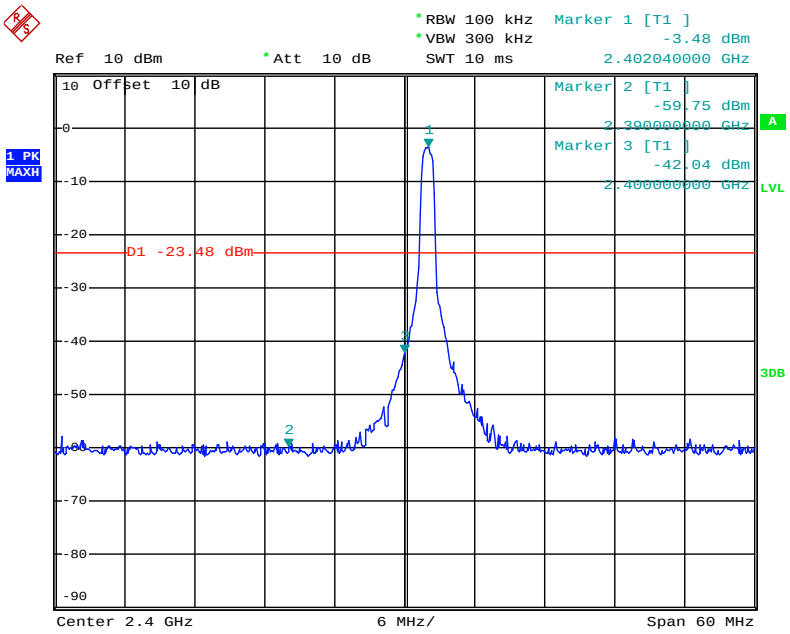
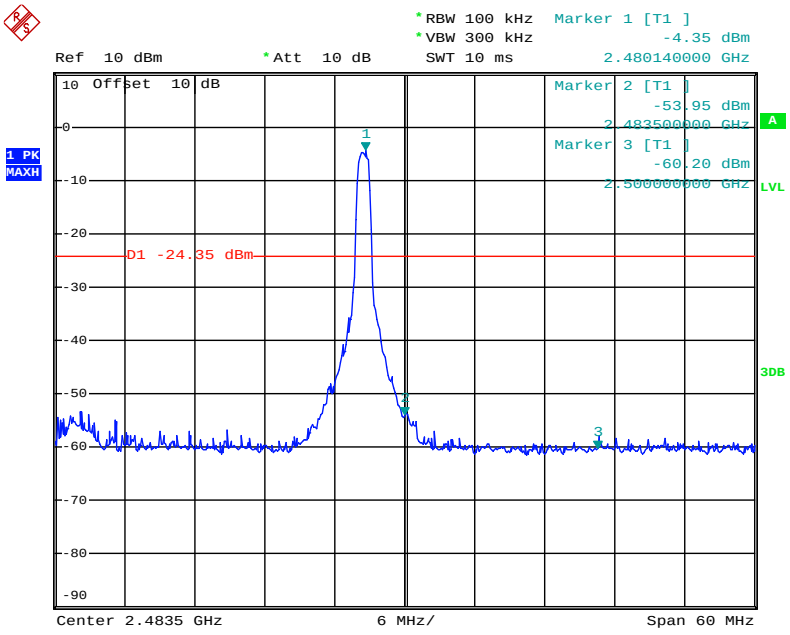


Date: 8.NOV.2019 16:13:07

8DPSK Mode



Date: 8.NOV.2019 16:11:51



Date: 8.NOV.2019 16:12:34

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 0.8 meter high above ground. 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.

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
Test Engineer: Frank

The spectrum analyzer plots are attached as below.

Non-hopping mode

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
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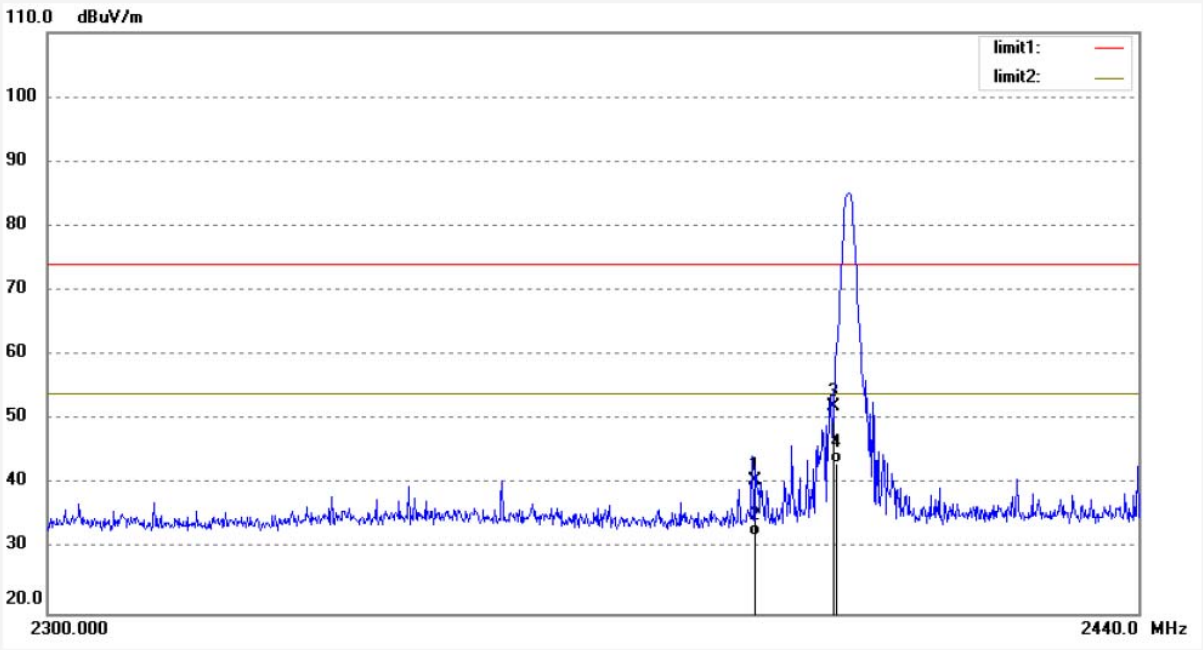
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019-BT #492
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2402MHz(GFSK)
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/08/
Time: 10/26/54
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	47.01	-6.32	40.69	74.00	-33.31	peak	150	92	
2	2390.000	38.45	-6.32	32.13	54.00	-21.87	AVG	150	189	
3	2400.000	58.25	-6.27	51.98	74.00	-22.02	peak	150	100	
4	2400.000	49.46	-6.27	43.19	54.00	-10.81	AVG	150	63	

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

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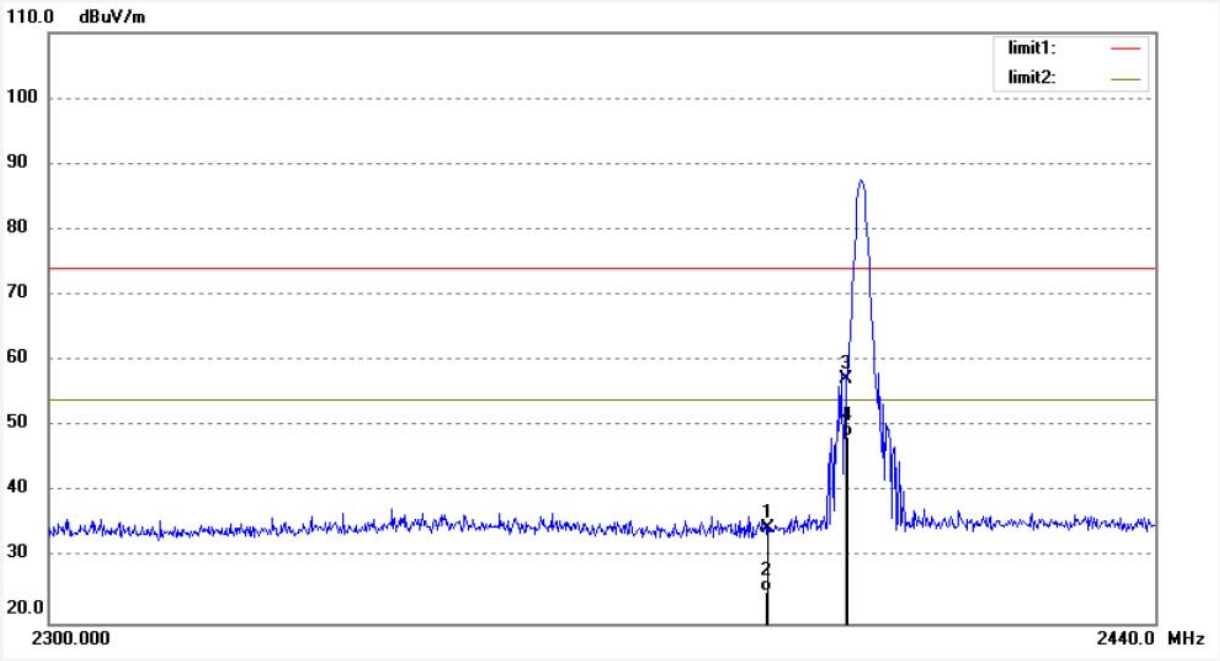
Fax:+86-0755-26503396

Job No.: FRANK2019-BT #491
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2402MHz(GFSK)
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/08/
Time: 10/24/35
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	40.77	-6.32	34.45	74.00	-39.55	peak	200	215	
2	2390.000	31.15	-6.32	24.83	54.00	-29.17	AVG	250	93	
3	2400.000	63.49	-6.27	57.22	74.00	-16.78	peak	200	216	
4	2400.000	54.64	-6.27	48.37	54.00	-5.63	AVG	200	32	

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

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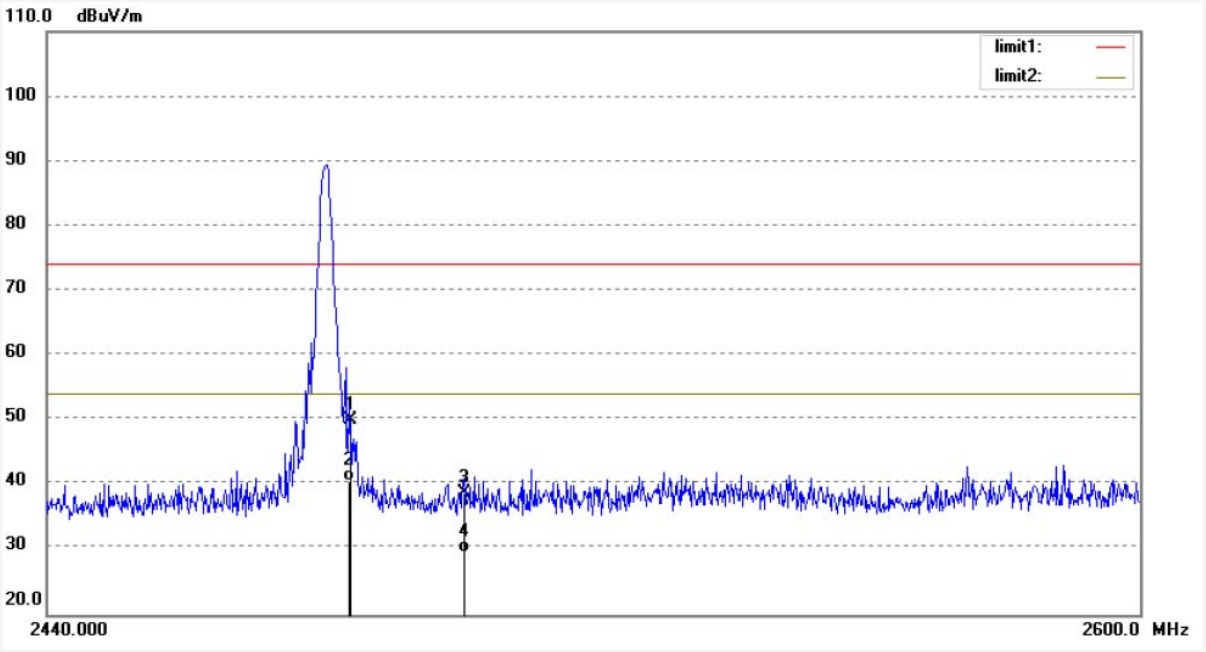
Job No.: FRANK2019-BT #481
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2480MHz(GFSK)
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/08/
Time: 10/04/01
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	55.98	-5.89	50.09	74.00	-23.91	peak	150	221	
2	2483.500	46.46	-5.89	40.57	54.00	-13.43	AVG	150	163	
3	2500.000	44.63	-5.81	38.82	74.00	-35.18	peak	150	52	
4	2500.000	35.46	-5.81	29.65	54.00	-24.35	AVG	150	108	

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

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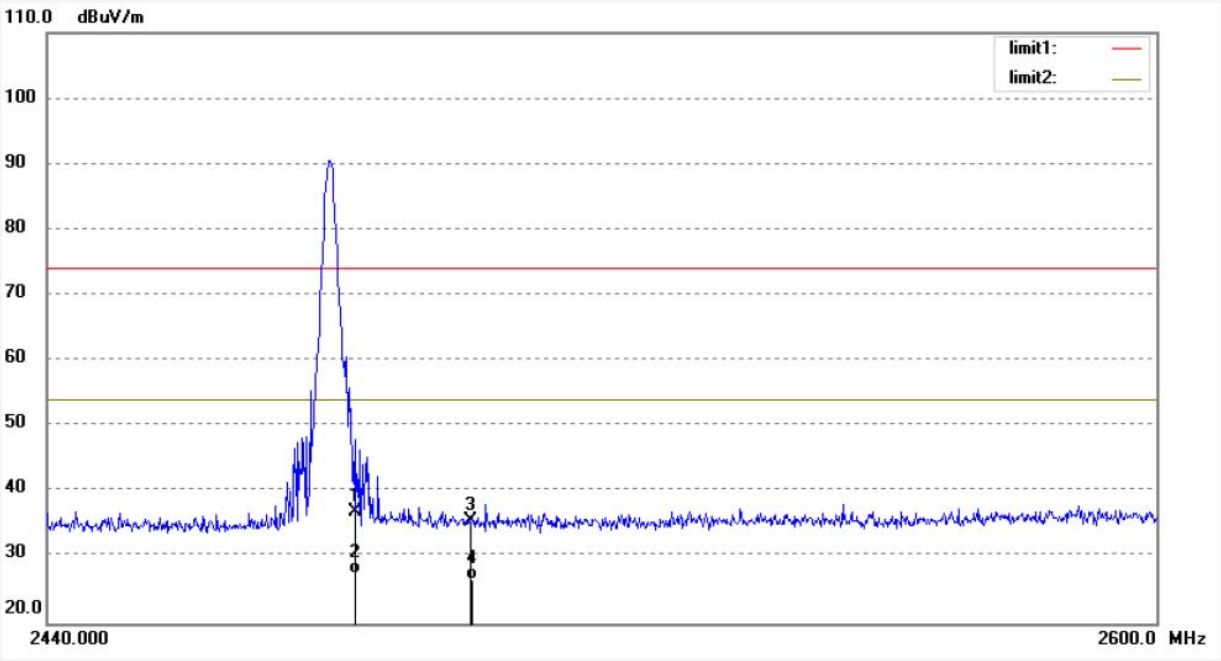
Fax:+86-0755-26503396

Job No.: FRANK2019-BT #482
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: TX2480MHz(GFSK)
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/08/
Time: 10/06/12
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	42.82	-5.89	36.93	74.00	-37.07	peak	200	201	
2	2483.500	33.46	-5.89	27.57	54.00	-26.43	AVG	200	311	
3	2500.000	41.38	-5.81	35.57	74.00	-38.43	peak	200	236	
4	2500.000	32.45	-5.81	26.64	54.00	-27.36	AVG	250	107	

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

Hopping mode

ACCURATE TECHNOLOGY CO., LTD.
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Site: 1# Chamber
Tel:+86-0755-26503290
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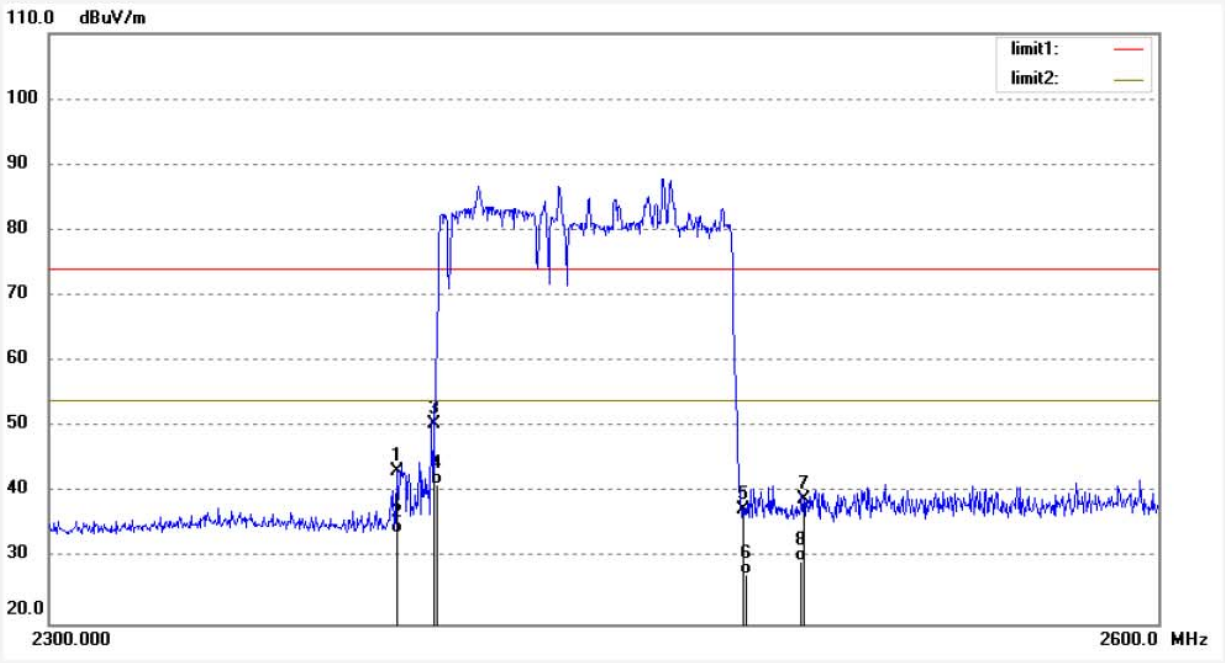
Job No.: FRANK2019-BT #493
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: HOPPING(GFSK)
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/11/08/
Time: 10/28/45
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



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	49.69	-6.32	43.37	74.00	-30.63	peak	150	108	
2	2390.000	40.16	-6.32	33.84	54.00	-20.16	AVG	150	93	
3	2400.000	56.72	-6.27	50.45	74.00	-23.55	peak	150	321	
4	2400.000	47.56	-6.27	41.29	54.00	-12.71	AVG	150	58	
5	2483.500	43.34	-5.89	37.45	74.00	-36.55	peak	150	211	
6	2483.500	33.45	-5.89	27.56	54.00	-26.44	AVG	150	96	
7	2500.000	44.80	-5.81	38.99	74.00	-35.01	peak	150	133	
8	2500.000	35.45	-5.81	29.64	54.00	-24.36	AVG	150	21	

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

ACCURATE TECHNOLOGY CO., LTD.
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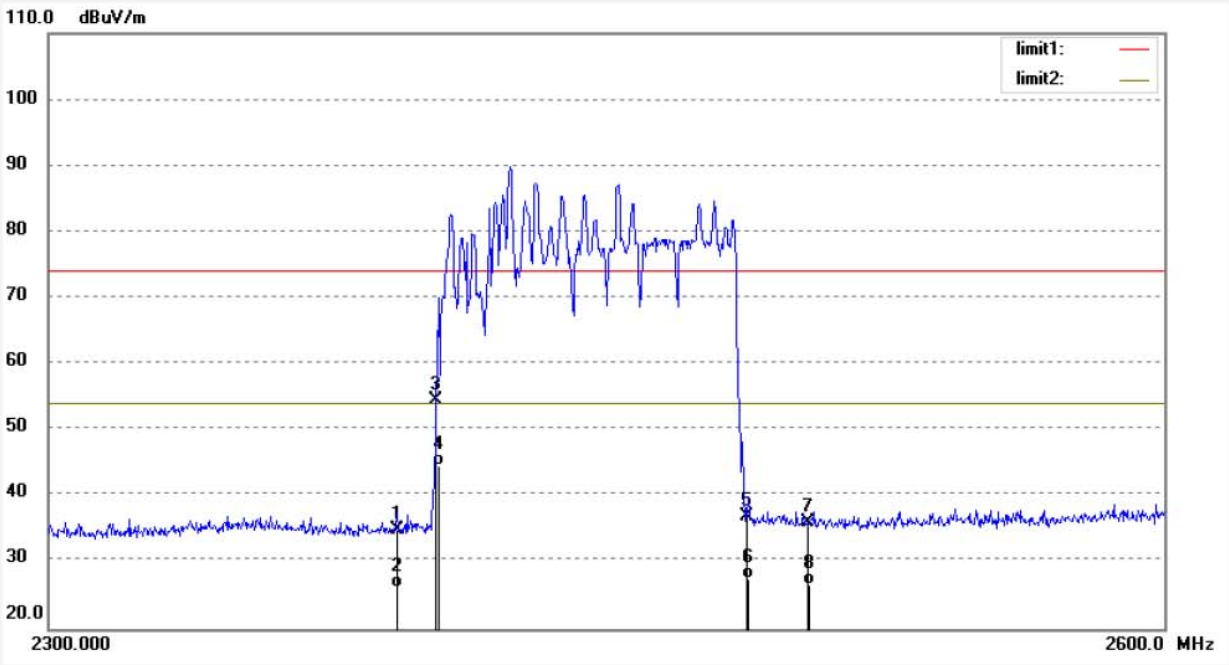
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019-BT #494
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headset
Mode: HOPPING(GFSK)
Model: KOSS KPH7 Wireless
Manufacturer: Dongguan Baizhenrong Limited

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/11/08/
Time: 10/30/42
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20191589



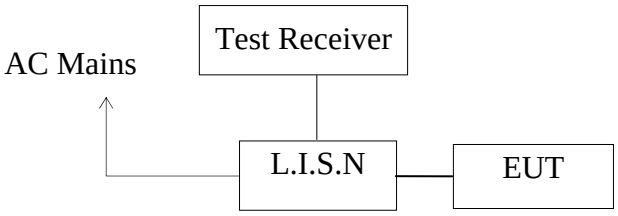
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.24	-6.32	34.92	74.00	-39.08	peak	200	109	
2	2390.000	32.49	-6.32	26.17	54.00	-27.83	AVG	200	33	
3	2400.000	60.85	-6.27	54.58	74.00	-19.42	peak	200	201	
4	2400.000	50.87	-6.27	44.60	54.00	-9.40	AVG	200	219	
5	2483.500	42.79	-5.89	36.90	74.00	-37.10	peak	200	96	
6	2483.500	33.45	-5.89	27.56	54.00	-26.44	AVG	200	31	
7	2500.000	41.81	-5.81	36.00	74.00	-38.00	peak	200	115	
8	2500.000	32.45	-5.81	26.64	54.00	-27.36	AVG	200	103	

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

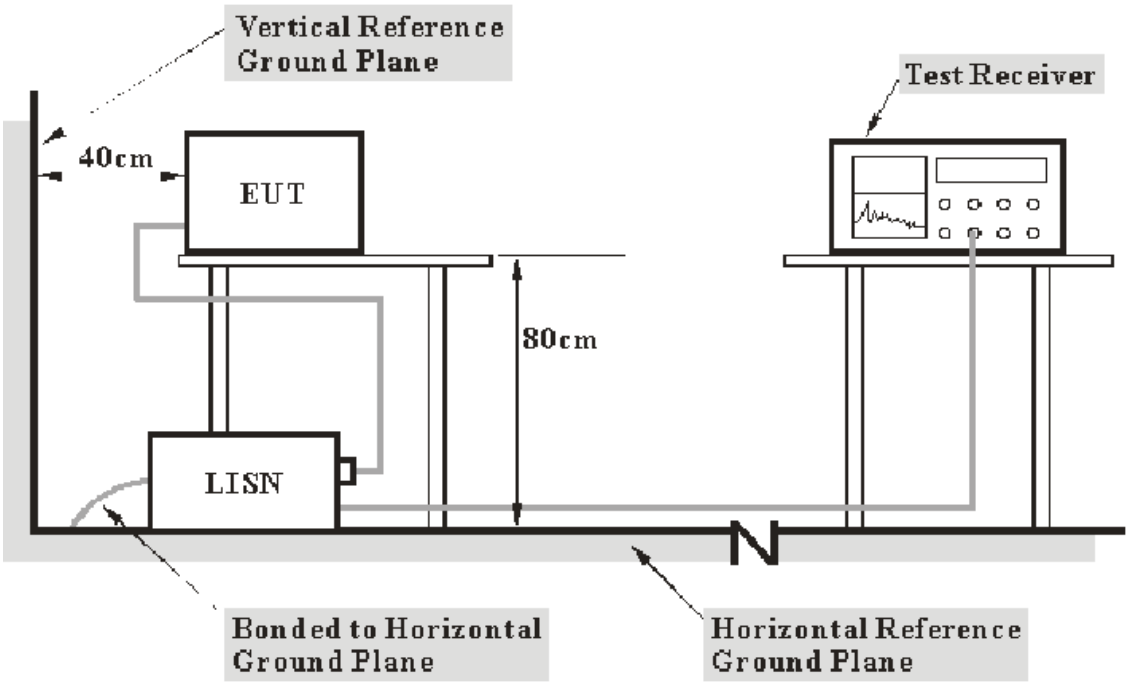
13. AC POWER LINE CONDUCTED EMISSION TEST

13.1. Block Diagram of Test Setup

13.1.1. Block diagram of connection between the EUT and simulators



13.1.2. 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 0.1m from other units and other metal planes support units.

13.2.Power Line Conducted Emission Test Limits

Frequency (MHz)	Conducted Limit dB(μV)	
	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.		

13.3.EUT Configuration on Test

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.

13.4.Operating Condition of EUT

13.4.1.Setup the EUT and simulator as shown as Section 13.1.

13.4.2.Turn on the power of all equipment.

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

13.5.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 (R & S ESCS30) is set at 9kHz.

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

13.6.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	10.5	51.1	34.2	56.0	46.0	4.9	11.8	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)

13.7.Test Results

Pass.
Test Lab: 3m Anechoic chamber
Test Engineer: Frank
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.

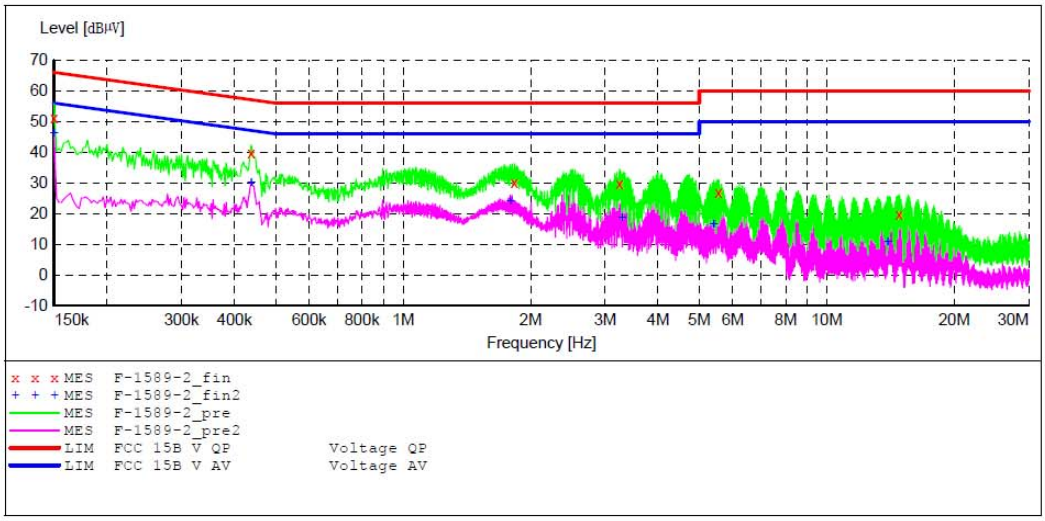
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  Bluetooth Headset  M/N:KOSS KPH7 Wireless
Manufacturer:         Dongguan Baizhenrong Limited
Operating Condition:  BT Communication
Test Site:            2#Shielding Room
Operator:             Frank
Test Specification:   L  120V/60Hz
Comment:              Report NO.:ATE20191589
Start of Test:        2019-11-5 / 16:08:07
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:          _SUB_STD_VTERM2 1.70
  Start      Stop       Step       Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz    QuasiPeak 1.0 s     9 kHz    NSLK8126 2008
                                   Average
```



MEASUREMENT RESULT: "F-1589-2_fin"

2019-11-5 16:09

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	51.40	10.8	66	14.6	QP	L1	GND
0.438000	39.90	11.0	57	17.2	QP	L1	GND
1.830000	30.10	11.2	56	25.9	QP	L1	GND
3.240000	29.80	11.4	56	26.2	QP	L1	GND
5.550000	27.10	11.5	60	32.9	QP	L1	GND
14.830000	19.80	11.6	60	40.2	QP	L1	GND

MEASUREMENT RESULT: "F-1589-2_fin2"

2019-11-5 16:09

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	46.40	10.8	56	9.6	AV	L1	GND
0.438000	30.20	11.0	47	16.9	AV	L1	GND
1.790000	24.20	11.2	46	21.8	AV	L1	GND
3.290000	18.70	11.4	46	27.3	AV	L1	GND
5.405000	16.60	11.5	50	33.4	AV	L1	GND
13.950000	10.70	11.6	50	39.3	AV	L1	GND

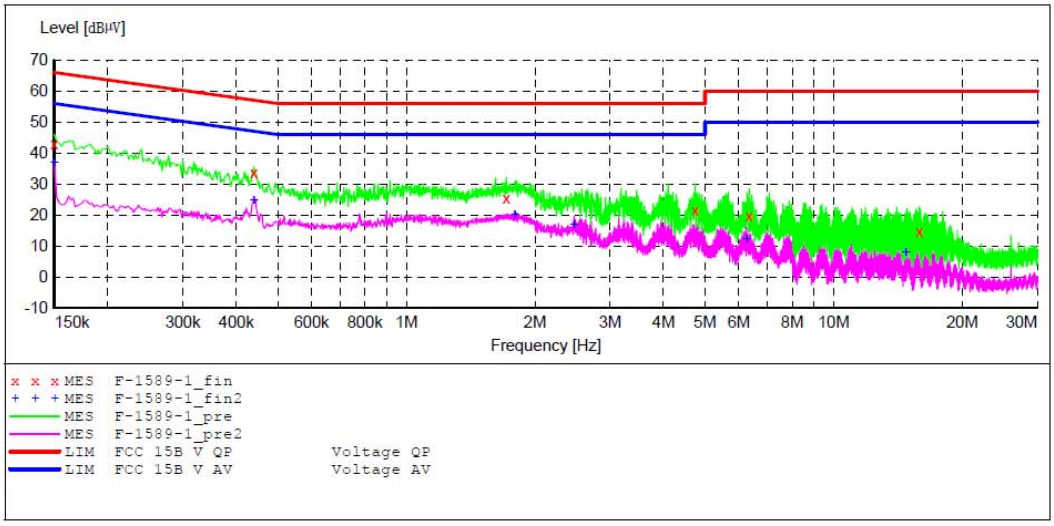
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                 Bluetooth Headset  M/N:KOSS KPH7 Wireless
Manufacturer:        Dongguan Baizhenrong Limited
Operating Condition: BT Communication
Test Site:           2#Shielding Room
Operator:            Frank
Test Specification:  N 120V/60Hz
Comment:             Report NO.:ATE20191589
Start of Test:       2019-11-5 / 16:04:10
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:          _SUB_STD_VTERM2 1.70
  Start      Stop       Step      Detector  Meas.     IF      Transducer
  Frequency  Frequency  Width               Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz   QuasiPeak 1.0 s     9 kHz   NSLK8126 2008
                                  Average
```



MEASUREMENT RESULT: "F-1589-1_fin"

2019-11-5 16:05

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	43.00	10.8	66	23.0	QP	N	GND
0.440000	33.80	11.0	57	23.3	QP	N	GND
1.714000	25.50	11.2	56	30.5	QP	N	GND
4.740000	21.70	11.4	56	34.3	QP	N	GND
6.345000	19.80	11.5	60	40.2	QP	N	GND
15.875000	14.90	11.7	60	45.1	QP	N	GND

MEASUREMENT RESULT: "F-1589-1_fin2"

2019-11-5 16:05

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	37.00	10.8	56	19.0	AV	N	GND
0.440000	24.70	11.0	47	22.4	AV	N	GND
1.794000	20.30	11.2	46	25.7	AV	N	GND
2.470000	16.80	11.3	46	29.2	AV	N	GND
6.255000	12.30	11.5	50	37.7	AV	N	GND
14.775000	8.10	11.6	50	41.9	AV	N	GND

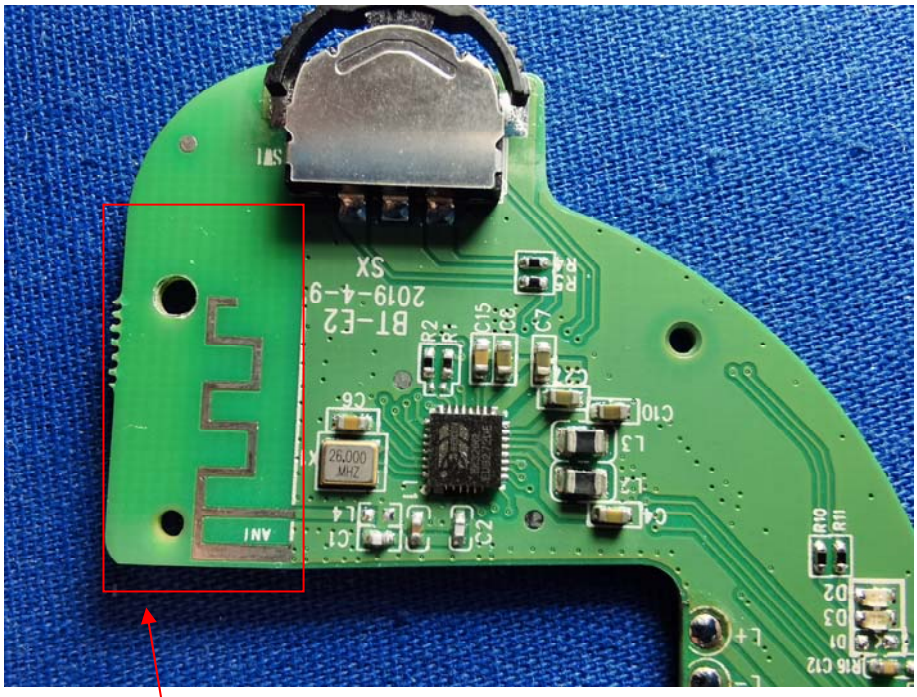
14. ANTENNA REQUIREMENT

14.1. 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.

14.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is 1.2dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

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