

APPLICATION CERTIFICATION

On Behalf of
Specialthing International Co.,Ltd

AM/FM Radio Headset with BT and Aux-in Jack
Model No.: HP-52RBJ, HP-52BJPR, GP-6000, SWX00260

FCC ID: WYQ-BTH5S2

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Test Report Certification

Applicant : Specialthing International Co.,Ltd
Manufacturer : Specialthing International Co.,Ltd
EUT Description : AM/FM Radio Headset with BT and Aux-in Jack
(A) MODEL NO.: HP-52RBJ, HP-52BJPR, GP-6000, SWX00260
(B) POWER SUPPLY: DC 4.5V (Battery)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.4- 2009

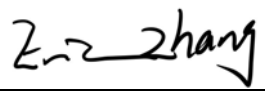
The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY 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 ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Oct 13-23,2014

Date of Report : Oct 24,2014

Prepared by :


(Eric Zhang, Engineer)

Approved & Authorized Signer :


(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	AM/FM Radio Headset with BT and Aux-in Jack
Model Number	:	HP-52RBJ, HP-52BJPR, GP-6000, SWX00260 (Note: These samples are same except for the model number are different. So we prepare the HP-52RBJ for test.)
Frequency Band	:	2402MHz-2480MHz
Number of Channels	:	79
Bluetooth Version	:	2.1+EDR
Modulation type	:	GFSK, $\Pi/4$ -DQPSK, 8DPSK
Antenna Gain	:	0dBi
Antenna type	:	PCB Antenna
Power Supply	:	DC 4.50V (Battery)
Applicant	:	Specialthing International Co.,Ltd
Address	:	Unit 7, 7/F,Block A,Veristrong Ind.Centre,34-36 Au Pui Wan Street,Fotan,Shatin,N.T.,Hong Kong
Manufacturer	:	Specialthing International Co.,Ltd
Address	:	Unit 7, 7/F,Block A,Veristrong Ind.Centre,34-36 Au Pui Wan Street,Fotan,Shatin,N.T.,Hong Kong
Date of sample received	:	Oct 08, 2014
Date of Test	:	Oct 08-14,2014

1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC
The Registration Number is 752051

Listed by Industry Canada
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee
for Laboratories
The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

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

1.3. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2
(Above 1GHz)

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. 11, 2014	Jan. 10, 2015
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 11, 2014	Jan. 10, 2015
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2014	Jan. 10, 2015
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 11, 2014	Jan. 10, 2015
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2014	Jan. 14, 2015
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan. 15, 2014	Jan. 14, 2015
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 11, 2014	Jan. 10, 2015
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 11, 2014	Jan. 10, 2015

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

EUT

(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	n.a.
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 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

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 30 kHz and VBW to 100 kHz.

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

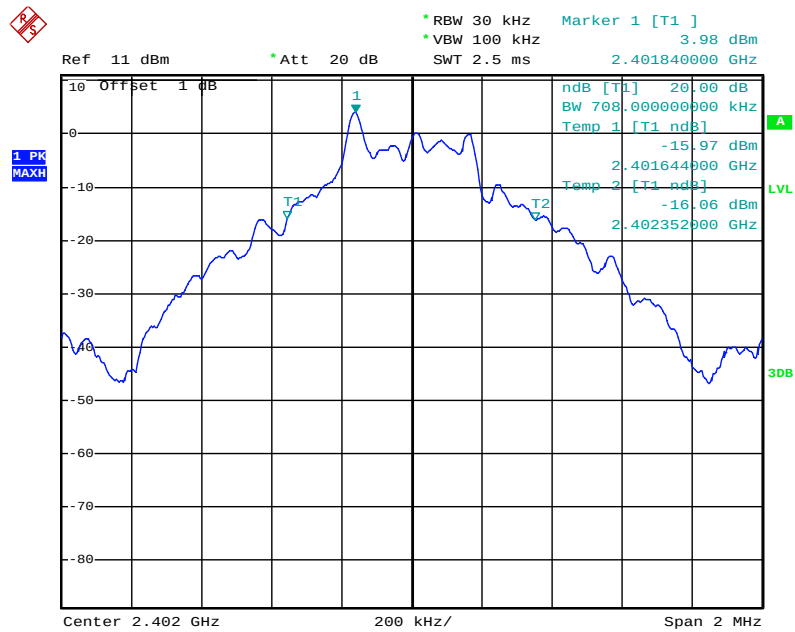
5.6. Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	$\Pi/4$ -DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	0.708	1.116	1.160	Pass
Middle	2441	0.704	1.116	1.164	Pass
High	2480	0.704	1.112	1.164	Pass

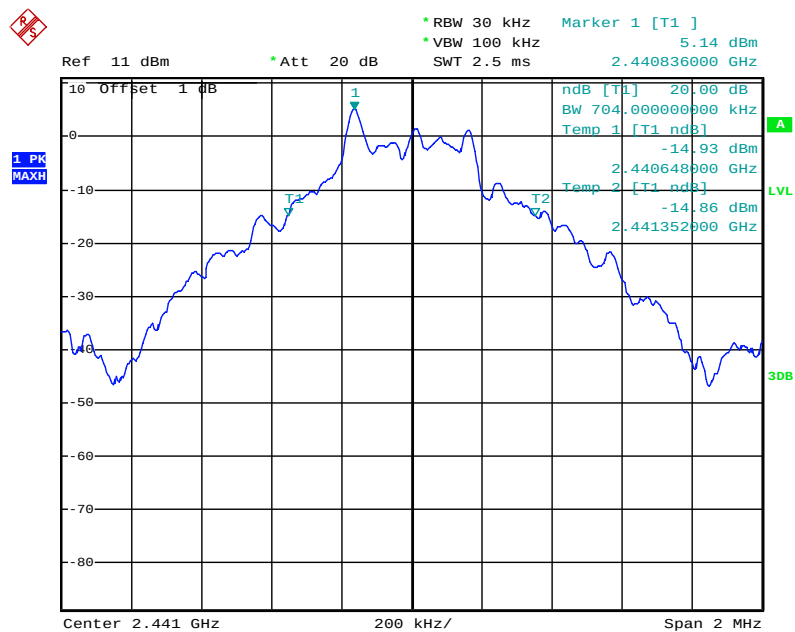
The spectrum analyzer plots are attached as below.

GFSK Mode

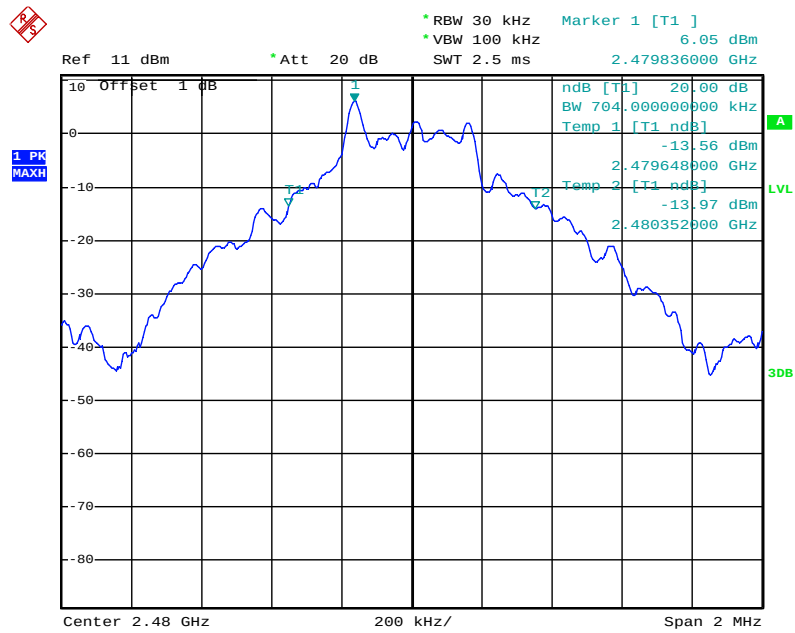
Low channel



Middle channel

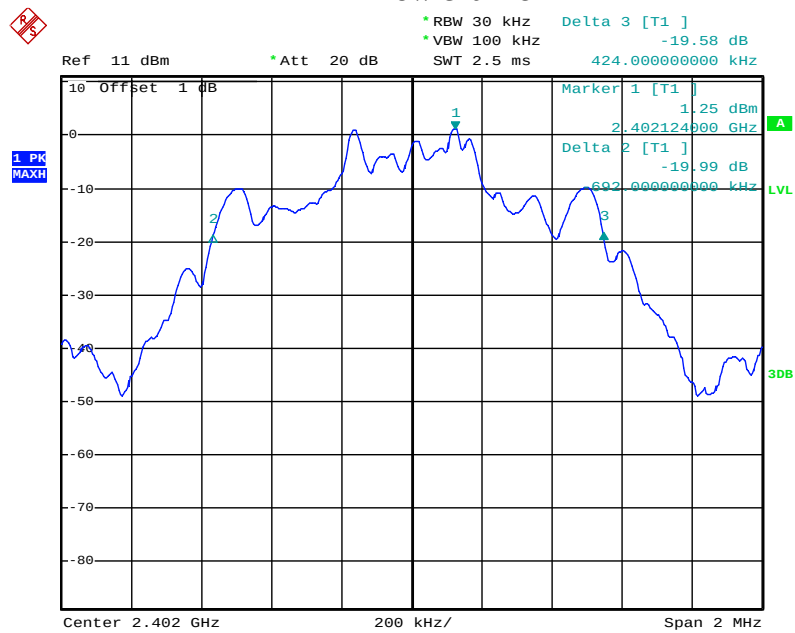


High channel

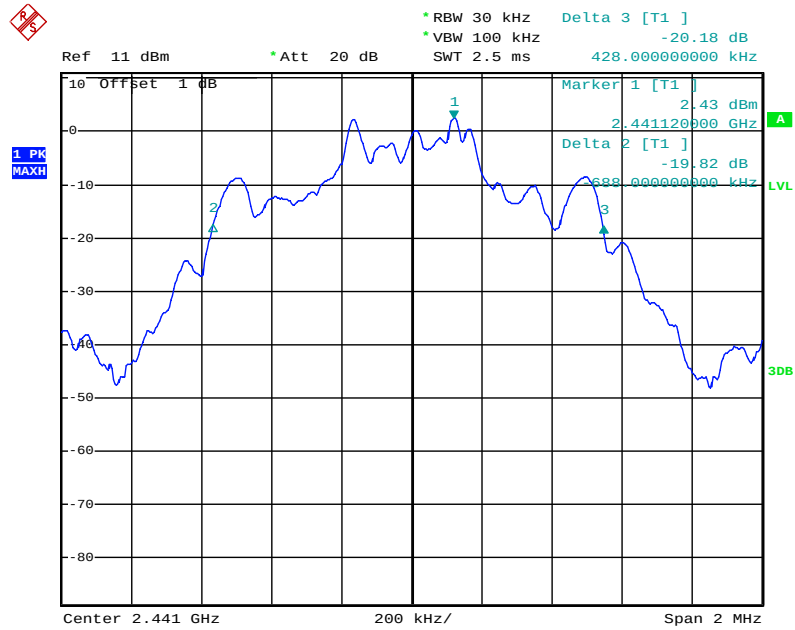


Π/4-DQPSK Mode

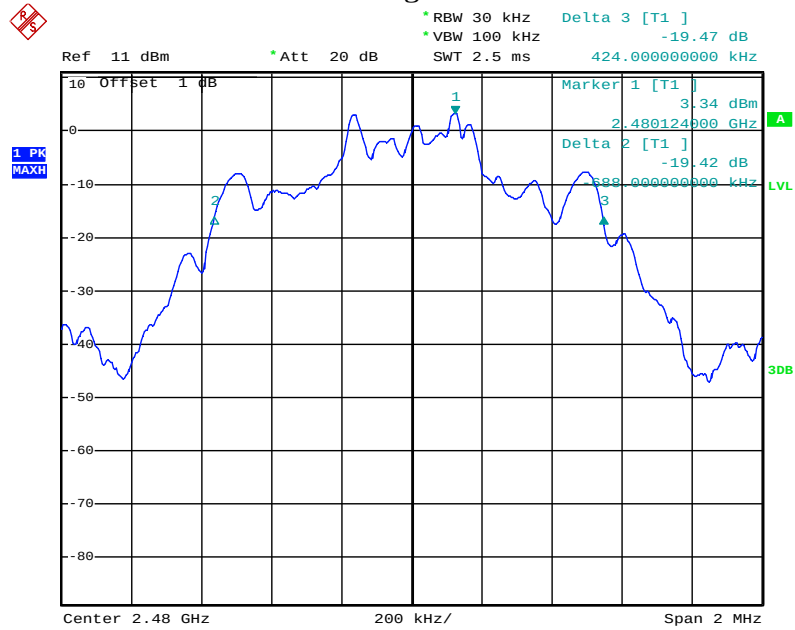
Low channel



Middle channel

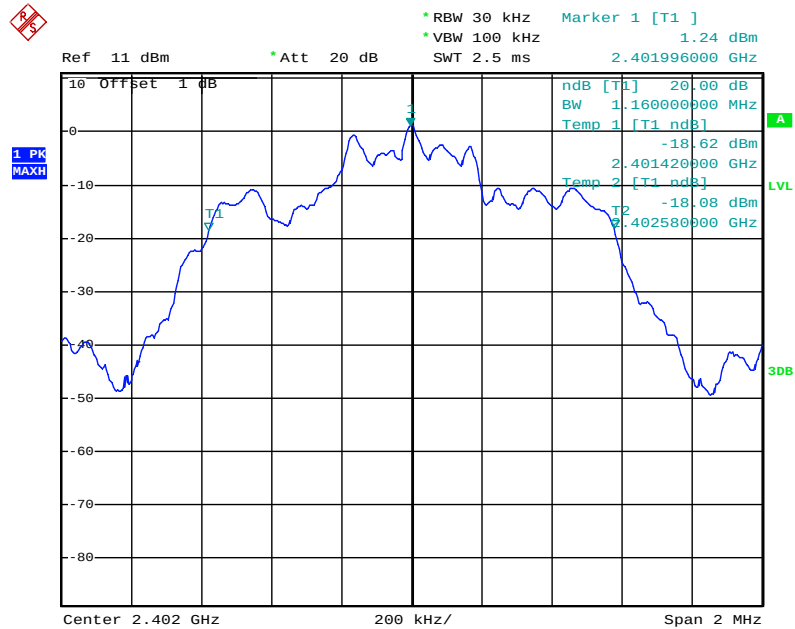


High channel

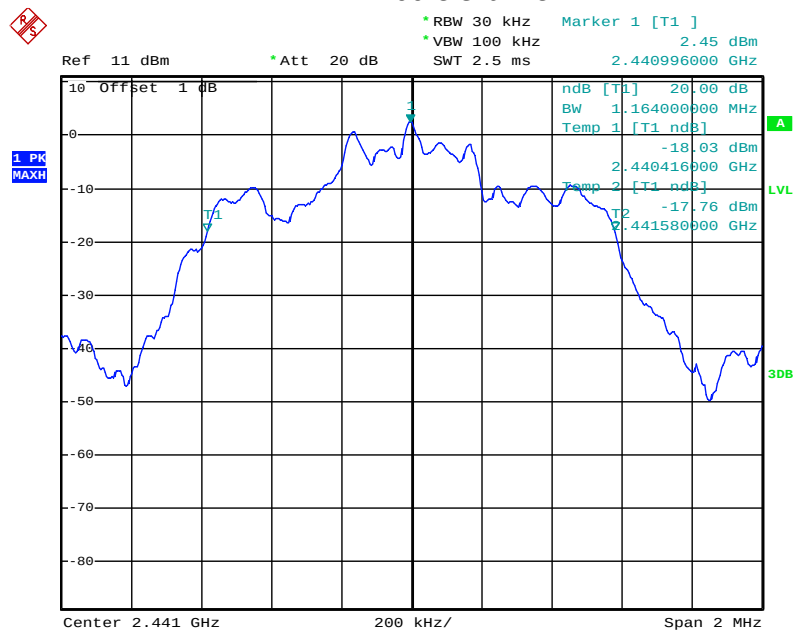


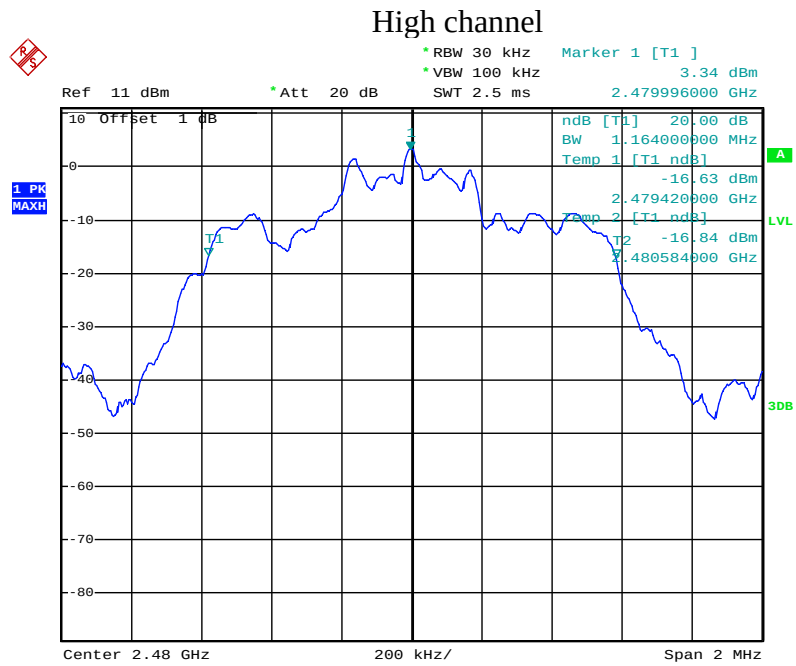
8DPSK Mode

Low channel



Middle channel





6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

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 pseudorandomly 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

GFSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.000	25KHz or 20dB bandwidth	PASS
	2403			
Middle	2440	1.000	25KHz or 20dB bandwidth	PASS
	2441			
High	2479	1.000	25KHz or 20dB bandwidth	PASS
	2480			

II/4-DQPSK

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

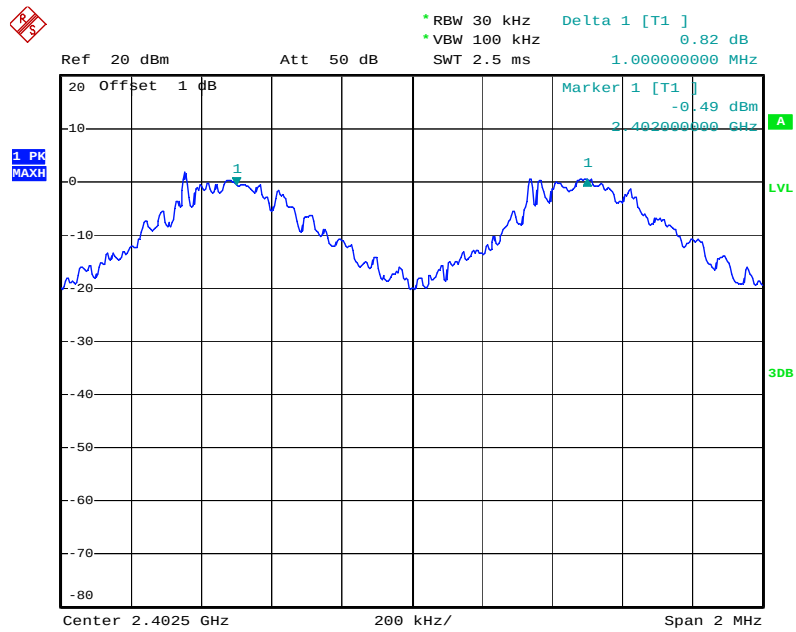
8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.000	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	1.004	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2480			

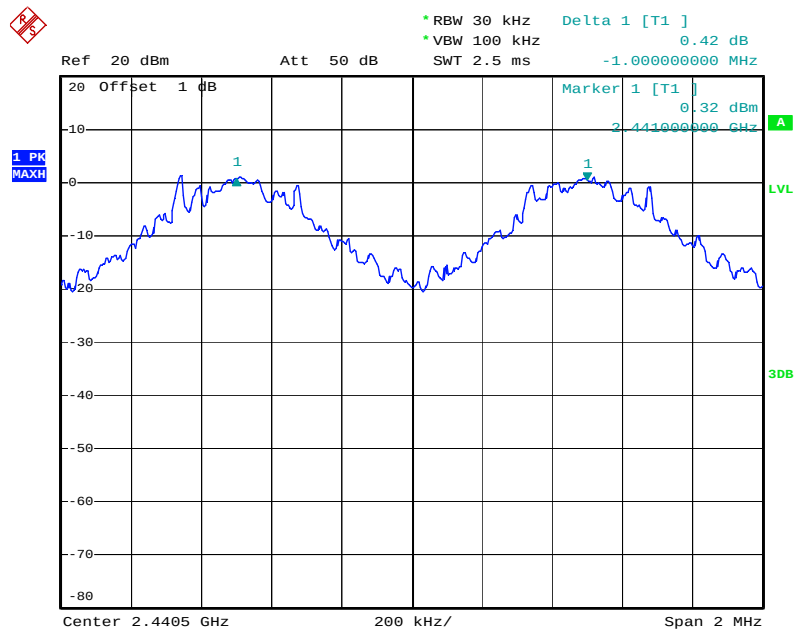
The spectrum analyzer plots are attached as below.

GFSK Mode

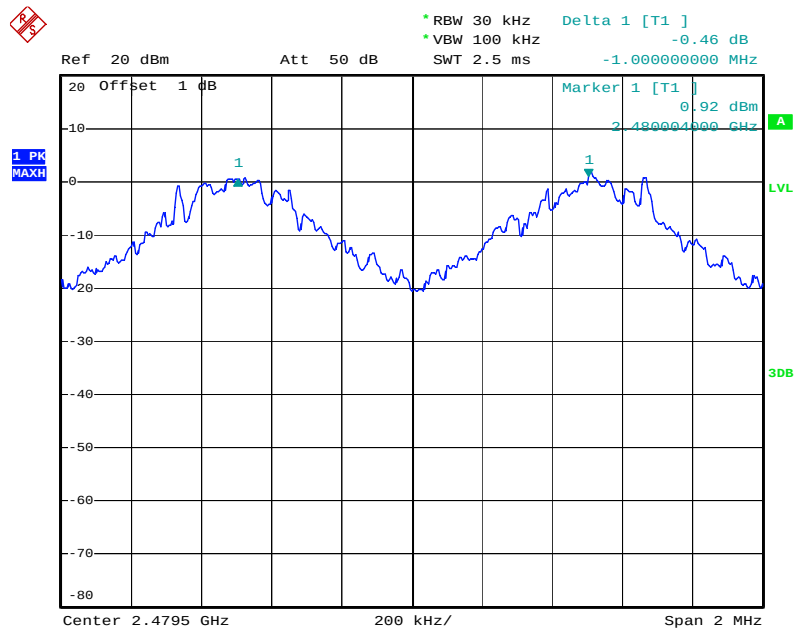
Low channel



Middle channel

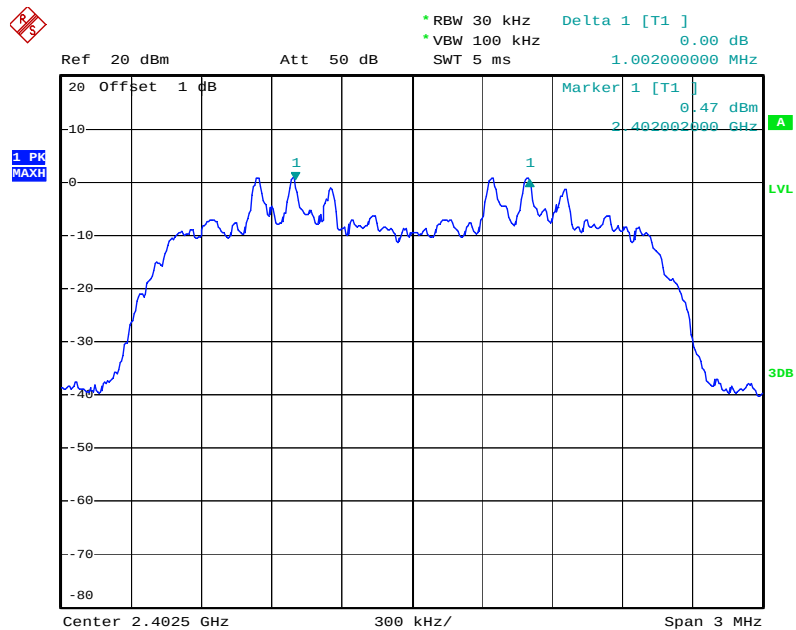


High channel

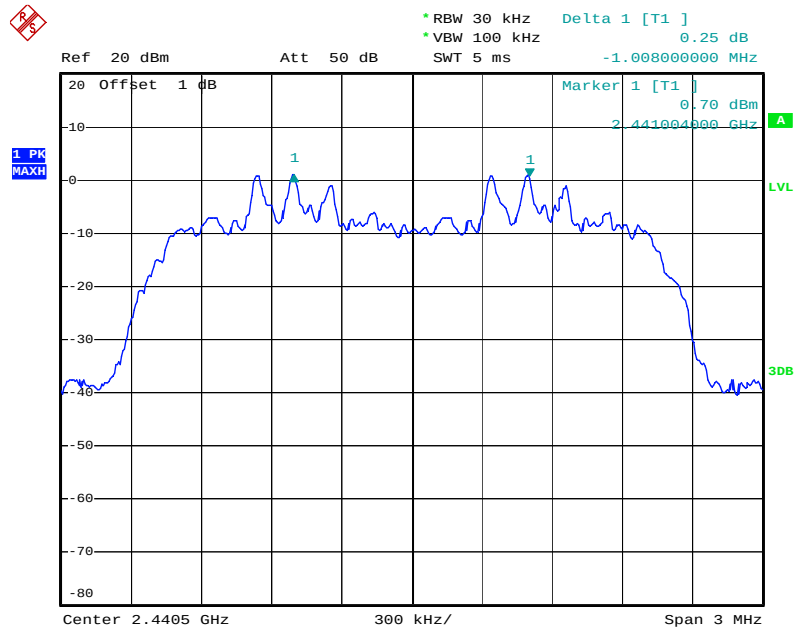


II/4-DQPSK Mode

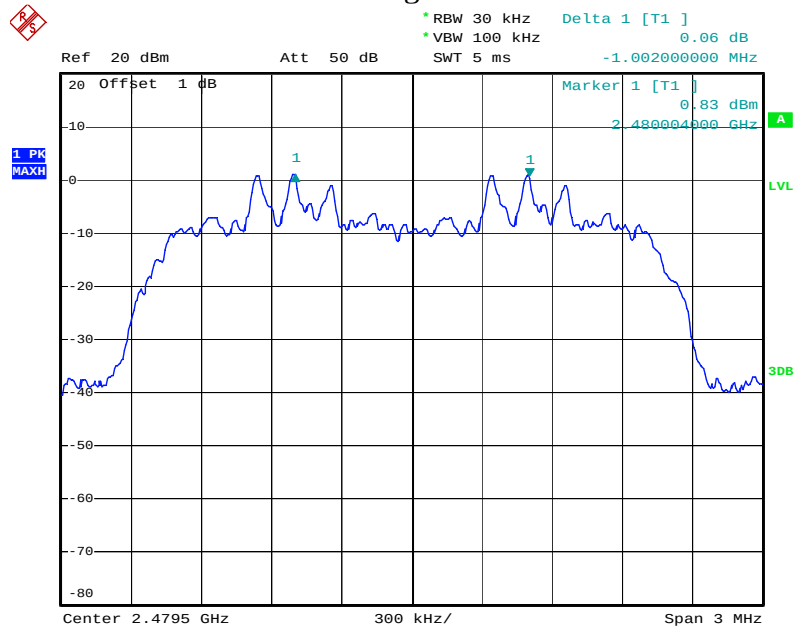
Low channel



Middle channel

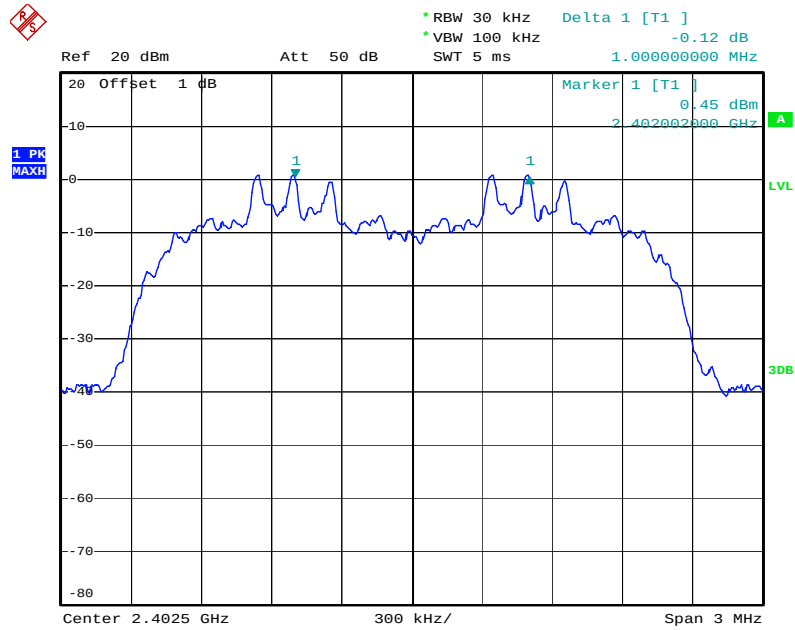


High channel

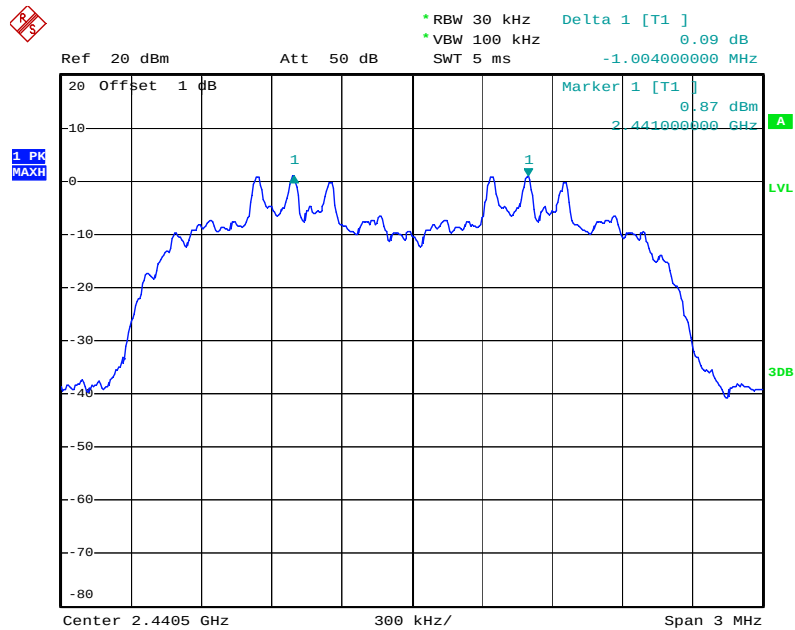


8DPSK Mode

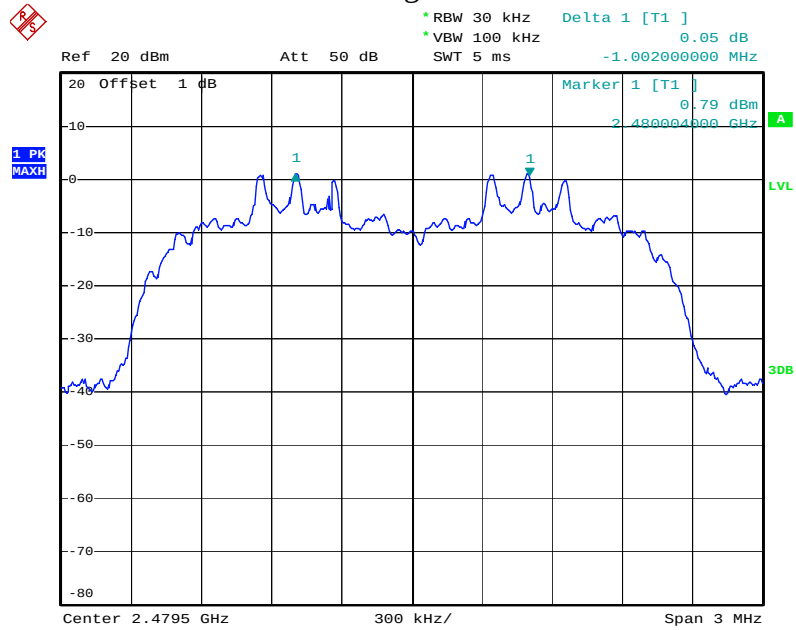
Low channel



Middle channel



High channel



7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

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

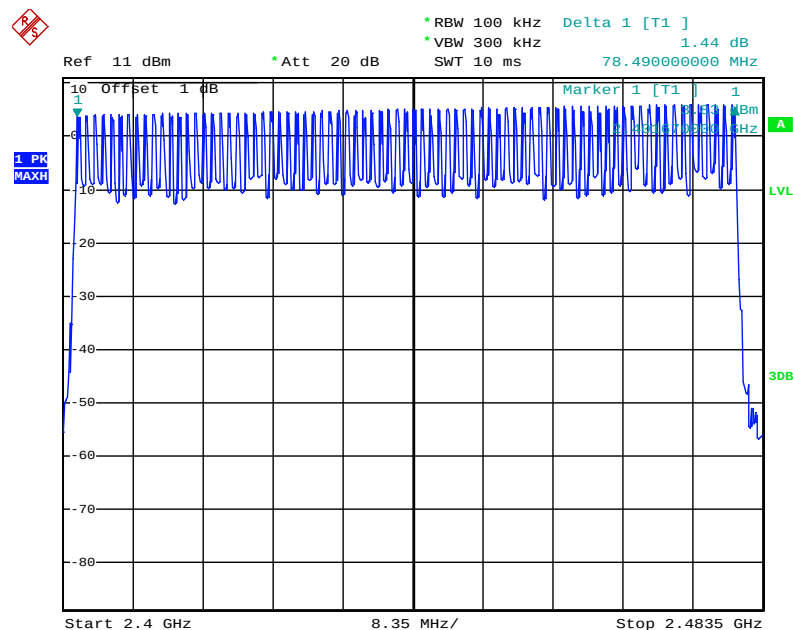
- 7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 7.5.2. Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.
- 7.5.3. Max hold, view and count how many channel in the band.

7.6. Test Result

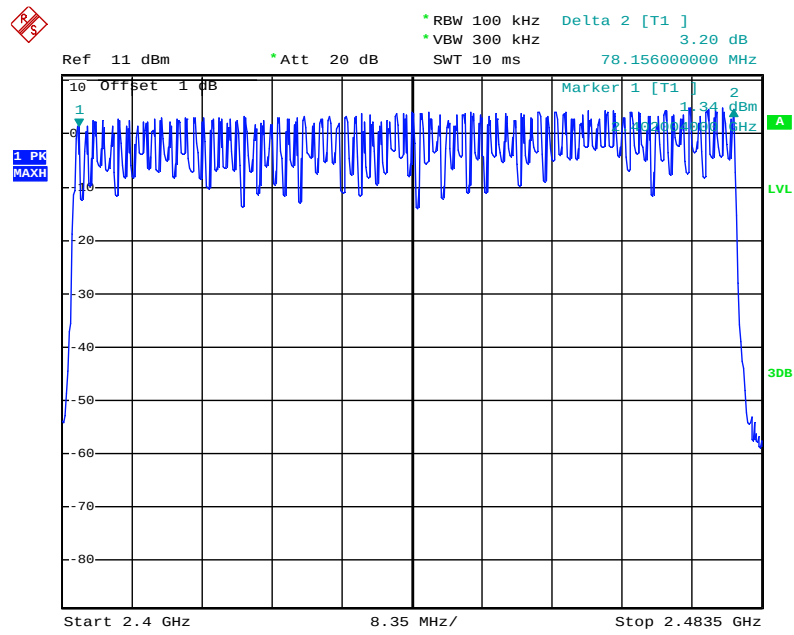
Total number of hopping channel	Measurement result(CH)	Limit(CH)
	79	≥ 15

The spectrum analyzer plots are attached as below.

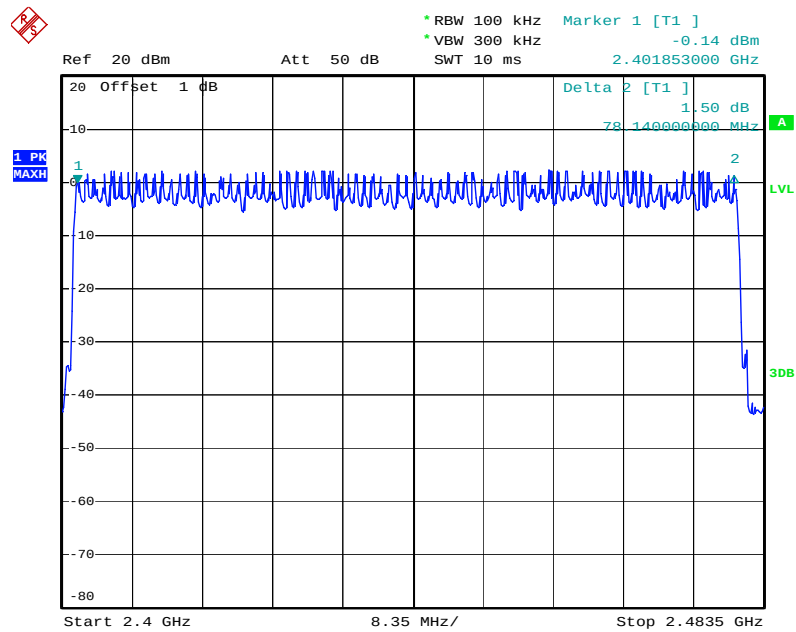
Number of hopping channels(GFSK)



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



Number of hopping channels(8DPSK)



8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

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.

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

8.6. Test Result

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.415	169.60	400
	2441	0.410	169.60	400
	2480	0.415	169.60	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.680	286.40	400
	2441	1.695	288.00	400
	2480	1.680	286.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	2.960	327.47	400
	2441	2.960	327.47	400
	2480	2.960	327.47	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

Π/4-DQPSK

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.415	174.40	400
	2441	0.420	174.40	400
	2480	0.420	174.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.695	210.40	400
	2441	1.695	212.00	400
	2480	1.695	212.00	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	2.960	372.80	400
	2441	2.960	328.00	400
	2480	2.960	328.00	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

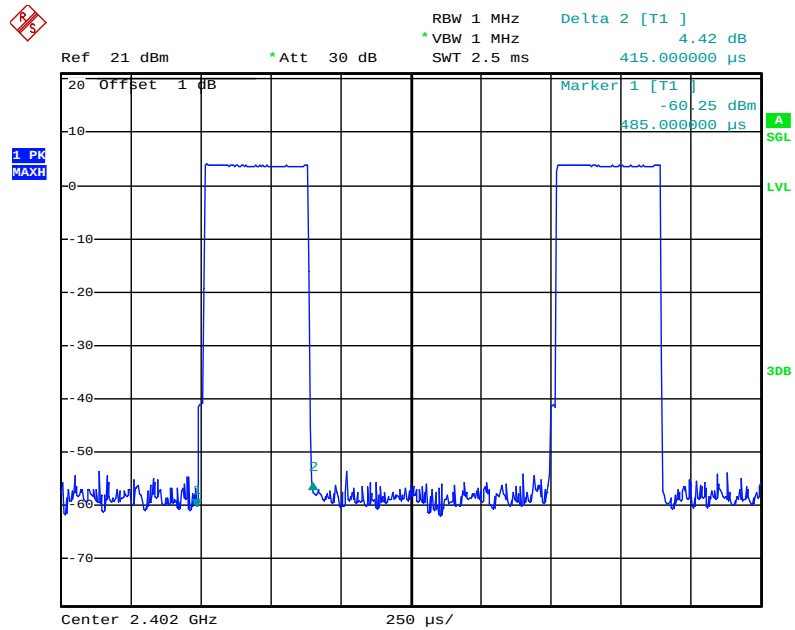
8DPSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.420	172.80	400
	2441	0.420	172.80	400
	2480	0.420	174.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.680	302.40	400
	2441	1.680	290.40	400
	2480	1.695	288.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	2.960	328.00	400
	2441	2.960	330.13	400
	2480	2.960	328.53	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

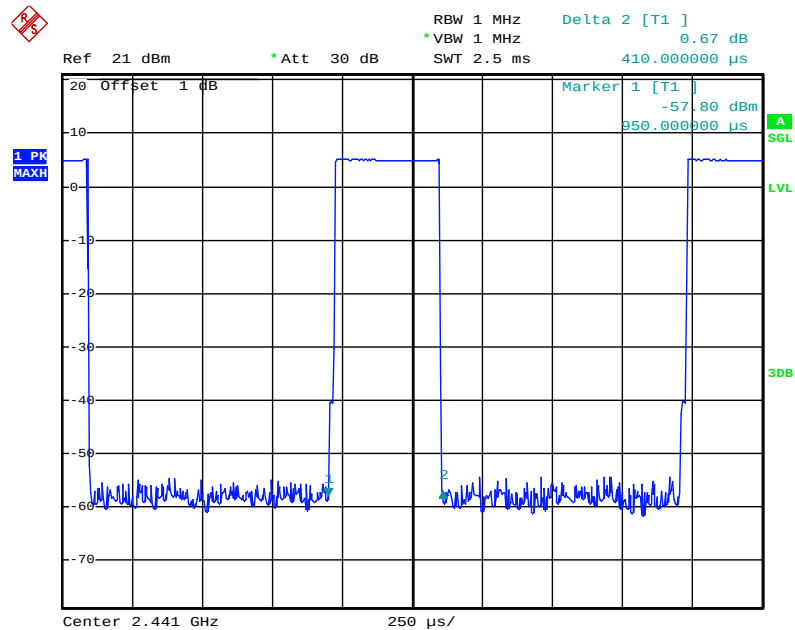
The spectrum analyzer plots are attached as below.

Mode 1: GFSK Link Mode

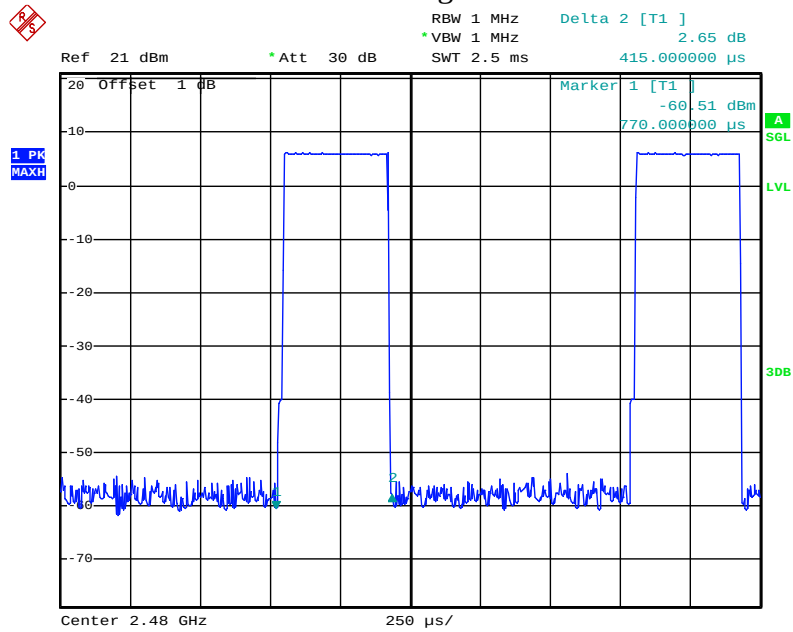
DH1 Low channel



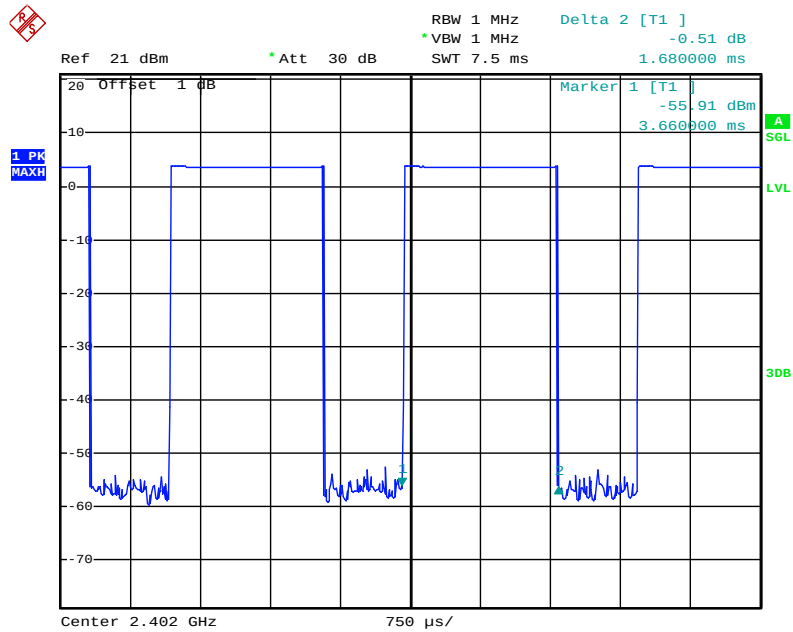
DH1 Middle channel



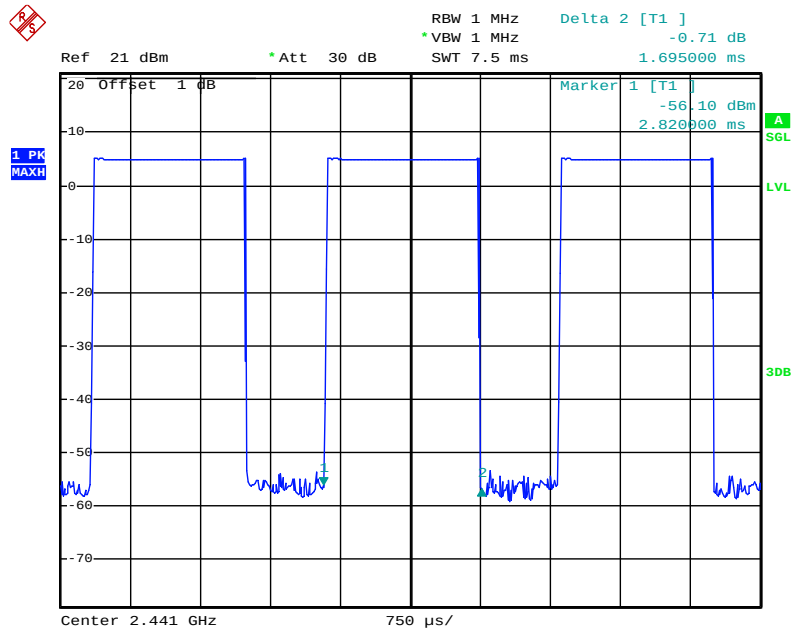
DH1 High channel



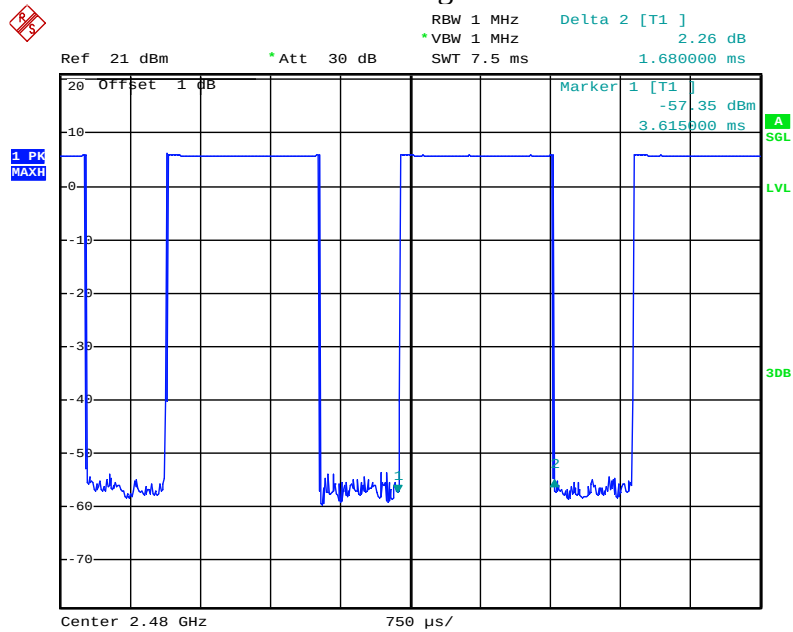
DH3 Low channel



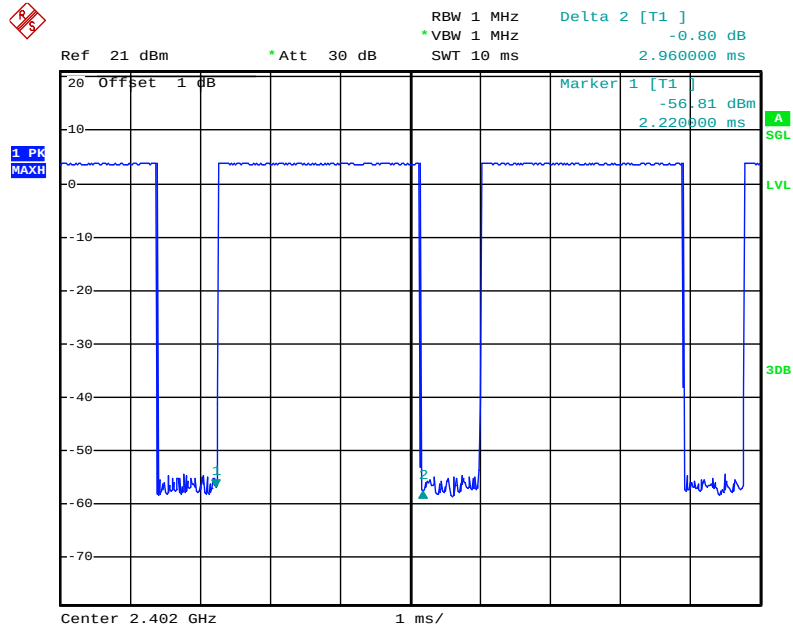
DH3 Middle channel



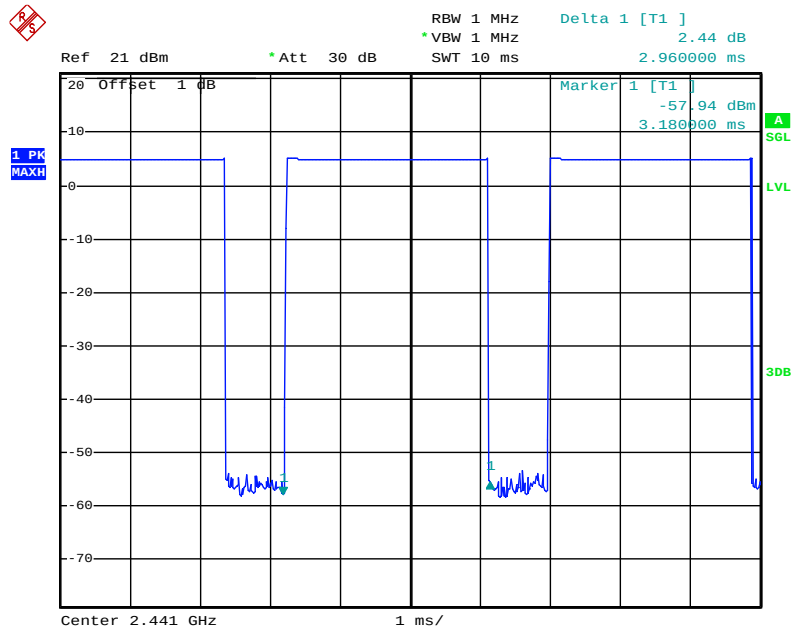
DH3 High channel



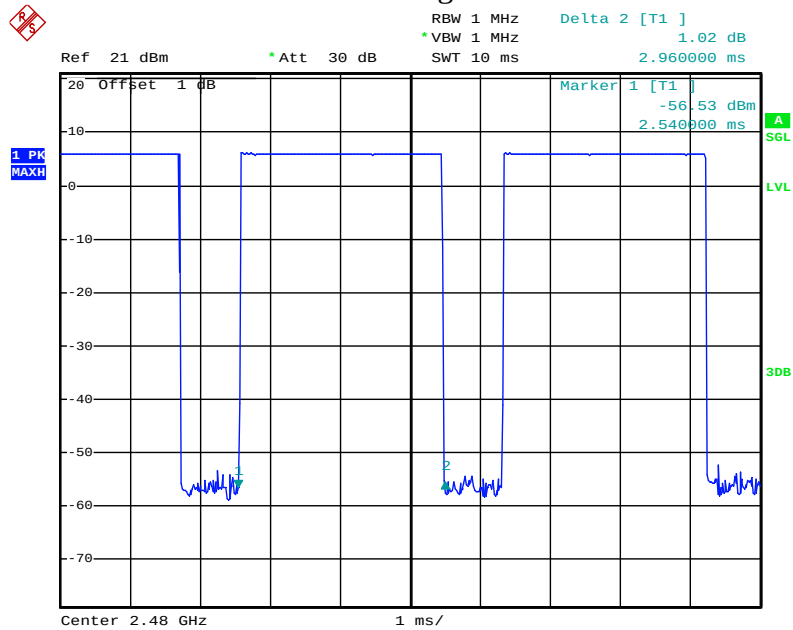
DH5 Low channel



DH5 Middle channel

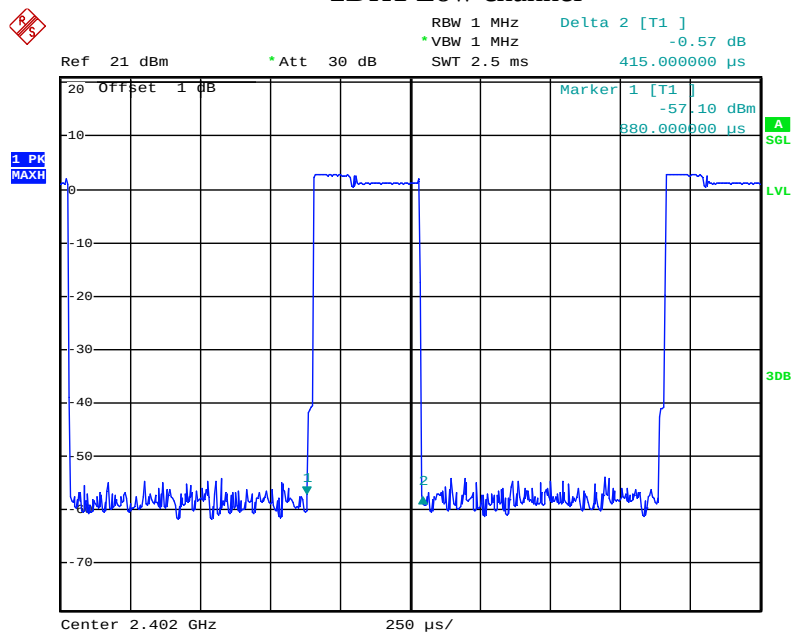


DH5 High channel

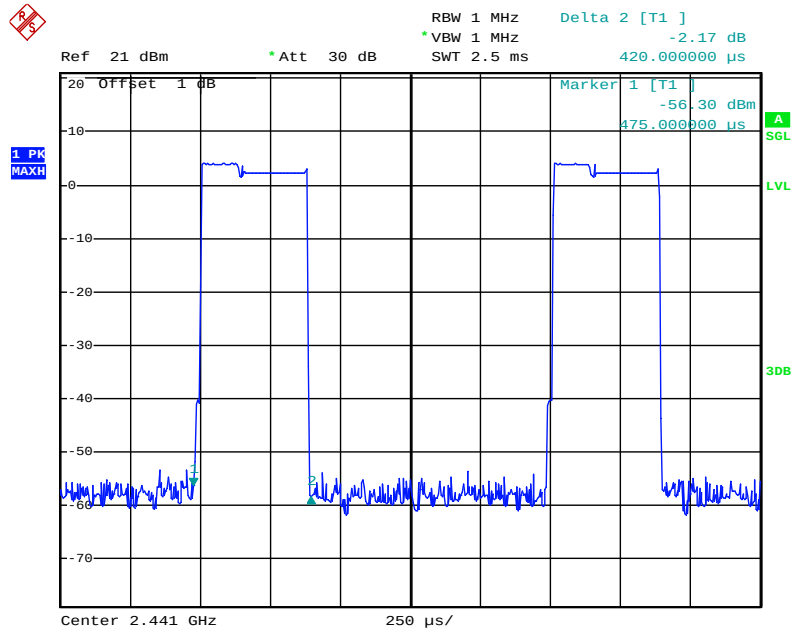


Mode 2: $\pi/4$ DQPSK Link Mode

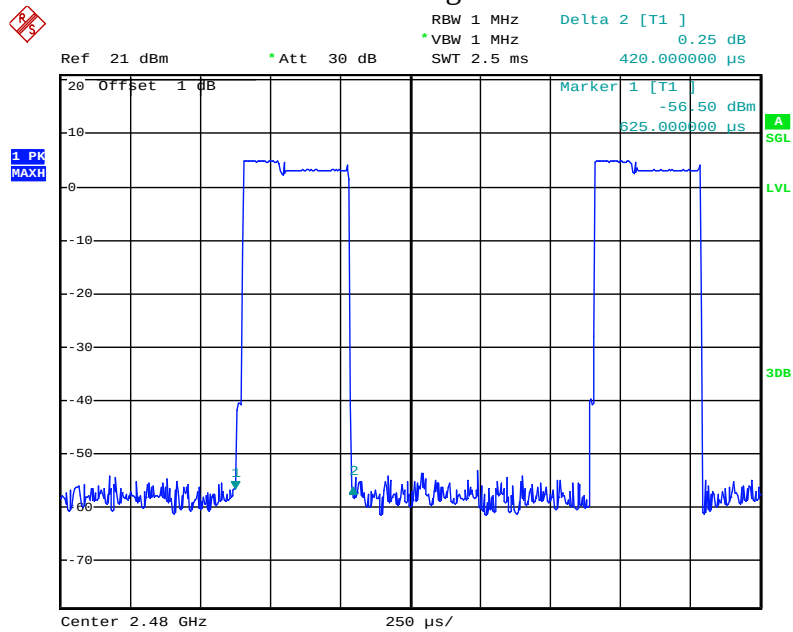
2DH1 Low channel



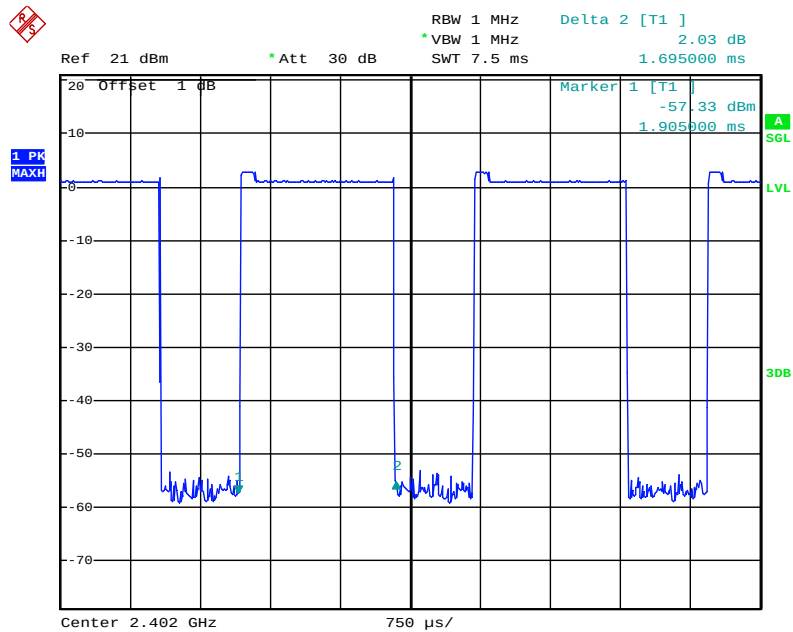
2DH1 Middle channel



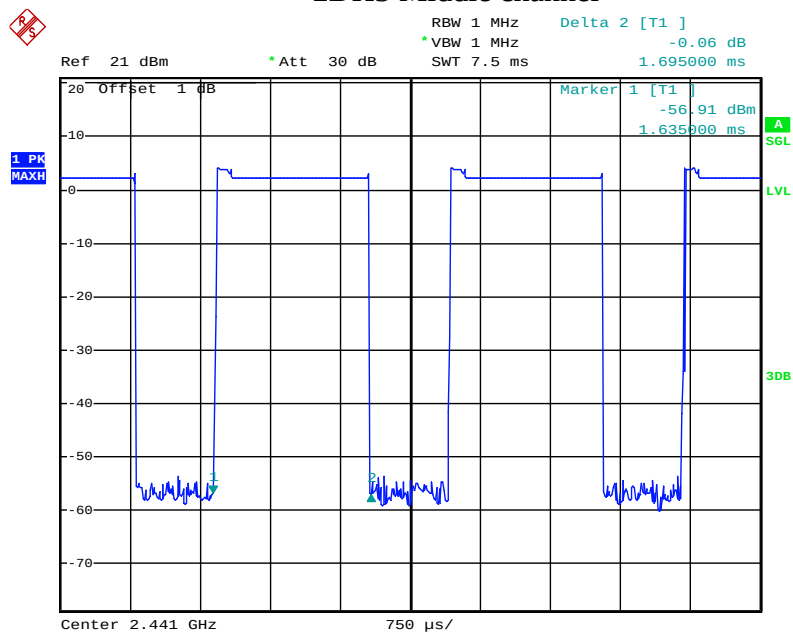
2DH1 High channel



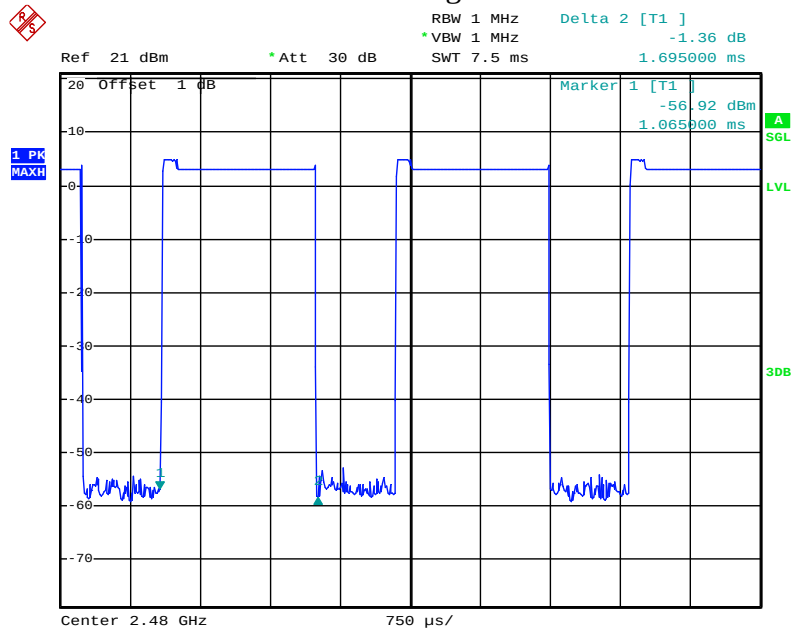
2DH3 Low channel



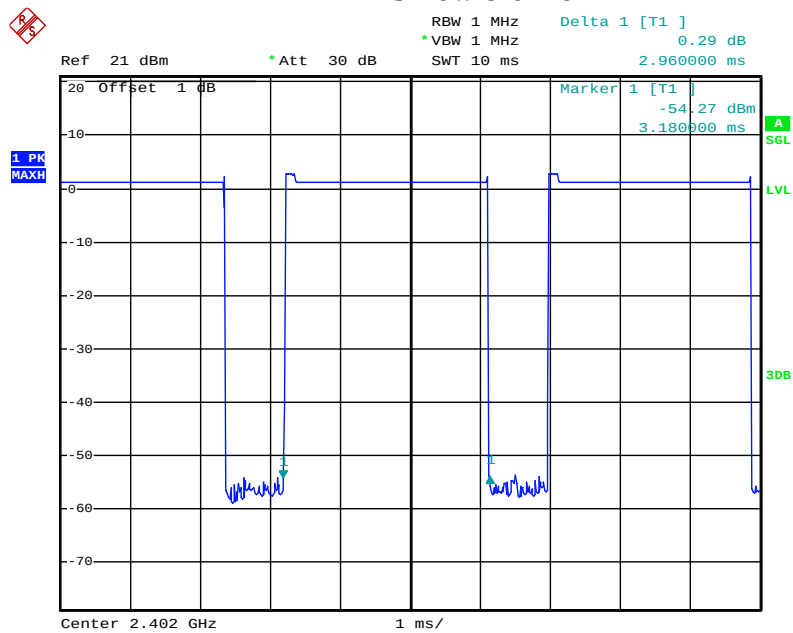
2DH3 Middle channel



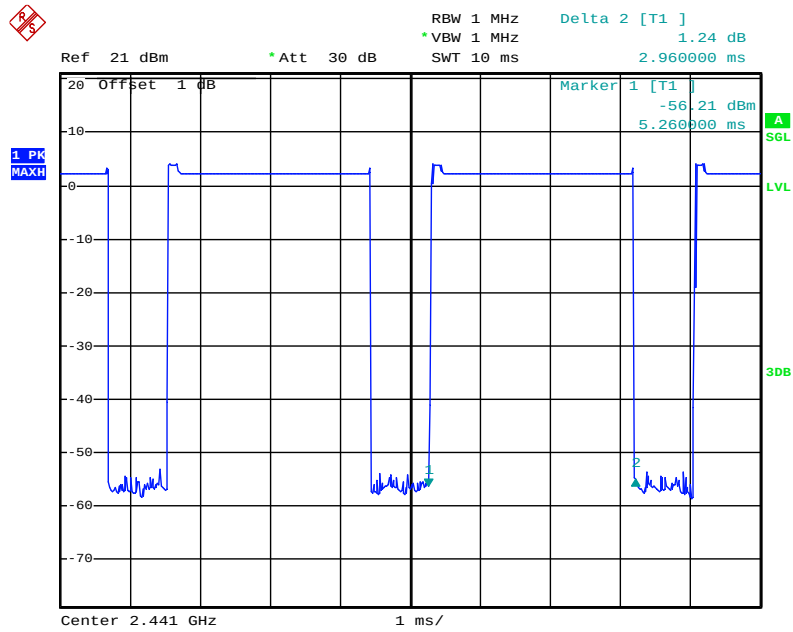
2DH3 High channel



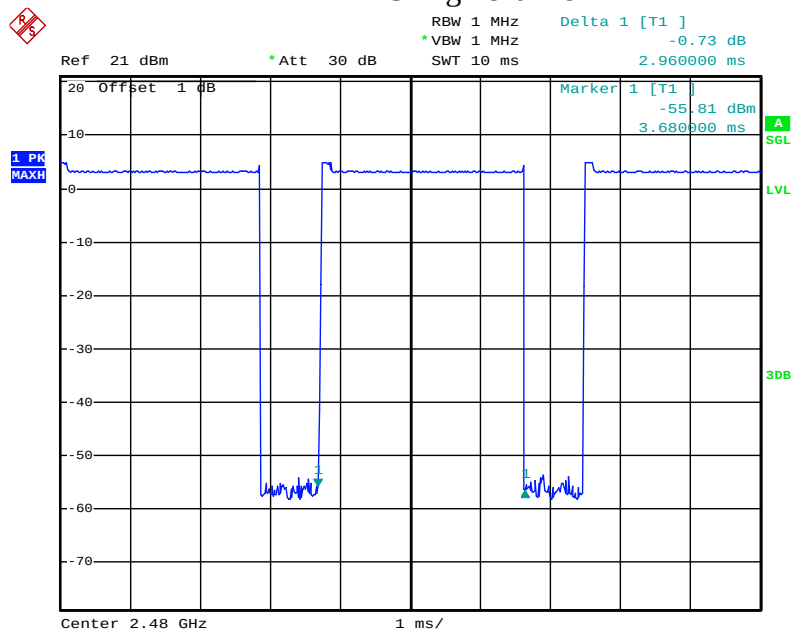
2DH5 Low channel



2DH5 Middle channel

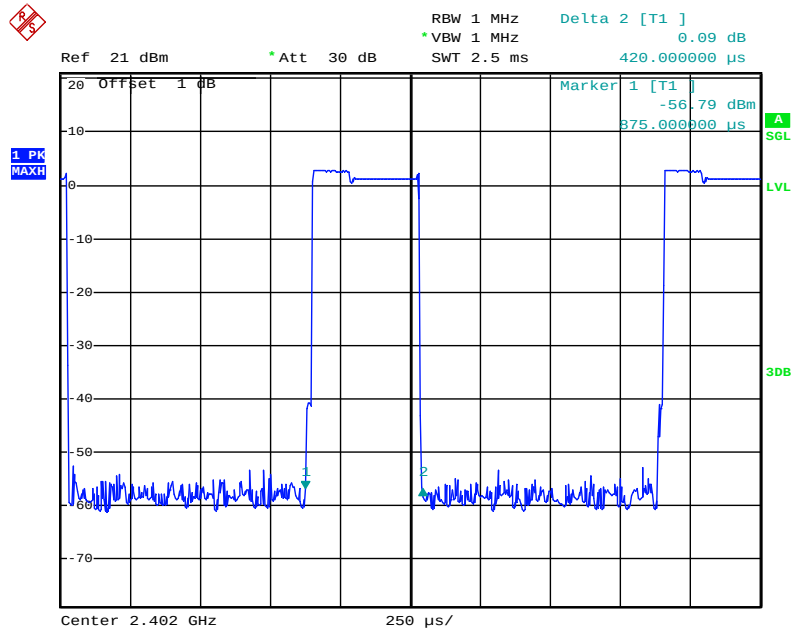


2DH5 High channel

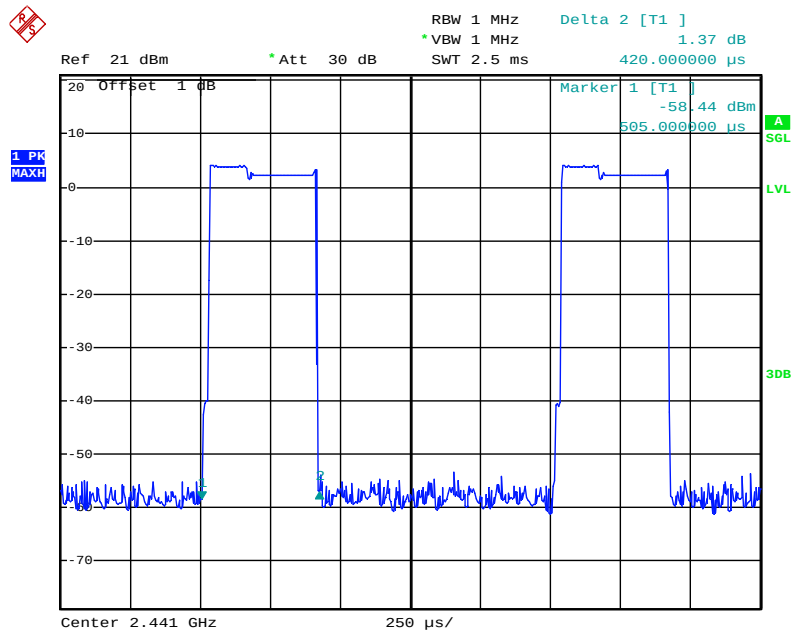


Mode 3: 8DPSK Link Mode

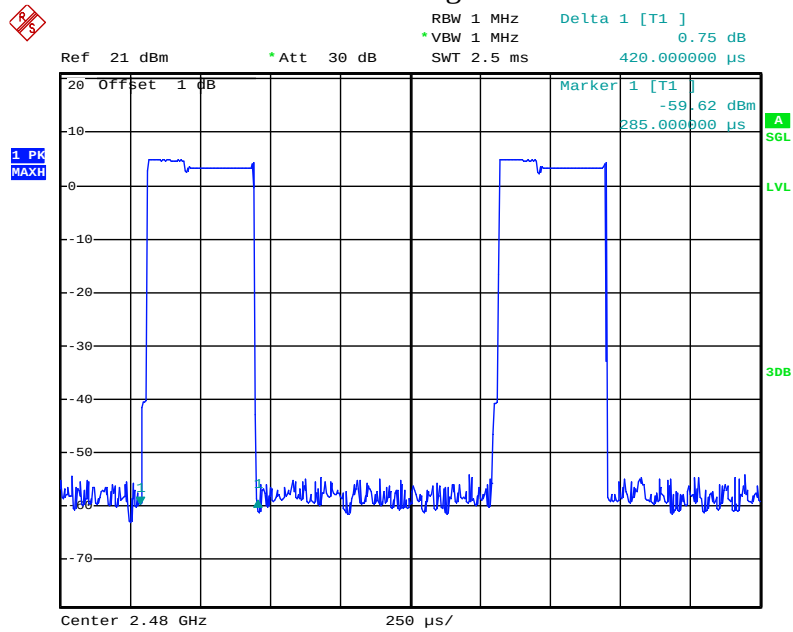
3DH1 Low channel



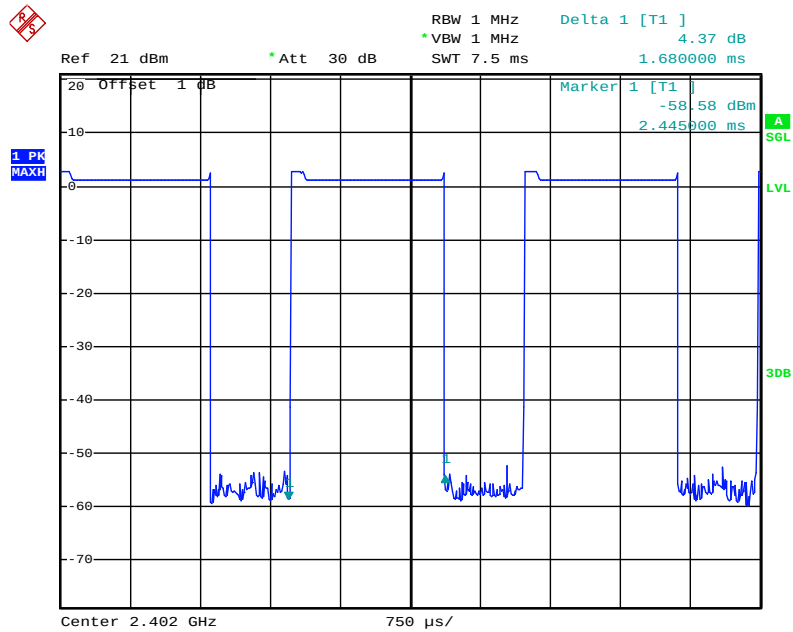
3DH1 Middle channel



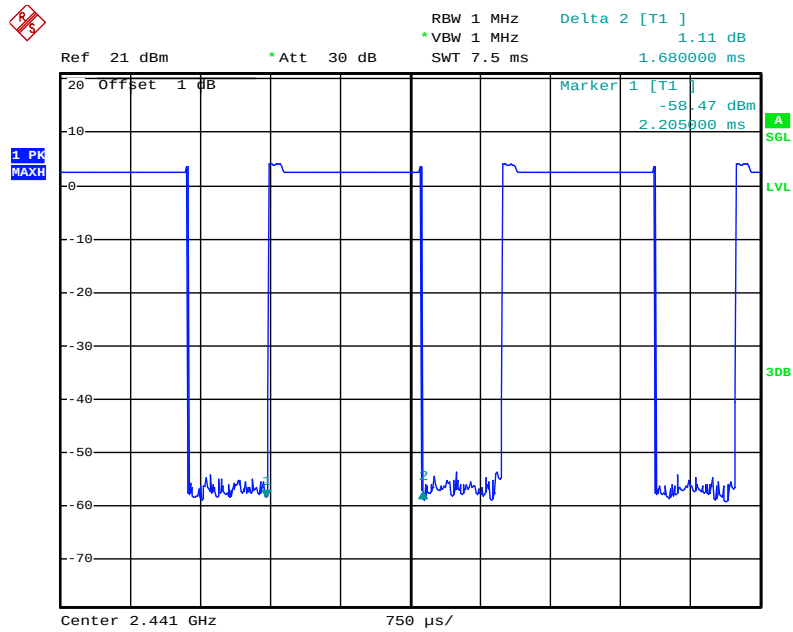
3DH1 High channel



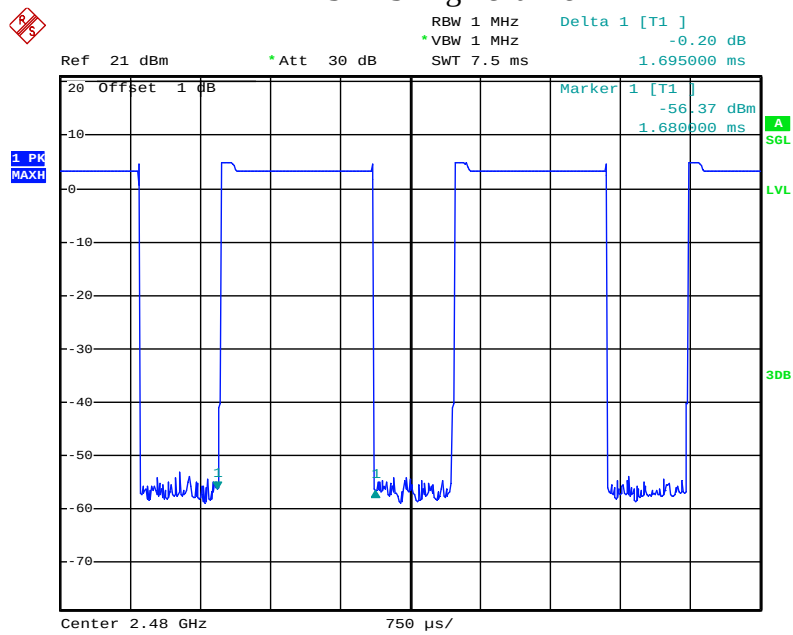
3DH3 Low channel



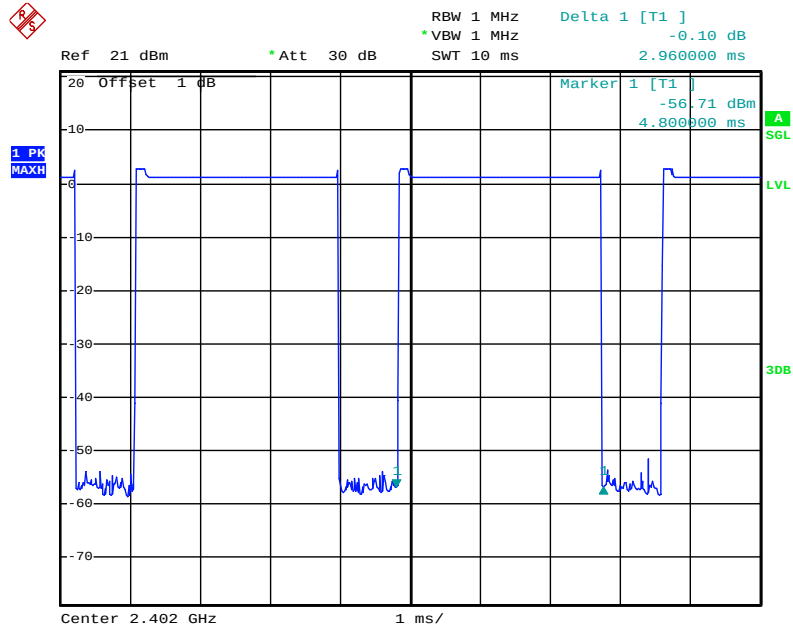
3DH3 Middle channel



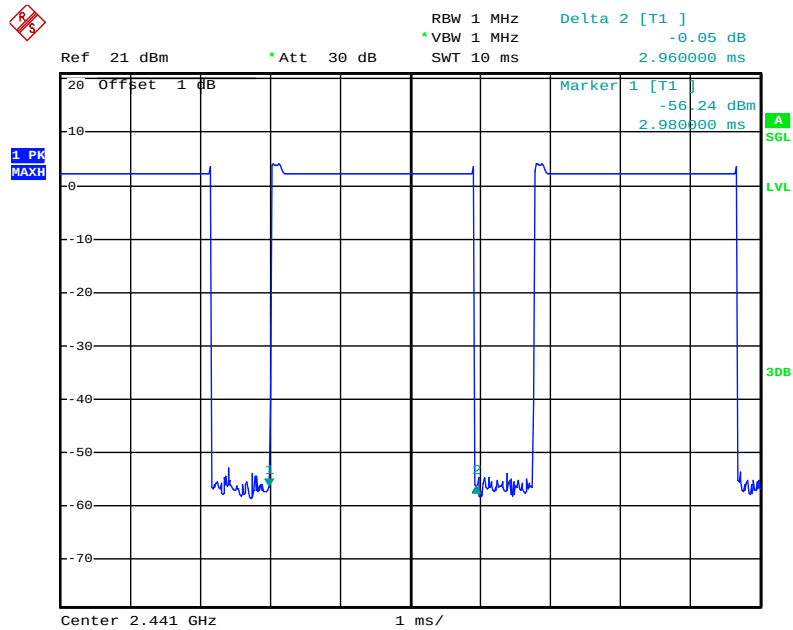
3DH3 High channel



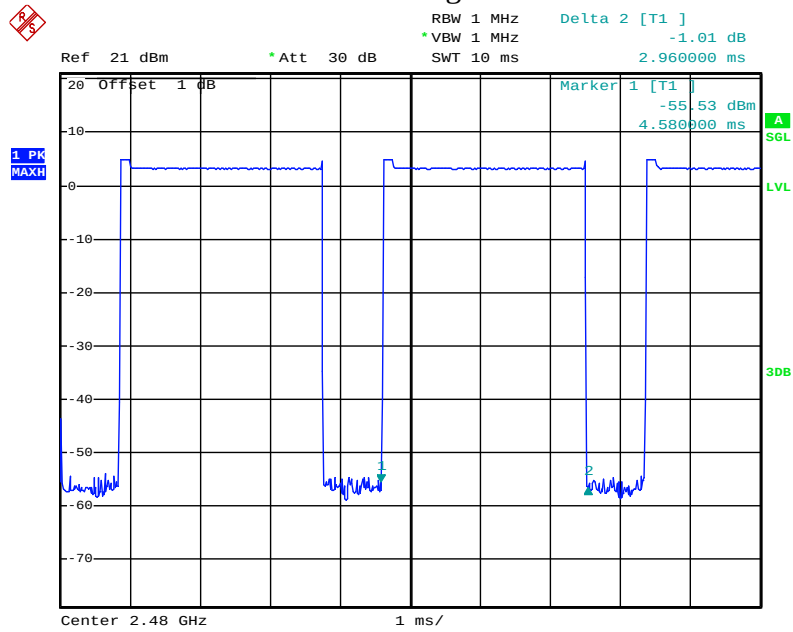
3DH5 Low channel



3DH5 Middle channel



3DH5 High channel



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

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 1MHz and VBW to 3MHz for GFSK mode

9.5.3. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz for other mode

9.5.4. Measurement the maximum peak output power.

9.6. Test Result

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limits dBm / W
Low	2402	3.61	30/1.0
Middle	2441	2.48	30/1.0
High	2480	2.43	30/1.0

II/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limits dBm / W
Low	2402	2.33	21 / 0.125
Middle	2441	1.64	21 / 0.125
High	2480	2.43	21 / 0.125

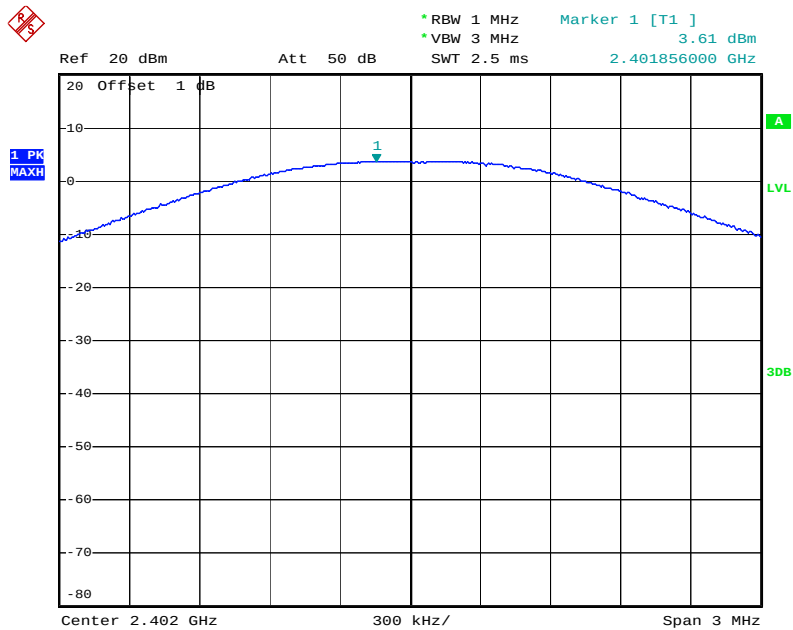
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limits dBm / W
Low	2402	2.42	21 / 0.125
Middle	2441	1.72	21 / 0.125
High	2480	3.53	21 / 0.125

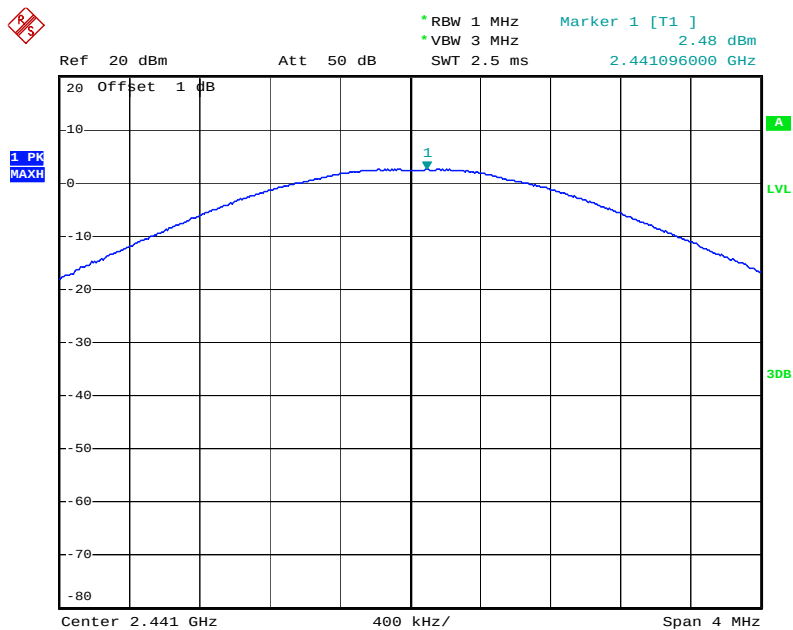
The spectrum analyzer plots are attached as below.

GFSK Mode

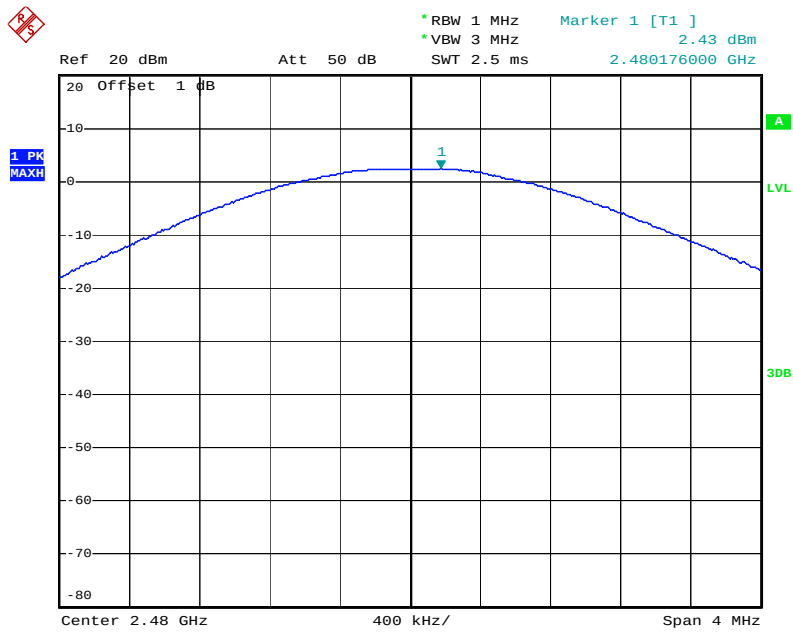
Low channel



Middle channel

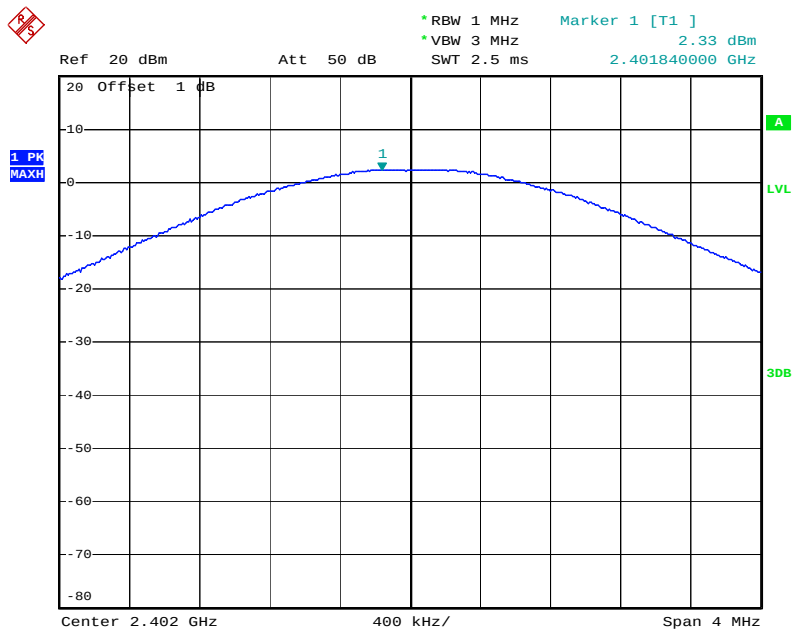


High channel

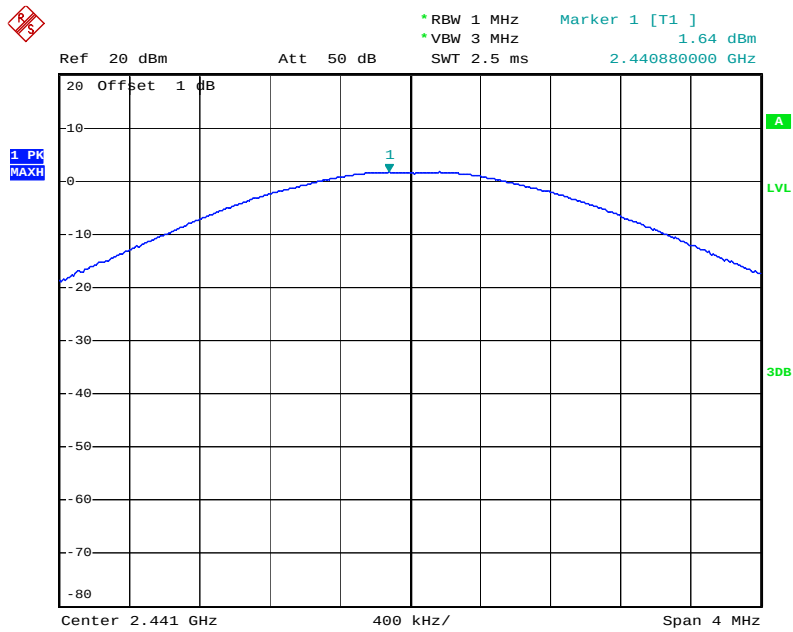


$\Pi/4$ -DQPSK Mode

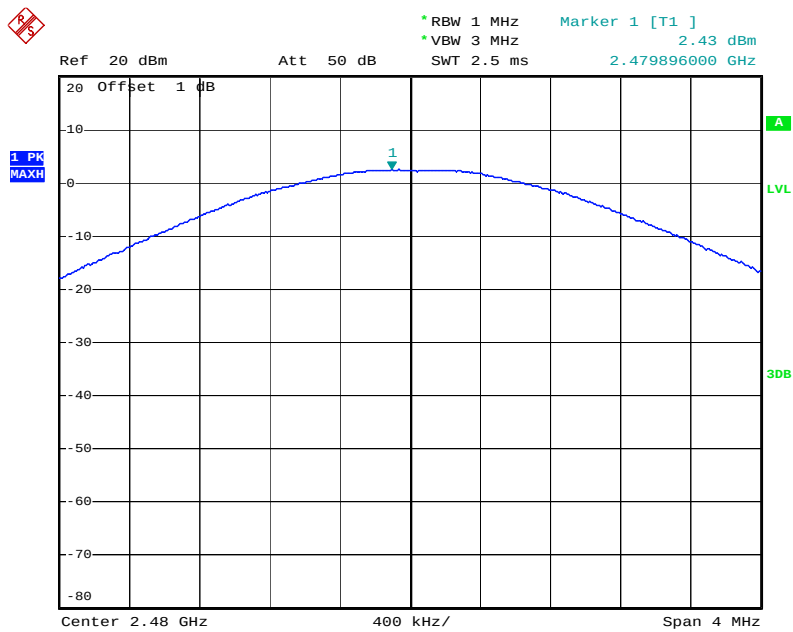
Low channel



Middle channel

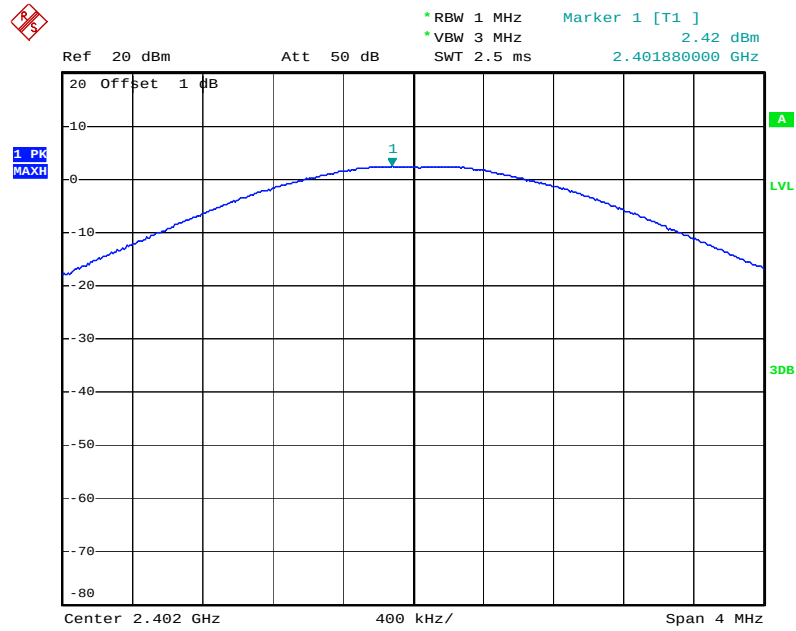


High channel

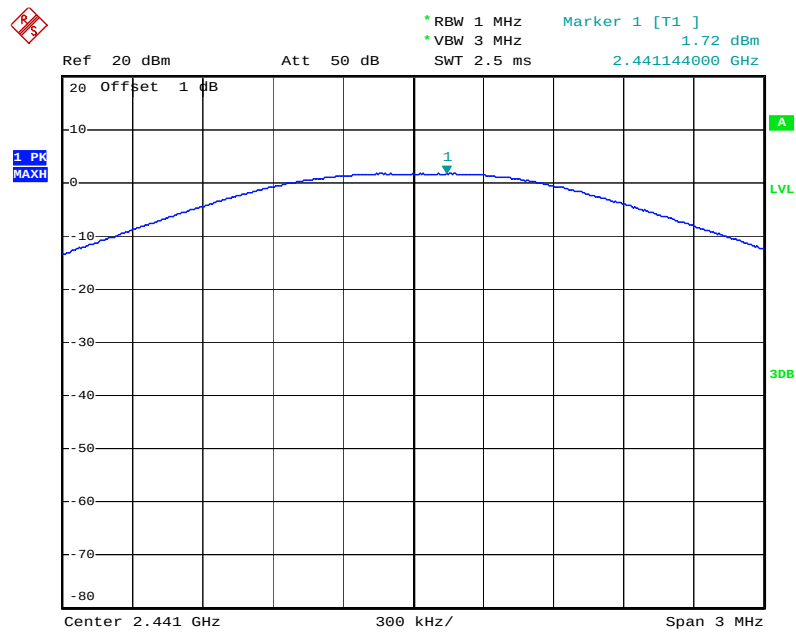


8DPSK Mode

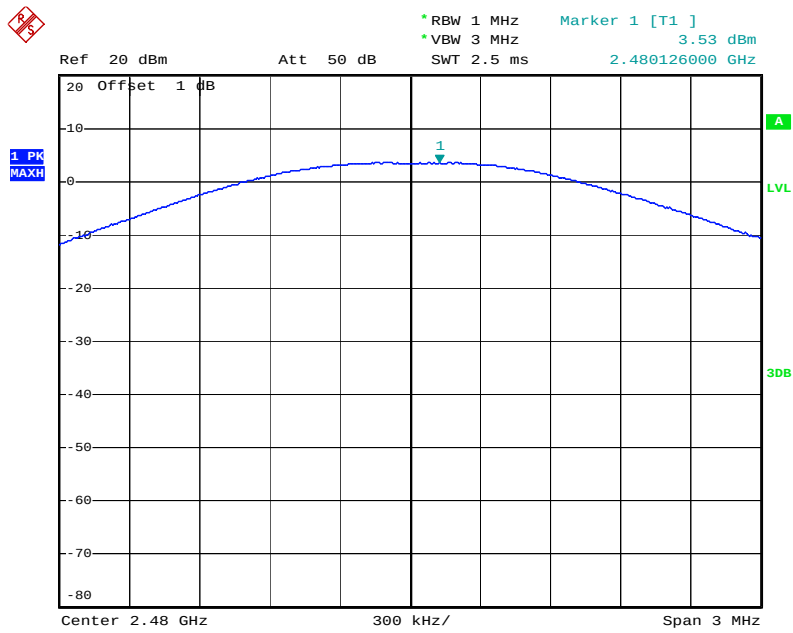
Low channel



Middle channel



High channel



10. RADIATED EMISSION TEST

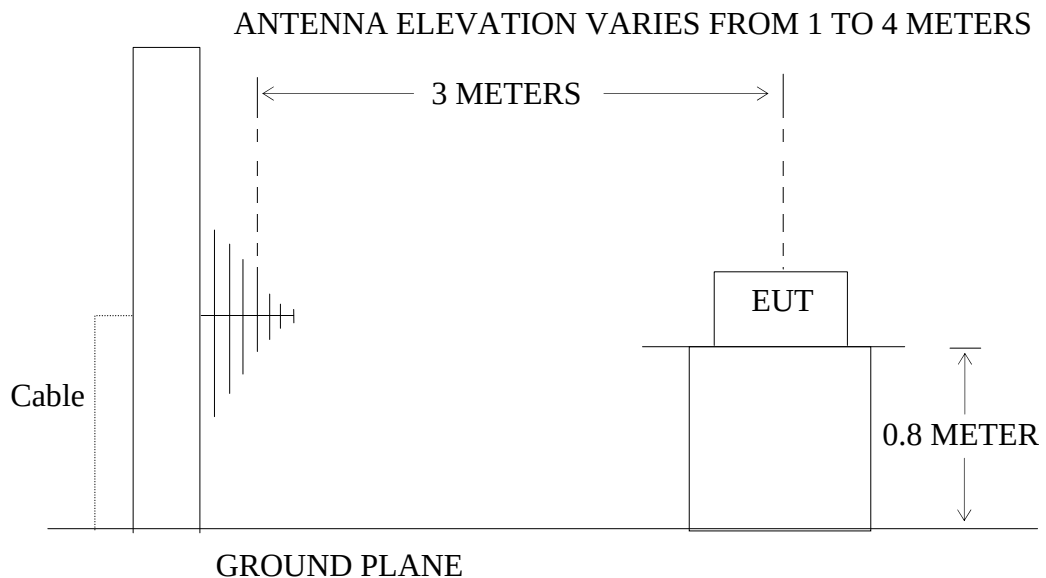
10.1. Block Diagram of Test Setup

10.1.1. Block diagram of connection between the EUT and simulators



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

10.1.2. Anechoic Chamber Test Setup Diagram



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

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 are 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. 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 bilog 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 interface cables must be manipulated according to ANSI C63.4- 2009 on radiated emission measurement.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz

Peak detector above 1GHz

RBW (1 MHz), VBW (3MHz) for Peak measurement

RBW (1 MHz), VBW (10Hz) for AV measurement

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

10.6.The Field Strength of Radiation Emission Measurement Results

Note: 1.We tested GFSK mode, $\Pi/4$ -DQPSK Mode & 8DPSK mode and recorded the worst case data (GFSK mode) for all test mode.

2. The fundamental radiated emissions were reduced by 2.4G Band Reject Filter in the attached plots.

3. The 18-25GHz emissions are not reported, because the levels are too low against the limit.


ACCURATE TECHNOLOGY CO., LTD.

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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: RICKY #677

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

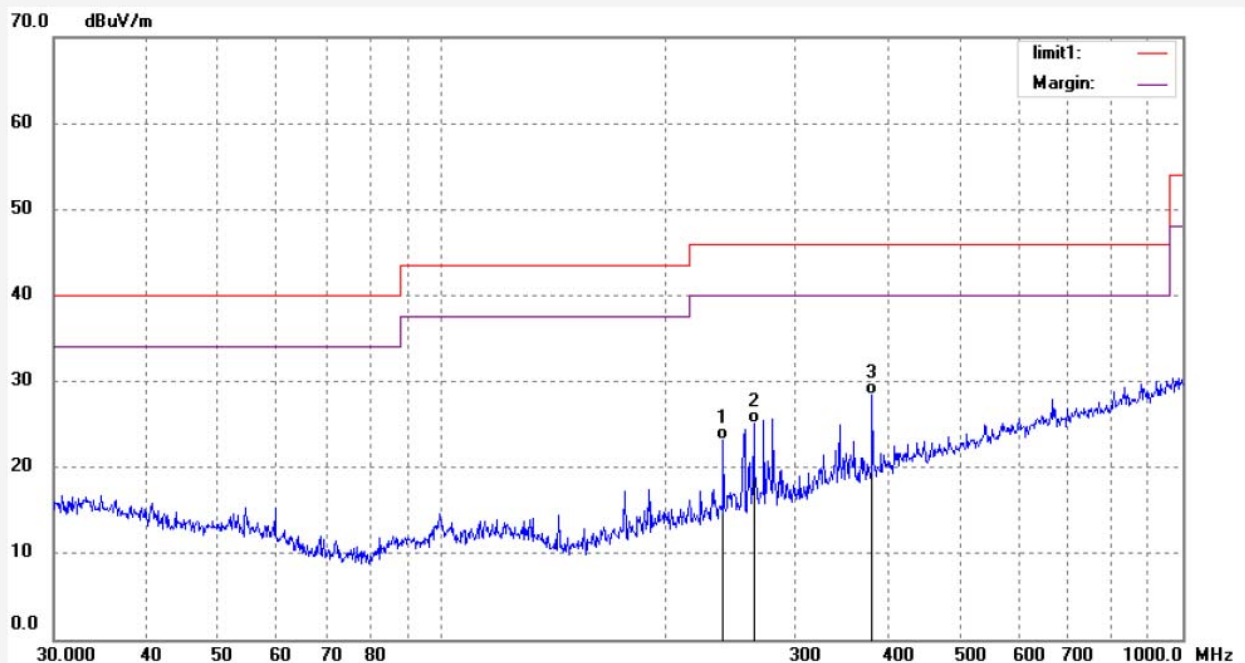
Date: 14/10/17/

Time: 9/09/37

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	239.9874	33.96	-10.84	23.12	46.00	-22.88	QP			
2	263.8190	35.65	-10.50	25.15	46.00	-20.85	QP			
3	381.2487	35.68	-7.32	28.36	46.00	-17.64	QP			



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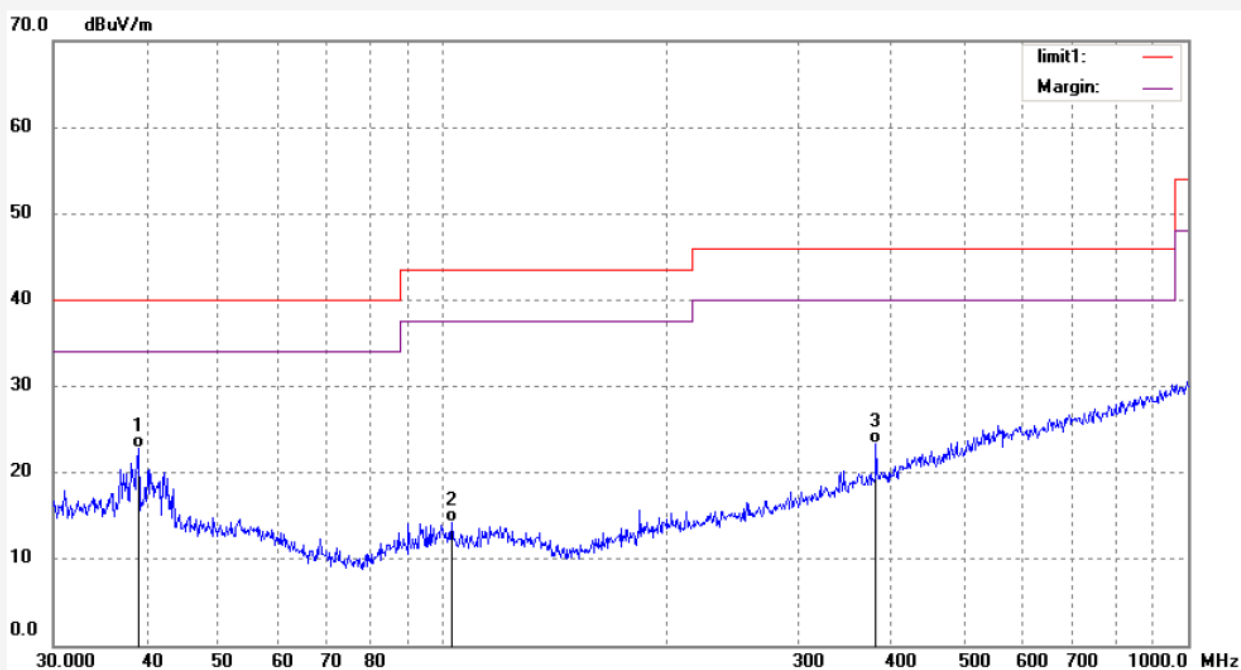
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: RICKY #678
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: AM/FM Radio Headset with BT and Aux-in Jack
Mode: TX 2402MHz
Model: HP-52RBJ
Manufacturer: Specialthing

Polarization: Vertical
Power Source: DC 4.5V
Date: 14/10/17/
Time: 9/11/00
Engineer Signature:Ricky
Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	39.0245	34.12	-11.33	22.79	40.00	-17.21	QP			
2	102.7192	27.85	-13.57	14.28	43.50	-29.22	QP			
3	381.2485	30.72	-7.32	23.40	46.00	-22.60	QP			



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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: RICKY #679

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2441MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

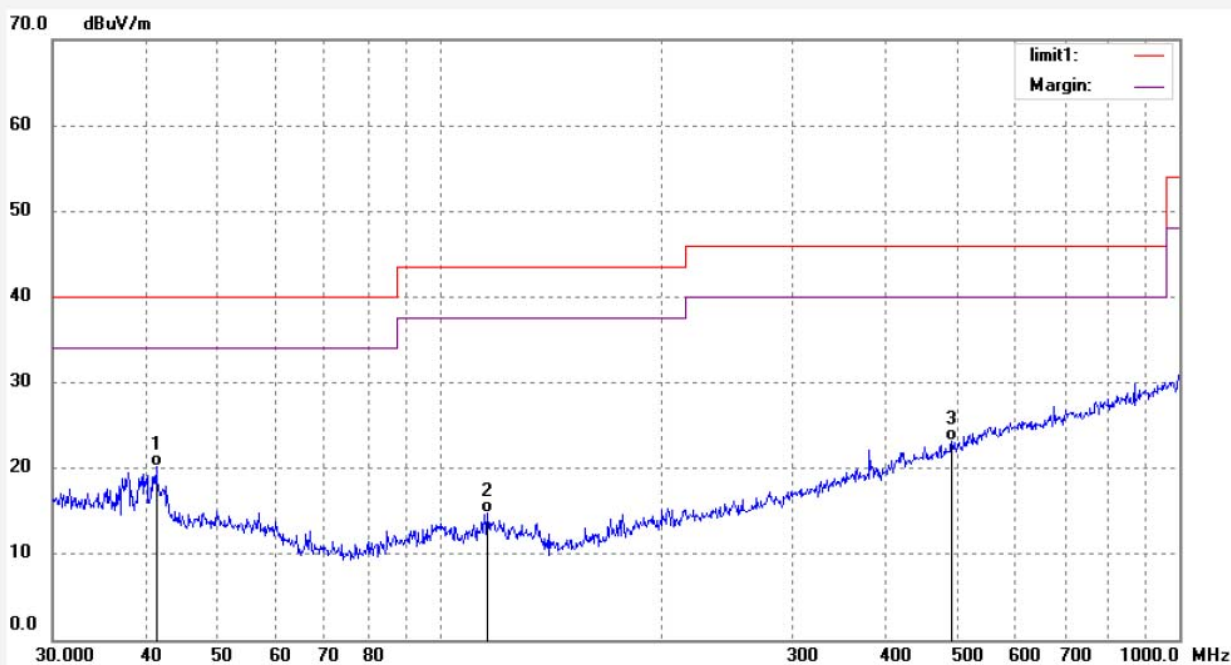
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Time: 9/12/30

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	41.4215	32.03	-11.86	20.17	40.00	-19.83	QP			
2	116.1320	28.01	-13.15	14.86	43.50	-28.64	QP			
3	492.4685	28.28	-5.11	23.17	46.00	-22.83	QP			

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Fax:+86-0755-26503396

Job No.: RICKY #680

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2441MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

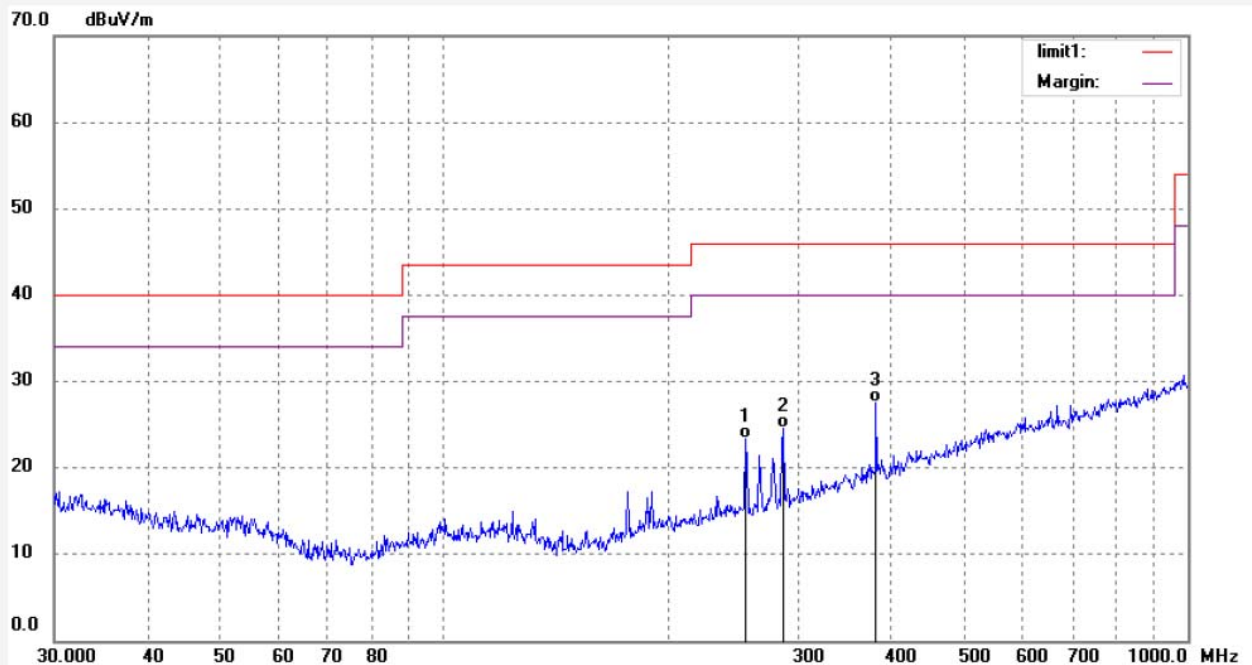
Date: 14/10/17/

Time: 9/13/53

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	254.7283	34.14	-10.76	23.38	46.00	-22.62	QP			
2	285.9778	34.19	-9.65	24.54	46.00	-21.46	QP			
3	381.2485	34.89	-7.32	27.57	46.00	-18.43	QP			

**ACCURATE TECHNOLOGY CO., LTD.**F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: RICKY #681

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

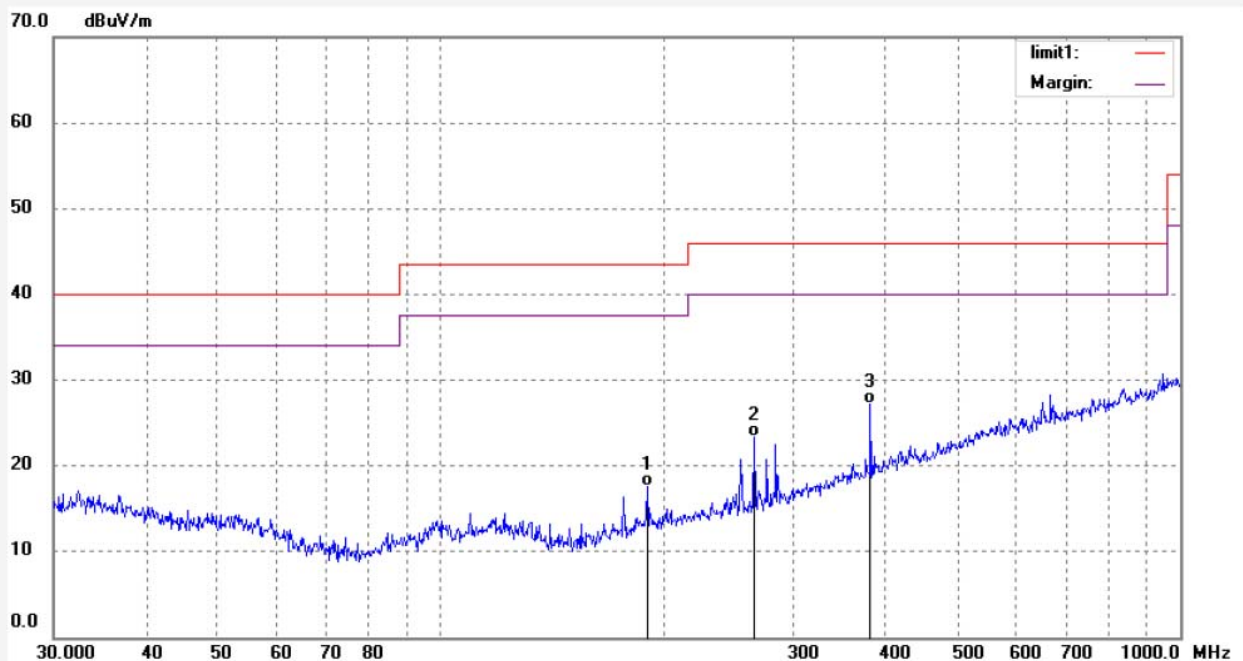
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Time: 9/14/49

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	190.4050	30.30	-12.64	17.66	43.50	-25.84	QP			
2	265.6757	33.73	-10.39	23.34	46.00	-22.66	QP			
3	381.2485	34.57	-7.32	27.25	46.00	-18.75	QP			

Job No.: RICKY #682

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

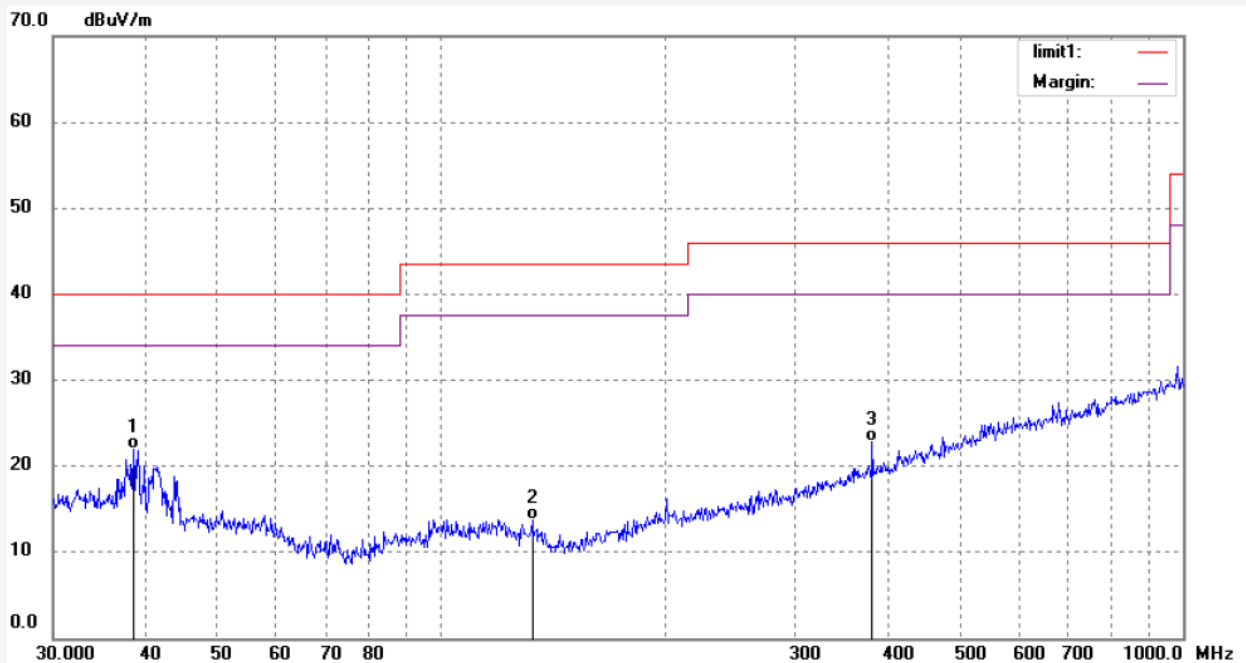
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Time: 9/17/08

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	38.4809	33.23	-11.21	22.02	40.00	-17.98	QP			
2	132.6850	27.76	-13.98	13.78	43.50	-29.72	QP			
3	381.2487	30.23	-7.32	22.91	46.00	-23.09	QP			

Job No.: RICKY #707

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

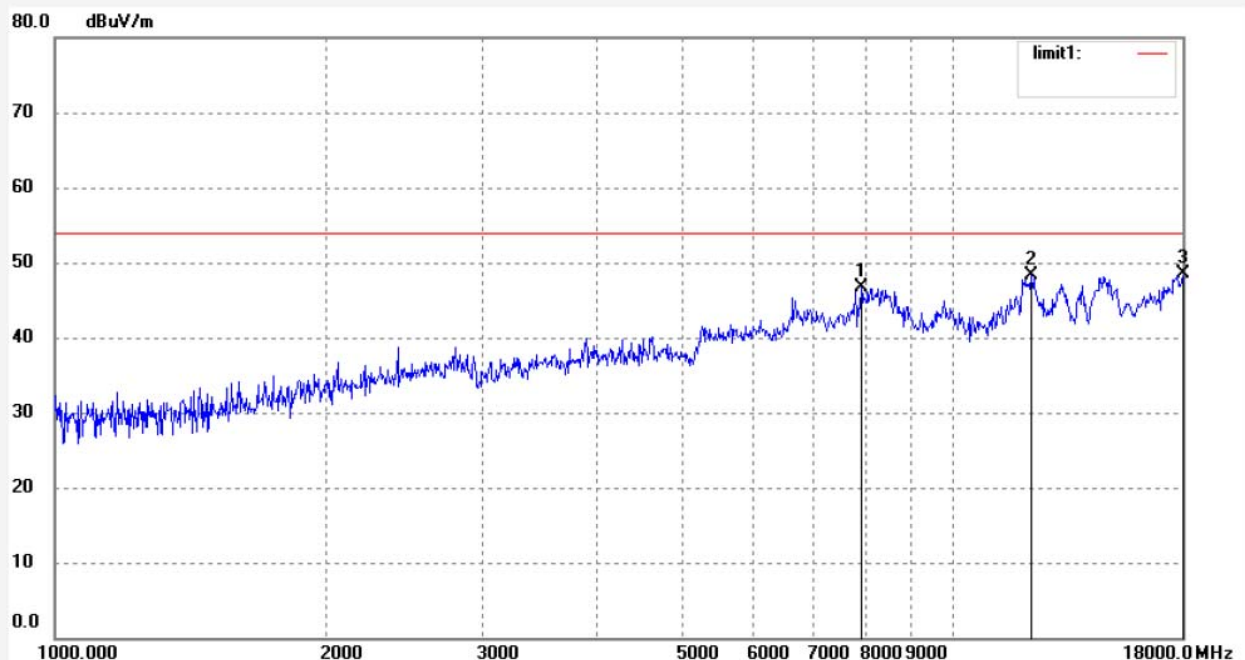
Date: 14/10/18/

Time: 8/44/49

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	7898.164	40.36	6.29	46.65	54.00	-7.35	peak			
2	12222.059	10.19	38.12	48.31	54.00	-5.69	peak			
3	18000.000	2.49	46.10	48.59	54.00	-5.41	peak			



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Job No.: RICKY #706

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

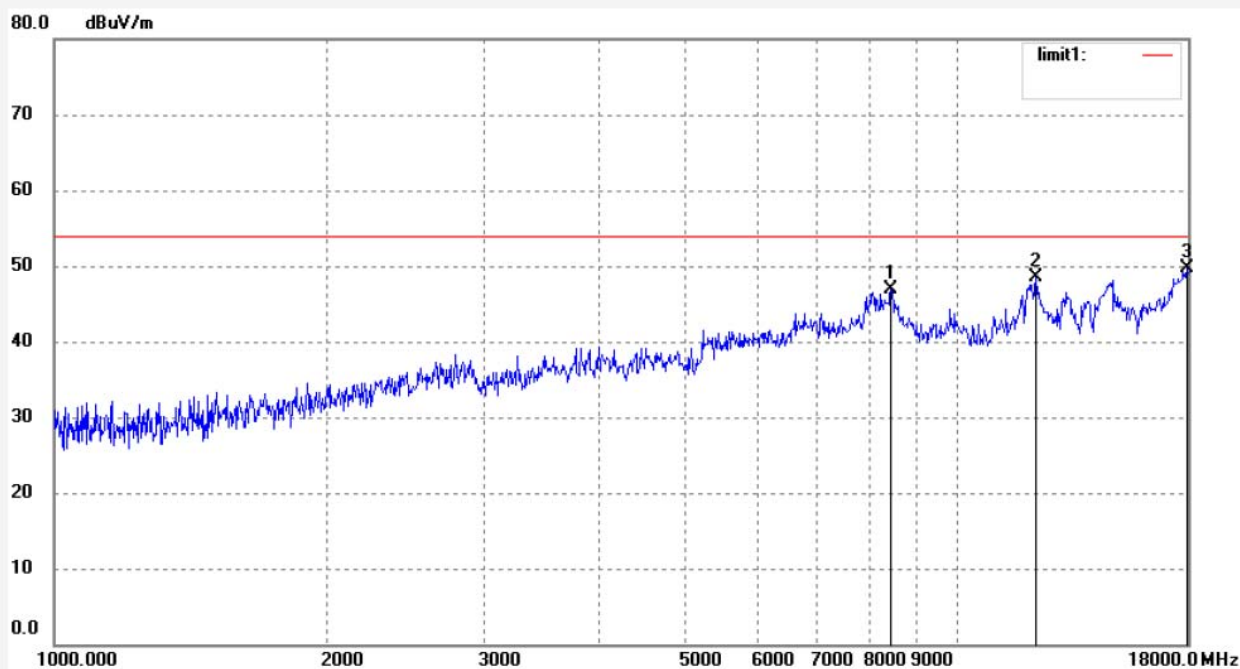
Date: 14/10/18/

Time: 8/41/08

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8445.025	38.91	8.00	46.91	54.00	-7.09	peak			
2	12222.059	10.41	38.12	48.53	54.00	-5.47	peak			
3	17947.683	3.81	45.85	49.66	54.00	-4.34	peak			

Job No.: RICKY #705

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2441MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

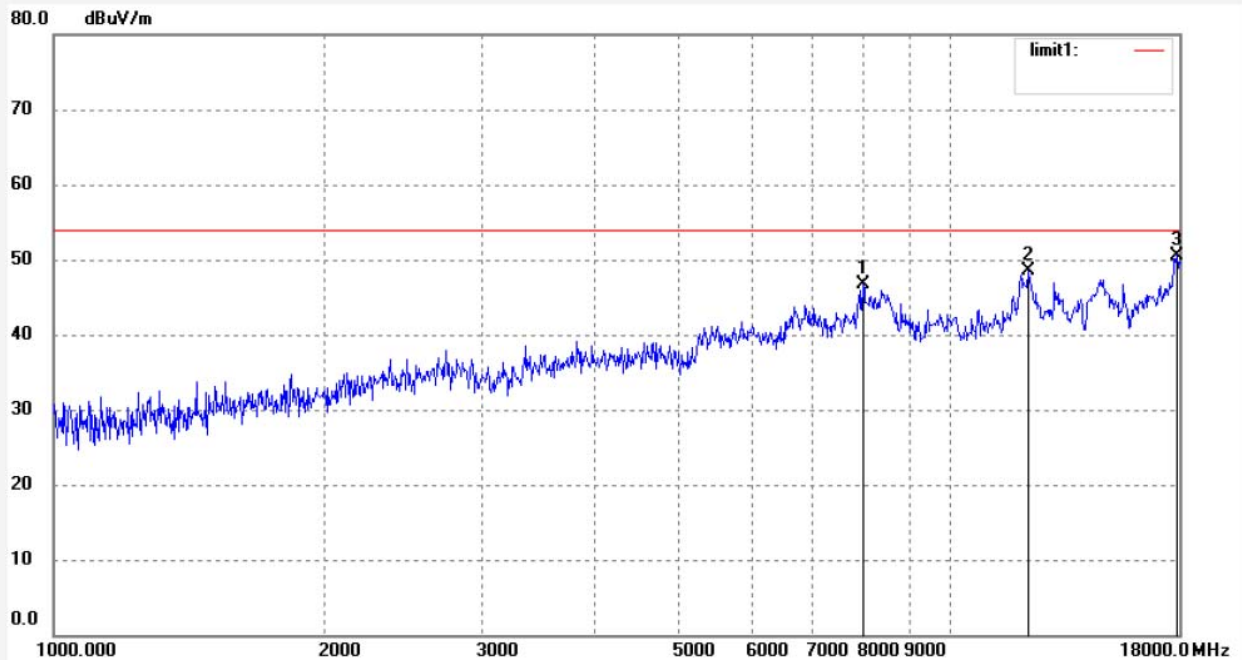
Date: 14/10/18/

Time: 8/39/38

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	7990.660	39.78	6.84	46.62	54.00	-7.38	peak			
2	12222.059	10.30	38.12	48.42	54.00	-5.58	peak			
3	17895.518	5.00	45.60	50.60	54.00	-3.40	peak			

Job No.: RICKY #704

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2441MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

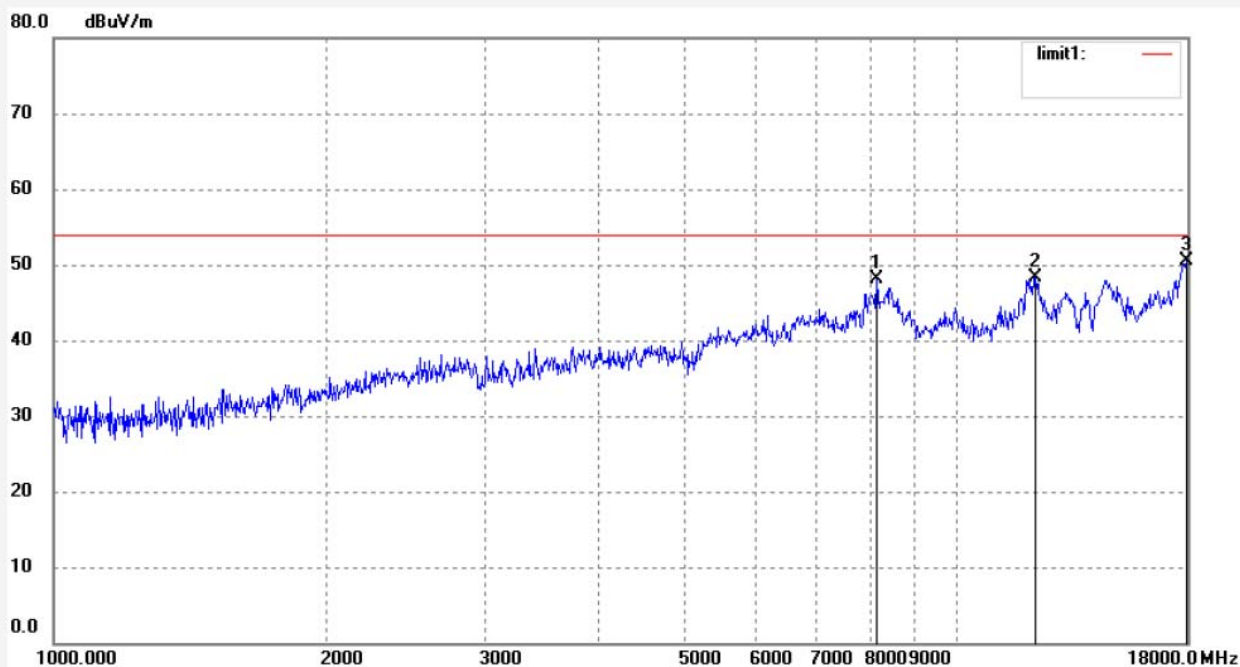
Date: 14/10/18/

Time: 8/37/12

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8155.141	41.12	6.98	48.10	54.00	-5.90	peak			
2	12222.059	10.15	38.12	48.27	54.00	-5.73	peak			
3	17947.683	4.68	45.85	50.53	54.00	-3.47	peak			

Job No.: RICKY #703

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

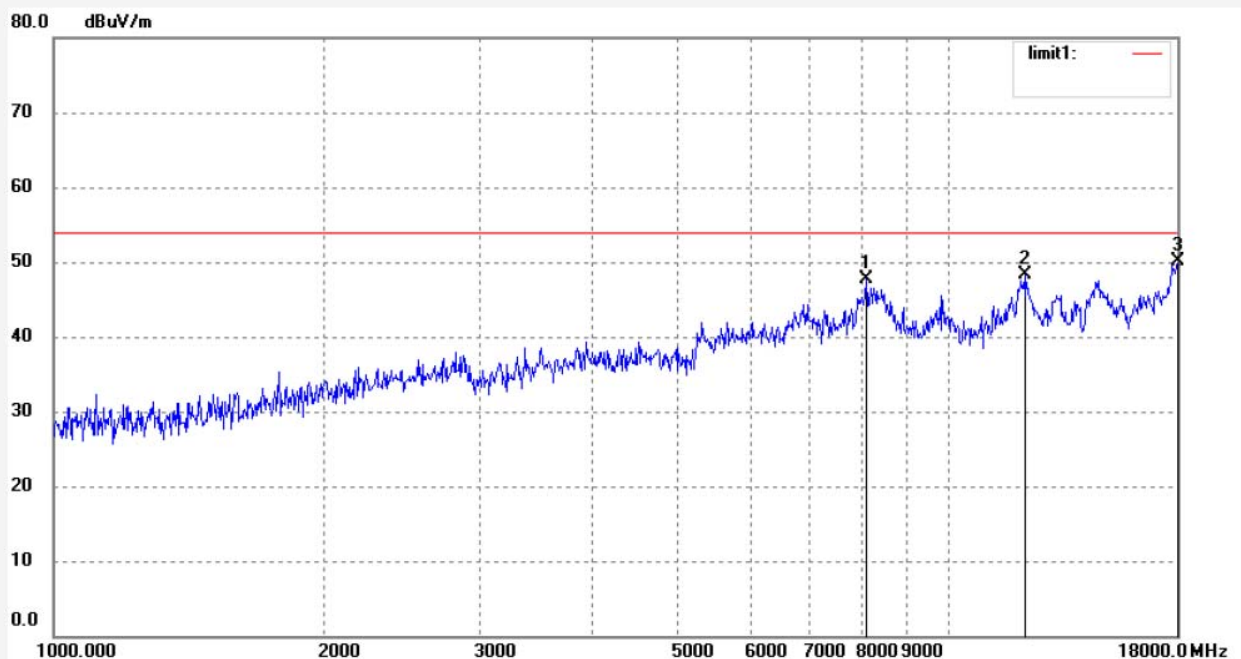
Date: 14/10/18/

Time: 8/36/34

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8084.239	40.78	6.94	47.72	54.00	-6.28	peak			
2	12151.115	38.15	10.12	48.27	54.00	-5.73	peak			
3	18000.000	3.92	46.10	50.02	54.00	-3.98	peak			

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Job No.: RICKY #702

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

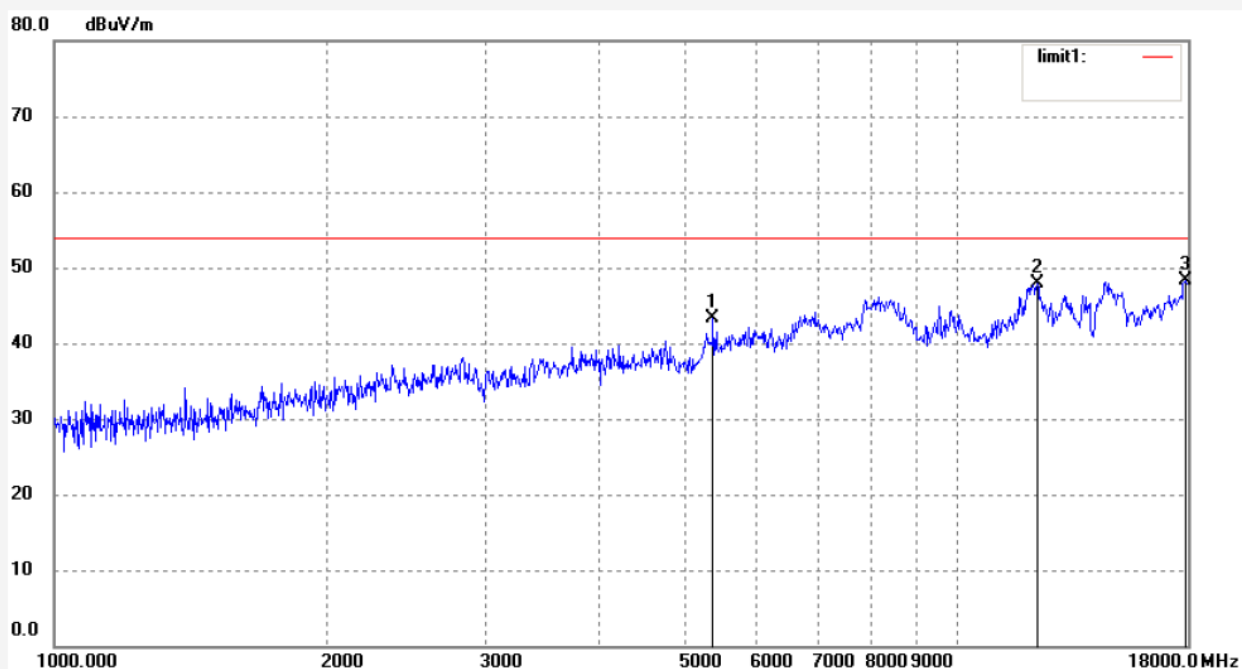
Date: 14/10/18/

Time: 8/34/18

Engineer Signature:Ricky

Distance: 3m

Note: Report No.:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	5362.879	42.60	0.79	43.39	54.00	-10.61	peak			
2	12257.686	9.69	38.16	47.85	54.00	-6.15	peak			
3	17895.518	2.67	45.60	48.27	54.00	-5.73	peak			

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

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.

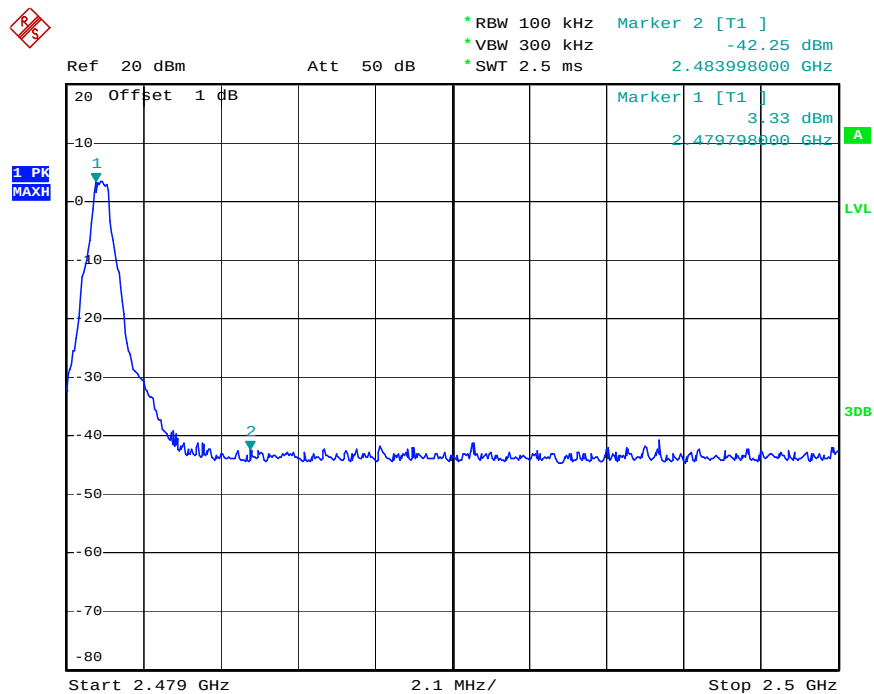
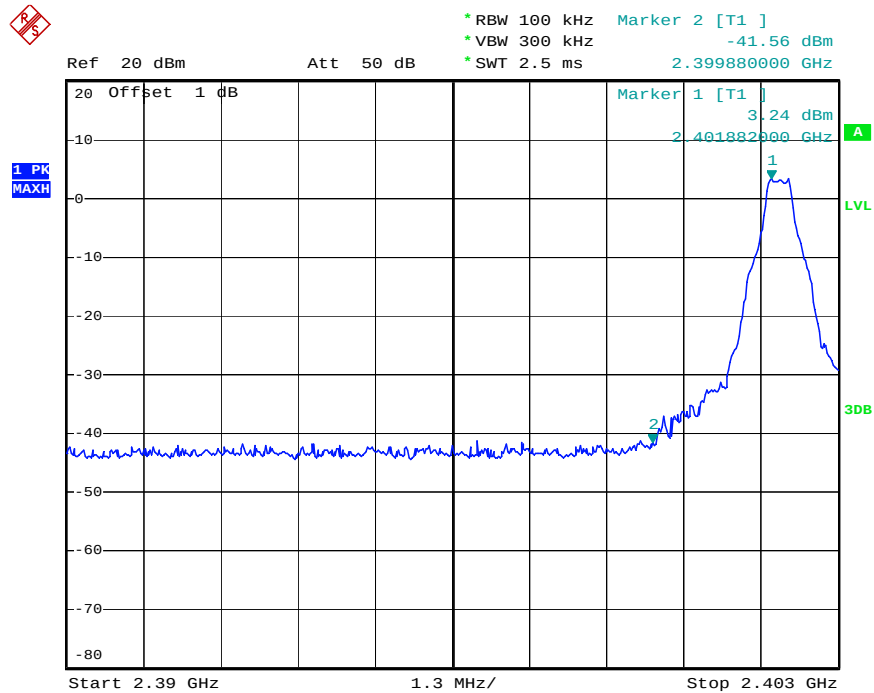
11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

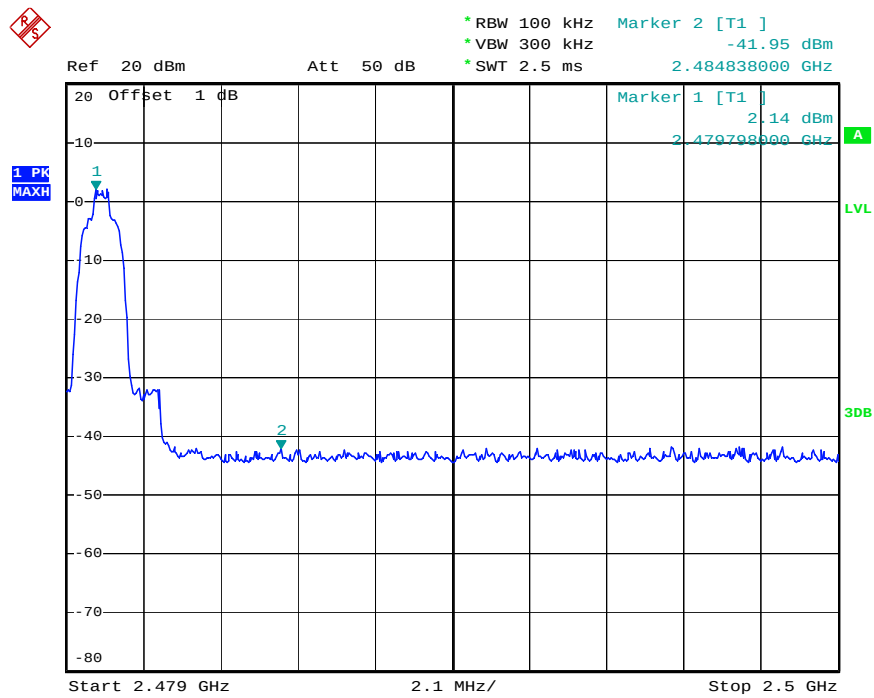
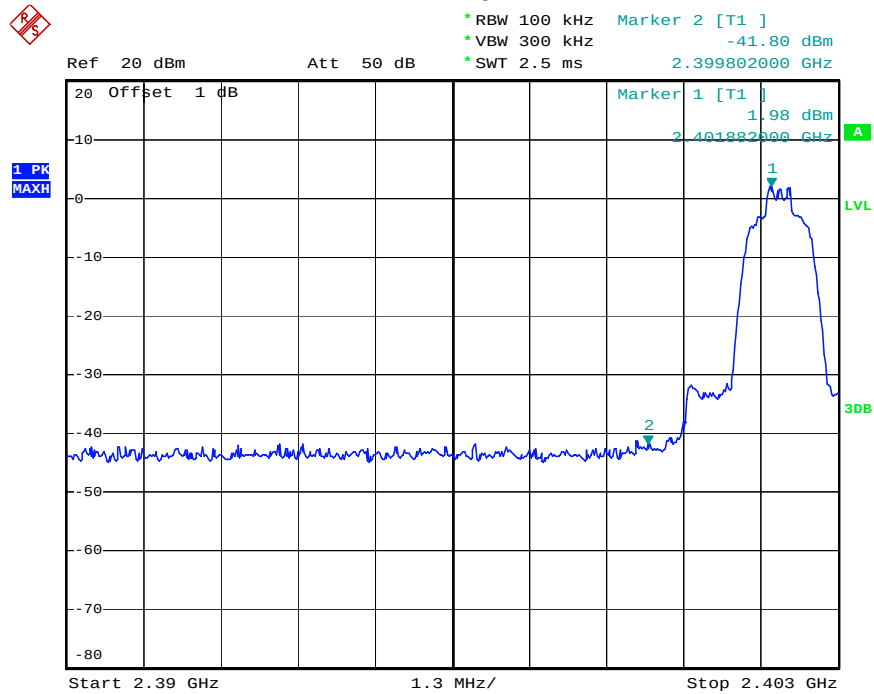
11.6. Test Result

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK		
2399.880	44.80	> 20dBc
2483.998	45.58	> 20dBc
Π/4-DQPSK Mode		
2399.802	43.79	> 20dBc
2484.838	44.09	> 20dBc
8QPSK		
2399.750	43.26	> 20dBc
2483.788	44.32	> 20dBc

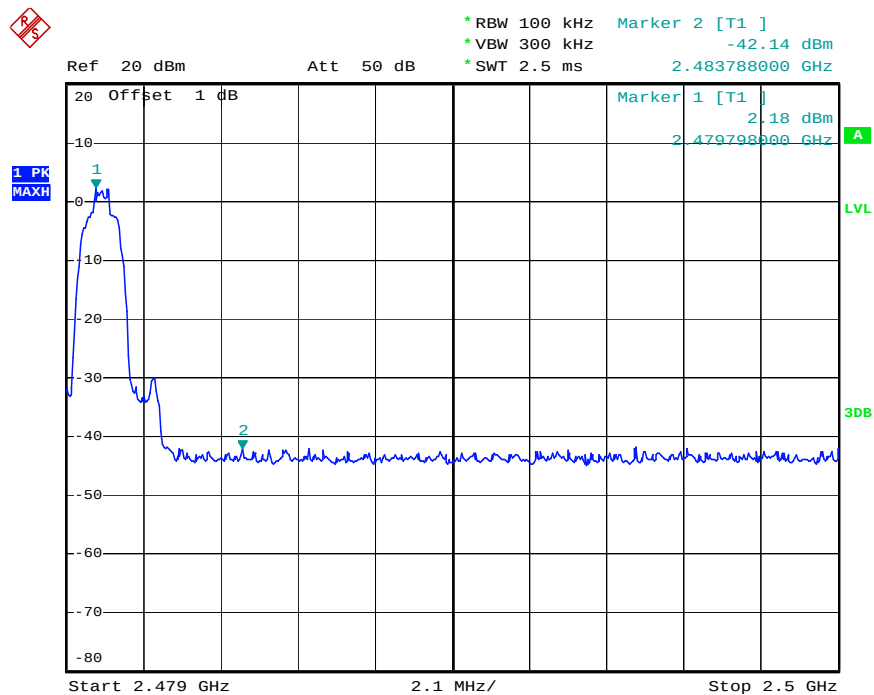
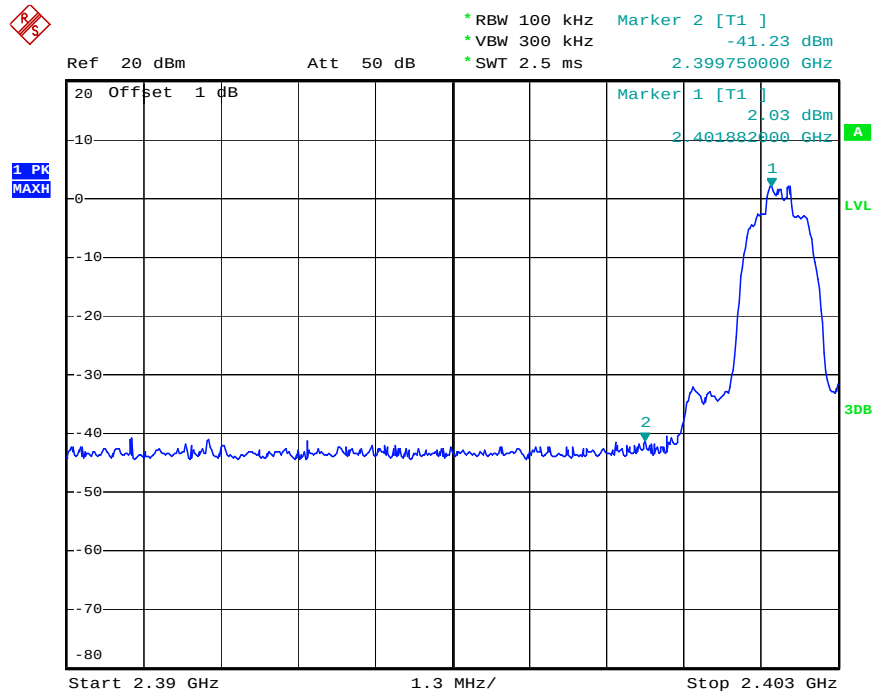
GFSK



$\Pi/4$ -DQPSK Mode



8DPSK



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.

Non-hopping mode



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Job No.: ricky #701

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz(GFSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

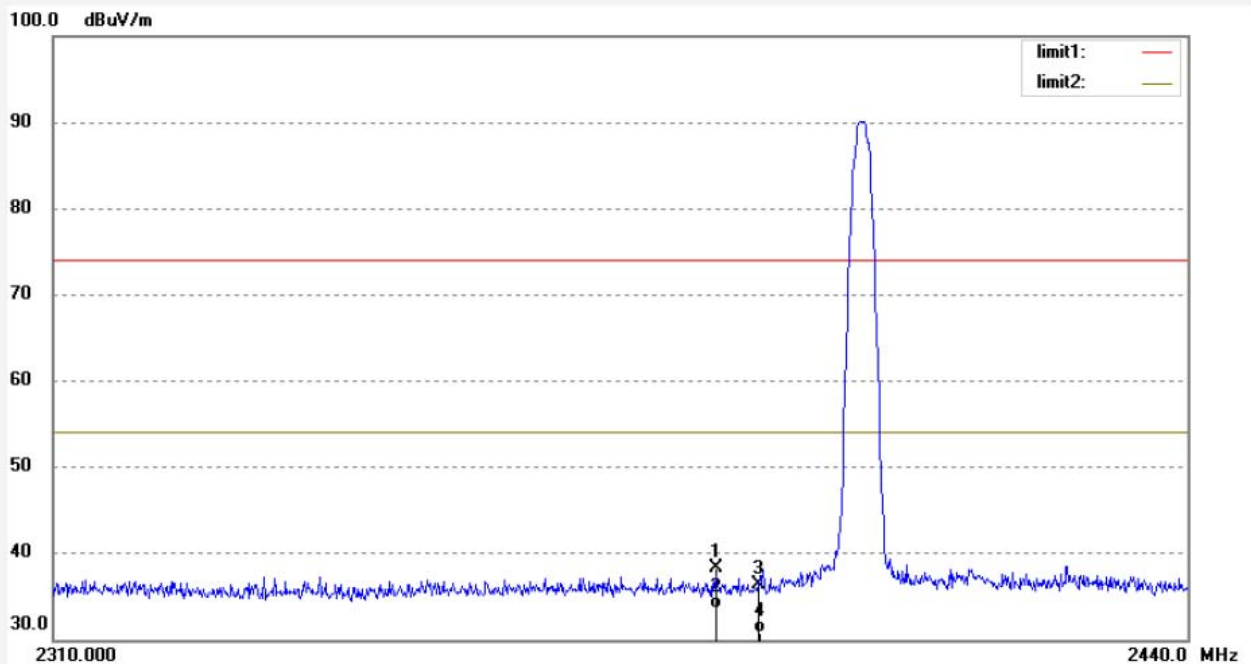
Date: 14/10/17/

Time: 11/24/24

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2385.381	46.01	-7.61	38.40	74.00	-35.60	peak			
2	2385.381	41.22	-7.61	33.61	54.00	-20.39	AVG			
3	2390.000	43.98	-7.57	36.41	74.00	-37.59	peak			
4	2390.000	38.41	-7.57	30.84	54.00	-23.16	AVG			



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Job No.: ricky #700

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz(GFSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

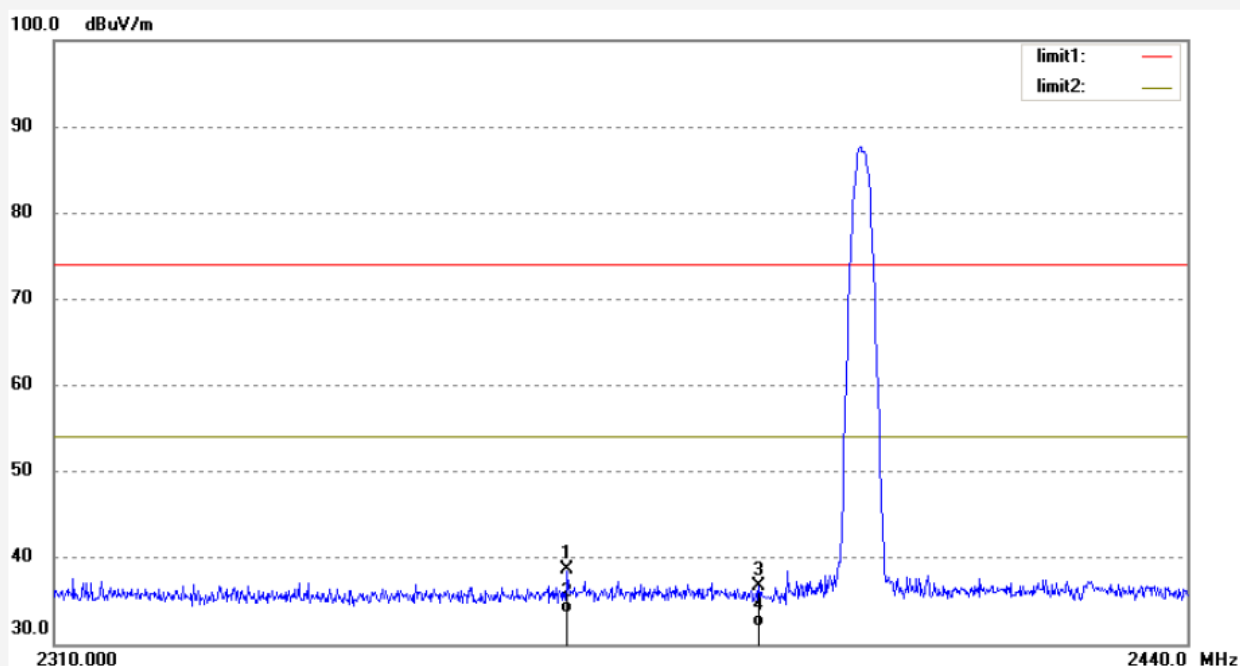
Date: 14/10/17/

Time: 11/28/27

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2367.921	46.35	-7.72	38.63	74.00	-35.37	peak			
2	2367.921	41.33	-7.72	33.61	54.00	-20.39	AVG			
3	2390.000	44.38	-7.57	36.81	74.00	-37.19	peak			
4	2390.000	39.64	-7.57	32.07	54.00	-21.93	AVG			



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Job No.: ricky #698

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz(GFSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

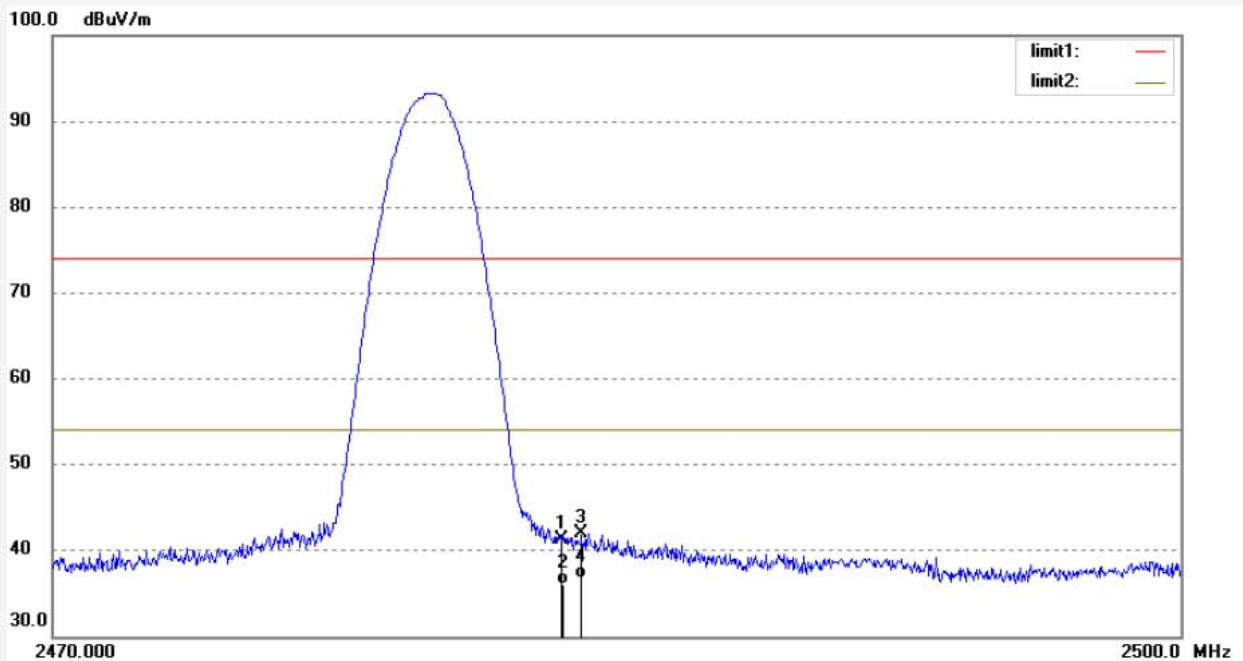
Date: 14/10/17/

Time: 11/26/28

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



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	48.69	-7.38	41.31	74.00	-32.69	peak			
2	2483.500	43.39	-7.38	36.01	54.00	-17.99	AVG			
3	2484.010	49.38	-7.39	41.99	74.00	-32.01	peak			
4	2484.010	44.18	-7.39	36.79	54.00	-17.21	AVG			

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Job No.: ricky #697

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz(GFSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

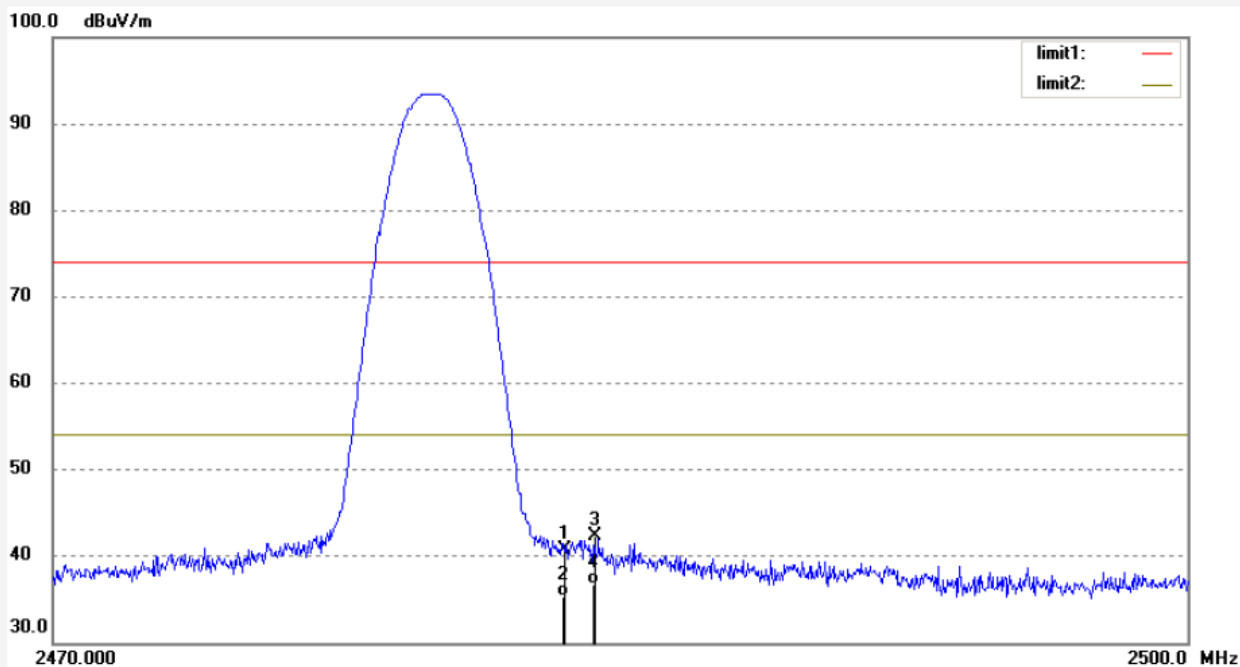
Date: 14/10/17/

Time: 11/25/38

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



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	48.11	-7.38	40.73	74.00	-33.27	peak			
2	2483.500	42.64	-7.38	35.26	54.00	-18.74	AVG			
3	2484.300	49.68	-7.39	42.29	74.00	-31.71	peak			
4	2484.300	44.10	-7.39	36.71	54.00	-17.29	AVG			



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Job No.: ricky #696

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz(PI/4DQPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

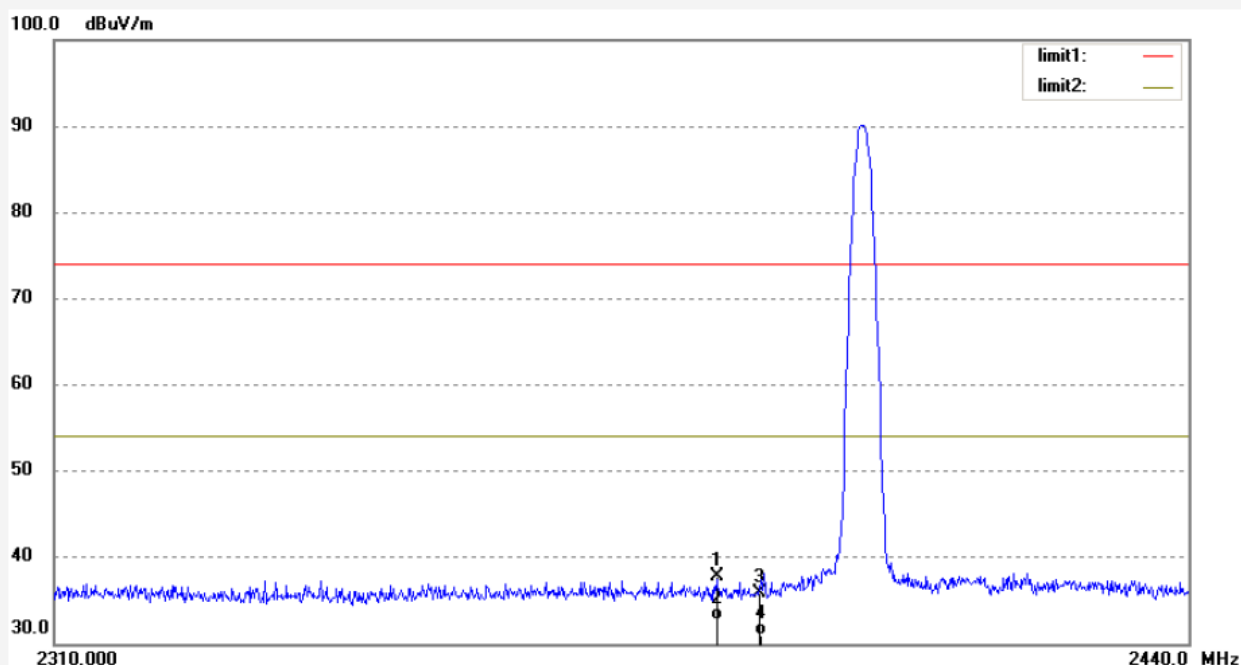
Date: 14/10/17/

Time: 11/24/24

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2385.390	45.35	-7.61	37.74	74.00	-36.26	peak			
2	2385.390	40.38	-7.61	32.77	54.00	-21.23	AVG			
3	2390.000	43.37	-7.57	35.80	74.00	-38.20	peak			
4	2390.000	38.45	-7.57	30.88	54.00	-23.12	AVG			



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Job No.: ricky #695

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz(PI/4DQPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

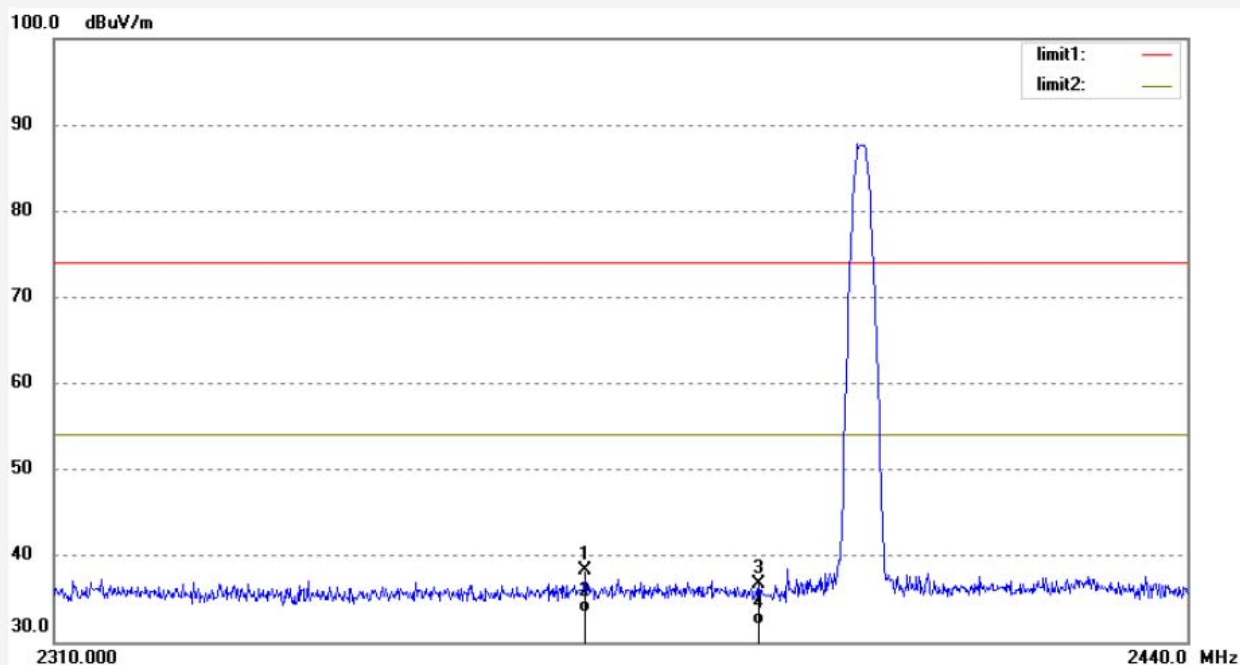
Date: 14/10/17/

Time: 11/23/37

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2370.220	46.10	-7.71	38.39	74.00	-35.61	peak			
2	2370.220	41.08	-7.71	33.37	54.00	-20.63	AVG			
3	2390.000	44.23	-7.57	36.66	74.00	-37.34	peak			
4	2390.000	39.51	-7.57	31.94	54.00	-22.06	AVG			



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Job No.: ricky #694

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz(PI/4DQPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

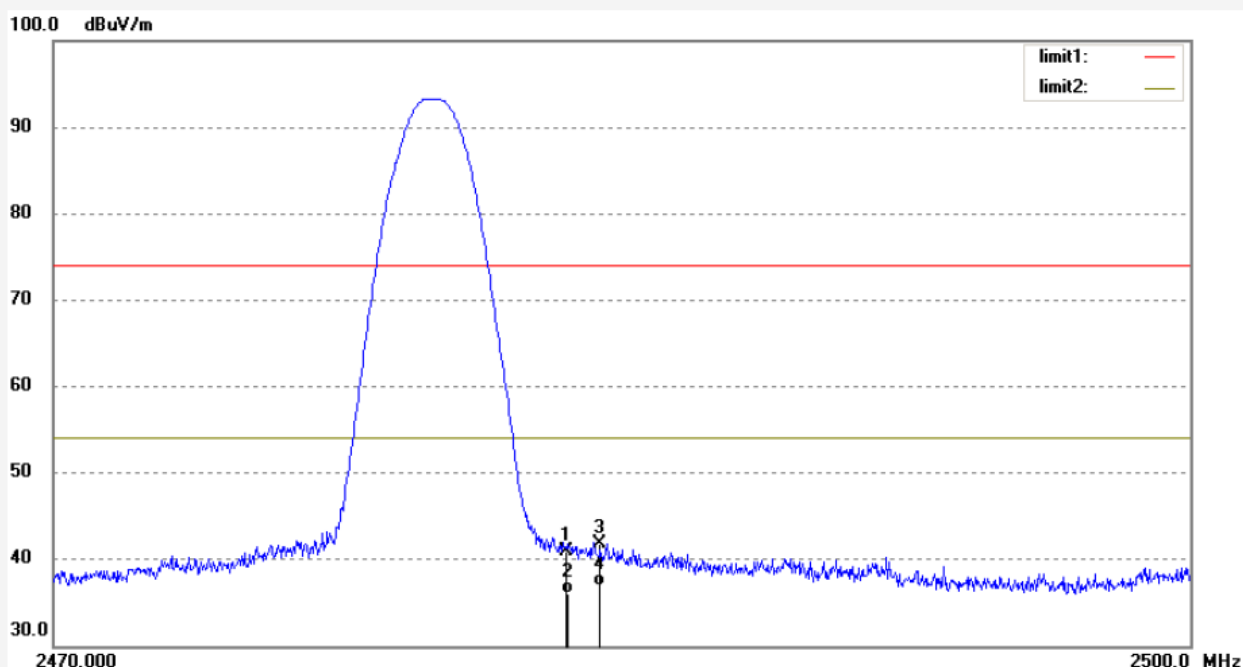
Date: 14/10/17/

Time: 11/22/15

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



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	48.28	-7.38	40.90	74.00	-33.10	peak			
2	2483.500	43.37	-7.38	35.99	54.00	-18.01	AVG			
3	2484.370	49.19	-7.39	41.80	74.00	-32.20	peak			
4	2484.370	44.23	-7.39	36.84	54.00	-17.16	AVG			

Job No.: ricky #693

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz(PI/4DQPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

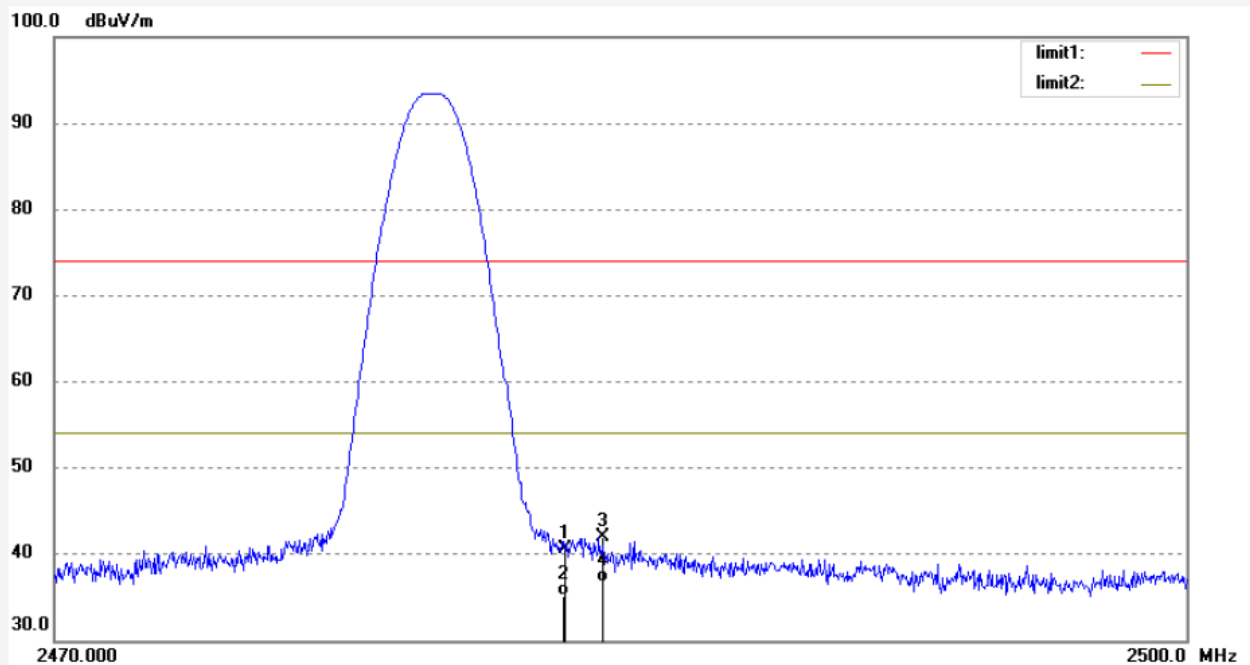
Date: 14/10/17/

Time: 11/21/21

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



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	47.94	-7.38	40.56	74.00	-33.44	peak			
2	2483.500	42.51	-7.38	35.13	54.00	-18.87	AVG			
3	2484.540	49.33	-7.39	41.94	74.00	-32.06	peak			
4	2484.540	44.08	-7.39	36.69	54.00	-17.31	AVG			

Job No.: ricky #692

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz(8DPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

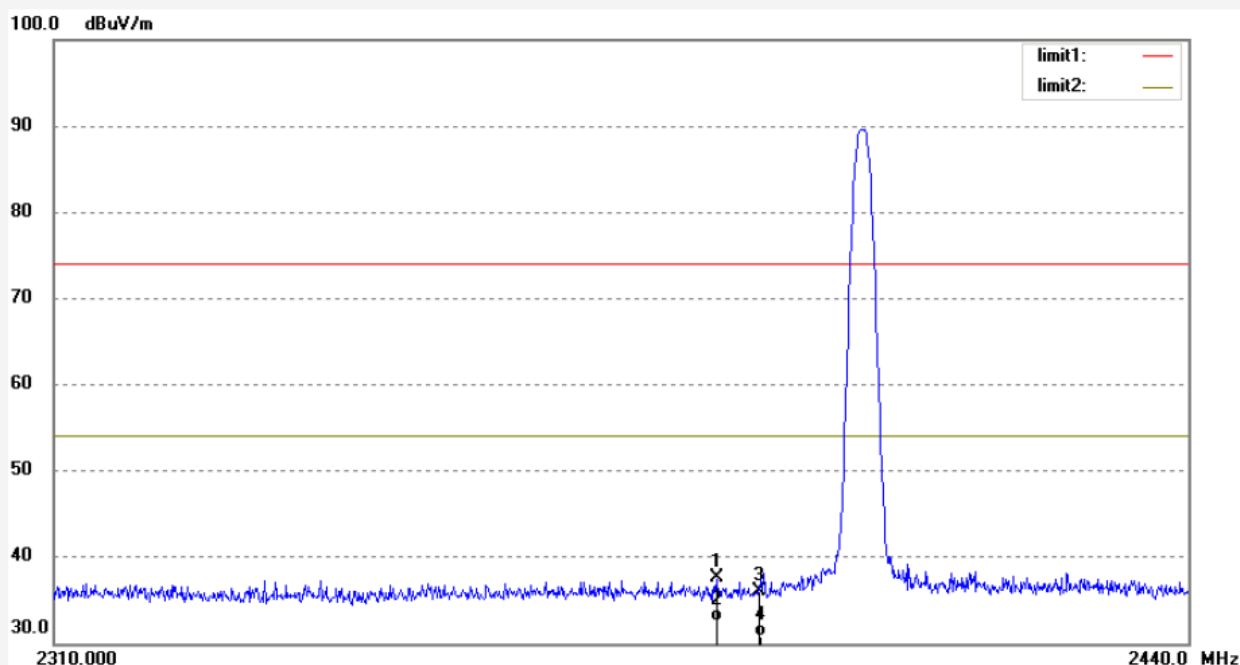
Date: 14/10/17/

Time: 11/20/30

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2385.280	45.18	-7.61	37.57	74.00	-36.43	peak			
2	2385.280	40.07	-7.61	32.46	54.00	-21.54	AVG			
3	2390.000	43.65	-7.57	36.08	74.00	-37.92	peak			
4	2390.000	38.37	-7.57	30.80	54.00	-23.20	AVG			

Job No.: ricky #691

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2402MHz(8DPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

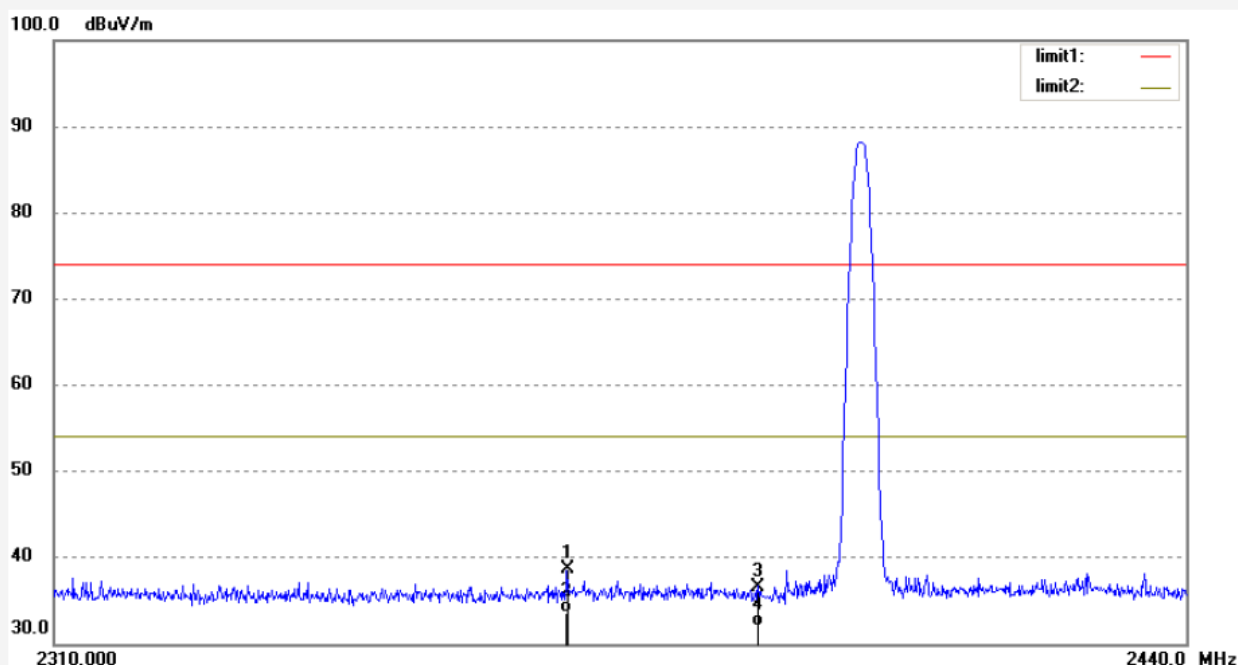
Date: 14/10/17/

Time: 11/19/30

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2368.340	46.38	-7.72	38.66	74.00	-35.34	peak			
2	2368.340	41.23	-7.72	33.51	54.00	-20.49	AVG			
3	2390.000	44.19	-7.57	36.62	74.00	-37.38	peak			
4	2390.000	39.61	-7.57	32.04	54.00	-21.96	AVG			

Job No.: ricky #690

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz(8DPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

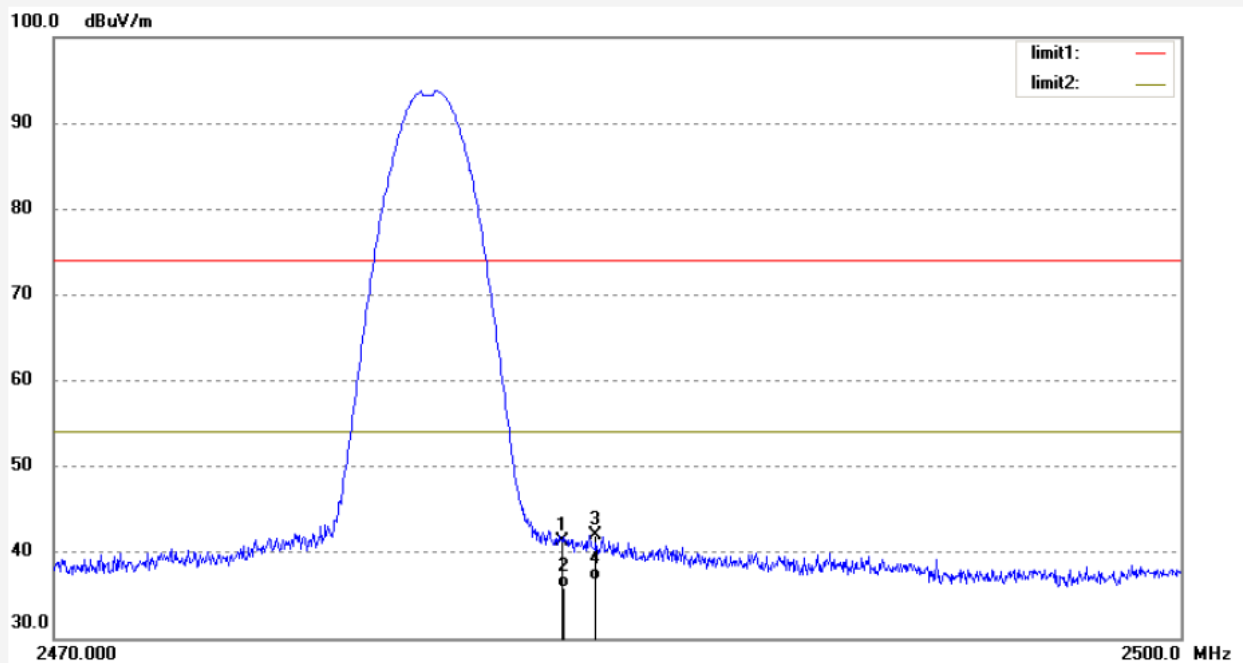
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Time: 11/18/29

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



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	48.67	-7.38	41.29	74.00	-32.71	peak			
2	2483.500	43.28	-7.38	35.90	54.00	-18.10	AVG			
3	2484.370	49.33	-7.39	41.94	74.00	-32.06	peak			
4	2484.370	44.15	-7.39	36.76	54.00	-17.24	AVG			

Job No.: ricky #689

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: TX 2480MHz(8DPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

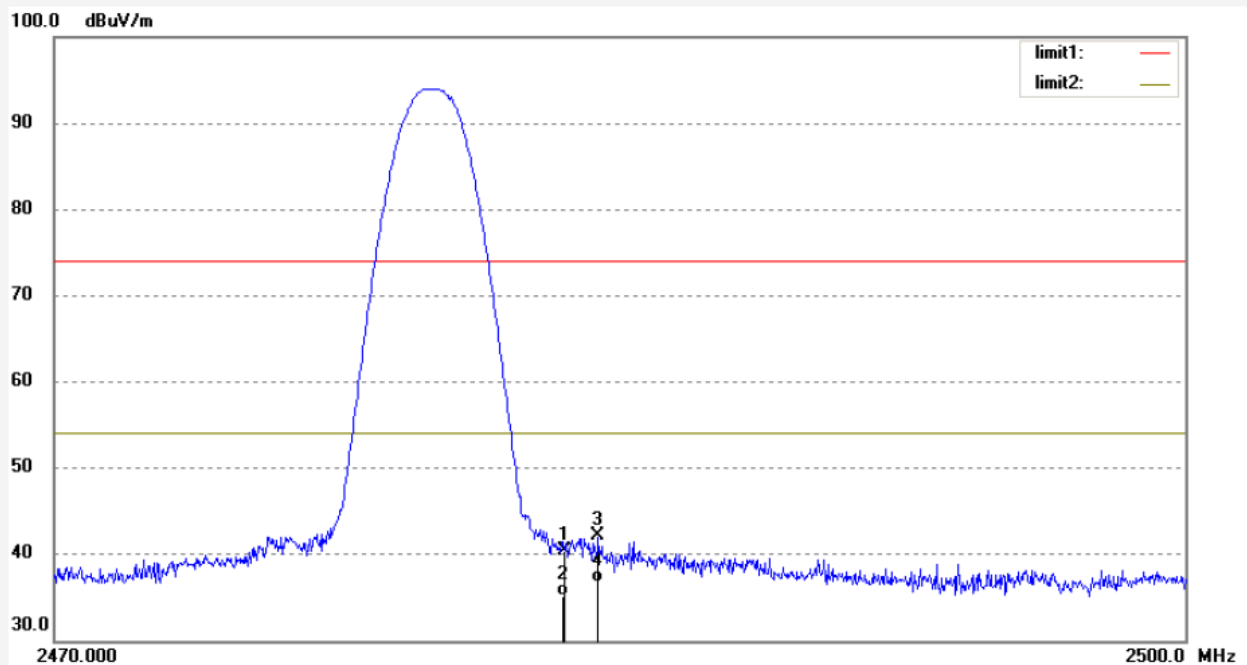
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Time: 11/17/00

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



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	47.80	-7.38	40.42	74.00	-33.58	peak			
2	2483.500	42.57	-7.38	35.19	54.00	-18.81	AVG			
3	2484.380	49.48	-7.39	42.09	74.00	-31.91	peak			
4	2484.380	44.20	-7.39	36.81	54.00	-17.19	AVG			

Hopping mode



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Job No.: ricky #683

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: HOPPING(GFSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

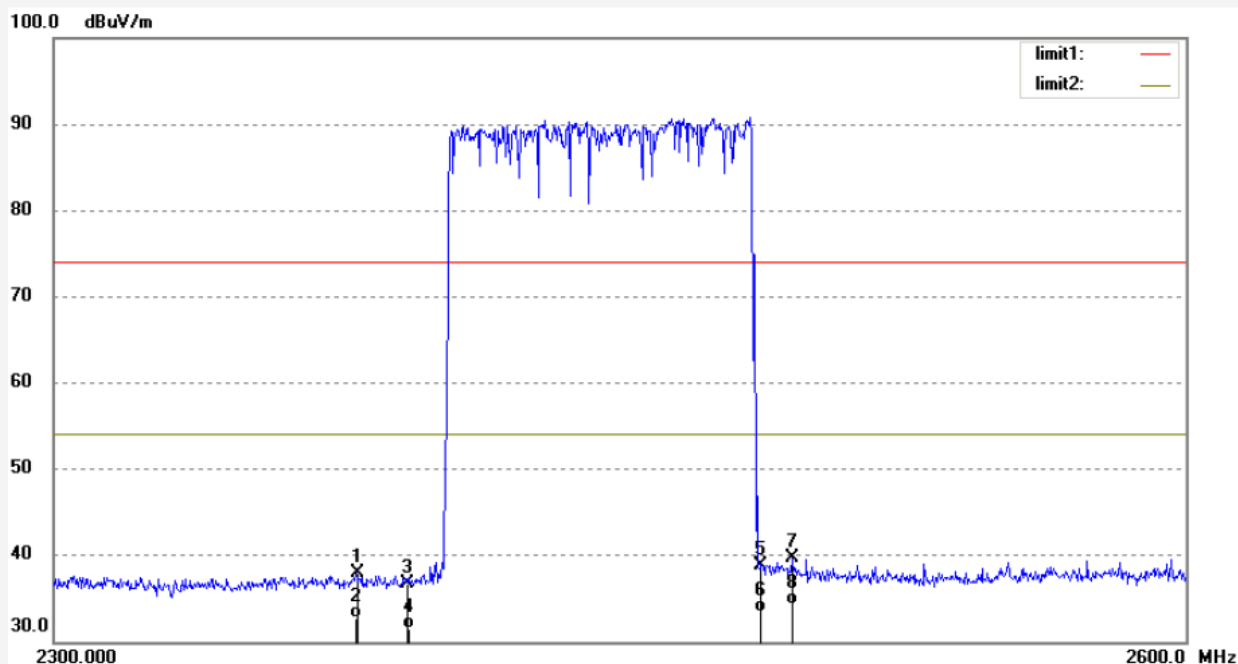
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Time: 11/11/37

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2377.100	45.61	-7.66	37.95	74.00	-36.05	peak			
2	2377.100	40.30	-7.66	32.64	54.00	-21.36	AVG			
3	2390.000	44.38	-7.57	36.81	74.00	-37.19	peak			
4	2390.000	39.13	-7.57	31.56	54.00	-22.44	AVG			
5	2483.500	46.30	-7.38	38.92	74.00	-35.08	peak			
6	2483.500	40.86	-7.38	33.48	54.00	-20.52	AVG			
7	2491.500	47.10	-7.39	39.71	74.00	-34.29	peak			
8	2491.500	41.68	-7.39	34.29	54.00	-19.71	AVG			

Job No.: ricky #684

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: HOPPING(GFSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

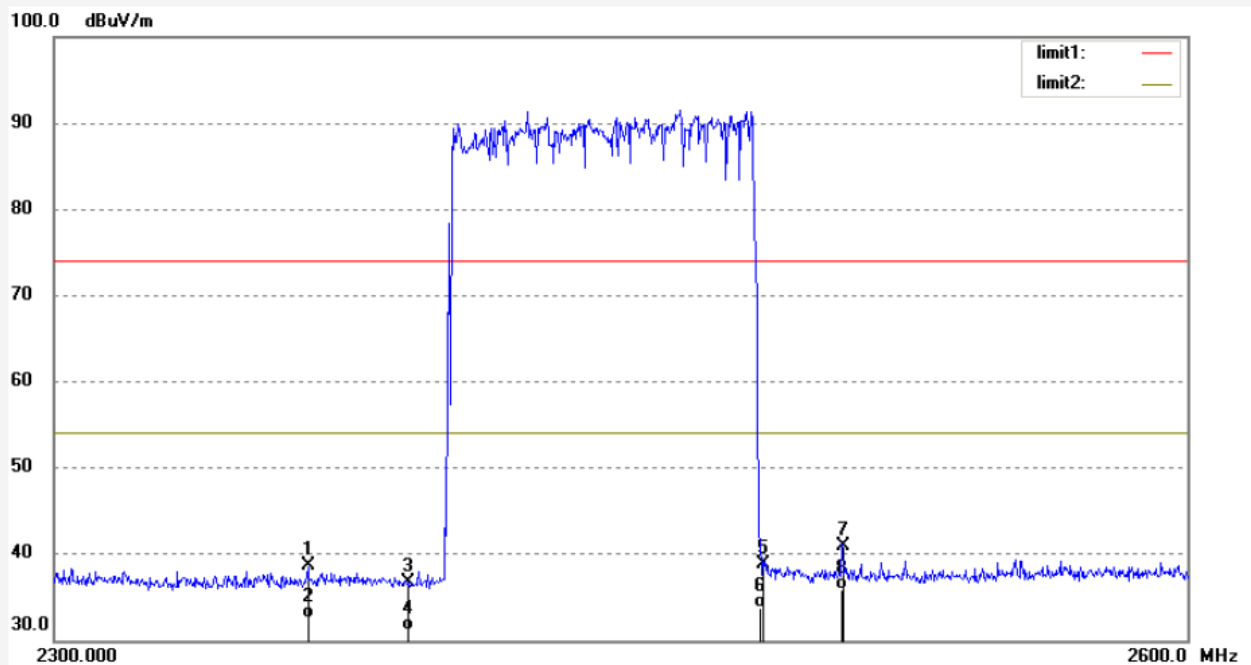
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Time: 11/12/50

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2364.500	46.35	-7.74	38.61	74.00	-35.39	peak			
2	2364.500	40.21	-7.74	32.47	54.00	-21.53	AVG			
3	2390.000	44.38	-7.57	36.81	74.00	-37.19	peak			
4	2390.000	38.70	-7.57	31.13	54.00	-22.87	AVG			
5	2483.500	46.19	-7.38	38.81	74.00	-35.19	peak			
6	2483.500	41.09	-7.38	33.71	54.00	-20.29	AVG			
7	2505.200	48.23	-7.37	40.86	74.00	-33.14	peak			
8	2505.200	43.21	-7.37	35.84	54.00	-18.16	AVG			

Job No.: ricky #685

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: HOPPING(PI/4DQPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

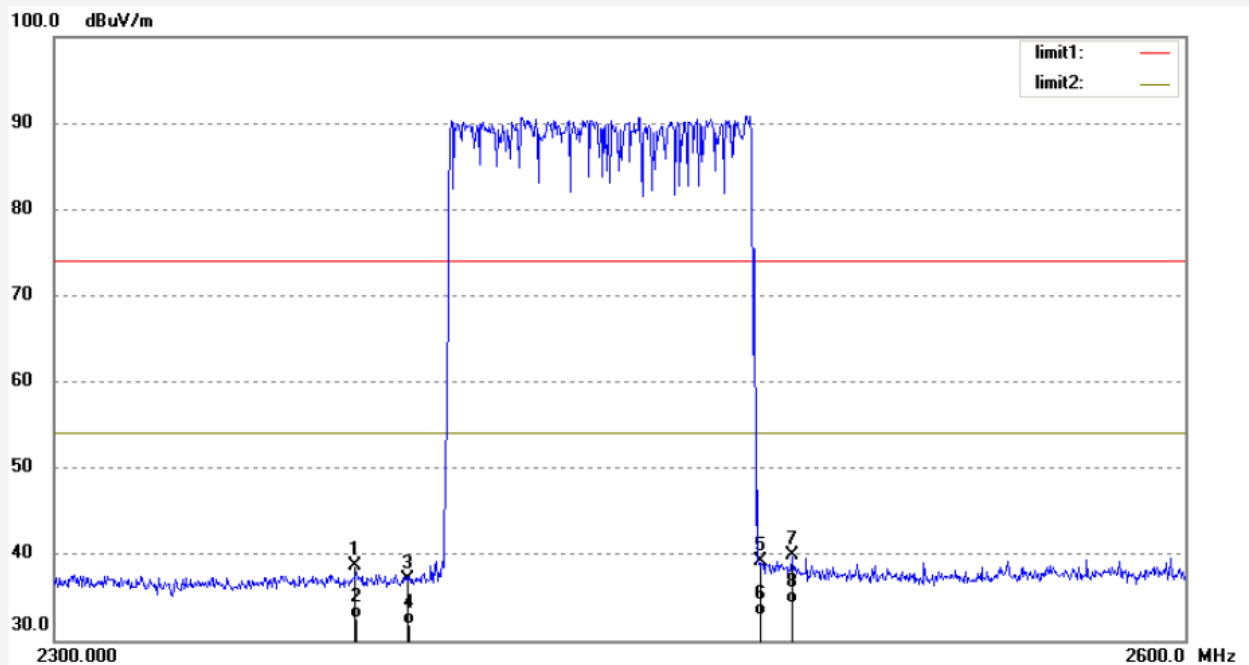
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Time: 11/13/32

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2376.500	46.35	-7.66	38.69	74.00	-35.31	peak			
2	2376.500	40.23	-7.66	32.57	54.00	-21.43	AVG			
3	2390.000	44.72	-7.57	37.15	74.00	-36.85	peak			
4	2390.000	39.37	-7.57	31.80	54.00	-22.20	AVG			
5	2483.500	46.51	-7.38	39.13	74.00	-34.87	peak			
6	2483.500	40.28	-7.38	32.90	54.00	-21.10	AVG			
7	2491.200	47.33	-7.38	39.95	74.00	-34.05	peak			
8	2491.200	41.61	-7.38	34.23	54.00	-19.77	AVG			

Job No.: ricky #686

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: HOPPING(PI/4DQPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

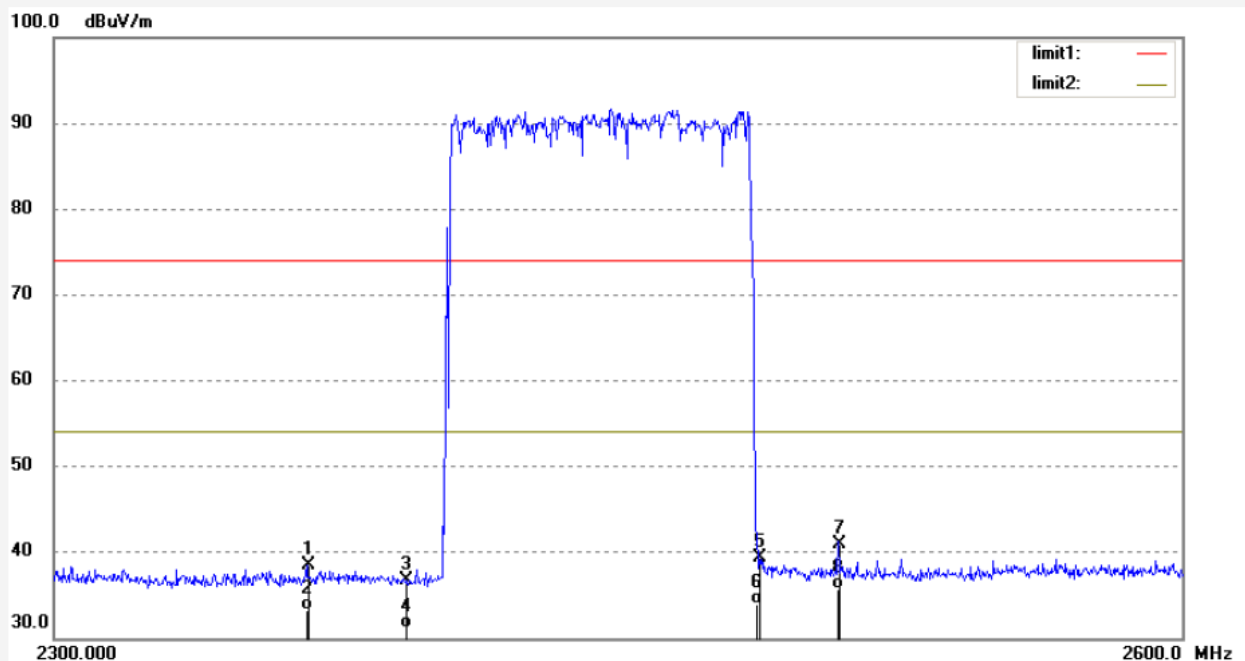
Date: 14/10/17/

Time: 11/14/28

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2364.600	46.28	-7.74	38.54	74.00	-35.46	peak			
2	2364.600	40.92	-7.74	33.18	54.00	-20.82	AVG			
3	2390.000	44.31	-7.57	36.74	74.00	-37.26	peak			
4	2390.000	38.72	-7.57	31.15	54.00	-22.85	AVG			
5	2483.500	46.67	-7.38	39.29	74.00	-34.71	peak			
6	2483.500	41.30	-7.38	33.92	54.00	-20.08	AVG			
7	2505.300	48.33	-7.37	40.96	74.00	-33.04	peak			
8	2505.300	42.99	-7.37	35.62	54.00	-18.38	AVG			

Job No.: ricky #687

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: HOPPING(8DPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Horizontal

Power Source: DC 4.5V

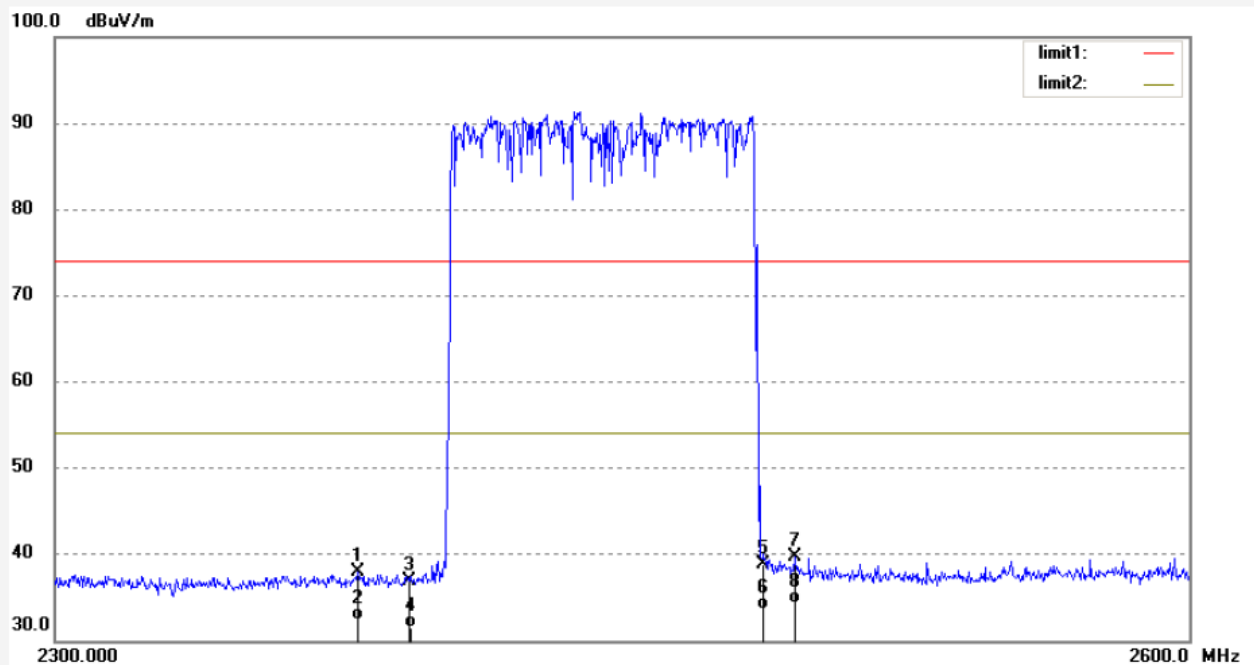
Date: 14/10/17/

Time: 11/15/25

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2376.610	45.58	-7.66	37.92	74.00	-36.08	peak			
2	2376.610	40.01	-7.66	32.35	54.00	-21.65	AVG			
3	2390.000	44.51	-7.57	36.94	74.00	-37.06	peak			
4	2390.000	39.14	-7.57	31.57	54.00	-22.43	AVG			
5	2483.500	46.19	-7.38	38.81	74.00	-35.19	peak			
6	2483.500	41.00	-7.38	33.62	54.00	-20.38	AVG			
7	2492.120	47.11	-7.39	39.72	74.00	-34.28	peak			
8	2492.120	41.62	-7.39	34.23	54.00	-19.77	AVG			

Job No.: ricky #688

Standard: FCC PK

Test item: Radiation Test

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

EUT: AM/FM Radio Headset with BT and Aux-in Jack

Mode: HOPPING(8DPSK)

Model: HP-52RBJ

Manufacturer: Specialthing

Polarization: Vertical

Power Source: DC 4.5V

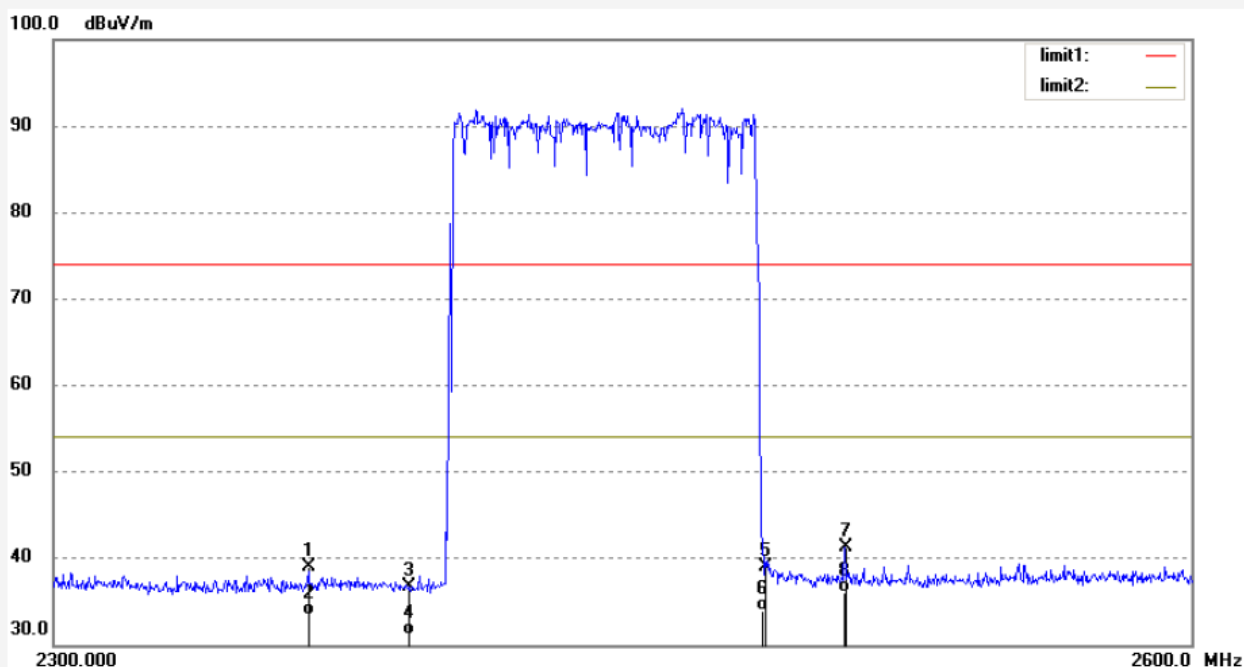
Date: 14/10/17/

Time: 11/16/52

Engineer Signature:Ricky

Distance: 3m

Note: Report No:ATE20142007



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2364.400	46.68	-7.74	38.94	74.00	-35.06	peak			
2	2364.400	41.11	-7.74	33.37	54.00	-20.63	AVG			
3	2390.000	44.33	-7.57	36.76	74.00	-37.24	peak			
4	2390.000	38.72	-7.57	31.15	54.00	-22.85	AVG			
5	2483.500	46.38	-7.38	39.00	74.00	-35.00	peak			
6	2483.500	41.23	-7.38	33.85	54.00	-20.15	AVG			
7	2505.120	48.61	-7.37	41.24	74.00	-32.76	peak			
8	2505.120	43.35	-7.37	35.98	54.00	-18.02	AVG			

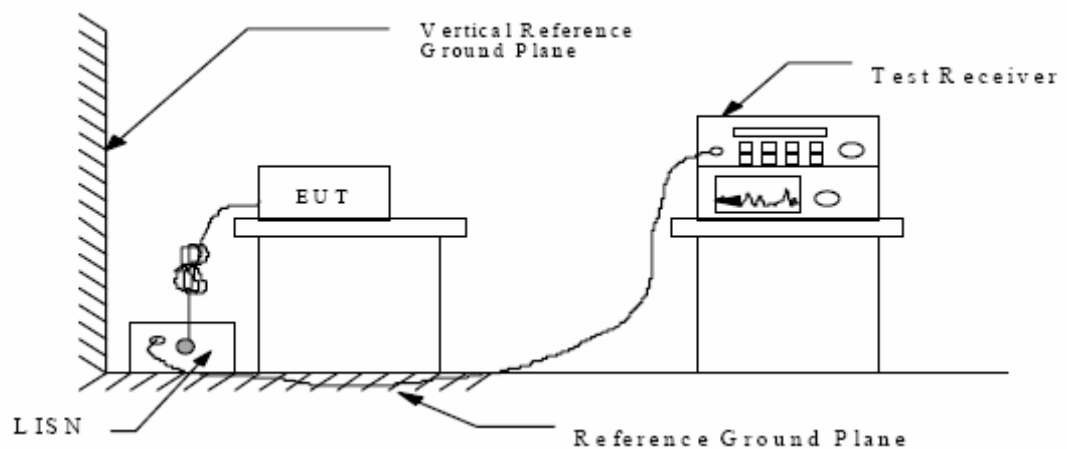
12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

15 SECTION 15.207(A)

12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators

12.1.2.Shielding Room Test Setup Diagram



(EUT: AM/FM Radio Headset with BT and Aux-in Jack)

12.2.The Emission Limit

12.2.1.Conducted Emission Measurement Limits According to Section 15.207(a)

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

* Decreases with the logarithm of the frequency.

12.3.Configuration of EUT on Measurement

The equipment are installed on the Conducted 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 11.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in TX (Operation) mode 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 C63.4- 2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

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

12.6.Power Line Conducted Emission Measurement Results

Not applicant to this device, because the device is power by battery.

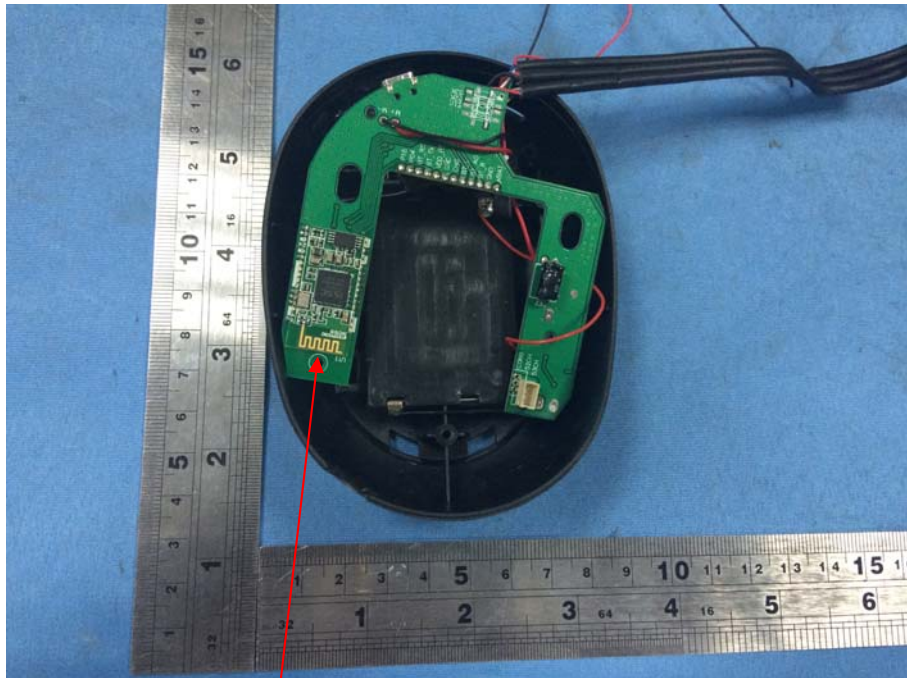
13.ANTENNA REQUIREMENT

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

The antenna is PCB antenna, no consideration of replacement. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna