

APPLICATION CERTIFICATION FCC Part 15C&RSS-247
On Behalf of
Edifier International Limited

Active Noise Cancelling Bluetooth Stereo Headphones

Model No.: W828NB

FCC ID: Z9G-EDF78

IC: 10004A-EDF78

Prepared for : Edifier International Limited
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Report No. : ATE20181718
Date of Test : Sep. 04, 2018--Sep. 18, 2018
Date of Report : Sep. 19, 2018

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Test Report Certification

Applicant : Edifier International Limited
Address : P.O. Box 6264 General Post Office Hong Kong
Product : Active Noise Cancelling Bluetooth Stereo Headphones
Model No. : W828NB
Trade name : EDIFIER

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247

ANSI C63.10: 2013

RSS-247 Issue 2 February 2017

RSS-Gen Issue 5 April 2018

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 and RSS-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 : Sep. 04, 2018--Sep. 18, 2018

Date of Report: Sep. 19, 2018

Prepared by :

Tim Zhang

(Tim Zhang, Engineer)

Approved &
Authorized Signer :

Sean Liu
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	Active Noise Cancelling Bluetooth Stereo Headphones
Model Number	:	W828NB
Rating	:	DC 3.7V (Powered by Lithium battery) or DC 5V (Powered by USB port)
HVIN	:	W828NB
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	2.59dBi
Antenna type	:	Integral Antenna
Trade Name	:	EDIFIER
Modulation mode	:	GFSK, $\pi/4$ DQPSK, 8DPSK
Applicant	:	Edifier International Limited
Address	:	P.O. Box 6264 General Post Office Hong Kong
Date of sample received	:	Sep. 03, 2018
Date of Test	:	Sep. 04, 2018--Sep. 18, 2018

1.2. Accessory and Auxiliary Equipment

1. Iphone6S PLUS
Manufacturer: Apple
Model: ML6D2 CH/A
S/N: C35QJ76JGRWM

2. Notebook PC
Manufacturer: Lenovo
M/N: ThinkPad X240
S/N: n.a

1.3. Description of Test Facility

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

1.4. Measurement Uncertainty

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

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 06, 2018	Jan. 05, 2019
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 06, 2018	Jan. 05, 2019
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 06, 2018	Jan. 05, 2019
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 06, 2018	Jan. 05, 2019
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 06, 2018	Jan. 05, 2019
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	Jan. 05, 2019
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	Jan. 05, 2019
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	Jan. 05, 2019
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	Jan. 05, 2019
Open Switch and Control Unit	Rohde&Schwarz	OSP120 + OSP-B157	101244 + 100866	Jan. 06, 2018	Jan. 05, 2019
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 06, 2018	Jan. 05, 2019
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	Jan. 05, 2019
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 06, 2018	Jan. 05, 2019
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 06, 2018	Jan. 05, 2019

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

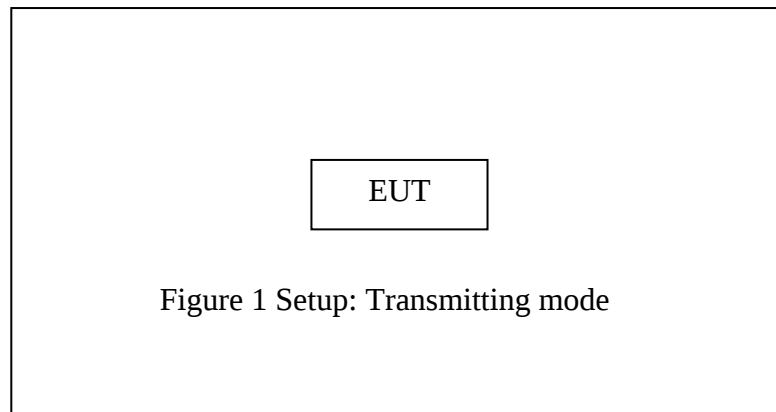


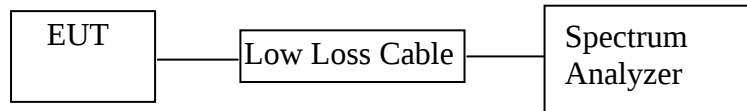
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC&IC Rules	Description of Test	Result
Section 15.207 RSS-Gen Section 8.8	AC Power Line Conducted Emission Test	Compliant
Section 15.247(a)(1) RSS-247 A5.1	20dB Bandwidth Test	Compliant
Section 15.247(a)(1) RSS-247 A5.1	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii) RSS-247 A5.1	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii) RSS-247 A5.1	Dwell Time Test	Compliant
Section 15.247(b)(1) RSS-247 A5.4	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209 RSS-247 A5.5 RSS-Gen 6.13	Radiated Emission Test	Compliant
RSS-Gen Section 6.7	99% Occupied Bandwidth	Compliant
Section 15.247(d) RSS-247 A5.5	Band Edge Compliance Test	Compliant
Section RSS-247	Conducted Spurious Emission Test	Compliant
Section 15.203 RSS-Gen 6.8	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



(EUT: Active Noise Cancelling Bluetooth Stereo Headphones)

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. The Requirement For RSS-247 Section 5.1

RSS-247 Section 5.1(a): The bandwidth of a frequency hopping channel is the 20dB emission bandwidth, measured with the hopping stopped. The system's radio frequency (RF) bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. 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.

5.4. 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.

5.5. Operating Condition of EUT

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

5.5.2. Turn on the power of all equipment.

5.5.3. 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.

5.6.Test Procedure

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

5.6.2.The RBW should be 1%~5% of OBW.

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

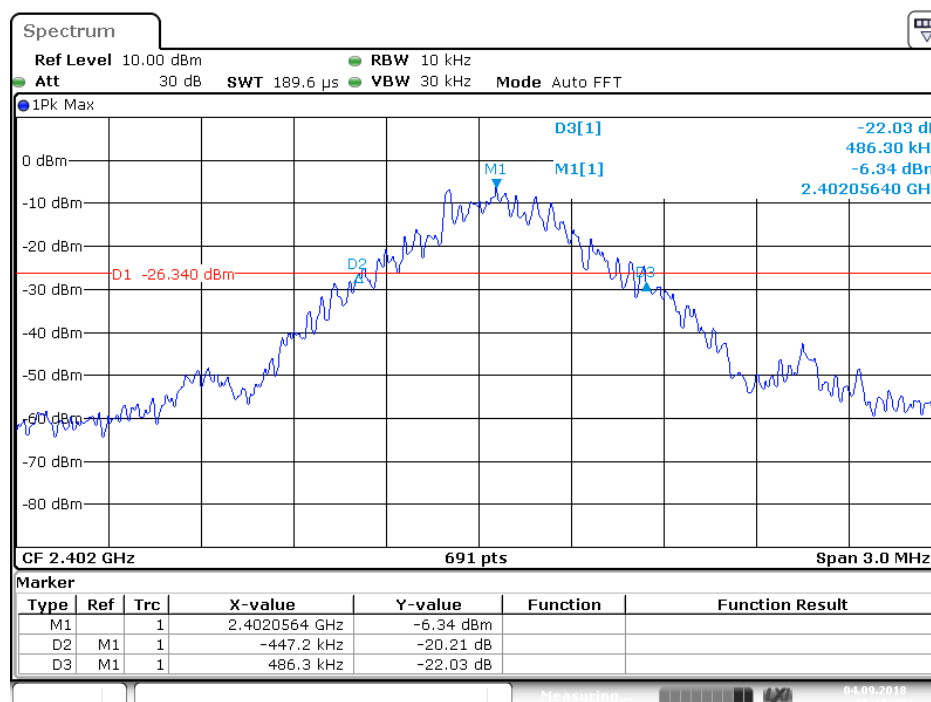
5.7.Test Result

Channel	Frequency (MHz)	BDR mode 20dB Bandwidth (MHz)	EDR mode 20dB Bandwidth (MHz)	Result
Low	2402	0.9335	1.2113	Pass
Middle	2441	0.9422	1.2330	Pass
High	2480	0.9422	1.2373	Pass

The spectrum analyzer plots are attached as below.

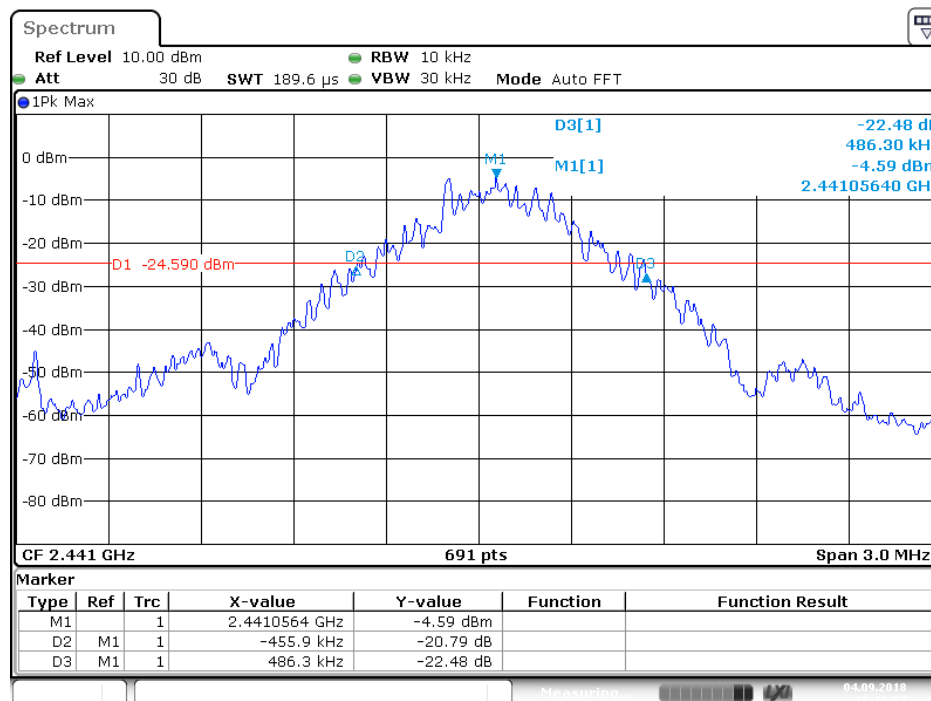
BDR Mode

Low channel



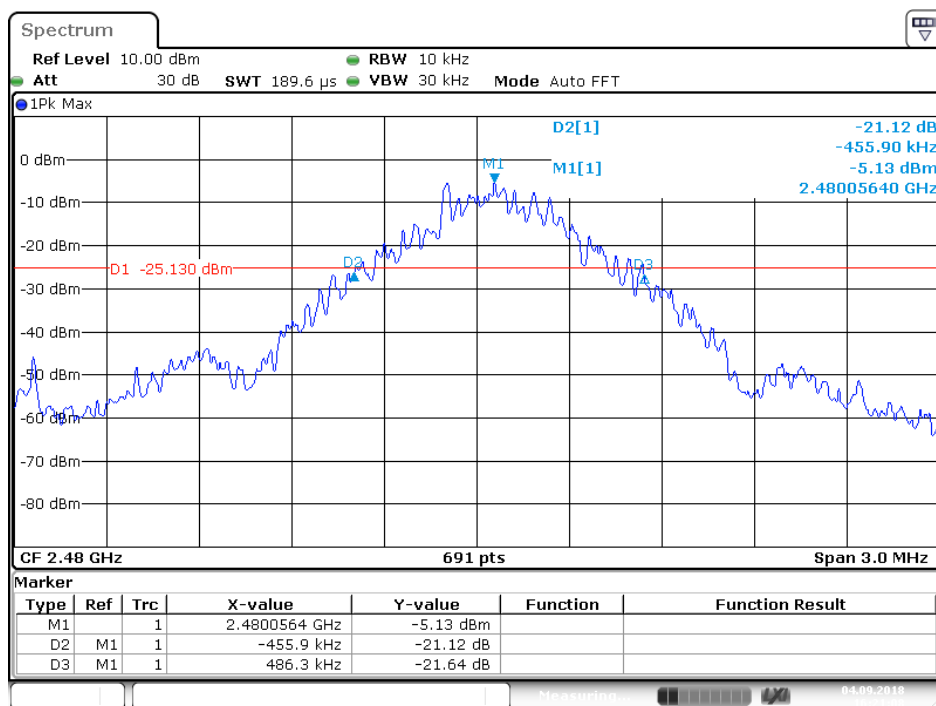
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Middle channel



Date: 4.SEP.2018 16:19:57

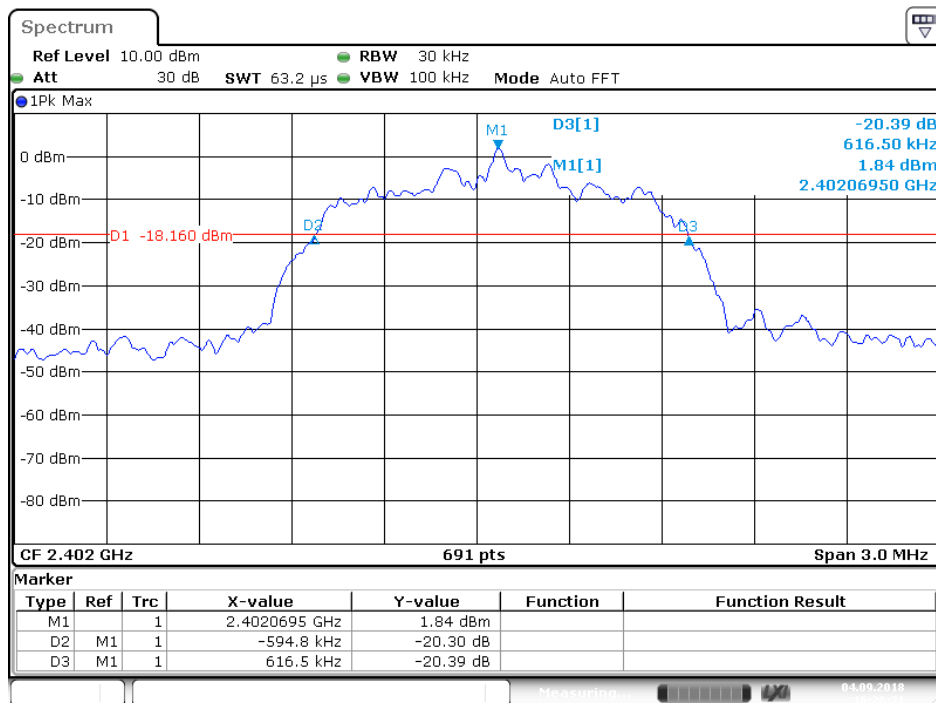
High channel



Date: 4.SEP.2018 16:21:08

EDR Mode

Low channel



Date: 4.SEP.2018 16:26:21

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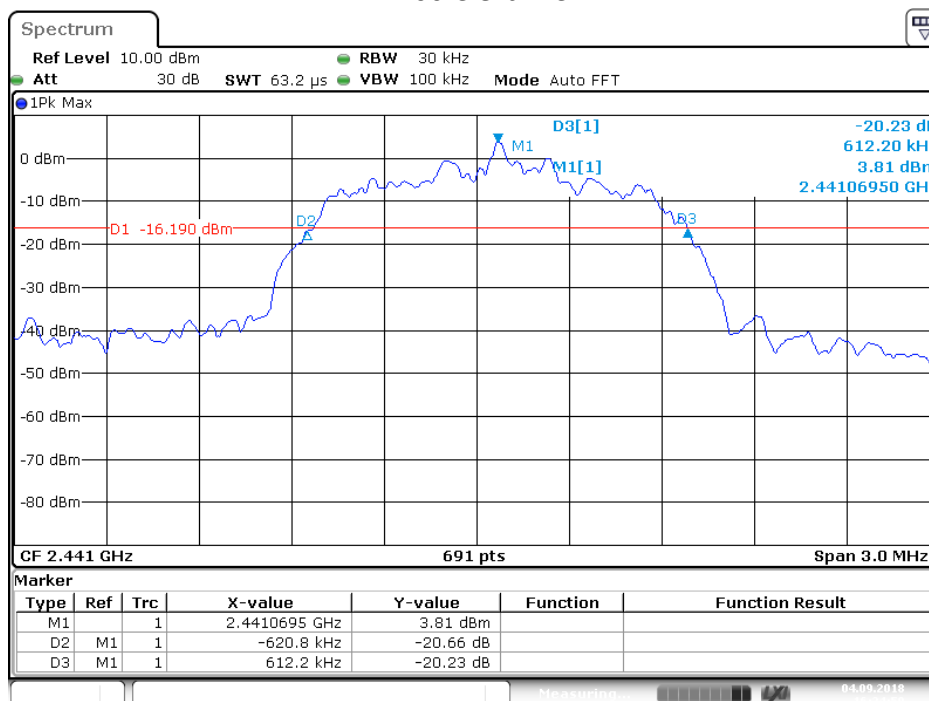
Tel: +86-755-26503290

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E-mail: webmaster@atc-lab.com

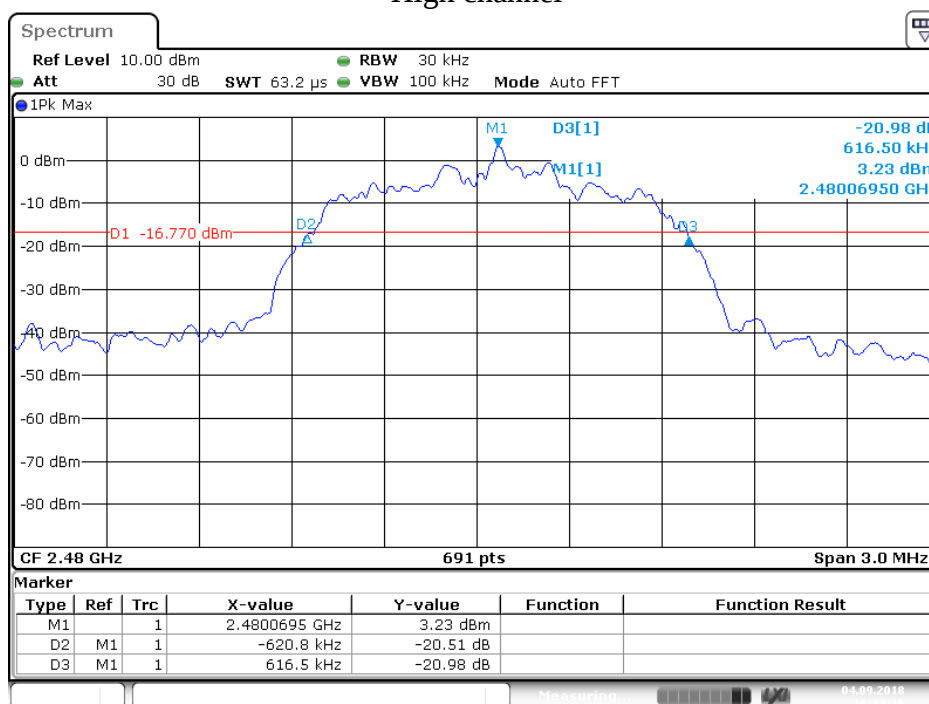
Http://www.atc-lab.com

Middle channel



Date: 4.SEP.2018 16:24:51

High channel



Date: 4.SEP.2018 16:23:16

6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: Active Noise Cancelling Bluetooth Stereo Headphones)

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. The Requirement For RSS-247 Section 5.1(b)

RSS-247 Section 5.1(b): FHSS 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, FHSs operating in the band 2400-2483.5 MHz 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

6.4. 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.

6.5.Operating Condition of EUT

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

6.5.2.Turn on the power of all equipment.

6.5.3.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.

6.6.Test Procedure

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

6.6.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz. Adjust Span to 3MHz.

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

6.6.4.Measurement the channel separation

6.7.Test Result

BDR mode

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0029	25KHz or 20dB bandwidth	PASS
	2403			
Middle	2440	1.0029	25KHz or 20dB bandwidth	PASS
	2441			
High	2479	1.0029	25KHz or 20dB bandwidth	PASS
	2480			

EDR mode

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0029	25KHz or 20dB bandwidth	PASS
	2403			
Middle	2440	1.0029	25KHz or 20dB bandwidth	PASS
	2441			
High	2479	1.0029	25KHz or 20dB bandwidth	PASS
	2480			

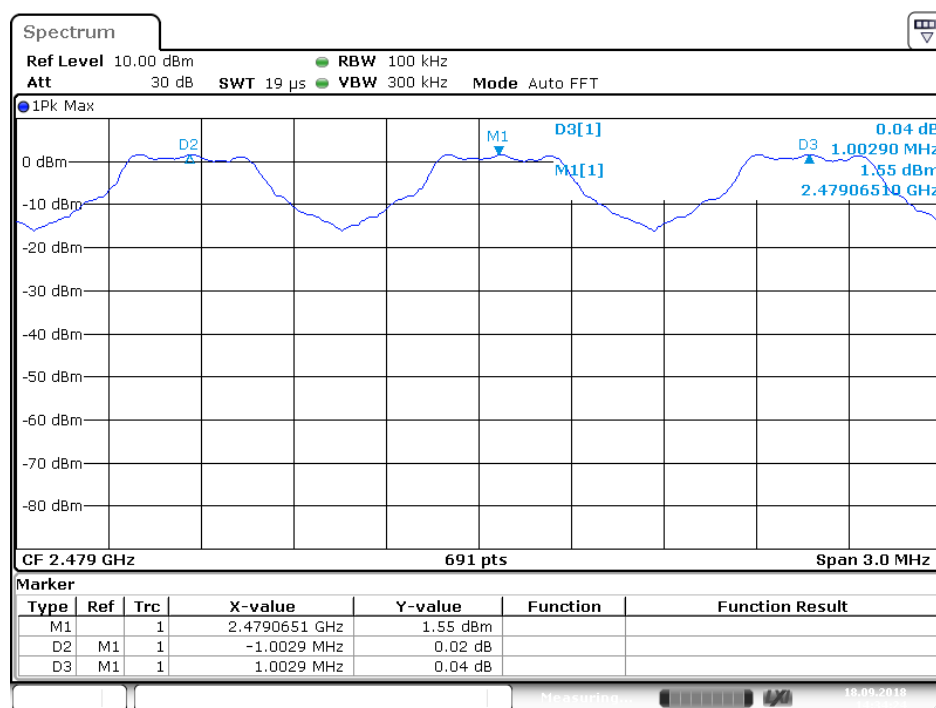
Low channel

Date: 18.SEP.2018 14:32:25

Middle channel

Date: 18.SEP.2018 14:33:34

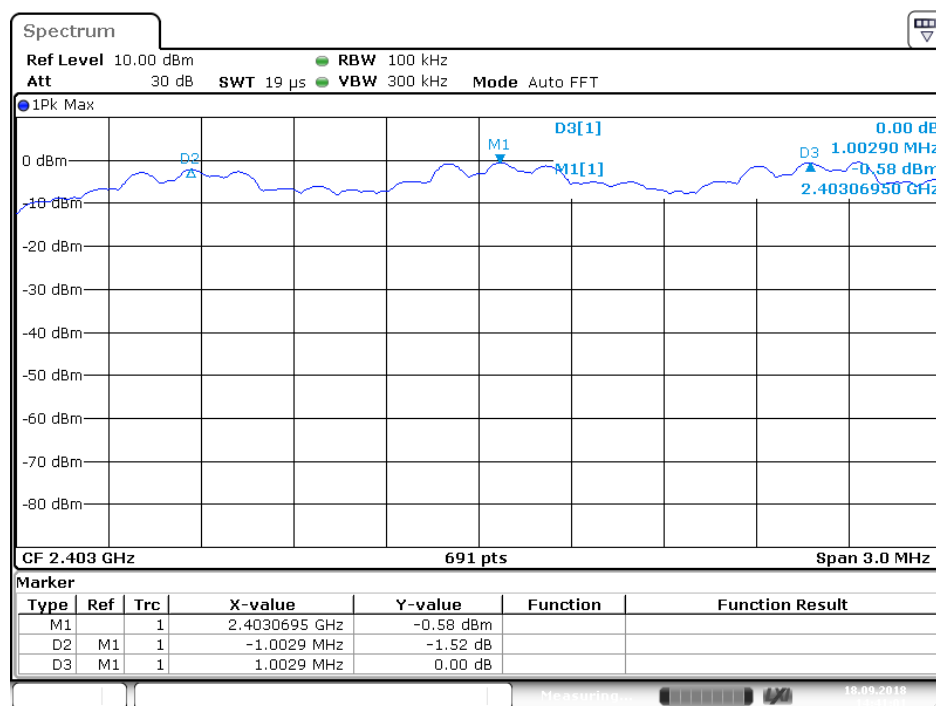
High channel



Date: 18.SEP.2018 14:34:25

EDR Mode

Low channel



Date: 18.SEP.2018 14:41:01

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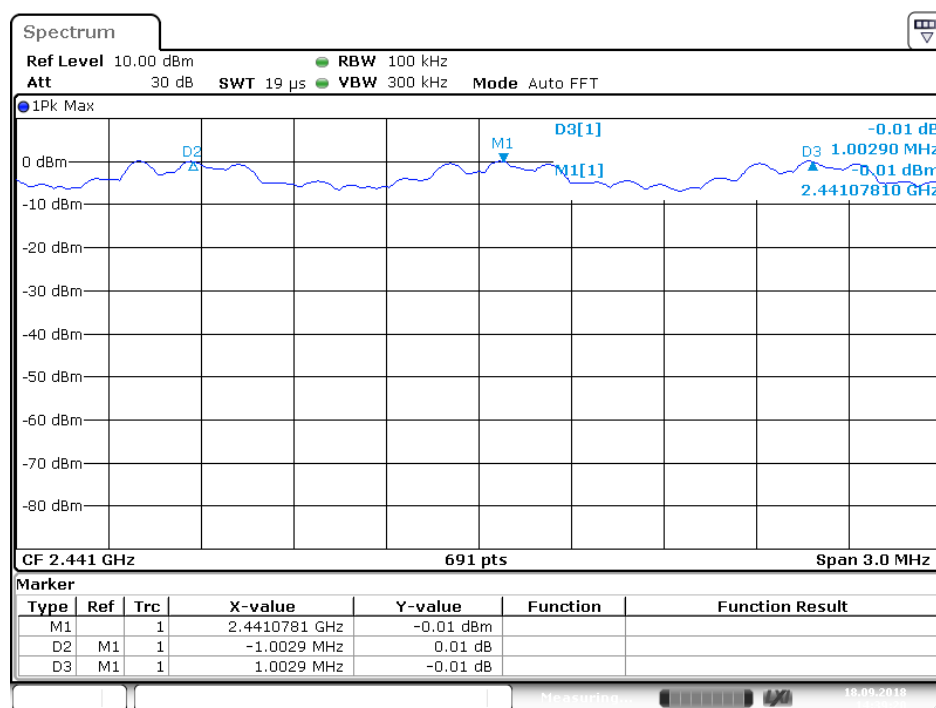
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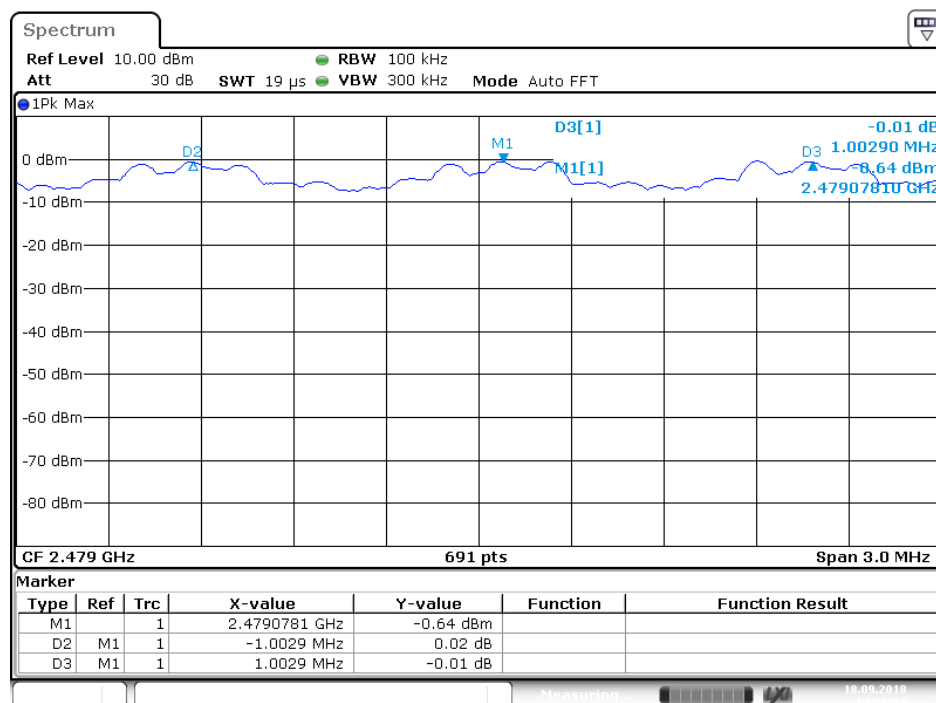
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Middle channel



Date: 18.SEP.2018 14:39:21

High channel



Date: 18.SEP.2018 14:38:15

7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: Active Noise Cancelling Bluetooth Stereo Headphones)

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. The Requirement For RSS-247 Section 5.1(d)

RSS-247 Section 5.1(d): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.4. 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.

7.5. Operating Condition of EUT

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

7.5.2. Turn on the power of all equipment.

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

7.6.Test Procedure

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

7.6.2.Set the spectrum analyzer as Span=90MHz, RBW=100 kHz, VBW=300 kHz.

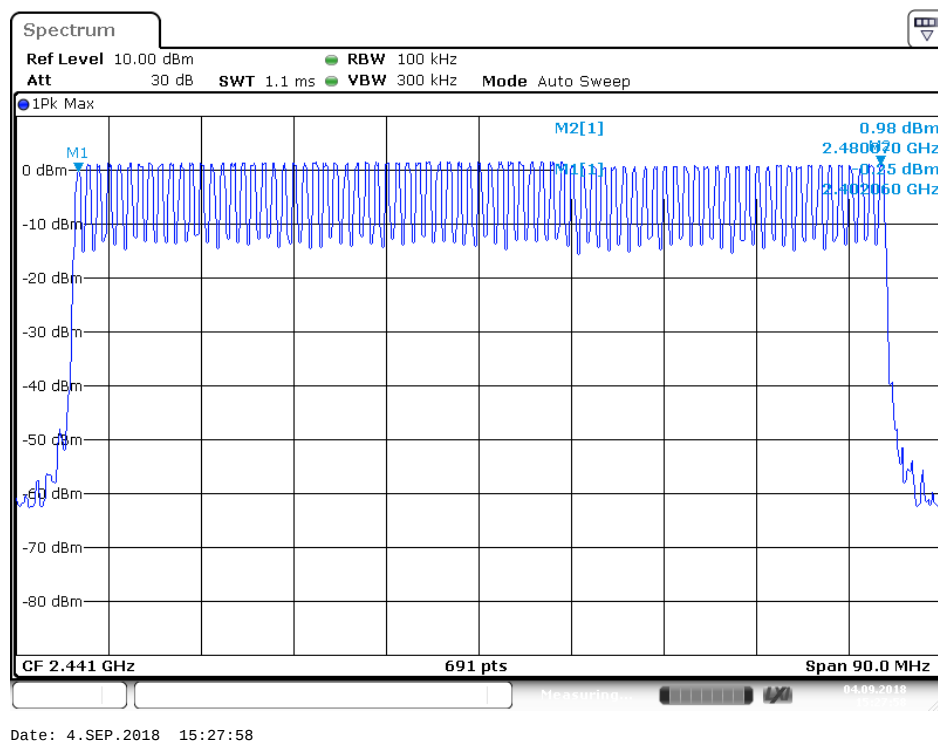
7.6.3.Max hold, view and count how many channel in the band.

7.7.Test Result

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

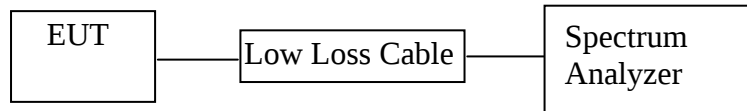
The spectrum analyzer plots are attached as below.

Number of hopping channels(GFSK)



8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: Active Noise Cancelling Bluetooth Stereo Headphones)

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. The Requirement For Section RSS-247 Section 5.1(d)

RSS-247 Section 5.1(d): 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.

8.4. 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.

8.5. Operating Condition of EUT

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

8.5.2. Turn on the power of all equipment.

8.5.3. 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.

8.6. Test Procedure

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

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

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

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

8.7. Test Result

BDR Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.44203	141.450	400
	2441	0.44203	141.450	400
	2480	0.44203	141.450	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	1.7246	275.936	400
	2441	1.7101	273.616	400
	2480	1.7246	275.936	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	2.9783	317.685	400
	2441	2.9783	317.685	400
	2480	2.9783	317.685	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

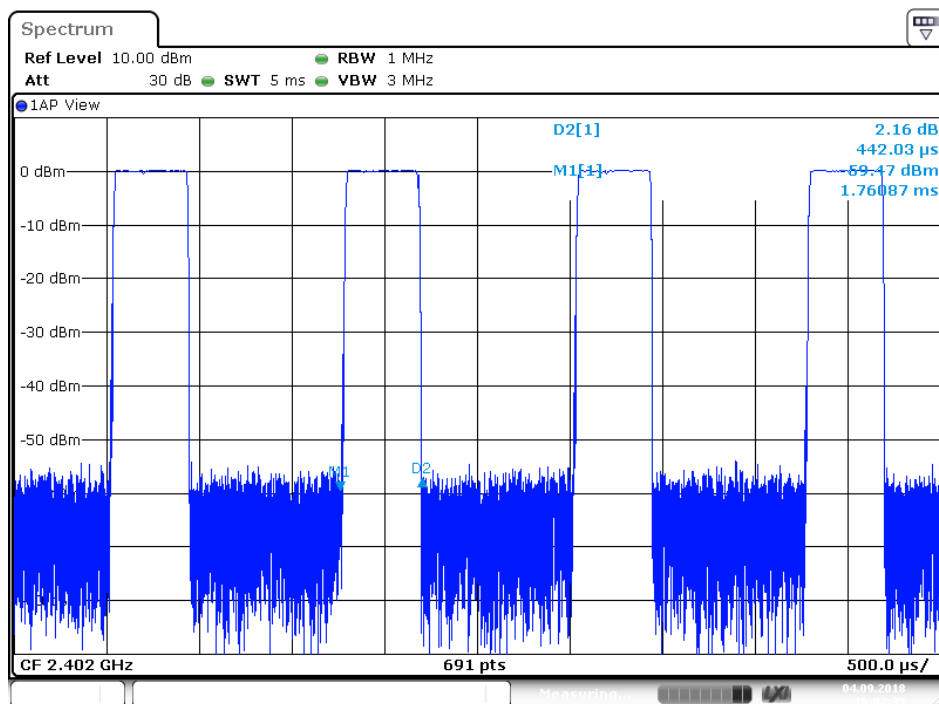
EDR Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
3DH1	2402	0.45652	146.086	400
	2441	0.45652	146.086	400
	2480	0.45652	146.086	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
3DH3	2402	1.7246	275.936	400
	2441	1.7246	275.936	400
	2480	1.7101	273.616	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
3DH5	2402	3.0000	320.000	400
	2441	3.0000	320.000	400
	2480	2.9783	317.685	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.

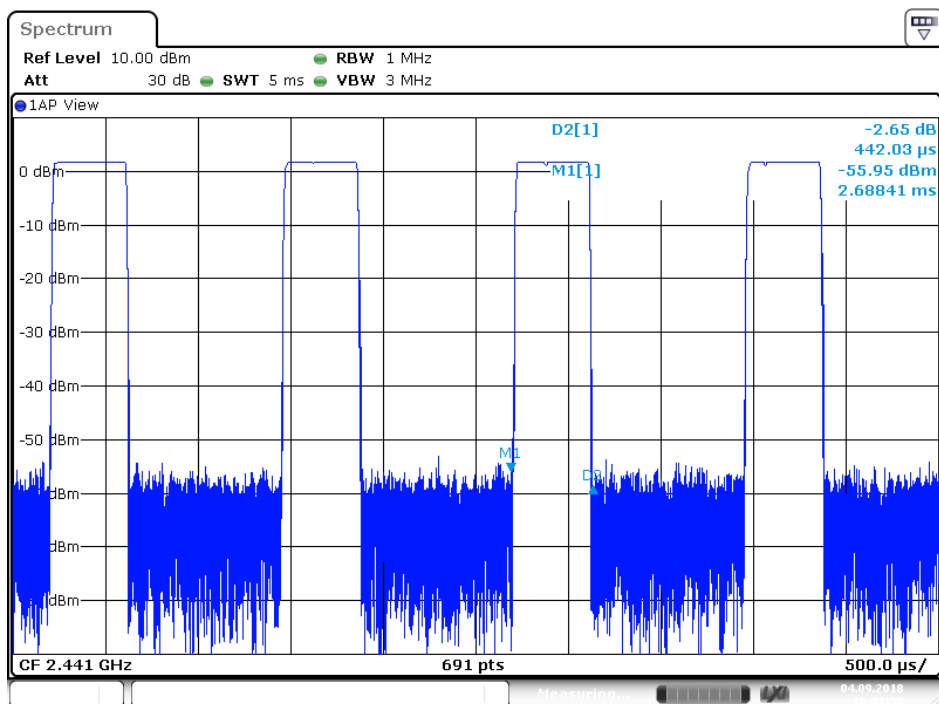
BDR Mode

DH1 Low channel



Date: 4.SEP.2018 16:02:35

DH1 Middle channel



Date: 4.SEP.2018 16:01:58

shenzhen Accurate Technology Co., Ltd.

Address: 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

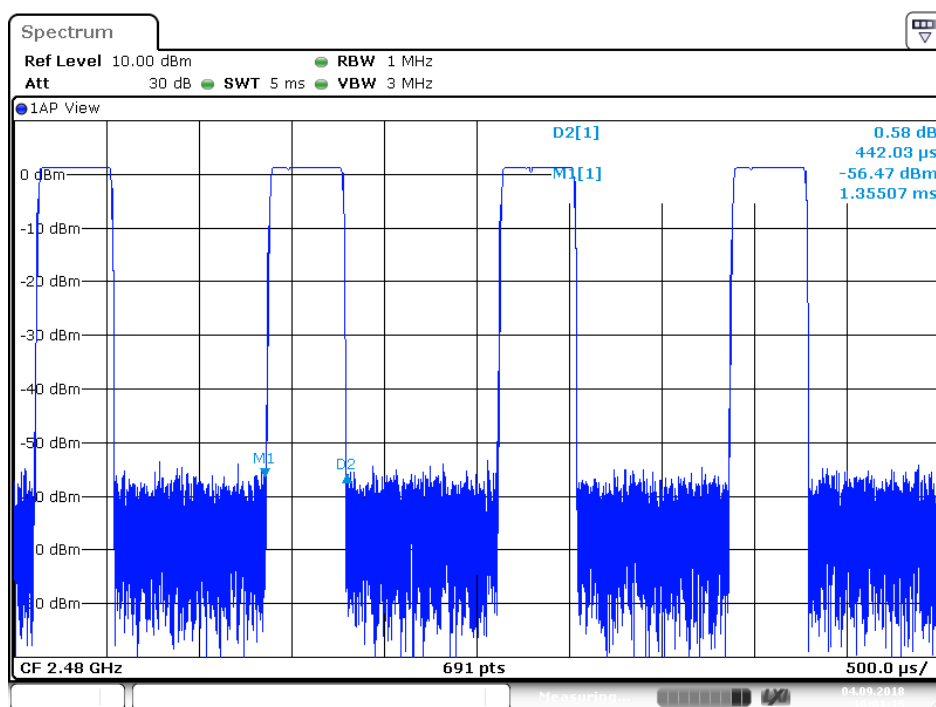
Tel: +86-755-26503290

Fax: +86-755-26503396

E-mail: webmaster@atc-lab.com

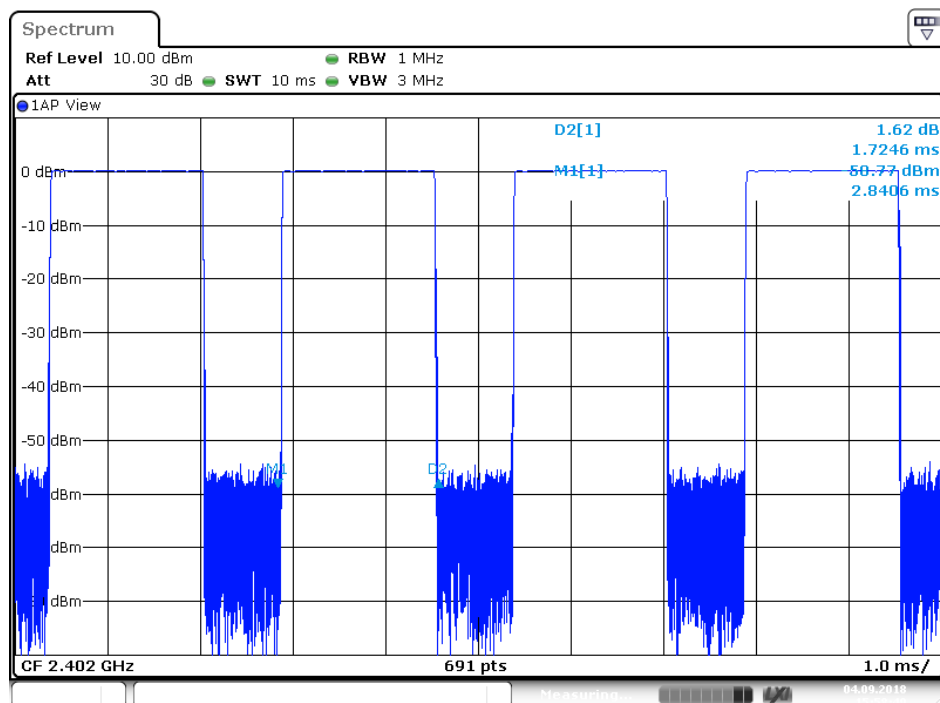
Http://www.atc-lab.com

DH1 High channel



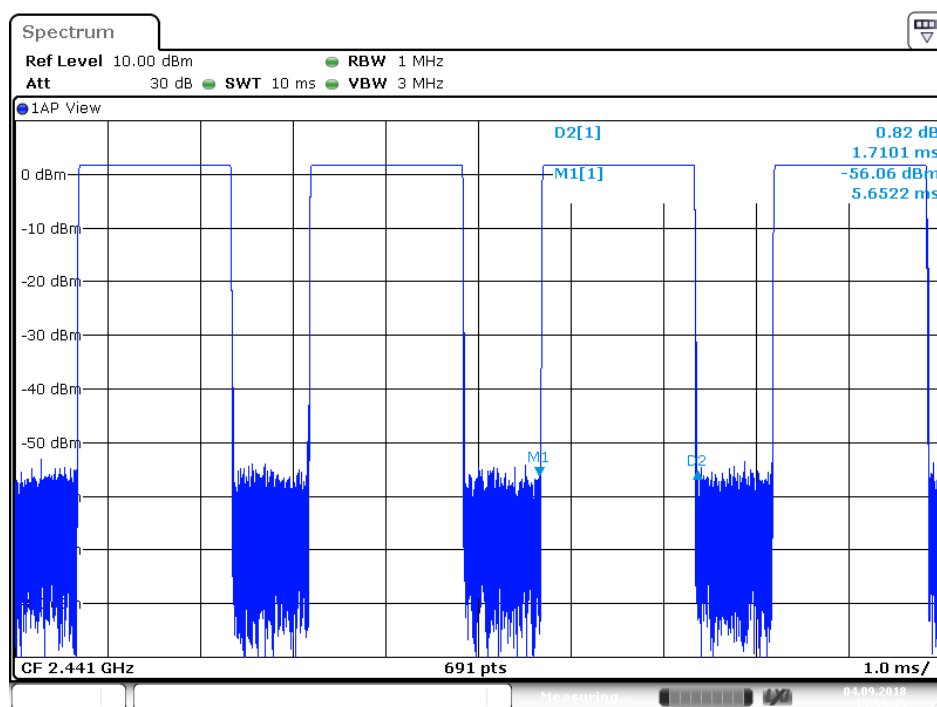
Date: 4.SEP.2018 16:01:16

DH3 Low channel



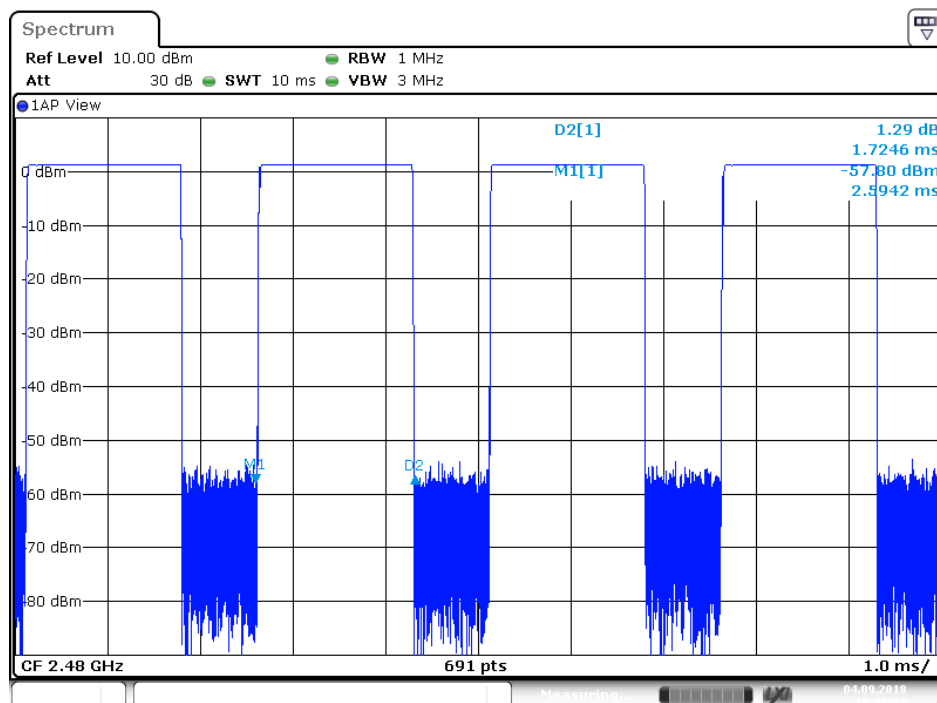
Date: 4.SEP.2018 15:58:50

DH3 Middle channel



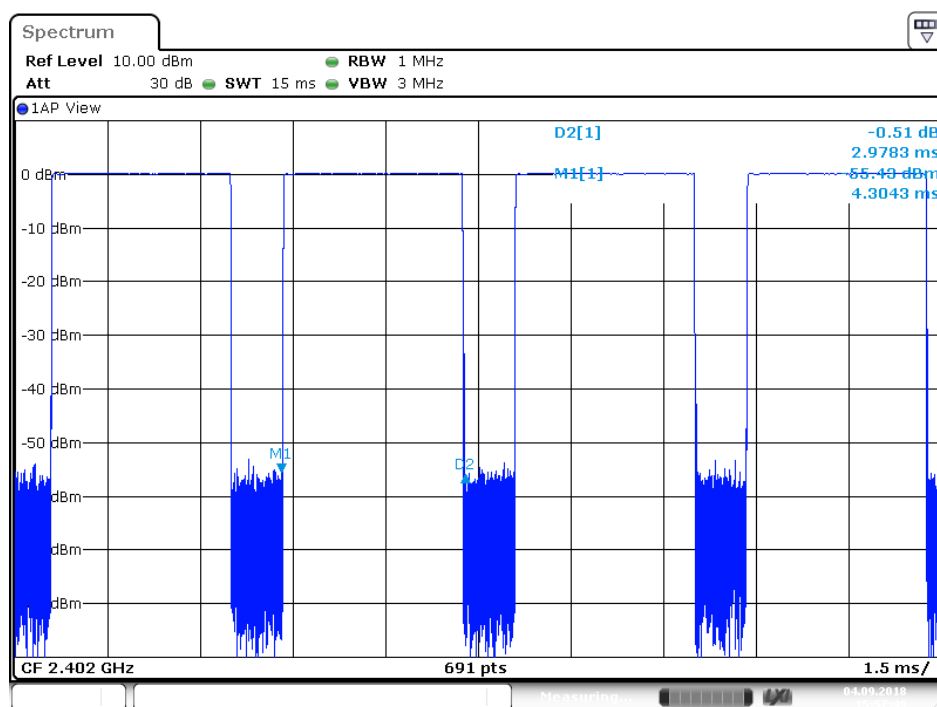
Date: 4.SEP.2018 15:59:39

DH3 High channel



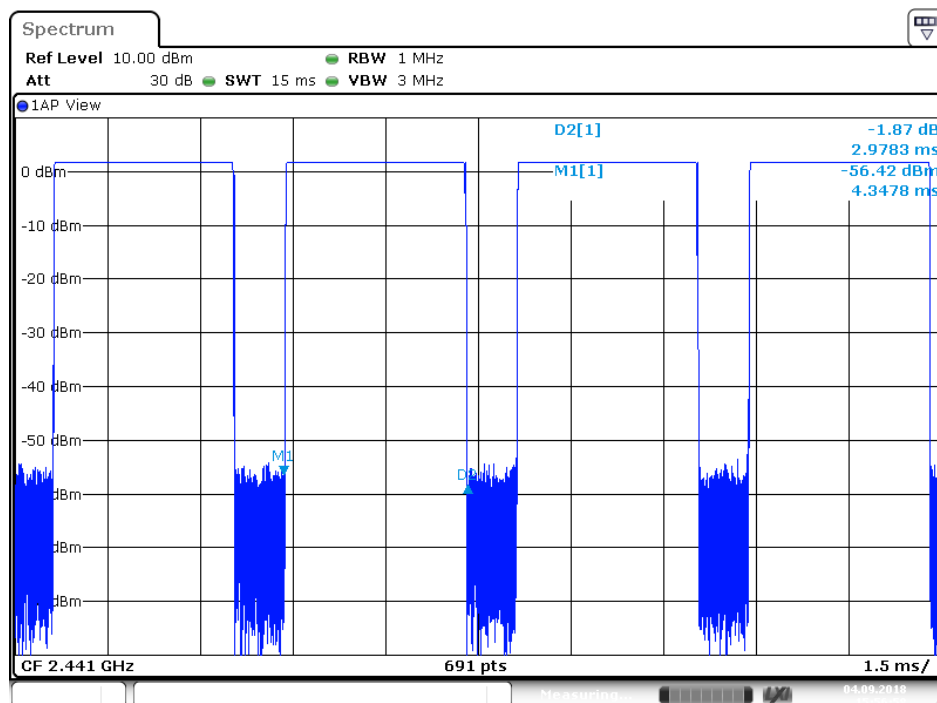
Date: 4.SEP.2018 16:00:28

DH5 Low channel



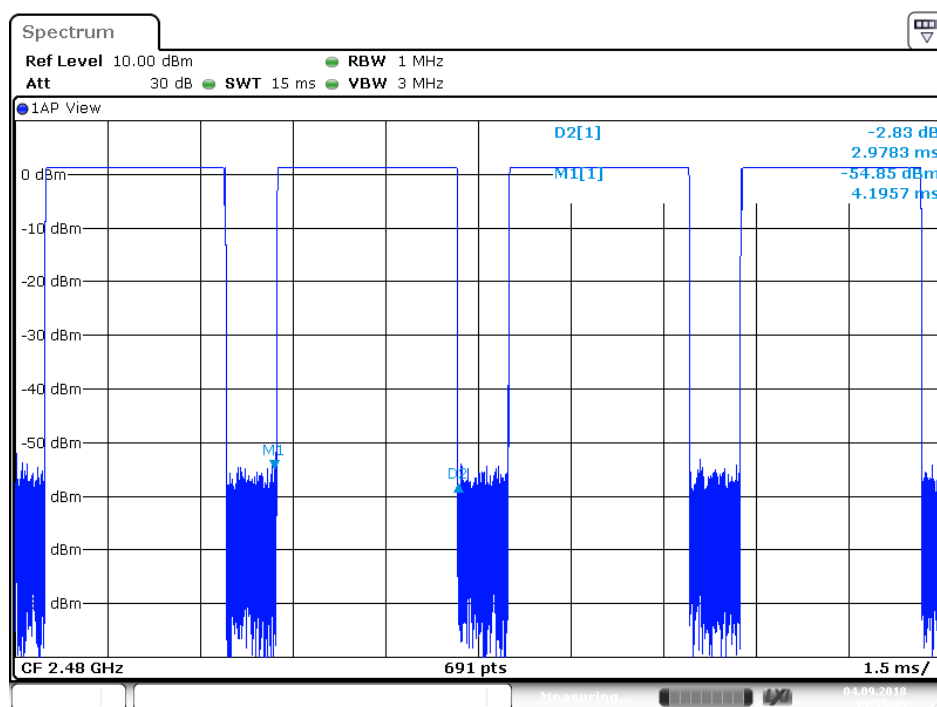
Date: 4.SEP.2018 15:57:49

DH5 Middle channel



Date: 4.SEP.2018 15:56:58

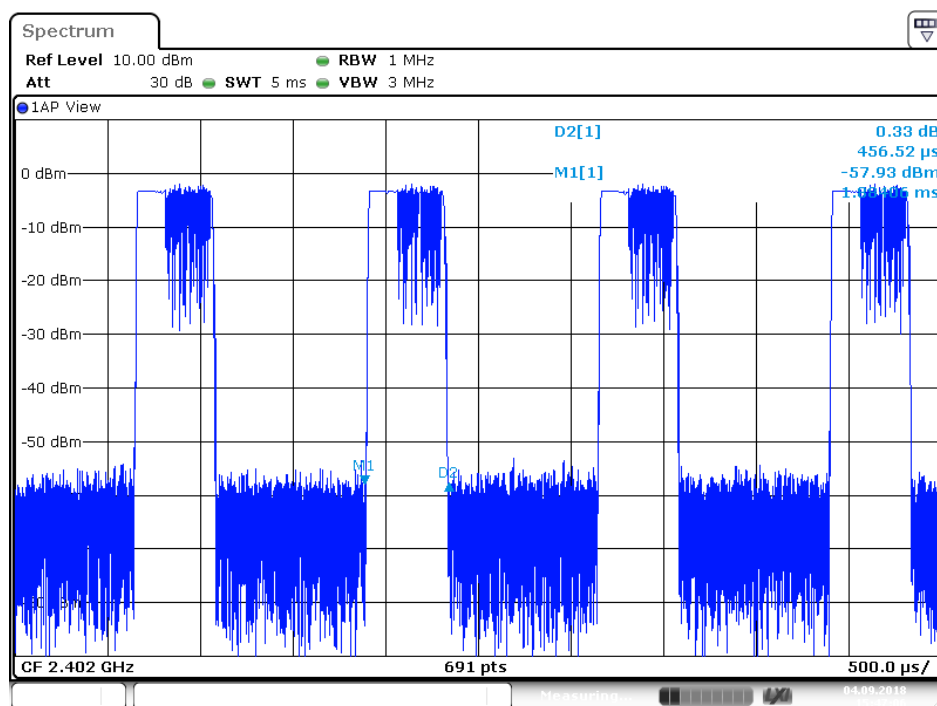
DH5 High channel



Date: 4.SEP.2018 15:55:49

EDR Mode

3DH1 Low channel



Date: 4.SEP.2018 15:47:06

shenzhen Accurate Technology Co., Ltd.

Address: 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

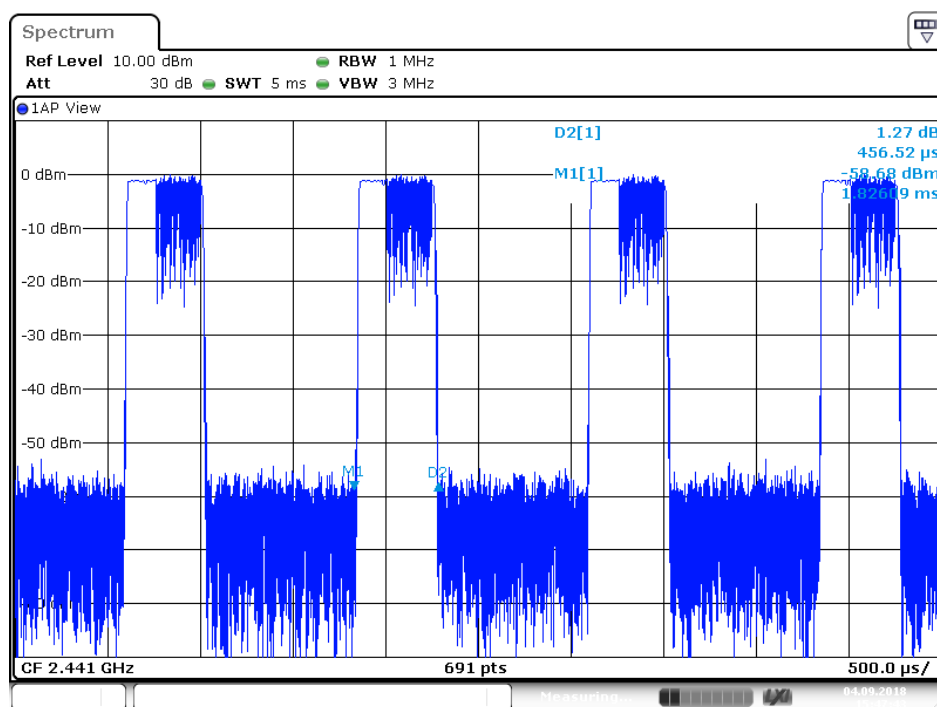
Tel: +86-755-26503290

Fax: +86-755-26503396

E-mail: webmaster@atc-lab.com

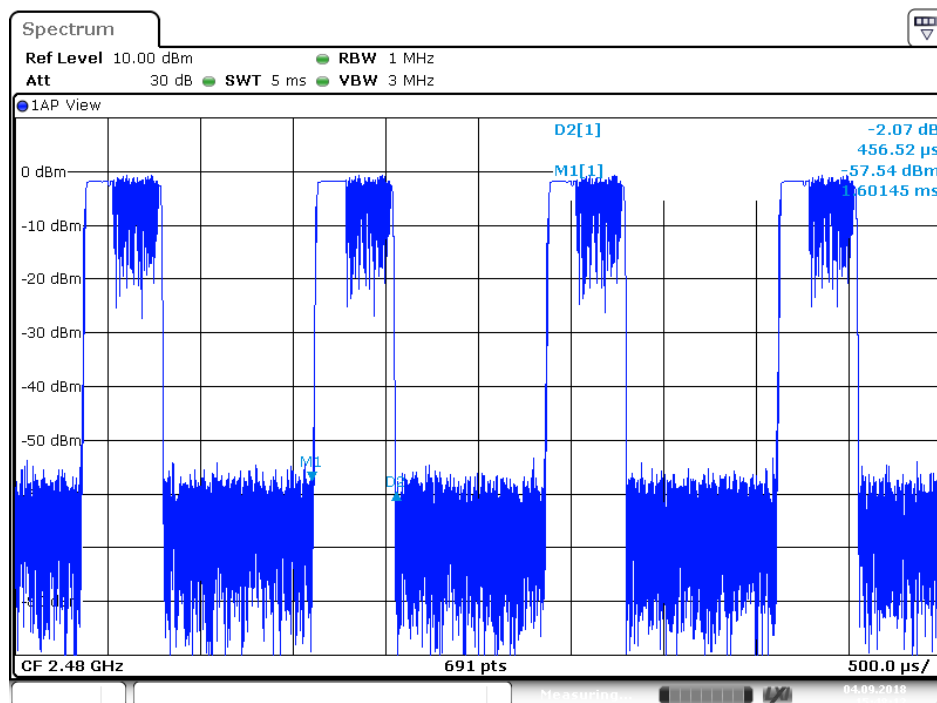
Http://www.atc-lab.com

3DH1 Middle channel



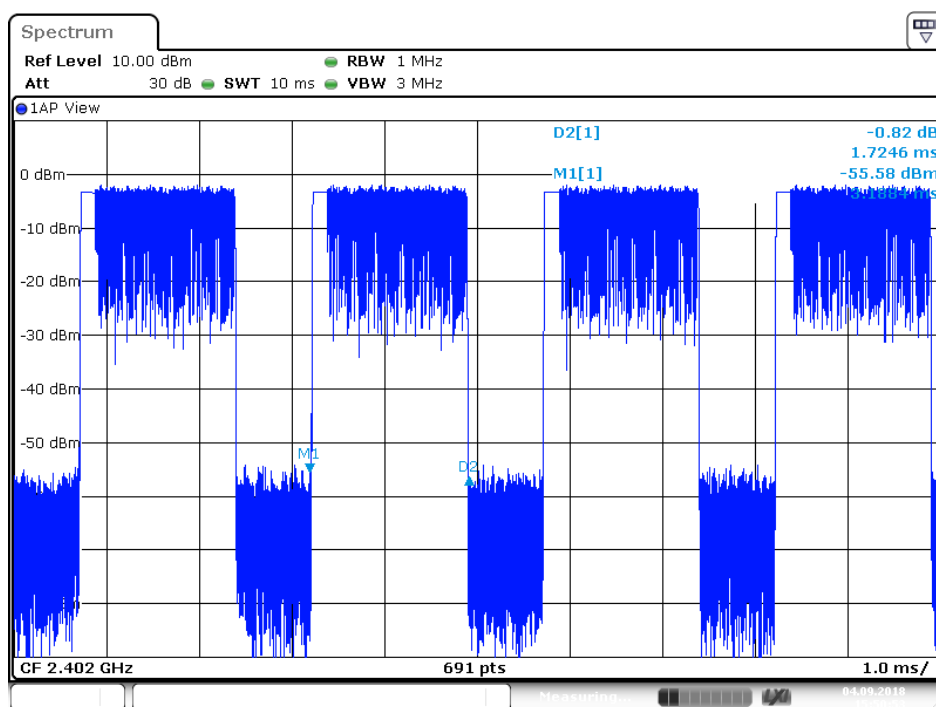
Date: 4.SEP.2018 15:47:43

3DH1 High channel



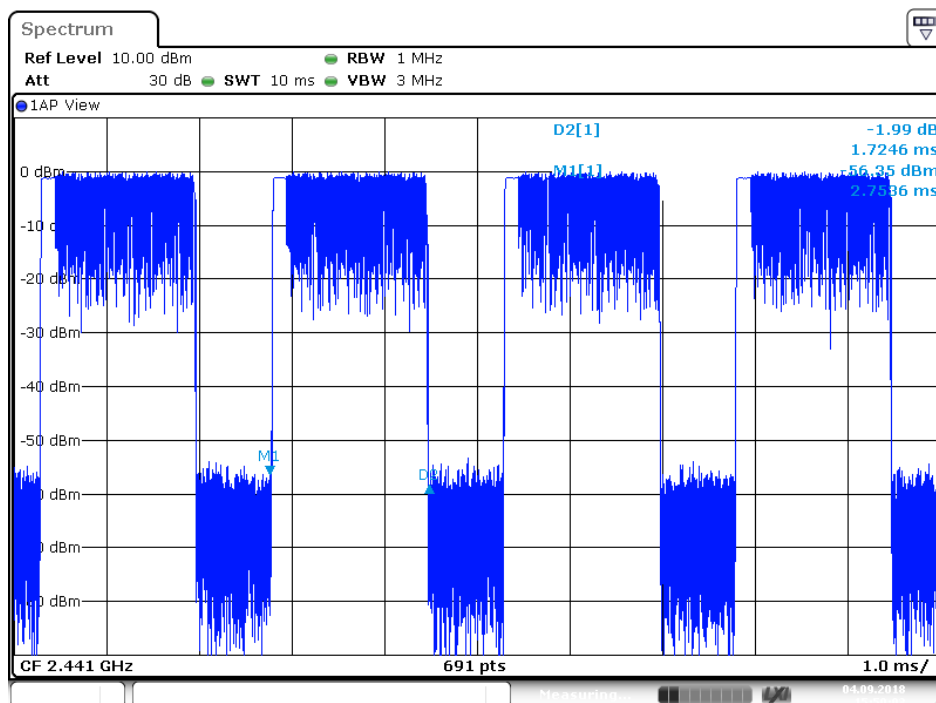
Date: 4.SEP.2018 15:48:12

3DH3 Low channel



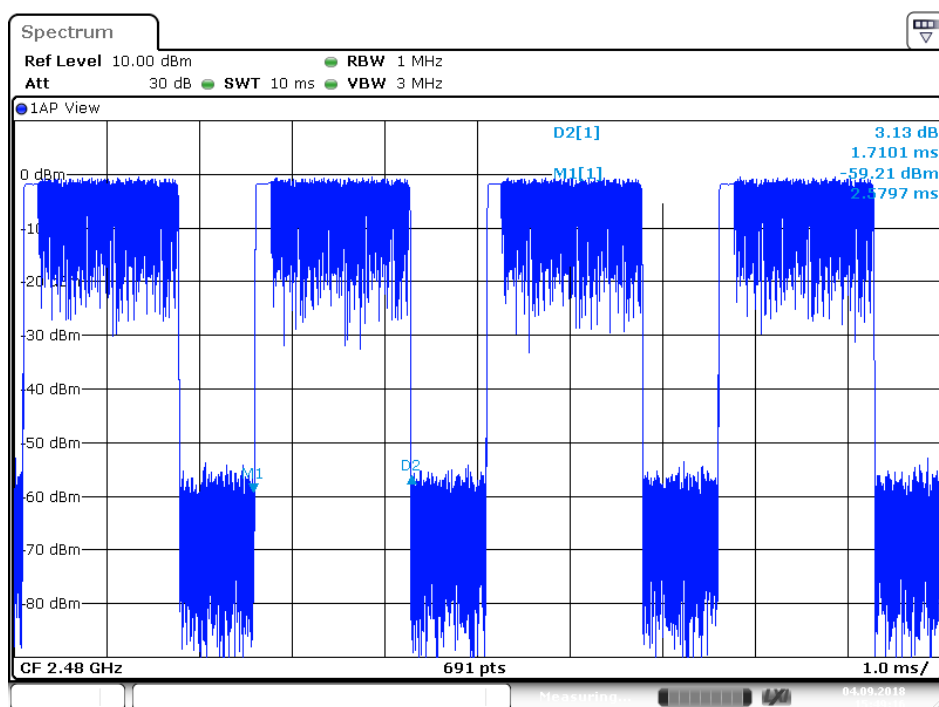
Date: 4.SEP.2018 15:50:53

3DH3 Middle channel



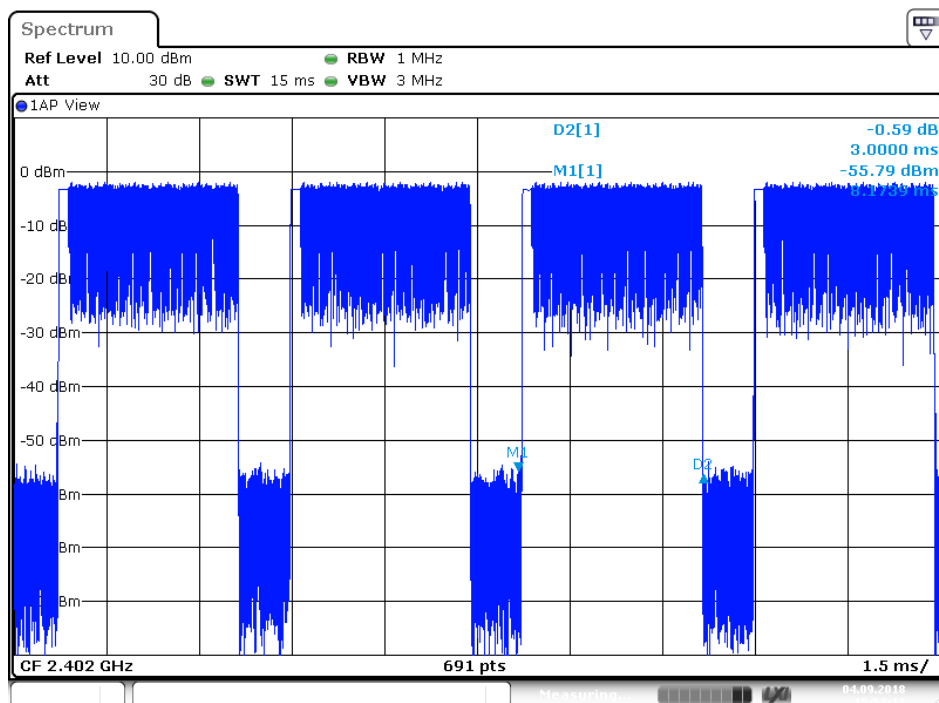
Date: 4.SEP.2018 15:50:03

3DH3 High channel



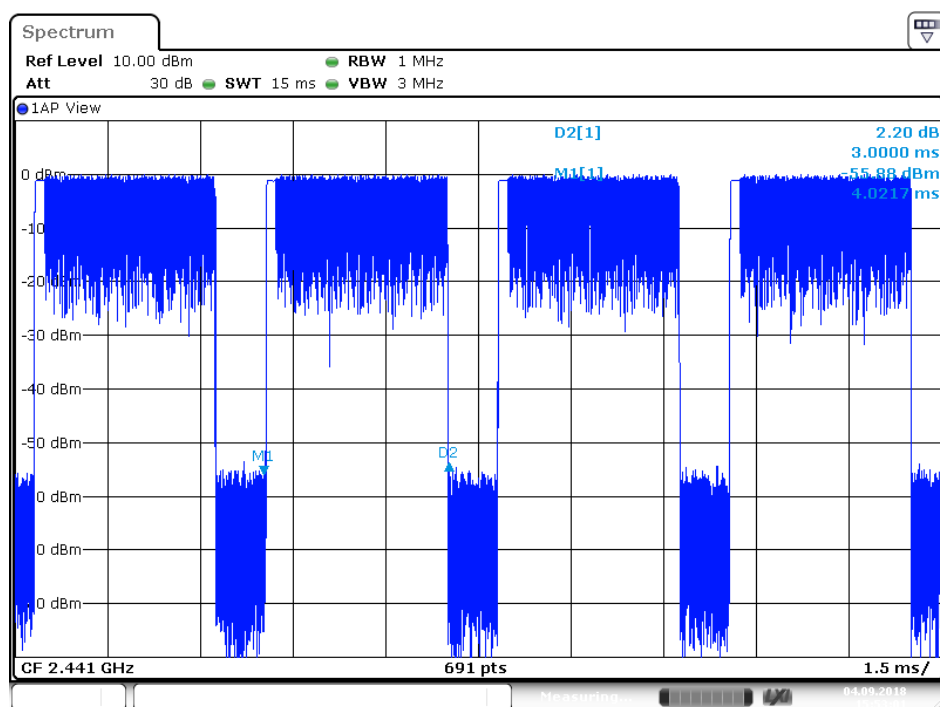
Date: 4.SEP.2018 15:49:17

3DH5 Low channel

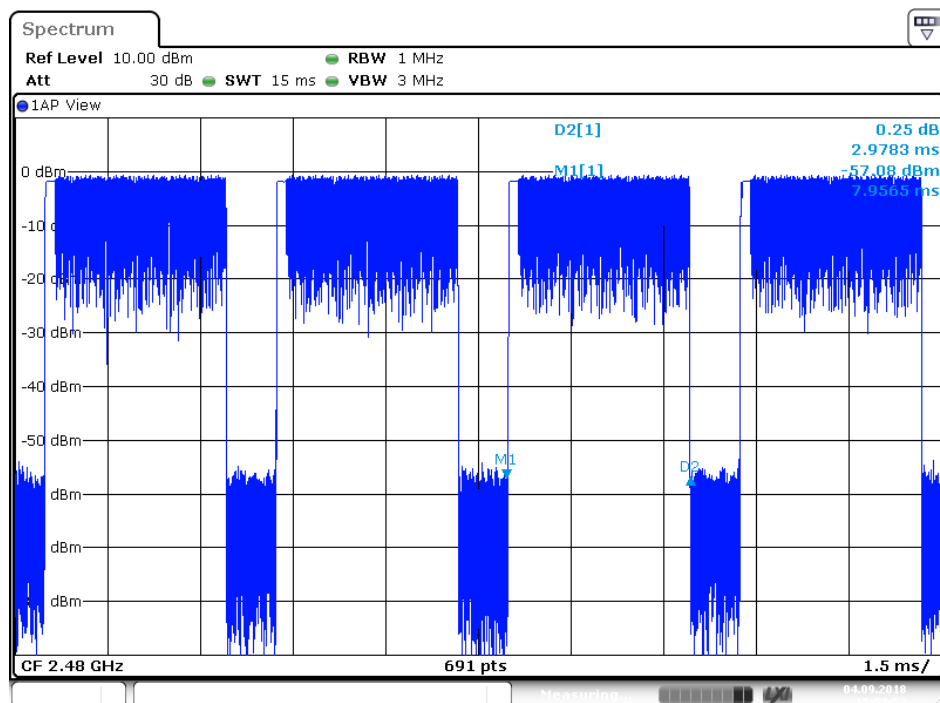


Date: 4.SEP.2018 15:52:11

3DH5 Middle channel

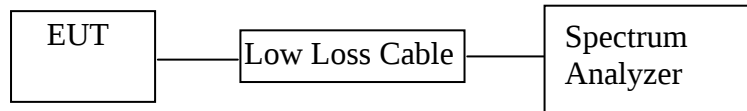


3DH5 High channel



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: Active Noise Cancelling Bluetooth Stereo Headphones)

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. The Requirement For RSS-247 Section 5.4(b)

RSS-247 Section 5.4(b): For FHSS operating in the band 2400-2483.5MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels.

The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

9.4. 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.

9.5. Operating Condition of EUT

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

9.5.2. Turn on the power of all equipment.

9.5.3. 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.

9.6.Test Procedure

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

9.6.2.Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz for BDR mode

9.6.3.Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz for EDR mode

9.6.4.Measurement the maximum peak output power.

9.7.Test Result

BDR Mode

Frequency (MHz)	Maximum peak conducted output power (dBm/W)	e.i.r.p. (dBm/W)	Limits dBm / W
2402	0.75/0.00119	3.34/0.00216	30 / 1.0
2441	0.89/0.00123	3.48/0.00223	30 / 1.0
2480	0.65/0.00116	3.24/0.00211	30 / 1.0

EDR Mode

Frequency (MHz)	Maximum peak conducted output power (dBm/W)	e.i.r.p. (dBm/W)	Limits dBm / W
2402	1.35/0.00136	3.94/0.00248	21 / 0.125
2441	1.20/0.00132	3.79/0.00239	21 / 0.125
2480	1.09/0.00129	3.68/0.00233	21 / 0.125

Note: e.i.r.p= Maximum peak conducted output power+Antenna gain(2.59dBi)

The spectrum analyzer plots are attached as below.

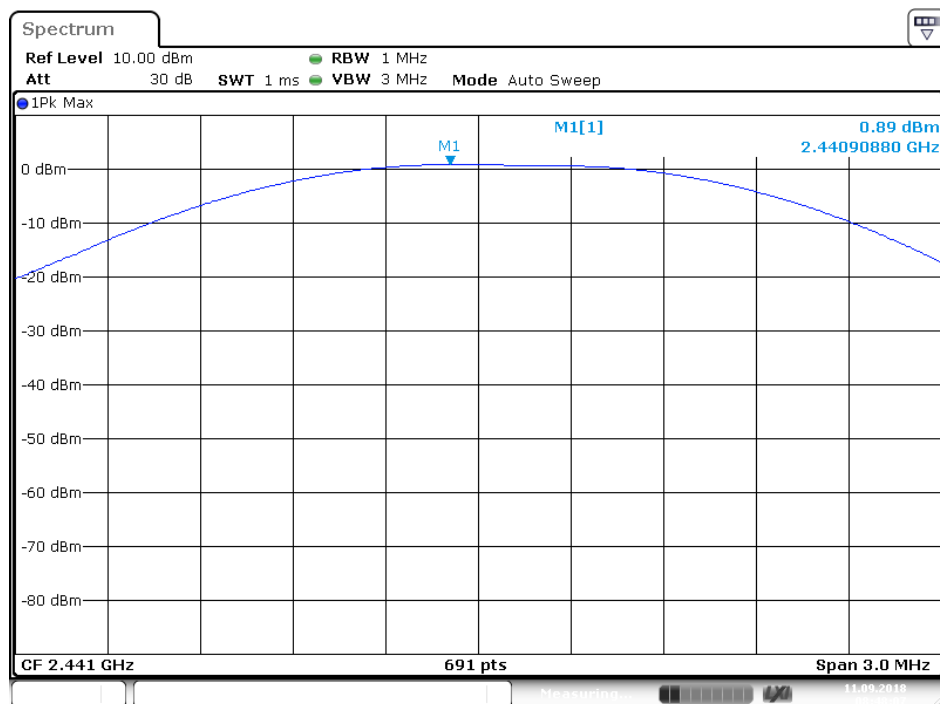
BDR Mode

Low channel



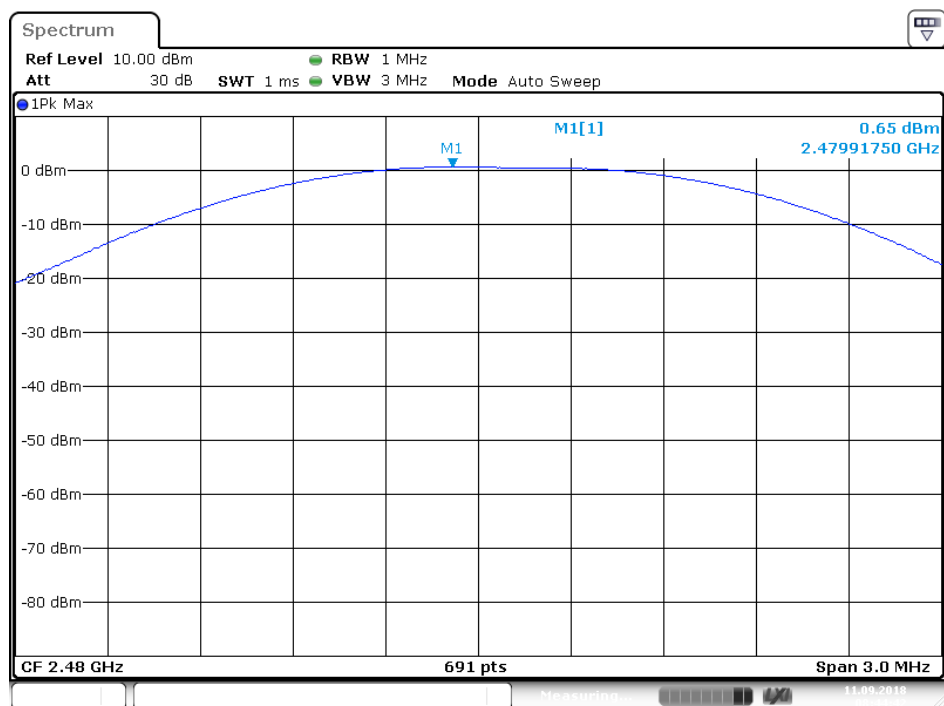
Date: 11.SEP.2018 08:40:23

Middle channel



Date: 11.SEP.2018 08:48:07

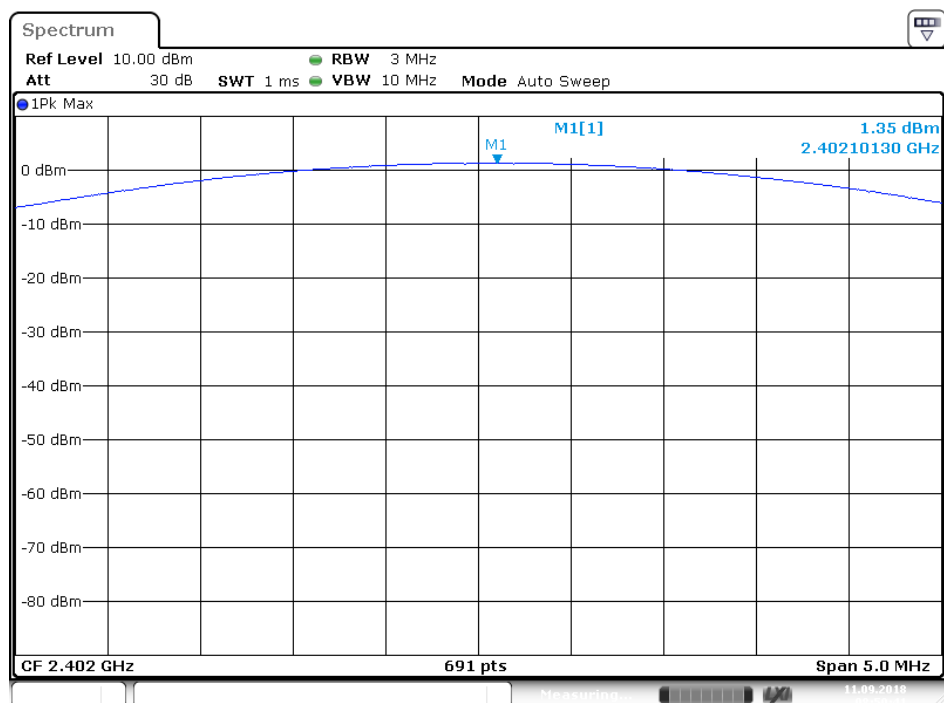
High channel



Date: 11.SEP.2018 08:44:41

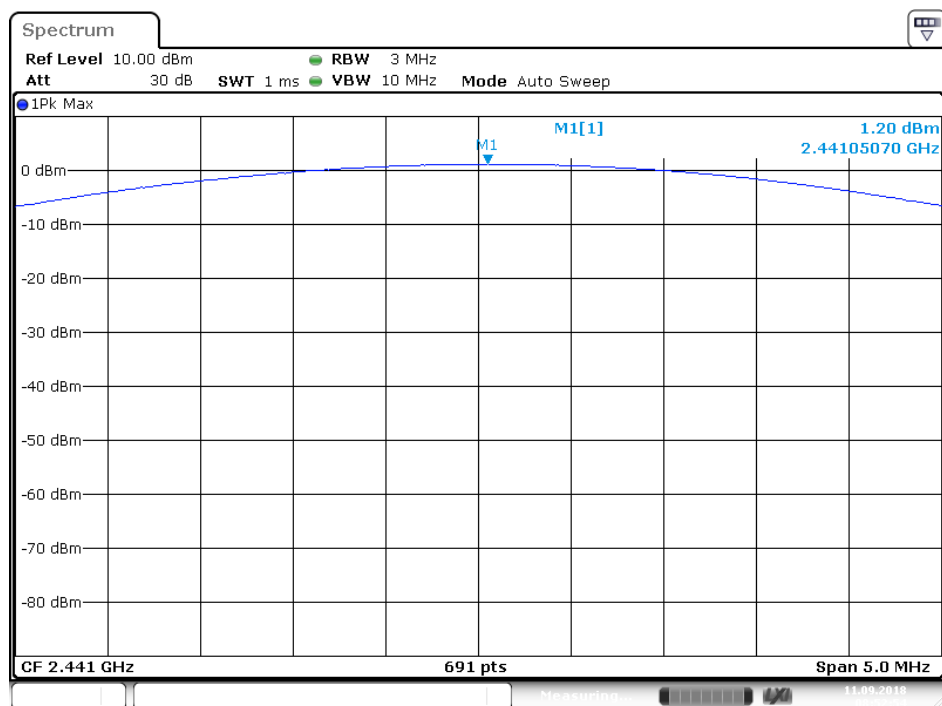
EDR Mode

Low channel



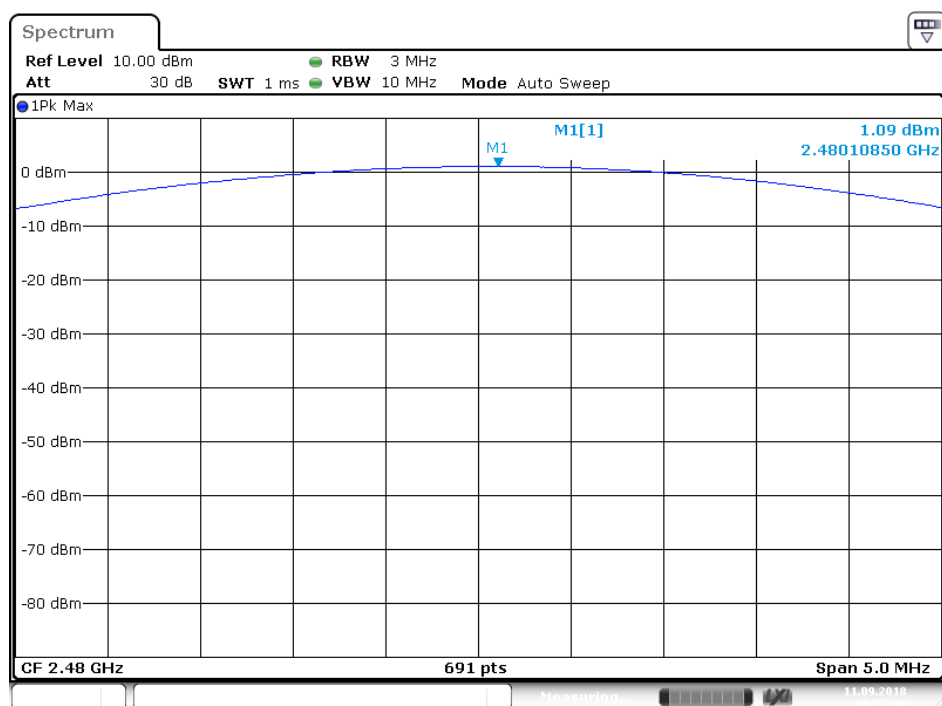
Date: 11.SEP.2018 08:50:40

Middle channel



Date: 11.SEP.2018 08:52:54

High channel

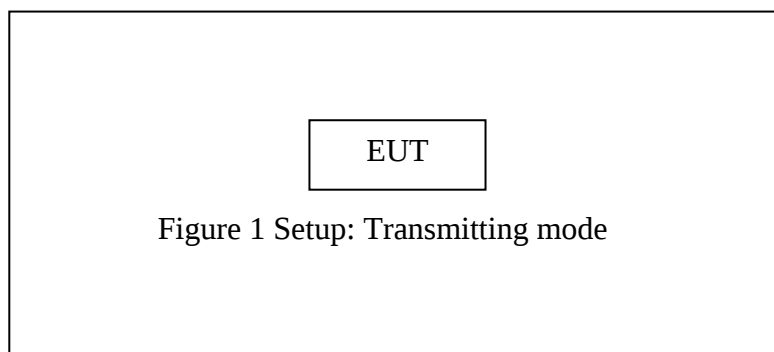


Date: 11.SEP.2018 08:53:39

10.RADIATED EMISSION TEST

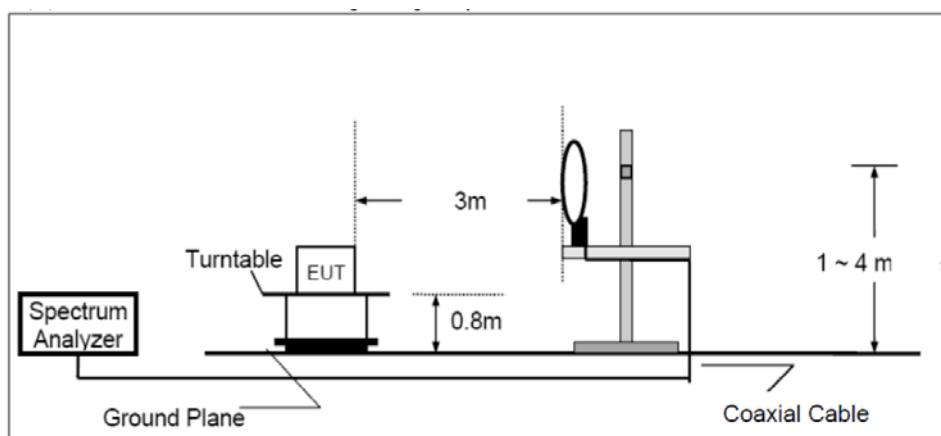
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

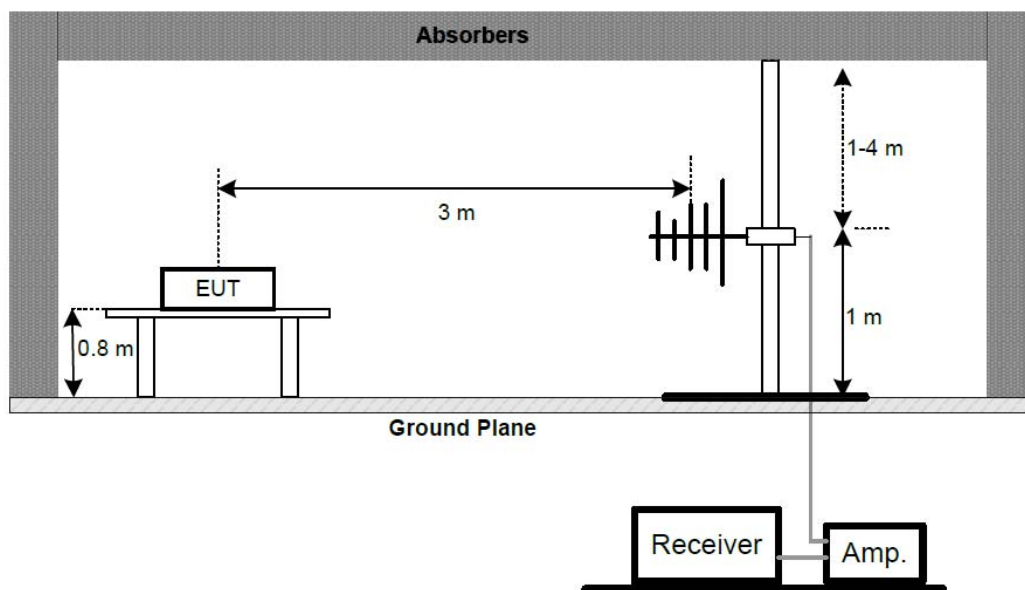


10.1.2.Semi-Anechoic Chamber Test Setup Diagram

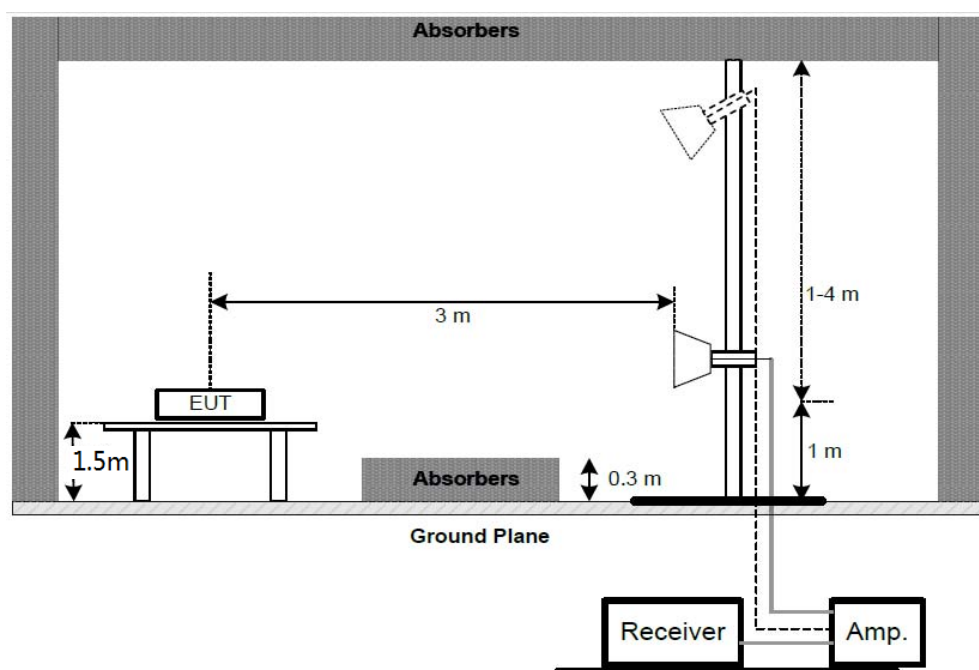
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



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



Above 1GHz:



10.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

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

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

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

²Above 38.6

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

based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4. Configuration of EUT on Measurement

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

10.5. Test Procedure

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

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

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

10.6.Data Sample

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

Frequency(MHz) = Emission frequency in MHz

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

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

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

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

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

QP = Quasi-peak Reading

Calculation Formula:

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

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

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

10.7.The Field Strength of Radiation Emission Measurement Results

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

9kHz-30MHz test data

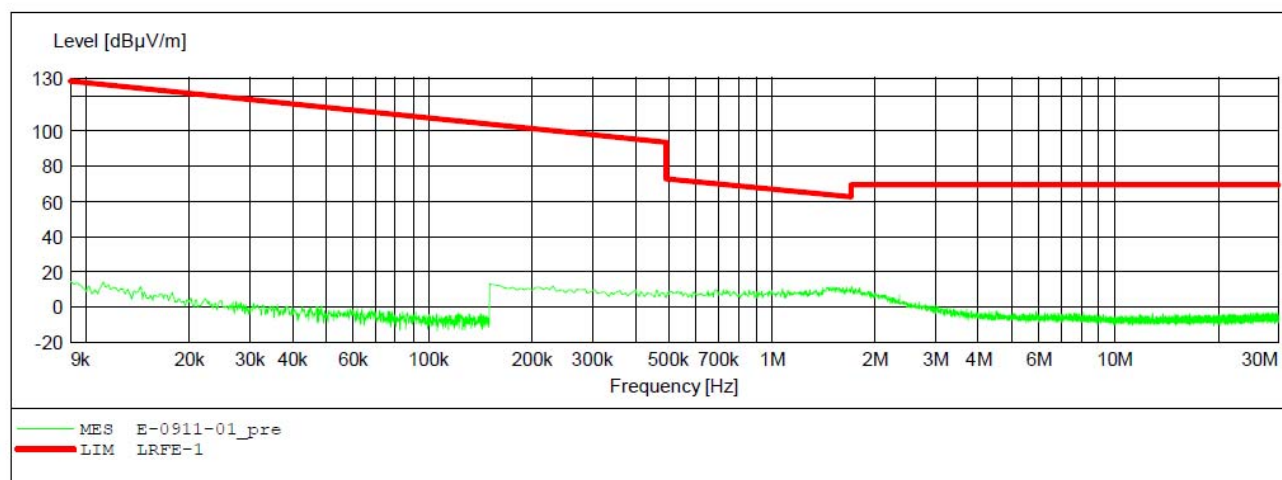
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2402MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: X
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description:			SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



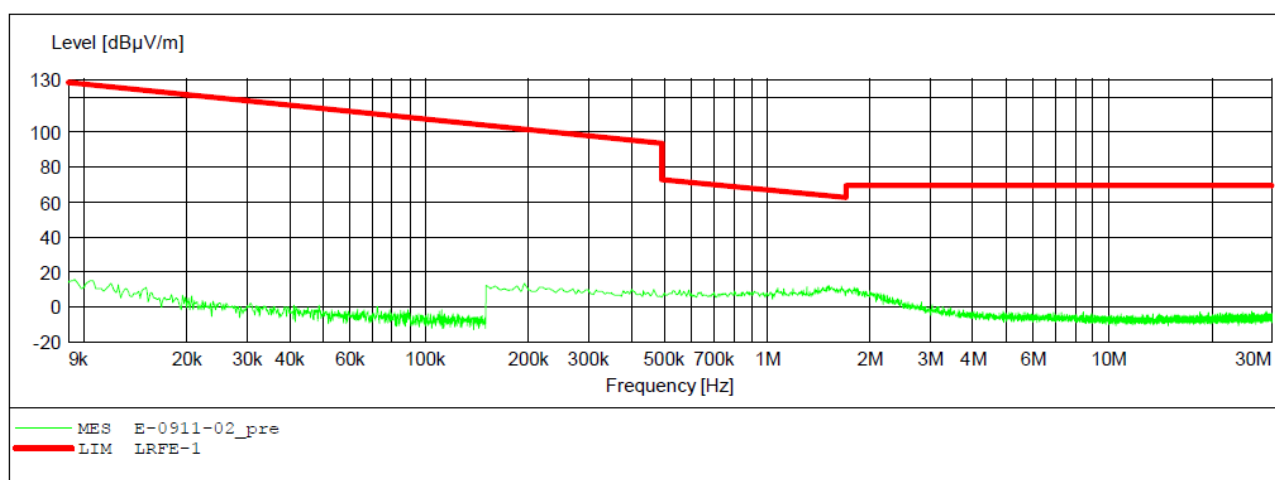
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2402MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: Y
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description:			SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



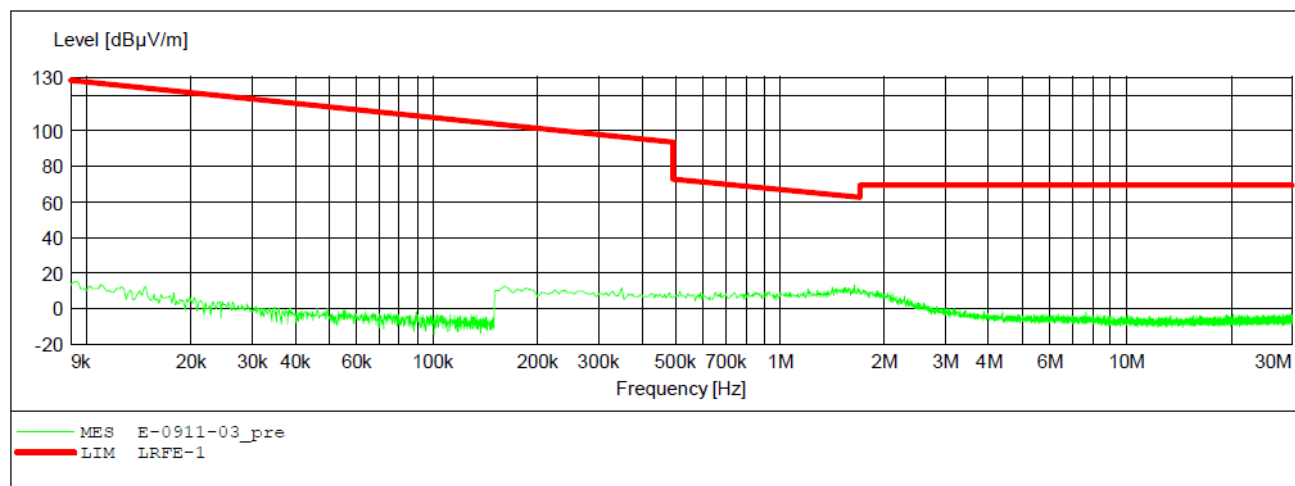
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2402MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: Z
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



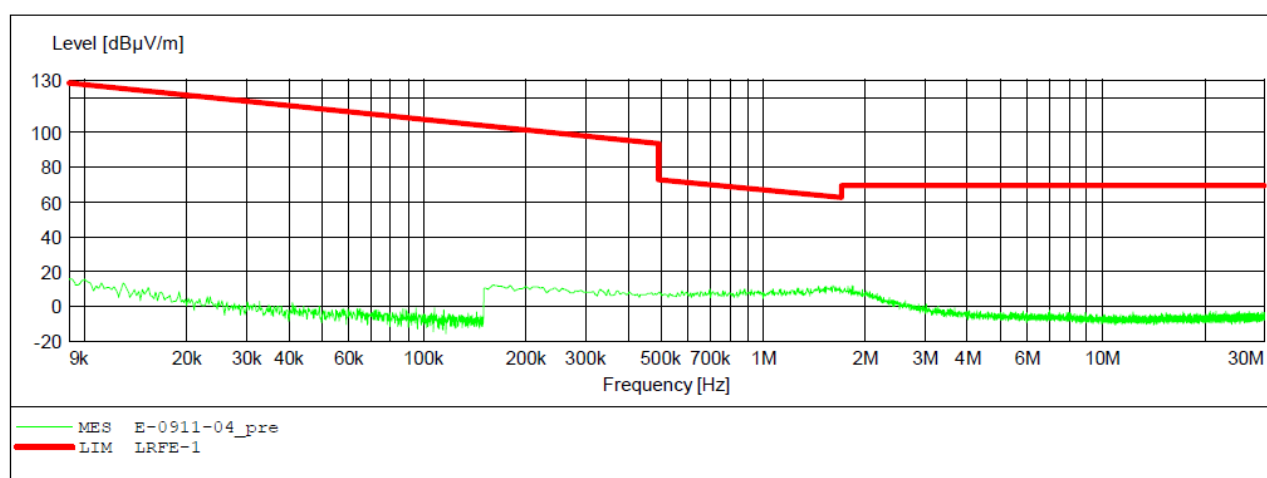
ACCURATE TECHNOLOGY CO.,LTD

FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2441MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: X
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description:			SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



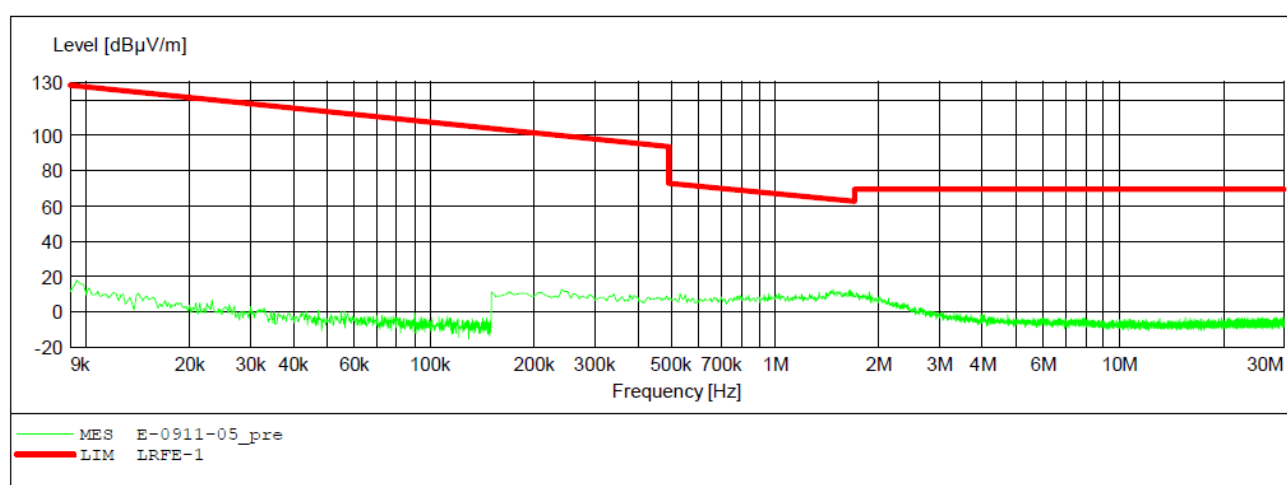
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2441MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: Y
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description:			SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



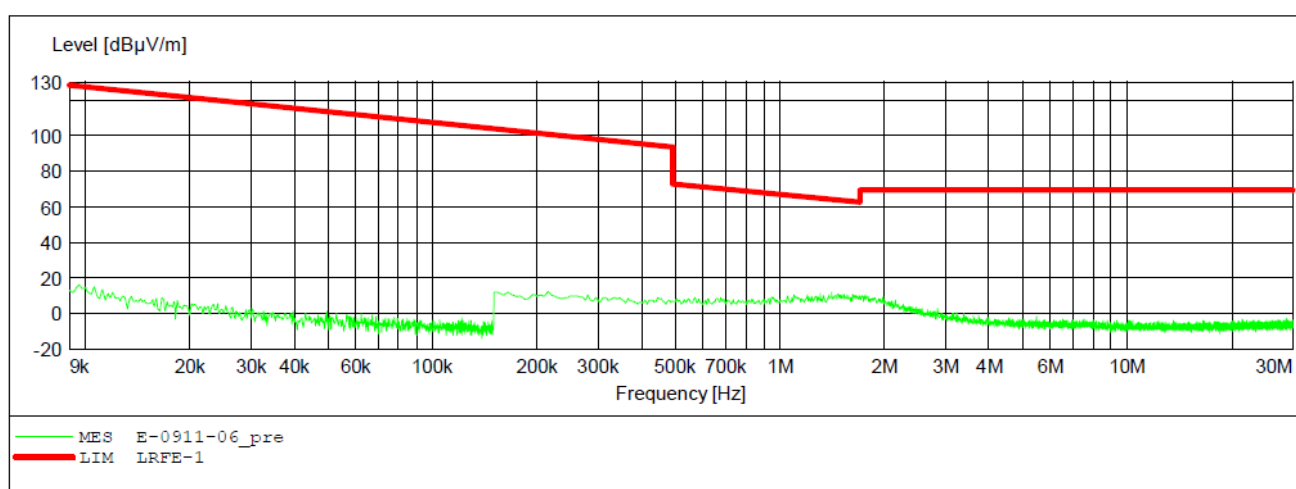
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2441MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: Z
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description:			SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



ACCURATE TECHNOLOGY CO., LTD

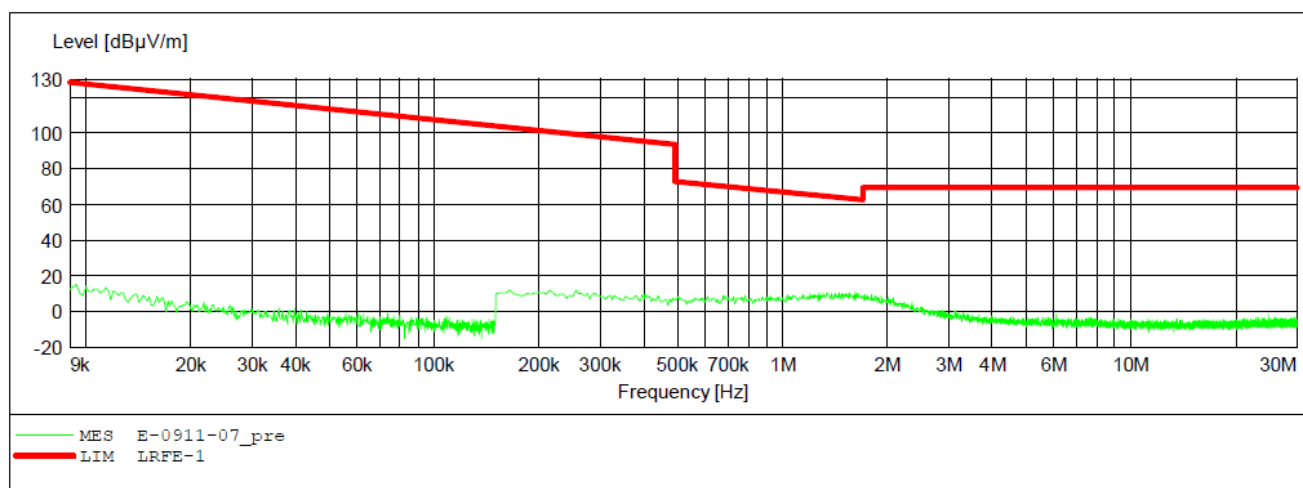
FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2480MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: X
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description: SUB STD VTERM2 1.70

Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



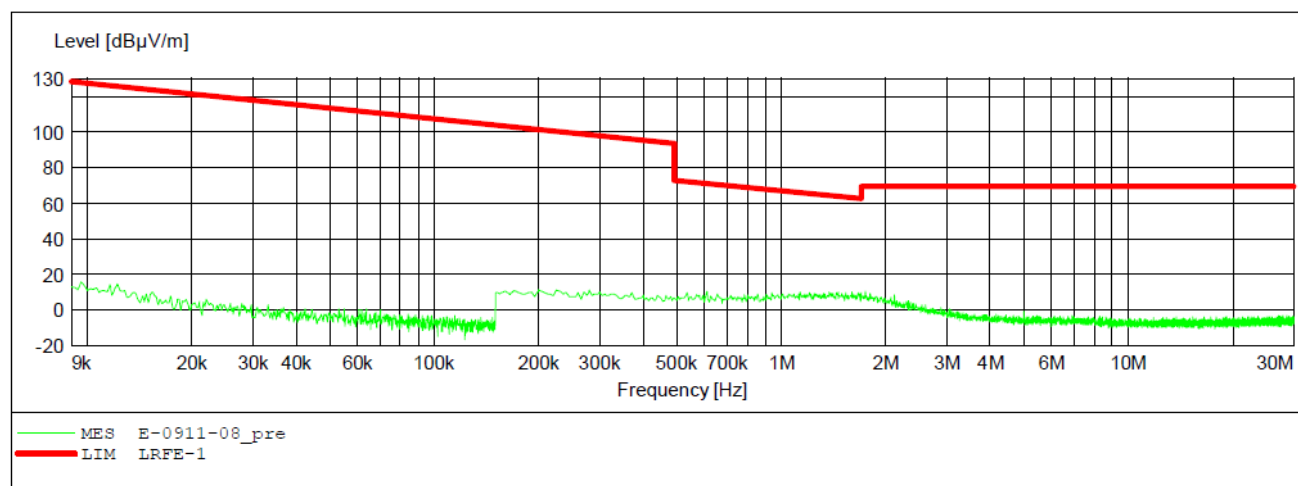
ACCURATE TECHNOLOGY CO., LTD

FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2480MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: Y
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description:			SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



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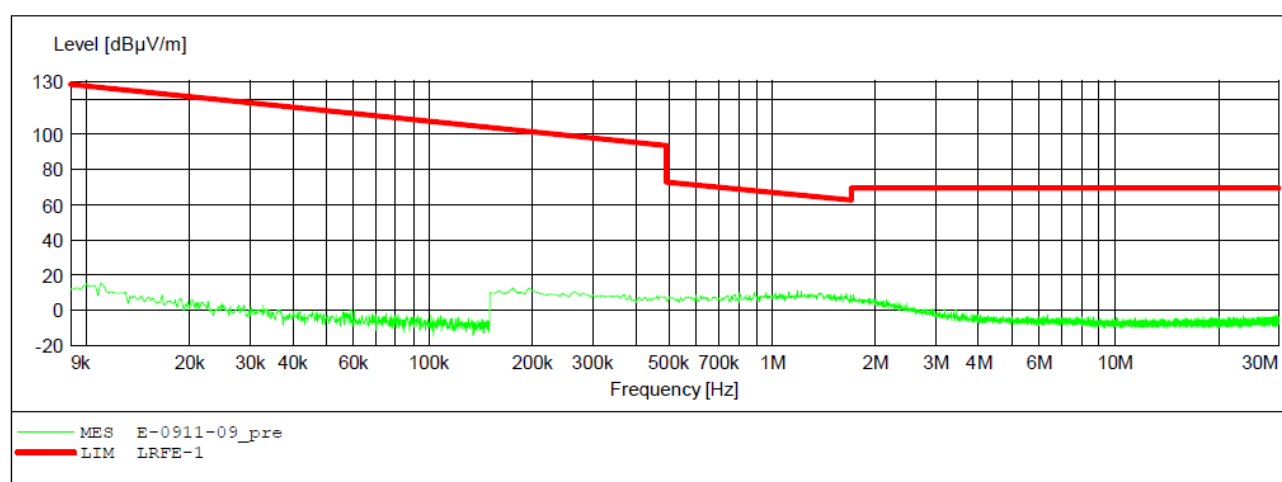
FCC Class B 3M Radiated

EUT: Active Noise Cancelling Bluetooth Stereo Headphones M/N:W828NB
 Applicant: Edifier International Limited
 Operating Condition: TX 2480MHz
 Test Site: 2# Chamber
 Operator: WADE
 Test Specification: DC 3.7V
 Comment: Z
 Start of Test: 2018-09-11 /

SCAN TABLE: "LFRE Fin"

Short Description: SUB STD VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



30MHz-1000MHz test data



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Job No.: LGW2018 #2481

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2402MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Horizontal

Power Source: DC 3.7V

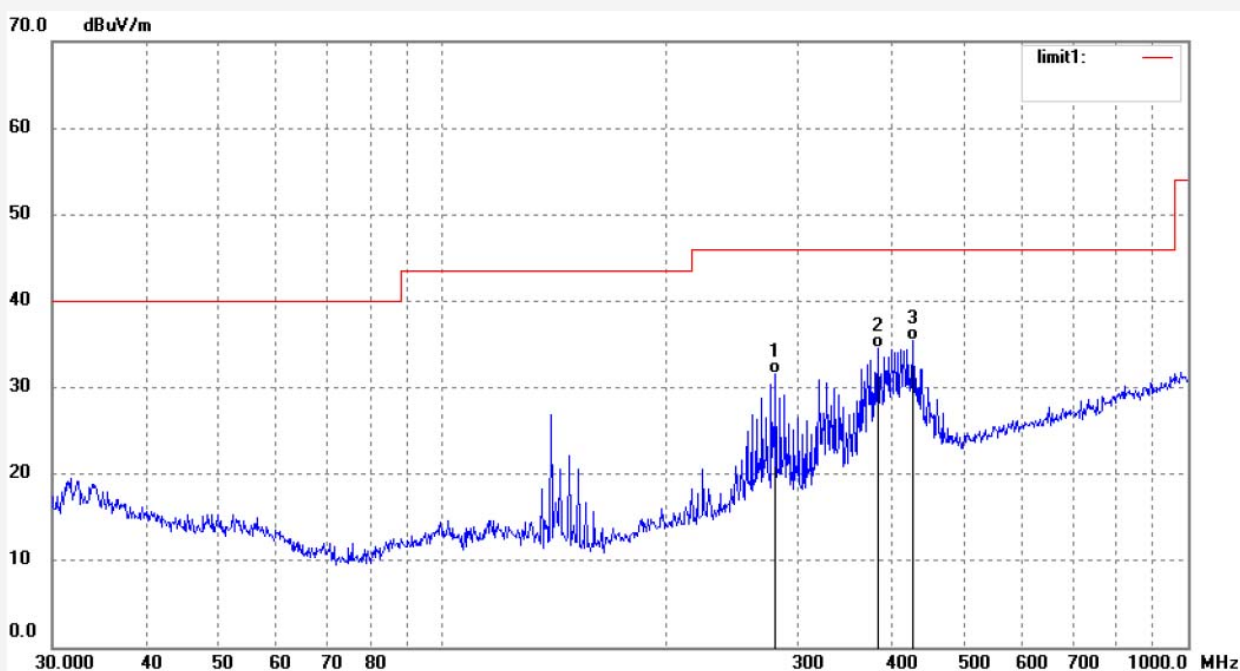
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	280.0237	41.12	-9.59	31.53	46.00	-14.47	QP			
2	383.9318	41.50	-6.94	34.56	46.00	-11.44	QP			
3	428.0192	41.08	-5.68	35.40	46.00	-10.60	QP			

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Job No.: LGW2018 #2480

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2402MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Vertical

Power Source: DC 3.7V

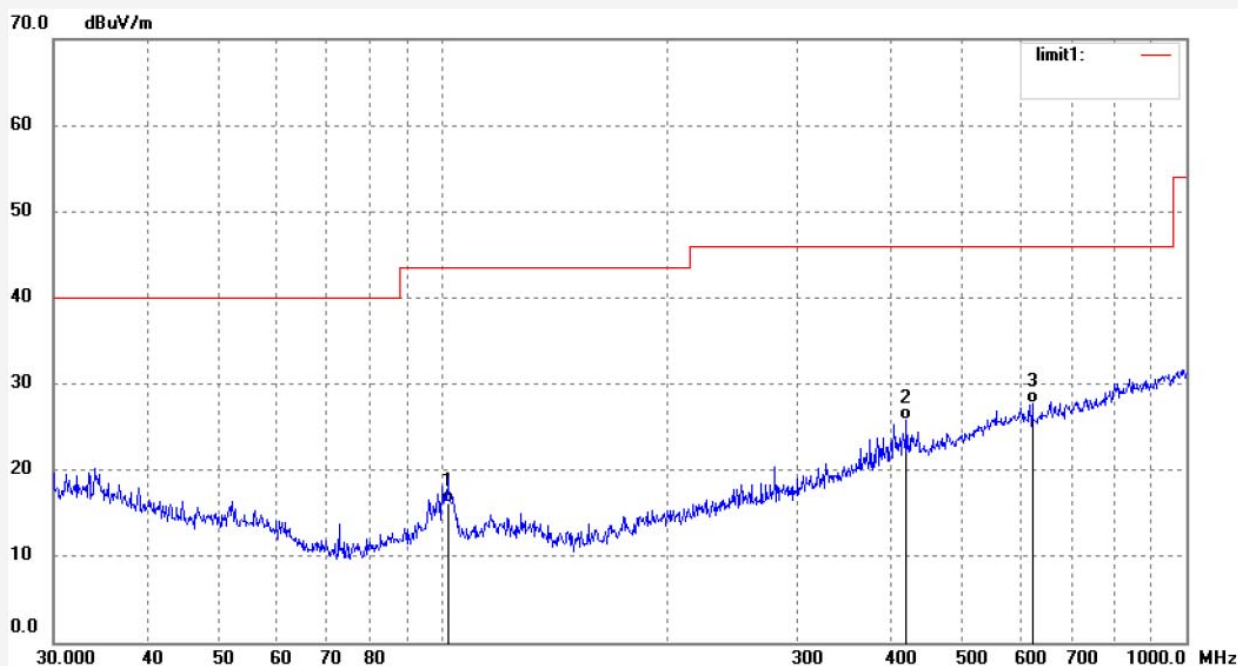
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	101.6443	29.46	-13.32	16.14	43.50	-27.36	QP			
2	420.5803	31.52	-5.75	25.77	46.00	-20.23	QP			
3	620.7096	29.85	-2.09	27.76	46.00	-18.24	QP			

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Job No.: LGW2018 #2482

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2441MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Horizontal

Power Source: DC 3.7V

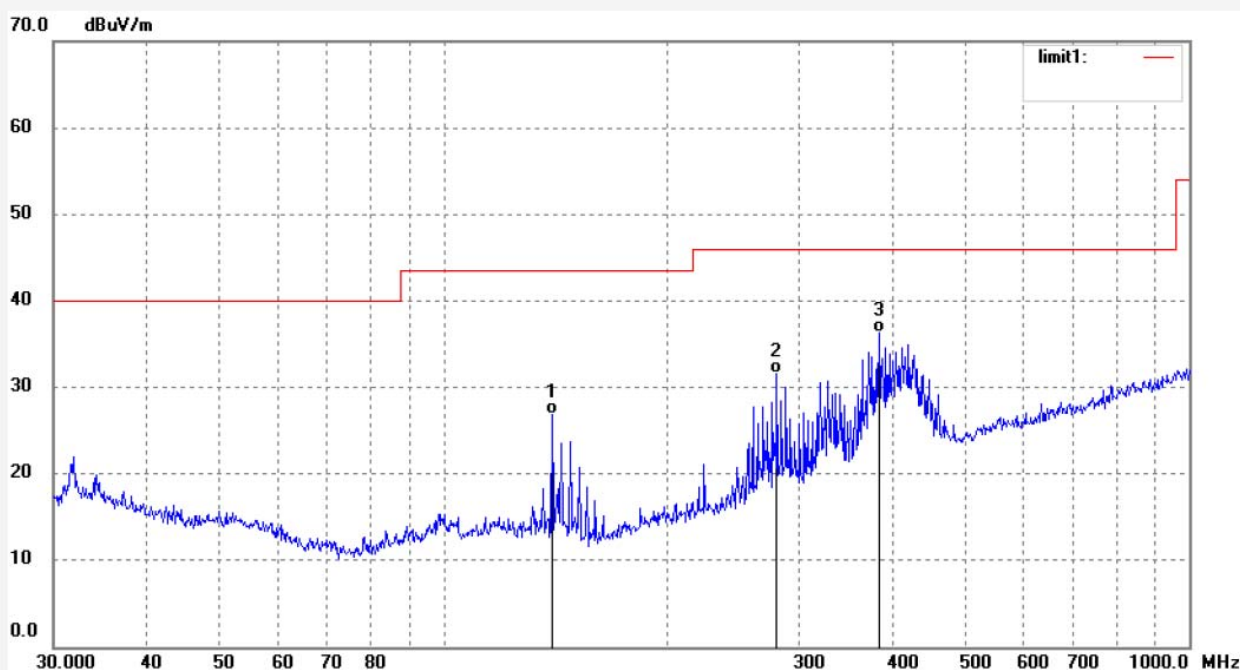
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	139.8507	41.95	-15.09	26.86	43.50	-16.64	QP			
2	280.0237	41.11	-9.59	31.52	46.00	-14.48	QP			
3	383.9318	43.32	-6.94	36.38	46.00	-9.62	QP			

Job No.: LGW2018 #2483

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2441MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Vertical

Power Source: DC 3.7V

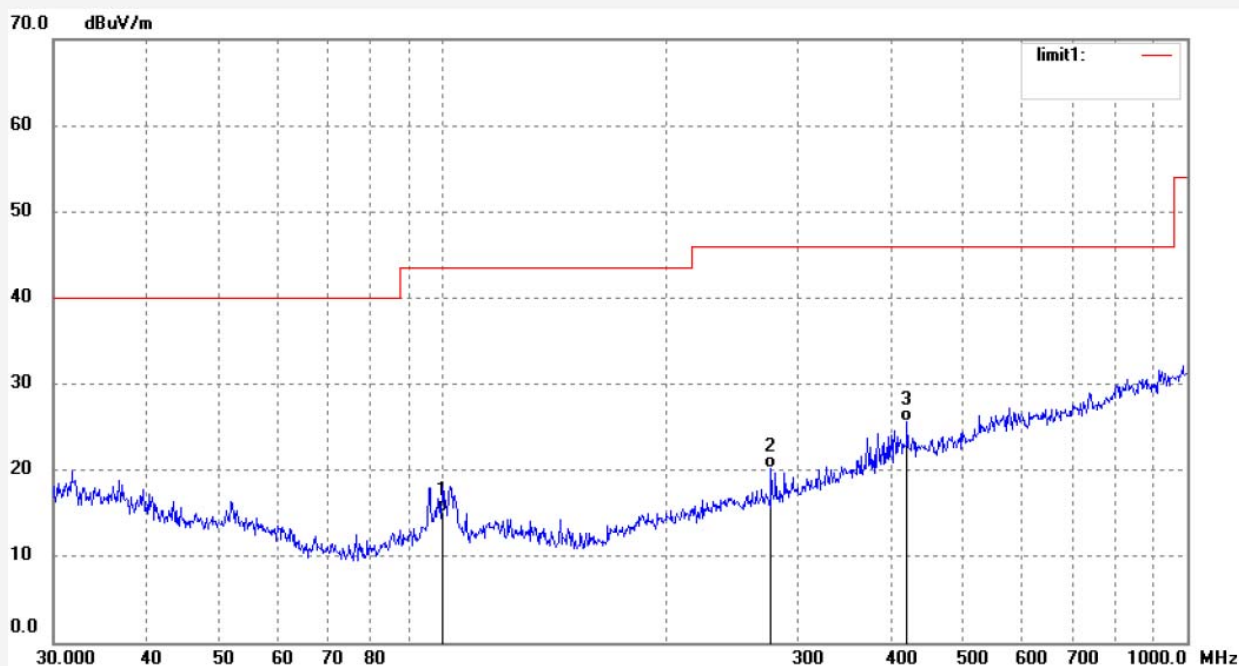
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	99.8777	28.19	-13.09	15.10	43.50	-28.40	QP			
2	276.1235	29.97	-9.70	20.27	46.00	-25.73	QP			
3	420.5803	31.36	-5.75	25.61	46.00	-20.39	QP			



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Job No.: LGW2018 #2485

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2480MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Horizontal

Power Source: DC 3.7V

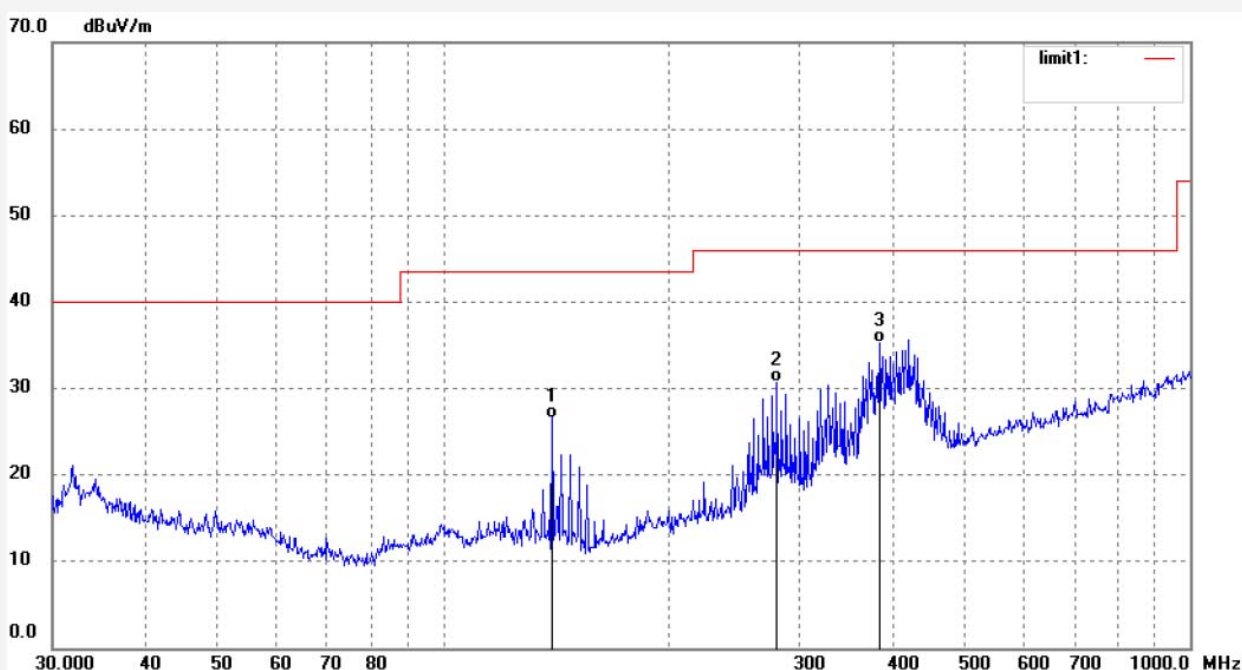
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	139.8507	41.69	-15.09	26.60	43.50	-16.90	QP			
2	280.0237	40.25	-9.59	30.66	46.00	-15.34	QP			
3	383.9318	42.12	-6.94	35.18	46.00	-10.82	QP			

Job No.: LGW2018 #2484

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2480MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Vertical

Power Source: DC 3.7V

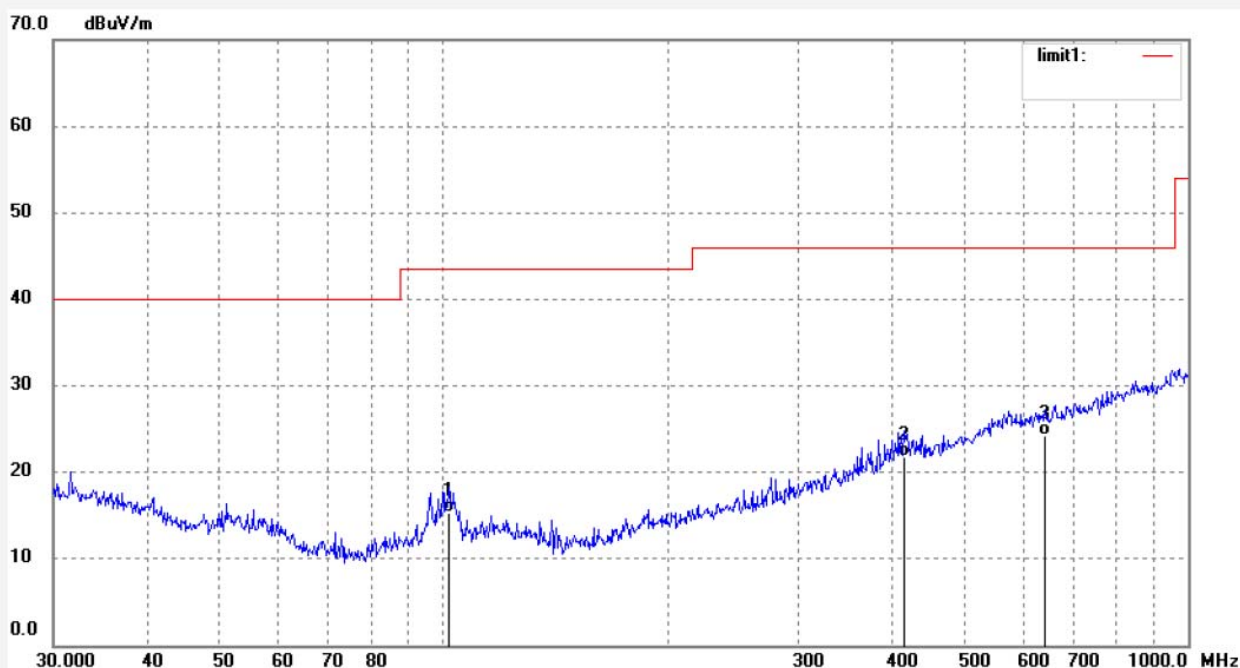
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	102.0014	28.62	-13.38	15.24	43.50	-28.26	QP			
2	416.1791	27.68	-5.95	21.73	46.00	-24.27	QP			
3	642.8613	26.09	-1.89	24.20	46.00	-21.80	QP			

1GHz-18GHz test data



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Job No.: LGW2018 #2457

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2402MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Horizontal

Power Source: DC 3.7V

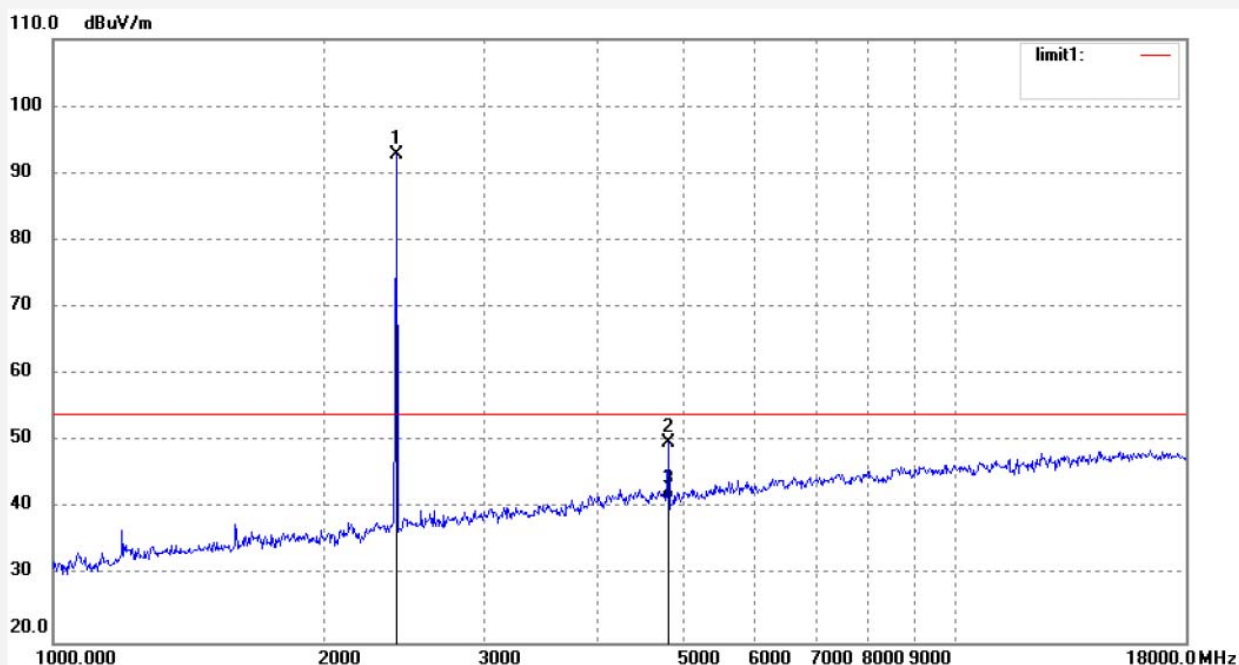
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	91.97	0.89	92.86	/	/	peak			
2	4804.027	42.39	7.40	49.79	74.00	-24.21	peak			
3	4804.027	33.84	7.40	41.24	54.00	-12.76	AVG			

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Job No.: LGW2018 #2456

Standard: FCC 15.247 3M Radiated

Test item: Radiation Test

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

EUT: Active Noise Cancelling Bluetooth Stereo Headphones

Mode: TX 2402MHz

Model: W828NB

Applicant: Edifier International Limited

Polarization: Vertical

Power Source: DC 3.7V

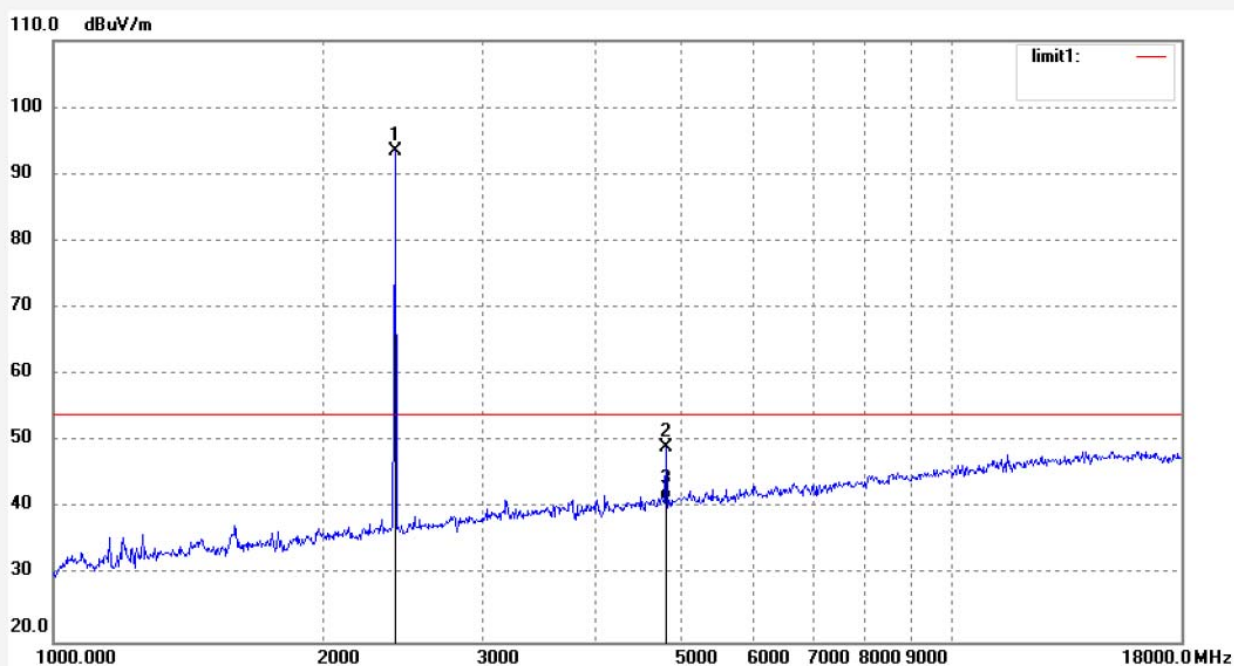
Date: 2018/09/07

Time:

Engineer Signature: WADE

Distance: 3m

Note:



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	92.52	0.89	93.41	/	/	peak			
2	4804.025	41.71	7.40	49.11	74.00	-24.89	peak			
3	4804.025	33.92	7.40	41.32	54.00	-12.68	AVG			