APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Shenzhen Zelin Technology Co.,Limited

Coors Light Bluetooth Earbuds
Model No.: 12169, 12181, 12182, 12183, 12184, 12185, 12186

FCC ID: 2AO8I-12169

Prepared for	:	Shenzhen Zelin Technology Co.,Limited
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Report No.	:	ATE20180249
Date of Test	:	March 1-March 2, 2018
Date of Report	:	March 3, 2018

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Test Report Certification

Applicant	:	Shenzhen Zelin Technology Co.,Limited
Manufacturer	:	Shenzhen Zelin Technology Co.,Limited
EUT Description	:	Coors Light Bluetooth Earbuds
Model No.	:	12169, 12181, 12182, 12183, 12184, 12185, 12186

Measurement Procedure Used:

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

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

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

Date of Test :	March 1-March 2, 2018
Date of Report :	March 3, 2018

Prepared by : _____
(Stan Yang, Engineer)

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

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

Model Number	:	12169, 12181, 12182, 12183, 12184, 12185, 12186 (Note: We hereby state that these models are identical in interior structure, electrical circuits and components, Just model name is different, Therefore, only model 12169 is tested for EMC tests.)
Bluetooth version	:	BT V4.2 Single mode This report is for BT classic mode
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	-0.68dBi
Antenna type	:	PCB Antenna
Adapter Input Voltage	:	DC 3.7V (Powered by Lithium battery) or DC 5V (Powered by USB port)
Modulation mode	:	GFSK, π/4 DQPSK Because of firmware limitation, this device only supports Bluetooth V4.2(BR+EDR mode) without the BLE mode and EDR 8DPSK mode
Trade Mark	:	Coors Light
Applicant	:	Shenzhen Zelin Technology Co.,Limited
Address	:	2TH Building HongYong Li Industrial Park, LongGuang District, Shenzhen, China
Manufacturer	:	Shenzhen Zelin Technology Co.,Limited
Address	:	2TH Building HongYong Li Industrial Park, LongGuang District, Shenzhen, China

1.2.Accessory and Auxiliary Equipment

AC/DC Power Adapter (provided by laboratory)	:	Model:TEKA006-0501000UKU
		Input: 100-240V~50/60Hz 0.3A
		Output: DC 5V/1A

1.3.Description of Test Facility

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

1.4.Measurement Uncertainty

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	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 06, 2018	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 06, 2018	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 06, 2018	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 06, 2018	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 06, 2018	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 06, 2018	1 Year

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

Note: The Bluetooth has been tested under continuous transmission mode.

3.2.Configuration and peripherals

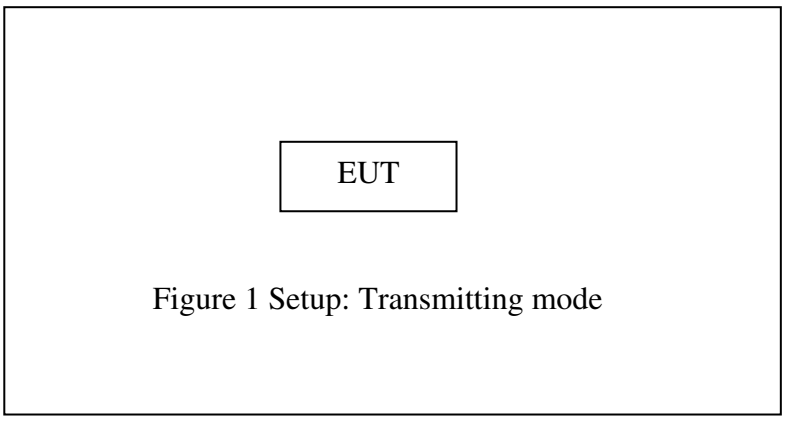


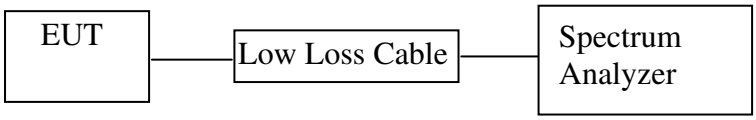
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	Compliant
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: Coors Light Bluetooth Earbuds)

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

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

5.3.EUT Configuration on Measurement

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

5.4.Operating Condition of EUT

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

5.4.2.Turn on the power of all equipment.

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

5.5.Test Procedure

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

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

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

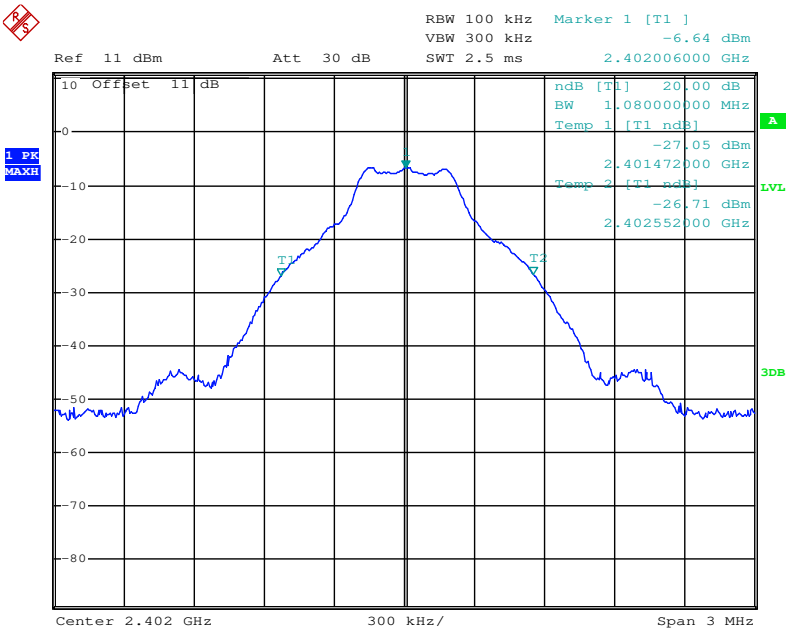
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.080	1.350	Pass
Middle	2441	1.086	1.356	Pass
High	2480	1.062	1.356	Pass

The spectrum analyzer plots are attached as below.

GFSK Mode

Low channel



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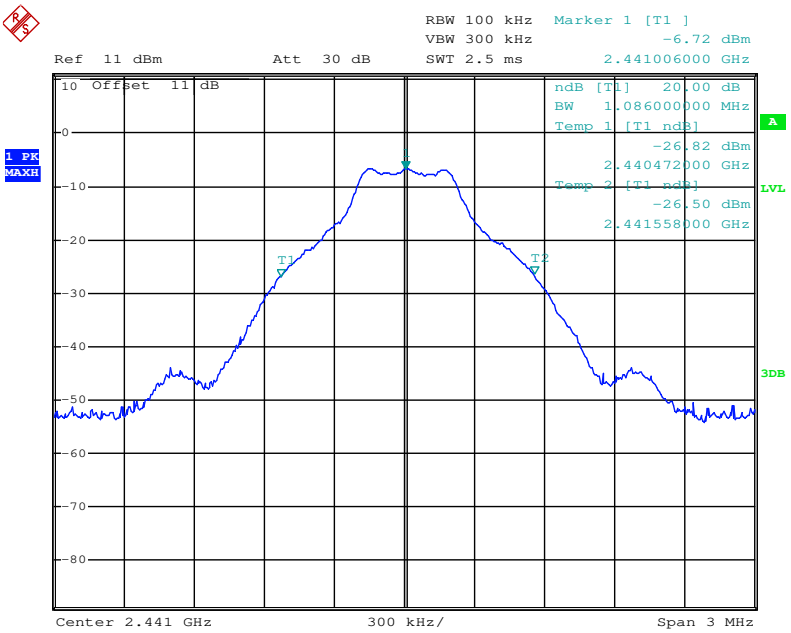
Middle channel



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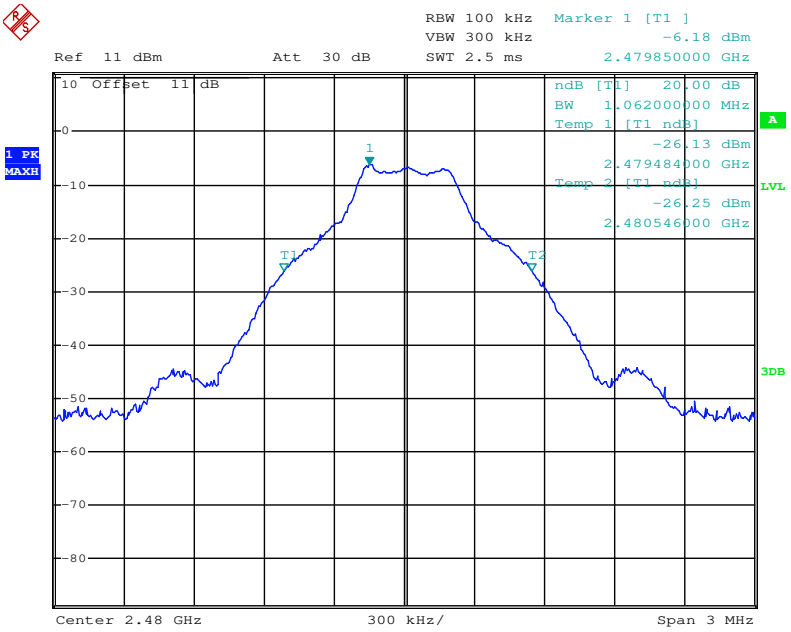
High channel



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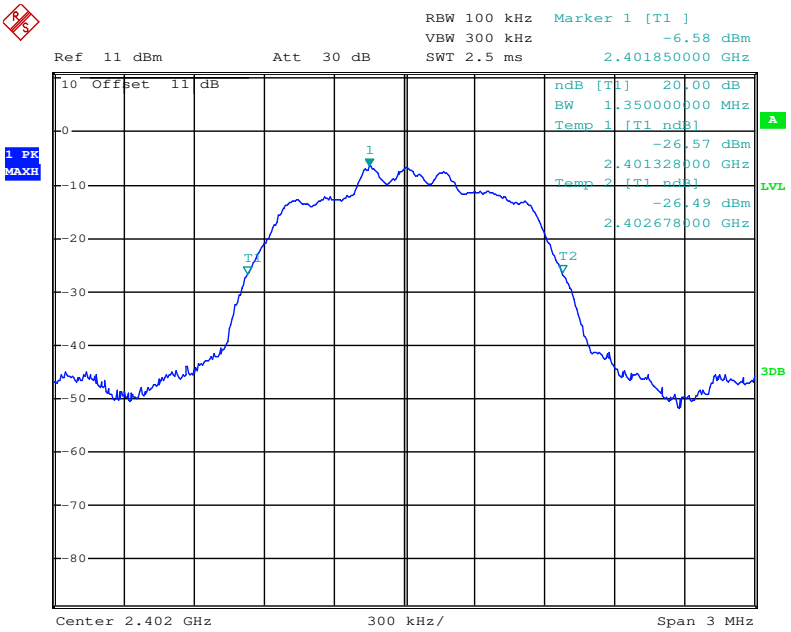
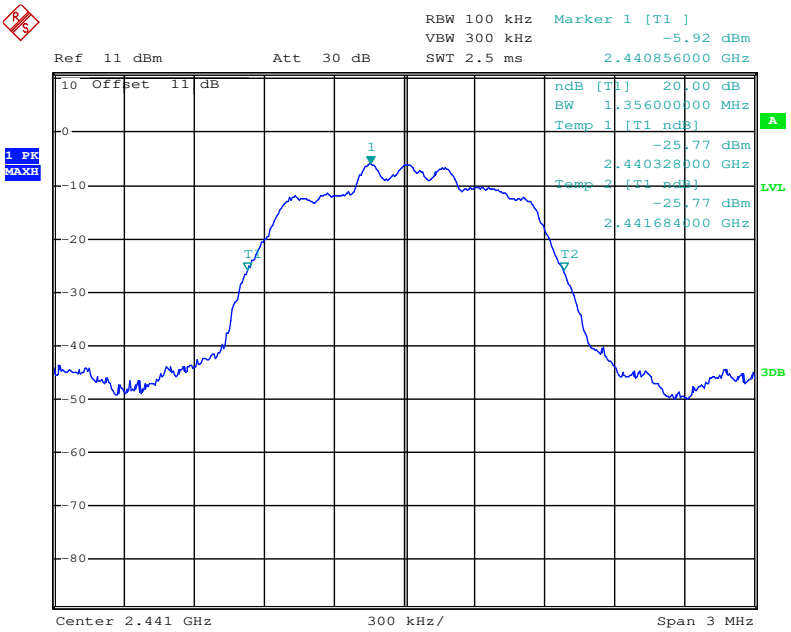
Π/4-DQPSK Mode

Low channel



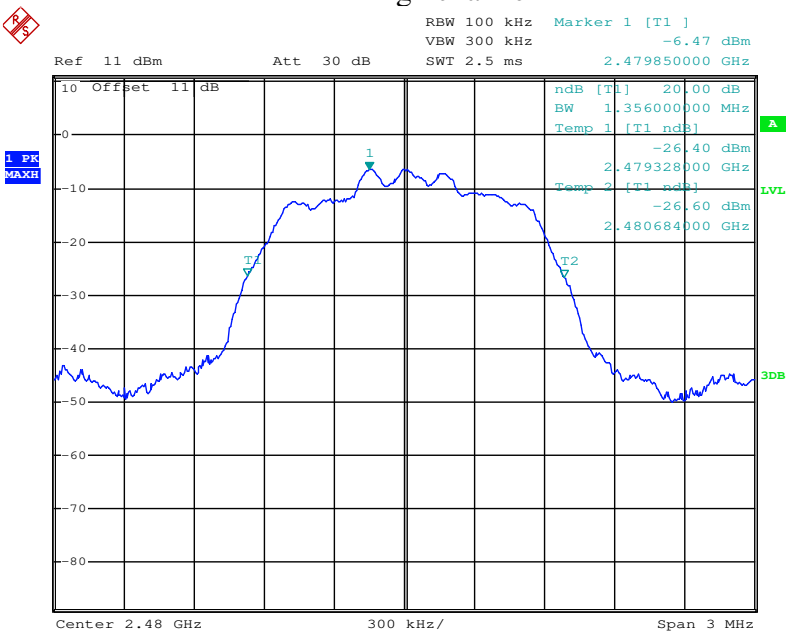
Date: 1.MAR.2018 15:52:42

Middle channel



Date: 1.MAR.2018 15:53:44

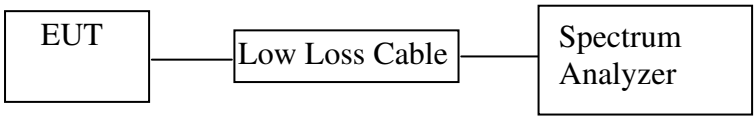
High channel



Date: 1.MAR.2018 15:54:32

6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



(EUT: Coors Light Bluetooth Earbuds)

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 2MHz.

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	1.009	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			

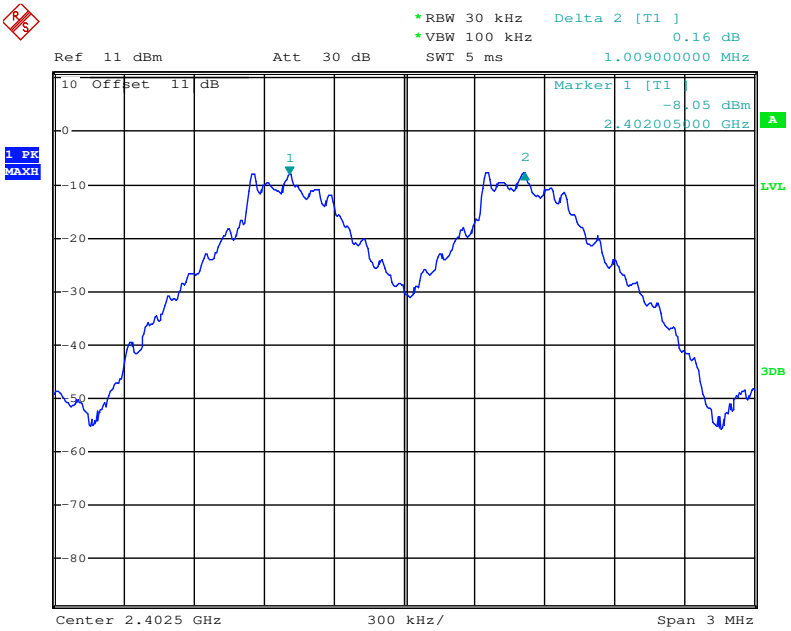
Π/4-DQPSK

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			

The spectrum analyzer plots are attached as below.

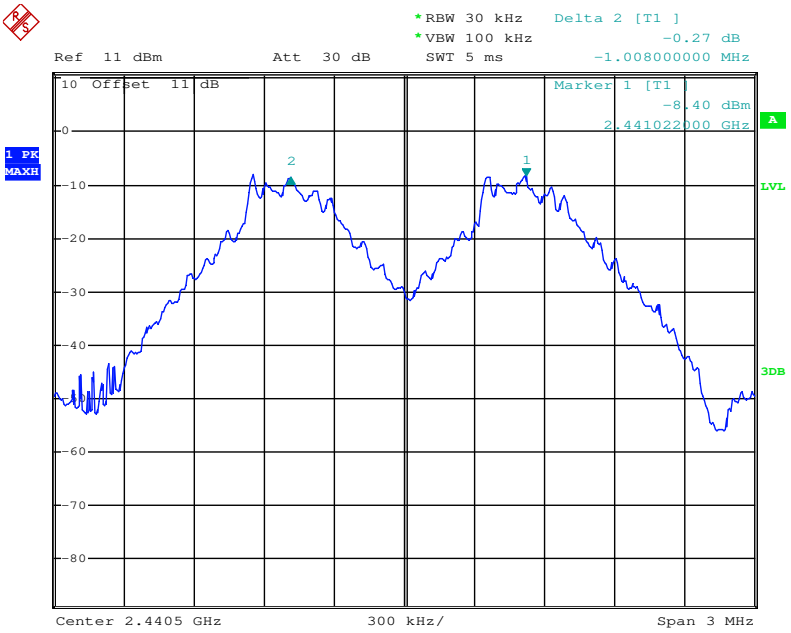
GFSK Mode

Low channel



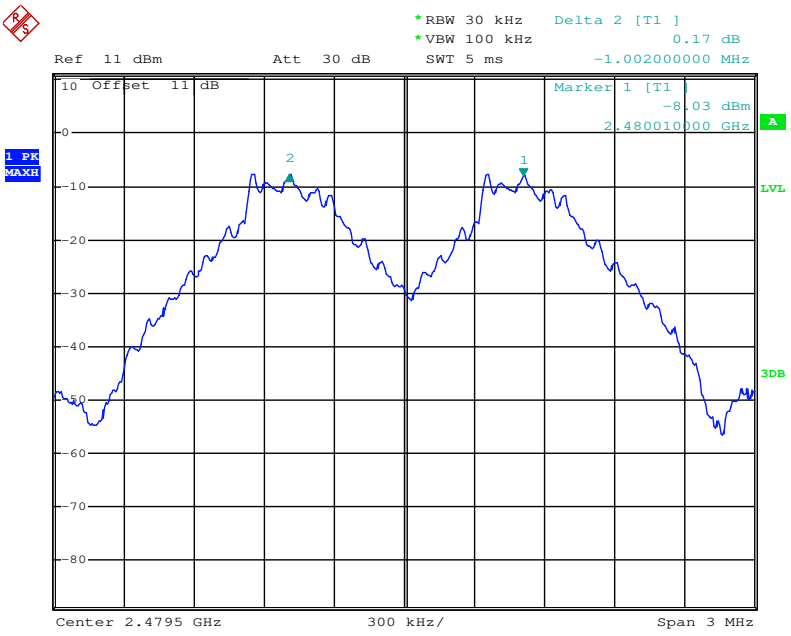
Date: 1.MAR.2018 16:04:22

Middle channel



Date: 1.MAR.2018 16:07:24

High channel



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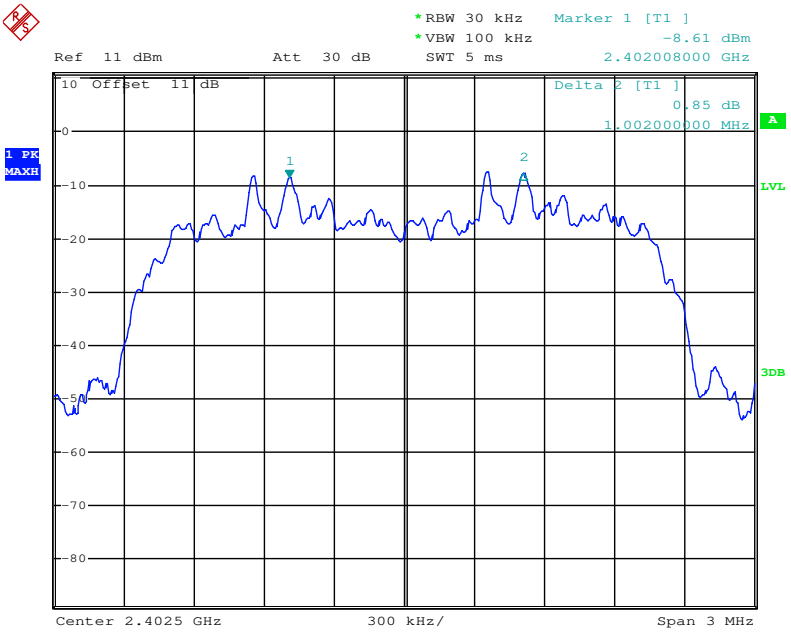
Π/4-DQPSK Mode

Low channel



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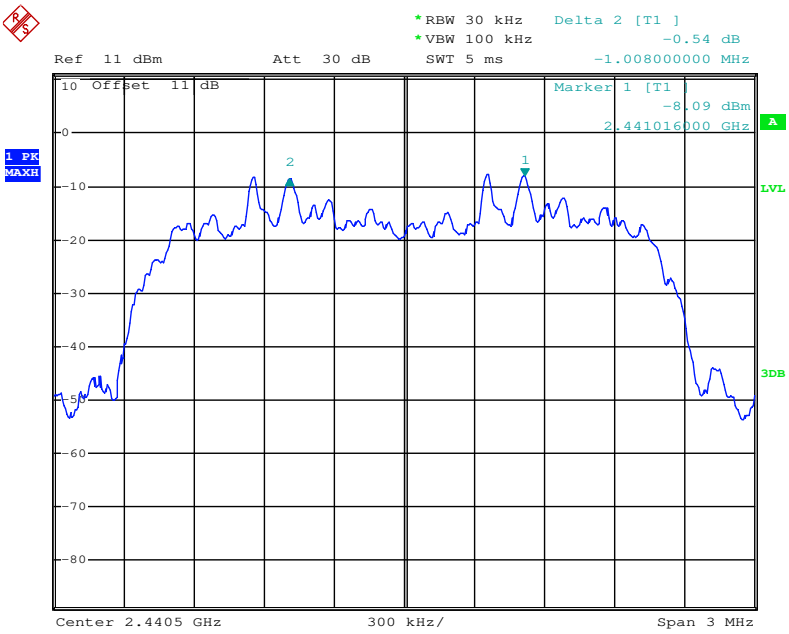
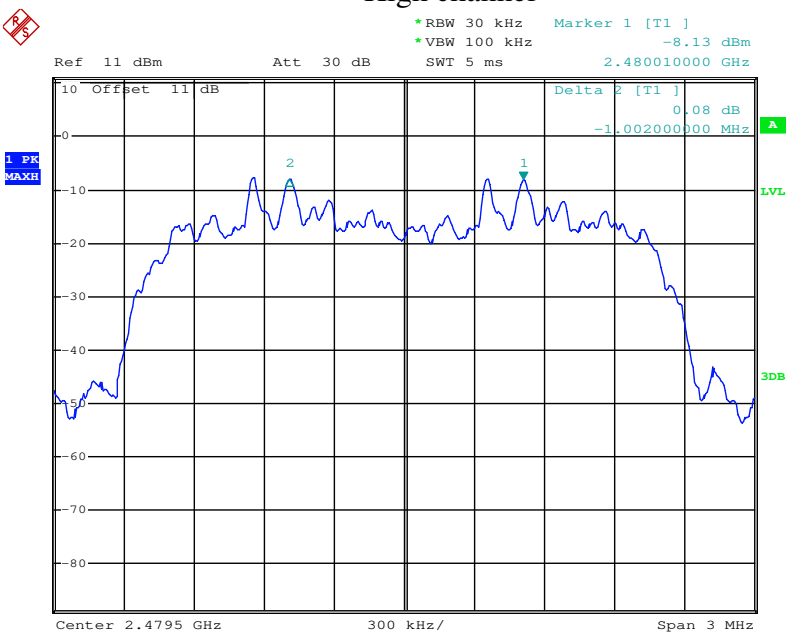
Middle channel



Date: 1.MAR.2018 16:12:22

High channel



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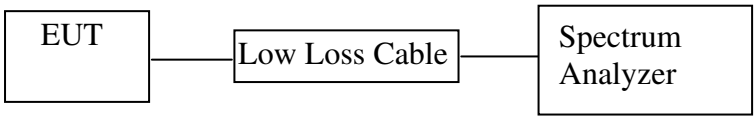
7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



(EUT: Coors Light Bluetooth Earbuds)

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

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

7.3.EUT Configuration on Measurement

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

7.4.Operating Condition of EUT

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

7.4.2.Turn on the power of all equipment.

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

7.5.Test Procedure

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

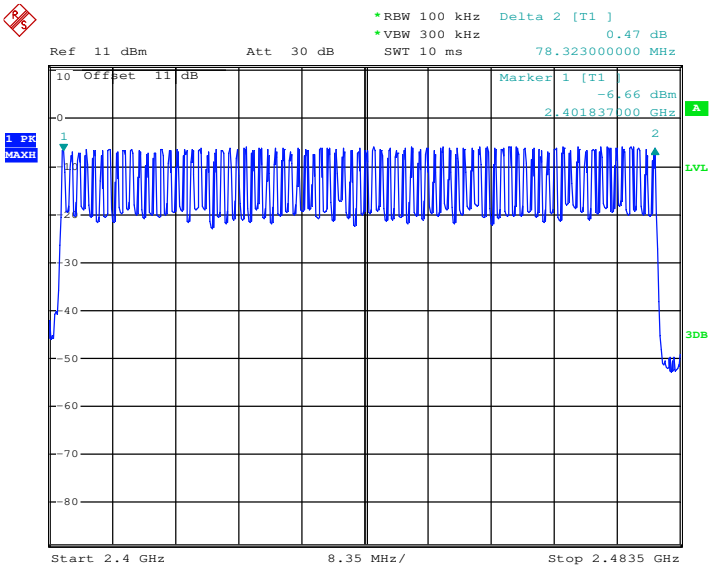
7.5.2.Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

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

7.6.Test Result

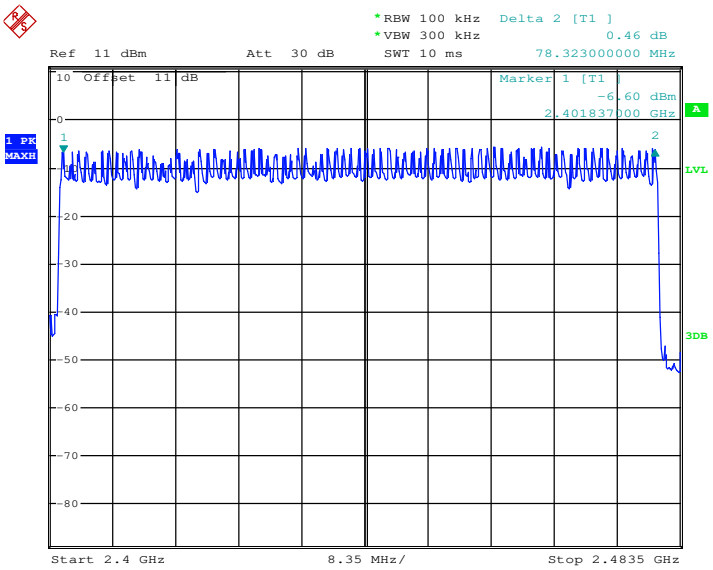
Total number of hopping channel	Measurement result(CH)	Limit(CH)
	79	⩾15

Number of hopping channels(GFSK)



Date: 1.MAR.2018 16:01:40

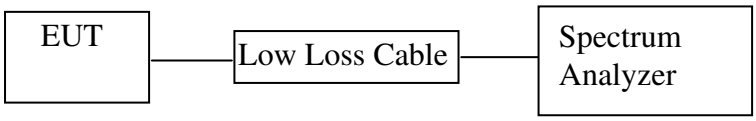
Number of hopping channels(Π/4-DQPSK)



Date: 1.MAR.2018 15:58:36

8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



(EUT: Coors Light Bluetooth Earbuds)

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

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

8.3.EUT Configuration on Measurement

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

8.4.Operating Condition of EUT

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

8.4.2.Turn on the power of all equipment.

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

8.5.Test Procedure

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

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

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

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

8.6.Test Result

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.410	131.20	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2441	1.670	267.20	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2441	2.930	312.53	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

Π/4-DQPSK

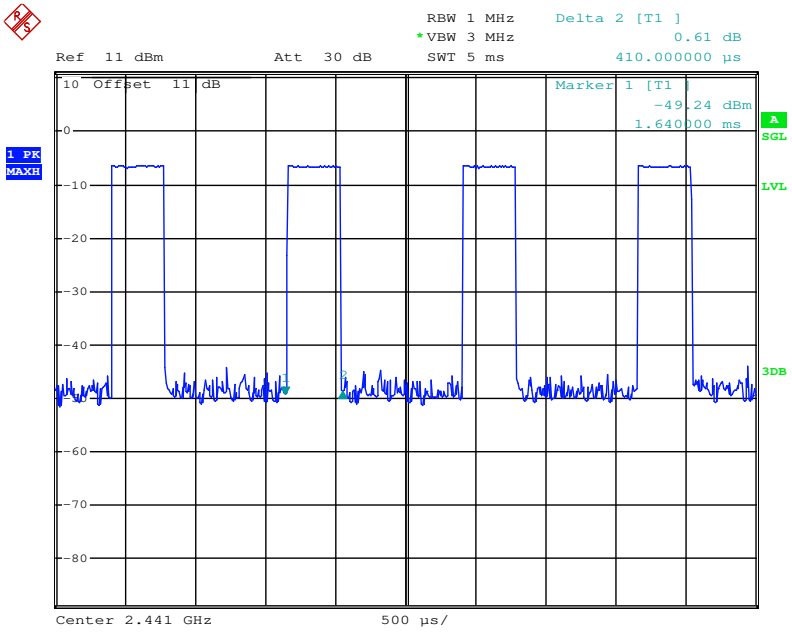
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.420	134.40	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2441	1.690	270.40	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2441	2.930	312.53	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

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

The spectrum analyzer plots are attached as below.

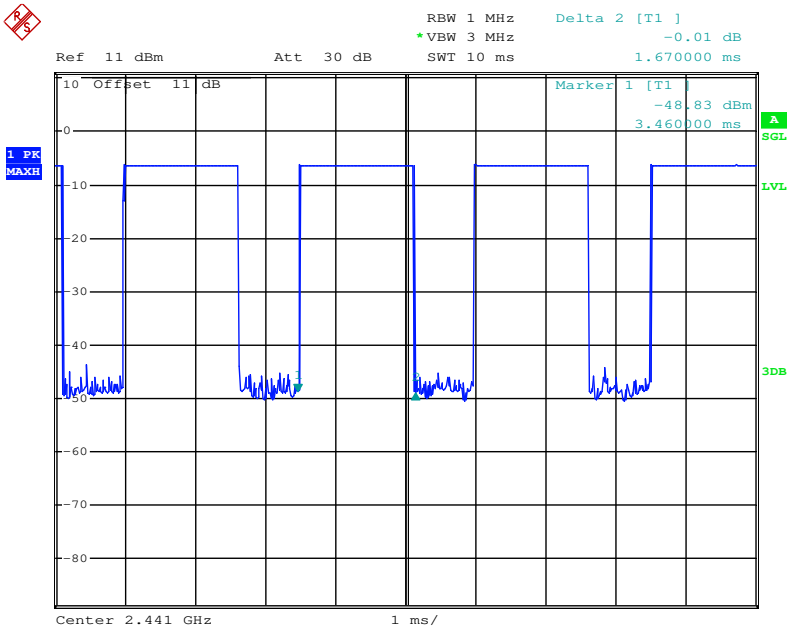
GFSK Mode

DH1 Middle channel



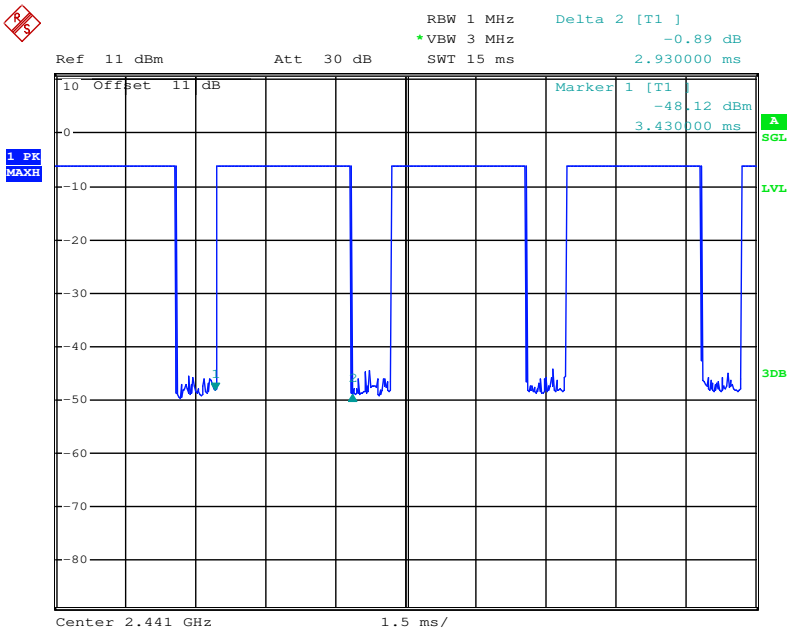
Date: 1.MAR.2018 16:30:08

DH3 Middle channel



Date: 1.MAR.2018 16:31:18

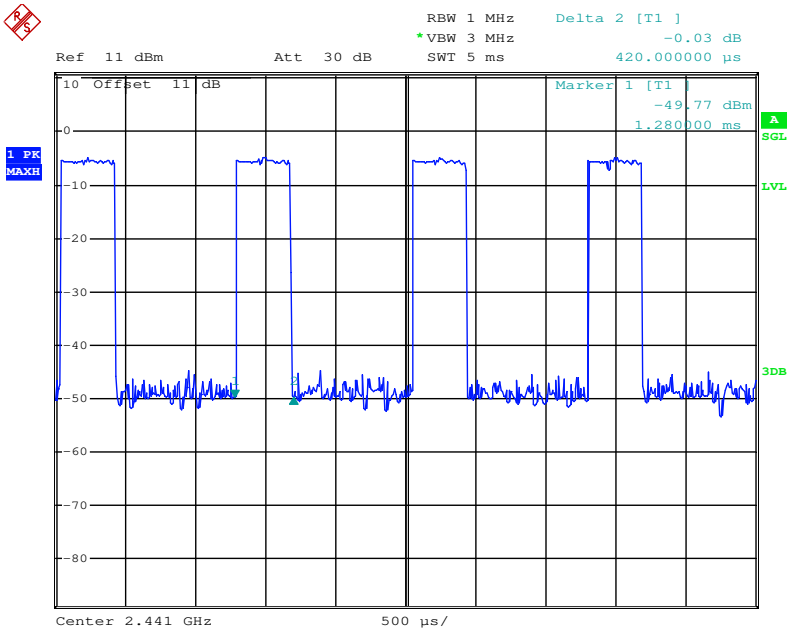
DH5 Middle channel



Date: 1.MAR.2018 16:31:55

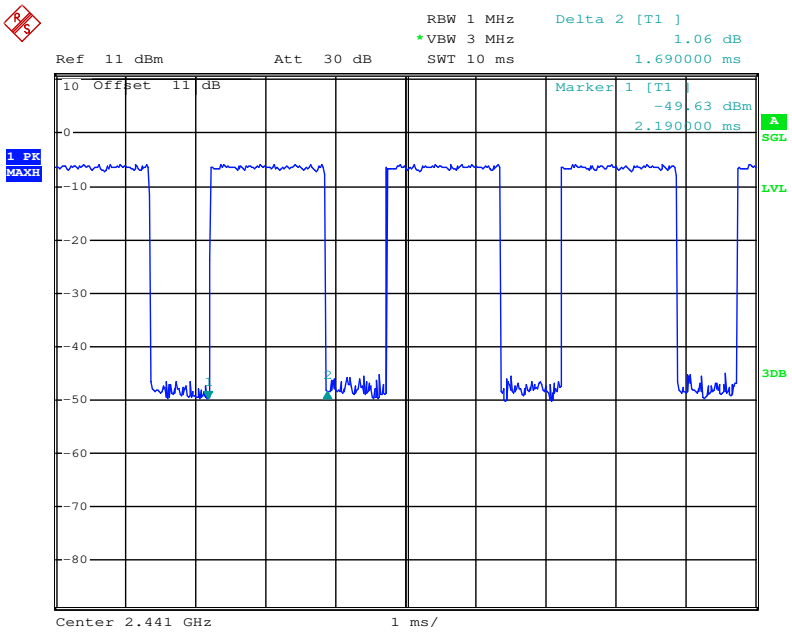
Π/4-DQPSK

2DH1 Middle channel



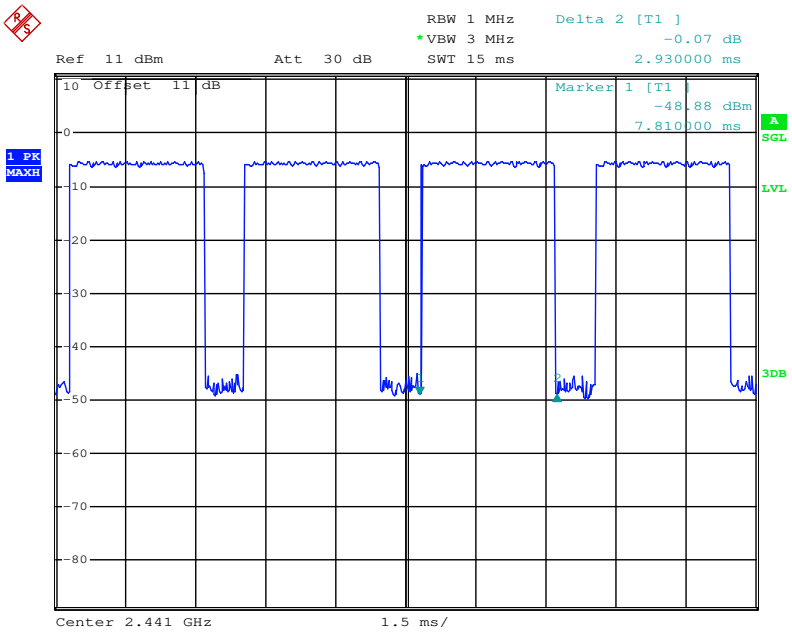
Date: 1.MAR.2018 16:34:30

2DH3 Middle channel



Date: 1.MAR.2018 16:33:42

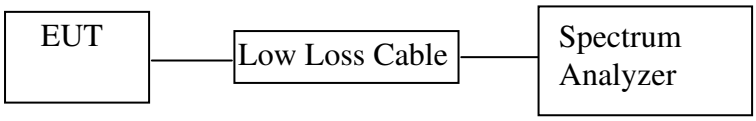
2DH5 Middle channel



Date: 1.MAR.2018 16:32:48

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



(EUT: Coors Light Bluetooth Earbuds)

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

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

9.3.EUT Configuration on Measurement

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

9.4.Operating Condition of EUT

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

9.4.2.Turn on the power of all equipment.

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

9.5.Test Procedure

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

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

9.5.3.Measurement the maximum peak output power.

9.6.Test Result

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-5.00/0.0003	21 / 0.125
Middle	2441	-4.91/0.0003	21 / 0.125
High	2480	-5.29/0.0003	21 / 0.125

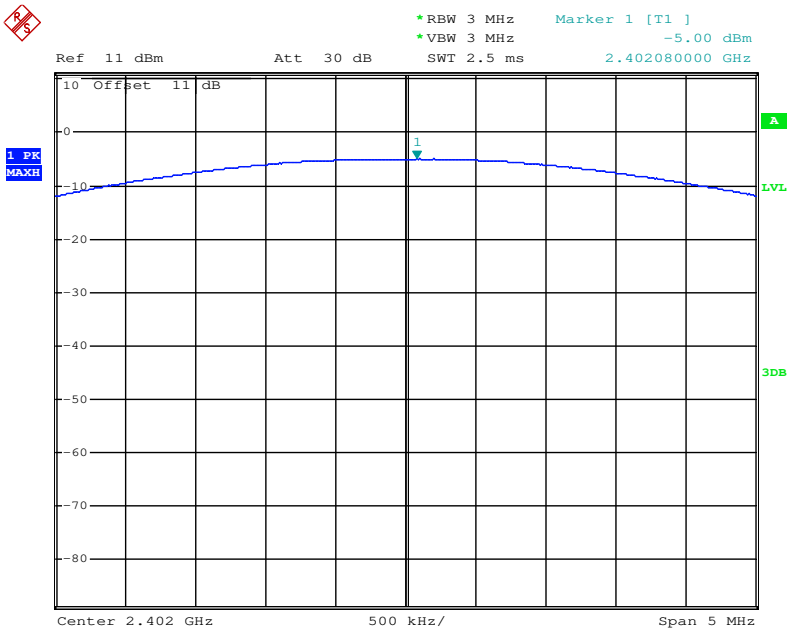
Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-4.52/0.0004	21 / 0.125
Middle	2441	-4.36/0.0004	21 / 0.125
High	2480	-4.24/0.0004	21 / 0.125

The spectrum analyzer plots are attached as below.

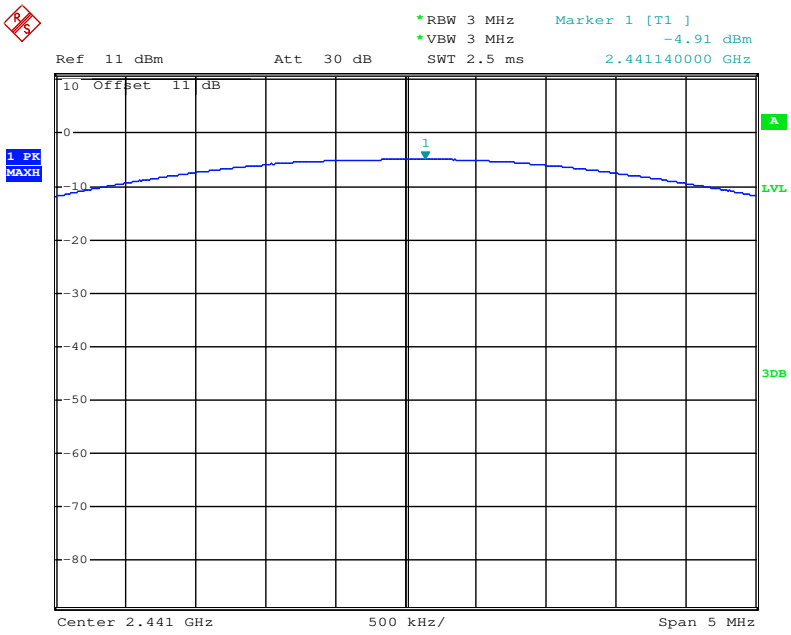
GFSK Mode

Low channel



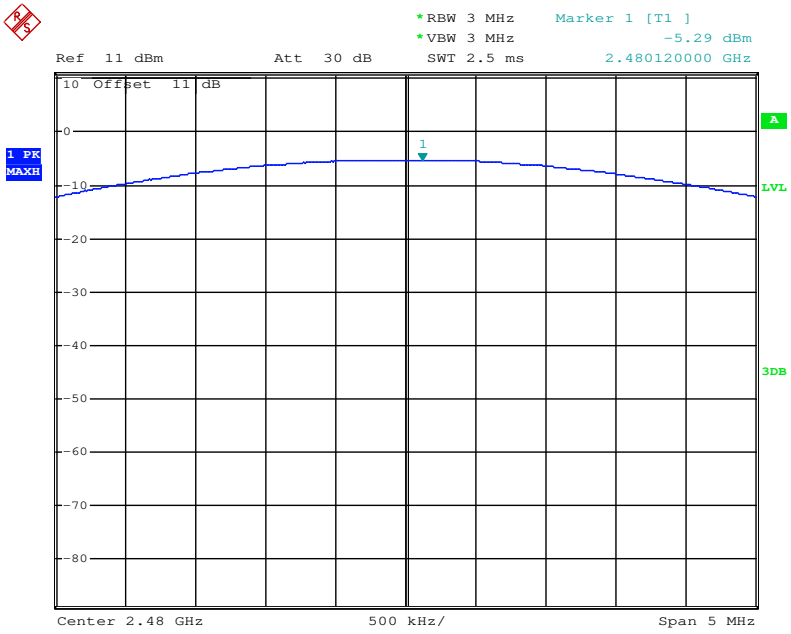
Date: 1.MAR.2018 16:20:47

Middle channel



Date: 1.MAR.2018 16:21:46

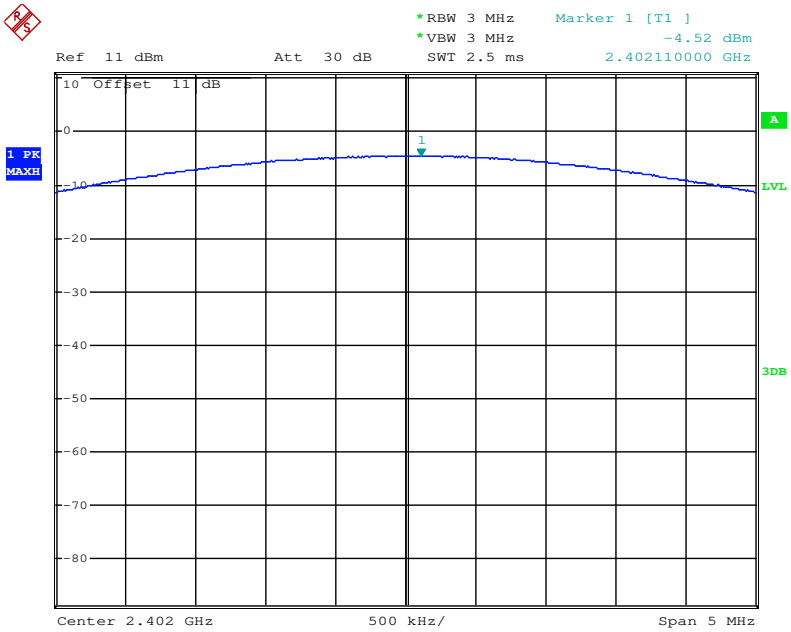
High channel



Date: 1.MAR.2018 16:22:27

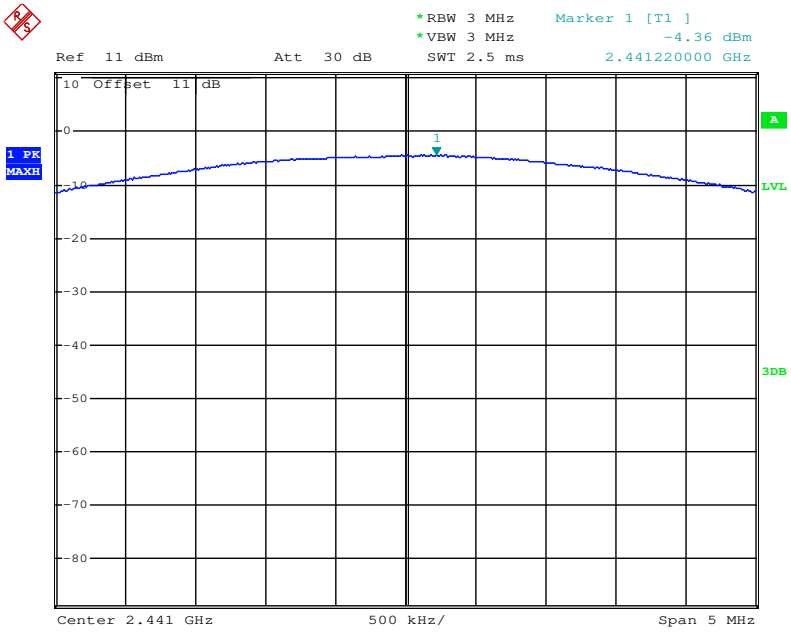
Π/4-DQPSK Mode

Low channel



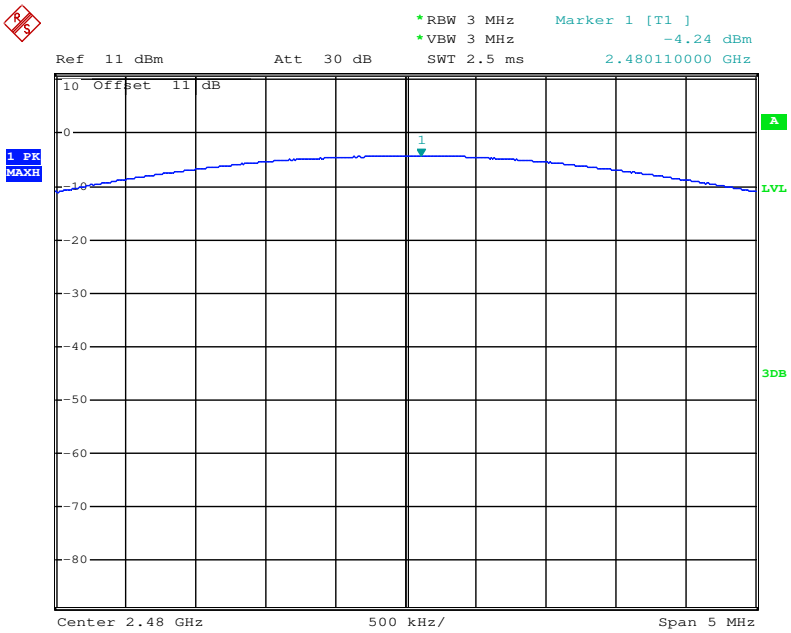
Date: 1.MAR.2018 16:26:33

Middle channel



Date: 1.MAR.2018 16:25:10

High channel



Date: 1.MAR.2018 16:23:33

10. RADIATED EMISSION TEST

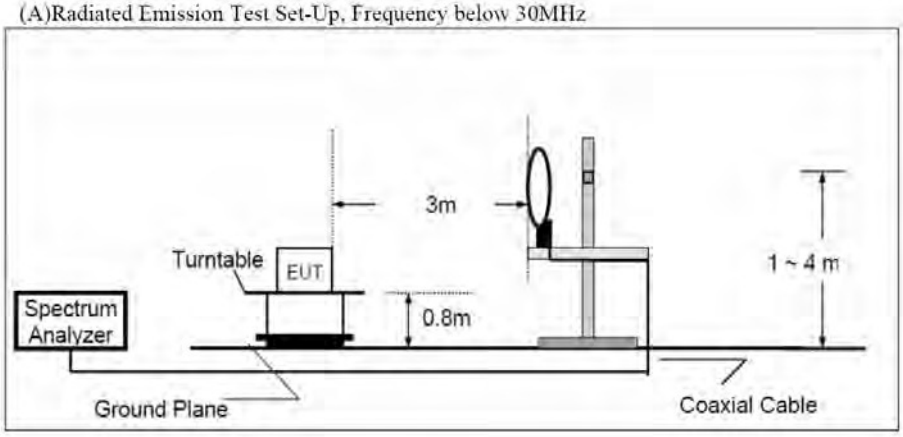
10.1. Block Diagram of Test Setup

10.1.1. Block diagram of connection between the EUT and peripherals

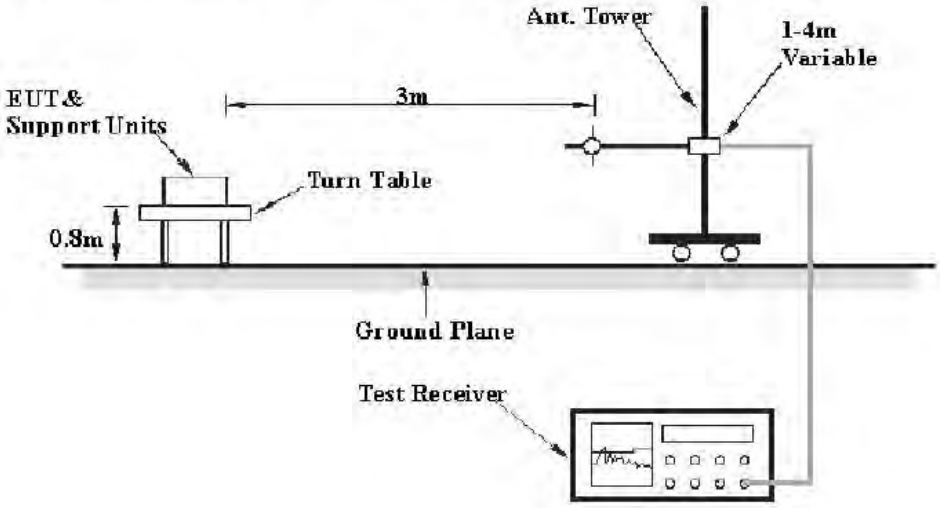
Figure 1 Setup: Transmitting mode

10.1.2. Semi-Anechoic Chamber Test Setup Diagram

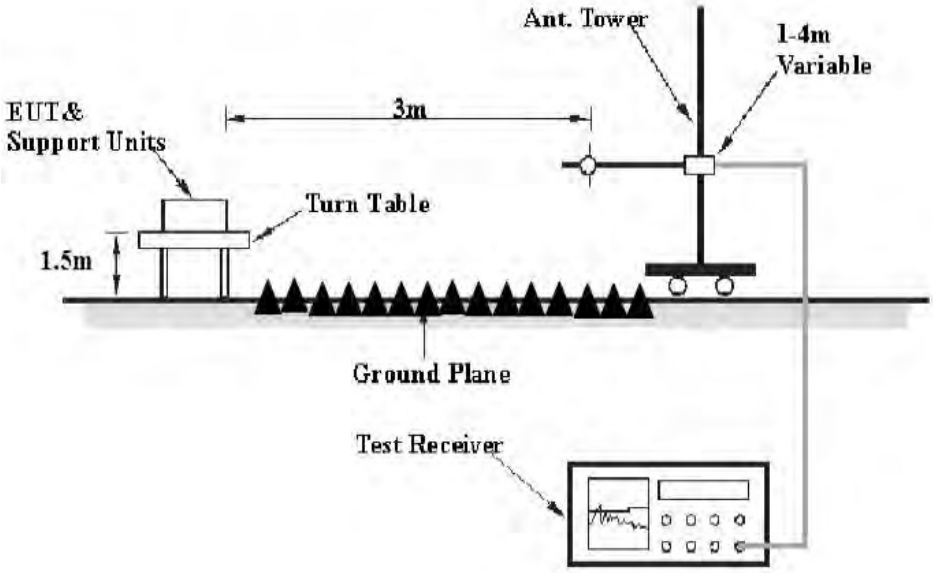
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



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



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



10.2.The Limit For Section 15.247(d)

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

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

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

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

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

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

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

10.6.Data Sample

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

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

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

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

10.7.The Field Strength of Radiation Emission Measurement Results

PASS.

Note: 1.We tested GFSK mode, Π/4-DQPSK mode and recorded the worst case data (GFSK mode) for all test mode.

2. The test frequency is from 30MHz to 26.5GHz, The 18-26.5GHz emissions are not reported, because the levels are too low against the limit.

Below 1GHz

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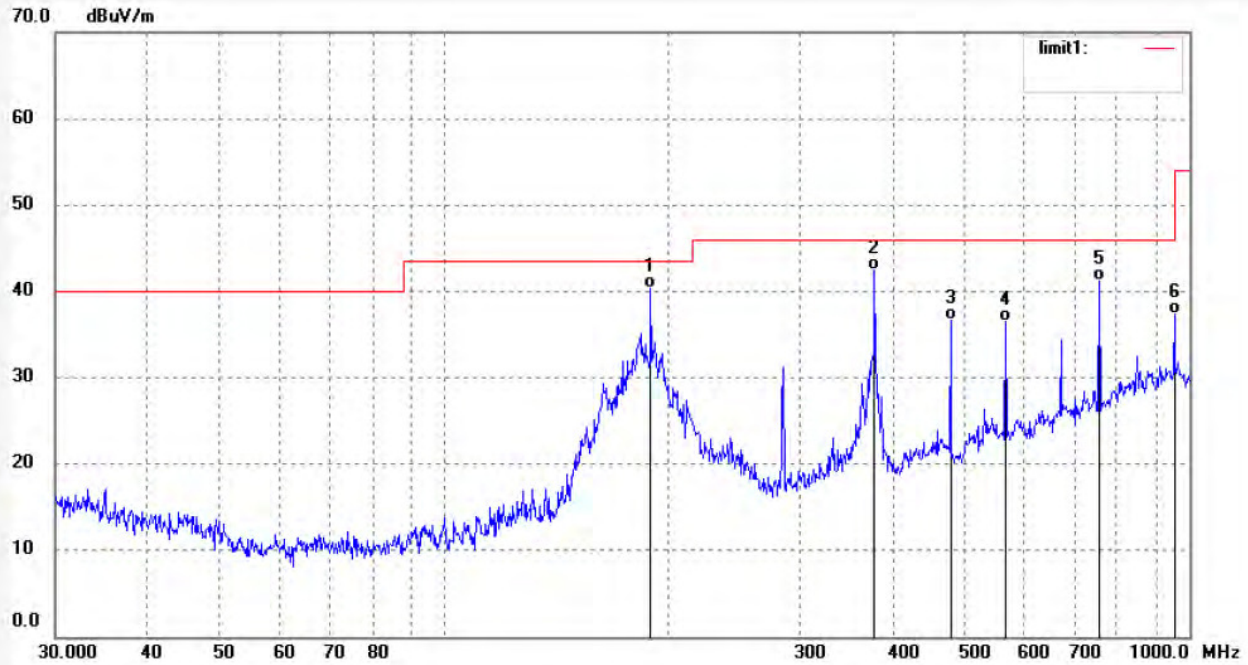
Fax:+86-0755-26503396

Job No.: star2018 #2	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/05/57
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.1074	59.83	-19.52	40.31	43.50	-3.19	QP	200	32	
2	377.8480	56.62	-14.16	42.46	46.00	-3.54	QP	200	186	
3	478.1394	49.22	-12.49	36.73	46.00	-9.27	QP	200	241	
4	565.9776	47.18	-10.73	36.45	46.00	-9.55	QP	200	206	
5	757.6200	47.76	-6.60	41.16	46.00	-4.84	QP	200	320	
6	955.3509	40.71	-3.35	37.36	46.00	-8.64	QP	200	229	

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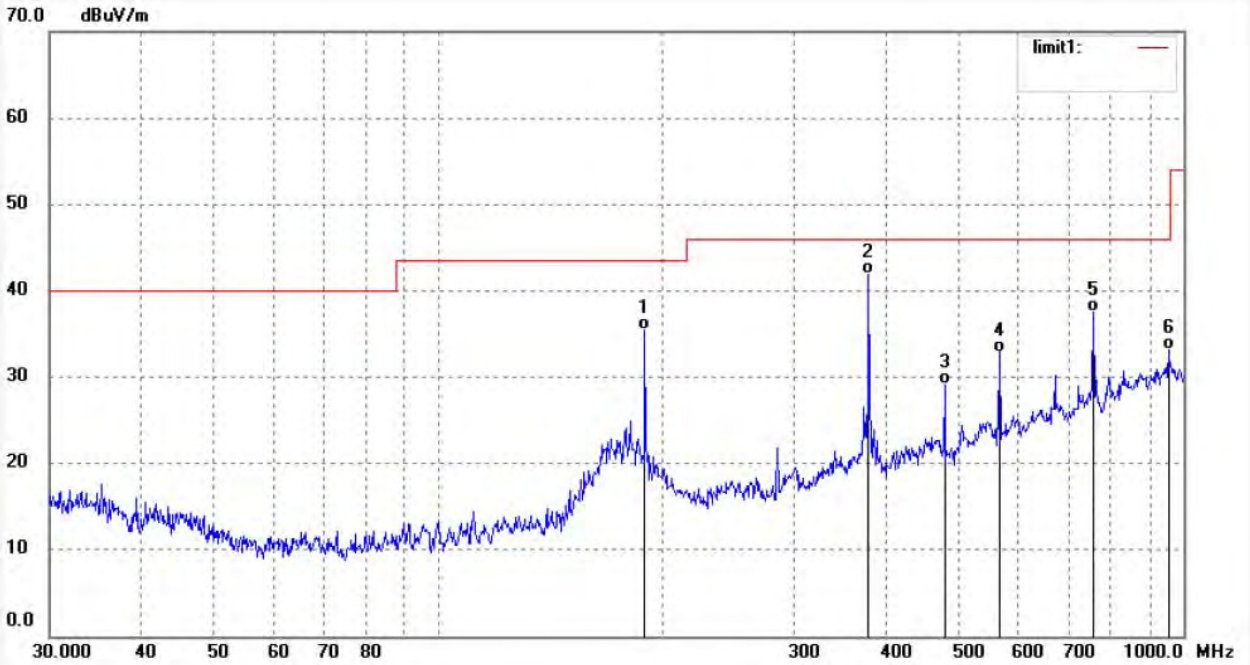
Fax:+86-0755-26503396

Job No.: star2018 #1	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/05/03
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.1074	55.01	-19.52	35.49	43.50	-8.01	QP	100	142	
2	377.8480	56.10	-14.16	41.94	46.00	-4.06	QP	100	103	
3	478.1394	41.61	-12.49	29.12	46.00	-16.88	QP	100	58	
4	565.9776	43.63	-10.73	32.90	46.00	-13.10	QP	100	192	
5	757.6200	44.06	-6.60	37.46	46.00	-8.54	QP	100	217	
6	955.3509	36.60	-3.35	33.25	46.00	-12.75	QP	100	225	

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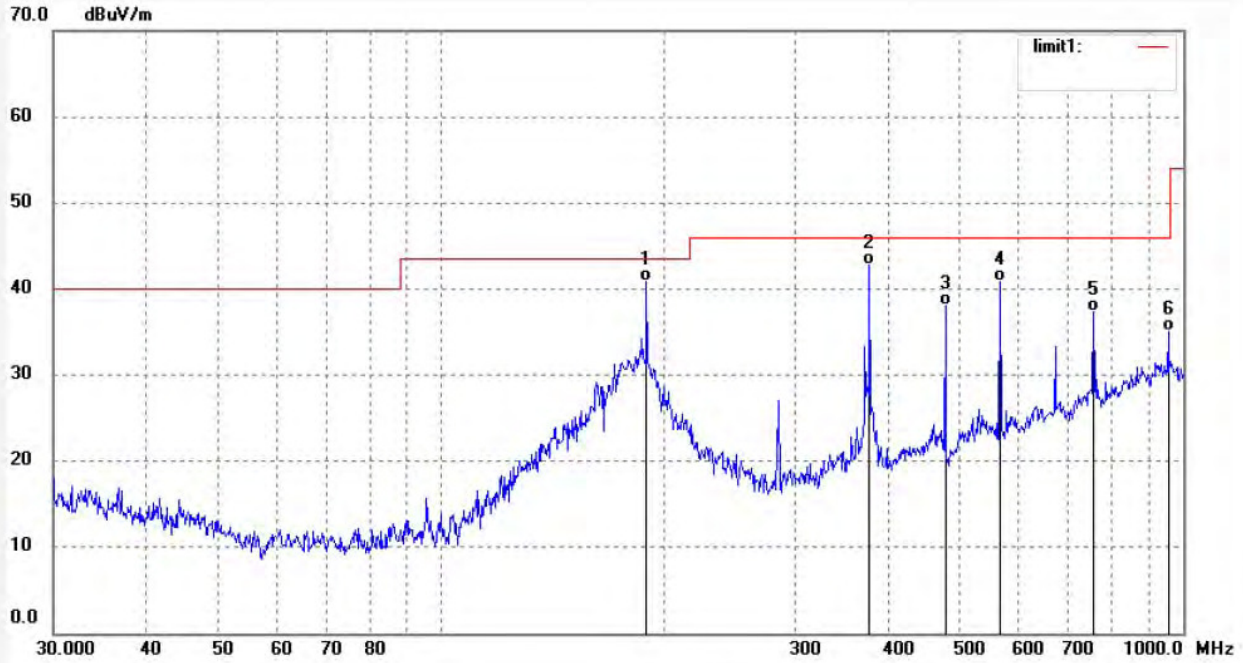
Fax:+86-0755-26503396

Job No.: star2018 #3	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/07/02
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2441MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.1075	60.39	-19.52	40.87	43.50	-2.63	QP	200	62	
2	377.8480	56.89	-14.16	42.73	46.00	-3.27	QP	200	58	
3	478.1394	50.62	-12.49	38.13	46.00	-7.87	QP	200	103	
4	565.9776	51.62	-10.73	40.89	46.00	-5.11	QP	200	78	
5	757.6200	43.88	-6.60	37.28	46.00	-8.72	QP	200	114	
6	955.3509	38.52	-3.35	35.17	46.00	-10.83	QP	200	197	

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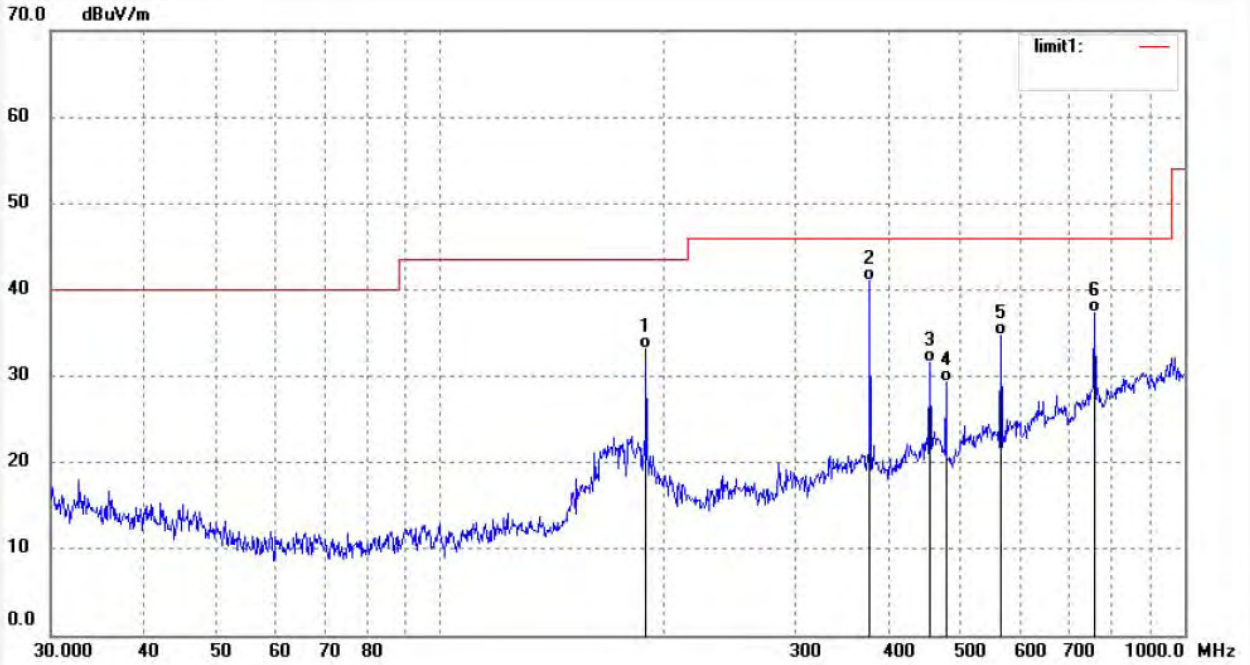
Fax:+86-0755-26503396

Job No.: star2018 #4	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/08/04
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2441MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.1075	52.71	-19.52	33.19	43.50	-10.31	QP	100	49	
2	377.8480	55.15	-14.16	40.99	46.00	-5.01	QP	100	103	
3	455.1888	44.51	-12.87	31.64	46.00	-14.36	QP	100	122	
4	478.1394	41.78	-12.49	29.29	46.00	-16.71	QP	100	241	
5	565.9776	45.55	-10.73	34.82	46.00	-11.18	QP	100	235	
6	757.6200	43.97	-6.60	37.37	46.00	-8.63	QP	100	310	

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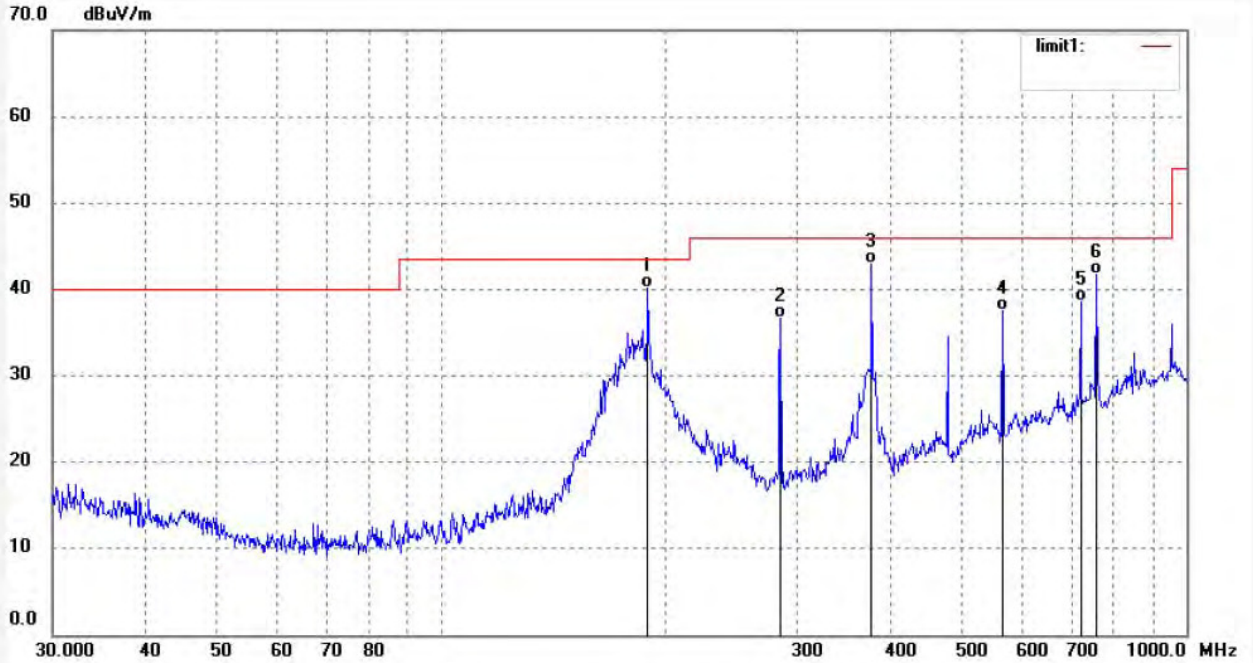
Job No.: star2018 #6	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/10/37
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2480MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.1075	59.75	-19.52	40.23	43.50	-3.27	QP	200	54	
2	285.2611	53.30	-16.59	36.71	46.00	-9.29	QP	200	122	
3	377.8480	57.04	-14.16	42.88	46.00	-3.12	QP	200	136	
4	565.9776	48.28	-10.73	37.55	46.00	-8.45	QP	200	258	
5	721.2544	45.99	-7.45	38.54	46.00	-7.46	QP	200	328	
6	757.6200	48.29	-6.60	41.69	46.00	-4.31	QP	200	336	

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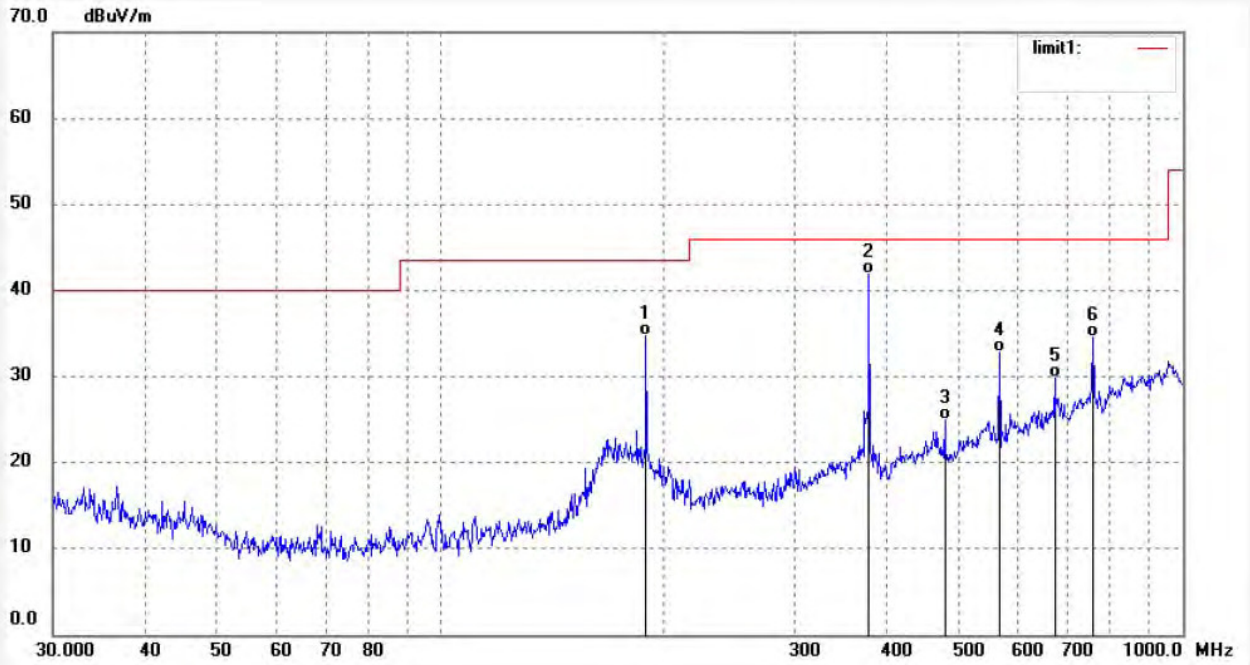
Job No.: star2018 #5	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/09/00
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2480MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	189.1075	54.32	-19.52	34.80	43.50	-8.70	QP	100	325	
2	377.8480	56.08	-14.16	41.92	46.00	-4.08	QP	100	214	
3	478.1394	37.50	-12.49	25.01	46.00	-20.99	QP	100	112	
4	565.9776	43.50	-10.73	32.77	46.00	-13.23	QP	100	98	
5	672.3103	38.28	-8.44	29.84	46.00	-16.16	QP	100	45	
6	757.6200	41.18	-6.60	34.58	46.00	-11.42	QP	100	100	

Above 1GHz

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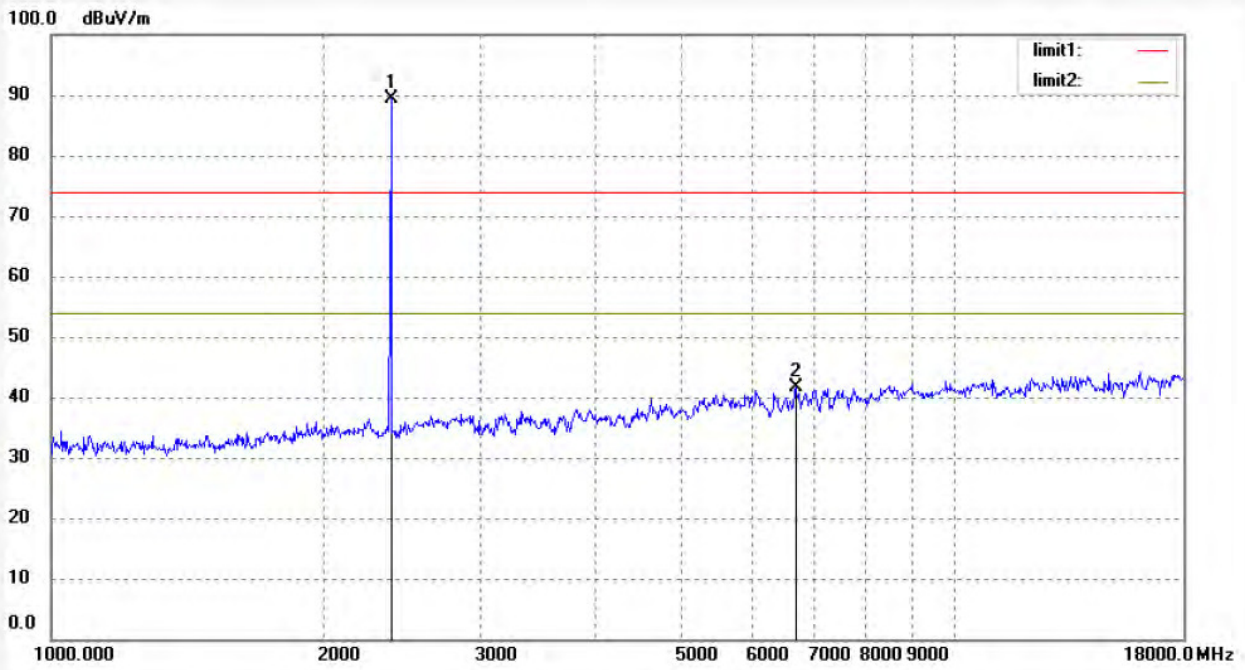
Job No.: star2018 #8	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/18/29
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	97.38	-8.03	89.35			peak	200	139	
2	6690.695	40.46	1.28	41.74	74.00	-32.26	peak	200	256	

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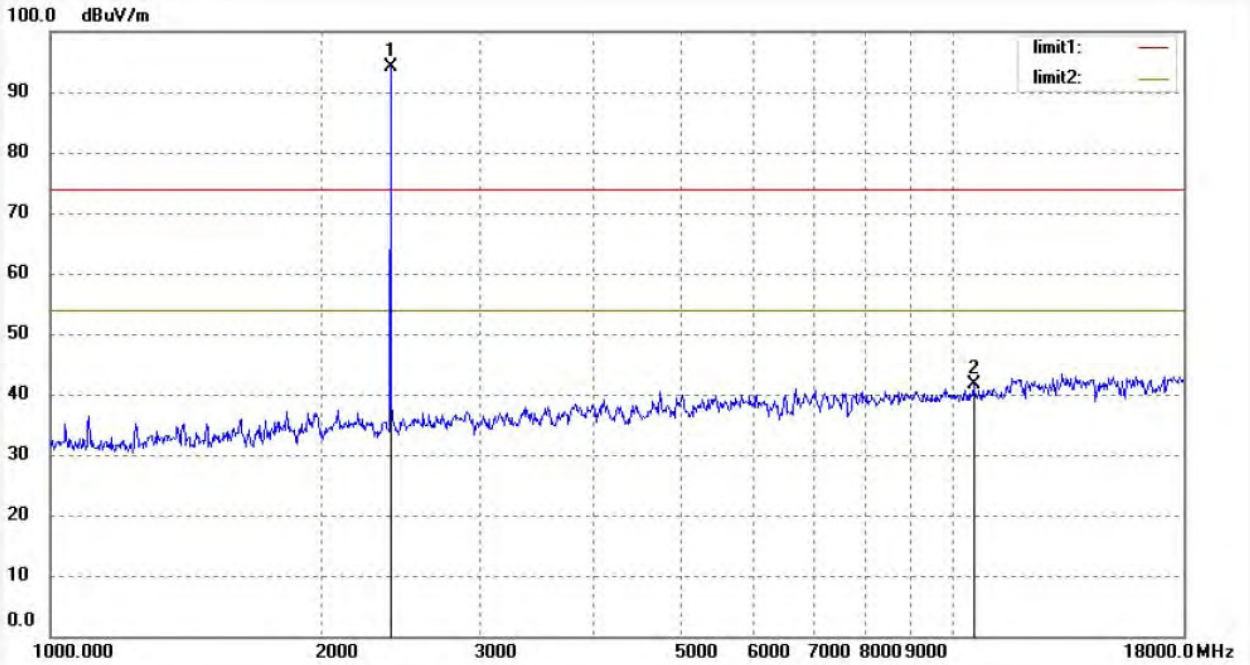
Job No.: star2018 #7	Polarization: Vertical
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/16/00
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	102.13	-8.03	94.10			peak	150	41	
2	10535.961	36.29	5.43	41.72	74.00	-32.28	peak	150	136	

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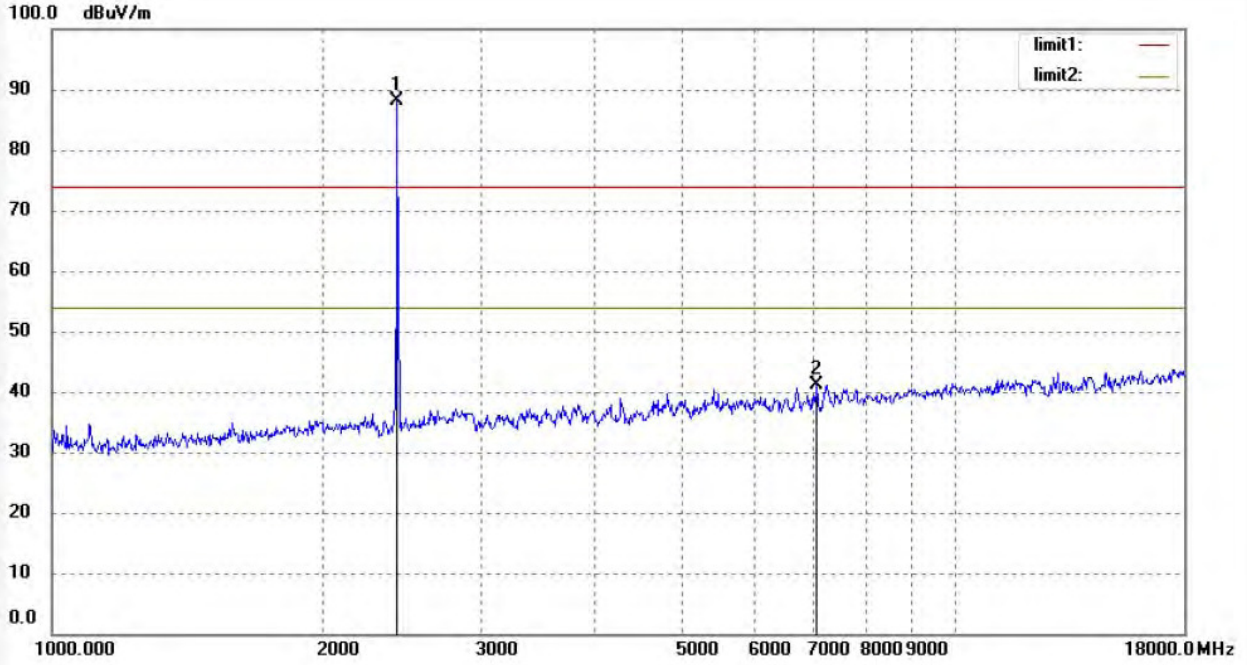
Job No.: star2018 #9	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/20/18
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2441MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.121	96.02	-7.93	88.09			peak	200	179	
2	7050.590	39.27	1.86	41.13	74.00	-32.87	peak	200	307	

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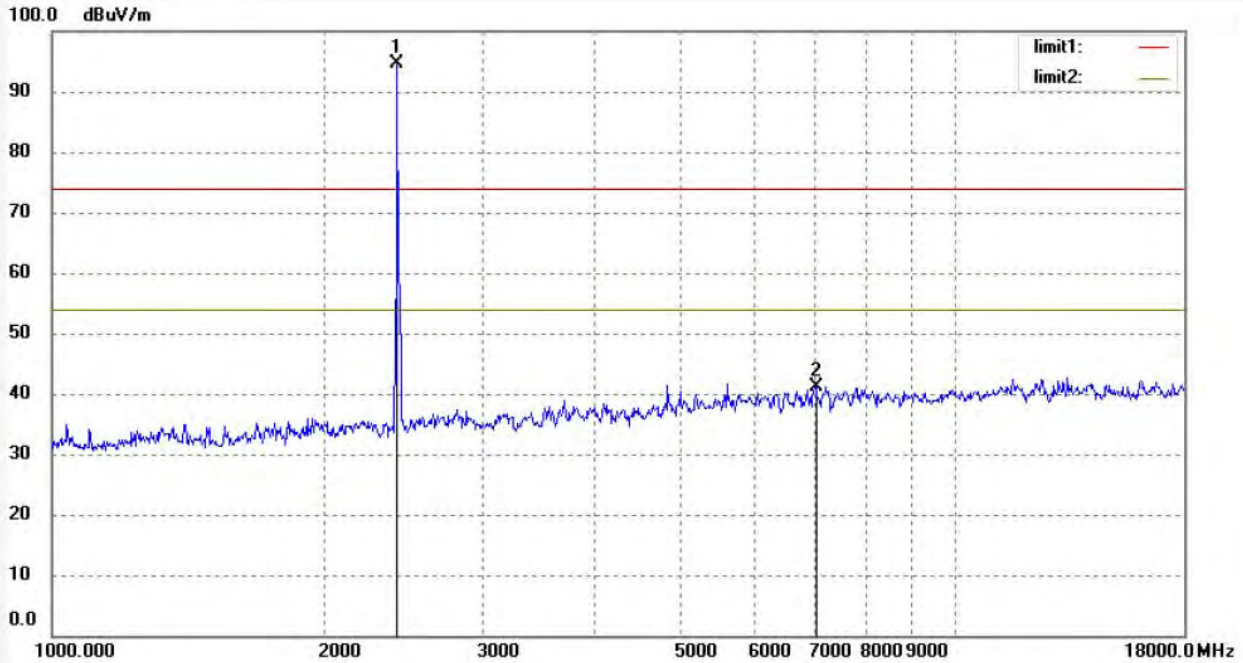
Job No.: star2018 #10	Polarization: Vertical
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/22/15
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2441MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.121	102.55	-7.93	94.62			peak	150	24	
2	7030.097	39.42	1.83	41.25	74.00	-32.75	peak	150	105	

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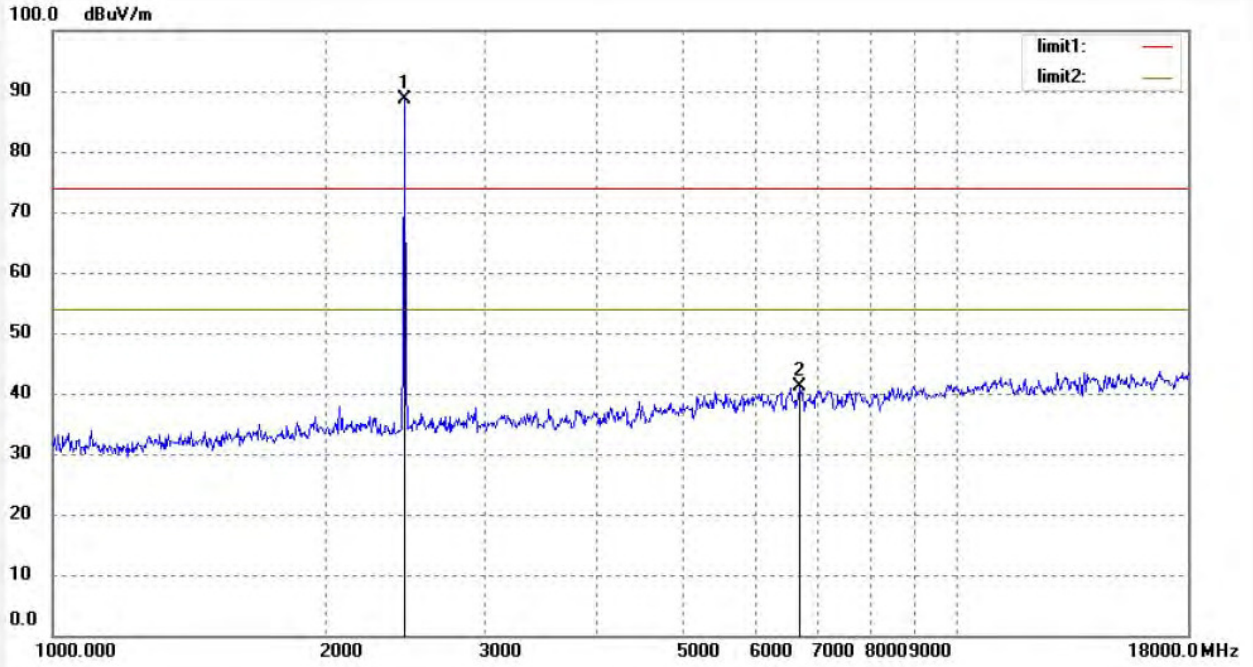
Job No.: star2018 #12	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/25/59
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2480MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	96.57	-7.84	88.73			peak	200	222	
2	6710.199	39.75	1.30	41.05	74.00	-32.95	peak	200	241	

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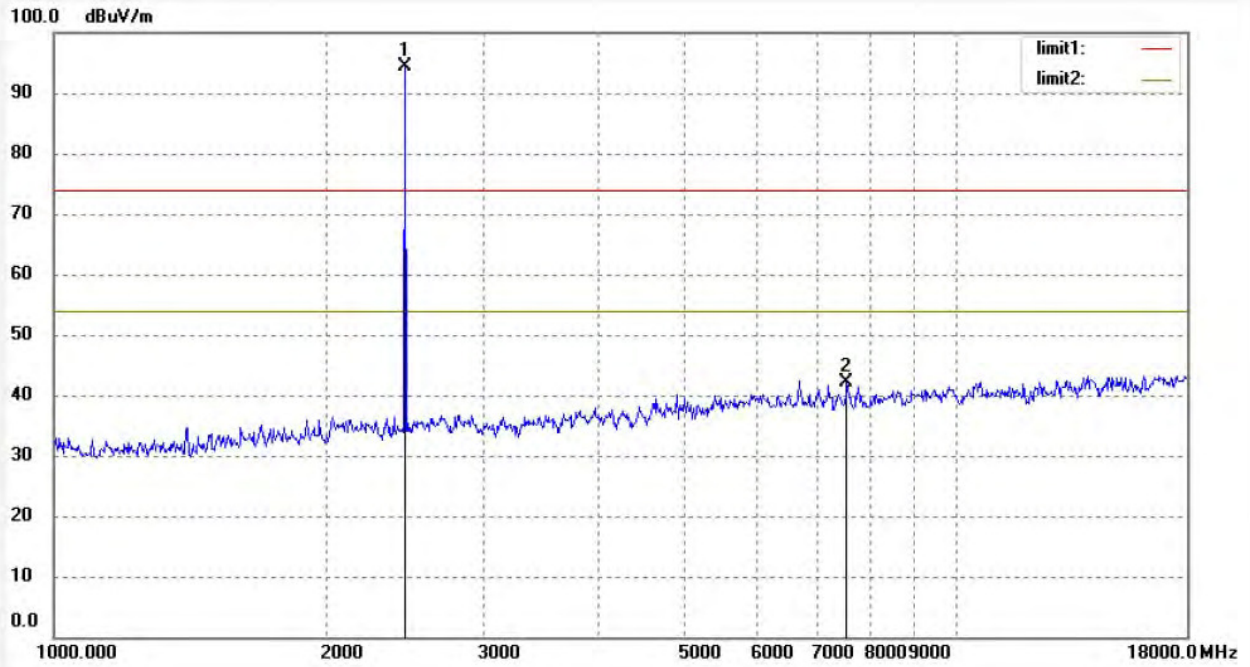
Job No.: star2018 #11	Polarization: Vertical
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/24/16
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2480MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

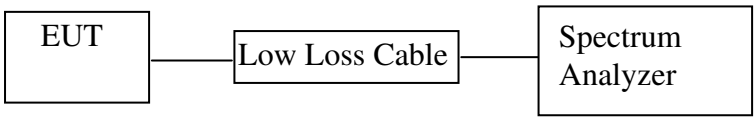
Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	102.26	-7.84	94.42			peak	150	174	
2	7560.741	39.62	2.62	42.24	74.00	-31.76	peak	150	252	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Coors Light Bluetooth Earbuds)

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.

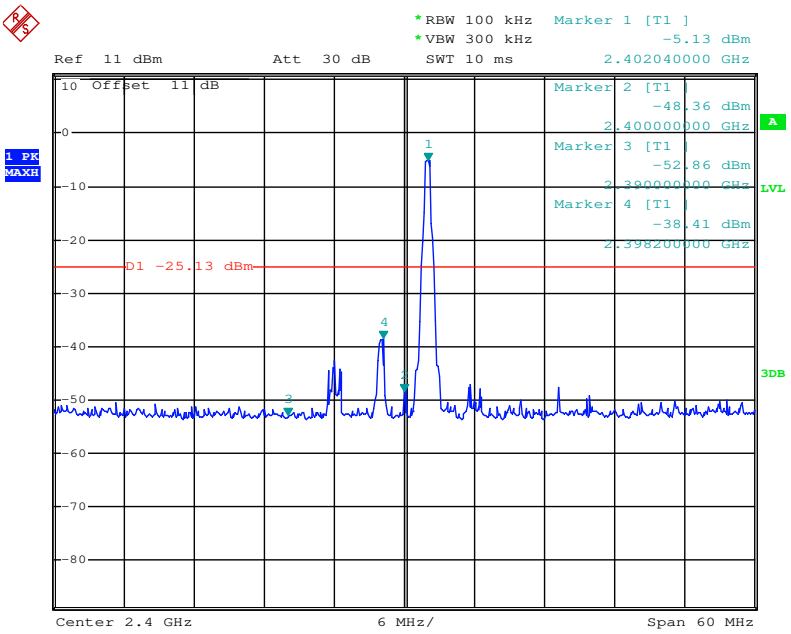
11.6.Test Result

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK Mode		
2400.00	43.23	> 20dBc
2483.50	42.25	> 20dBc
Π/4-DQPSK Mode		
2400.00	46.89	> 20dBc
2483.50	42.37	> 20dBc

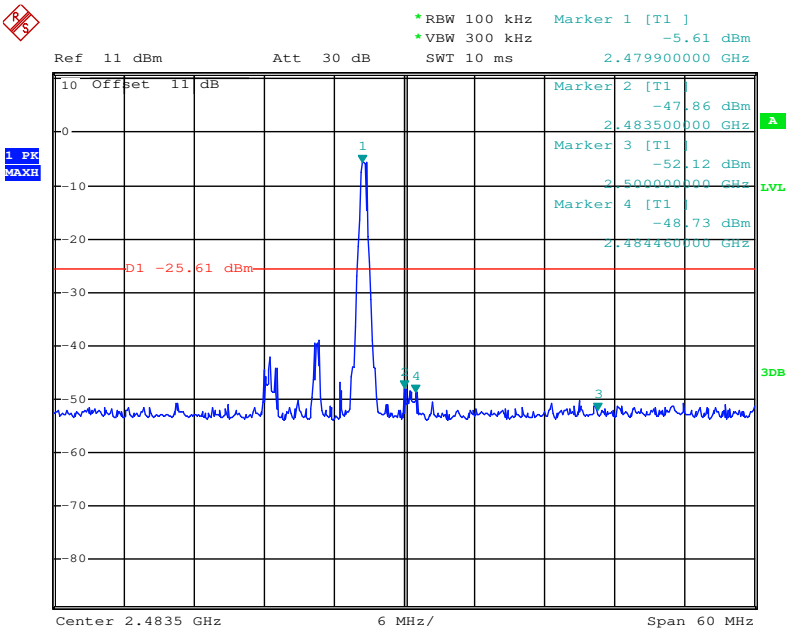
Note: Both hopping-on mode and hopping-off mode had been pre-tested, and only the worst case was recorded in the test report.

The spectrum analyzer plots are attached as below.

GFSK Mode

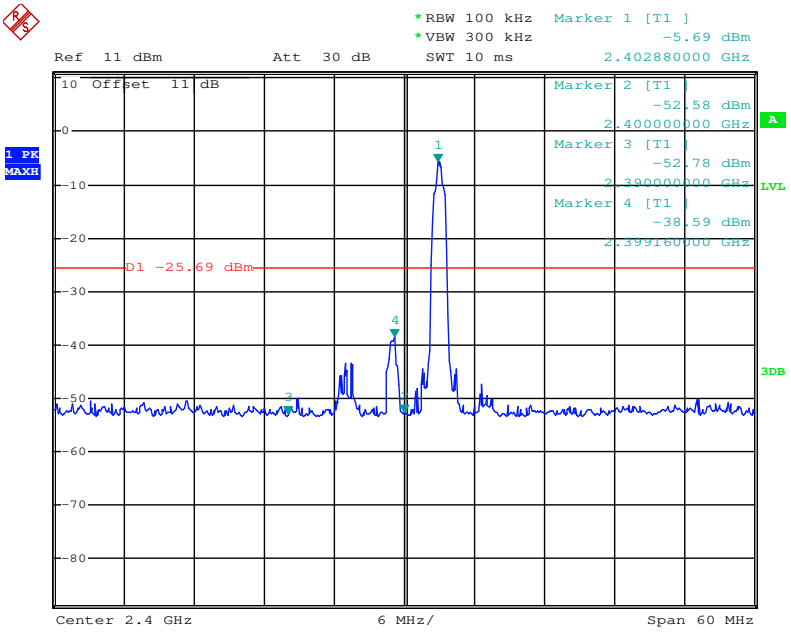


Date: 1.MAR.2018 16:19:24

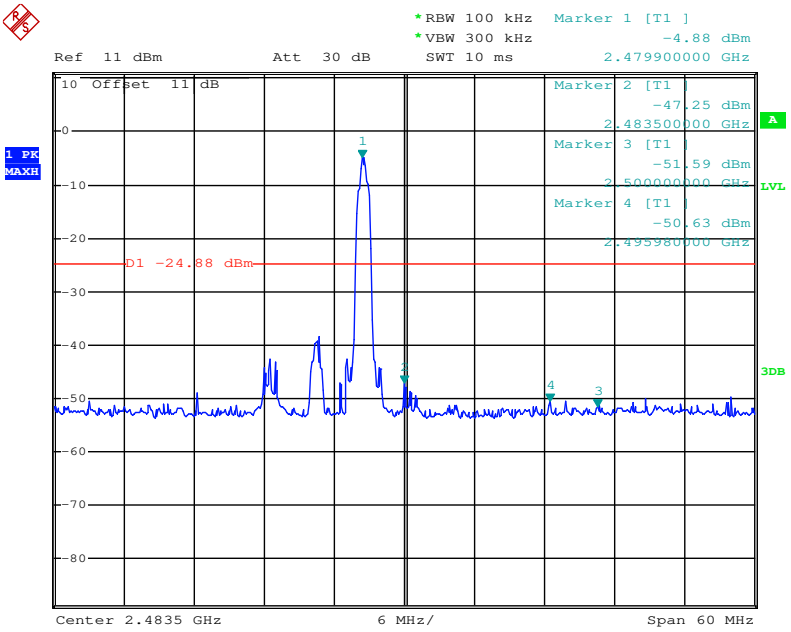


Date: 1.MAR.2018 16:18:05

Π/4-DQPSK Mode



Date: 1.MAR.2018 16:15:22



Date: 1.MAR.2018 16:17:02

Radiated Band Edge Result

Note:

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

   Result = Reading + Corrected Factor
3. Display the measurement of peak values.

Test Procedure:

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

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

During the radiated emission test, the spectrum analyzer was set with the following configurations:
1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
3.All modes of operation were investigated and the worst-case(GFSK) emissions are reported.

The spectrum analyzer plots are attached as below.

Non-hopping mode

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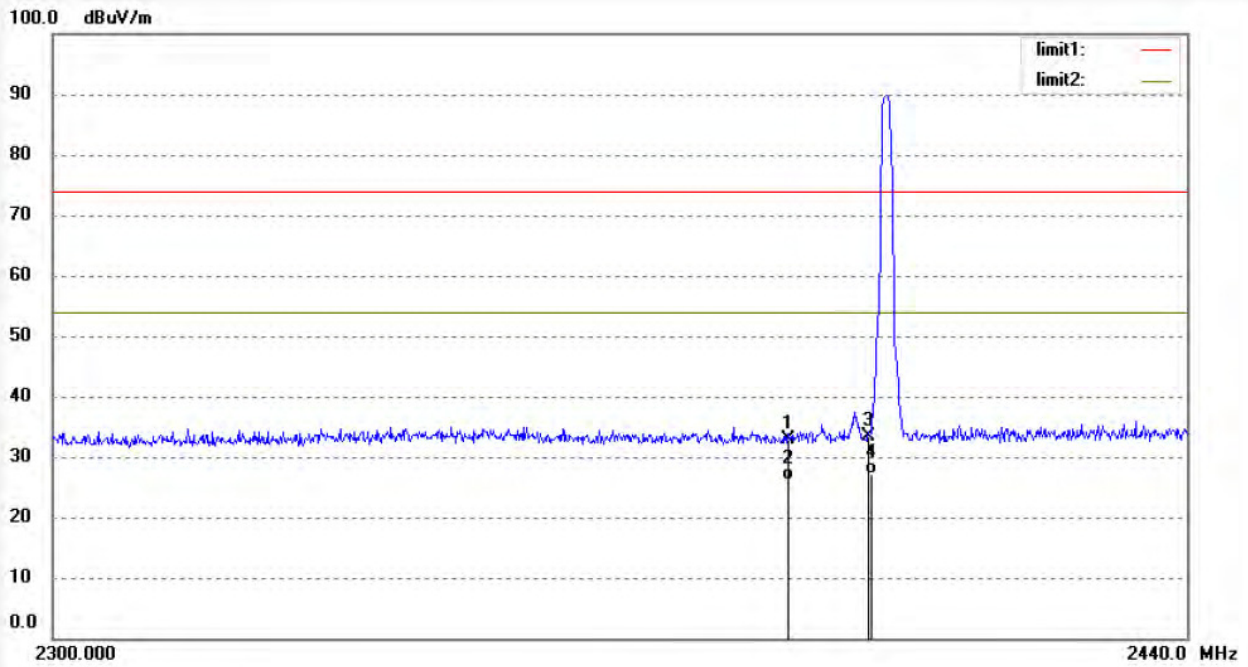
Job No.: star2018 #13	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/28/51
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	40.98	-8.00	32.98	74.00	-41.02	peak	200	156	
2	2390.000	34.06	-8.00	26.06	54.00	-27.94	AVG	200	135	
3	2400.000	41.26	-7.97	33.29	74.00	-40.71	peak	200	268	
4	2400.000	35.14	-7.97	27.17	54.00	-26.83	AVG	200	300	

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

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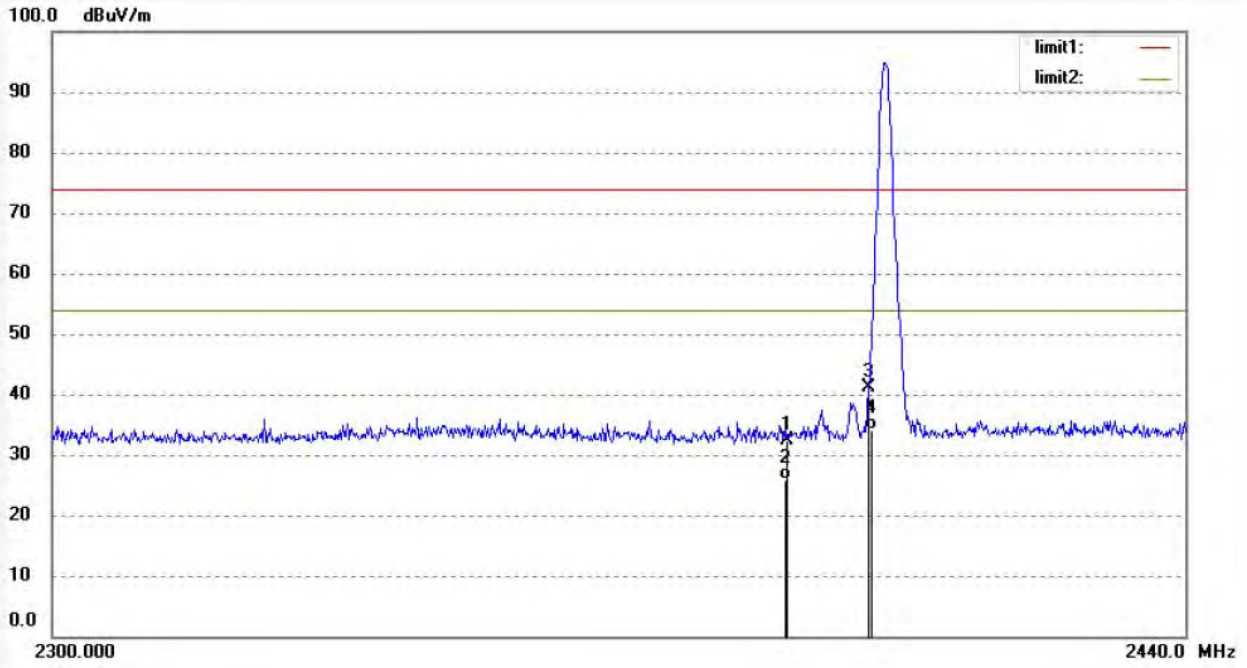
Job No.: star2018 #14	Polarization: Vertical
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/30/06
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	40.30	-8.00	32.30	74.00	-41.70	peak	150	192	
2	2390.000	33.84	-8.00	25.84	54.00	-28.16	AVG	150	188	
3	2400.000	49.01	-7.97	41.04	74.00	-32.96	peak	150	241	
4	2400.000	42.10	-7.97	34.13	54.00	-19.87	AVG	150	256	

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

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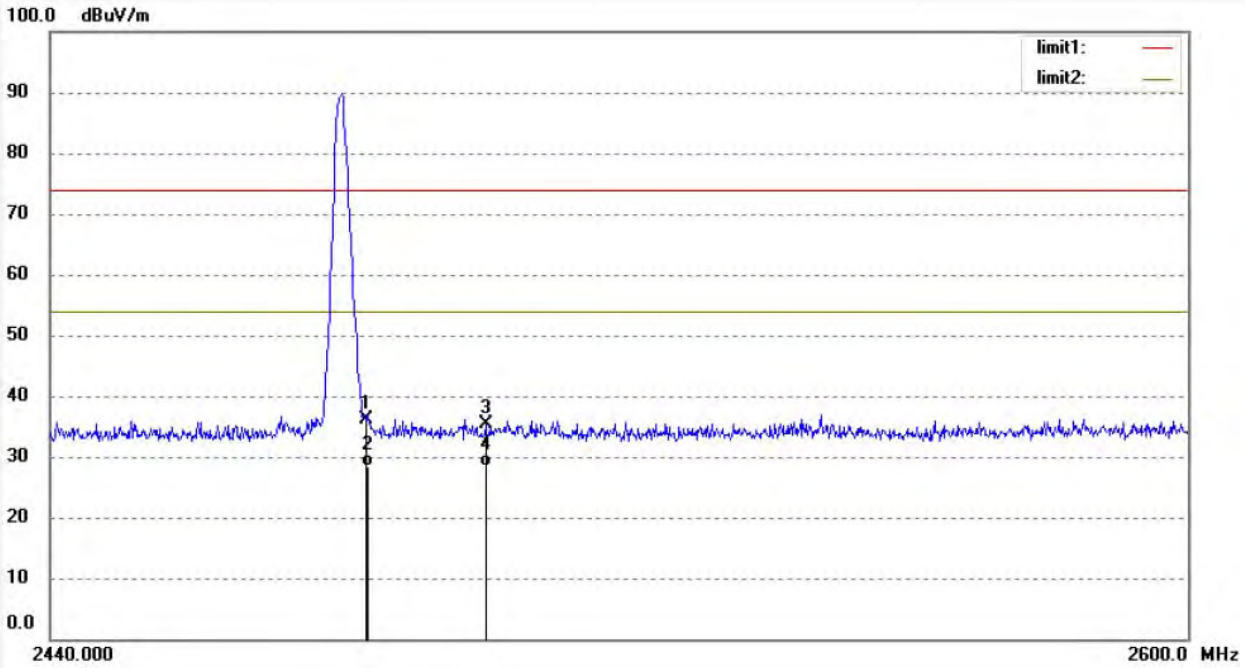
Job No.: star2018 #16	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/33/16
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2480MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



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	43.91	-7.76	36.15	74.00	-37.85	peak	200	354	
2	2483.500	36.10	-7.76	28.34	54.00	-25.66	AVG	200	302	
3	2500.000	43.17	-7.71	35.46	74.00	-38.54	peak	200	258	
4	2500.000	36.00	-7.71	28.29	54.00	-25.71	AVG	200	184	

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

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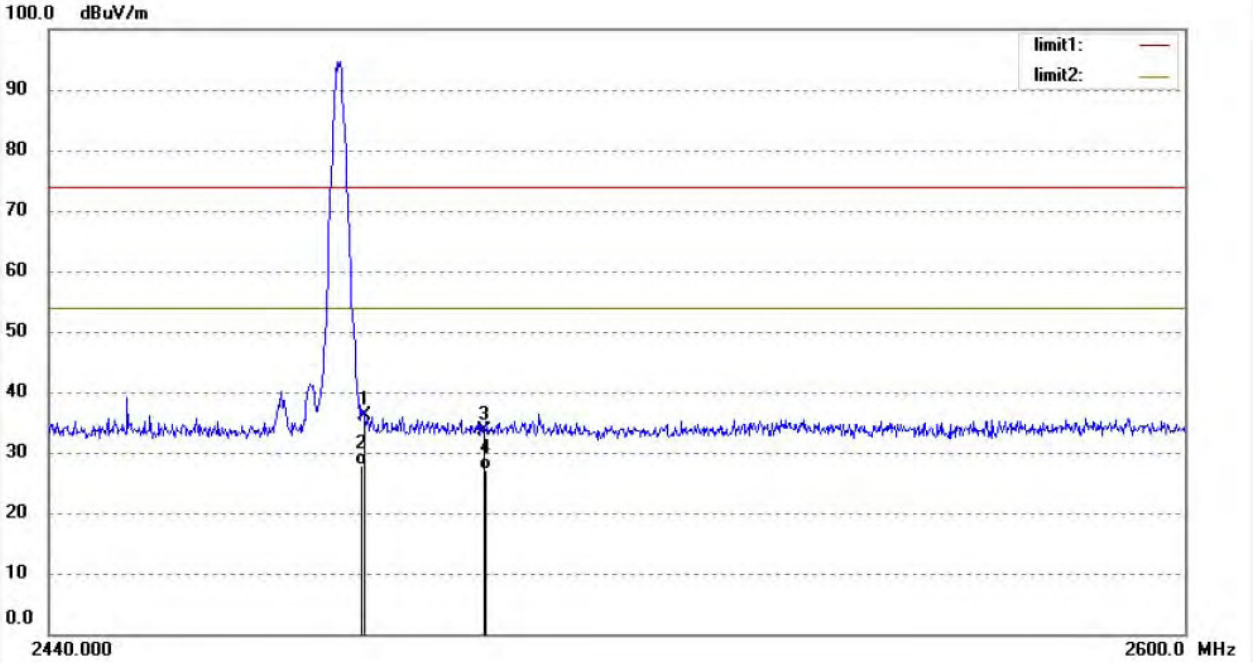
Job No.: star2018 #15	Polarization: Vertical
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/32/27
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: TX 2480MHz(GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



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	43.86	-7.76	36.10	74.00	-37.90	peak	150	67	
2	2483.500	35.67	-7.76	27.91	54.00	-26.09	AVG	150	102	
3	2500.000	41.44	-7.71	33.73	74.00	-40.27	peak	150	125	
4	2500.000	34.95	-7.71	27.24	54.00	-26.76	AVG	150	92	

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

Hopping mode

ACCURATE TECHNOLOGY CO., LTD.
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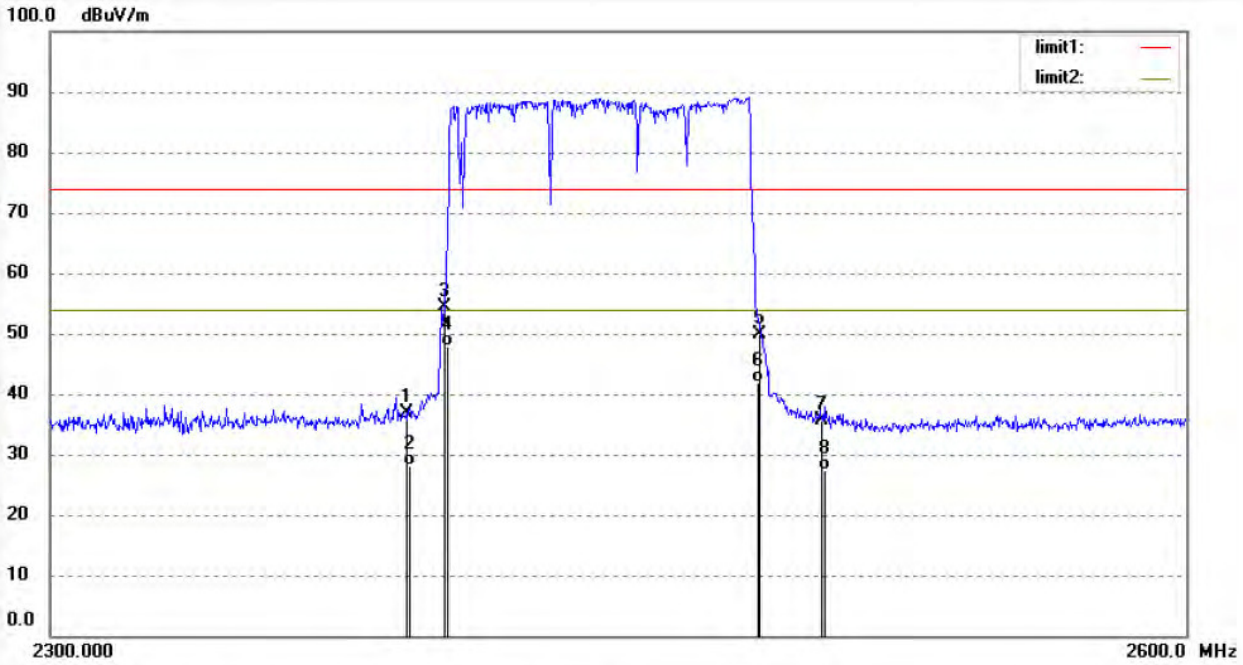
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #22	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/50/33
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: HOPPING (GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	44.81	-8.00	36.81	74.00	-37.19	peak	200	152	
2	2390.000	36.25	-8.00	28.25	54.00	-25.75	AVG	200	122	
3	2400.000	62.38	-7.97	54.41	74.00	-19.59	peak	200	169	
4	2400.000	55.87	-7.97	47.90	54.00	-6.10	AVG	200	105	
5	2483.500	57.52	-7.76	49.76	74.00	-24.24	peak	200	238	
6	2483.500	49.57	-7.76	41.81	54.00	-12.19	AVG	200	207	
7	2500.000	43.41	-7.71	35.70	74.00	-38.30	peak	200	196	
8	2500.000	35.10	-7.71	27.39	54.00	-26.61	AVG	200	75	

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

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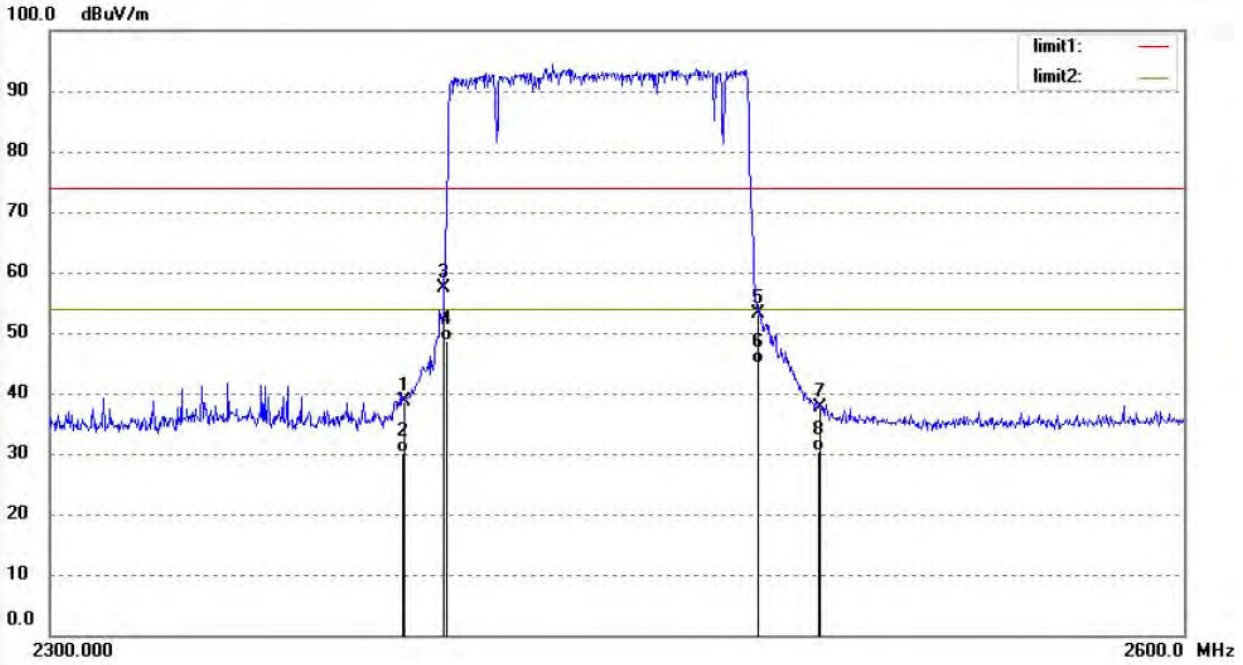
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2018 #21	Polarization: Vertical
Standard: FCC PK	Power Source: DC 3.7V
Test item: Radiation Test	Date: 18/03/02/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/45/29
EUT: Coors Light Bluetooth Earbuds	Engineer Signature: star
Mode: HOPPING (GFSK)	Distance: 3m
Model: 12169	
Manufacturer: Zelin	

Note: Report No.:ATE20180249



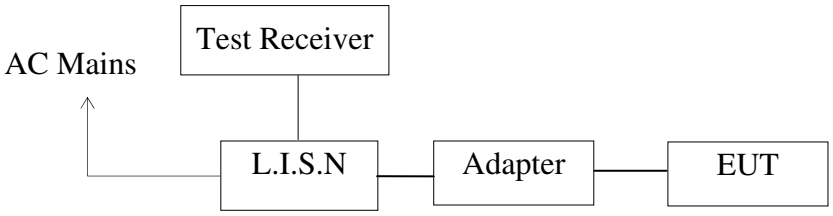
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	46.75	-8.00	38.75	74.00	-35.25	peak	150	147	
2	2390.000	38.14	-8.00	30.14	54.00	-23.86	AVG	150	135	
3	2400.000	65.23	-7.97	57.26	74.00	-16.74	peak	150	263	
4	2400.000	56.70	-7.97	48.73	54.00	-5.27	AVG	150	255	
5	2483.500	60.99	-7.76	53.23	74.00	-20.77	peak	150	21	
6	2483.500	52.69	-7.76	44.93	54.00	-9.07	AVG	150	64	
7	2500.000	45.42	-7.71	37.71	74.00	-36.29	peak	150	138	
8	2500.000	38.06	-7.71	30.35	54.00	-23.65	AVG	150	142	

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

12. AC POWER LINE CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.207(A)

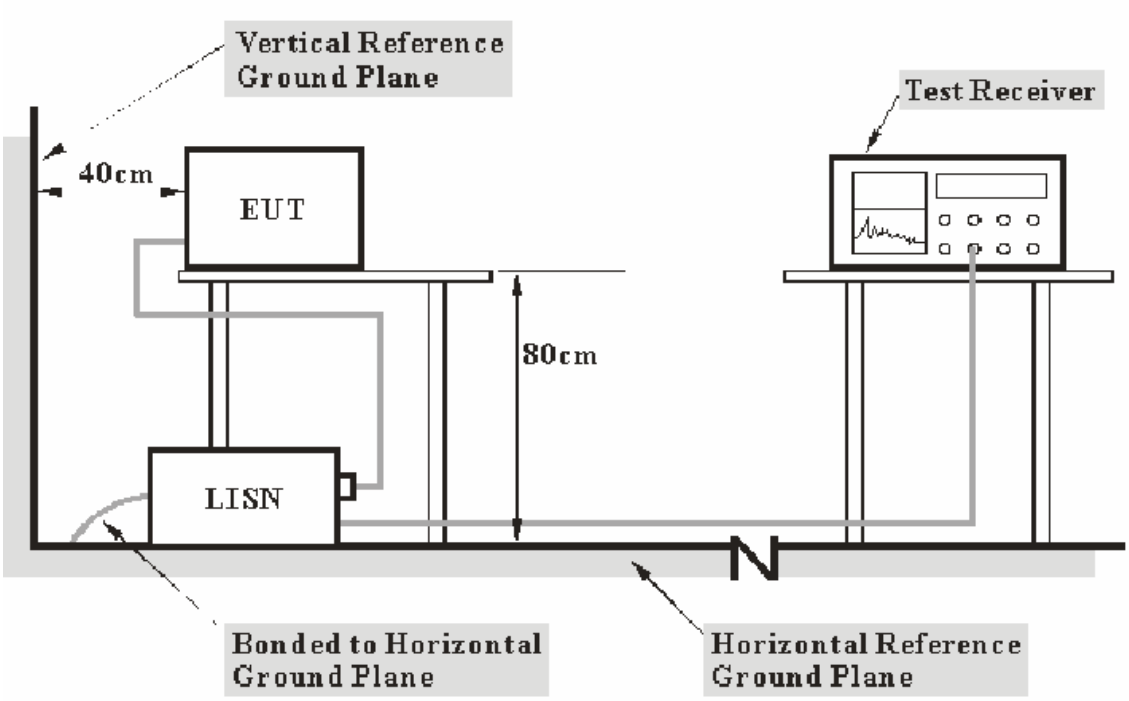
12.1. Block Diagram of Test Setup

12.1.1. Block diagram of connection between the EUT and simulators



(EUT: Coors Light Bluetooth Earbuds)

12.1.2. Test System Setup



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

12.2.Power Line Conducted Emission Measurement Limits

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

12.3.Configuration of EUT on Measurement

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

12.4.Operating Condition of EUT

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

12.4.2.Turn on the power of all equipment.

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

12.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

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

12.6.Data Sample

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

Frequency(MHz) = Emission frequency in MHz
Transducer value(dB) = Insertion loss of LISN + Cable Loss
Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value
Limit (dBμV) = Limit stated in standard
Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:
Margin = Limit (dBμV) - Level (dBμV)

12.7.Power Line Conducted Emission Measurement Results

PASS.

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

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

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

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

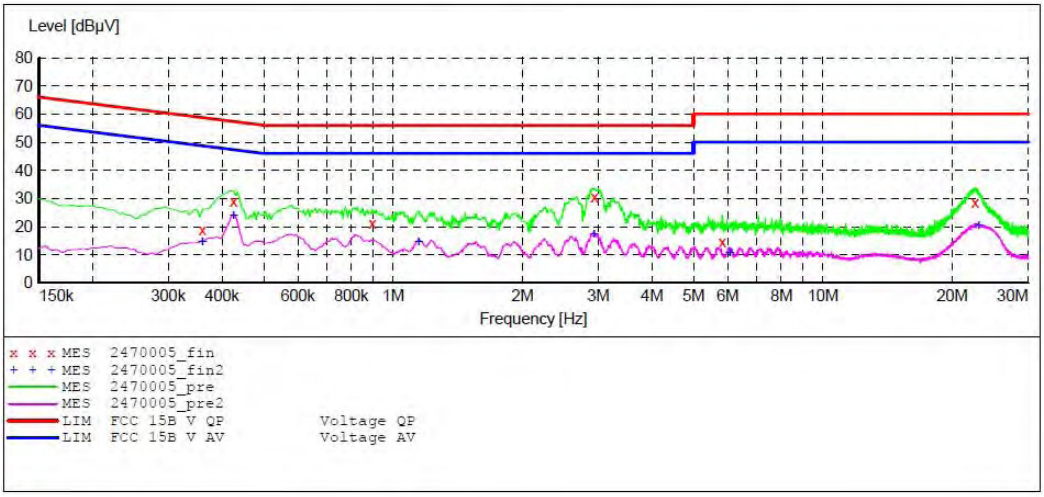
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT:	Coors Light Bluetooth Earbuds	M/N:12169
Manufacturer:	Zelin	
Operating Condition:	BT Communication	
Test Site:	1#Shielding Room	
Operator:	star	
Test Specification:	N 120V/60Hz	
Comment:	Report No.:ATE20180249	
Start of Test:	3/1/2018 / 5:17:19PM	

SCAN TABLE: "V 9K-30MHz 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 Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "2470005_fin"

3/1/2018 5:20PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	18.80	10.6	59	39.9	QP	N	GND
0.425000	28.80	10.7	57	28.5	QP	N	GND
0.895000	21.20	10.8	56	34.8	QP	N	GND
2.940000	30.50	11.1	56	25.5	QP	N	GND
5.830000	14.60	11.2	60	45.4	QP	N	GND
22.585000	28.70	11.4	60	31.3	QP	N	GND

MEASUREMENT RESULT: "2470005_fin2"

3/1/2018 5:20PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	14.50	10.6	49	34.2	AV	N	GND
0.425000	24.00	10.7	47	23.3	AV	N	GND
1.145000	14.40	10.9	46	31.6	AV	N	GND
2.930000	17.30	11.1	46	28.7	AV	N	GND
6.070000	10.70	11.2	50	39.3	AV	N	GND
23.020000	20.20	11.4	50	29.8	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

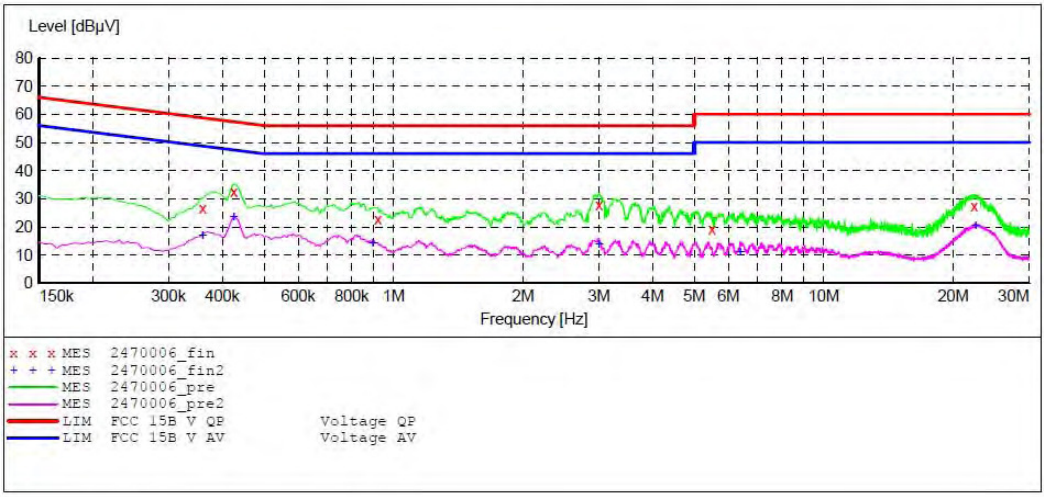
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT:	Coors Light Bluetooth Earbuds	M/N:12169
Manufacturer:	Zelin	
Operating Condition:	BT Communication	
Test Site:	1#Shielding Room	
Operator:	star	
Test Specification:	L 120V/60Hz	
Comment:	Report No.:ATE20180249	
Start of Test:	3/1/2018 / 5:21:20PM	

SCAN TABLE: "V 9K-30MHz 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 Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "2470006_fin"

3/1/2018 5:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	26.60	10.6	59	32.1	QP	L1	GND
0.425000	32.60	10.7	57	24.7	QP	L1	GND
0.920000	22.50	10.8	56	33.5	QP	L1	GND
3.000000	27.70	11.1	56	28.3	QP	L1	GND
5.490000	19.40	11.2	60	40.6	QP	L1	GND
22.360000	27.30	11.4	60	32.7	QP	L1	GND

MEASUREMENT RESULT: "2470006_fin2"

3/1/2018 5:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	16.80	10.6	49	31.9	AV	L1	GND
0.425000	23.30	10.7	47	24.0	AV	L1	GND
0.895000	14.10	10.8	46	31.9	AV	L1	GND
3.000000	13.60	11.1	46	32.4	AV	L1	GND
6.390000	11.10	11.2	50	38.9	AV	L1	GND
22.540000	20.20	11.4	50	29.8	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

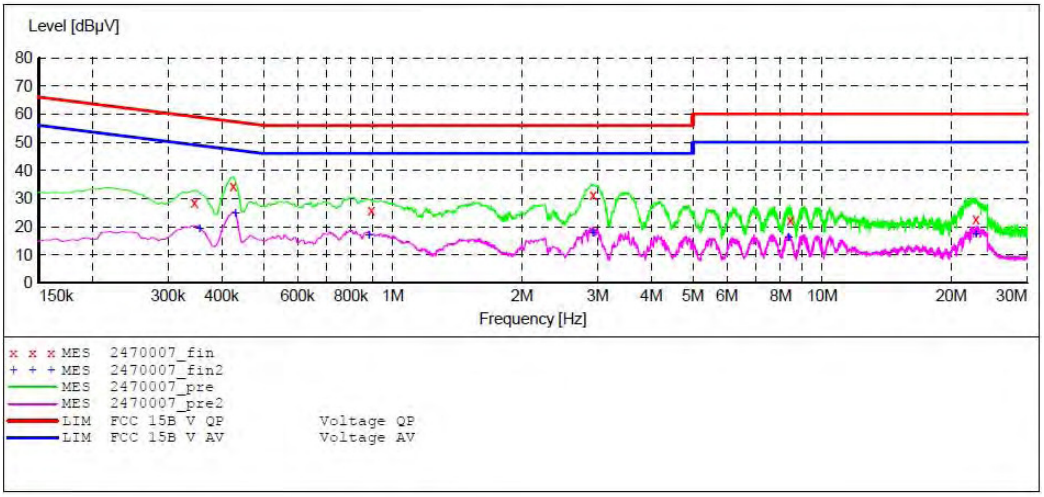
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT:	Coors Light Bluetooth Earbuds	M/N:12169
Manufacturer:	Zelin	
Operating Condition:	BT Communication	
Test Site:	1#Shielding Room	
Operator:	star	
Test Specification:	L 240V/60Hz	
Comment:	Report No.:ATE20180249	
Start of Test:	3/1/2018 / 5:25:34PM	

SCAN TABLE: "V 9K-30MHz 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 Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "2470007_fin"

3/1/2018 5:29PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.345000	28.70	10.6	59	30.4	QP	L1	GND
0.425000	34.40	10.7	57	22.9	QP	L1	GND
0.890000	25.70	10.8	56	30.3	QP	L1	GND
2.930000	31.40	11.1	56	24.6	QP	L1	GND
8.420000	22.40	11.3	60	37.6	QP	L1	GND
22.780000	22.60	11.4	60	37.4	QP	L1	GND

MEASUREMENT RESULT: "2470007_fin2"

3/1/2018 5:29PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.355000	19.10	10.6	49	29.7	AV	L1	GND
0.430000	24.80	10.7	47	22.5	AV	L1	GND
0.880000	16.90	10.8	46	29.1	AV	L1	GND
2.920000	17.80	11.1	46	28.2	AV	L1	GND
8.340000	15.90	11.3	50	34.1	AV	L1	GND
22.825000	17.10	11.4	50	32.9	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

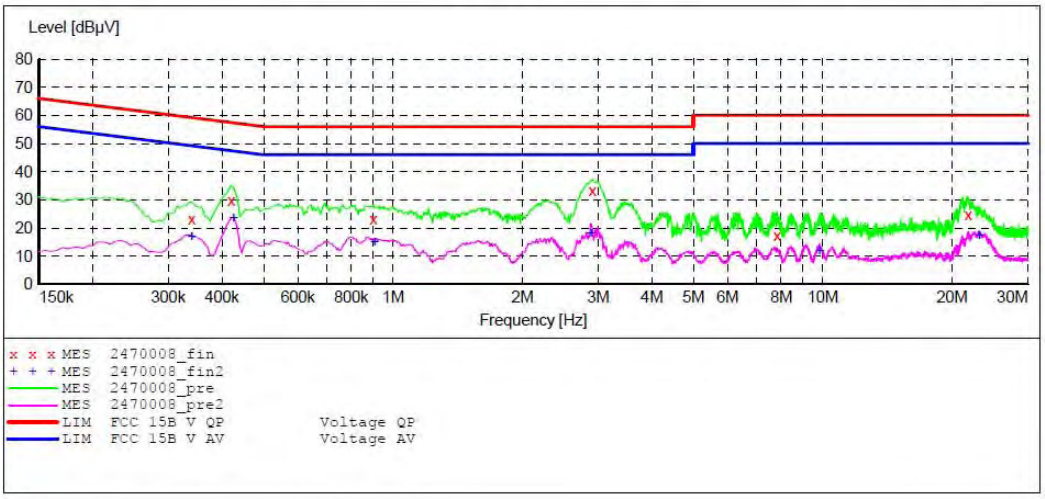
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT:	Coors Light Bluetooth Earbuds	M/N:12169
Manufacturer:	Zelin	
Operating Condition:	BT Communication	
Test Site:	1#Shielding Room	
Operator:	star	
Test Specification:	N 240V/60Hz	
Comment:	Report No.:ATE20180249	
Start of Test:	3/1/2018 / 5:29:37PM	

SCAN TABLE: "V 9K-30MHz 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 Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "2470008_fin"

3/1/2018 5:38PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.340000	22.90	10.6	59	36.3	QP	N	GND
0.420000	29.70	10.7	57	27.7	QP	N	GND
0.900000	22.90	10.8	56	33.1	QP	N	GND
2.910000	33.40	11.0	56	22.6	QP	N	GND
7.820000	17.30	11.2	60	42.7	QP	N	GND
21.775000	24.70	11.4	60	35.3	QP	N	GND

MEASUREMENT RESULT: "2470008_fin2"

3/1/2018 5:38PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.340000	16.70	10.6	49	32.5	AV	N	GND
0.425000	23.30	10.7	47	24.0	AV	N	GND
0.905000	15.00	10.8	46	31.0	AV	N	GND
2.890000	18.00	11.0	46	28.0	AV	N	GND
9.830000	11.80	11.3	50	38.2	AV	N	GND
23.095000	17.20	11.4	50	32.8	AV	N	GND

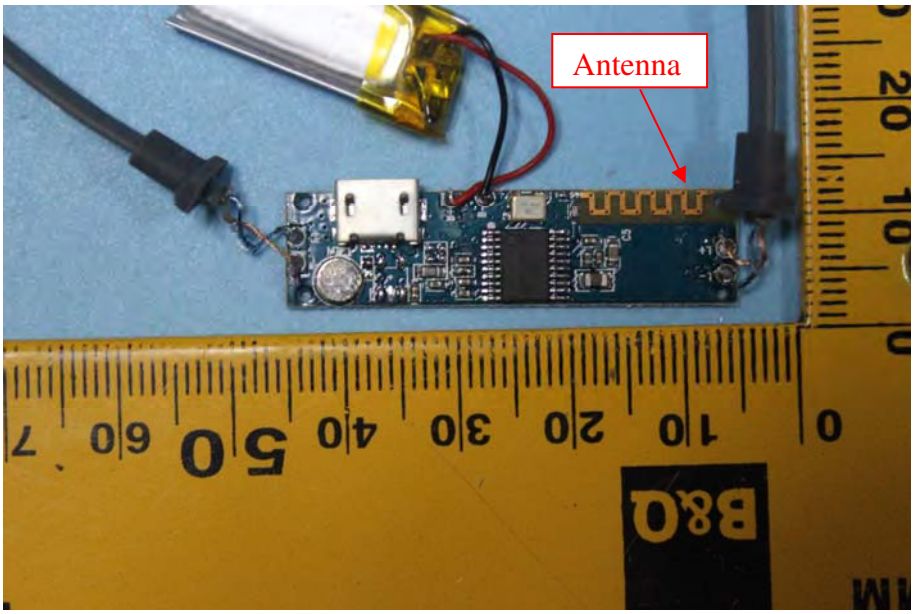
13. ANTENNA REQUIREMENT

13.1. The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

13.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is -0.68dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



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