APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
TIMSEN INTERNATIONAL LIMITED

Bluetooth Speaker
Model No.: CR3028U-XX
("X" can be replaced by letter from "A" to "Z" or blank)

FCC ID: 2ACX8-CR3028U-XX

Prepared for	:	TIMSEN INTERNATIONAL LIMITED
Address	:	5F, No. 447, Tianhebei Road, Tianhe District, Guangzhou, Guangdong Province, 510610, China
Prepared by	:	ACCURATE TECHNOLOGY CO., LTD
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Report No.	:	ATE20160914
Date of Test	:	May 17-22, 2016
Date of Report	:	May 30, 2016

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Description Page

Test Report Certification

Applicant	:	TIMSEN INTERNATIONAL LIMITED
Manufacturer	:	TIMSEN INTERNATIONAL LIMITED
EUT Description	:	Bluetooth Speaker
Model No.	:	CR3028U-XX ("X" can be replaced by letter from "A" to "Z" or blank)
Trade Mark	:	CROSLEY

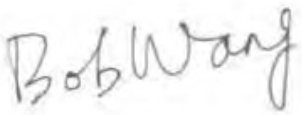
Measurement Procedure Used:

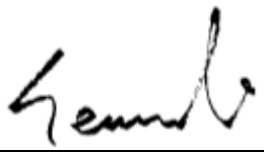
FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2015
ANSI C63.10: 2013

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

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : May 17-22, 2016
Date of Report: May 30, 2016

Prepared by : 
(Bob Wang, Engineer)

Approved & Authorized Signer : 
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Bluetooth Speaker
Model Number	:	CR3028U-XX ("X" can be replaced by letter from "A" to "Z" or blank)
Trade Mark	:	CROSLEY
Bluetooth version	:	BT 2.1+EDR
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain	:	0dBi
Antenna type	:	Integral Antenna
Power Supply	:	DC 5V (Power by Adapter)
Adapter	:	MODEL: XY06S-0501200Q-UZ INPUT: AC 100-240V; 50/60Hz 0.3A OUTPUT: DC 5V; 1.2A
Modulation mode	:	GFSK, π/4 DQPSK, 8DPSK
Applicant	:	TIMSEN INTERNATIONAL LIMITED
Address	:	5F, No. 447, Tianhebei Road, Tianhe District, Guangzhou, Guangdong Province, 510610, China
Manufacuter	:	TIMSEN INTERNATIONAL LIMITED
Address	:	5F, No. 447, Tianhebei Road, Tianhe District, Guangzhou, Guangdong Province, 510610, China
Date of sample received	:	May 16, 2016
Date of Test	:	May 17-22, 2016

1.2.Accessory and Auxiliary Equipment

N/A

1.3.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	ACCURATE TECHNOLOGY CO. LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.4.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. 9, 2016	Jan. 09, 2017
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 9, 2016	Jan. 09, 2017
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 9, 2016	Jan. 09, 2017
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 9, 2016	Jan. 09, 2017
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 14, 2016	Jan. 13, 2017
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 14, 2016	Jan. 13, 2017
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 14, 2016	Jan. 12, 2017
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 14, 2016	Jan. 13, 2017
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 9, 2016	Jan. 09, 2017
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 9, 2016	Jan. 09, 2017
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 9, 2016	Jan. 09, 2017
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 9, 2016	Jan. 09, 2017

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

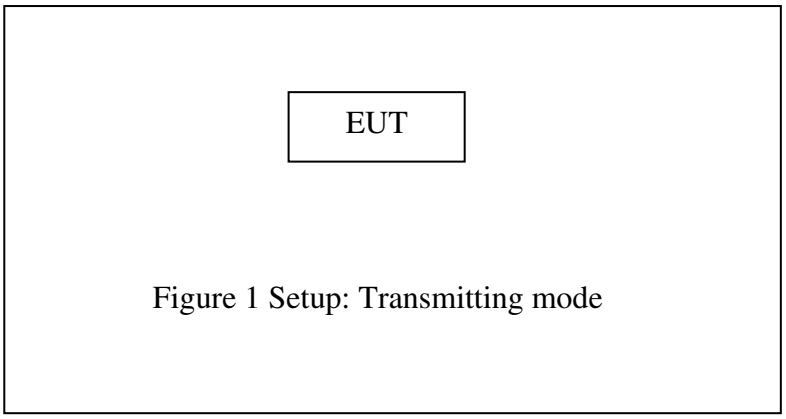


Figure 1 Setup: Transmitting mode

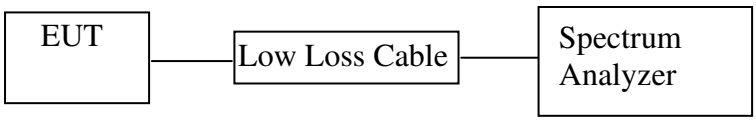
(EUT: Bluetooth Speaker)

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: Bluetooth Speaker)

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

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

5.3.EUT Configuration on Measurement

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

5.4.Operating Condition of EUT

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

5.4.2.Turn on the power of all equipment.

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

5.5.Test Procedure

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

5.5.2.Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz.

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

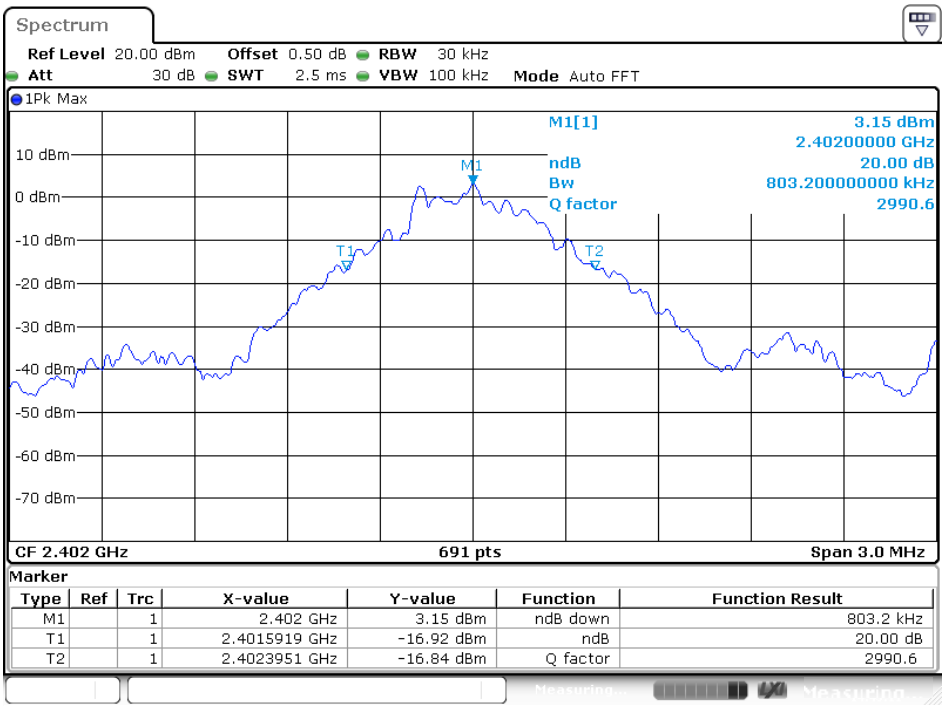
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	0.803	1.220	1.207	Pass
Middle	2441	0.803	1.220	1.207	Pass
High	2480	0.803	1.224	1.211	Pass

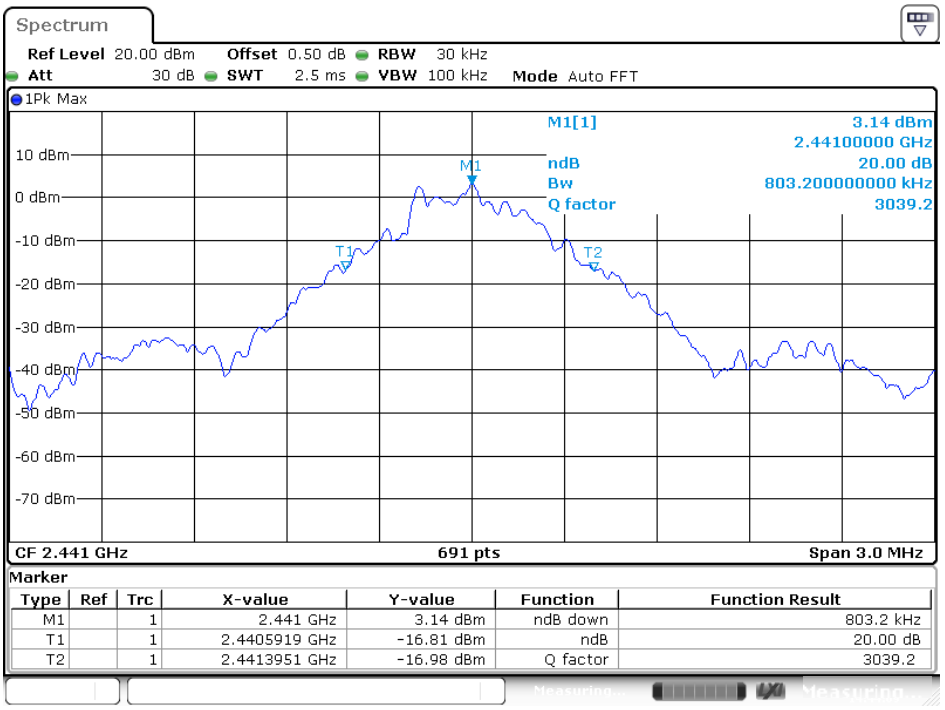
The spectrum analyzer plots are attached as below.

GFSK Mode

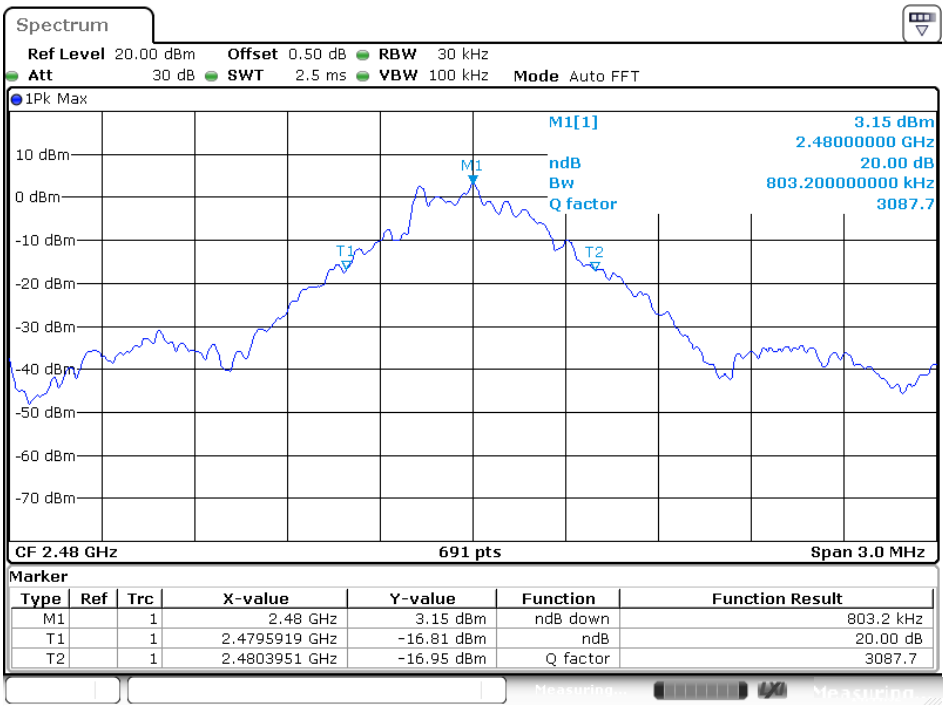
Low channel



Middle channel

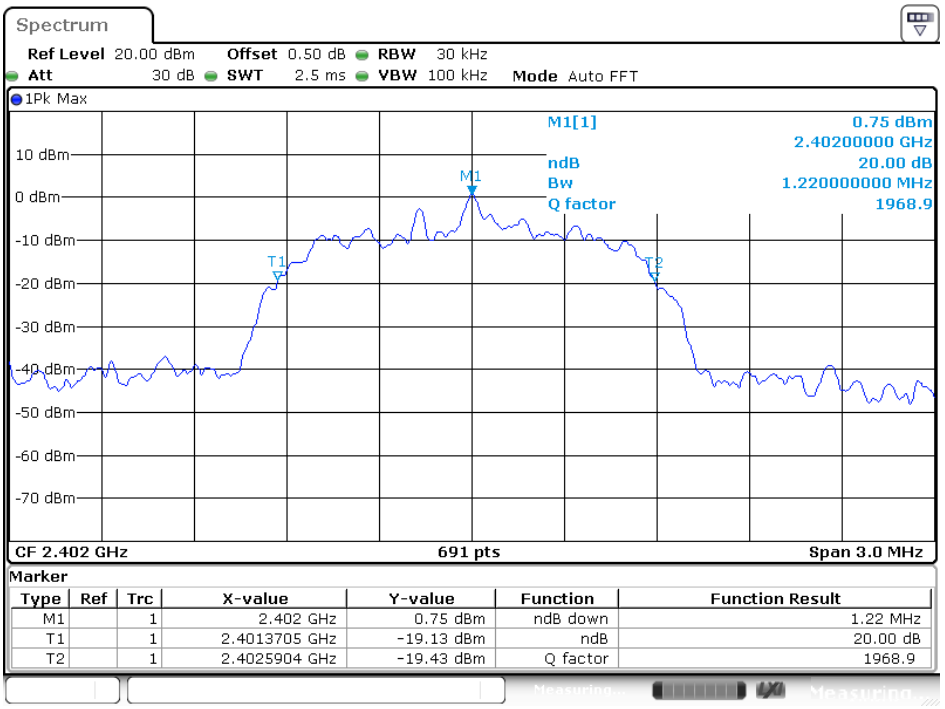


High channel

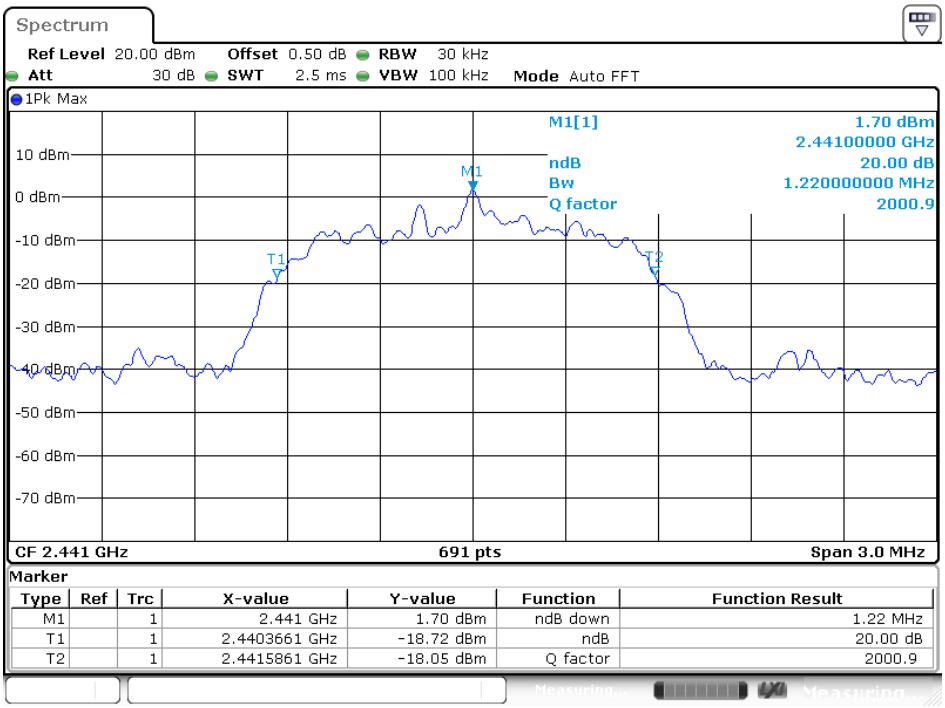


Π/4-DQPSK Mode

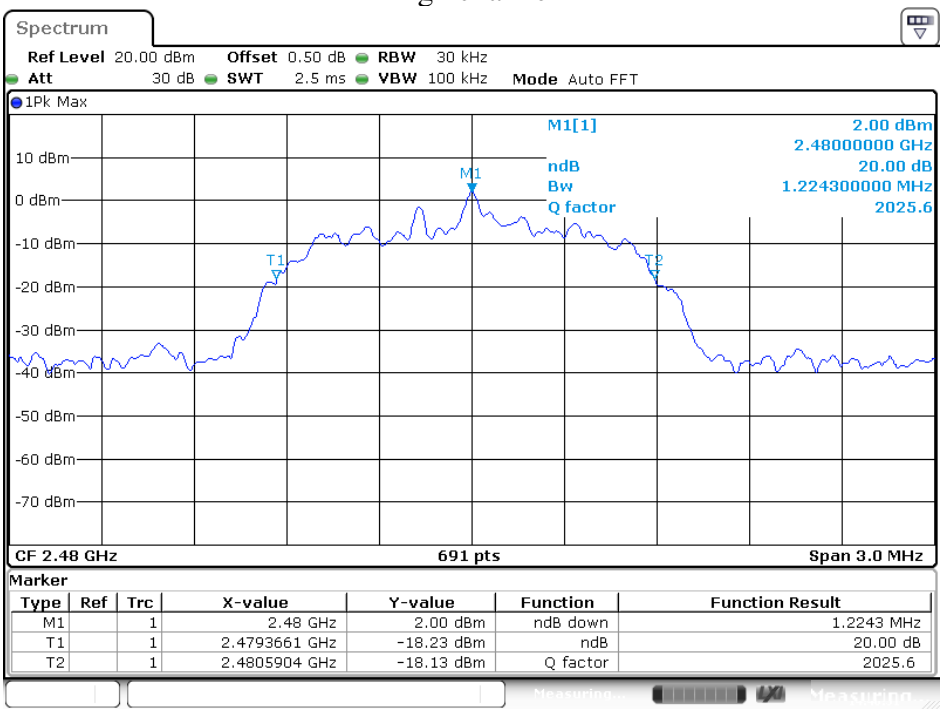
Low channel



Middle channel

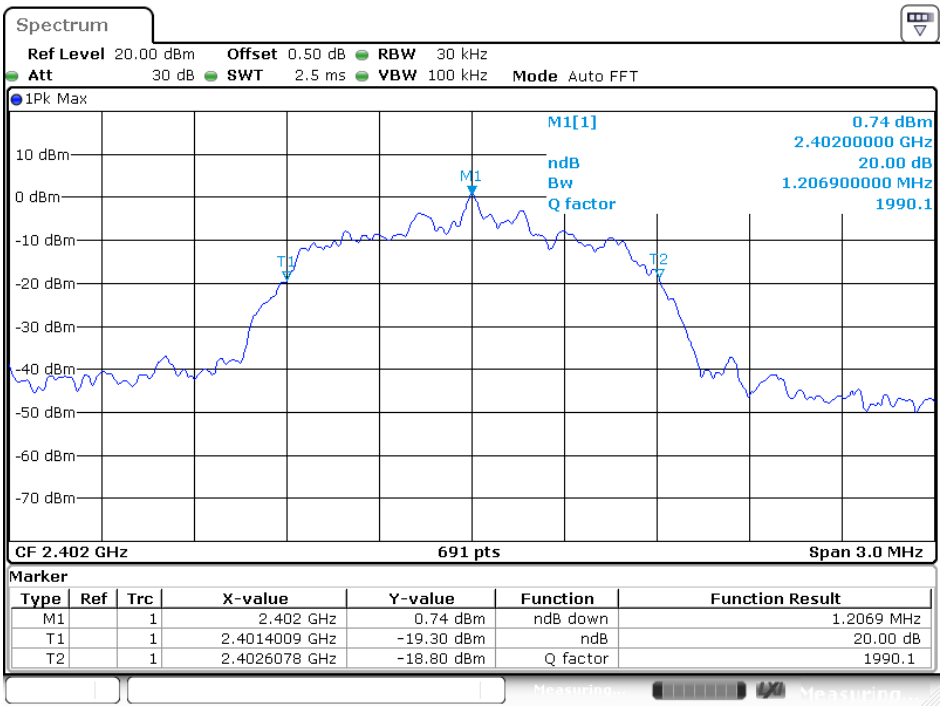


High channel

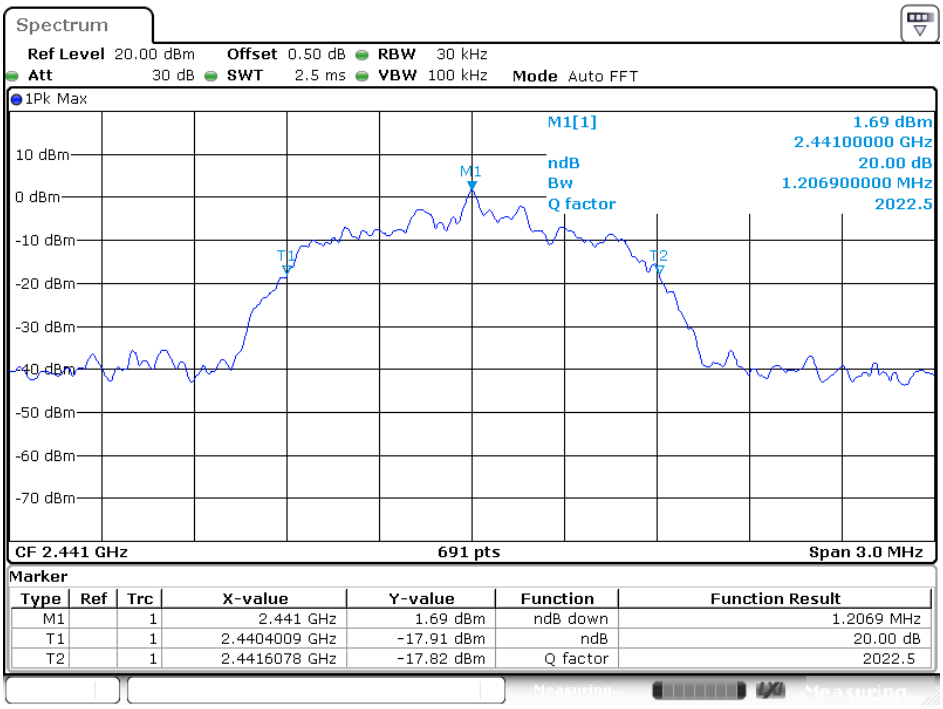


8DPSK Mode

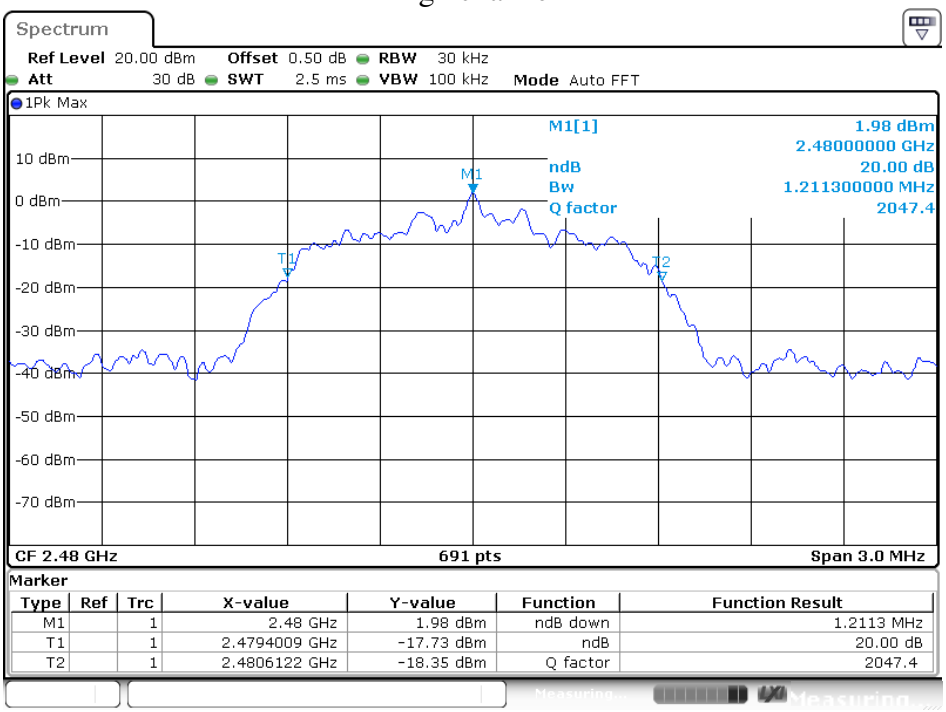
Low channel



Middle channel

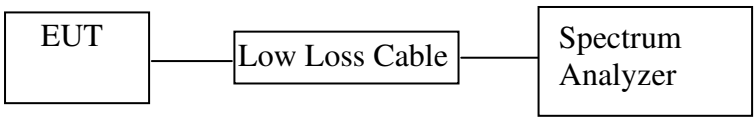


High channel



6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

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 2 MHz.

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

6.5.4.Measurement the channel separation

6.6.Test Result

GFSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0014	25KHz or 20dB bandwidth	PASS
	2403			
Middle	2440	1.0014	25KHz or20dB bandwidth	PASS
	2441			
High	2479	1.0014	25KHz or 20dB bandwidth	PASS
	2480			

Π/4-DQPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0029	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	1.0029	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.0029	25KHz or 2/3*20dB bandwidth	PASS
	2480			

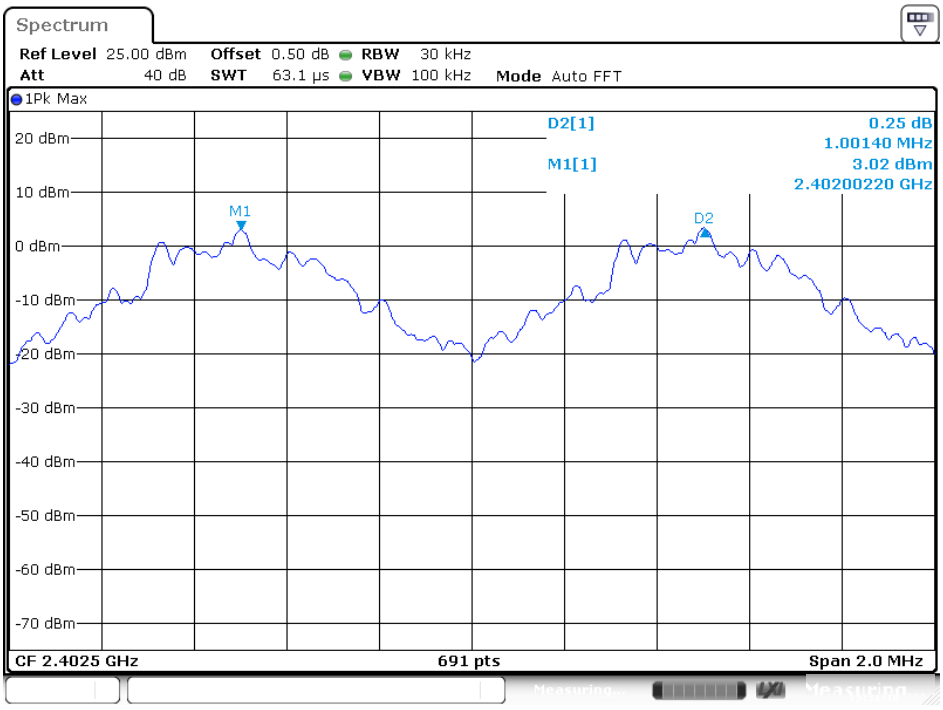
8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0029	25KHz or 2/3*20dB bandwidth	PASS
	2403			
Middle	2440	1.0029	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.0029	25KHz or 2/3*20dB bandwidth	PASS
	2480			

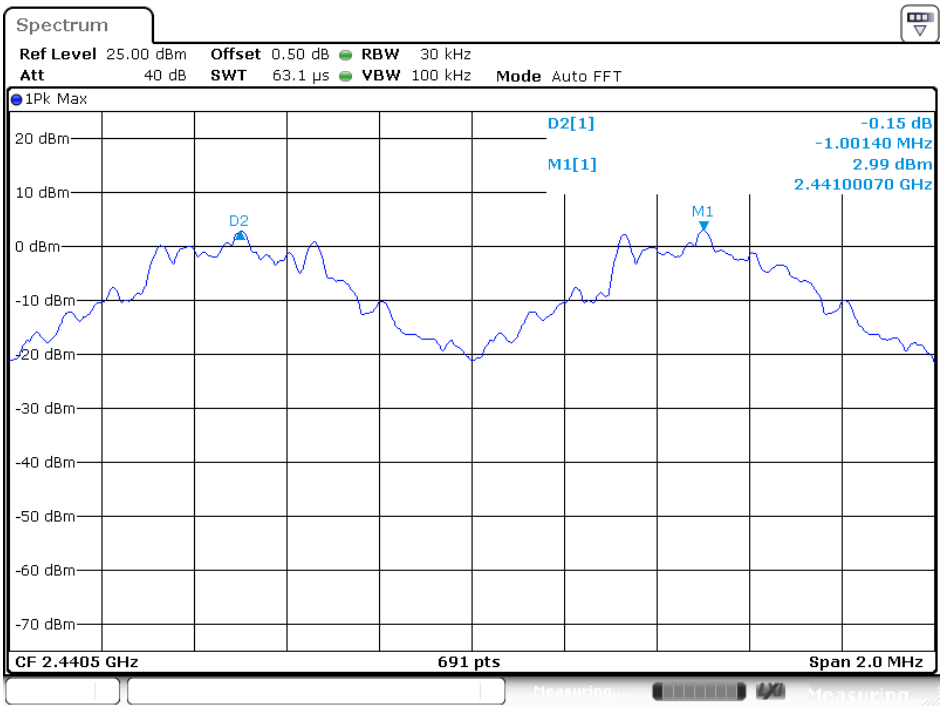
The spectrum analyzer plots are attached as below.

GFSK Mode

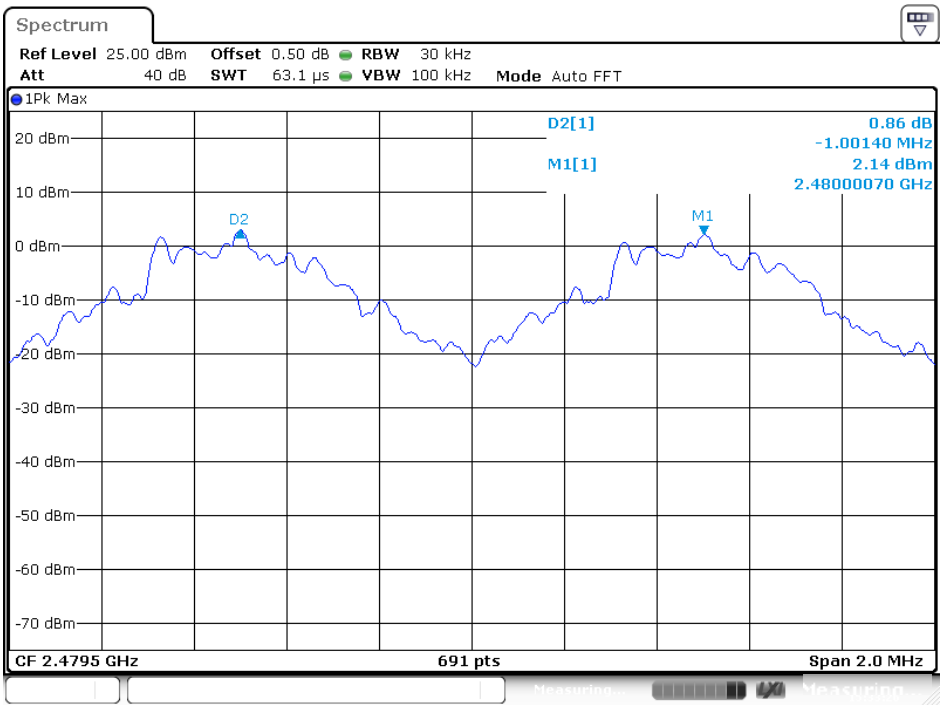
Low channel



Middle channel

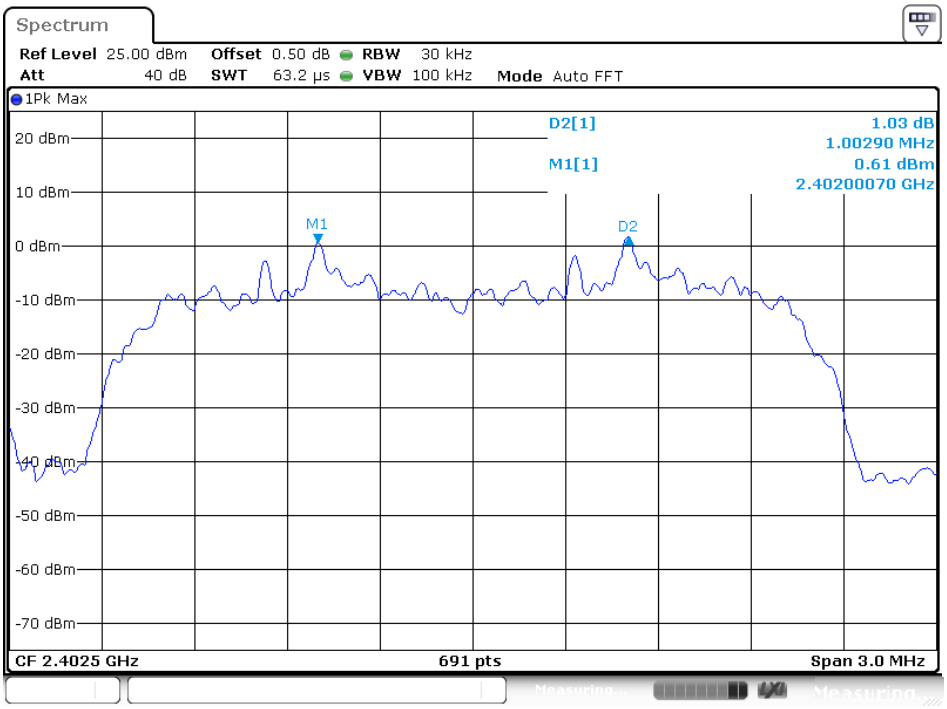


High channel

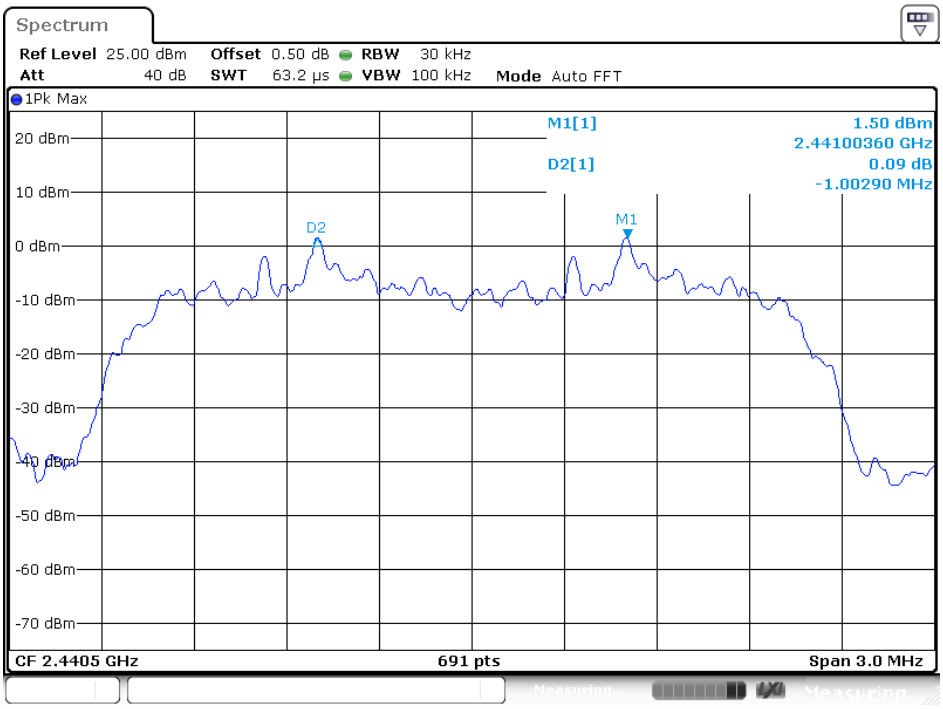


Π/4-DQPSK Mode

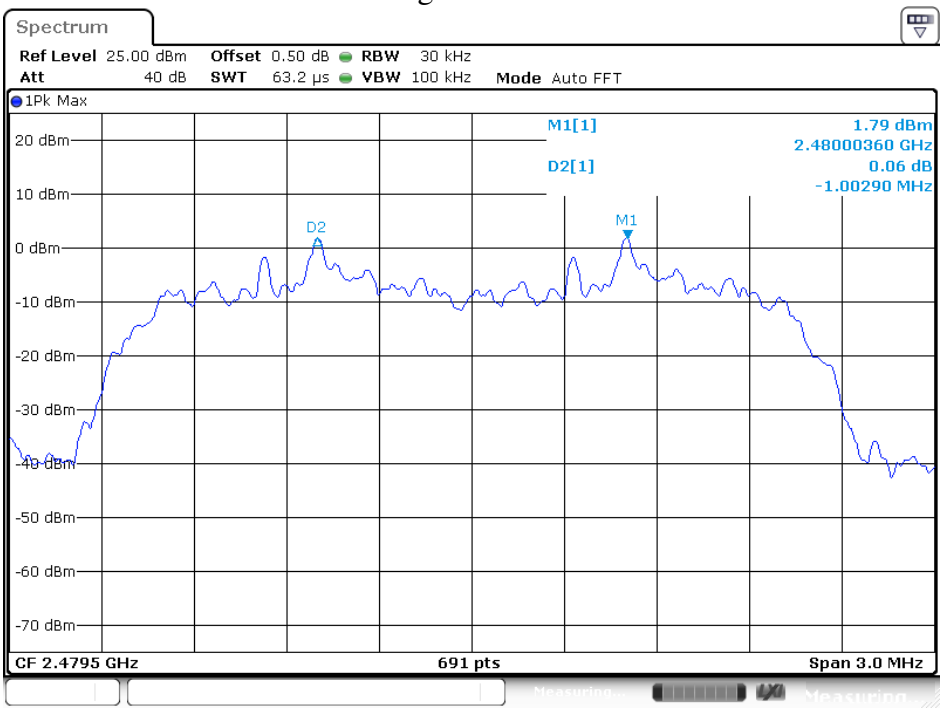
Low channel



Middle channel

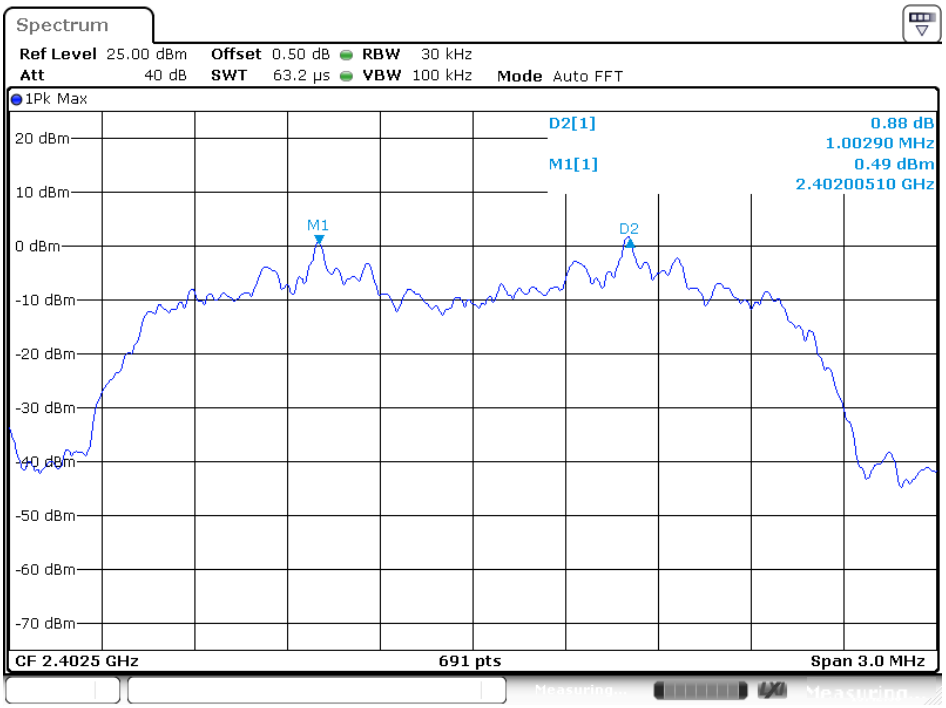


High channel

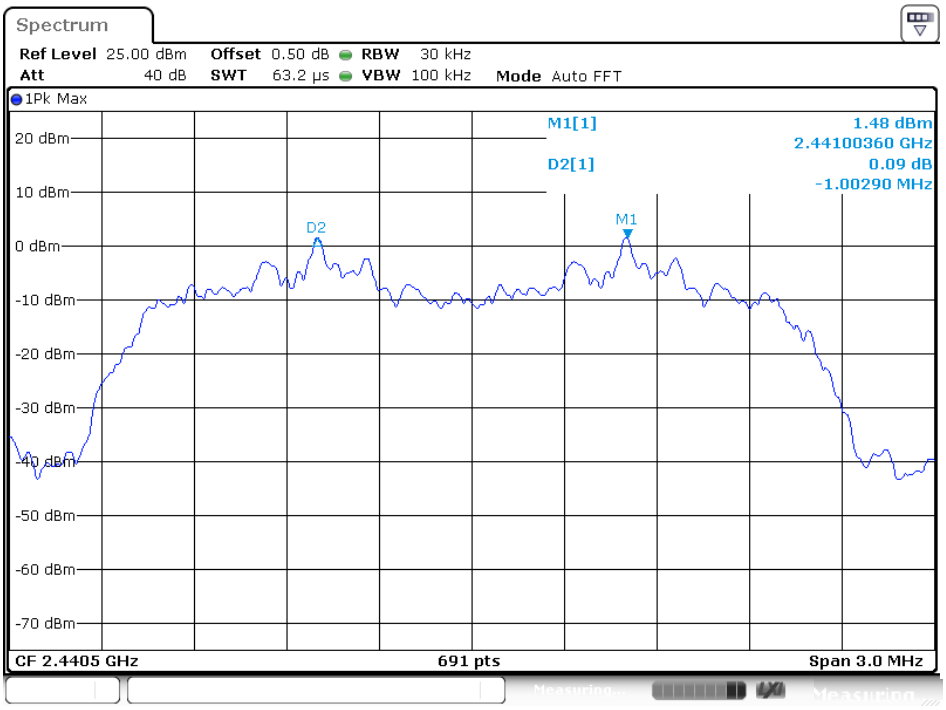


8DPSK Mode

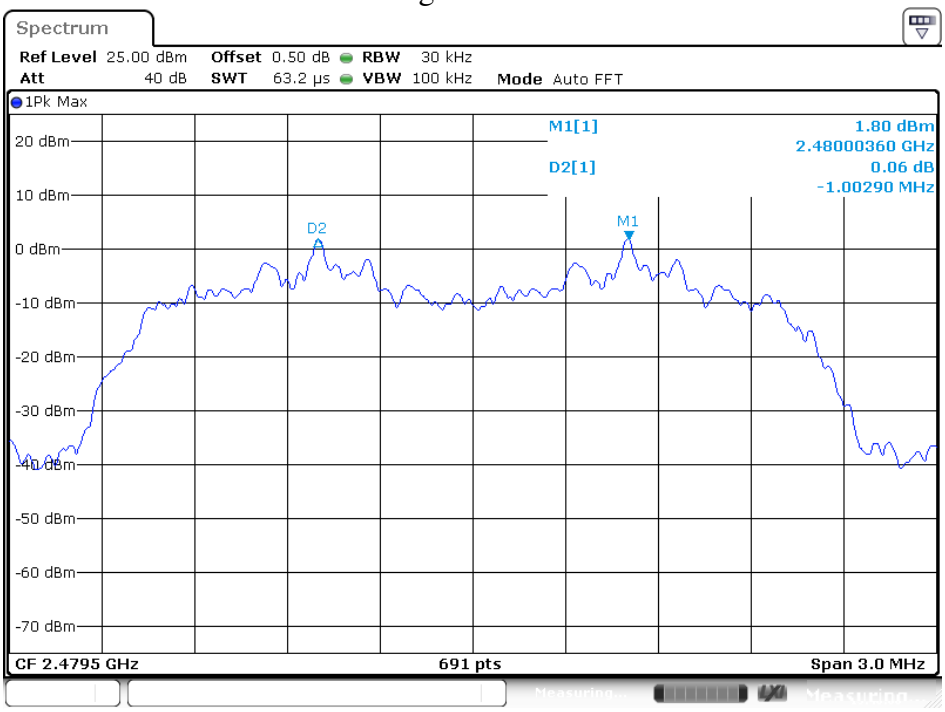
Low channel



Middle channel

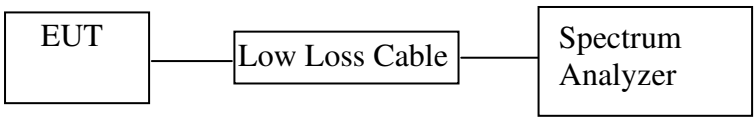


High channel



7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

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

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

7.3.EUT Configuration on Measurement

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

7.4.Operating Condition of EUT

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

7.4.2.Turn on the power of all equipment.

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

7.5.Test Procedure

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

7.5.2.Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.

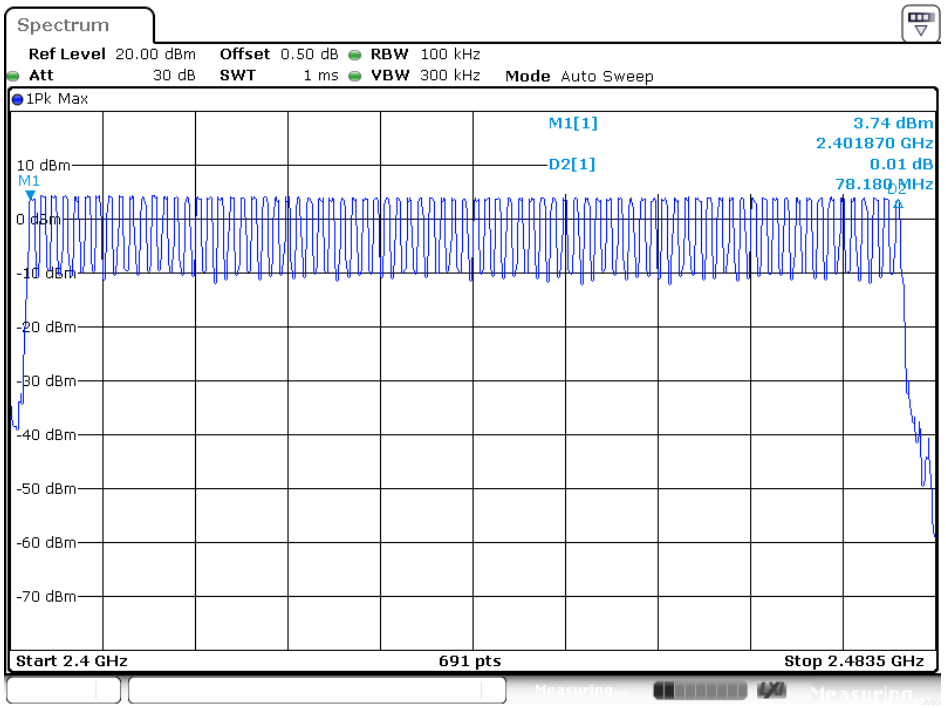
7.5.3.Max hold, view and count how many channel in the band.

7.6.Test Result

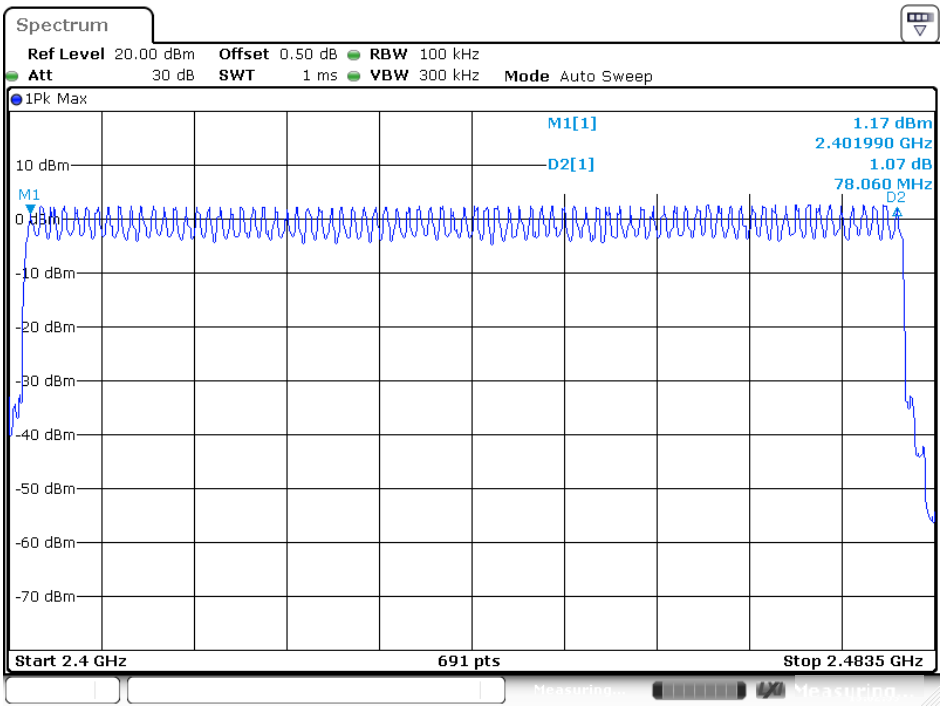
Total number of hopping channel	Measurement result(CH)	Limit(CH)
	79	≥15

The spectrum analyzer plots are attached as below.

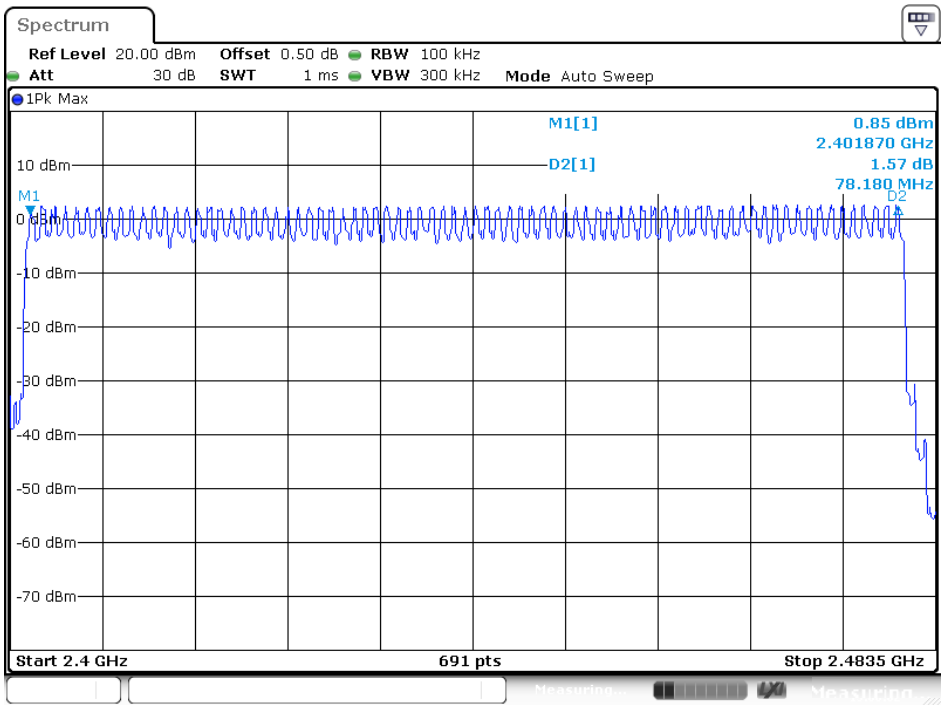
Number of hopping channels(GFSK)



Number of hopping channels(Π/4-DQPSK)

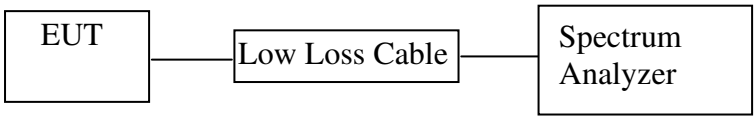


Number of hopping channels(8DPSK)



8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

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	2402	0.428	136.96	400
	2441	0.438	140.16	400
	2480	0.442	141.44	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.746	279.36	400
	2441	1.790	286.40	400
	2480	1.761	281.76	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	2.978	317.65	400
	2441	2.978	317.65	400
	2480	3.000	320.00	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	2402	0.446	142.72	400
	2441	0.442	141.44	400
	2480	0.438	140.16	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.714	274.24	400
	2441	1.714	274.24	400
	2480	1.728	276.48	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	3.000	320.00	400
	2441	3.022	322.35	400
	2480	2.978	317.65	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

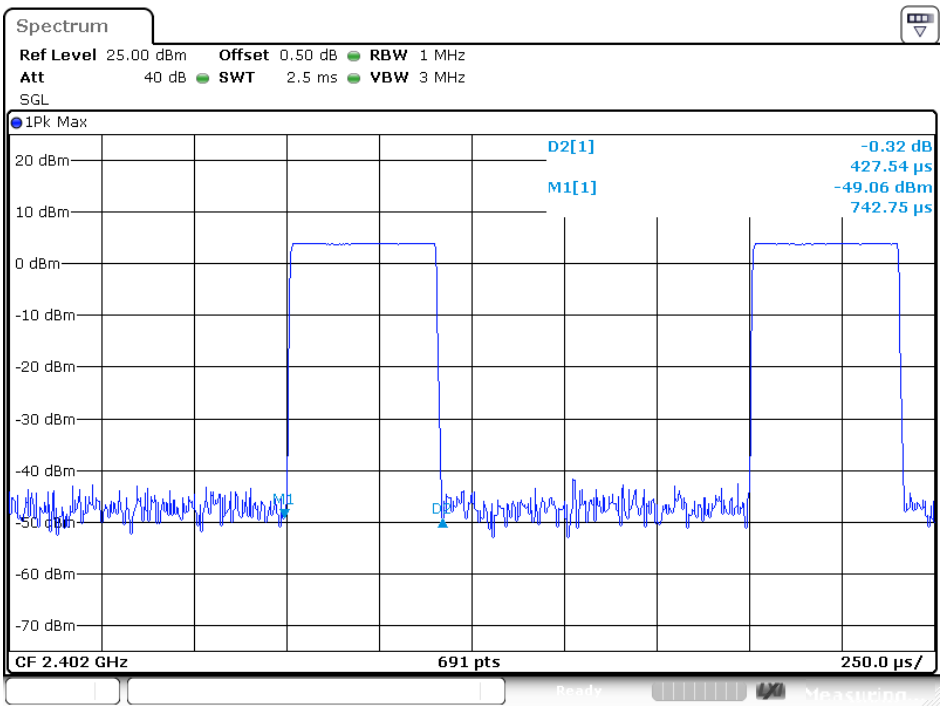
8DPSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.449	143.68	400
	2441	0.446	142.72	400
	2480	0.446	142.72	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.736	277.76	400
	2441	1.721	275.36	400
	2480	1.736	277.76	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	3.040	324.27	400
	2441	2.975	317.33	400
	2480	3.062	326.61	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

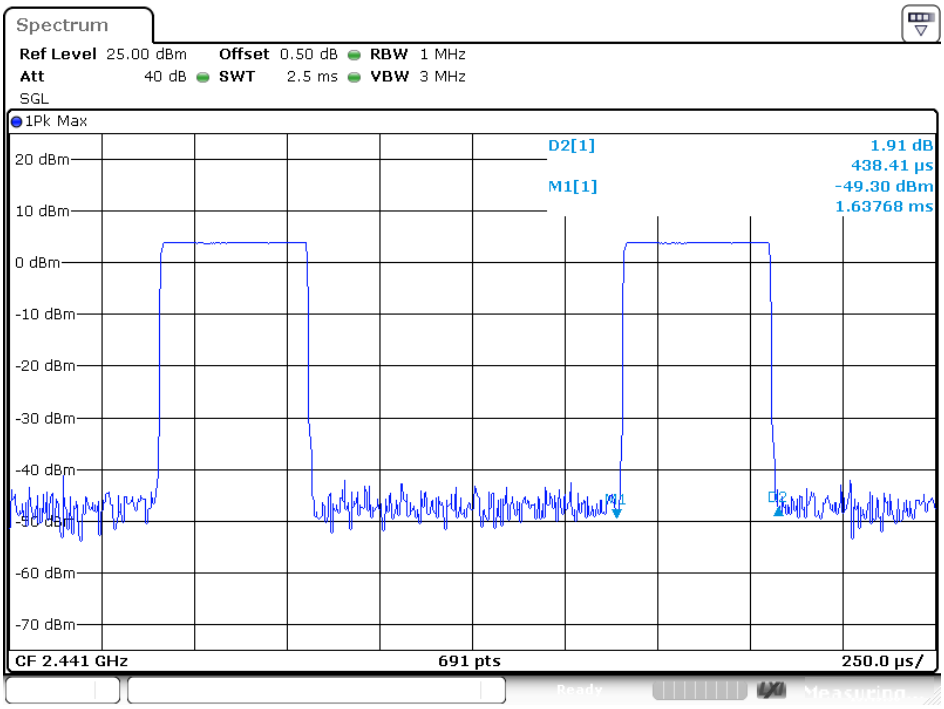
The spectrum analyzer plots are attached as below.

GFSK Mode

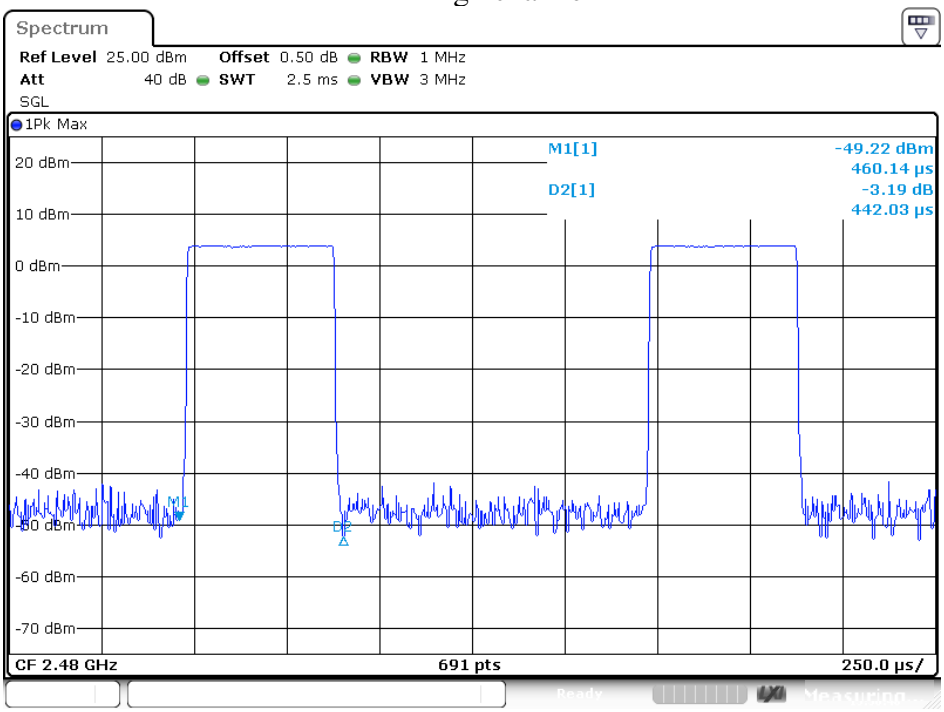
DH1 Low channel



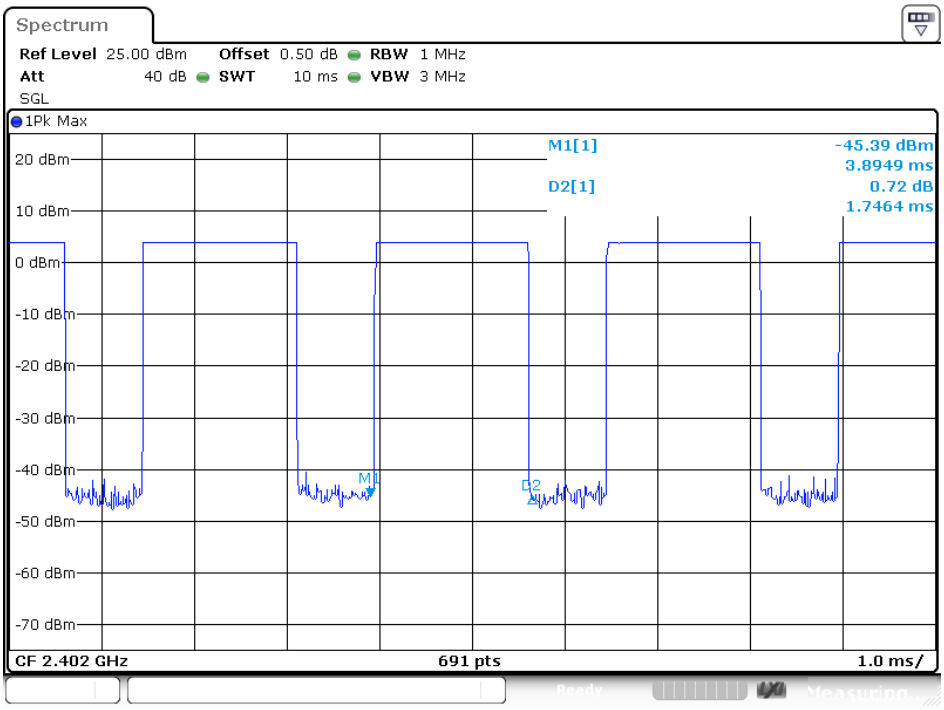
DH1 Middle channel



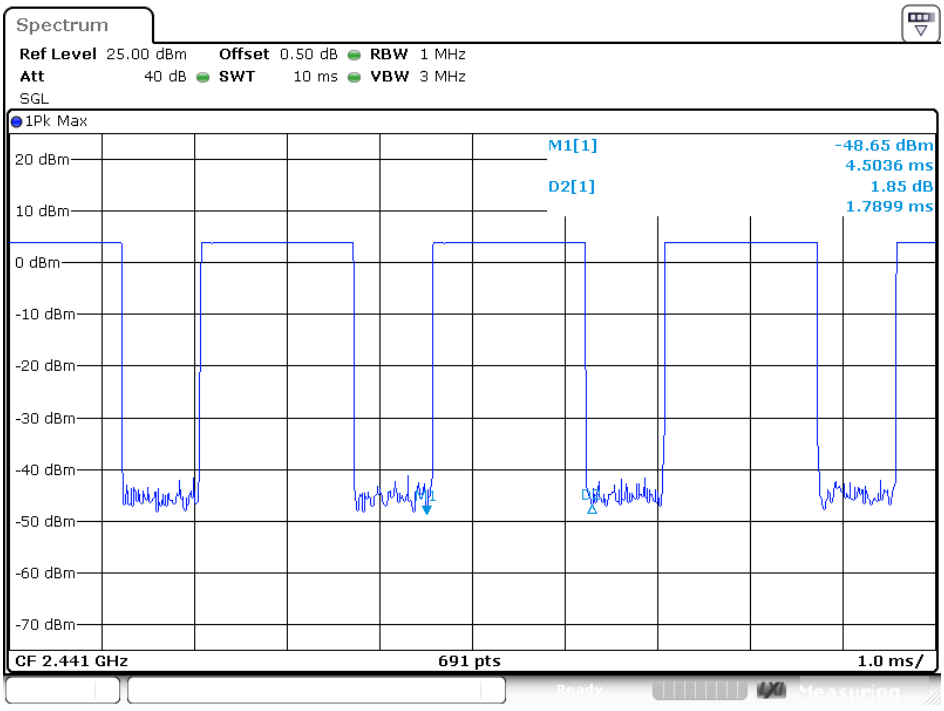
DH1 High channel



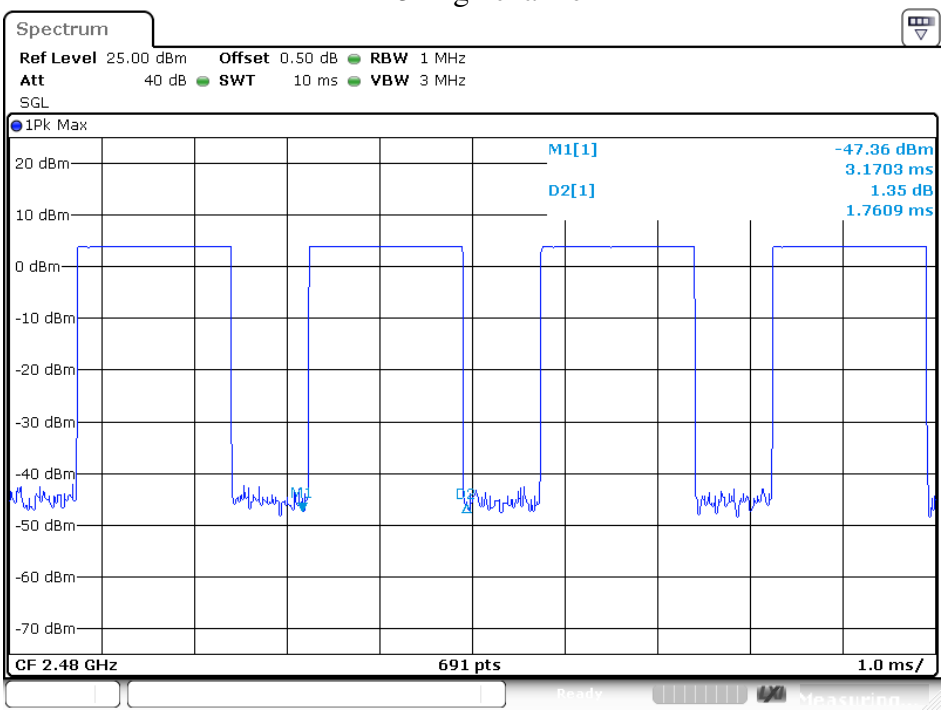
DH3 Low channel



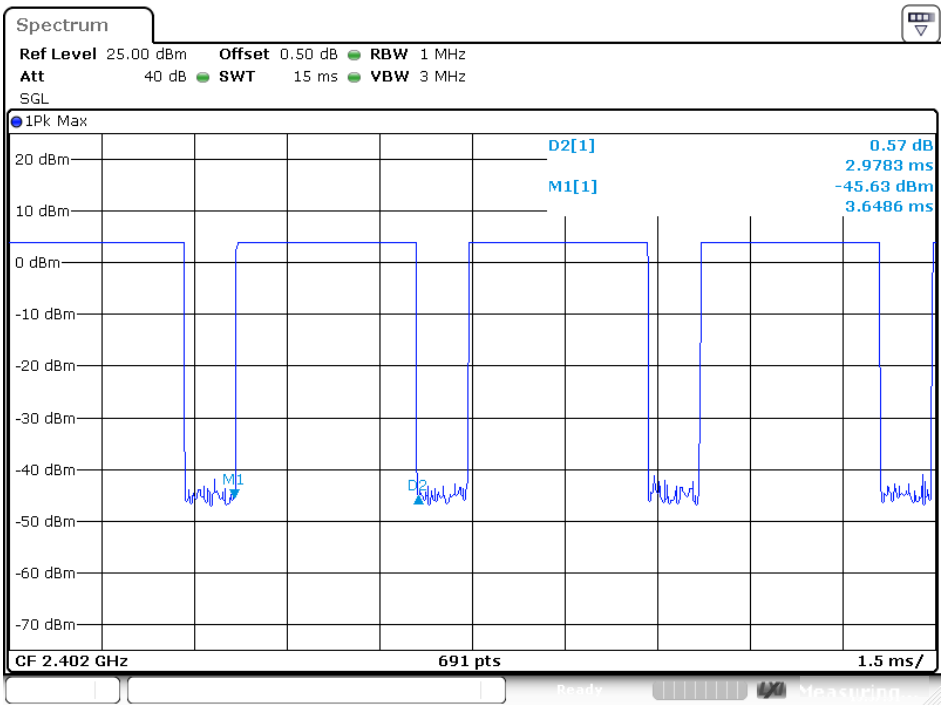
DH3 Middle channel



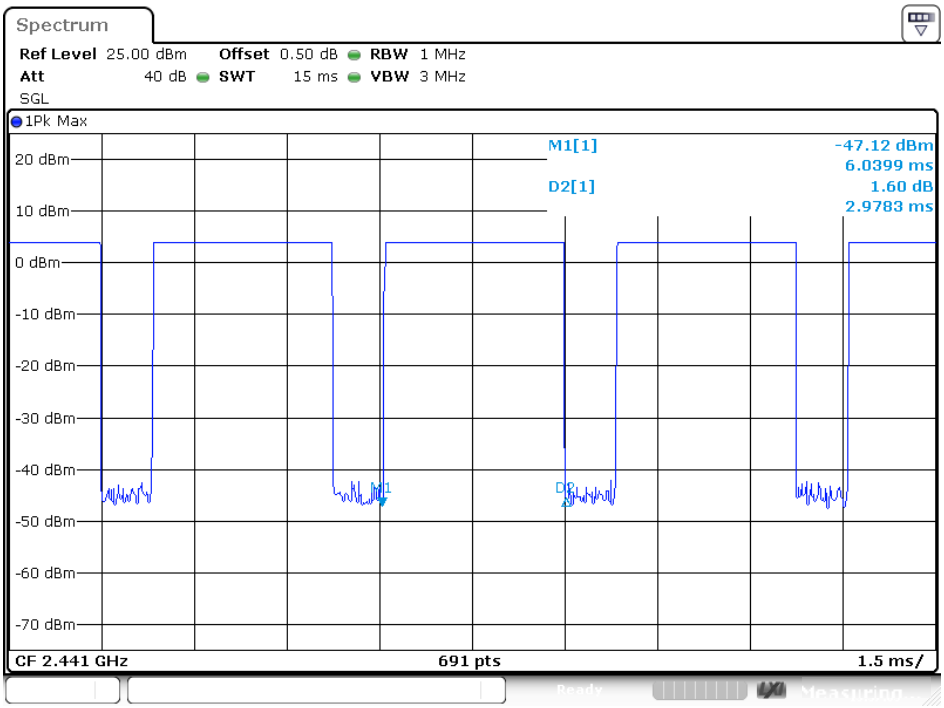
DH3 High channel



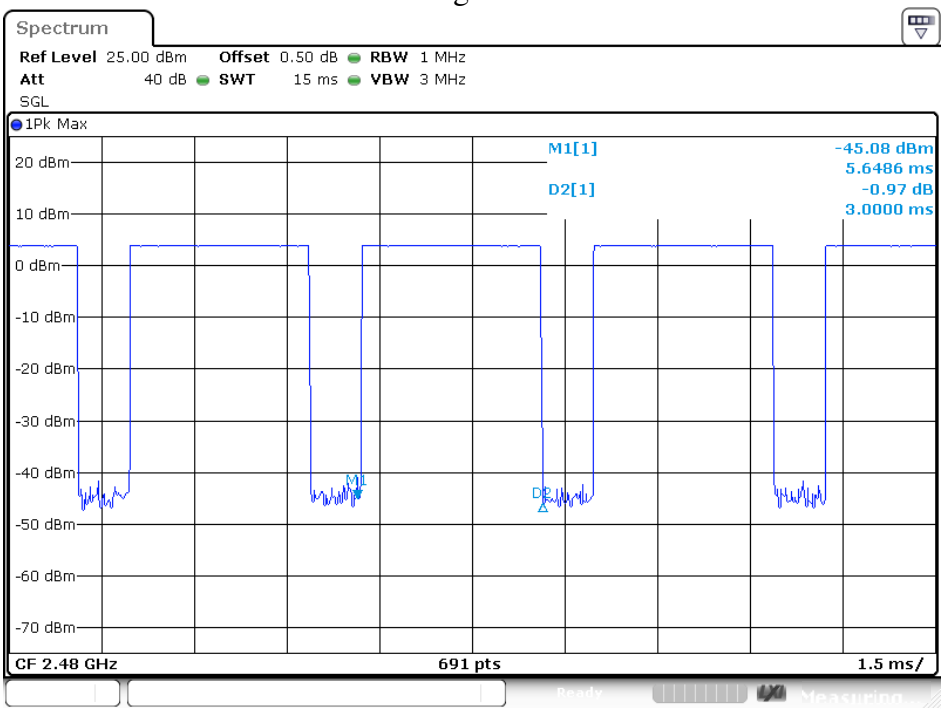
DH5 Low channel



DH5 Middle channel

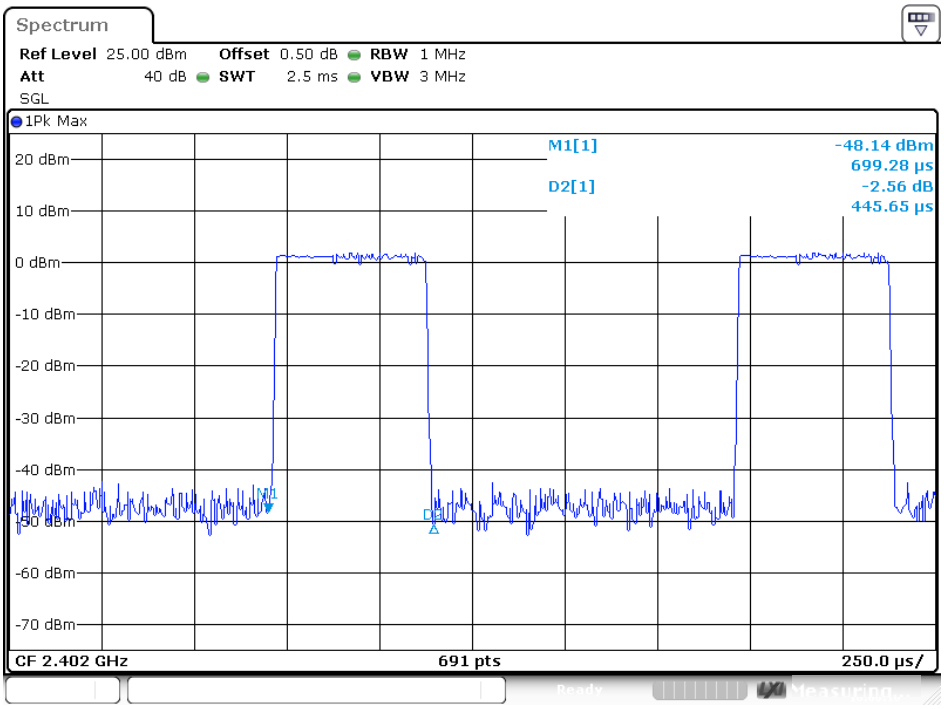


DH5 High channel

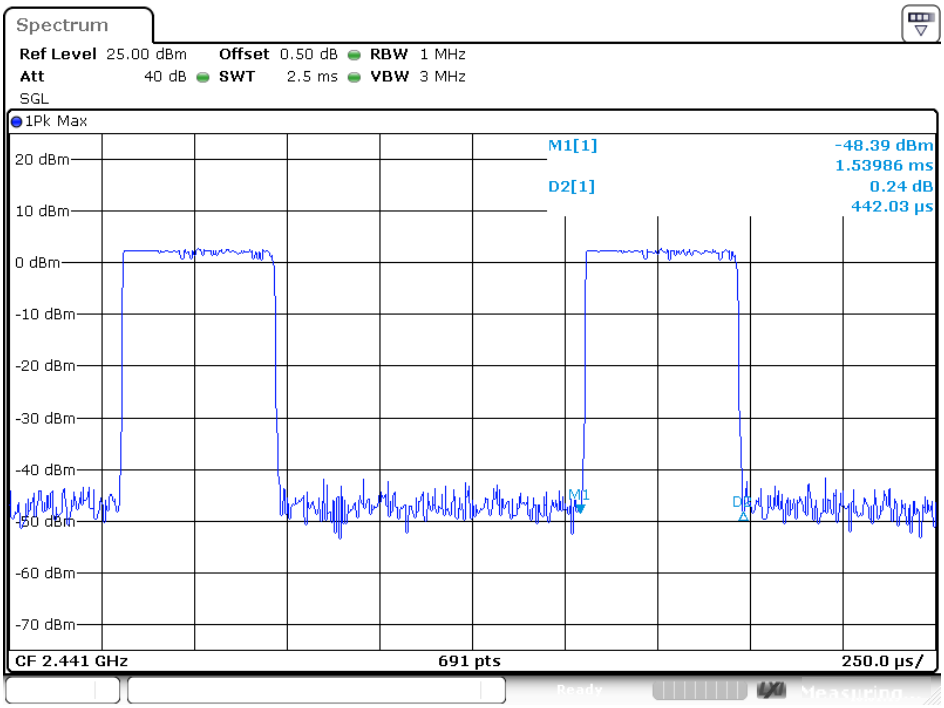


Π/4-DQPSK

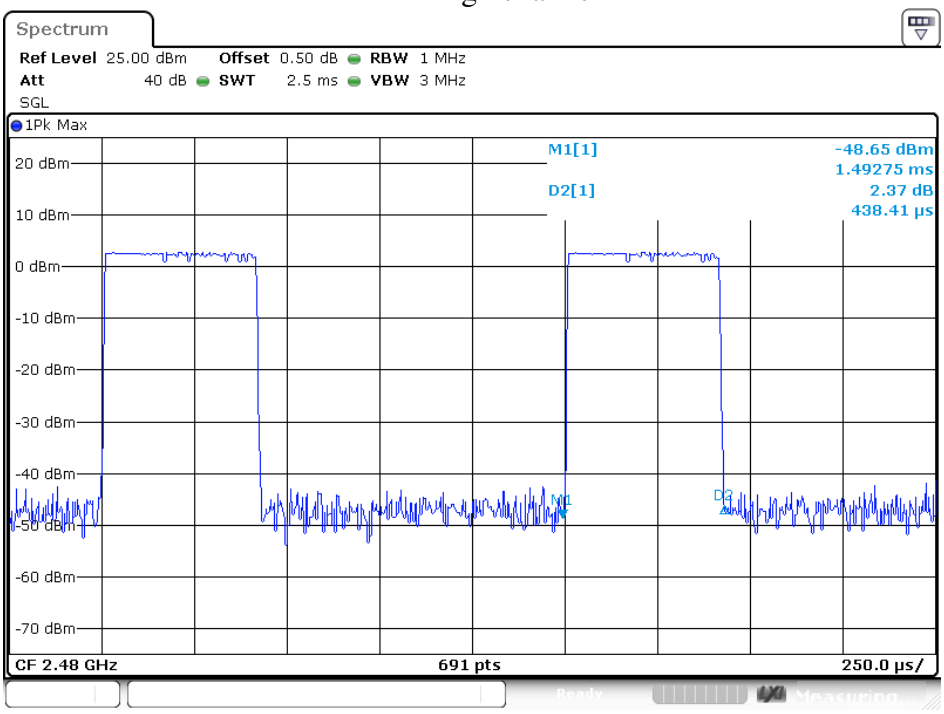
2DH1 Low channel



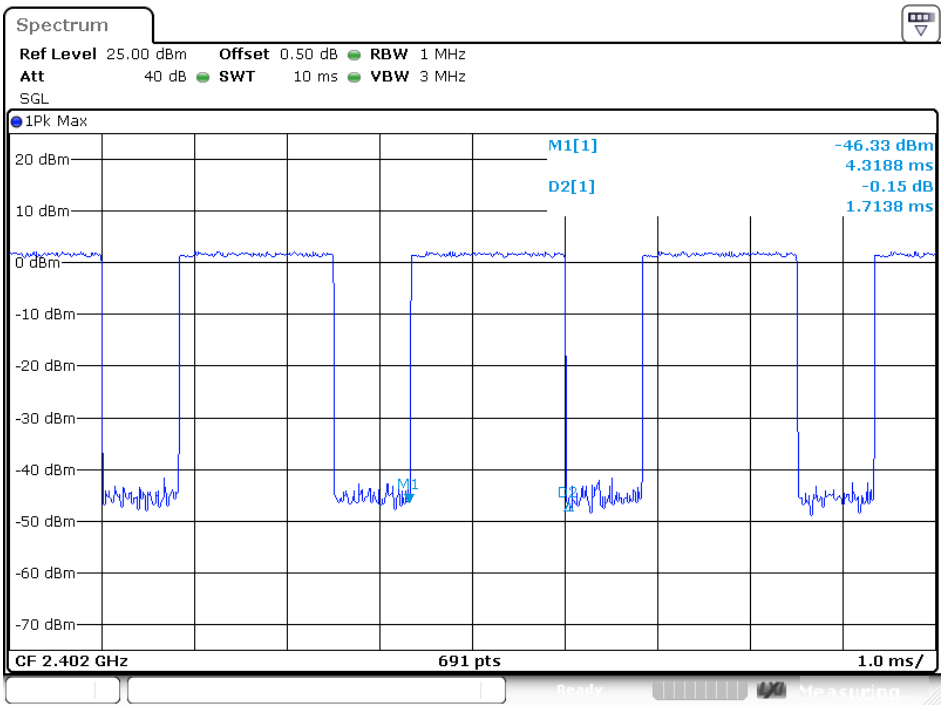
2DH1 Middle channel



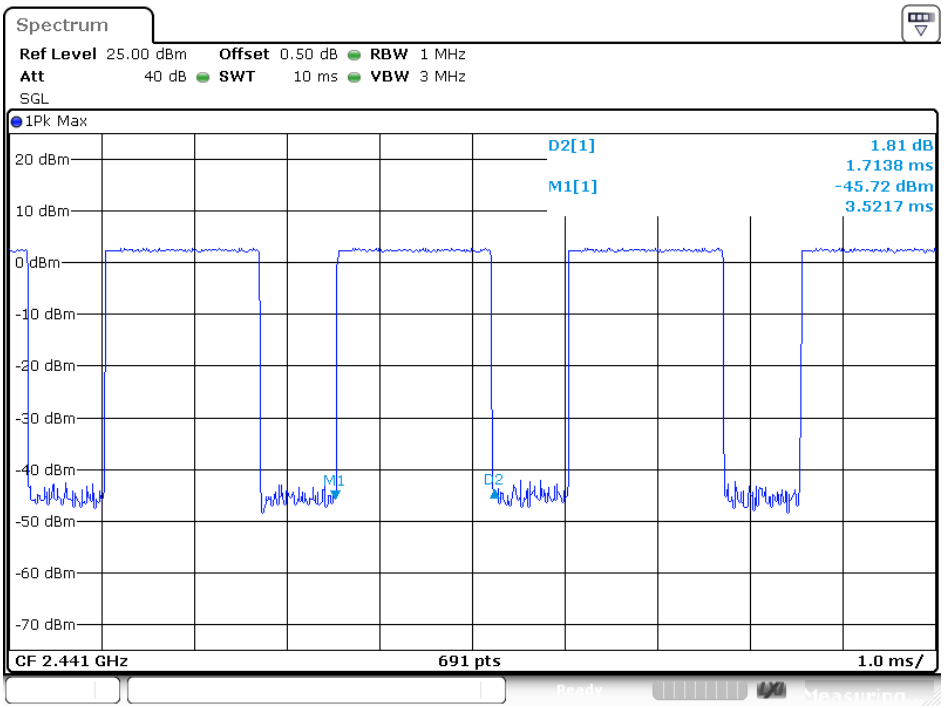
2DH1 High channel



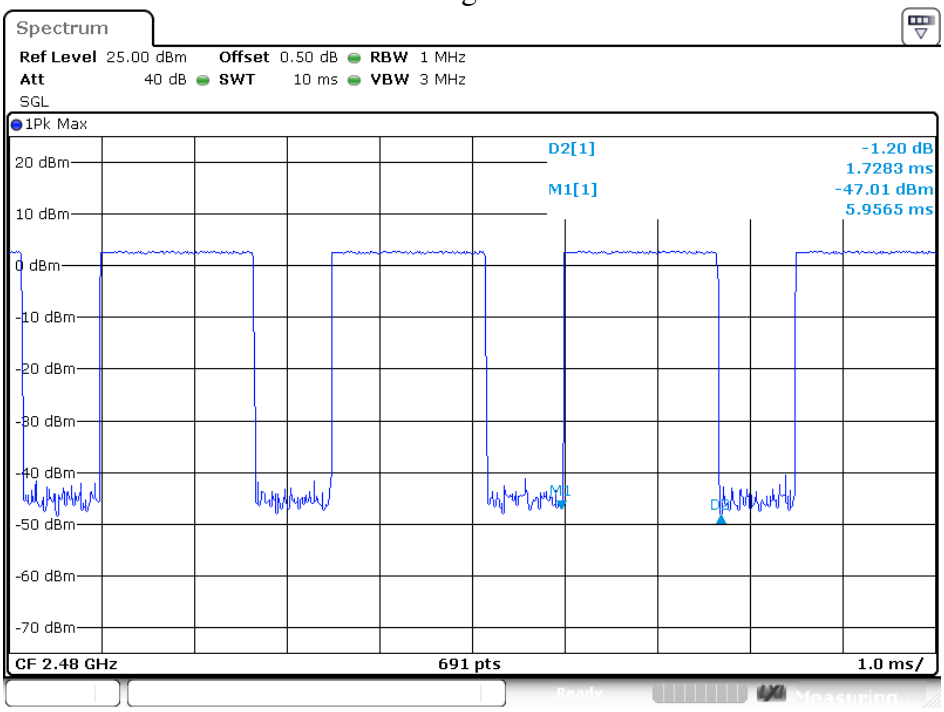
2DH3 Low channel



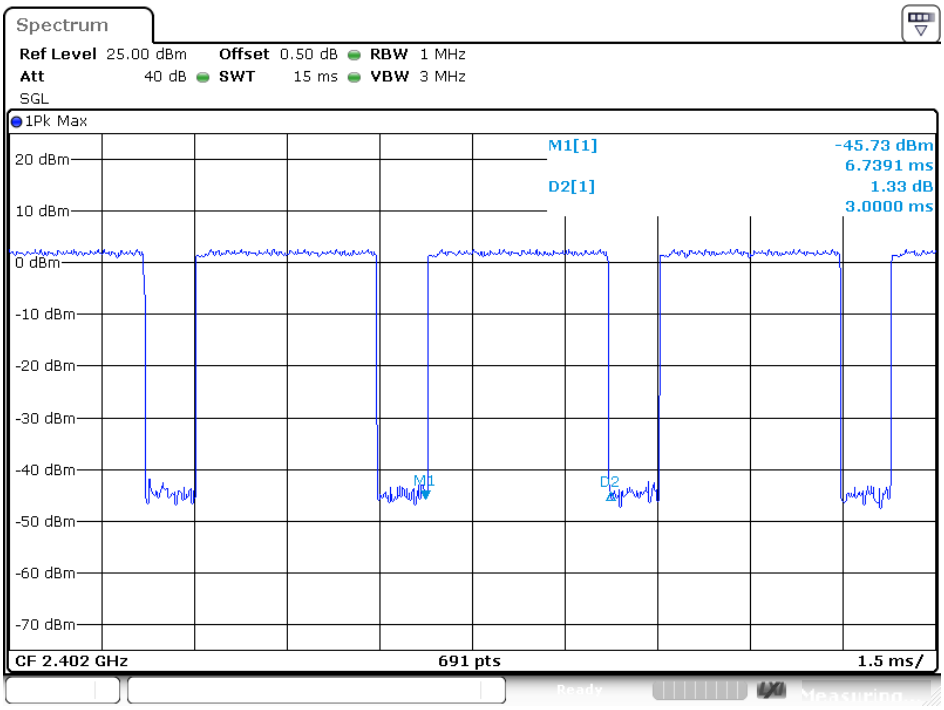
2DH3 Middle channel



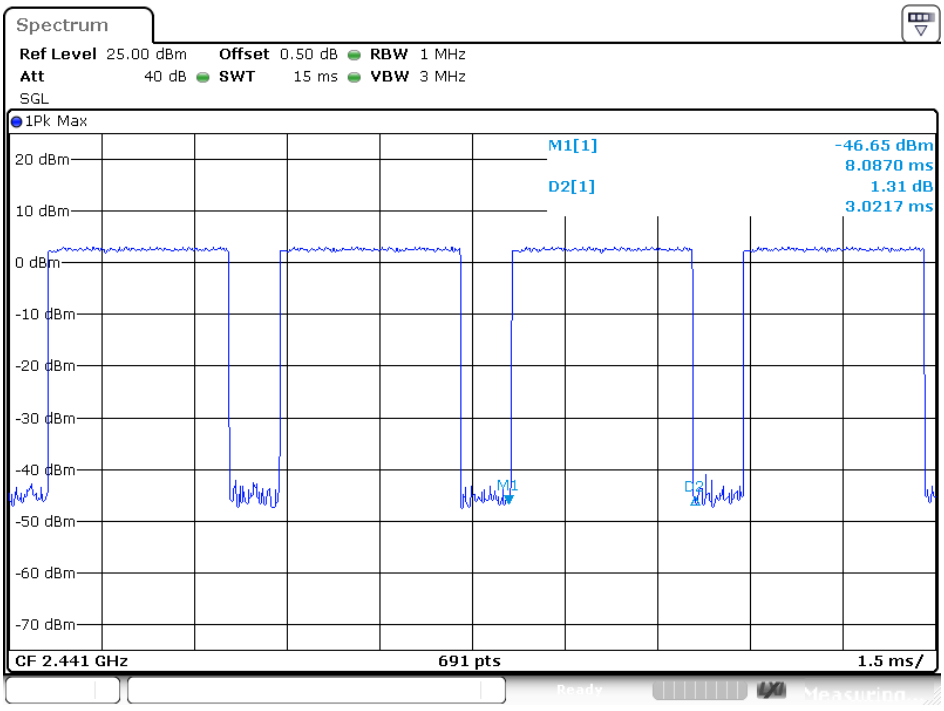
2DH3 High channel



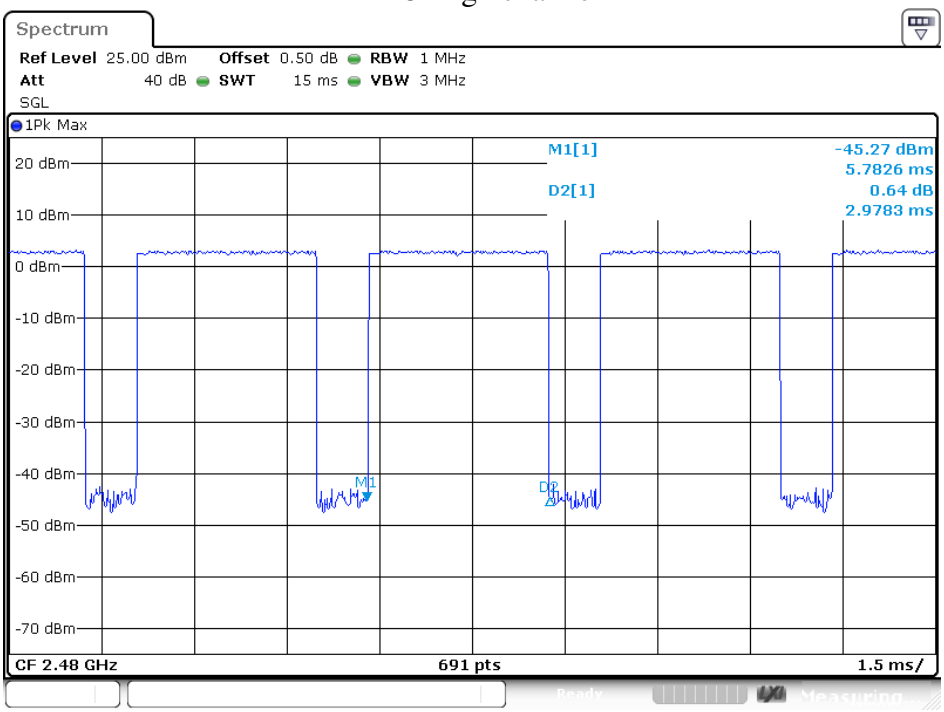
2DH5 Low channel



2DH5 Middle channel

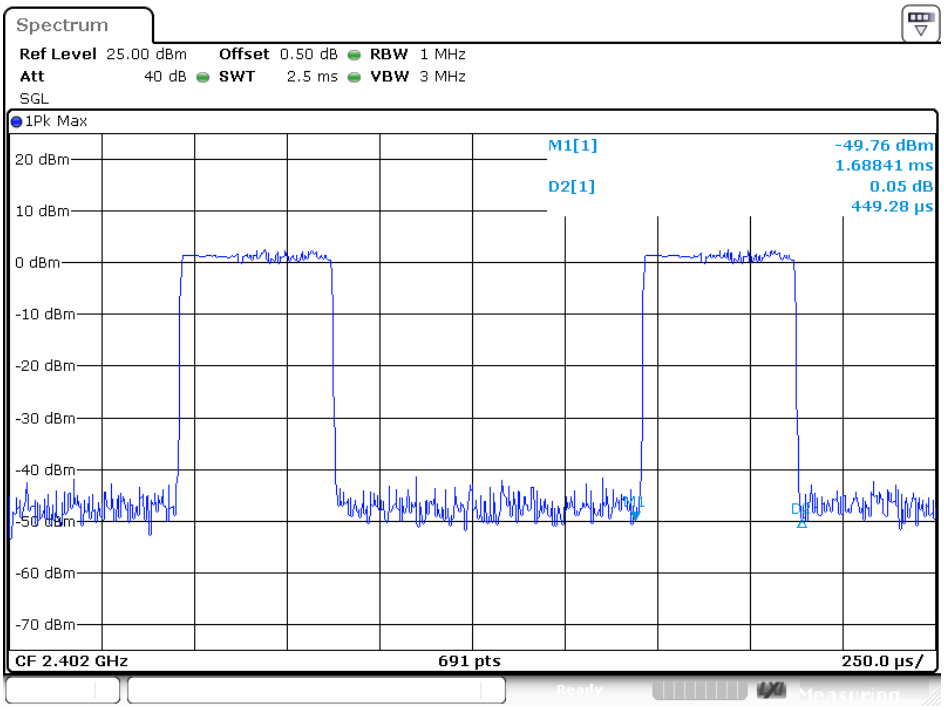


2DH5 High channel

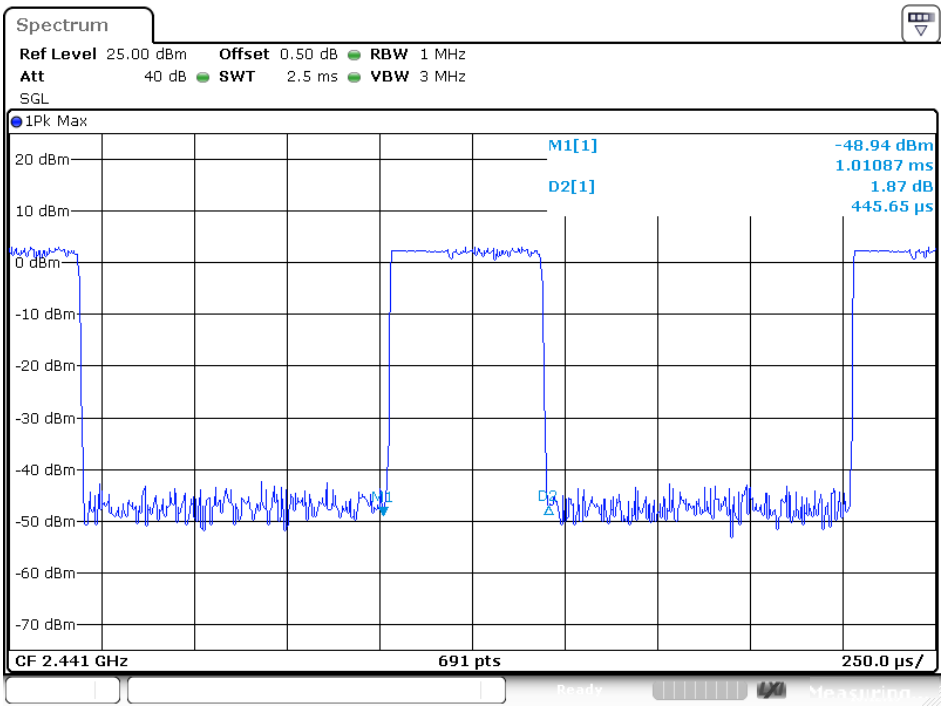


8DPSK Mode

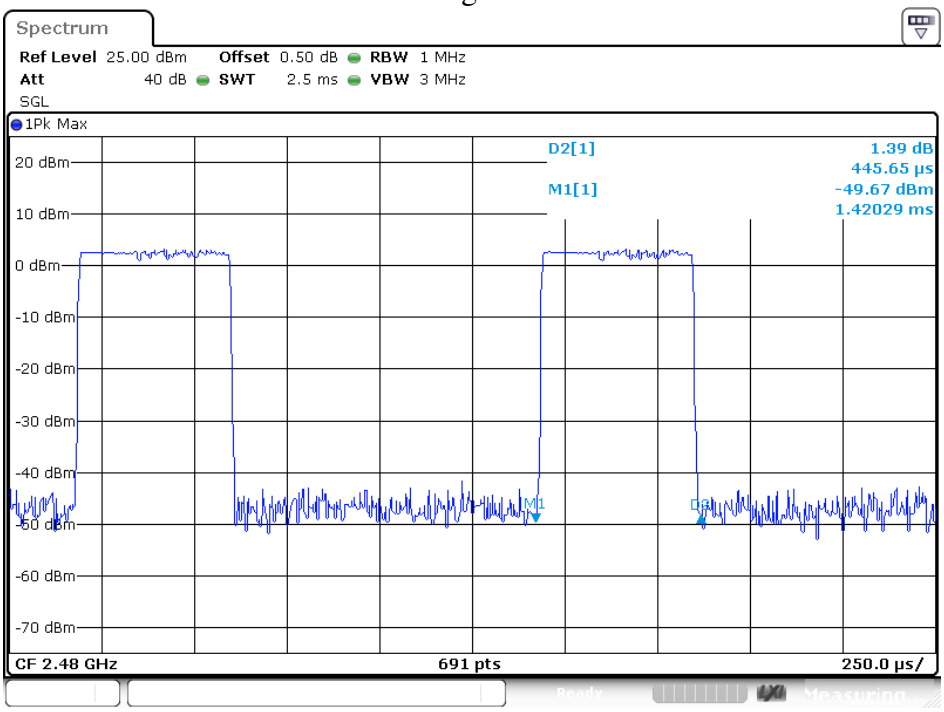
3DH1 Low channel



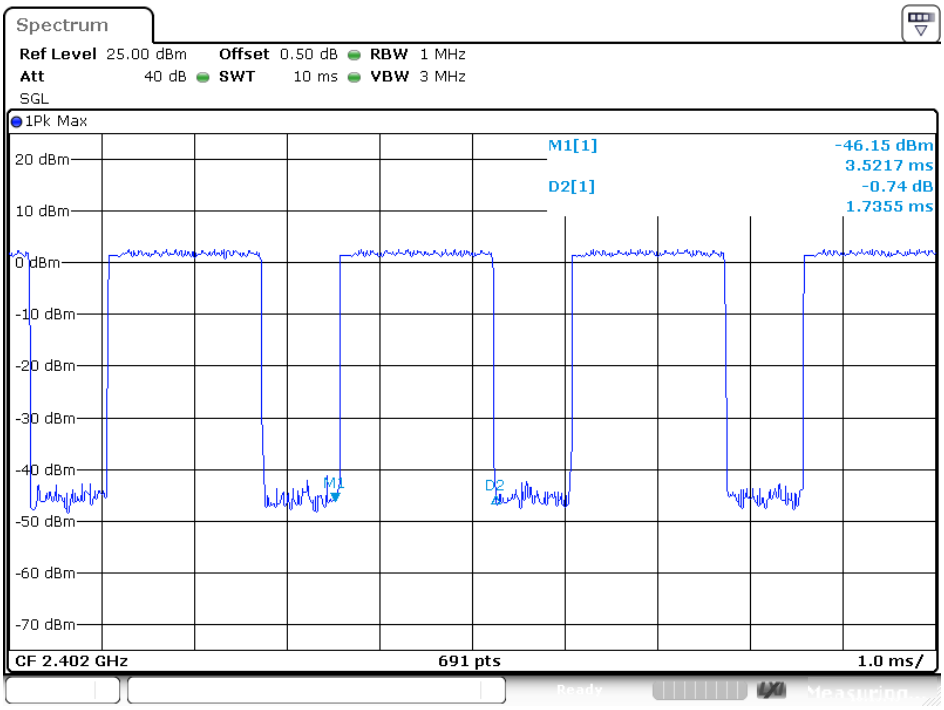
3DH1 Middle channel



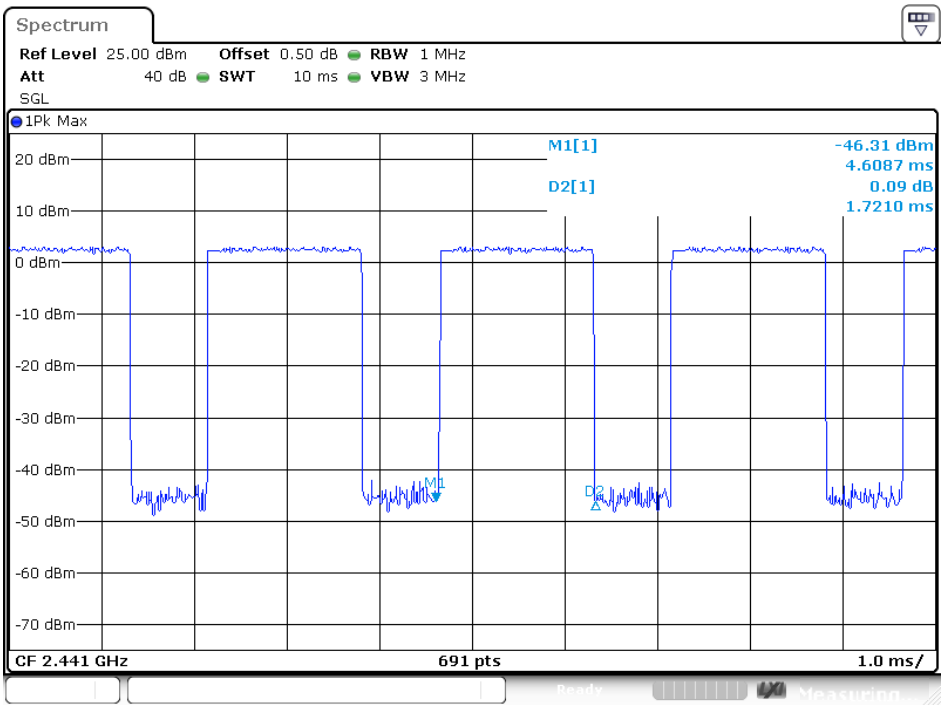
3DH1 High channel



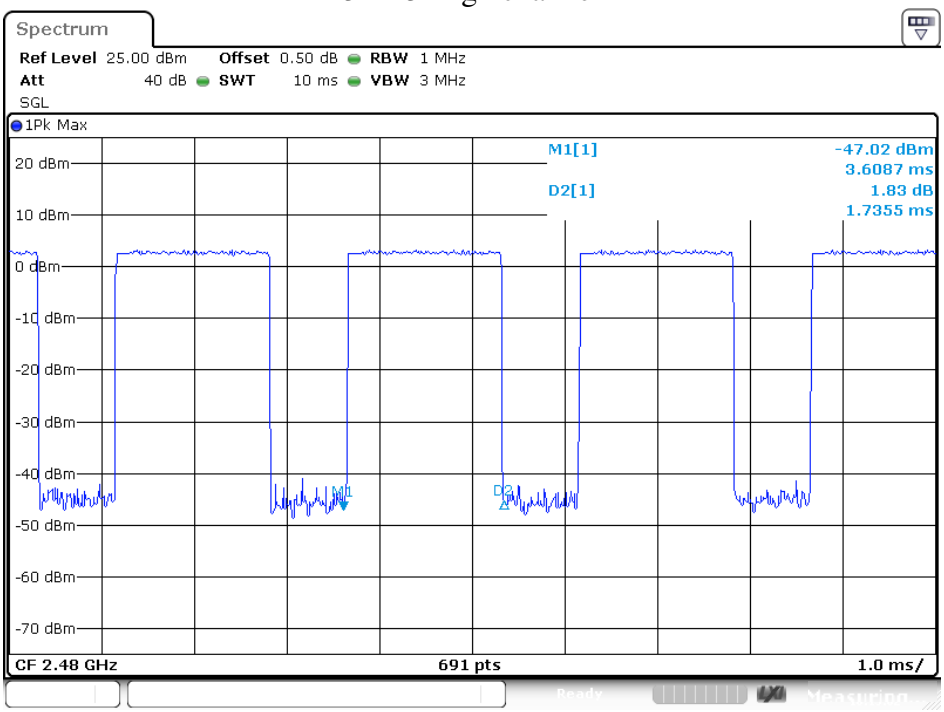
3DH3 Low channel



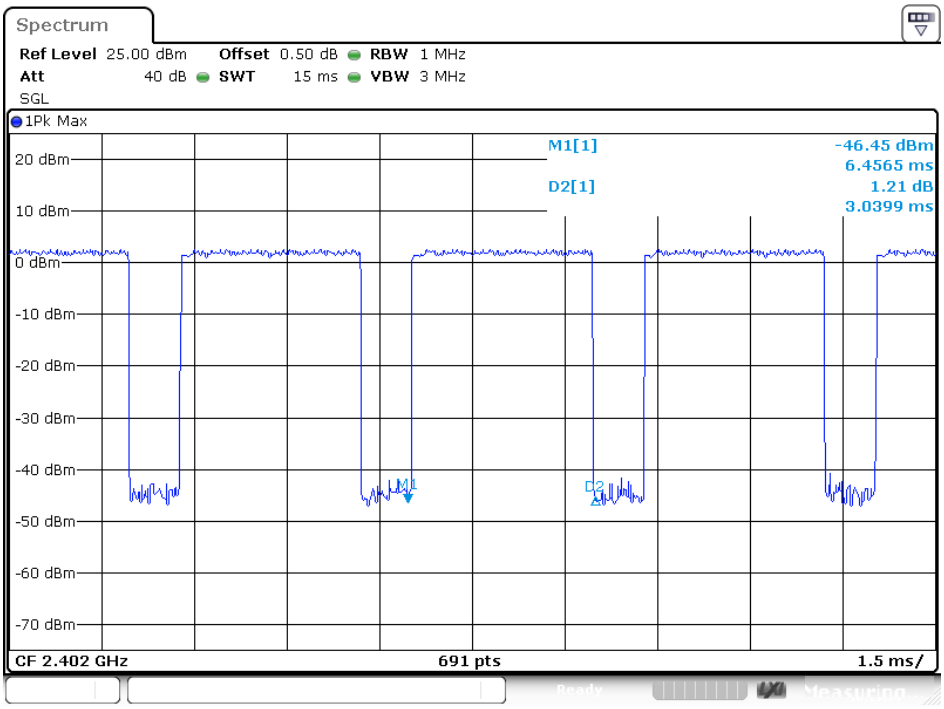
3DH3 Middle channel



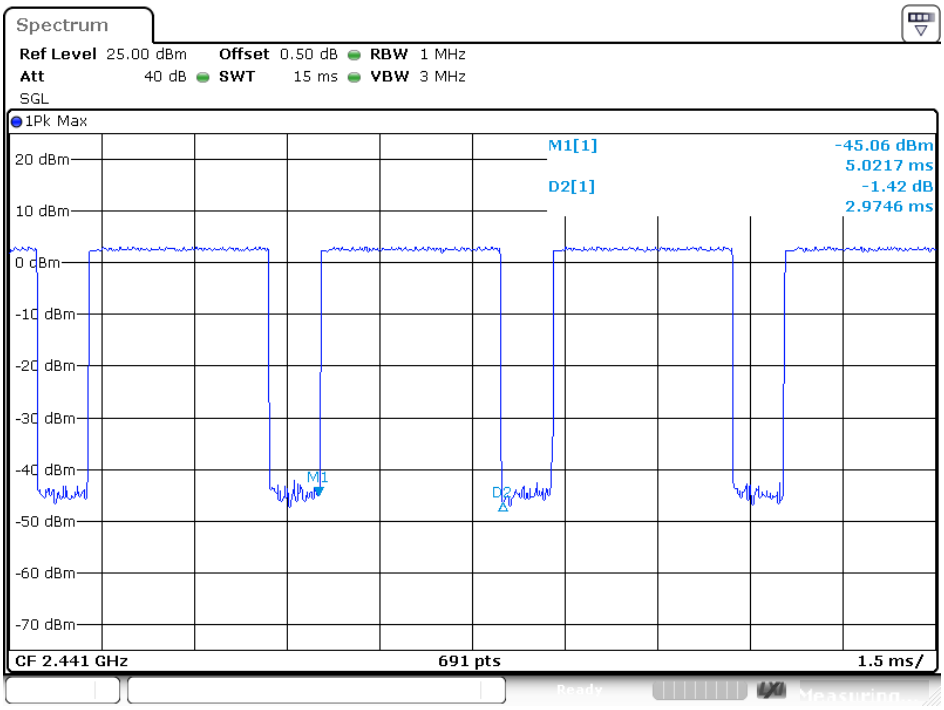
3DH3 High channel



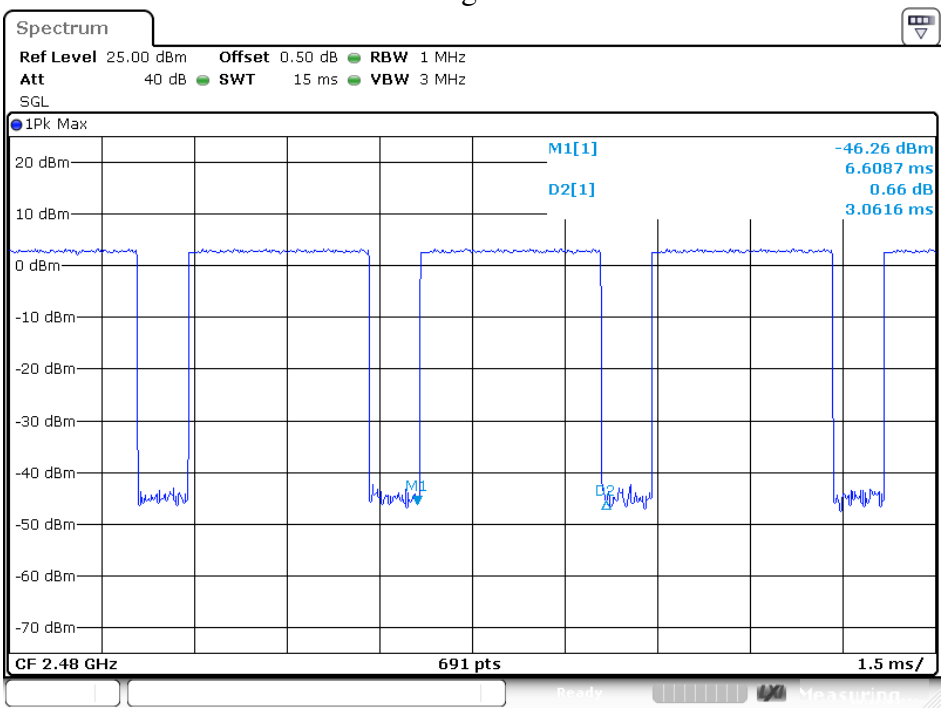
3DH5 Low channel



3DH5 Middle channel

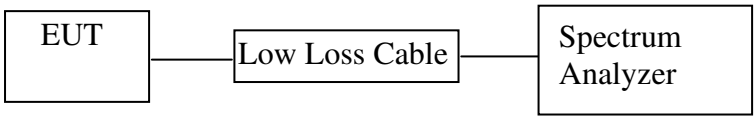


3DH5 High channel



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

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

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

9.3.EUT Configuration on Measurement

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

9.4.Operating Condition of EUT

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

9.4.2.Turn on the power of all equipment.

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

9.5.Test Procedure

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

9.5.2.Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz for GFSK mode

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

9.5.4.Measurement the maximum peak output power.

9.6.Test Result

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	4.18/0.0026	30 / 1.0
Middle	2441	4.10/0.0026	30 / 1.0
High	2480	4.04/0.0025	30 / 1.0

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	2.42/0.0017	21 / 0.125
Middle	2441	3.07/0.0020	21 / 0.125
High	2480	3.14/0.0021	21 / 0.125

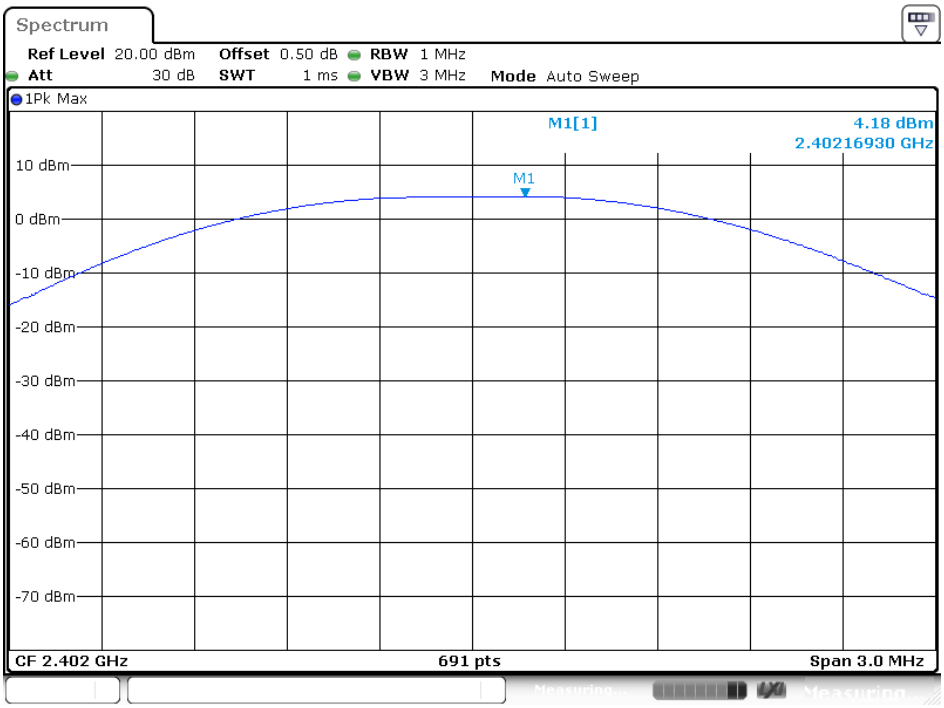
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	2.62/0.0018	21 / 0.125
Middle	2441	3.18/0.0021	21 / 0.125
High	2480	3.25/0.0021	21 / 0.125

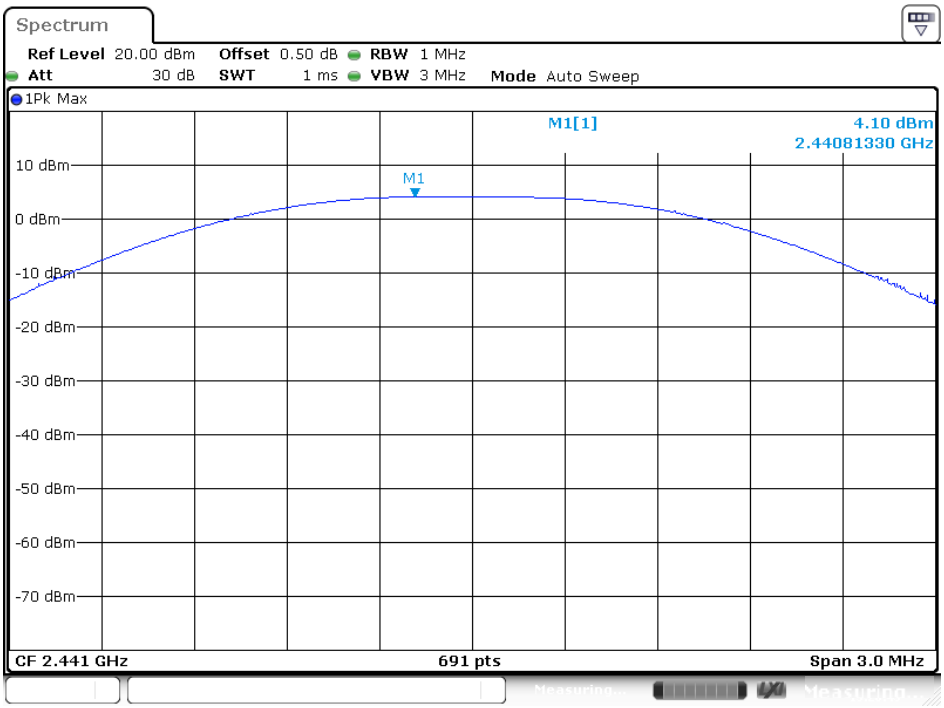
The spectrum analyzer plots are attached as below.

GFSK Mode

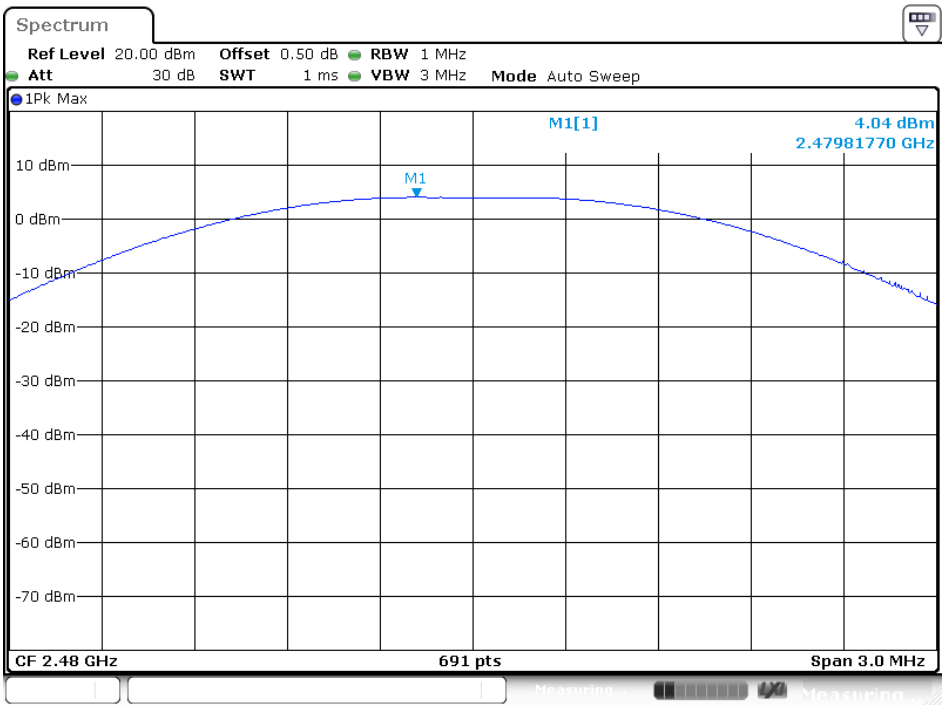
Low channel



Middle channel

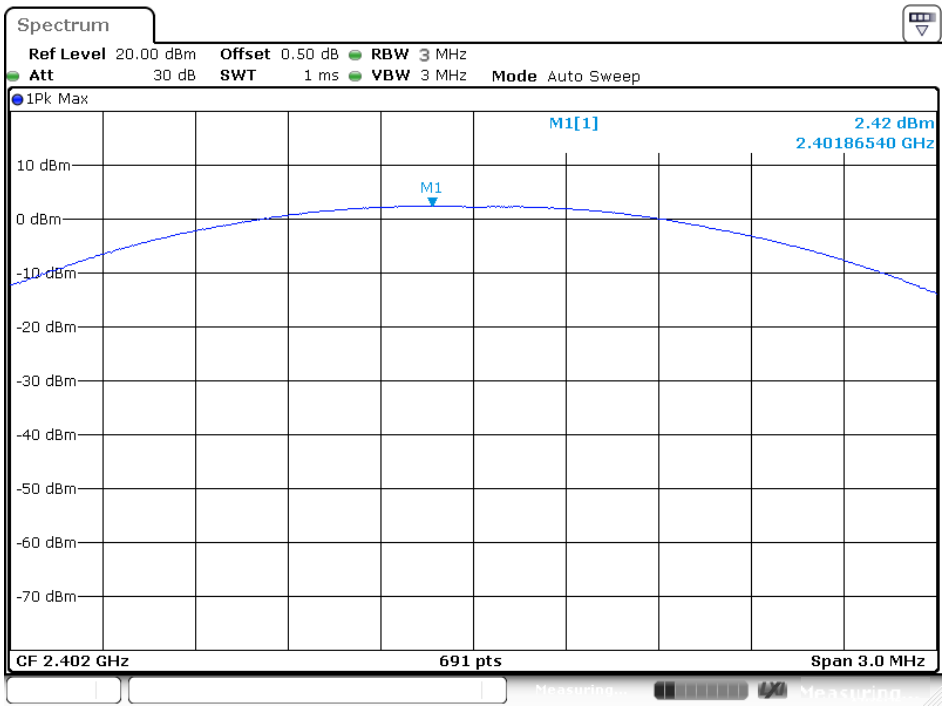


High channel

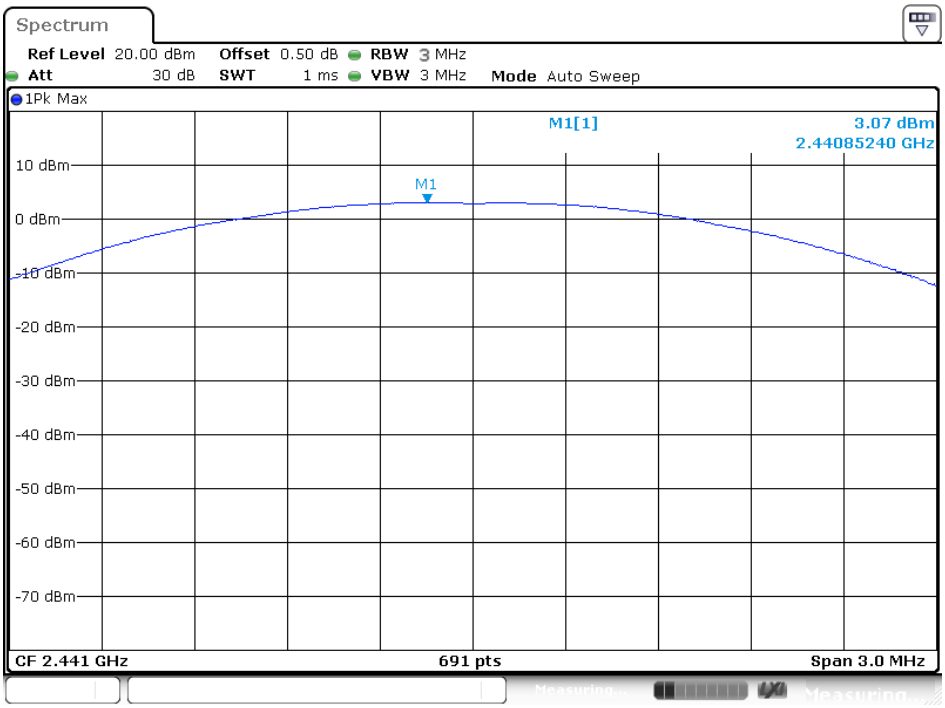


Π/4-DQPSK Mode

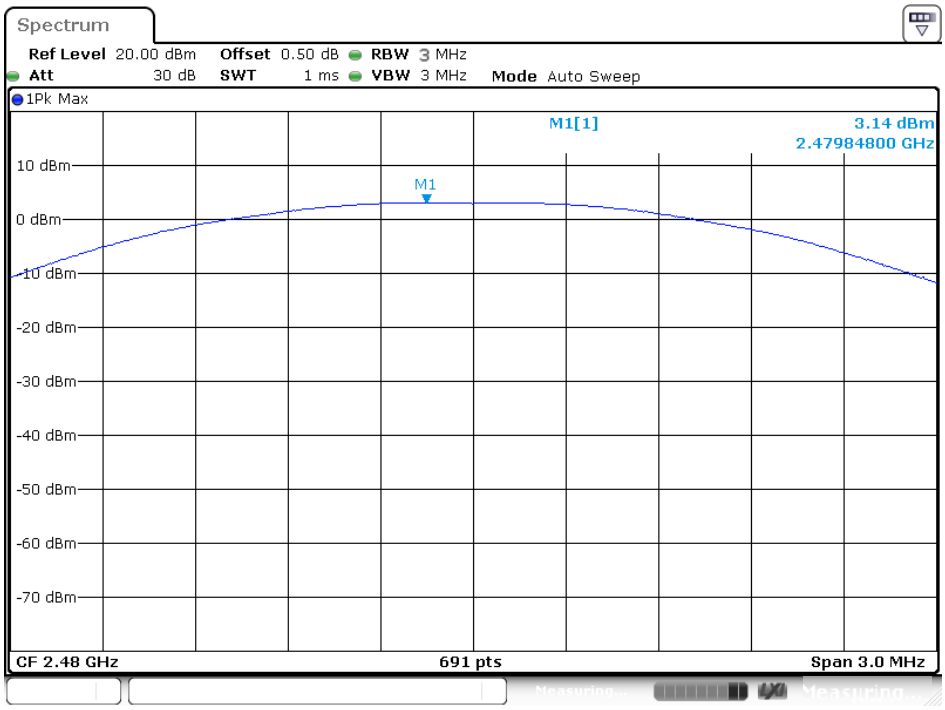
Low channel



Middle channel

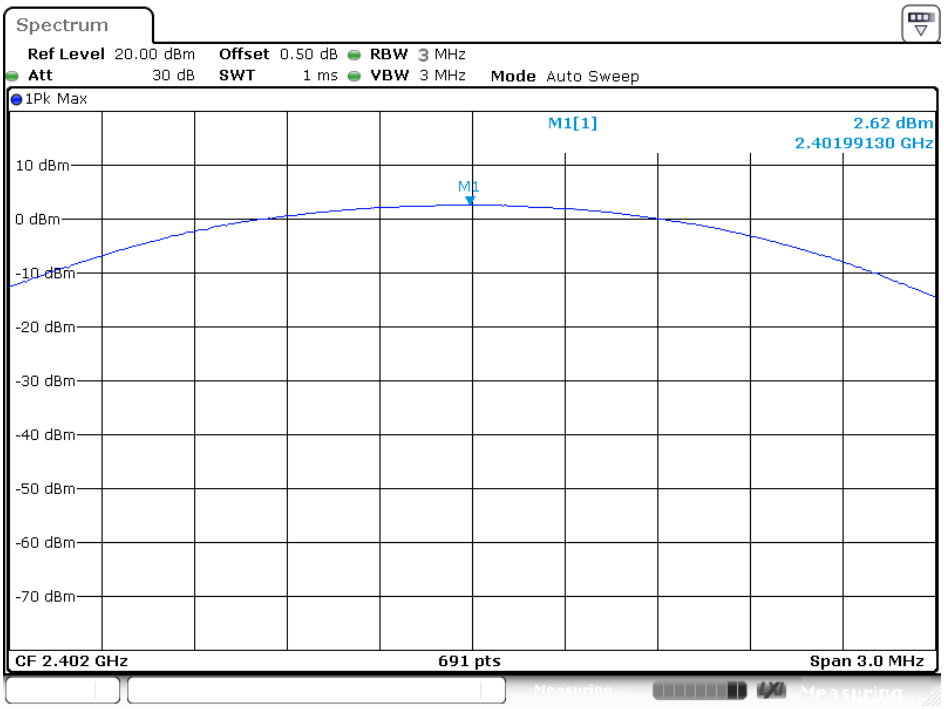


High channel

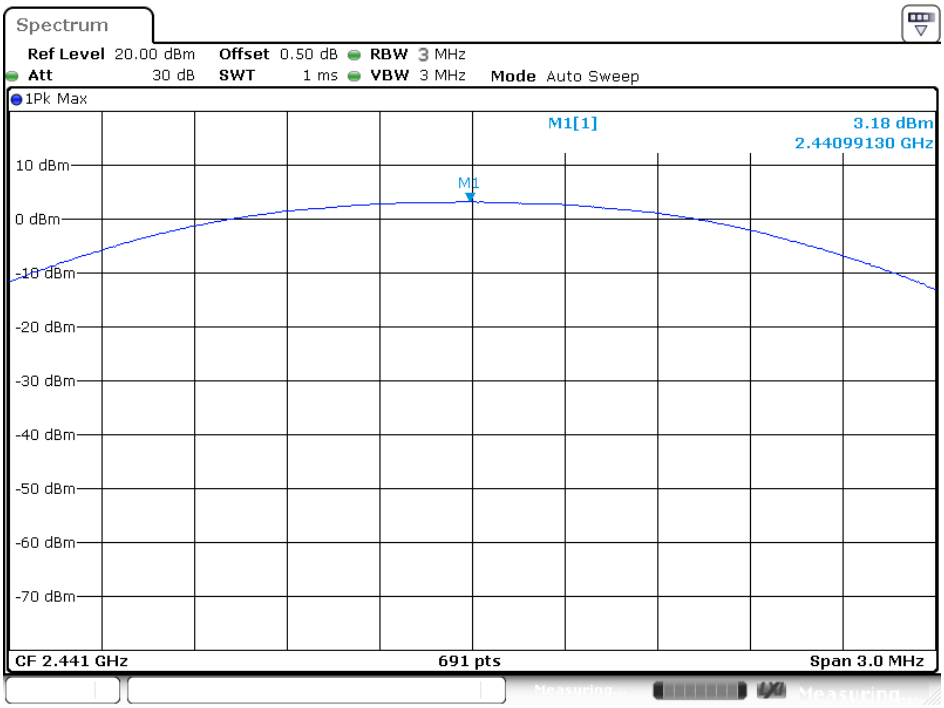


8DPSK Mode

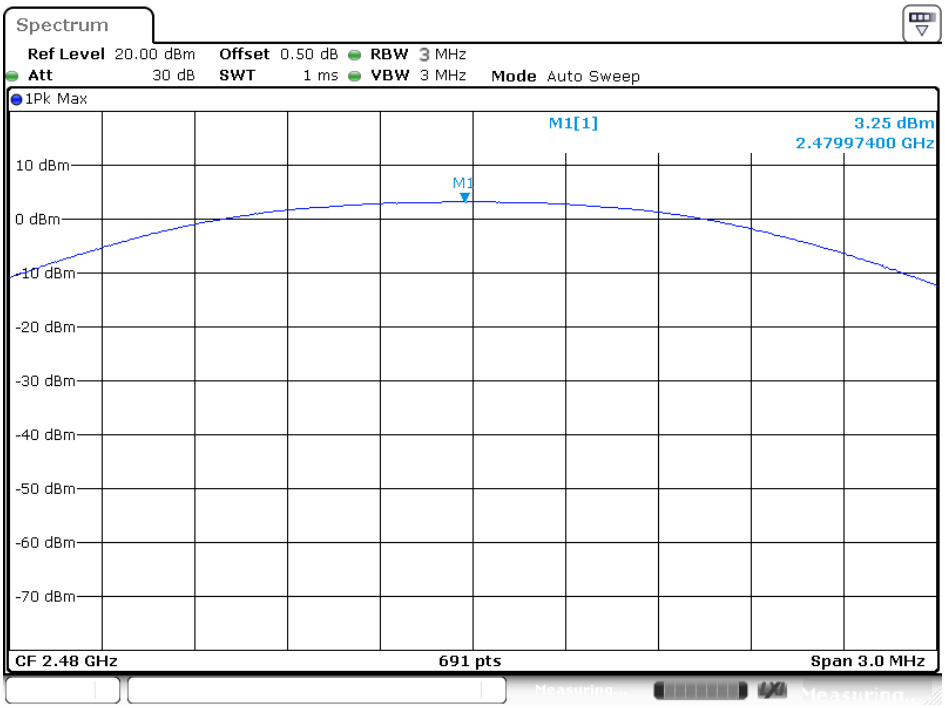
Low channel



Middle channel



High channel



10. RADIATED EMISSION TEST

10.1. Block Diagram of Test Setup

10.1.1. Block diagram of connection between the EUT and peripherals

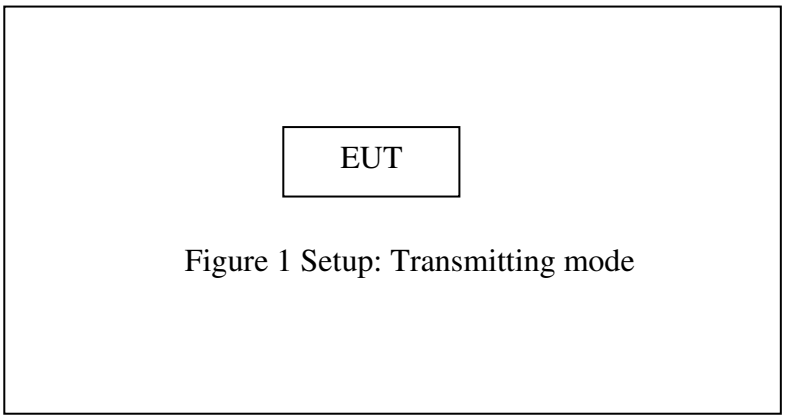
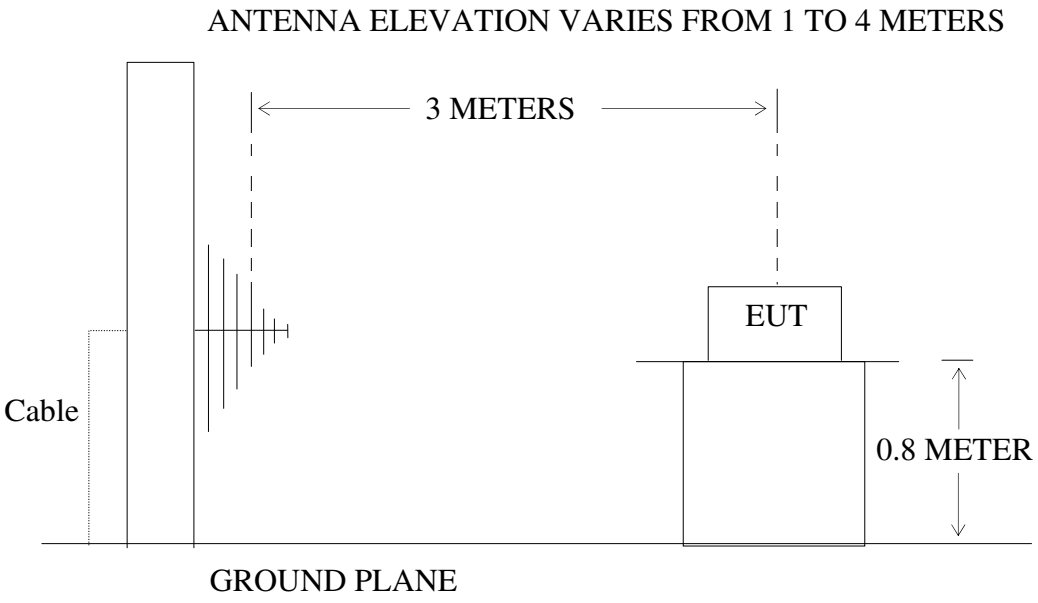


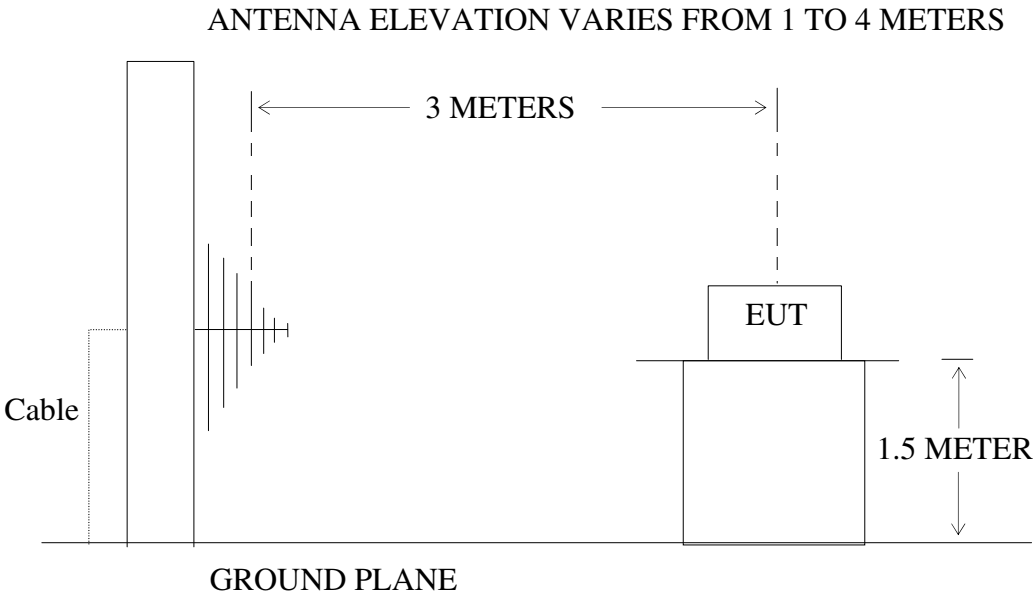
Figure 1 Setup: Transmitting mode

10.1.2. Semi-Anechoic Chamber Test Setup Diagram

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			

[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. 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.The Field Strength of Radiation Emission Measurement Results

Note:

1.We tested GFSK mode, Π/4-DQPSK Mode & 8QPSK mode and recorded the worst case data (GFSK mode) for all test mode.

2. The test frequency is from 30MHz to 25GHz, The 18-25GHz emissions are not reported, because the levels are too low against the limit.

Below 1GHz

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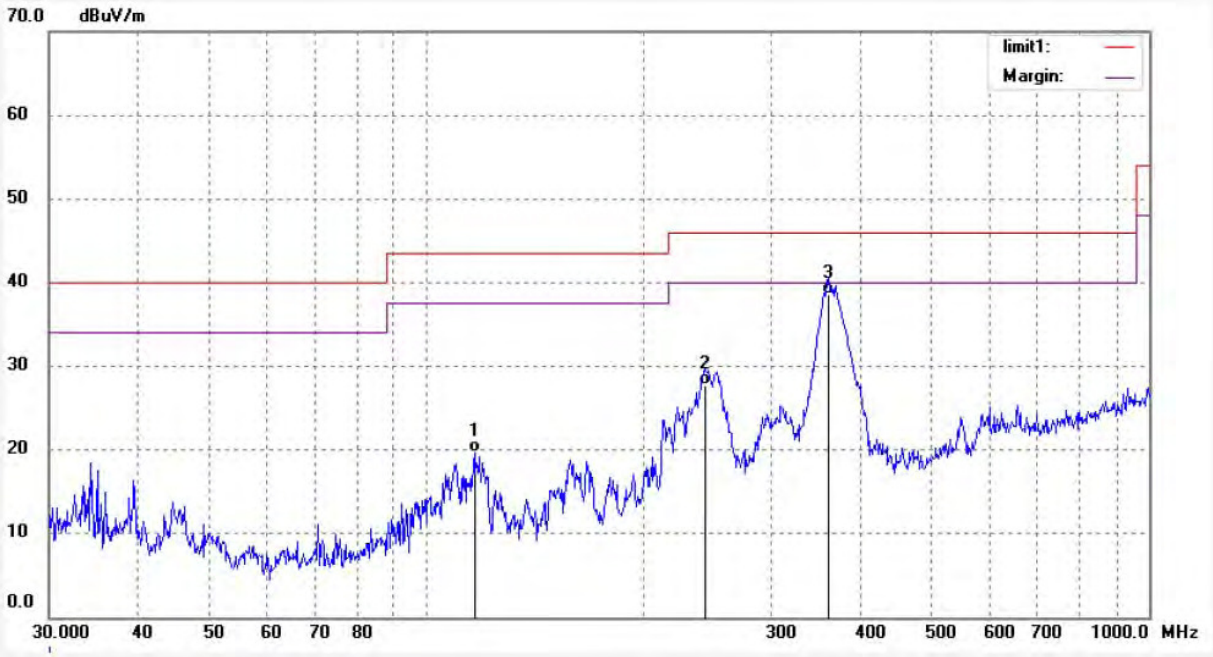
Job No.: ricky 2016 #619	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15/36/51
EUT: Bluetooth Speaker	Engineer Signature:
Mode: TX 2402MHz	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	116.4476	41.01	-21.25	19.76	43.50	-23.74	QP			
2	242.6889	45.92	-18.23	27.69	46.00	-18.31	QP			
3	359.7114	52.95	-14.30	38.65	46.00	-7.35	QP			

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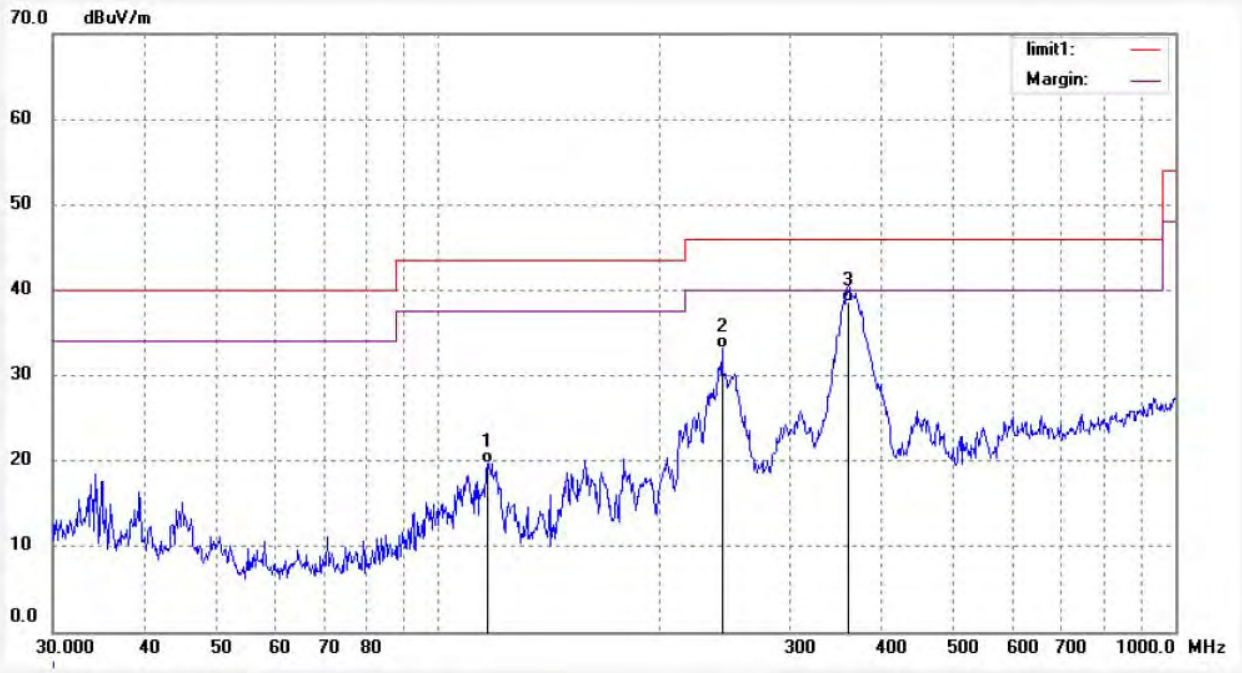
Job No.: ricky 2016 #620	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15/38/29
EUT: Bluetooth Speaker	Engineer Signature:
Mode: TX 2402MHz	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	116.4476	41.01	-21.25	19.76	43.50	-23.74	QP			
2	242.6889	51.36	-18.23	33.13	46.00	-12.87	QP			
3	359.7114	52.95	-14.30	38.65	46.00	-7.35	QP			

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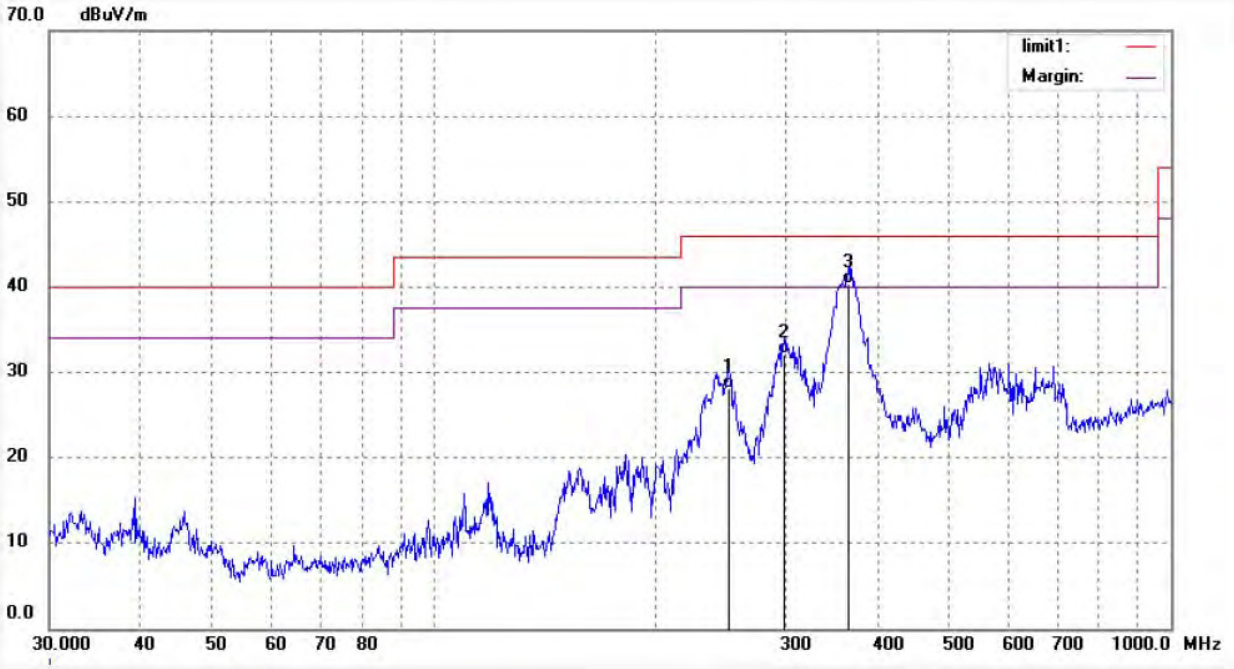
Job No.: ricky 2016 #621	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15/40/23
EUT: Bluetooth Speaker	Engineer Signature:
Mode: TX 2441MHz	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	251.3676	46.21	-18.10	28.11	46.00	-17.89	QP			
2	298.5932	48.49	-16.30	32.19	46.00	-13.81	QP			
3	364.8026	54.63	-14.25	40.38	46.00	-5.62	QP			

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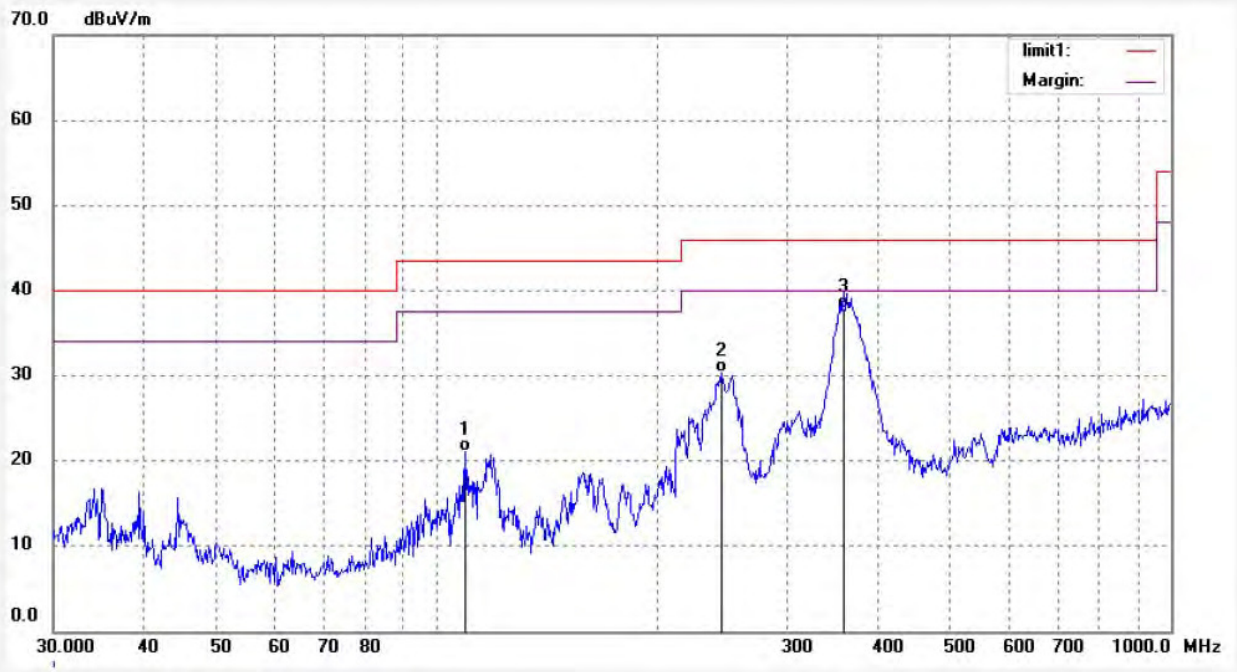
Job No.: ricky 2016 #622
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2441MHz
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 15/44/09
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	109.3110	42.23	-21.17	21.06	43.50	-22.44	QP			
2	244.4004	48.61	-18.21	30.40	46.00	-15.60	QP			
3	358.4497	52.18	-14.34	37.84	46.00	-8.16	QP			

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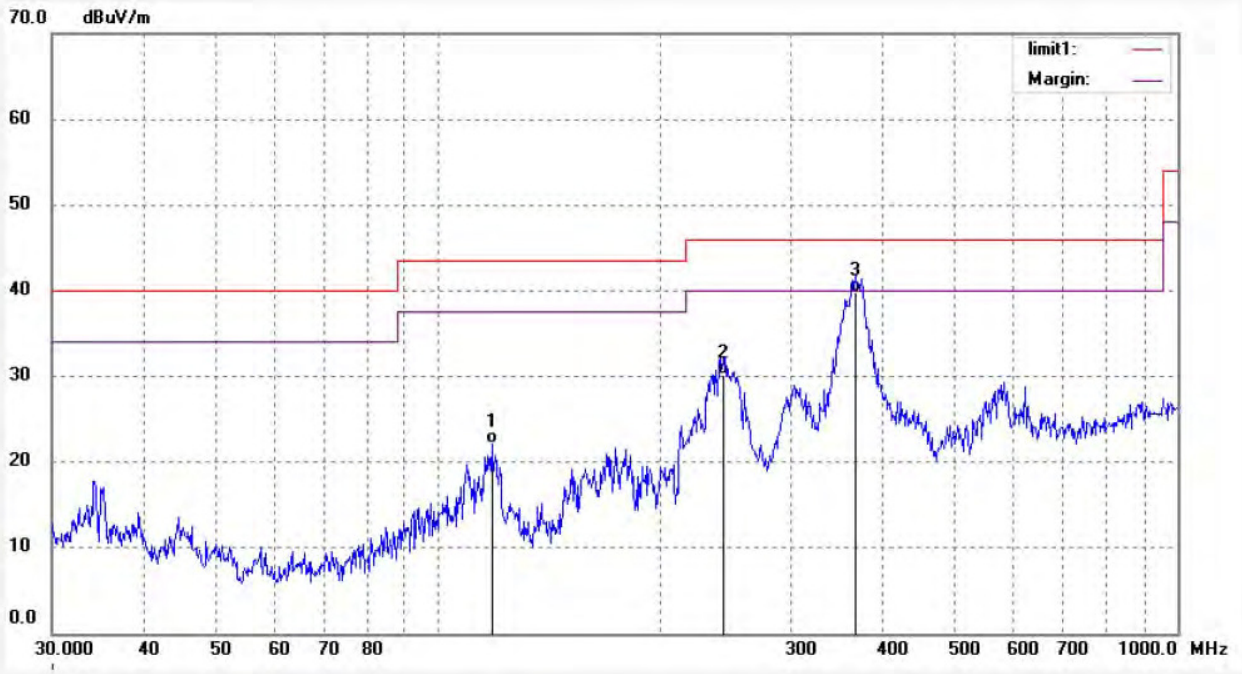
Job No.: ricky 2016 #623
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 15/57/38
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	118.0957	43.33	-21.27	22.06	43.50	-21.44	QP			
2	242.6889	48.41	-18.23	30.18	46.00	-15.82	QP			
3	366.0866	54.03	-14.25	39.78	46.00	-6.22	QP			

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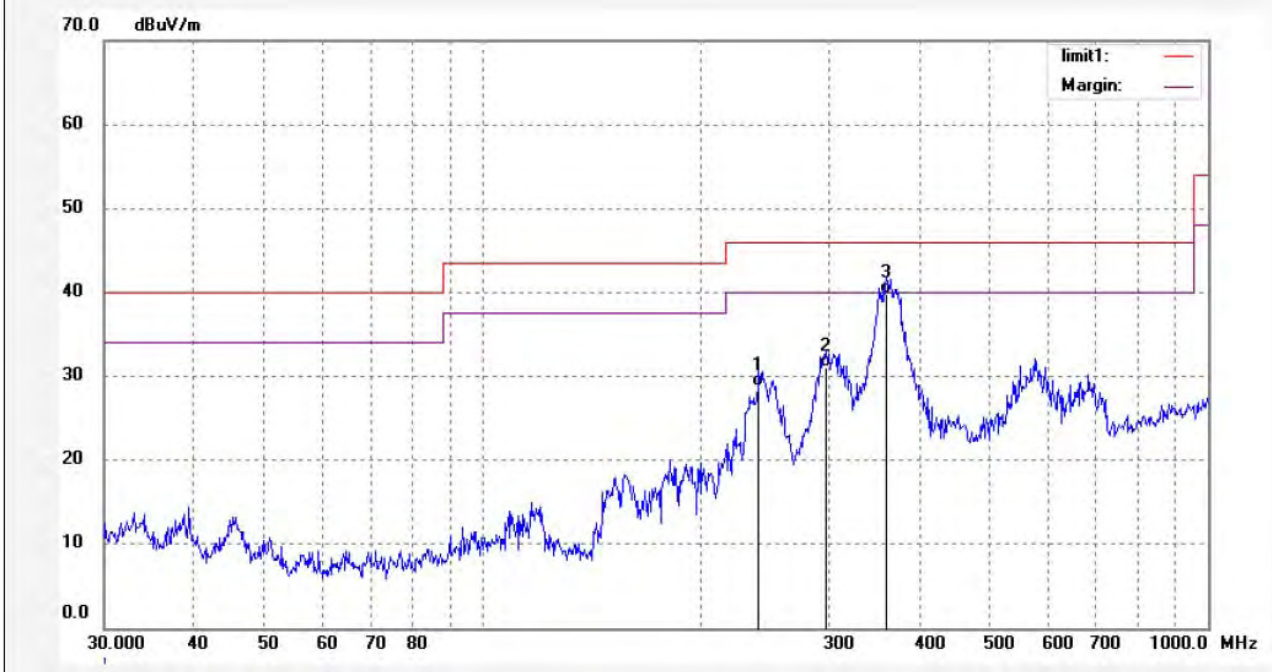
Job No.: ricky 2016 #624	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15/59/32
EUT: Bluetooth Speaker	Engineer Signature:
Mode: TX 2480MHz	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	240.1442	46.99	-18.25	28.74	46.00	-17.26	QP			
2	297.5459	47.45	-16.33	31.12	46.00	-14.88	QP			
3	359.7114	54.13	-14.30	39.83	46.00	-6.17	QP			

Above 1GHz

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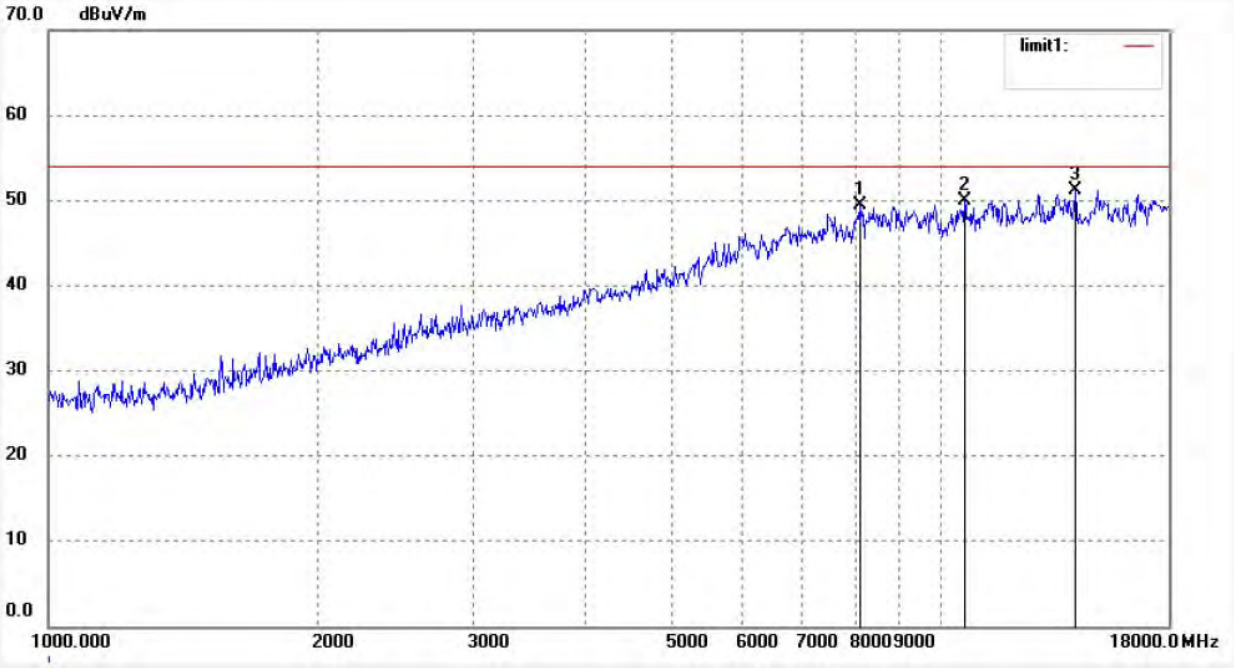
Job No.: ricky 2016 #595	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/22/16
EUT: Bluetooth Speaker	Engineer Signature: Ricky
Mode: TX 2402MHz	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8107.804	40.88	8.52	49.40	54.00	-4.60	peak			
2	10628.367	40.11	9.83	49.94	54.00	-4.06	peak			
3	14136.778	2.61	48.60	51.21	54.00	-2.79	peak			

Note: Average measurement with peak detection at No.2

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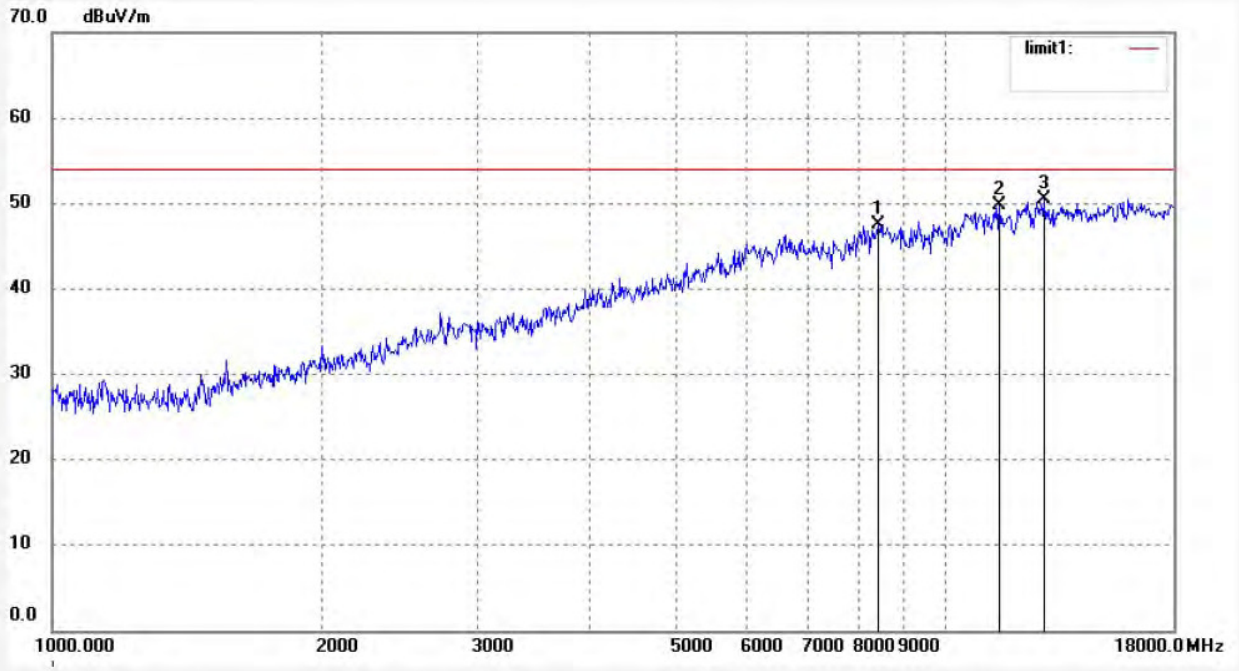
Job No.: ricky 2016 #596	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/24/48
EUT: Bluetooth Speaker	Engineer Signature: Ricky
Mode: TX 2402MHz	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8420.480	38.51	9.01	47.52	54.00	-6.48	peak			
2	11497.352	37.99	11.85	49.84	54.00	-4.16	peak			
3	12879.487	4.44	46.01	50.45	54.00	-3.55	peak			

Note: Average measurement with peak detection at No.2

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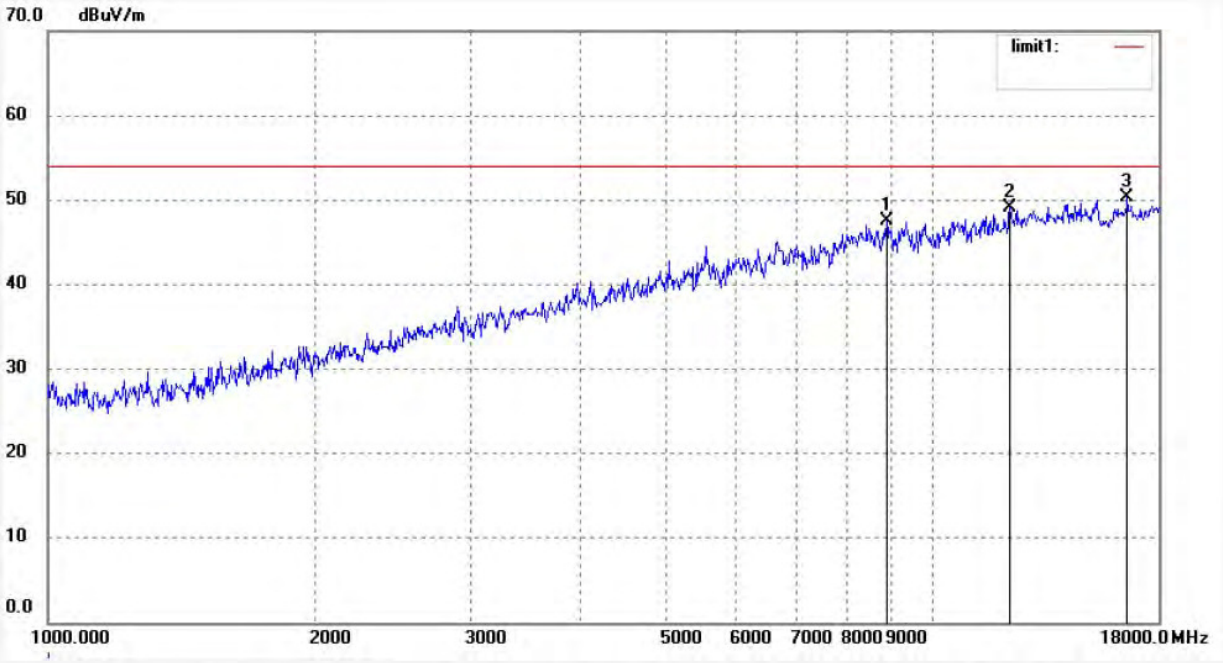
Job No.: ricky 2016 #597	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/26/43
EUT: Bluetooth Speaker	Engineer Signature: Ricky
Mode: TX 2441MHz	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8873.419	38.73	8.79	47.52	54.00	-6.48	peak			
2	12222.059	4.16	45.01	49.17	54.00	-4.83	peak			
3	16591.174	0.88	49.51	50.39	54.00	-3.61	peak			

Note: Average measurement with peak detection at No.2

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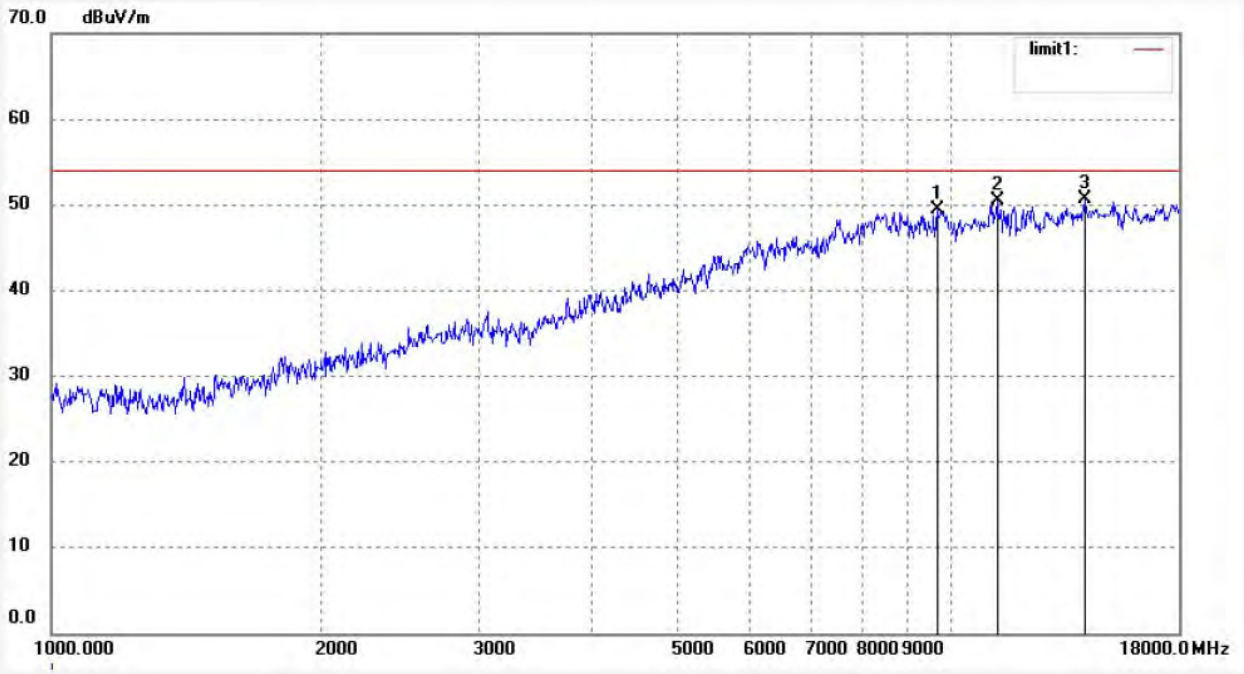
Job No.: ricky 2016 #598
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2441MHz
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/29/11
Engineer Signature: Ricky
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	9683.105	38.72	10.69	49.41	54.00	-4.59	peak			
2	11298.300	39.11	11.36	50.47	54.00	-3.53	peak			
3	14136.778	2.08	48.60	50.68	54.00	-3.32	peak			

Note: Average measurement with peak detection at No.2

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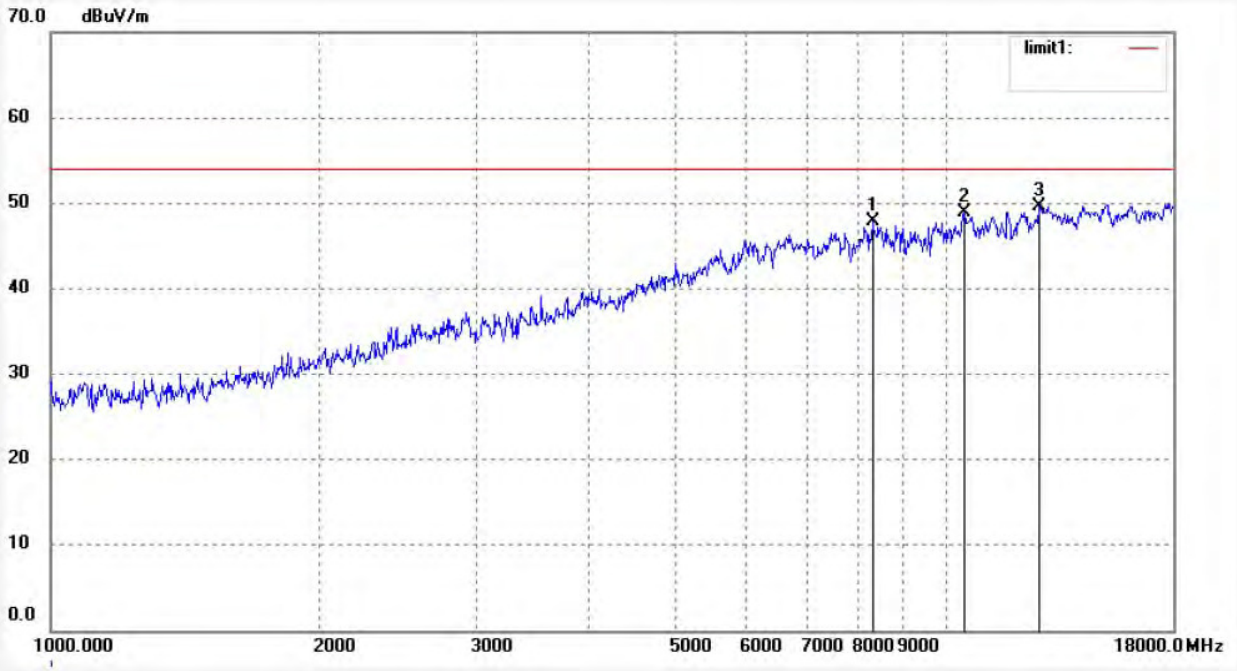
Job No.: ricky 2016 #599
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/34/24
Engineer Signature: Ricky
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	8298.818	39.04	8.88	47.92	54.00	-6.08	peak			
2	10505.339	39.06	9.89	48.95	54.00	-5.05	peak			
3	12730.400	3.88	45.77	49.65	54.00	-4.35	peak			

Note: Average measurement with peak detection at No.2

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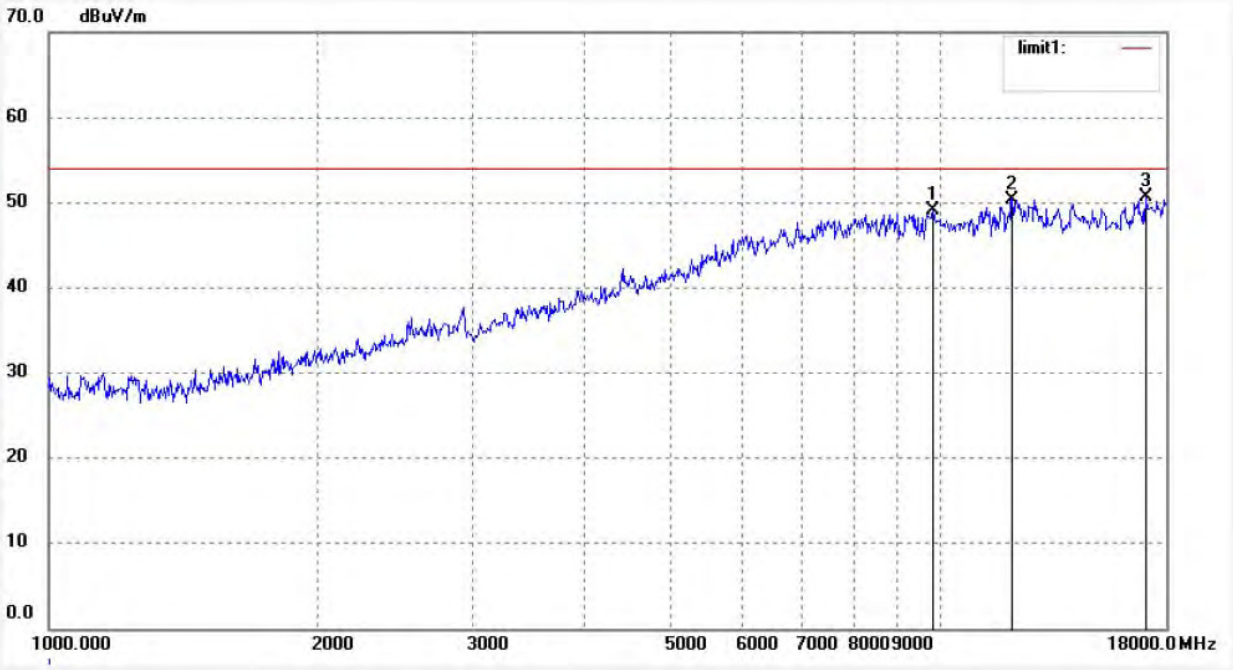
Job No.: ricky 2016 #600
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/37/57
Engineer Signature: Ricky
Distance: 3m

Note: Report NO.:ATE20160914

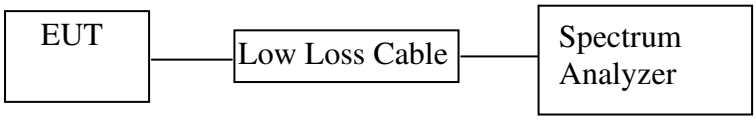


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	9853.701	38.18	10.94	49.12	54.00	-4.88	peak			
2	12080.583	38.63	11.77	50.40	54.00	-3.60	peak			
3	17081.198	-0.52	51.25	50.73	54.00	-3.27	peak			

Note: Average measurement with peak detection at No.2

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Bluetooth Speaker)

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.

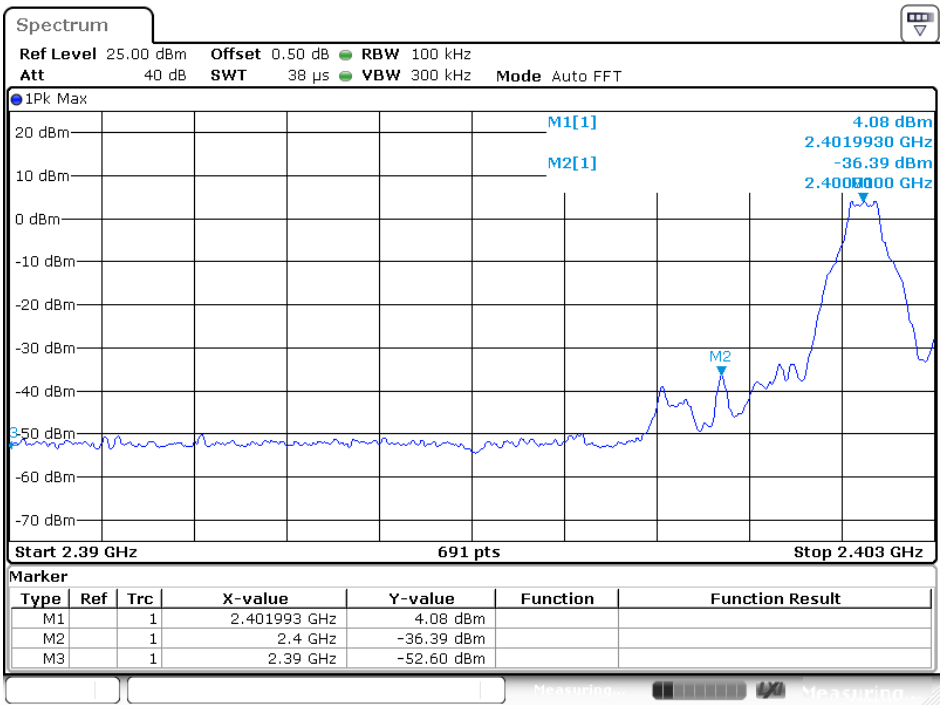
11.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

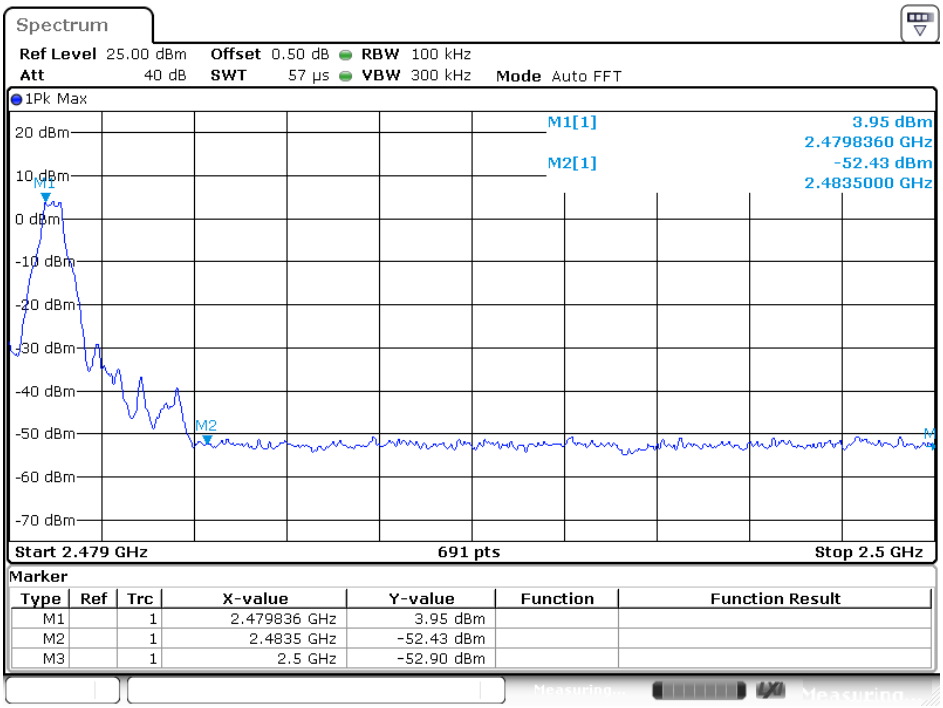
11.5.3.The band edges was measured and recorded.

11.6.Test Result

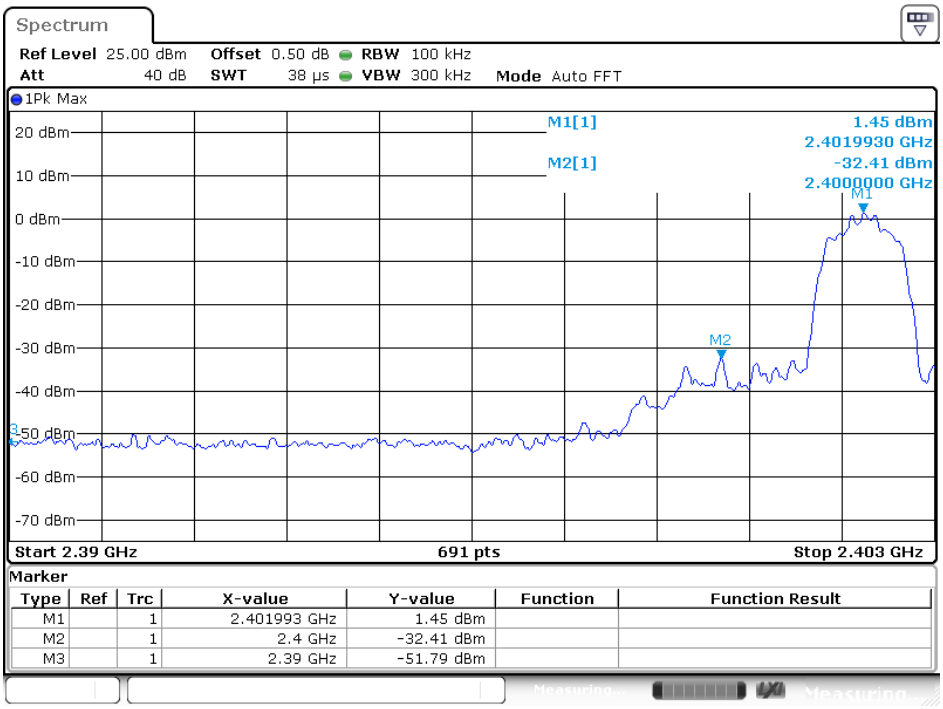
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK		
2400.00	40.47	> 20dBc
2483.50	56.38	> 20dBc
Π/4-DQPSK Mode		
2400.00	33.86	> 20dBc
2483.50	53.11	> 20dBc
8DPSK		
2400.00	34.13	> 20dBc
2483.50	51.72	> 20dBc

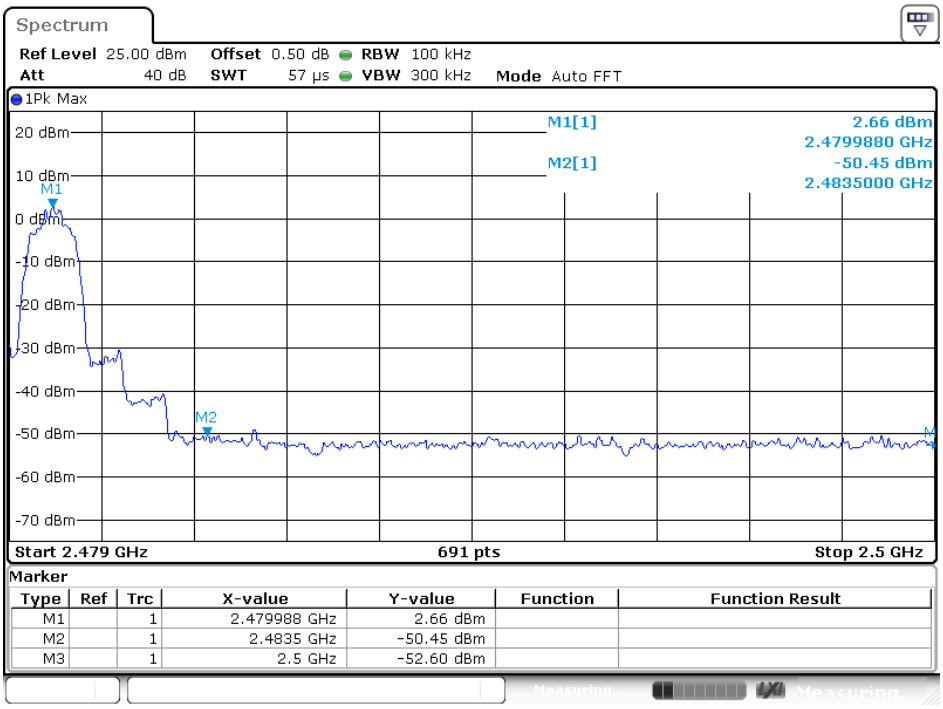
GFSK


Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 4.08 dBm
2.4019930 GHz
M2[1] -36.39 dBm
2.4000000 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.39 GHz
691 pts
Stop 2.403 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.401993 GHz 4.08 dBm
M2 1 2.4 GHz -36.39 dBm
M3 1 2.39 GHz -52.60 dBm

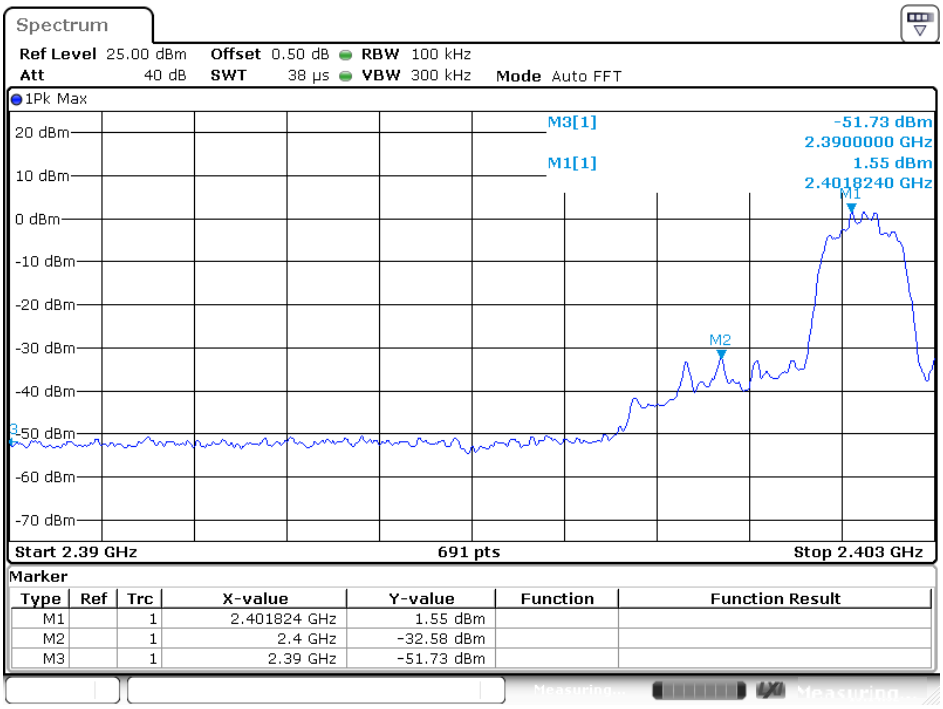

Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 57 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 3.95 dBm
2.4798360 GHz
M2[1] -52.43 dBm
2.4835000 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.479 GHz
691 pts
Stop 2.5 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.479836 GHz 3.95 dBm
M2 1 2.4835 GHz -52.43 dBm
M3 1 2.5 GHz -52.90 dBm

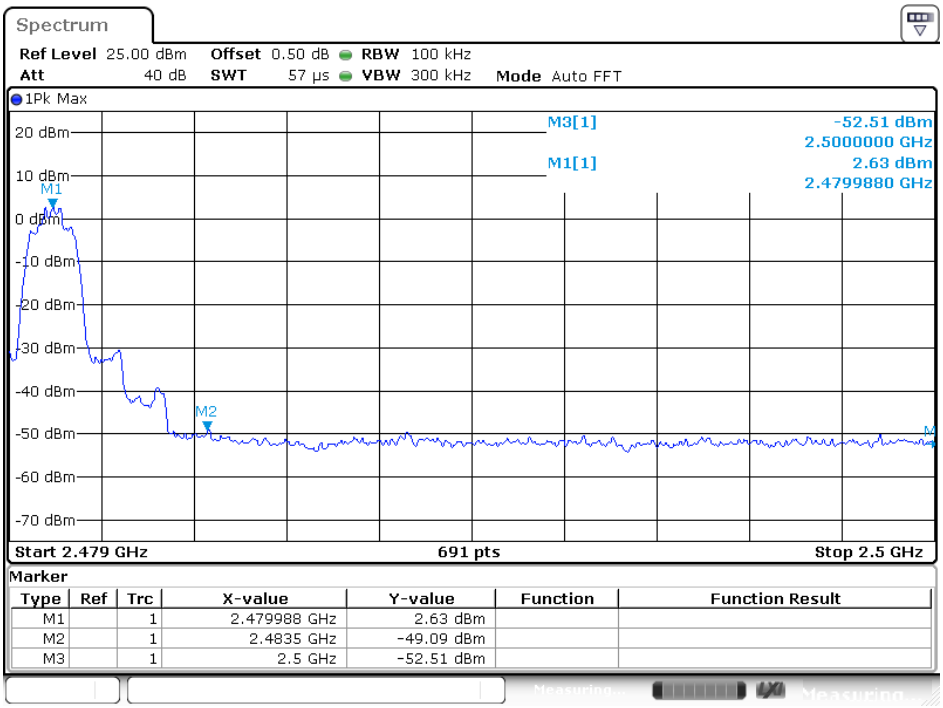
Π/4-DQPSK Mode





8DPSK


Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M3[1] -51.73 dBm
2.3900000 GHz
M1[1] 1.55 dBm
2.4018240 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.39 GHz
691 pts
Stop 2.403 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.401824 GHz 1.55 dBm
M2 1 2.4 GHz -32.58 dBm
M3 1 2.39 GHz -51.73 dBm


Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 57 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M3[1] -52.51 dBm
2.5000000 GHz
M1[1] 2.63 dBm
2.4799880 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.479 GHz
691 pts
Stop 2.5 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.479988 GHz 2.63 dBm
M2 1 2.4835 GHz -49.09 dBm
M3 1 2.5 GHz -52.51 dBm

Radiated Band Edge Result

Note:

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

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

Test Procedure:

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

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

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

Non-hopping mode

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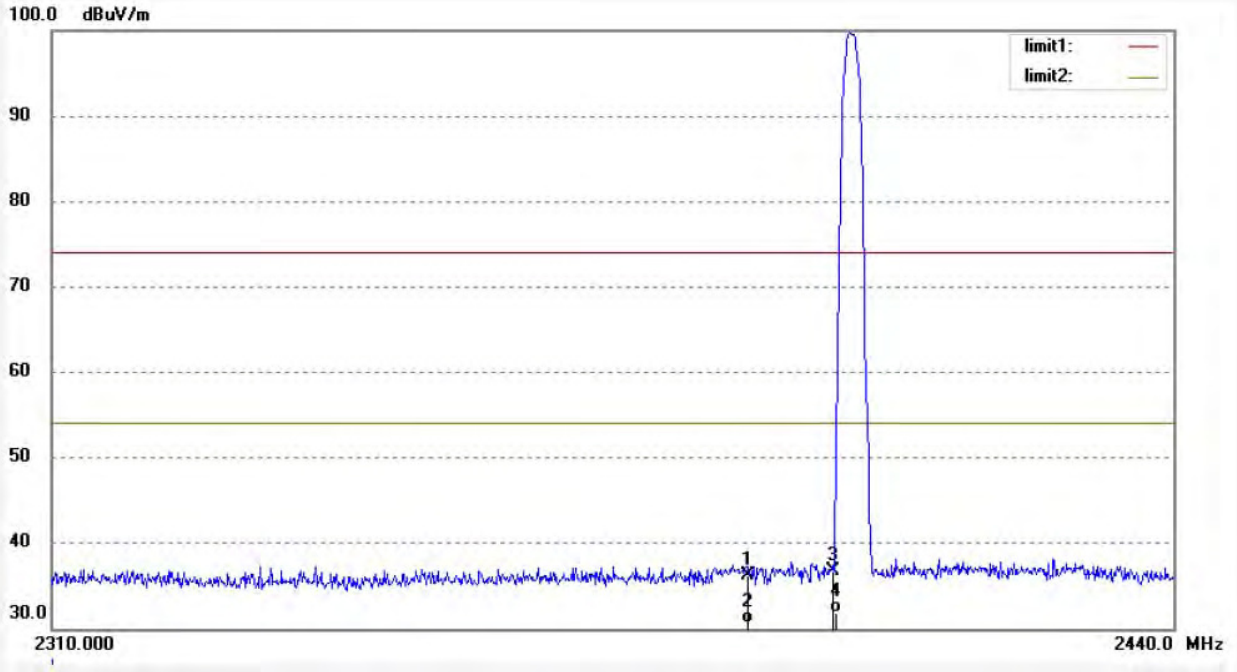
Job No.: ricky 2016 #614
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2402MHz(GFSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/54/24
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



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	43.70	-7.57	36.13	74.00	-37.87	peak			
2	2390.000	38.22	-7.57	30.65	54.00	-23.35	AVG			
3	2400.000	44.26	-7.50	36.76	74.00	-37.24	peak			
4	2400.000	39.28	-7.50	31.78	54.00	-22.22	AVG			

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

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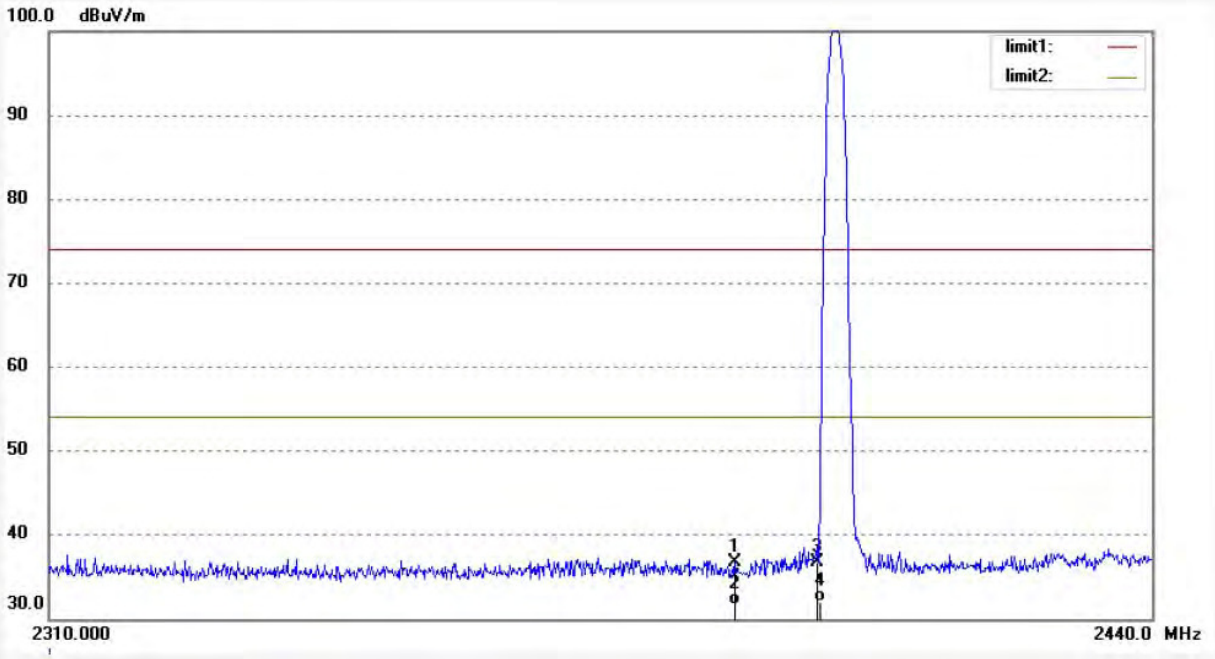
Job No.: ricky 2016 #613
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2402MHz(GFSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/53/37
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



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	44.24	-7.57	36.67	74.00	-37.33	peak			
2	2390.000	39.18	-7.57	31.61	54.00	-22.39	AVG			
3	2400.000	44.27	-7.50	36.77	74.00	-37.23	peak			
4	2400.000	39.58	-7.50	32.08	54.00	-21.92	AVG			

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

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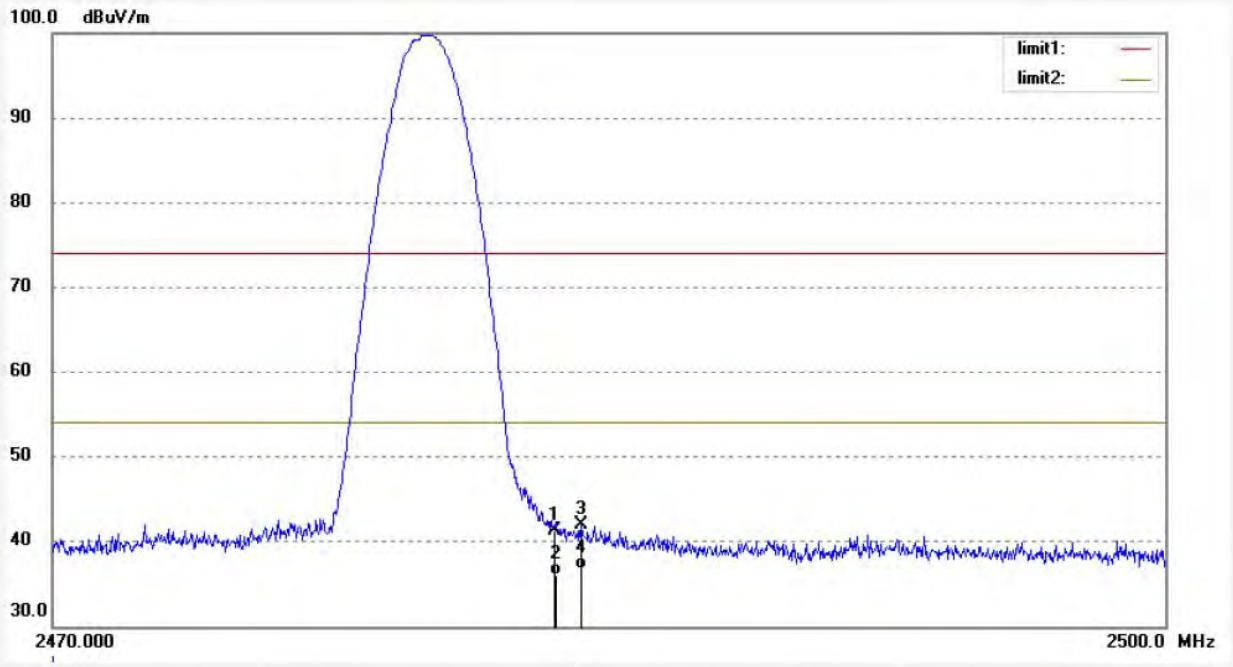
Job No.: ricky 2016 #612	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/52/15
EUT: Bluetooth Speaker	Engineer Signature:
Mode: TX 2480MHz(GFSK)	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.71	-7.38	41.33	74.00	-32.67	peak			
2	2483.500	43.37	-7.38	35.99	54.00	-18.01	AVG			
3	2484.220	49.32	-7.39	41.93	74.00	-32.07	peak			
4	2484.220	44.13	-7.39	36.74	54.00	-17.26	AVG			

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

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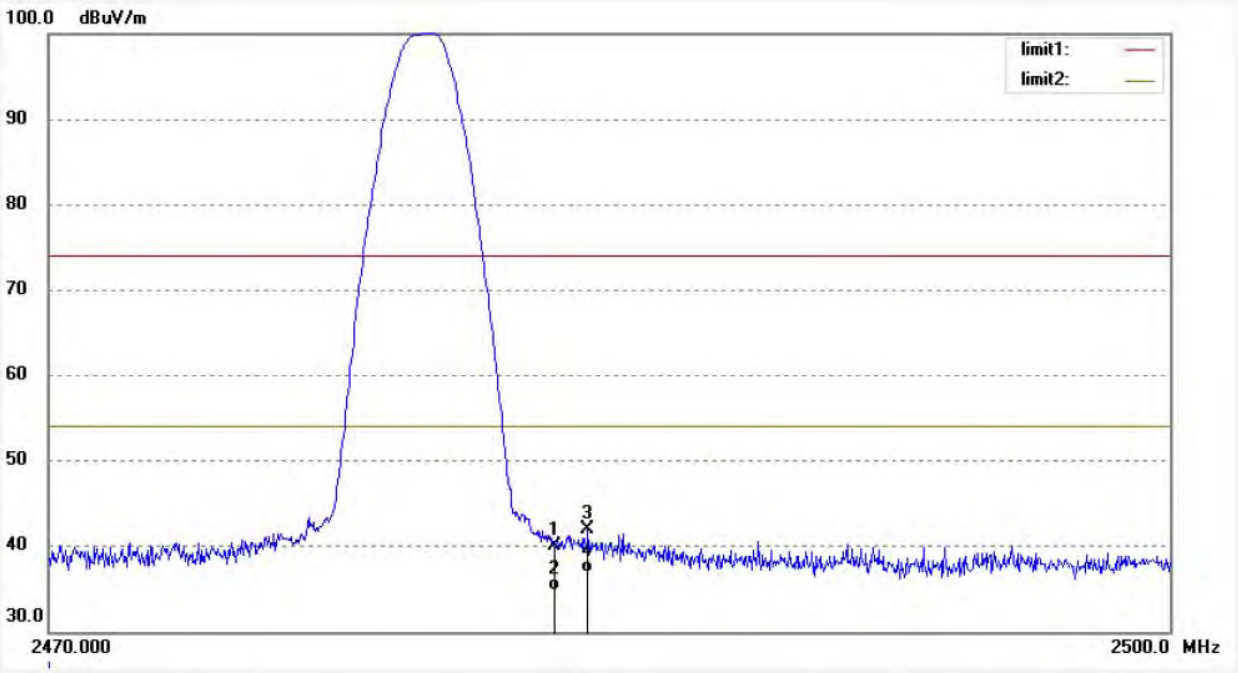
Job No.: ricky 2016 #611
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz(GFSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/51/21
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	47.40	-7.38	40.02	74.00	-33.98	peak			
2	2483.500	42.23	-7.38	34.85	54.00	-19.15	AVG			
3	2484.400	49.45	-7.39	42.06	74.00	-31.94	peak			
4	2484.400	44.26	-7.39	36.87	54.00	-17.13	AVG			

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

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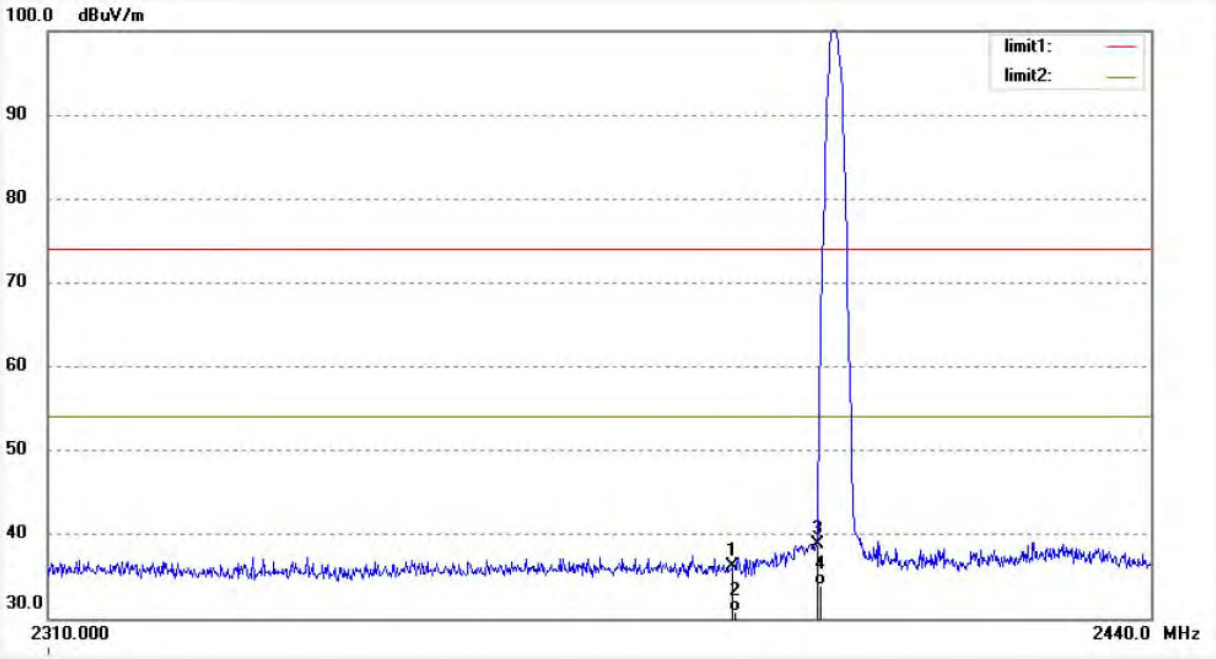
Job No.: ricky 2016 #610
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2402MHz(π/4 DQPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/50/30
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



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	43.70	-7.57	36.13	74.00	-37.87	peak			
2	2390.000	38.35	-7.57	30.78	54.00	-23.22	AVG			
3	2400.000	46.26	-7.50	38.76	74.00	-35.24	peak			
4	2400.000	41.39	-7.50	33.89	54.00	-20.11	AVG			

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

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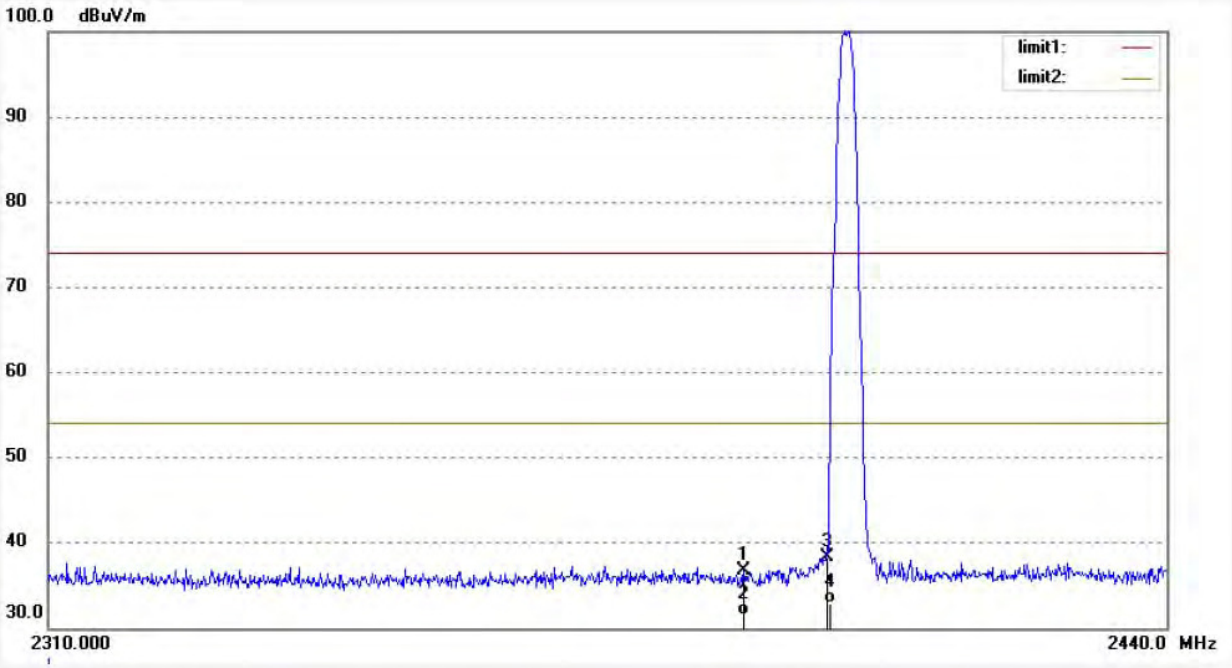
Job No.: ricky 2016 #609
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2402MHz(π/4 DQPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/49/30
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



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	44.24	-7.57	36.67	74.00	-37.33	peak			
2	2390.000	39.11	-7.57	31.54	54.00	-22.46	AVG			
3	2400.000	45.77	-7.50	38.27	74.00	-35.73	peak			
4	2400.000	40.41	-7.50	32.91	54.00	-21.09	AVG			

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

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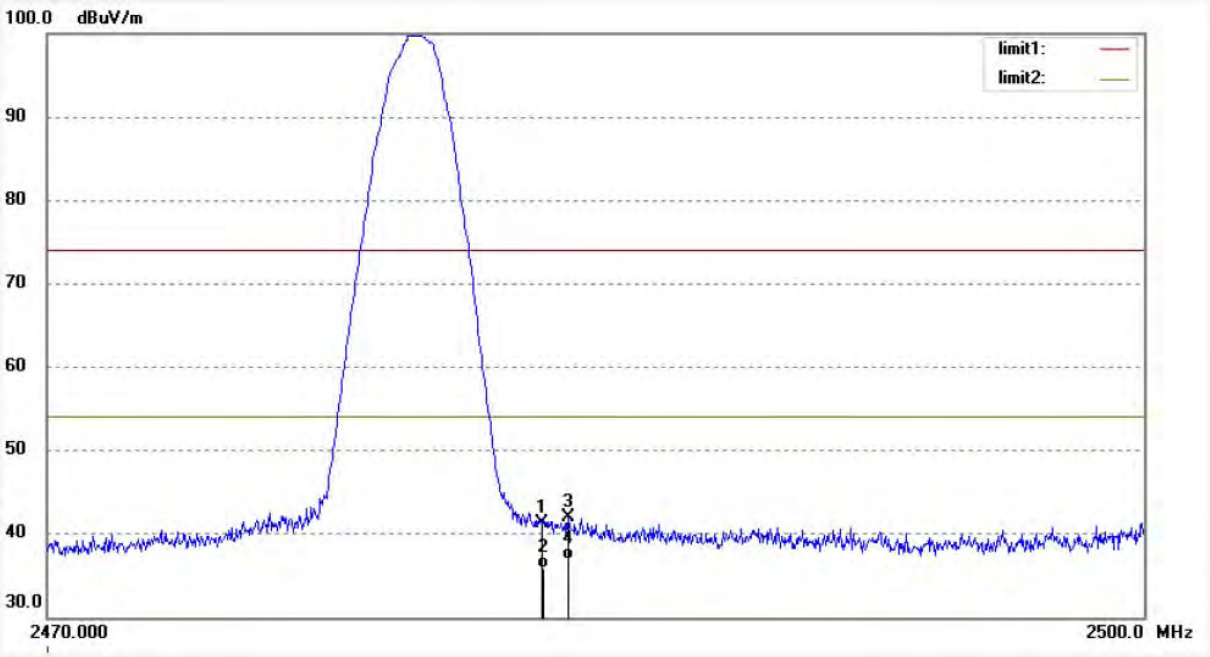
Job No.: ricky 2016 #608
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz(π/4 DQPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/48/29
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.71	-7.38	41.33	74.00	-32.67	peak			
2	2483.500	43.28	-7.38	35.90	54.00	-18.10	AVG			
3	2484.220	49.32	-7.39	41.93	74.00	-32.07	peak			
4	2484.220	44.34	-7.39	36.95	54.00	-17.05	AVG			

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

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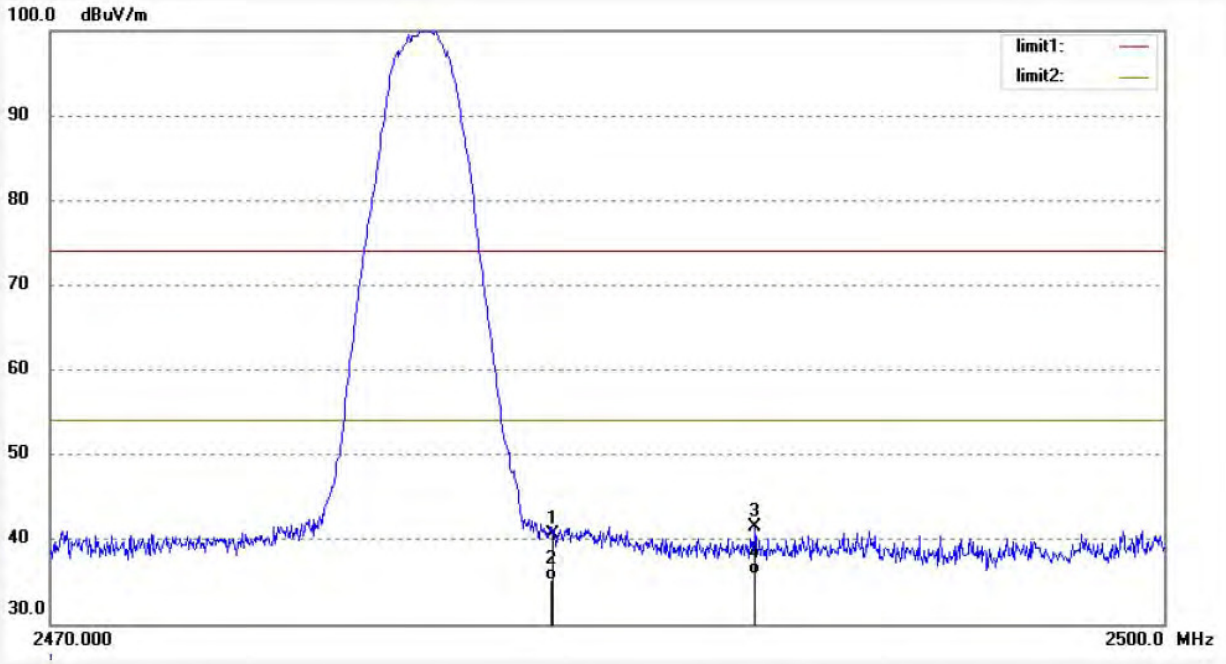
Job No.: ricky 2016 #607
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz(π/4 DQPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/47/00
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	47.90	-7.38	40.52	74.00	-33.48	peak			
2	2483.500	42.56	-7.38	35.18	54.00	-18.82	AVG			
3	2488.960	48.93	-7.39	41.54	74.00	-32.46	peak			
4	2488.960	43.19	-7.39	35.80	54.00	-18.20	AVG			

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

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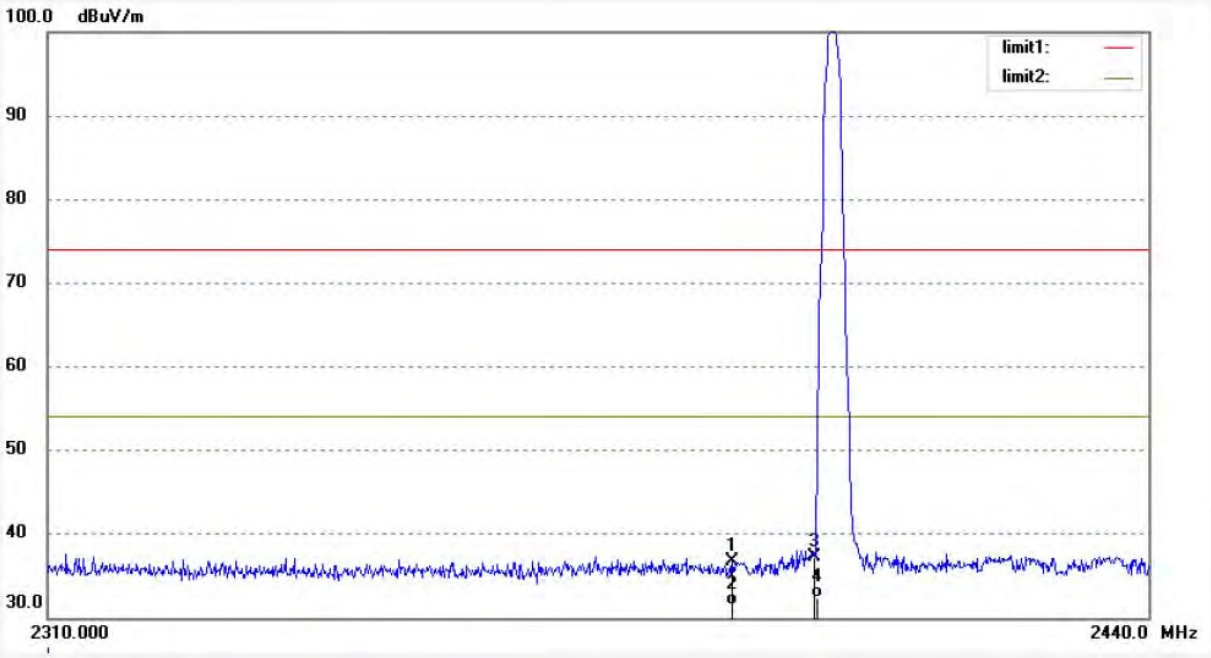
Job No.: ricky 2016 #618	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 16/05/22/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/58/27
EUT: Bluetooth Speaker	Engineer Signature:
Mode: TX 2402MHz(8DPSK)	Distance: 3m
Model: CR3028U-XX	
Manufacturer: TIMSEN	

Note: Report NO.:ATE20160914



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	44.24	-7.57	36.67	74.00	-37.33	peak			
2	2390.000	39.02	-7.57	31.45	54.00	-22.55	AVG			
3	2400.000	44.77	-7.50	37.27	74.00	-36.73	peak			
4	2400.000	39.87	-7.50	32.37	54.00	-21.63	AVG			

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

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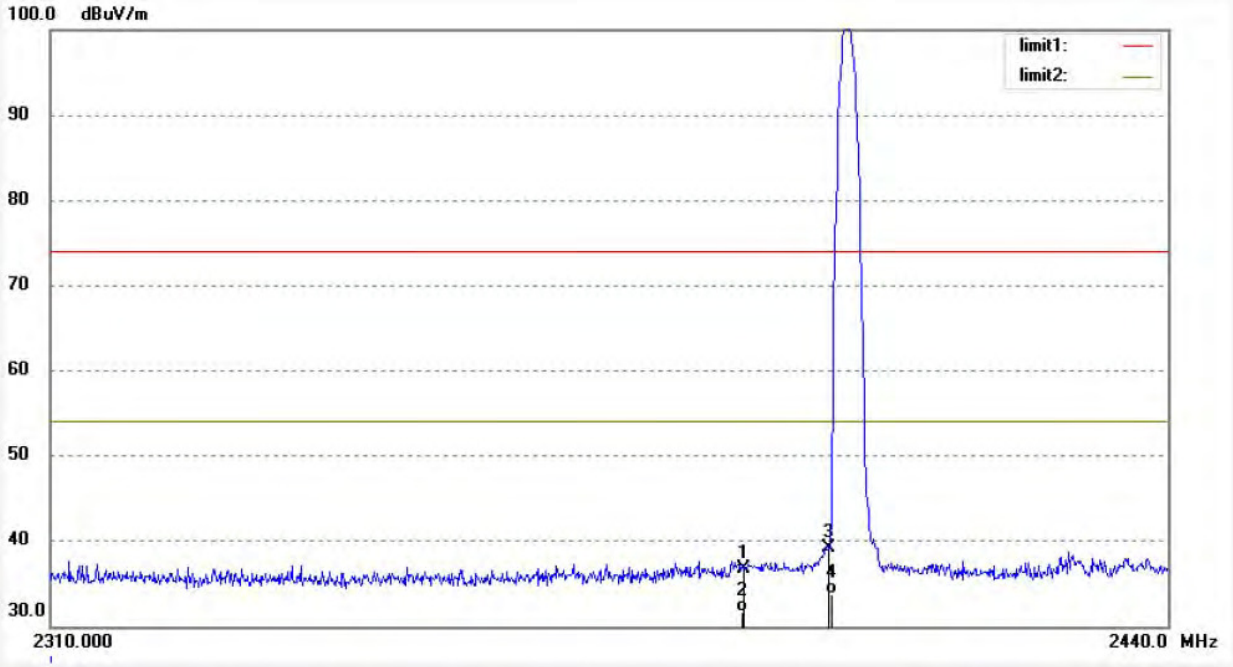
Job No.: ricky 2016 #617
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2402MHz(8DPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/57/41
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



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	44.24	-7.57	36.67	74.00	-37.33	peak			
2	2390.000	39.27	-7.57	31.70	54.00	-22.30	AVG			
3	2400.000	46.77	-7.50	39.27	74.00	-34.73	peak			
4	2400.000	41.23	-7.50	33.73	54.00	-20.27	AVG			

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

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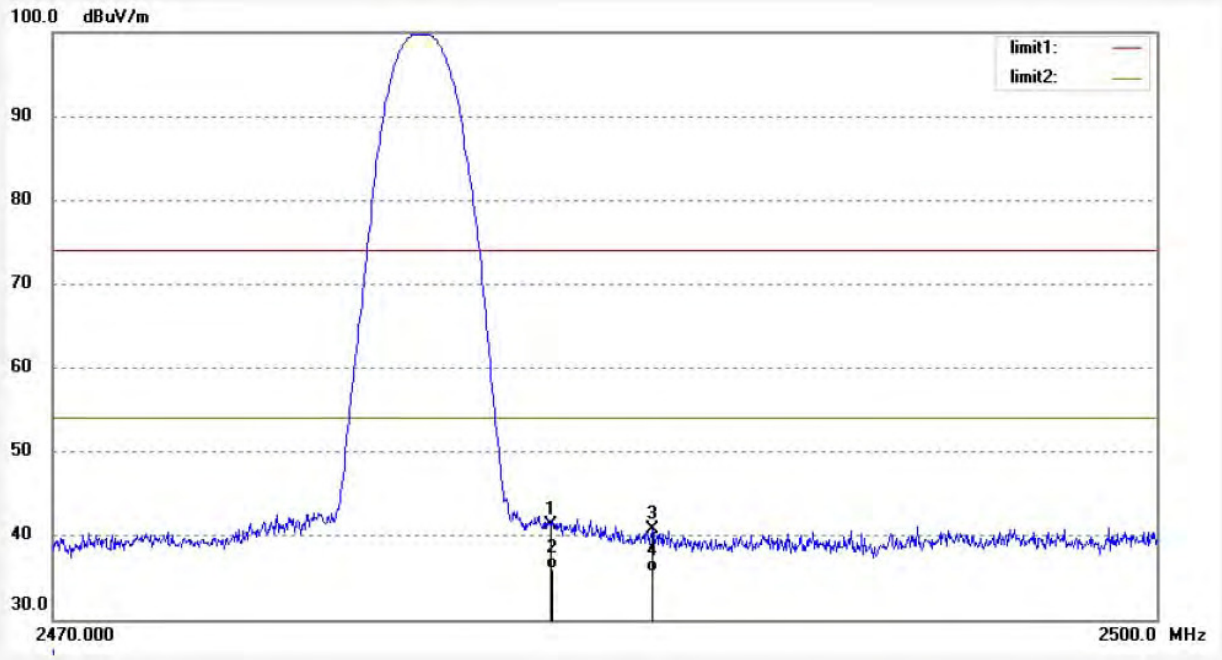
Job No.: ricky 2016 #616
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz(8DPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/56/28
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	48.71	-7.38	41.33	74.00	-32.67	peak			
2	2483.500	43.35	-7.38	35.97	54.00	-18.03	AVG			
3	2486.260	48.13	-7.40	40.73	74.00	-33.27	peak			
4	2486.260	43.10	-7.40	35.70	54.00	-18.30	AVG			

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

ACCURATE TECHNOLOGY CO., LTD.
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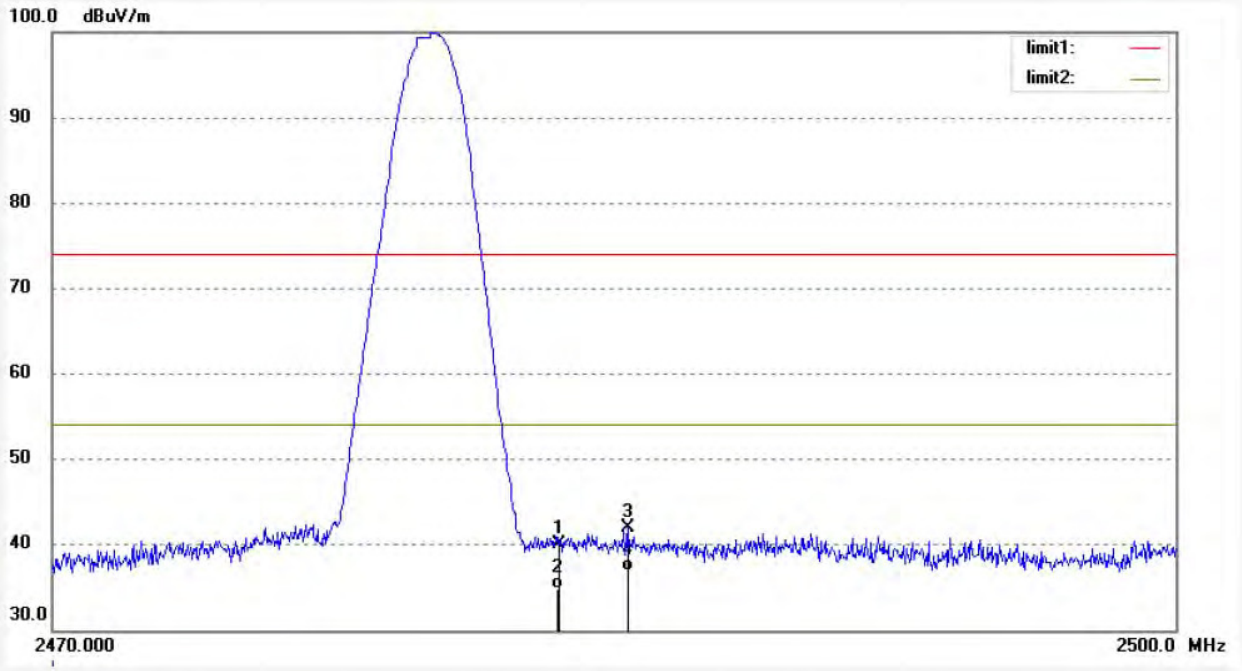
Job No.: ricky 2016 #615
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: TX 2480MHz(8DPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/55/38
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	47.40	-7.38	40.02	74.00	-33.98	peak			
2	2483.500	42.19	-7.38	34.81	54.00	-19.19	AVG			
3	2485.330	49.40	-7.39	42.01	74.00	-31.99	peak			
4	2485.330	44.28	-7.39	36.89	54.00	-17.11	AVG			

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

Hopping mode

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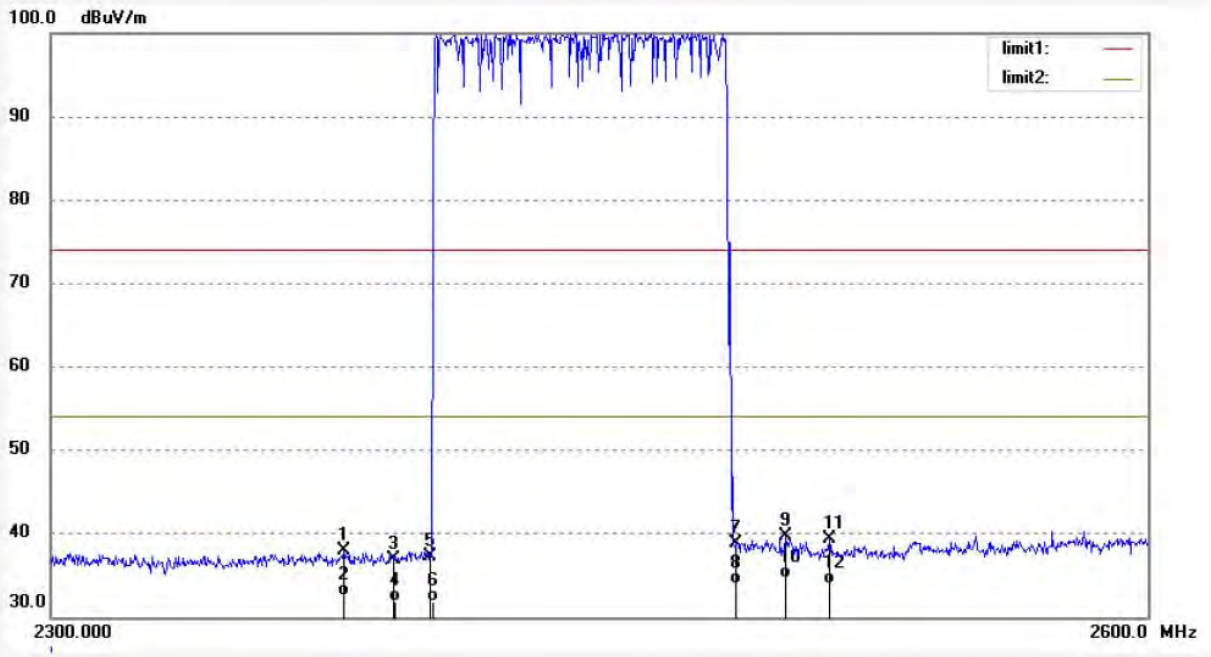
Fax:+86-0755-26503396

Job No.: ricky 2016 #603
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: HOPPING(GFSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/43/32
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2376.800	45.59	-7.66	37.93	74.00	-36.07	peak			
2	2376.800	40.12	-7.66	32.46	54.00	-21.54	AVG			
3	2390.000	44.48	-7.57	36.91	74.00	-37.09	peak			
4	2390.000	39.45	-7.57	31.88	54.00	-22.12	AVG			
5	2400.000	44.84	-7.50	37.34	74.00	-36.66	peak			
6	2400.000	39.28	-7.50	31.78	54.00	-22.22	AVG			
7	2483.500	46.20	-7.38	38.82	74.00	-35.18	peak			
8	2483.500	41.32	-7.38	33.94	54.00	-20.06	AVG			
9	2497.100	47.13	-7.40	39.73	74.00	-34.27	peak			
10	2497.100	42.00	-7.40	34.60	54.00	-19.40	AVG			
11	2509.400	46.62	-7.32	39.30	74.00	-34.70	peak			
12	2509.400	41.33	-7.32	34.01	54.00	-19.99	AVG			

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

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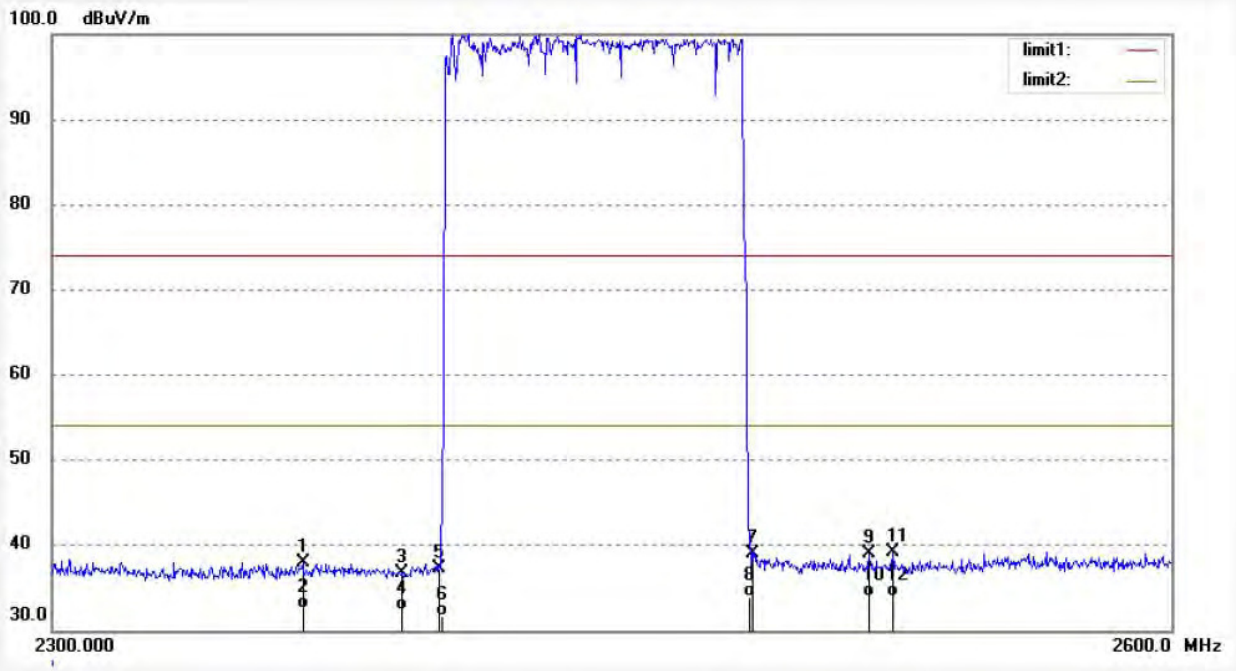
Job No.: ricky 2016 #604
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: HOPPING(GFSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/44/28
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2364.200	45.79	-7.74	38.05	74.00	-35.95	peak			
2	2364.200	40.25	-7.74	32.51	54.00	-21.49	AVG			
3	2390.000	44.26	-7.57	36.69	74.00	-37.31	peak			
4	2390.000	39.87	-7.57	32.30	54.00	-21.70	AVG			
5	2400.000	44.82	-7.50	37.32	74.00	-36.68	peak			
6	2400.000	39.21	-7.50	31.71	54.00	-22.29	AVG			
7	2483.500	46.34	-7.38	38.96	74.00	-35.04	peak			
8	2483.500	41.24	-7.38	33.86	54.00	-20.14	AVG			
9	2515.400	46.24	-7.29	38.95	74.00	-35.05	peak			
10	2515.400	41.21	-7.29	33.92	54.00	-20.08	AVG			
11	2522.000	46.42	-7.24	39.18	74.00	-34.82	peak			
12	2522.000	41.23	-7.24	33.99	54.00	-20.01	AVG			

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

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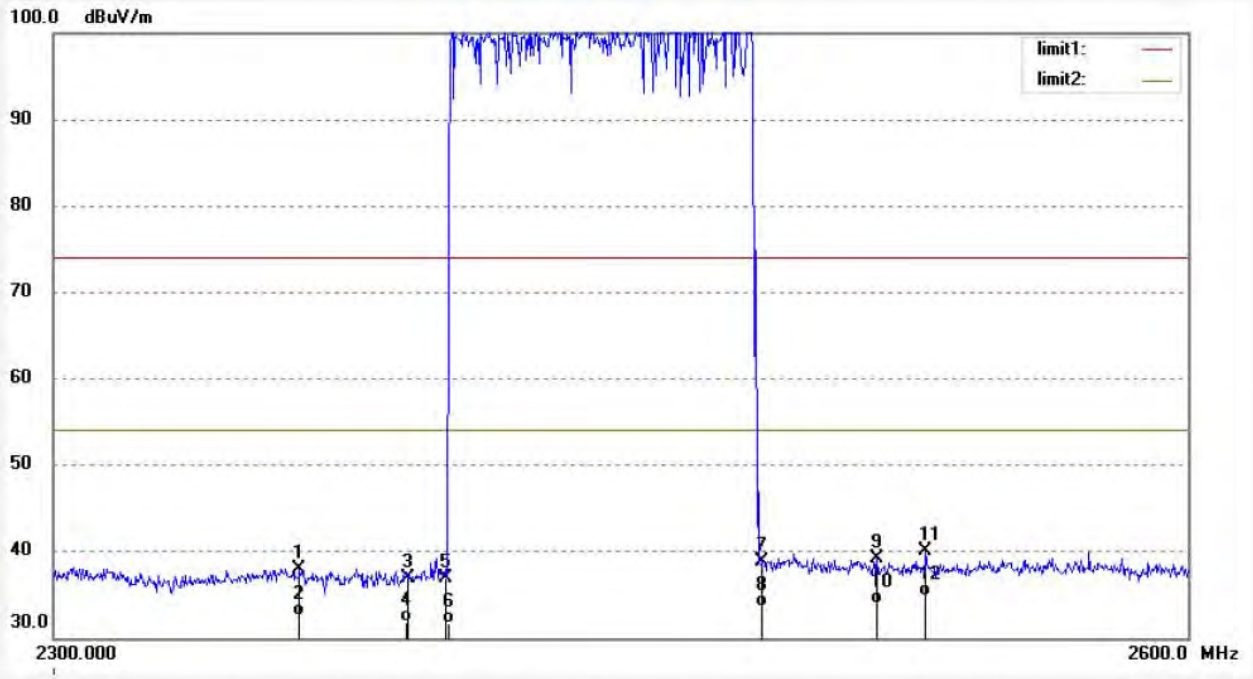
Fax:+86-0755-26503396

Job No.: ricky 2016 #605
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: HOPPING(π/4 DQPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/45/25
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2362.100	45.79	-7.77	38.02	74.00	-35.98	peak			
2	2362.100	40.28	-7.77	32.51	54.00	-21.49	AVG			
3	2390.000	44.48	-7.57	36.91	74.00	-37.09	peak			
4	2390.000	39.38	-7.57	31.81	54.00	-22.19	AVG			
5	2400.000	44.34	-7.50	36.84	74.00	-37.16	peak			
6	2400.000	39.24	-7.50	31.74	54.00	-22.26	AVG			
7	2483.500	46.20	-7.38	38.82	74.00	-35.18	peak			
8	2483.500	41.04	-7.38	33.66	54.00	-20.34	AVG			
9	2514.200	46.42	-7.29	39.13	74.00	-34.87	peak			
10	2514.200	41.28	-7.29	33.99	54.00	-20.01	AVG			
11	2527.700	47.19	-7.19	40.00	74.00	-34.00	peak			
12	2527.700	41.92	-7.19	34.73	54.00	-19.27	AVG			

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

ACCURATE TECHNOLOGY CO., LTD.
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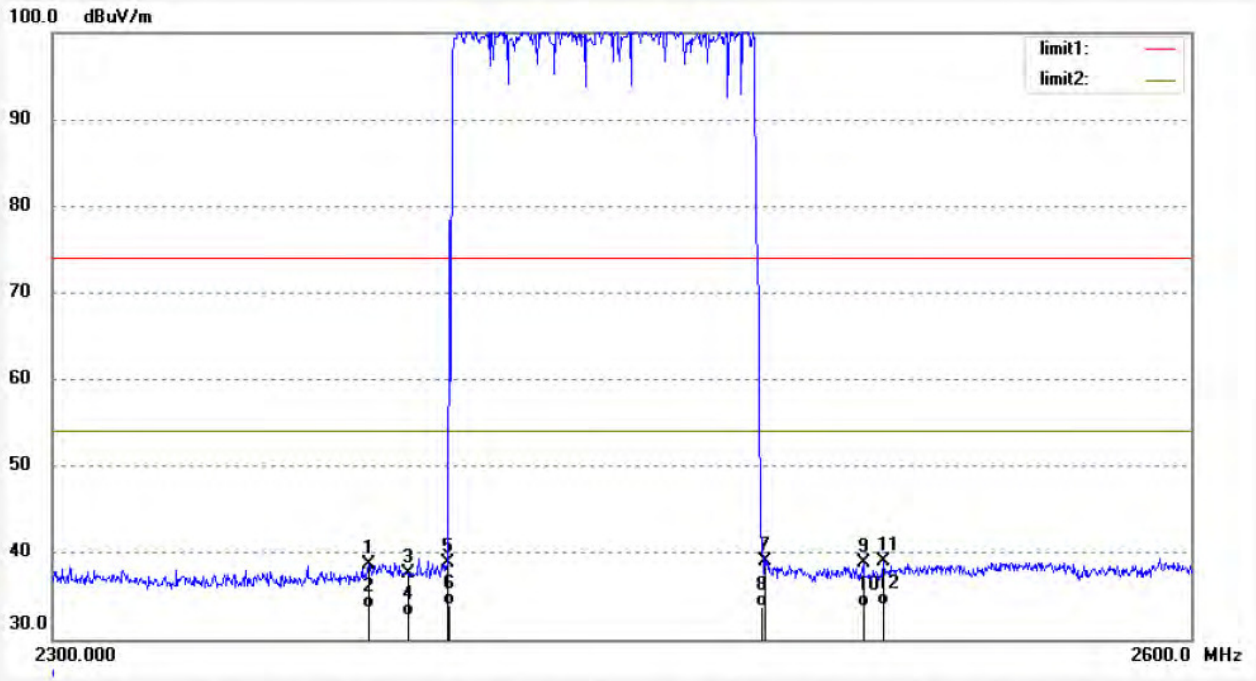
Job No.: ricky 2016 #606
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: HOPPING(π/4 DQPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/46/52
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2379.800	46.26	-7.64	38.62	74.00	-35.38	peak			
2	2379.800	41.20	-7.64	33.56	54.00	-20.44	AVG			
3	2390.000	45.26	-7.57	37.69	74.00	-36.31	peak			
4	2390.000	40.31	-7.57	32.74	54.00	-21.26	AVG			
5	2400.000	46.32	-7.50	38.82	74.00	-35.18	peak			
6	2400.000	41.38	-7.50	33.88	54.00	-20.12	AVG			
7	2483.500	46.34	-7.38	38.96	74.00	-35.04	peak			
8	2483.500	41.11	-7.38	33.73	54.00	-20.27	AVG			
9	2510.000	46.14	-7.32	38.82	74.00	-35.18	peak			
10	2510.000	41.08	-7.32	33.76	54.00	-20.24	AVG			
11	2515.400	46.24	-7.29	38.95	74.00	-35.05	peak			
12	2515.400	41.29	-7.29	34.00	54.00	-20.00	AVG			

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

ACCURATE TECHNOLOGY CO., LTD.
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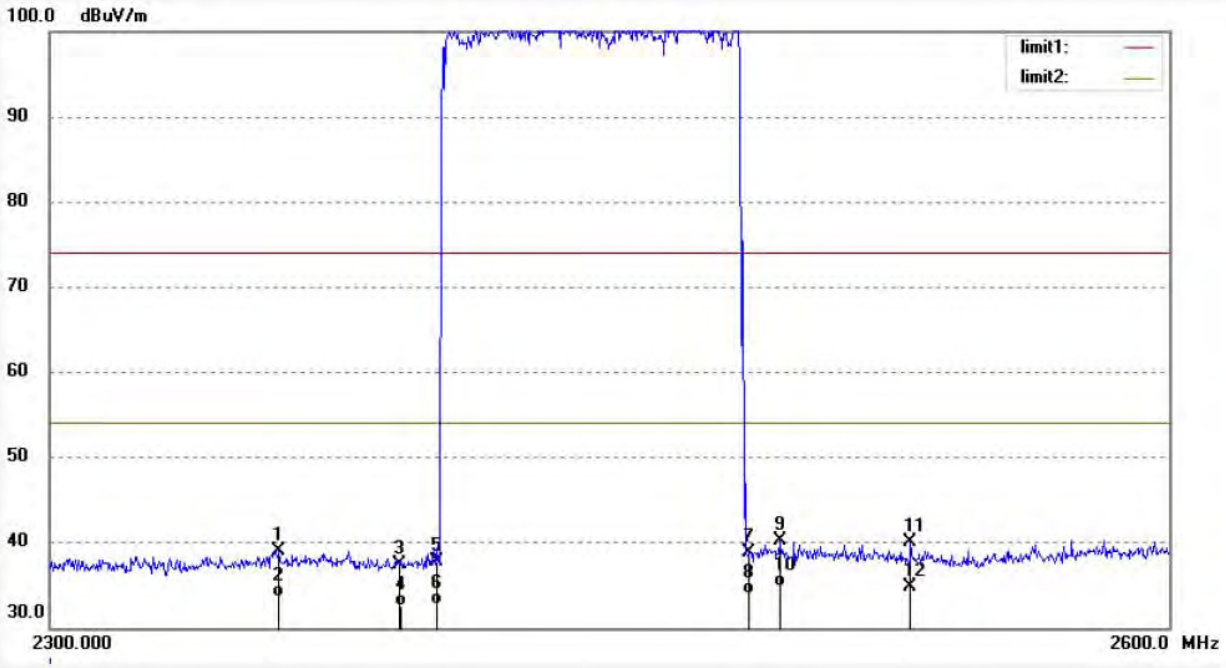
Job No.: ricky 2016 #601
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: HOPPING(8DPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/41/37
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2358.800	46.78	-7.79	38.99	74.00	-35.01	peak			
2	2358.800	41.38	-7.79	33.59	54.00	-20.41	AVG			
3	2390.000	44.98	-7.57	37.41	74.00	-36.59	peak			
4	2390.000	40.06	-7.57	32.49	54.00	-21.51	AVG			
5	2400.000	45.34	-7.50	37.84	74.00	-36.16	peak			
6	2400.000	40.24	-7.50	32.74	54.00	-21.26	AVG			
7	2483.500	46.20	-7.38	38.82	74.00	-35.18	peak			
8	2483.500	41.33	-7.38	33.95	54.00	-20.05	AVG			
9	2491.700	47.55	-7.39	40.16	74.00	-33.84	peak			
10	2491.700	42.18	-7.39	34.79	54.00	-19.21	AVG			
11	2527.700	47.19	-7.19	40.00	74.00	-34.00	peak			
12	2527.700	42.09	-7.19	34.90	74.00	-39.10	peak			

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

ACCURATE TECHNOLOGY CO., LTD.
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Science & Industry Park,Nanshan Shenzhen,P.R.China
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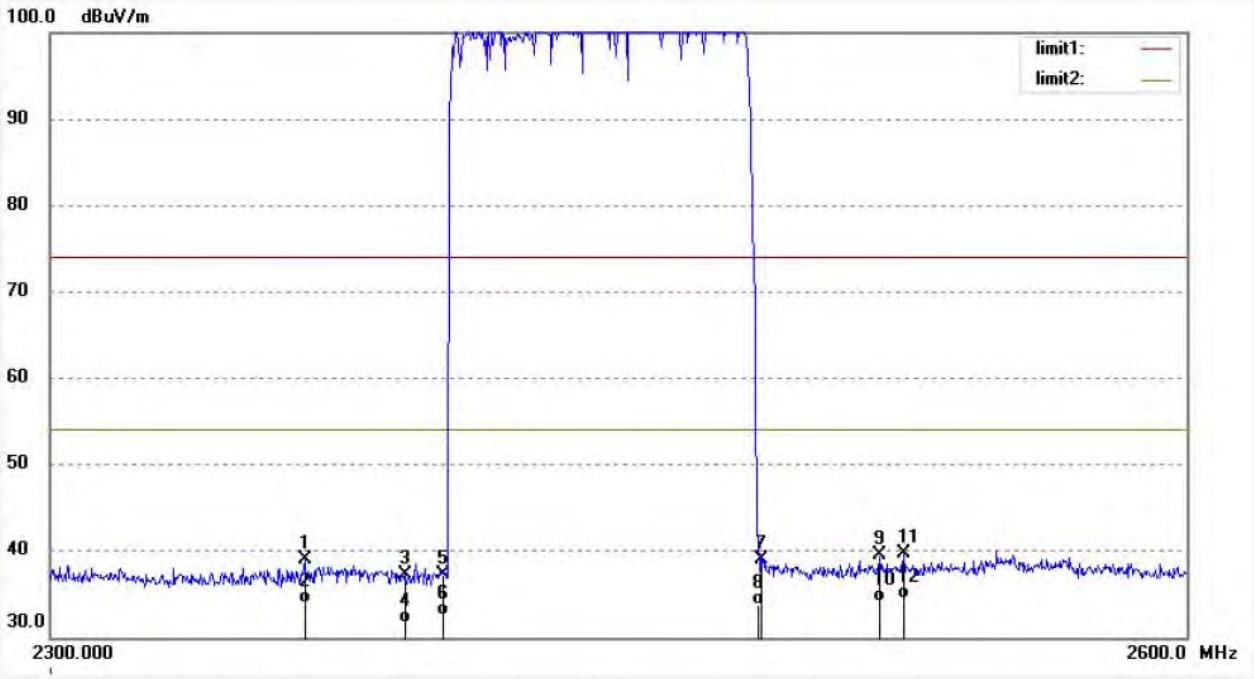
Fax:+86-0755-26503396

Job No.: ricky 2016 #602
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Speaker
Mode: HOPPING(8DPSK)
Model: CR3028U-XX
Manufacturer: TIMSEN

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 16/05/22/
Time: 14/42/50
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20160914

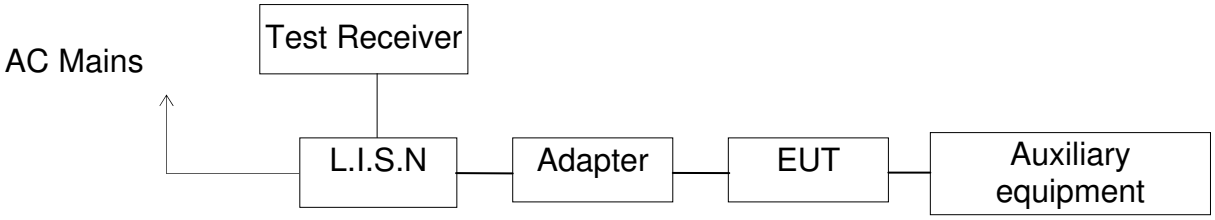


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2364.200	46.79	-7.74	39.05	74.00	-34.95	peak			
2	2364.200	41.67	-7.74	33.93	54.00	-20.07	AVG			
3	2390.000	44.76	-7.57	37.19	74.00	-36.81	peak			
4	2390.000	39.21	-7.57	31.64	54.00	-22.36	AVG			
5	2400.000	44.82	-7.50	37.32	74.00	-36.68	peak			
6	2400.000	39.98	-7.50	32.48	54.00	-21.52	AVG			
7	2483.500	46.34	-7.38	38.96	74.00	-35.04	peak			
8	2483.500	41.22	-7.38	33.84	54.00	-20.16	AVG			
9	2515.400	46.74	-7.29	39.45	74.00	-34.55	peak			
10	2515.400	41.38	-7.29	34.09	54.00	-19.91	AVG			
11	2522.000	46.92	-7.24	39.68	74.00	-34.32	peak			
12	2522.000	41.75	-7.24	34.51	54.00	-19.49	AVG			

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



(EUT: Bluetooth Speaker)

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 following 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 5.1.

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 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.Power Line Conducted Emission Measurement Results

PASS.

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

Test mode : BT communicating(AC 120V/60Hz)
EUT mode : CR3028U-XX

MEASUREMENT RESULT: "RY0517-12_fin"

2016-5-17 15:27

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.600000	41.30	11.5	56	14.7	QP	L1	GND
1.758000	38.30	11.7	56	17.7	QP	L1	GND
23.987000	37.40	12.0	60	22.6	QP	L1	GND

MEASUREMENT RESULT: "RY0517-12_fin2"

2016-5-17 15:27

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.602000	30.90	11.5	46	15.1	AV	L1	GND
2.981000	24.60	11.7	46	21.4	AV	L1	GND
23.978000	21.40	12.0	50	28.6	AV	L1	GND

MEASUREMENT RESULT: "RY0517-11_fin"

2016-5-17 15:24

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.602000	41.10	11.5	56	14.9	QP	N	GND
1.830000	35.80	11.7	56	20.2	QP	N	GND
23.960000	36.60	12.0	60	23.4	QP	N	GND

MEASUREMENT RESULT: "RY0517-11_fin2"

2016-5-17 15:24

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.598000	30.40	11.5	46	15.6	AV	N	GND
4.241000	23.20	11.8	46	22.8	AV	N	GND
23.964500	21.40	12.0	50	28.6	AV	N	GND

Test mode : BT communicating(AC 240V/60Hz)
EUT mode : CR3028U-XX

MEASUREMENT RESULT: "RY0517-7_fin"

2016-5-17 15:06

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.662000	39.60	11.5	56	16.4	QP	L1	GND
1.758000	37.60	11.7	56	18.4	QP	L1	GND
23.978000	37.30	12.0	60	22.7	QP	L1	GND

MEASUREMENT RESULT: "RY0517-7_fin2"

2016-5-17 15:06

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.610000	29.10	11.5	46	16.9	AV	L1	GND
2.765000	23.50	11.7	46	22.5	AV	L1	GND
23.982500	24.70	12.0	50	25.3	AV	L1	GND

MEASUREMENT RESULT: "RY0517-8_fin"

2016-5-17 15:08

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.602000	41.40	11.5	56	14.6	QP	N	GND
1.672000	34.60	11.6	56	21.4	QP	N	GND
23.982500	37.20	12.0	60	22.8	QP	N	GND

MEASUREMENT RESULT: "RY0517-8_fin2"

2016-5-17 15:08

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.610000	29.60	11.5	46	16.4	AV	N	GND
4.299500	23.60	11.8	46	22.4	AV	N	GND
23.982500	24.70	12.0	50	25.3	AV	N	GND

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

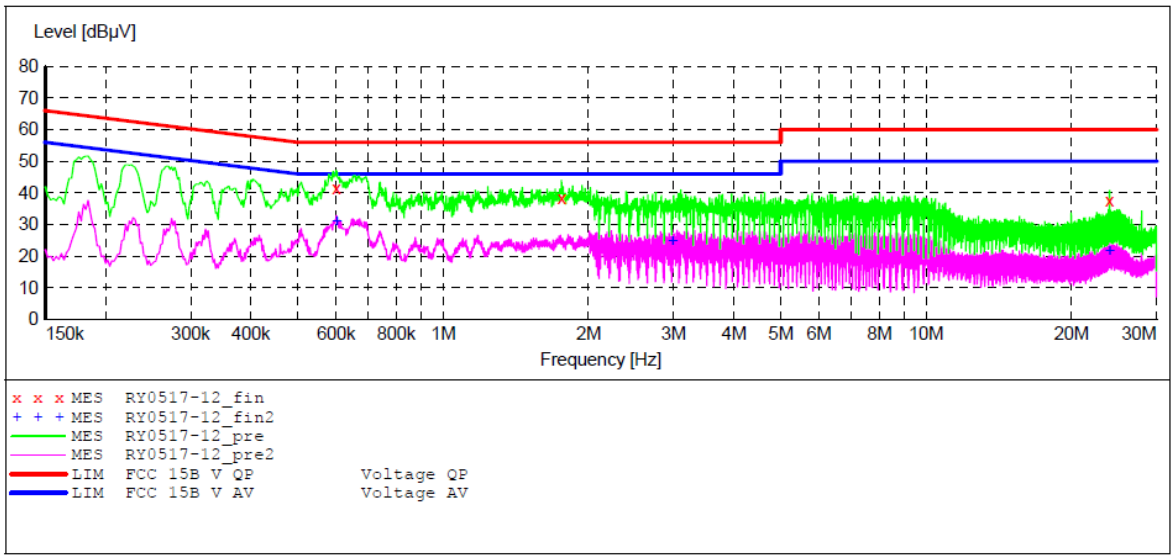
CONDUCTED EMISSION STANDARD FCC PART15 B

EUT: Bluetooth Speaker M/N:CR3028U-XX
Manufacturer: TIMSEN
Operating Condition: BT communicating
Test Site: 2#Shielding Room
Operator: Ricky
Test Specification: L 120V/60Hz
Comment: Report No.:ATE20160914
Start of Test: 2016-5-17 / 15:25:40

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

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak Average	1.0 s	9 kHz	LISN(ESH3-Z5)



MEASUREMENT RESULT: "RY0517-12_fin"

2016-5-17 15:27

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.600000	41.30	11.5	56	14.7	QP	L1	GND
1.758000	38.30	11.7	56	17.7	QP	L1	GND
23.987000	37.40	12.0	60	22.6	QP	L1	GND

MEASUREMENT RESULT: "RY0517-12_fin2"

2016-5-17 15:27

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.602000	30.90	11.5	46	15.1	AV	L1	GND
2.981000	24.60	11.7	46	21.4	AV	L1	GND
23.978000	21.40	12.0	50	28.6	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

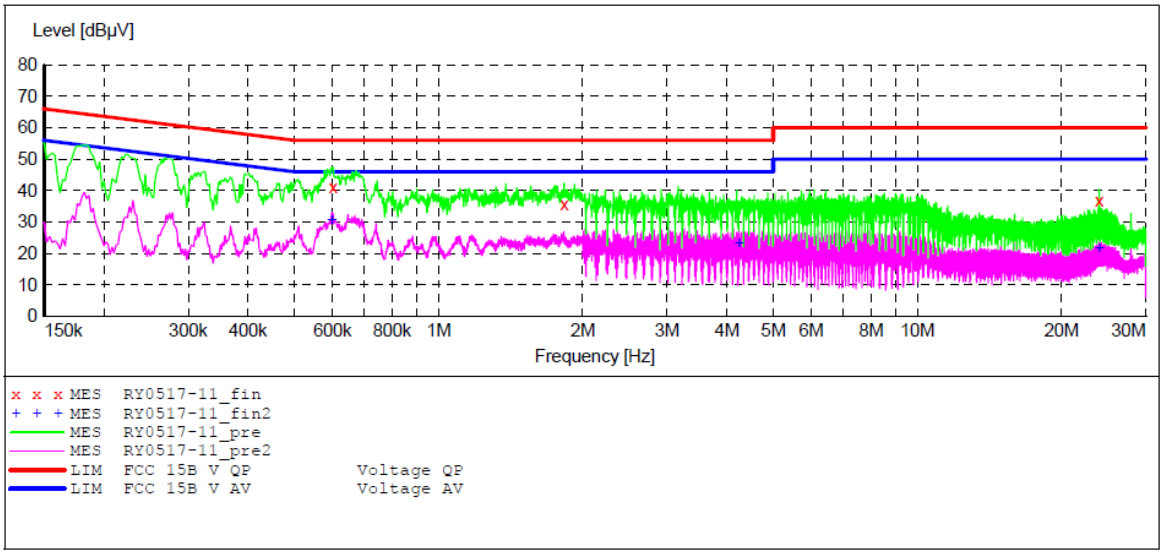
CONDUCTED EMISSION STANDARD FCC PART15 B

EUT: Bluetooth Speaker M/N:CR3028U-XX
Manufacturer: TIMSEN
Operating Condition: BT communicating
Test Site: 2#Shielding Room
Operator: Ricky
Test Specification: N 120V/60Hz
Comment: Report No.:ATE20160914
Start of Test: 2016-5-17 / 15:22:56

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

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak Average	1.0 s	9 kHz	LISN(ESH3-Z5)



MEASUREMENT RESULT: "RY0517-11_fin"

2016-5-17 15:24

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.602000	41.10	11.5	56	14.9	QP	N	GND
1.830000	35.80	11.7	56	20.2	QP	N	GND
23.960000	36.60	12.0	60	23.4	QP	N	GND

MEASUREMENT RESULT: "RY0517-11_fin2"

2016-5-17 15:24

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.598000	30.40	11.5	46	15.6	AV	N	GND
4.241000	23.20	11.8	46	22.8	AV	N	GND
23.964500	21.40	12.0	50	28.6	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

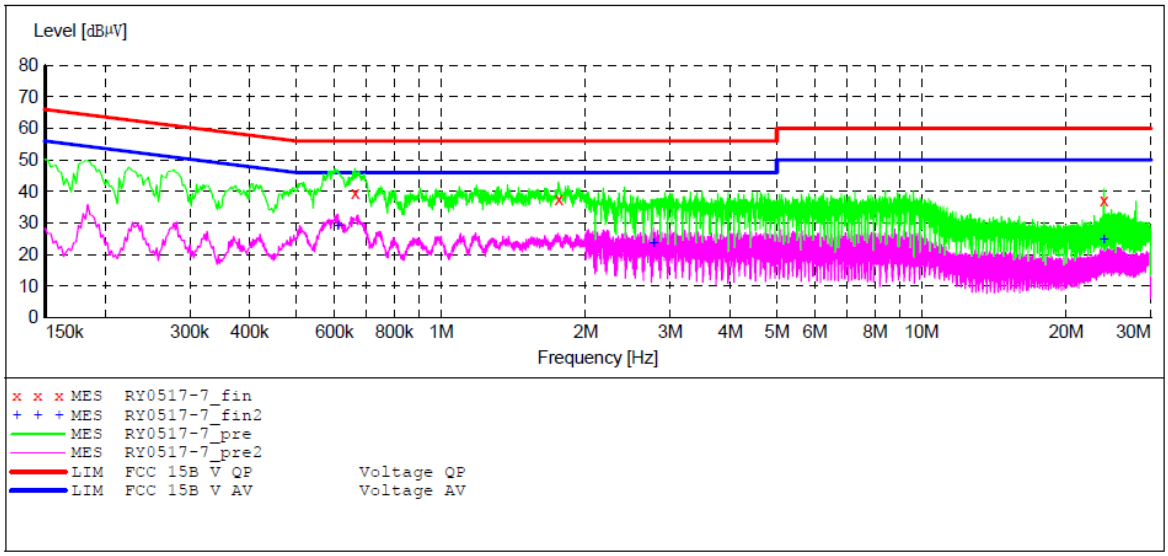
CONDUCTED EMISSION STANDARD FCC PART15 B

EUT: Bluetooth Speaker M/N:CR3028U-XX
Manufacturer: TIMSEN
Operating Condition: BT communicating
Test Site: 2#Shielding Room
Operator: Ricky
Test Specification: L 240V/60Hz
Comment: Report No.:ATE20160914
Start of Test: 2016-5-17 / 15:04:24

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

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak Average	1.0 s	9 kHz	LISN(ESH3-Z5)



MEASUREMENT RESULT: "RY0517-7_fin"

2016-5-17 15:06

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.662000	39.60	11.5	56	16.4	QP	L1	GND
1.758000	37.60	11.7	56	18.4	QP	L1	GND
23.978000	37.30	12.0	60	22.7	QP	L1	GND

MEASUREMENT RESULT: "RY0517-7_fin2"

2016-5-17 15:06

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.610000	29.10	11.5	46	16.9	AV	L1	GND
2.765000	23.50	11.7	46	22.5	AV	L1	GND
23.982500	24.70	12.0	50	25.3	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

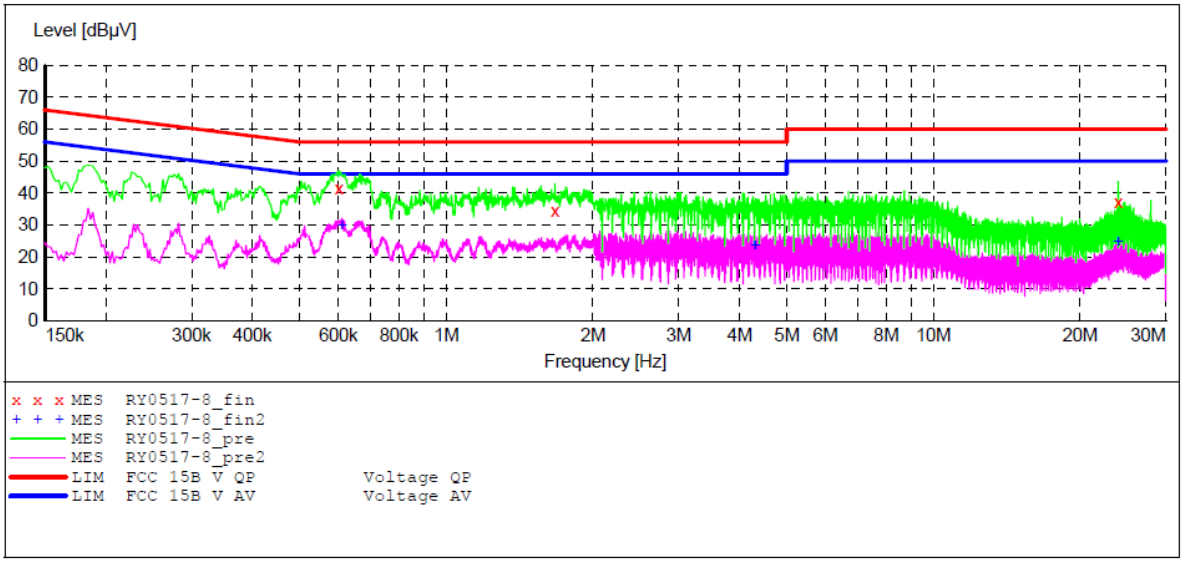
CONDUCTED EMISSION STANDARD FCC PART15 B

EUT: Bluetooth Speaker M/N:CR3028U-XX
Manufacturer: TIMSEN
Operating Condition: BT communicating
Test Site: 2#Shielding Room
Operator: Ricky
Test Specification: N 240V/60Hz
Comment: Report No.:ATE20160914
Start of Test: 2016-5-17 / 15:07:04

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

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak Average	1.0 s	9 kHz	LISN(ESH3-Z5)



MEASUREMENT RESULT: "RY0517-8_fin"

2016-5-17 15:08

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.602000	41.40	11.5	56	14.6	QP	N	GND
1.672000	34.60	11.6	56	21.4	QP	N	GND
23.982500	37.20	12.0	60	22.8	QP	N	GND

MEASUREMENT RESULT: "RY0517-8_fin2"

2016-5-17 15:08

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.610000	29.60	11.5	46	16.4	AV	N	GND
4.299500	23.60	11.8	46	22.4	AV	N	GND
23.982500	24.70	12.0	50	25.3	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 Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.