

APPLICATION CERTIFICATION

On Behalf of
3SIXTY INDUSTRIES INC

Active Floorstanding Loudspeaker System

Model No.: V-LGAST401-CHY, V-LGAST401-WT, V-LGAST401-BK, V-LGAST401-BR

FCC ID: 2ADC5V-LGAST401-CHY

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Date of Test : September 1-2, 2015
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Test Report Certification

Applicant : 3SIXTY INDUSTRIES INC
Manufacturer : 3SIXTY INDUSTRIES INC
EUT Description : Active Floorstanding Loudspeaker System
(A) MODEL NO.: V-LGAST401-CHY, V-LGAST401-WT,
V-LGAST401-BK, V-LGAST401-BR
(B) Trade Name.: /
(C) POWER SUPPLY: AC 120V; 60Hz

Measurement Procedure Used:

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

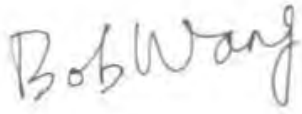
The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY 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 : September 1-2, 2015

Date of Report : September 7, 2015

Prepared by :


(Bob Wang , Engineer)

Approved & Authorized Signer :


(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Product of Device (EUT)

Product	:	Active Floorstanding Loudspeaker System
Model No.	:	V-LGAST401-CHY, V-LGAST401-WT, V-LGAST401-BK, V-LGAST401-BR (Note: We hereby state that these models are identical in interior structure, electrical circuits and components, and just model names are different for the marketing requirement. Therefore only model V-LGAST401-CHY is tested for EMC tests.)
Frequency Band	:	2402MHz-2480MHz
Number of Channels	:	79
Bluetooth Version	:	2.1+EDR
Modulation type	:	GFSK, $\Pi/4$ -DQPSK, 8DPSK
Antenna Gain	:	0dBi
Antenna type	:	PCB Antenna
Power Supply	:	AC 120V; 60Hz
Applicant	:	3SIXTY INDUSTRIES INC
Address	:	1407 N. BATAVIA STREET STE 111, ORANGE California 92867 United States
Manufacturer	:	3SIXTY INDUSTRIES INC
Address	:	1407 N. BATAVIA STREET STE 111, ORANGE California 92867 United States
Date of sample received	:	August 28, 2015
Date of Test	:	September 1-2, 2015

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 = 3.08dB, k=2
(9kHz-30MHz)

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

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

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 11, 2015	Jan. 10, 2016
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 11, 2015	Jan. 10, 2016
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2015	Jan. 10, 2016
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 11, 2015	Jan. 10, 2016
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2015	Jan. 14, 2016
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2015	Jan. 14, 2016
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2015	Jan. 14, 2016
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 15, 2015	Jan. 14, 2016
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 11, 2015	Jan. 10, 2016
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 11, 2015	Jan. 10, 2016
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 11, 2015	Jan. 10, 2016
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 11, 2015	Jan. 10, 2016

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

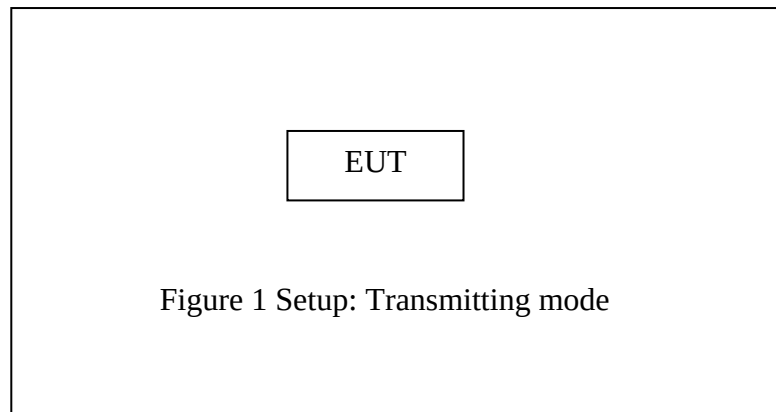


Figure 1 Setup: Transmitting mode

(EUT: Active Floorstanding Loudspeaker System)

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: Active Floorstanding Loudspeaker System)

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.

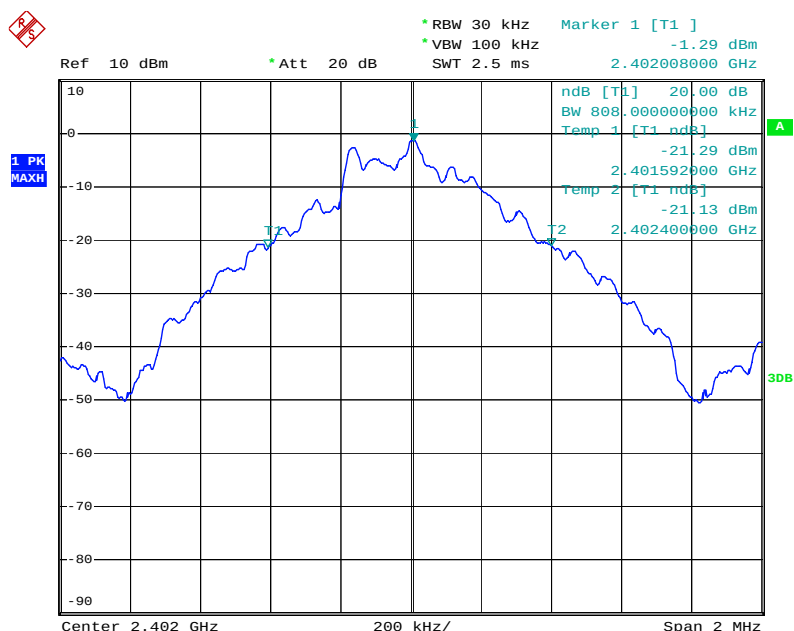
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	0.808	1.228	1.152	Pass
Middle	2441	0.808	1.224	1.152	Pass
High	2480	0.844	1.224	1.148	Pass

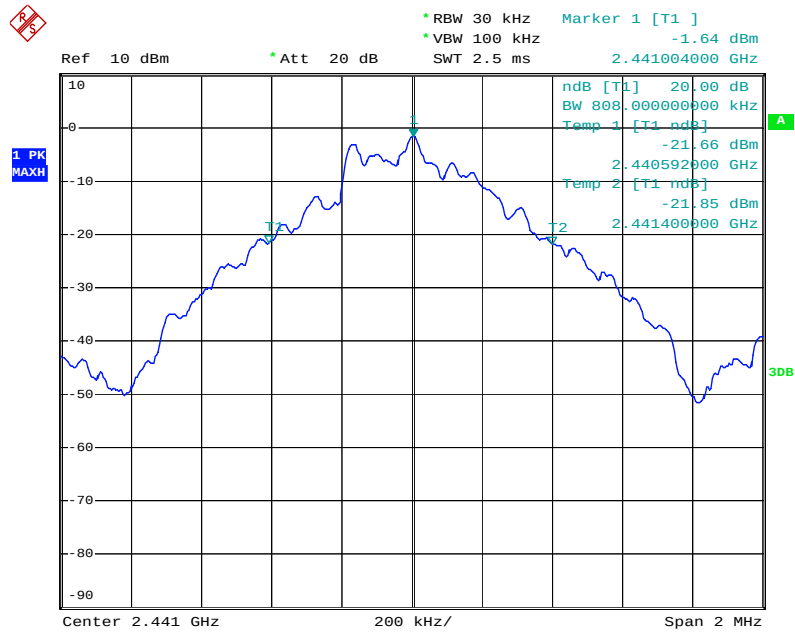
The spectrum analyzer plots are attached as below.

GFSK Mode

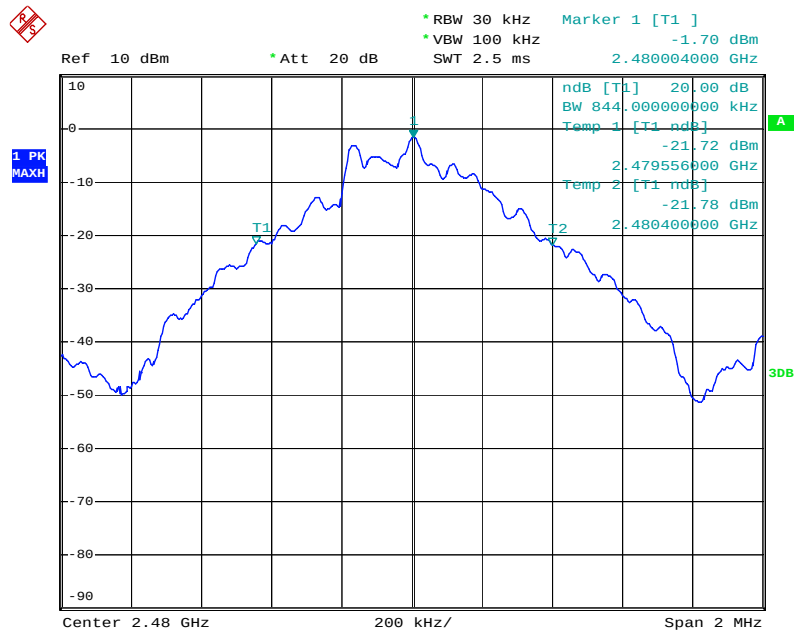
Low channel



Middle channel

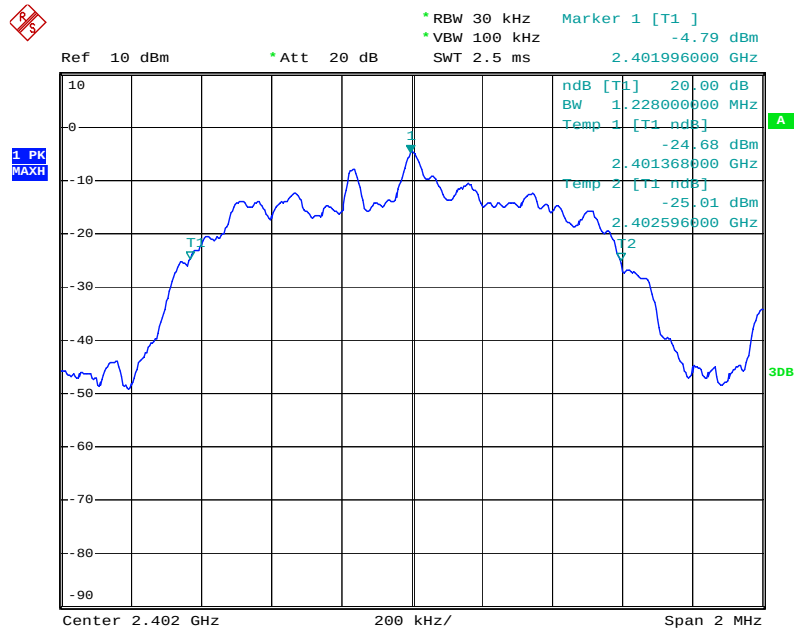


High channel

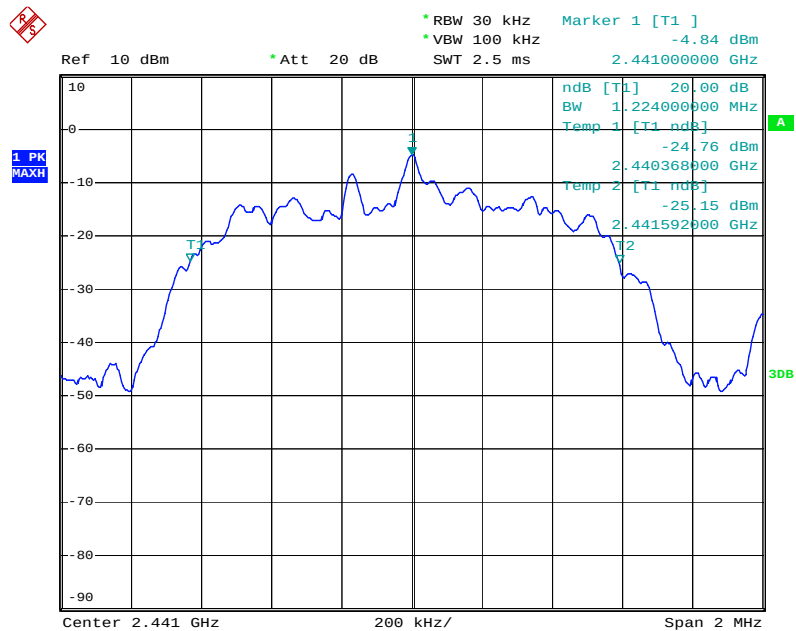


$\Pi/4$ -DQPSK Mode

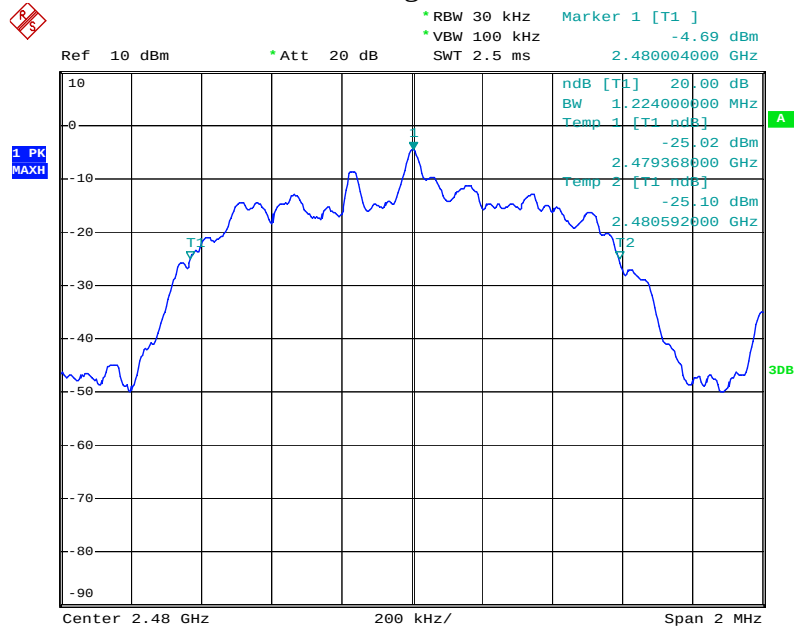
Low channel



Middle channel

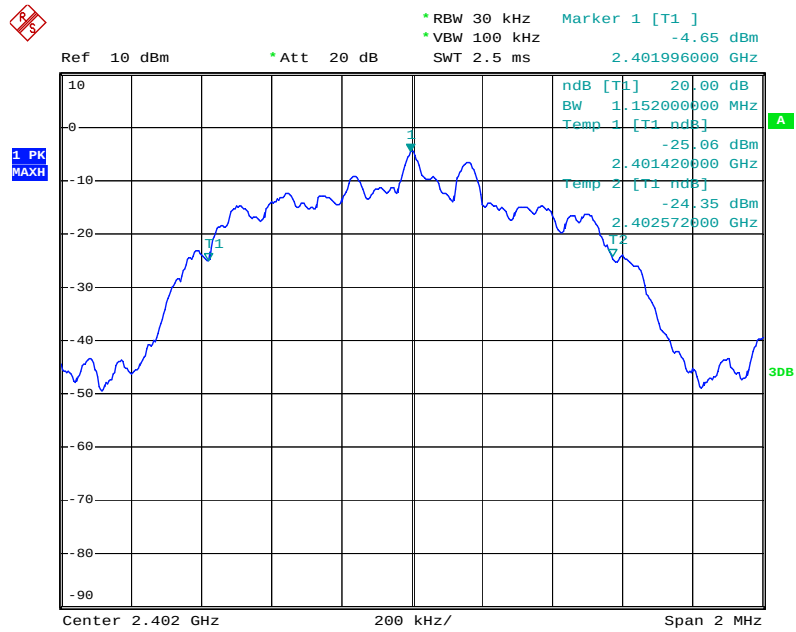


High channel

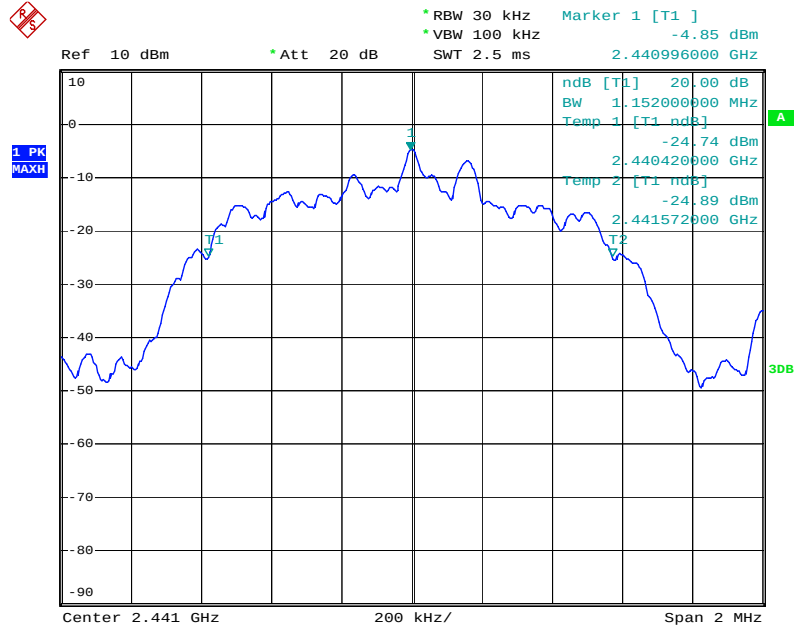


8DPSK Mode

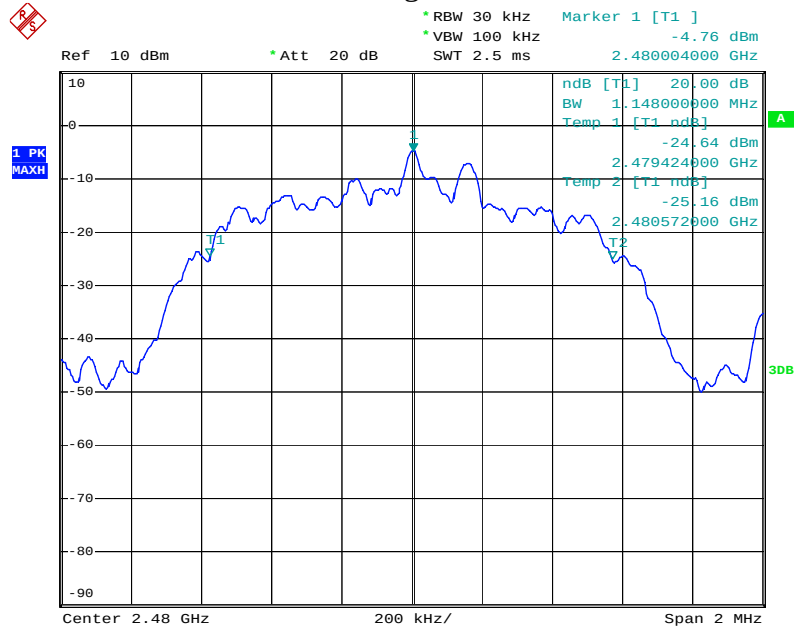
Low channel



Middle channel



High channel



6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: Active Floorstanding Loudspeaker System)

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 100 kHz and VBW to 300 kHz. Adjust Span to 3 MHz.

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

6.5.4. Measurement the channel separation

6.6. Test Result

GFSK

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

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	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	PASS
	2480			

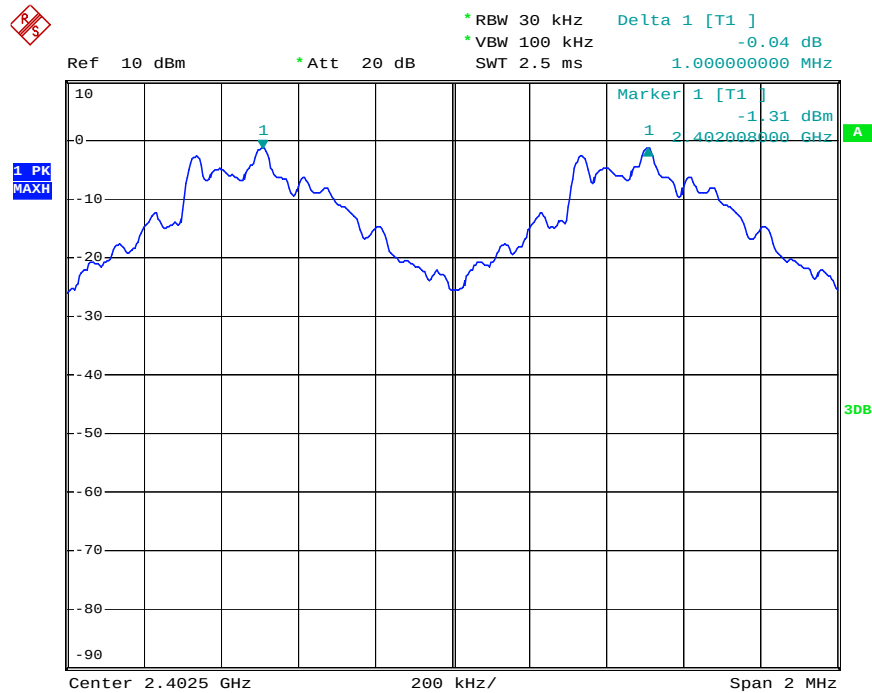
8DPSK

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

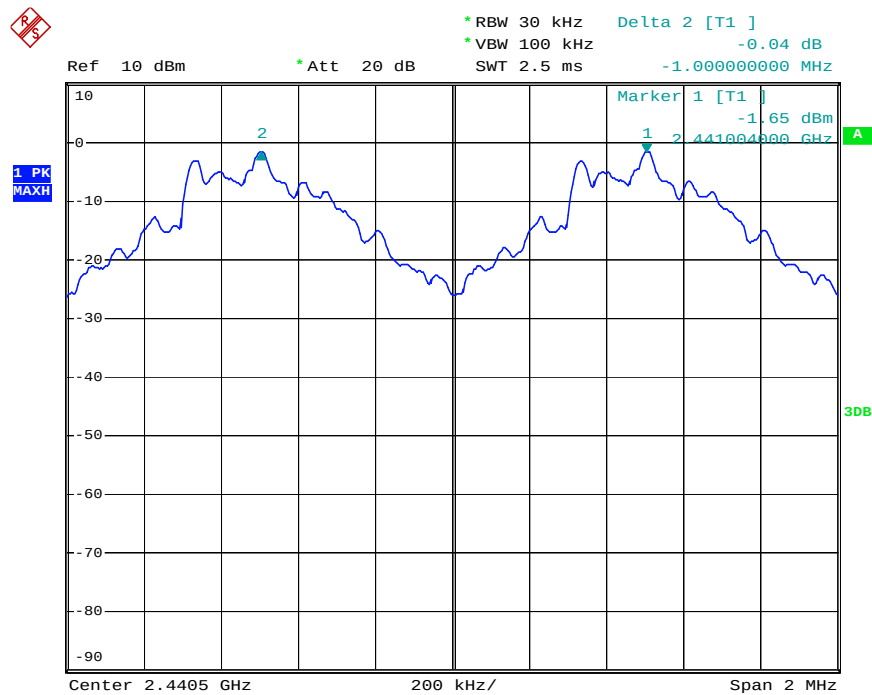
The spectrum analyzer plots are attached as below.

GFSK Mode

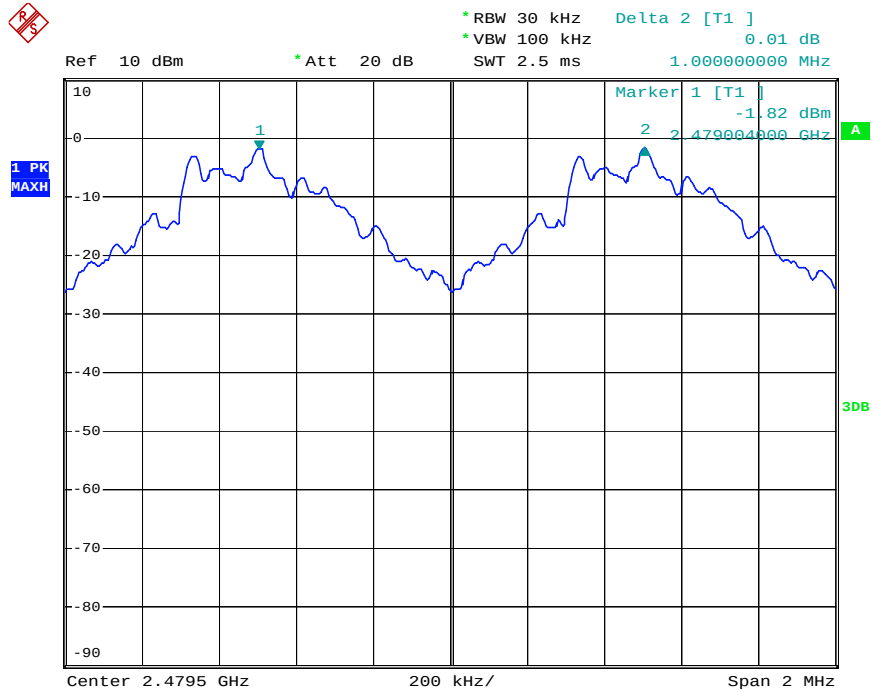
Low channel



Middle channel

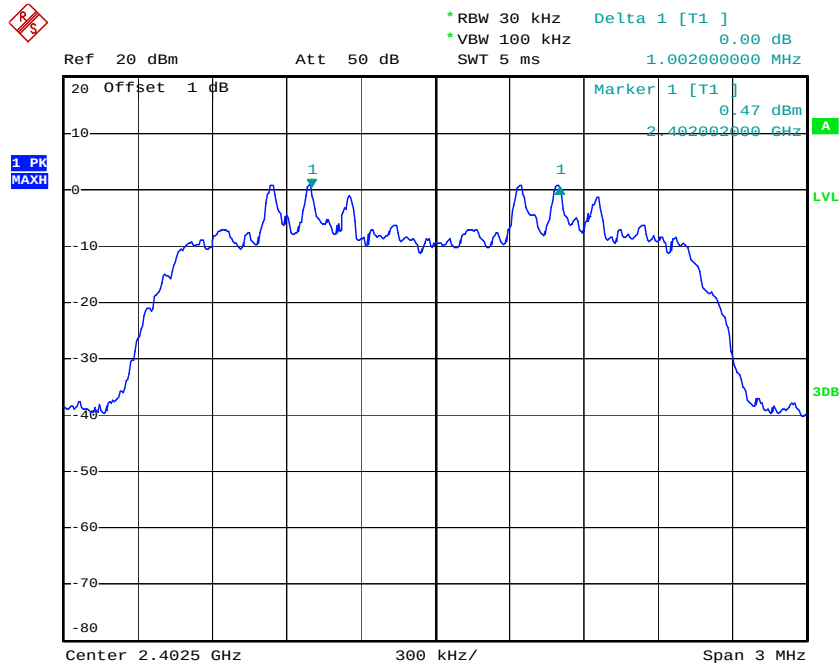


High channel

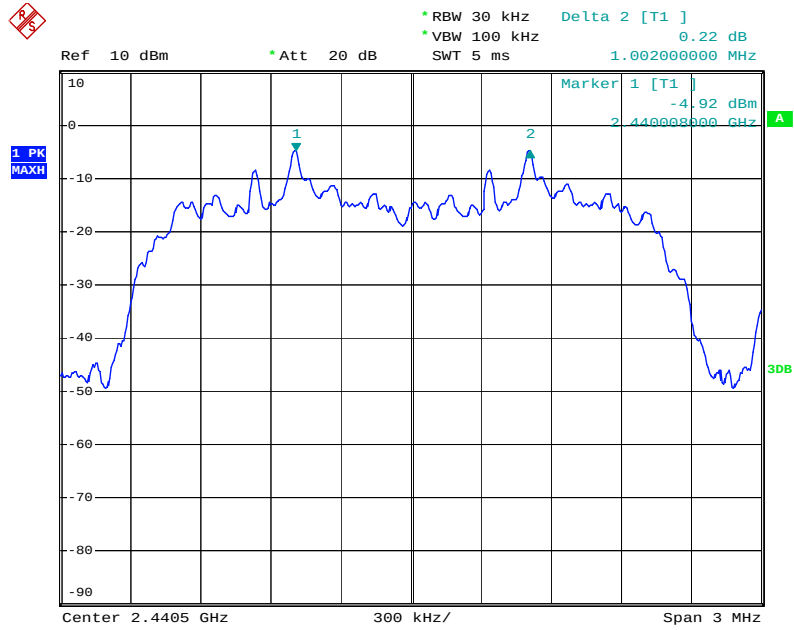


Π/4-DQPSK Mode

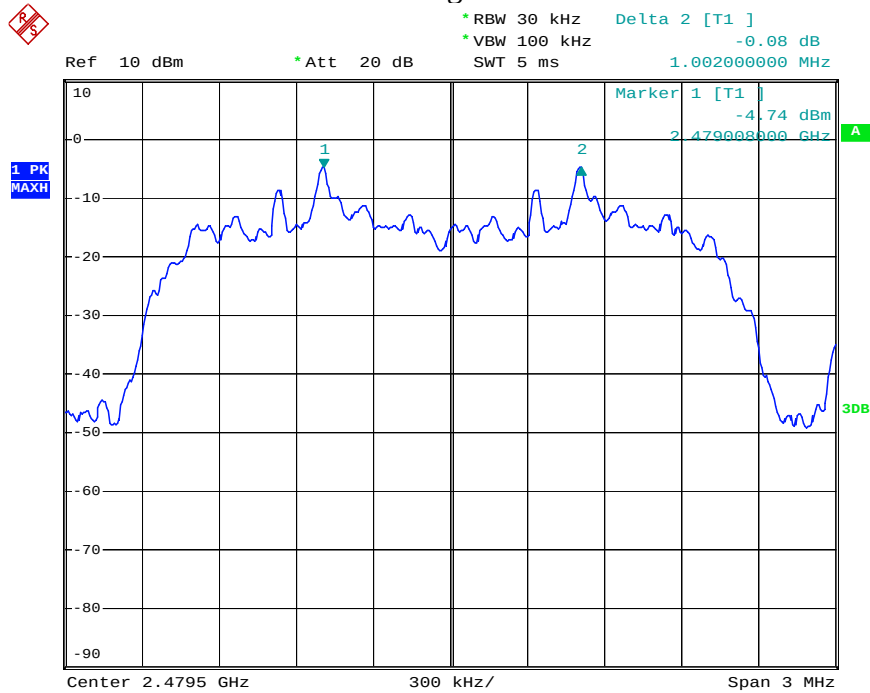
Low channel



Middle channel

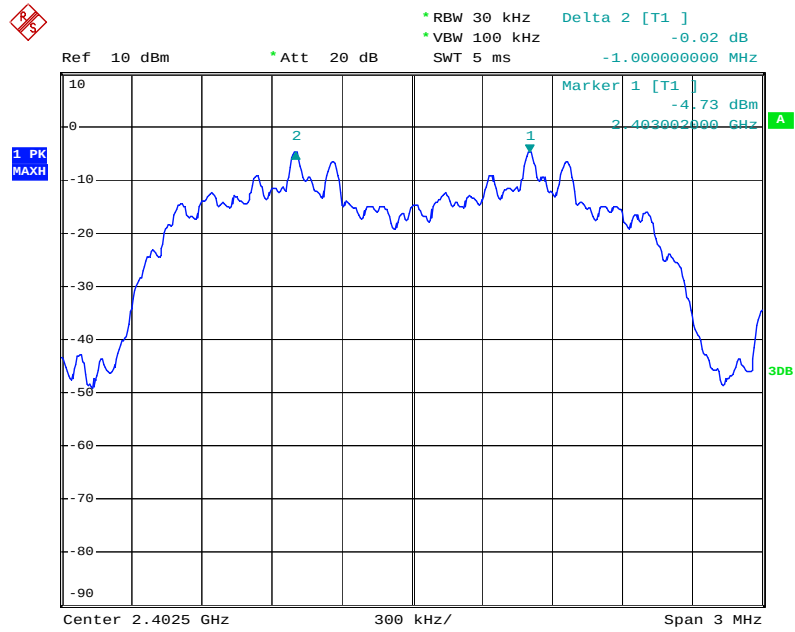


High channel

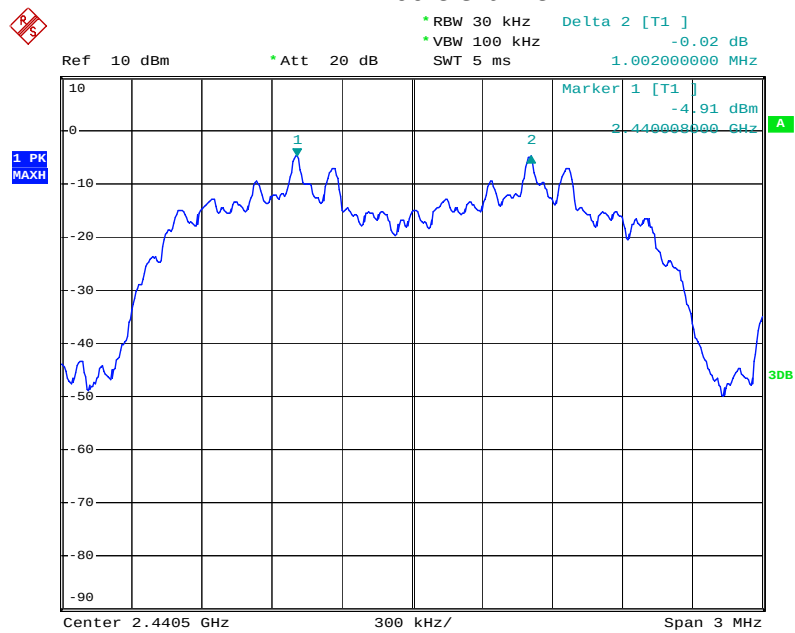


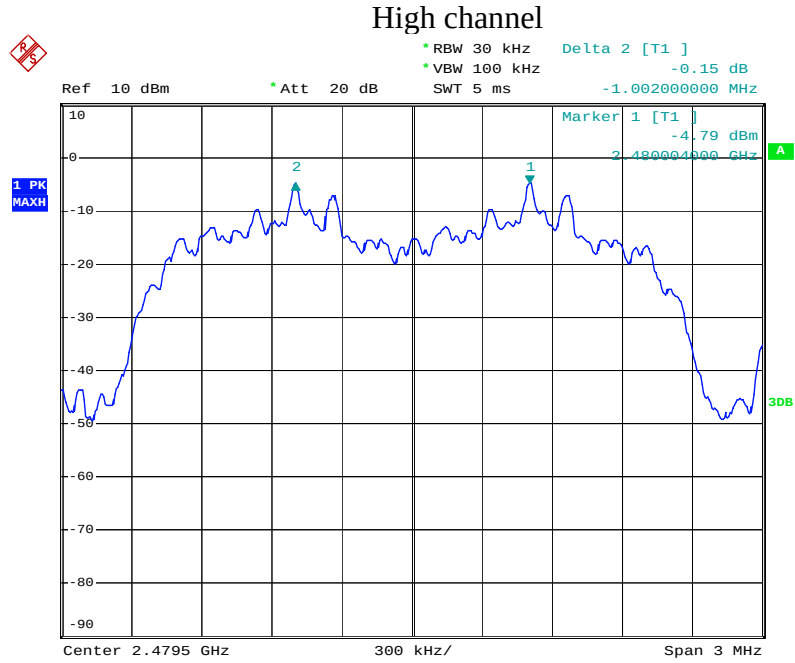
8DPSK Mode

Low channel



Middle channel





7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: Active Floorstanding Loudspeaker System)

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.

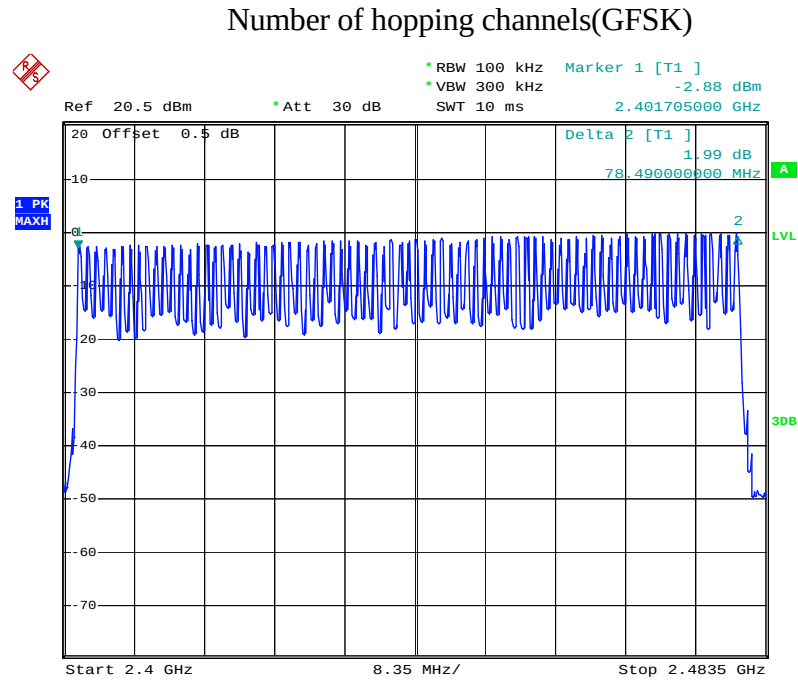
7.5.2. Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.

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

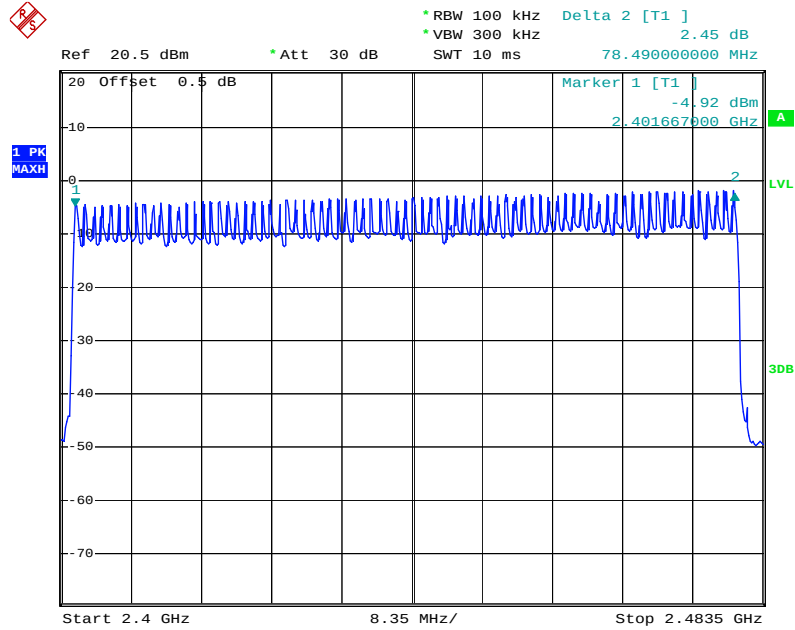
7.6.Test Result

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

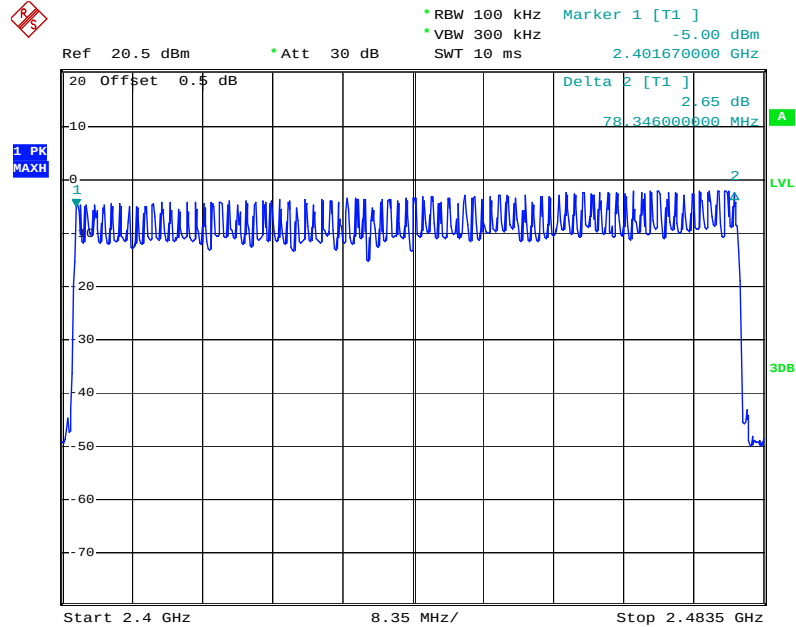
The spectrum analyzer plots are attached as below.



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

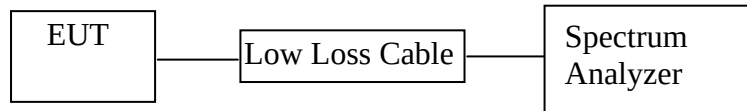


Number of hopping channels(8DPSK)



8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: Active Floorstanding Loudspeaker System)

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

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

8.3. EUT Configuration on Measurement

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

8.4. Operating Condition of EUT

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

8.4.2. Turn on the power of all equipment.

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

8.5. Test Procedure

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

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

8.5.3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz.

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

8.6. Test Result

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.530	169.60	400
	2441	0.530	169.60	400
	2480	0.530	169.60	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.790	286.40	400
	2441	1.800	288.00	400
	2480	1.790	286.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	3.070	327.47	400
	2441	3.070	327.47	400
	2480	3.070	327.47	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

Π/4-DQPSK

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.545	174.40	400
	2441	0.545	174.40	400
	2480	0.545	174.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.315	210.40	400
	2441	1.325	212.00	400
	2480	1.325	212.00	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	3.495	372.80	400
	2441	3.075	328.00	400
	2480	3.075	328.00	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

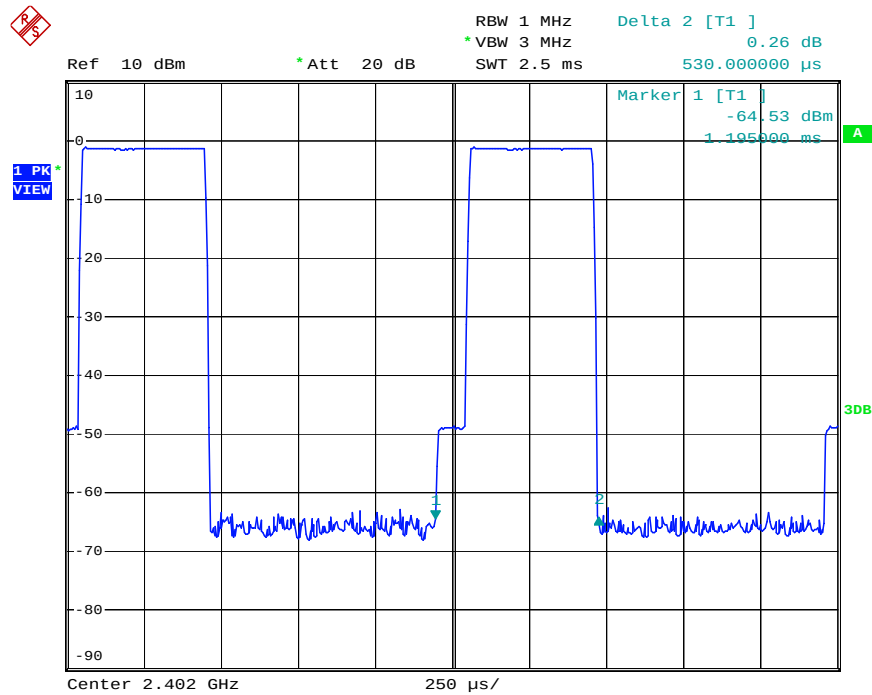
8DPSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.540	172.80	400
	2441	0.540	172.80	400
	2480	0.545	174.40	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2402	1.890	302.40	400
	2441	1.815	290.40	400
	2480	1.805	288.80	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2402	3.075	328.00	400
	2441	3.095	330.13	400
	2480	3.080	328.53	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

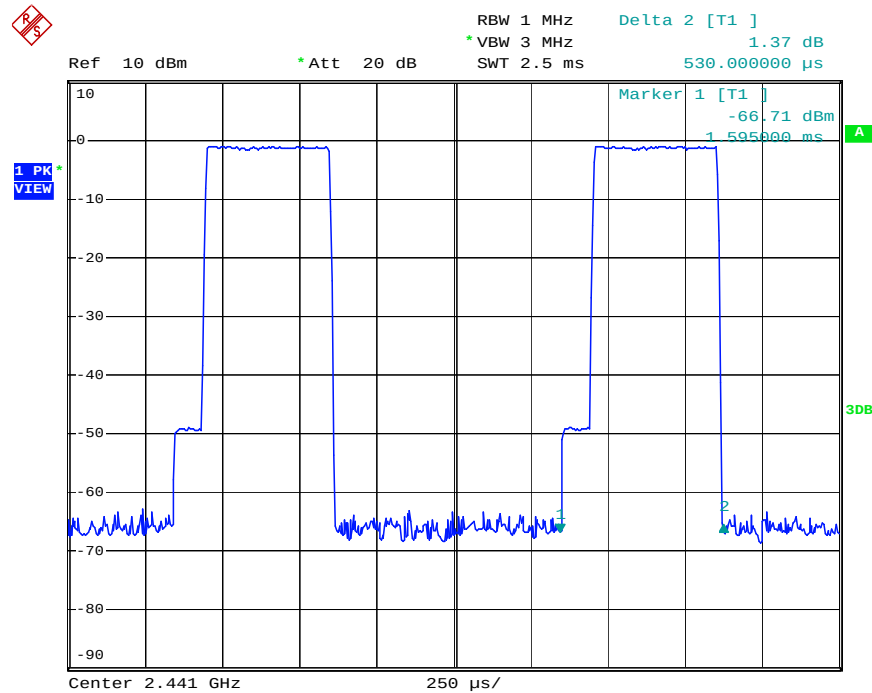
The spectrum analyzer plots are attached as below.

Mode 1: GFSK Link Mode

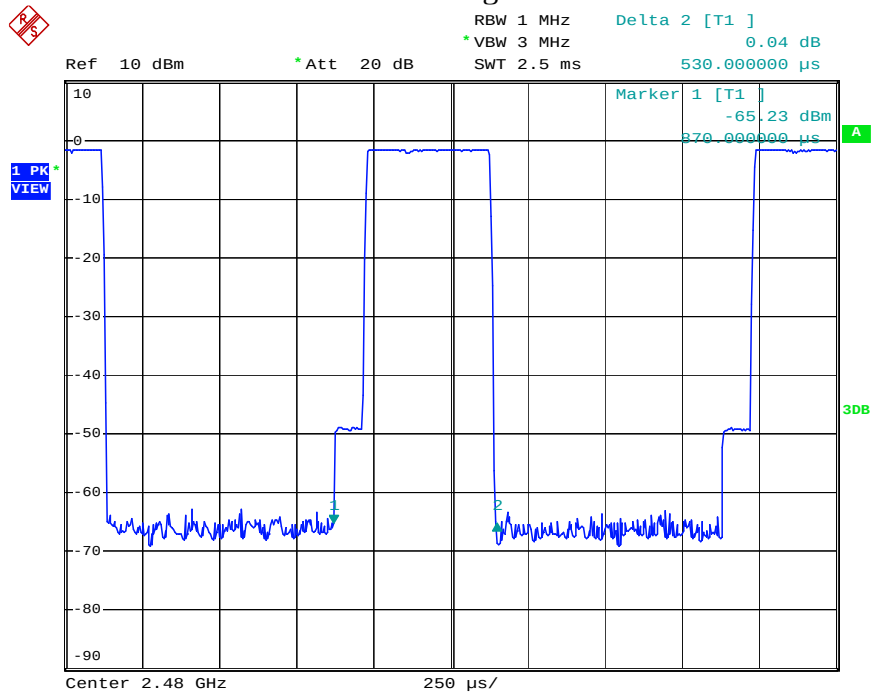
DH1 Low channel



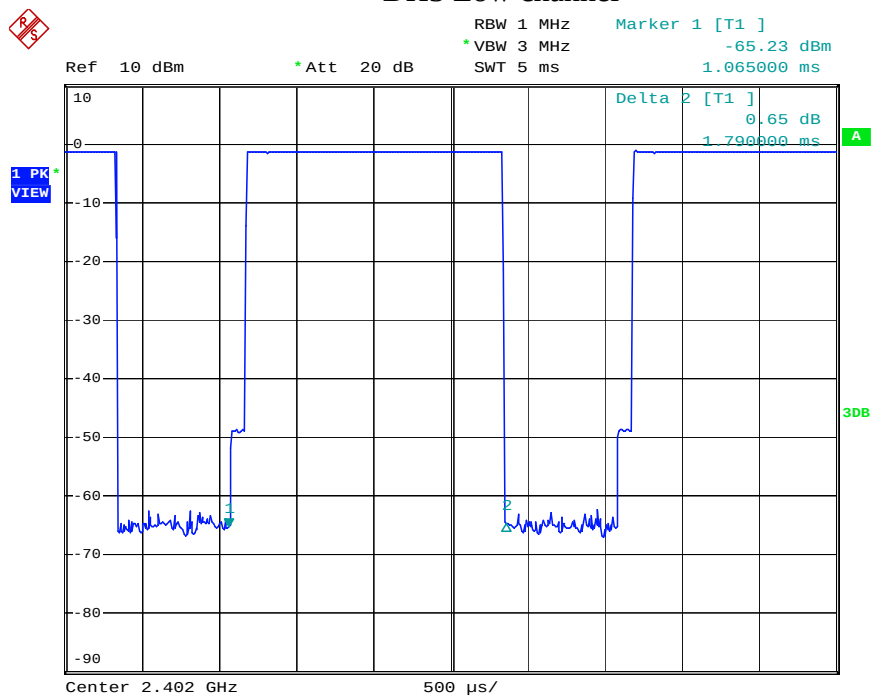
DH1 Middle channel



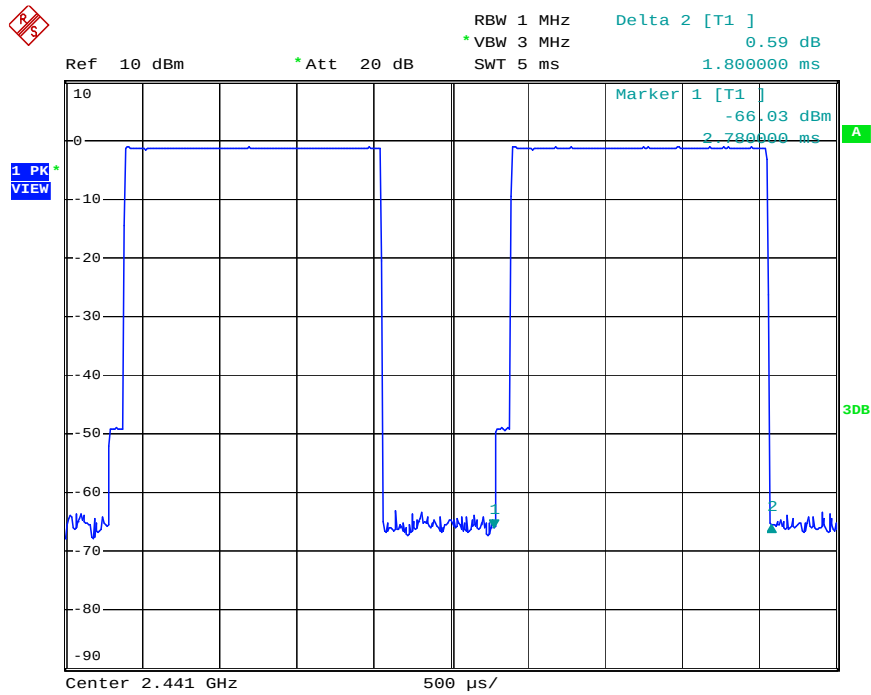
DH1 High channel



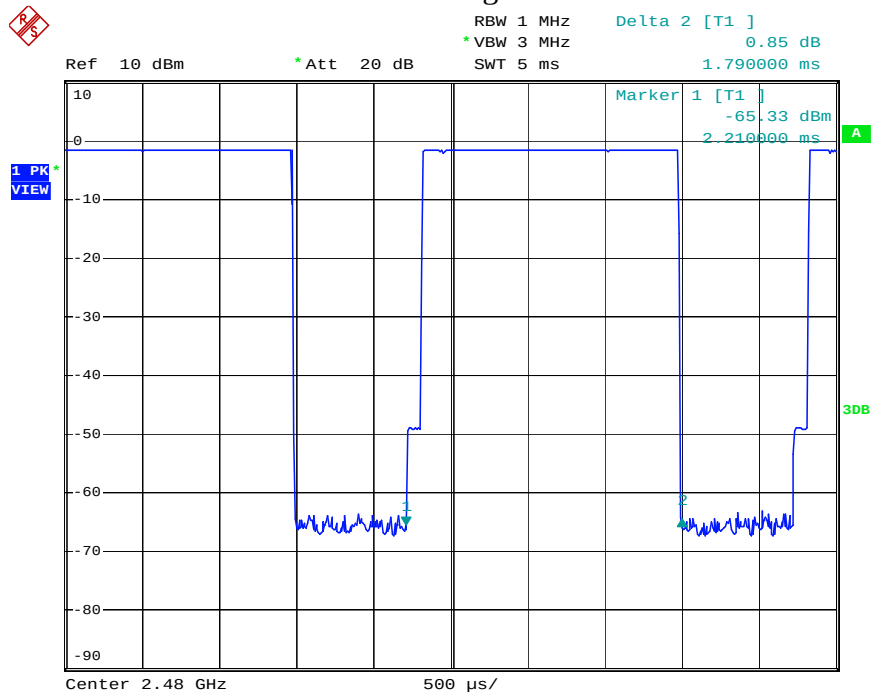
DH3 Low channel



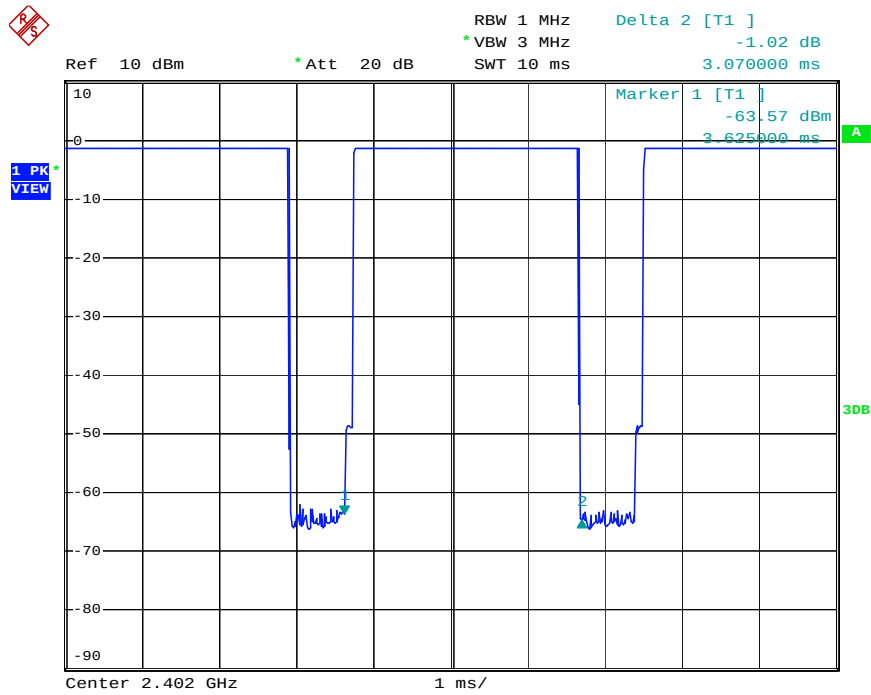
DH3 Middle channel



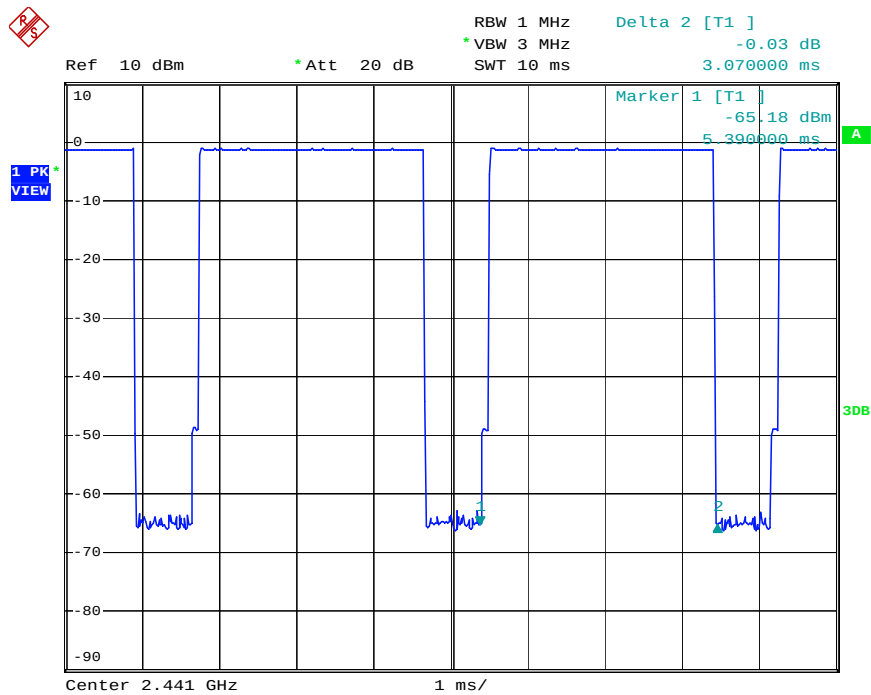
DH3 High channel



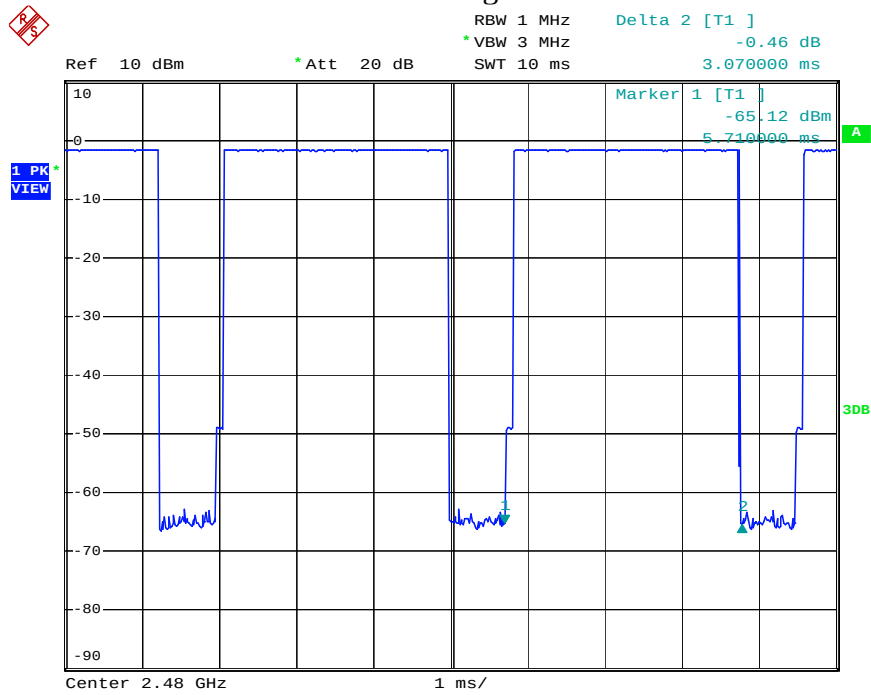
DH5 Low channel



DH5 Middle channel

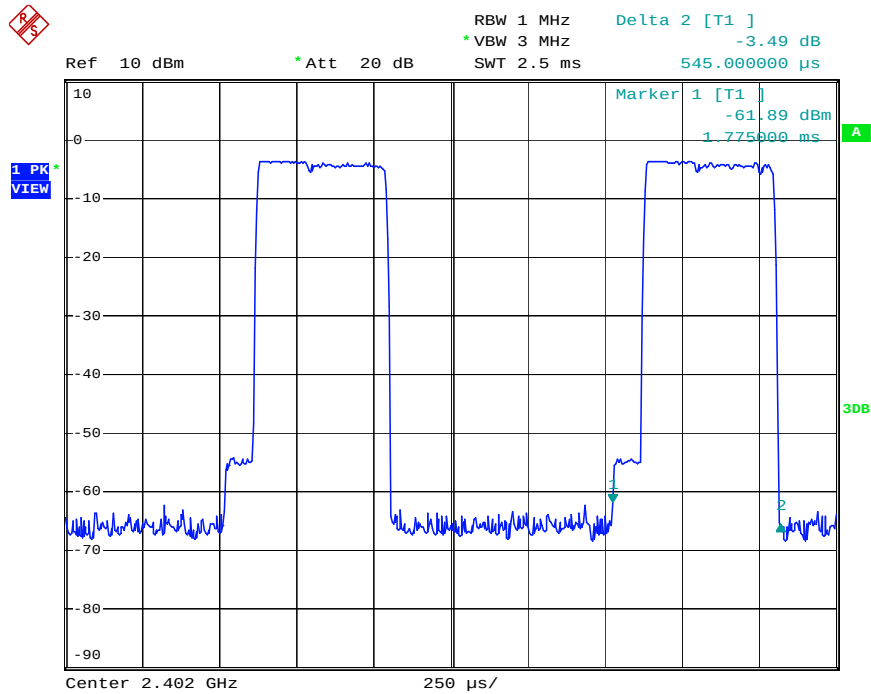


DH5 High channel

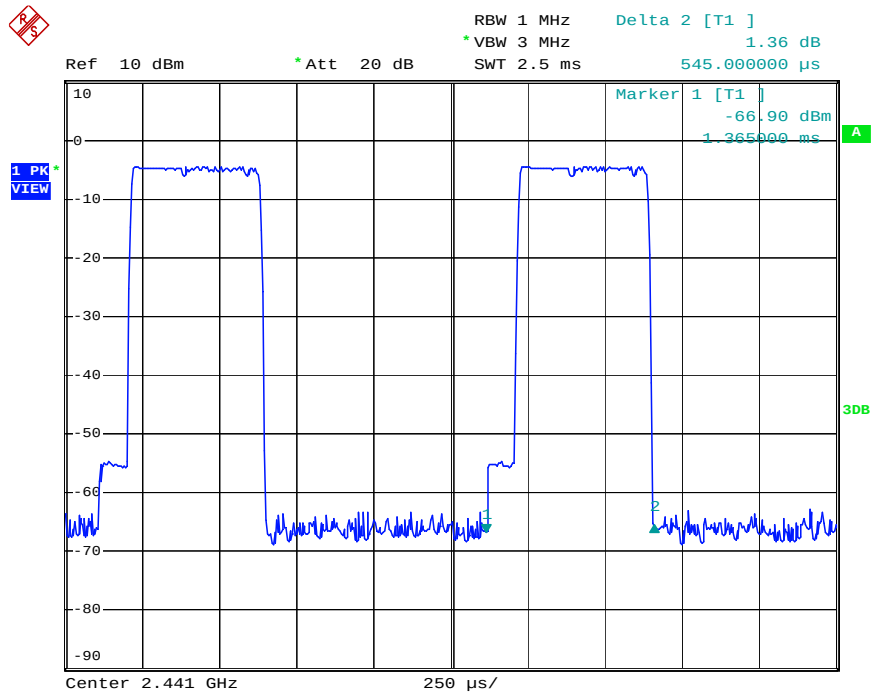


Mode 2: $\pi/4$ DQPSK Link Mode

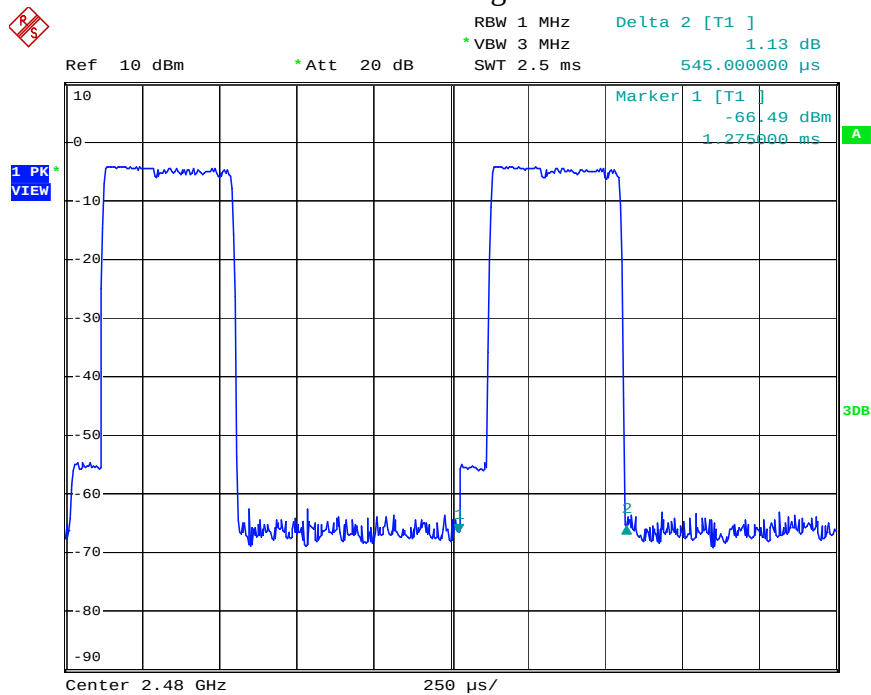
2DH1 Low channel



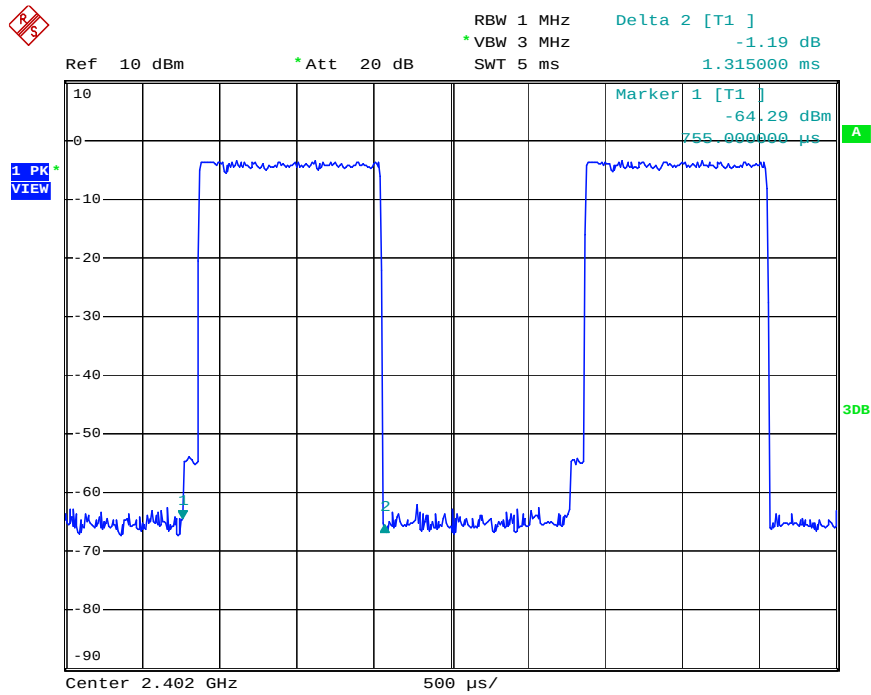
2DH1 Middle channel



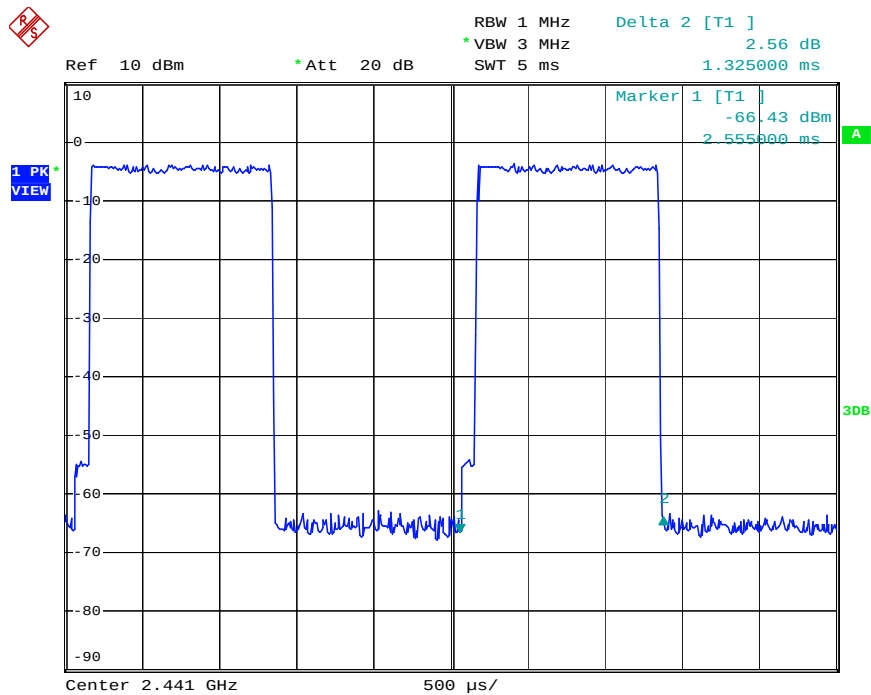
2DH1 High channel



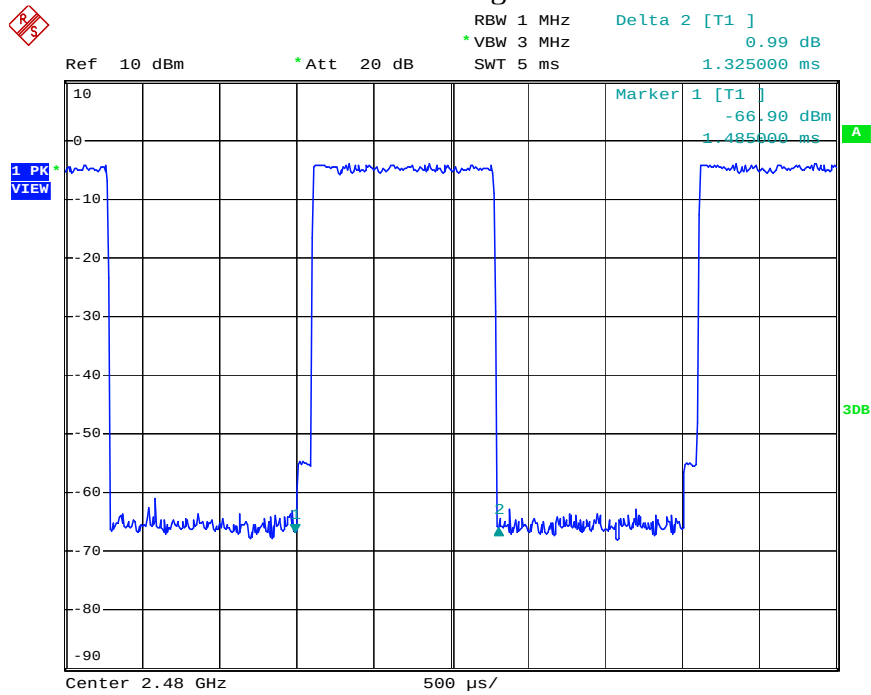
2DH3 Low channel



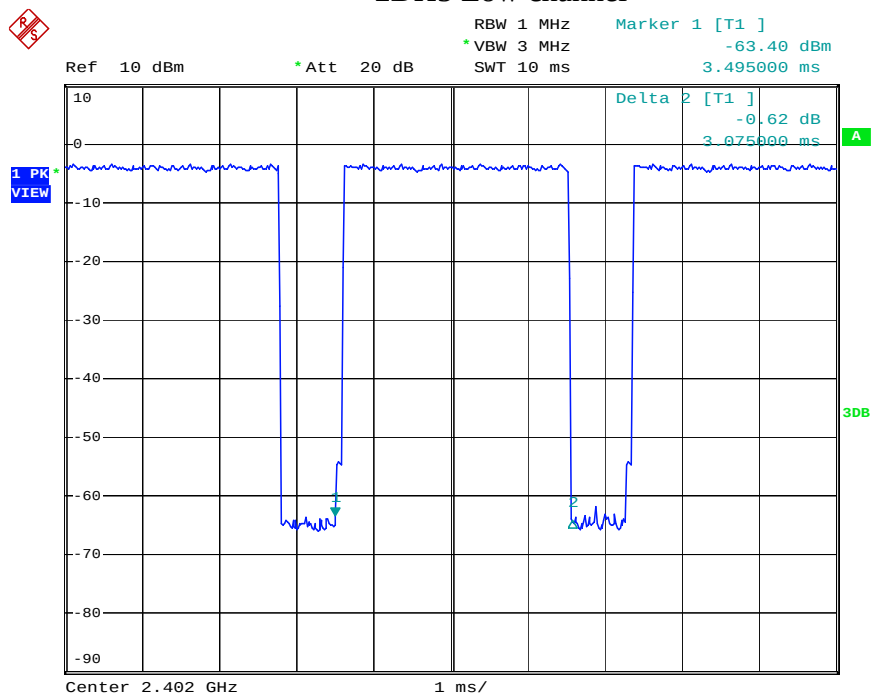
2DH3 Middle channel



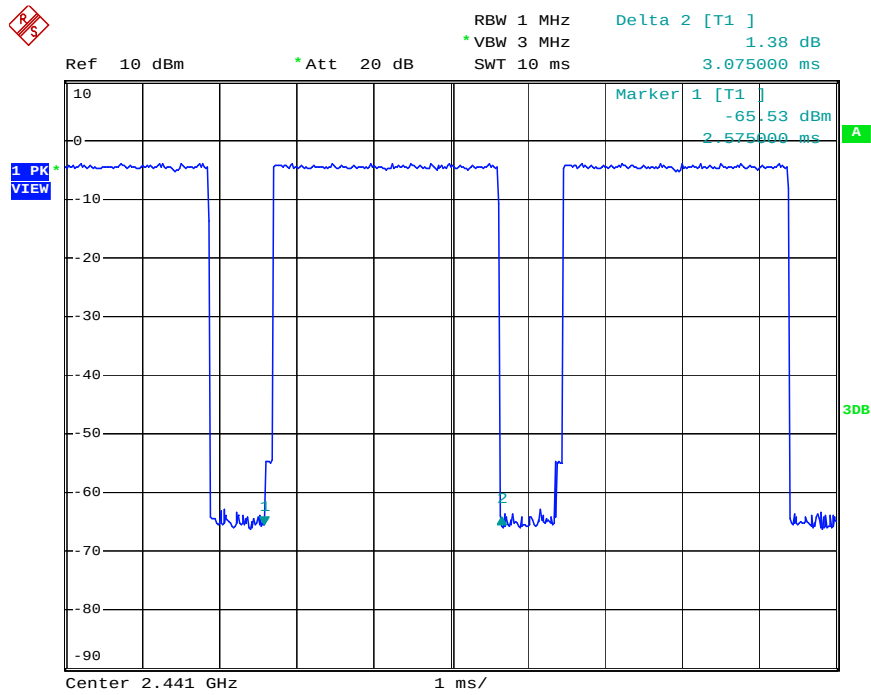
2DH3 High channel



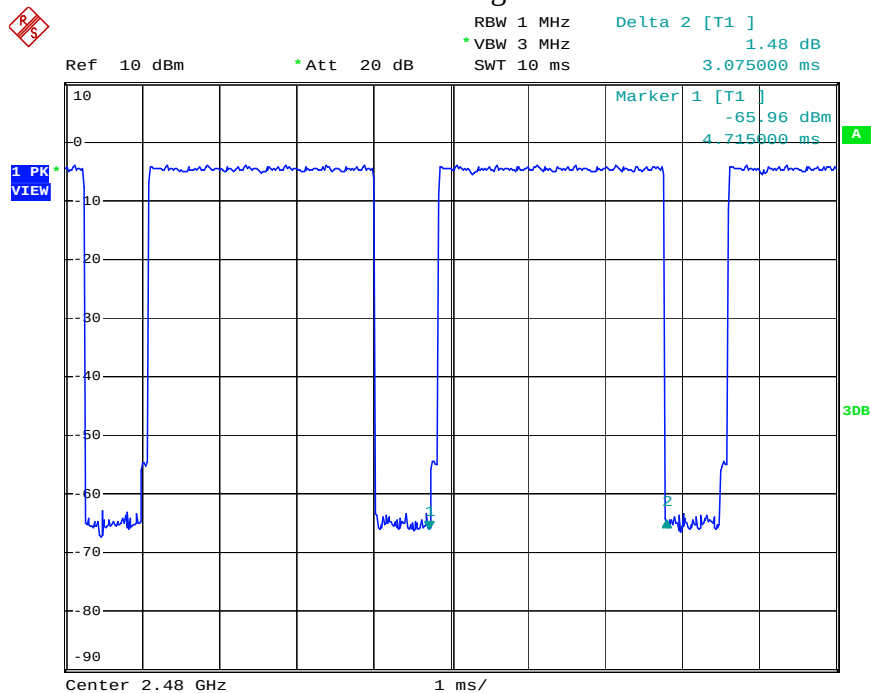
2DH5 Low channel



2DH5 Middle channel

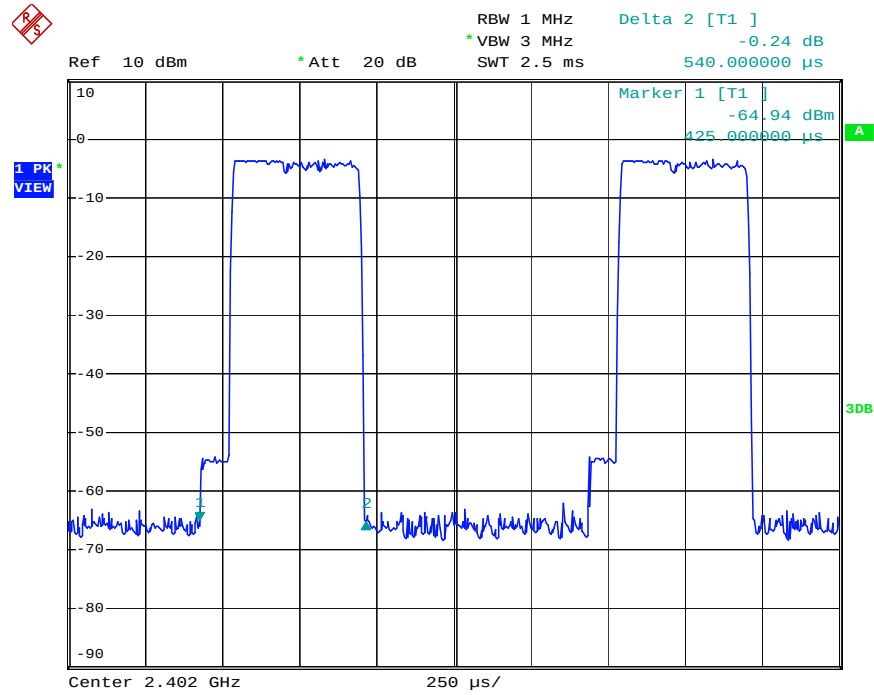


2DH5 High channel

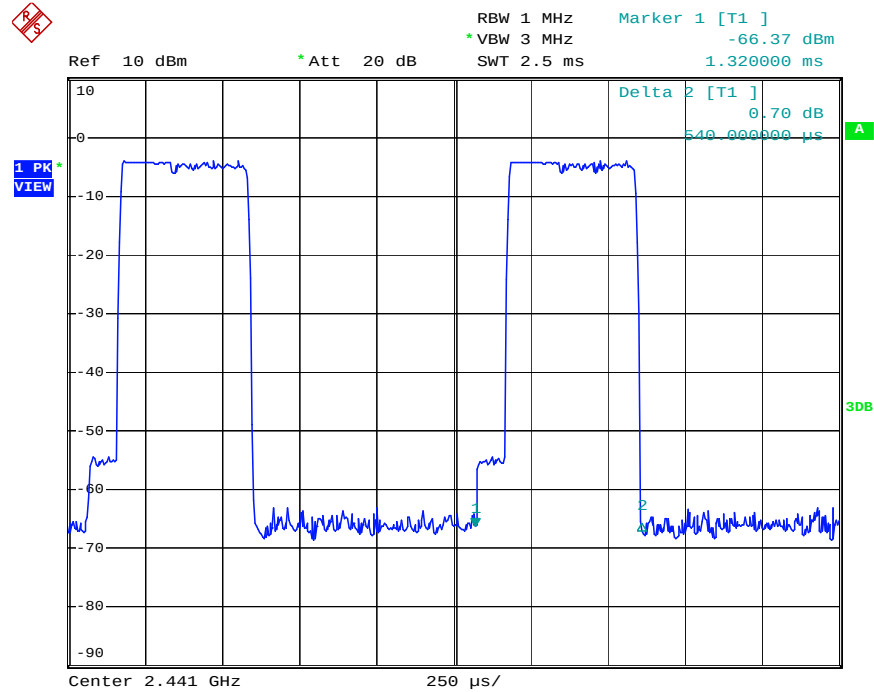


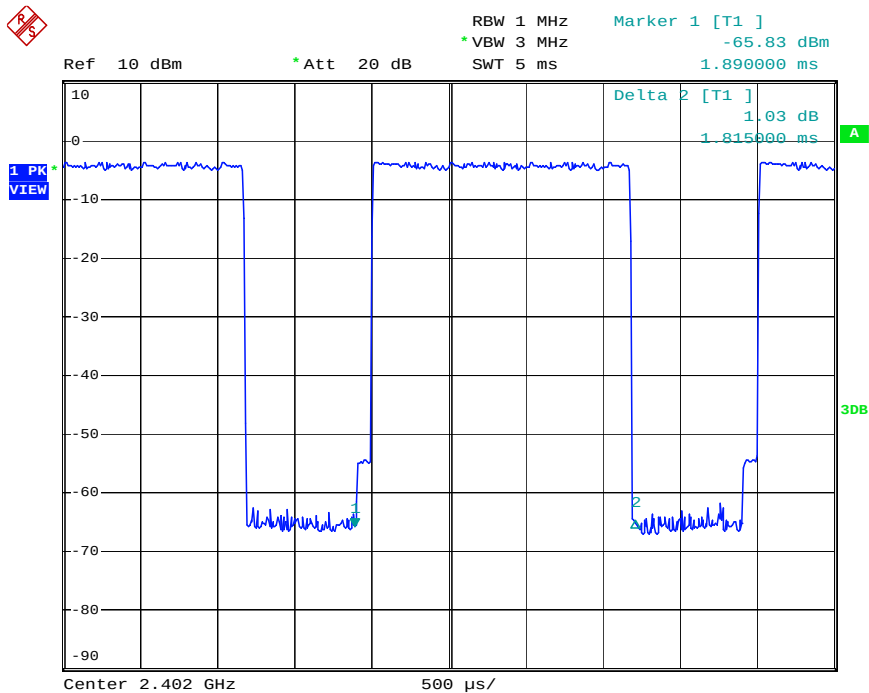
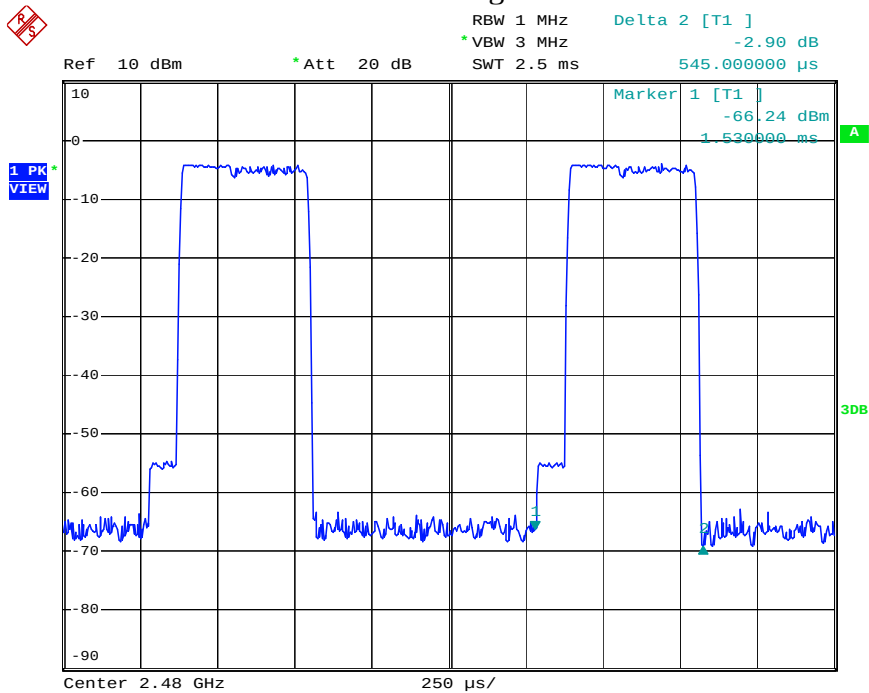
Mode 3: 8DPSK Link Mode

3DH1 Low channel

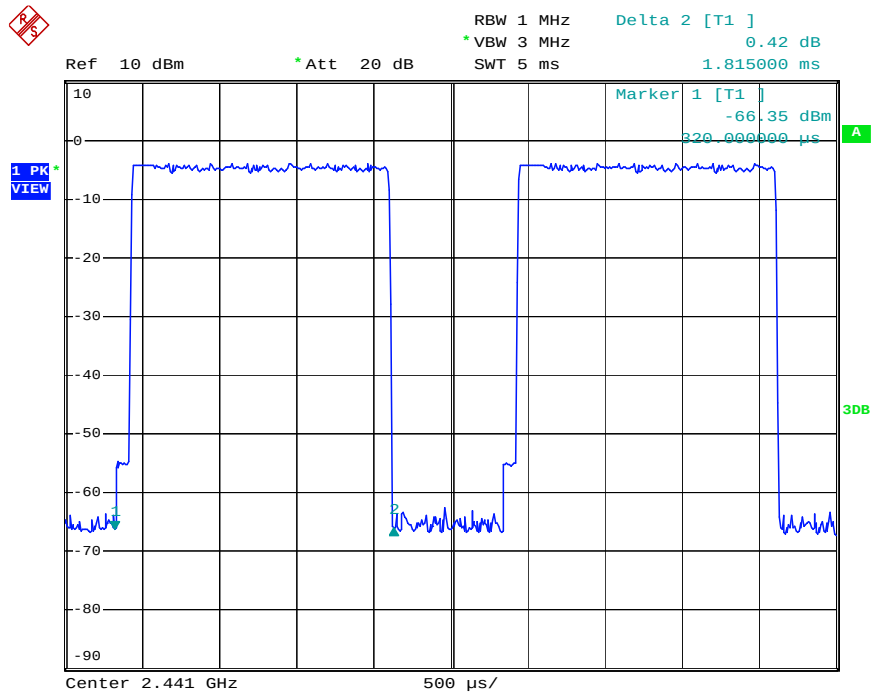


3DH1 Middle channel

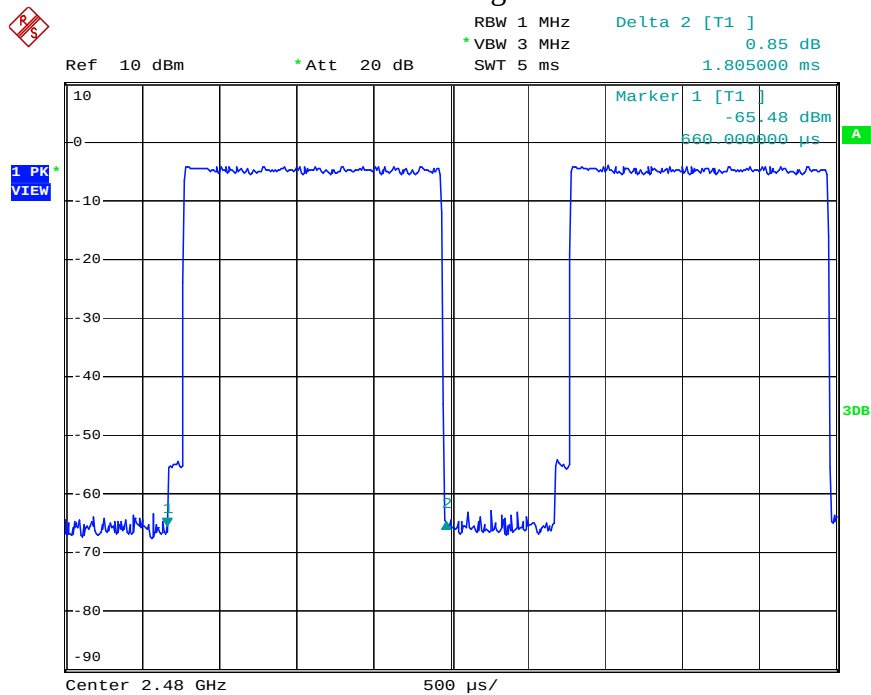




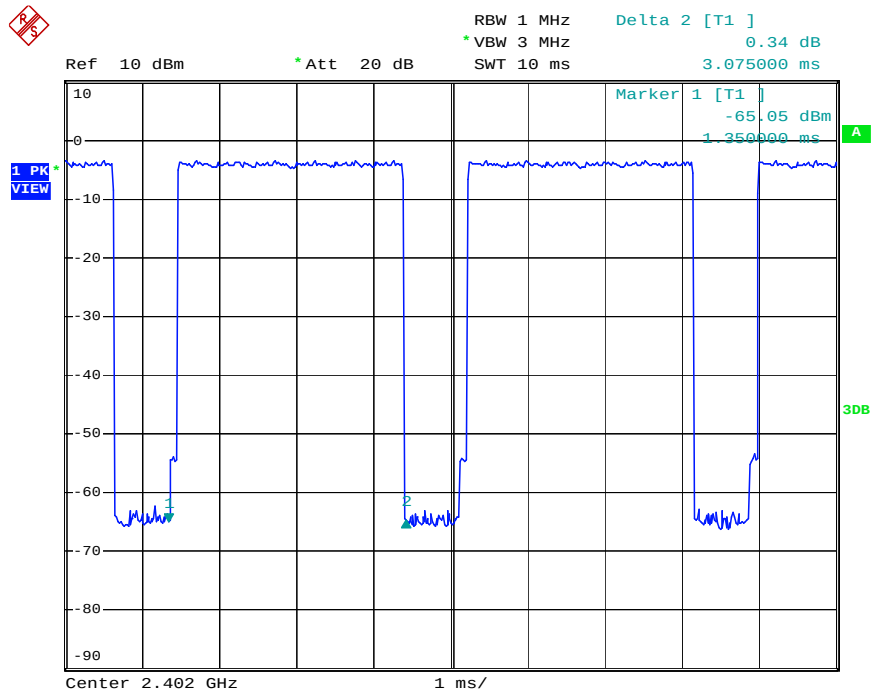
3DH3 Middle channel



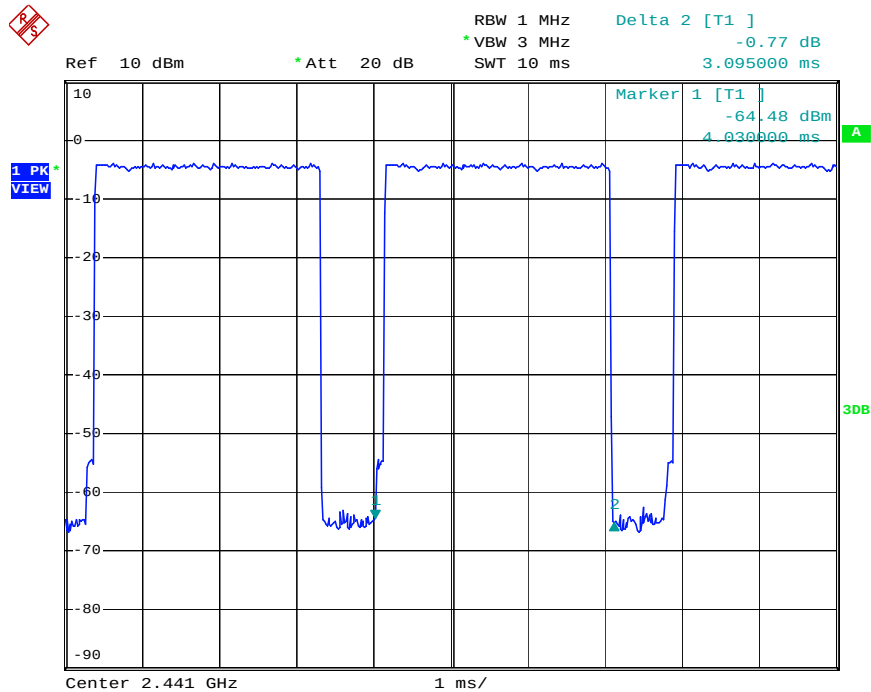
3DH3 High channel

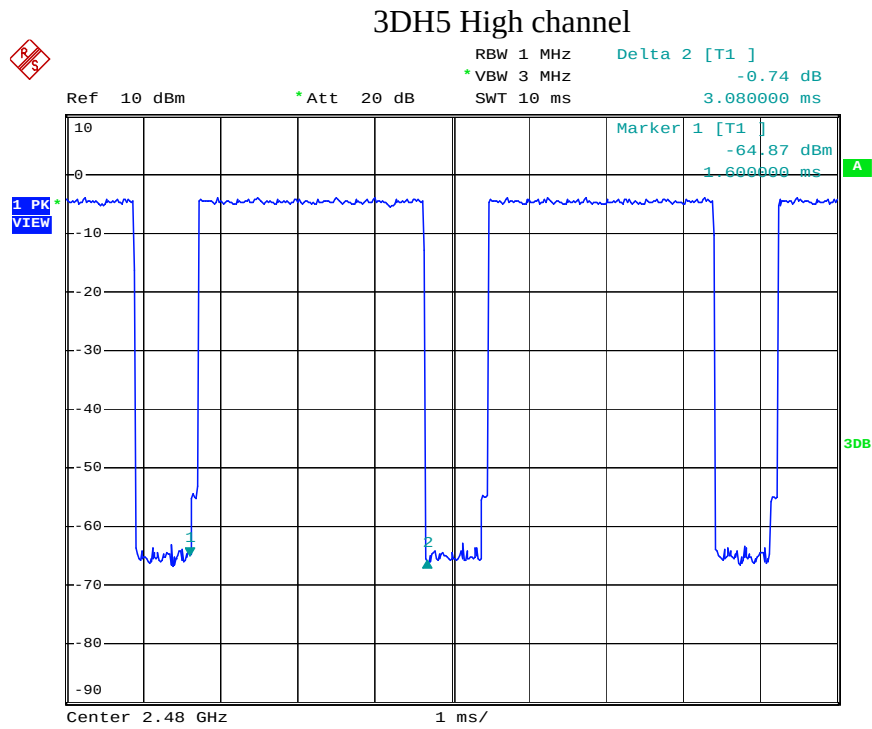


3DH5 Low channel



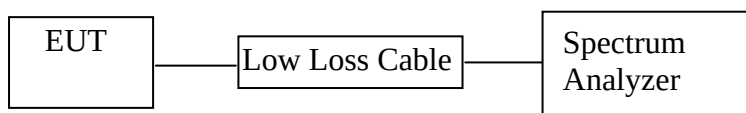
3DH5 Middle channel





9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: Active Floorstanding Loudspeaker System)

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)	Peak Output Power(mW)	Limits dBm / W
Low	2402	-0.66	0.86	30/1.0
Middle	2441	-0.19	0.96	30/1.0
High	2480	0.03	1.01	30/1.0

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power(dBm)	Peak Output Power(mW)	Limits dBm / W
Low	2402	-2.24	0.60	21 / 0.125
Middle	2441	-1.59	0.69	21 / 0.125
High	2480	-1.66	0.68	21 / 0.125

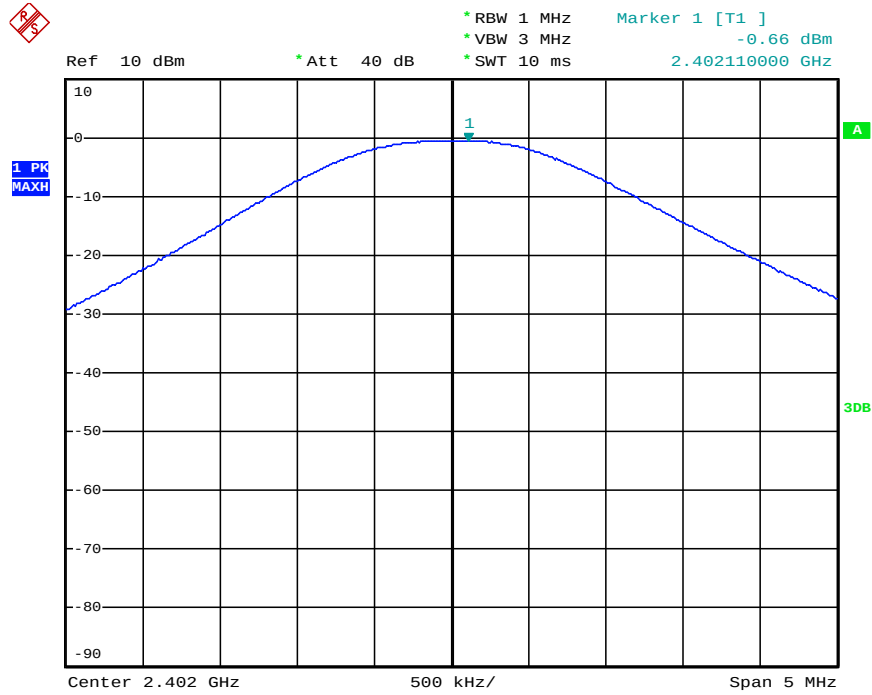
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power(dBm)	Peak Output Power(mW)	Limits dBm / W
Low	2402	-1.93	0.64	21 / 0.125
Middle	2441	-1.75	0.67	21 / 0.125
High	2480	-1.44	0.72	21 / 0.125

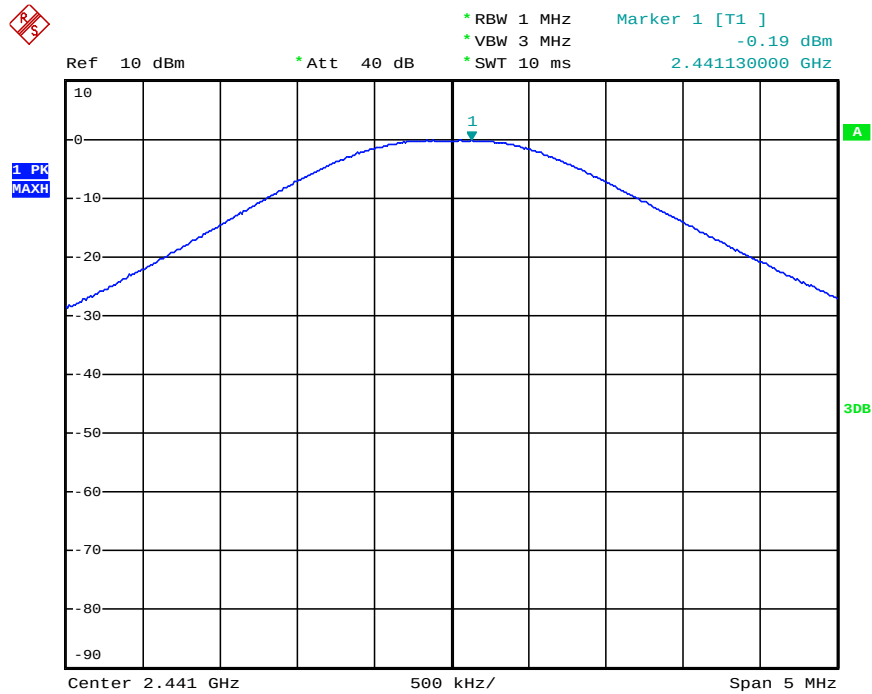
The spectrum analyzer plots are attached as below.

GFSK Mode

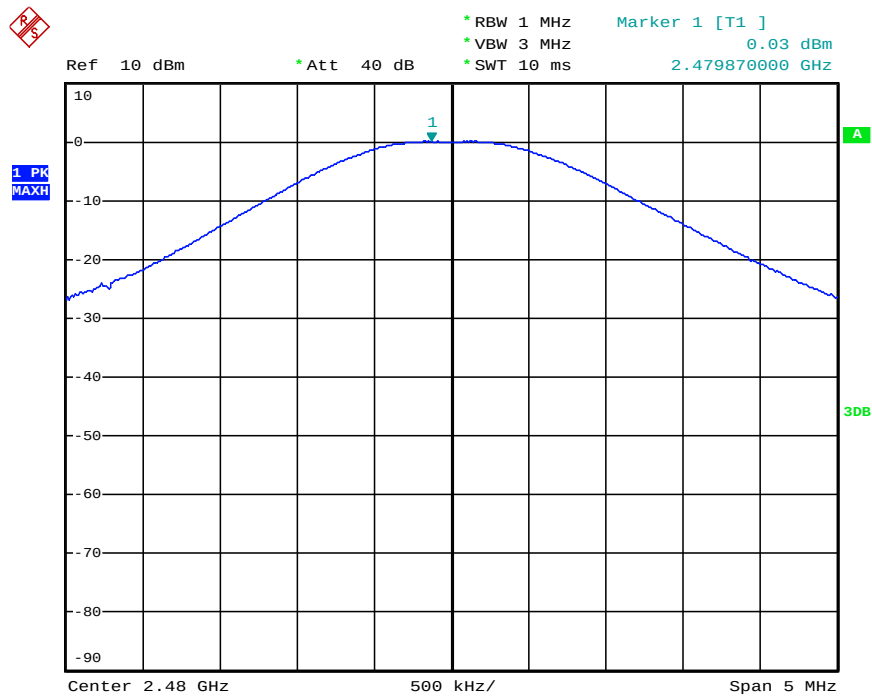
Low channel



Middle channel

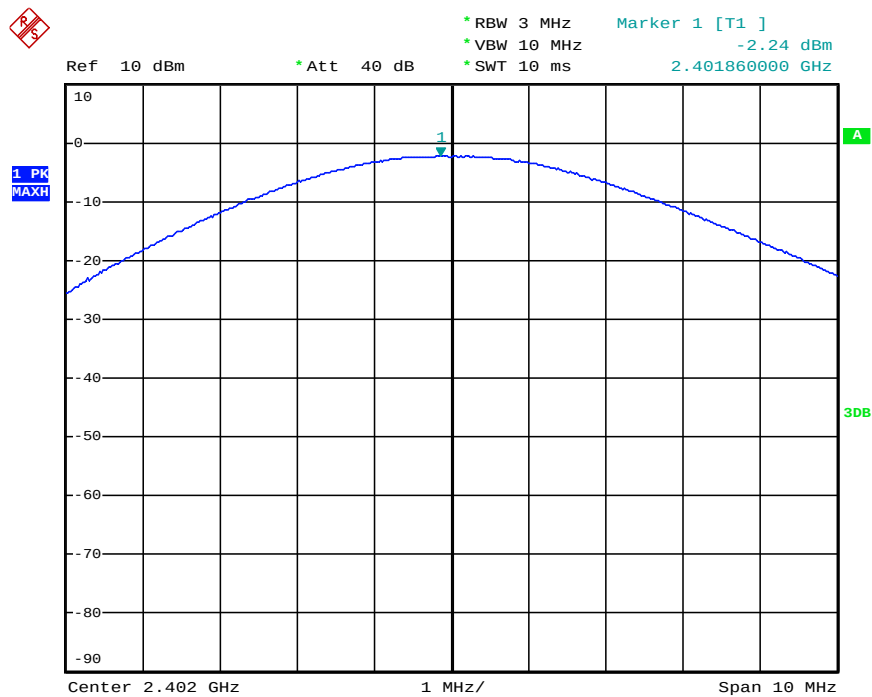


High channel

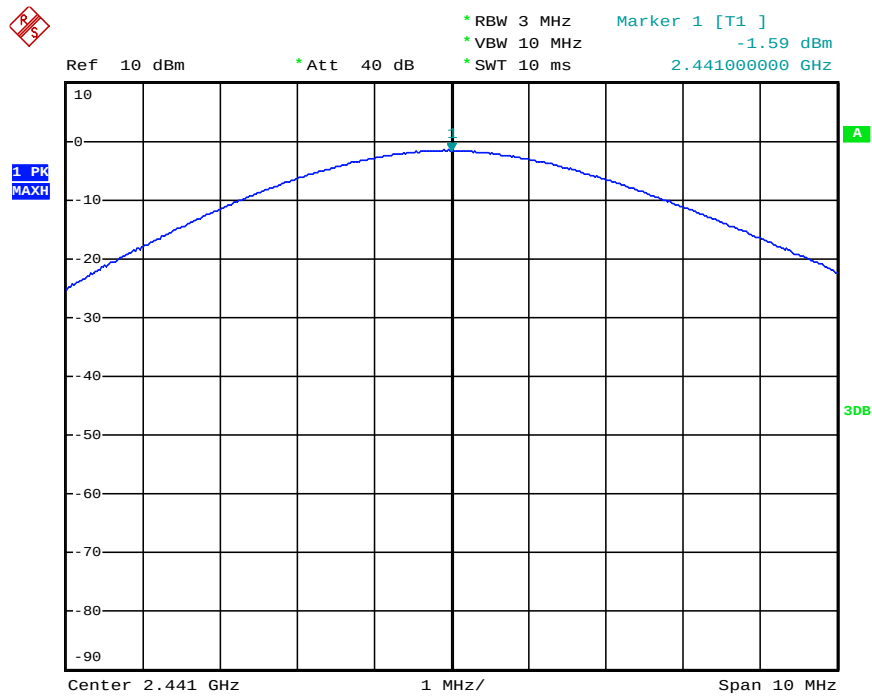


Π/4-DQPSK Mode

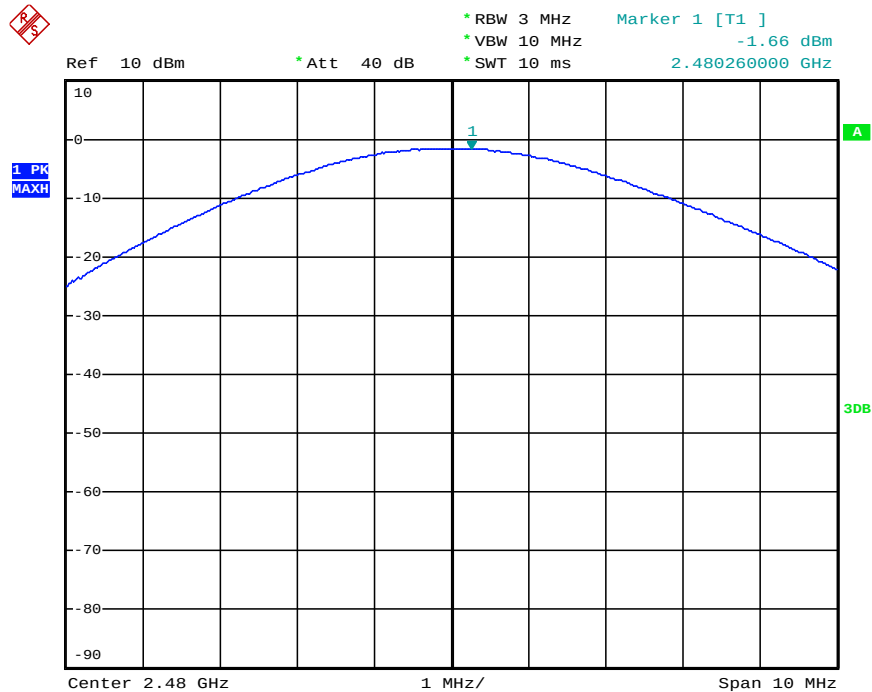
Low channel



Middle channel

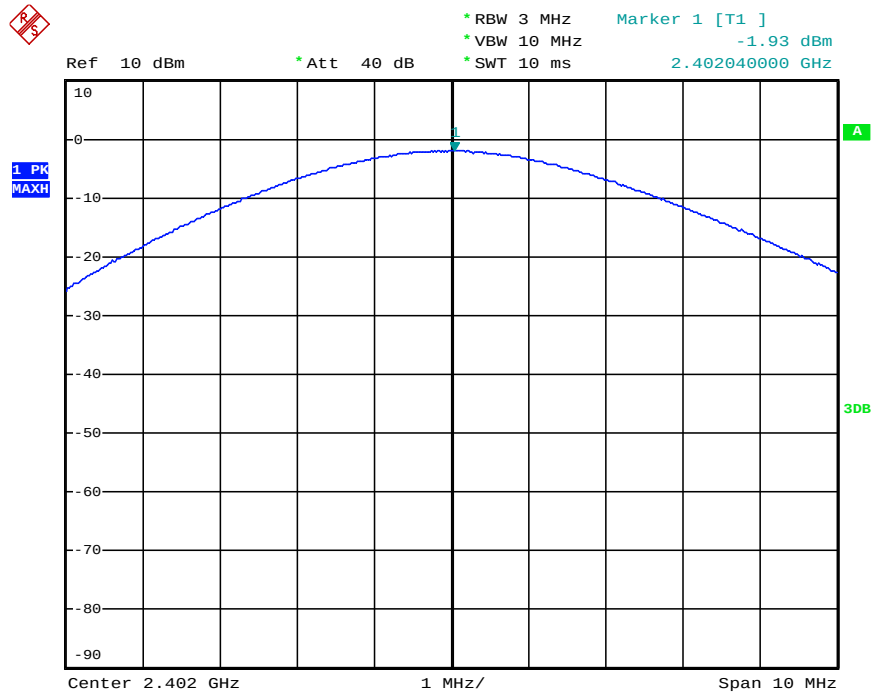


High channel

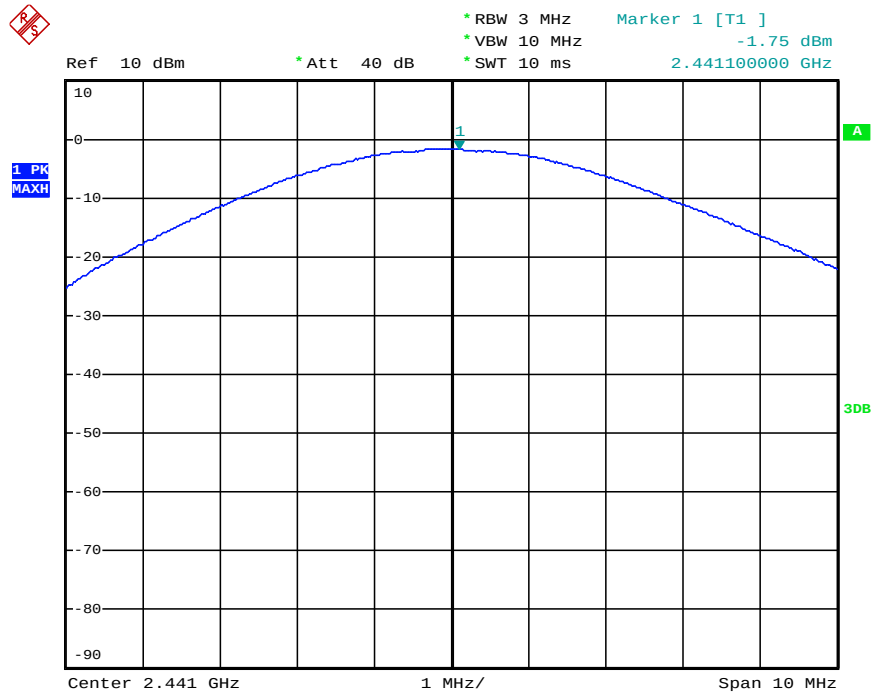


8DPSK Mode

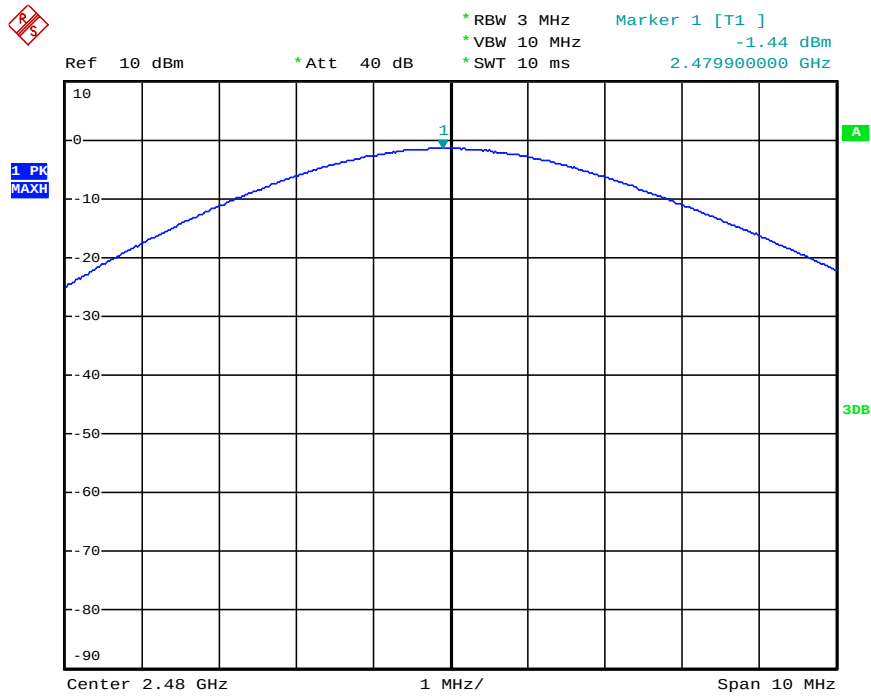
Low channel



Middle channel



High channel



10.RADIATED EMISSION TEST

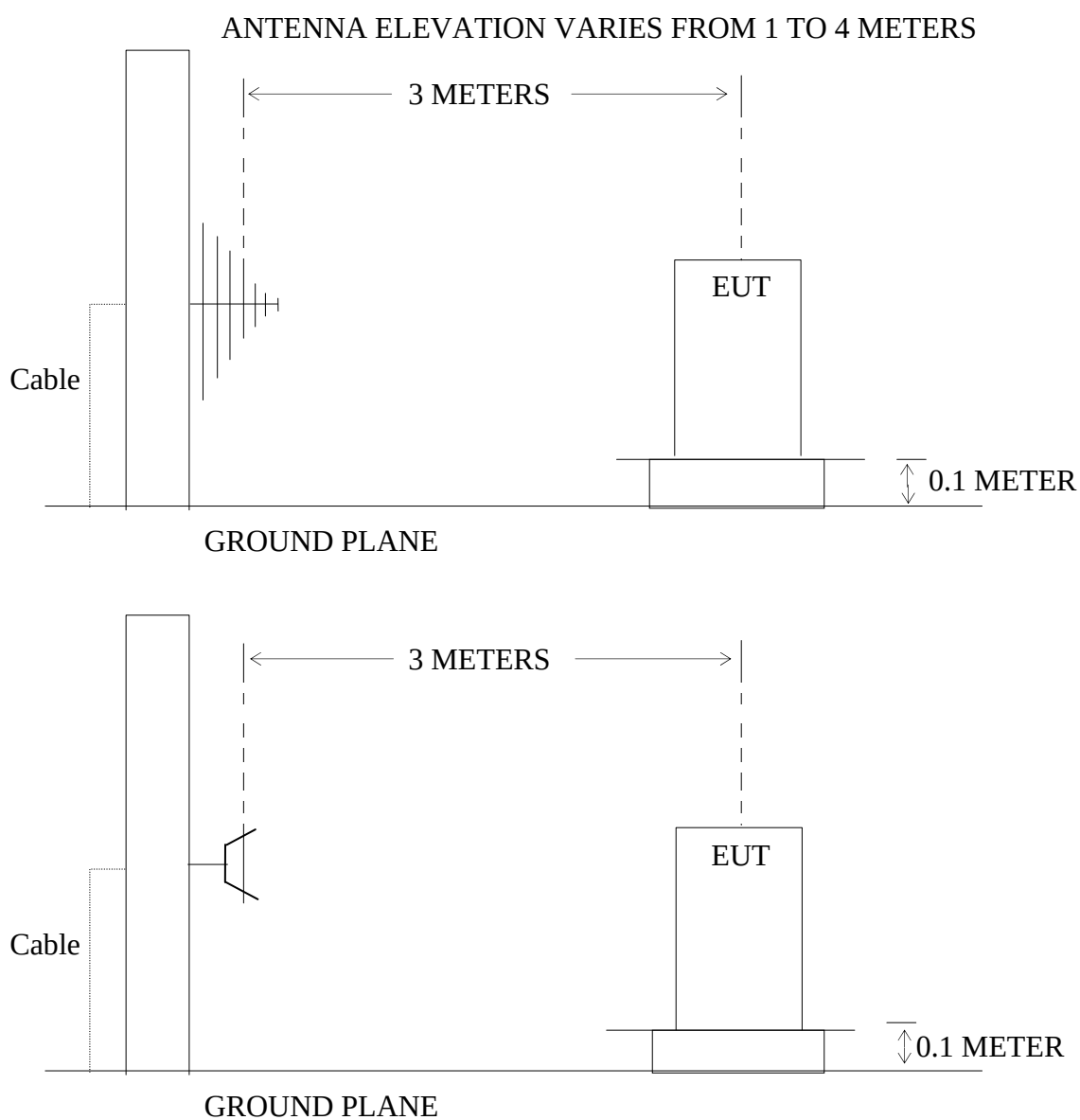
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and simulators



(EUT: Active Floorstanding Loudspeaker System)

10.1.2.Anechoic Chamber Test Setup Diagram



10.2.The Limit For Section 15.247(d)

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

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

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

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

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

²Above 38.6

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

10.4.Configuration of EUT on Measurement

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

10.5.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.1 meter (below 1G) or 1.5 meter (above 1G) high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2013 on radiated emission measurement.

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

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

Peak detector above 1GHz

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

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

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

10.6.The Field Strength of Radiation Emission Measurement Results

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

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

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

4. The EUT is tested radiation emission in three axes. The worst emissions are reported in all channels.



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Job No.: STAR2015 #1719

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

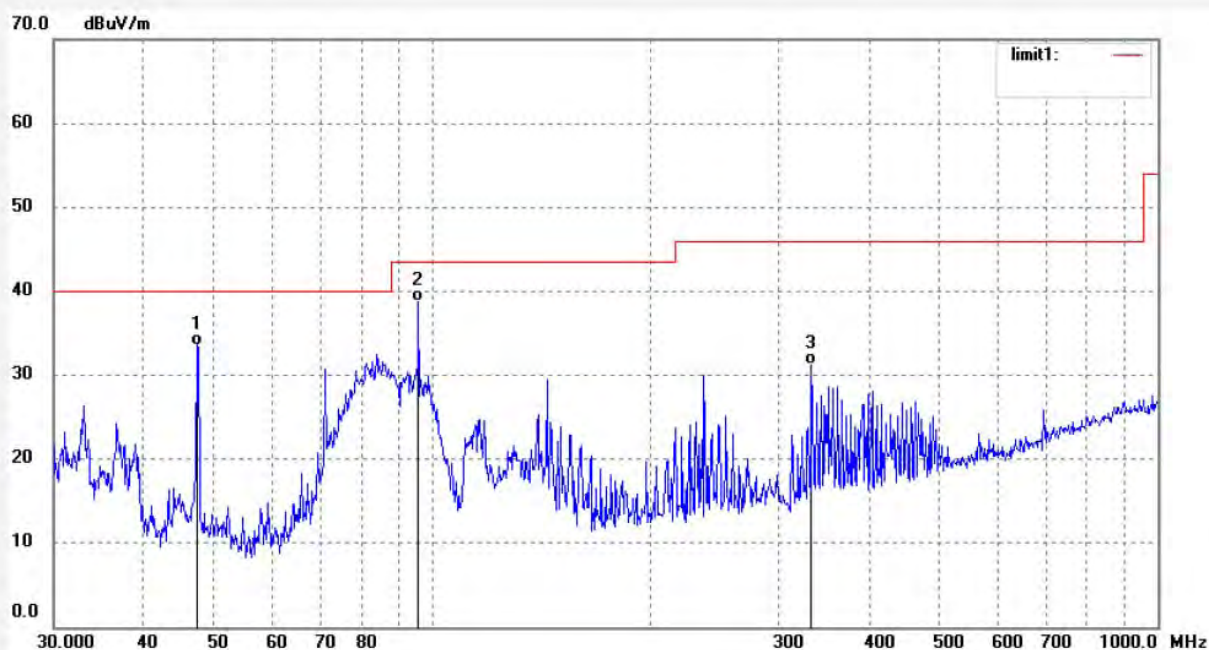
Date: 15/09/01/

Time: 11/17/48

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	47.3688	53.61	-20.01	33.60	40.00	-6.40	QP			
2	95.6485	60.21	-21.48	38.73	43.50	-4.77	QP			
3	332.9536	46.38	-15.22	31.16	46.00	-14.84	QP			



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Job No.: STAR2015 #1720

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

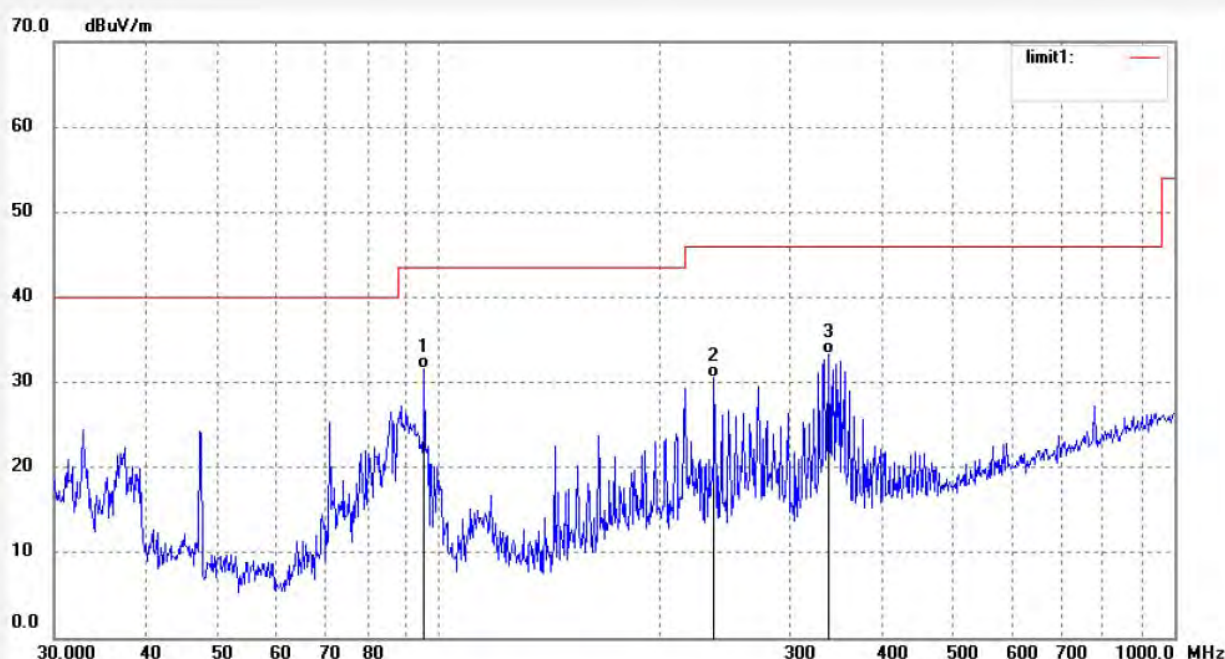
Date: 15/09/01/

Time: 11/18/35

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878





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Job No.: STAR2015 #1721

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2441MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

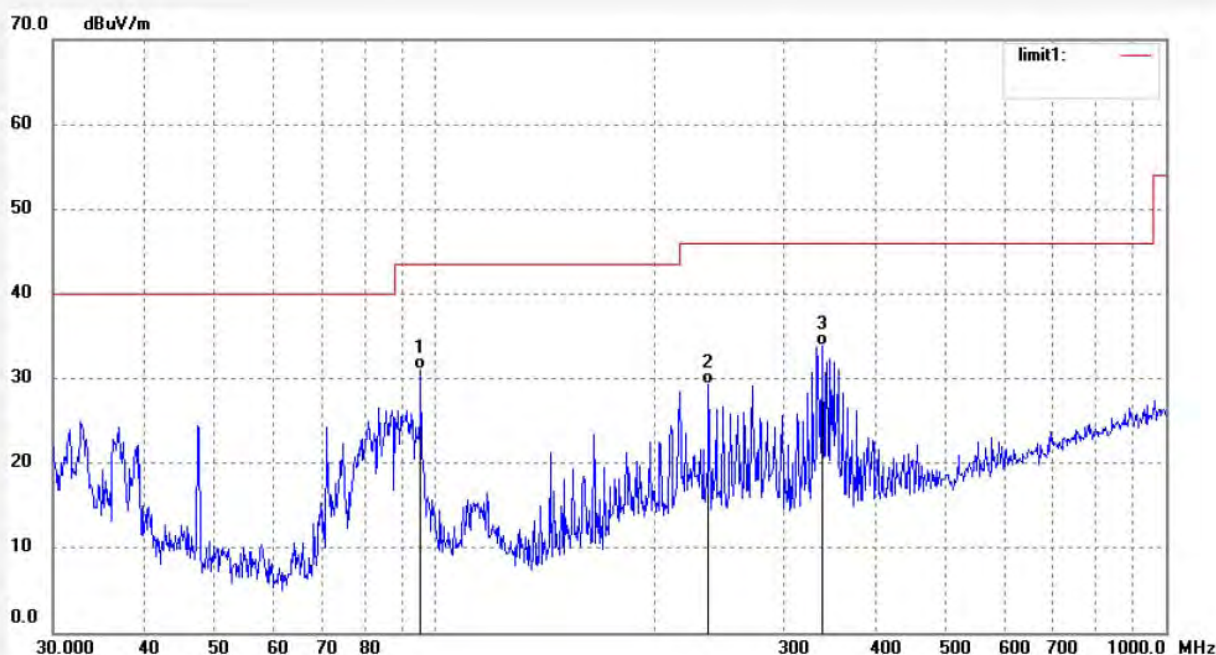
Date: 15/09/01/

Time: 11/19/17

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6484	52.52	-21.48	31.04	43.50	-12.46	QP			
2	236.7927	47.64	-18.27	29.37	46.00	-16.63	QP			
3	338.8546	48.94	-15.04	33.90	46.00	-12.10	QP			



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Job No.: STAR2015 #1722

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2441MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

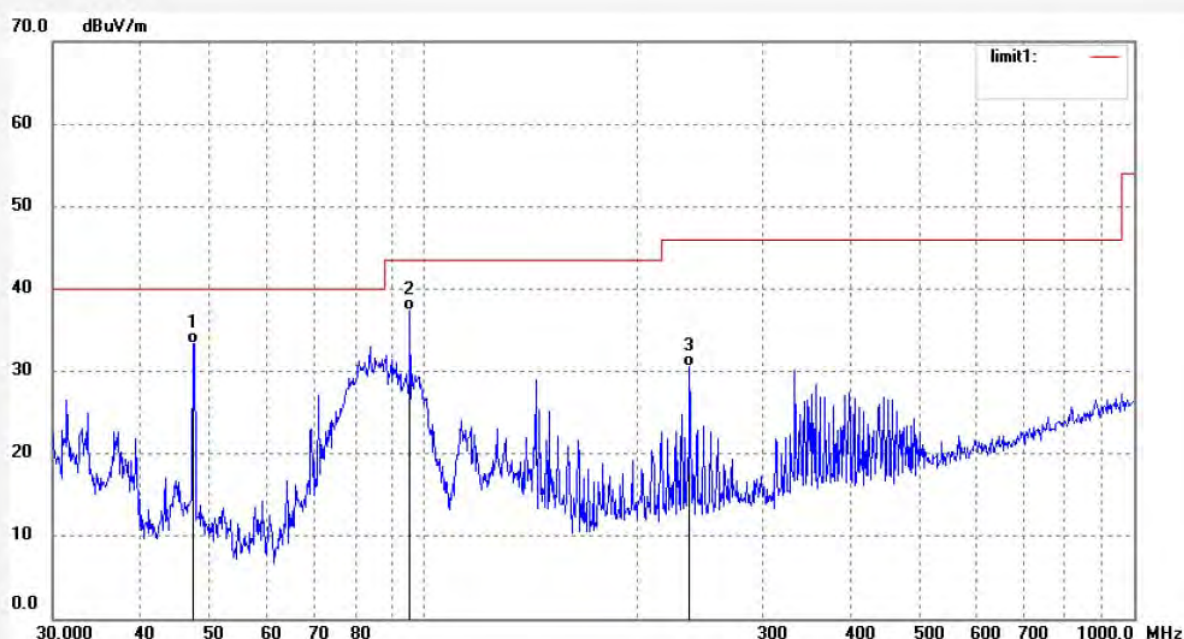
Date: 15/09/01/

Time: 11/20/27

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	47.3688	53.31	-20.01	33.30	40.00	-6.70	QP			
2	95.6484	58.90	-21.48	37.42	43.50	-6.08	QP			
3	236.7927	48.89	-18.27	30.62	46.00	-15.38	QP			



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Job No.: STAR2015 #1723

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

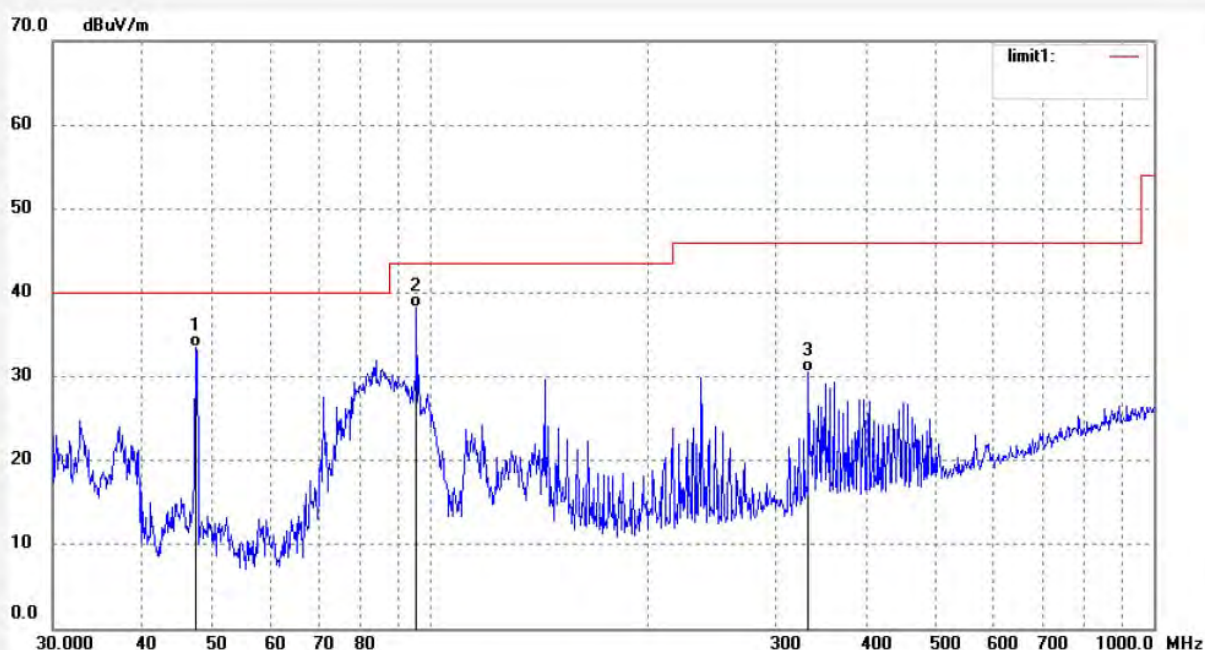
Date: 15/09/01/

Time: 11/21/14

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	47.3688	53.47	-20.01	33.46	40.00	-6.54	QP			
2	95.6484	59.70	-21.48	38.22	43.50	-5.28	QP			
3	332.9534	45.77	-15.22	30.55	46.00	-15.45	QP			



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Job No.: STAR2015 #1724

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

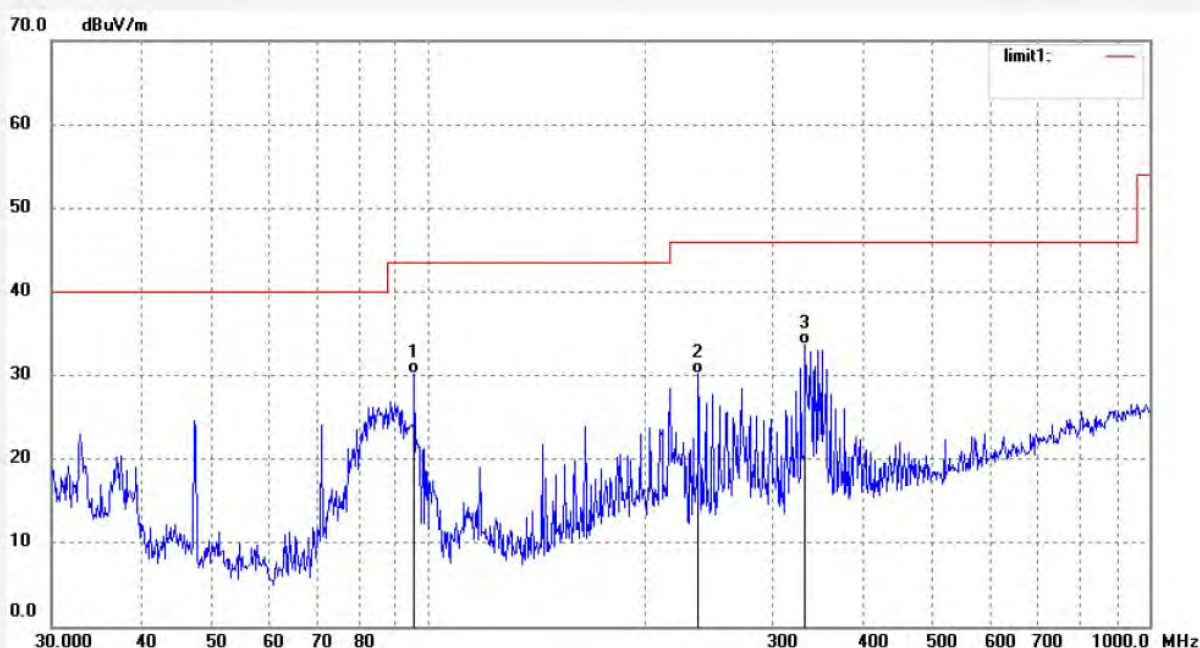
Date: 15/09/01/

Time: 11/21/56

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6484	51.62	-21.48	30.14	43.50	-13.36	QP			
2	236.7927	48.39	-18.27	30.12	46.00	-15.88	QP			
3	332.9534	48.93	-15.22	33.71	46.00	-12.29	QP			



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Job No.: STAR2015 #1725

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

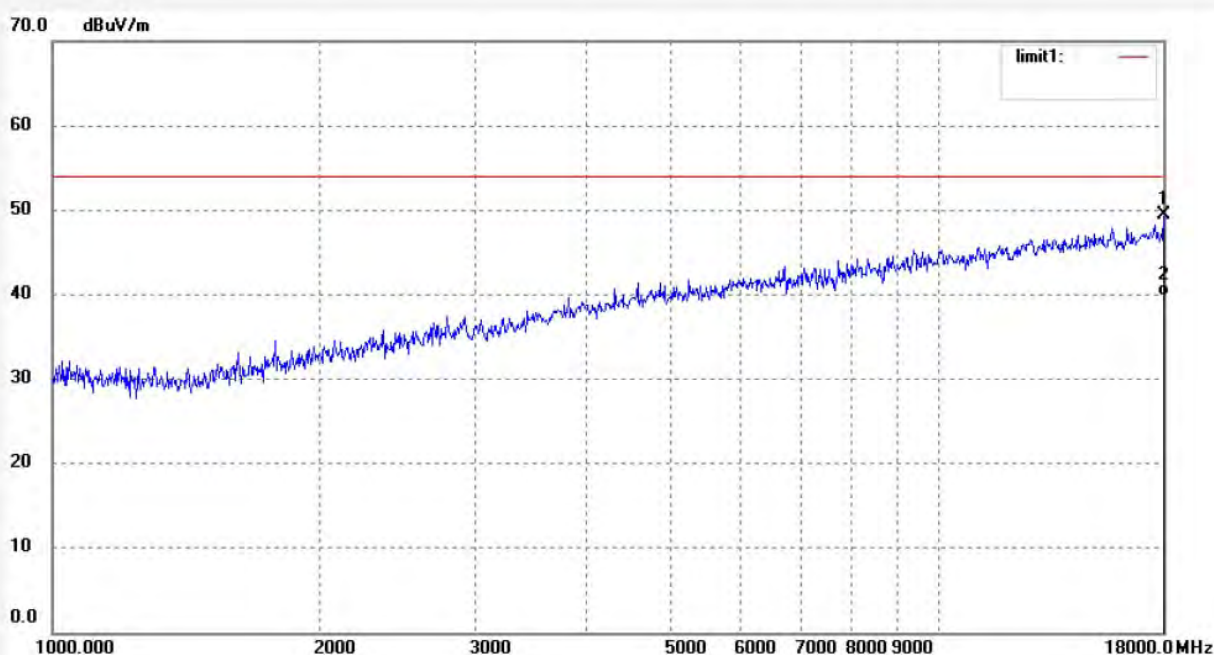
Date: 15/09/01/

Time: 11/23/20

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	18000.000	33.97	15.48	49.45	54.00	-4.55	peak			
2	18000.000	24.31	15.48	39.79	54.00	-14.21	AVG			



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Job No.: STAR2015 #1726

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

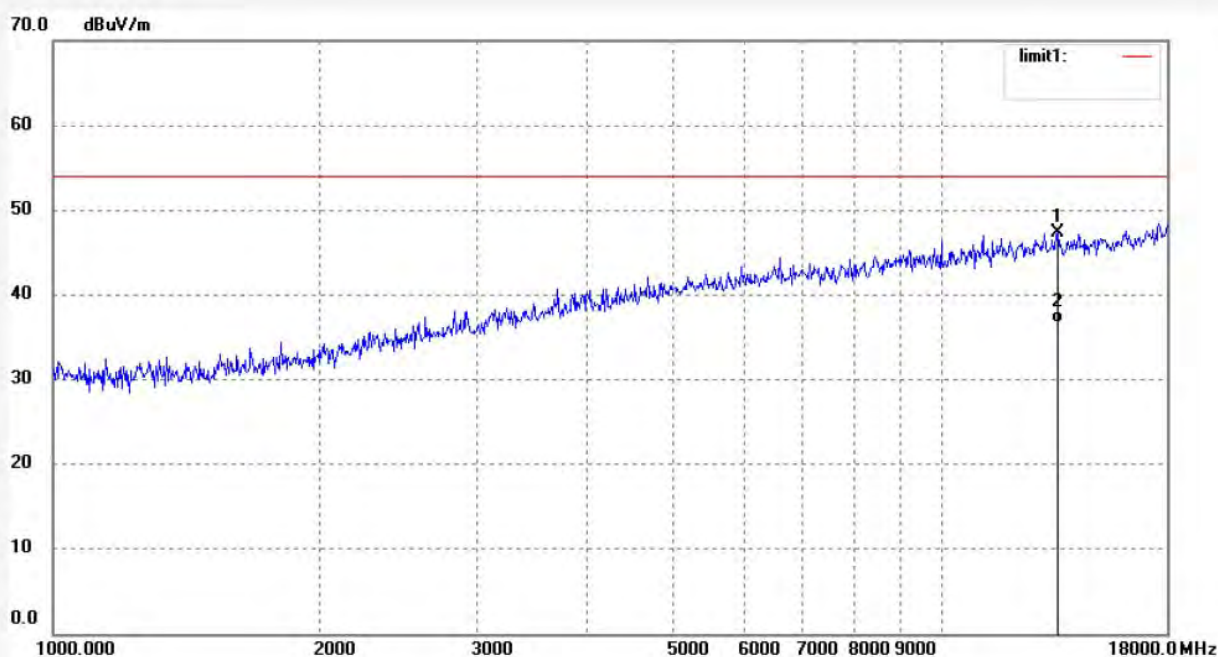
Date: 15/09/01/

Time: 11/24/39

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	13572.278	36.76	10.59	47.35	54.00	-6.65	peak			
2	13572.278	26.14	10.59	36.73	54.00	-17.27	AVG			



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Job No.: STAR2015 #1727

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2441MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

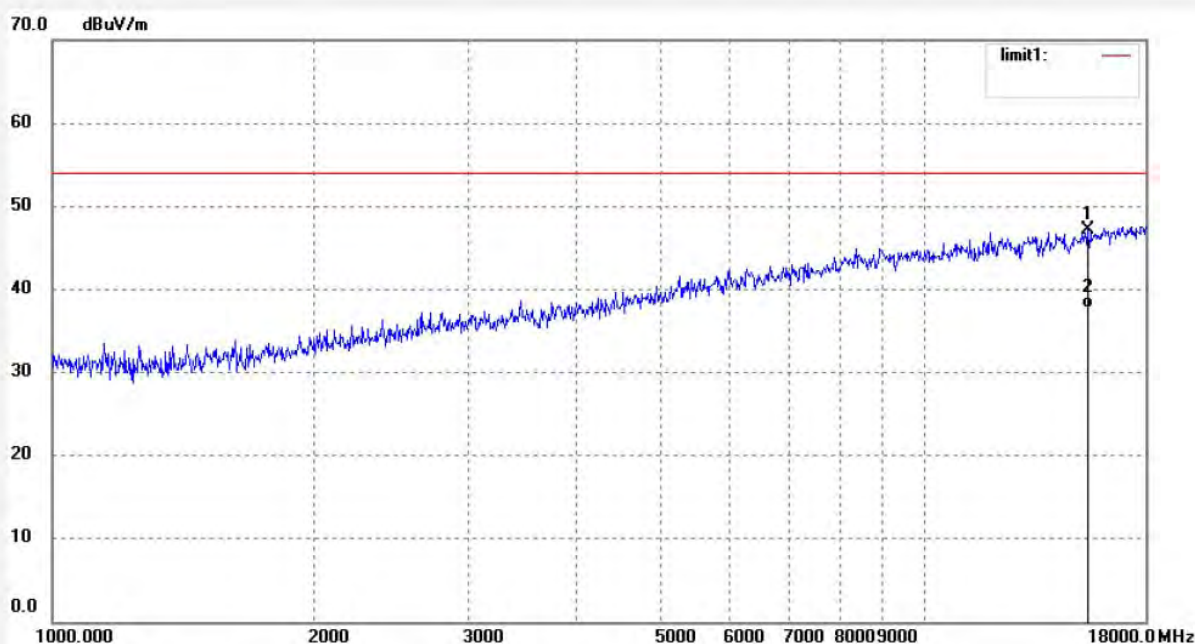
Date: 15/09/01/

Time: 11/26/03

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	15471.706	34.60	12.64	47.24	54.00	-6.76	peak			
2	15471.706	25.13	12.64	37.77	54.00	-16.23	AVG			



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Job No.: STAR2015 #1728

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2441MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

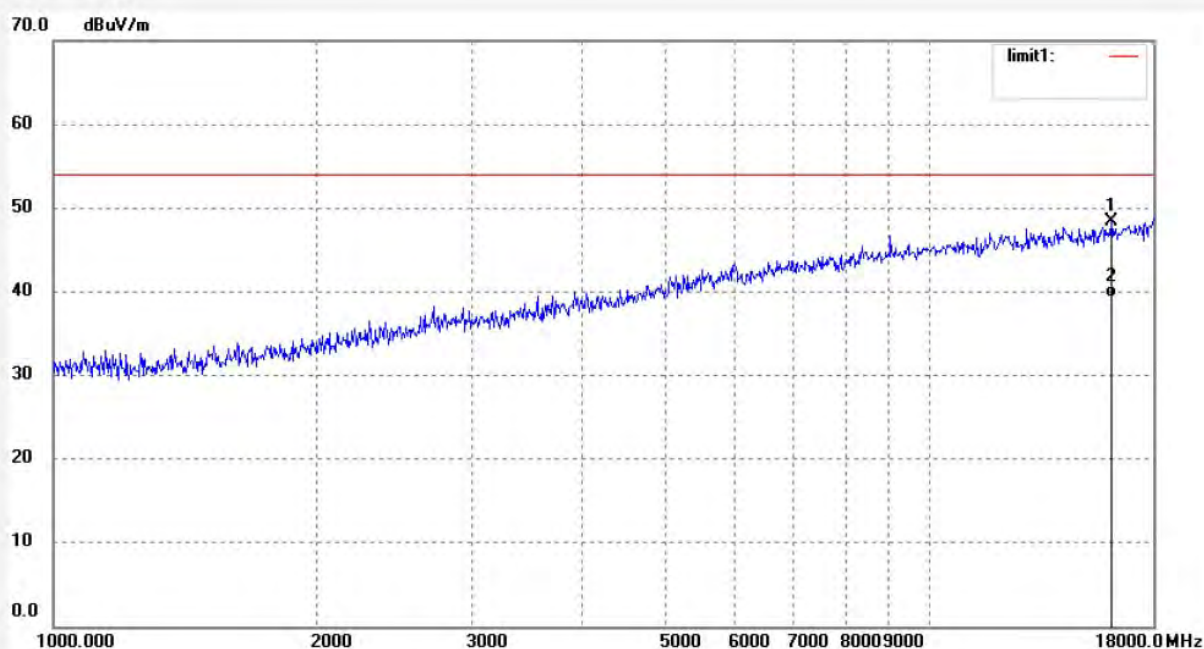
Date: 15/09/01/

Time: 11/27/53

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	16115.207	35.47	12.92	48.39	54.00	-5.61	peak			
2	16115.207	26.30	12.92	39.22	54.00	-14.78	AVG			



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Job No.: STAR2015 #1729

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

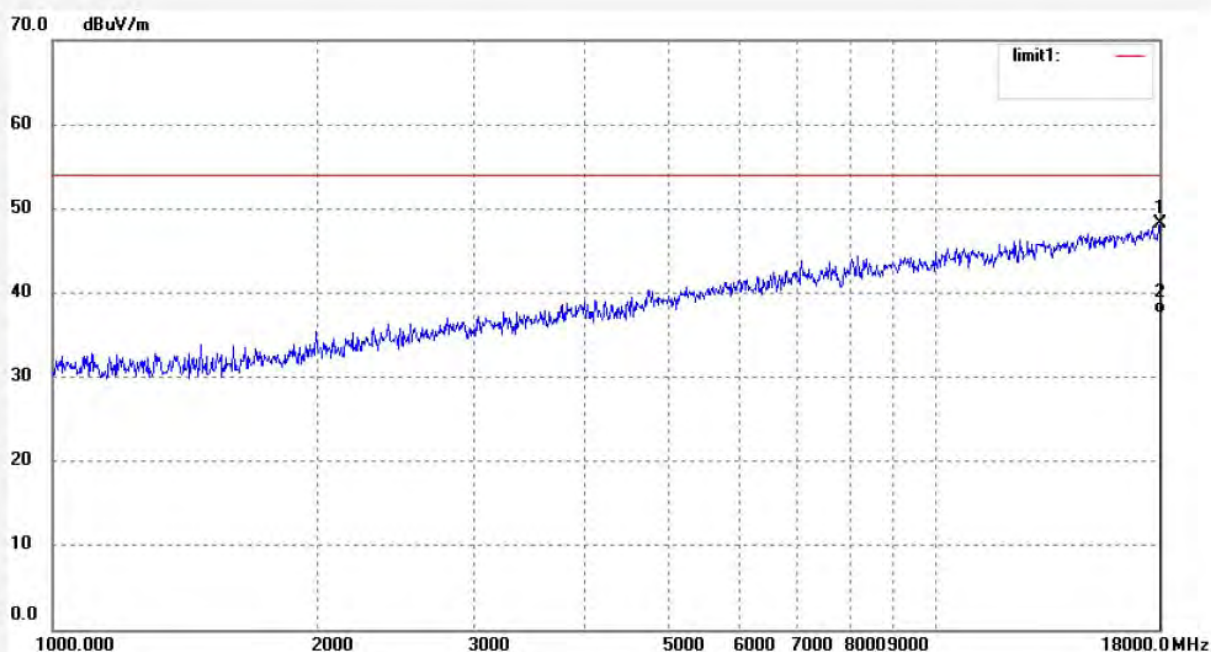
Date: 15/09/01/

Time: 11/29/16

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	18000.000	32.70	15.48	48.18	54.00	-5.82	peak			
2	18000.000	22.00	15.48	37.48	54.00	-16.52	AVG			



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Job No.: STAR2015 #1730

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

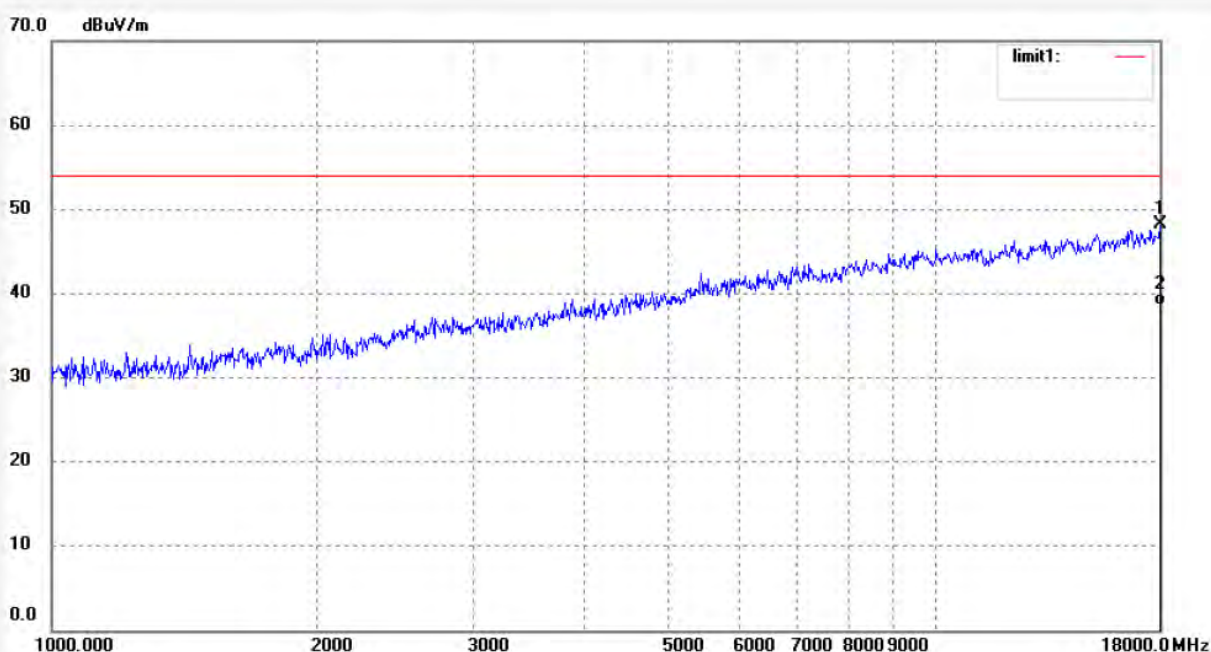
Date: 15/09/01/

Time: 11/30/25

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	18000.000	32.75	15.48	48.23	54.00	-5.77	peak			
2	18000.000	23.13	15.48	38.61	54.00	-15.39	AVG			

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Active Floorstanding Loudspeaker System)

11.2.The Requirement For Section 15.247(d)

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

11.3.EUT Configuration on Measurement

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

11.4.Operating Condition of EUT

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

11.4.2.Turn on the power of all equipment.

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

11.5. Test Procedure

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

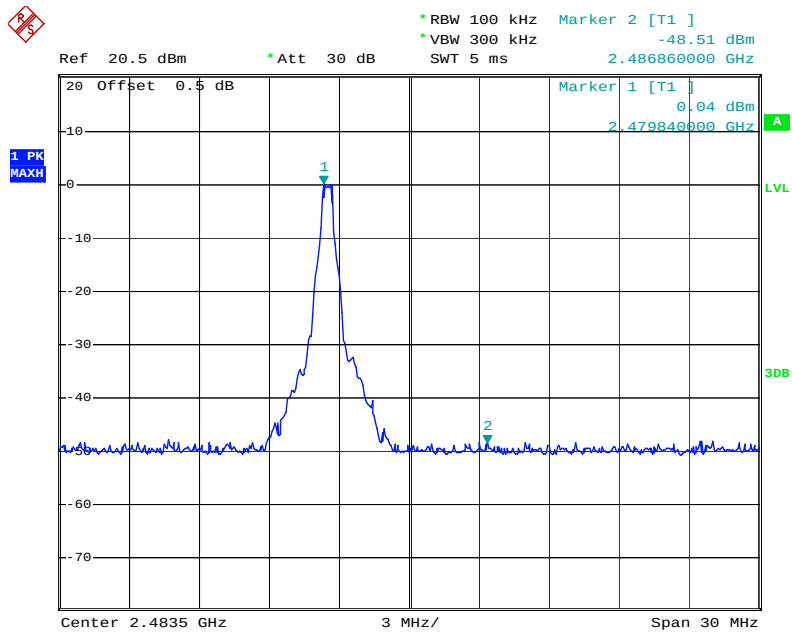
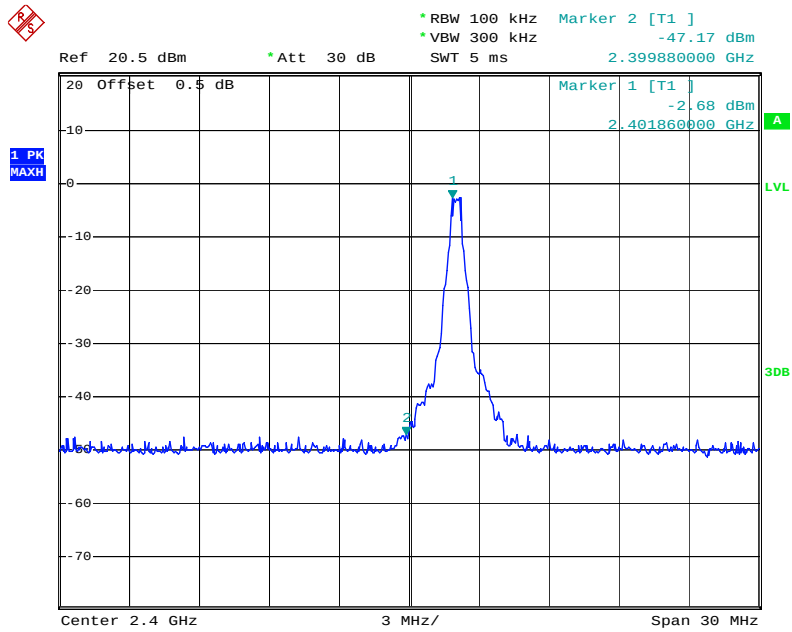
11.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3. The band edges was measured and recorded.

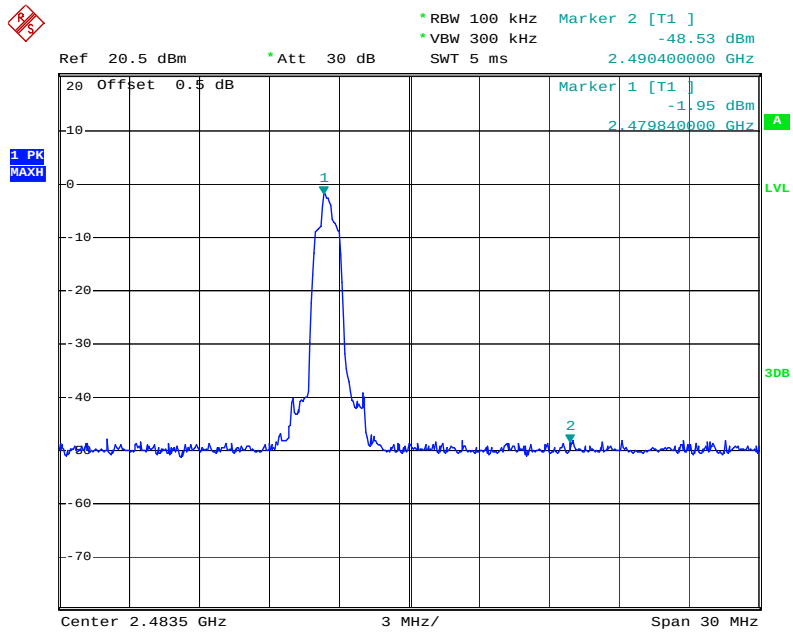
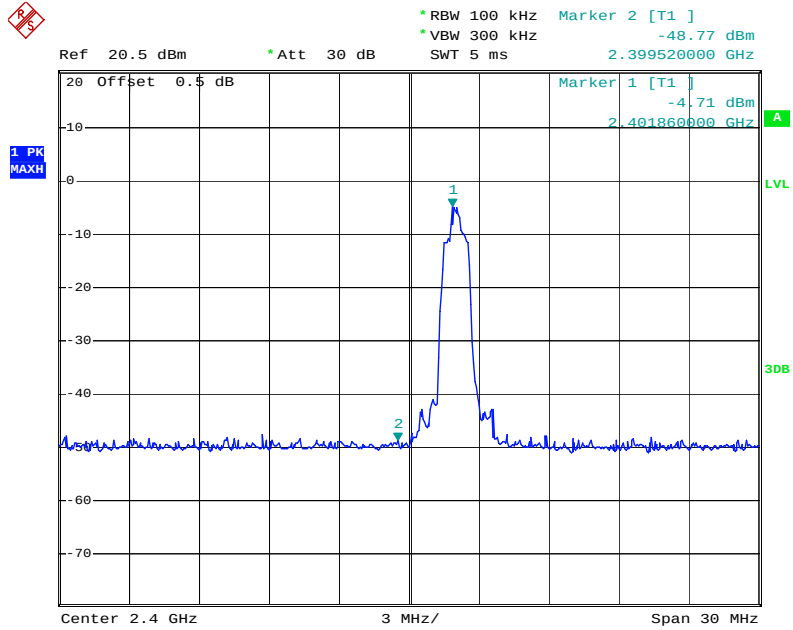
11.6. Test Result

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK		
2399.880	44.49	> 20dBc
2486.860	48.55	> 20dBc
Π/4-DQPSK Mode		
2399.520	44.06	> 20dBc
2490.400	46.58	> 20dBc
8DPSK		
2398.920	43.27	> 20dBc
2485.300	46.71	> 20dBc

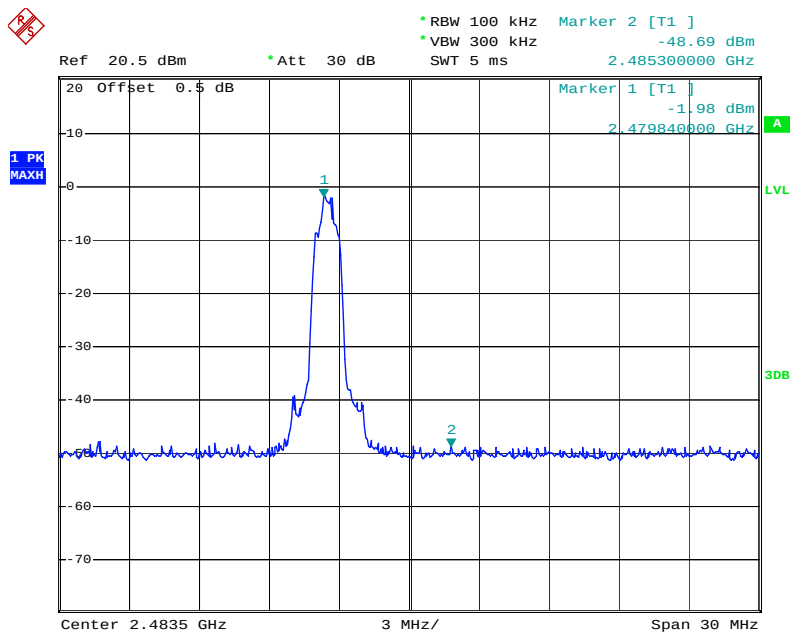
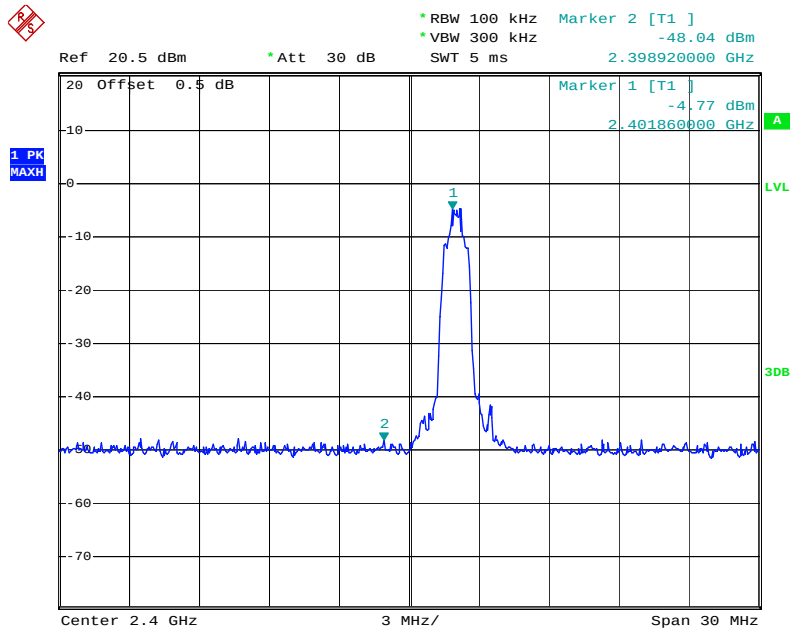
GFSK



$\Pi/4$ -DQPSK Mode



8DPSK



Radiated Band Edge Result

Note:

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

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 0.1 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2009 on radiated emission measurement. The 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.: STAR #3958

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz(GFSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

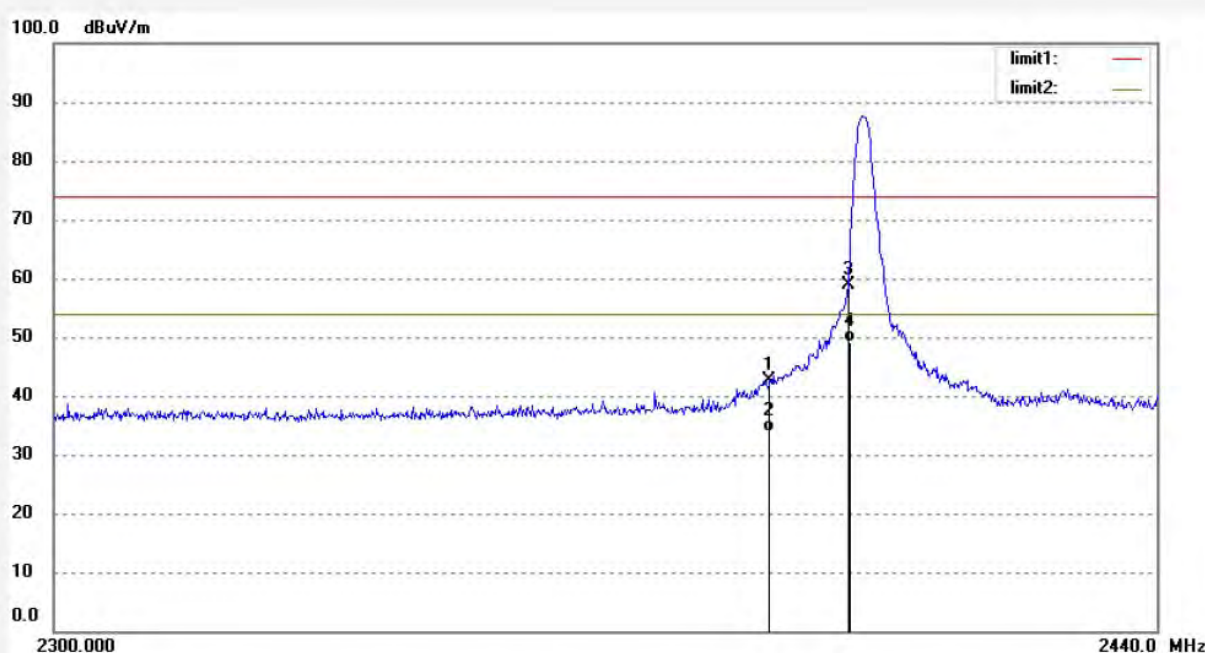
Date: 15/09/02/

Time: 8/44/05

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	49.39	-6.78	42.61	74.00	-31.39	peak			
2	2390.000	40.64	-6.78	33.86	54.00	-20.14	AVG			
3	2400.000	65.67	-6.76	58.91	74.00	-15.09	peak			
4	2400.000	55.97	-6.76	49.21	54.00	-4.79	AVG			



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Job No.: STAR #3959

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz(GFSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

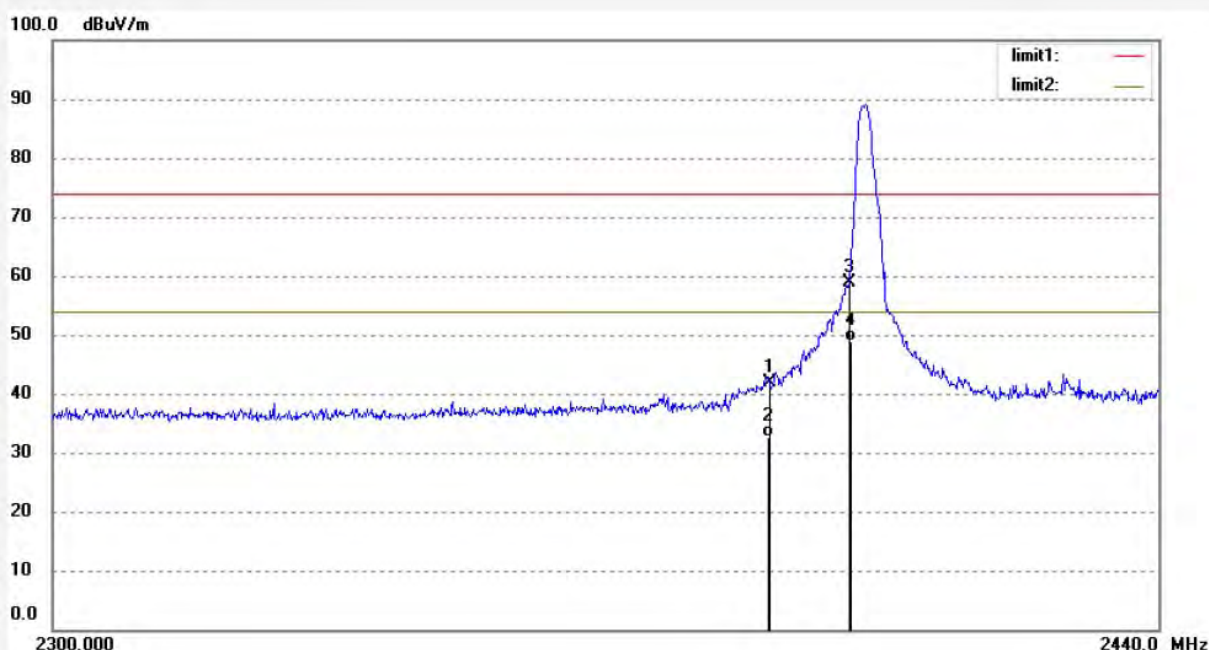
Date: 15/09/02/

Time: 8/48/19

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	48.75	-6.78	41.97	74.00	-32.03	peak			
2	2390.000	39.50	-6.78	32.72	54.00	-21.28	AVG			
3	2400.000	65.59	-6.76	58.83	74.00	-15.17	peak			
4	2400.000	55.64	-6.76	48.88	54.00	-5.12	AVG			

Job No.: STAR #3960

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz(PI/4DQPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

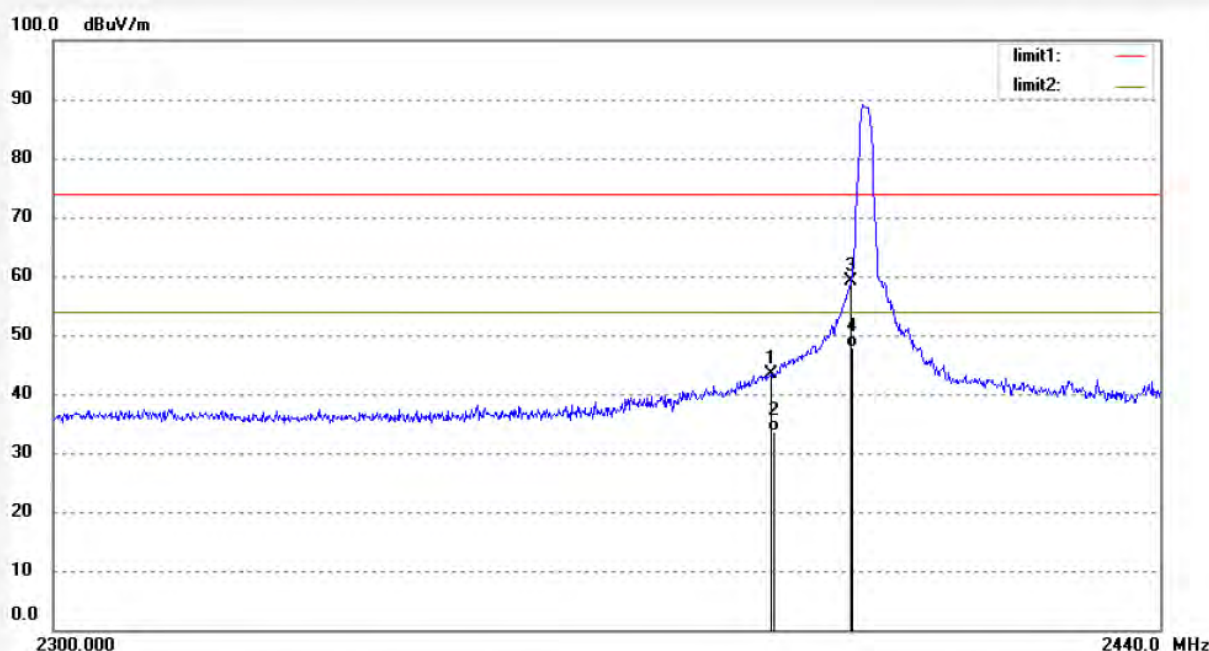
Date: 15/09/02/

Time: 8/52/46

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	50.04	-6.78	43.26	74.00	-30.74	peak			
2	2390.000	40.31	-6.78	33.53	54.00	-20.47	AVG			
3	2400.000	65.91	-6.76	59.15	74.00	-14.85	peak			
4	2400.000	54.67	-6.76	47.91	54.00	-6.09	AVG			



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Job No.: STAR #3961

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz(PI/4DQPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

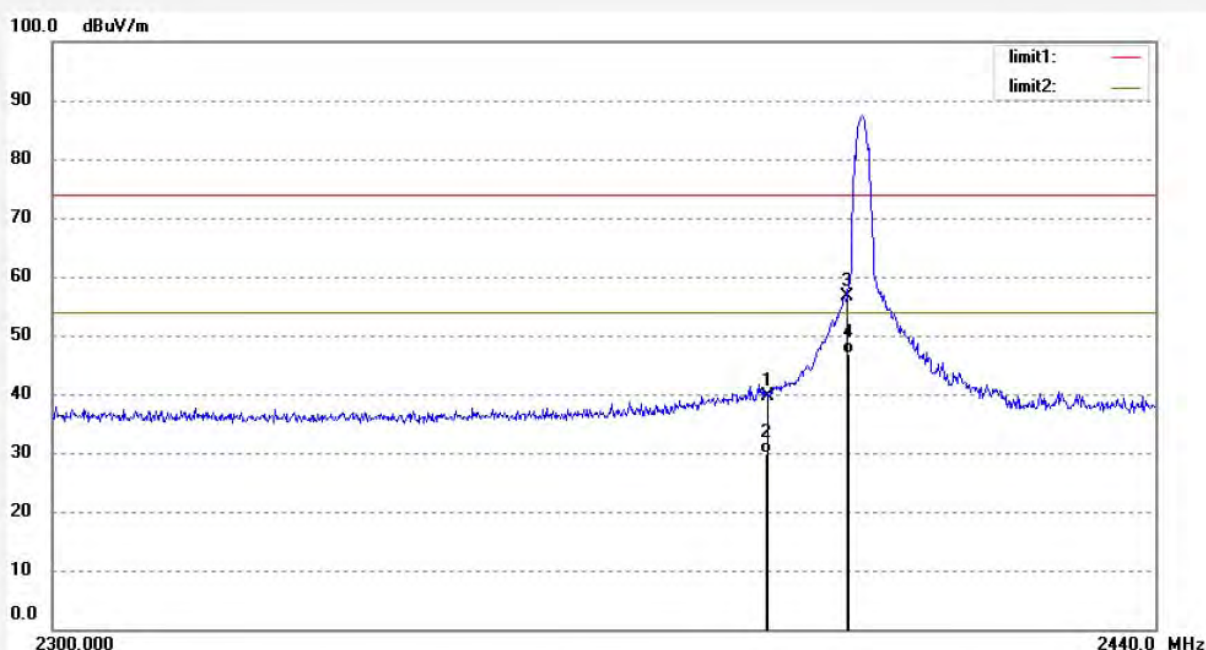
Date: 15/09/02/

Time: 8/55/45

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	46.51	-6.78	39.73	74.00	-34.27	peak			
2	2390.000	36.70	-6.78	29.92	54.00	-24.08	AVG			
3	2400.000	63.47	-6.76	56.71	74.00	-17.29	peak			
4	2400.000	53.67	-6.76	46.91	54.00	-7.09	AVG			



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Job No.: STAR #3962

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz(8DPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

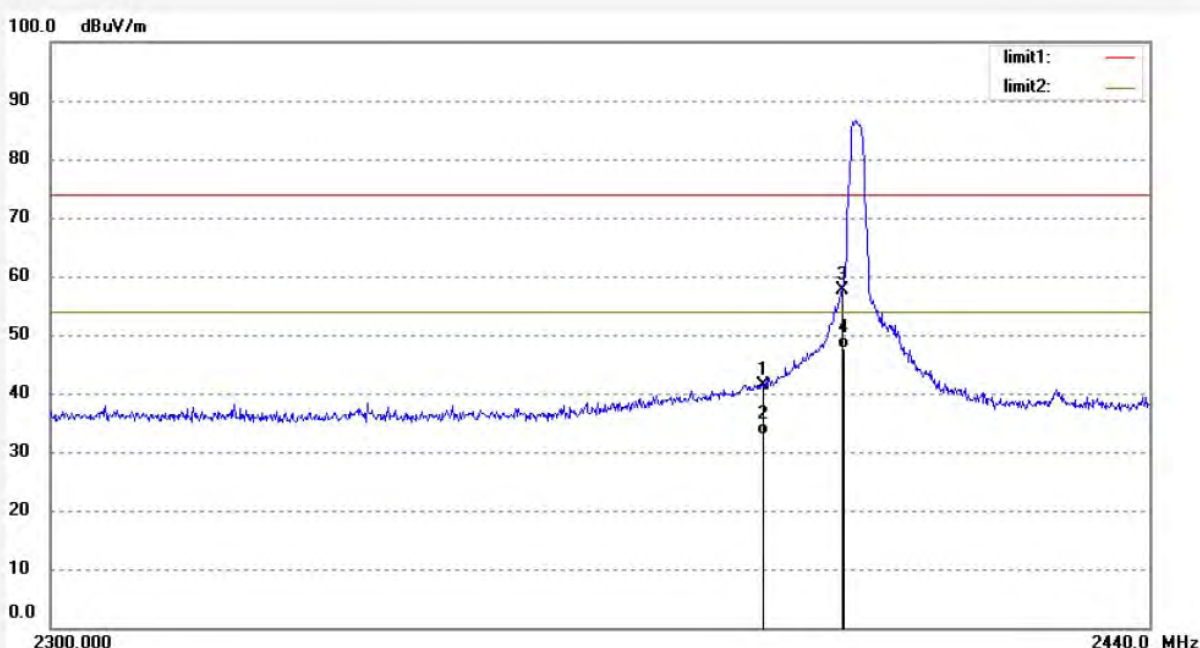
Date: 15/09/02/

Time: 8/58/50

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	48.27	-6.78	41.49	74.00	-32.51	peak			
2	2390.000	39.62	-6.78	32.84	54.00	-21.16	AVG			
3	2400.000	64.44	-6.76	57.68	74.00	-16.32	peak			
4	2400.000	54.39	-6.76	47.63	54.00	-6.37	AVG			



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Job No.: STAR #3963

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2402MHz(8DPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

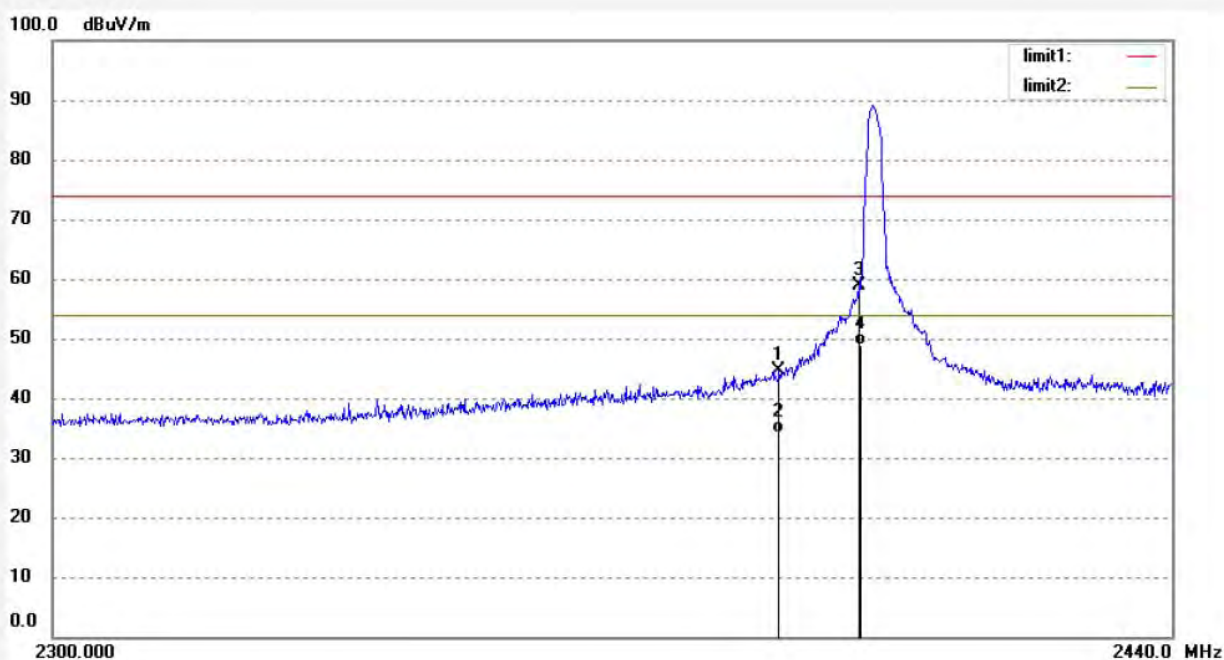
Date: 15/09/02/

Time: 9/03/58

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	51.36	-6.78	44.58	74.00	-29.42	peak			
2	2390.000	40.86	-6.78	34.08	54.00	-19.92	AVG			
3	2400.000	65.65	-6.76	58.89	74.00	-15.11	peak			
4	2400.000	55.67	-6.76	48.91	54.00	-5.09	AVG			



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Job No.: STAR #3964

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz(GFSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

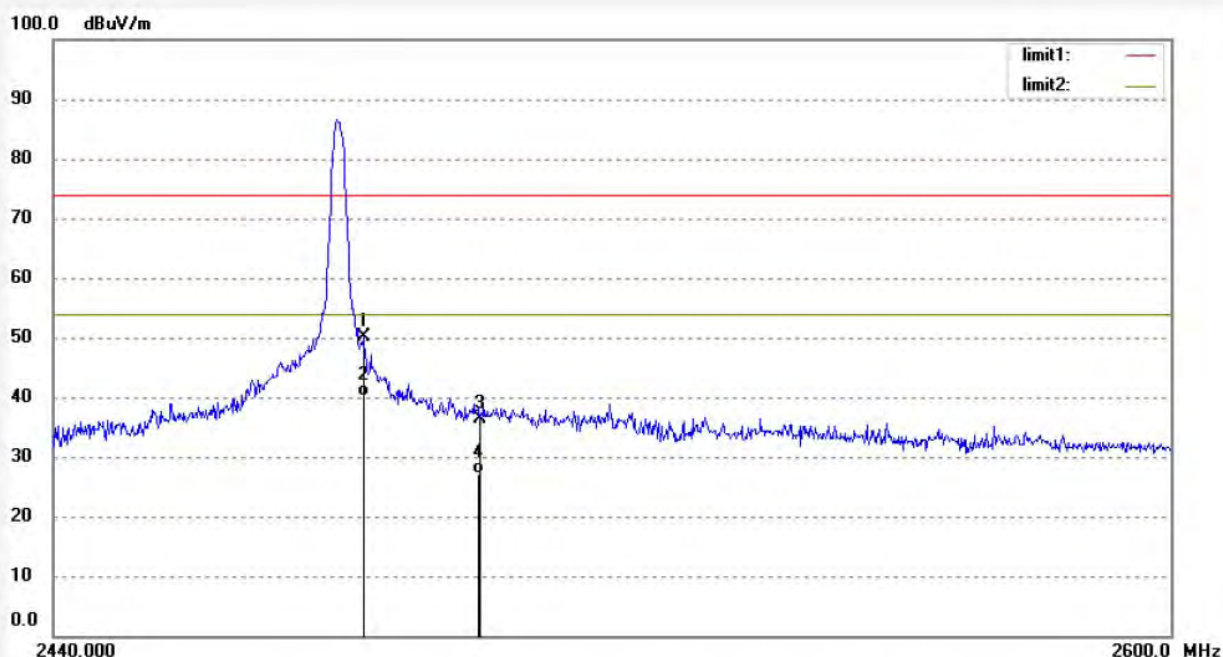
Date: 15/09/02/

Time: 9/07/04

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	56.79	-6.54	50.25	74.00	-23.75	peak			
2	2483.500	46.79	-6.54	40.25	54.00	-13.75	AVG			
3	2500.000	42.79	-6.50	36.29	74.00	-37.71	peak			
4	2500.000	33.62	-6.50	27.12	54.00	-26.88	AVG			



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Job No.: STAR #3965

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz(GFSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

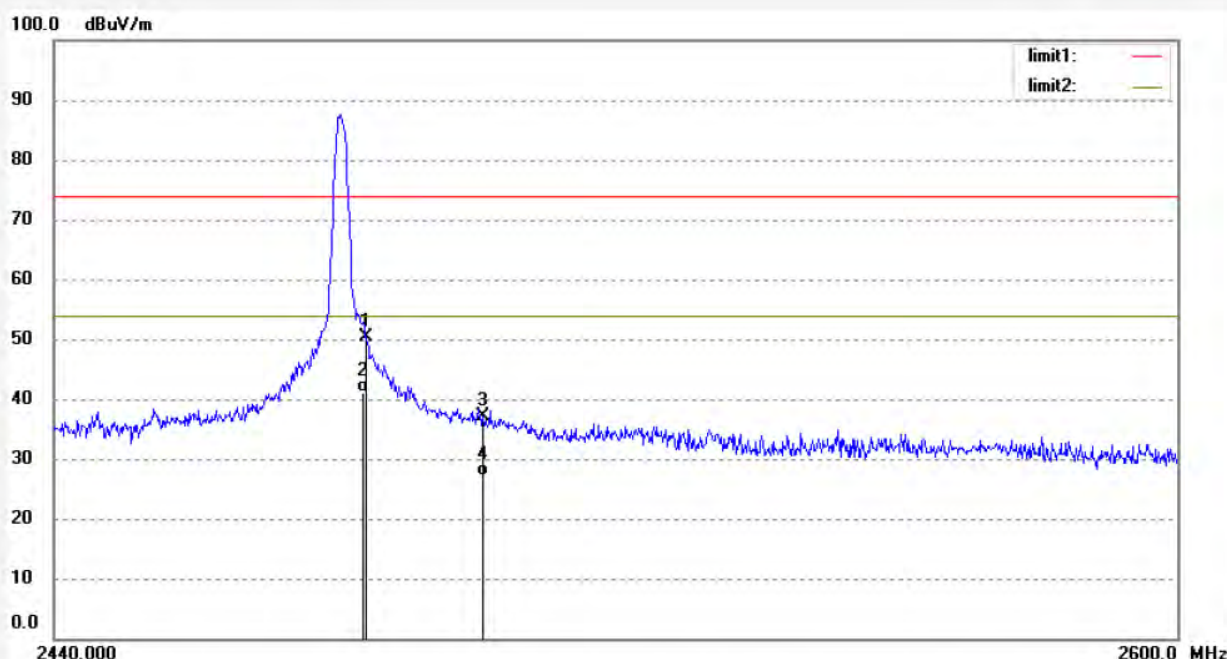
Date: 15/09/02/

Time: 9/11/34

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	57.02	-6.54	50.48	74.00	-23.52	peak			
2	2483.500	47.58	-6.54	41.04	54.00	-12.96	AVG			
3	2500.000	43.62	-6.50	37.12	74.00	-36.88	peak			
4	2500.000	33.67	-6.50	27.17	54.00	-26.83	AVG			



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Job No.: STAR #3966

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz(8DPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

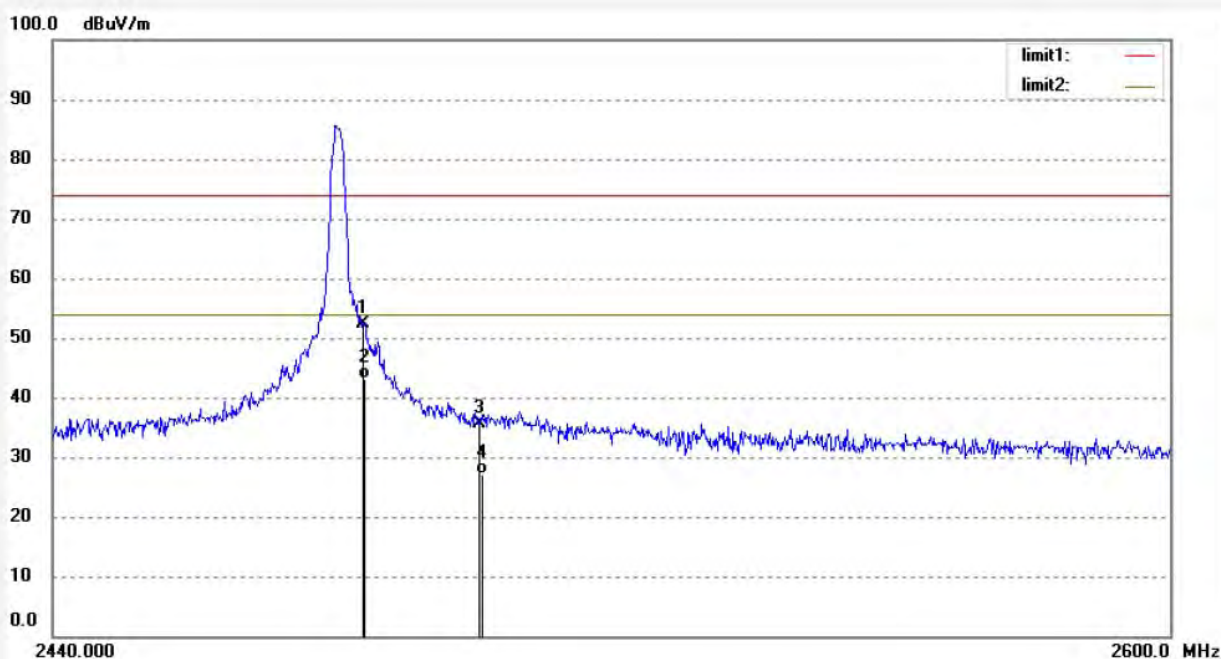
Date: 15/09/02/

Time: 9/15/59

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	58.81	-6.54	52.27	74.00	-21.73	peak			
2	2483.500	49.66	-6.54	43.12	54.00	-10.88	AVG			
3	2500.000	42.02	-6.50	35.52	74.00	-38.48	peak			
4	2500.000	33.51	-6.50	27.01	54.00	-26.99	AVG			



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Job No.: STAR #3967

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz(8DPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

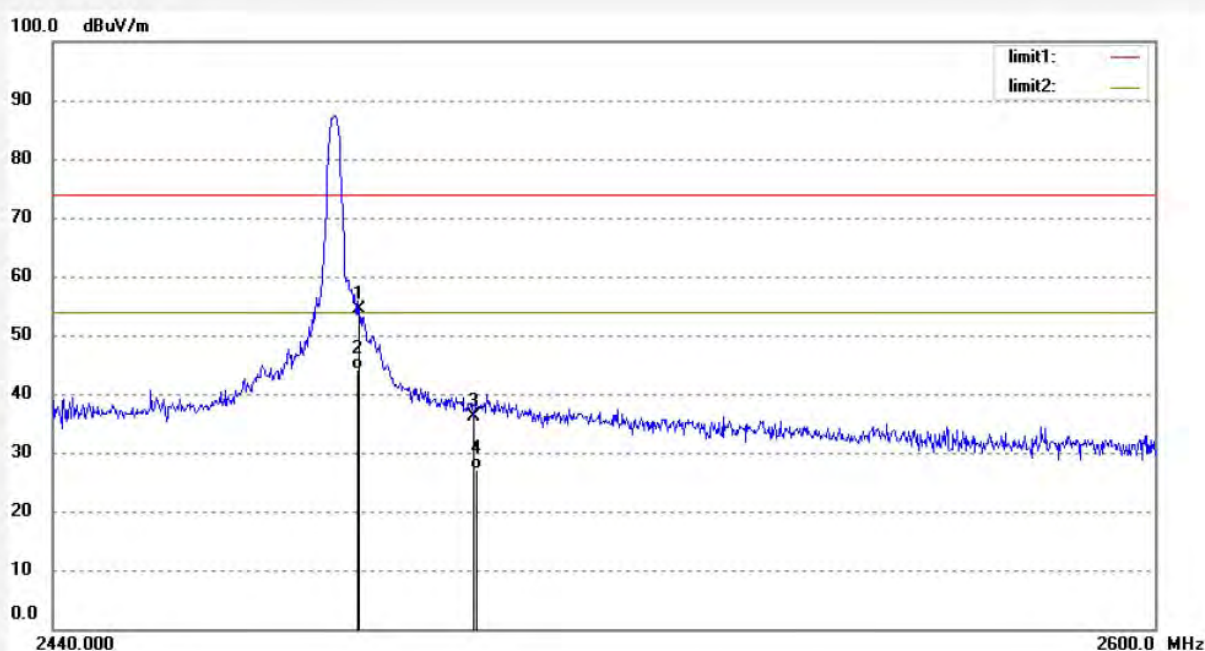
Date: 15/09/02/

Time: 9/19/53

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	60.87	-6.54	54.33	74.00	-19.67	peak			
2	2483.500	50.67	-6.54	44.13	54.00	-9.87	AVG			
3	2500.000	42.60	-6.50	36.10	74.00	-37.90	peak			
4	2500.000	33.67	-6.50	27.17	54.00	-26.83	AVG			



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Job No.: STAR #3968

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz(PI/4DQPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

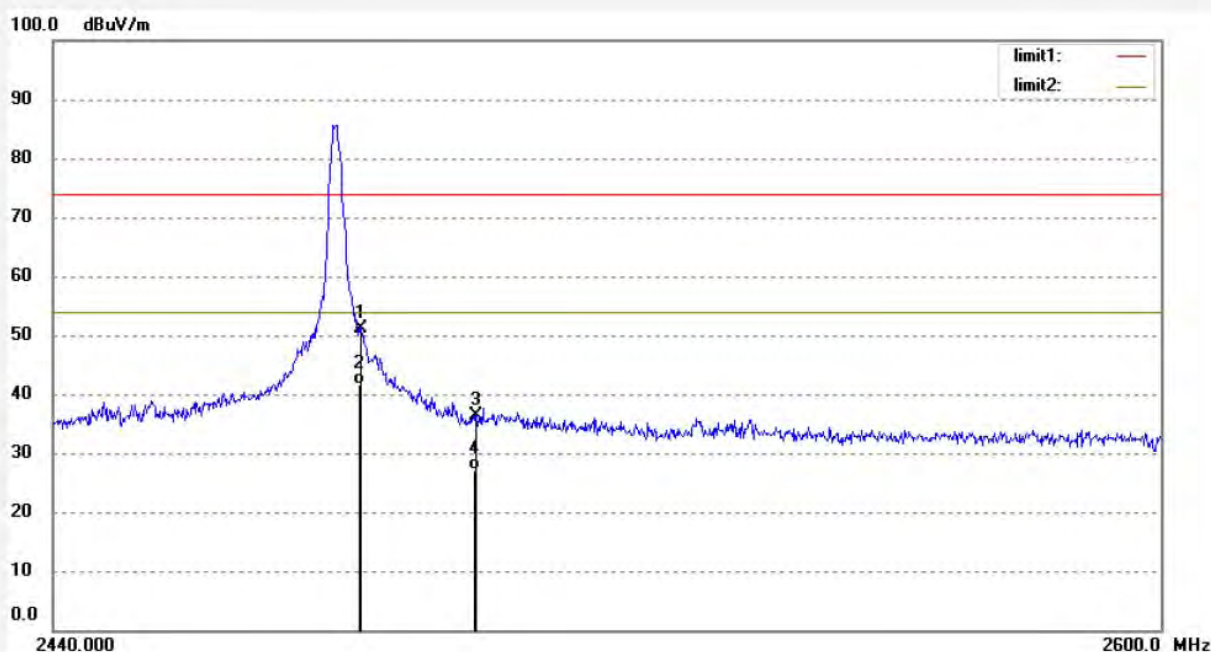
Date: 15/09/02/

Time: 9/23/20

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	57.77	-6.54	51.23	74.00	-22.77	peak			
2	2483.500	48.16	-6.54	41.62	54.00	-12.38	AVG			
3	2500.000	42.90	-6.50	36.40	74.00	-37.60	peak			
4	2500.000	33.55	-6.50	27.05	54.00	-26.95	AVG			



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Fax:+86-0755-26503396

Job No.: STAR #3969

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: TX 2480MHz(PI/4DQPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

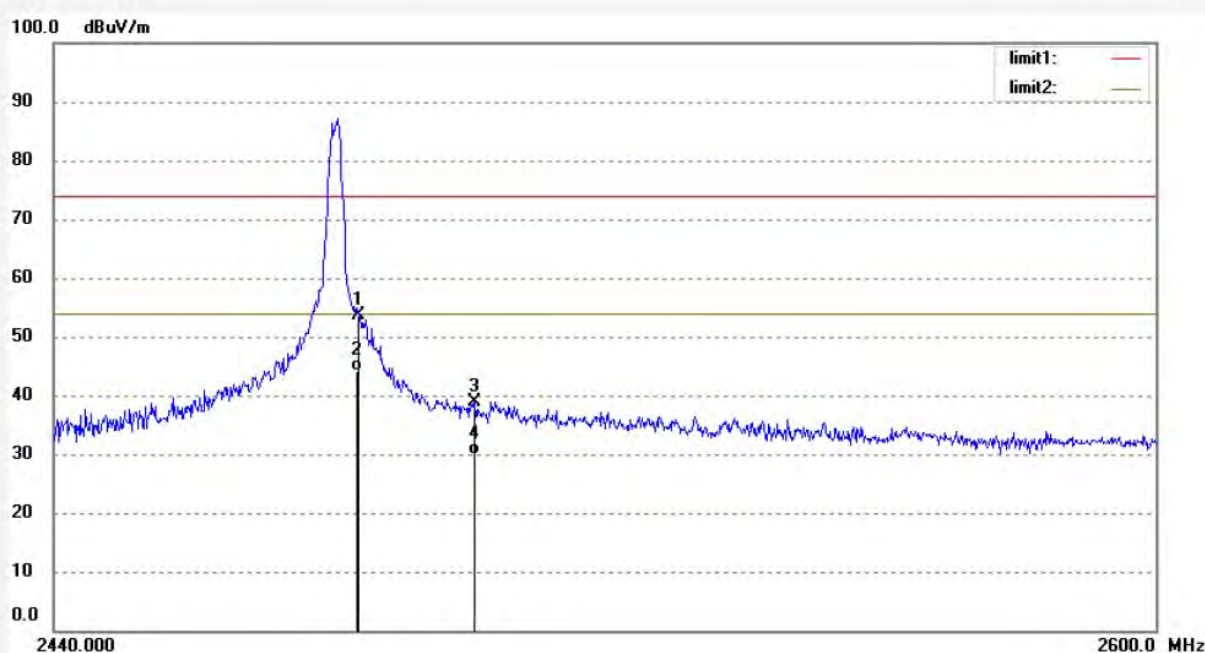
Date: 15/09/02/

Time: 9/28/07

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	60.16	-6.54	53.62	74.00	-20.38	peak			
2	2483.500	50.67	-6.54	44.13	54.00	-9.87	AVG			
3	2500.000	45.34	-6.50	38.84	74.00	-35.16	peak			
4	2500.000	36.44	-6.50	29.94	54.00	-24.06	AVG			

Hopping mode



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Job No.: STAR #3996

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: HOPPING (GFSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

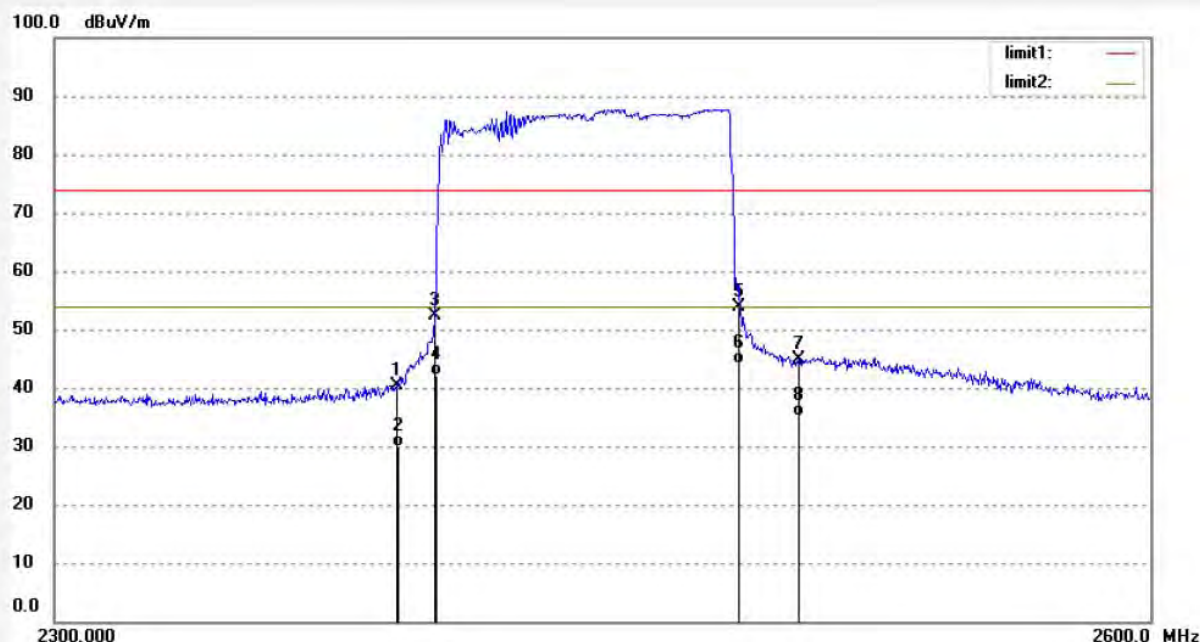
Date: 15/09/02/

Time: 9:35:18

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	47.19	-6.78	40.41	74.00	-33.59	peak			
2	2390.000	36.78	-6.78	30.00	54.00	-24.00	AVG			
3	2400.000	59.11	-6.76	52.35	74.00	-21.65	peak			
4	2400.000	49.00	-6.76	42.24	54.00	-11.76	AVG			
5	2483.500	60.54	-6.54	54.00	74.00	-20.00	peak			
6	2483.500	50.67	-6.54	44.13	54.00	-9.87	AVG			
7	2500.000	51.37	-6.50	44.87	74.00	-29.13	peak			
8	2500.000	41.69	-6.50	35.19	54.00	-18.81	AVG			



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Job No.: STAR #3997

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: HOPPING (GFSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

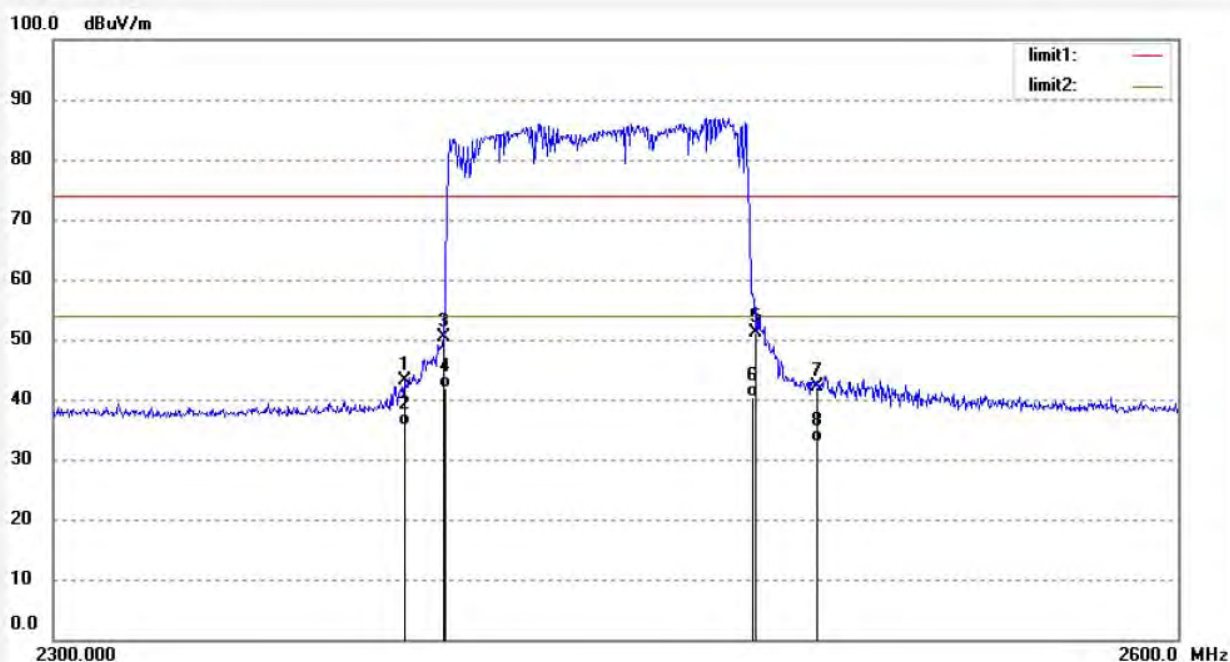
Date: 15/09/02/

Time: 9:39:45

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	49.92	-6.78	43.14	74.00	-30.86	peak			
2	2390.000	42.40	-6.78	35.62	54.00	-18.38	AVG			
3	2400.000	57.04	-6.76	50.28	74.00	-23.72	peak			
4	2400.000	48.67	-6.76	41.91	54.00	-12.09	AVG			
5	2483.500	57.74	-6.54	51.20	74.00	-22.80	peak			
6	2483.500	46.97	-6.54	40.43	54.00	-13.57	AVG			
7	2500.000	48.73	-6.50	42.23	74.00	-31.77	peak			
8	2500.000	39.46	-6.50	32.96	54.00	-21.04	AVG			



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Job No.: STAR #3998

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: HOPPING (PI/4DQPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

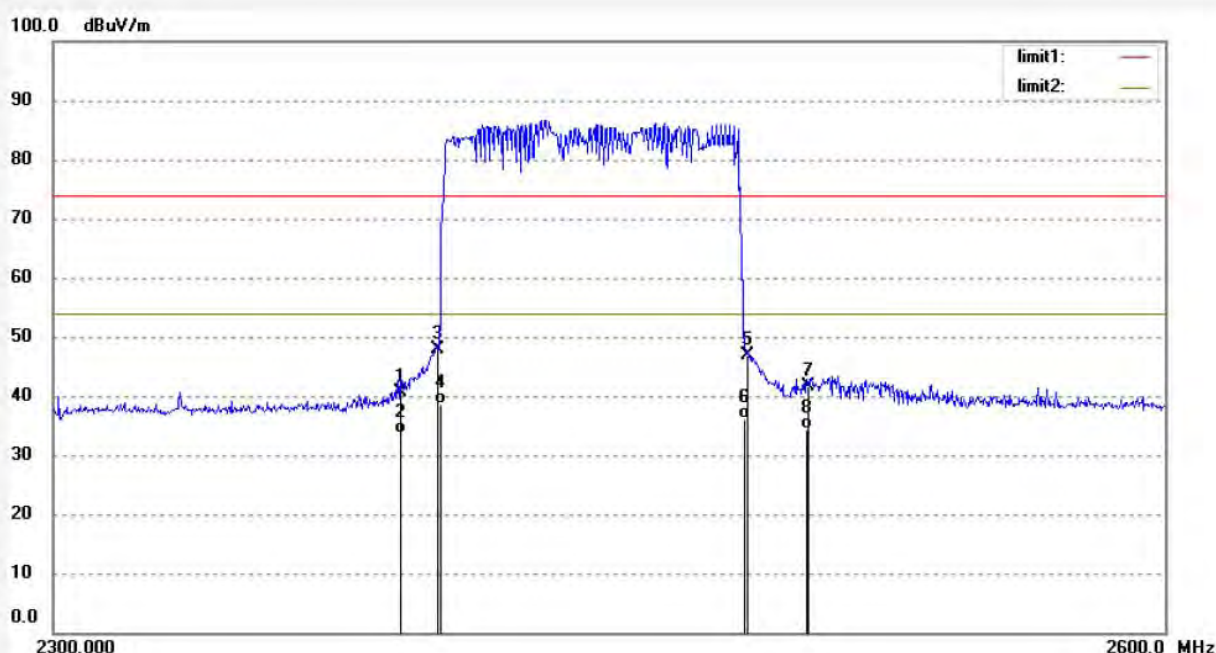
Date: 15/09/02/

Time: 9:46:41

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	47.44	-6.78	40.66	74.00	-33.34	peak			
2	2390.000	40.31	-6.78	33.53	54.00	-20.47	AVG			
3	2400.000	54.56	-6.76	47.80	74.00	-26.20	peak			
4	2400.000	45.31	-6.76	38.55	54.00	-15.45	AVG			
5	2483.500	53.47	-6.54	46.93	74.00	-27.07	peak			
6	2483.500	42.57	-6.54	36.03	54.00	-17.97	AVG			
7	2500.000	48.04	-6.50	41.54	74.00	-32.46	peak			
8	2500.000	40.82	-6.50	34.32	54.00	-19.68	AVG			

Job No.: STAR #3999

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: HOPPING (PI/4DQPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

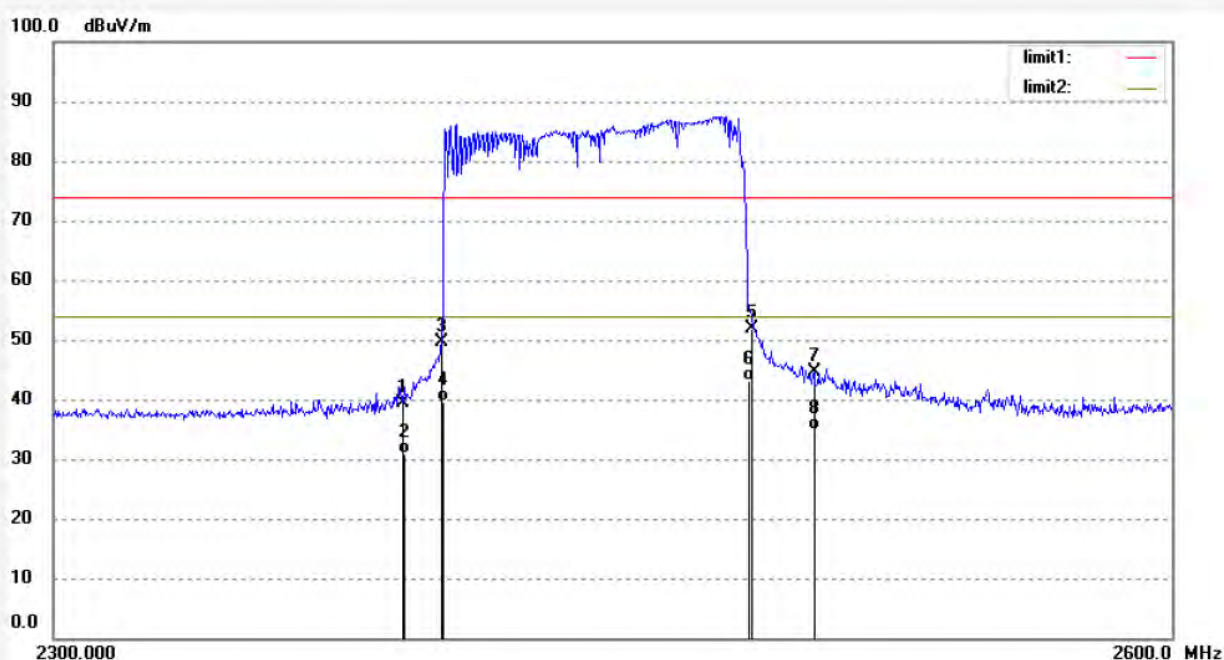
Date: 15/09/02/

Time: 9:51:16

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	46.09	-6.78	39.31	74.00	-34.69	peak			
2	2390.000	37.62	-6.78	30.84	54.00	-23.16	AVG			
3	2400.000	56.51	-6.76	49.75	74.00	-24.25	peak			
4	2400.000	46.34	-6.76	39.58	54.00	-14.42	AVG			
5	2483.500	58.34	-6.54	51.80	74.00	-22.20	peak			
6	2483.500	49.77	-6.54	43.23	54.00	-10.77	AVG			
7	2500.000	51.06	-6.50	44.56	74.00	-29.44	peak			
8	2500.000	41.36	-6.50	34.86	54.00	-19.14	AVG			



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Job No.: STAR #4000

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: HOPPING (8DPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Vertical

Power Source: AC 120V/60Hz

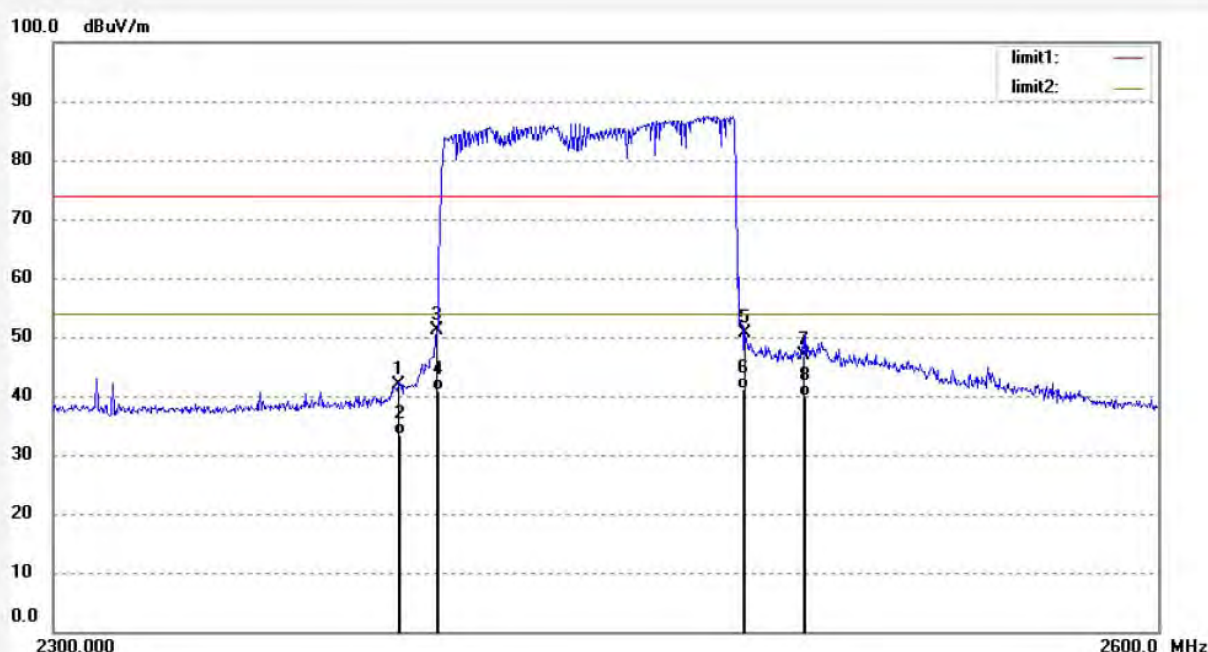
Date: 15/09/02/

Time: 9:56:29

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



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	48.77	-6.78	41.99	74.00	-32.01	peak			
2	2390.000	40.20	-6.78	33.42	54.00	-20.58	AVG			
3	2400.000	57.88	-6.76	51.12	74.00	-22.88	peak			
4	2400.000	47.67	-6.76	40.91	54.00	-13.09	AVG			
5	2483.500	57.21	-6.54	50.67	74.00	-23.33	peak			
6	2483.500	47.67	-6.54	41.13	54.00	-12.87	AVG			
7	2500.000	53.50	-6.50	47.00	74.00	-27.00	peak			
8	2500.000	46.30	-6.50	39.80	54.00	-14.20	AVG			



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Job No.: STAR #4001

Standard: FCC PK

Test item: Radiation Test

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

EUT: Active Floorstanding Loudspeaker System

Mode: HOPPING (8DPSK)

Model: V-LGAST401-CHY

Manufacturer: 3SIXTY INDUSTRIES INC

Polarization: Horizontal

Power Source: AC 120V/60Hz

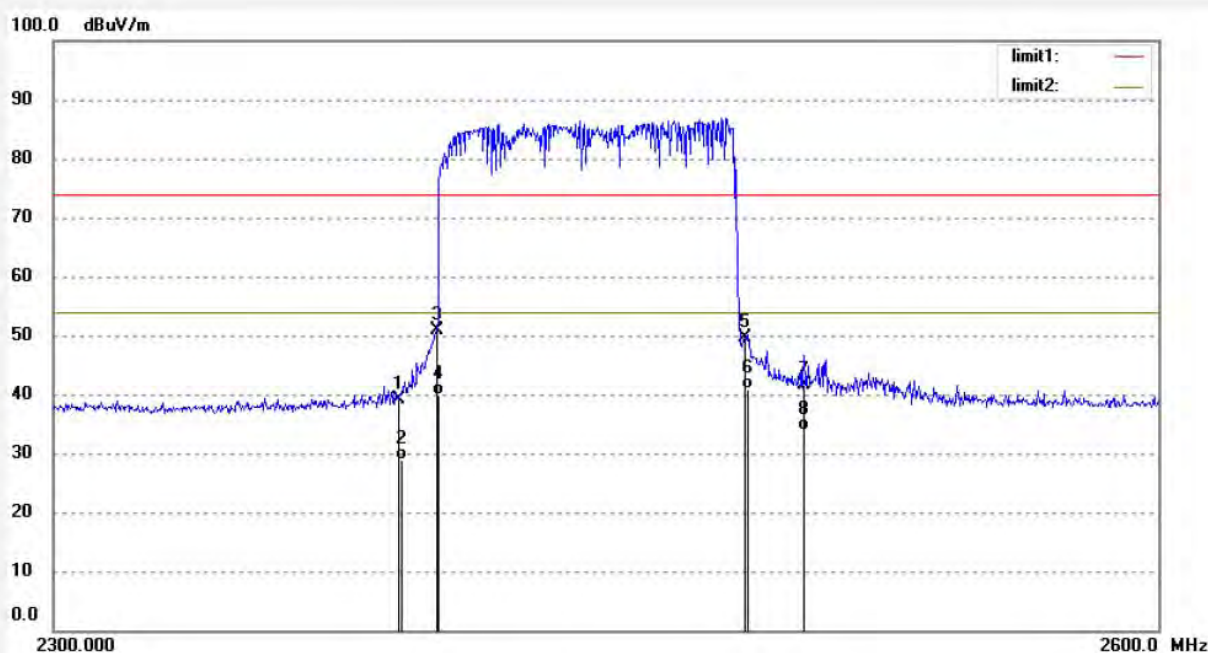
Date: 15/09/02/

Time: 10:02:30

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20151878



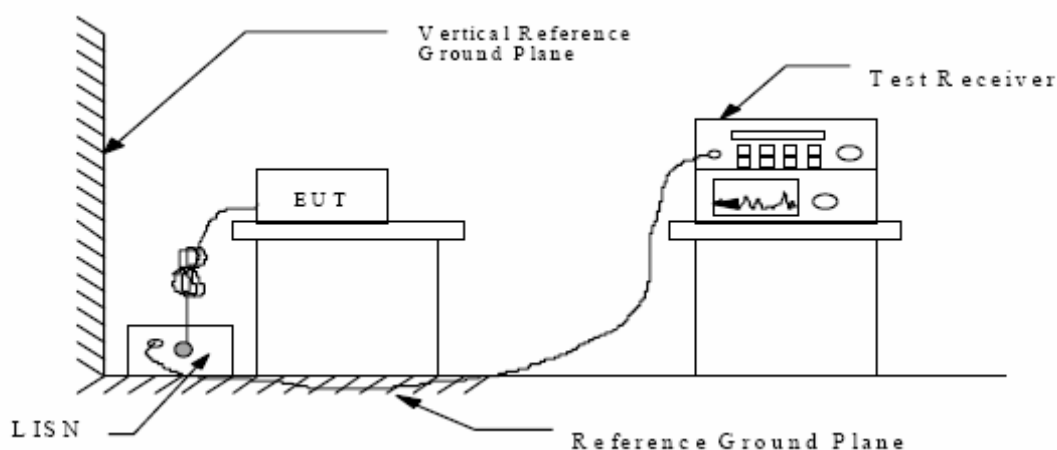
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	45.95	-6.78	39.17	74.00	-34.83	peak			
2	2390.000	35.69	-6.78	28.91	54.00	-25.09	AVG			
3	2400.000	57.62	-6.76	50.86	74.00	-23.14	peak			
4	2400.000	46.67	-6.76	39.91	54.00	-14.09	AVG			
5	2483.500	56.20	-6.54	49.66	74.00	-24.34	peak			
6	2483.500	47.38	-6.54	40.84	54.00	-13.16	AVG			
7	2500.000	48.23	-6.50	41.73	74.00	-32.27	peak			
8	2500.000	40.36	-6.50	33.86	54.00	-20.14	AVG			

12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

15 SECTION 15.207(A)

12.1.Block Diagram of Test Setup

12.1.1.Shielding Room Test Setup Diagram



12.2.The Emission Limit

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

Frequency (MHz)	Limit dB(μ V)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

* Decreases with the logarithm of the frequency.

12.3.Configuration of EUT on Measurement

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

12.4.Operating Condition of EUT

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

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in Test mode measure it.

12.5.Test Procedure

The EUT is put on the plane 0.1m 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 9 kHz.

The frequency range from 150 kHz 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 AC120V; 60Hz								
MEASUREMENT RESULT: "XH031313_fin"								
2015-9-1 10:48								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.150000	51.10	10.3	66	14.9	QP	N	GND	
0.202000	43.20	10.6	64	20.3	QP	N	GND	
0.536000	35.10	11.5	56	20.9	QP	N	GND	
MEASUREMENT RESULT: "XH031313_fin2"								
2015-9-1 10:48								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.150000	38.40	10.3	56	17.6	AV	N	GND	
0.208000	31.30	10.7	53	22.0	AV	N	GND	
0.524000	31.20	11.5	46	14.8	AV	N	GND	
MEASUREMENT RESULT: "XH031314_fin"								
2015-9-1 10:51								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.150000	50.50	10.3	66	15.5	QP	L1	GND	
0.306000	32.20	11.0	60	27.9	QP	L1	GND	
0.528000	34.80	11.5	56	21.2	QP	L1	GND	
MEASUREMENT RESULT: "XH031314_fin2"								
2015-9-1 10:51								
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE	
0.150000	37.90	10.3	56	18.1	AV	L1	GND	
0.346000	32.50	11.1	49	16.6	AV	L1	GND	
0.526000	30.30	11.5	46	15.7	AV	L1	GND	

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

The spectral diagrams are attached as below.

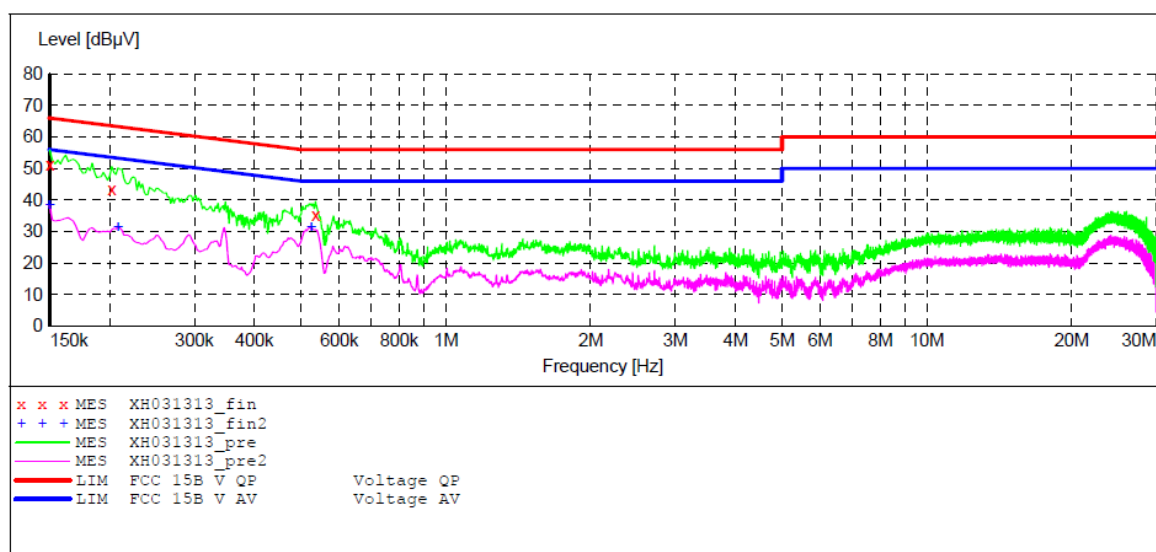
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Active Floorstanding Loudspeaker System M/N:V-LGAST401-CHY
 Manufacturer: 3SIXTY INDUSTRIES INC
 Operating Condition: BT
 Test Site: 2#Shielding Room
 Operator: star
 Test Specification: N 120V/60Hz
 Comment: Report No.:ATE20151878
 Start of Test: 2015-9-1 / 10:45:50

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

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN(ESH3-Z5)
 Average



MEASUREMENT RESULT: "XH031313_fin"

2015-9-1 10:48

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	51.10	10.3	66	14.9	QP	N	GND
0.202000	43.20	10.6	64	20.3	QP	N	GND
0.536000	35.10	11.5	56	20.9	QP	N	GND

MEASUREMENT RESULT: "XH031313_fin2"

2015-9-1 10:48

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	38.40	10.3	56	17.6	AV	N	GND
0.208000	31.30	10.7	53	22.0	AV	N	GND
0.524000	31.20	11.5	46	14.8	AV	N	GND

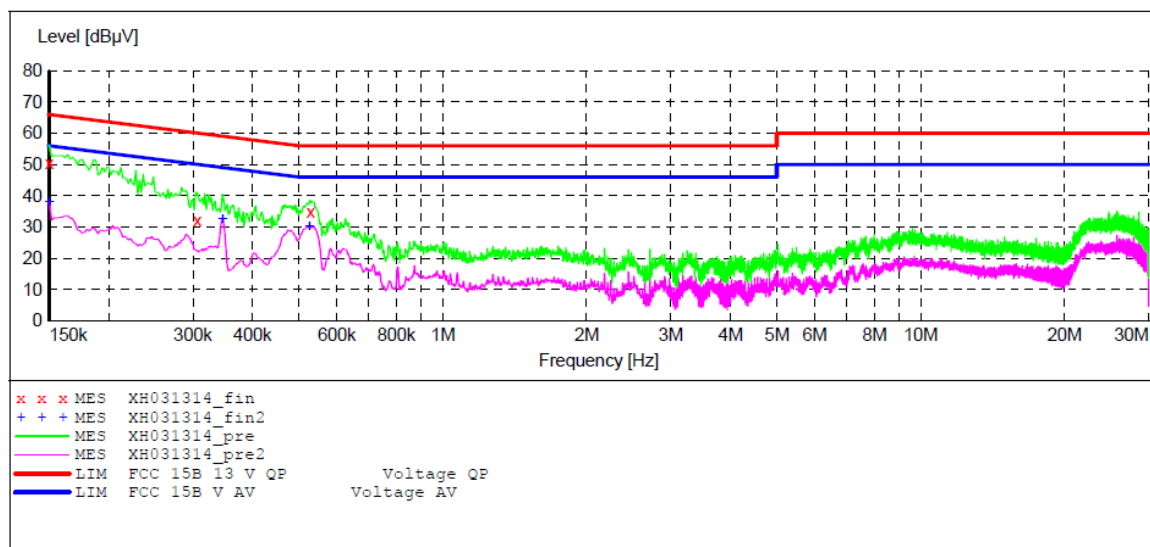
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Active Floorstanding Loudspeaker System M/N:V-LGAST401-CHY
 Manufacturer: 3SIXTY INDUSTRIES INC
 Operating Condition: BT
 Test Site: 2#Shielding Room
 Operator: star
 Test Specification: L 120V/60Hz
 Comment: Report No.:ATE20151878
 Start of Test: 2015-9-1 / 10:48:41

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

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz LISN (ESH3-Z5)
 Average



MEASUREMENT RESULT: "XH031314_fin"

2015-9-1 10:51

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	50.50	10.3	66	15.5	QP	L1	GND
0.306000	32.20	11.0	60	27.9	QP	L1	GND
0.528000	34.80	11.5	56	21.2	QP	L1	GND

MEASUREMENT RESULT: "XH031314_fin2"

2015-9-1 10:51

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	37.90	10.3	56	18.1	AV	L1	GND
0.346000	32.50	11.1	49	16.6	AV	L1	GND
0.526000	30.30	11.5	46	15.7	AV	L1	GND

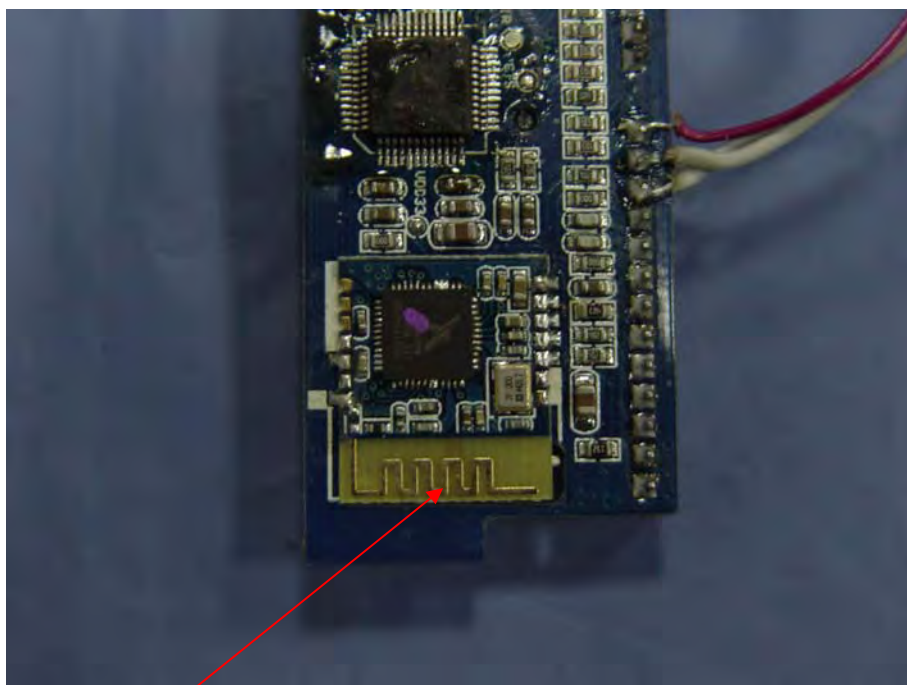
13.ANTENNA REQUIREMENT

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

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



Antenna