FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

TCL Technoly Electronics (Huizhou) Co.,Ltd.

System Name : Sound Bar
(Active Speaker System and Active Subwoofer)

System Model Number : HT-CT180(SA-CT180 and SA-WCT180)

Brand Name : Sony

EUT Name	EUT Model No.
Active Speaker System	SA-CT180

FCC ID: ZVASB000013

Prepared for : TCL Technoly Electronics (Huizhou) Co.,Ltd.
Secion 37, Zhongkai High-tech Development Zone, Huizhou City, Guangdong Province, P.R. China

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Report Number : ACS-F14353
Date of Test : Sep.29~Nov.04, 2014
Date of Report : Dec.05, 2014

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TEST REPORT CERTIFICATION

Applicant : TCL Technoly Electronics (Huizhou) Co.,Ltd.

Manufacturer : Sony Corporation

System Name : Sound Bar(Active Speaker System and Active Subwoofer)

System Model Number : HT-CT180(SA-CT180 and SA-WCT180)

Brand Name : Sony

FCC ID : ZVASB000013

(A) EUT Name & EUT Model Number :

EUT Name	EUT Model No.
Active Speaker System	SA-CT180

(B) SERIAL NO. : N/A

(C)POWER SUPPLY : AC 120V/60Hz

(D)TEST VOLTAGE : AC 120V/60Hz

Tested for comply with:
FCC Rules and Regulations Part 15 Subpart C: 2013
Test procedure used:
ANSI C63.10: 2009

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements. The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC and IC requirements. This report contains data that are not covered by the NVLAP accreditation.

This Report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Sep.29~Nov.04, 2014 Report of date: Dec.05, 2014

Prepared by : Kayli He
Kayli He / Assistant

Reviewed by :
Sunny Lu / Assistant Manager

信華科技（深圳）有限公司
Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章
Stamp only for EMC Dept. Report
Signature: David Jin

Approved & Authorized Signer :
David Jin / Manager

1. SUMMARY OF STANDARDS AND RESULTS

1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	**Standard**	**Results**
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.10 :2009	PASS
Radiated Emission Test	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :2009	PASS
Conducted Spurious Emissions	FCC Part 15: 15.247(a)(1) ANSI C63.10 :2009	PASS
Carrier Frequency Separation Test	FCC Part 15: 15.247(a)(1) ANSI C63.10 :2009	PASS
20dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10 :2009	PASS
Number Of Hopping Frequency Test	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2009	PASS
Dwell Time Test	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2009	PASS
Maximum Peak Output Power Test	FCC Part 15: 15.247(b)(1)\ ANSI C63.10 :2009	PASS
Band Edge Compliance Test	FCC Part 15: 15.247(d) ANSI C63.10 :2009	PASS
N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1.Description of Device (EUT)

System Name : Sound Bar(Active Speaker System and Active Subwoofer)

System Model Number : HT-CT180(SA-CT180 and SA-WCT180)

Brand Name : Sony

EUT Name & EUT Model Number :

Brand Name	EUT Model No.
Active Speaker System	SA-CT180

FCC ID : ZVASB000013

Operation frequency : 2402-2480MHz; 2403-2478MHz

Modulation : Bluetooth V3.0+EDR: GFSK, π/4DQPSK, 8DPSK;
Bluetooth V4.0: GFSK;
General 2.4GHz wireless: GFSK

Radio : Bluetooth V3.0+EDR;
Bluetooth V4.0;
General 2.4GHz wireless

Antenna : Integrated PCB Antenna, 2.0dBi PK gain

Applicant : TCL Technoly Electronics (Huizhou) Co.,Ltd.
Secion 37, Zhongkai High-tech Development Zone,
Huizhou City, Guangdong Province, P.R. China

Manufacturer : Sony Corporation
1-7-1 Konan, Minato-Ku, Tokyo, 108-0075 Japan

Power Cord : Unshielded, Undetectable, 1.2m

Remote Controller : Brand: Sony, Model Number: RMT-AH100U

Date of Test : Sep.29~Nov.04, 2014

Date of Receipt : Sep.27, 2014

Sample Type : Prototype production

The Product covered in this report was Sound bar; This product consists of Active Speaker System (SA-CT180) and Active Subwoofer (SA-WCT180)

2.2.Test information

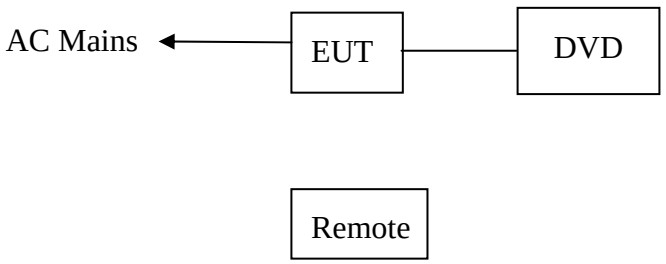
The test software "bluesuite.exe" was used to control EUT work in Continuous TX mode, and select test channel.

Tested mode, channel, and data rate information			
Mode	data rate (Mbps)	Channel	Frequency (MHz)
Tx Mode GFSK modulation	1	Low :CH 0	2402
	1	Middle: CH39	2441
	1	High: CH78	2480
Tx Mode 8-DPSK modulation	3	Low :CH 0	2402
	3	Middle: CH39	2441
	3	High: CH78	2480
Note: π/4DQPSK modulation is same type modulation with 8-DPSK, and according exploratory test, 8-DPSK will have worse emissions, so the final test were only performed with GFSK and 8-DPSK modulation.			

2.3.Tested Supporting System Details

	Description	ACS No.	Manufacturer	Model	Serial Number	Approved type
1.	DVD	ACS-EMC-DVD01	DENON	DVD-3910	4098400342E	☐FCC ID ☐BSMI ID
		Power cord：Unshielded, Detachabled , 1.8m Data Cable：Shielded, Detachabled, 1.8m				

2.4.Block Diagram of Test Setup



(EUT: Active Speaker System)

2.5.Test Facility

Site Description

Name of Firm	:	Audix Technology (Shenzhen) Co., Ltd. No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park,Nantou, Shenzhen, Guangdong, China
3m Anechoic Chamber	:	Certificated by FCC, USA Registration Number: 90454 Valid Date: Feb.22, 2015
3m & 10m Anechoic Chamber	:	Certificated by FCC, USA Registration Number: 794232 Valid Date: Oct.31, 2015
EMC Lab.	:	Certificated by Industry Canada Registration Number: IC 5183A-1 Valid Date: Jun.13, 2014 Certificated by DAkkS, Germany Registration No: D-PL-12151-01-00 Valid Date: Dec.15, 2016 Accredited by NVLAP, USA NVLAP Code: 200372-0 Valid Date: Mar.31, 2015

2.6.Measurement Uncertainty (95% confidence levels, k=2)

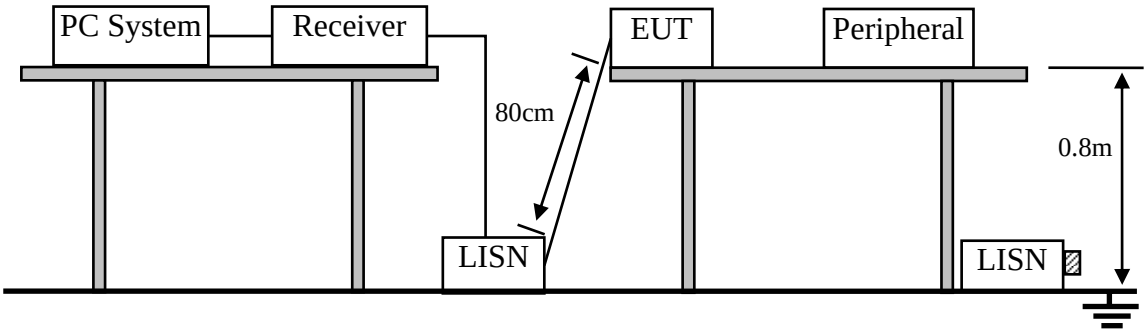
Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	3.10dB (150KHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	3.22 dB(30~200MHz, Polarize: H)
	3.23 dB(30~200MHz, Polarize: V)
	3.49 dB(200M~1GHz, Polarize: H)
	3.39 dB(200M~1GHz, Polarize: V)
Uncertainty for Radiation Emission test in 3m chamber (1GHz-18GHz)	4.97 dB (Distance: 3m Polarize: V)
	4.99 dB (Distance: 3m Polarize: H)
Uncertainty for Radiated Spurious Emission test in RF chamber	3.57 dB
Uncertainty for Conduction Spurious emission test	2.00 dB
Uncertainty for Output power test	0.73 dB
Uncertainty for Bandwidth test	83 kHz
Uncertainty for DC power test	0.038 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

3. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	1# Shielding Room	AUDIX	N/A	N/A	Apr.17,14	1 Year
2.	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Oct.29, 14	1 Year
3.	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	100429	Jan.22, 14	1 Year
4.	L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	Apr. 28,14	1 Year
5.	Terminator	Hubersuhner	50Ω	No. 1	Apr. 28,14	1 Year
6.	Terminator	Hubersuhner	50Ω	No. 2	Apr. 28,14	1 Year
7.	RF Cable	Hubersuhner	RG58	0100.6954.20#	Jan.22, 14	1Year
8.	Coaxial Switch	Anritsu	MP59B	6200298346	Apr. 28,14	1 Year
9.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101838	Jan.22, 14	1 Year

3.2.Block Diagram of Test Setup



:50Ω Terminator

3.3. Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.4. Configuration of EUT on Test

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

3.4.1.Active Speaker System (EUT)

Model Number : SA-CT180
Serial Number : N/A

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 3.2.
3.5.2. Turn on the power of all equipment.
3.5.3. Let the EUT work in test mode (TX Mode) and measure it.

3.6. Test Procedure

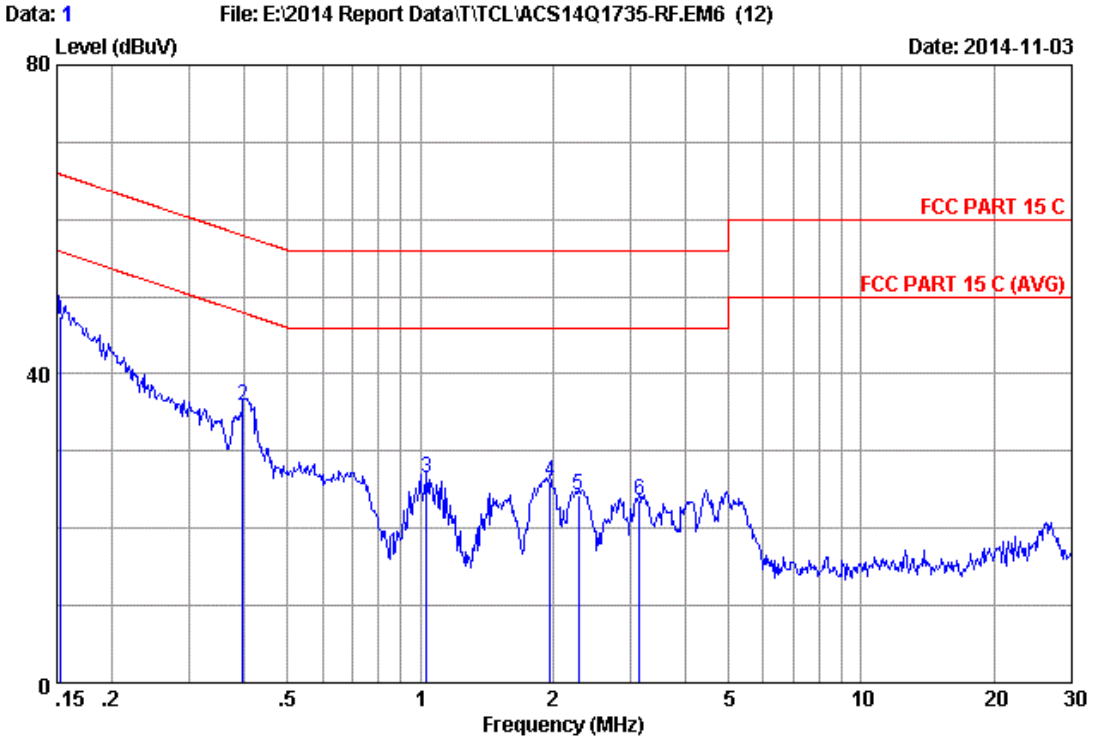
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4-2009 on conducted Emission test.

The bandwidth of test receiver (R&S TEST RECEIVER ESHS10) is set at 9 kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 3.7.

3.7. Conducted Emission at Mains Terminals Test Results

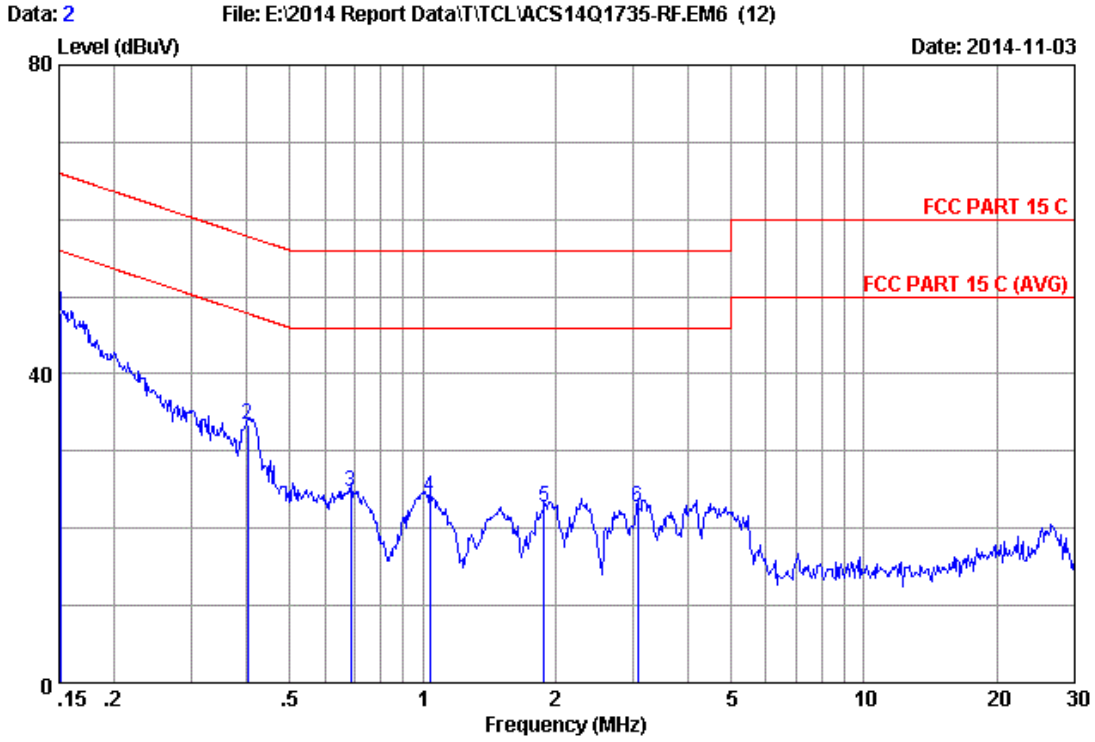
PASS. (All emissions not reported below are too low against the prescribed limits.)



Site no :1# Conduction Data No :1
Dis./Ant. :2014 KNW-242C-VA
Limit :FCC PART 15 C
Env./Ins. :24.1*C/47% Engineer :Kevin_He
EUT :Active Speaker System M/N: SA-CT180
Power Rating :AC 120V/60Hz
Test Mode :TX Mode

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15240	0.34	9.87	37.32	47.53	65.87	18.34	QP
2	0.39553	0.34	9.88	25.56	35.78	57.95	22.17	QP
3	1.032	0.41	9.89	16.16	26.46	56.00	29.54	QP
4	1.970	0.41	9.91	15.65	25.97	56.00	30.03	QP
5	2.285	0.42	9.91	13.96	24.29	56.00	31.71	QP
6	3.140	0.44	9.92	13.22	23.58	56.00	32.42	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit) +Reading.
2.If the average limit is met when useing a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



Site no :1# Conduction Data No :2
Dis./Ant. :2014 KNW-242C-VB
Limit :FCC PART 15 C
Env./Ins. :24.1*C/47% Engineer :Kevin_He
EUT :Active Speaker System M/N:SA-CT180
Power Rating :AC 120V/60Hz
Test Mode :TX Mode

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15160	0.06	9.87	37.98	47.91	65.91	18.00	QP
2	0.40187	0.04	9.88	23.43	33.35	57.81	24.46	QP
3	0.68626	0.05	9.89	14.83	24.77	56.00	31.23	QP
4	1.037	0.06	9.89	14.19	24.14	56.00	31.86	QP
5	1.888	0.06	9.91	12.71	22.68	56.00	33.32	QP
6	3.074	0.08	9.92	12.82	22.82	56.00	33.18	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss(Include 10dB pulse limit) +Reading.
2.If the average limit is met when useing a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

4. RADIATED EMISSION MEASUREMENT

4.1.Test Equipment

Frequency rang: 30~1000MHz

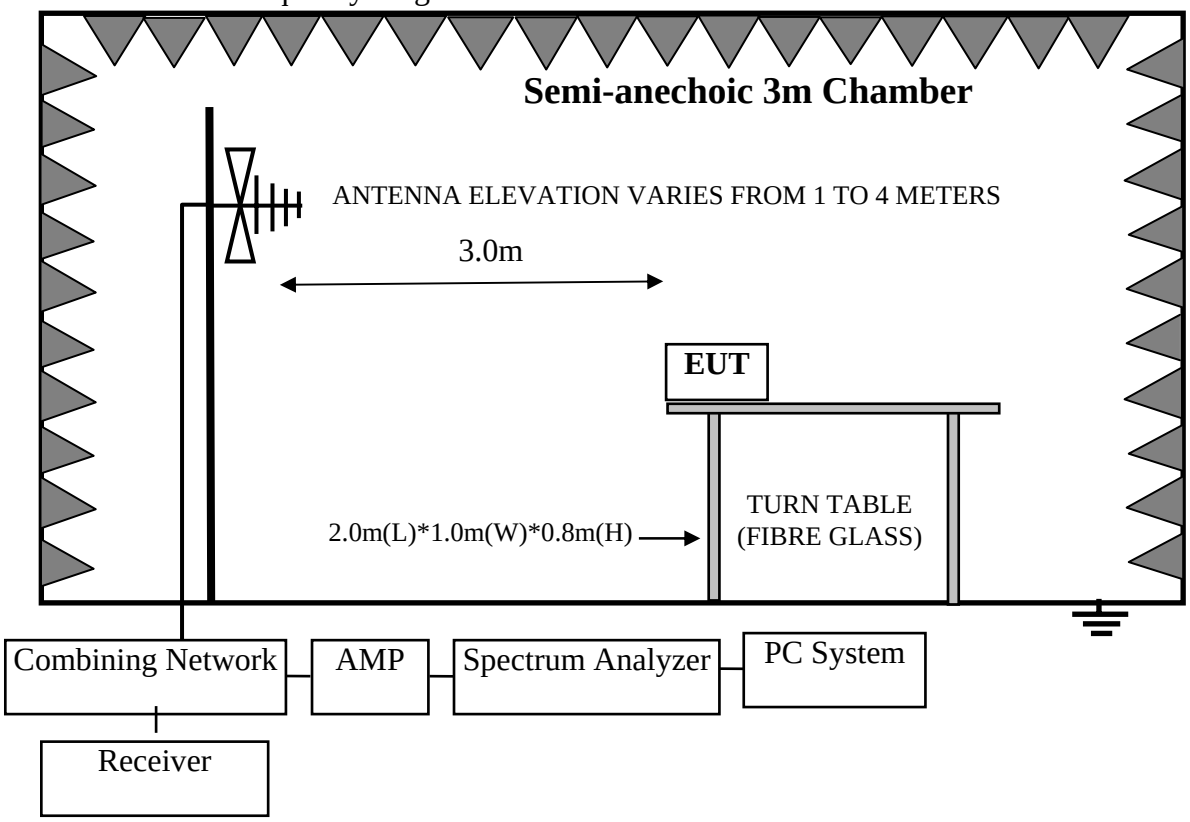
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	Nov.24, 13	1 Year
2.	EMI Spectrum	Agilent	E4407B	MY41440292	Apr. 28,14	1 Year
3.	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	Apr. 28,14	1 Year
4.	Amplifier	HP	8447D	2648A04738	Apr. 28,14	1 Year
5.	Bilog Antenna	TESEQ	CBL6112D	35375	Jun. 18, 14	1 Year
6.	RF Cable	MIYAZAKI	CFD400-NL	3# Chamber No.1	Apr. 28,14	1 Year
7.	Coaxial Switch	Anritsu	MP59B	6200313662	Apr. 28,14	1 Year

Frequency rang: above 1000MHz

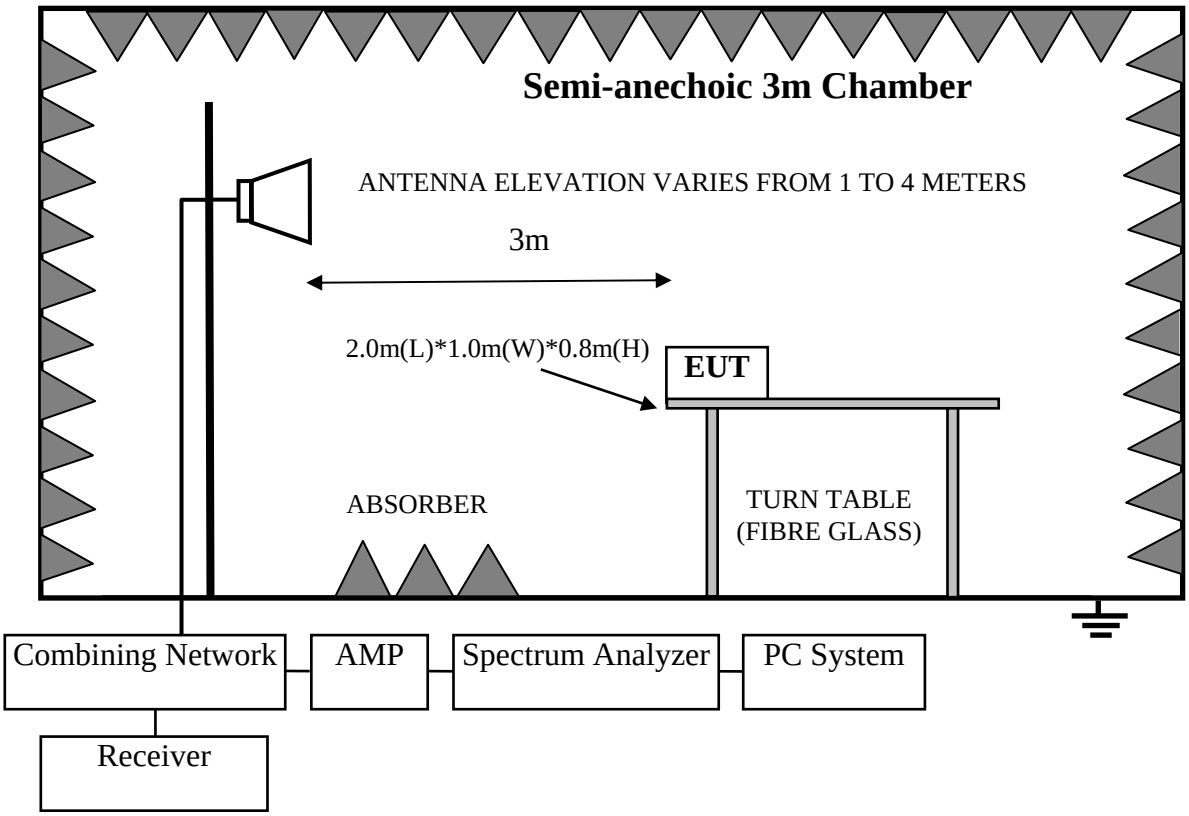
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	Nov.02, 14	1 Year
2.	Spectrum Analyzer	Agilent	E4407B	MY41440292	Apr. 28,14	1 Year
3.	Horn Antenna	ETS	3115	9607-4877	Jun. 06, 14	1 Year
4.	Amplifier	Agilent	8449B	3008A00863	Apr. 28,14	1 Year
5.	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	Apr. 28,14	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX106	28616/2	Apr. 28,14	1 Year
7.	Horn Antenna	ETS	3116	00060089	Sep.20, 14	1 Year

4.2.Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range 1GHz-25GHz



4.3. Radiated Emission Limit Standard: FCC 15.209

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000MHz	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark： (1) Emission level dBμV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.4.EUT Configuration on Test

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

4.4.1. Active Speaker System (EUT)

Model Number	:	SA-CT180
Serial Number	:	N/A

4.5. Operating Condition of EUT

4.5.1. Setup the EUT and simulator as shown as Section 3.2.
4.5.2. Turned on the power of all equipment.
4.5.3. Let EUT work in Tx mode.

4.6. Test Procedure

The EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 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 polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2009 on radiated emission Test.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as the test photo indicated.

The bandwidth of the EMI test receiver (R&S ESVS10) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz

This device is pulse Modulated, a duty cycle factor was used to calculated average level based measured peak level.

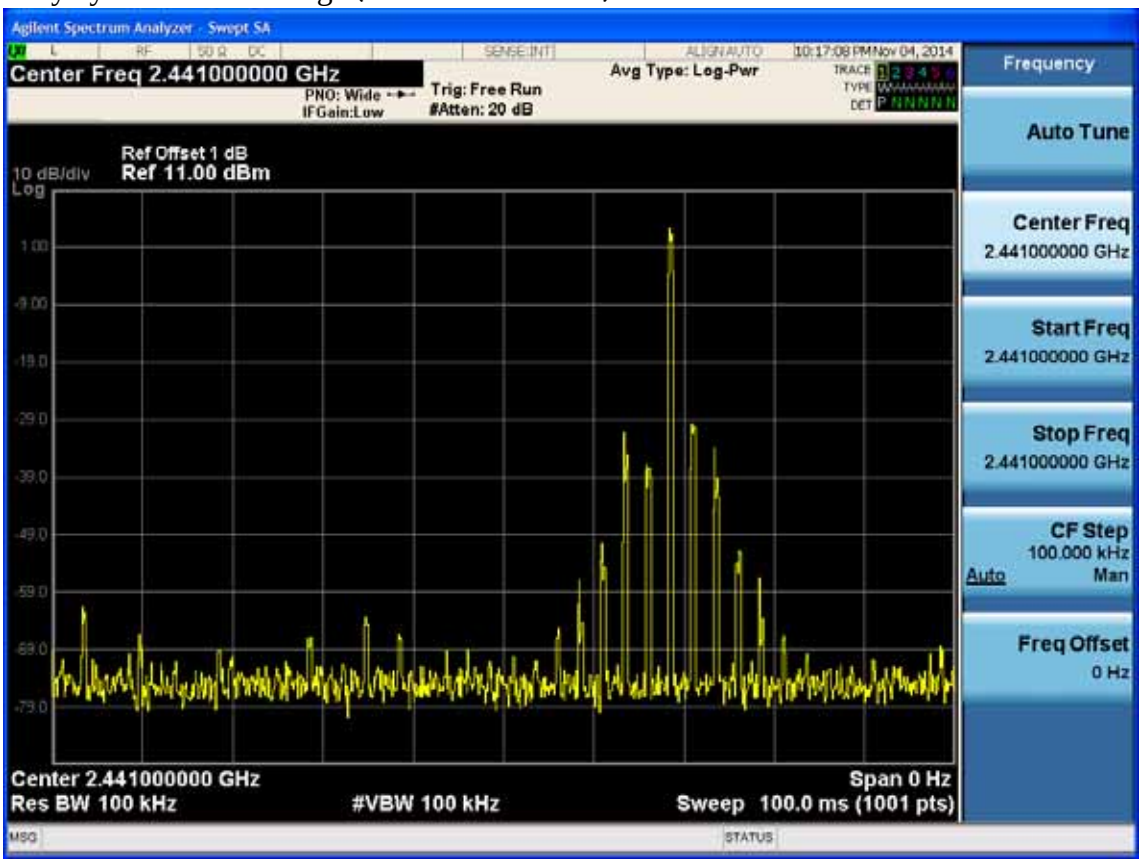
The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

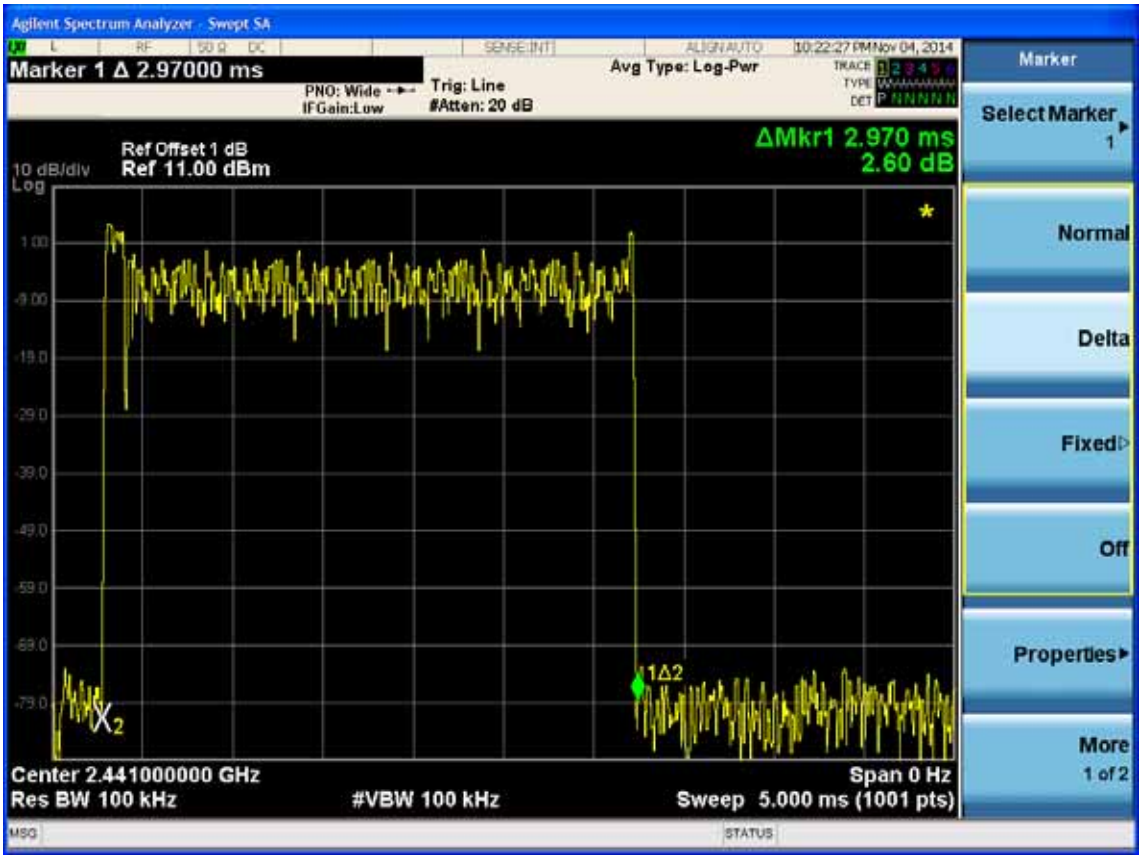
4.7. Radiated Emission Test Results

PASS.

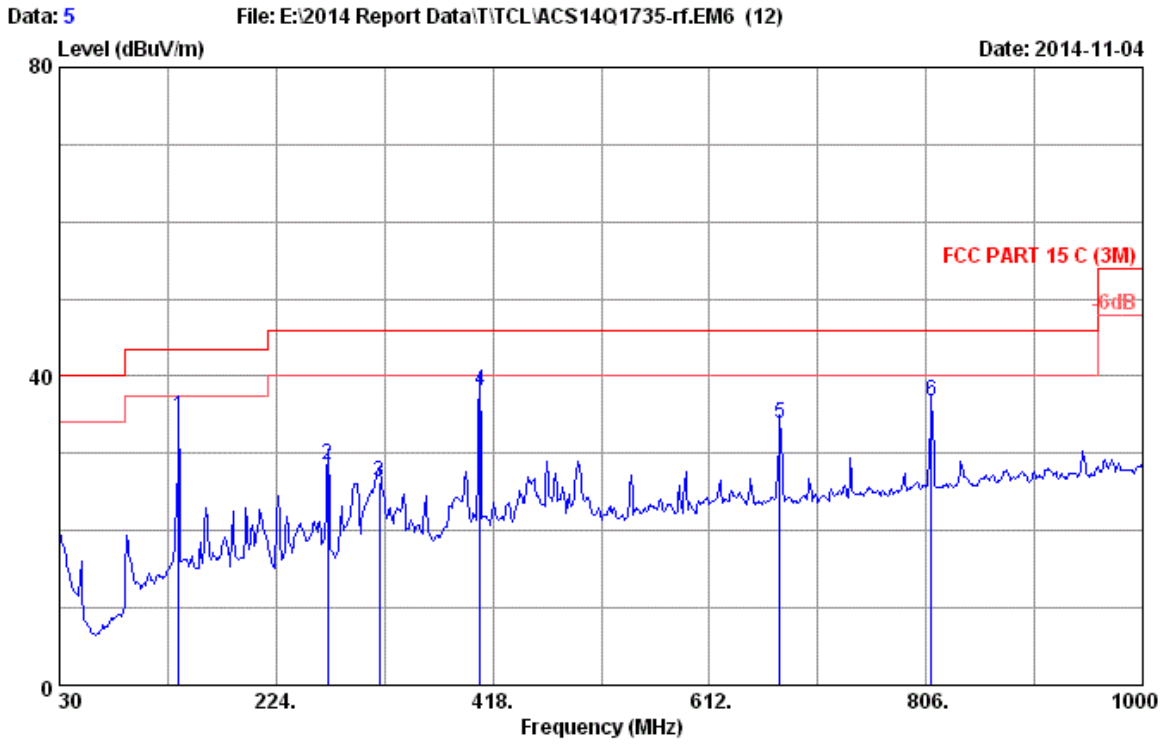
All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.
Note: The duty cycle factor for calculate average level is -30.545dB, and average limit is 20dB below peak limit, so if peak measured level comply with peak limit, the average level was deemed to comply with average limit.

Duty cycle factor = 20log（Dwell time/100ms）= -30.545





Frequency: 30MHz~1GHz

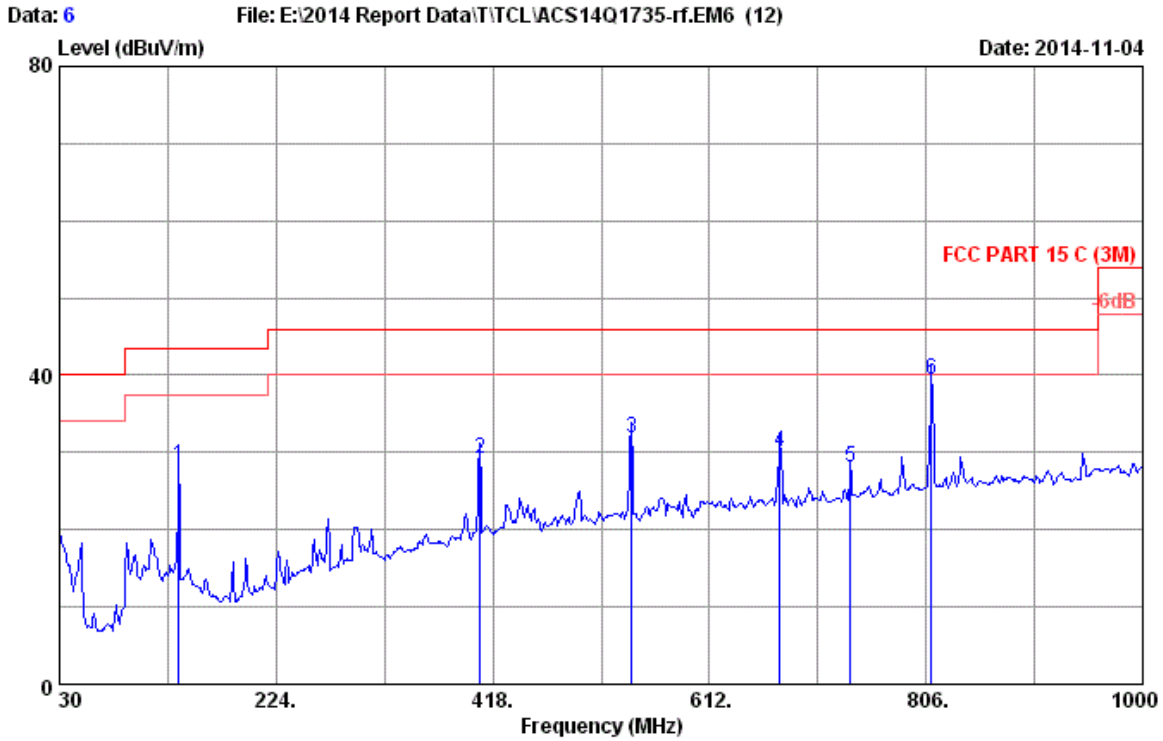


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 CBL6112D 35375
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.7*C/51%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : TX Mode
M/N: SA-CT180

Data no. : 5
Ant. pol. : HORIZONTAL
Engineer : donjon_huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	136.700	12.19	1.44	21.03	34.66	43.50	8.84	QP
2	270.560	13.50	2.16	12.87	28.53	46.00	17.47	QP
3	316.150	14.22	2.37	9.63	26.22	46.00	19.78	QP
4	406.360	17.15	2.83	18.22	38.20	46.00	7.80	QP
5	675.050	20.00	4.02	9.96	33.98	46.00	12.02	QP
6	810.850	21.00	4.52	11.20	36.72	46.00	9.28	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



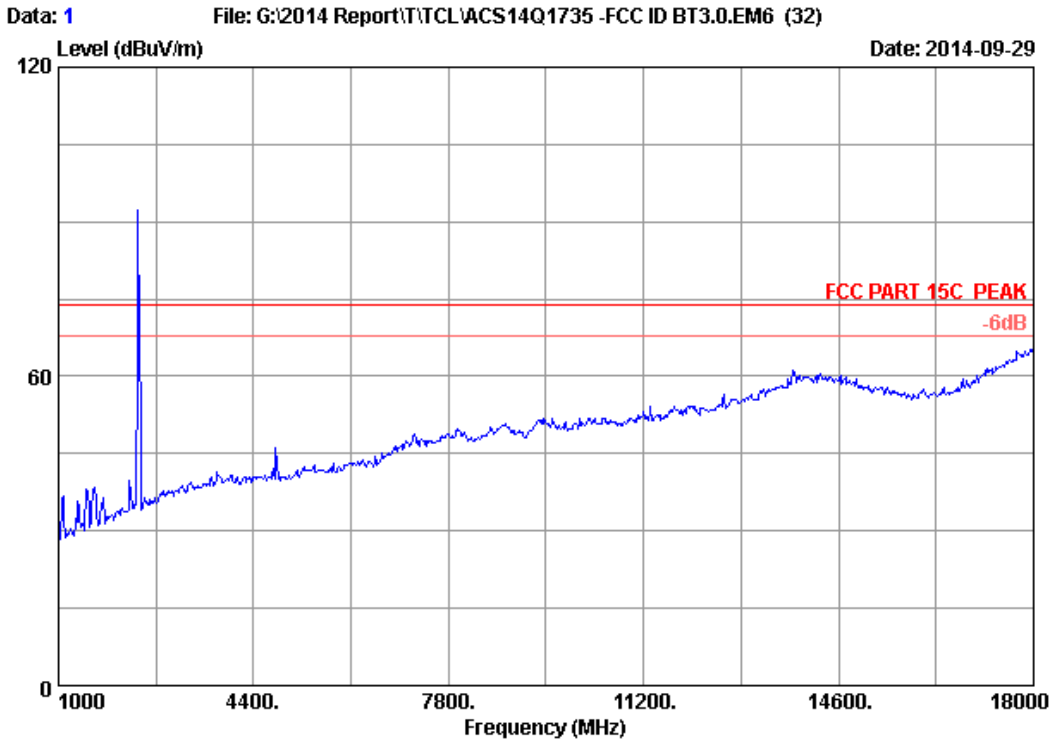
Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 CBL6112D 35375
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.7*C/51%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : TX Mode
M/N: SA-CT180

Data no. : 6
Ant. pol. : VERTICAL
Engineer : donjon_huang

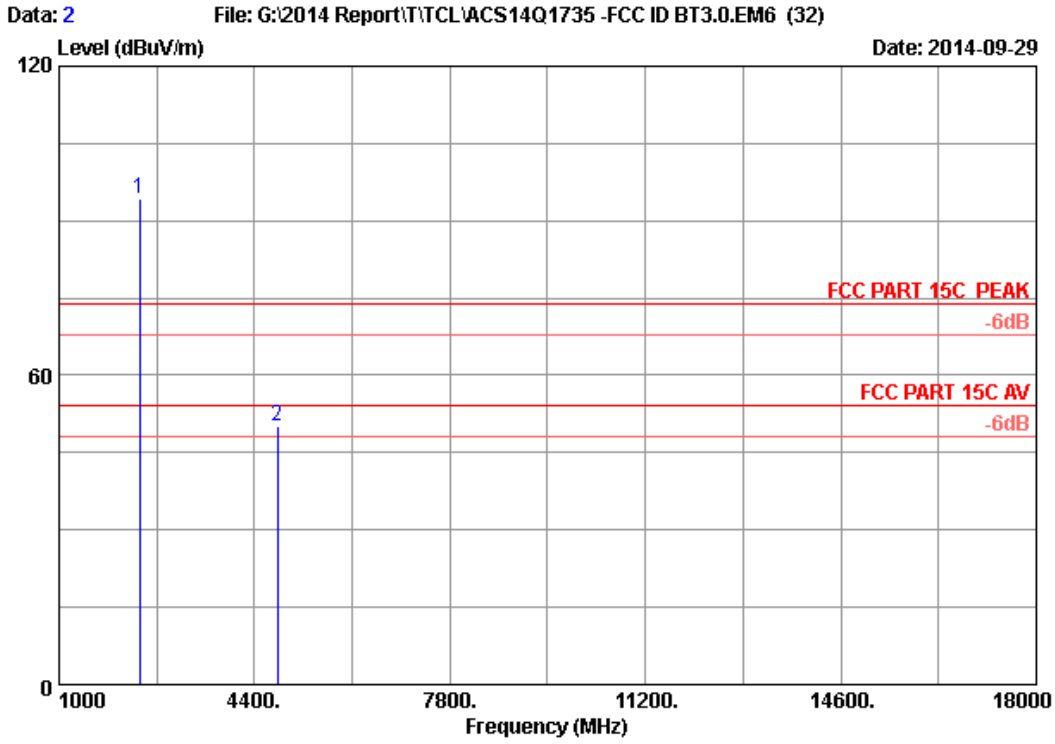
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	136.700	12.19	1.44	14.72	28.35	43.50	15.15	QP
2	406.360	17.15	2.83	9.22	29.20	46.00	16.80	QP
3	542.160	18.69	3.44	9.73	31.86	46.00	14.14	QP
4	675.050	20.00	4.02	5.97	29.99	46.00	16.01	QP
5	738.100	20.56	4.26	3.24	28.06	46.00	17.94	QP
6	810.850	21.00	4.52	13.96	39.48	46.00	6.52	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 1GHz~18GHz



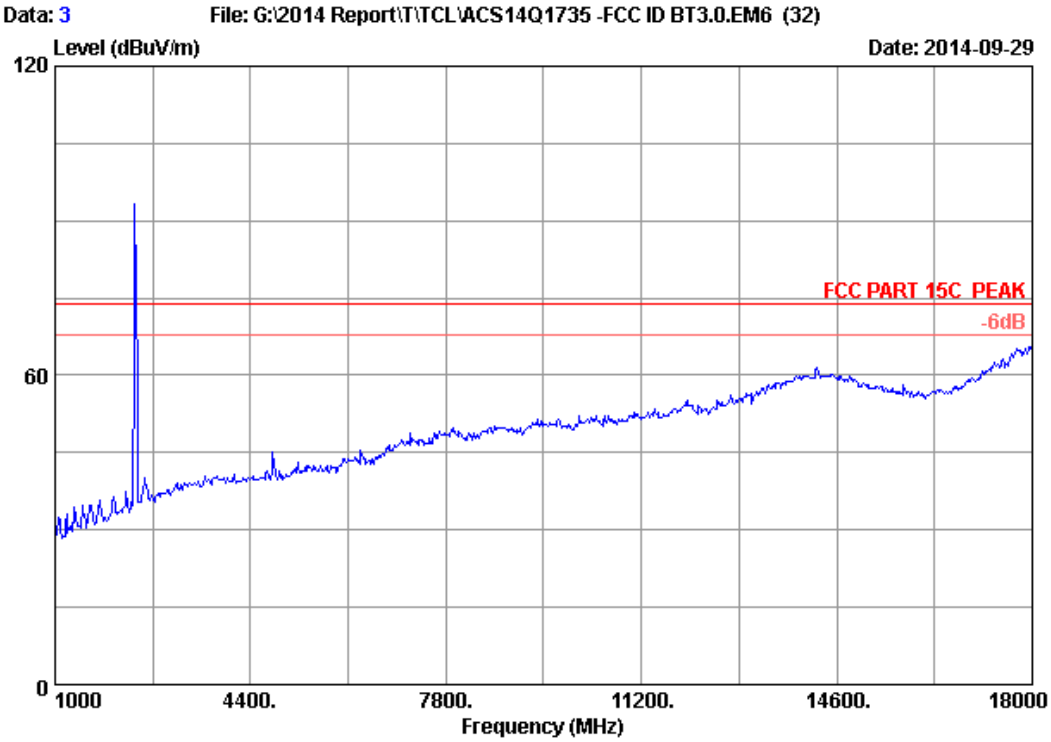

```
Site no.      : 3m Chamber                        Data no.   : 1
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : GFSK 2402MHz
M/N           : SA-CT180
```



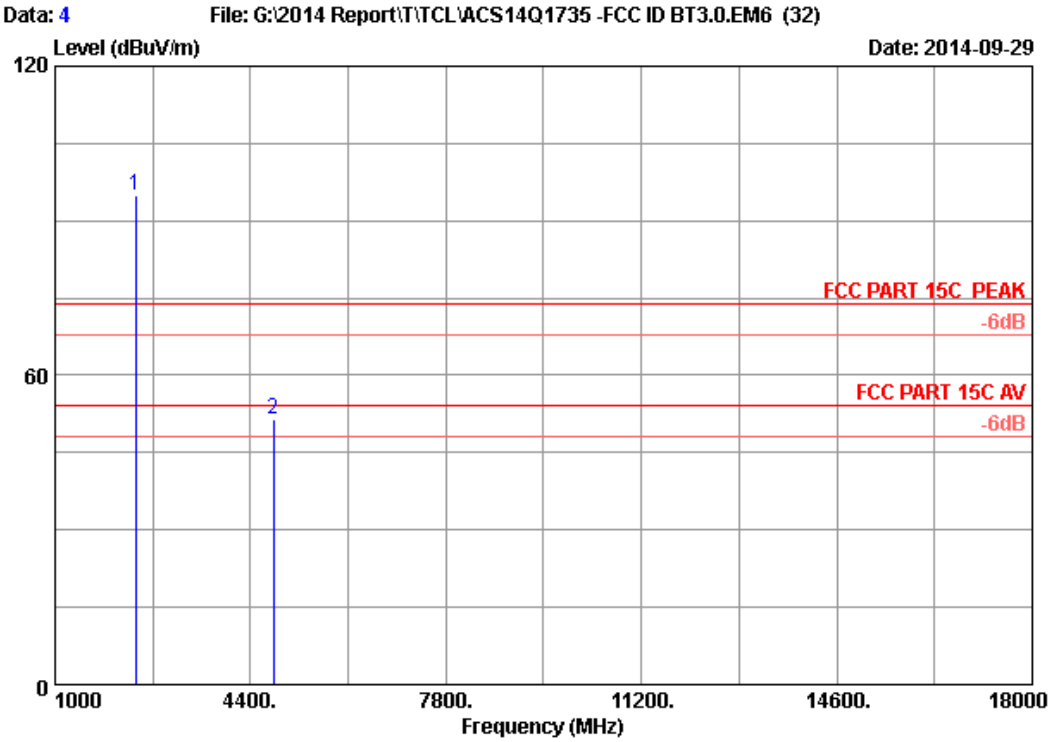
Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2402MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	28.18	5.80	35.70	95.97	94.25	74.00	-20.25	Peak
2	4804.000	32.85	8.56	35.70	44.39	50.10	74.00	23.90	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



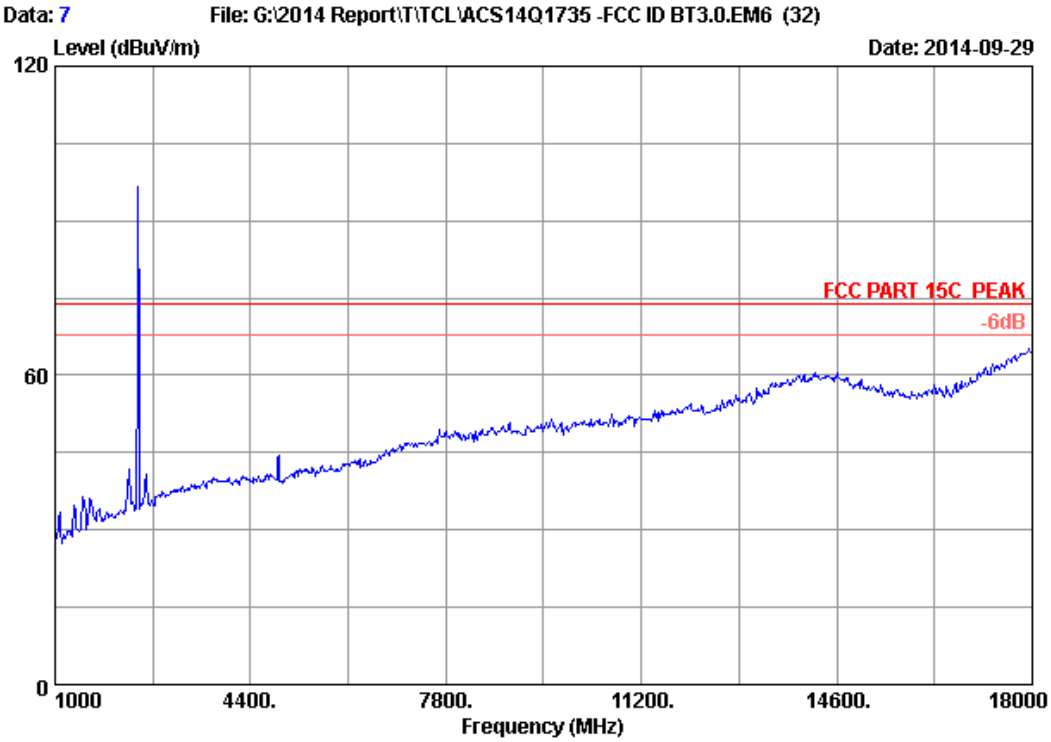

```
Site no.      : 3m Chamber                        Data no.   : 3
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : GFSK 2402MHz
M/N           : SA-CT180
```



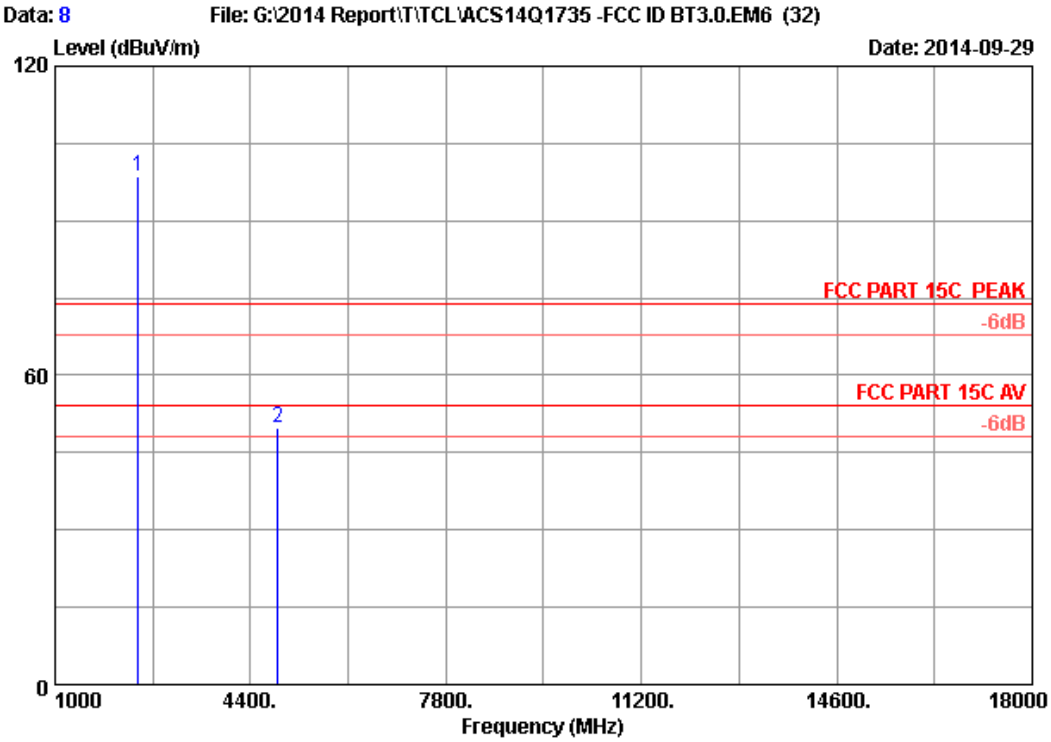
Site no. : 3m Chamber Data no. : 4
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2402MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	28.18	5.80	35.70	96.75	95.03	74.00	-21.03	Peak
2	4804.000	32.85	8.56	35.70	45.88	51.59	74.00	22.41	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



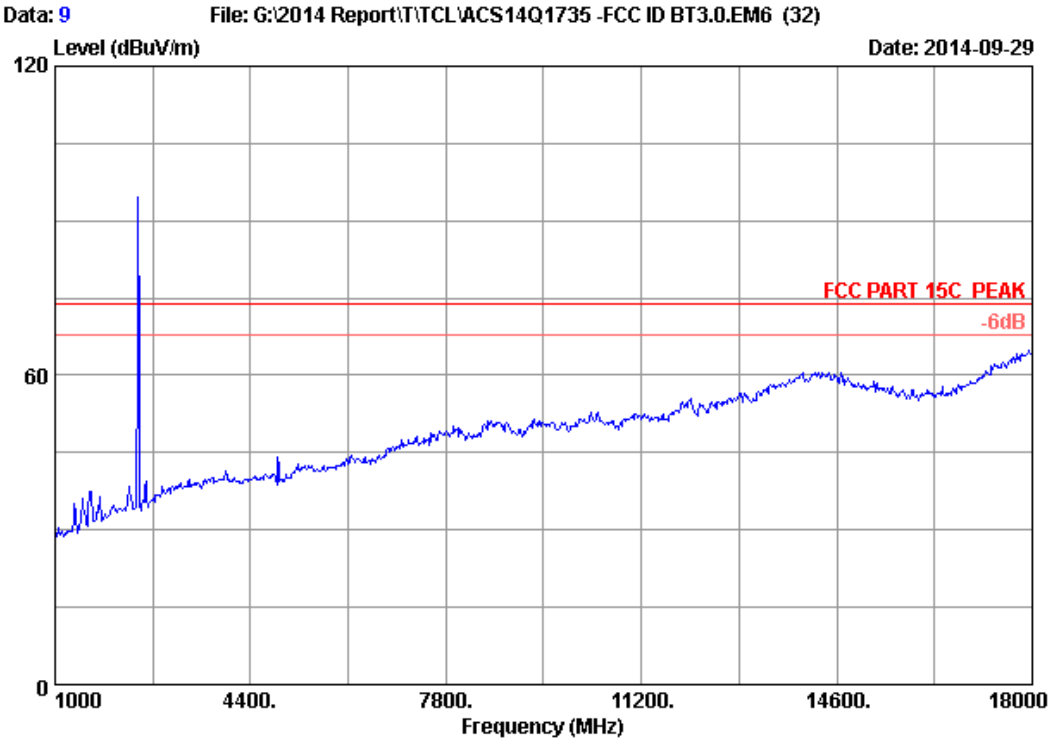

```
Site no.      : 3m Chamber                        Data no.   : 7
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : GFSK 2441MHz
M/N           : SA-CT180
```



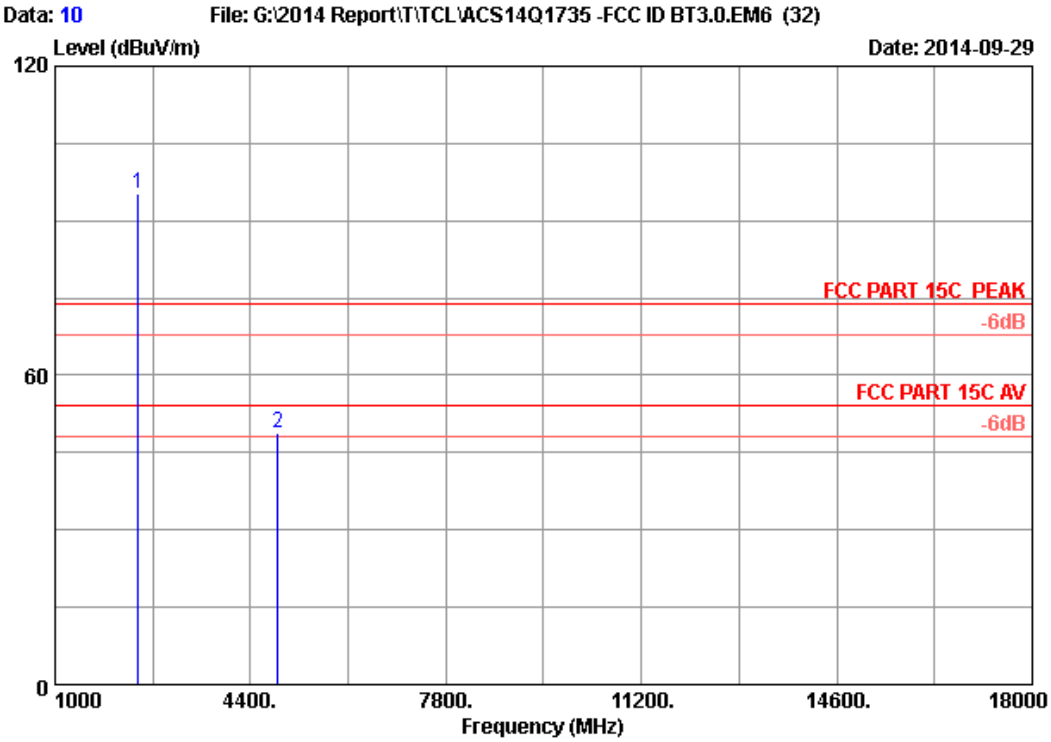
Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2441MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	28.27	5.86	35.70	100.11	98.54	74.00	-24.54	Peak
2	4882.000	32.99	8.64	35.70	43.86	49.79	74.00	24.21	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



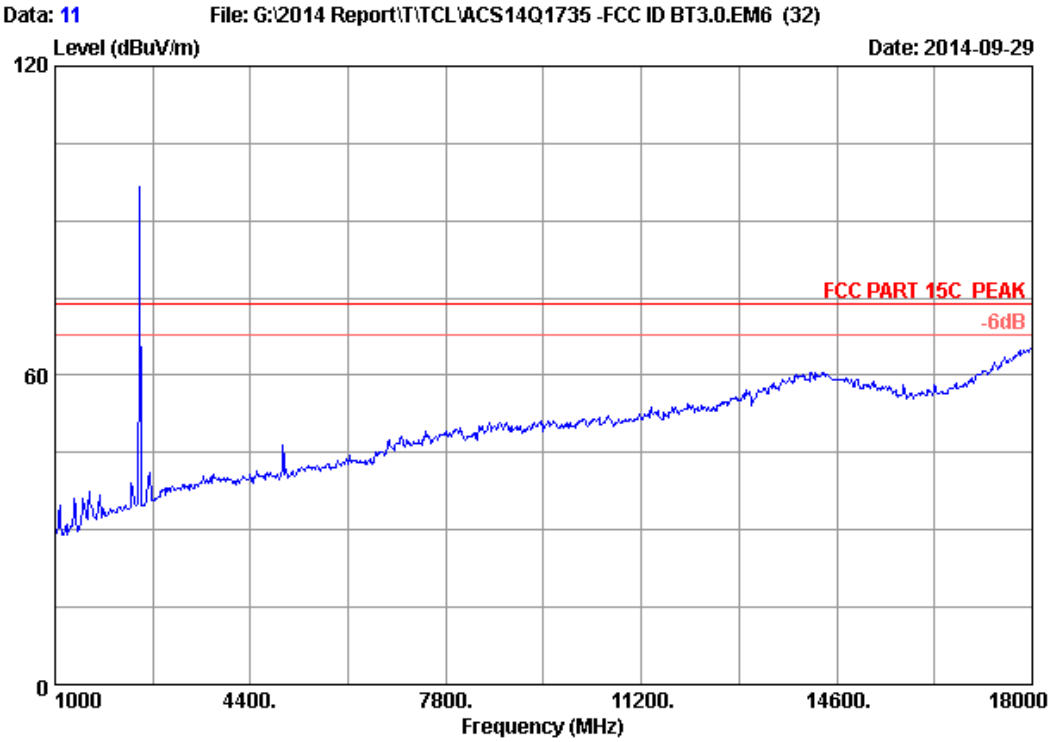

```
Site no.      : 3m Chamber                        Data no.   : 9
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : GFSK 2441MHz
M/N           : SA-CT180
```



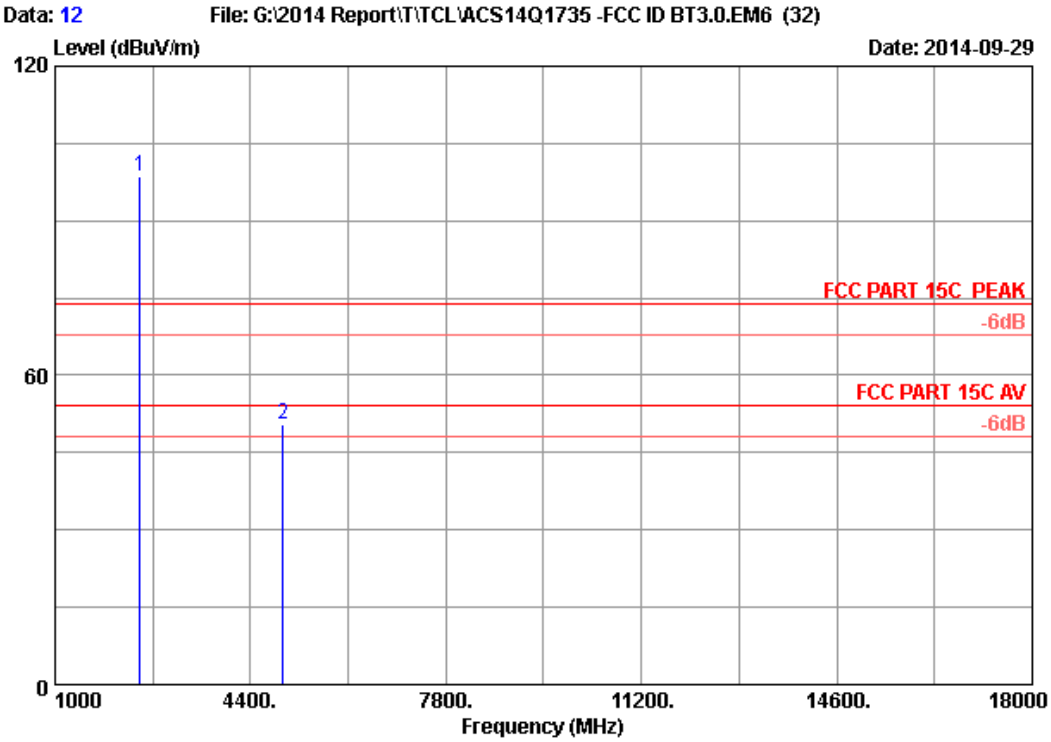
Site no. : 3m Chamber Data no. : 10
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2441MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	28.27	5.86	35.70	96.75	95.18	74.00	-21.18	Peak
2	4882.000	32.99	8.64	35.70	42.98	48.91	74.00	25.09	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.      : 3m Chamber                        Data no.   : 11
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : GFSK 2480MHz
M/N           : SA-CT180
```

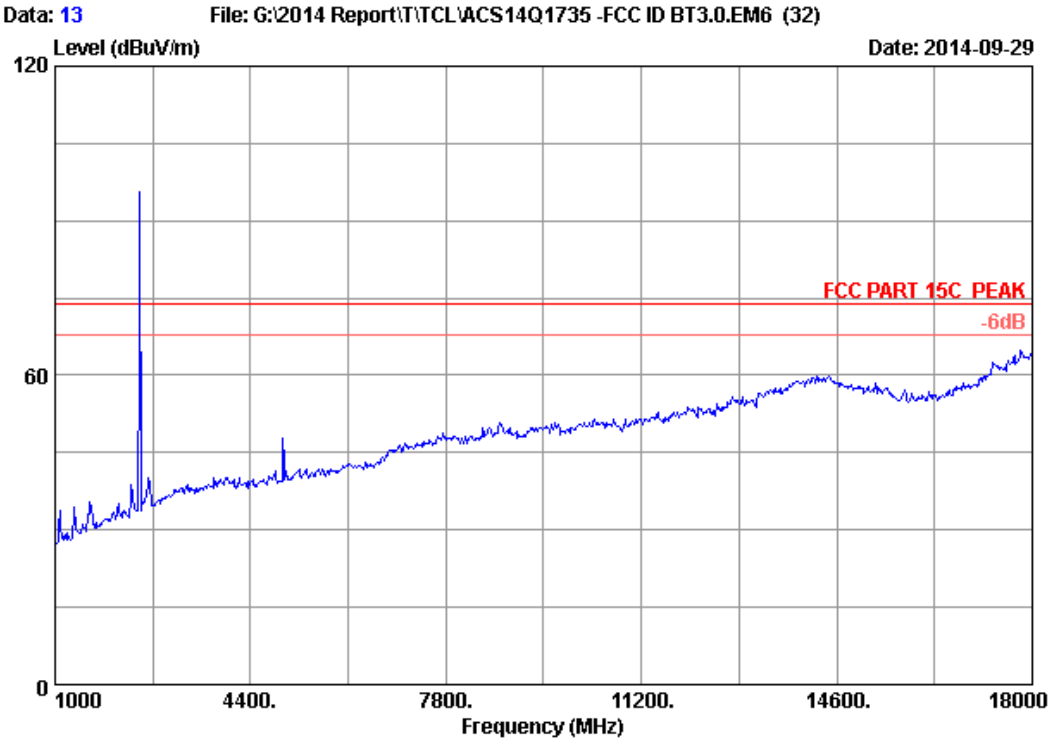


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 3115 (4580)
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2480MHz
M/N : SA-CT180

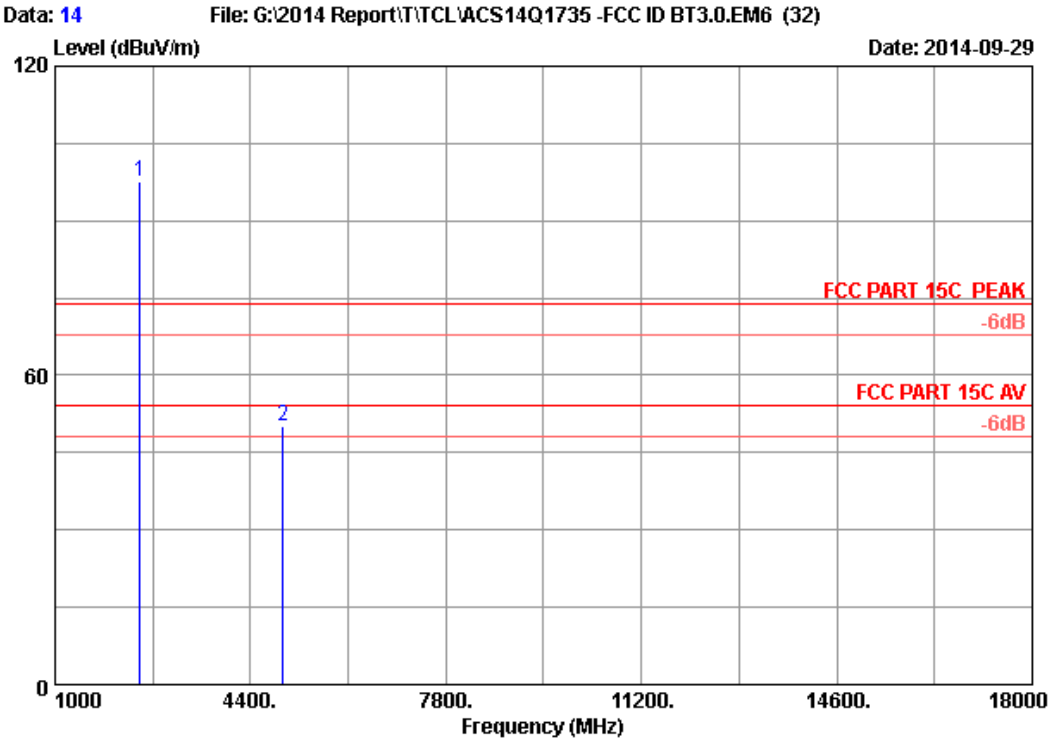
Data no. : 12
Ant. pol. : HORIZONTAL
Engineer : Kobe-Huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	28.36	5.91	35.70	100.20	98.77	74.00	-24.77	Peak
2	4960.000	33.13	8.72	35.70	44.46	50.61	74.00	23.39	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



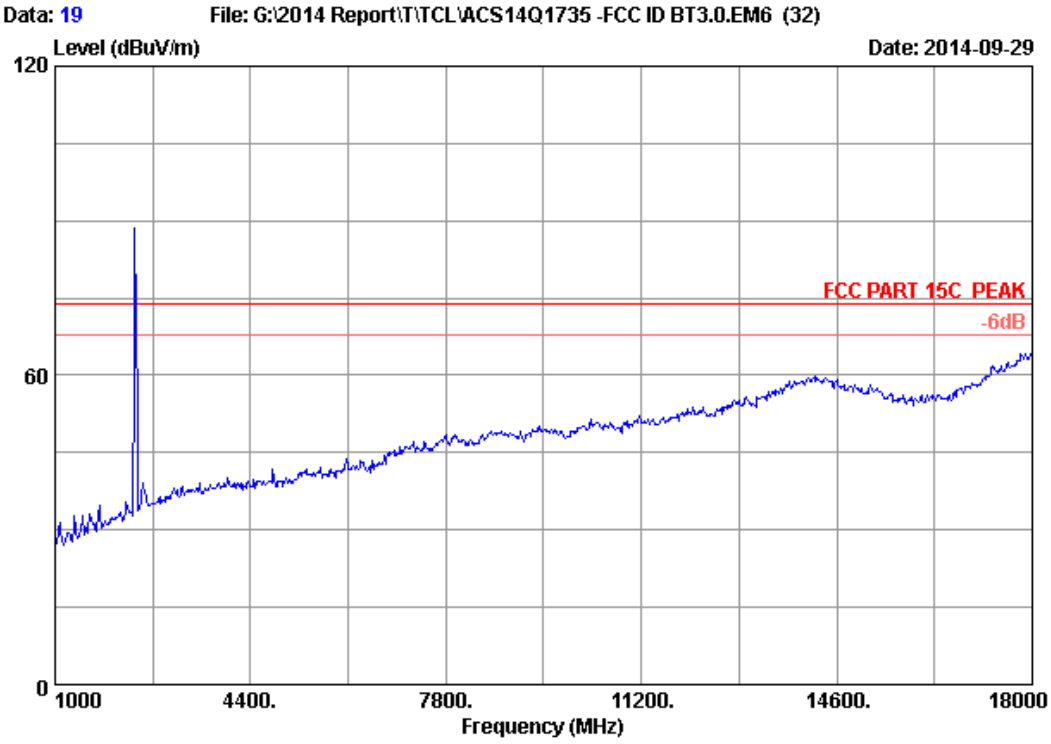

```
Site no.      : 3m Chamber                        Data no.   : 13
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : GFSK 2480MHz
M/N           : SA-CT180
```



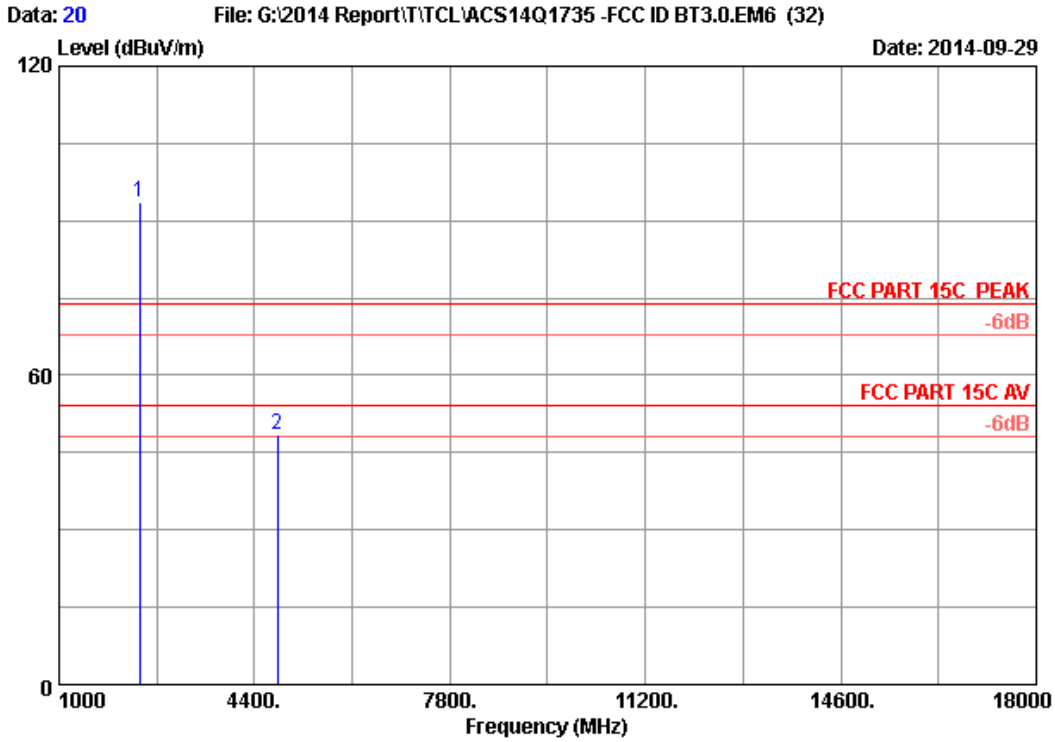
Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2480MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	28.36	5.91	35.70	98.91	97.48	74.00	-23.48	Peak
2	4960.000	33.13	8.72	35.70	44.02	50.17	74.00	23.83	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



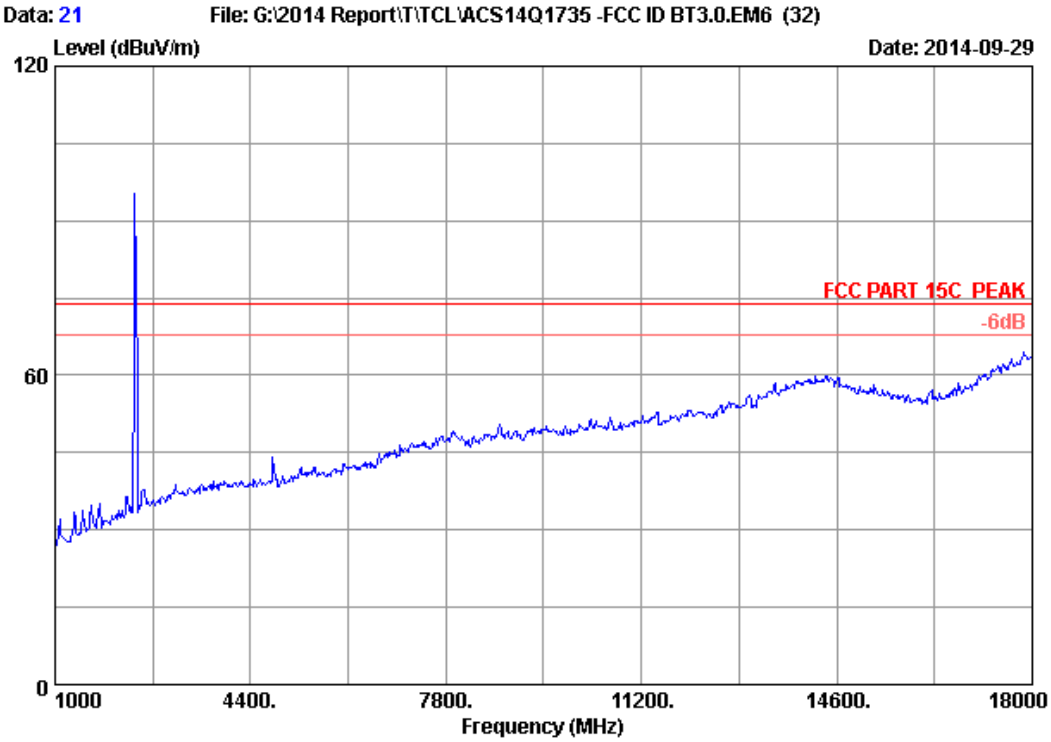

```
Site no.      : 3m Chamber                        Data no.   : 19
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : 8-DPSK 2402MHz
M/N           : SA-CT180
```



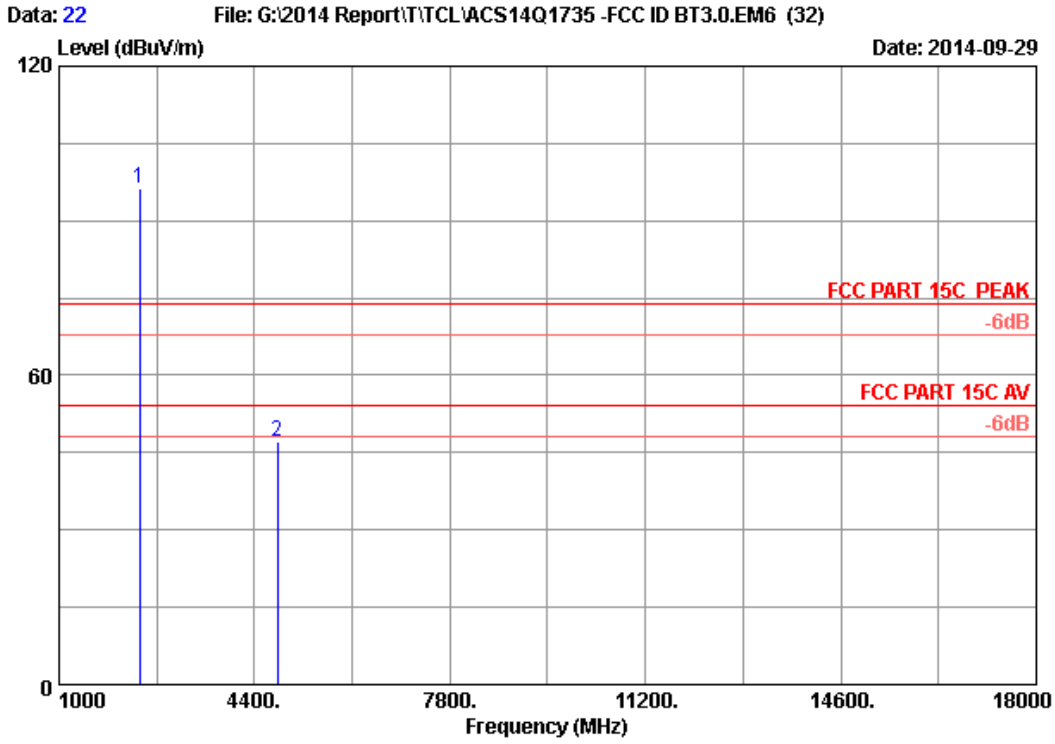
Site no. : 3m Chamber Data no. : 20
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2402MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	28.18	5.80	35.70	95.29	93.57	74.00	-19.57	Peak
2	4804.000	32.85	8.56	35.70	42.85	48.56	74.00	25.44	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



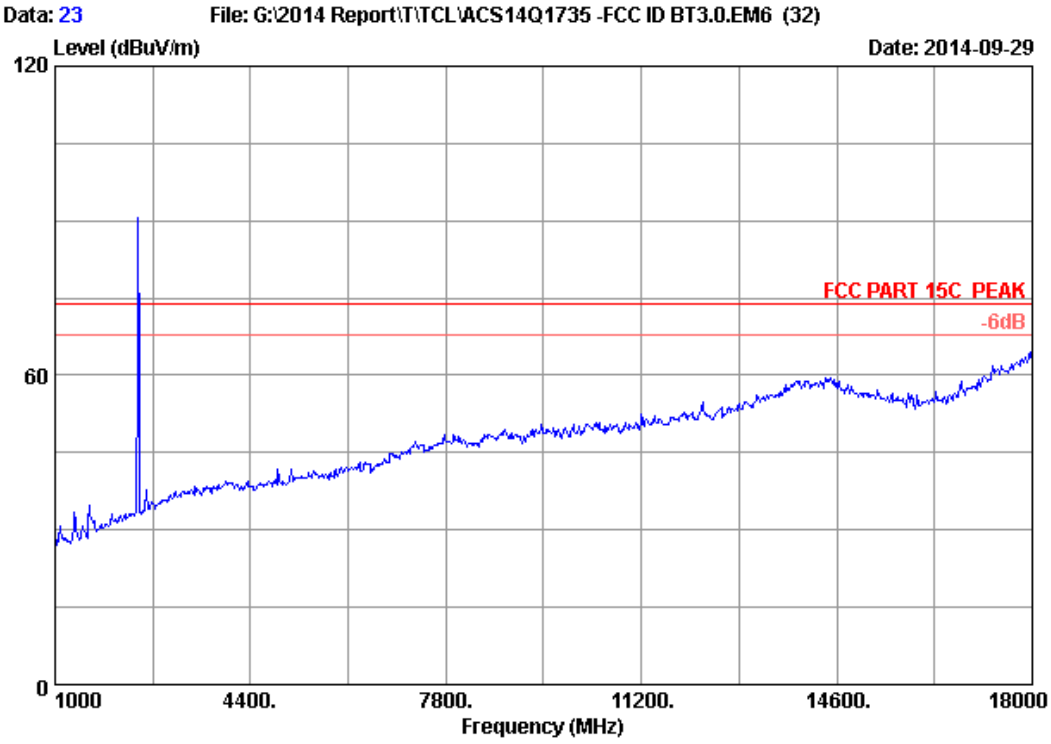

```
Site no.      : 3m Chamber                        Data no.   : 21
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : 8-DPSK 2402MHz
M/N           : SA-CT180
```



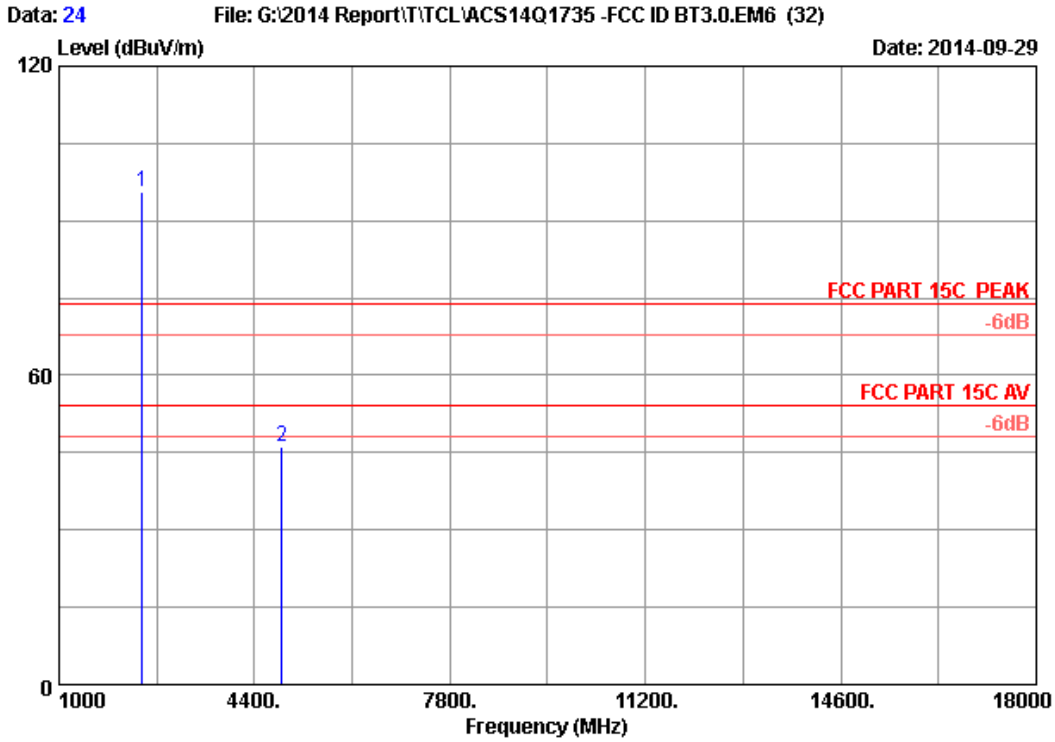
Site no. : 3m Chamber Data no. : 22
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2402MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	28.18	5.80	35.70	97.84	96.12	74.00	-22.12	Peak
2	4804.000	32.85	8.56	35.70	41.52	47.23	74.00	26.77	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



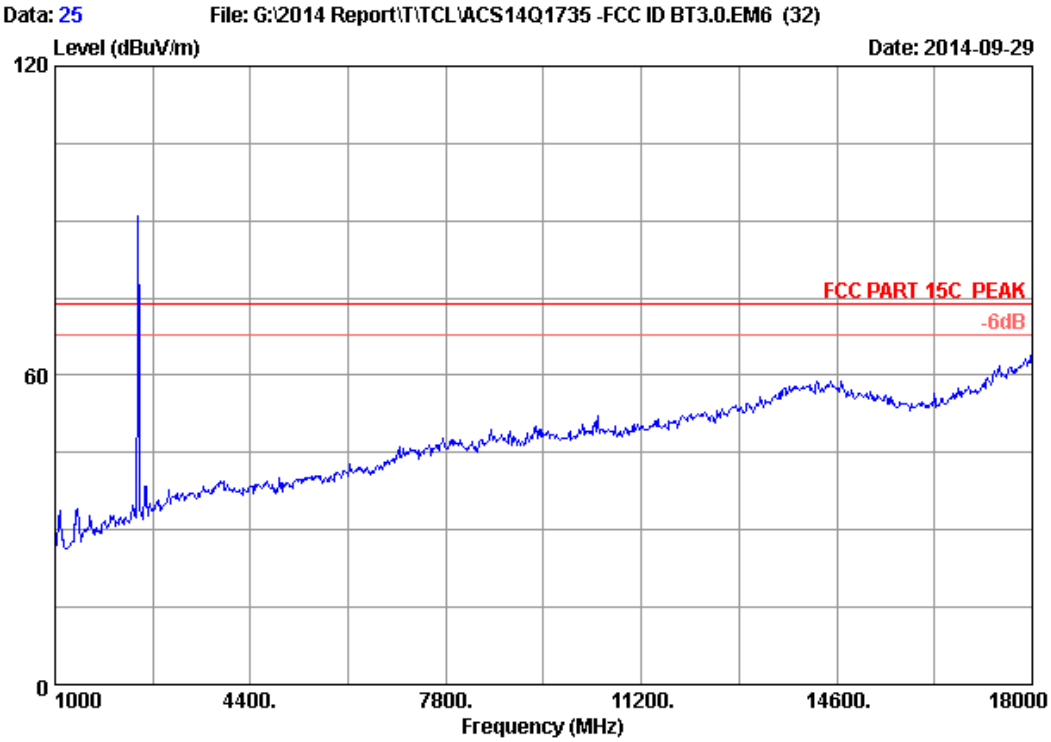

```
Site no.      : 3m Chamber                        Data no.   : 23
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : 8-DPSK 2441MHz
M/N           : SA-CT180
```



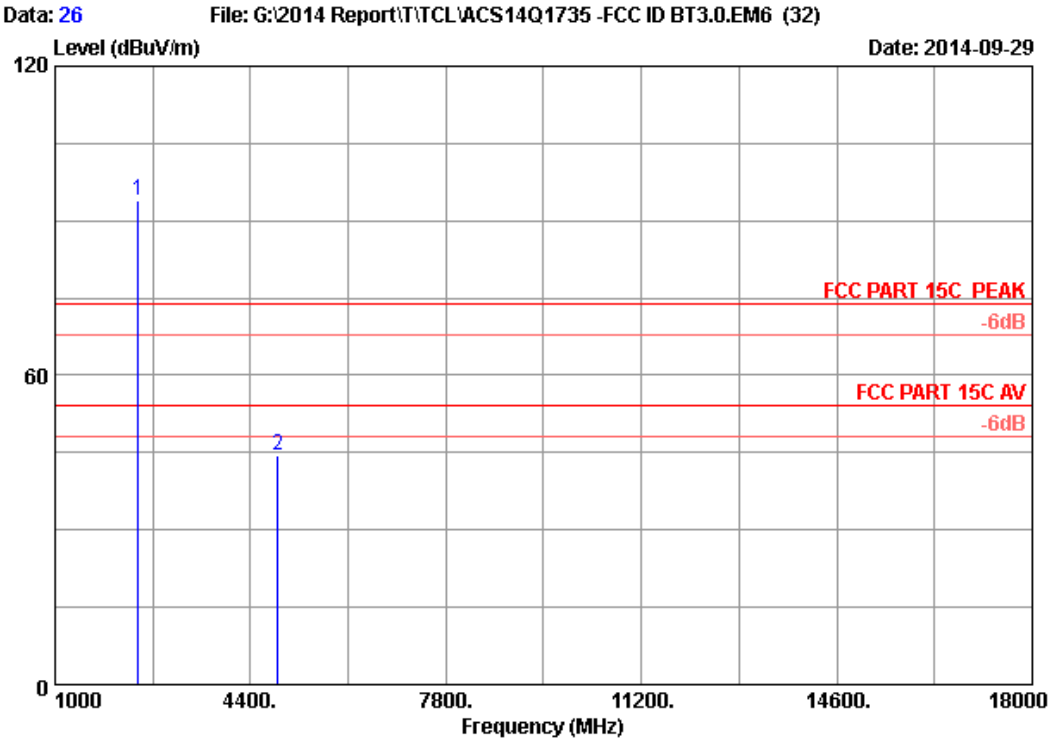
Site no. : 3m Chamber Data no. : 24
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2441MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	28.27	5.86	35.70	97.02	95.45	74.00	-21.45	Peak
2	4882.000	32.99	8.64	35.70	40.15	46.08	74.00	27.92	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



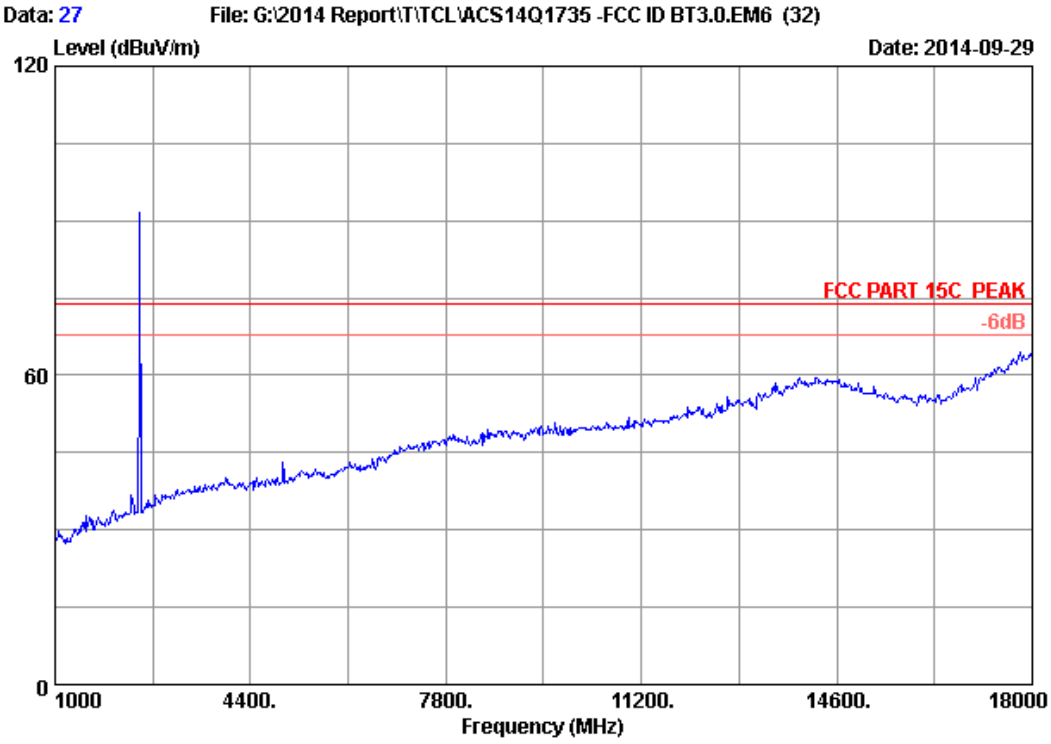

```
Site no.      : 3m Chamber                        Data no.   : 25
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : 8-DPSK 2441MHz
M/N           : SA-CT180
```



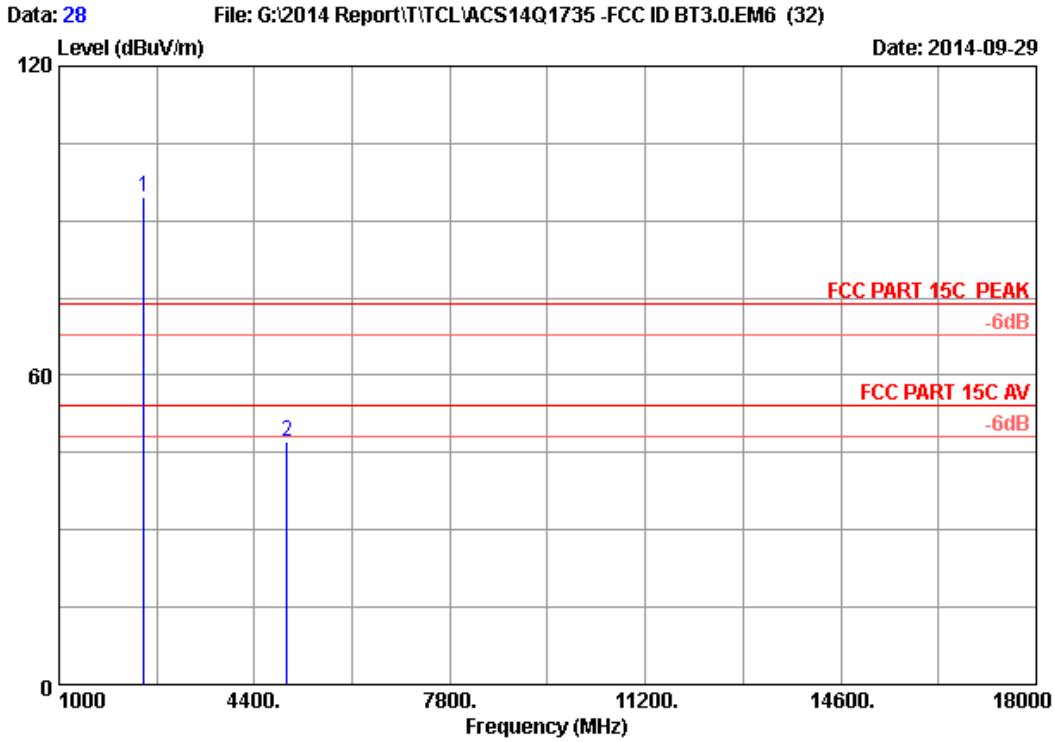
Site no. : 3m Chamber Data no. : 26
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2441MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.000	28.27	5.86	35.70	95.45	93.88	74.00	-19.88	Peak
2	4882.000	32.99	8.64	35.70	38.64	44.57	74.00	29.43	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



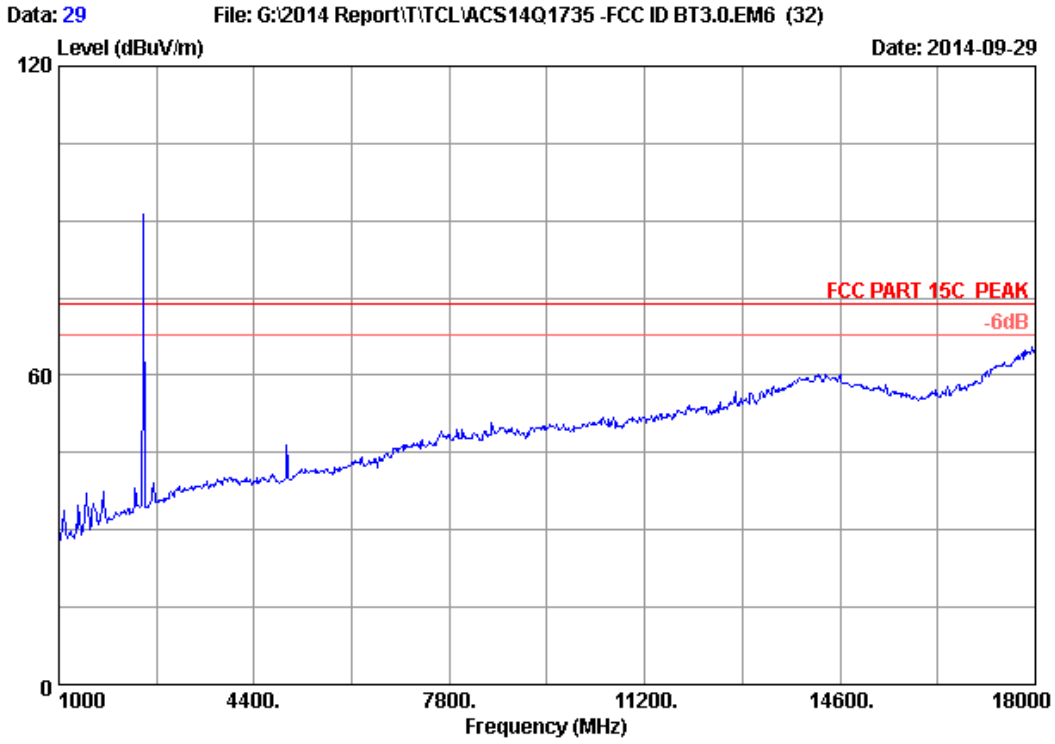

```
Site no.      : 3m Chamber                        Data no.   : 27
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : 8-DPSK 2480MHz
M/N           : SA-CT180
```



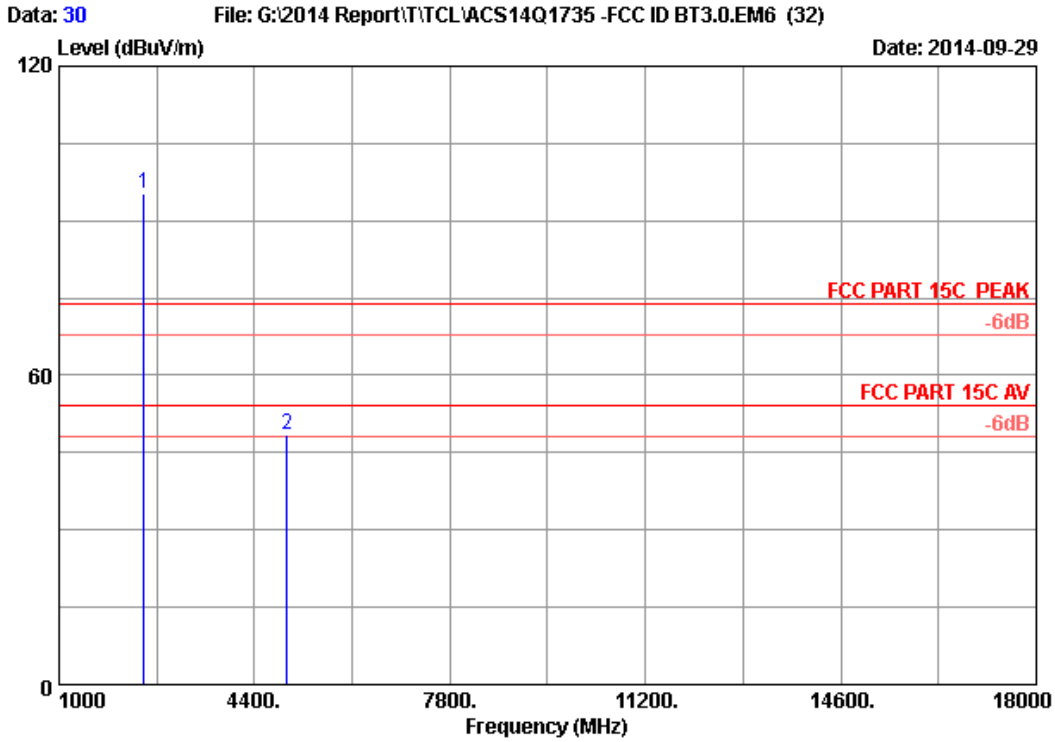
Site no. : 3m Chamber Data no. : 28
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2480MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	28.36	5.91	35.70	95.99	94.56	74.00	-20.56	Peak
2	4960.000	33.13	8.72	35.70	40.84	46.99	74.00	27.01	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.      : 3m Chamber                        Data no.   : 29
Dis. / Ant.   : 3m   2014 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Kobe-Huang
EUT           : Active Speaker System
Power rating  : AC 120V/60Hz
Test Mode     : 8-DPSK 2480MHz
M/N           : SA-CT180
```



Site no. : 3m Chamber Data no. : 30
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2480MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	28.36	5.91	35.70	96.85	95.42	74.00	-21.42	Peak
2	4960.000	33.13	8.72	35.70	42.28	48.43	74.00	25.57	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.

5. CONDUCTED SPURIOUS EMISSIONS

5.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	N9030A	MY51380221	Sep. 29, 14	1Year
2.	Attenuator (20dB)	Agilent	8491B	MY39262165	Apr. 28,14	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	Apr. 28,14	1 Year

5.2.Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

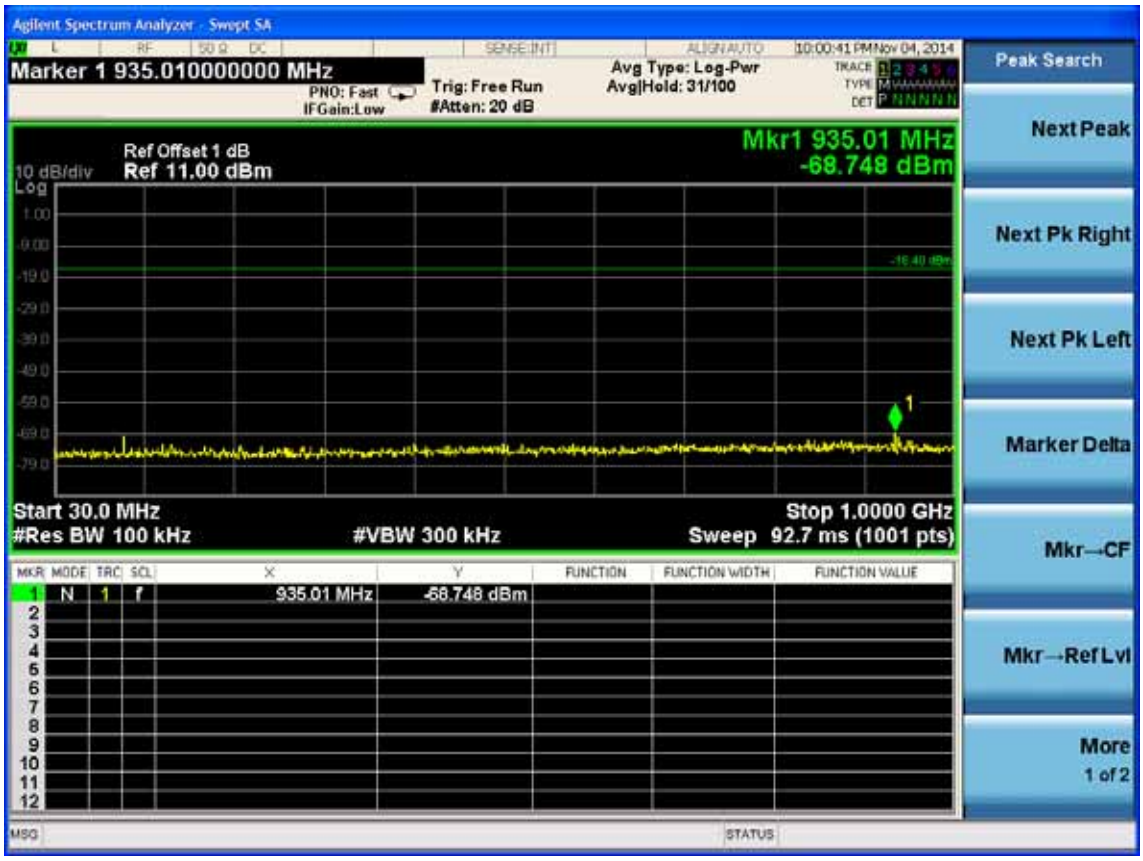
5.3.Test Procedure

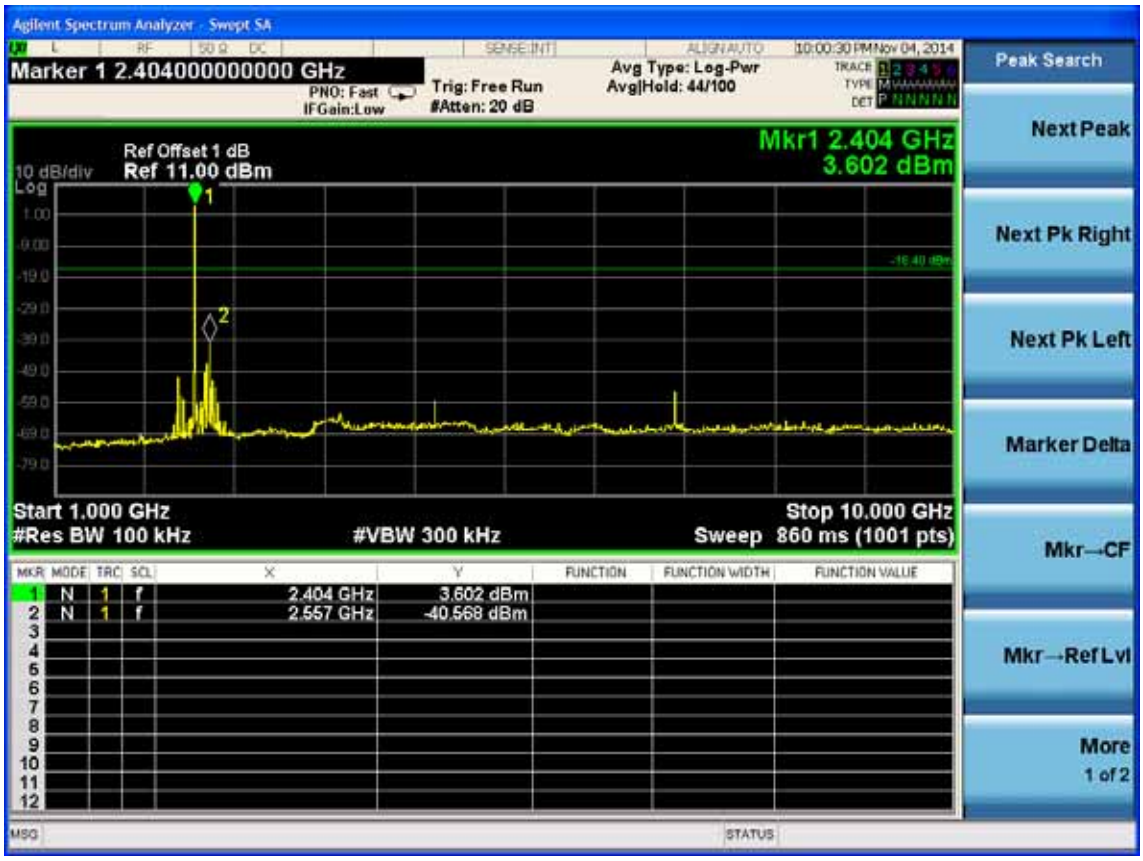
The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions detected.

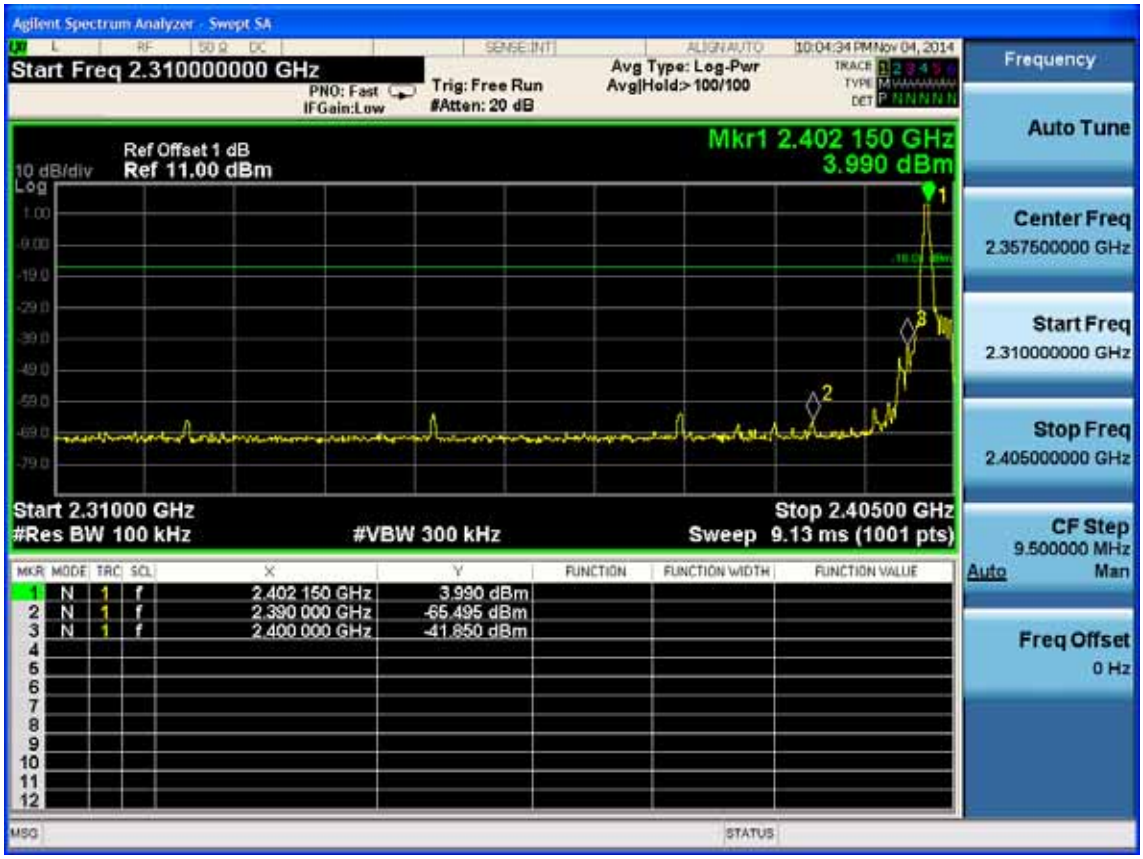
5.4.Test result

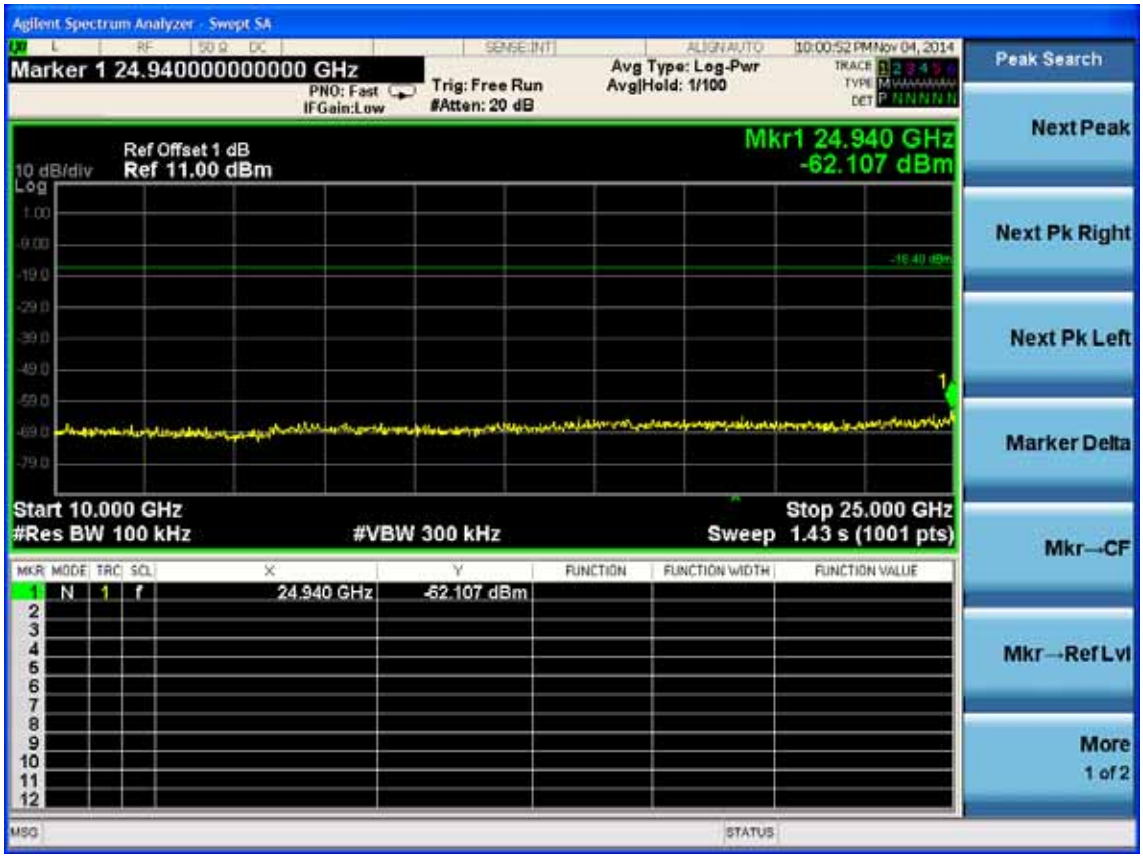
PASS (The testing data was attached in the next pages.)

Hopping Off
GFSK
2402MHz

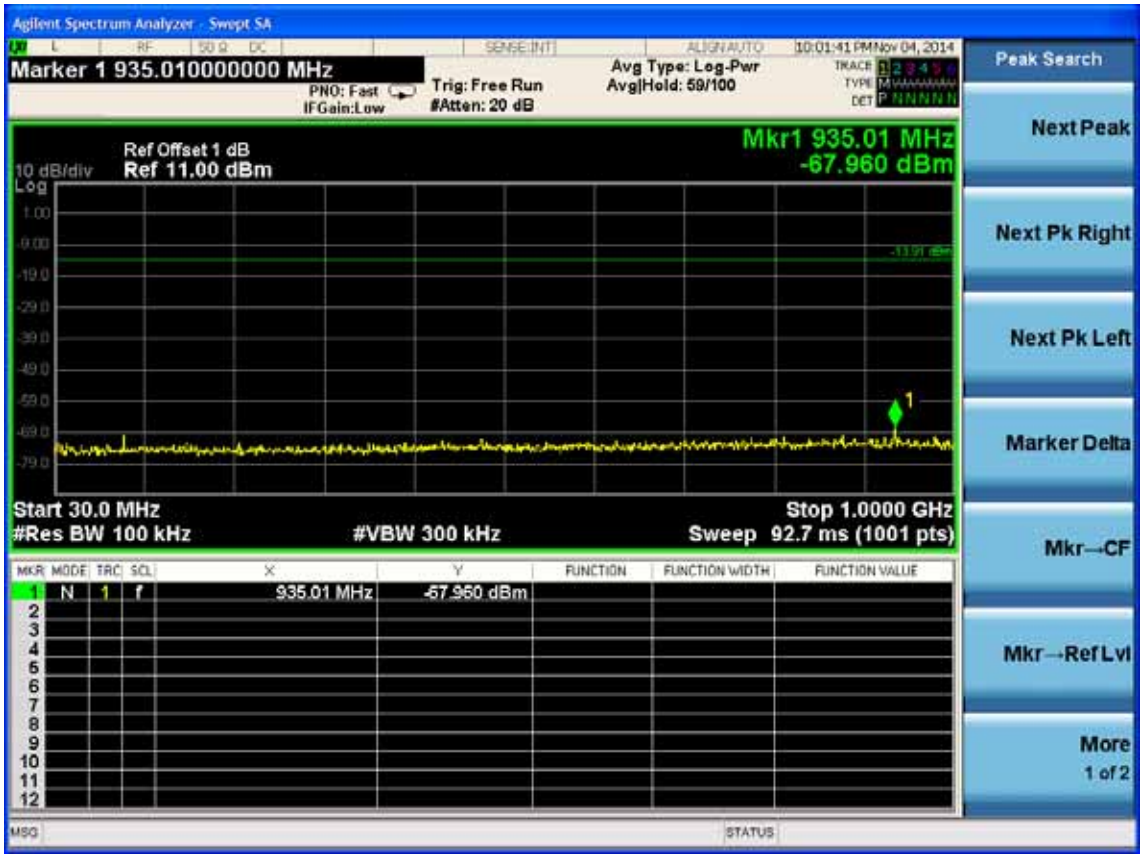


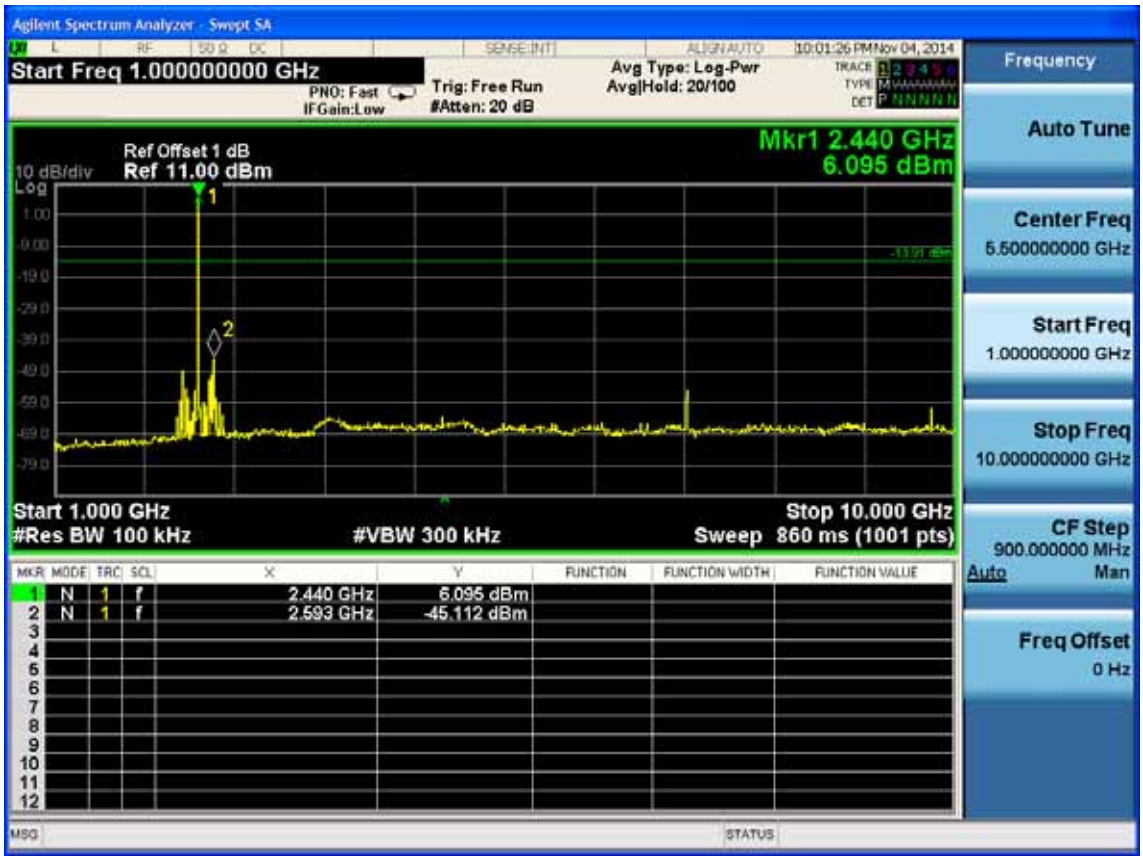


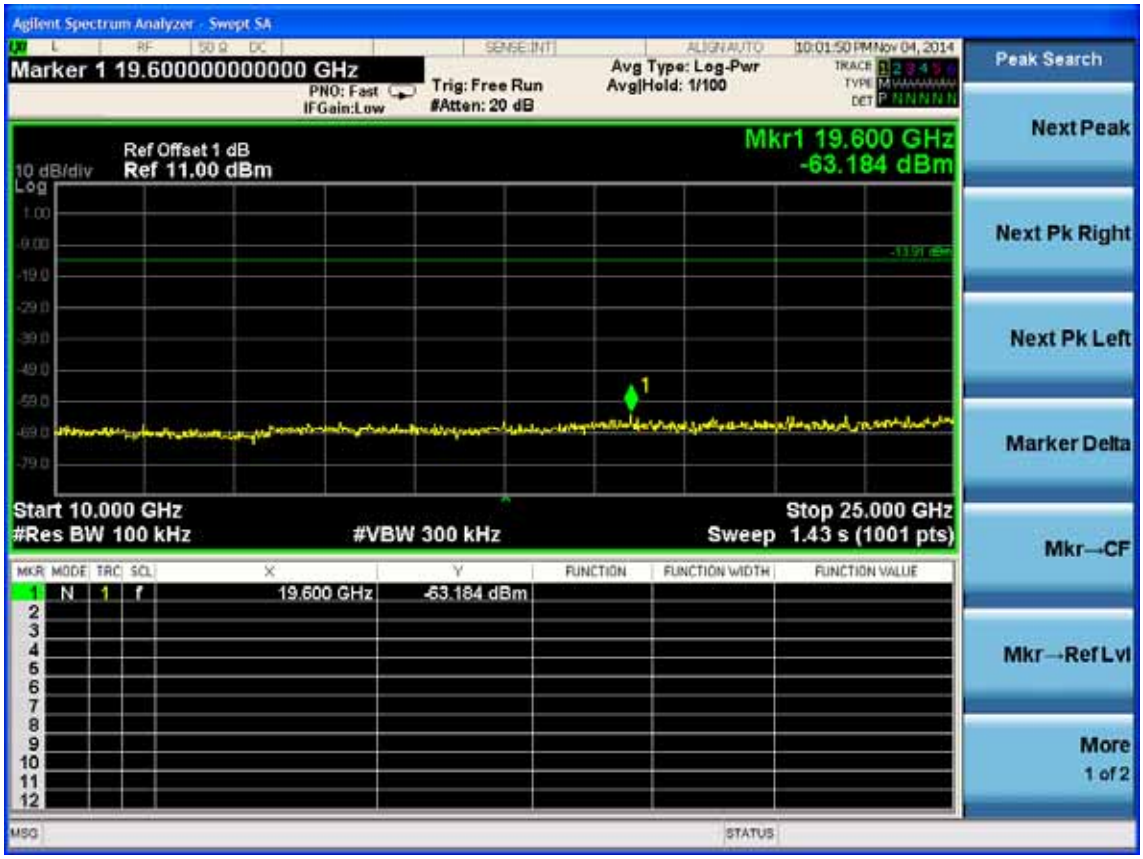

Agilent Spectrum Analyzer - Swept SA
Start Freq 2.310000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:04:34 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.402 150 GHz
3.990 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.40500 GHz
Sweep 9.13 ms (1001 pts)
1 N 1 f 2.402 150 GHz 3.990 dBm
2 N 1 f 2.390 000 GHz -65.495 dBm
3 N 1 f 2.400 000 GHz -41.850 dBm
Frequency
Auto Tune
Center Freq
2.357500000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.405000000 GHz
CF Step
9.500000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Marker 1 24.940000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
10:00:52 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 24.940 GHz
-62.107 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.940 GHz -62.107 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

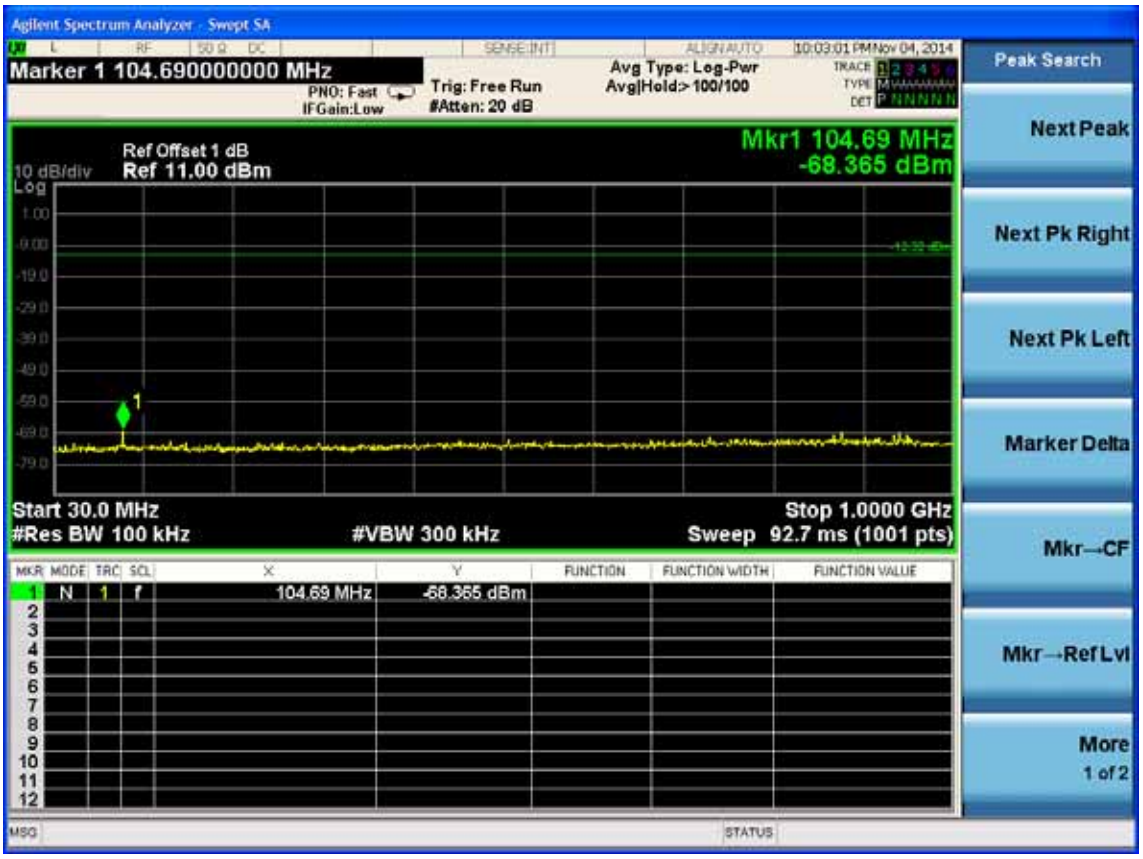
2441MHz

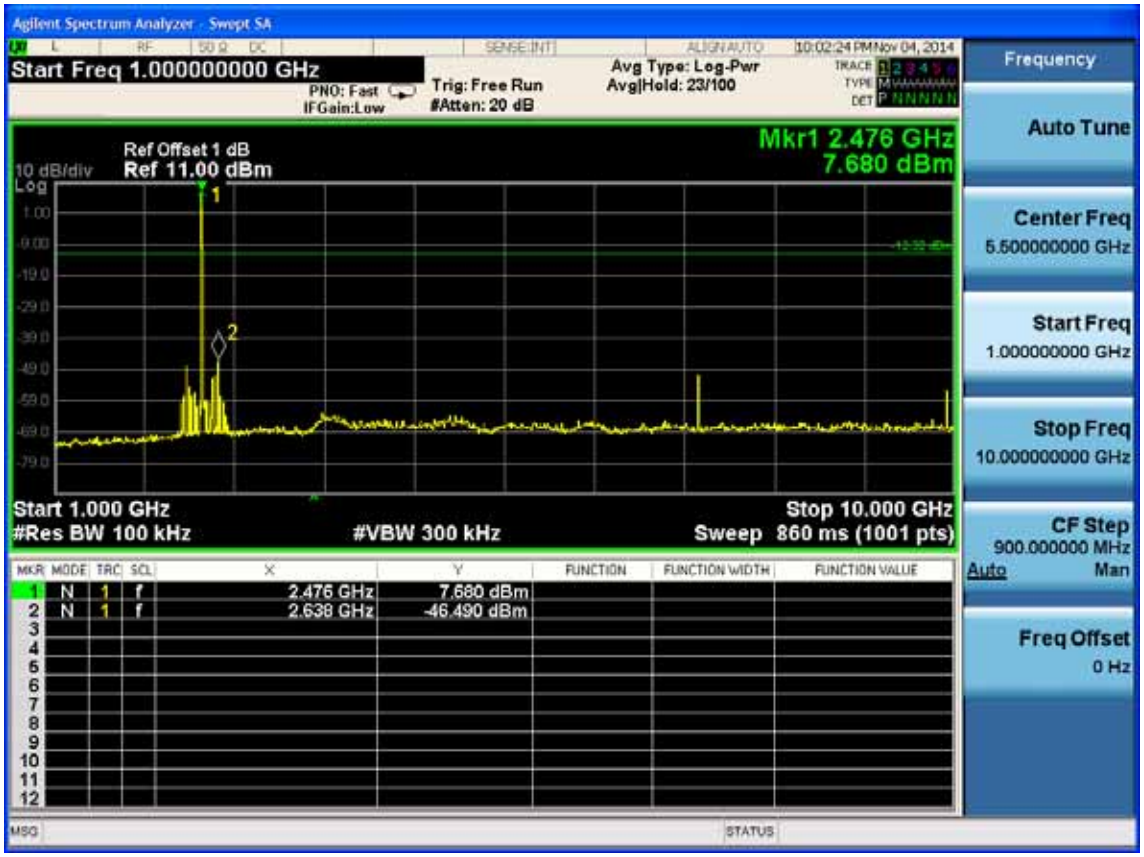

Agilent Spectrum Analyzer - Swept SA
Marker 1 935.010000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 59/100
10:01:41 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 935.01 MHz
-67.960 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 935.01 MHz -67.960 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 20/100
10:01:26 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.440 GHz
6.095 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.440 GHz 6.095 dBm
2 N 1 f 2.593 GHz -45.112 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto Man
Freq Offset
0 Hz

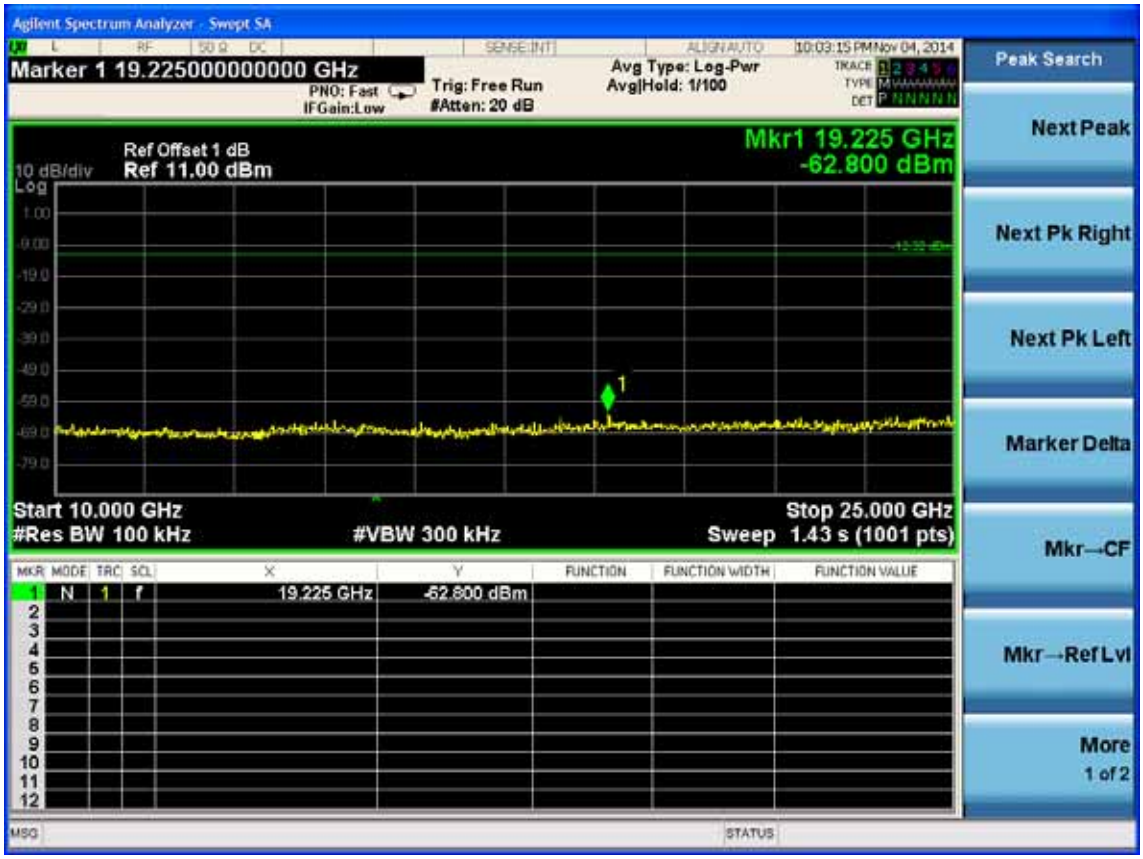

Agilent Spectrum Analyzer - Swept SA
Marker 1 19.600000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
10:01:50 PM Nov 04, 2014
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 19.600 GHz
-63.184 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 19.600 GHz -63.184 dBm
MSG
STATUS

2480MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 104.690000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:03:01 PM Nov 04, 2014
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 104.69 MHz
-68.365 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 104.69 MHz -68.365 dBm
MSG
STATUS

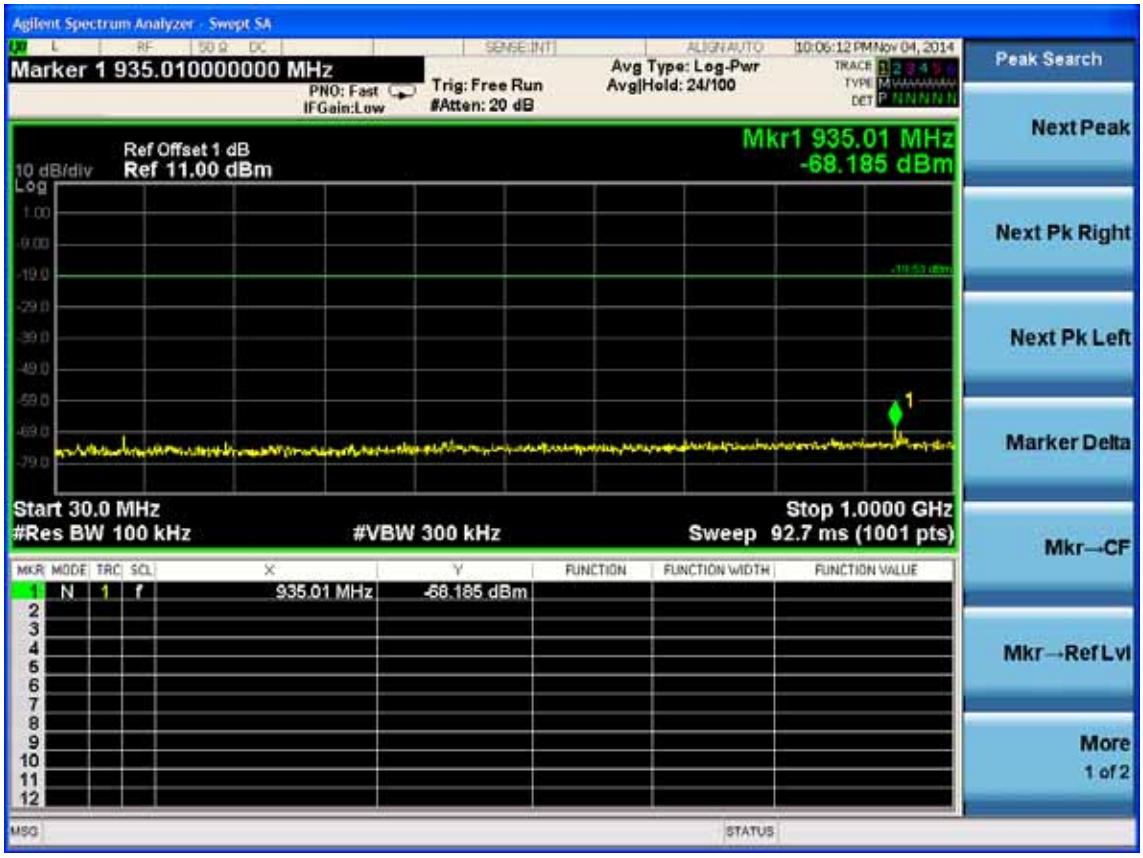

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 23/100
10:02:24 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.476 GHz
7.680 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.476 GHz 7.680 dBm
2 N 1 f 2.638 GHz -46.490 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto
Man
Freq Offset
0 Hz

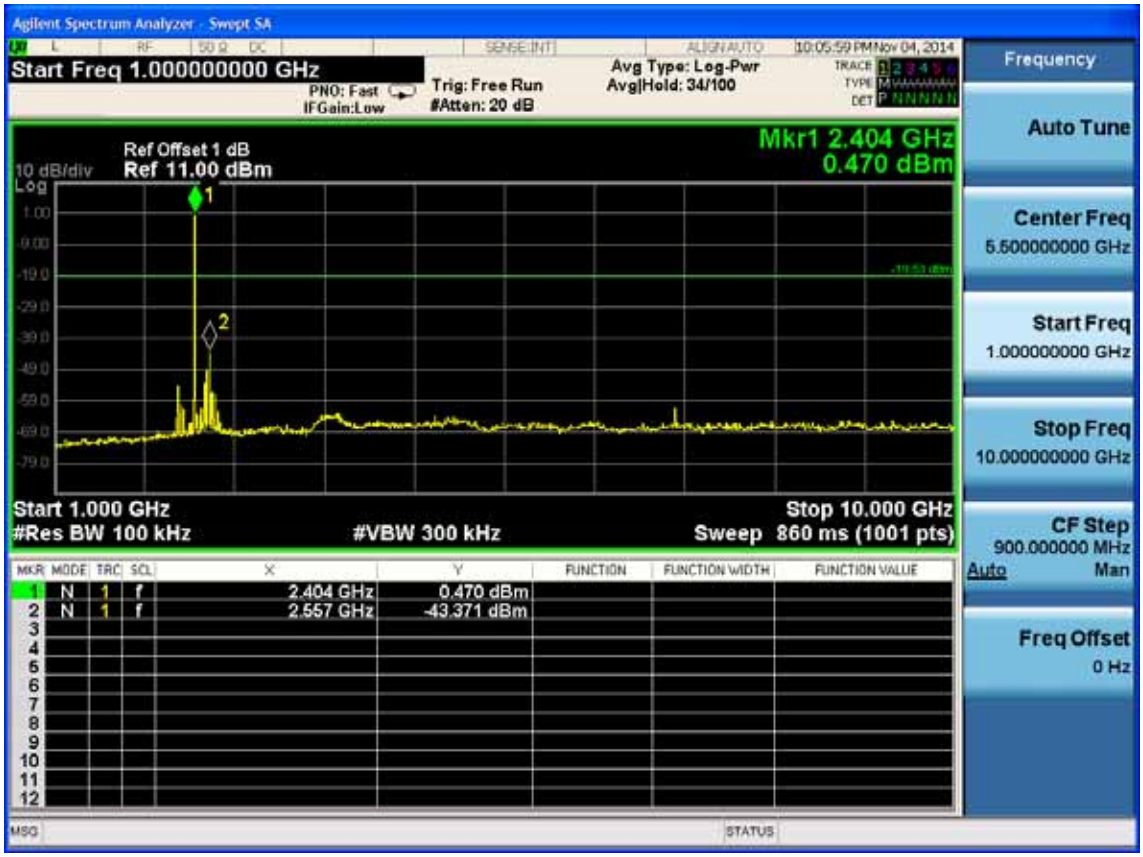
Agilent Spectrum Analyzer - Swept SA
Start Freq 2.477000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:03:47 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.479 838 GHz
7.702 dBm
Start 2.47700 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.51000 GHz
Sweep 3.20 ms (1001 pts)
1 N 1 f 2.479 838 GHz 7.702 dBm
2 N 1 f 2.493 500 GHz -53.984 dBm
3 N 1 f 2.500 000 GHz -62.306 dBm
4 N 1 f 2.484 029 GHz -51.796 dBm
Frequency
Auto Tune
Center Freq
2.493500000 GHz
Start Freq
2.477000000 GHz
Stop Freq
2.510000000 GHz
CF Step
3.300000 MHz
Auto
Man
Freq Offset
0 Hz

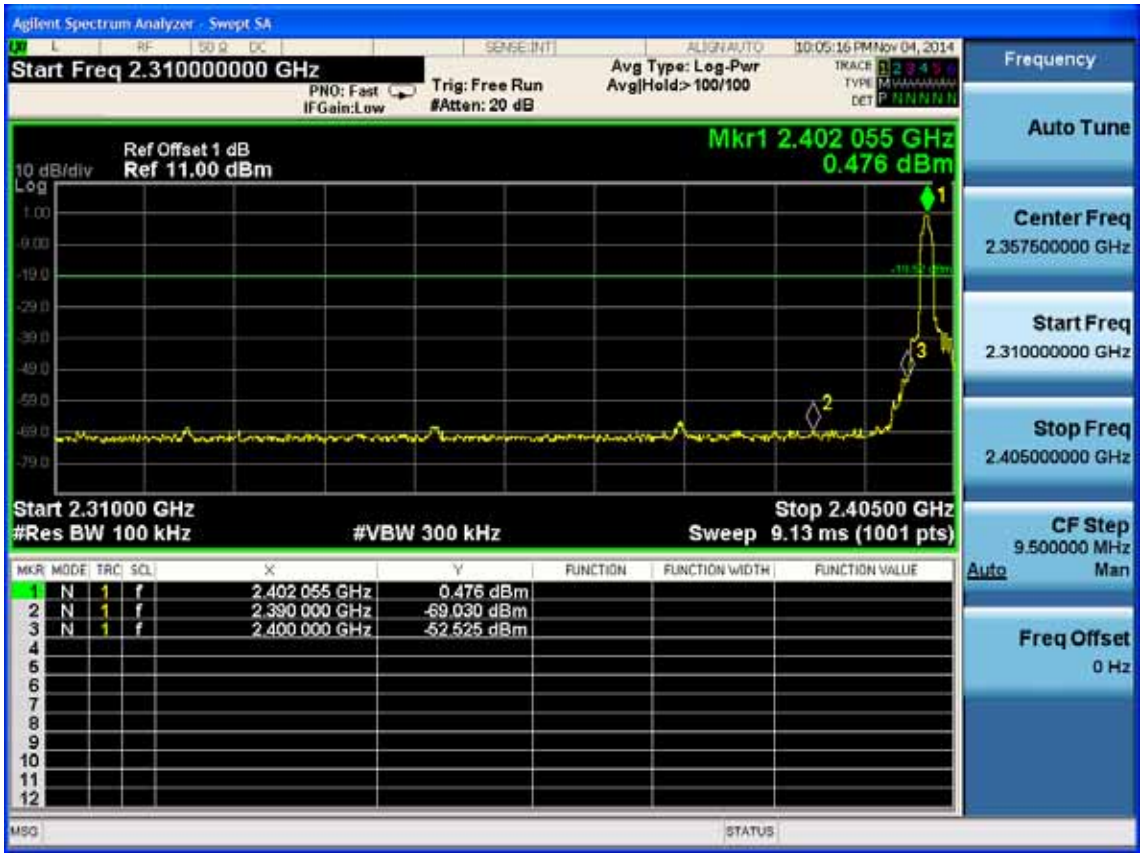


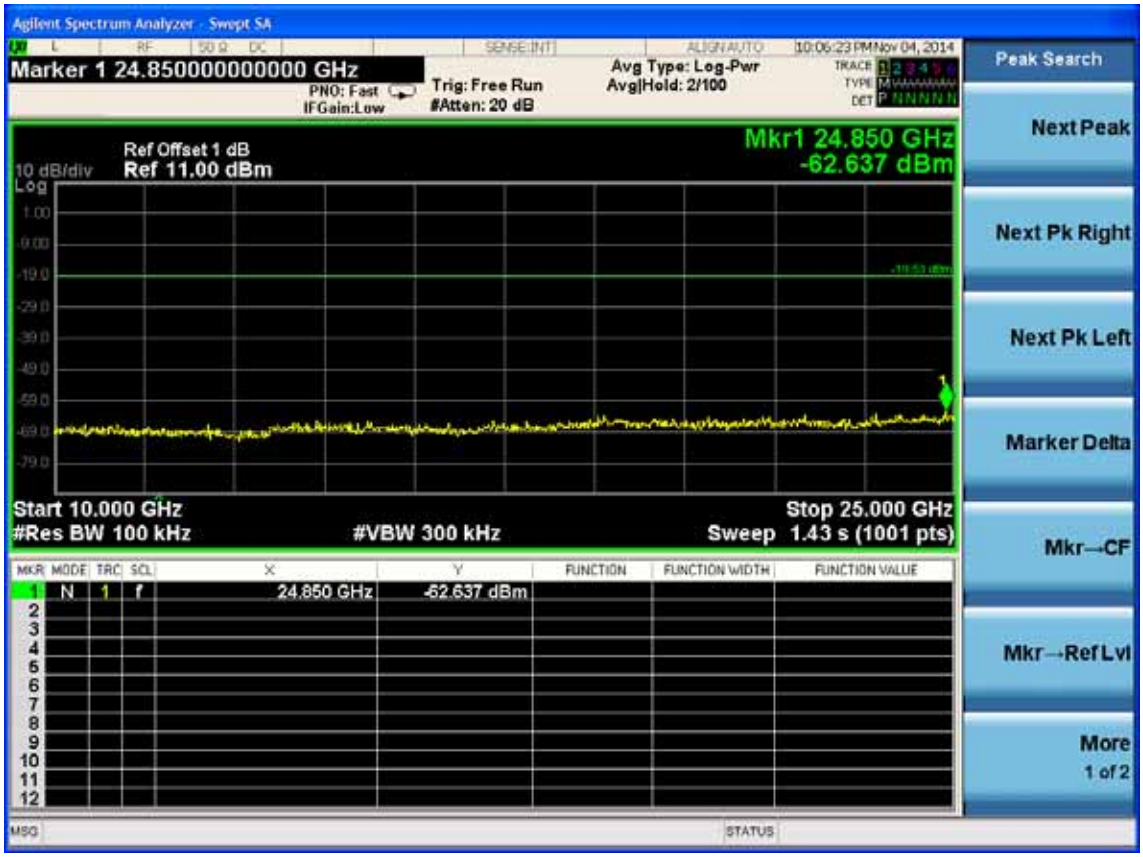
8-DPSK

2402MHz

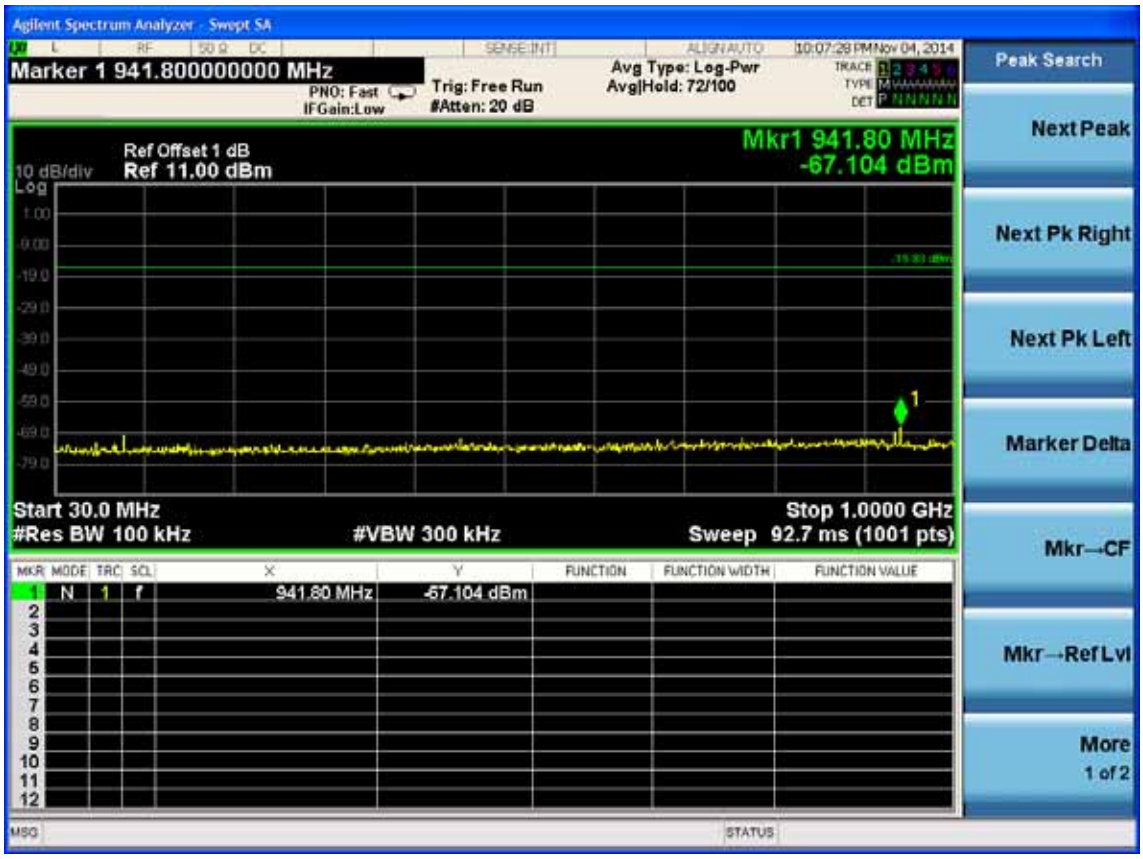


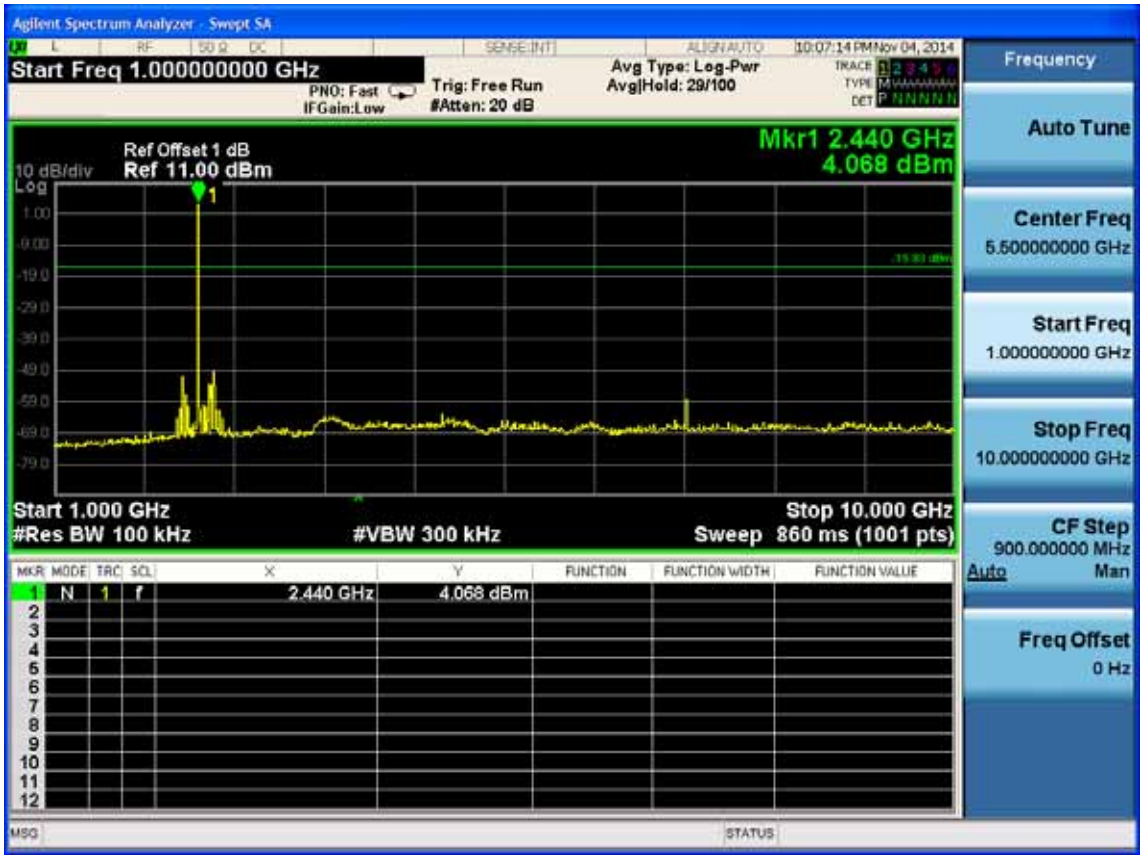

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 34/100
10:05:59 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.404 GHz
0.470 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.404 GHz 0.470 dBm
2 N 1 f 2.557 GHz -43.371 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto Man
Freq Offset
0 Hz

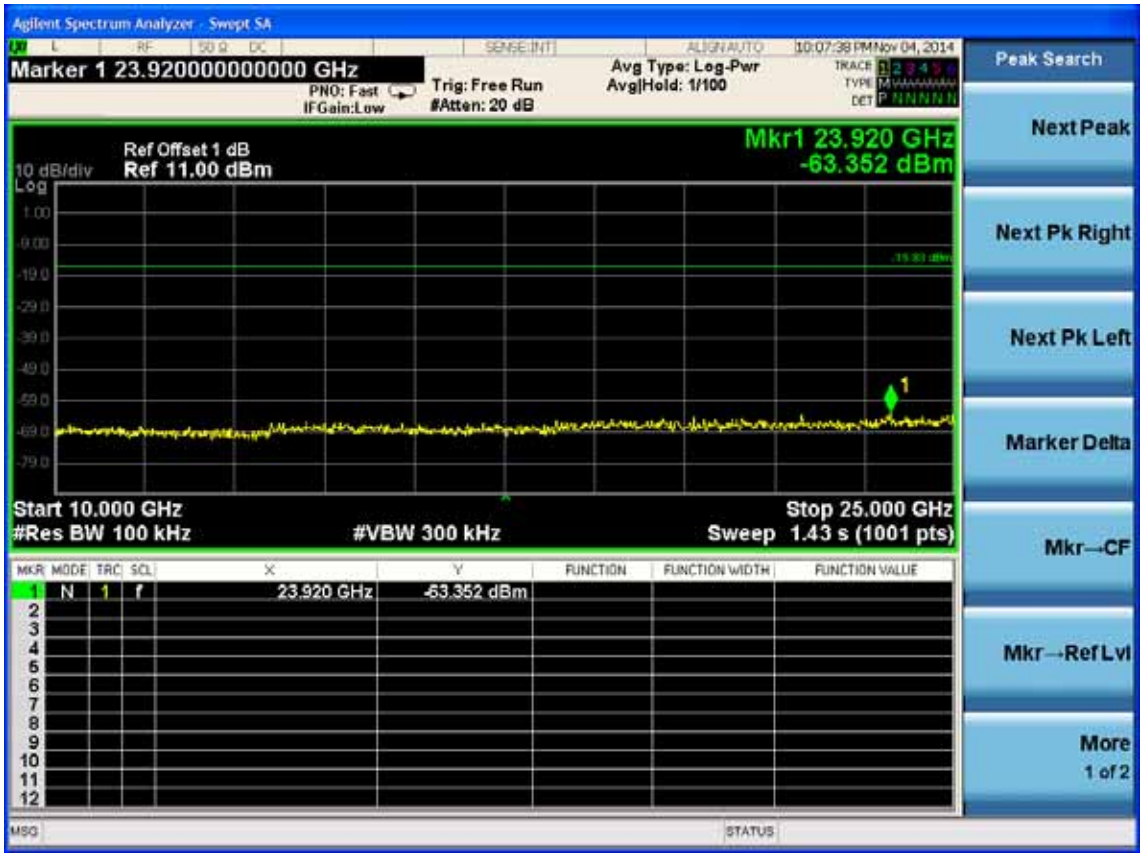

Agilent Spectrum Analyzer - Swept SA
Start Freq 2.310000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:05:16 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.402 055 GHz
0.476 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.40500 GHz
Sweep 9.13 ms (1001 pts)
1 N 1 f 2.402 055 GHz 0.476 dBm
2 N 1 f 2.390 000 GHz -69.030 dBm
3 N 1 f 2.400 000 GHz -52.525 dBm
Frequency
Auto Tune
Center Freq
2.357500000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.405000000 GHz
CF Step
9.500000 MHz
Auto Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Marker 1 24.850000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
10:06:23 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 24.850 GHz
-62.637 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.850 GHz -62.637 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

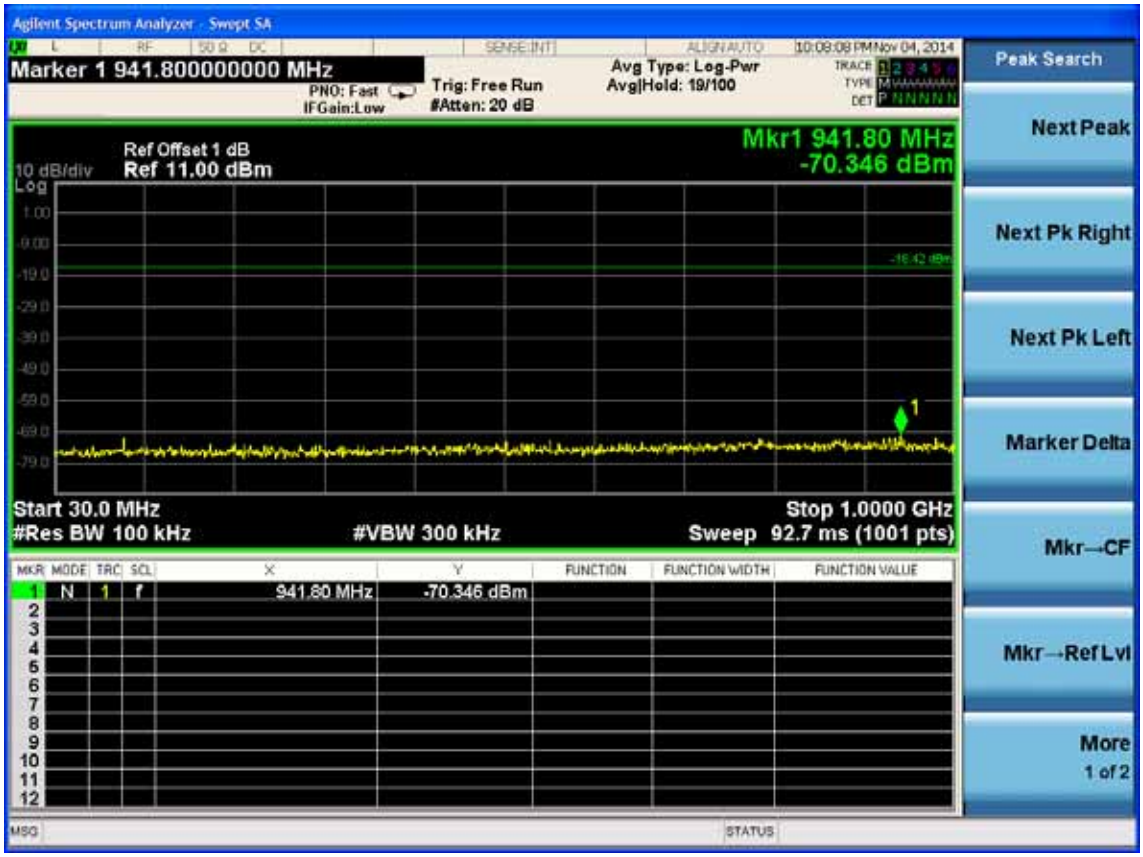
2441MHz

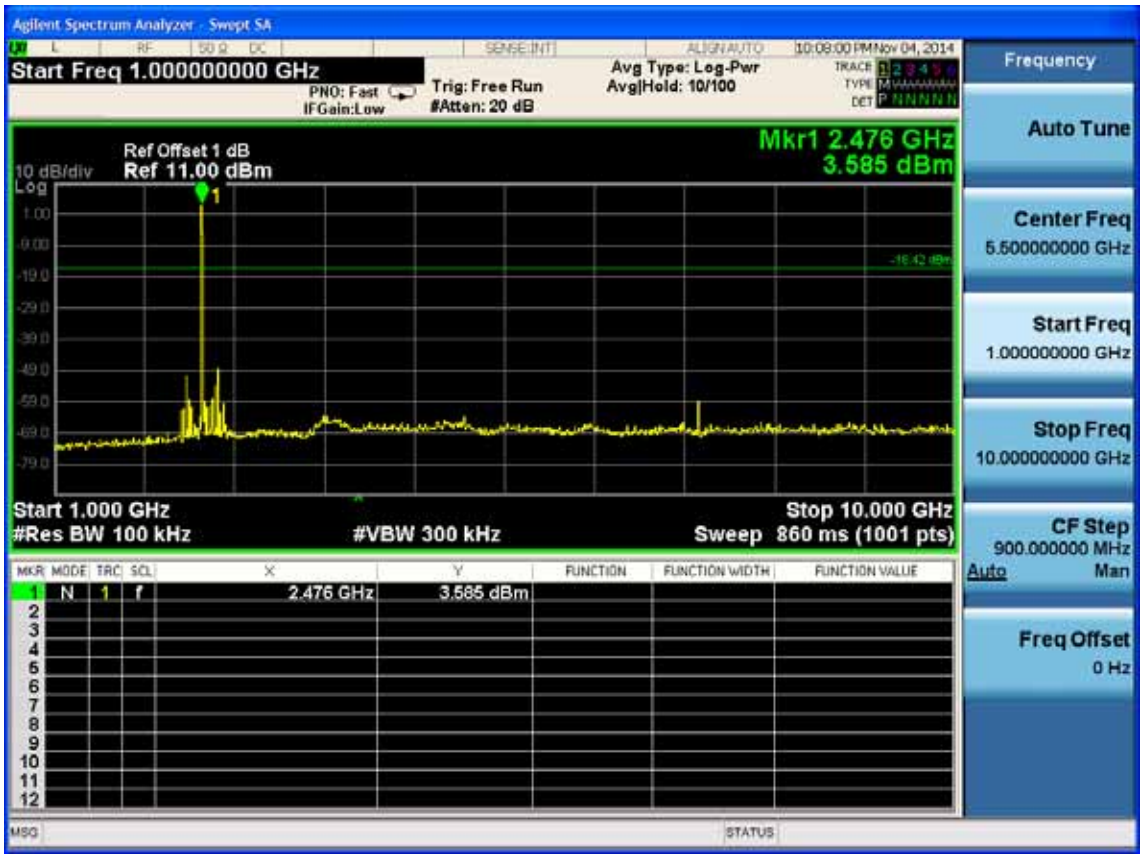

Agilent Spectrum Analyzer - Swept SA
Marker 1 941.800000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 72/100
10:07:28 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 941.80 MHz
-67.104 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 941.80 MHz -67.104 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 29/100
10:07:14 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.440 GHz
4.068 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.440 GHz 4.068 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto Man
Freq Offset
0 Hz

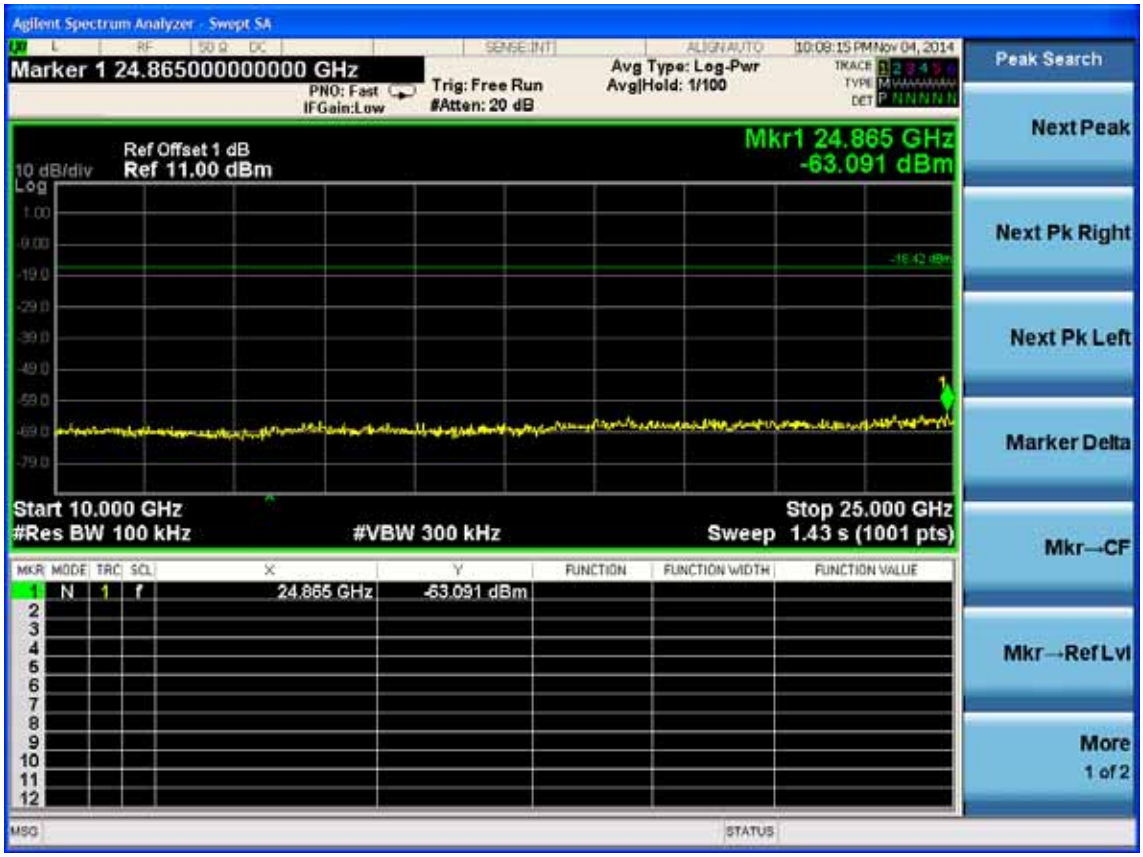

Agilent Spectrum Analyzer - Swept SA
Marker 1 23.920000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
10:07:38 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 23.920 GHz
-63.352 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 23.920 GHz -63.352 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

2480MHz

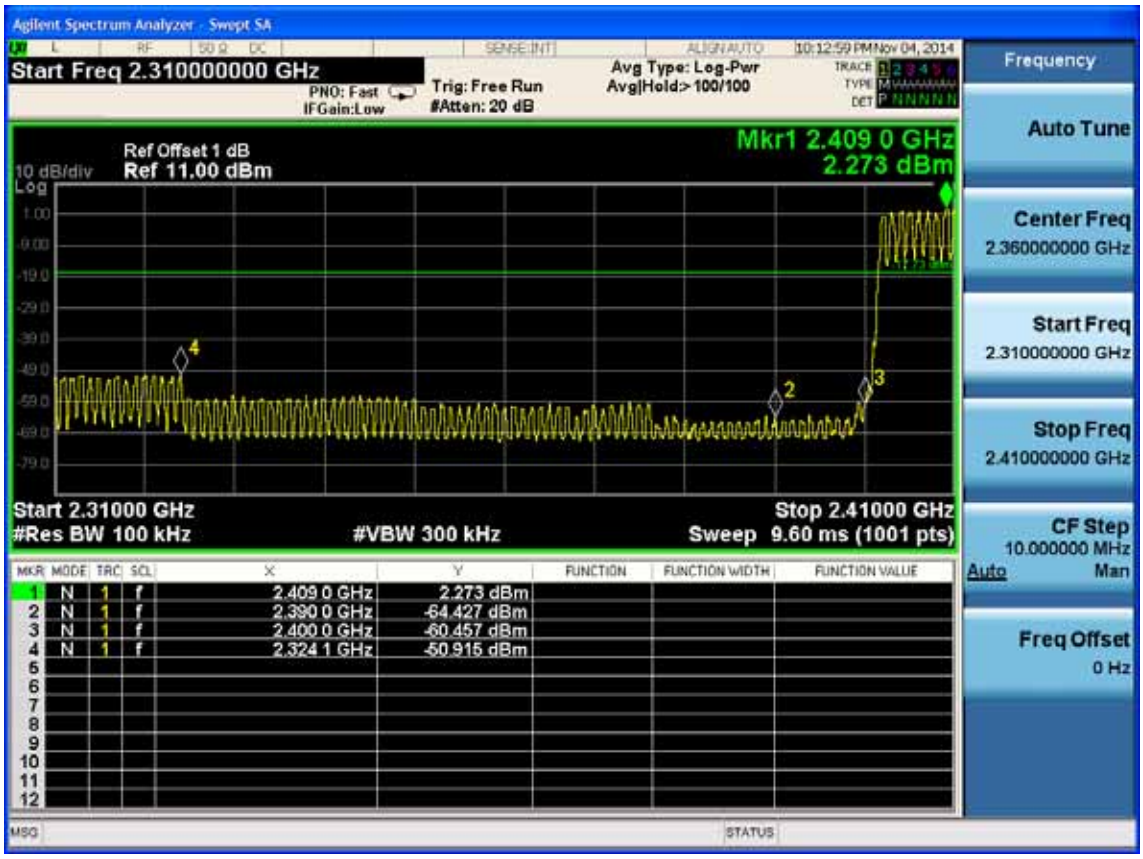

Agilent Spectrum Analyzer - Swept SA
Marker 1 941.800000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 19/100
10:08:08 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 941.80 MHz
-70.346 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 941.80 MHz -70.346 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

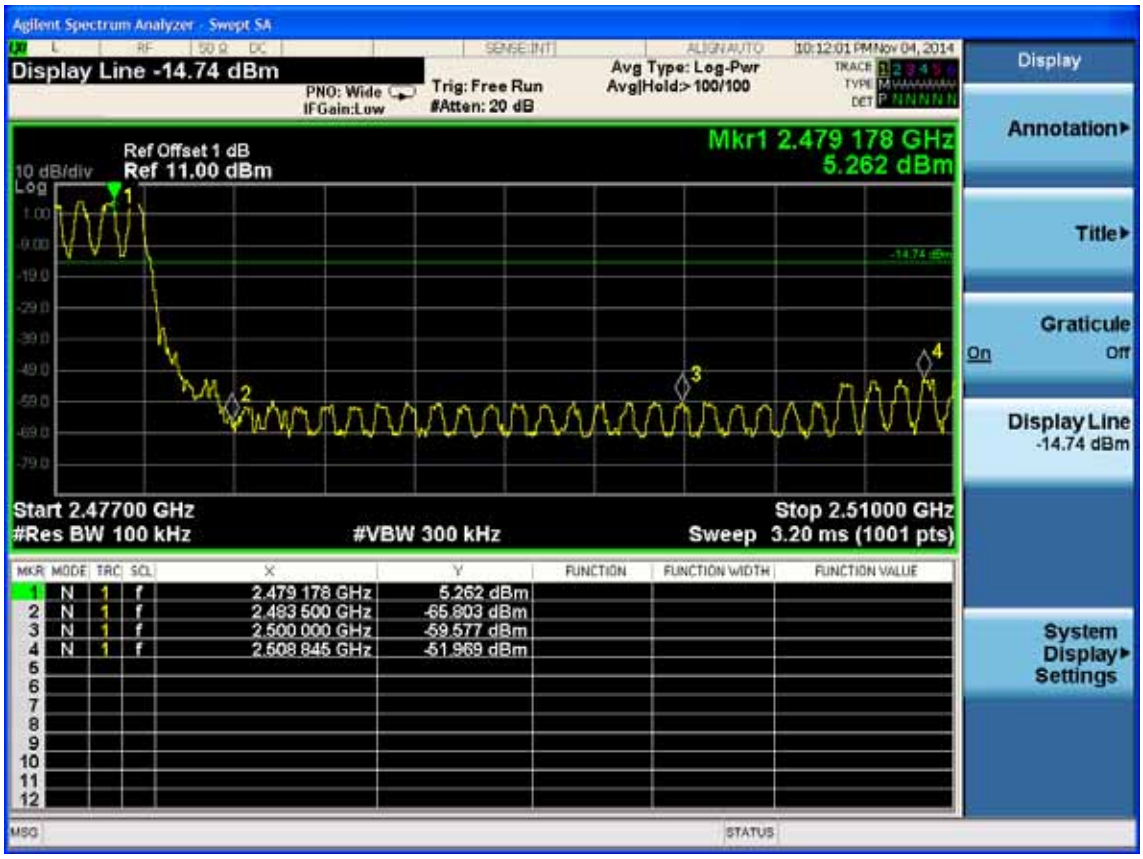

Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 10/100
10:08:00 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr1 2.476 GHz
3.585 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.476 GHz 3.585 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
900.000000 MHz
Auto Man
Freq Offset
0 Hz

Agilent Spectrum Analyzer - Swept SA
Display Line -14.42 dBm
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:08:37 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.479 838 GHz
5.580 dBm
Start 2.47700 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.51000 GHz
Sweep 3.20 ms (1001 pts)
1 N 1 f 2.479 838 GHz 5.580 dBm
2 N 1 f 2.493 500 GHz -57.201 dBm
3 N 1 f 2.500 000 GHz -63.970 dBm
Display
Annotation
Title
Graticule
On
Off
Display Line
-14.42 dBm
System Display Settings
MSG
STATUS

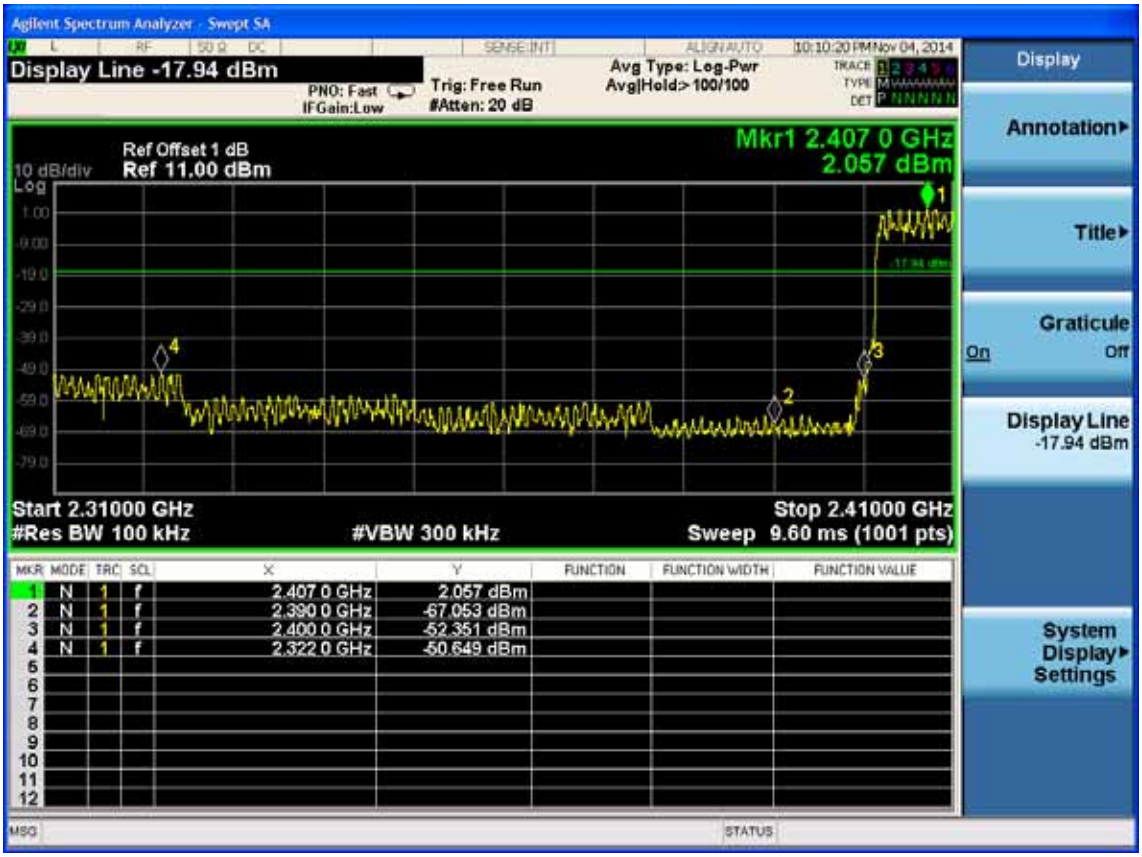

Agilent Spectrum Analyzer - Swept SA
Marker 1 24.865000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
10:08:15 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 24.865 GHz
-63.091 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.865 GHz -63.091 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

Hopping on GFSK





8-DPSK


Agilent Spectrum Analyzer - Swept SA
Display Line -17.94 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:10:20 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.407 0 GHz
2.057 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.41000 GHz
Sweep 9.60 ms (1001 pts)
1 N 1 f 2.407 0 GHz 2.057 dBm
2 N 1 f 2.390 0 GHz -67.053 dBm
3 N 1 f 2.400 0 GHz -52.351 dBm
4 N 1 f 2.322 0 GHz -50.649 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-17.94 dBm
System Display Settings

Agilent Spectrum Analyzer - Swept SA
Display Line -14.69 dBm
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:11:17 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.478 023 GHz
5.313 dBm
Start 2.47700 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.51000 GHz
Sweep 3.20 ms (1001 pts)
1 N 1 f 2.478 023 GHz 5.313 dBm
2 N 1 f 2.483 500 GHz -61.576 dBm
3 N 1 f 2.500 000 GHz -60.231 dBm
4 N 1 f 2.507 987 GHz -51.892 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-14.69 dBm
System Display Settings

6. CARRIER FREQUENCY SEPARATION TEST

6.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A	MY51380221	Sep.29, 14	1Year

6.2.Limit

Frequency hopping systems shall have hopping channel carrier frequency separated by a minimum of 25kHz or the 20dB 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.

6.3.Test Results.

EUT: Sound Bar		
M/N: HT-CT180		
Test date: 2014-11-04	Pressure: 101.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Kobe_Huang	Test site: RF Site	Temperature：22.1±0.6℃

Test Mode	Channel separation	Conclusion
8-DPSK	1.0MHz	PASS
GFSK	1.0MHz	PASS

Agilent Spectrum Analyzer - Swept SA
Marker 3 Δ -1.000000000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:14:33 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
ΔMkr3 -1.000 MHz
5.985 dB
3Δ4
1Δ2
Center 2.441000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 5.000 MHz
Sweep 2.53 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 Δ2 1 f (Δ) 1.000 MHz (Δ) 6.337 dB
2 F 1 f 2.441 000 GHz -2.670 dBm
3 Δ4 1 f (Δ) -1.000 MHz (Δ) 5.985 dB
4 F 1 f 2.441 000 GHz -2.670 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2
MSG
STATUS

7. 20 DB BANDWIDTH TEST

7.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	N9030A	MY51380221	Sep. 29, 14	1Year
2.	Attenuator (20dB)	Agilent	8491B	MY39262165	Apr. 28,14	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	Apr. 28,14	1 Year

7.2.Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

7.3.Test Results

EUT: Sound Bar		
M/N: HT-CT180		
Test date: 2014-11-04	Pressure: 101.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Kobe_Huang	Test site: RF Site	Temperature：22.1±0.6℃

Test Mode	Frequency (MHz)	20dB bandwidth (KHz)	Limit (KHz)
GFSK	2402	872.1	N/A
	2441	870.7	N/A
	2480	840.7	N/A
8-DPSK	2402	1208	N/A
	2441	1198	N/A
	2480	1213	N/A
Conclusion：PASS			

GFSK

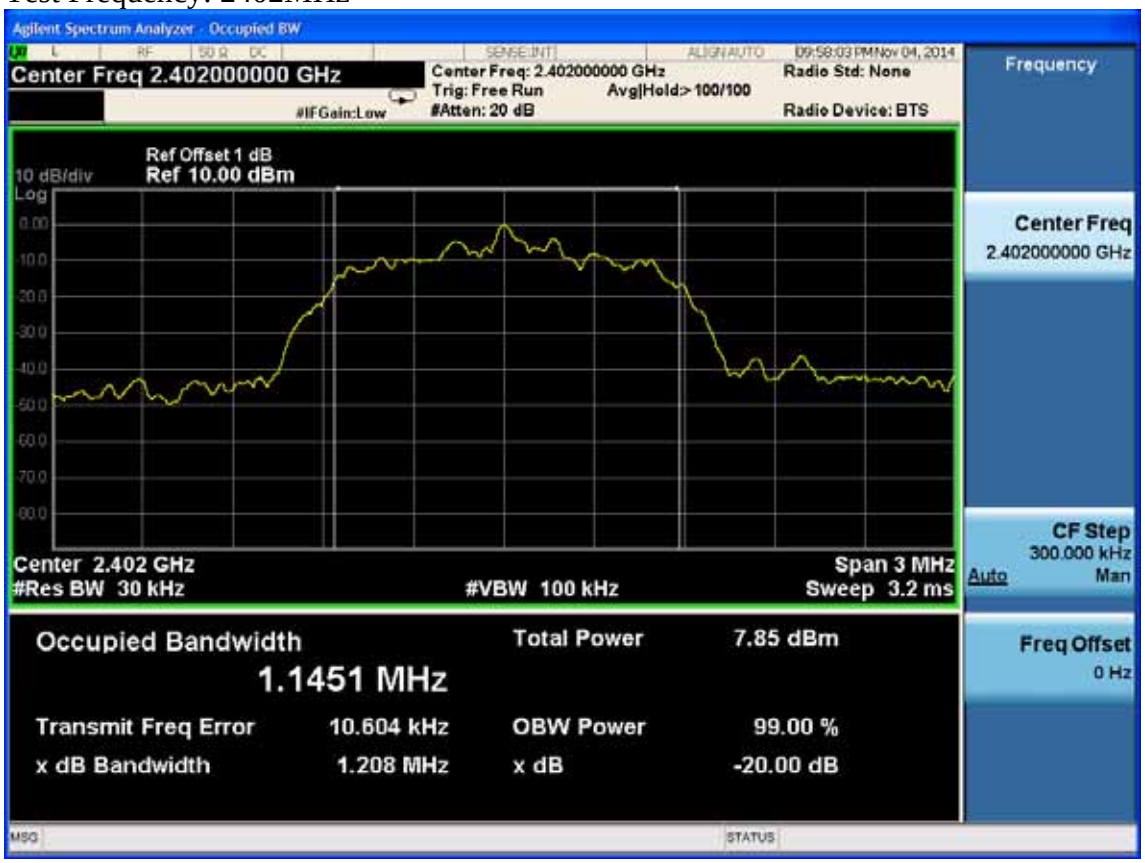
Test Frequency: 2402MHz

Test Frequency: 2441MHz

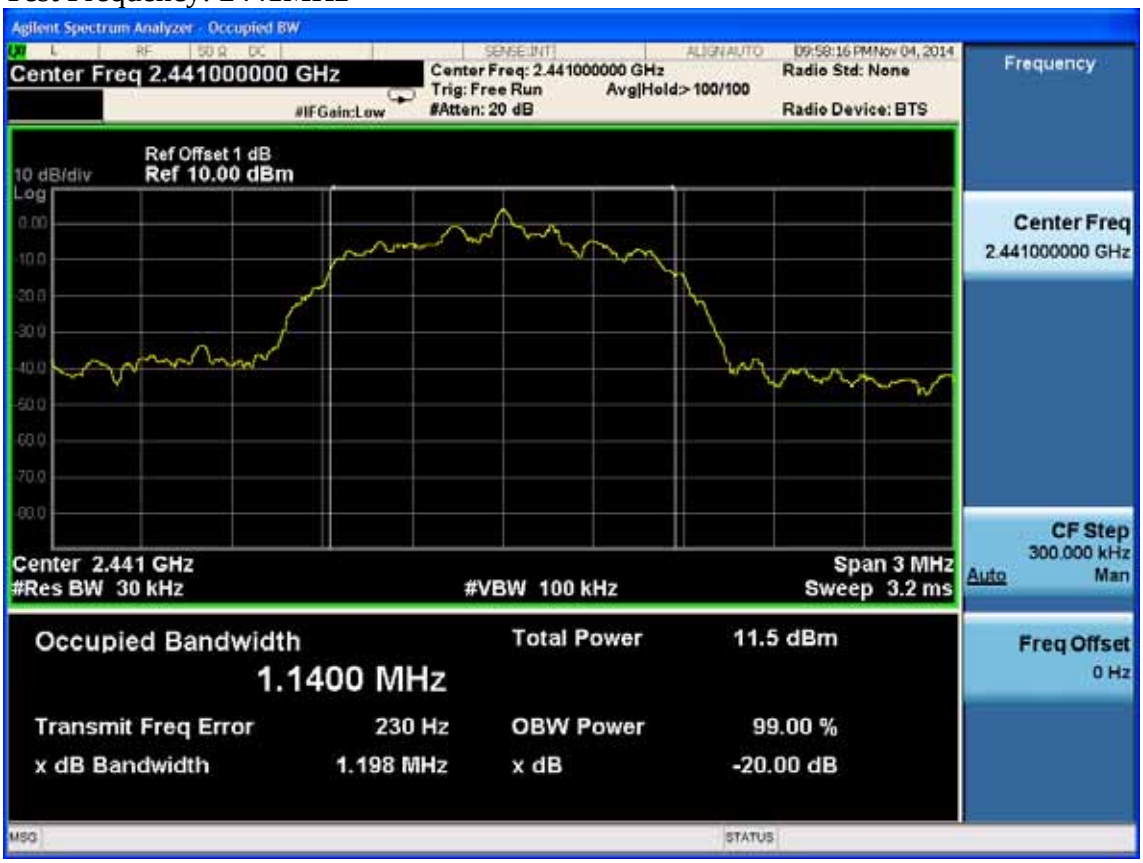
Test Frequency: 2480MHz

8-DPSK

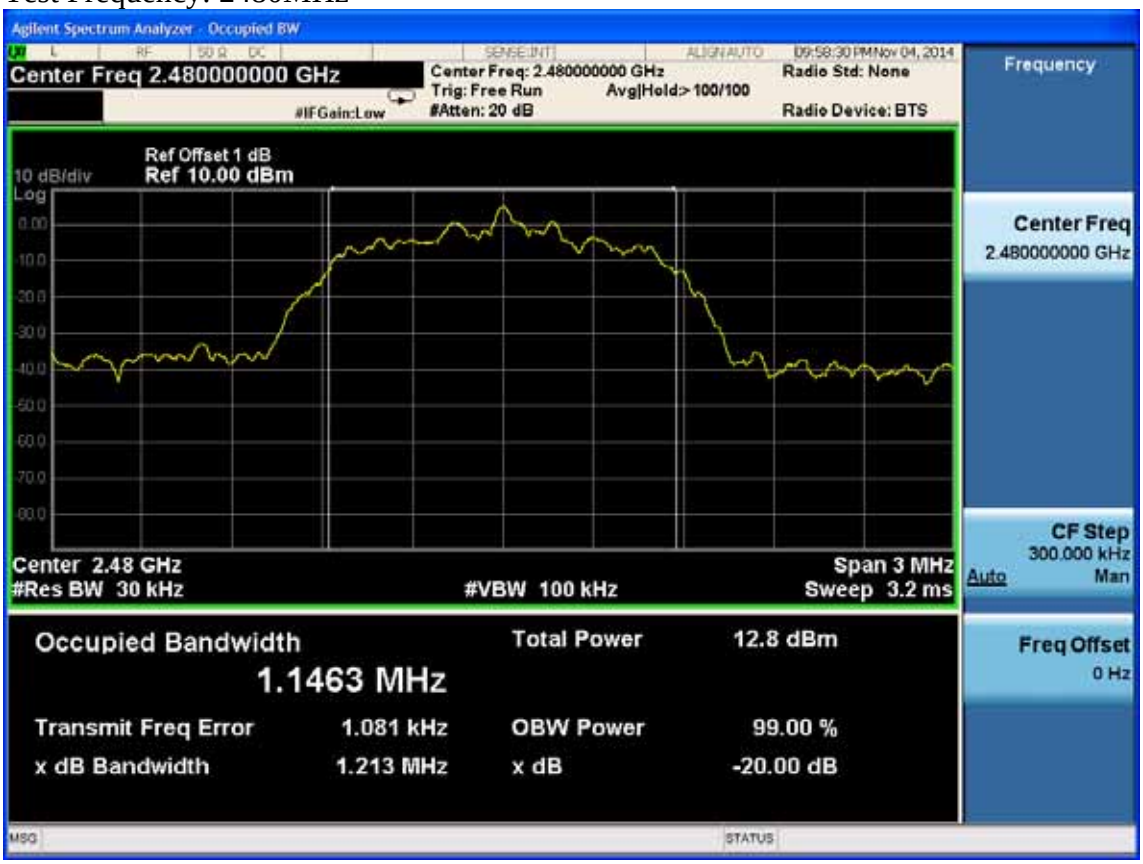
Test Frequency: 2402MHz



Test Frequency: 2441MHz



Test Frequency: 2480MHz



8. NUMBER OF HOPPING FREQUENCY TEST

8.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A	MY51380221	Sep. 29, 2014	1Year

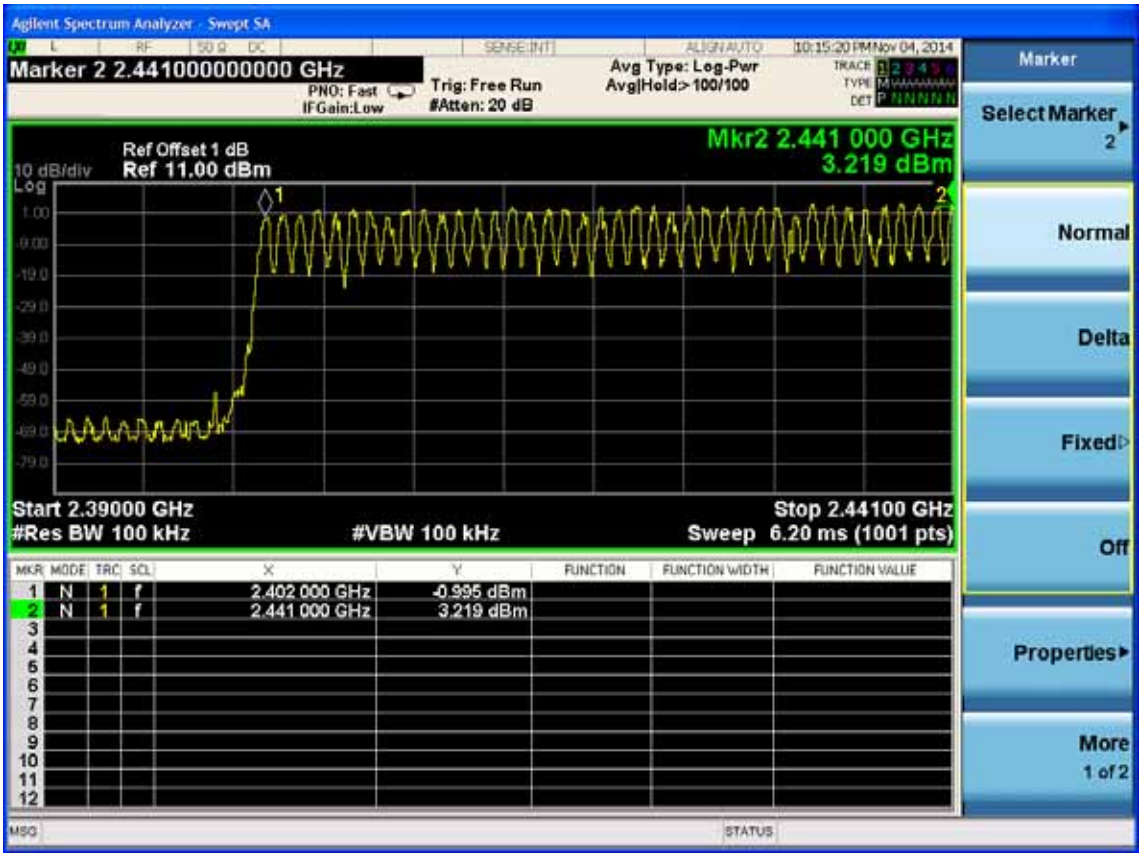
8.2.Limit

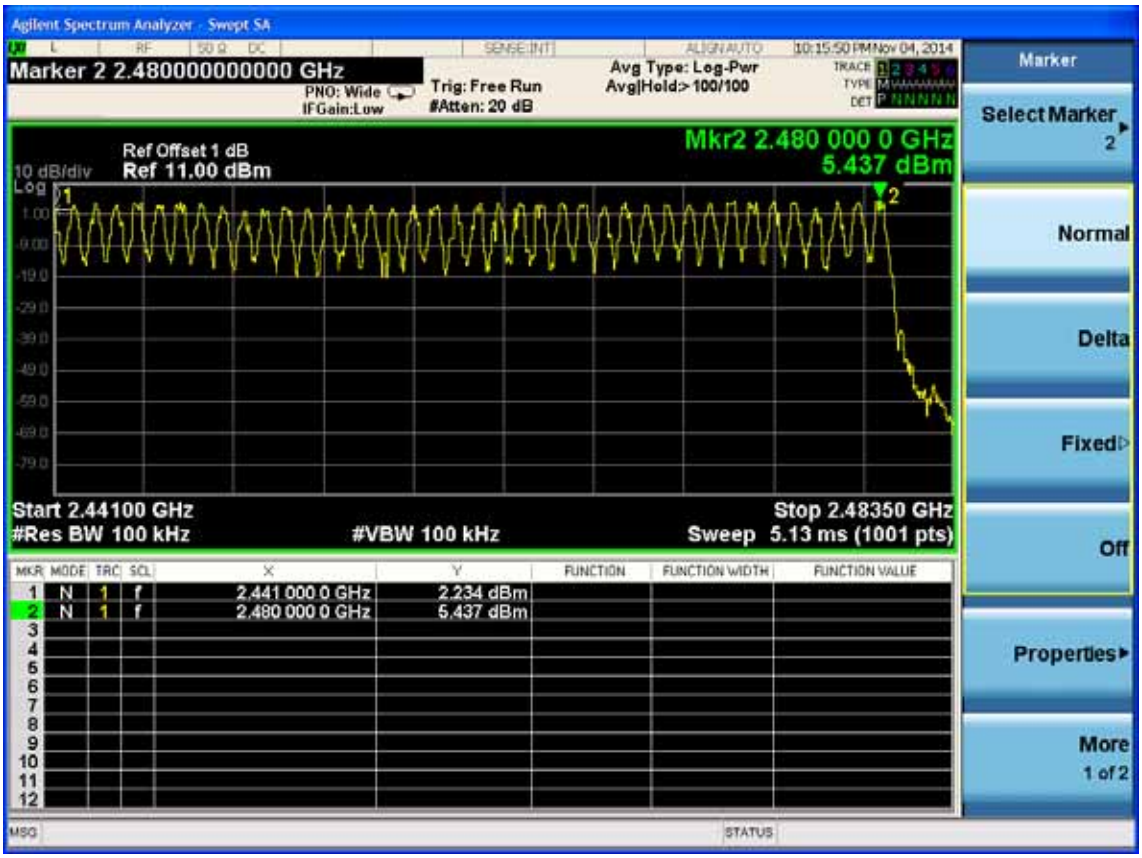
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

8.3.Test Results

EUT: Sound Bar		
M/N: HT-CT180		
Test date: 2014-11-04	Pressure: 101.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Kobe_Huang	Test site: RF Site	Temperature：22.1±0.6℃

Test Mode	Number of channel	Limit	Conclusion
8-DPSK	79	>=15	PASS
GFSK	79	>=15	PASS


Agilent Spectrum Analyzer - Swept SA
Marker 2 2.441000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:15:20 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr2 2.441 000 GHz
3.219 dBm
Start 2.39000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 2.44100 GHz
Sweep 6.20 ms (1001 pts)
1 N 1 f 2.402 000 GHz -0.995 dBm
2 N 1 f 2.441 000 GHz 3.219 dBm
Marker
Select Marker 2
Normal
Delta
Fixed
Off
Properties
More 1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 2 2.480000000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:15:50 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr2 2.480 000 0 GHz
5.437 dBm
Start 2.44100 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 2.48350 GHz
Sweep 5.13 ms (1001 pts)
1 N 1 f 2.441 000 0 GHz 2.234 dBm
2 N 1 f 2.480 000 0 GHz 5.437 dBm
Marker
Select Marker 2
Normal
Delta
Fixed
Off
Properties
More 1 of 2

9. DWELL TIME

9.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	N9030A	MY51380221	Sep.29, 14	1Year

9.2.Limit

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.

9.3.Test Results

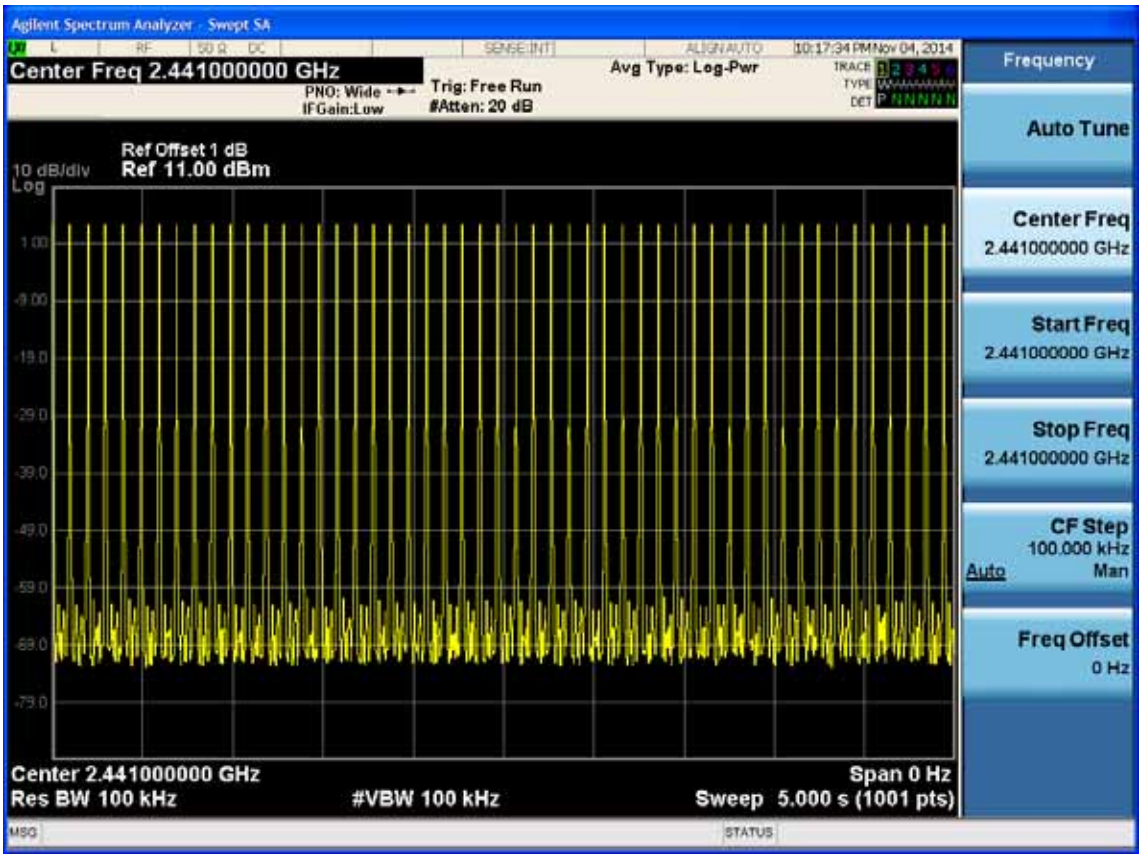
EUT: Sound Bar		
M/N: HT-CT180		
Test date: 2014-11-04	Pressure: 101.5±1.0 kpa	Humidity: 53.6±3.0%
Tested by: Kobe_Huang	Test site: RF Site	Temperature：22.1±0.6℃

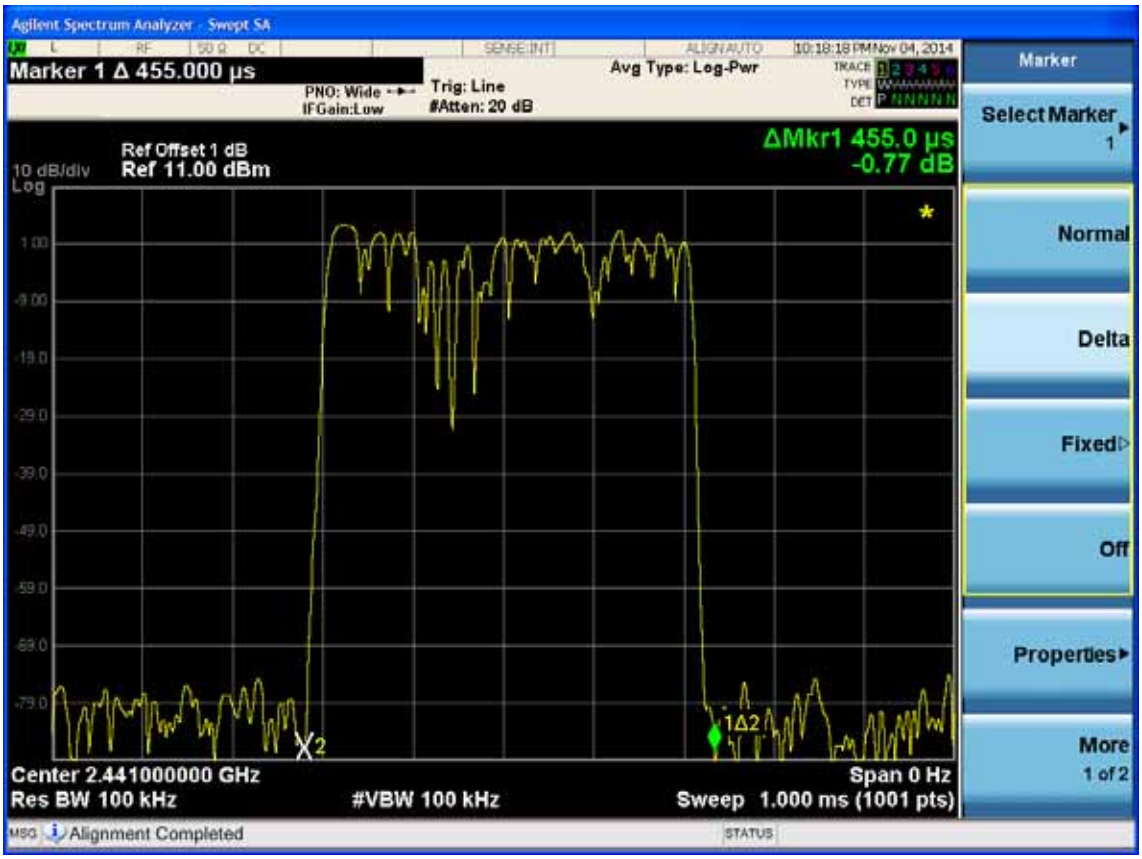
Mode		dwell time	Limit	Conclusion
GFSK	DH1	51hops/5s*0.4*79chanels*0.455ms =146.656ms	<400ms	PASS
	DH3	26hops/5s*0.4*79chanels*1.713ms =281.480ms	<400ms	PASS
	DH5	16hops/5s*0.4*79chanels*2.950ms=298.304ms	<400ms	PASS
8-DPSK	DH1	51hops/5s*0.4*79chanels*0.458ms =147.623ms	<400ms	PASS
	DH3	25hops/5s*0.4*79chanels*1.740ms =274.920ms	<400ms	PASS
	DH5	17hops/5s*0.4*79chanels*2.970ms =319.097ms	<400ms	PASS

Note: All the lower levels were signal from receiver's, and should not considered in here.

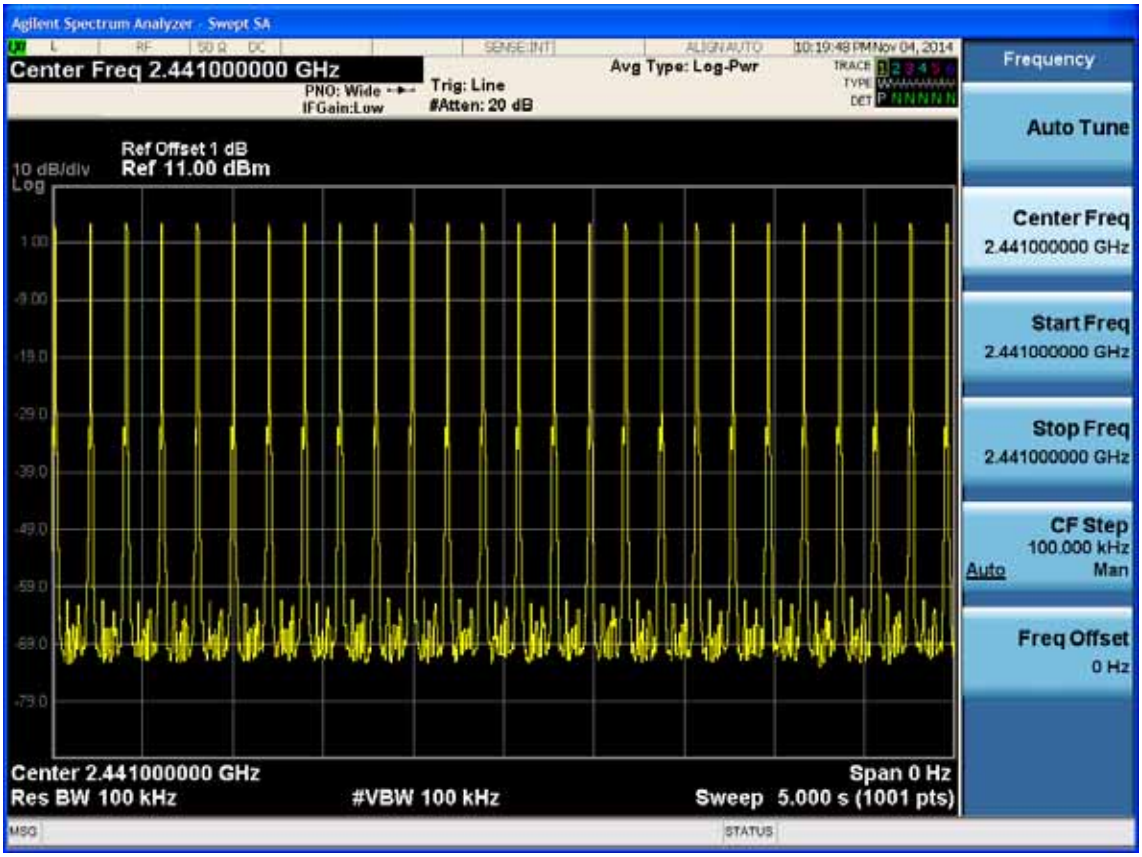
GFSK

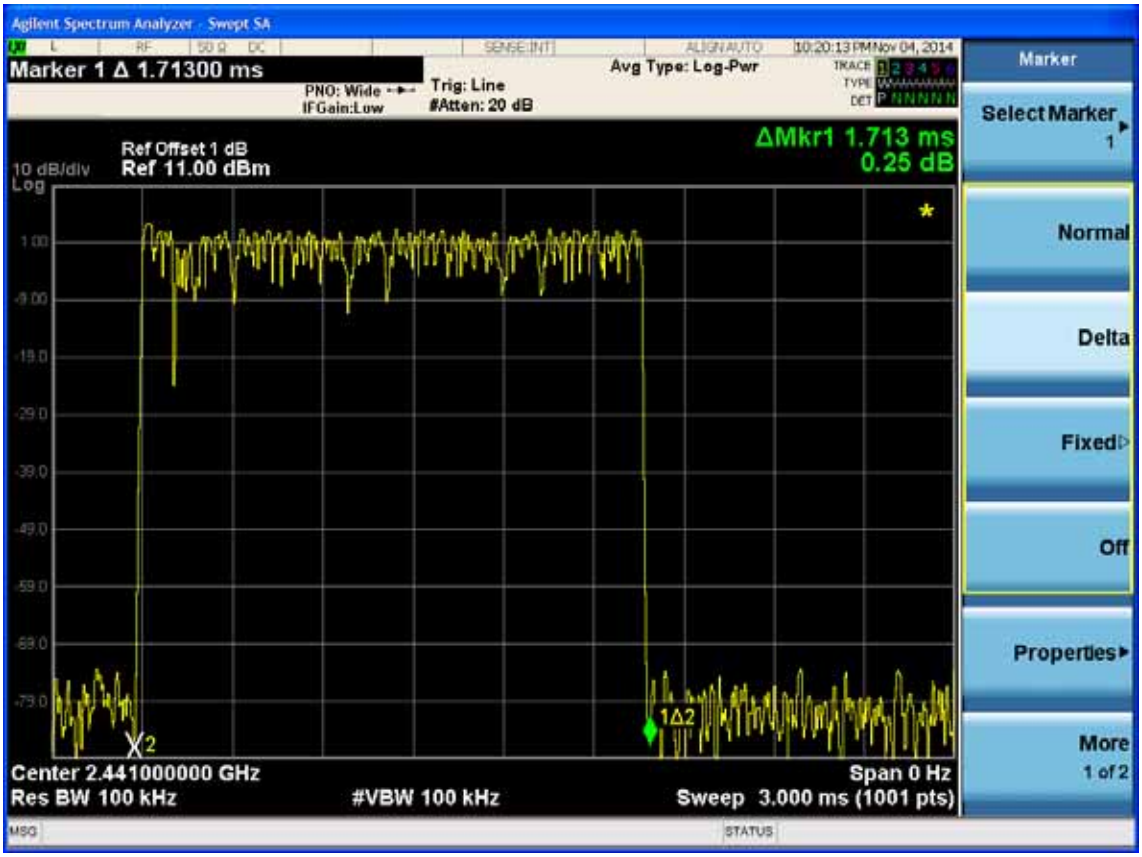
DH 1


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Span 0 Hz
Res BW 100 kHz
#VBW 100 kHz
Sweep 5.000 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
100.000 kHz
Auto
Man
Freq Offset
0 Hz

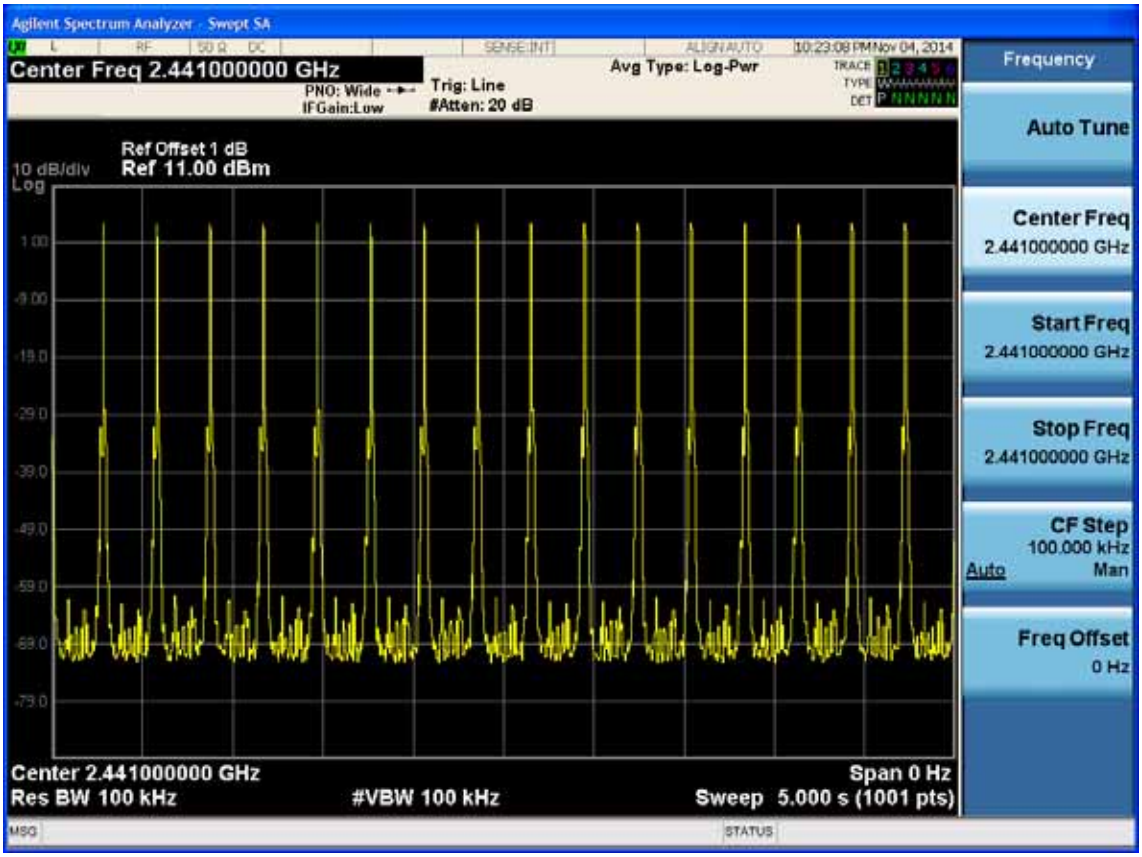

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 455.000 µs
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
ΔMkr1 455.0 µs
-0.77 dB
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Span 0 Hz
Res BW 100 kHz
#VBW 100 kHz
Sweep 1.000 ms (1001 pts)
Alignment Completed
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

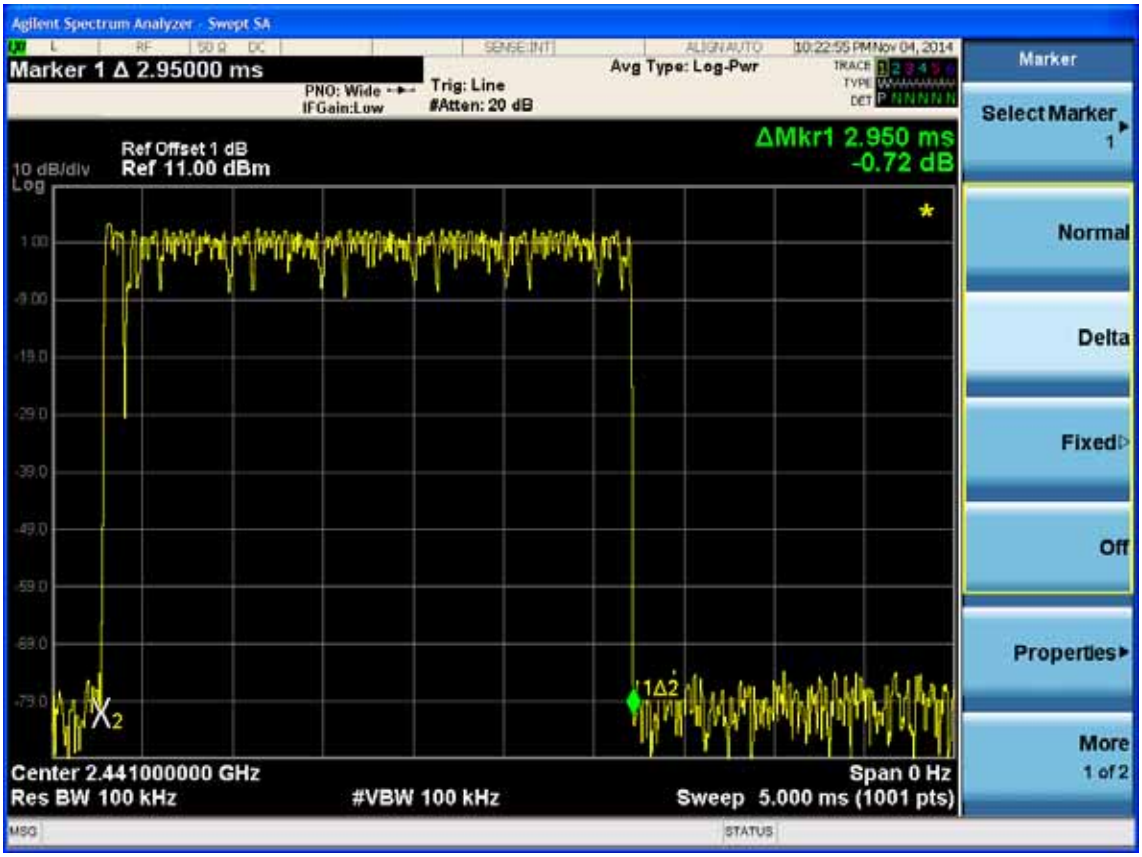
DH 3


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
10:19:48 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
100.000 kHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 1.71300 ms
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
10:20:13 PM Nov 04, 2014
ΔMkr1 1.713 ms
0.25 dB
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 3.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

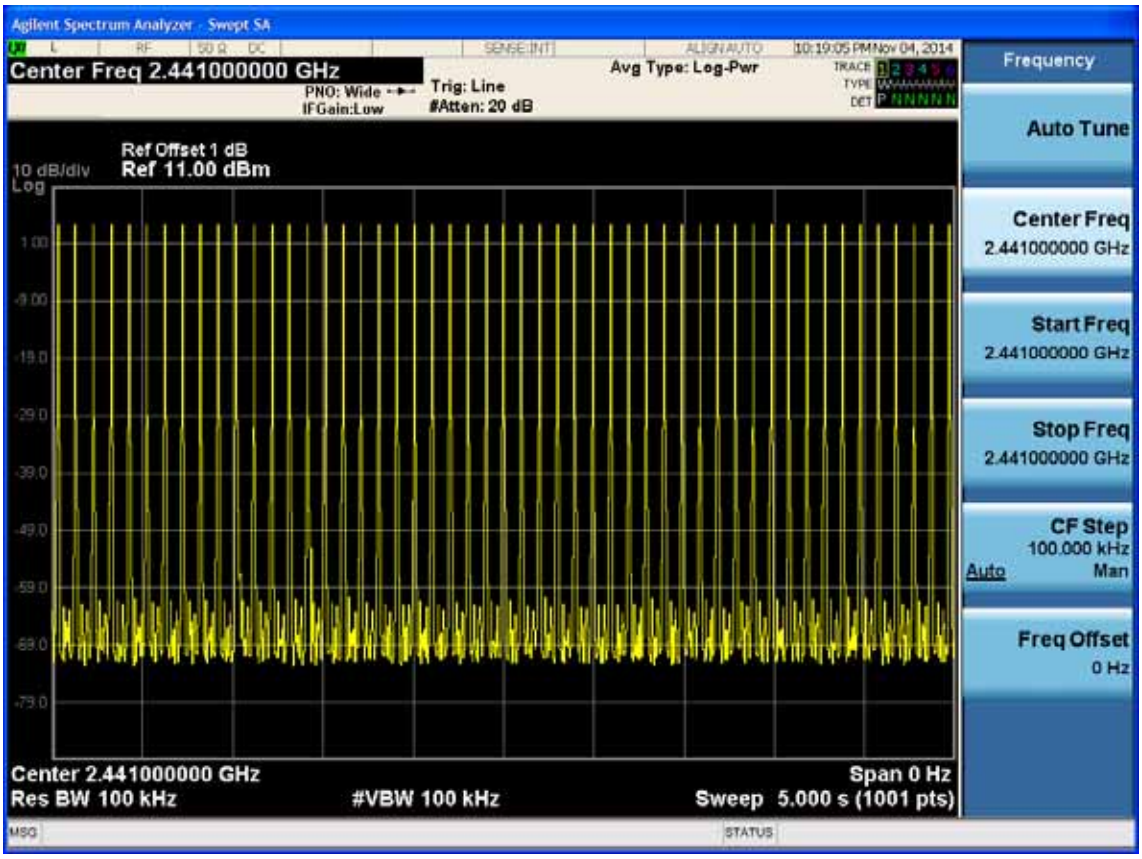
DH 5

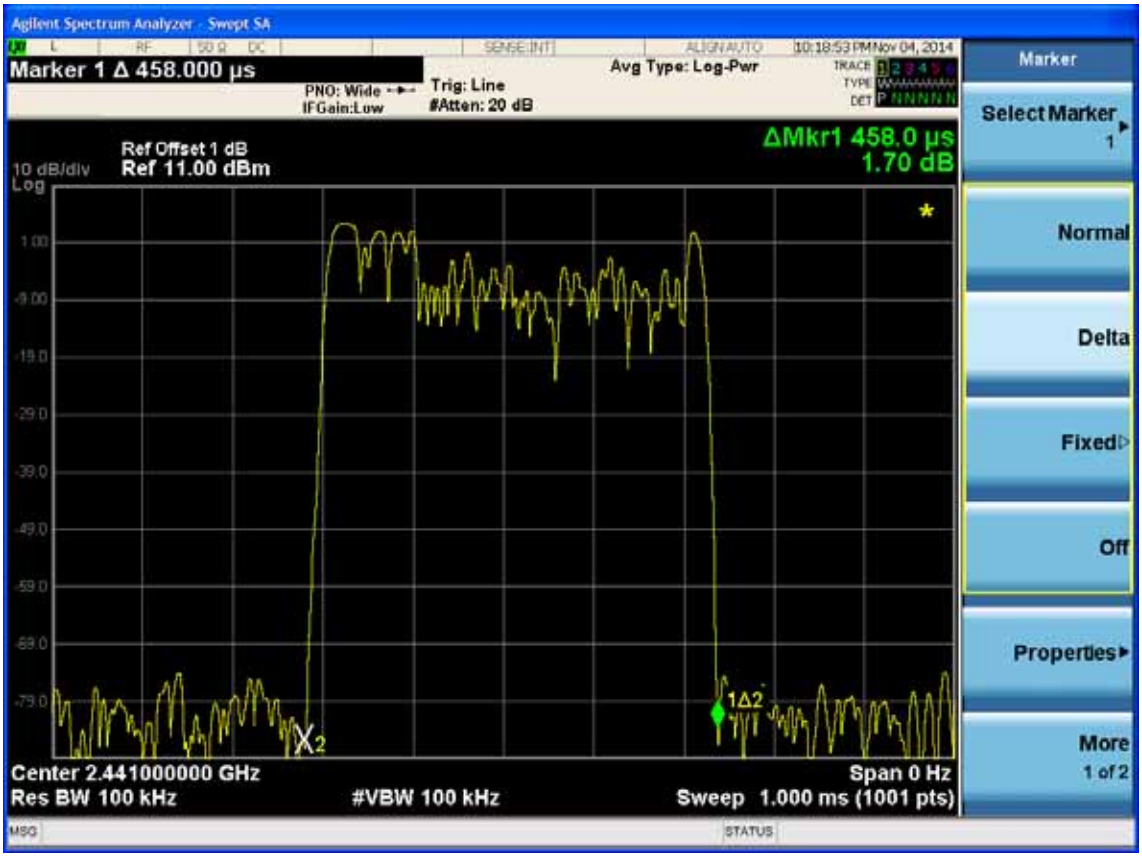

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
10:23:08 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
100.000 kHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.95000 ms
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
10:22:55 PM Nov 04, 2014
ΔMkr1 2.950 ms
-0.72 dB
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

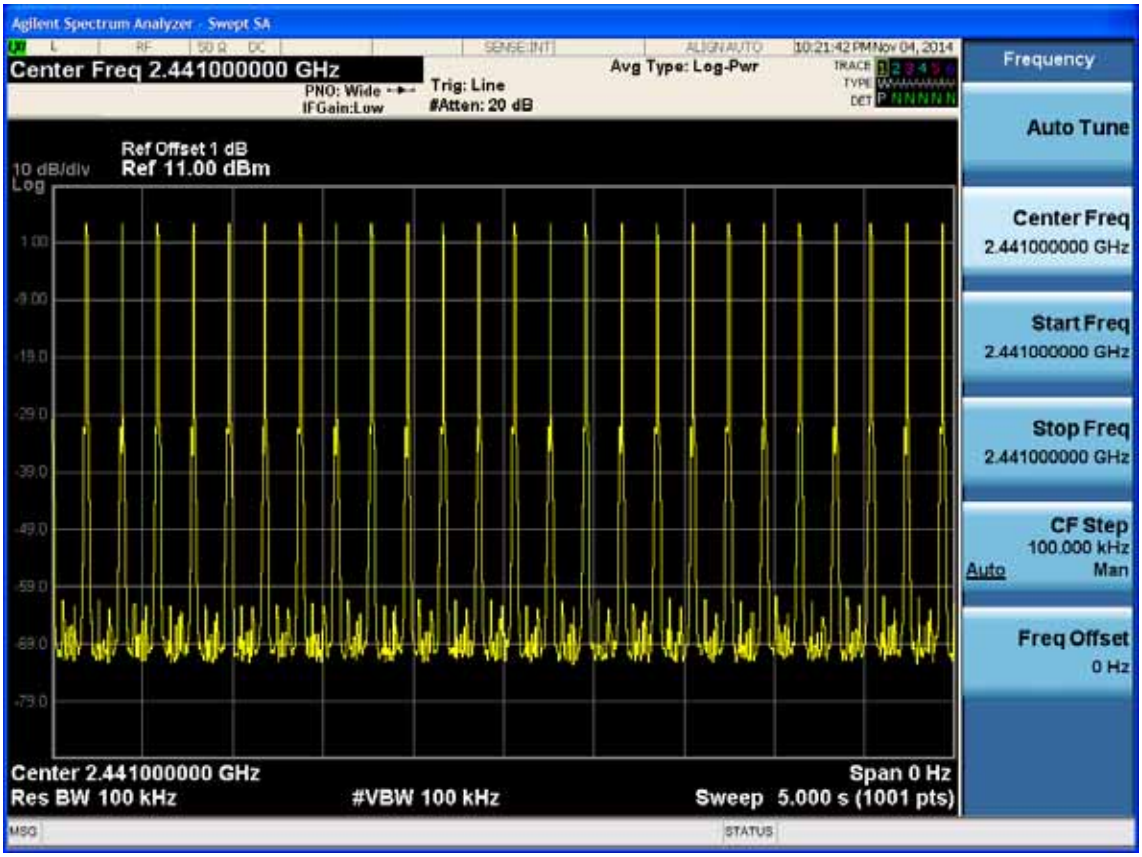
8-DPSK

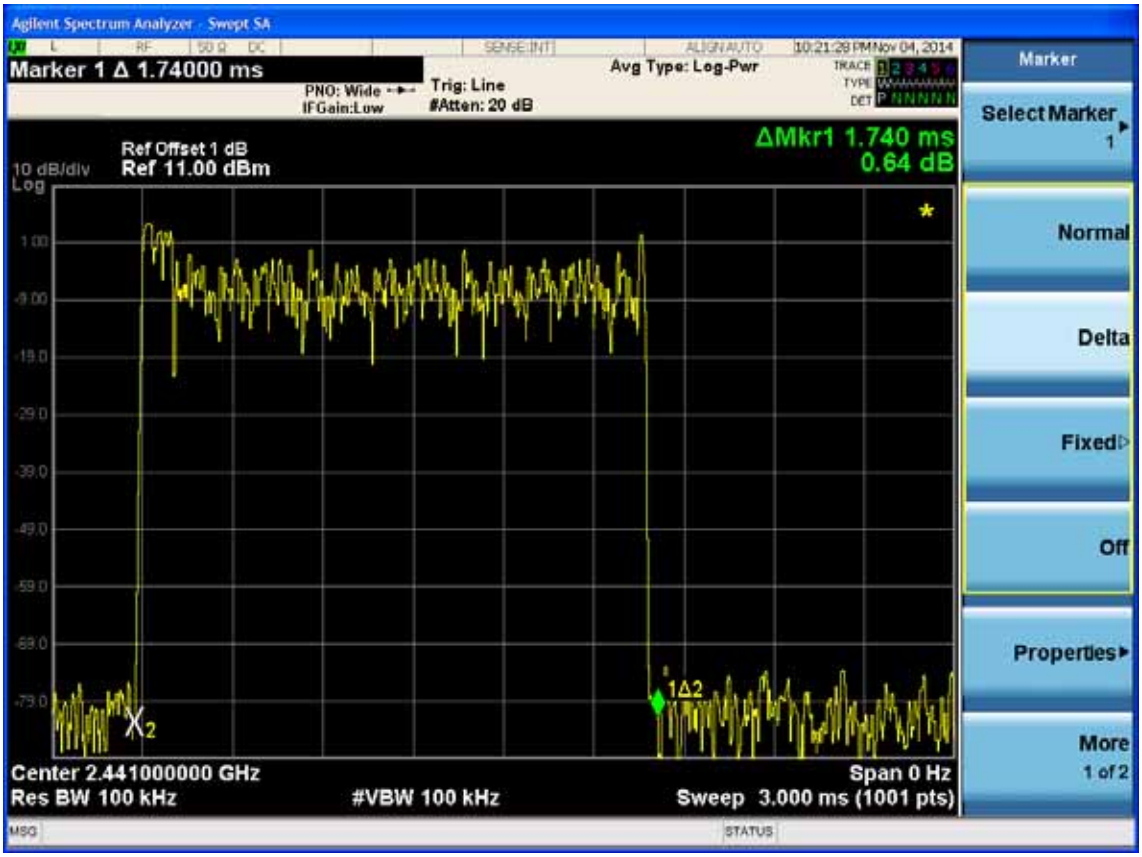
DH 1


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
100.000 kHz
Auto
Man
Freq Offset
0 Hz

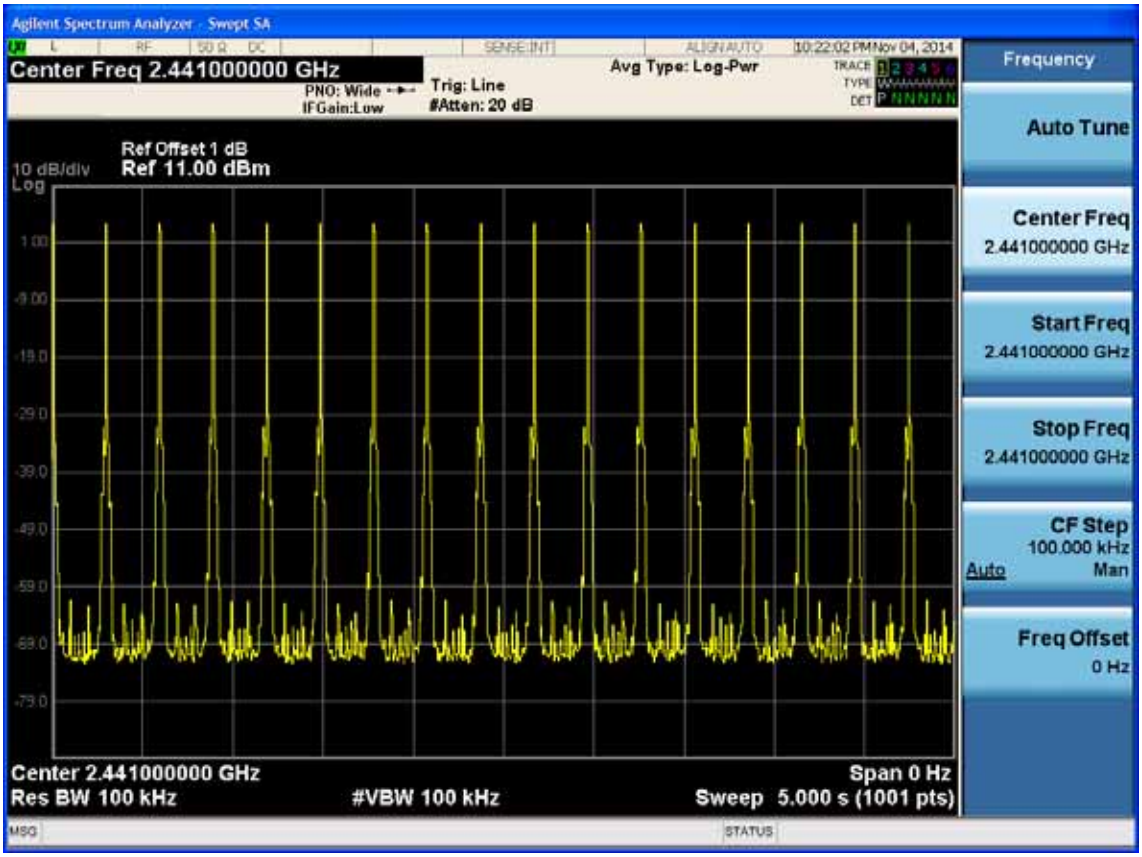

Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 458.000 µs
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
ΔMkr1 458.0 µs
1.70 dB
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 1.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

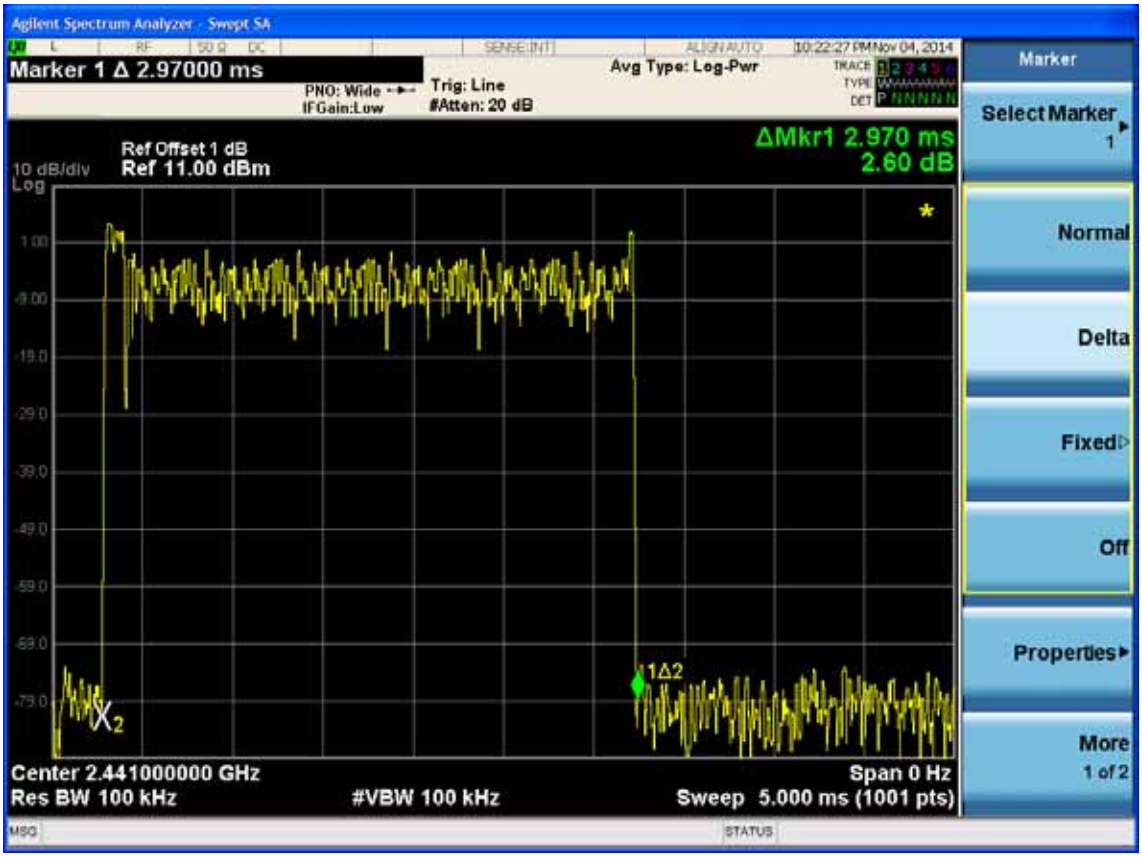
DH 3


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
10:21:42 PM Nov 04, 2014
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
100.000 kHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 1.74000 ms
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
10:21:28 PM Nov 04, 2014
ΔMkr1 1.740 ms
0.64 dB
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 3.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

DH 5


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 5.000 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
100.000 kHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.97000 ms
PNO: Wide
IFGain:Low
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
ΔMkr1 2.970 ms
2.60 dB
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Center 2.441000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2

10.MAXIMUM PEAK OUTPUT POWER TEST

10.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	N9030A	MY51380221	Sep. 29, 14	1Year
2.	Power meter	Anritsu	ML2487A	6K00002472	Apr. 28,14	1Year
3.	Power sensor	Anritsu	MA2491A	0033005	Apr. 28,14	1Year
4.	Attenuator (20dB)	Agilent	8491B	MY39262165	Apr. 28,14	1Year
5.	RF Cable	Hubersuhner	SUCOFLEX102	28610/2	Apr. 28,14	1Year

10.2.Limit

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.

10.3.Test Procedure

Connected the EUT's antenna port to Power Sensor, and use power meter to test peak output power.

10.4.Test Results

EUT: Sound Bar		
M/N: HT-CT180		
Test date: 2014-11-04	Pressure: 101.6±1.0 kpa	Humidity: 53.7±1.0%
Tested by: Kobe_Huang	Test site: RF site	Temperature: 22.6±1.0℃

Test Mode	Frequency (MHz)	Peak output Power (dBm)	Limit (dBm)
GFSK	2402	4.073	30
	2441	6.733	30
	2480	7.659	30
8-DPSK	2402	2.243	30
	2441	5.695	30
	2480	6.729	30

Conclusion: PASS

11. BAND EDGE COMPLIANCE TEST

11.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Amp	HP	8449B	3008A02495	Apr. 28,14	1 Year
2.	Horn Antenna	ETS	3115	9510-4580	Jun. 06, 14	1 Year
3.	HF Cable	Hubersuhner	Sucoflex104	274094/4	Apr. 28,14	1 Year
4.	RF Cable	Hubersuhner	Sucoflex102	28610/2	Apr. 28,14	1 Year

11.2. Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

11.3. Test Produce

For upper band emissions that are up to two bandwidths(2MHz) away (2483.5MHz to 2485.5MHz) from the band-edge use below produce:

1. Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 100KHz and with a video bandwidth 300KHz. Record the peak levels of the fundamental emission and the relevant band-edge emission, Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not a field strength measurement, it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.
2. Subtract the delta measured in step (1) from the maximum field strengths measured in clause 4 .The resultant field strengths are then used to determine band-edge compliance as required by Section 15.205

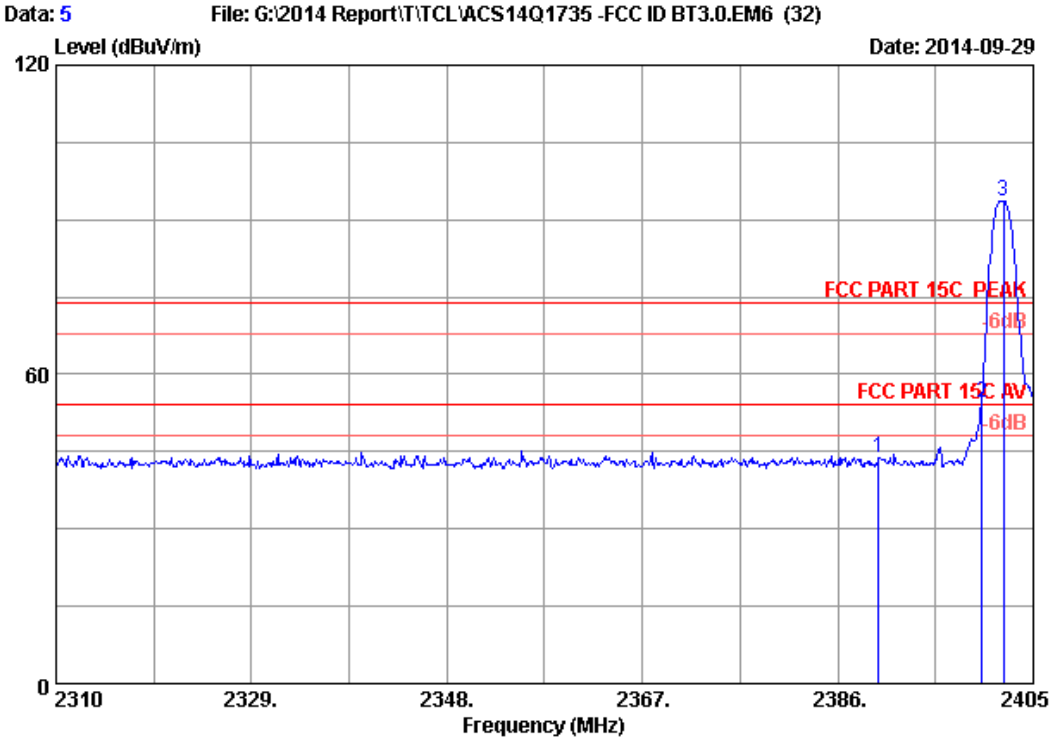
For emissions above two bandwidths away from the band-edge use below produce:

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upperband-edges of the emission:
   (a) PEAK: RBW=1MHz ;VBW=3MHz, PK detector, Sweep=AUTO
   (b) This is pulse Modulation device a duty cycle factor was used to calculate average level based measured peak level.

11.4. Test Results

Pass (The testing data was attached in the next pages.)

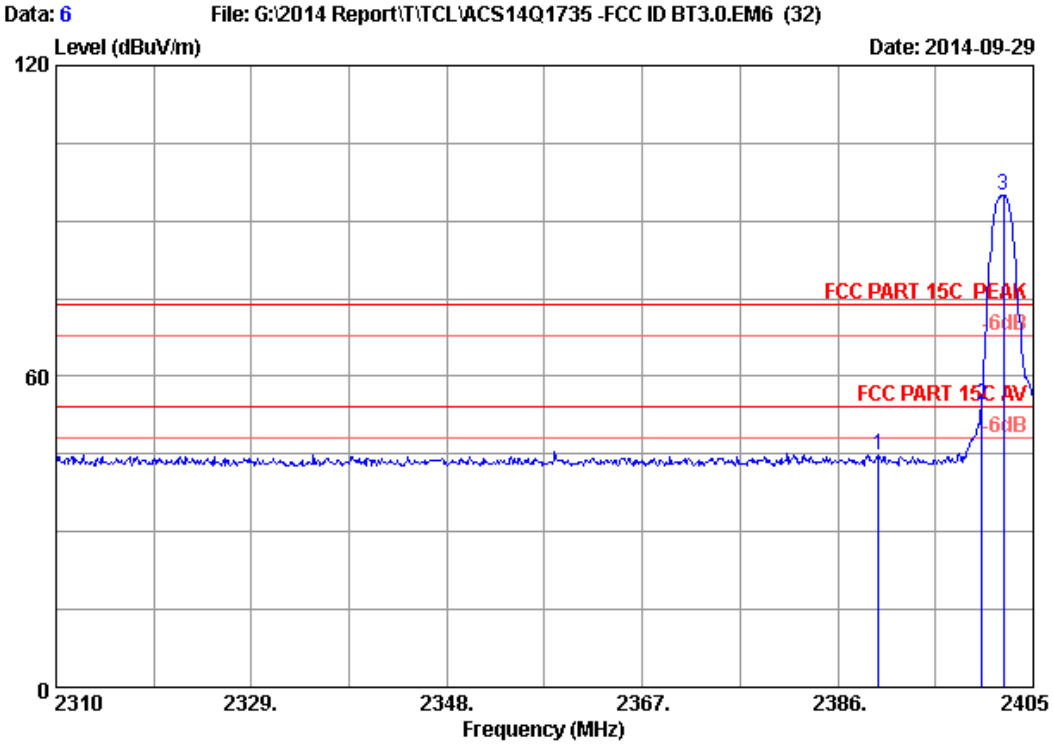
Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.



Site no. : 3m Chamber Data no. : 5
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2402MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	45.48	43.72	74.00	30.28	Peak
2	2400.000	28.18	5.80	35.70	56.13	54.41	74.00	19.59	Peak
3	2402.150	28.18	5.80	35.70	95.37	93.65	74.00	-19.65	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.

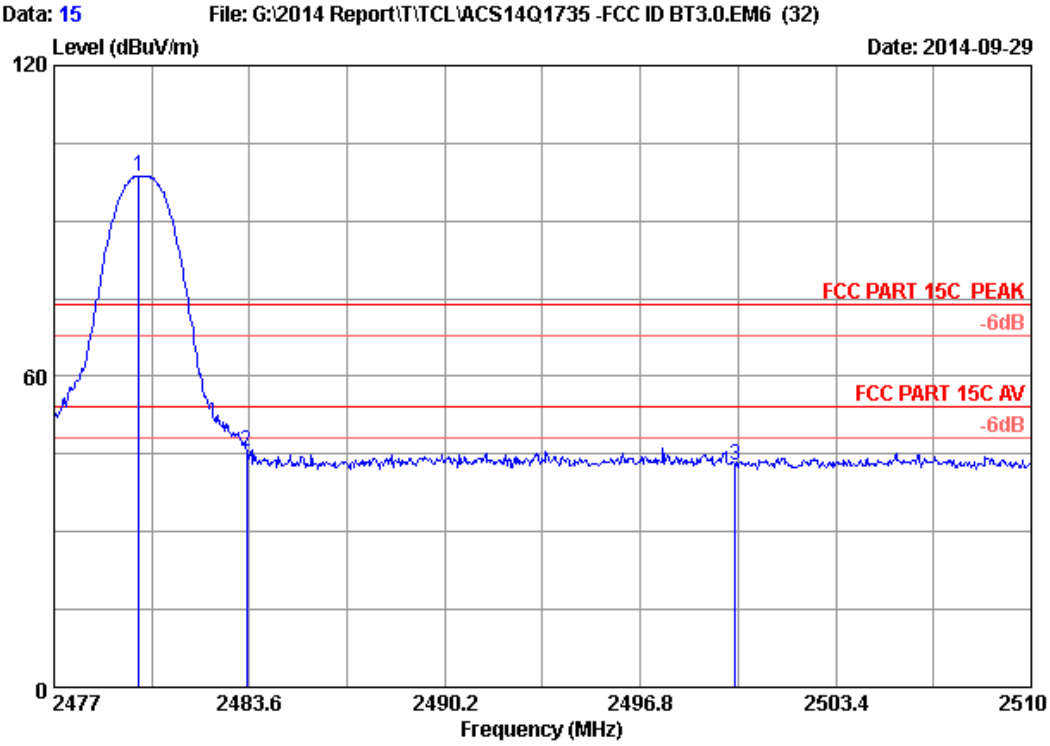


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 3115 (4580)
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2402MHz
M/N : SA-CT180

Data no. : 6
Ant. pol. : VERTICAL
Engineer : Kobe-Huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	46.50	44.74	74.00	29.26	Peak
2	2400.000	28.18	5.80	35.70	56.35	54.63	74.00	19.37	Peak
3	2402.150	28.18	5.80	35.70	96.70	94.98	74.00	-20.98	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.

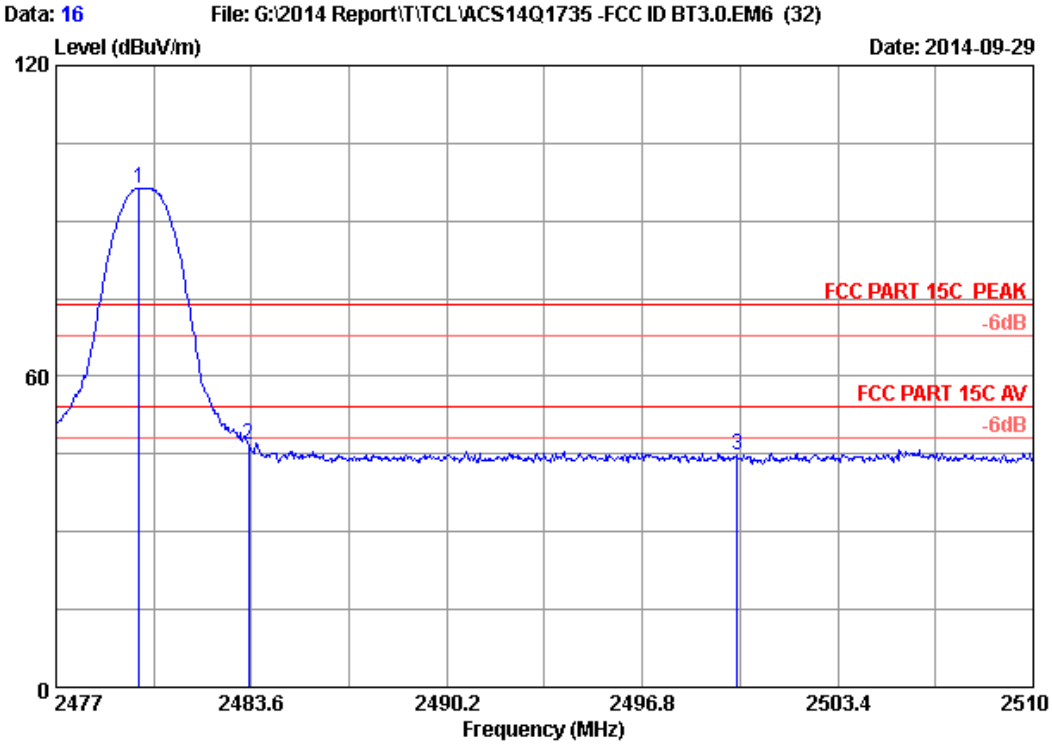


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 3115 (4580)
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2480MHz
M/N : SA-CT180

Data no. : 15
Ant. pol. : HORIZONTAL
Engineer : Kobe-Huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.871	28.36	5.91	35.70	100.06	98.63	74.00	-24.63	Peak
2	2483.500	28.36	5.92	35.70	46.73	45.31	74.00	28.69	Peak
3	2500.000	28.40	5.94	35.70	44.23	42.87	74.00	31.13	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.

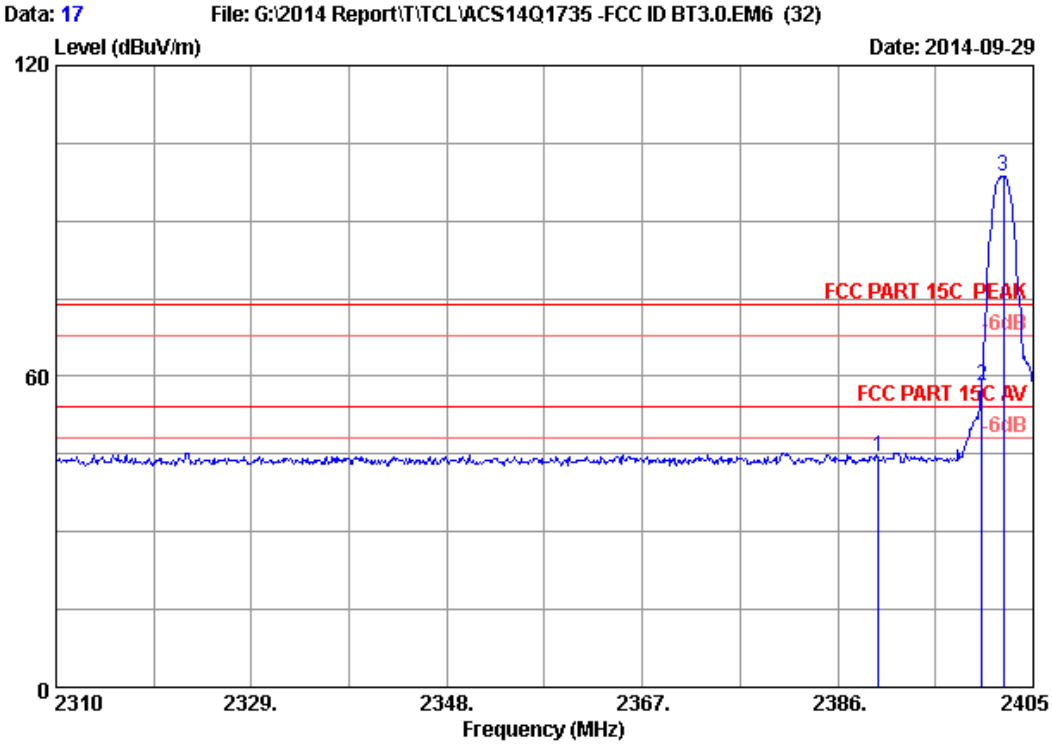


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 3115 (4580)
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : GFSK 2480MHz
M/N : SA-CT180

Data no. : 16
Ant. pol. : VERTICAL
Engineer : Kobe-Huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.805	28.36	5.91	35.70	97.82	96.39	74.00	-22.39	Peak
2	2483.500	28.36	5.92	35.70	48.11	46.69	74.00	27.31	Peak
3	2500.000	28.40	5.94	35.70	46.16	44.80	74.00	29.20	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.

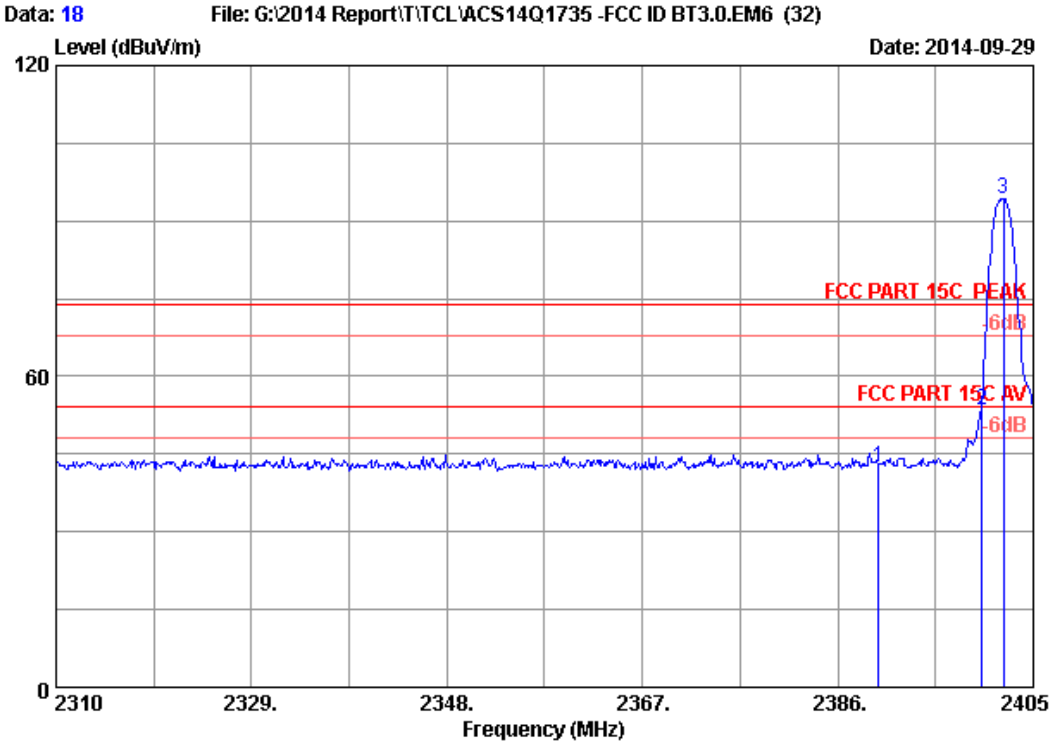


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 3115 (4580)
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2402MHz
M/N : SA-CT180

Data no. : 17
Ant. pol. : HORIZONTAL
Engineer : Kobe-Huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	46.05	44.29	74.00	29.71	Peak
2	2400.000	28.18	5.80	35.70	59.90	58.18	74.00	15.82	Peak
3	2402.150	28.18	5.80	35.70	100.39	98.67	74.00	-24.67	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.

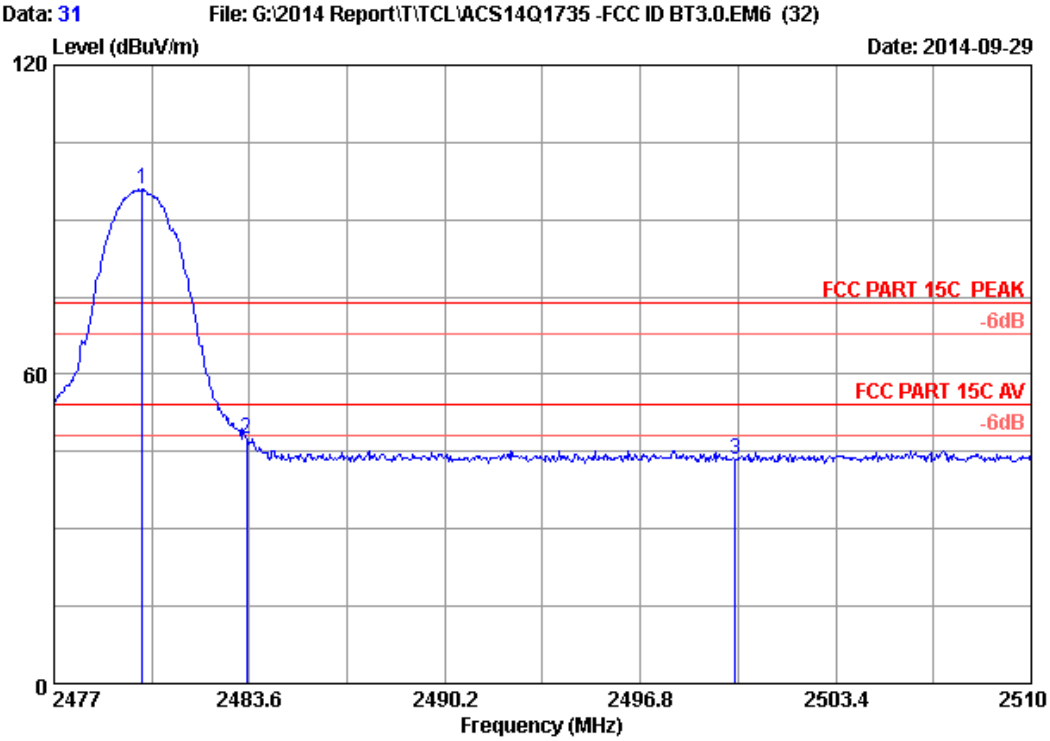


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 3115 (4580)
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2402MHz
M/N : SA-CT180

Data no. : 18
Ant. pol. : VERTICAL
Engineer : Kobe-Huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	44.21	42.45	74.00	31.55	Peak
2	2400.000	28.18	5.80	35.70	55.34	53.62	74.00	20.38	Peak
3	2402.150	28.18	5.80	35.70	96.01	94.29	74.00	-20.29	Peak

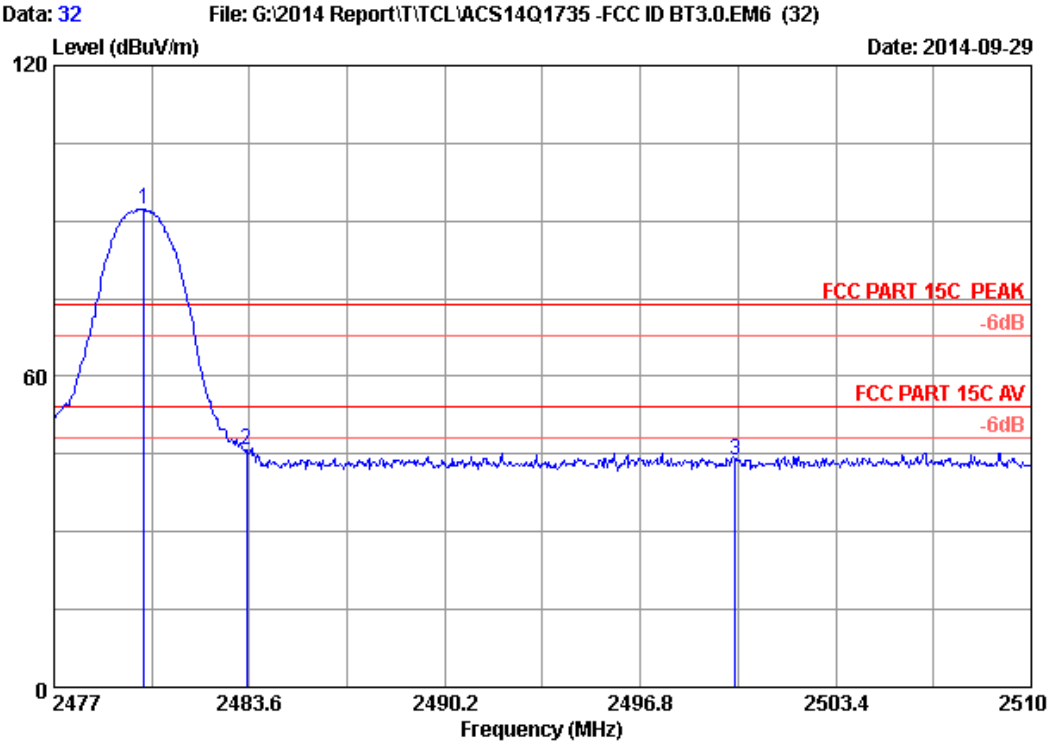
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 31
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Kobe-Huang
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2480MHz
M/N : SA-CT180

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.970	28.36	5.91	35.70	97.23	95.80	74.00	-21.80	Peak
2	2483.500	28.36	5.92	35.70	48.92	47.50	74.00	26.50	Peak
3	2500.000	28.40	5.94	35.70	44.88	43.52	74.00	30.48	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 3115 (4580)
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56%
EUT : Active Speaker System
Power rating : AC 120V/60Hz
Test Mode : 8-DPSK 2480MHz
M/N : SA-CT180

Data no. : 32
Ant. pol. : HORIZONTAL
Engineer : Kobe-Huang

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.036	28.36	5.91	35.70	93.75	92.32	74.00	-18.32	Peak
2	2483.500	28.36	5.92	35.70	47.32	45.90	74.00	28.10	Peak
3	2500.000	28.40	5.94	35.70	45.26	43.90	74.00	30.10	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.

12. DEVIATION TO TEST SPECIFICATIONS

[NONE]