Test Report

FCC Part15 Subpart C

Product Name	:	Audio mixer
Model No.	:	XR-AT
FCC ID	:	I4S-XR-AT
IC	:	3642B-XR-AT

Applicant	:	Peavey Electronics Corp.
Address	:	5022 Hartley Peavey Drive, Meridian, MS, 39305, USA

Date of Receipt	:	Mar. 30, 2015
Test Date	:	Mar. 30, 2015~ May. 08, 2015
Issued Date	:	May. 08, 2015
Report No.	:	1540056R-RF-US-P06V01
Report Version	:	V 1.0

Test Report Certification

Issued Date : May. 08, 2015
Report No. : 1540056R-RF-US-P06V01

QuieTek

Product Name	:	Audio mixer
Applicant	:	Peavey Electronics Corp.
Address	:	5022 Hartley Peavey Drive, Meridian, MS, 39305, USA
Model No.	:	XR-AT
FCC ID	:	I4S-XR-AT
IC	:	3642B-XR-AT
EUT Voltage	:	AC 120V / 60Hz
Brand Name	:	Peavey
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C: 2014 ANSI C63.4: 2014; ANSI C63.10: 2013 Industry Canada RSS-Gen Issue 4/RSS-210 Issue 8
Test Result	:	Complied
Performed Location	:	Suzhou EMC Laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392; IC Lab Code: 4075B

Documented By : Alice Li

Reviewed By : Harry Mei

Approved By : Jream Cao

Laboratory Information

We, **QuieTek Corporation,** are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	**:**	**BSMI, NCC**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC**
Japan	**:**	**VCCI**
China	**:**	**CNAS**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site :http://www.quietek.com/tw/ctg/cts/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

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TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1540056R-RF-US-P06V01	V1.0	Initial Issued Report	May. 08, 2015

1. General Information

1.1. EUT Description

Product Name	Audio mixer
Brand Name	Peavey
Model No.	XR-AT
Working Voltage	AC 120V / 60Hz
Bluetooth Specification	3.0+HS
Frequency Range	2402- 2480 MHz
Channel Number	V3.0+HS: 79
Channel Separation	V3.0+HS: 1MHz
Type of Modulation	V3.0+HS: GFSK, Pi/4 DQPSK, 8DPSK
Data Rate	V3.0+HS: 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)
Antenna Type	Reference to Antenna List
Peak Antenna Gain	Reference to Antenna List

Bluetooth Working Frequency of Each Channel: (For V3.0+HS)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz	03	2405 MHz
04	2406 MHz	05	2407 MHz	06	2408 MHz	07	2409 MHz
08	2410 MHz	09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz	15	2417 MHz
16	2418 MHz	17	2419 MHz	18	2420 MHz	19	2421 MHz
20	2422 MHz	21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz	27	2429 MHz
28	2430 MHz	29	2431 MHz	30	2432 MHz	31	2433 MHz
32	2434 MHz	33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz	39	2441 MHz
40	2442 MHz	41	2443 MHz	42	2444 MHz	43	2445 MHz
44	2446 MHz	45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz	51	2453 MHz
52	2454 MHz	53	2455 MHz	54	2456 MHz	55	2457 MHz
56	2458 MHz	57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz	63	2465 MHz
64	2466 MHz	65	2467 MHz	66	2468 MHz	67	2469 MHz
68	2470 MHz	69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz	75	2477 MHz
76	2478 MHz	77	2479 MHz	78	2480 MHz	N/A	N/A

Bluetooth Antenna List

Antenna	Manufacturer	Model No.	Peak Gain
FPC Antenna	SHENZHEN TAIHUAKE TELECOM EQUIPMENT CO.,LTD	THK-R&D-TY-DF-P1	2.4G:-1dBi

1.1. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmitter-1Mbps(GFSK_DH5)
Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5)
Mode 3: Transmitter-3Mbps(8DPSK_DH5)

Note:

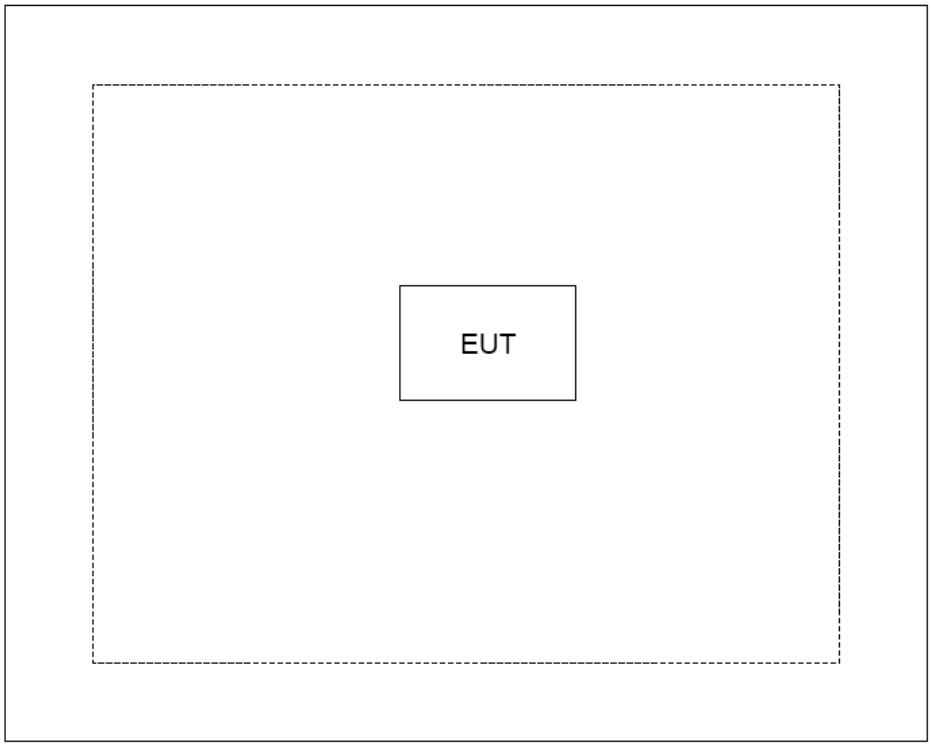
1. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For portable device, radiated spurious emission was verified over X, Y, Z axis, and shown the worst case on this report.

1.2. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	N/A	N/A	N/A	N/A	N/A

1.3. Configuration of Tested System

Connection Diagram


Signal Cable Type		Signal cable Description
N/A	N/A	N/A

1.4. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	Run the RF test software “Blue Test 3”, and set the test mode and channel, then press OK to start continue Transmit.

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.209	Yes	No
20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.247(a)(1)	Yes	No
Carrier Frequency Separation	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.247(a)(1)	Yes	No
Number of Hopping Frequencies	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.247(a)(1)(iii)	Yes	No
Time of Occupancy (Dwell Time)	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.247(a)(1)(iii)	Yes	No
Peak Output Power	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.247(b)(1)	Yes	No
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2014 Section 15.215(c), 15.247(d)	Yes	No
Spurious RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2014 15.247(d)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2014 15.247(d)	Yes	No

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	RSS-Gen Issue 4 November 2014 Section 8.8	Yes	No
Radiated Emission	RSS-210 Issue 8 December 2010 Section 2.7 Table 2 and Table 3	Yes	No
RF Antenna Conducted Spurious	RSS-210 Issue 8 December 2010 Section A8.5	Yes	No
Radiated Emission Band Edge	RSS-210 Issue 8 December 2010 Section A8.5	Yes	No
Occupied Bandwidth	RSS-Gen Issue 4 November 2014 Section 6.6 RSS-210 Issue 8 December 2010 Section A8.2(1)	Yes	No
Power Output	RSS-210 Issue 8 December 2010 Section A8.4(4)	Yes	No
Power Spectral Density	RSS-210 Issue 8 December 2010 Section A8.2(2)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

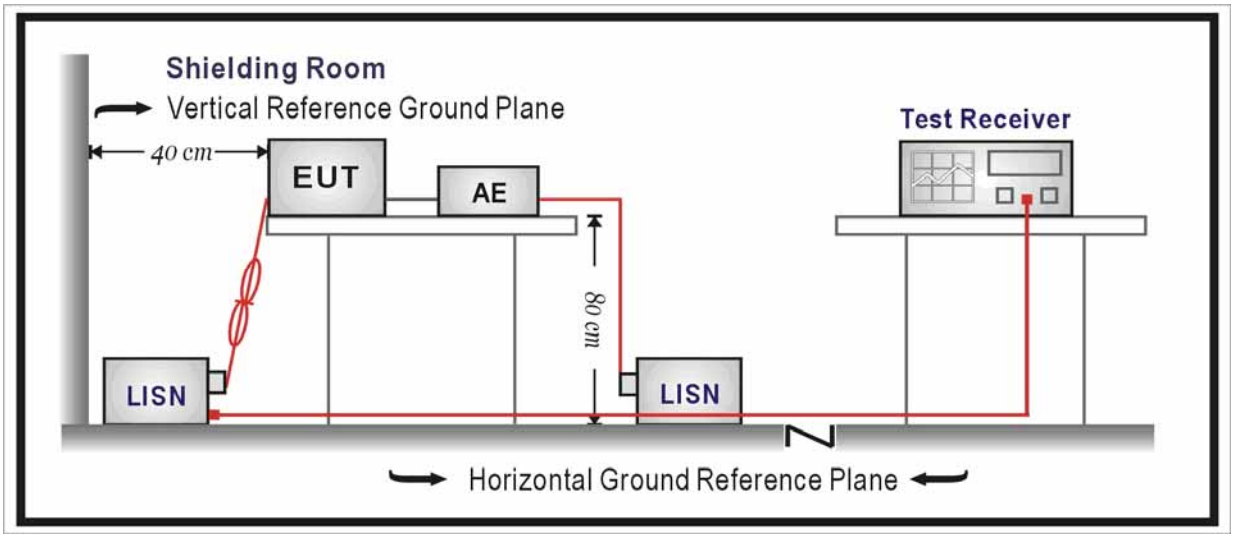
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2016.03.10
Two-Line V-Network	R&S	ENV216	100043	2016.03.10
Two-Line V-Network	R&S	ENV216	100044	2015.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2016.03.01
50ohm Termination	SHX	TF2	07081401	2015.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2016.01.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

According to FCC ANSI C63.4: 2014 & ANSI C63.10: 2013.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

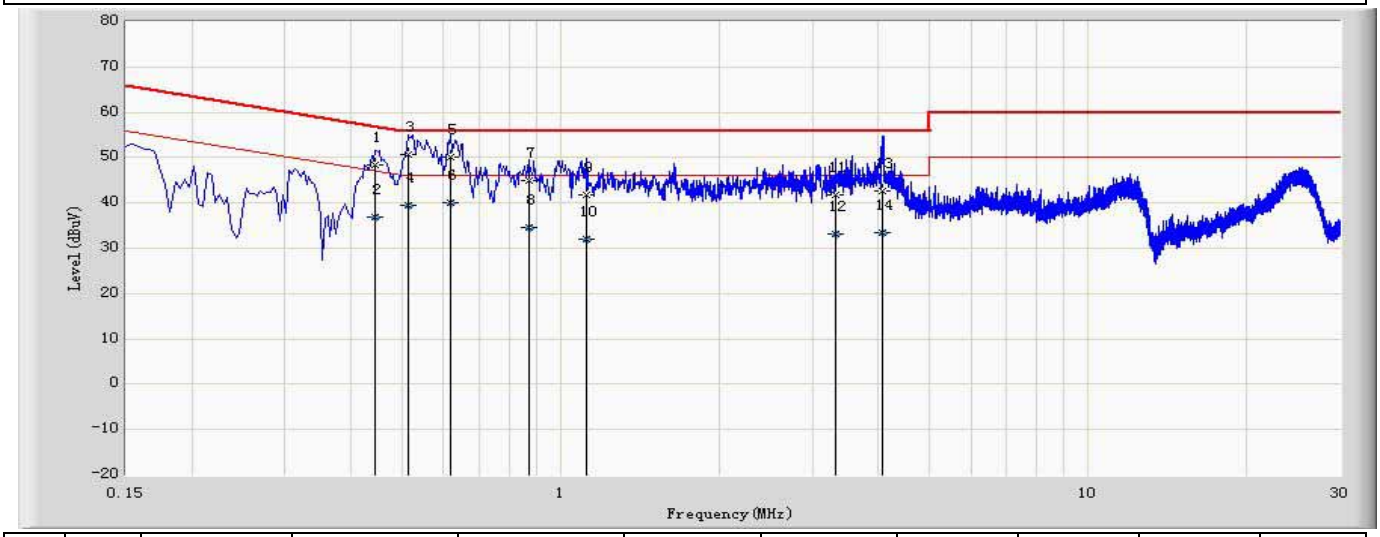
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

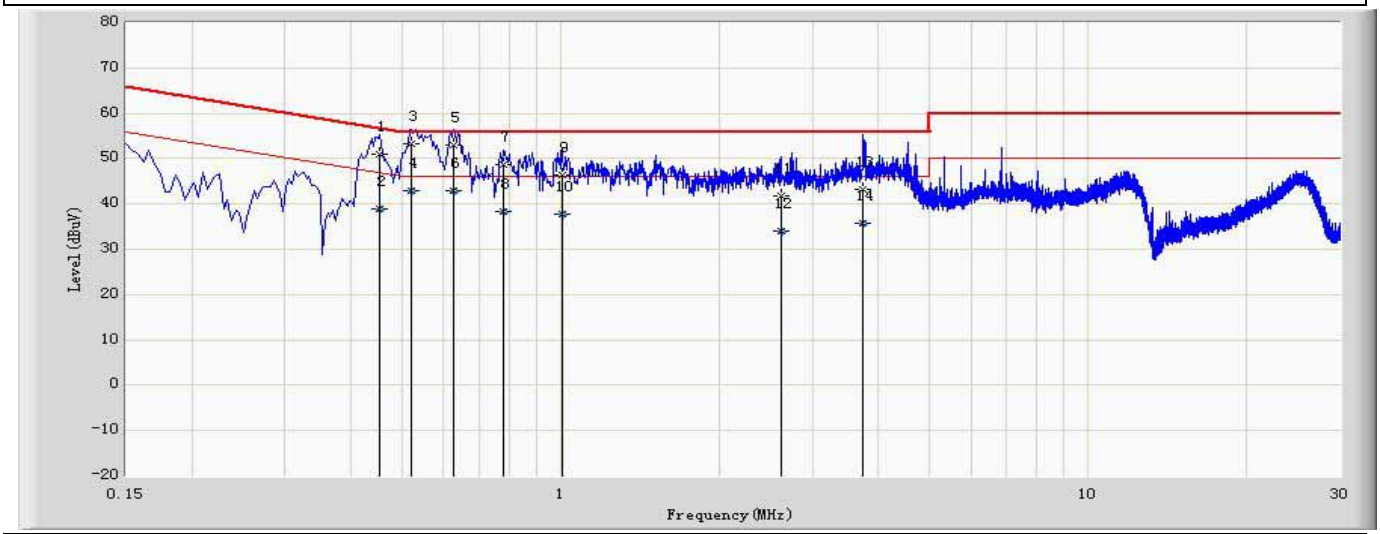
3.6. Test Result

Site: TR1	Time: 2015/04/20 - 16:00
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1: Transmit at CH2402 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		0.446	48.295	38.595	-8.654	56.949	9.630	0.070	0.000	QP
2		0.446	36.927	27.227	-10.022	46.949	9.630	0.070	0.000	AV
3	*	0.514	50.677	40.977	-5.323	56.000	9.630	0.070	0.000	QP
4		0.514	39.360	29.660	-6.640	46.000	9.630	0.070	0.000	AV
5		0.618	50.140	40.450	-5.860	56.000	9.620	0.070	0.000	QP
6		0.618	39.924	30.234	-6.076	46.000	9.620	0.070	0.000	AV
7		0.870	44.799	35.101	-11.201	56.000	9.627	0.071	0.000	QP
8		0.870	34.606	24.908	-11.394	46.000	9.627	0.071	0.000	AV
9		1.122	41.835	32.125	-14.165	56.000	9.630	0.080	0.000	QP
10		1.122	31.910	22.200	-14.090	46.000	9.630	0.080	0.000	AV
11		3.326	41.845	32.065	-14.155	56.000	9.650	0.130	0.000	QP
12		3.326	33.021	23.241	-12.979	46.000	9.650	0.130	0.000	AV
13		4.078	42.749	32.949	-13.251	56.000	9.660	0.140	0.000	QP
14		4.078	33.378	23.578	-12.622	46.000	9.660	0.140	0.000	AV

Site: TR1	Time: 2015/04/20 - 16:04
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1: Transmit at CH2402 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		0.454	51.035	41.333	-5.767	56.802	9.632	0.070	0.000	QP
2		0.454	38.898	29.196	-7.904	46.802	9.632	0.070	0.000	AV
3	*	0.522	53.283	43.583	-2.717	56.000	9.630	0.070	0.000	QP
4		0.522	42.844	33.144	-3.156	46.000	9.630	0.070	0.000	AV
5		0.626	53.126	43.416	-2.874	56.000	9.640	0.070	0.000	QP
6		0.626	43.047	33.337	-2.953	46.000	9.640	0.070	0.000	AV
7		0.778	48.549	38.839	-7.451	56.000	9.640	0.070	0.000	QP
8		0.778	38.203	28.493	-7.797	46.000	9.640	0.070	0.000	AV
9		1.006	46.343	36.633	-9.657	56.000	9.630	0.080	0.000	QP
10		1.006	37.806	28.096	-8.194	46.000	9.630	0.080	0.000	AV
11		2.622	41.647	31.887	-14.353	56.000	9.650	0.110	0.000	QP
12		2.622	33.903	24.143	-12.097	46.000	9.650	0.110	0.000	AV
13		3.746	43.091	33.296	-12.909	56.000	9.660	0.135	0.000	QP
14		3.746	35.702	25.907	-10.298	46.000	9.660	0.135	0.000	AV

Note: All the low ,middle and high channels of all different modes are investigated, and only report the worst case.

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

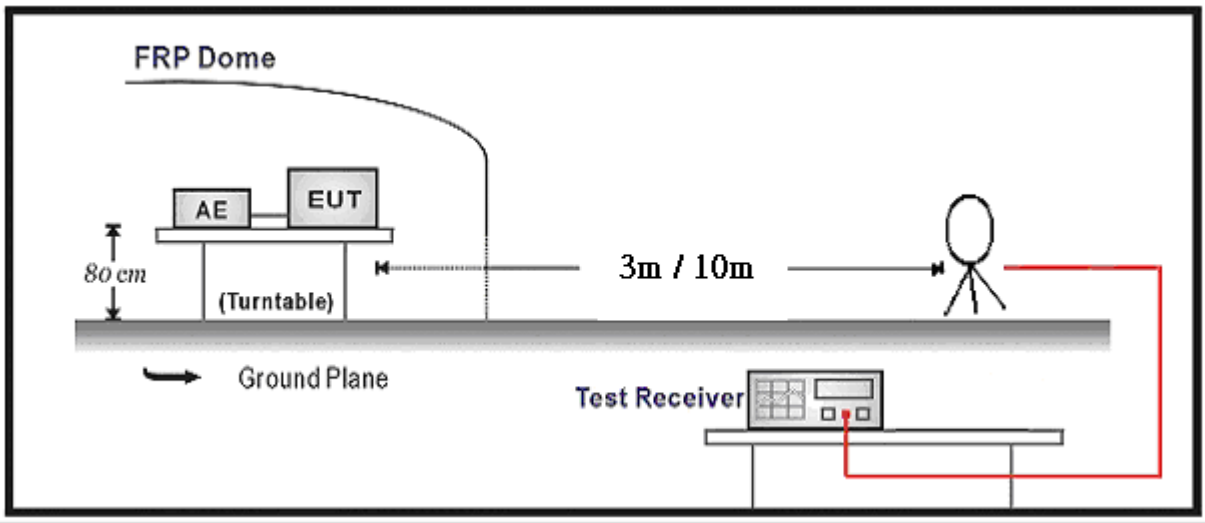
Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.10
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.25
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2015.10.10
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2016.01.07

Radiated Emission / AC-5

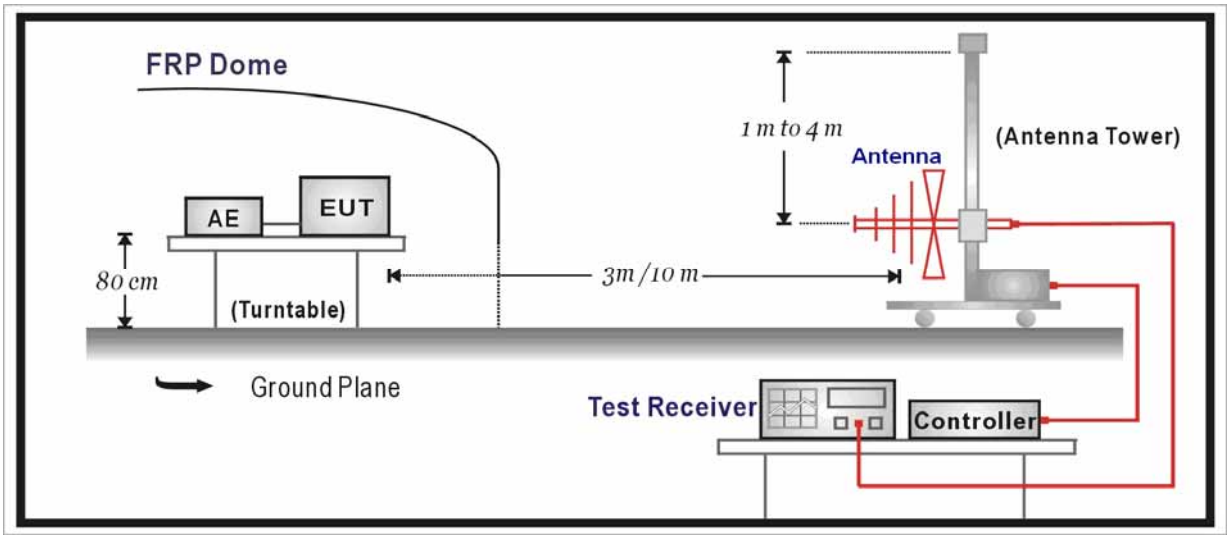
Instrument	Manufacturer	Type No.	Serial No.	Cal.Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2015.05.12
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.03
Preamplifier	QuieTek	AP-040G	CHM-0906001	2016.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2015.10.15
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2015.06.08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2016.04.10
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2016.01.07

4.2. Test Setup

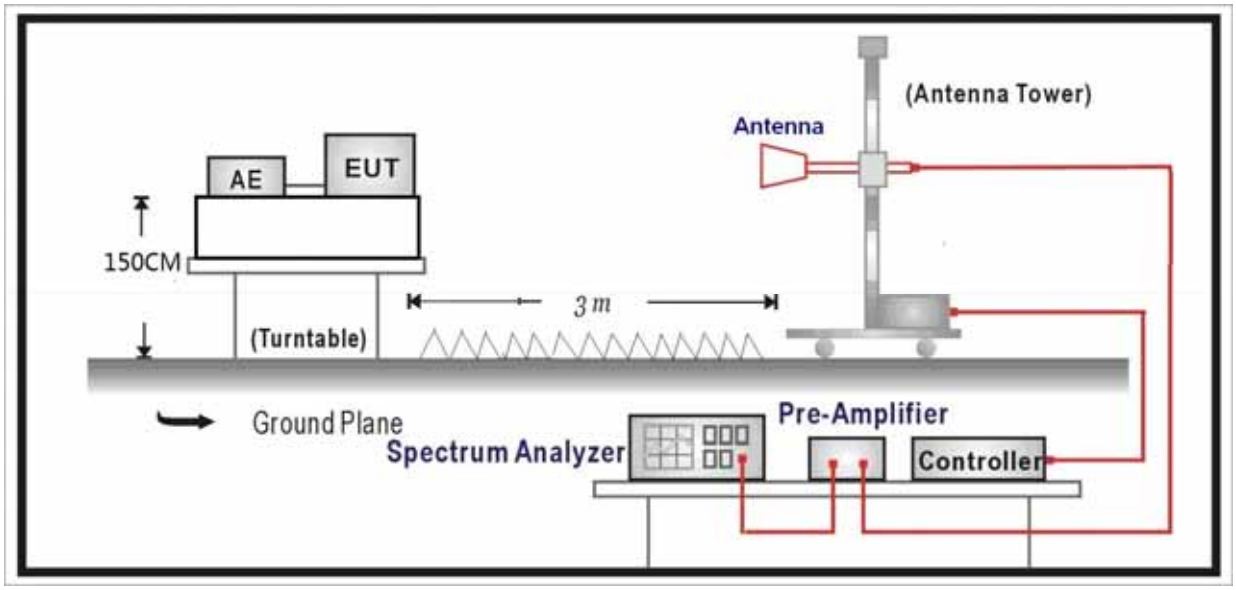
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:

2014 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

Note: When doing emission measurement above 1GHz, the horn antenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the antenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60~10 degrees for H-plane and 90~10 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

below 1G is defined as ± 3.8 dB

4.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Measure Level = Reading Level + Cable Loss + Antenna Factor – Preamplifier Gain

Mode 1: Transmitter-1Mbps(GFSK_DH5)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
0	H	4804.0	45.8	6.3	52.1	54(Note3)	-21.9	PK
	V	4808.0	52.3	6.3	58.6	74.0	-15.4	PK
	V	4808.0	45.3	6.3	51.7	54.0	-2.4	AV
	H	7206.0	38.7	10.1	48.9	54(Note3)	-25.1	PK
	V	7206.0	38.5	10.1	48.6	54(Note3)	-25.4	PK
	H	9608.0	35.5	12.9	48.4	54(Note3)	-25.6	PK
	V	9608.0	35.5	12.9	48.4	54(Note3)	-25.6	PK
39	H	4882.0	41.3	6.4	47.7	54(Note3)	-26.3	PK
	V	4884.5	45.9	6.4	52.3	54(Note3)	-21.7	PK
	H	7323.0	37.5	10.3	47.9	54(Note3)	-26.1	PK
	V	7323.0	37.8	10.3	48.1	54(Note3)	-25.9	PK
	H	9764.0	36.1	13.1	49.2	54(Note3)	-24.8	PK
	V	9764.0	36.0	13.1	49.2	54(Note3)	-24.9	PK
78	H	4960.0	40.2	6.5	46.7	54(Note3)	-27.3	PK
	V	4960.0	40.8	6.5	47.3	54(Note3)	-26.7	PK
	H	7440.0	35.9	10.8	46.7	54(Note3)	-27.3	PK
	V	7440.0	37.0	10.8	47.7	54(Note3)	-26.3	PK
	H	9920.0	37.1	13.1	50.1	54(Note3)	-23.9	PK
	V	9920.0	36.4	13.1	49.5	54(Note3)	-24.5	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

3: Measure Level = Reading Level + Factor.

Mode 2: Transmitter-2Mbps(Pi/4 DQPSK _DH5)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
0	H	4804.0	43.1	6.3	49.4	54(Note3)	-24.6	PK
	V	4808.0	46.6	6.3	52.9	54(Note3)	-21.1	PK
	H	7206.0	38.0	10.1	48.1	54(Note3)	-25.9	PK
	V	7206.0	38.1	10.1	48.3	54(Note3)	-25.7	PK
	H	9608.0	35.2	12.9	48.1	54(Note3)	-25.9	PK
	V	9608.0	34.9	12.9	47.8	54(Note3)	-26.2	PK
39	H	4882.0	40.4	6.4	46.8	54(Note3)	-27.2	PK
	V	4882.0	41.4	6.4	47.8	54(Note3)	-26.2	PK
	H	7323.0	37.5	10.3	47.9	54(Note3)	-26.1	PK
	V	7323.0	37.1	10.3	47.4	54(Note3)	-26.6	PK
	H	9764.0	36.3	13.1	49.4	54(Note3)	-24.6	PK
	V	9764.0	36.9	13.1	50.0	54(Note3)	-24.0	PK
78	H	4960.0	37.5	6.5	44.0	54(Note3)	-30.0	PK
	V	4960.0	37.9	6.5	44.4	54(Note3)	-29.6	PK
	H	7440.0	36.0	10.8	46.8	54(Note3)	-27.2	PK
	V	7440.0	36.4	10.8	47.2	54(Note3)	-26.8	PK
	H	9920.0	35.1	13.1	48.2	54(Note3)	-25.8	PK
	V	9920.0	34.6	13.1	47.7	54(Note3)	-26.3	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

3: Measure Level = Reading Level + Factor.

Mode 3: Transmitter-3Mbps(8DPSK_DH5)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
0	H	4804.0	40.2	6.3	46.5	54(Note3)	-27.5	PK
	V	4804.0	39.9	6.3	46.2	54(Note3)	-27.8	PK
	H	7206.0	37.1	10.1	47.2	54(Note3)	-26.8	PK
	V	7206.0	37.0	10.1	47.1	54(Note3)	-26.9	PK
	H	9608.0	34.2	12.9	47.1	54(Note3)	-26.9	PK
	V	9608.0	34.5	12.9	47.4	54(Note3)	-26.6	PK
39	H	4882.0	39.5	6.4	45.9	54(Note3)	-28.1	PK
	V	4882.0	39.5	6.4	45.9	54(Note3)	-28.1	PK
	H	7323.0	36.3	10.3	46.6	54(Note3)	-27.4	PK
	V	7323.0	37.1	10.3	47.4	54(Note3)	-26.6	PK
	H	9764.0	35.1	13.1	48.2	54(Note3)	-25.8	PK
	V	9764.0	34.6	13.1	47.8	54(Note3)	-26.2	PK
78	H	4960.0	38.7	6.5	45.3	54(Note3)	-28.7	PK
	V	4960.0	39.0	6.5	45.5	54(Note3)	-28.5	PK
	H	7440.0	36.0	10.8	46.7	54(Note3)	-27.3	PK
	V	7440.0	36.4	10.8	47.1	54(Note3)	-26.9	PK
	H	9920.0	35.8	13.1	48.9	54(Note3)	-25.1	PK
	V	9920.0	36.4	13.1	49.5	54(Note3)	-24.5	PK

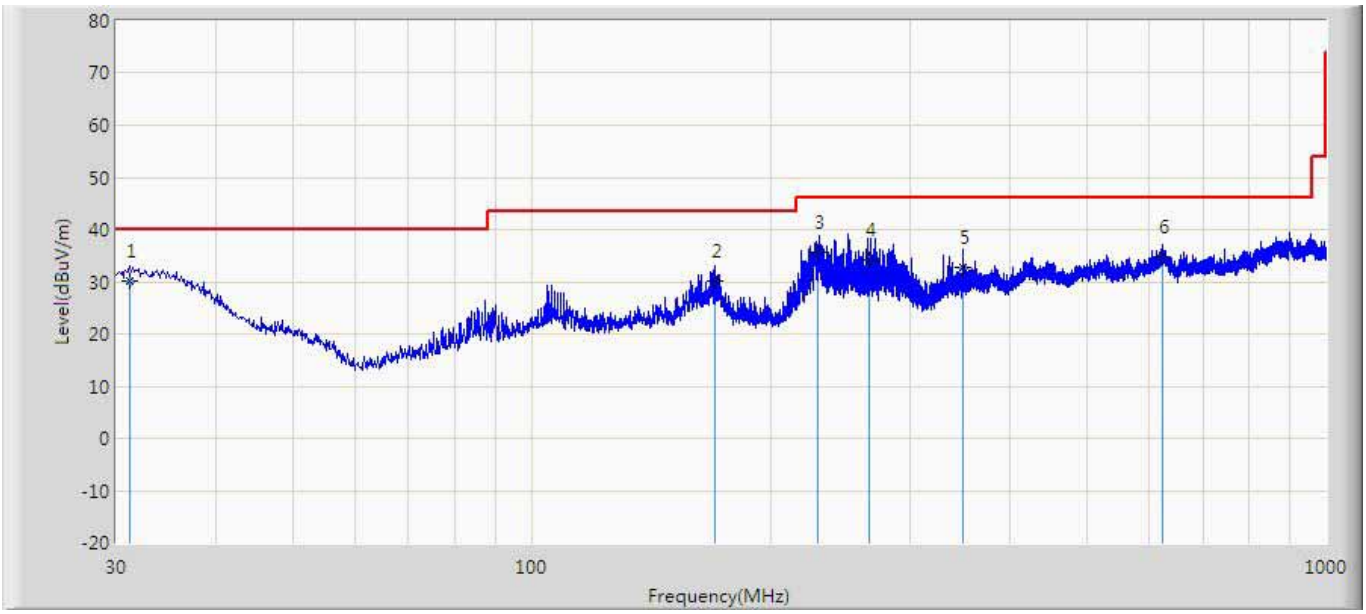
Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

3: Measure Level = Reading Level + Factor.

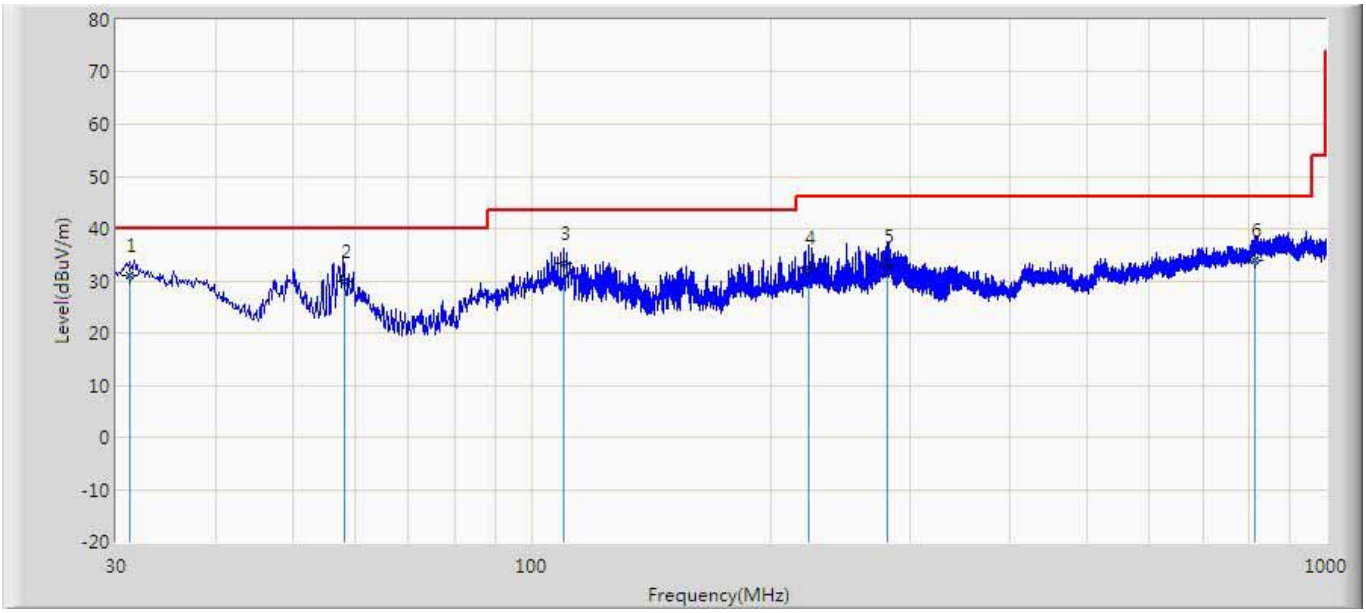
The worst case of Radiated Emission below 1GHz:

Site: AC2	Time: 2015/04/19 - 15:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_10M(30-1000M)20130511	Polarity: Horizontal
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1: Transmit at CH2402 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	31.218	30.124	34.523	-9.876	40.000	18.093	0.613	23.105	200	321	QP
2		170.155	30.164	42.223	-13.336	43.500	9.596	1.415	23.070	200	3	QP
3		229.222	35.629	47.041	-10.371	46.000	10.222	1.630	23.264	100	223	QP
4		266.330	34.105	42.288	-11.895	46.000	13.277	1.750	23.210	100	159	QP
5		349.155	32.619	38.881	-13.381	46.000	14.678	2.040	22.980	100	1	QP
6		622.222	34.772	35.606	-11.228	46.000	19.000	2.735	22.569	100	211	QP

Site: AC2	Time: 2015/04/19 - 15:16
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_10M(30-1000M)20130511	Polarity: Vertical
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1: Transmit at CH2402 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	31.148	30.970	35.328	-9.030	40.000	18.134	0.612	23.104	100	193	QP
2		58.218	29.876	45.282	-10.124	40.000	6.803	0.821	23.030	200	148	QP
3		109.621	33.248	43.198	-10.252	43.500	12.060	1.131	23.140	100	333	QP
4		223.211	32.329	44.346	-13.671	46.000	9.621	1.612	23.250	100	269	QP
5		280.622	32.807	41.195	-13.193	46.000	12.912	1.800	23.100	200	11	QP
6		813.152	33.773	32.888	-12.227	46.000	20.105	3.140	22.360	200	276	QP

5. 20dB Bandwidth

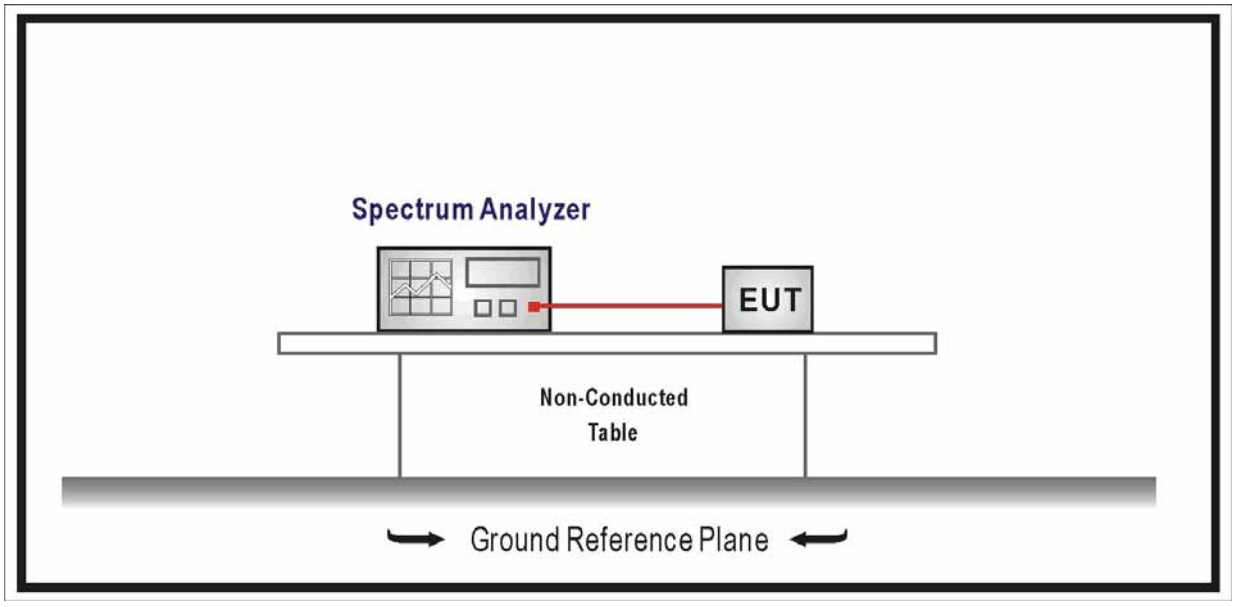
5.1 Test Equipment

20dB Bandwidth / TR8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2 Test Setup



5.3 Limit

- For frequency hopping systems operating in 2400-2483.5 MHz band, no limitation.
- For frequency hopping systems operating in 902-928 MHz band, the maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- For frequency hopping systems operating in 5725-5850 MHz band, the maximum 20 dB bandwidth of the hopping channel is 1 MHz.

5.4 Test Procedure

According to ANSI C63.10: 2013.
Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel
RBW ≧ 1% of the 20dB bandwidth
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

5.5 Uncertainty

The measurement uncertainty is defined as ± 1 kHz

5.6 Test Result

Product	:	Audio Mixer
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	929.1	880.99
39	2441	923.4	871.86
78	2480	925.8	869.77

Channel 00 (2402MHz)

Channel 39 (2441MHz)

Channel 78 (2480MHz)

Product	:	Audio Mixer
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	1268	1162.9
39	2441	1235	1157.3
78	2480	1233	1157.1

Channel 00 (2402MHz)

Channel 39 (2441MHz)

Channel 78 (2480MHz)

Product	:	Audio Mixer
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	1277	1163.2
39	2441	1267	1169.0
78	2480	1267	1156.3

Channel 00 (2402MHz)

Channel 39 (2441MHz)

Channel 78 (2480MHz)

6. Carrier Frequency Separation

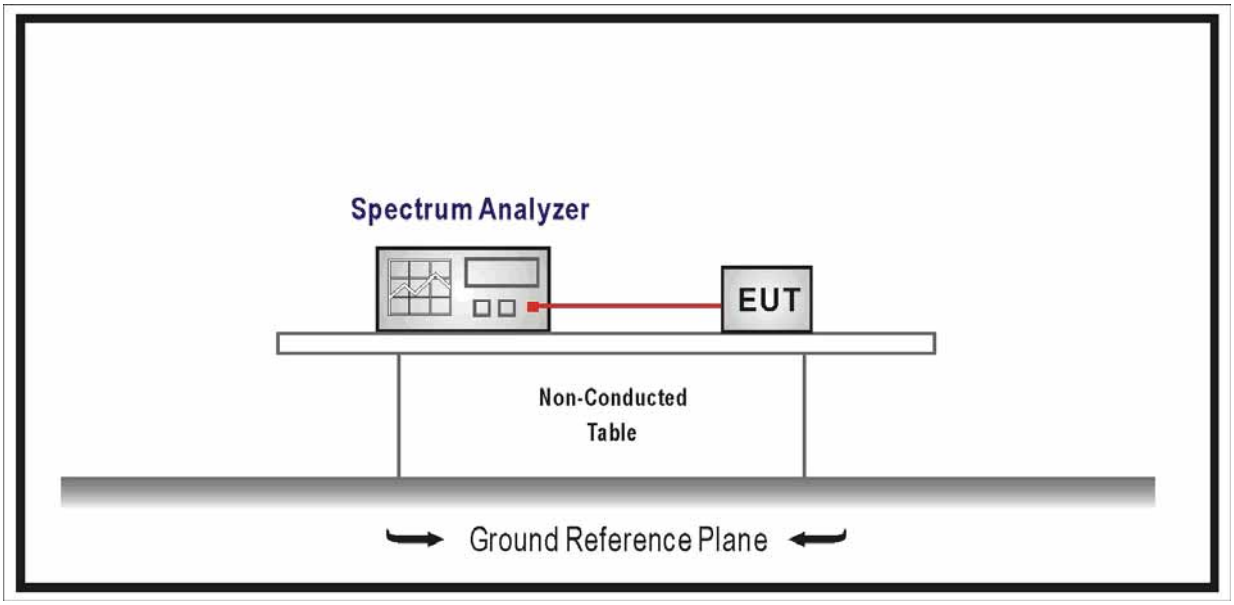
6.1. Test Equipment

Carrier Frequency Separation / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.05
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

- 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 125mW. 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.

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

6.4. Test Procedure

According to ANSI C63.10: 2013.
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≧ 1% of the span
Video (or Average) Bandwidth VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

6.5. Uncertainty

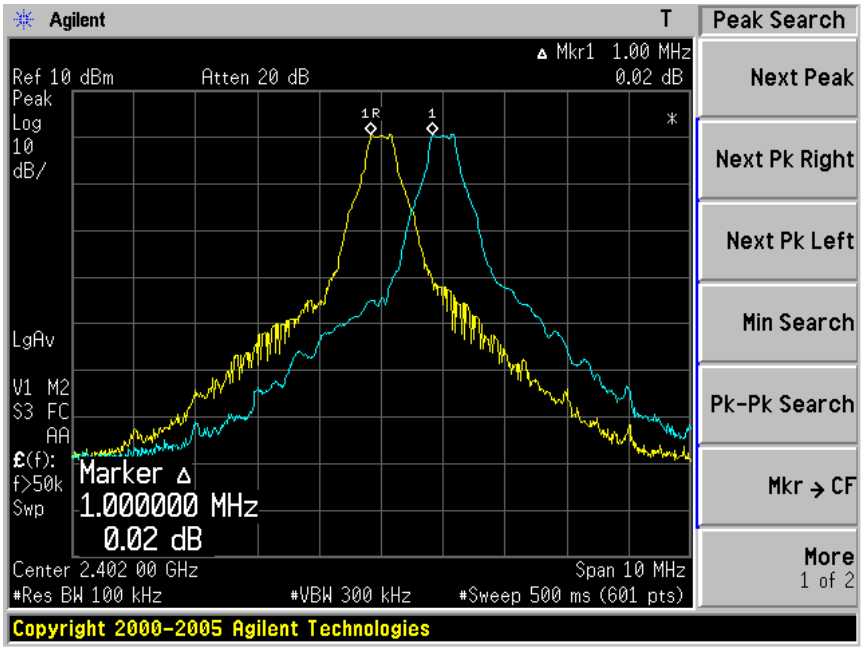
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

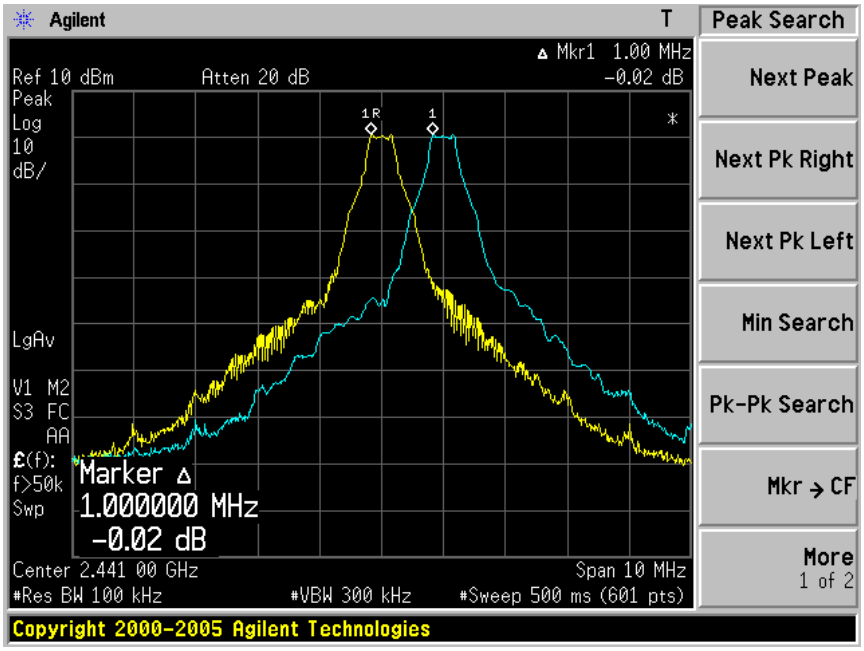
Product	:	Audio Mixer
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

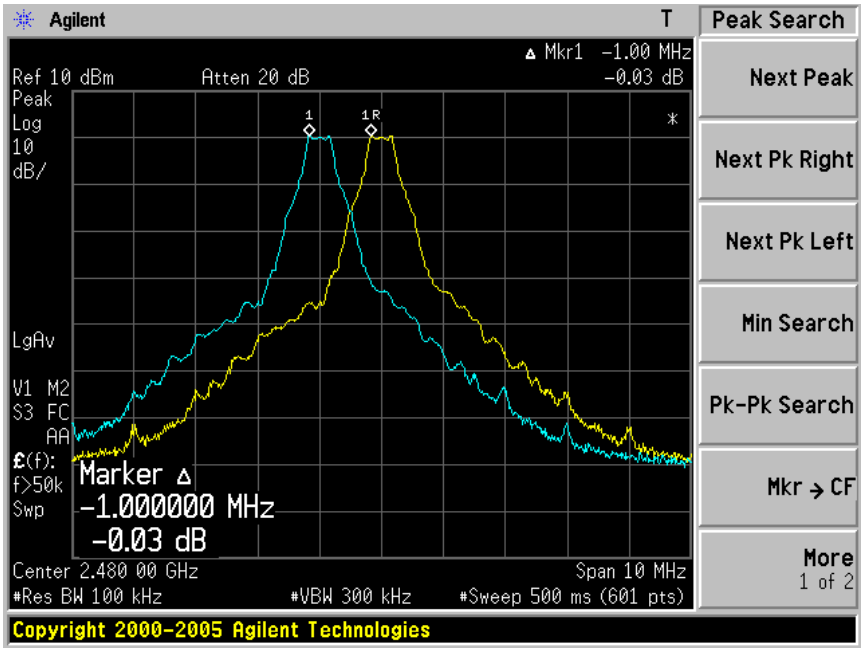
Channel 00 (2402MHz)



Channel 39 (2441MHz)



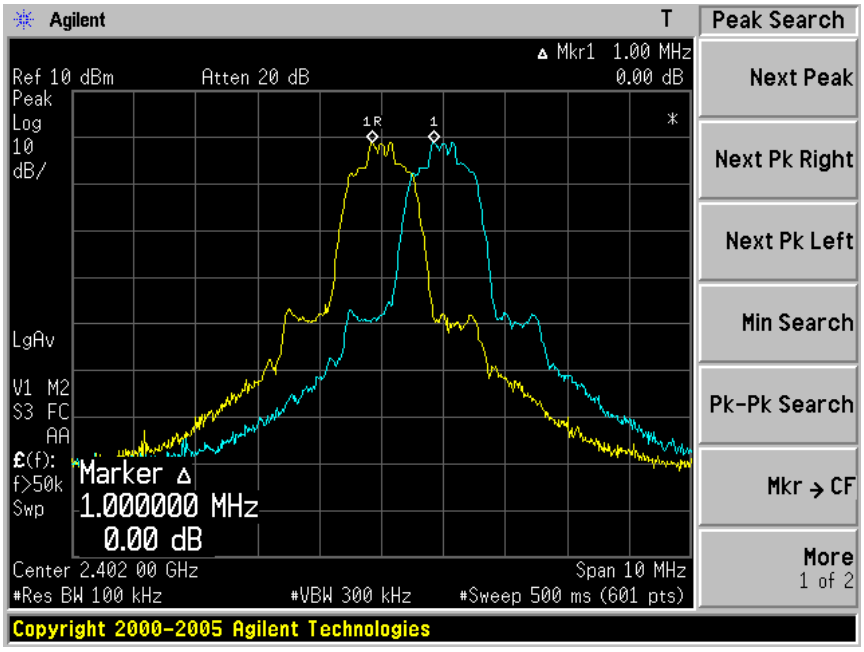
Channel 78 (2480MHz)



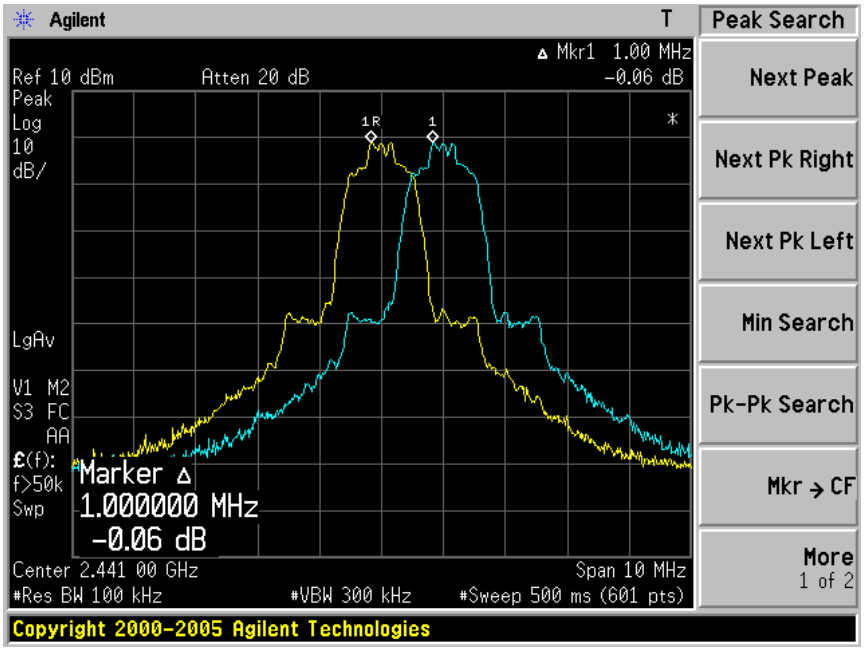
Product	:	Audio Mixer
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

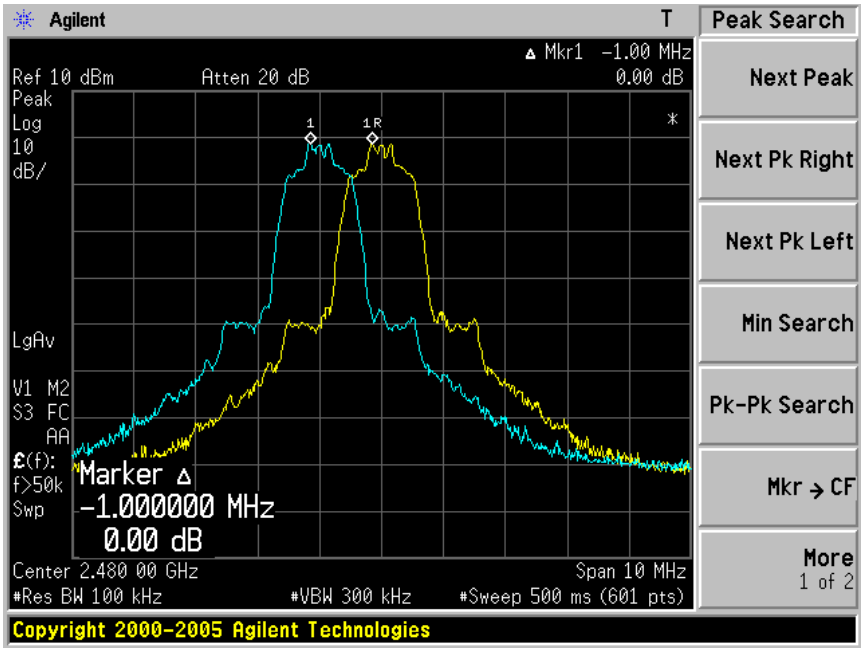
Channel 00 (2402MHz)



Channel 39 (2441MHz)



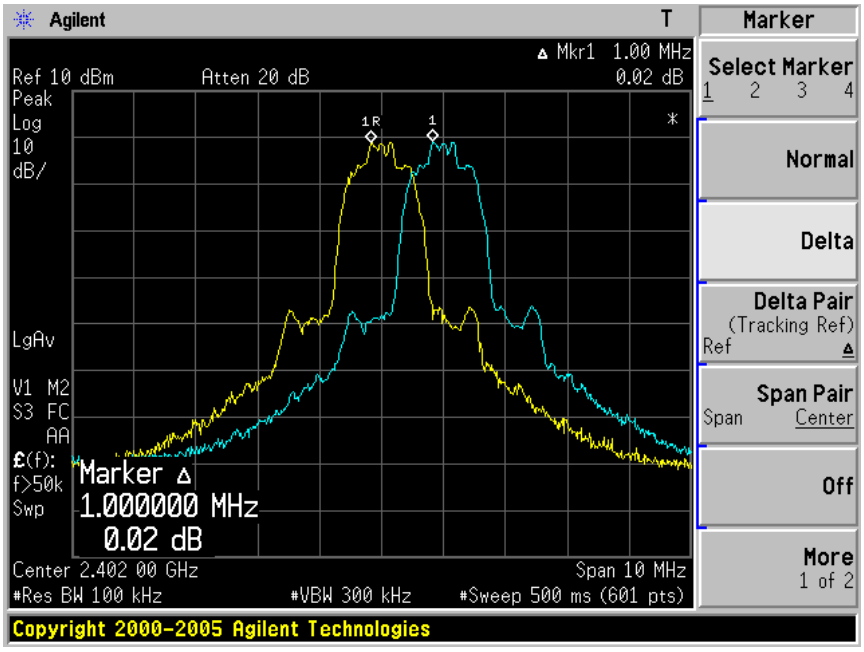
Channel 78 (2480MHz)



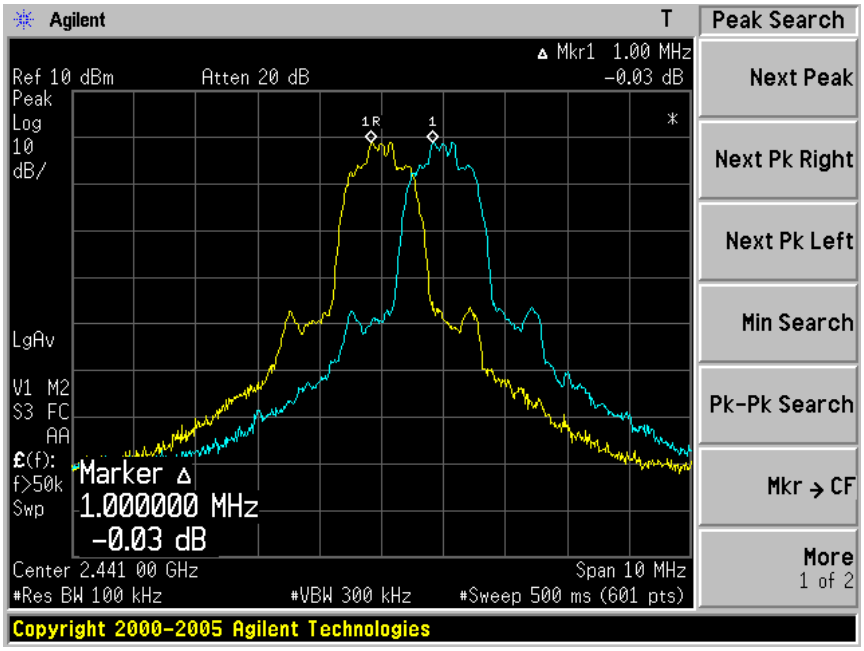
Product	:	Audio Mixer
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel No.	Frequency (MHz)	Carrier Frequency Separation (kHz)	Limit (kHz)	Result
00	2402	1000	>25 kHz or 2/3 of 20 dB BW	Pass
39	2441	1000	>25 kHz or 2/3 of 20 dB BW	Pass
78	2480	1000	>25 kHz or 2/3 of 20 dB BW	Pass

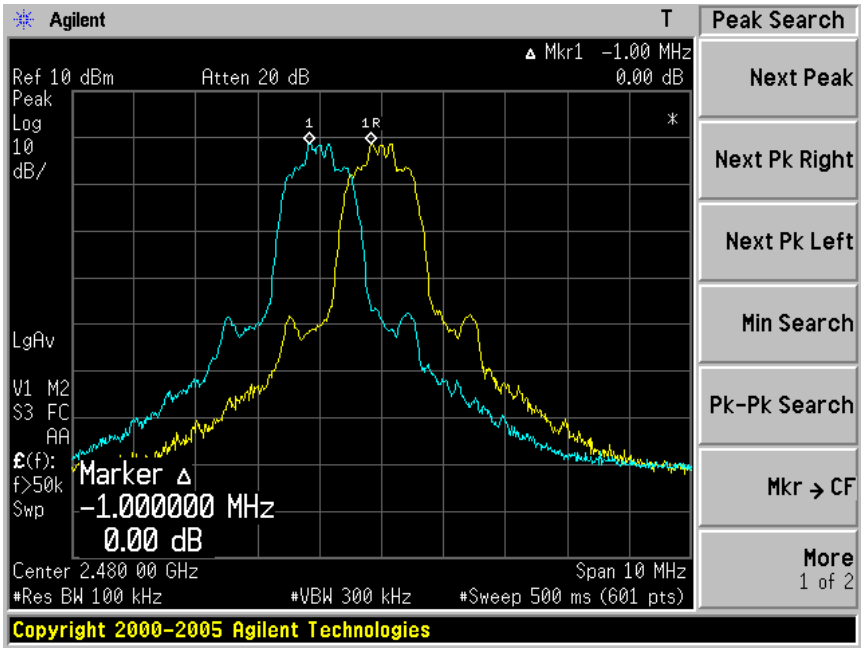
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



7. Number of Hopping Frequencies

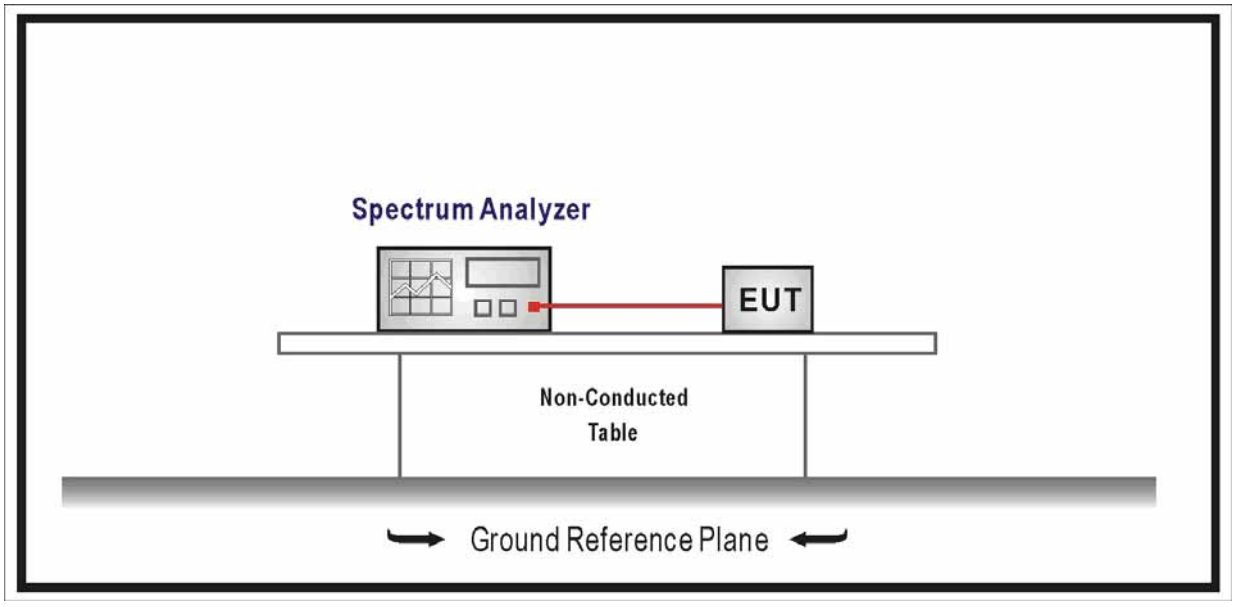
7.1. Test Equipment

Number of Hopping Frequencies / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies.
- For frequency hopping systems operating in 902-928 MHz band shall use at least 50 hopping frequencies.
- For frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

7.4. Test Procedure

According to ANSI C63.10: 2013.
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation
RBW ≧ 1% of the span
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. It may prove necessary to bread the span up to sections, in order to clearly show all of the hopping frequencies.

7.5. Uncertainty

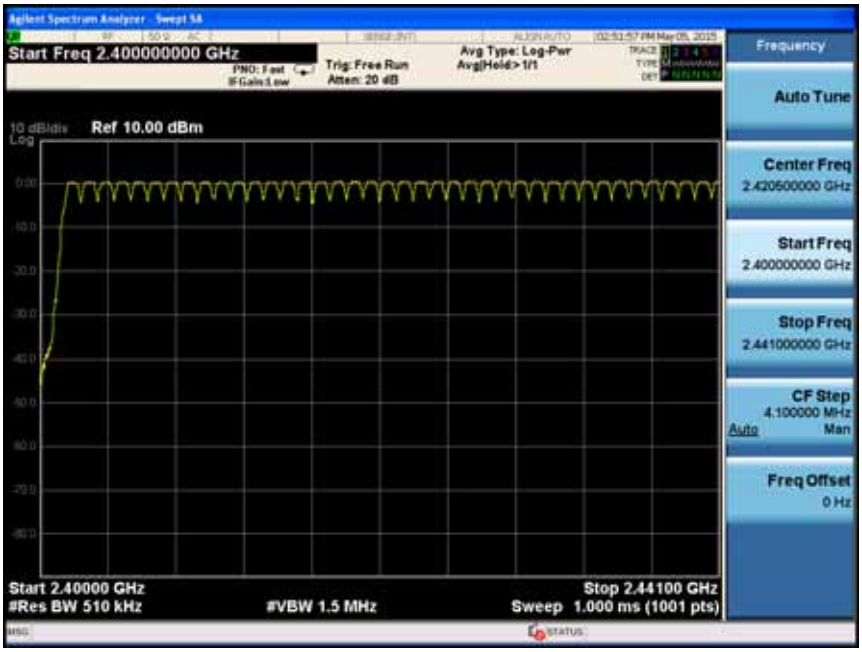
The measurement uncertainty is defined as ± 1 kHz

7.6. Test Result

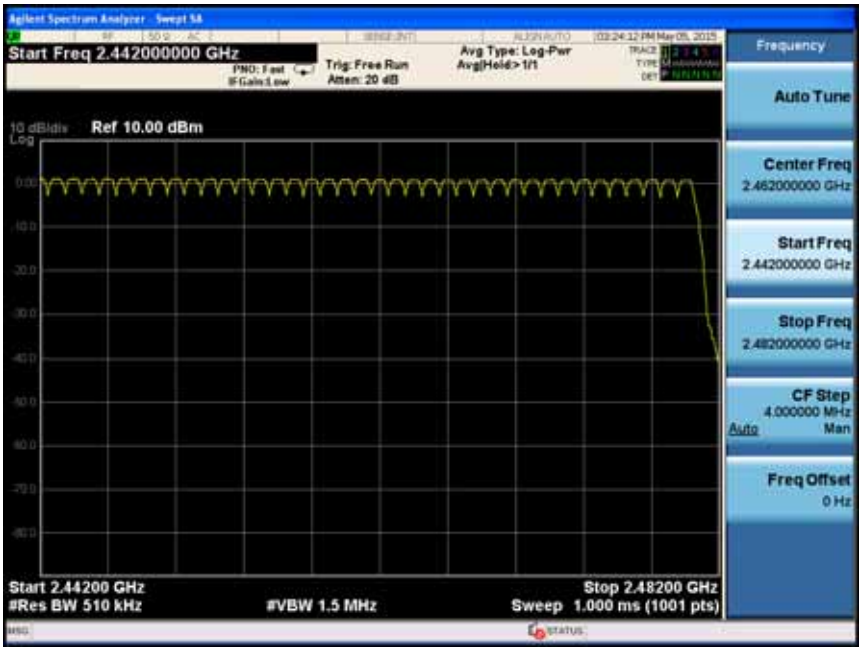
Product	:	Audio Mixer
Test Item	:	Number of Hopping Frequencies
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

2402 - 2441 MHz



2442 - 2480 MHz



Product	:	Audio Mixer
Test Item	:	Number of Hopping Frequencies
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

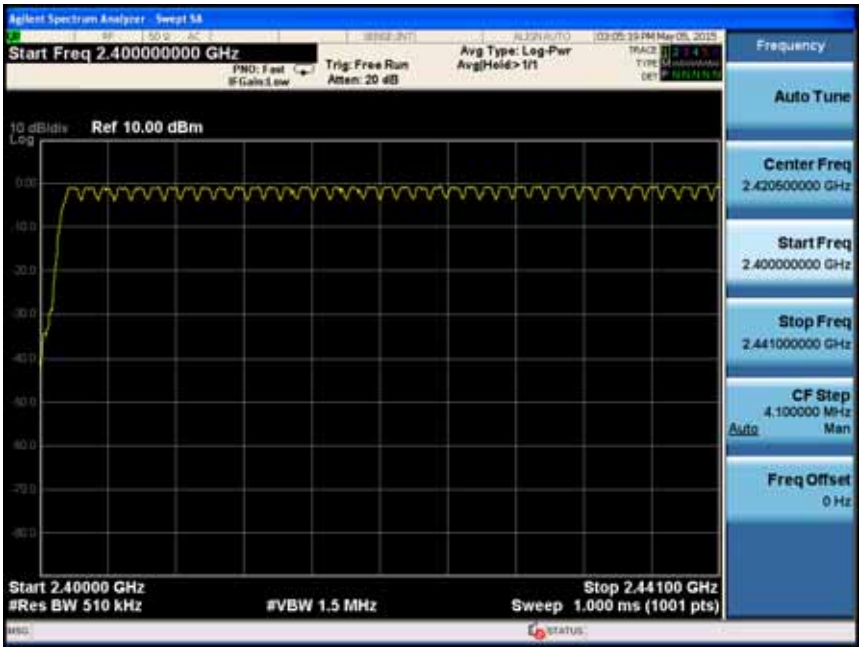
2402 - 2441 MHz

2442 - 2480 MHz

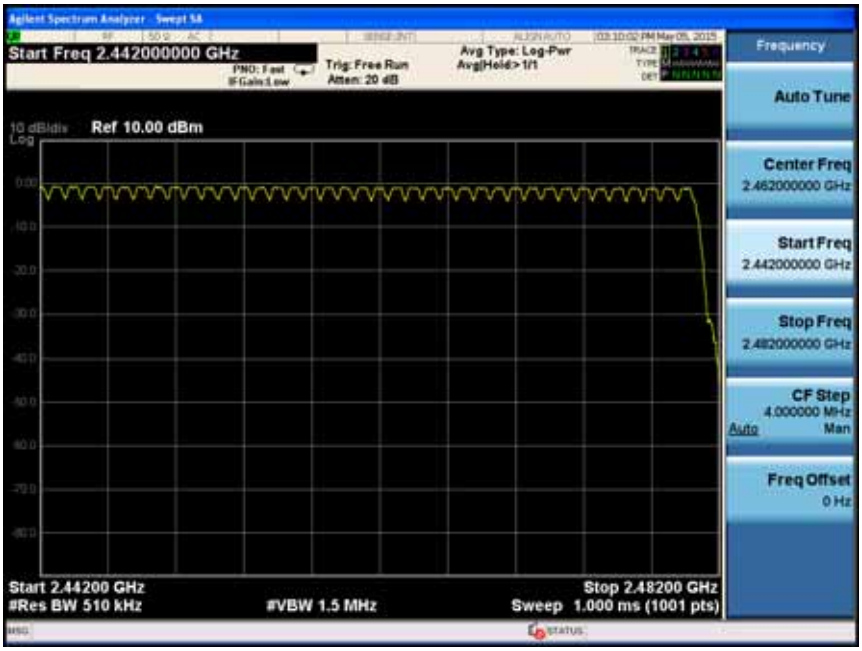
Product	:	Audio Mixer
Test Item	:	Number of Hopping Frequencies
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Frequency Band (MHz)	Number of Hopping Frequencies	Limit	Result
2400 - 2483.5	79	>15	Pass

2402 - 2441 MHz



2442 - 2480 MHz



8. Time of Occupancy (Dwell Time)

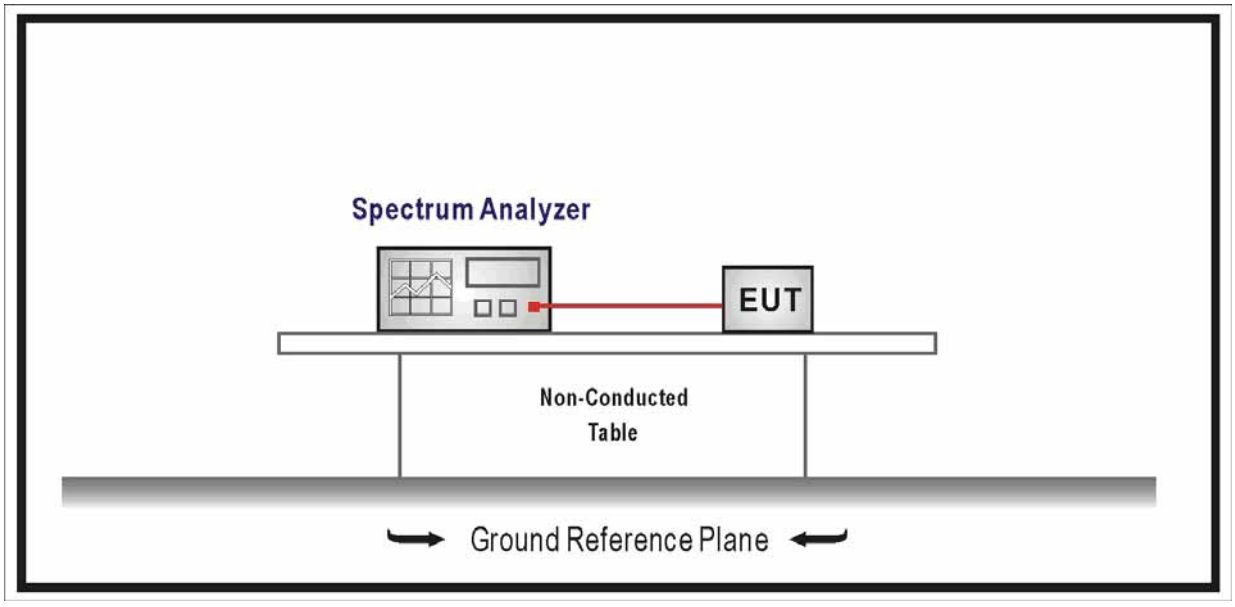
8.1. Test Equipment

Time of Occupancy (Dwell Time) / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

- For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
- Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75

hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

- 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 then 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.4. Test Procedure

According to ANSI C63.10: 2013.
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = zero span, centered on a hopping channel
RBW = 1MHz
VBW ≧ RBW
Sweep = as necessary to capture the entire dwell time per hopping channel
Detector function = peak
Trace = max hold
If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.

8.5. Uncertainty

The measurement uncertainty is defined as ± 0.1 us

8.6. Test Result

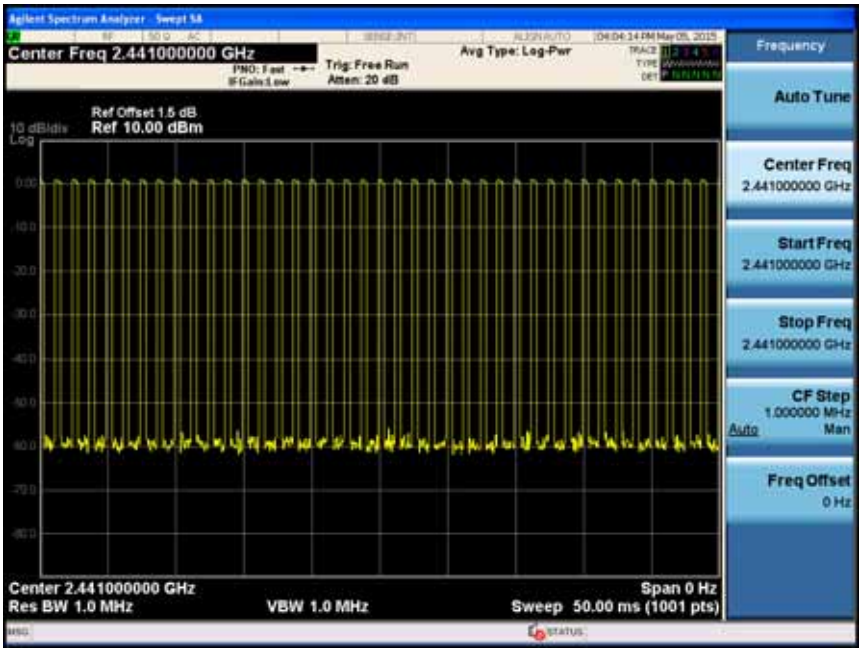
Product	:	Audio Mixer
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	TR-8
Test Mode	:	Transmitter-3Mbps (8DPSK_DH1)

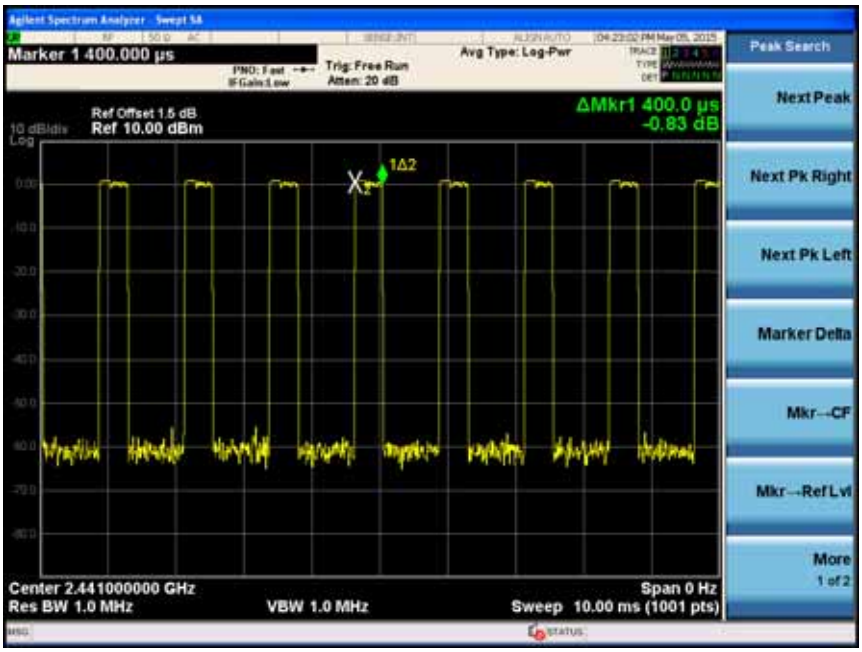
Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
39	2441	128.0	< 400	Pass

Test Time Period: 0.4*79=31.6sec, Hopping Times Within 1sec: 40/50msec = 800 hops/sec.

- 2441MHz, The Maximum Occupancy Time Within 31.6sec: [(0.4ms*800)/79]*31.6 =128.0msec

Channel 39 (2441MHz)-(3DH1)




Agilent Spectrum Analyzer - Swept SA
Marker 1 400.000 µs
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Ref Offset 1.5 dB
10 dB/div
Ref 10.00 dBm
Log
ΔMkr1 400.0 µs
-0.83 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
VBW 1.0 MHz
Span 0 Hz
Sweep 10.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

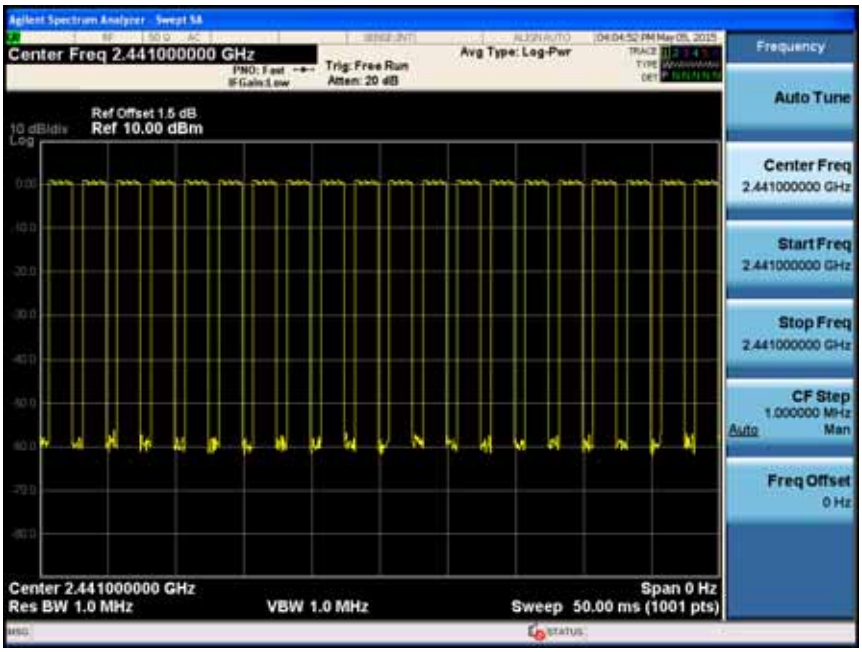
Product	:	Audio Mixer
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	TR-8
Test Mode	:	Transmitter-3Mbps (8DPSK_DH3)

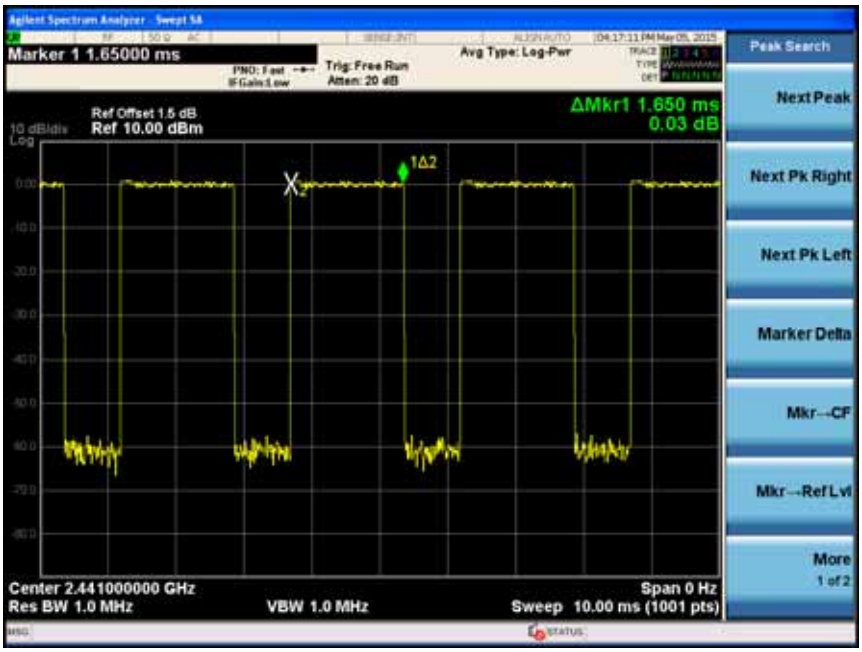
Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
39	2441	264.0	< 400	Pass

Test Time Period: 0.4*79=31.6sec, Hopping Times Within 1sec: 20/50msec=400hops/sec.

- 2441MHz, The Maximum Occupancy Time Within 31.6sec: [(1.65ms*400)/79]*31.6=264.0msec

Channel 39 (2441MHz) - (3DH3)




Agilent Spectrum Analyzer - Swept SA
Marker 1 1.65000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Ref Offset 1.5 dB
10 dB/div
Log
Ref 10.00 dBm
ΔMkr1 1.650 ms
0.03 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
VBW 1.0 MHz
Span 0 Hz
Sweep 10.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

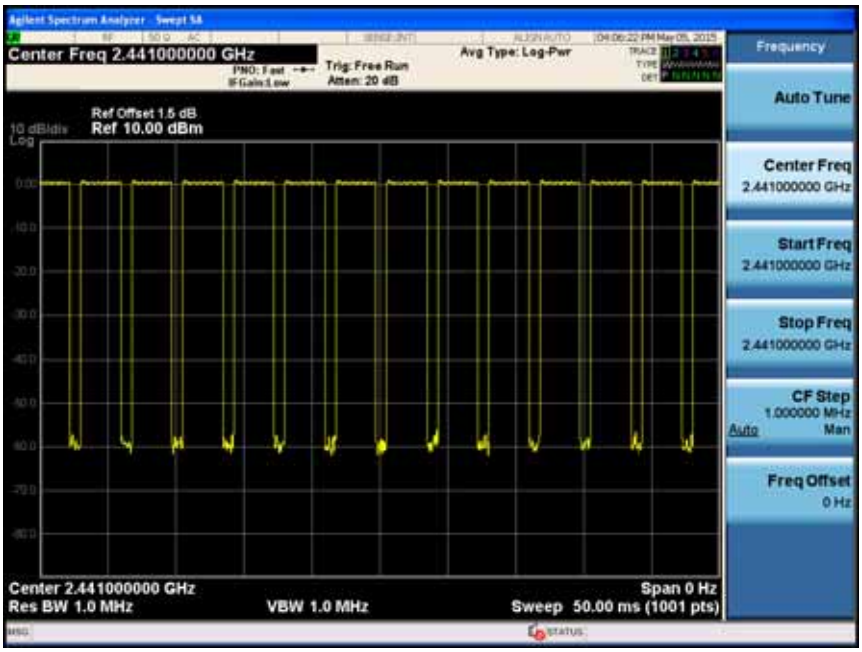
Product	:	Audio Mixer
Test Item	:	Time of Occupancy (Dwell Time)
Test Site	:	TR-8
Test Mode	:	Transmitter-3Mbps (8DPSK_DH5)

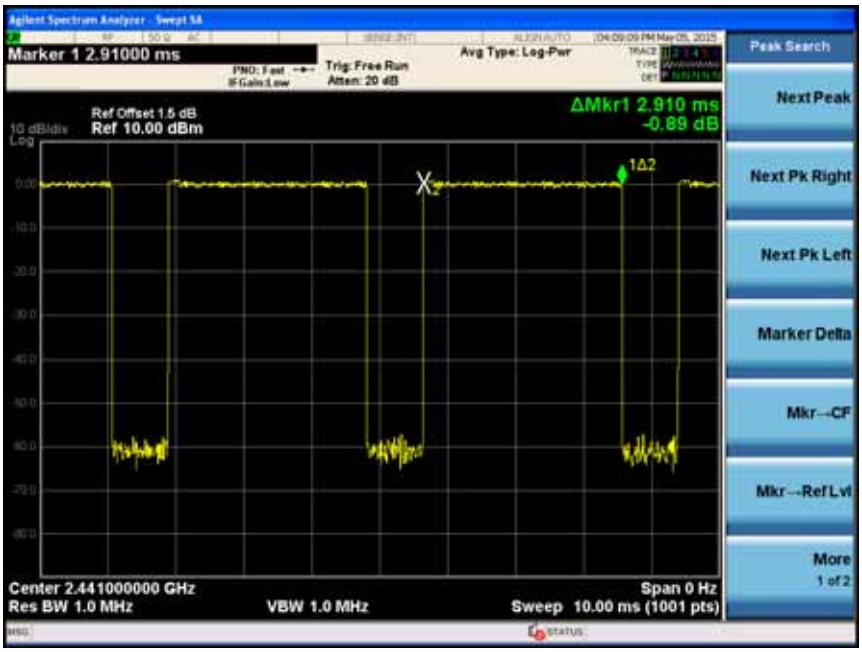
Channel No.	Frequency (MHz)	Time of Occupancy (ms)	Limit (ms)	Result
39	2441	303.4	< 400	Pass

Test Time Period: 0.4*79=31.6sec, Hopping Times Within 1sec: 13/50msec=260 hops/sec.

- 2441MHz, The Maximum Occupancy Time Within 31.6sec: [(2.910ms*260)/79]*31.6= 302.6msec

Channel 39 (2441MHz) - (3DH5)




Agilent Spectrum Analyzer - Swept SA
Marker 1 2.91000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Ref Offset 1.5 dB
10 dB/div
Ref 10.00 dBm
Log
ΔMkr1 2.910 ms
-0.89 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
VBW 1.0 MHz
Span 0 Hz
Sweep 10.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

9. Peak Output Power

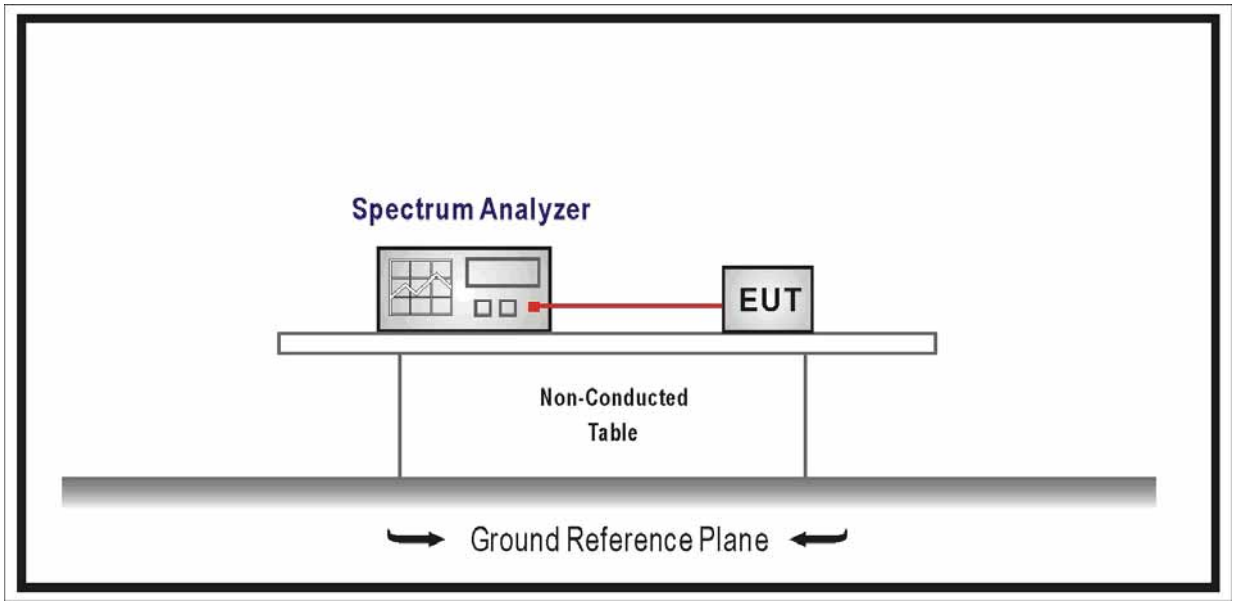
9.1. Test Equipment

Peak Output Power / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. 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.
- For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels.

Note: the conducted output power limit specified above is based on the use the antennas with

directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

9.4. Test Procedure

According to ANSI C63.10: 2013.
Use the following spectrum analyzer settings:
Span = approximately 5 times the 20dB bandwidth, centered on a hopping channel
RBW ＞ the 20 dB bandwidth of the emission being measured.
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (don't forget added the external attenuation and cable loss).

9.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

9.6. Test Result

Product	:	Audio Mixer
Test Item	:	Power Output
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
0	2402	2.496	30.00	Pass
39	2441	2.771	30.00	Pass
78	2480	2.468	30.00	Pass

DH5 2402MHz

DH5 2441MHz

DH5 2480MHz

Product	:	Audio Mixer
Test Item	:	Power Output
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
0	2402	0.911	30.00	Pass
39	2441	1.177	30.00	Pass
78	2480	0.844	30.00	Pass

2DH5 2402MHz

2DH5 2441MHz

2DH5 2480MHz

Product	:	Audio Mixer
Test Item	:	Power Output
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
0	2402	1.215	30.00	Pass
39	2441	1.403	30.00	Pass
78	2480	1.040	30.00	Pass

3DH5 2402MHz

3DH5 2441MHz

3DH5 2480MHz

10. Band-edge Compliance of RF Conducted Emissions

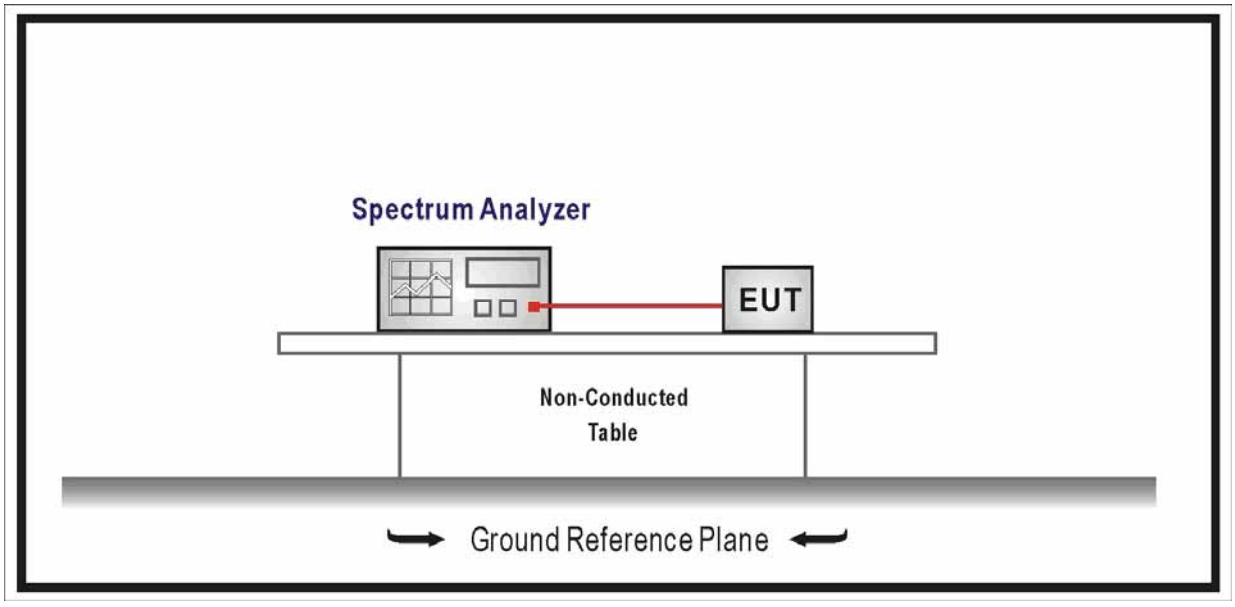
10.1. Test Equipment

Band-edge Compliance of RF Conducted Emissions / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. 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 FCC part 15, must be designed to ensure that 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.
- 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 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, 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) of FCC part 15 is not required.

10.4. Test Procedure

According to ANSI C63.10: 2013.
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation.
RBW ≧ 1% of the span
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge.
Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.
Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

10.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

10.6. Test Result

Product	:	Audio Mixer
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel 00 (2402MHz)

Channel 78 (2480MHz)

Product	:	Audio Mixer
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel 00 (2402MHz)

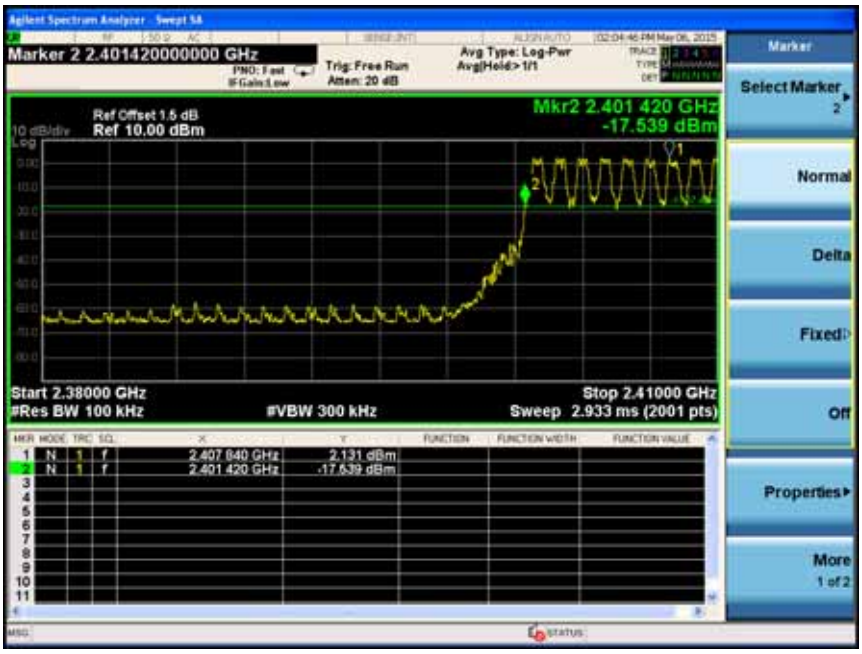
Channel 78 (2480MHz)

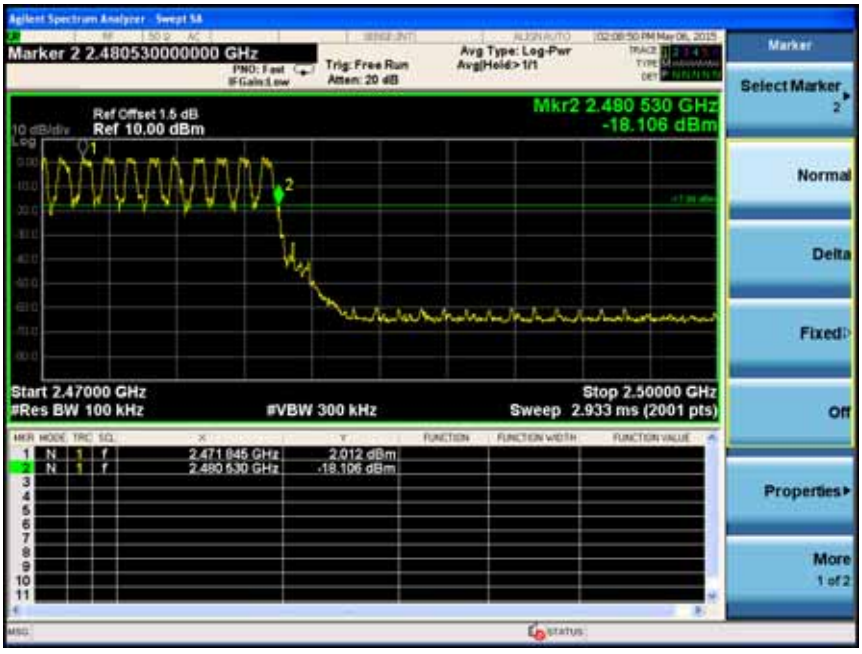
Product	:	Audio Mixer
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel 00 (2402MHz)

Channel 78 (2480MHz)

Product	:	Audio Mixer
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode: Hopping Mode





11. Spurious RF Conducted Emissions

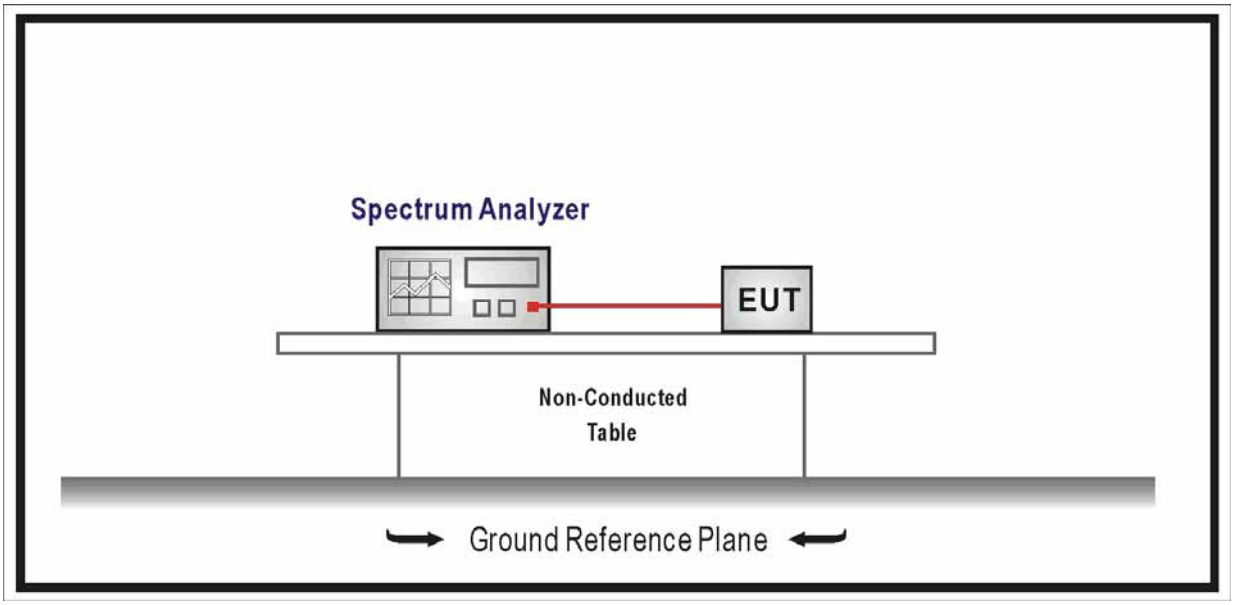
11.1. Test Equipment

Spurious RF Conducted Emissions / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2015.05.12
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

11.2. Test Setup



11.3. Limit

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 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, 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) of FCC part 15 is not required.

11.4. Test Procedure

According to ANSI C63.10: 2013.
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10^{th} harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

11.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

11.6. Test Result

Product	:	Audio Mixer
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 1: Transmitter-1Mbps (GFSK_DH5)

Channel 00 (2402MHz)

Channel 39 (2441MHz)

Channel 78 (2480MHz)

Product	:	Audio Mixer
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 2: Transmitter-2Mbps (Pi/4 DQPSK_DH5)

Channel 00 (2402MHz)

Channel 39 (2441MHz)

Channel 78 (2480MHz)

Product	:	Audio Mixer
Test Item	:	Spurious RF Conducted Emissions
Test Mode	:	Mode 3: Transmitter-3Mbps (8DPSK_DH5)

Channel 00 (2402MHz)

Channel 39 (2441MHz)

Channel 78 (2480MHz)

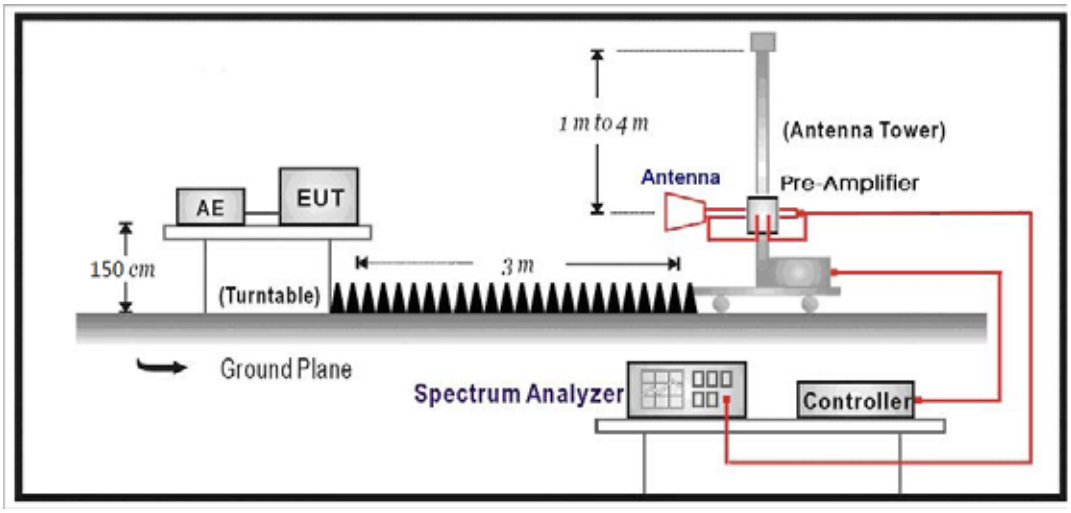
12. Radiated Emission Band Edge

12.1. Test Equipment

☒Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.10
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.03
Preamplifier	QuieTek	AP-040G	CHM-0906001	2016.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2015.10.15
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2016.01.05
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2015.08.07
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2016.01.07

12.2. Test Setup



12.3. Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) of FCC part 15.

12.4. Test Procedure

According to ANSI C63.10: 2013.

This test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205 of FCC part 15. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for f ≧ 1 GHz, 100 kHz for f < 1GHz

VBW ≧ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength,

which must comply with the limit specified in Section 15.35(b) of FCC part 15.
Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209 of FCC Part 15. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit of FCC part 15.
If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method may be employed.

12.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
below 1G is defined as ± 3.8 dB

12.6. Test Result

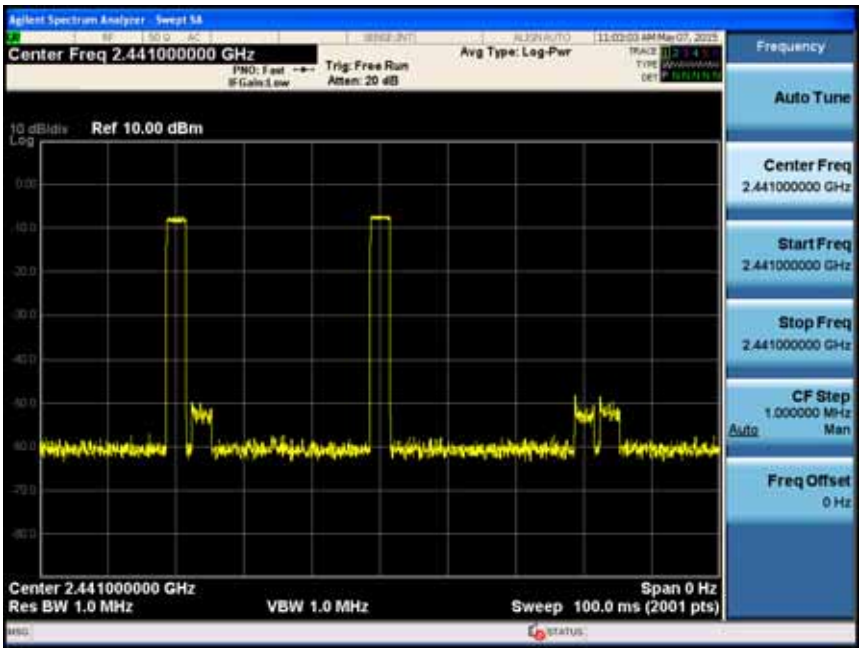
All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

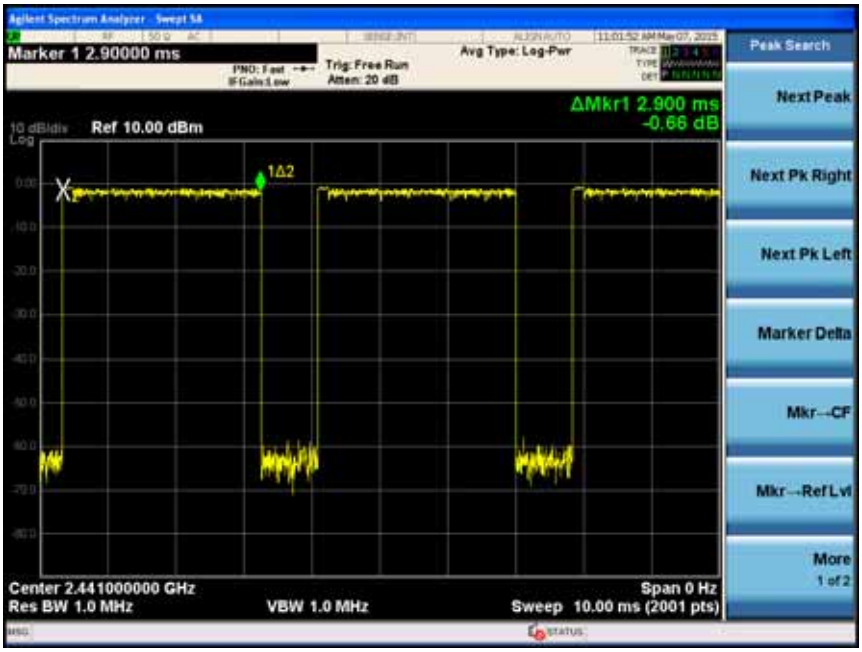
Average = Peak Measure Level+ Duty Factor

Duty Factor= 20*LOG(Pulse Number*On Time/100)= -24.73dB in the worst condition of normal using.

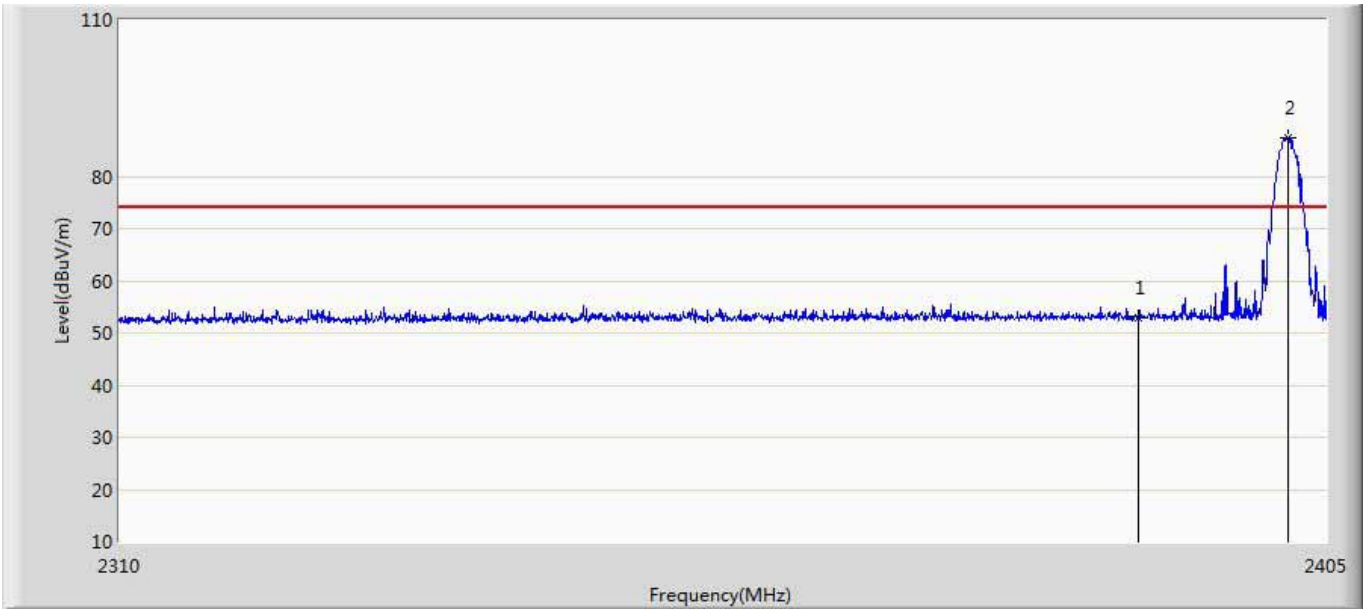
Pulse Number



On Time



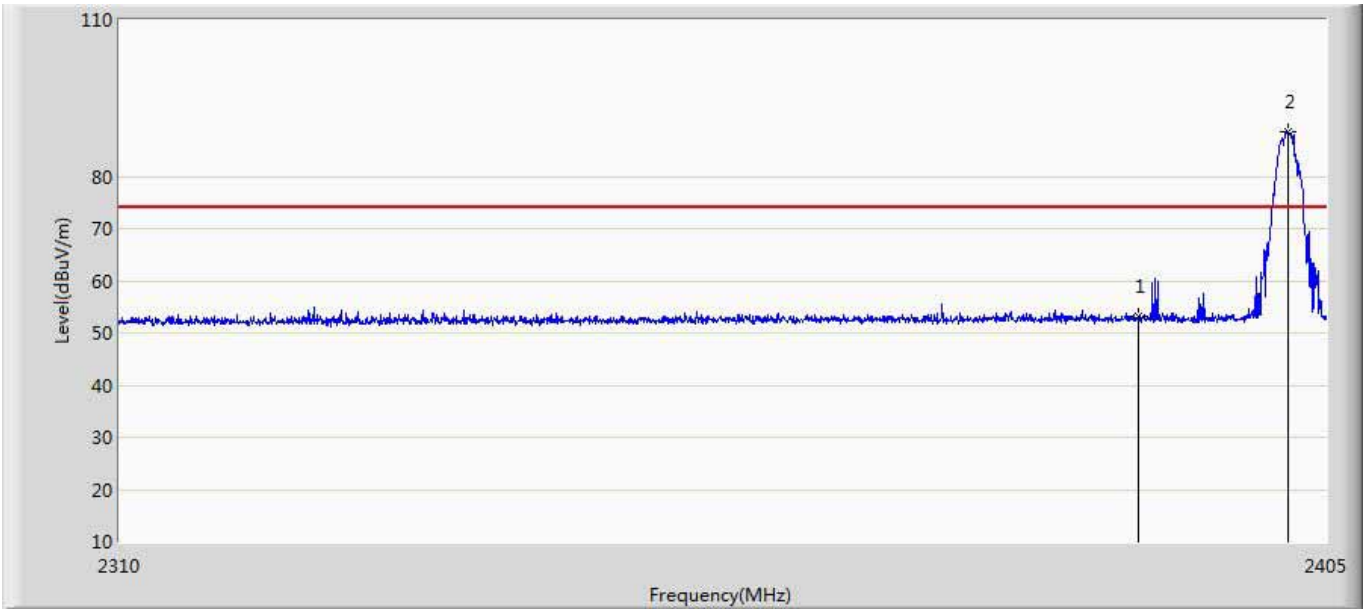
Site: AC5	Time: 2015/05/06 - 17:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2402 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.855	15.162	-21.145	74.000	37.693	PK
2	*	2401.913	87.445	49.693	N/A	N/A	37.752	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	52.855	28.125	-25.875	54.000	-24.730	AV
2	*	2401.913	87.445	62.715	N/A	N/A	-24.730	AV

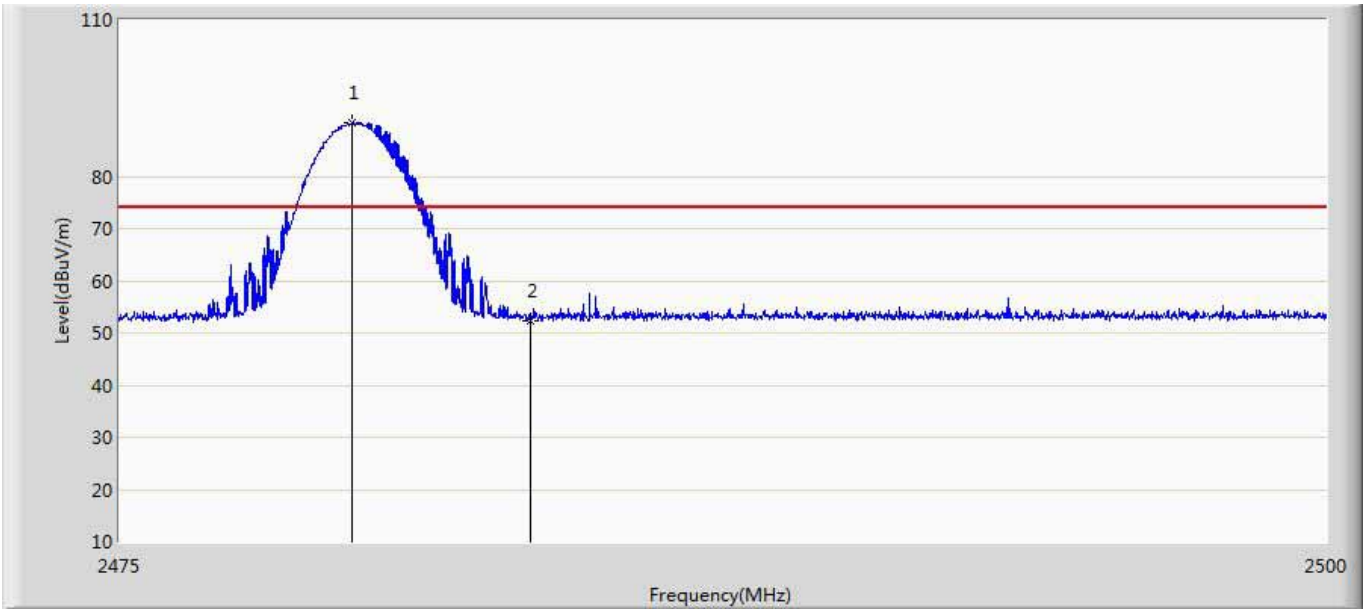
Site: AC5	Time: 2015/05/06 - 17:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2402 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	53.156	15.463	-20.844	74.000	37.693	PK
2	*	2401.913	88.519	50.767	N/A	N/A	37.752	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	53.156	28.426	-25.574	54.000	-24.730	AV
2	*	2401.913	88.519	63.789	N/A	N/A	-24.730	AV

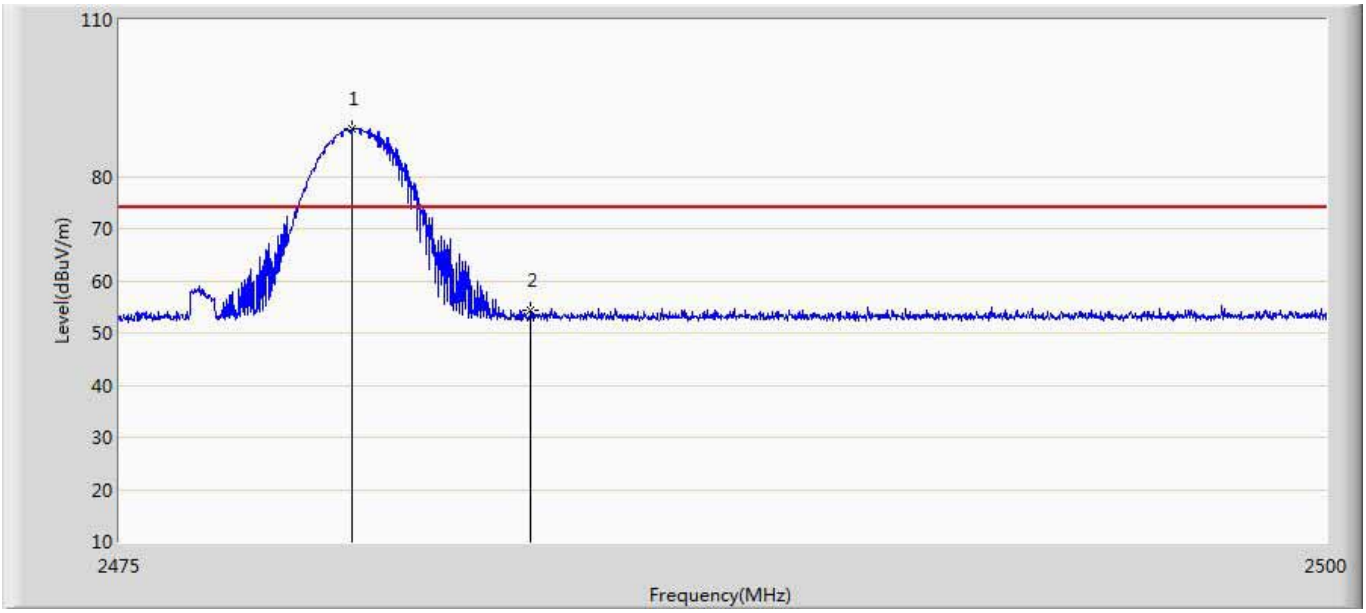
Site: AC5	Time: 2015/05/06 - 17:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.812	90.158	52.025	N/A	N/A	38.133	PK
2		2483.500	52.457	14.306	-21.543	74.000	38.150	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2479.812	90.158	65.428	N/A	N/A	-24.730	AV
2	*	2483.500	52.457	27.727	-26.273	54.000	-24.730	AV

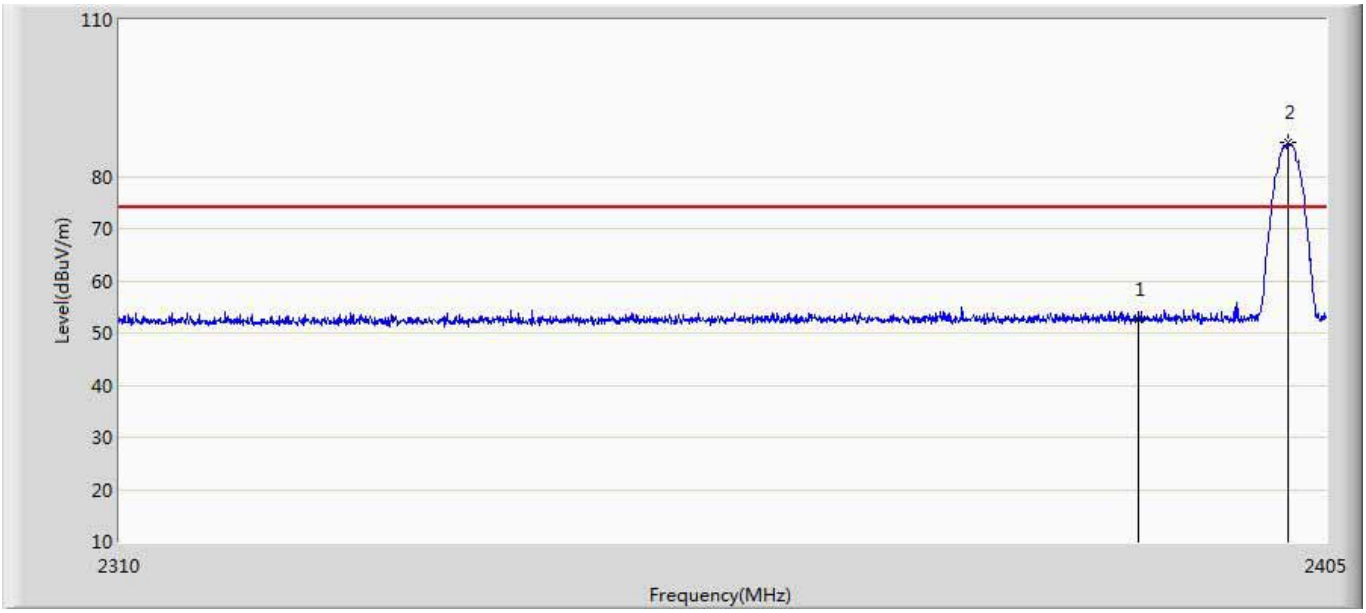
Site: AC5	Time: 2015/05/06 - 17:28
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480 by DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.812	89.123	50.990	N/A	N/A	38.133	PK
2		2483.500	54.411	16.260	-19.589	74.000	38.150	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2479.812	89.123	64.393	N/A	N/A	-24.730	AV
2	*	2483.500	54.411	29.681	-24.319	54.000	-24.730	AV

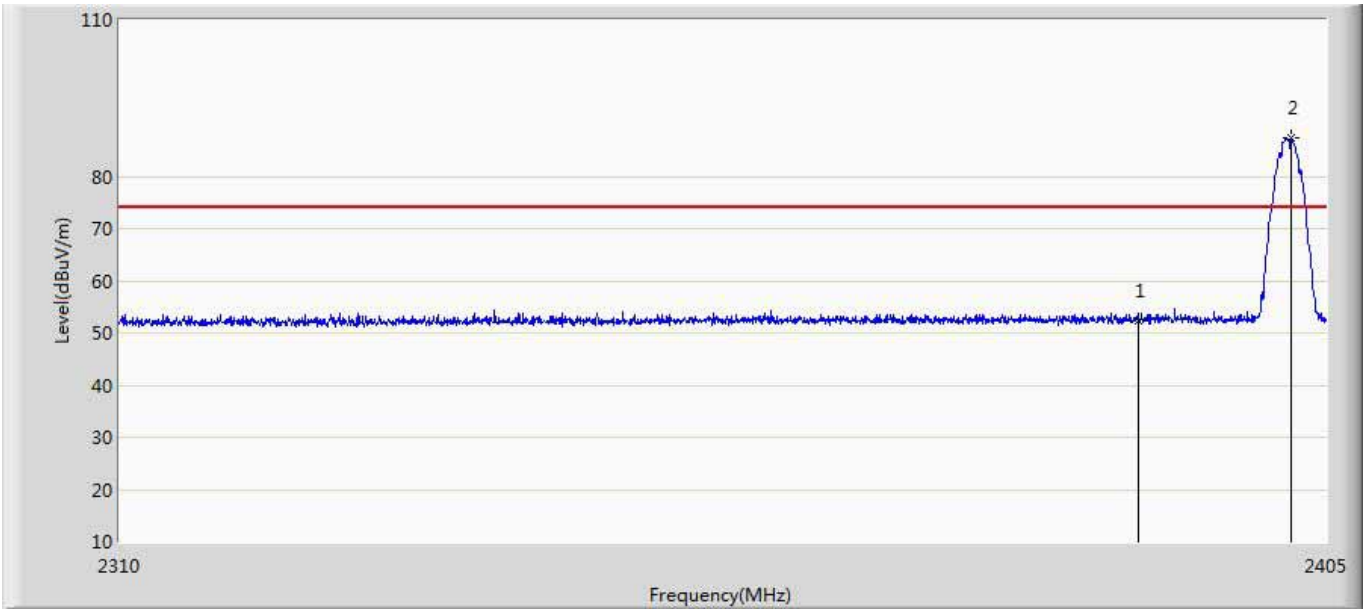
Site: AC5	Time: 2015/05/06 - 17:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH2402 by 2DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.729	15.036	-21.271	74.000	37.693	PK
2	*	2402.008	86.519	48.767	N/A	N/A	37.752	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	52.729	27.999	-26.001	54.000	-24.730	AV
2	*	2402.008	86.519	61.789	N/A	N/A	-24.730	AV

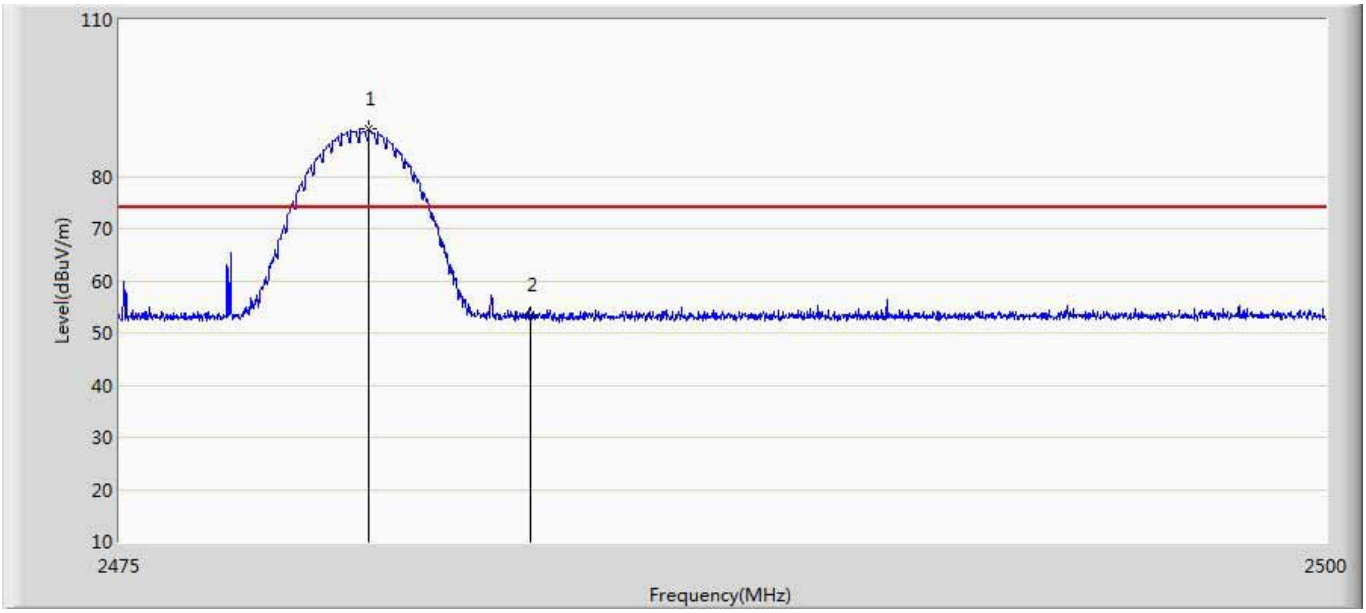
Site: AC5	Time: 2015/05/06 - 17:37
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH2402 by 2DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.460	14.767	-21.540	74.000	37.693	PK
2	*	2402.198	87.350	49.597	N/A	N/A	37.753	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	52.460	27.730	-26.270	54.000	-24.730	AV
2	*	2402.198	87.350	62.620	N/A	N/A	-24.730	AV

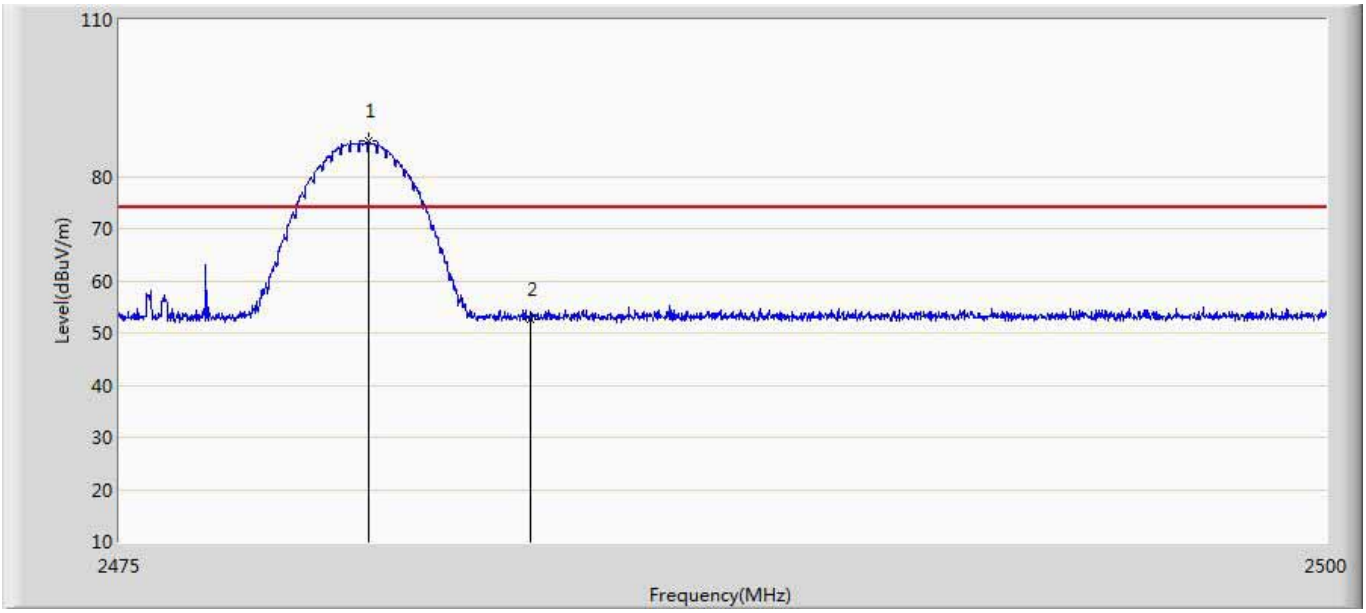
Site: AC5	Time: 2015/05/06 - 17:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH2480 by 2DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.150	89.046	50.911	N/A	N/A	38.134	PK
2		2483.500	53.376	15.225	-20.624	74.000	38.150	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2480.150	89.046	64.316	N/A	N/A	-24.730	AV
2	*	2483.500	53.376	28.646	-25.354	54.000	-24.730	AV

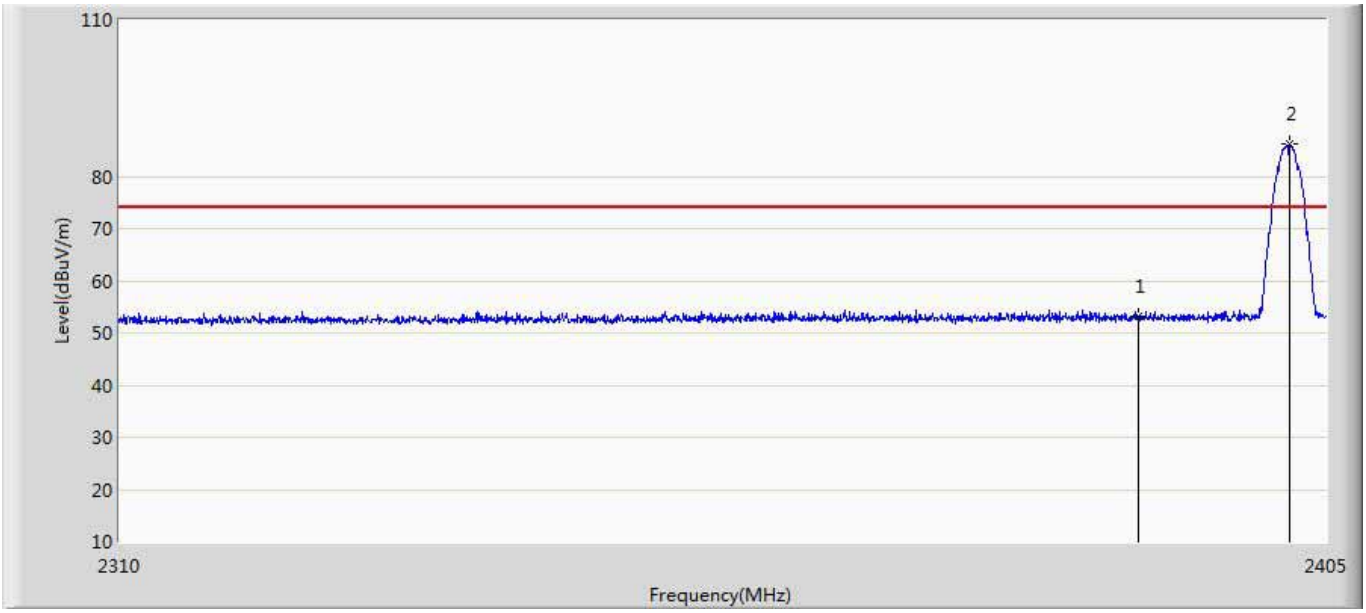
Site: AC5	Time: 2015/05/06 - 17:40
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 2:Transmit at CH2480 by 2DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.163	86.904	48.769	N/A	N/A	38.134	PK
2		2483.500	52.735	14.584	-21.265	74.000	38.150	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2480.163	86.904	62.174	N/A	N/A	-24.730	AV
2	*	2483.500	52.735	28.005	-25.995	54.000	-24.730	AV

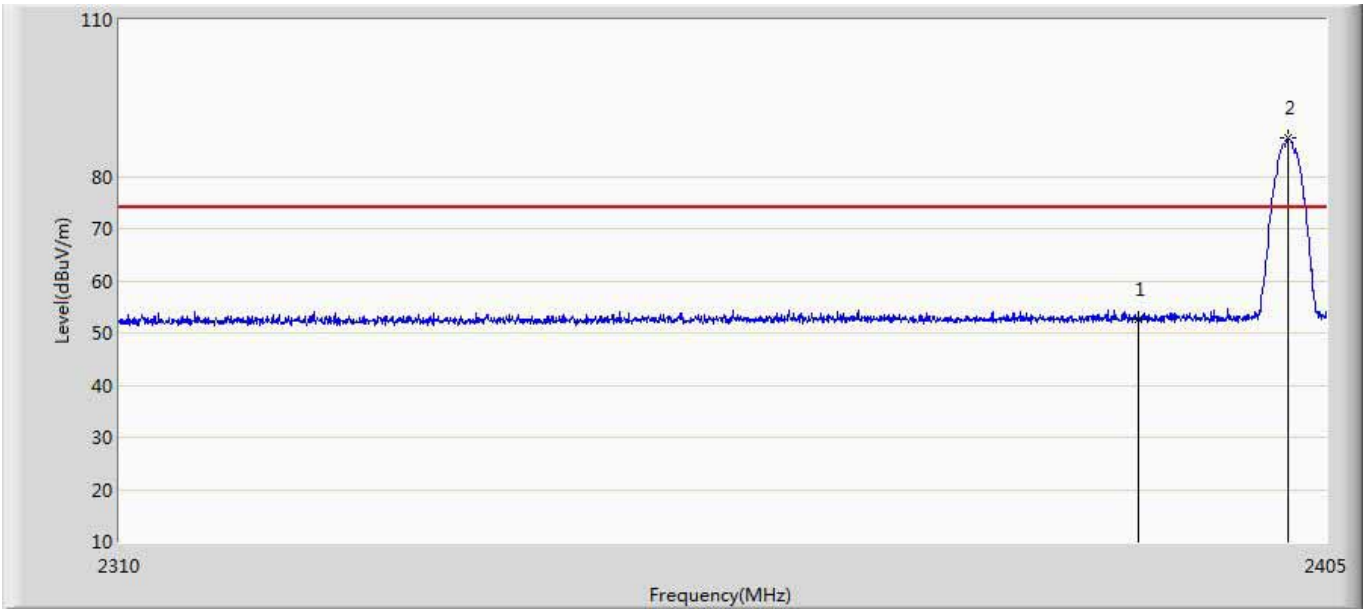
Site: AC5	Time: 2015/05/06 - 17:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH2402 by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	53.081	15.388	-20.919	74.000	37.693	PK
2	*	2402.055	86.276	48.524	N/A	N/A	37.752	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	53.081	28.351	-25.649	54.000	-24.730	AV
2	*	2402.055	86.276	61.546	N/A	N/A	-24.730	AV

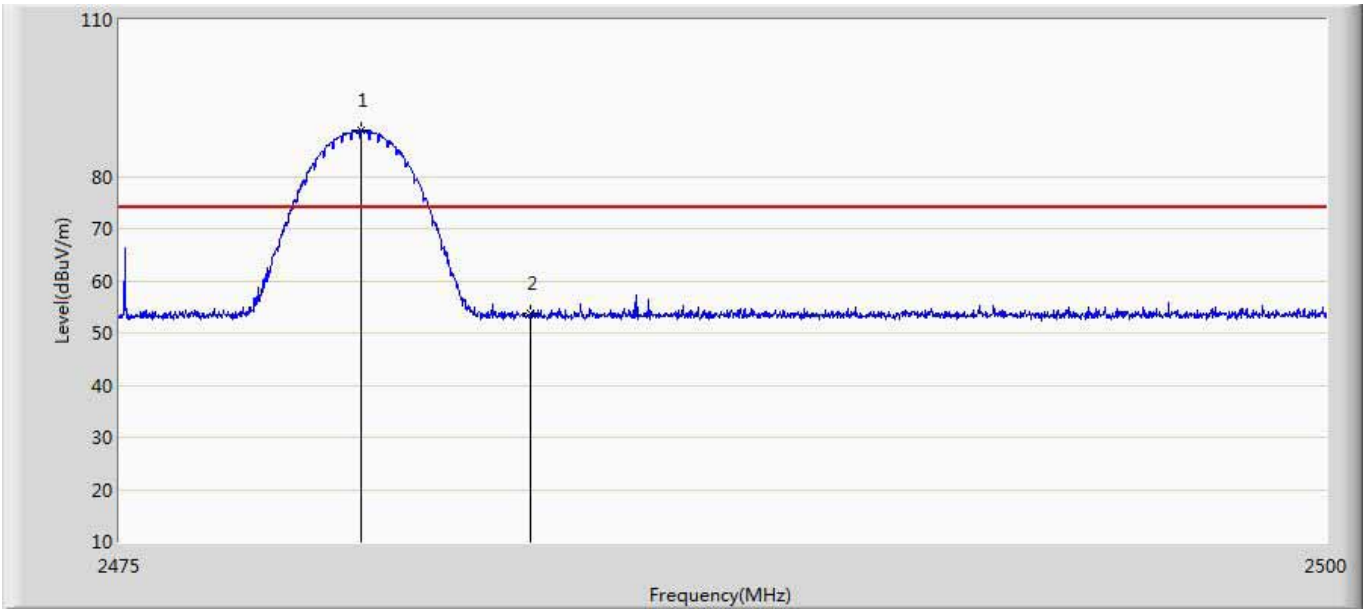
Site: AC5	Time: 2015/05/06 - 17:48
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH2402 by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.696	15.003	-21.304	74.000	37.693	PK
2	*	2401.960	87.278	49.526	N/A	N/A	37.752	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	52.696	27.966	-26.034	54.000	-24.730	AV
2	*	2401.960	87.278	62.548	N/A	N/A	-24.730	AV

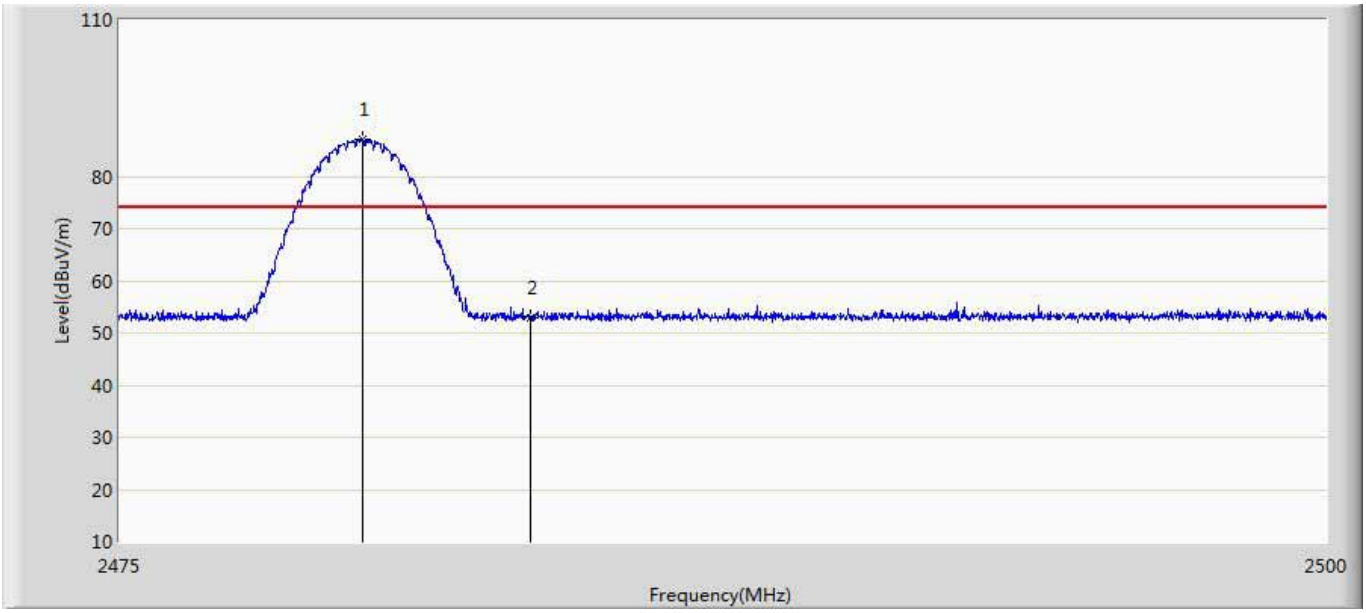
Site: AC5	Time: 2015/05/06 - 17:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH2480 by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.000	88.758	50.624	N/A	N/A	38.134	PK
2		2483.500	53.630	15.479	-20.370	74.000	38.150	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2480.000	88.758	64.028	N/A	N/A	-24.730	AV
2	*	2483.500	53.630	28.900	-25.100	54.000	-24.730	AV

Site: AC5	Time: 2015/05/06 - 17:53
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: Audio Mixer	Power: AC 120V/60Hz
Note: Mode 3:Transmit at CH2480 by 3DH5	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.012	87.117	48.983	N/A	N/A	38.134	PK
2		2483.500	52.790	14.639	-21.210	74.000	38.150	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2480.012	87.117	62.387	N/A	N/A	-24.730	AV
2	*	2483.500	52.790	28.060	-25.940	54.000	-24.730	AV

The End