



Test Report

**Industry Canada RSS-Gen Issue 3/RSS-210 Issue 8
FCC Part15 Subpart C**

Product Name : Speaker
Model No. : SCR400D/ SCR400/ SPS300
FCC ID : R48EVA400300
IC : 7190A-EVA400300

Applicant : MEILOON INDUSTRIAL Co., Ltd.
Address : No.77, LANE 1775, CHUEN-RYH ROAD,
TAOYUAN CITY, TAIWAN 300 R.O.C.

Date of Receipt : 08/01/2013
Test Date : 09/01/2013~24/02/2013
Issued Date : 20/05/2013
Report No. : 131S021R-RF-US-P06V01
Report Version : V 3.2

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

Issued Date : 20/05/2013

Report No. : 131S021R-RF-US-P06V01



Product Name : Speaker

Applicant : MEILOON INDUSTRIAL Co., Ltd.

Address : No.77, LANE 1775, CHUEN-RYH ROAD, TAOYUAN CITY,
TAIWAN 300 R.O.C.

Manufacturer : AudioXperts Inc.

Address : 505 Paradise Road, #397 Swampscott, MA 01907 USA

Model No. : SCR400D/ SCR400/ SPS300

FCC ID : R48EVA400300

IC : 7190A-EVA400300

EUT Voltage : AC 100-240V, 50-60Hz

Trade Name : AudioXperts

Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2012
ANSI C63.4: 2009; ANSI C63.10: 2009
Industry Canada RSS-Gen Issue 3/RSS-210 Issue 8

Test Result : Complied

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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, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC, NVLAP
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 :
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TABLE OF CONTENTS

Description	Page
1. General Information.....	7
1.1. EUT Description	7
1.2. Mode of Operation.....	9
1.3. Tested System Details.....	10
1.4. Configuration of Tested System.....	11
1.5. EUT Exercise Software	12
2. Technical Test.....	13
2.1. Summary of Test Result	13
2.2. Test Environment.....	14
3. Conducted Emission	15
3.1. Test Equipment	15
3.2. Test Setup	15
3.3. Limit.....	16
3.4. Test Procedure	16
3.5. Uncertainty	16
3.6. Test Result	17
4. Radiated Emission	19
4.1. Test Equipment	19
4.2. Test Setup	20
4.3. Limit.....	21
4.4. Test Procedure	21
4.5. Uncertainty	22
4.6. Test Result	23
5. 20dB Bandwidth	26
5.1. Test Equipment	26
5.2. Test Setup	26
5.3. Limit.....	26
5.4. Test Procedure	27
5.5. Uncertainty	27
5.6. Test Result	28
6. Carrier Frequency Separation	34
6.1. Test Equipment	34
6.2. Test Setup	34
6.3. Limit.....	34
6.4. Test Procedure	35
6.5. Uncertainty	35
6.6. Test Result	36

7.	Number of Hopping Frequencies.....	42
7.1.	Test Equipment	42
7.2.	Test Setup	42
7.3.	Limit.....	42
7.4.	Test Procedure	43
7.5.	Uncertainty	43
7.6.	Test Result	44
8.	Time of Occupancy (Dwell Time).....	53
8.1.	Test Equipment	53
8.2.	Test Setup	53
8.3.	Limit.....	53
8.4.	Test Procedure	54
8.5.	Uncertainty	54
8.6.	Test Result	55
9.	Peak Output Power	61
9.1.	Test Equipment	61
9.2.	Test Setup	61
9.3.	Limit.....	61
9.4.	Test Procedure	62
9.5.	Uncertainty	62
9.6.	Test Result	63
10.	Band-edge Compliance of RF Conducted Emissions.....	69
10.1.	Test Equipment	69
10.2.	Test Setup	69
10.3.	Limit.....	69
10.4.	Test Procedure	70
10.5.	Uncertainty	70
10.6.	Test Result	71
11.	Spurious RF Conducted Emissions.....	75
11.1.	Test Equipment	75
11.2.	Test Setup	75
11.3.	Limit.....	75
11.4.	Test Procedure	76
11.5.	Uncertainty	76
11.6.	Test Result	77
12.	Radiated Emission Band Edge.....	83
12.1.	Test Equipment	83
12.2.	Test Setup	84

12.3. Limit.....84

12.4. Test Procedure84

12.5. Uncertainty85

12.6. Test Result86

13. Receiver Spurious Emission for Industry Canada RSS-Gen Requirement..... 110

13.1. Test Equipment 110

13.2. Test Setup 111

13.3. Limit..... 112

13.4. Test Procedure 113

13.5. Uncertainty 113

13.6. Test Result 114

1. General Information

1.1. EUT Description

Product Name	Speaker
Brand Name	AudioXperts
Model No.	SCR400D/ SCR400/ SPS300
Bluetooth Specification	Version 2.1 + EDR
Working Voltage	AC 100-240V, 50-60Hz
Frequency Range	2402 - 2480 MHz
Channel Number	79
Channel Separation	1MHz
Type of Modulation	FHSS
Data Rate	1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)
Channel Control	Auto
Antenna Type	Printed Antenna
Peak Antenna Gain	-1.89dBi
Component	
AC Adapter	MFR: SWITCHING ADAPTER M/N: GQ30-180166-E2 Input: AC 100-240V~ 50/60Hz, 1.0A Output: DC 18V, 1.66A

Note: The difference of models as show below:

Trademark	AudioXperts		
Model No.	SPS300	SCR400	SCR400D
BLUE TOOCH	V	V	V
USB	V	V	V
DISPLAY	V	V	V
PIG TAIL ANTENNA	X	V	V
FM	X	V	V
DAB	X	X	V
CLOCK	X	V	V

Bluetooth Working Frequency of Each Channel:							
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

1.2. 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:

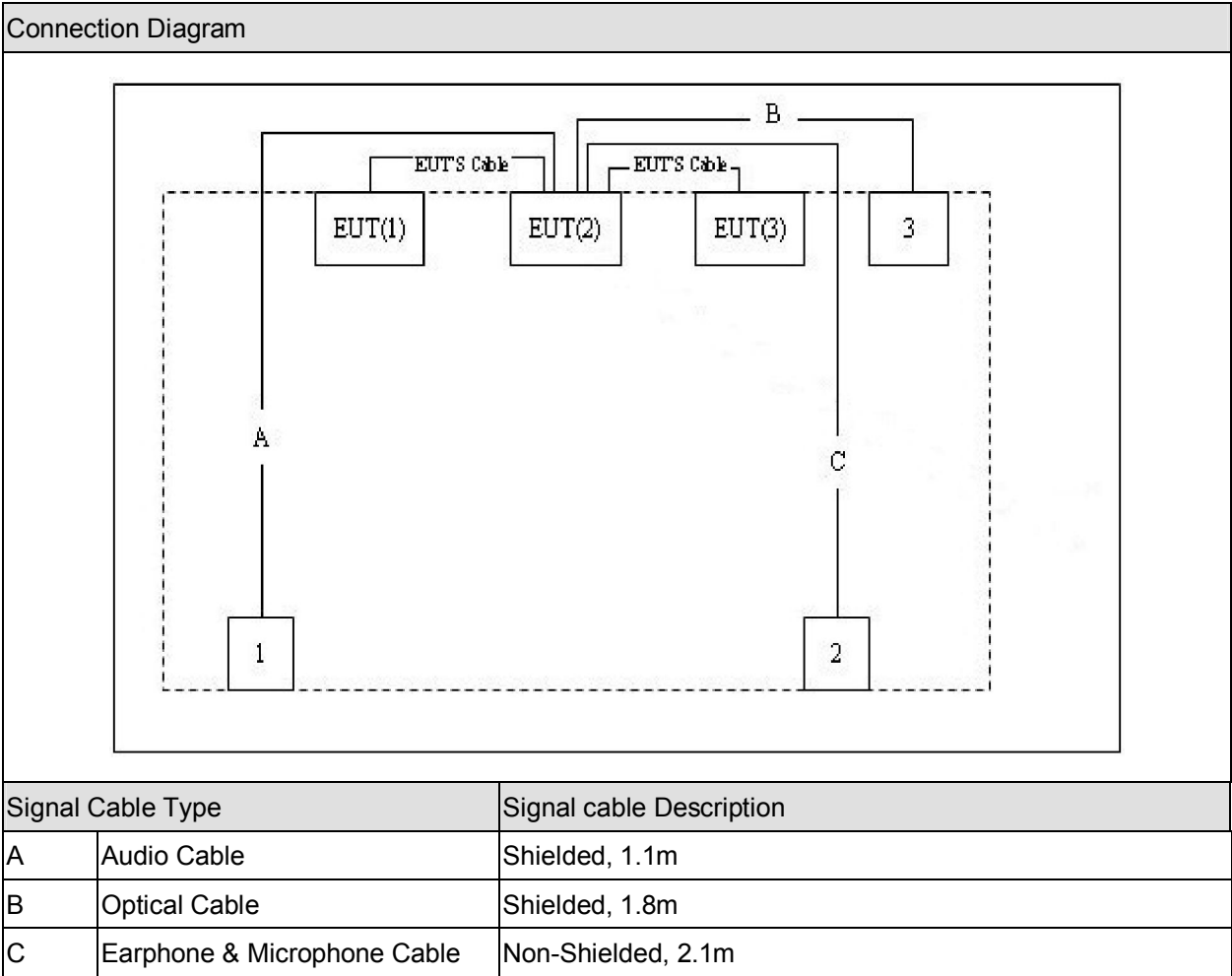
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For portable device, radiated spurious emission was verified over X, Y, Z axis, and shown the worst case on this report.
3. This device is a composite device in accordance with Part 15 Subpart B regulations. The report number is 131S021R-RF-US-P01V03.

1.3. 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	Ipod	Apple	A1199	6U715YGEVQ5	N/A
2	Microphone & Earphone	SOMIC	V85	N/A	N/A
3	DVD	Pioneer	DV-410V-G	IEKD018404CN	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Run the RF test software "Bluetest", 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: 2011 Section 15.207 RSS-Gen Issue 3 December 2010 Section 7.2.2	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2011 Section 15.209 RSS-210 Issue 8 December 2010 Section 2.7 Table 2 and Table 3	Yes	No
20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2011 Section 15.247(a)(1) RSS-210 Issue 8 December 2010 Section A8.1	Yes	No
99% Occupied Bandwidth	RSS-Gen Issue 3 June 2010 Section 4.6.1	Yes	No
Carrier Frequency Separation	FCC CFR Title 47 Part 15 Subpart C: 2011 Section 15.247(a)(1) RSS-210 Issue 8 December 2010 Section A8.1	Yes	No
Number of Hopping Frequencies	FCC CFR Title 47 Part 15 Subpart C: 2011 Section 15.247(a)(1)(iii) RSS-210 Issue 8 December 2010 Section A8.1	Yes	No
Time of Occupancy (Dwell Time)	FCC CFR Title 47 Part 15 Subpart C: 2011 Section 15.247(a)(1)(iii) RSS-210 Issue 8 December 2010 Section A8.1	Yes	No
Peak Output Power	FCC CFR Title 47 Part 15 Subpart C: 2011 Section 15.247(b)(1) RSS-210 Issue 8 December 2010 Section A8.4	Yes	No
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2011 Section 15.215(c), 15.247(d)	Yes	No
Spurious RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2011 15.247(d) RSS-210 Issue 8 December 2010 Section A8.5	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2011 15.247(d) RSS-210 Issue 8 December 2010 Section A8.5	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

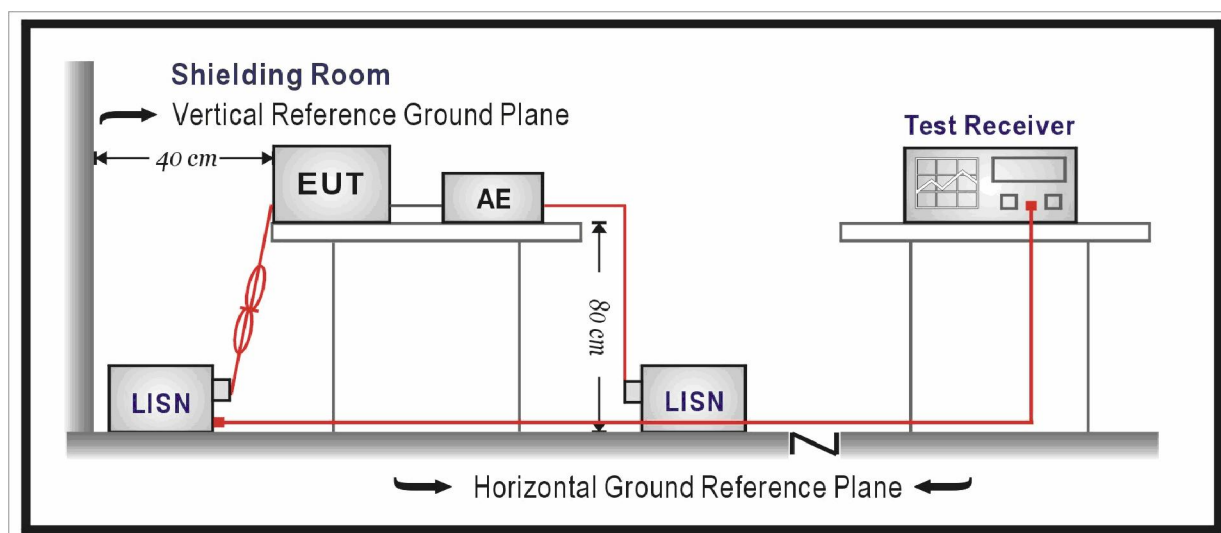
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2013.04.18
Two-Line V-Network	R&S	ENV216	100043	2013.04.18
Two-Line V-Network	R&S	ENV216	100044	2013.09.07
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2013.05.04
50ohm Termination	SHX	TF2	07081401	2013.09.17
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2014.01.10

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: 2009 & ANSI C63.10: 2009.

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.

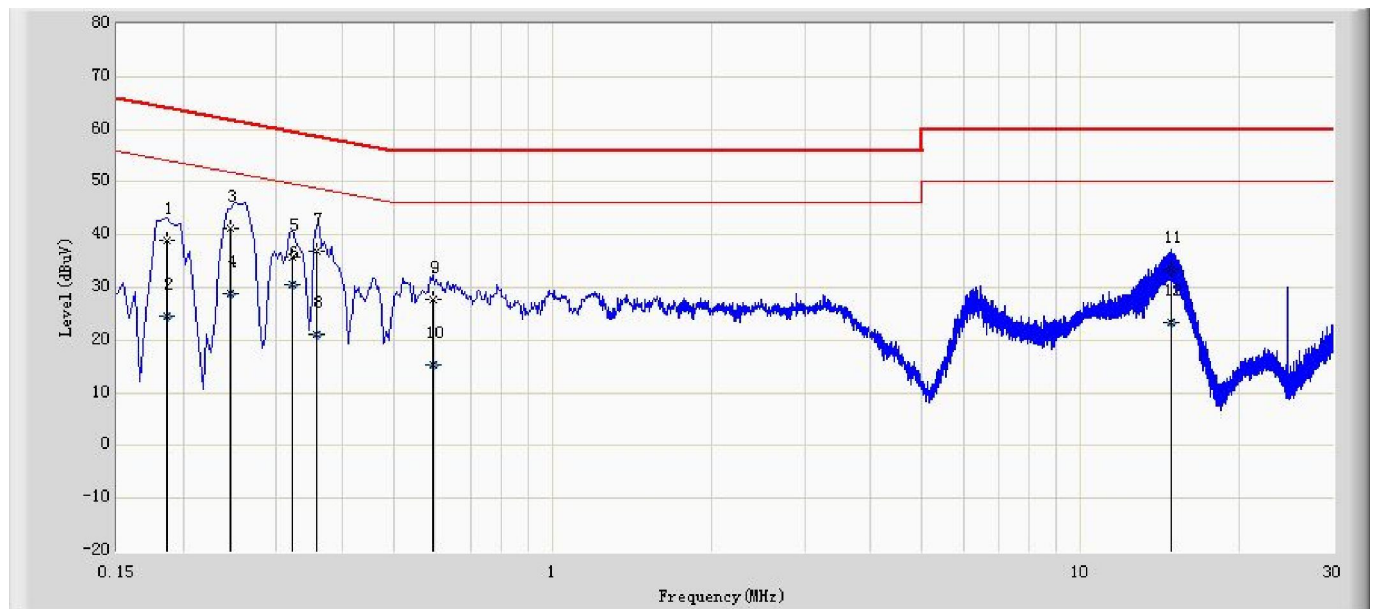
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

Engineer: Emin	
Site: TR1	Time: 2013/02/07 - 11:13
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: Speaker	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.186	39.004	29.147	-25.209	64.213	9.857	QP
2		0.186	24.663	14.805	-29.551	54.213	9.857	AV
3		0.246	41.114	31.247	-20.777	61.891	9.867	QP
4		0.246	28.906	19.039	-22.985	51.891	9.867	AV
5		0.322	35.745	25.868	-23.910	59.655	9.877	QP
6	*	0.322	30.442	20.566	-19.213	49.655	9.877	AV
7		0.358	36.887	27.006	-21.888	58.775	9.882	QP
8		0.358	21.229	11.348	-27.546	48.775	9.882	AV
9		0.594	27.772	17.896	-28.228	56.000	9.877	QP
10		0.594	15.361	5.484	-30.639	46.000	9.877	AV
11		14.830	33.430	23.284	-26.570	60.000	10.146	QP
12		14.830	23.260	13.114	-26.740	50.000	10.146	AV

Engineer: Emin

Site: TR1

Time: 2013/02/07 - 11:18

Limit: FCC_Part15.207_CE_AC Power_ClassB

Margin: 0

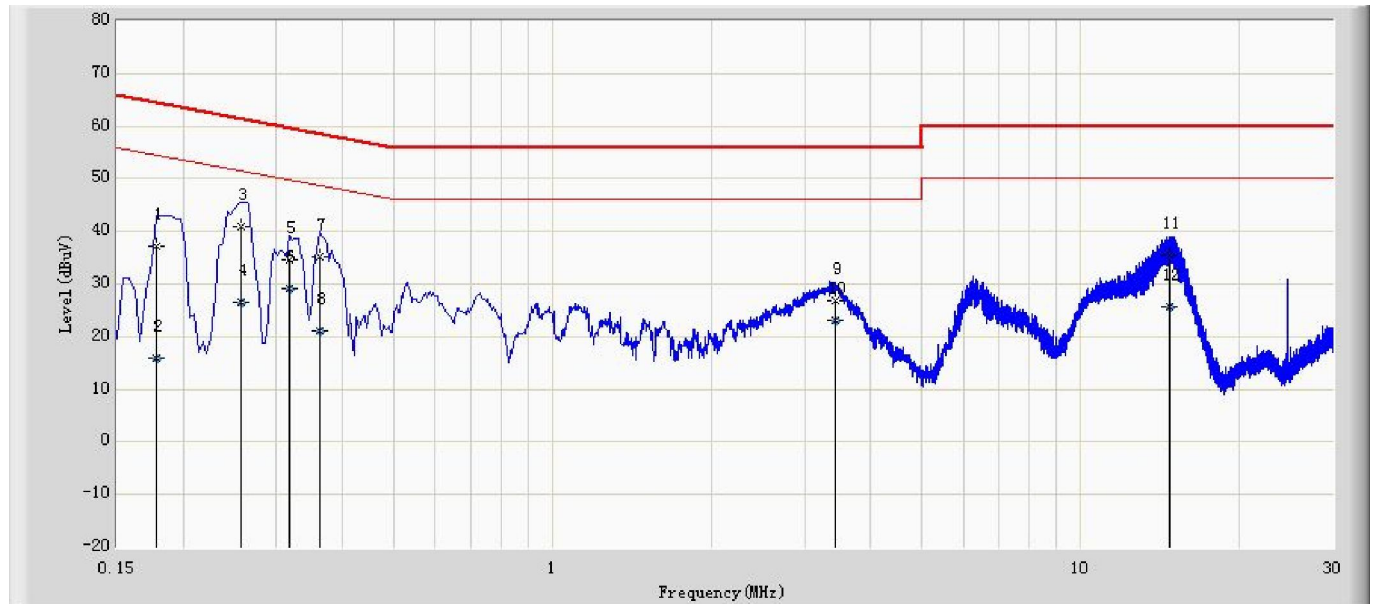
Probe: ENV216_101044(0.009-30MHz)

Polarity: Neutral

EUT: Speaker

Power: AC 120V/60Hz

Note: Mode 1



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		0.178	37.160	27.208	-27.418	64.578	9.952	QP
2		0.178	16.000	6.047	-38.579	54.578	9.952	AV
3	*	0.258	41.018	31.090	-20.477	61.496	9.929	QP
4		0.258	26.471	16.542	-25.025	51.496	9.929	AV
5		0.318	34.517	24.559	-25.242	59.759	9.959	QP
6		0.318	29.271	19.313	-20.488	49.759	9.959	AV
7		0.362	35.277	25.297	-23.405	58.682	9.981	QP
8		0.362	20.982	11.002	-27.700	48.682	9.981	AV
9		3.422	26.738	16.716	-29.262	56.000	10.023	QP
10		3.422	23.095	13.072	-22.905	46.000	10.023	AV
11		14.770	35.353	25.169	-24.647	60.000	10.185	QP
12		14.770	25.780	15.596	-24.220	50.000	10.185	AV

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

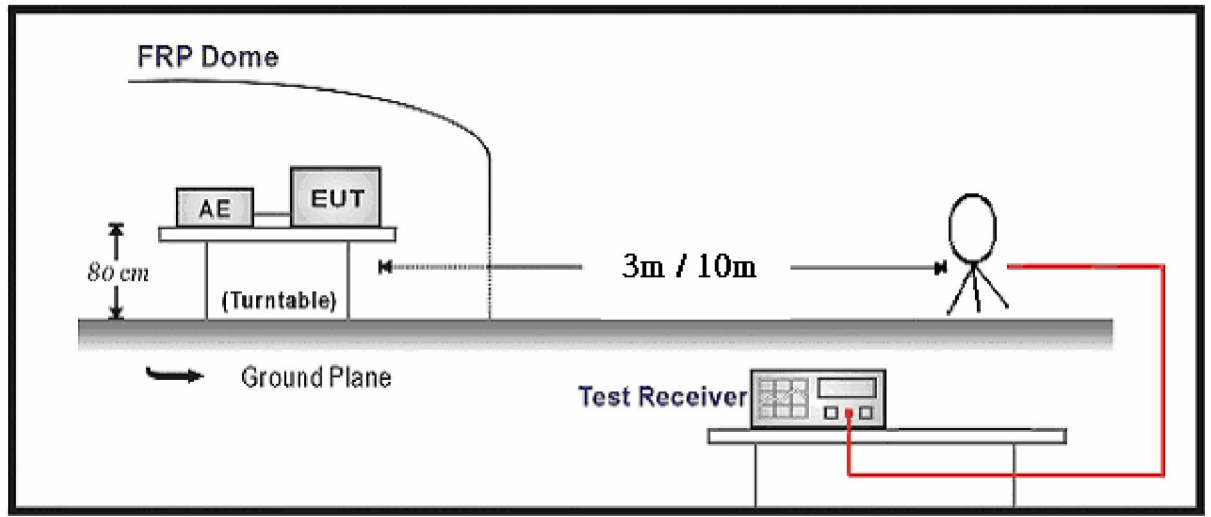
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2013.04.18
Loop Antenna	R&S	HFH2-Z2	833799/003	2013.11.17
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2013.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2013.03.02
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2014.01.09

Radiated Emission / AC-5

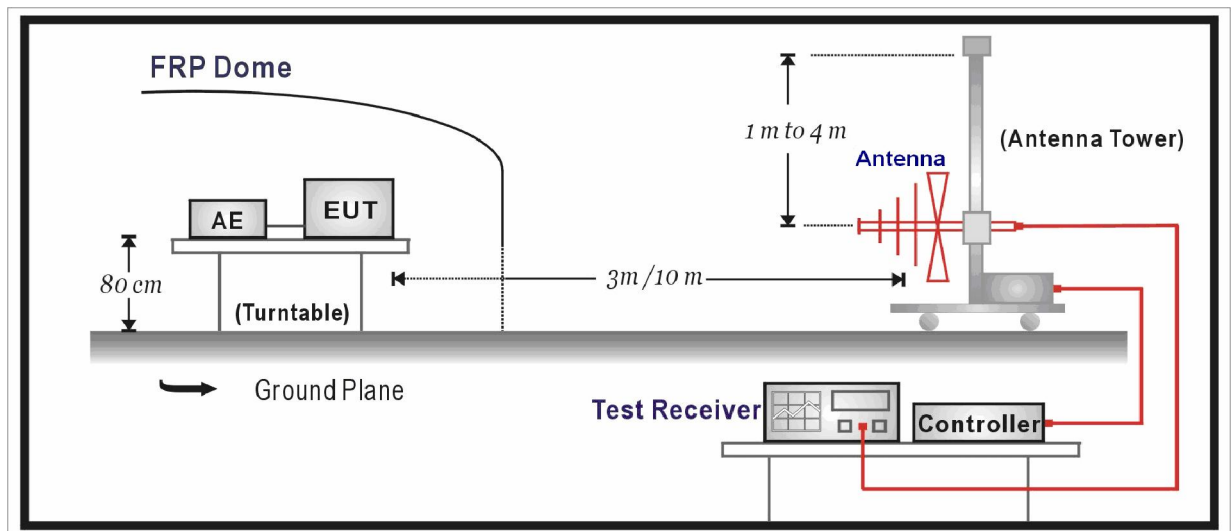
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2013.04.18
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Preamplifier	Quietek	AP-040G	CHM-0906001	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2013.10.15
DRG Horn	ETS-Lindgren	3117	00123988	2014.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2013.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2013.03.02
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2013.03.02
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2013.03.02
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2014.01.11

4.2. Test Setup

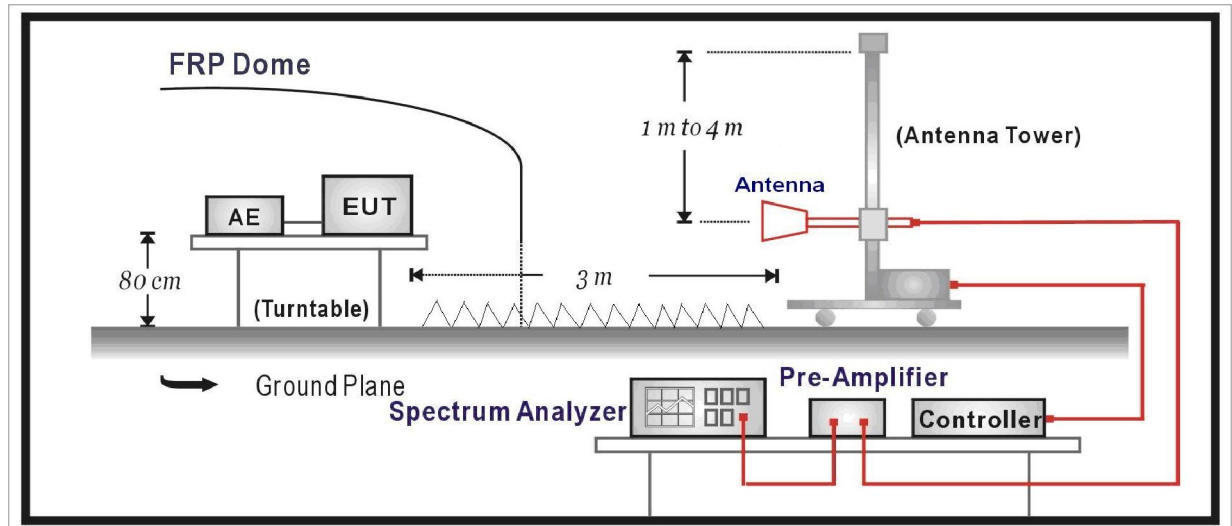
Below 30MHz Test Setup:



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

According to ANSI C63.10: 2009.

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: 2009 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	2402.1	57.9	36.4	94.3	Fundamental	/	PK
	H	430.1	11.9	24.2	36.1	46	-9.9	QP
	H	683.1	14.0	27.5	41.5	46	-4.5	QP
	H	3201.5	54.7	-9.5	45.2	54(Note3)	-8.8	PK
	H	7206.0	47.8	-3.1	44.7	54(Note3)	-9.3	PK
	H	4799.5	64.4	-7.6	56.8	74	-17.2	PK
	H	4804.0	61.1	-7.6	53.5	54	-0.5	AV
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK
39	H	2441.0	57.7	36.2	93.9	Fundamental	/	PK
	H	442.4	11.6	24.2	35.8	46	-10.2	QP
	V	621.0	11.2	27.2	38.4	46	-7.6	QP
	H	3201.5	54.4	-9.5	44.8	54(Note3)	-9.2	PK
	H	7323.0	46.6	-2.9	43.7	54(Note3)	-10.3	PK
	H	4884.5	65.3	-7.6	57.7	74	-16.3	PK
	H	4882.1	61.2	-7.6	53.6	54	-0.4	AV
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK
78	V	2479.9	57.5	36.0	93.5	Fundamental	/	PK
	H	442.4	12.1	24.2	36.3	46	-9.7	QP
	H	683.1	9.7	27.5	37.1	46	-8.9	QP
	H	3201.5	54.4	-9.5	44.9	54(Note3)	-9.1	PK
	H	7440.0	44.6	-2.5	42.1	54(Note3)	-11.9	PK
	H	4961.0	64.2	-7.7	56.5	74	-17.5	PK
	H	4960.1	61.1	-7.7	53.4	54	-0.6	AV
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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.

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	V	2402.1	57.9	35.7	93.6	Fundamental	/	PK
	H	442.4	12.7	24.2	36.9	46	-9.1	QP
	V	621.0	10.6	27.2	37.8	46	-8.2	QP
	H	3201.5	54.7	-9.5	45.2	54(Note3)	-8.8	PK
	H	7206.0	45.3	-3.1	42.2	54(Note3)	-11.8	PK
	H	4799.5	64.8	-7.6	57.2	74	-16.8	PK
	H	4804.1	61.0	-7.6	53.4	54	-0.6	AV
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK
39	H	2441.0	57.0	35.9	92.9	Fundamental	/	PK
	H	442.4	11.8	24.2	35.9	46	-10.1	QP
	H	683.1	9.1	27.5	36.6	46	-9.4	QP
	V	3193.0	54.8	-9.8	45.0	54(Note3)	-9.0	PK
	H	4884.5	61.3	-7.6	53.6	54(Note3)	-0.4	PK
	H	7323.0	44.9	-2.9	42.0	54(Note3)	-12.0	PK
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK
78	V	2480.0	56.2	36.0	92.2	Fundamental	/	PK
	H	434.6	12.5	24.2	36.7	46	-9.3	QP
	H	683.1	12.4	27.5	39.8	46	-6.2	QP
	H	3201.5	54.6	-9.5	45.1	54(Note3)	-8.9	PK
	H	7440.0	45.3	-2.5	42.8	54(Note3)	-11.2	PK
	H	4961.0	63.5	-7.7	55.8	74	-18.2	PK
	H	4960.0	58.4	-7.7	50.7	54	-3.3	AV
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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.

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	V	2401.9	58.1	35.7	93.8	Fundamental	/	PK
	H	442.4	12.2	24.2	36.4	46	-9.6	QP
	V	683.1	10.1	27.5	37.6	46	-8.4	QP
	V	3184.5	55.0	-9.8	45.2	54(Note3)	-8.8	PK
	V	7206.0	47.1	-3.1	44.0	54(Note3)	-10.0	PK
	H	4808.0	65.5	-7.6	57.9	74	-16.1	PK
	H	4804.0	61.1	-7.6	53.5	54	-0.5	AV
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK
39	V	2441.0	57.2	35.9	93.1	Fundamental	/	PK
	H	442.4	12.3	24.2	36.5	46	-9.5	QP
	H	683.1	11.9	27.5	39.4	46	-6.6	QP
	V	3184.5	56.3	-9.8	46.5	54(Note3)	-7.5	PK
	H	7323.0	46.8	-2.9	44.0	54(Note3)	-10.0	PK
	H	4884.5	63.9	-7.6	56.3	74	-17.7	PK
	H	4882.0	56.5	-7.6	48.9	54	-5.1	AV
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK
78	V	2480.0	56.3	36.0	92.4	Fundamental	/	PK
	H	378.1	10.9	22.8	33.7	46	-12.3	QP
	H	683.1	10.5	27.5	38.0	46	-8.0	QP
	V	3193.0	56.0	-9.8	46.2	54(Note3)	-7.8	PK
	H	4961.0	60.5	-7.7	52.9	54(Note3)	-1.2	PK
	V	7440.0	47.1	-2.5	44.6	54(Note3)	-9.4	PK
	H	24000.0	59.1	-8.9	50.2	54(Note3)	-3.8	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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.

5. 20dB Bandwidth

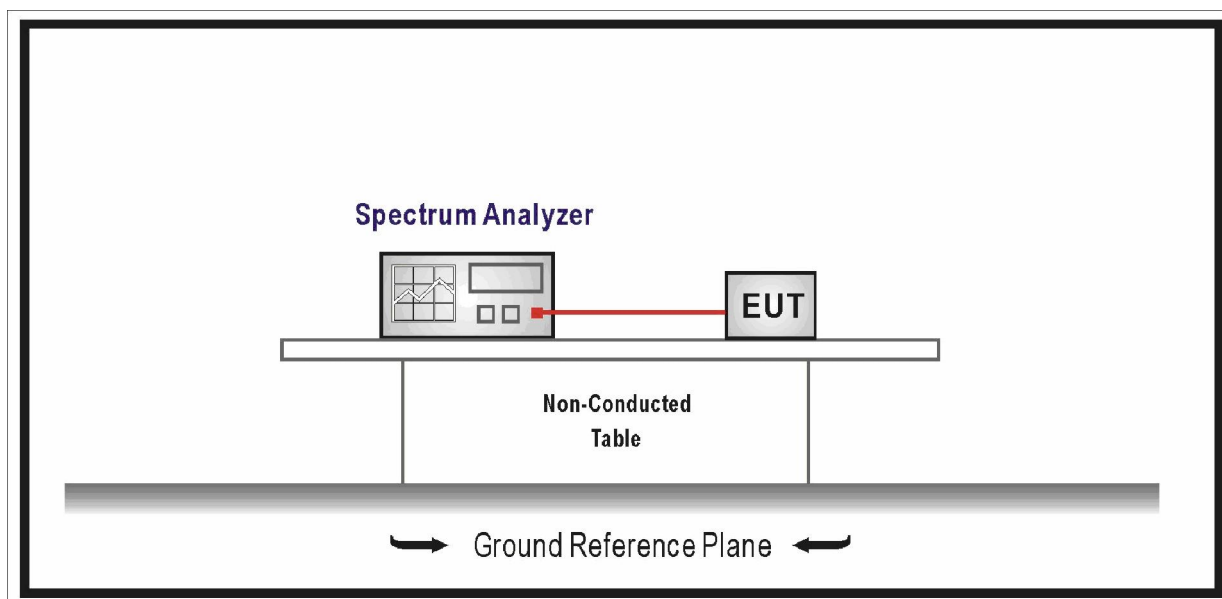
5.1 Test Equipment

20dB Bandwidth / TR8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

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: 2009.

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel

RBW $\geq$ 1% of the 20dB bandwidth

VBW $\geq$ 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

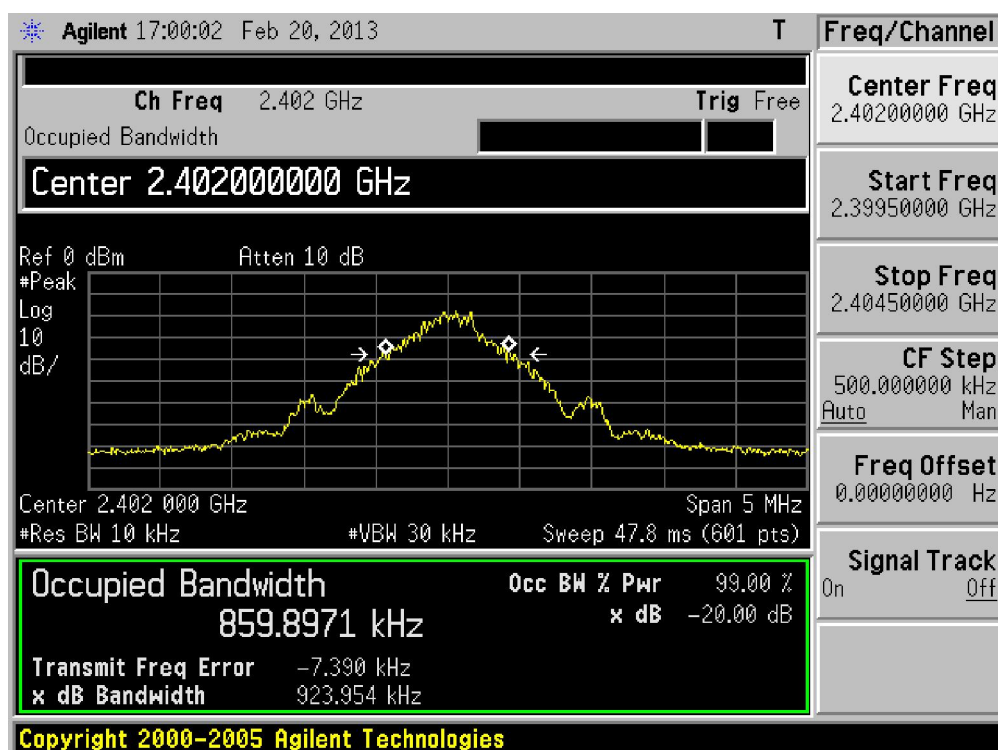
The measurement uncertainty is defined as ± 1 kHz

5.6 Test Result

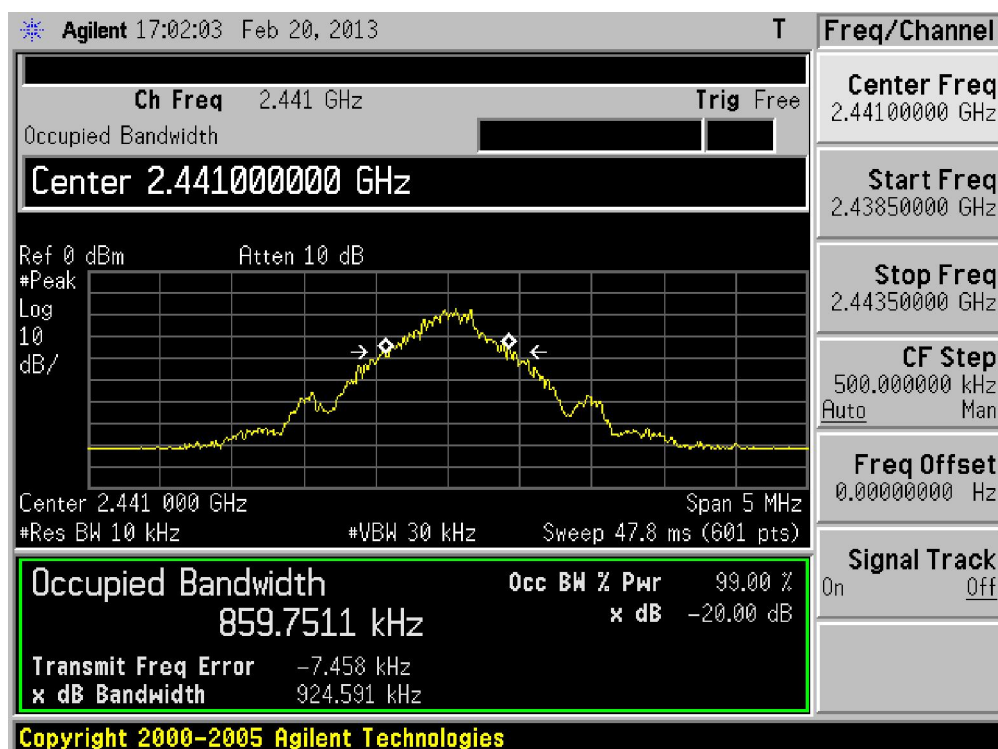
Product	:	Speaker
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps(GFSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	924.0	859.9
39	2441	924.6	859.8
78	2480	924.0	858.6

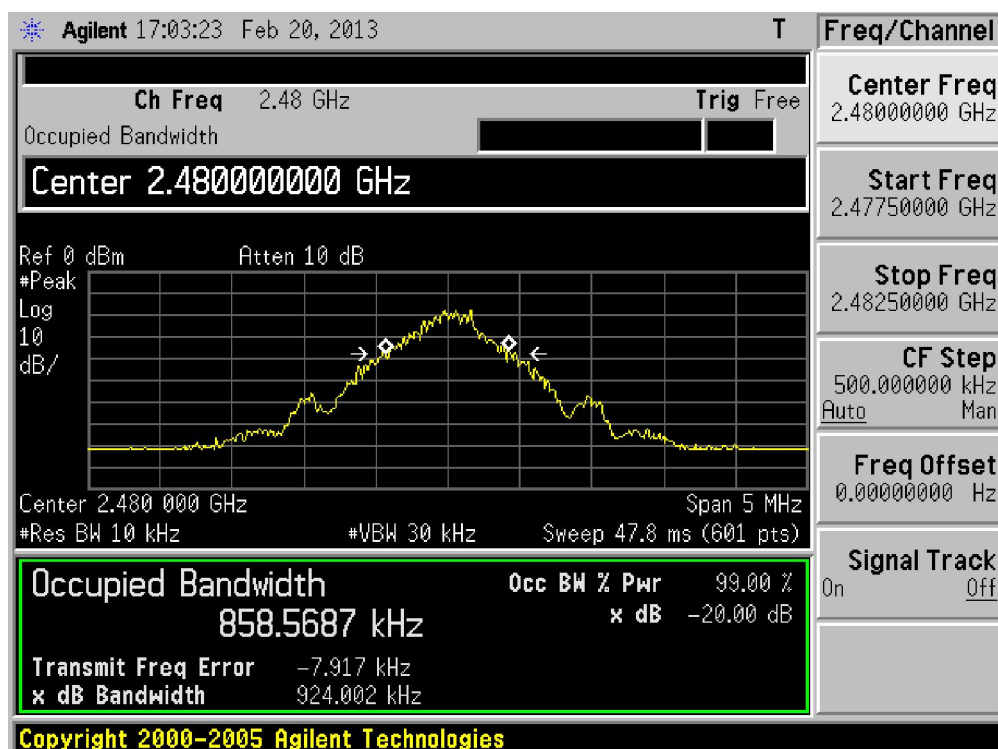
Channel 00 (2402MHz)



Channel 39 (2441MHz)



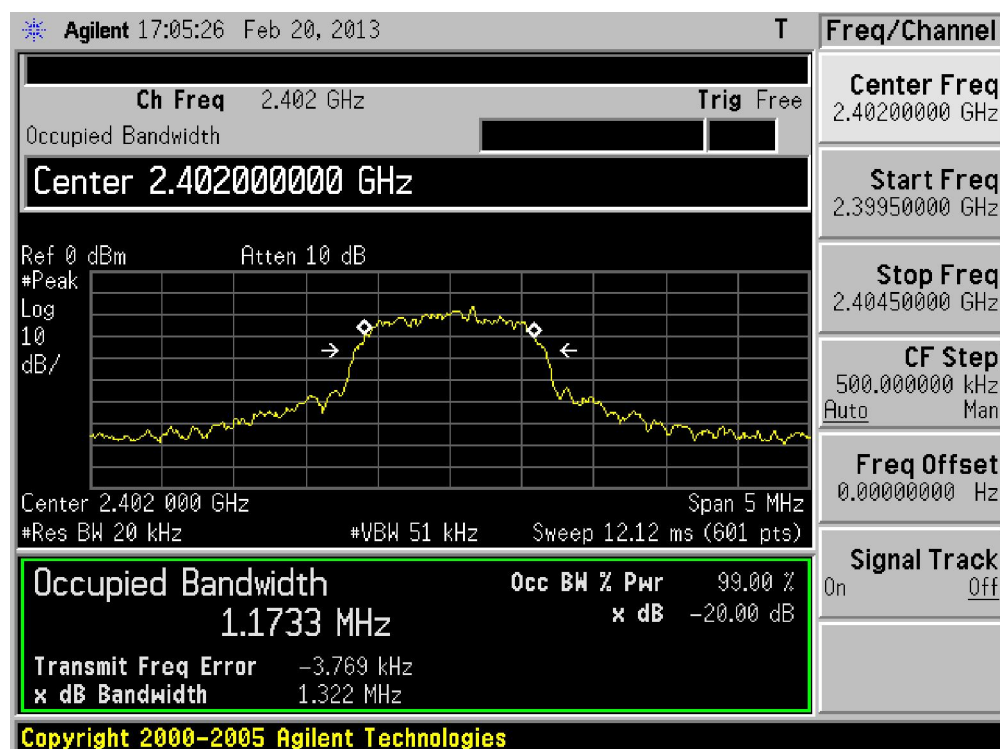
Channel 78 (2480MHz)



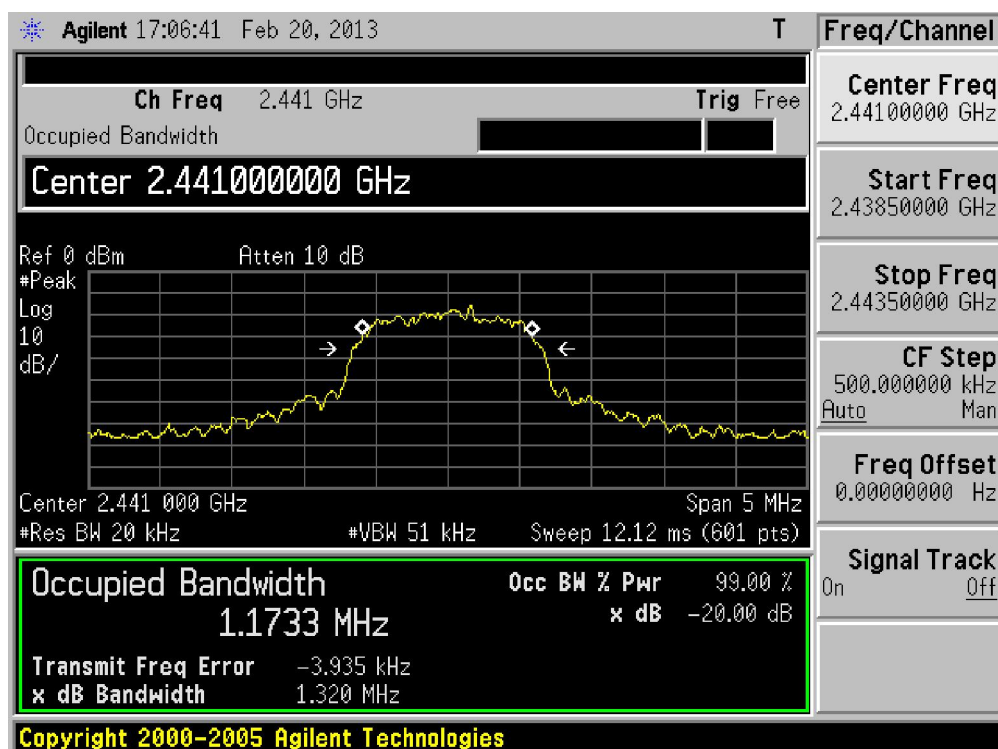
Product	:	Speaker
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	1322.0	1173.3
39	2441	1320.0	1173.3
78	2480	1323.0	1174.8

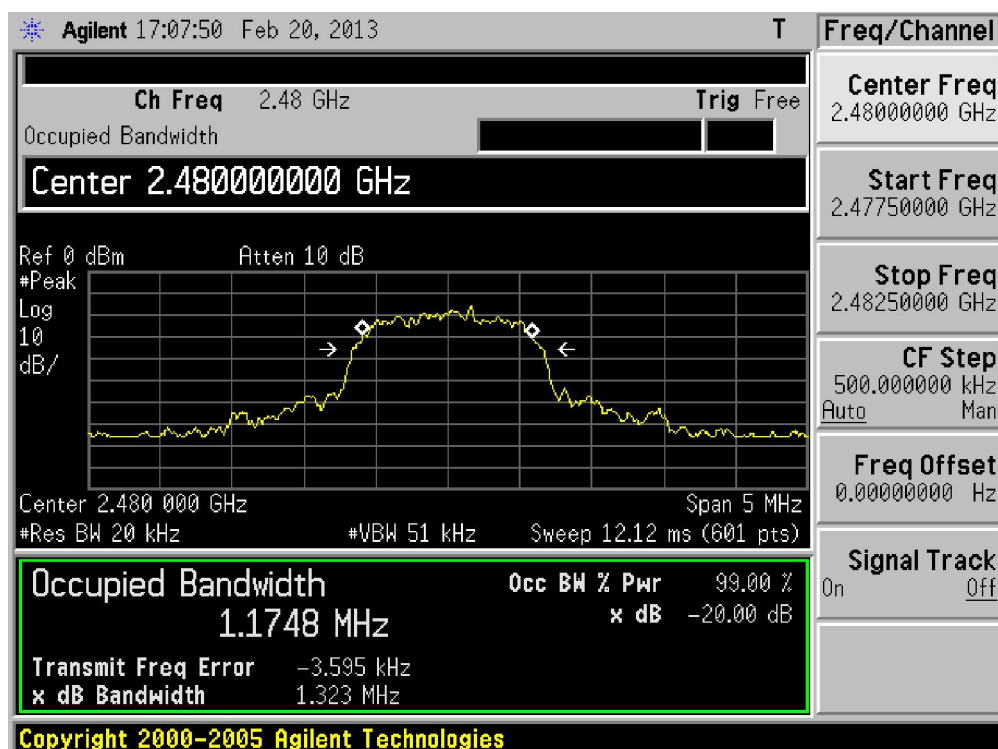
Channel 00 (2402MHz)



Channel 39 (2441MHz)



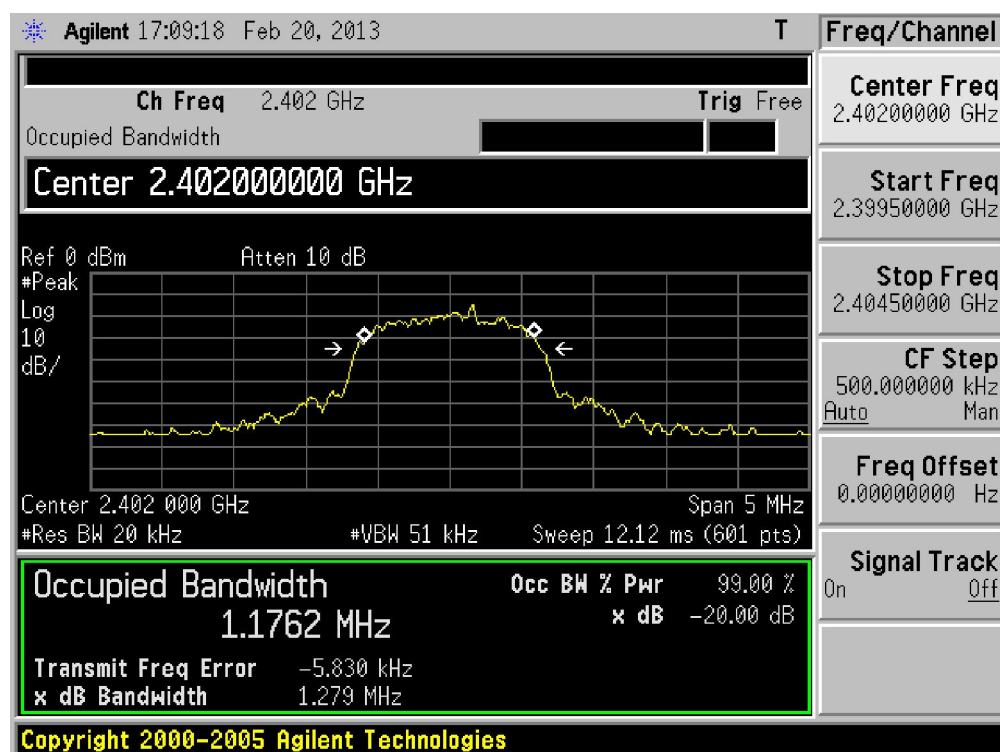
Channel 78 (2480MHz)



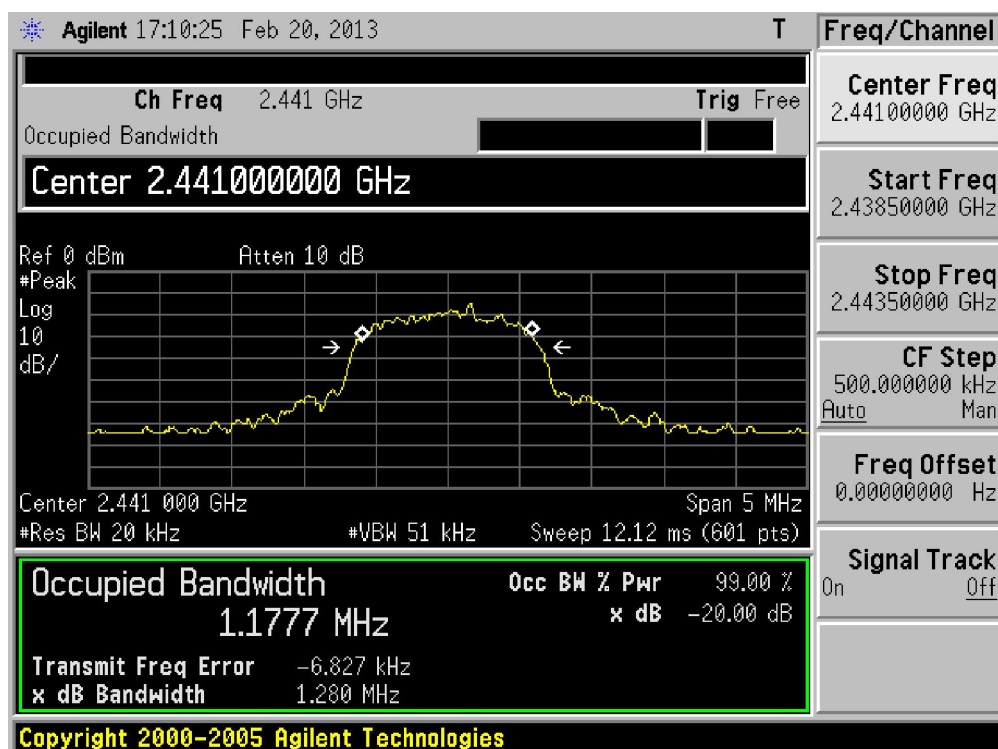
Product	:	Speaker
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmitter-3Mbps(8DPSK_DH5)

Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
00	2402	1279.0	1176.2
39	2441	1280.0	1177.7
78	2480	1278.0	1179.2

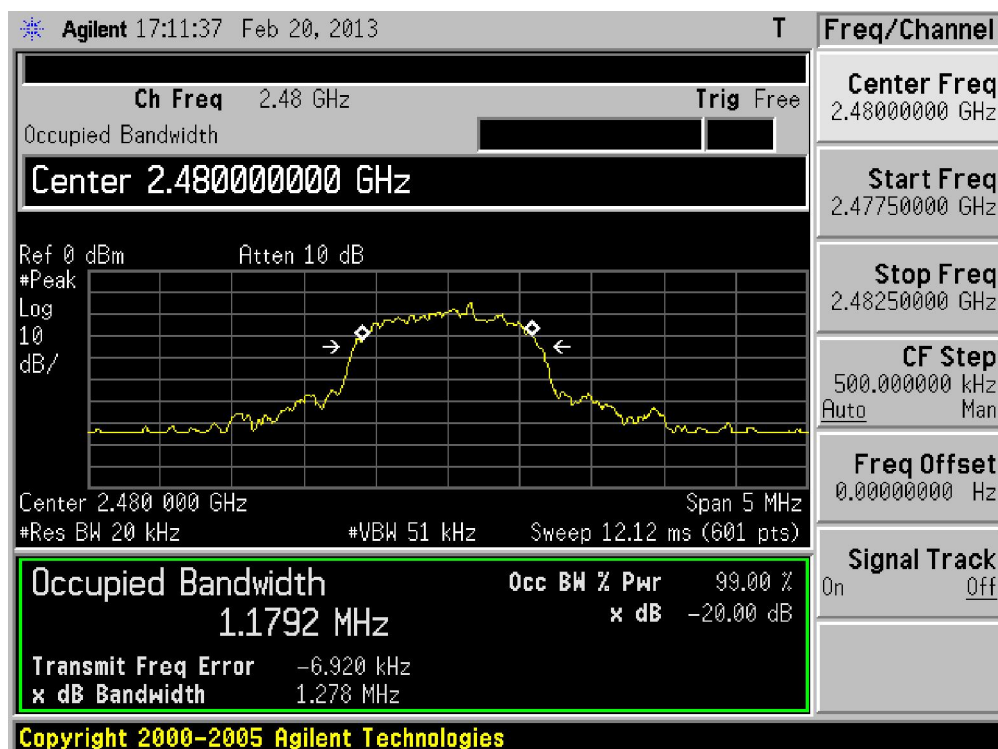
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



6. Carrier Frequency Separation

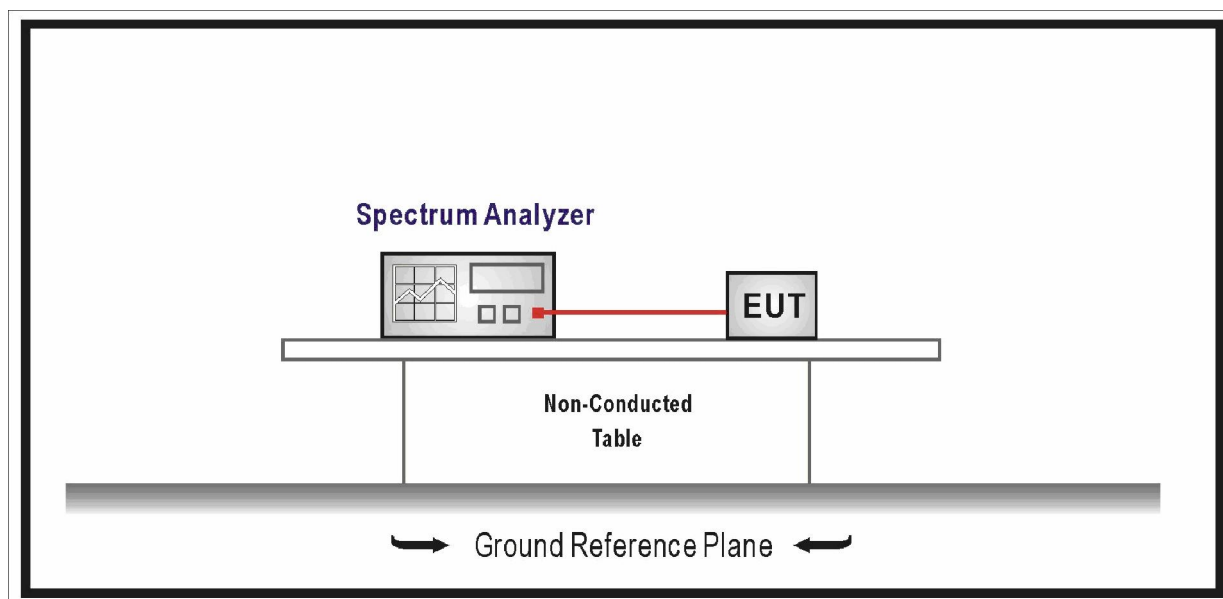
6.1. Test Equipment

Carrier Frequency Separation / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

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: 2009.

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) $\geq$ 1% of the span

Video (or Average) Bandwidth VBW $\geq$ 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

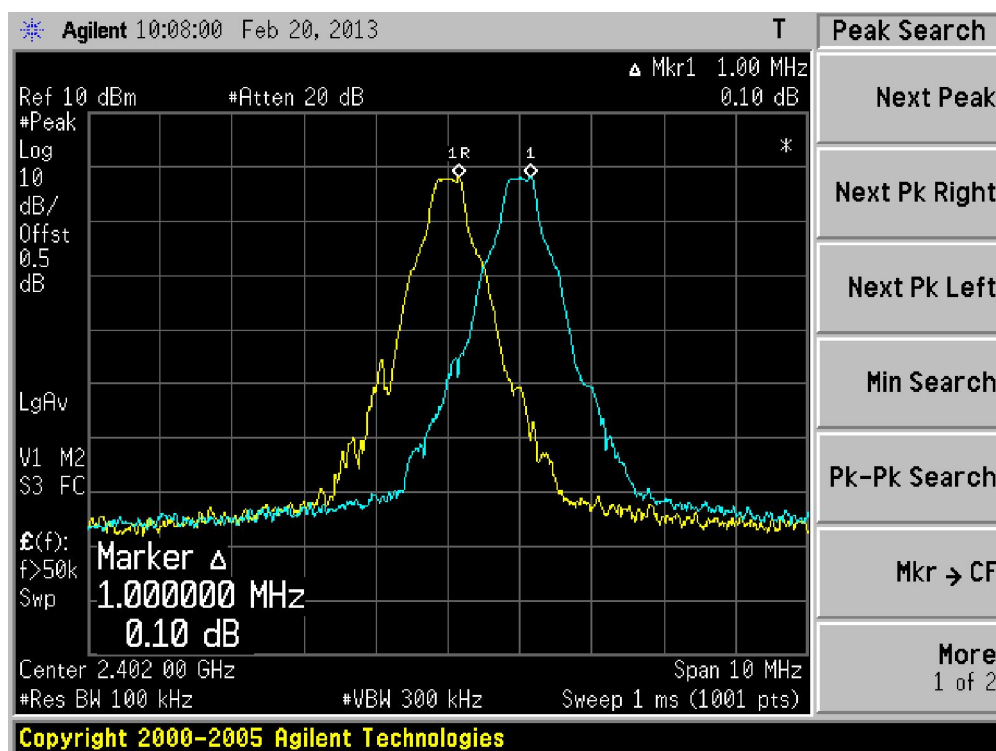
The measurement uncertainty is defined as ± 1 kHz

6.6. Test Result

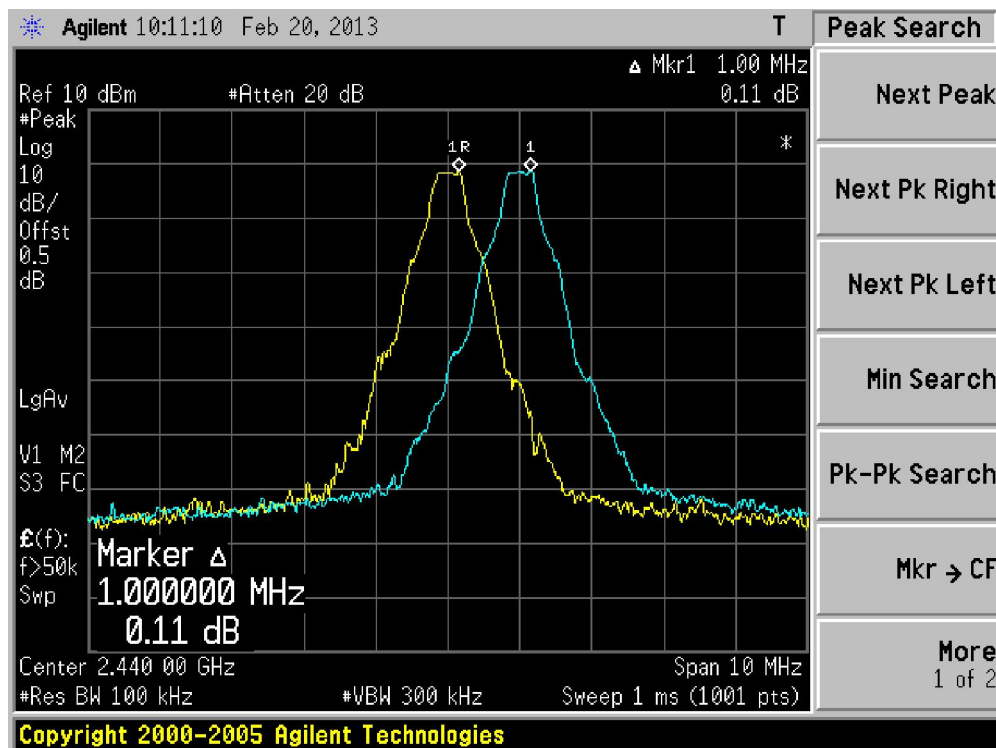
Product	:	Speaker
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter-1Mbps(GFSK_DH5)

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

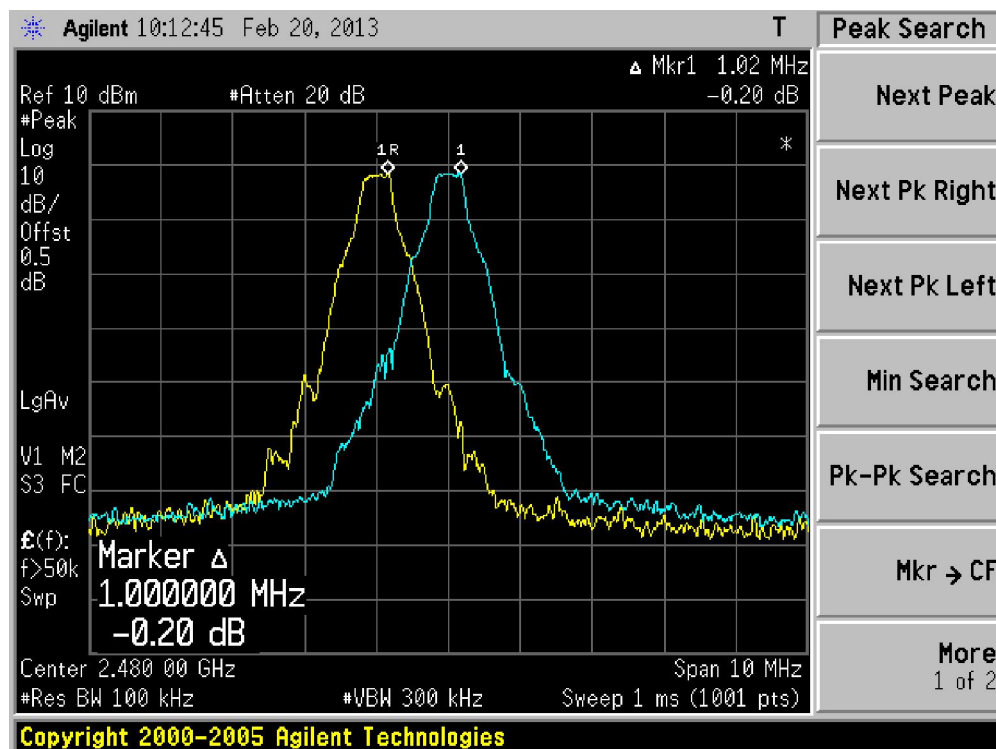
Channel 00 (2402MHz)



Channel 39 (2441MHz)



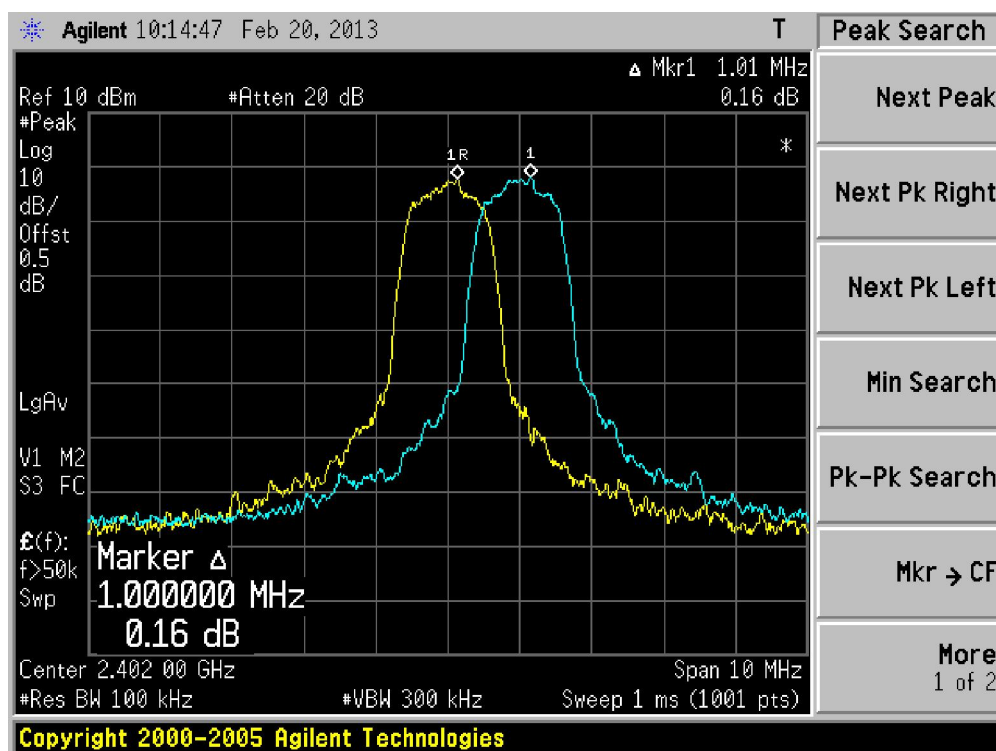
Channel 78 (2480MHz)



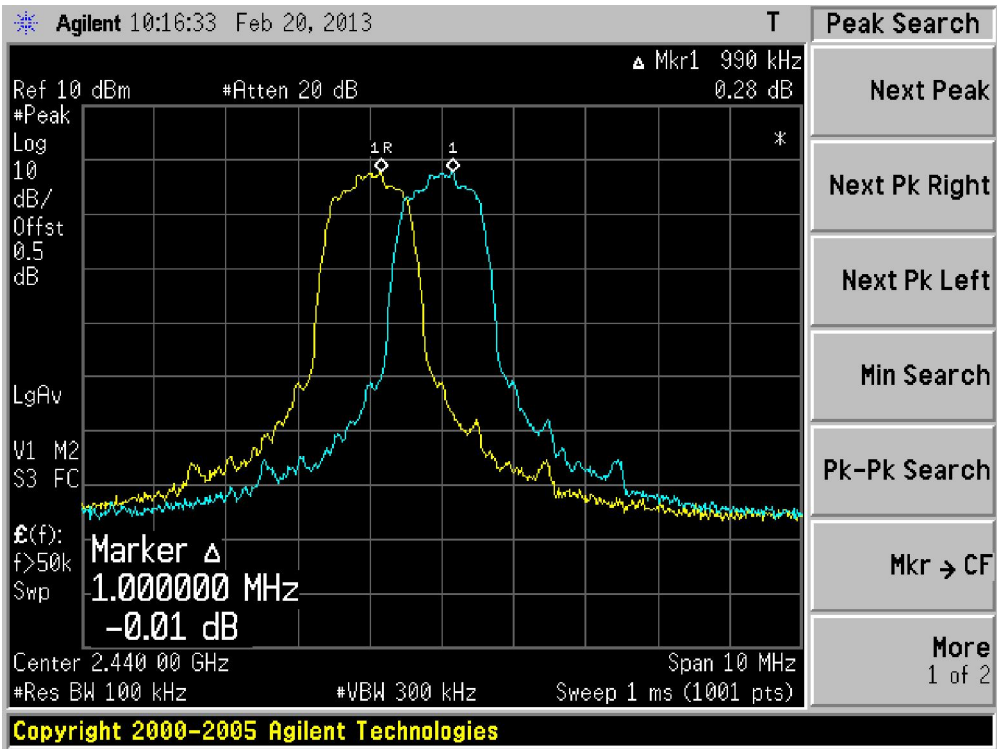
Product	:	Speaker
Test Item	:	Carrier Frequency Separation
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmitter-2Mbps(Pi/4 DQPSK_DH5)

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

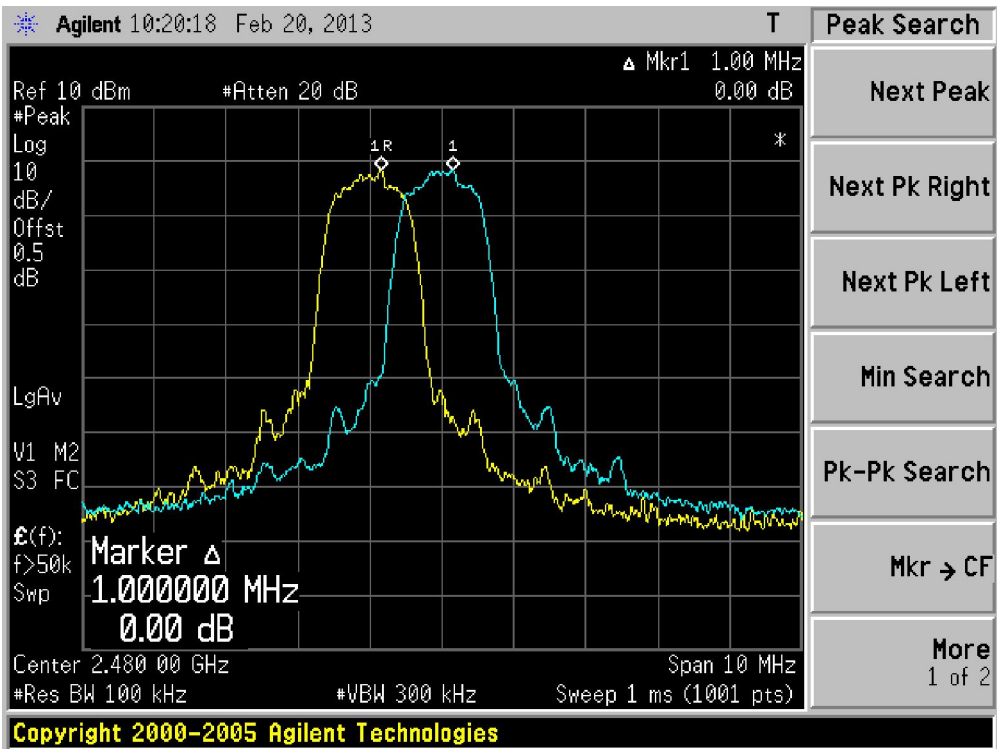
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



Product	:	Speaker
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)

