



Test Report

Product Name	Voice Siren
Model No.	HSE03-0
FCC ID	ZGXHSE03

Applicant	Chromagic Technologies Corporation
Address	5 of 2nd Fl., No.611, Sec.1, Wanshou Rd., Kwei Shan, Taoyuan Hsien 333, Taiwan.

Date of Receipt	Oct. 27, 2011
Issued Date	Nov. 25, 2011
Report No.	11B049R-RFUSP30V01
Report Version	V1.0

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date: Nov. 25, 2011

Report No.: 11B049R-RFUSP30V01



Product Name	Voice Siren
Applicant	Chromagic Technologies Corporation
Address	5 of 2nd Fl., No.611, Sec.1, Wanshou Rd., Kwei Shan, Taoyuan Hsien 333, Taiwan.
Manufacturer	Chromagic Technologies Corporation
Model No.	HSE03-0
EUT Rated Voltage	DC 6V(Battery 1.5V*4)
EUT Test Voltage	DC 6V(Battery 1.5V*4)
Trade Name	Chromagic Technologies Corporation
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010 ANSI C63.4: 2009
Test Result	Complied



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Documented By :

A handwritten signature in blue ink that appears to read 'Leven Huang'.

(Senior Adm. Specialist / Leven Huang)



Tested By :

A handwritten signature in blue ink that appears to read 'Vincent Chu'.

(Engineer / Vincent Chu)



Testing Laboratory

0914

Approved By :

A handwritten signature in blue ink that appears to read 'Vincent Lin'.

(Manager / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Voice Siren
Trade Name	Chromagic Technologies Corporation
Model No.	HSE03-0
FCC ID	ZGXHSE03
Frequency Range	923.0MHz
Antenna Type	Monopole
Channel Number	1
Type of Modulation	FSK

Note:

1. The EUT is a Voice Siren with a built-in 923.0MHz transceiver.
2. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249 for spread spectrum devices.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

1.2. Operational Description

The EUT is a Voice Siren with a built-in 923.0MHz transceiver. The EUT operation frequency is 923.0MHz. The signals modulated by FSK are transmitted from the Monopole Antenna of the EUT.

The HSE03 is a two-way wireless alarm which functions not only as a siren, but also has vocal alert sound and strobe light. Unlike any other siren alone or strobe alone products available in the market, this unique three-in-one device integrates functions of siren, vocal alert and strobe light into one unit.

Test Mode	Mode 1: Transmit
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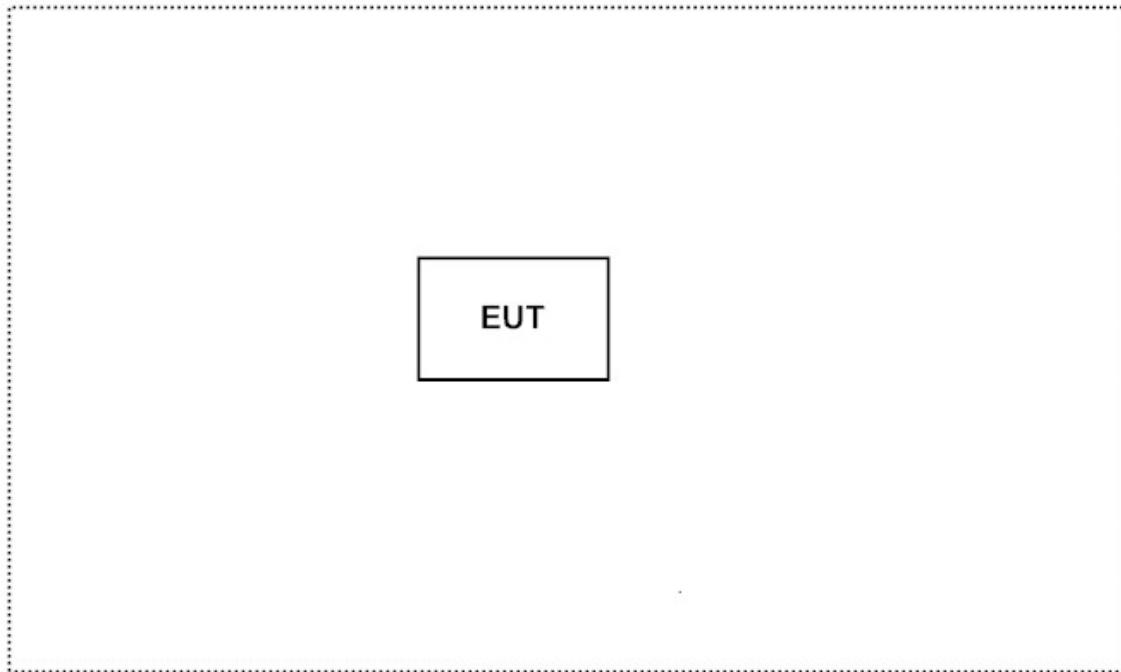
1.3. Tested System Details

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

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

Signal Cable Type	Signal cable Description
	N/A

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4
- (2) Inserts the battery, start continuous transmit
- (3) Verify that the EUT works correctly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

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/>

Site Description: File on

Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195



Accreditation on NVLAP
NVLAP Lab Code: 200533-0



Site Name:

Quietek Corporation

Site Address:

No.5-22, Ruishukeng, Linkou Dist.,

New Taipei City 24451,

Taiwan, R.O.C.

TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789

E-Mail : service@quietek.com

FCC Accreditation Number: TW1014



Testing Laboratory

0914

2. Conducted Emission

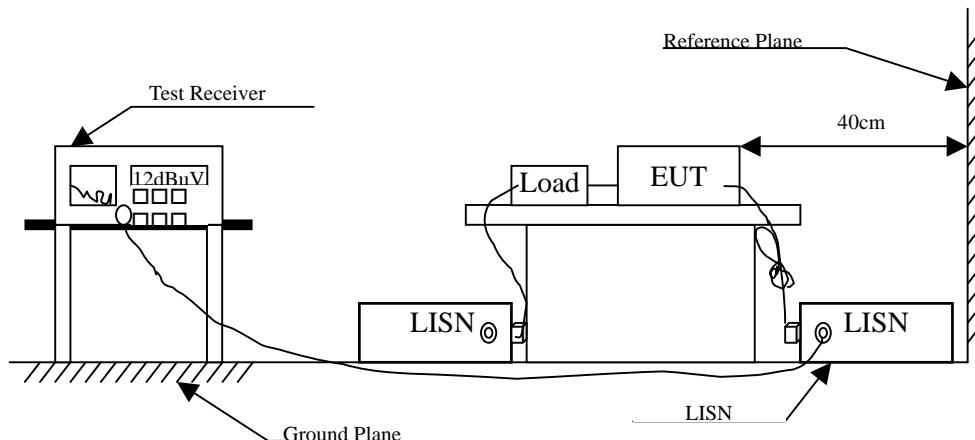
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2011	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2011	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2011	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2011	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2011	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

2.2. Test Setup



2.3. Limits

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

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement.

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

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

The EUT powered by battery, this test item is not performed.

3. Radiated Emission

3.1. Test Equipment

The following test equipment are used during the radiated emission test:

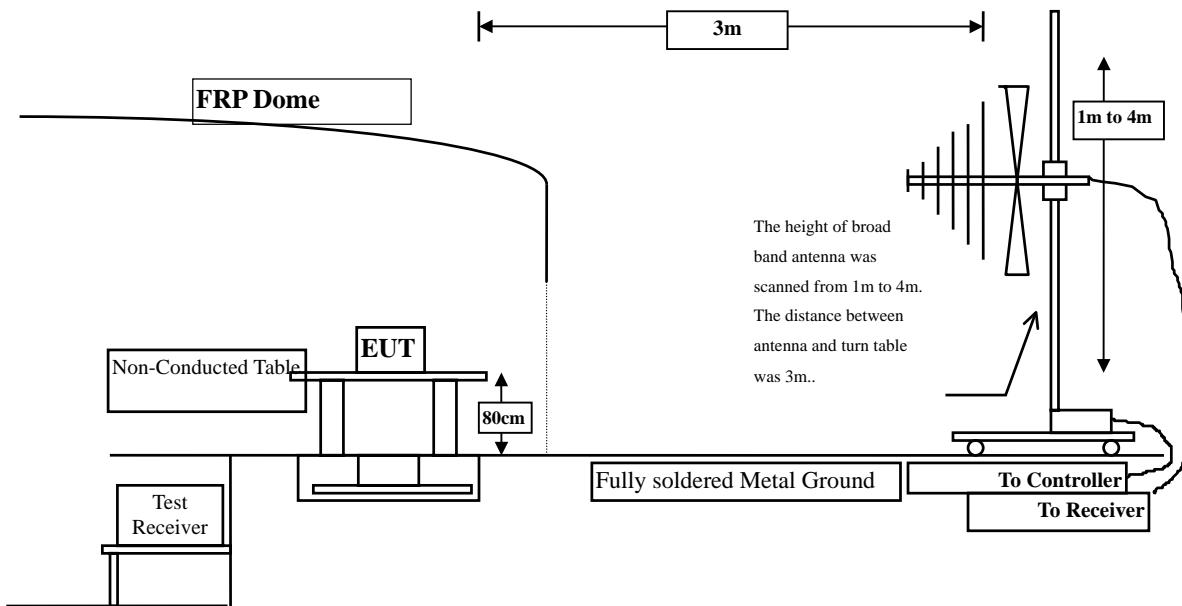
Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2011
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
	X	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2011
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2011
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

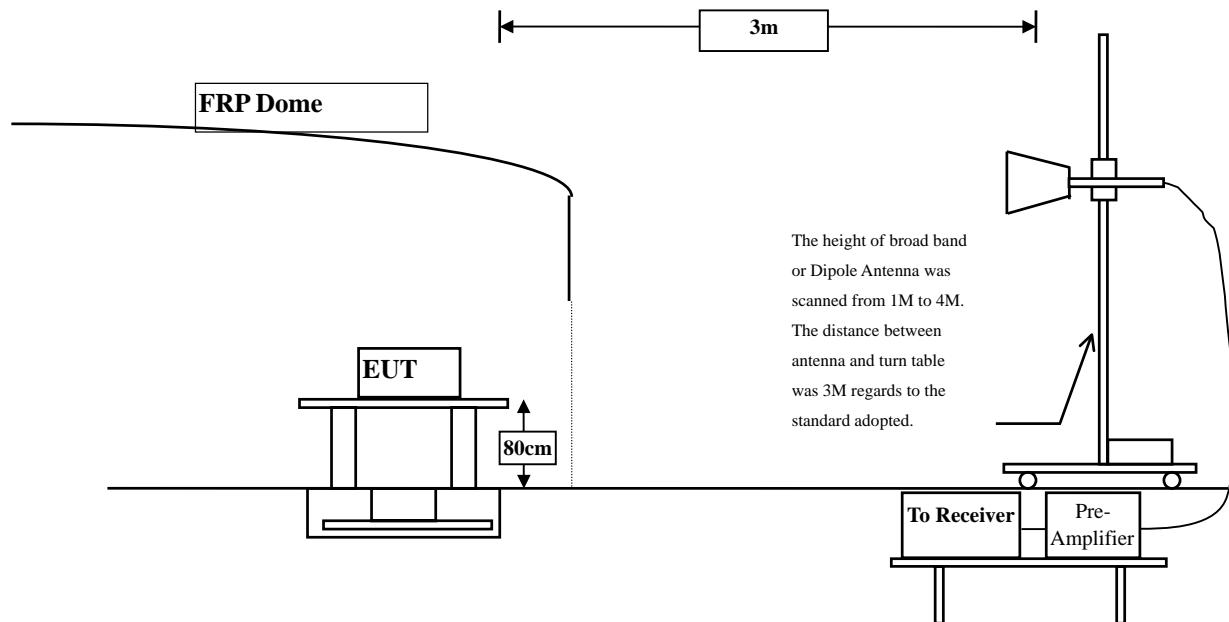
2. The test instruments marked with “X” are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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

3.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested compliance to FCC 47CFR 15.249 requirements.

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 between 1 meter and 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.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

The measurement frequency range from 30MHz - 10th Harmonic of fundamental was investigated.

3.5. Uncertainty

\pm 3.9 dB above 1GHz

\pm 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : Voice Siren
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit (X- Axis)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
923.000	28.293	71.300	99.593	-14.407	114.000
Vertical					
Peak Detector:					
923.000	28.293	75.800	104.093	-9.907	114.000

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Average Detector:

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Average Detector:					
923	99.593	-26.936	72.657	-21.343	94.000
Vertical					
Average Detector:					
923	104.093	-26.936	77.157	-16.843	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Voice Siren
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit (Y- Axis)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
923.000	28.293	77.300	105.593	-8.407	114.000
Vertical					
Peak Detector:					
923.000	28.293	68.100	96.393	-17.607	114.000

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Average Detector:

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Average Detector:					
923	105.593	-26.936	78.657	-15.343	94.000
Vertical					
Average Detector:					
923	96.393	-26.936	69.457	-24.543	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Voice Siren
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit (Z- Axis)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
923.000	28.293	77.800	106.093	-7.907	114.000
Vertical					
Peak Detector:					
923.000	28.293	69.200	97.493	-16.507	114.000

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Average Detector:

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Average Detector:					
923	106.093	-26.936	79.157	-14.843	94.000
Vertical					
Average Detector:					
923	97.493	-26.936	70.557	-23.443	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Voice Siren
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (Z- Axis)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin dB	Limit dBuV/m
MHz	dB	dBuV	dBuV/m		
Horizontal					
Peak Detector:					
1846.000	-4.230	55.670	51.440	-22.560	74.000
2769.000	-0.785	43.160	42.375	-31.625	74.000
3692.000	-0.973	54.910	52.937	-20.063	74.000
4615.000	2.092	44.770	46.862	-27.138	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
1846.000	-2.941	51.730	48.789	-25.211	74.000
2769.000	-0.968	39.800	38.832	-35.168	74.000
3692.000	0.171	53.230	53.401	-20.599	74.000
4615.000	5.939	45.320	51.259	-22.741	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Voice Siren
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (Z- Axis)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
371.440	-1.097	23.892	22.795	-23.205	46.000
472.320	0.637	23.952	24.589	-21.411	46.000
573.200	2.537	26.742	29.279	-16.721	46.000
644.980	1.552	24.177	25.729	-20.271	46.000
745.860	3.308	25.644	28.952	-17.048	46.000
844.800	5.601	25.680	31.281	-14.719	46.000
Vertical					
315.180	-6.886	26.550	19.664	-26.336	46.000
371.440	-2.737	25.742	23.005	-22.995	46.000
472.320	-4.613	26.403	21.790	-24.210	46.000
600.360	-2.833	25.352	22.519	-23.481	46.000
652.740	-4.594	31.814	27.220	-18.780	46.000
747.800	2.166	35.974	38.140	-7.860	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss -Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

4. Band Edge

4.1. Test Equipment

The following test equipments are used during the band edge tests:

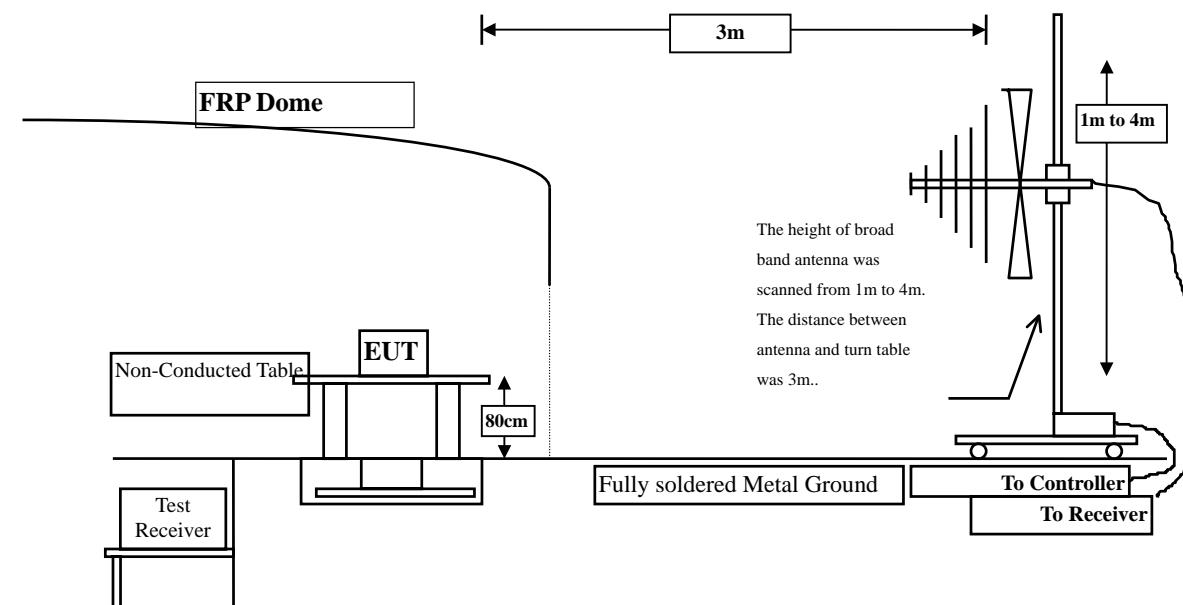
Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
		Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2011
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note:

1. All equipments are calibrated every one year.
2. The test equipments marked by “X” are used to measure the final test results.

4.2. Test Setup

RF Radiated Measurement:



4.3. Limits

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2009 on radiated measurement.

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

4.5. Uncertainty

Conducted is \pm 1.27 dB

Radiated is \pm 3.9 dB

4.6. Test Result of Band Edge

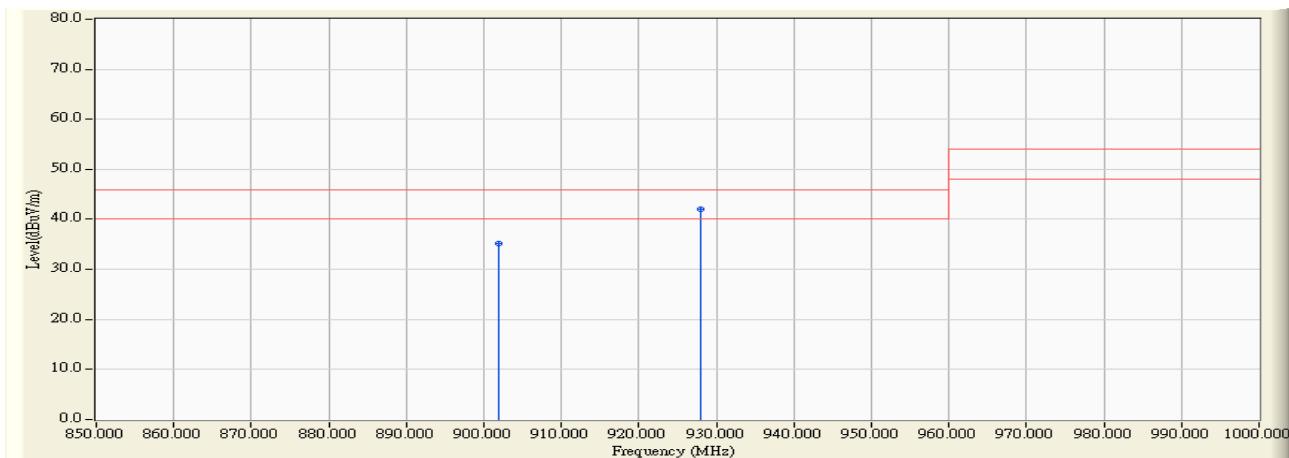
Product : Voice Siren
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Margin (dB)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	902.000	4.210	30.887	35.096	-10.904	46.000	Pass
01(Quasi-Peak)	928.000	4.728	37.319	42.047	-3.953	46.000	Pass

Figure Channel 01:

Horizontal (Quasi-Peak)



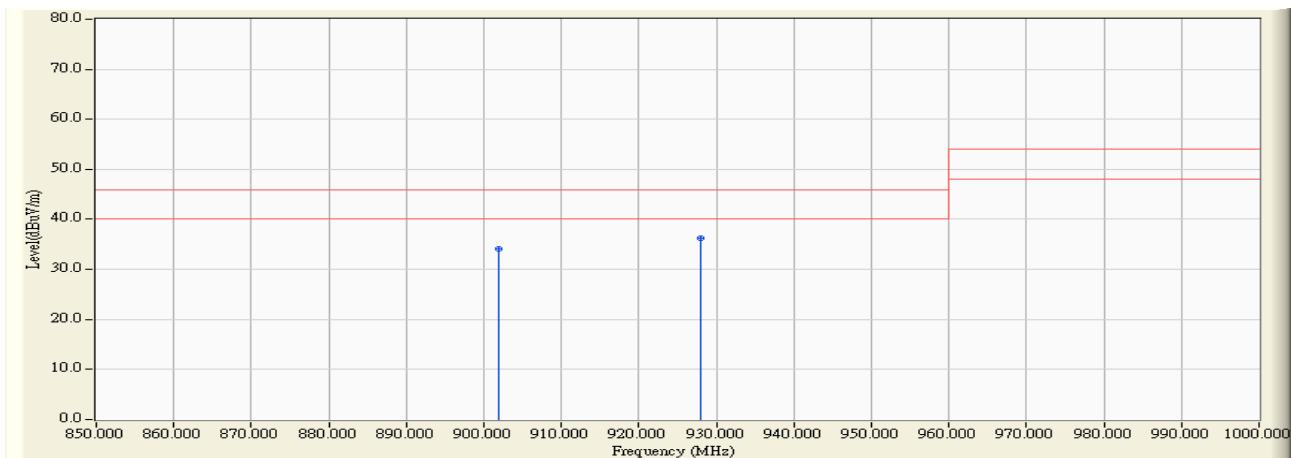
Note:

1. Quasi-Peak measurements: RBW=100kHz, VBW=1MHz, Sweep: Auto.
2. “*”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Product : Voice Siren
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Margin (dB)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	902.000	5.360	28.736	34.096	-11.904	46.000	Pass
01(Quasi-Peak)	928.000	5.708	30.639	36.347	-9.653	46.000	Pass

Figure Channel 01:**Vertical (Quasi-Peak)**

Note:

1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. “ * ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

5. Duty Cycle

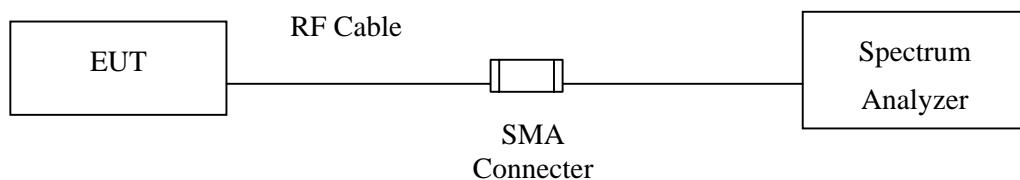
5.1. Test Equipment

The following test equipments are used during the band edge tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

Note: 1. All equipments are calibrated every one year.
2. The test equipments marked by “X” are used to measure the final test results.

5.2. Test Setup

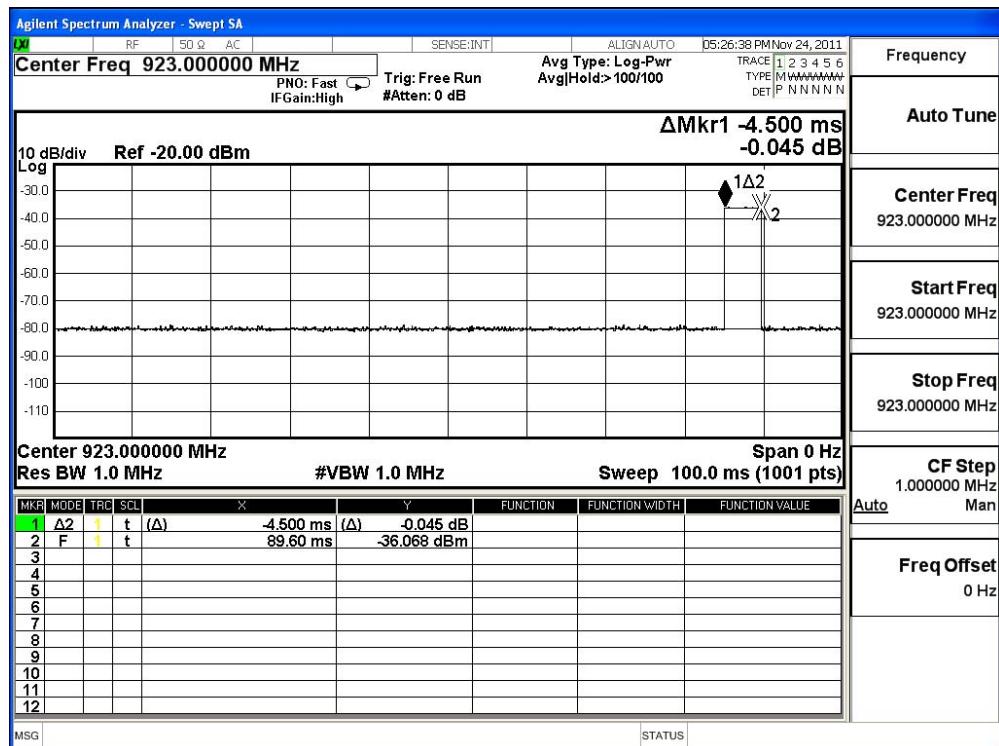


5.3. Uncertainty

± 150Hz

5.4. Test Result of Duty Cycle

Product : Voice Siren
 Test Item : Duty Cycle Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit



Time on of 100ms= 4.500 ms

Duty Cycle= 4.5ms / 100ms= 0.045

Duty Cycle correction factor= 20 LOG 0.045= -26.936 dB

Duty Cycle correction factor	-26.936	dB
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6. EMI Reduction Method During Compliance Testing

No modification was made during testing.