Test Report

Product Name	Wireless Sound Bar (SB1-20W)
Model No.	SB1-GDT
FCC ID.	DoC

Applicant	TATUNG CO.
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

Date of Receipt	Mar. 31, 2009
Issued Date	Apr. 14, 2009
Report No.	094066R-RFUSP01V02
Report Version	V1.0

Test Report Certification

Issued Date: Apr. 14, 2009
Report No.: 094066R-RFUSP01V02

Product Name	Wireless Sound Bar (SB1-20W)
Applicant	TATUNG CO.
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.
Manufacturer	TATUNG CO.
Model No.	SB1-GDT
FCC ID.	DoC
Rated Voltage	AC 120V/60Hz
Working Voltage	AC 100-240V, 50-60Hz
Trade Name	GE
Applicable Standard	FCC CFR Title 47 Part 15 Subpart B: 2007 ANSI C63.4: 2003
Test Result	Complied

NVLAP Lab Code: 200533-0

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

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(Engineering Adm. Specialist / Rita Huang)

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(Engineer / Molin Huang)

Approved By :
(Manager / Vincent Lin)

Testing Laboratory
0914

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless Sound Bar (SB1-20W)
Trade Name	GE
FCC ID.	DoC
Model No.	SB1-GDT
Frequency Range	2405 – 2477MHz
Number of Channels	37
Channel Separation	2 MHz
Channel Control	Auto
Type of Modulation	π/4 DQPSK (Differential Quadrature Phase Shift Keying)
Antenna Type	Chip
Antenna Gain	Refer to the table "Antenna List"
Power Adapter (1)	MFR: FSP, M/N:FSP065-AAC Input: AC 100-240V,50-60Hz,1.5A Output: DC 19V, 3.42A Cable Out: Non-Shielded,1.75m with one ferrite core bonded. Power cord: Non-Shielded, 1.75m
Power Adapter (2)	MFR: HIPRO, M/N:HP-A0652R2B Input: AC 100-240V,50-60Hz, 1.7A Output: DC 19V, 3.42A Cable Out: Non-Shielded,1.75m with one ferrite core bonded. Power cord: Non-Shielded, 1.6m

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	JOHANSON	2450AT18A100	Chip Antenna	0.5dBi in 2.4 GHz

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 2:	2405 MHz	Channel 3:	2407 MHz	Channel 4:	2409 MHz
Channel 5:	2411 MHz	Channel 6:	2413 MHz	Channel 7:	2415 MHz
Channel 8:	2417 MHz	Channel 9:	2419 MHz	Channel 10:	2421 MHz
Channel 11:	2423 MHz	Channel 12:	2425 MHz	Channel 13:	2427 MHz
Channel 14:	2429 MHz	Channel 15:	2431 MHz	Channel 16:	2433 MHz
Channel 17:	2435 MHz	Channel 18:	2437 MHz	Channel 19:	2439 MHz
Channel 20:	2441 MHz	Channel 21:	2443 MHz	Channel 22:	2445 MHz
Channel 23:	2447 MHz	Channel 24:	2449 MHz	Channel 25:	2451 MHz
Channel 26:	2453 MHz	Channel 27:	2455 MHz	Channel 28:	2457 MHz
Channel 29:	2459 MHz	Channel 30:	2461 MHz	Channel 31:	2463 MHz
Channel 32:	2465 MHz	Channel 33:	2467 MHz	Channel 34:	2469 MHz
Channel 35:	2471 MHz	Channel 36:	2473 MHz	Channel 37:	2475 MHz
Channel 38:	2477 MHz				

Note:

1. The EUT is a Wireless Sound Bar (SB1-20W) with a built-in 2.4GHz transceiver.
2. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart B.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. The function for the 2.4GHz transmitting is measured and produces a test report that the report number is 094066R-RFUSP07V01, certified under FCC ID: BJM-SB1GDT

EMI Test Mode	Mode 1: Receiver - Adapter 1 (FSP) Mode 2: Receiver - Adapter 2 (HIPRO)

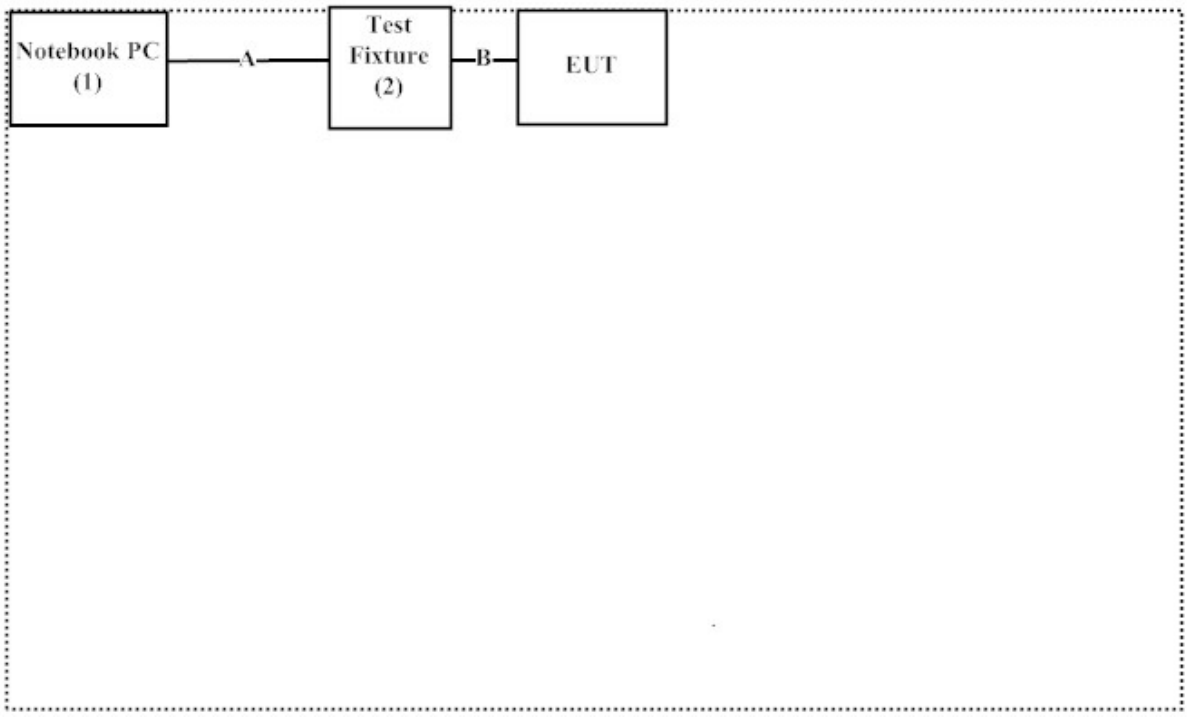
1.2. Tested System Details

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
1.	Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
2.	Test Fixture	TATUNG	N/A	N/A	N/A

Signal Cable Type		Signal Cable Description
A.	USB Cable	Shielded, 1.8m with one ferrite core bonded
B.	Controller Cable	Non-Shielded, 0.1m

1.3. Configuration of Tested System



1.4. EUT Exercise Software

(1) Setup the EUT as shown in section 1.3.
(2) Connect the EUT to a notebook via a USB.
(3) Execute “AMD2Debug.exe(V1.37.001)” on the notebook.
(4) Setup the test channel.
(5) Presses “Apply” to start the continuous transmit.
(6) Verify that the EUT works correctly.

1.5. 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://tw.quietek.com/modules/myalbum/
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, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
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E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

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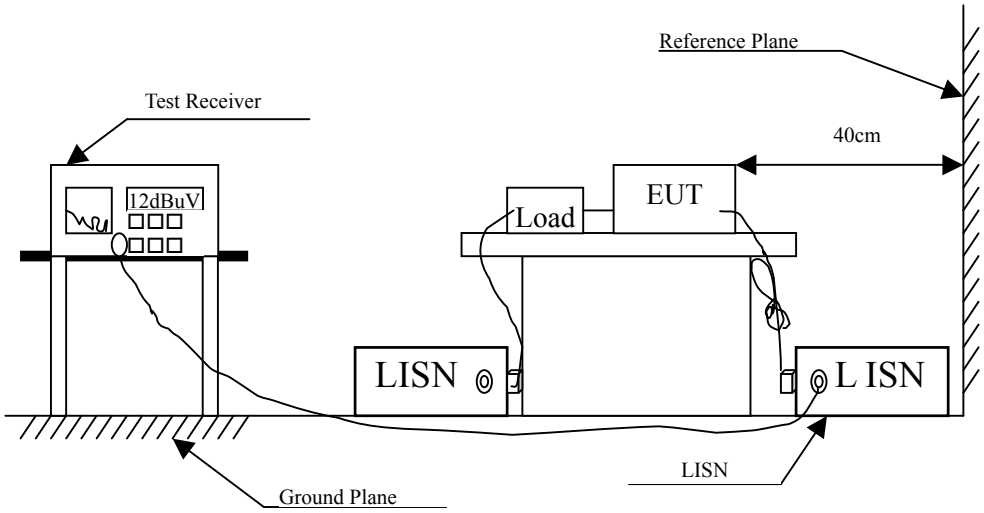
2. Conducted Emission

2.1. Test Equipment

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2008	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2008	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2008	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2008	
5	No.1 Shielded Room			N/A	

Note: All equipments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart B Paragraph 15.107 (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 refer 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 the interface cables must be changed according to ANSI C63.4: 2003 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

Product : Wireless Sound Bar (SB1-20W)
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Receiver - Adapter 1 (FSP) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.158	9.810	11.670	21.480	-44.291	65.771
0.197	9.823	30.680	40.503	-24.154	64.657
0.252	9.830	11.600	21.430	-41.656	63.086
0.267	9.830	22.120	31.950	-30.707	62.657
0.322	9.830	14.470	24.300	-36.786	61.086
0.459	9.820	18.100	27.920	-29.251	57.171
Average					
0.158	9.810	-1.410	8.400	-47.371	55.771
0.197	9.823	13.820	23.643	-31.014	54.657
0.252	9.830	-1.170	8.660	-44.426	53.086
0.267	9.830	7.370	17.200	-35.457	52.657
0.322	9.830	2.150	11.980	-39.106	51.086
0.459	9.820	5.930	15.750	-31.421	47.171

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless Sound Bar (SB1-20W)
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 1: Receiver - Adapter 1 (FSP) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.162	9.869	10.790	20.659	-44.998	65.657
0.197	9.860	31.020	40.880	-23.777	64.657
0.205	9.860	19.940	29.800	-34.629	64.429
0.259	9.857	24.710	34.567	-28.319	62.886
0.322	9.850	14.850	24.700	-36.386	61.086
0.396	9.840	18.250	28.090	-30.881	58.971
Average					
0.162	9.869	-1.850	8.019	-47.638	55.657
0.197	9.860	13.060	22.920	-31.737	54.657
0.205	9.860	4.060	13.920	-40.509	54.429
0.259	9.857	7.670	17.527	-35.359	52.886
0.322	9.850	1.020	10.870	-40.216	51.086
0.396	9.840	2.790	12.630	-36.341	48.971

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless Sound Bar (SB1-20W)
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 2: Receiver - Adapter 2 (HIPRO) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.166	9.746	23.690	33.435	-32.108	65.543
0.201	9.706	19.590	29.296	-35.247	64.543
0.236	9.682	19.460	29.142	-34.401	63.543
0.525	9.640	25.840	35.480	-20.520	56.000
0.677	9.630	12.130	21.760	-34.240	56.000
1.252	9.670	13.730	23.400	-32.600	56.000
Average					
0.166	9.746	11.560	21.305	-34.238	55.543
0.201	9.706	8.390	18.096	-36.447	54.543
0.236	9.682	19.340	29.022	-24.521	53.543
0.525	9.640	19.260	28.900	-17.100	46.000
0.677	9.630	7.610	17.240	-28.760	46.000
1.252	9.670	7.210	16.880	-29.120	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless Sound Bar (SB1-20W)
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 2: Receiver - Adapter 2 (HIPRO) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.170	9.743	24.050	33.793	-31.636	65.429
0.189	9.724	17.110	26.834	-38.052	64.886
0.236	9.692	20.120	29.812	-33.731	63.543
0.529	9.640	26.270	35.910	-20.090	56.000
0.654	9.650	16.090	25.740	-30.260	56.000
1.263	9.670	15.830	25.500	-30.500	56.000
Average					
0.170	9.743	11.220	20.963	-34.466	55.429
0.189	9.724	2.740	12.464	-42.422	54.886
0.236	9.692	20.090	29.782	-23.761	53.543
0.529	9.640	22.750	32.390	-13.610	46.000
0.654	9.650	4.480	14.130	-31.870	46.000
1.263	9.670	7.130	16.800	-29.200	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Radiated Emission

3.1. Test Equipment

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

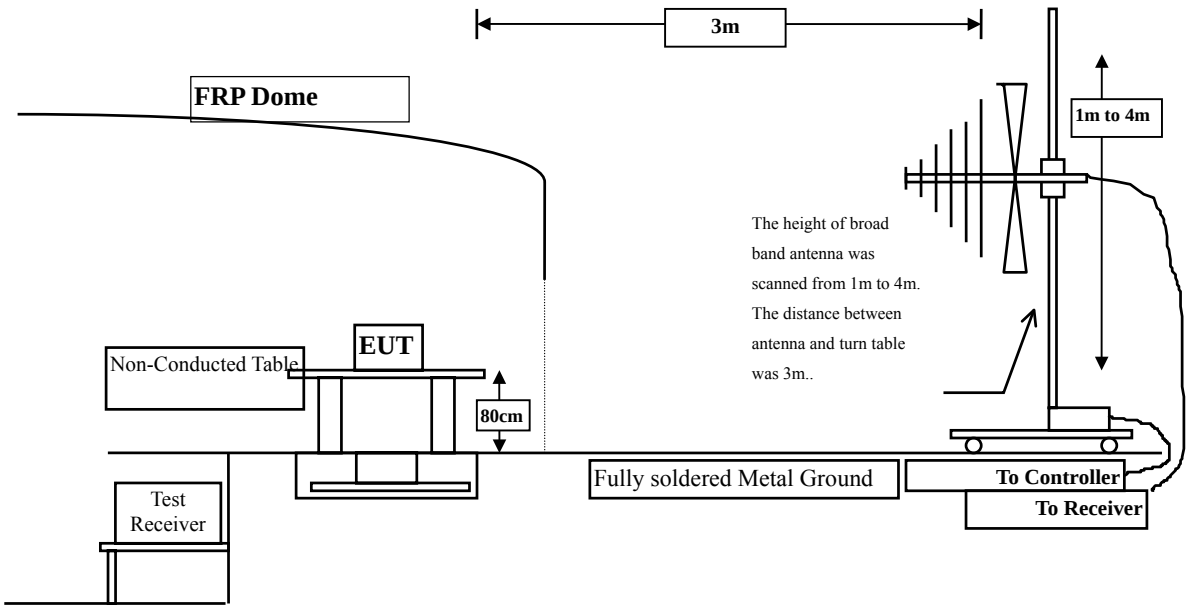
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2008
	X	Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2008
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2008
	X	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2008
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2009
	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.

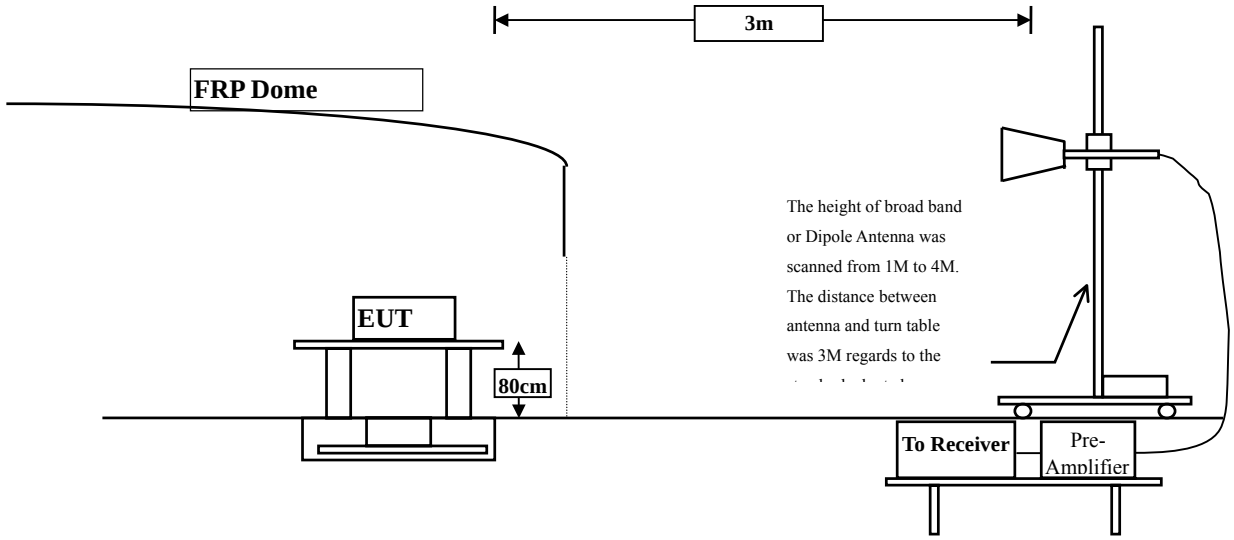
2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

FCC Part 15 Subpart B Paragraph 15.109 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 : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

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

3.4. 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: 2003 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 beamwidth of the antenna.
The worst radiated emission is measured on the Final Measurement.
The frequency range from 30MHz to 10th harminics is checked.

3.5. Uncertainty

± 3.9 dB above 1GHz
± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : Wireless Sound Bar (SB1-20W)
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Receiver - Adapter 1 (FSP) (2405MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m
Horizontal					
Peak Detector:					
2405.000	-1.561	43.150	41.589	-32.411	74.000
4810.000	3.510	42.880	46.390	-27.610	74.000
7215.000	7.945	40.970	48.915	-25.085	74.000
9620.000	13.096	40.110	53.206	-20.794	74.000
Average Detector					
--					
Vertical					
Peak Detector:					
2405.000	-2.335	41.990	39.655	-34.345	74.000
4810.000	3.495	42.880	46.375	-27.625	74.000
7215.000	8.927	41.200	50.127	-23.873	74.000
9620.000	13.679	40.100	53.779	-20.221	74.000
Average Detector					
--					

Note:
1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz。
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz。
4. Emission Level = Reading Level + Correct Factor.
5. 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.

Product : Wireless Sound Bar (SB1-20W)
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Receiver - Adapter 1 (FSP) (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m
Horizontal					
Peak Detector:					
2441.000	-1.362	41.330	39.968	-34.032	74.000
4882.000	3.430	42.070	45.500	-28.500	74.000
7323.000	7.273	40.360	47.633	-26.367	74.000
9764.000	13.379	39.660	53.038	-20.962	74.000
Average Detector					
--					
Vertical					
Peak Detector:					
2441.000	-1.928	40.390	38.462	-35.538	74.000
4882.000	3.966	41.280	45.246	-28.754	74.000
7323.000	8.062	40.590	48.653	-25.347	74.000
9764.000	13.424	40.170	53.593	-20.407	74.000
Average Detector					
--					

Note:
1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz。
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz。
4. Emission Level = Reading Level + Correct Factor.
5. 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.

Product : Wireless Sound Bar (SB1-20W)
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Receiver - Adapter 1 (FSP) (2477MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Average Limit dBuV/m
Horizontal					
Peak Detector:					
2477.000	-1.061	41.770	40.709	-33.291	74.000
4954.000	3.409	42.580	45.988	-28.012	74.000
7431.000	7.079	40.690	47.769	-26.231	74.000
9908.000	13.448	39.690	53.138	-20.862	74.000
Average Detector					
--					
Vertical					
Peak Detector:					
2477.000	-1.394	41.690	40.296	-33.704	74.000
4954.000	4.494	42.250	46.744	-27.256	74.000
7431.000	7.635	39.980	47.615	-26.385	74.000
9908.000	13.500	39.980	53.480	-20.520	74.000
Average Detector					
--					

Note:
1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz。
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz。
4. Emission Level = Reading Level + Correct Factor.
5. 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.

Product : Wireless Sound Bar (SB1-20W)
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Receiver - Adapter 1 (FSP) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
156.100	-8.635	39.118	30.483	-13.017	43.500
309.360	-4.669	38.110	33.441	-12.559	46.000
398.600	0.801	33.963	34.764	-11.236	46.000
447.100	-0.210	31.750	31.540	-14.460	46.000
658.560	1.736	28.928	30.664	-15.336	46.000
875.840	5.520	29.358	34.878	-11.122	46.000
Vertical					
136.700	-4.721	40.013	35.292	-8.208	43.500
200.720	-5.850	34.349	28.499	-15.001	43.500
350.100	-1.412	29.687	28.275	-17.725	46.000
540.220	1.970	30.391	32.361	-13.639	46.000
660.500	-1.267	28.881	27.614	-18.386	46.000
817.640	2.700	25.096	27.796	-18.204	46.000

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Wireless Sound Bar (SB1-20W)
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Receiver - Adapter 2 (HIPRO) (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
101.780	-9.148	40.340	31.192	-12.308	43.500
144.460	-7.714	44.079	36.365	-7.135	43.500
299.660	-4.929	34.885	29.956	-16.044	46.000
499.480	1.808	32.428	34.235	-11.765	46.000
563.500	1.720	29.573	31.294	-14.706	46.000
844.800	6.300	20.966	27.266	-18.734	46.000
Vertical					
72.680	-9.708	37.509	27.802	-12.198	40.000
326.820	-2.931	29.845	26.914	-19.086	46.000
526.640	0.960	27.365	28.325	-17.675	46.000
701.240	-0.720	26.280	25.560	-20.440	46.000
885.540	1.031	22.245	23.276	-22.724	46.000
968.960	3.740	21.626	25.366	-28.634	54.000

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

4. EMI Reduction Method During Compliance Testing

No modification was made during testing.