

Certification of Compliance

CFR 47 Part 15 Subpart C

Test Report File No. : 02-IST-118 Date of Issue : June 17, 2002

Model : BW-2400

Kind of Product : Sound Modulator

Applicant : BrightWorld Co., Ltd.

Address : Jaeil-Bldg 5Fl, 397, 3rd St, DangSan-Dong, Youngdungpo-Ku,
Seoul , Korea

Manufacturer : BrightWorld Co., Ltd.

Address : Jaeil-Bldg 5Fl, 397, 3rd St, DangSan-Dong, Youngdungpo-Ku,
Seoul , Korea

Test Result ☒ Positive ☐ Negative

Reviewed By

Approved By



J.H. Lee / General Manager of EMC



G. Chung / Chief

- The test report with appendix consists of 9 pages.
- The test result only responds to the tested sample.
- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.
- This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4 1992.



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INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. (*FCC Filing Lab*)

San 21-8, Goan-Ri, Baekam-Myun, Yongin-City

Kyonggi-Do, 449-860, Korea

TEL : +82 31 333 4093

FAX : +82 31 333 4094

ENVIRONMENTAL CONDITIONS

Temperature 26 degree

Humidity 37 percent

Atmospheric pressure 1003 mbar

POWER SUPPLY SYSTEM USED

Power supply system DC 3V (AAA Battery x 2)

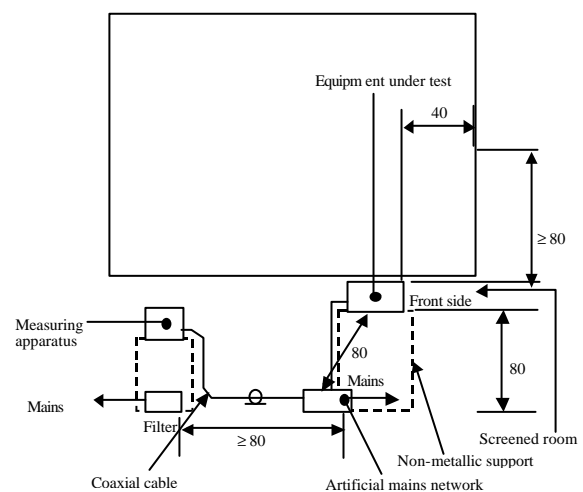
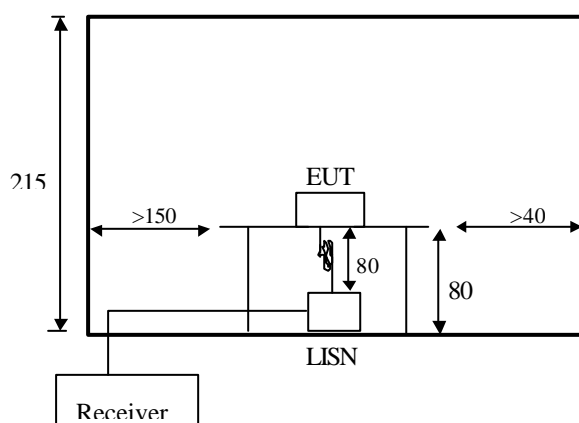
DESCRIPTIONS OF TEST

Conducted Emissions:

The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50 /50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10KHz or for "quasi-peak" within a bandwidth of 9KHz.

- Procedure of Test

The line-conducted facility is located inside a shielded room No.1. A 1m X 1.5m wooden table 80cm height is placed 40cm away from the vertical wall and 1.5m away from the other wall of the shielded room. The R/S ESH3-Z5 and EMCO 3825/2 LISN are bonded to bottom of the shielded room. The EUT is located on the wooden table with distance more than 80cm from the LISN and powered from the EMCO LISN .The peripheral equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the EMCO LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling to a 1m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating conditions. The RF output of the LISN was connected to the R/S receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using Quasi-Peak mode by manual measurement, after scanned by automatic Peak mode for frequency range from 0.45 to 30MHz. The bandwidth of the receiver was set to 10kHz. The EUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.



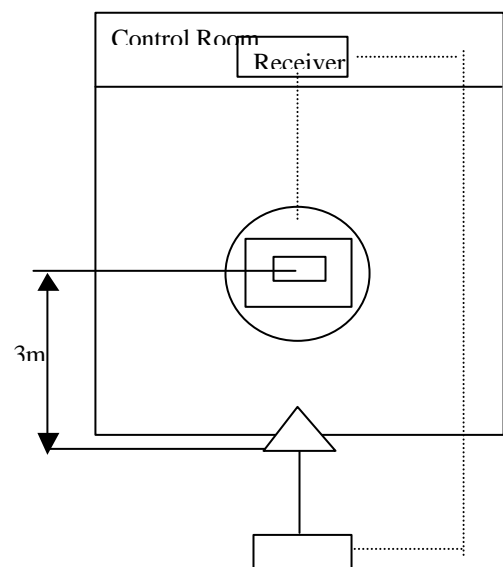
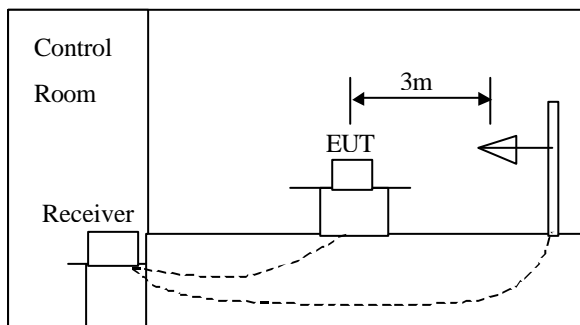
DESCRIPTION OF TEST

Radiated Emissions:

The measurement was performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "peak" or "average" detect mode.

- Procedure of Test

The peak measurements were made at 3 meter using bi-conical and log-periodic antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30MHz to 230MHz using S/B bi-conical antenna and 230 to 1000MHz using S/B log-periodic antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. The average measurements were made at open site with 3-meters test distance using S/B bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuation. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR average mode and the bandwidth of the receiver was set to 100kHz or 1MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.



SUMMARY

☐ Conducted Emission

The requirements are

() MET

() Not MET

Minimum limit margin

dB at

MHz

Maximum limit exceeding

Remarks :.

☒ Radiated Emission

The requirements are

(*) MET

() Not MET

Minimum limit margin

7.2 dB at

88.773 MHz

Maximum limit exceeding

Remarks : For peak measurement

Reported By



H.C. Kim / EMC Engineer

Note :

☒ means the test is applicable, ☐ is not applicable.

TEST CONDITIONS AND DATA

Conducted Emissions

[Not Applicable]

Test Equipment Used

<u>Model Name</u>	<u>Manufacture</u>	<u>Description</u>	<u>Serial Number</u>	<u>Next Cal. Date</u>
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The equipment used is calibrated in regular for every year.

Test Program

Test Date

Test Area

Note : .

TEST CONDITIONS AND DATA

Radiated Emission

[Applicable]

Test Equipment Used

Model Name	Manufacture	Description	Serial Number	Next Cal. Date
ESVP	Rohde Schwarz	Receiver	861744/004	Jun. 12, 2002
VULB9160	Schwarzbeck	Antenna	3048	Jun. 04, 2002
EZM	Rohde Schwarz	Spectrum monitor	863183/008	
8566B	Hewlett Packard	Spectrum Analyzer	3014A07159	July 15, 2002
PM5418	FLUKE	Pattern Generator	LO796009	May 20, 2003
-	-	-		
-	-	-		

The equipment used is calibrated in regular for every year.

Test Program Transmitting

Test Date June 3, 2002

Test Area Anechoic chamber #1 / Open Field Test Site #2

*Note : The regulation Sec. 15.239 and Sec. 15.35 were employed.
The average measurement was performed at OATS with IF Bandwidth 100kHz.
The test signal, 1kHz, was fed by PM5418 as Audio Output.*

- Find the test data in following page.

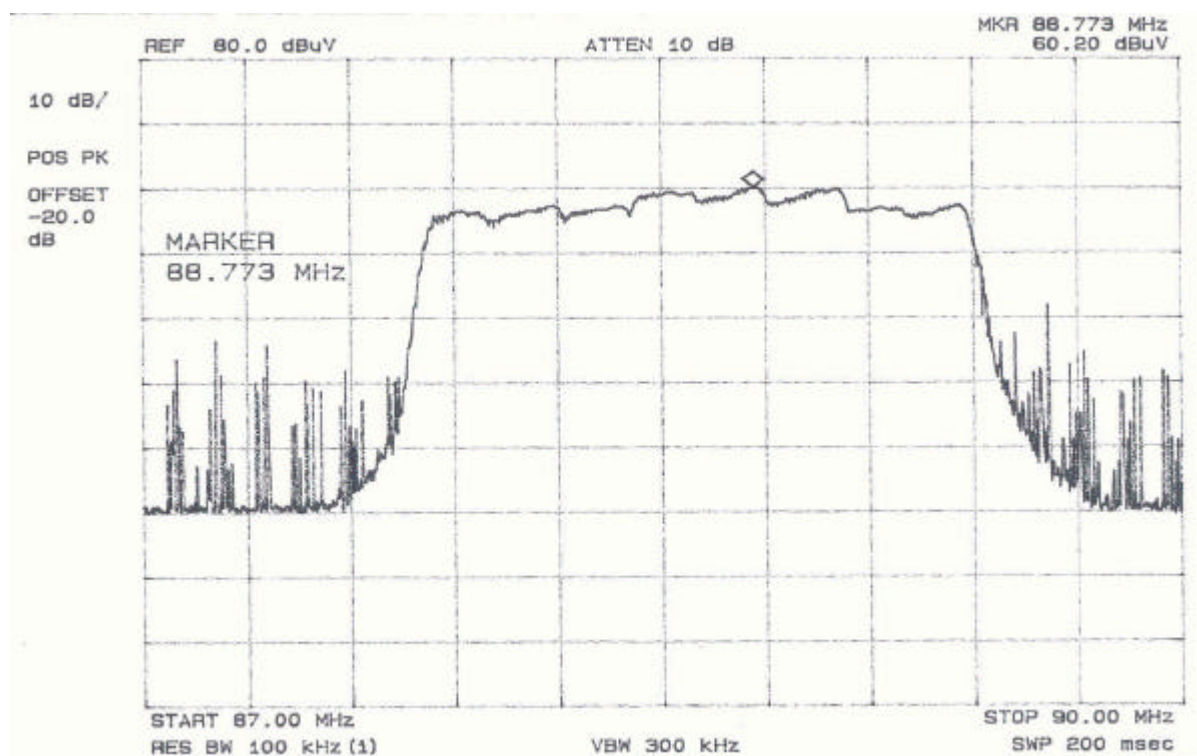
Radiated Emissions

(Disturbance Radiation)

[Applicable]

Transmitting

Freq. [MHz]	Reading [dBuV] Average	Antenna Factor [dB]	Cable Loss [dB]	Azimuth [deg]	Height [cm]	Polar. [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
88.0	28.0	8.4	2.2	147	120	H	38.6	48.0	9.5
88.2	27.3	8.4	2.2	157	126	H	37.9	48.0	10.2
88.4	28.1	8.4	2.2	151	116	H	38.7	48.0	9.4
88.6	28.0	8.4	2.2	166	122	H	38.6	48.0	9.5
88.8	28.5	8.6	2.2	159	120	H	39.2	48.0	8.8
89.0	28.4	8.6	2.2	170	120	H	39.1	48.0	8.9
89.2	27.9	8.6	2.2	174	118	H	38.6	48.0	9.4
Q-peak									
165.2	12.9	12.6	3.0	165	162	V	28.5	43.5	15.1
267.6	17.5	11.4	4.0	204	198	H	32.9	46.0	13.1



Peak Measurement (Max Hold for all channel)