TEST REPORT

Report No.: HK09071589-2

BELLMAN AND SYMFON EUROPE AB

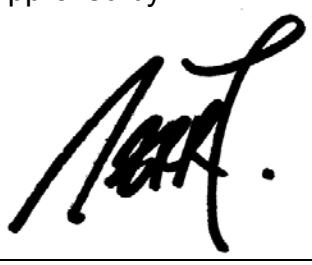
Application
For
Certification
(Original Grant)
(FCC ID: WMSBETXAUD)
(IC: 6693A-BETXAUD)

Transceiver

Prepared and Checked by:

Benny Lau
Engineer

Approved by:



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Date: October 09, 2009

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GENERAL INFORMATION

BELLMAN AND SYMFON EUROPE AB
BRAND NAME: Bellman Audio Domino, MODEL: BE2230

FCC ID: WMSBETXAUD
IC: 6693A-BETXAUD

Grantee:	BELLMAN AND SYMFON EUROPE AB
Grantee Address:	Södra Långebergsgatan 30, S-421 32 Västra Frölunda, Sweden.
Contact Person:	Anders Lenning
Tel:	+46-31-682820
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e-mail:	N/A
Manufacturer:	BELLMAN AND SYMFON EUROPE AB
Manufacturer Address:	Södra Långebergsgatan 30, S-421 32 Västra Frölunda, Sweden.
Brand Name:	Bellman Audio Domino
Model:	BE2230
Type of EUT:	Transmitter
Description of EUT:	Personal Hearing System
Serial Number:	N/A
FCC ID / IC:	WMSBETXAUD / 6693A-BETXAUD
Date of Sample Submitted:	July 31, 2009
Date of Test:	September 23, 2009
Report No.:	HK09071589-2
Report Date:	October 09, 2009
Environmental Conidtions:	Temperature: +10 to 40°C Humidity: 10 to 90%

SUMMARY OF TEST RESULT

BELLMAN AND SYMFON EUROPE AB
BRAND NAME: Bellman Audio Domino, MODEL: BE2230

FCC ID: WMSBETXAUD
IC: 6693A-BETXAUD

TEST SPECIFICATION	REFERENCE	RESULTS
Maximum Peak Output Power	15.247(b), (c) / RSS-210 A8.4	Pass
6 dB Bandwidth	15.247(a)(2) / RSS-210 A8.2	Pass
Maximum Power Density	15.247(e) / RSS-210 A8.2	Pass
Out of Band Antenna Conducted Emission	15.247(d) / RSS-210 A8.5	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Transmitter Power Line Conducted Emissions	15.207 / RSS-Gen 7.2.2	Pass
Antenna Requirement	15.203	Pass (See Note 1)
Radiated Spurious Emissions	15.247(d) / RSS-210 A8.5	Pass
Digital Device Radiated Emissions	15.109 / ICES-003	Pass
Digital Device Conducted Emissions	15.107 / ICES-003	Pass
Receiver Radiated Eissions	RSS-210 2.3	Pass
Receiver Conducted Emissions	RSS-Gen 7.2.2	Pass

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.

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Table of Contents

1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) Model: Bellman Audio Domino BE2230 is a transceiver operating at 2412-2464 MHz. The EUT is power by a rechargeable 3.7 V Li-Ion batteries with 600 mAh capacity. The charger can be an AC type (100-240 VAC) or DC type (12-24 VDC). BE2230 is so-called a transmitter unit. It picks up the voice of the speaker by the omni/uni-directional microphones. Or it is connected to an external audio source connected through a Line in connector for e.g. TV-listening or listening to music at home. Then transmit the digital audio data to the related receiver Model: Bellman Audio Domino BE2210. The communication link between the BE2210 and BE2230 is a point-to-point or point-to-multipoint connection where digital audio data is transmitted using packet data (frames) at a predefined frame-rate. The communication link is half-duplex. A non-acknowledge (NACK) based protocol is used to ensure that faulty frames are retransmitted. At a given time-slot the BE2230 switches to reception and the BE2210 may transmit an un-modulated carrier, within this time-slot, to signal a NACK to the BE2230.

Antenna Type : Internal, Integral

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

The Certification procedure of the corresponding transceiver for this transceiver (with FCC ID: WMSBERXAUD) is being processed as the same time of this application. The receiver portion of this transceiver is exempted from the Part 15 technical rules per 15.101(b).

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All radiated measurements were performed in an Open Area Test Site. Preliminary scans were performed in the Open Area Test Site only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been placed on file with the FCC and IC.

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

The device was powered from 3.7VDC Li-ion battery (Part No.: NTA2617) and AC/DC adaptor (Model: MH-0601, Input: 100-240VAC 50/60Hz, Output: 5VDC 1A)

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit enters test mode, it transmits the RF signal continuously.

2.3 Special Accessories

AC/DC adaptor (Model: MH-0601, Input: 100-240VAC 50/60Hz, Output: 5VDC 1A)

2.4 Equipment Modification

Any modifications installed previous to testing by BELLMAN AND SYMFON EUROPE AB will be incorporated in each production model sold/leased in the United States and Canada

No modifications were installed by Intertek Testing Services Hong Kong Ltd.

2.5 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

1. Transceiver
   Model: BE2210

3.0 Emission Results

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
RR = 18.0 dBµV
LF = 9.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 34.850 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by -6.7 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 0.4785 MHz

For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conducted photos.pdf.

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgment: Passed by -2.63 dB

4.0 **Measurement Results**

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm).

Frequency (MHz)	Antenna Gain = 2.1 dBi	
	Output in dBm	Output in mWatt
Low Channel: 2412	19.95	98.86
Middle Channel: 2438	19.35	86.10
High Channel: 2464	18.67	73.62

EUT dBm max. output level = 19.95 dBm (+30 dBm or less)

For RF Safety, the information is saved with filename: RF exposure.pdf.

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Frequency (MHz)	6 dB Bandwidth (KHz)
2412	9680
2438	9680
2464	9640

Limit: at least 500kHz

For electronic filing, the above plots are saved with filename: 6db.pdf

4.3 Maximum Power Density Reading, FCC Rule 15.247(e) :

The spectrum analyzer RES BW was set to 3kHz. In order to look for a peak, the START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs.

Frequency Span = 3MHz

Sweep Time = 1000 seconds

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are added to the analyzer raw readings.

Frequency (MHz)	Power Density (dBm/3kHz)
2411.304	1.39
2437.304	0.99
2463.304	0.17

Limit: 8dBm/ 3kHz

For electronic filing, the above plots are saved with filename: maxpd.pdf

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

The plots showed all spurious emission and up to the tenth harmonic. They were found to be at least 20 dB below the highest level of the desired power in the passband.

For the electronic filing, the above plots are saved with filename: oob.pdf

4.5 Out of Band Radiated Emissions, FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

See section 4.7.

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The following data list the significant emission frequencies, the limit and the margin of compliance.

Frequency (MHz)	OATS radiated field strength at carrier frequency measured at 3m (dBµV/m)		Attenuation (dBc)	Calculated radiated field strength at the bandage (dBµV/m)	
2483.5	Peak	Average		Peak	Average
	109.0	88.04	-41.83	67.17	46.21

Limit:
The average radiated field strength at bandedge should be smaller that 54 dBµV/m and the peak radiated field strength at bandedge should be smaller that 74 dBµV/m.

4.7 Radiated Spurious Emissions

Applicant: BELLMAN AND SYMFON EUROPE AB Date of Test: September 23, 2009
Model: BE2230
Worst-Case Operating Mode: Transmitter with Adaptor (Lowest Channel)

Table 1-2

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	4824.200	28.5	33	34.9	51.4	20.96	30.4	54.0	-23.6
H	12060.500	23.1	33	40.5	51.6	20.96	30.6	54.0	-23.4
H	14472.600	22.3	33	40.0	50.3	20.96	29.3	54.0	-24.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	4824.200	49.5	33	34.9	51.4	0	51.4	74.0	-22.6
H	12060.500	44.1	33	40.5	51.6	0	51.6	74.0	-22.4
H	14472.600	43.3	33	40.0	50.3	0	50.3	74.0	-23.7

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

Applicant: BELLMAN AND SYMFON EUROPE AB Date of Test: September 23, 2009
Model: BE2230
Worst-Case Operating Mode: Transmitter with Adaptor (Middle Channel)

Table 3-4

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	4876.260	27.9	33	34.9	50.8	20.96	29.8	54.0	-24.2
H	7314.390	24.3	33	37.9	50.2	20.96	29.2	54.0	-24.8
H	12190.650	22.8	33	40.5	51.3	20.96	30.3	54.0	-23.7

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	4876.260	48.9	33	34.9	50.8	0	50.8	74.0	-23.2
H	7314.390	45.3	33	37.9	50.2	0	50.2	74.0	-23.8
H	12190.650	43.8	33	40.5	51.3	0	51.3	74.0	-22.7

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

Applicant: BELLMAN AND SYMFON EUROPE AB Date of Test: September 23, 2009
Model: BE2230
Worst-Case Operating Mode: Transmitter with Adaptor (Highest Channel)

Table 5-6

Radiated Emissions

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	4928.200	27.2	33	34.9	50.1	20.96	29.1	54.0	-24.9
H	7392.300	24.1	33	37.9	50.0	20.96	29.0	54.0	-25.0
H	12320.500	22.6	33	40.5	51.1	20.96	30.1	54.0	-23.9

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
H	4928.200	48.2	33	34.9	50.1	0	50.1	74.0	-23.9
H	7392.300	45.1	33	37.9	50.0	0	50.0	74.0	-24.0
H	12320.500	43.6	33	40.5	51.1	0	51.1	74.0	-22.9

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

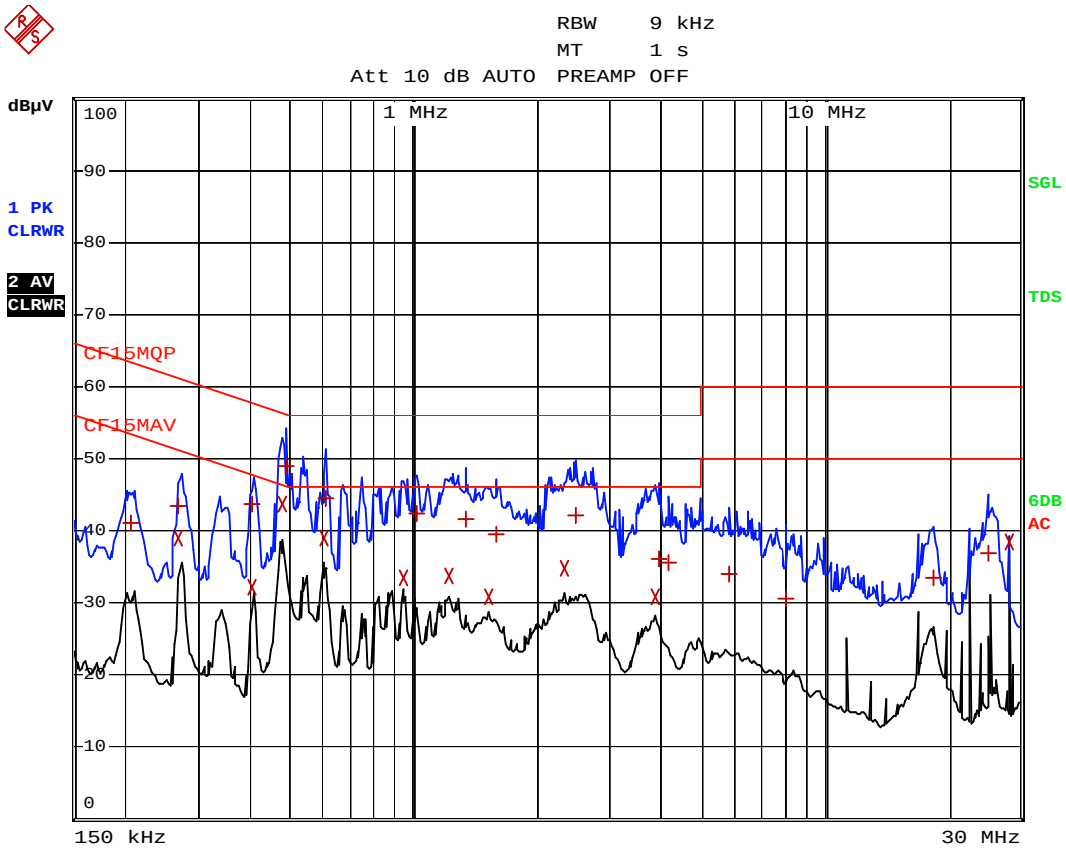
4.8 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

For the electronic filing, the above plots are saved with filename: timing.pdf

4.9 AC Line Conducted Emission, FCC Rule 15.207:

Phase:	Live / Neutral
Model No.:	BE2230
Worst Case:	Tx Mode



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Date: 23.SEP.2009 10:22:44

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	208.5 kHz	41.02	L1 gnd	-22.24
1	Quasi Peak	271.5 kHz	43.31	L1 gnd	-17.76
2	CISPR Average	271.5 kHz	39.06	N gnd	-12.00
1	Quasi Peak	402 kHz	43.64	L1 gnd	-14.16
2	CISPR Average	402 kHz	32.13	N gnd	-15.67
2	CISPR Average	478.5 kHz	43.72	N gnd	-2.63
1	Quasi Peak	487.5 kHz	48.91	N gnd	-7.29
2	CISPR Average	604.5 kHz	39.06	N gnd	-6.93
1	Quasi Peak	609 kHz	44.49	N gnd	-11.50
2	CISPR Average	942 kHz	33.52	N gnd	-12.47
1	Quasi Peak	1.0185 MHz	42.38	L1 gnd	-13.61
2	CISPR Average	1.2165 MHz	33.81	N gnd	-12.18
1	Quasi Peak	1.338 MHz	41.63	L1 gnd	-14.36
2	CISPR Average	1.527 MHz	30.72	N gnd	-15.27
1	Quasi Peak	1.59 MHz	39.54	L1 gnd	-16.45
2	CISPR Average	2.3325 MHz	34.88	N gnd	-11.11
1	Quasi Peak	2.4765 MHz	42.07	L1 gnd	-13.92
2	CISPR Average	3.858 MHz	30.75	N gnd	-15.25
1	Quasi Peak	3.9705 MHz	36.02	N gnd	-19.98
1	Quasi Peak	4.182 MHz	35.43	N gnd	-20.56

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Date: 23.SEP.2009 10:21:38

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	5.8425 MHz	34.07	N gnd	-25.92
1	Quasi Peak	8.061 MHz	30.63	N gnd	-29.36
1	Quasi Peak	18.348 MHz	33.36	L1 gnd	-26.63
1	Quasi Peak	25.1385 MHz	36.86	N gnd	-23.13
2	CISPR Average	28.23 MHz	38.33	N gnd	-11.66

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Date: 23.SEP.2009 10:22:02

4.10 Radiated Emissions, FCC Ref: 15.109/ RSS-210.2.3

Applicant: BELLMAN AND SYMFON EUROPE AB Date of Test: September 23, 2009
Model: BE2230
Worst-Case Operating Mode: Charging Mode

Data Table
Radiated Scan
Pursuant to FCC 15.109: Emissions Requirement

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	34.850	39.3	16	10.0	33.3	40.0	-6.7
V	38.950	38.5	16	10.0	32.5	40.0	-7.5
V	41.050	38.0	16	10.0	32.0	40.0	-8.0
V	45.705	37.7	16	10.0	31.7	40.0	-8.3
V	53.080	36.6	16	11.0	31.6	40.0	-8.4
H	58.405	36.0	16	11.0	31.0	40.0	-9.0

Notes: 1. Peak Detector Data.

2. Negative sign (-) in the margin column signify levels below the limit.

3. Only emissions significantly above equipment noise floor are reported.

Applicant: BELLMAN AND SYMFON EUROPE AB Date of Test: September 23, 2009
Model: BE2230
Worst-Case Operating Mode: RX Mode

Data Table
Radiated Scan
Pursuant to RSS-210: Emissions Requirement

Lowest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	2412.100	48.6	33	29.4	45.0	54.0	-9.0
H	4824.200	38.6	33	34.9	40.5	54.0	-13.5
H	7236.300	36.2	33	37.9	41.1	54.0	-12.9
H	9648.400	35.4	33	40.4	42.8	54.0	-11.2
H	12060.500	36.1	33	40.5	43.6	54.0	-10.4

Middle Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	2438.130	49.0	33	29.4	45.4	54.0	-8.6
H	4876.260	38.9	33	34.9	40.8	54.0	-13.2
H	7314.390	36.6	33	37.9	41.5	54.0	-12.5
H	9752.510	35.5	33	40.4	42.9	54.0	-11.1
H	12190.650	36.5	33	40.5	44.0	54.0	-10.0

Highest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	2464.100	45.6	33	29.4	45.4	54.0	-8.6
H	4928.200	40.6	33	34.9	40.8	54.0	-13.2
H	7392.300	41.7	33	37.9	41.5	54.0	-12.5
H	9856.400	42.4	33	40.4	42.9	54.0	-11.1
H	12320.500	43.8	33	40.5	44.0	54.0	-10.0

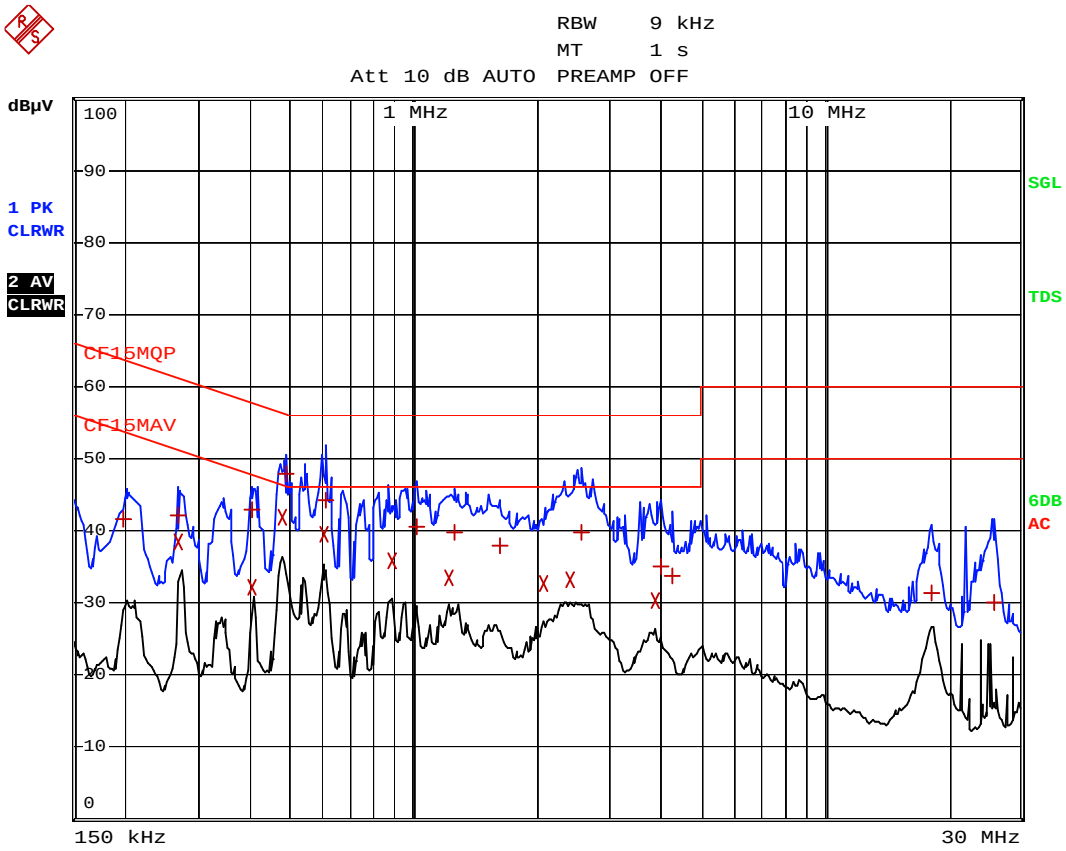
Notes: 1. Peak Detector Data.

2. Negative sign (-) in the margin column signify levels below the limit.

3. Only emissions significantly above equipment noise floor are reported.

4.11 AC Line Conducted Emission, FCC Rule 15.107/ RSS-Gen 7.2.2:

Phase:	Live / Neutral
Model No.:	BE2230
Worst Case:	Charging Mode



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Date: 23.SEP.2009 11:48:48

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	199.5 kHz	41.54	L1 gnd	-22.08
1	Quasi Peak	267 kHz	42.13	L1 gnd	-19.07
2	CISPR Average	271.5 kHz	38.57	N gnd	-12.49
1	Quasi Peak	402 kHz	42.95	L1 gnd	-14.85
2	CISPR Average	402 kHz	32.12	N gnd	-15.68
2	CISPR Average	478.5 kHz	41.95	N gnd	-4.40
1	Quasi Peak	487.5 kHz	47.78	N gnd	-8.42
2	CISPR Average	604.5 kHz	39.37	N gnd	-6.62
1	Quasi Peak	609 kHz	44.28	N gnd	-11.71
2	CISPR Average	883.5 kHz	35.71	N gnd	-10.28
1	Quasi Peak	1.0185 MHz	40.51	L1 gnd	-15.48
2	CISPR Average	1.2165 MHz	33.53	N gnd	-12.46
1	Quasi Peak	1.2615 MHz	39.87	N gnd	-16.12
1	Quasi Peak	1.6305 MHz	37.90	N gnd	-18.09
2	CISPR Average	2.0715 MHz	32.59	N gnd	-13.41
2	CISPR Average	2.409 MHz	33.26	N gnd	-12.73
1	Quasi Peak	2.5665 MHz	39.70	N gnd	-16.29
2	CISPR Average	3.858 MHz	30.43	N gnd	-15.56
1	Quasi Peak	4.002 MHz	34.90	N gnd	-21.09
1	Quasi Peak	4.2765 MHz	33.78	N gnd	-22.21

G15892B1

Date: 23.SEP.2009 11:48:03

EDIT PEAK LIST (Final Measurement Results)

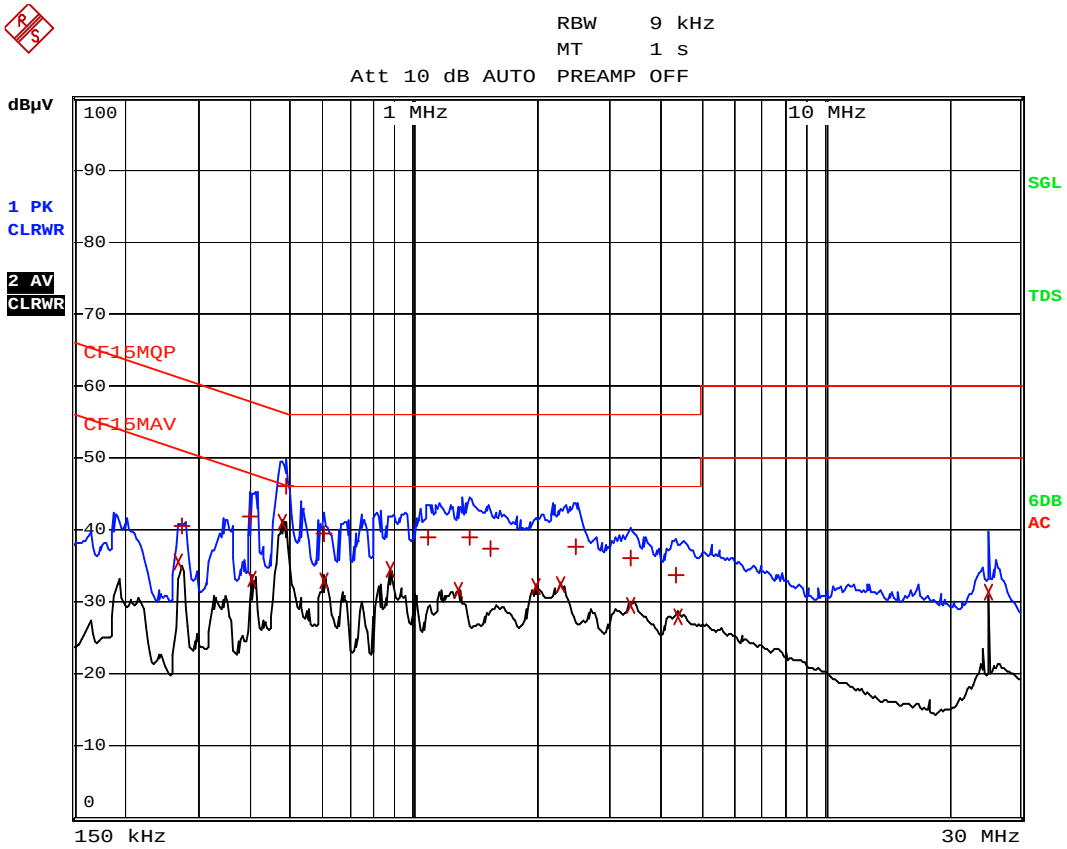
Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	18.2985 MHz	31.39	L1 gnd	-28.60
1	Quasi Peak	25.782 MHz	30.14	N gnd	-29.86

G15892B1

Date: 23.SEP.2009 11:48:24

Phase:	Live / Neutral
Model No.:	BE2230
Worst Case:	RX Mode



HK09071589-2 (G15892A2)

Date: 25.AUG.2009 18:52:44

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2	CISPR Average	271.5 kHz	35.45	L1 gnd	-15.61
1	Quasi Peak	276 kHz	40.50	L1 gnd	-20.43
1	Quasi Peak	397.5 kHz	41.99	N gnd	-15.91
2	CISPR Average	402 kHz	33.29	L1 gnd	-14.51
2	CISPR Average	478.5 kHz	41.12	L1 gnd	-5.24
1	Quasi Peak	487.5 kHz	46.14	L1 gnd	-10.07
1	Quasi Peak	600 kHz	39.41	L1 gnd	-16.58
2	CISPR Average	604.5 kHz	32.99	L1 gnd	-13.00
2	CISPR Average	879 kHz	34.50	L1 gnd	-11.49
1	Quasi Peak	1.086 MHz	38.96	L1 gnd	-17.03
2	CISPR Average	1.284 MHz	31.60	L1 gnd	-14.39
1	Quasi Peak	1.374 MHz	39.06	L1 gnd	-16.94
1	Quasi Peak	1.5315 MHz	37.39	L1 gnd	-18.61
2	CISPR Average	1.995 MHz	32.03	L1 gnd	-13.96
2	CISPR Average	2.283 MHz	32.41	L1 gnd	-13.58
1	Quasi Peak	2.481 MHz	37.63	L1 gnd	-18.36
2	CISPR Average	3.3765 MHz	29.60	L1 gnd	-16.40
1	Quasi Peak	3.3945 MHz	36.02	L1 gnd	-19.97
1	Quasi Peak	4.3755 MHz	33.79	L1 gnd	-22.21
2	CISPR Average	4.416 MHz	27.82	L1 gnd	-18.17

HK09071589-2 (G15892A2)

Date: 25.AUG.2009 18:52:23

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2 CISPR Average	24.999 MHz	31.35	N gnd	-18.64

HK09071589-2 (G15892A2)

Date: 25.AUG.2009 18:52:34

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

6.0 Product Labelling

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States and Canada.

9.0 Miscellaneous Information

The miscellaneous information includes details of the test procedure and calculation of factor such as averaging factor (calculation and timing diagram).

9.1 Calculation of Average Factor

The duty cycle is simply the on-time divided by the period:
The duration of one cycle = (0.4+2.12) ms
Effective period of the cycle = 100ms
DC = 8.954/ 100 = 0.08954

Therefore, the averaging factor is found by 20log(0.08954) = -20.96dB.

9.2 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2003. A typical or an unmodulated CW signal at the operating frequency of the EUT has been supplied to the EUT for all measurements. Such a signal is supplied by a signal generator and an antenna in close proximity to the EUT. The signal level is sufficient to stabilize the local oscillator of the EUT.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

9.2 **Emissions Test Procedures (cont'd)**

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements were made as described in ANSI C63.4 - 2003.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

10.0 **Confidentiality Request**

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: request.pdf.

11.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Biconical Antenna	Spectrum Analyzer
Registration No.	EW-0014	EW-0954	EW-2188
Manufacturer	R&S	EMCO	AGILENTTECH
Model No.	ESVS30	3104C	E4407B
Calibration Date	Jun. 01, 2009	Sep. 30, 2008	Dec. 18, 2008
Calibration Due Date	Jun. 01, 2010	Mar. 30, 2010	Dec. 18, 2009

Equipment	Double Ridged Guide Antenna	Log Periodic Antenna
Registration No.	EW-1015	EW-0446
Manufacturer	EMCO	EMCO
Model No.	3115	3146
Calibration Date	Jul. 28, 2008	Oct. 02, 2008
Calibration Due Date	Jan. 28, 2010	Apr. 02, 2010

2) Conducted Emissions Test

Equipment	EMI Test Receiver	Pulse Limiter	LISN
Registration No.	EW-2251	EW-0698	EW-0192
Manufacturer	R&S	R&S	R&S
Model No.	ESCI	ESH3-Z2	ESH3-Z5
Calibration Date	Oct. 28, 2008	Feb. 03, 2009	Nov. 12, 2008
Calibration Due Date	Oct. 28, 2009	Feb. 03, 2010	Nov. 12, 2009

3) 15.247 Test

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	ROHDESCHWARZ
Model No.	FSP30
Calibration Date	Jun. 25, 2009
Calibration Due Date	Jun. 25, 2010