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No. : HM162428

Applicant (MUE001): Musical Electronics Limited.

8/F., Wider Industrial Building, 58 Tsun Yip Street, Kwun

Tong, Kowloon, Hong Kong.

Manufacturer: Musical Electronics (Qing Yuan) Ltd.

Tai He Industrial Park, Qing Xin County, Qing Yuan, Quang

Dong, China

Description of Samples: Product: Outdoor Wireless Speaker – Outback

Brand Name: Rocketfish
Model Number: RF-WS02
FCC ID: AUISP707LRX

Date Samples Received: 2008-04-16, 2008-05-07, 2008-05-20

Date Tested: 2008-04-22 to 2008-05-22

Investigation Requested: Perform ElectroMagnetic Interference measurement in

accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2007 and ANSI C63.4:2003 for FCC Certification.

Conclusions: The submitted product COMPLIED with the requirements of

Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this

Test Report.

Remarks: ---

Dr. LEE Kam Chuen,
ElectroMagnetic Compatibility Department
For and on behalf of

The Hong Kong Standards and Testing Centre Ltd.



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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd. EMC Laboratory 10 Dai Wang Street, Taipo Industrial Estate New Territories, Hong Kong

1.2 Applicant Details Applicant

Musical Electronics Limited. 8/F., Wider Industrial Building, 58 Tsun Yip Street, Kwun Tong, Kowloon, Hong Kong.

Manufacturer

Musical Electronics (Qing Yuan) Ltd.

Tai He Industrial Park, Qing Xin County, Qing Yuan, Quang Dong, China



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1.3 Equipment Under Test [EUT] Description of Sample

Product: Outdoor Wireless Speaker – Outback
Manufacturer: Musical Electronics (Qing Yuan) Ltd.

Brand Name: Rocketfish
Model Number: RF-WS02
Input Voltage: 15Vd.c. 1200mA

The AC/DC Adaptor used for the tests was provided by the applicant with the following details: Two pins (Live / Neutral) only adaptor, Model Number: KSS24_150_1200U, Input: 100-

240Va.c. 50/60Hz 600mA, Output: 15Vd.c. 1200mA

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Musical Electronics Limited., OUTDOOR WIRELESS SPEAKER – OUTBACK, the transmission signal is within the 2.405-2.477GHz frequency range.

1.4 Date of Order

2008-04-16, 2008-05-07, 2008-05-20

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2008-04-22 to 2008-05-22

1.7 Country of Origin

N/A



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2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2007 Regulations and ANSI C63.4:2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary								
Test Condition	Test Requirement	Test Method	Class /	Test I	Result			
			Severity	Pass	Fail			
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.4:2003	N/A					
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A					

Note: N/A - Not Applicable



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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

Test Requirement: FCC 47CFR 15.249
Test Method: ANSI C63.4:2003
Test Date: 2008-05-22

Mode of Operation: Communication mode and Communication mode (spurious except

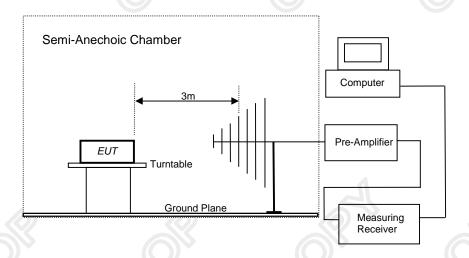
harmonics)

Test Method:

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

* Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:





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Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of	Field Strength of	Field Strength of		
Fundamental	Fundamental Emission	Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

Results of Communication mode (Tx mode - Lowest Channel Frequency): Pass

	Field Strength of Fundamental Emissions								
	Peak Value								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	uV/m	μV/m				
2405.0	55.8	29.1	84.9	17,579.2	500,000	Horizontal			
* 4810.0					500	Vertical			
7215.0					500	Vertical			
9620.0					500	Vertical			
* 12025.0					500	Vertical			
14430.0		No Emissio	on Detected		500	Vertical			
16835.0					500	Vertical			
* 19240.0					500	Vertical			
21645.0					500	Vertical			
24050.0					500	Vertical			

Field Strength of Fundamental Emissions								
Average Value								
Frequency	Measured Correction Field Field Limit @3m E-Field							
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	μ V/m	μV/m			
2405.0	42.2	29.1	71.3	3,672.8	50,000	Horizontal		

Remarks:

No further spurious emissions found between lowest internal frequency and 30MHz

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB 1GHz to 18GHz 5.1dB

^{*:} Denotes restricted band of operation.



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Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of	Field Strength of	Field Strength of		
Fundamental	Fundamental Emission	Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

Results of Communication mode (Tx mode - Mid Channel Frequency): Pass

	Field Strength of Fundamental Emissions								
	Peak Value								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBμV/m	dBμV/m	$dB\mu V/m$	uV/m	μV/m				
2441.0	61.2	29.3	90.5	33,496.5	500,000	Horizontal			
* 4882.0					500	Vertical			
7323.0					500	Vertical			
9764.0					500	Vertical			
* 12205.0					500	Vertical			
14646.0		No Emissio	on Detected		500	Vertical			
17087.0					500	Vertical			
* 19528.0					500	Vertical			
21969.0					500	Vertical			
24410.0					500	Vertical			

Field Strength of Fundamental Emissions								
Average Value								
Frequency	quency Measured Correction Field Field Limit @3m E-Field							
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	uV/m	μV/m	-		
2441.0	48.9	29.3	78.2	8,128.3	50,000	Horizontal		

Remarks:

No further spurious emissions found between lowest internal frequency and 30MHz

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB 1GHz to 18GHz 5.1dB

^{*:} Denotes restricted band of operation.



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Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of	Field Strength of	Field Strength of		
Fundamental	Fundamental Emission	Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

Results of Communication mode (Tx mode – Highest Channel Frequency): Pass

	Field Strength of Fundamental Emissions							
			Peak Value					
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field		
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	uV/m	μV/m	-		
2477.0	54.4	29.7	84.1	16,032.5	500,000	Horizontal		
* 4954.0					500	Vertical		
7431.0					500	Vertical		
9908.0				4	500	Vertical		
* 12385.0					500	Vertical		
14862.0		No Emissio	on Detected		500	Vertical		
17339.0	1				500	Vertical		
* 19816.0					500	Vertical		
22293.0					500	Vertical		
24770.0					500	Vertical		

Field Strength of Fundamental Emissions								
Average Value								
Frequency	cy Measured Correction Field Field Limit @3m E-Field							
	Level @3m	Factor	Strength	Strength		Polarity		
MHz	$dB\mu V/m$	$dB\mu V/m$	$dB\mu V/m$	$\mu V/m$	μV/m			
2477.0	41.1	29.7	70.8	3,467.4	50,000	Horizontal		

Remarks:

No further spurious emissions found between lowest internal frequency and 30MHz

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB 1GHz to 18GHz 5.1dB

^{*:} Denotes restricted band of operation.



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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]		
30-88	100		
88-216	150		
216-960	200		
Above960	500		

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Communication mode (Tx Spurious except harmonics): Pass

	Radiated Emissions									
	Quasi - Peak									
Emission	E-Field	Level	Limit	Level	Limit					
Frequency	Polarity	@3m	@3m	@3m	@3m					
MHz		dBμV/m	dBμV/m	μV/m	$\mu m V/m$					
36.1	Vertical	28.6	40.0	26.9	100					
92.7	Vertical	41.2	43.5	114.8	150					
117.2	Vertical	41.3	43.5	116.1	150					
557.2	Vertical	39.8	46.0	97.7	200					
641.3	Vertical	39.2	46.0	91.2	200					
890.3	Vertical	42.6	46.0	134.9	200					

Results of Communication mode (Rx Spurious except harmonics): Pass

Radiated Emissions Quasi - Peak						
Emission	E-Field	Level	Limit	Level	Limit	
Frequency	Polarity	@3m	@3m	@3m	@3m	
MHz		dBμV/m	dBμV/m	$\mu V/m$	$\mu V/m$	
36.1	Vertical	28.6	40.0	26.9	100	
92.7	Vertical	41.2	43.5	114.8	150	
117.2	Vertical	41.3	43.5	116.1	150	
557.2	Vertical	39.8	46.0	97.7	200	
641.3	Vertical	39.2	46.0	91.2	200	
890.3	Vertical	42.6	46.0	134.9	200	

Remarks:

No further spurious emissions found between lowest internal frequency and 30MHz

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB



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3.2 Conducted Emissions (0.15MHz to 30MHz)

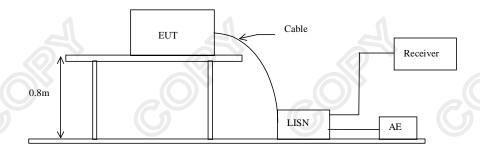
Test Requirement: FCC 47CFR 15.107
Test Method: ANSI C63.4:2003
Test Date: 2008-04-22

Mode of Operation: Communication mode with charging function

Test Method:

The test was performed in accordance with ANSI C63.4: 2003, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:





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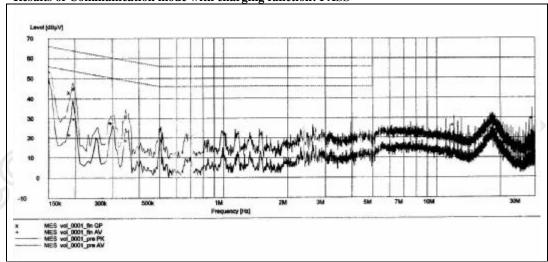
Limit for Conducted Emissions (FCC 47 CFR 15.107):

	Frequency Range	Quasi-Peak Limits	Average	
	[MHz]	[dBµV]	[dBµV]	
	0.15-0.5	66 to 56*	56 to 46*	
7	0.5-5.0	56	46	
	5.0-30.0	60	50	

^{*} Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Communication mode with charging function: PASS



Remarks:

Calculated measurement uncertainty: 3.97dB

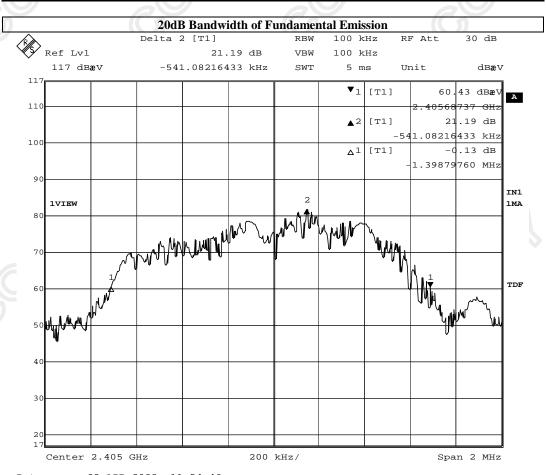


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Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range	20dB Bandwidth
[GHz]	[MHz]
2.405	1.399



Date: 23.APR.2008 11:54:46

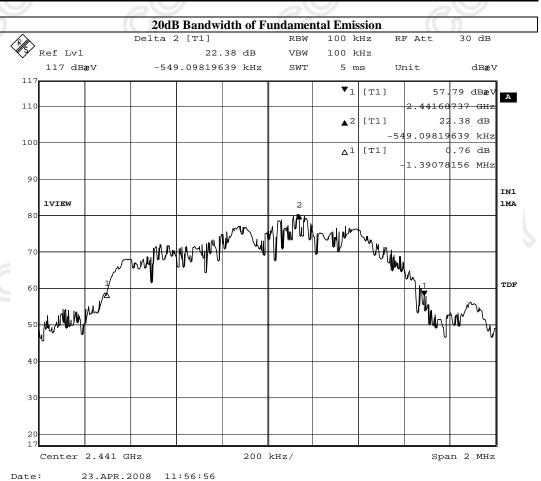


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Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range	20dB Bandwidth
[GHz]	[MHz]
2.441	1.391



Date: 23.APR.2008 11:56:56

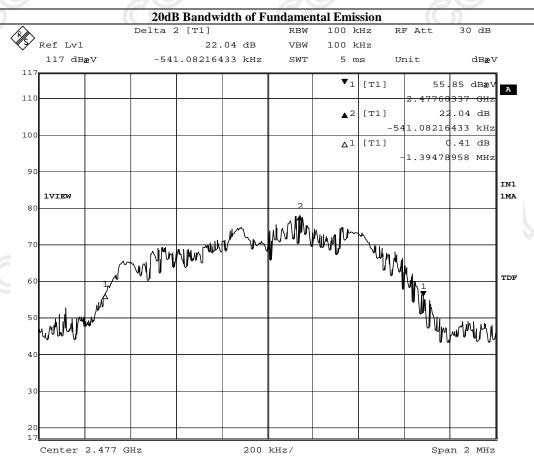


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Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range	20dB Bandwidth		
[GHz]	[MHz]		
2.477	1.395		



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Appendix A

List of Measurement Equipment

Radiated Emission

Radiated Emission						
EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM020	HORN ANTENNA	EMCO	3115	4032	2006/07/11	2009/07/11
EM215	MULTIDEVICE CONTROLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3		2006/05/02	2009/05/02
EM174	BICONILOG ANTENNA	EMCO	3142C	00029071	2008/01/24	2009/01/24
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2008/06/16	2009/06/16
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2006/07/26	2009/07/26

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM197	LISN	EMCO	4825/2	1193	2007/10/30	2009/10/30
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2008/06/16	2009/06/16
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057- 99A	2008/01/23	2009/01/23

Remarks:-

CM Corrective Maintenance

N/A Not Applicable or Not Available

TBD To Be Determined



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Appendix B

Photographs of EUT

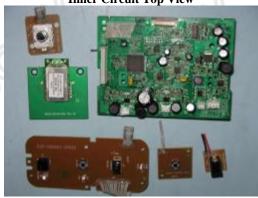
Front View of the product



Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View





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Photographs of EUT





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Photographs of EUT



***** End of Test Report *****