STC Test Report

Date: 2006-09-08

No.: HM157164

Applicant: SUPERSONICS ELECTRIC COMPANY
PHASE II, BLOCK C, 4TH FLOOR, GEE CHANG IND. BLDG., 108 LOK SHAN ROAD, KOWLOON, HONG KONG.

Description of Samples:

Model name:	LIGHTRONIX STAGE MIKE
Model no.:	88020
Brand name:	KAWASAKI
FCC ID:	II680020

Date Samples Received: 2006-08-02, 2006-08-14, 2006-09-05

Date Tested: 2006-08-16 to 2006-09-06

Investigation Requested: FCC Part 15 Subpart C

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: For additional models details, see page 5.

TSANG Chi Ho, Steven, EMD
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

CONTENT:

Appendix A

Appendix B

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

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

SUPERSONICS ELECTRIC COMPANY
PHASE II, BLOCK C, 4TH FLOOR, GEE CHANG IND. BLDG.,
108 LOK SHAN ROAD, KOWLOON, HONG KONG.

Manufacturer

Supersonics Electronics Toys (Shenzhen) Co., Ltd.
BLOCK 1 & 2, XIN TIAN VILLAGE, XIN FENG IND. AREA,
GUAN LAN, BAO AN, SHENZHEN, CHINA

1.3 Equipment Under Test [EUT]

Description of Sample

Model Name:	LIGHTRONIX STAGE MIKE
Manufacturer:	Supersonics Electronics Toys (Shenzhen) Co., Ltd.
Brand Name:	KAWASAKI
Model Number:	88020
Additional Model Number:	80020
Additional Brand Name	NIL
Input Voltage:	3Vd.c. (“AA” size battery x 2)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a SUPERSONICS ELECTRIC COMPANY, LIGHTRONIX STAGE MIKE. The transmitter is a voice transmitter; The EUT continues to transmit while trigger is being pressed. It is voice transmitter, modulation by microphone and type is frequency modulation.

1.4 Date of Order

2006-08-02, 2006-08-14, 2006-09-05

1.5 Submitted Sample(s):

3 Samples per model

1.6 Test Duration

2006-08-16 to 2006-09-06

1.7 Country of Origin

CHINA

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2005 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 / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.239	ANSI C63.4:2003	N/A	☒	☐	☐
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:2003	Class B	☒	☐	☐
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	Class B	☐	☐	☒

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

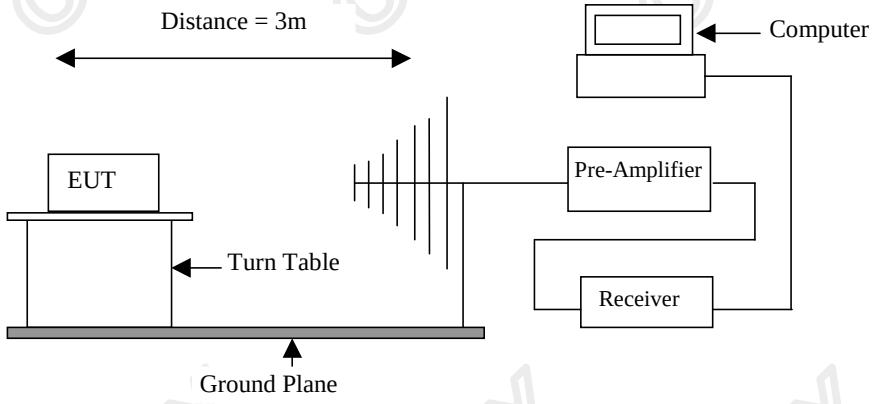
Test Requirement:	FCC 47CFR 15.239
Test Method:	ANSI C63.4:2003
Test Date:	2006-09-06
Mode of Operation:	Tx mode

Test Method:

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. 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.

*: On a standard radiated emission test site located at HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90657 or 607756.

Test Setup:



Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of Fundamental [MHz]	Peak Limits [μV/m]	Average Limits [μV/m]
88-108	2,500	250

Results of Tx mode (Low) : PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
99.99	26.30	9.5	35.8	61.7	2,500	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
99.99	25.70	9.5	35.2	57.5	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

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

Frequency Range [MHz]	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 Tx mode (Low): PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
199.98	< 1.0	10.9	< 11.9	< 3.9	150	Vertical
299.97	< 1.0	14.0	< 15.0	< 5.6	200	Vertical
399.96	< 1.0	17.5	< 18.5	< 8.4	200	Vertical
499.95	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
599.93	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
699.92	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
799.91	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
899.90	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
999.89	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of Fundamental [MHz]	Peak Limits [μV/m]	Average Limits [μV/m]
88-108	2,500	250

Results of Tx mode (High): PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
100.03	25.60	9.5	35.1	56.9	2,500	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
100.03	25.00	9.5	34.5	53.1	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

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

Frequency Range [MHz]	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 Tx mode (High): PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Field Strength dBµV/m	Field Strength µV/m	Limit @3m µV/m	E-Field Polarity
200.06	< 1.0	11.3	< 12.3	< 4.1	150	Vertical
300.09	< 1.0	14.8	< 15.8	< 6.2	200	Vertical
400.12	< 1.0	18.4	< 19.4	< 9.3	200	Vertical
500.15	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
600.17	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
700.20	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
800.23	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
900.26	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
1000.29	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

3.1.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2003
Test Date:	N/A
Mode of Operation:	N/A

Results: N/A

The EUT is operated by a single source of car battery power, therefore power line conducted emission was deemed unnecessary.

3.2 20B Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.227
Test Method:	ANSI C63.4:2003 (Section 13.1.7)
Test Date:	2006-09-06
Mode of Operation:	Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

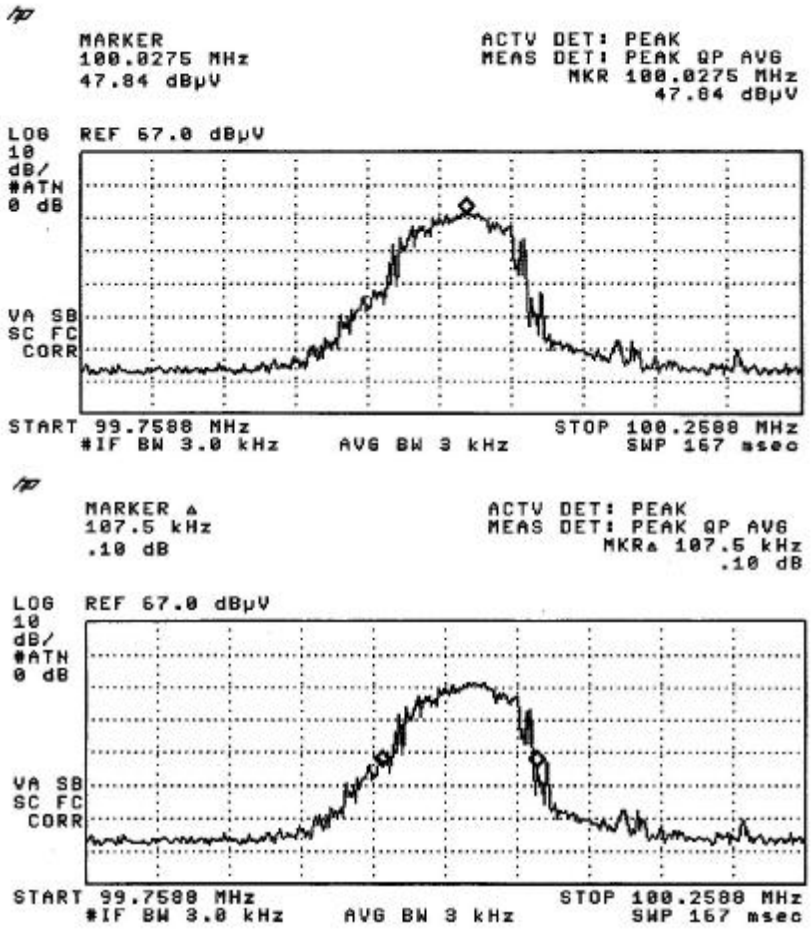
Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
100.02975	107.5	200

Result:

The following figure is the measured bandwidth of Fundamental Emission.

20dB Bandwidth of Fundamental Emission



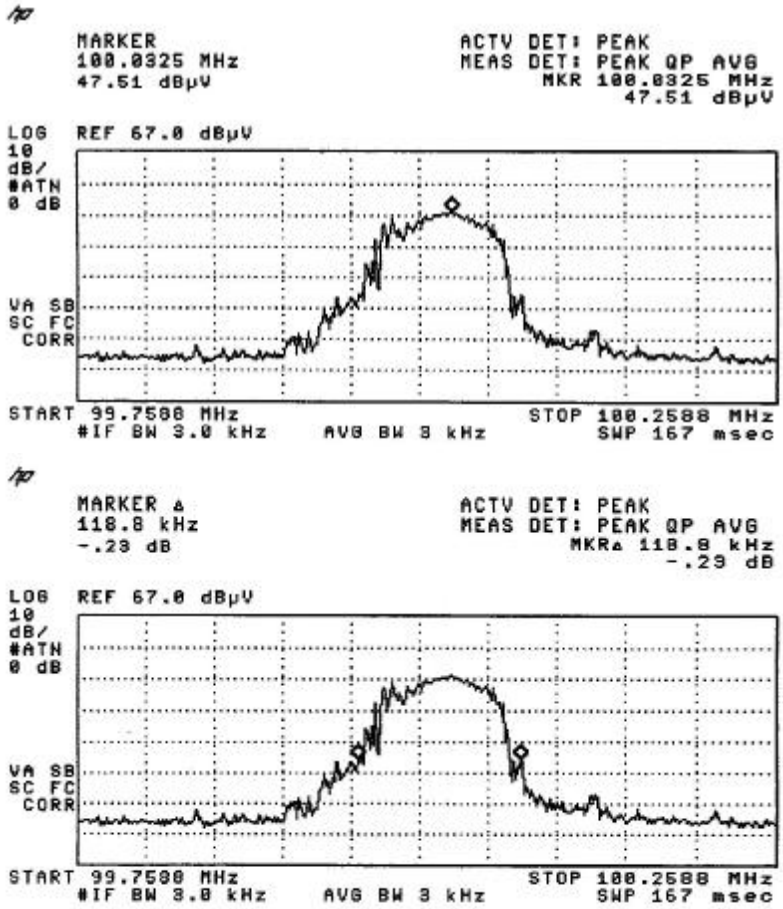
Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
100.0325	118.8	200

Result:

The following figure is the measured bandwidth of Fundamental Emission.

20dB Bandwidth of Fundamental Emission



Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	2005/06/27
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	2005/06/27
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	2005/06/27
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	2005/06/27
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	2005/06/27
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	2005/06/27
EM020	HORN ANTENNA	ETS-Linggren	3115	4032	2003/07/30
EM022	LOOP ANTENNA	ETS-Linggren	6502	1189-2424	2003/09/19
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	OPEN AREA TEST SITE	HKSTC	N/A	N/A	2005/12/08
EM131	EMC ANALYZER	HEWLETT PACKARD	8595EM	3710A00155	2006/03/29
EM145	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS 30	830245/021	2004/10/04
EM195	ANTENNA POSITIONING MAST	ETS-Linggren	2075	2368	N/A
EM196	MULTI-DEVICE CONTROLLER	ETS-Linggren	2090	1662	N/A
EM215	MULTIDEVICE CONTROLER	ETS-Linggren	2090	00024676	N/A
EM216	MINI MAST SYSTEM	ETS-Linggren	2075	00026842	N/A
EM217	ELECTRIC POWERED TURNTABLE	ETS-Linggren	2088	00029144	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	2006/05/02
EM219	BICONILOG ANTENNA	ETS-Linggren	3142C	00029071	2006/02/01
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2005/02/04

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A	CM
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A	2006/01/12
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	2004/10/14
EM127	ISOLATION TRANSFORMER 220 TO 300V	WING SUN	N/A	N/A	CM
EM233	PULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	100314	2006/01/09
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2006/03/17
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2006/01/12
EM197	LISN	ETS-Linggren	4825/2	1193	2005/06/27
EM213	DIGITAL POWER METER	VICNOBL	VIP120	00277	2004/09/14

Remarks:-

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined

Appendix B

Photographs of EUT

Front View of the product

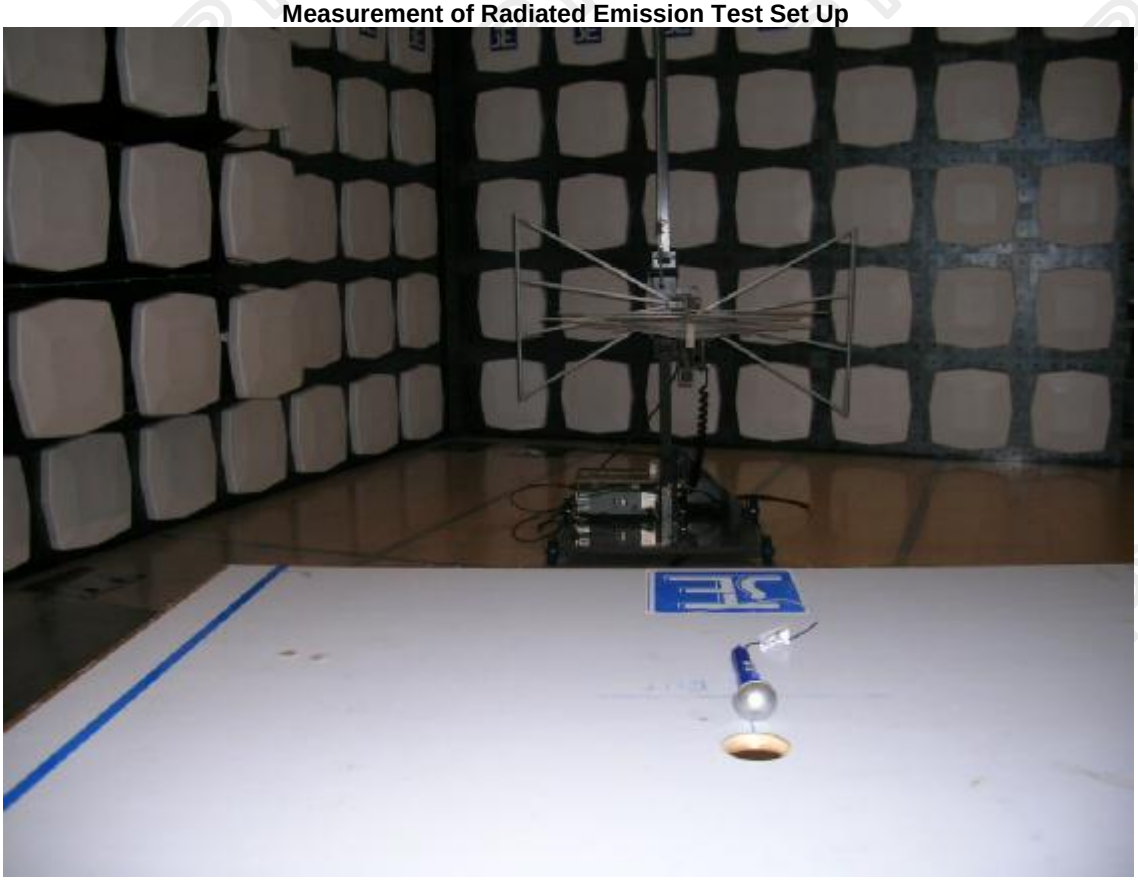
Rear View of the product

Front View of the product

Rear View of the product

Photographs of EUT

Measurement of Radiated Emission Test Set Up



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