SGS-CSTC Standards Technical Services Ltd.

No.198 Kezhu Road, Science Town Economic& Technology Development District
Guangzhou, China 510663
FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

FCC TEST REPORT

Application No. : GLEMO060400965AV

Applicant : International SMC (HK) Ltd.

FCC ID : QNISMM-107AB

Assigned Frequency : 171.905MHz(SMM-107A) , 171.105MHz(SMM-107B)

Equipment under Test (EUT):

Name : Wireless Microphone

Model : SMM-107A / SMM-107B

Emission Designator : 75K0F3E

Standards : FCC PART 90.217& 2.1047

Date of Receipt : 30 June 2006

Date of Test : 11 May to 30 June 2006

Date of Issue : 30 June 2006

Test Result :	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jerry Chen
Manager

2 Test Summary

Test	Test Requirement	Stanadard Paragraph	Result
Output Power	FCC PART 90	Section 90.265(b)	PASS
Radiated Spurious Emission	FCC PART 90	Section 90.217	PASS
Occupied Bandwidth	FCC PART 90	Section 90.265(b)	PASS
Frequency Stability	FCC PART 90	Section 90.265(b)	PASS
Modulation Characteristics	FCC PART 2	Section 2.1047	PASS

3 Contents

4 General Information

4.1 Client Information

Applicant:	International SMC (HK) Ltd.
Address of Applicant:	Suite 1210,Ocean Centre,5 Canton Road,TST,HK

4.2 Details of E.U.T.

Product Name:	Wireless Microphone
Model:	SMM-107A
Power Supply:	9.0Vdc (1 x '6F22' Size Batteries).

4.3 Description of Support Units

The EUT was tested as an independent unit: a 171.905MHz radio transmitter.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

4.5 Other Information Requested by the Customer

None.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0. Effective through December 31, 2006.

- **ACA**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **VCCI**

  The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.

  Date of Registration:June 01, 2005. Valid until February 22, 2008

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAL – LAB Code: L0141**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.

- **FCC – Registration No.: 282399**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorised test laboratory for the DoC process.

- **Industry Canada (IC)**

  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5169.

5 Test Results

5.1 Test Instruments

No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (dd-mm-yy)	Cal.Duedate (dd-mm-yy)
1	Temperature Chamber	TERCHY	MHG-800RR	0118	05-12-2005	05-12-2006
2	D.C. Power Supply	Instek	PS-3030	9862036	Check when used	
3	DMM	Fluke	73	70681569 or 70671122	12-09-2005	12-09-2006
4	Impact 3m Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	06-03-2006	06-03-2007
5	Biconical Antenna (Rx)	Rohde & Schwarz	HK116	100032	30-01-2006	30-01-2007
6	Biconical Antenna (Tx)	Rohde & Schwarz	HK116	100033	10-05-2006	09-05-2007
7	Log-Perd. Dipole Antenna (Rx)	Rohde & Schwarz	HL223	100039	11-06-2006	10-06-2007
8	Log-Perd. Dipole Antenna (Tx)	Rohde & Schwarz	HL223	100040	10-05-2006	09-05-2007
9	Horn Antenna (Rx)	Rohde & Schwarz	HF906	100095	11-06-2006	10-06-2007
10	Horn Antenna (Tx)	Rohde & Schwarz	HF906	100096	10-06-2006	09-06-2007
11	Bilog Type Antenna	Schaffner Chase	CBL6143	5070	14-01-2006	13-01-2007
12	Bilog Type Antenna	Schaffner Chase	CBL6112B	2966	31-10-2005	31-10-2006
13	0.1-1300 MHz Pre Amplifier	HP	8447D OPT 010	2944A06252	16-01-2006	16-01-2007
14	1-26.5GHz Pre Amplifier	Agilent	8449B	3008A01649	06-03-2006	06-03-2007
15	Antenna Mask (Tx)	HD-GmbH	AS620M	620/408	06-03-2006	06-03-2007
16	Antenna Mask (Rx)	HD-GmbH	MA240	240/619	N/A	N/A
17	Turntable	HD-GmbH	DT430	EMC0509	N/A	N/A
18	Turntable & Antenna Mask Controller	HD-GmbH	HD100	EMC0510	N/A	N/A
19	EMI Test Software	Rohde & Schwarz	ES-K1	EMC0512	N/A	N/A
20	Coaxial cable	Rohde & Schwarz	N/A	EMC0511	N/A	N/A
21	Coaxial cable	Rohde & Schwarz	N/A	EMC0514	04-11-2005	03-11-2006
22	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	04-11-2005	03-11-2006
23	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2005	05-12-2006
24	Signal Generator	Rohde & Schwarz	SMR20	100416	05-12-2005	05-12-2006
25	Radio Communication Monitor	Rohde & Schwarz	CMS54	100137	05-12-2005	05-12-2006
26	Power Meter	Rohde & Schwarz	NRVS	825770/074	20-12-2005	20-12-2006
27	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	18-07-2005	18-07-2006

28	Dual Directional Coupler	Werlatone Inc.	C1795	6634	18-07-2005	18-07-2006
29	Audio Analyzer	Rohde & Schwarz	UPL	100855	16-08-2005	16-08-2006
30	Digital Oscilloscope	Tektronix	TDS3012	B015508	16-08-2005	16-08-2006
31	Temp. Humidity	Shenzhen Tai Kong	THG-1	EMC0054	04-01-2006	04-01-2007

5.2 E.U.T. Operation

Operating Environment:

Temperature:	22~27 °C
Humidity:	46~58 % RH
Atmospheric Pressure:	995~1003 mbar

5.3 Test Procedure & Measurement Data

5.3.1 Carrier Radiated Power & Radiated Spurious Emissions

Test Requirement:	FCC Part 90.217(a) & (e)
Test Method:	ANSI C63.4
Test Date:	2 June 2006

Test Requirement:

90.217(a) For equipment designed to operate with a 25 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 40 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier.

(e) Transmitters used for wireless microphone operations and operating on frequencies allocated for Federal use must comply with the requirements of §90.265(b).

Test Procedure: The procedure uesd was ANSI Standard C63.4-2003. The receive was scanned from 30MHz to 5.0GHz.When an emission was found,the table was roated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier . The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the Carrier Radiated Power and spurious emissions were measured by the substitution.

Test Result:

Carrier Frequency	Factual Level	Limit in 90.265(b)
171.903 MHz	-27 dBm(i.e. 0.002mW)	17 dBm (i.e. 50 mW)

Spurious Emission Frequency (MHz)	Factual Level (dBm)		Limits (dBm)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
57.301	-58.0	-65.0	-57.0	1.0	8.0
114.603	-62.0	-74.0	-57.0	5.0	17.0
229.204	-58.0	-60.0	-57.0	1.0	3.0
286.504	-58.0	-60.0	-57.0	1.0	3.0
343.804	-59.0	-61.0	-57.0	2.0	4.0

TEST RESULTS: The unit does meet the FCC requirements.

5.3.2 Occupied Bandwidth

Test Requirement:	FCC Part 90.265(b) & 90.210(c)
Test Method:	ANSI C63.4 & FCC Part 2.1049
Test Date:	8 June 2006

Requirements:

90.265(b)(1) The emission bandwidth shall not exceed 54 kHz.

Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable.

90.210(b) *Emission Mask B.* For transmitters that are equipped with an audio lowpass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth:At least 43 + 10 log (P) dB.

Test procedure: Input 1000Hz signal to the microphone, find the 50% rated deviation,keep the level , tune the signal to 2500KHz, add the level 16dB, test this status the 20dB occupied bandwidth and record it.

The results: The unit does meet the FCC requirements.

Please refer the following curve and plots.

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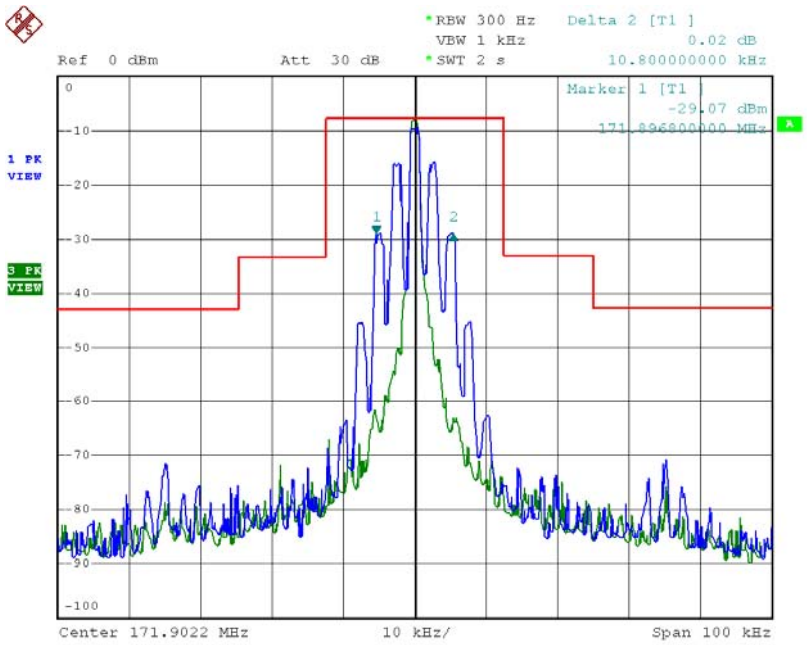


5.3.3 Frequency Stability

Test Requirement:	FCC 90.265(b)
Test Method:	ANSI C63.4 & FCC Part 2.1055
Test Date:	29 May 2006
Requirements:	90.265(b)(3) The frequency stability of wireless microphones shall limit the total emission to within ±32.5 kHz of the assigned frequency.

Test Procedure:

Frequency stability versus environmental temperature

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feedthrough attenuators. The EUT was placed inside the temperature chamber. After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

Frequency Stability versus Input Voltage

At room temperature (25±5°C), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

Test Result

Assigned Frequency: 171.905 MHz, Limit: total emission within +/- 32.5KHz of the assigned frequency.		
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed Total emission within KHz
50	9.0	- 4.2
40	9.0	- 3.8
30	9.0	- 2.6
20	9.0	- 1.9
10	9.0	- 1.0
0	9.0	- 0.2
-10	9.0	+ 0.6
-20	9.0	+ 0.8
-30	9.0	+ 1.2

Assigned Frequency: 171.045 MHz, Limit: total emission within +/- 32.5KHz of the assigned frequency		
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed Total emission within Max KHz
20	9.0	-1.9
20	7.55	-2.0
20	7.2	-2.1
20	6.8	-2.5
20	5.4	-3.0

Battery end point: 5.4Vdc

The results: The unit does meet the FCC requirements.

5.3.4 Modulation Characteristics

Test Requirement: FCC2.1047

Test Method: FCC2.1047

Test Date: 29 May 2006

5.3.4.1 Audio Frequency Response

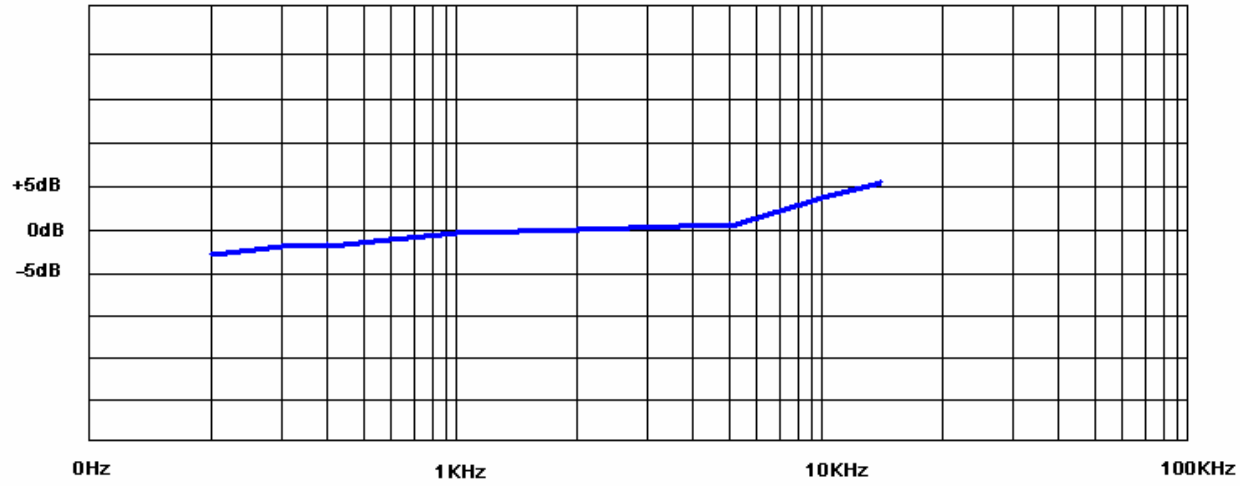
Test Procedure:

The RF output of the transceiver was connected to the input of FSP 30 with FM deviation module through sufficient attenuation so as not to overload the meter or distort the reading. An audio signal generator was connect to the audio input of microphone.

The audio signal input level was adjusted to obtain 20% of the maximum rated system deviation at 1 kHz, and recorded as DEV_{REF}. With the audio signal generator level unchanged, set the generator frequency between 100 Hz to 15000 Hz. The transmitter deviations (DEV_{FREQ}) were measured and the audio frequency response was calculated as 20log10 [DEV_{FREQ} / DEV_{REF}]

Test result:

The plot(s) of Aduio Frequency Response is presented hereinafter as reference.



0dB= 12mV, Frequency of Maximum Aduio Response , Hz =15000

Additional points:

Frequency(Hz)	Audio Response(dB)
100	-2.4
300	-1.3
500	-1.0
1000	0
2000	0.3
5000	1.2
10000	3.8
15000	5.3

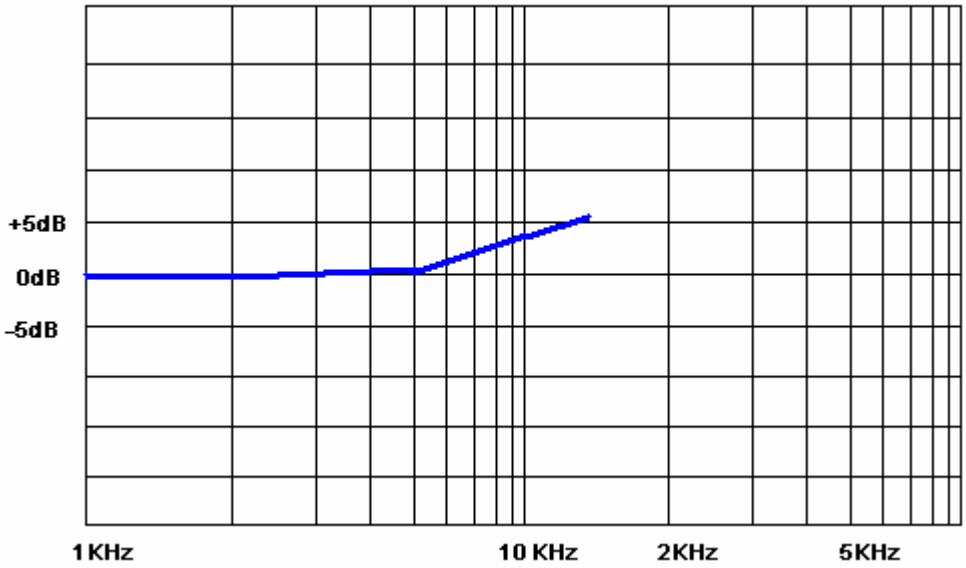
5.3.4.2 Audio Low-Pass Filter Response

An audio signal generator and FSP 30 with FM deviation module were connected to the input and output of the post limiter low pass filter respectively. The audio signal generator frequency was set between 1000 Hz and 15000Hz. The level corresponding to1000Hz was recorded as $LEV_{REF.}$ The audio frequency response (LEV_{FREQ}) at test frequency was calculated as:

$LEV_{FREQ} - LEV_{REF}$

Test result:

The plot(s) of Aduio Frequency Response is presented hereinafter as reference.



5.3.4.3 Modulation Limiting

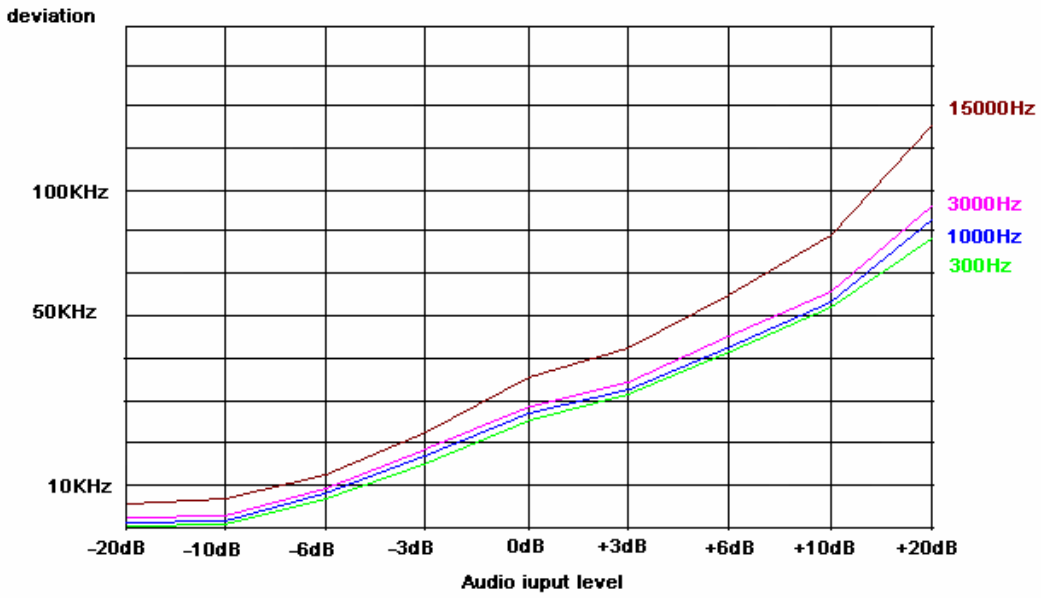
Test Procedure:

With the same setup as above, at four different modulating frequencies (300Hz , 1KHz , 3KHz ,15KHz) (one of which was the frequency of maximum response,here is 15KHz), , the output level of the audio generator was varied and the FM deviation level was recorded.

Test result:

0dB=18mV

1. Positive peak deviation



2. Negative peak deviation