

Date: 2000-06-12

TEST REPORT

Page 1 of 20

No.: HM102299

FCC PART 15 SUBPART C CERTIFICATION REPORT

FOR LOW POWER TRANSMITTER

TEST REPORT No.: HM102299

Equipment Under Test [EUT]:
Model Number:
Applicant:
FCC ID :

Wireless FM Microphone Trasmitter
12706VC
Rising Sun Industrial Company
N8F12706VC

Date: 2000-06-12

TEST REPORT

Page 2 of 20

No.: HM102299

CONTENT:

Cover
Content
Conclusion

Page 1 of 20
Page 2-3 of 20
Page 4 of 20

1.0 General Details

1.1	Test Laboratory	Page 5 of 20
1.2	Applicant Details Applicant HKSTC Code Number for Applicant Manufacturer	Page 5 of 20
1.3	Equipment Under Test [EUT] Description of EUT operation	Page 6 of 20
1.4	Date of Order	Page 6 of 20
1.5	Submitted Sample	Page 6 of 20
1.6	Test Duration	Page 6 of 20
1.7	Country of Origin	Page 6 of 20
1.8	Additional Information of EUT	Page 7 of 20

2.0 Technical Details

2.1	Investigations Requested	Page 8 of 20
2.2	Test Standards and Results Summary	Page 8 of 20

3.0 Test Results

3.1	Emission	Page 9-14 of 20
3.2	Bandwidth Measurement	Page 15-17 of 20

Date: 2000-06-12

TEST REPORT

Page 3 of 20

No.: HM102299

Appendix A

List of Measurement Equipment

Page 18 of 20

Appendix B

Photographs

Page 19-20 of 20

Date: 2000-06-12

TEST REPORT

Page 4 of 20

No.: HM102299

CONCLUSION

The submitted product was deemed to have 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.

Law Man Kit

Testing Engineer

Steven Tsang

Verify by

Patrick Wong

Patrick Wong
for Managing Director

Date: 2000-06-12

TEST REPORT

Page 5 of 20

No.: HM102299

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**

Rising Sun Industrial Company
5/F., Koon Wah Mirror Fty. (3rd) Bldg.,
5-9 Ka Hing Road, Kwai Chung, N.T., Hong Kong.

Telephone: 852 24011286
Fax: 852 24948569

HKSTC Code Number for Applicant

RIS001

Manufacturer

Rising Sun Industrial Company
5/F., Koon Wah Mirror Fty. (3rd) Bldg.,
5-9 Ka Hing Road, Kwai Chung, N.T., Hong Kong.

Telephone: 852 24011286
Fax: 852 24948569

Date: 2000-06-12

TEST REPORT

Page 6 of 20

No.: HM102299

1.3 Equipment Under Test [EUT] Description of Sample

Product:	Wireless FM Microphone Transmitter
Manufacturer:	Rising Sun Industrial Company
Brand Name:	N/A
Model Number:	12706VC
Input Voltage:	9Vd.c ("6F22" size battery x 1)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is an Rising Sun Industrial Ltd., 97.37-106.645MHz Wireless FM Microphone Transmitter. The EUT continues to transmit while switch on. It is voice transmission, Modulation by Mic. and tape is frequency modulation.

1.4 Date of Order

2000-03-08

1.5 Submitted Sample(s):

4 Samples per model

1.6 Test Duration

2000-06-10

1.7 Country of Origin

China

1.8 Additional Information of EUT

	Submitted	Not Available
User Manual	☒	☐
Part List	☒	☐
Circuit Diagram	☒	☐
Printed Circuit Board [PCB] Layout	☒	☐
Rating Label	☒	☐
Block diagram	☒	☐
FCC ID Label	☒	☐

Date: 2000-06-12

TEST REPORT

Page 8 of 20

No.: HM102299

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.4:1992 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 C63.4:1992	N/A	☒	☐	☐
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:1992	Class B	☒	☐	☐
Conducted Emissions on AC, 0.45MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:1992	Class B	☐	☐	☒

Note: N/A - Not Applicable

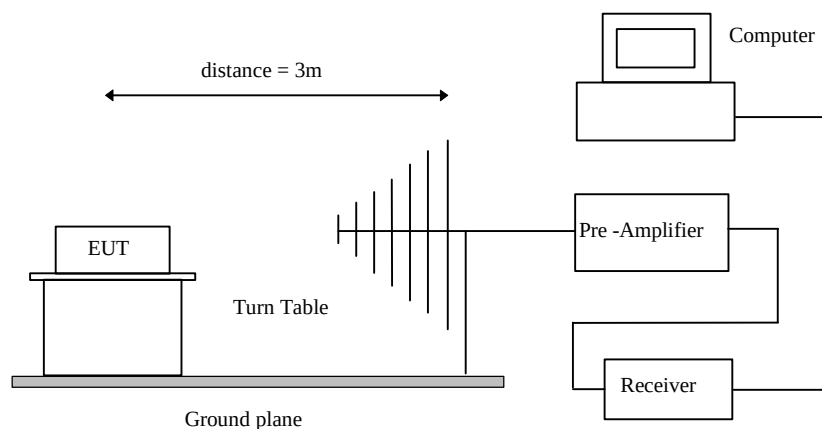
3.0 Test Results**3.1 Emission****3.1.1 Radiated Emissions**

Test Requirement:	FCC 47CFR 15.239 & 15.209
Test Method:	ANSI C63.4:1992
Test Date:	2000-06-10
Mode of Operation:	On mode

Test Method:

The sample was placed 0.8m above the ground plane on the OATS *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigate all operating modes, rotated about all 3 axis (X, Y & Z) 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.

*: OATS [Open Area Test Site] located at HKSTC with a metal ground plane on filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90657.

Test Setup:

Date: 2000-06-12

TEST REPORT

Page 10 of 20

No.: HM102299

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:

Field Strength of Fundamental Emissions Peak Value						
Frequency	Level @3m	Correction Factor	Field Strength	Field Strength	Limit ** @3m	Antenna Polarity
MHz	dBμV	dB/m	dBμV/m	μV/m	μV/m	
105.9	40.2	12.3	52.5	421.7	2,500.0	Vertical

Field Strength of Fundamental Emissions Peak Value						
Frequency	Level @3m	Correction Factor	Field Strength	Field Strength	Limit ** @3m	Antenna Polarity
MHz	dBμV	dB/m	dBμV/m	μV/m	μV/m	
106.6	34.5	12.3	46.8	218.8	2,500.0	Vertical

Field Strength of Fundamental Emissions Peak Value						
Frequency	Level @3m	Correction Factor	Field Strength	Field Strength	Limit ** @3m	Antenna Polarity
MHz	dBμV	dB/m	dBμV/m	μV/m	μV/m	
97.4	31.7	11.8	43.5	149.6	2,500.0	Vertical

Date: 2000-06-12

TEST REPORT

Page 11 of 20

No.: HM102299

Results:

Field Strength of Fundamental Emissions Average Value *						
Frequency	Level @3m	Correction Factor	Field Strength	Field Strength	Limit ** @3m	Antenna Polarity
MHz	dBμV	dB/m	dBμV/m	μV/m	μV/m	
105.9	30.4	12.3	42.7	136.5	250.0	Vertical

Field Strength of Fundamental Emissions Average Value *						
Frequency	Level @3m	Correction Factor	Field Strength	Field Strength	Limit ** @3m	Antenna Polarity
MHz	dBμV	dB/m	dBμV/m	μV/m	μV/m	
106.6	25.3	12.3	37.6	75.9	250.0	Vertical

Field Strength of Fundamental Emissions Average Value *						
Frequency	Level @3m	Correction Factor	Field Strength	Field Strength	Limit ** @3m	Antenna Polarity
MHz	dBμV	dB/m	dBμV/m	μV/m	μV/m	
97.4	20.8	11.8	32.6	42.7	250.0	Vertical

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty = 30MHz to 300MHz ±3.7dB
300MHz to 1GHz +3.0dB / -2.7dB

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.

For effective averaging, the bandwidth of the video filter must be smaller than the resolution bandwidth. The higher the ratio of resolution bandwidth to video bandwidth, the greater the averaging will be. Below setting for HP8572A EMI Receiver.

Resolution Bandwidth = 3MHz
Video Bandwidth 1Hz

No.: HM102299

TEST REPORT

Page 12 of 20

Limited 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:

Radiated Emissions						
Quasi-Peak						
Frequency	Level	Correction	Field	Field	Limit	Antenna
MHz	@3m	Factor	Strength	Strength	@3m	Polarity
	dBμV	dB/m	dBμV/m	μV/m	μV/m	
NO EMISSION DETECTED WITHIN 20dB OF THE FCC LIMITS						

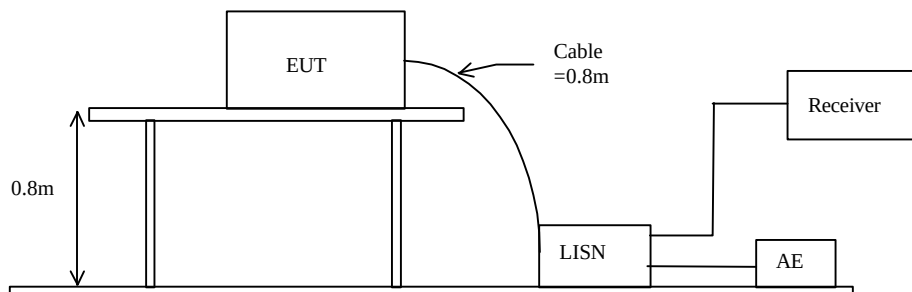
3.1.1 Conducted Emissions (0.45MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:1992
Test Date:	2000-06-10
Mode of Operation:	Not Applicable

Test Method:

The test was performed in accordance with ANSI C63.4:1992, 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:



Date: 2000-06-12

TEST REPORT

Page 14 of 20

No.: HM102299

Limit for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
0.45-30	250

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

Results:

The EUT is operated by a single source of internal battery power [located in the battery compartment], therefore power line conducted emission was deemed unnecessary.

Remarks:

Calculated measurement uncertainty = $\pm 2.3\text{dB}$

Date: 2000-06-12

TEST REPORT

Page 15 of 20

No.: HM102299

3.2 20dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.239
Test Method:	ANSI C63.4:1992 (Section 13.1.7)
Test Date:	2000-06-10
Mode of Operation:	On 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.

Date: 2000-06-12

TEST REPORT

Page 16 of 20

No.: HM102299

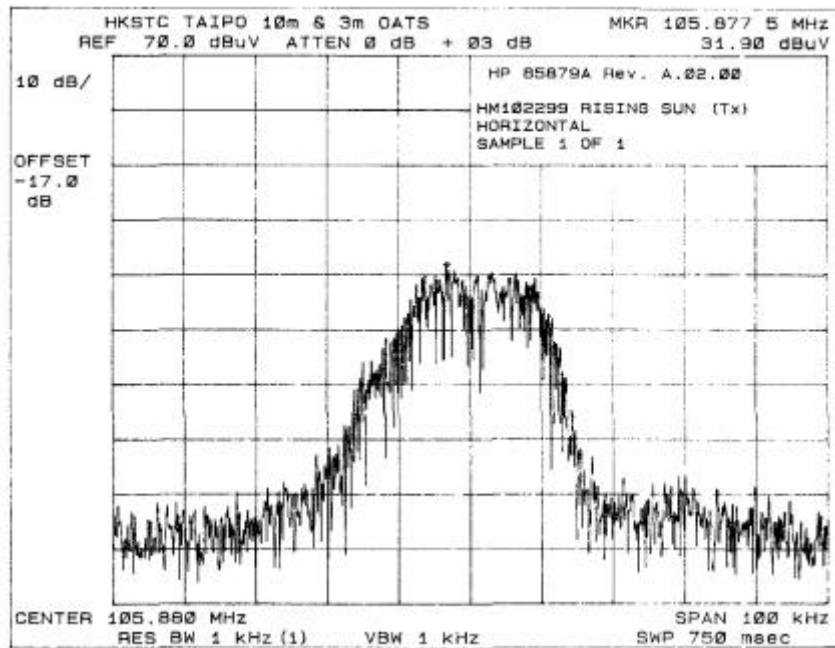
Limits for 20 dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits * [KHz]
105.877	28.9	200

Results:

The following figure is the measured bandwidth of Fundamental Emission.

20dB Bandwidth of Fundamental Emission



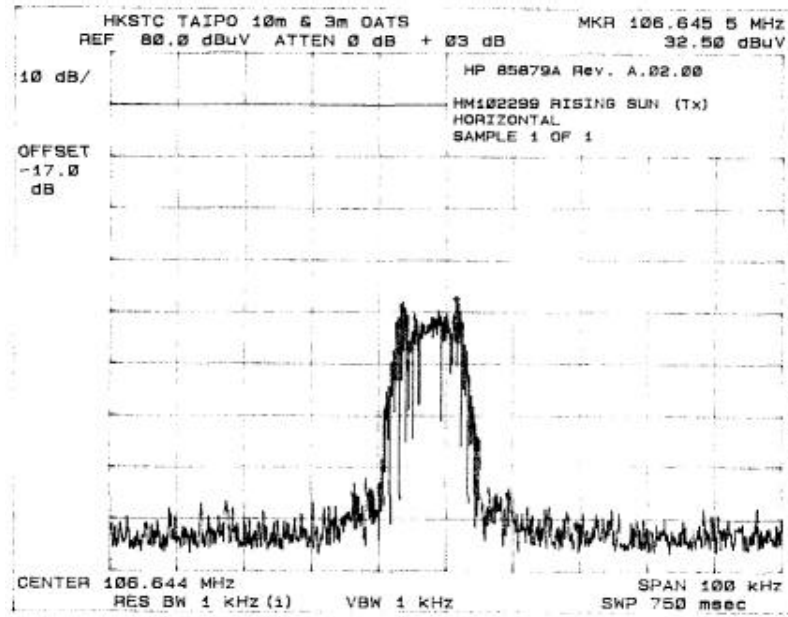
Date: 2000-06-12

TEST REPORT

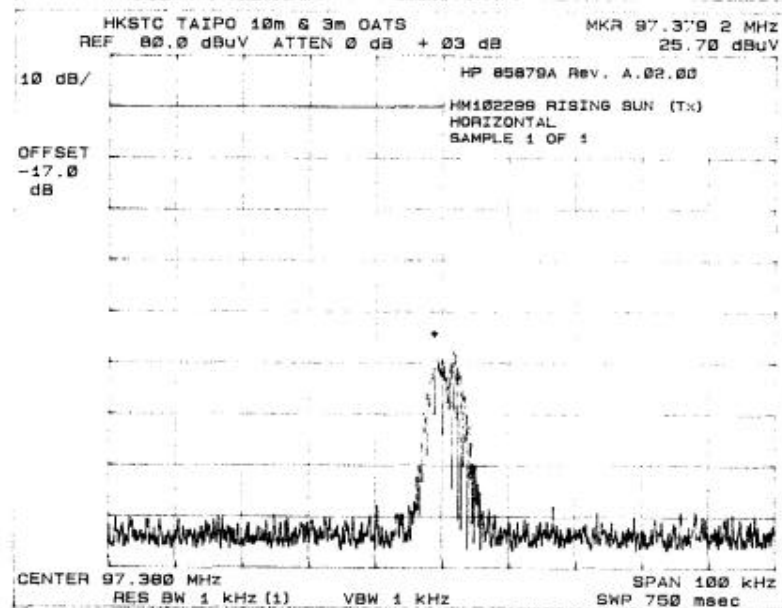
Page 17 of 20

No.: HM102299

20dB Bandwidth of Fundamental Emission



20dB Bandwidth of Fundamental Emission



Date: 2000-06-12

TEST REPORT

Page 18 of 20

No.: HM102299

Appendix A

Test Equipment Audit

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL.
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	18/07/00
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	18/07/00
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	18/07/00
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	18/07/00
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	18/07/00
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	18/07/00
EM013	CONTROLLER (COMPUTER), COLOR MONITOR, KEYBOARD & MOUSE FLOPPY DRIVE	HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD	HP9000 HP A1097C HP9133L	6226A60314 3151J39517 2623A02468	CM
EM131	PORTABLE SPECTRUM ANALYSER	HEWLETT PACKARD	8595EM	3710A00155	10/07/00
EM017	ANTENNA	ARA INC.	LPB-2513/A	1069	17/02/00
EM020	HORN ANTENNA	EMCO	3115	4032	09/08/00
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	30/03/98
EM083	HKSTC OPEN AREA TEST SITE	HKSTC	N/A	N/A	15/02/01
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	31/05/00

Conducted Emission

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	10/09/00
EM002	LISN	EMCO	3825-2	9005-1657	27/07/99
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	31/08/00
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	31/05/00
EM120	EMI TEST RECEIVER	R&S	ESHS10	1004.0401.10	04/09/00
EM127	ISOLATION TRANSFORMER 220 TO 300	WING SUN	N/A	N/A	N/A
EM142	PLUSE LIMITER	R & S	ESH3Z2	357.8810.52	29/01/00

Remarks:

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

No.: HM102299

TEST REPORT

Page 19 of 20

Appendix B

Photographs of EUT

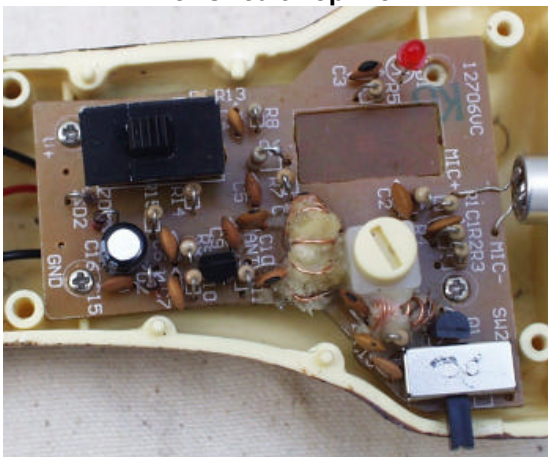
Front View of the product



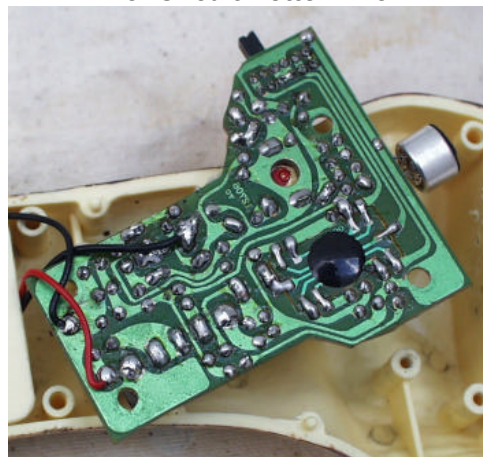
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



Date: 2000-06-12

TEST REPORT

Page 20 of 20

No.: HM102299

Photographs of EUT

Measurement of Radiated Emission Test Set Up



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