

Date:1999-01-25
No.: HM1619/504

TEST REPORT

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APPLICANT: (CODE :018842)

SUNNY-TECH ELECTRONIC CO., LTD.

18/F, Po Shau Centre, 115 How Ming Street, Kwun Tong, Kowloon, Hong Kong.

DATE OF SAMPLES RECEIVED: 1998-11-28

DATE OF TESTING: 1998-11-29 & 1999-01-18

DESCRIPTION OF SAMPLE(S):

A sample of product said to be:

Product: PLL DIGITAL RADIO RECEIVER
Manufacturer: SUNNY-TECH ELECTRONIC CO., LTD.
Band Combination: AM/FM/MARINE/WEATHER
Model Number: MR-318WM
Brand Name: N/A
Rating: 3.0Vd.c.(“AA” size battery × 2)/with DC jack
Origin: China

The product tested with AC-DC adaptor Brand Name: WINSTAR, model no. NA-1535, input AC117/230V 50/60Hz 34W Output DC 3-15V 1500mA max.

INVESTIGATIONS REQUESTED:

Measurement to the relevant clauses of F.C.C. Rules and Regulations Part 15 Subpart B - Unintentional Radiators.

RESULT/ REMARK: Please see attached sheet(s).

CONCLUSION:

From the measurement data obtained, the tested sample was considered to have COMPLIED after modification by customer with the requirement for the relevant clauses of Federal Communication Commission Rules for Radio Receivers.

TEST EQUIPMENT AUDIT: Please see Appendix A

Law Man Kit
Testing Engineer

Kitty Choy
Verify by

Patrick Wong
Patrick Wong
for Managing Director

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TEST SUMMARY

- (A) Measurement of Radiated Emissions
(On FM, MARINE & WEATHER BAND)

Result -- Satisfactory
Data -- See the attached data

- (B) Measurement of Line-Conducted Voltage
(On FM, MARINE & WEATHER BAND)

Result -- Satisfactory
Data -- See the attached data

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FM BAND RADIO RECEIVER

(A) Measurement of Radiated Interference

TEST REFERENCE: FCC Rules Part 15 Subpart B section 15.109

TEST CONDITION : FM Broadcast Receiver

TEST DATE : 1999.01.18

Freq. to which tuned	Freq. of the emission	Polarity	Meter Reading (including Antenna Factor) at 3m	Field Strength (at 3m)	FCC Limit @
MHz	MHz		dB(μ V/m)	μ V/m	μ V/m
88.3	99.0	Vertical	24.1	16.0	150
98.3	109.0	Vertical	23.3	14.6	150
108.3	119.0	Vertical	26.8	21.9	150

=====SUMMARY=====

All data is within limits

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Broad-band Antennas were used

=====

Remark: IF = 10.70 MHz

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MARINE BAND RECEIVER

(A) Measurement of Radiated Interference

TEST REFERENCE: FCC Rules Part 15 Subpart B section 15.109

TEST CONDITION : MARINE BAND RECEIVER

TEST DATE : 1999-01-18

Freq. to which tuned	Freq. of the emission	Polarity	Meter Reading (including Antenna Factor) at 3m	Field Strength (at 3m)	FCC Limit @
MHz	MHz		dB(μ V/m)	μ V/m	μ V/m
156.05	166.76	Horizontal	27.4	23.4	150
	333.52	Horizontal	37.4	74.1	200
157.43	168.15	Vertical	29.0	28.2	150
	336.27	Horizontal	39.5	94.4	200

=====SUMMARY=====

All data is within limits

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Broad-band Antennas were used

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WEATHER BAND RECEIVER

(A) Measurement of Radiated Interference

TEST REFERENCE: FCC Rules Part 15 Subpart B section 15.109

TEST CONDITION : WEATHER BAND RECEIVER (Build in Antenna)

TEST DATE : 1999-01-18

Freq. to which tuned	Freq. of the emission	Polarity	Meter Reading (including Antenna Factor) at 3m	Field Strength (at 3m)	FCC Limit @
MHz	MHz		dB(μ V/m)	μ V/m	μ V/m
163.27	173.97	Horizontal	29.8	30.9	150
	347.97	Horizontal	40.5	105.9	200
161.77	172.48	Horizontal	30.2	32.4	150
	344.96	Horizontal	39.7	96.6	200

=====SUMMARY=====

All data is within limits

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Broad-band Antennas were used

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NOTES FOR THE RADIATION MEASUREMENT

(1) Test site facility:

Open field test site located at Taipo (Hong Kong) with a metal ground plane on filed with the FCC pursuant to section 15.109 of the FCC rules.

(2) Distance between the EUT and measuring antenna:

3 meters.

(3) Measuring instrumentations:

CISPR Quasi-peak type field strength meter (25MHz - 1000MHz) 6 dB bandwidth set at 120KHz.

(4) Measuring antenna:

Broad band antenna for the frequency range 25 - 1000 MHz, connected with 10 meters coaxial cable. Cable loss of the coaxial cable included in the Antenna Factor for measurement data. The antenna are capable of measuring both horizontal and vertical polarization.

(5) Frequency range scanned:

The frequency range from 25 MHz to 1000 MHz had been searched. Readings of the highest emissions relating to the limit were reported as above.

(6) Arrangement of EUT:

During the test, the sample was operated at rated supply voltage and arranged for maximum emissions.

(7) Measuring Procedure:

In accordance with the relevant sections of ANSI C63.4:1992.

(8) Measuring Uncertainty:

The calculated uncertainty for measurement performed at 3M test distance are:-
30MHz to 200MHz = $\pm 3.7\text{dB}$, 300MHz to 1000MHz = $3.0\text{dB}/-2.7\text{dB}$.

Remark : Purpose of this test is to provide the Applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under FCC's Equipment Authorization Program. This test itself is not an Approval Test.

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FM BAND RADIO RECEIVER

(B) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)
(Class B)
TEST CONDITION : FM Broadcast Receiver
TEST DATE : 1998-11-29

(1) Between "Live" and "Ground"

Frequency Range of Emission		Maximum Measured Radio Noise		FCC Limit (Class B)
MHz		dB(μV)	μV	μV
0.45 - 0.8		0.00	1.00	250.00
0.8 - 1.6		0.00	1.00	250.00
1.6 - 3.0		0.00	1.00	250.00
3.0 - 5.0		18.98	8.89	250.00
5.0 - 7.0		25.90	19.72	250.00
7.0 - 9.0		8.66	2.71	250.00
9.0 - 11.0	<	25.78	19.45	250.00
11.0 - 13.0		0.00	1.00	250.00
13.0 - 15.0		21.87	12.40	250.00
15.0 - 17.0		17.58	7.57	250.00
17.0 - 19.0		0.00	1.00	250.00
19.0 - 21.0		20.90	11.09	250.00
21.0 - 23.0		0.00	1.00	250.00
23.0 - 25.0	<	13.89	4.95	250.00
25.0 - 27.0		0.00	1.00	250.00
27.0 - 30.0	<	30.40	33.11	250.00

- End -

===== SUMMARY =====

All data is within limits

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FM BAND RADIO RECEIVER

(B) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)
(Class B)
TEST CONDITION : FM Broadcast Receiver
TEST DATE : 1998-11-29

(1) Between "Neutral" and "Ground"

Frequency Range of Emission		Maximum Measured Radio Noise		FCC Limit (Class B)
MHz		dB(μV)	μV	μV
0.45 - 0.8		0.00	1.00	250.00
0.8 - 1.6		0.00	1.00	250.00
1.6 - 3.0		0.00	1.00	250.00
3.0 - 5.0	< 18.98		8.89	250.00
5.0 - 7.0	< 25.90		19.72	250.00
7.0 - 9.0	< 8.66		2.71	250.00
9.0 - 11.0	25.78		19.45	250.00
11.0 - 13.0	0.00		1.00	250.00
13.0 - 15.0	< 21.87		12.40	250.00
15.0 - 17.0	< 17.58		7.57	250.00
17.0 - 19.0	0.00		1.00	250.00
19.0 - 21.0	< 20.90		11.09	250.00
21.0 - 23.0	0.00		1.00	250.00
23.0 - 25.0	13.89		4.95	250.00
25.0 - 27.0	0.00		1.00	250.00
27.0 - 30.0	30.40		33.11	250.00

- End -

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===== SUMMARY =====

All data is within limits

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WEATHER BAND RECEIVER

(B) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)
(Class B)

TEST CONDITION : Weather Band Receiver

TEST DATE : 1998-11-29

(1) Between "Live" and "Ground"

Frequency Range of Emission		Maximum Measured Radio Noise		FCC Limit (Class B)
MHz		dB(μV)	μV	μV
0.45 - 0.8		0.00	1.00	250.00
0.8 - 1.6		0.00	1.00	250.00
1.6 - 3.0		0.00	1.00	250.00
3.0 - 5.0		10.37	1.00	250.00
5.0 - 7.0		< 22.34	3.30	250.00
7.0 - 9.0		0.00	1.00	250.00
9.0 - 11.0		< 23.32	14.66	250.00
11.0 - 13.0		20.97	11.18	250.00
13.0 - 15.0		0.00	1.00	250.00
15.0 - 17.0		8.85	2.77	250.00
17.0 - 19.0		0.00	1.00	250.00
19.0 - 21.0		25.68	19.23	250.00
21.0 - 23.0		< 17.75	7.72	250.00
23.0 - 25.0		0.00	1.00	250.00
25.0 - 27.0		0.00	1.00	250.00
27.0 - 30.0		< 36.11	63.90	250.00

- End -

===== SUMMARY =====

All data is within limits

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WEATHER BAND RECEIVER

(B) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)
(Class B)

TEST CONDITION : Weather Band Receiver

TEST DATE : 1998-11-29

(1) Between "Neutral" and "Ground"

Frequency Range of Emission		Maximum Measured Radio Noise		FCC Limit (Class B)
MHz		dB(μV)	μV	μV
0.45 - 0.8		0.00	1.00	250.00
0.8 - 1.6		0.00	1.00	250.00
1.6 - 3.0		0.00	1.00	250.00
3.0 - 5.0	< 10.37		1.00	250.00
5.0 - 7.0	22.34		3.30	250.00
7.0 - 9.0	0.00		1.00	250.00
9.0 - 11.0	23.32		14.66	250.00
11.0 - 13.0	< 20.97		11.18	250.00
13.0 - 15.0	0.00		1.00	250.00
15.0 - 17.0	< 8.85		2.77	250.00
17.0 - 19.0	0.00		1.00	250.00
19.0 - 21.0	< 25.68		19.23	250.00
21.0 - 23.0	17.75		7.72	250.00
23.0 - 25.0	0.00		1.00	250.00
25.0 - 27.0	0.00		1.00	250.00
27.0 - 30.0	36.11		63.90	250.00

- End -

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===== SUMMARY =====

All data is within limits

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MARINE BAND RECEIVER

(B) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)

(Class B)

TEST CONDITION : Marine Band Receiver

TEST DATE : 1998-11-29

(1) Between "Live" and "Ground"

Frequency Range of Emission		Maximum Measured Radio Noise		FCC Limit (Class B)
MHz		dB(μV)	μV	μV
0.45 - 0.8		0.00	1.00	250.00
0.8 - 1.6		0.00	1.00	250.00
1.6 - 3.0		0.00	1.00	250.00
3.0 - 5.0		10.37	1.00	250.00
5.0 - 7.0	<	22.34	3.30	250.00
7.0 - 9.0		0.00	1.00	250.00
9.0 - 11.0	<	23.32	14.66	250.00
11.0 - 13.0		20.97	11.18	250.00
13.0 - 15.0		0.00	1.00	250.00
15.0 - 17.0		8.85	2.77	250.00
17.0 - 19.0		0.00	1.00	250.00
19.0 - 21.0		25.68	19.23	250.00
21.0 - 23.0	<	17.75	7.72	250.00
23.0 - 25.0		0.00	1.00	250.00
25.0 - 27.0		0.00	1.00	250.00
27.0 - 30.0	<	36.11	63.90	250.00

- End -

===== SUMMARY =====

All data is within limits

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MARINE BAND RECEIVER

(B) Measurement of Line-Conducted Voltage onto AC Power Line

TEST REFERENCE : FCC Rules Part 15 Subpart B Section 15.107(a)
(Class B)
TEST CONDITION : Marine Band Receiver
TEST DATE : 1998-11-29

(1) Between "Neutral" and "Ground"

Frequency Range of Emission		Maximum Measured Radio Noise		FCC Limit (Class B)
MHz		dB(μV)	μV	μV
0.45 - 0.8		0.00	1.00	250.00
0.8 - 1.6		0.00	1.00	250.00
1.6 - 3.0		0.00	1.00	250.00
3.0 - 5.0	< 10.37		1.00	250.00
5.0 - 7.0	22.34		3.30	250.00
7.0 - 9.0	0.00		1.00	250.00
9.0 - 11.0	23.32		14.66	250.00
11.0 - 13.0	< 20.97		11.18	250.00
13.0 - 15.0	0.00		1.00	250.00
15.0 - 17.0	< 8.85		2.77	250.00
17.0 - 19.0	0.00		1.00	250.00
19.0 - 21.0	< 25.68		19.23	250.00
21.0 - 23.0	17.75		7.72	250.00
23.0 - 25.0	0.00		1.00	250.00
25.0 - 27.0	0.00		1.00	250.00
27.0 - 30.0	36.11		63.90	250.00

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NOTES FOR THE CONDUCTED POWER-LINE MEASUREMENT

- (1)LISN (Line Impedance Stabilization Network) used :
50 μ H LISN in accordance with Section of ANSI C63.4:1992.
- (2)Measurement Instrumentations:
CISPR quasi-peak type radio noise meter (9 KHz - 30 MHz), 6 dB bandwidth set at 9 KHz for measurement between 150 KHz & 30MHz.
- (3)Frequency range scanned :
The frequency range from 450 KHz to 30 MHz had been searched. Reading of the highest emissions relating to the limit were reported as above.
- (4)Configuration of EUT
Connection of equipment and operation conditions were same as those in the Radiation measurement.
- (5)Measurement procedure :
In accordance with the relevant sections of ANSI C63.4:1992 "FCC Methods of measurement of Radio Noise Emissions from Computing Devices".
- (6)Measuring Uncertainty:
The calculated uncertainty for conducted power-line measurement is = ± 2.3 dB.

Remark : Purpose of this test is to provide the Applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under FCC's Equipment Authorization Program. This test itself is not an Approval Test.

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