

FCC Part 15B Measurement and Test Report

For

TEHCITY TECHNOLOGY CO., LTD.

4F, No. 4, Alley 1, Szu Wei Lane, Chung Cheng Rd, Hsin Tien Taipei

Hsien, Taiwan, R.O.C.

FCC ID: UQORP-20F

Test Rule(s): FCC Part 15 Subpart B

Product Description: Controller

Tested Model: RP-20F

Report No.: STR15078229I-2

Tested Date: 2015-07-18 to 2015-08-04

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: TECHCITY TECHNOLOGY CO., LTD.
Address of applicant: 4F, No. 4, Alley 1, Szu Wei Lane, Chung Cheng Rd,
Hsin Tien Taipei Hsien, Taiwan, R.O.C
Manufacturer: TECHCITY TECHNOLOGY CO., LTD.
Address of manufacturer: 4F, No. 4, Alley 1, Szu Wei Lane, Chung Cheng Rd,
Hsin Tien Taipei Hsien, Taiwan, R.O.C

General Description of EUT	
Product Name:	Controller
Trade Name:	e-live
Model No.:	RP-20F
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	Adapter DC 5V
Rated Current:	/
Rated Power:	/
Power Adapter Model:	CF0605-B I/P: AC 100-240V; O/P: DC5V
Lowest Internal Frequency:	16MHz
Highest Internal Frequency:	47.0244MHz
Classification of Equipment:	CLASS B

1.2 Test Standards

The following report is prepared on behalf of the TEHCITY TECHNOLOGY CO., LTD. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology 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 and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Operating	Connected to computer
TM2	/	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB cable	0.6	Unshielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

N/A: not applicable

3. Conducted Emissions

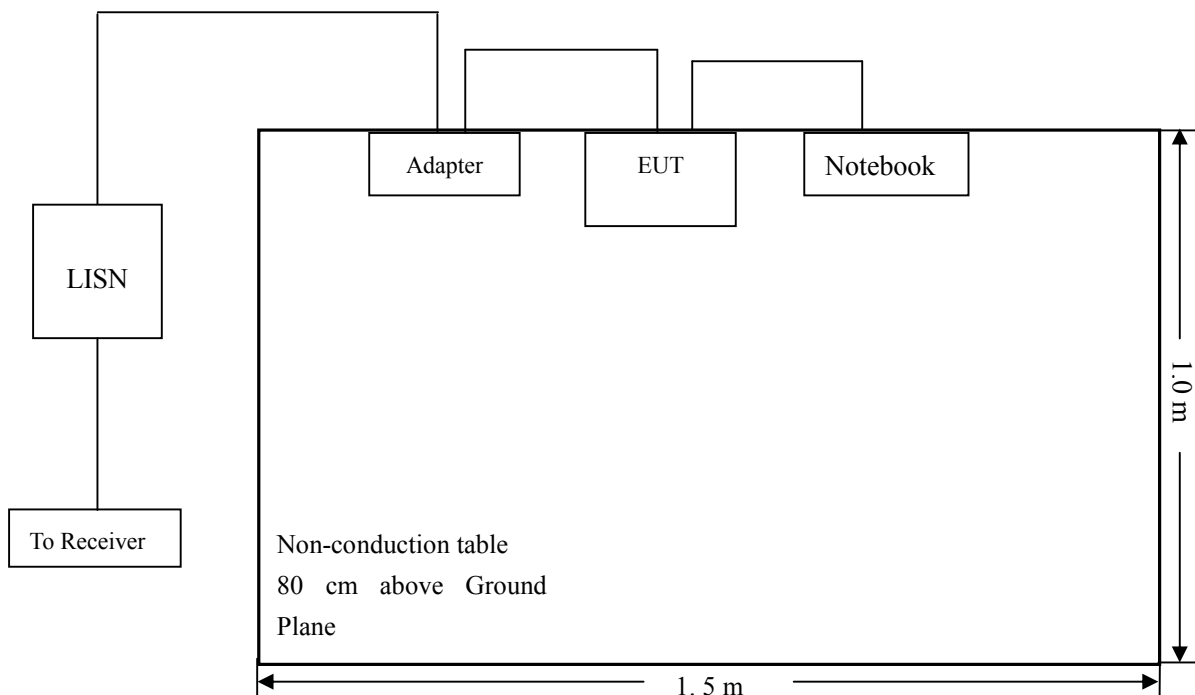
3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

3.2 Test Procedure

Test is conducting under the description of ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.3 Basic Test Setup Block Diagram



3.4 Environmental Conditions

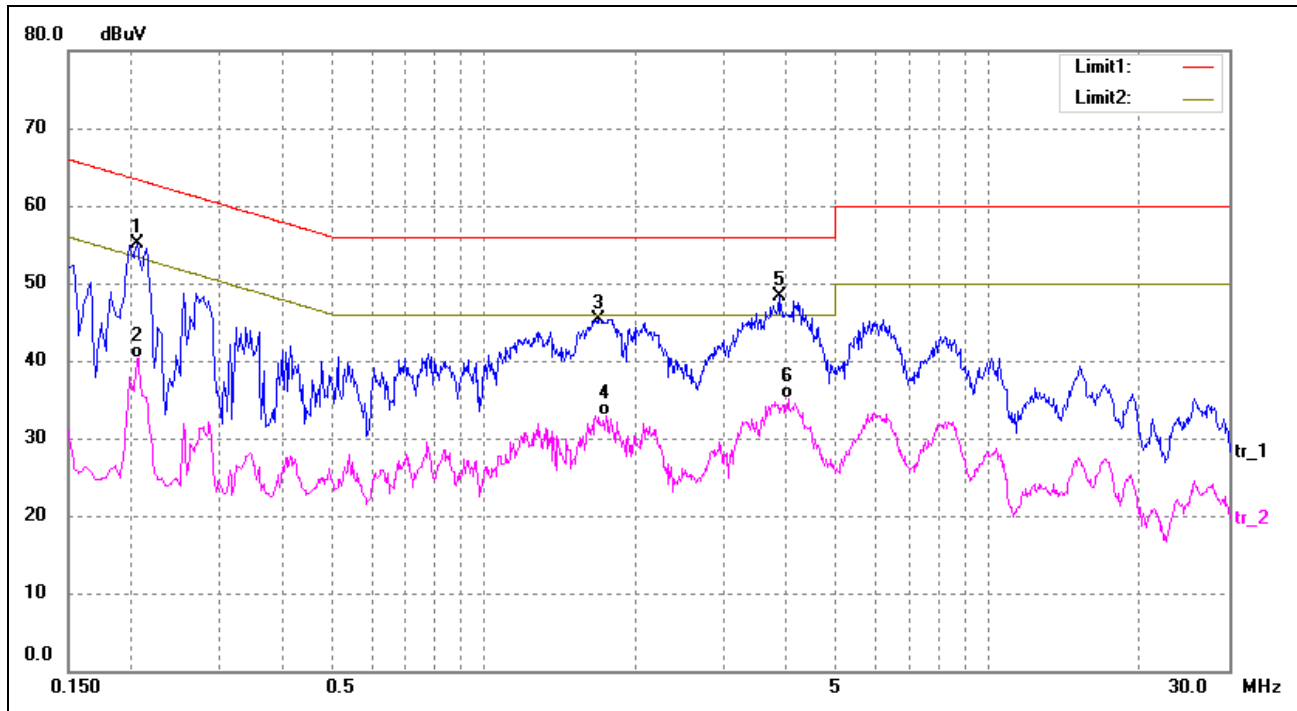
Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.5 Summary of Test Results/Plots

According to the data in section 3.6, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

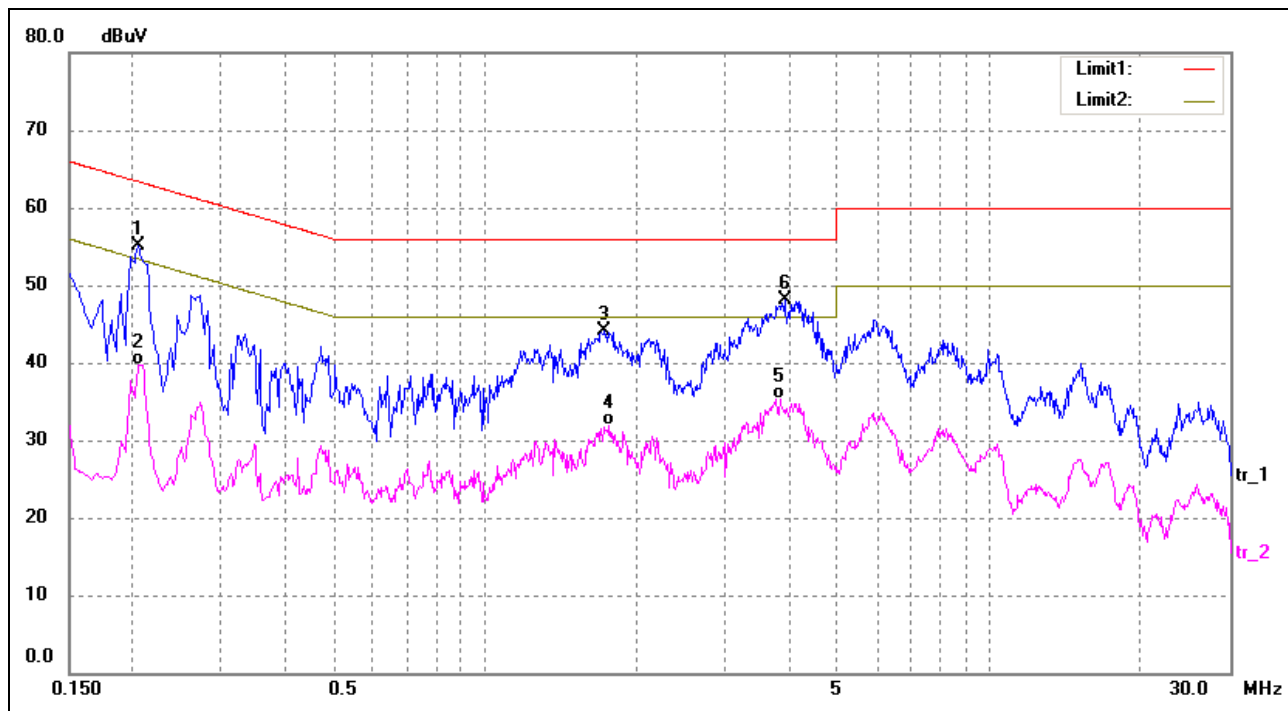
-7.73 dB at **3.8460 MHz** in the **Neutral, Peak** detector, 0.15-30MHz

3.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data*EUT:* Controller*Tested Model:* RP-20F*Operating Condition:* TM1*Comment:* AC120V/60Hz; Adapter DC 5V*Test Specification:* Neutral

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2060	42.58	12.50	55.08	63.36	-8.28	peak
2	0.2060	27.86	12.50	40.36	53.36	-13.00	AVG
3	1.6860	32.40	13.00	45.40	56.00	-10.60	peak
4	1.7460	19.87	13.00	32.87	46.00	-13.13	AVG
5*	3.8460	35.27	13.00	48.27	56.00	-7.73	peak
6	4.0180	22.08	13.00	35.08	46.00	-10.92	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2060	42.68	12.50	55.18	63.36	-8.18	peak
2	0.2060	27.19	12.50	39.69	53.36	-13.67	AVG
3	1.7260	31.08	13.00	44.08	56.00	-11.92	peak
4	1.7700	18.88	13.00	31.88	46.00	-14.12	AVG
5	3.8500	22.39	13.00	35.39	46.00	-10.61	AVG
6*	3.9300	35.17	13.00	48.17	56.00	-7.83	peak

4. Radiated Emissions

4.1 Measurement Uncertainty

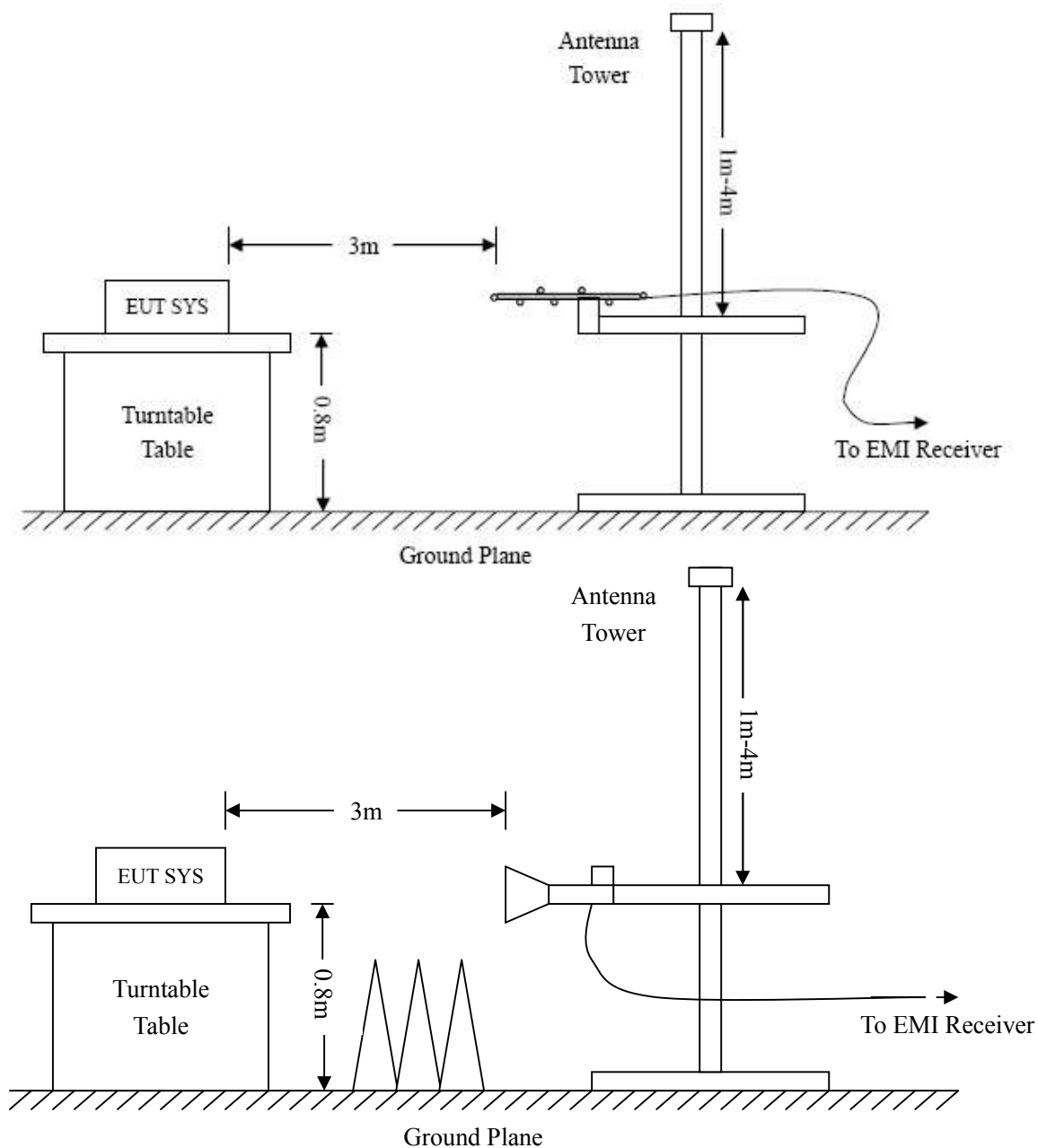
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



4.3 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

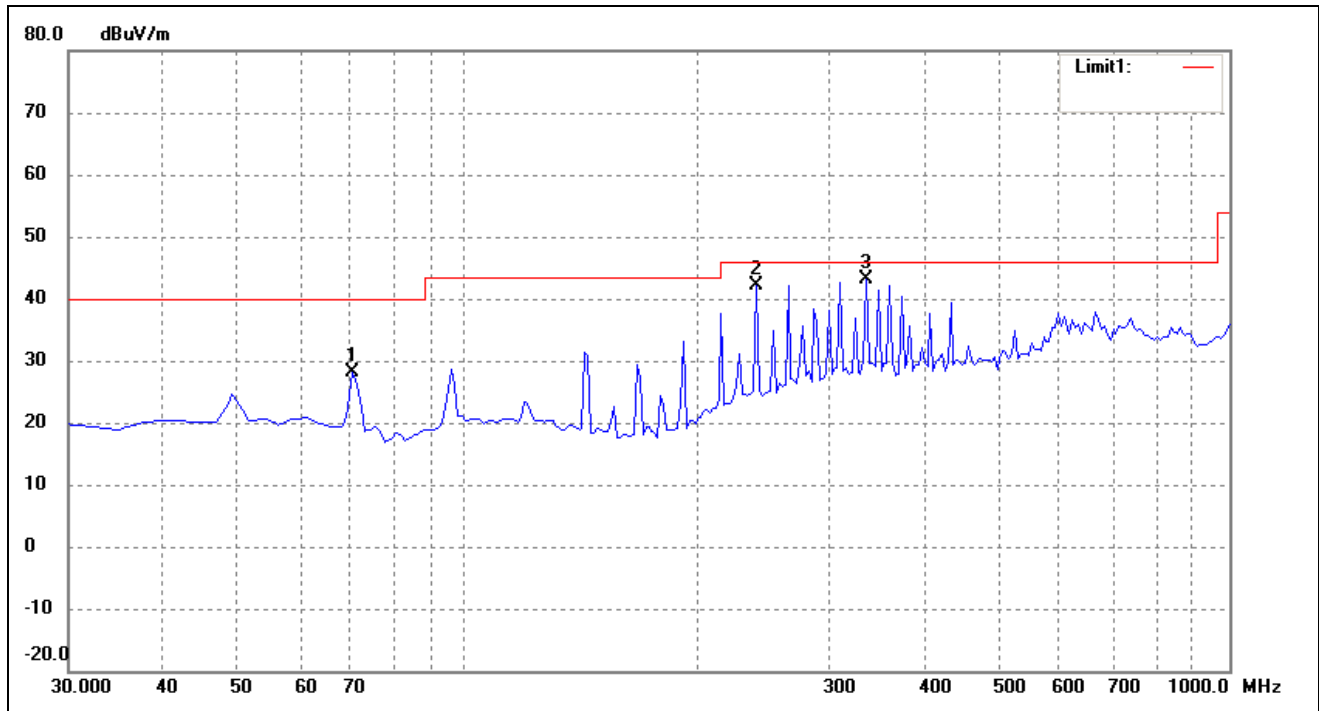
4.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.6 Summary of Test Results/Plots

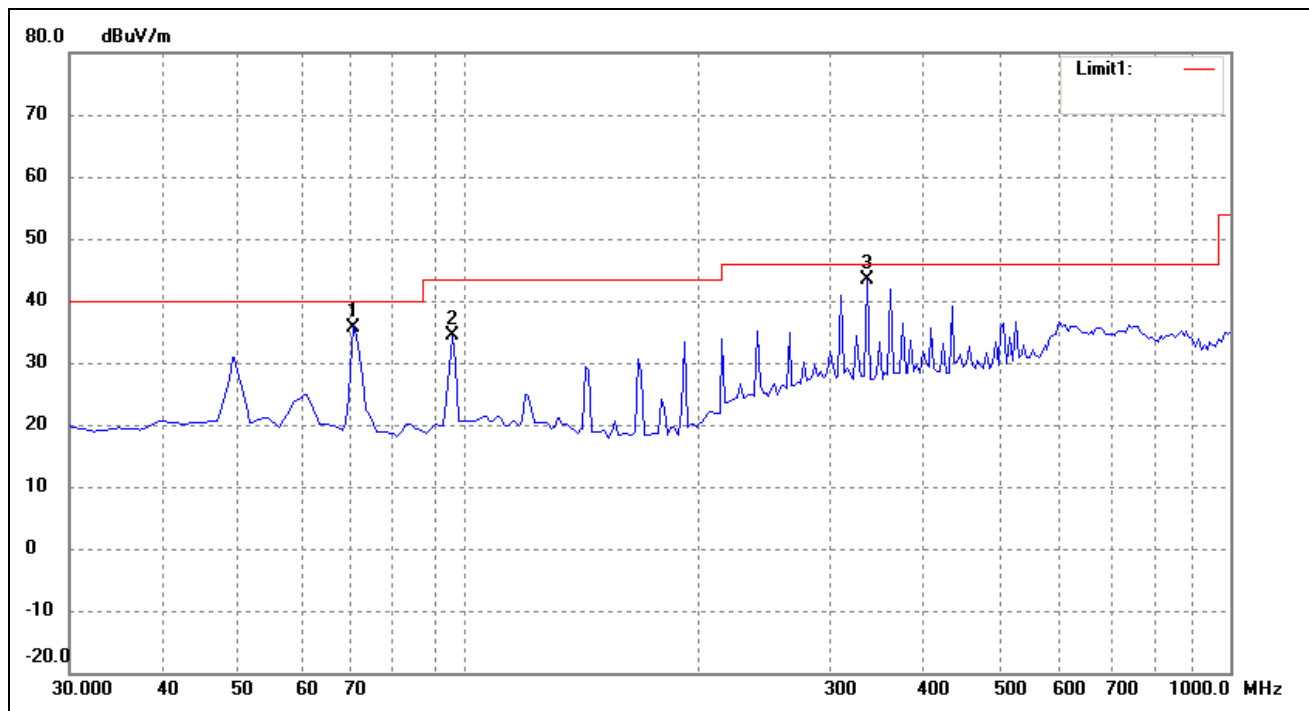
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-2.51 dB at 335.5500 MHz in the Vertical polarization, 30 MHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data*EUT:* Controller*Tested Model:* RP-20F*Operating Condition:* TM1*Comment:* AC120V/60Hz; Adapter DC 5V*Test Specification:* Horizontal

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	71.2250	25.06	3.04	28.10	40.00	-11.90	64	200	peak
2	240.9750	32.65	9.37	42.02	46.00	-3.98	132	200	peak
3	335.5500	31.23	11.85	43.08	46.00	-2.92	183	200	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	71.2250	32.71	3.04	35.75	40.00	-4.25	33	100	peak
2	95.4750	29.87	4.44	34.31	43.50	-9.19	97	100	peak
3	335.5500	31.64	11.85	43.49	46.00	-2.51	155	100	peak

Note: Testing is carried out with frequency rang 9kHz to the 1GHz, which above 1GHz is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and test data are not provided.

***** END OF REPORT *****