APPLICATION FOR CERTIFICATION

On Behalf of

Powertech Industrial Co Ltd

Surge Protective Devices

Model No.：R9P602NIZ8

FCC ID：NHS-R9P602NI

Prepared for : Powertech Industrial Co Ltd
10F, No. 407, Chung Shan Rd., Sec 2
Chung Ho City, Taipei Hsien, 235 Taiwan,
R.O.C.

Prepared by : AUDIX Technology Corporation
EMC Department
No. 53-11, Dingfu, Linkou Dist., New Taipei City 244,
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File Number	：	C1M1206218
Report Number	：	EM-F1010539
Date of Test	：	Jul. 02 ~ 03, 2012
Date of Report	：	Aug. 15, 2012

TABLE OF CONTENTS

TEST REPORT CERTIFICATION

Applicant	:	Powertech Industrial Co Ltd
Manufacturer	:	Dongguan Quan Sheng Electric Co., Ltd.
EUT Description	:	Surge Protective Devices
FCC ID	:	NHS-R9P602NI
(A) Model No.	:	R9P602NIZ8
(B) Serial No.	:	N/A
(C) Power Supply	:	AC 120V/60Hz
(D) Test Voltage	:	AC 120V/60Hz

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, Oct. 2011
AND ANSI C63.4/2003
(FCC CFR 47 Part 15C, §15.207, §15.249, §15.209)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test : Jul. 02 ~ 03, 2012 Date of Report : Aug. 15, 2012

Producer : Tina Huang
(Tina Huang/Administrator)

Signatory: Leon Liu
(Leon Liu/Deputy General Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Surge Protective Devices
FCC ID	:	NHS-R9P602NI
Model Number	:	R9P602NIZ8
Applicant	:	Powertech Industrial Co Ltd 10F, No. 407, Chung Shan Rd., Sec 2 Chung Ho City, Taipei Hsien, 235 Taiwan, R.O.C.
Manufacturer	:	Dongguan Quan Sheng Electric Co., Ltd. Chu-Tang 2nd Industrial Park Hou-Chieh Town Dongguan Guangdong 523963 China.
Fundamental Frequency	:	915MHz
AC Power Cord	:	Non-Shielded, Undetachable, 1.5m
Date of Receipt of Sample	:	Jun. 21, 2012
Date of Test	:	Jul. 02 ~ 03, 2012

1.2. Tested Supporting System Details

1.2.1. BULBS LOAD

Model Number	:	AS100
Manufacturer	:	PHILIPS
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.3. Description of Test Facility

Name of Firm	:	**AUDIX Technology Corporation** **EMC Department** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C.
Test Facility & Location (C4/AC)	:	**No. 4 Shielded Room &** No. 67-4, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C. **Semi-Anechoic Chamber** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C. Renewal on May 11, 2012 Federal Communication Commission Registration Number: 90993
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150kHz~30MHz	±1.73dB
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.94dB
	Above 1GHz	± 5.02dB

Remark：Uncertainty = $ku_c(y)$

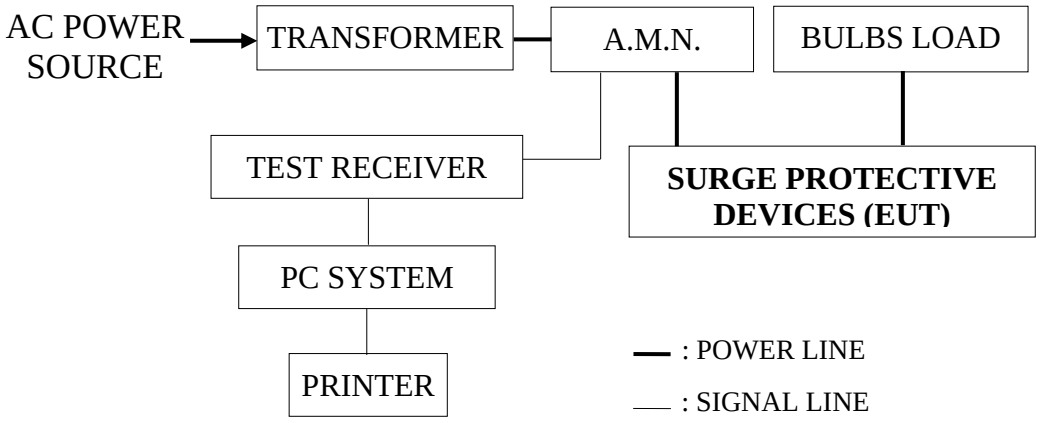
2. POWERLINE CONDUCTED EMISSION MEASUREMENT

2.1. Test Equipment

The following test equipment were used during the power line conducted measurement**:** (No. 4 Shielded Room)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R & S	ESCS30	100339	Mar. 08, 12’	Mar. 07, 13’
2.	A.M.N.	R & S	ESH2-Z5	890485/023	Apr. 20, 12’	Apr. 19, 13’

2.2. Block Diagram of Test Setup



2.3. Powerline Conducted Emission Limit (§15.207)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dBμV	56 ~ 46 dBμV
500kHz ~ 5MHz	56 dBμV	46 dBμV
5MHz ~ 30MHz	60 dBμV	50 dBμV

Remark1.: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.: The lower limit applies at the band edges.

2.4. Operating Condition of EUT

2.4.1. Setup the **EUT (Surge Protective Devices)** as shown on 2.2.

2.4.2. Turn on the power of all equipment.

2.4.3. The **EUT (Surge Protective Devices)** was on transmitting function at work during all testing.

2.5. Test Procedure

The EUT was put on table which was above the ground by 80cm and it's power cord was connected to power mains through an Artificial Mains Network (A.M.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.) Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to FCC ANSI C63.4-2003 during conducted measurement.

The bandwidth of the R & S Test Receiver ESCS 30 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

2.6. Powerline Conducted Emission Measurement Results

PASSED. All emissions not reported below are too low against the prescribed limits.

The EUT was measured during this section testing and all the test results are listed in next pages.

EUT：Surge Protective Devices Model No.：R9P602NIZ8

Test Date：Jul. 03, 2012 Temperature：25℃ Humidity：55%

The details are as follows：

Mode	Reference Test Data	
	Neutral	Line
1.	# 2	# 1

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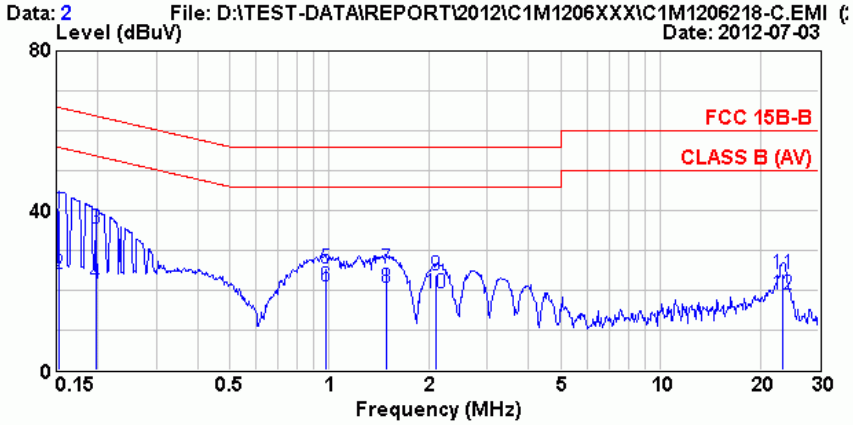

Site : NO.4 Shielded Room Data : 2
Condition : ESH2-Z5 Phase : NEUTRAL
Limit : FCC 15B-B
Env. / Ins. : 25*C/55% ESCS 30 (339) Engineer: Fate
EUT : R9P602NIZ8
Power Rating : 120Vac / 60Hz
Test Mode : OPERATING

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Emission Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.152	0.22	0.24	39.69	40.14	65.87	25.72	QP
2	0.152	0.22	0.24	23.70	24.15	55.87	31.71	AVERAGE
3	0.198	0.23	0.26	35.12	35.61	63.71	28.10	QP
4	0.198	0.23	0.26	21.40	21.89	53.71	31.82	AVERAGE
5	0.974	0.30	0.40	24.74	25.44	56.00	30.56	QP
6	0.974	0.30	0.40	20.24	20.94	46.00	25.06	AVERAGE
7	1.487	0.36	0.40	24.73	25.49	56.00	30.51	QP
8	1.487	0.36	0.40	20.04	20.80	46.00	25.20	AVERAGE
9	2.110	0.41	0.40	23.12	23.93	56.00	32.07	QP
10	2.110	0.41	0.40	18.44	19.25	46.00	26.75	AVERAGE
11	23.387	1.00	0.70	22.29	23.99	60.00	36.01	QP
12	23.387	1.00	0.70	17.25	18.95	50.00	31.05	AVERAGE

Remarks: 1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasi-peak detector ,the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

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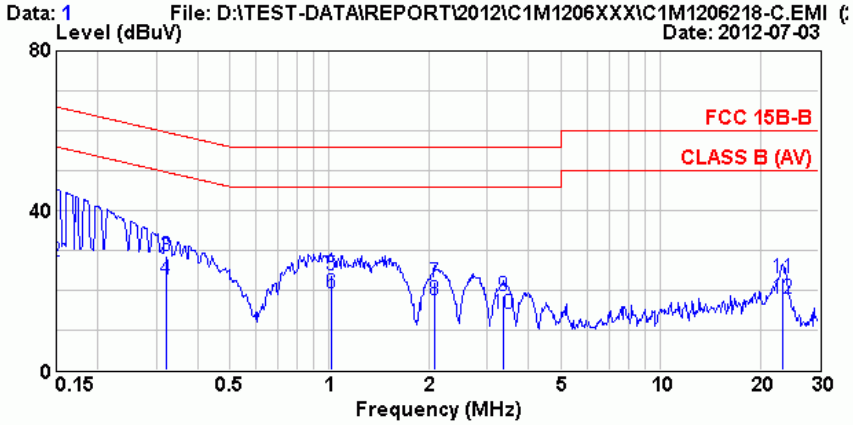


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Site          : NO.4 Shielded Room          Data     : 1
Condition     : ESH2-Z5                     Phase    : LINE
Limit         : FCC 15B-B
Env. / Ins.   : 25*C/55% ESCS 30 (339)      Engineer: Fate
EUT           : R9P602NIZ8
Power Rating  : 120Vac / 60Hz
Test Mode     : OPERATING
```

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Emission Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.22	0.24	14.11	14.56	66.00	51.44	QP
2	0.150	0.22	0.24	26.84	27.29	56.00	28.71	AVERAGE
3	0.322	0.25	0.30	28.06	28.61	59.66	31.05	QP
4	0.322	0.25	0.30	22.08	22.63	49.66	27.03	AVERAGE
5	1.016	0.30	0.40	23.12	23.82	56.00	32.18	QP
6	1.016	0.30	0.40	18.50	19.20	46.00	26.80	AVERAGE
7	2.077	0.41	0.40	21.33	22.14	56.00	33.86	QP
8	2.077	0.41	0.40	16.72	17.53	46.00	28.47	AVERAGE
9	3.346	0.47	0.40	17.76	18.63	56.00	37.37	QP
10	3.346	0.47	0.40	13.16	14.03	46.00	31.97	AVERAGE
11	23.387	1.00	0.70	21.54	23.24	60.00	36.76	QP
12	23.387	1.00	0.70	16.14	17.84	50.00	32.16	AVERAGE

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Remarks: 1.Emission Level= AMN Factor + Cable Loss + Reading.
         2.If the average limit is met when using a quasi-peak detector
           ,the EUT shall be deemed to meet both limits and measurement
           with average detector is unnecessary.
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3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

3.1.1. For Frequency Range 30MHz-1000MHz (At Semi-Anechoic Chamber)

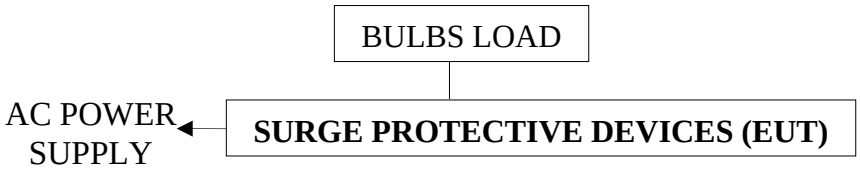
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 11’	Aug. 03, 12’
2.	Test Receiver	R & S	ESCS30	100265	Aug. 25, 11’	Aug. 24, 12’
3.	Pre-Amplifier	HP	8447D	2944A06305	Feb. 13, 12’	Feb. 11, 13’
4.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 03, 12’	Mar. 02, 13’
5.	Log Periodic Antenna	Schwarzbeck	UHALP9108-A	0810	Mar. 03, 12’	Mar. 02, 13’

3.1.2. For Frequency Range Above 1GHz (At Semi-Anechoic Chamber)

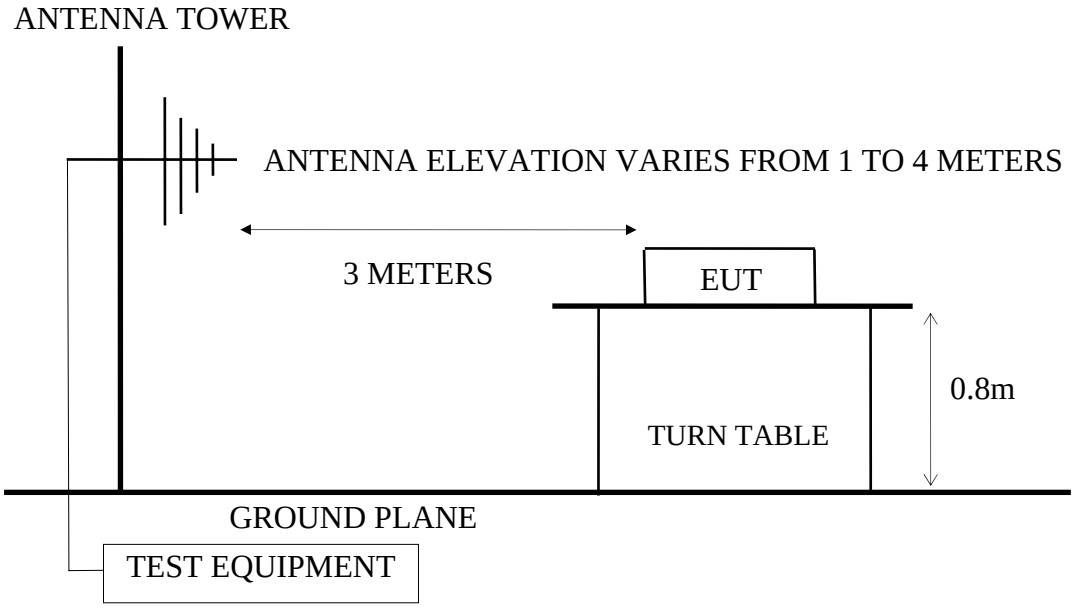
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 11’	Aug. 03, 12’
2.	Pre-Amplifier	HP	8449B	3008A00529	Dec. 09, 11’	Dec. 08, 12’
3.	Horn Antenna	ETS-Lindgren	3115	00114104	Mar. 27, 12’	Mar. 26, 13’

3.2. Block Diagram of Test Setup

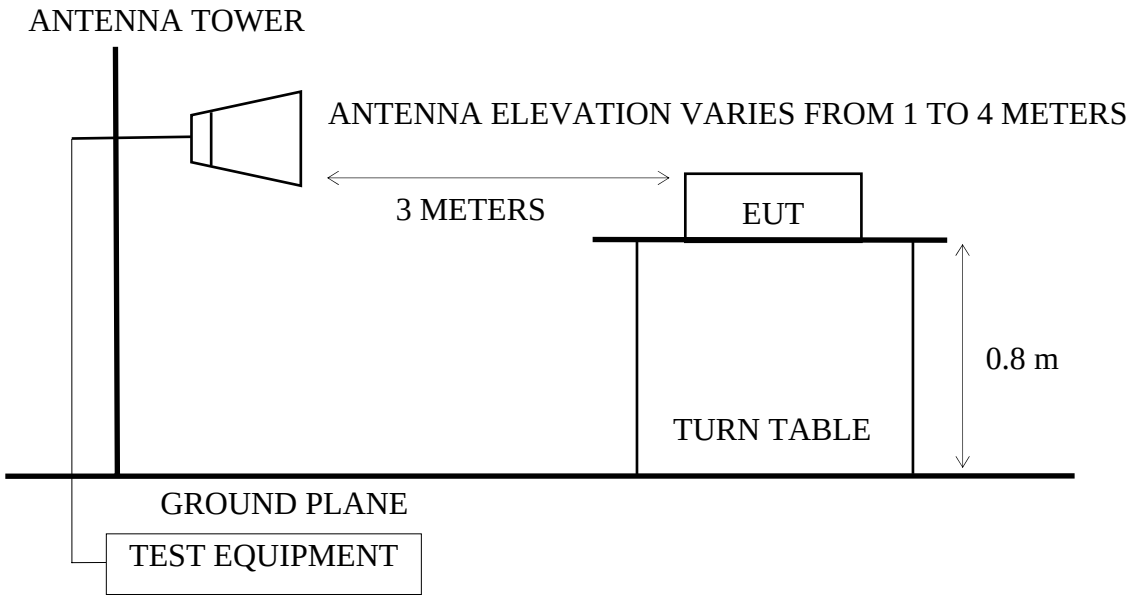
3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Area Test Site (3m) Setup Diagram for 30-1000MHz



3.2.3. Open Area Test Site (3m) Setup Diagram for above 1GHz



3.3. Radiated Emission Limits (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark：(1) Emission level (dBμV/m) = 20 log Emission level (μV/m)

(2) The tighter limit applies at the edge between two frequency bands.

(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

(4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).

(5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

3.4. Fundamental Frequency Limits (§15.249)

FUNDAMENTAL FREQUENCY MHZ	LIMITS
902-928	94 dBμV/m

3.5. Operating Condition of EUT

3.5.1. Setup the **EUT (Surge Protective Devices)** as shown on 3.2.

3.5.2. Turn on the power of all equipment.

3.5.3. The **EUT (Surge Protective Devices)** was on transmitting function at work during all testing.

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set to 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antennas such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R & S Test Receiver ESCS 30 was set at 120kHz.
(For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 10GHz
(Up to 10^{th} harmonics from fundamental frequency) was checked.

Above 1GHz was measured with peak and average detector. For frequency from 1GHz to 10GHz or , we checked it in 1 meter distance and with a shorter cable 2 meter instead of original's. There is no signal exist.

3.7. Radiated Emission Measurement Test Results

PASSED. All emissions not reported below are too low against the prescribed limits.

EUT：Surge Protective Devices Model No.：R9P602NIZ8

Test Date：Jul. 02, 2012 Temperature：24℃ Humidity：58%

For Frequency Range 30MHz~1000MHz:

The EUT was measured during this section testing and all the test results are listed in section 3.7.1.

The details are as follows：

Mode	Reference Test Data	
	Horizontal	Vertical
1.	# 2, # 4	#1, # 3

* Above all final readings were measured with Quasi-Peak detector.

For Frequency above 1GHz:

The EUT was measured during this section testing and all the test results are listed in section 3.7.2.

The details are as follows：

Mode	Reference Test Data	
	Horizontal	Vertical
1.	# 6	---

* There is no emission be found at vertical polarization.

For Fundamental Frequency:

The EUT was measured during this section testing and all the test results are listed in section 3.7.3.

The details are as follows：

Mode	Reference Test Data
1.	# 2

3.7.1. Frequency Range 30-1000MHz

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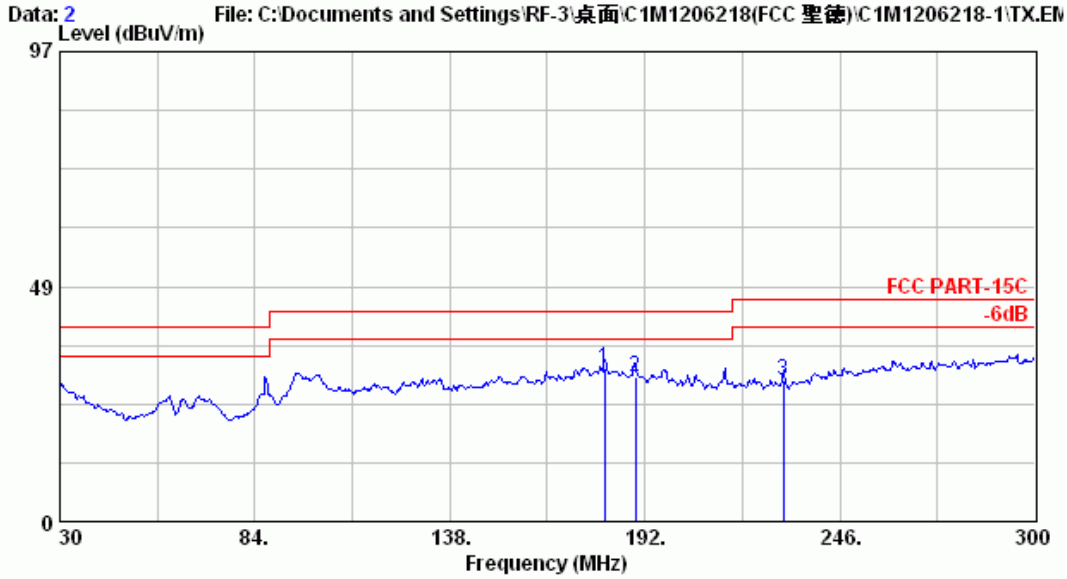

Site no. : A/C Chamber Data no. : 2
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 24℃/58% □jianlun_hung
EUT : R9P602NIZ8
Power Rating : AC120V / 60Hz
Test Mode : OPERATING

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	180.930	21.32	2.90	7.25	31.47	43.50	12.03	QP
2	189.300	21.46	2.90	5.58	29.94	43.50	13.56	QP
3	230.340	22.17	3.30	3.74	29.20	46.00	16.80	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

3. All readings are Quasi-Peak values.

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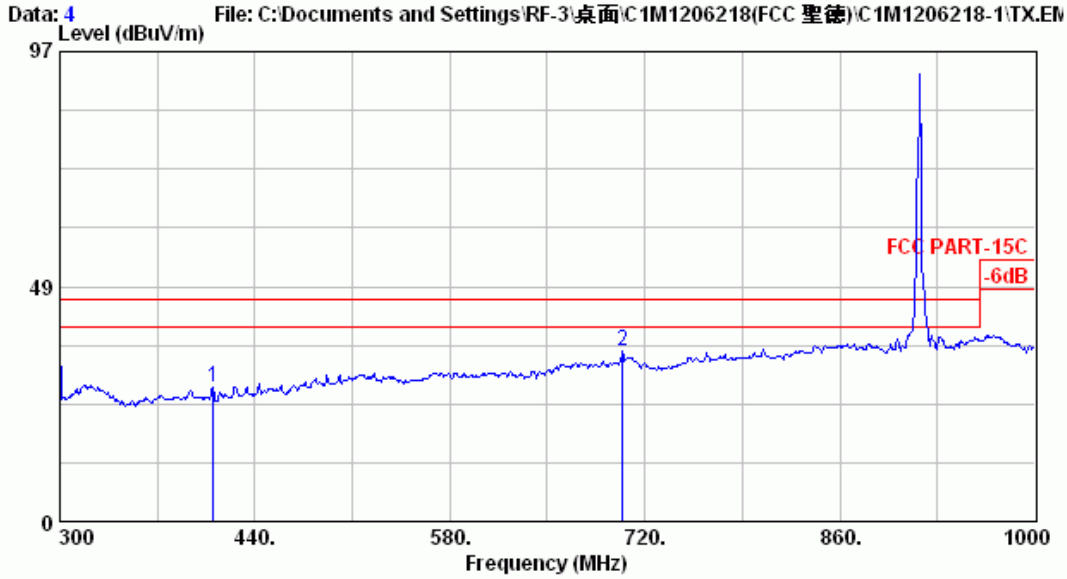

Site no. : A/C Chamber Data no. : 4
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 24℃/58% □jianlun_hung
EUT : R9P602NIZ8
Power Rating : AC120V / 60Hz
Test Mode : OPERATING

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	409.900	17.18	4.90	5.79	27.87	46.00	18.13	QP
2	703.900	23.56	6.60	5.13	35.29	46.00	10.71	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All readings are Quasi-Peak values.

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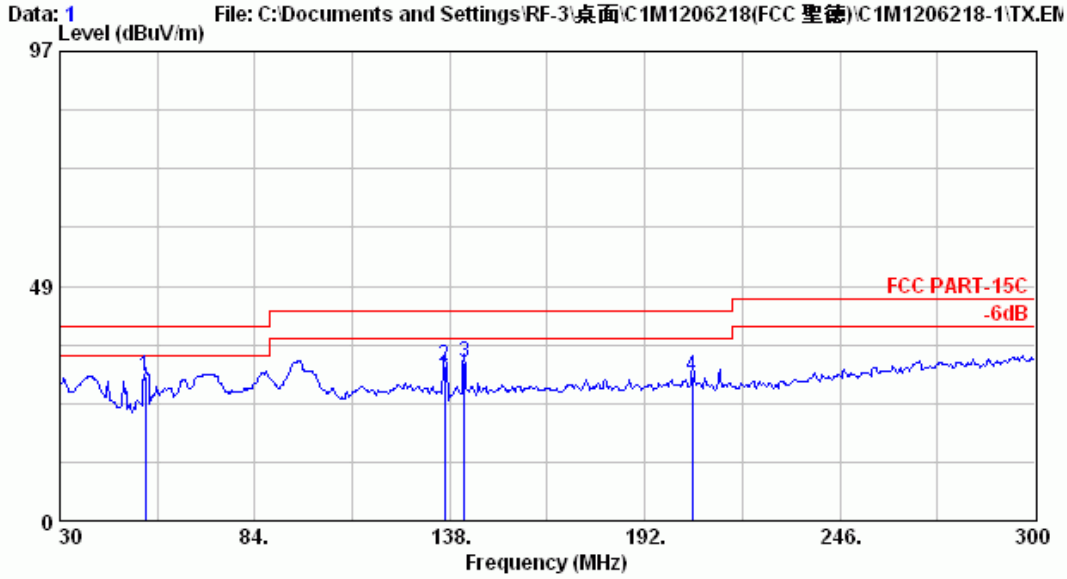

Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 24℃/58% □jianlun_hung
EUT : R9P602NIZ8
Power Rating : AC120V / 60Hz
Test Mode : OPERATING

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	53.760	15.09	1.50	13.12	29.71	40.00	10.29	QP
2	136.650	19.97	2.40	9.69	32.06	43.50	11.44	QP
3	142.050	20.26	2.50	9.87	32.63	43.50	10.87	QP
4	205.230	21.94	3.10	4.87	29.90	43.50	13.60	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All readings are Quasi-Peak values.

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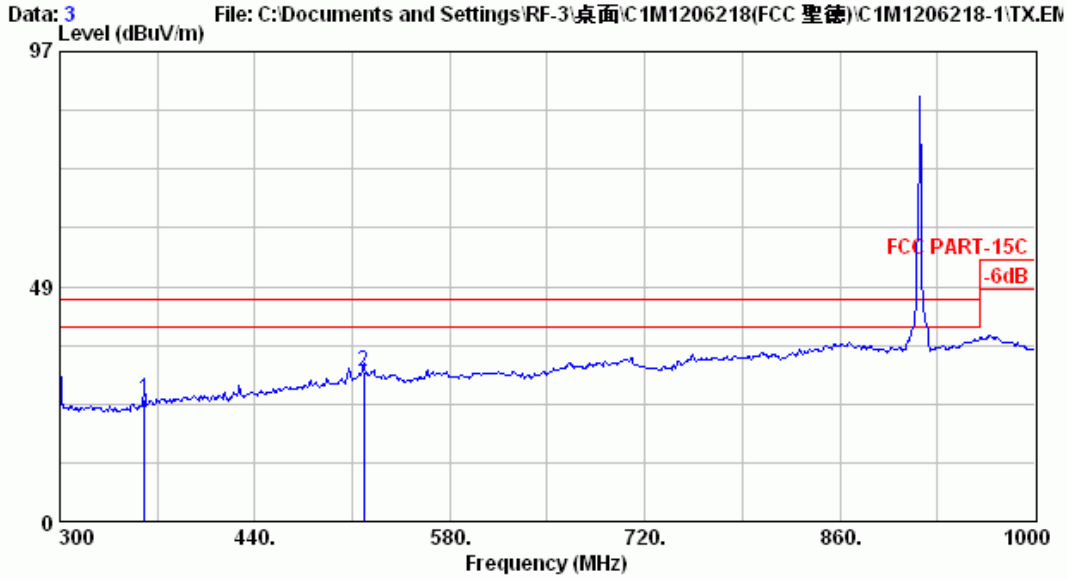

Site no. : A/C Chamber Data no. : 3
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 24℃/58% □jianlun_hung
EUT : R9P602NIZ8
Power Rating : AC120V / 60Hz
Test Mode : OPERATING

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	360.900	16.24	4.43	4.68	25.35	46.00	20.65	QP
2	518.400	20.01	6.86	3.89	30.76	46.00	15.24	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All readings are Quasi-Peak values.

3.7.2. Frequency Range Above 1GHz

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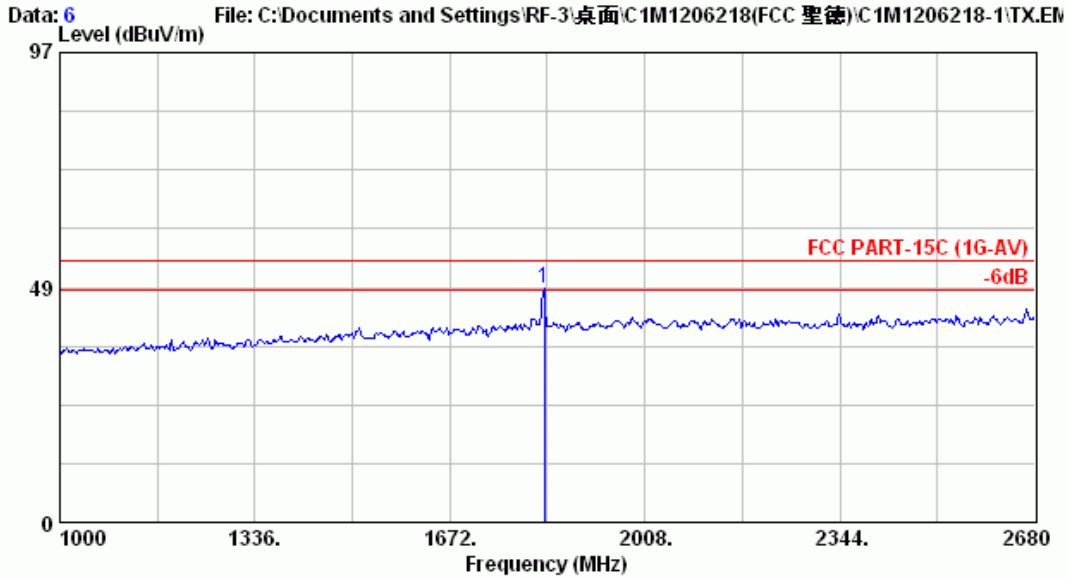


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Site no.      : A/C Chamber                 Data no.   : 6
Dis. / Ant.   : 3m   3115(4104)             Ant. pol.  : HORIZONTAL
Limit         : FCC PART-15C (1G-AV)
Env. / Ins.   : E4446A 24℃/58%                         □jianlun_hung
EUT           : R9P602NIZ8
Power Rating  : AC120V / 60Hz
Test Mode     : OPERATING
```
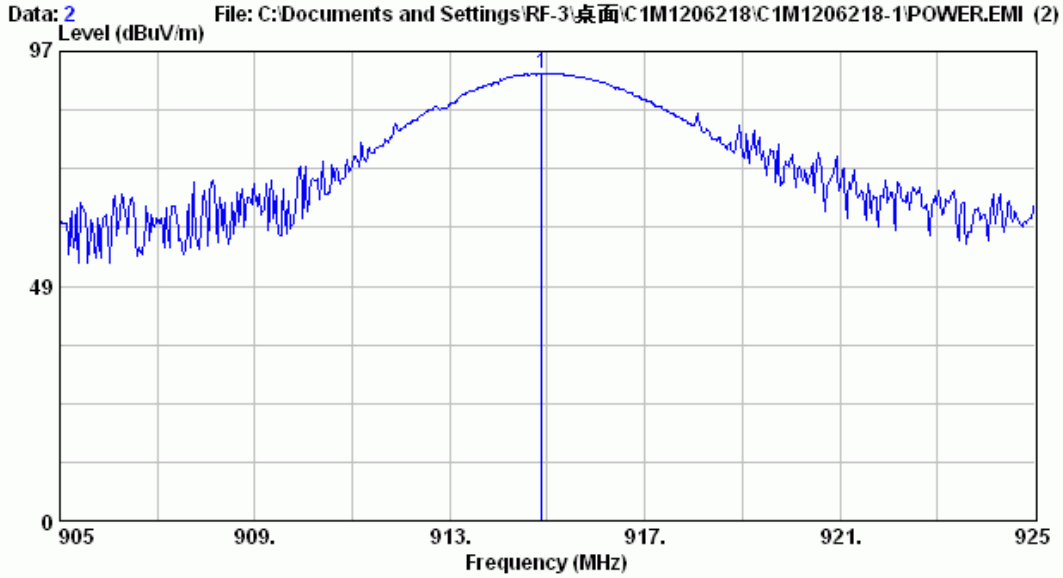

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	1834.960	26.46	6.72	14.99	48.17	54.00	5.83	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

3.7.3. Fundamental Frequency

AUDIX TECHNOLOGY Corp. EMC Laboratory
No.53-11, Tin-fu Tsun, Lin-kou Hsiang, Taipei County, Taiwan R.O.C. Post Code:24443
Tel:+886-2-26092133 Fax:+886-2-26099303
Email:ttemc@ttemc.com.tw




```
Site no.      : A/C Chamber                  Data no.   : 2
Dis. / Ant.   : 3m   VBA6106A/UHALP9108A     Ant. pol.  : HORIZONTAL
Limit         :
Env. / Ins.   : E4446A 24℃/58%                          □jianlun_hung
EUT           : R9P602NIZ8
Power Rating  : AC120V / 60Hz
Test Mode     : OPERATING
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)
1	914.880	24.92	7.40	60.13	92.45

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

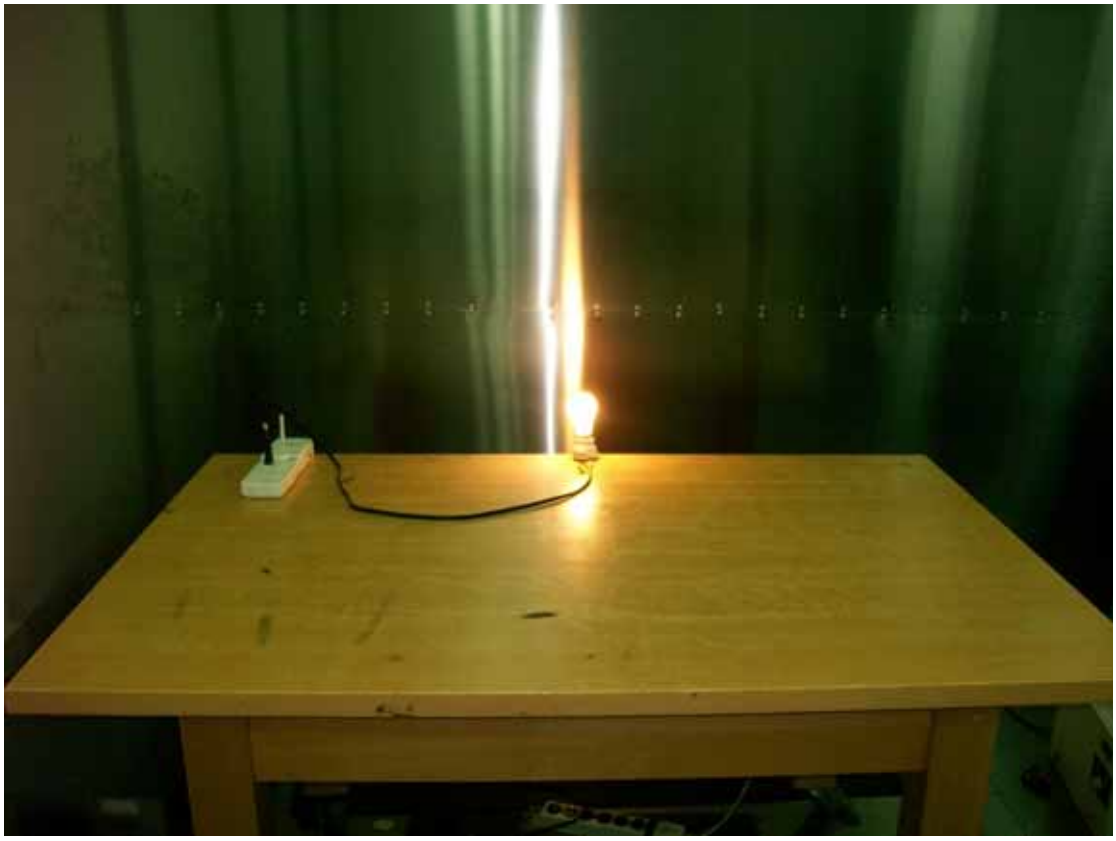
3. Fundament frequency peak value has complied with average limit, thus Q.P. value is not required.

4. DEVIATION TO TEST SPECIFICATIONS

【NONE】

5. PHOTOGRAPHS

5.1. Photos of Powerline Conducted Emission Measurement

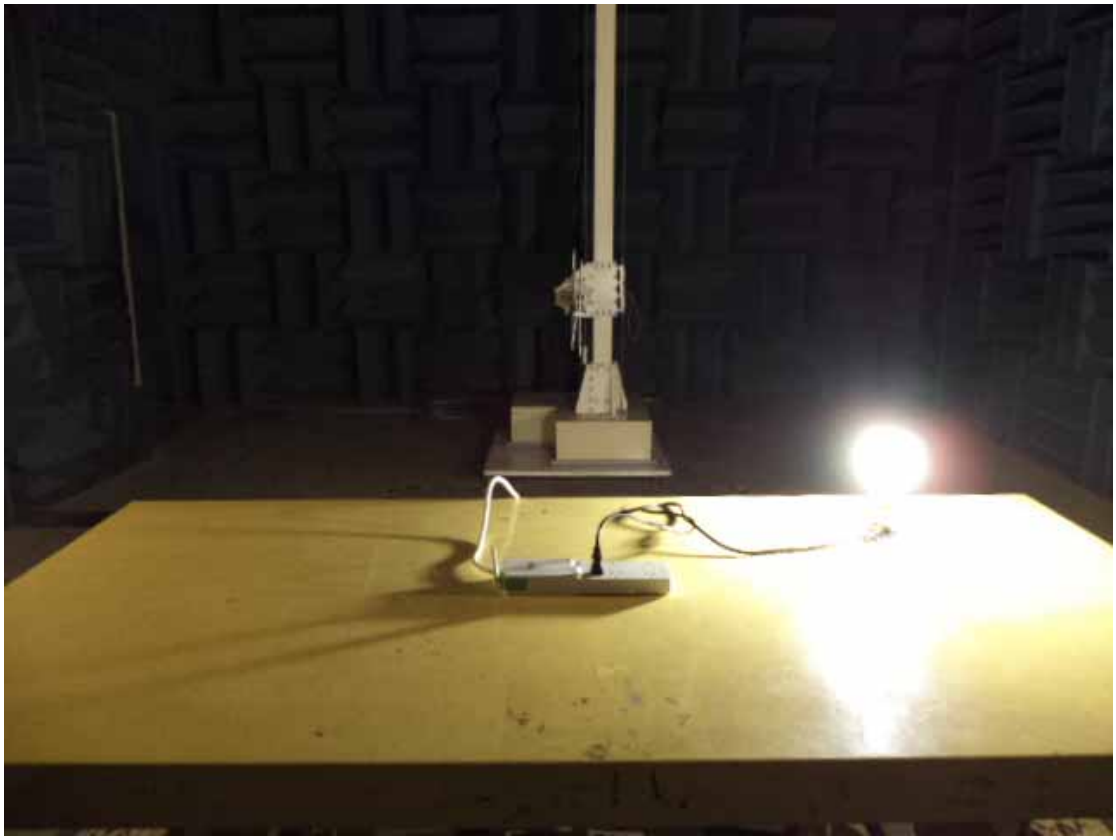


FRONT VIEW OF CONDUCTED MEASUREMENT

BACK VIEW OF CONDUCTED MEASUREMENT

5.2. Photos of Radiated Emission Measurement at Semi-Anechoic Chamber

5.2.1. For Frequency Range 30MHz~1GHz



5.2.2. For Frequency Above 1GHz