

# MEASUREMENT REPORT of *2.4 GHz Wireless device*

**Applicant** : Well Communication Corp.  
**Model No.** : AWR-8214, AWR-8214B  
**EUT** : ADSL Wireless Router  
**FCC ID** : JCHAWR-8214  
**Report No.** : W0115002

Tested by :

***Training Research Co., Ltd.***

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# CERTIFICATION

**We here by verify that:**

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (1992) as a reference. All test were conducted by *Training Research Co., Ltd.*, 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is in compliance with the technical requirements set forth in the FCC Rules Part 15 Subpart C Section 15.247.

**Applicant** : Well Communication Corp.  
**Applicant address** : 11F, No. 778, Chung Cheng Rd., Chung Ho City,  
Taipei Hsien, Taiwan, R.O.C.  
**EUT** : ADSL Wireless Router  
**Model No.** : AWR-8214, AWR-8214B  
**FCC ID** : JCHAWR-8214  
**Report No.** : W0115002  
**Test Date** : September 18, 2003

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## **I . GENERAL**

### **1.1 Introduction**

The following measurement report is submitted on behalf of applicant in support that the *cable gateway* certification in accordance with Part 2 Subpart J and Part 15 Subpart A/B/C of the Commission's Rules and Regulations.

### **1.2 Description of EUT**

The ADSL Wireless Router is passport to full internetworking and high-speed multimedia communications from your home or office to a corporate network or the Internet. With the ADSL Wireless Router connected to computer, and an account activated by network service provider, the ADSL Wireless Router provides a high-speed Digital Subscriber Line (DSL).

**EUT** : ADSL Wireless Router  
**Model No.** : AWR-8214, AWR-8214B  
**Granted FCC ID** : JCHAWR-8214  
**Frequency Range** : 2.412 GHz ~ 2.462GHz  
**Support Channel** : 11 Channels  
**Modulation Skill** : DBPSK, DQPSK, CCK  
**Power Type** : By the Power adaptor  
M/N: MW41-1200800A  
I/P: 120Vac, 60Hz  
O/P: 12Vac, 800mA  
**Power Cable** : 193 cm length, non-shielded.

**\*The input signal to the radio is received through either one of the antennas. The selection of the antenna is performed through the Diversity Switch. Only one of the antennas can transmit the signal, thus conducting all the tests with the main antenna.**

### 1.3 Description of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

**PC** : **HP Brio 85xx 6/350**  
Model No. : D6928A  
Serial No. : SG91801432  
FCC ID : Doc Approved  
Power type : 100 ~ 230VAC / 50 ~ 60Hz, 5A, Switching  
Power cord : Non-shielded, 2.33m long, Plastic, No ferrite core

**Monitor** : **HP 15' Color Monitor**  
Model No. : D2827A  
Serial No. : KR91161719  
FCC ID : C5F7NFCMC1518X  
Power type : 110 ~ 240 VAC / 50 ~ 60 Hz, Switching  
Power cord : Shielded, 1.83m long, No ferrite core  
Data cable : Shielded, 1.46m long, with two ferrite cores

**Keyboard** : **HP**  
Model No. : 5219  
Serial No. : BN31206351  
FCC ID : E5XKB5209  
Power type : By PC  
Data cable : Shielded, 1.60m long

**Mouse** : **HP**  
Model No. : MO42KOA  
Serial No. : 0306044011  
FCC ID : DOC Approved  
Power type : By PC  
Power cord : Non-shielded, 1.88m long, No ferrite core

**Wireless PC Card:** **LINKSYS**  
Model No. : WPC11 ver.3  
FCC ID : PKW-WPC11-V3  
Canada Code : 3839A12075

**Printer** : **HP**  
Model No. : C2642A  
Serial No. : SG69A196GV  
FCC ID : B94C2642X  
Power type : 220 VAC, 50Hz  
Power cord : Non-shielded, 2m long, no ferrite core  
Data cable : Shielded, 1.84m (1.7m) long, no ferrite core

**USB Joystick** : **Rockfire**  
Model No. : QF-337uv  
Serial No. : 10600545  
FCC ID : CE Approval  
Power type : Powered by PC  
Power cable : Shielded, 1.8m long, No ferrite bead data cable

**PC** : **HP Vectra VE**  
Model No. : D6970A  
Serial No. : SG53000707  
FCC ID : Doc Approved  
Power type : 100 ~ 230VAC / 50 ~ 60Hz, 5A, Switching  
Power cord : Non-shielded, 2.30m long, Plastic, No ferrite core

**LAN Card** : **D-Link**  
Model No. : DFE-530TX  
Serial No. : 0050BAE32FF3, 0050BAE3158B  
FCC ID : N/A, DoC Approved

**Notebook PC** : **ASUSTek Computer**  
Model No. : AB00F  
Serial No. : 24NP016361  
FCC ID : DoC Approved  
BSMI : 41016012  
Power type : 100 ~ 240VAC, 1A 50/60 Hz, Switching

**Adaptor of Notebook** : **LITE-ON Electronics, Inc.**  
Model No. : PA-1530-01  
Serial No. : 00151184  
FCC ID : Doc Approved  
Power cable : Non-shielded, 1.72m length, Plastic hood, No ferrite core  
(Between power adaptor and AC power source)  
Power cable : Shielded, 1.48m length, Plastic hood, with ferrite core  
(Between power adaptor and notebook)

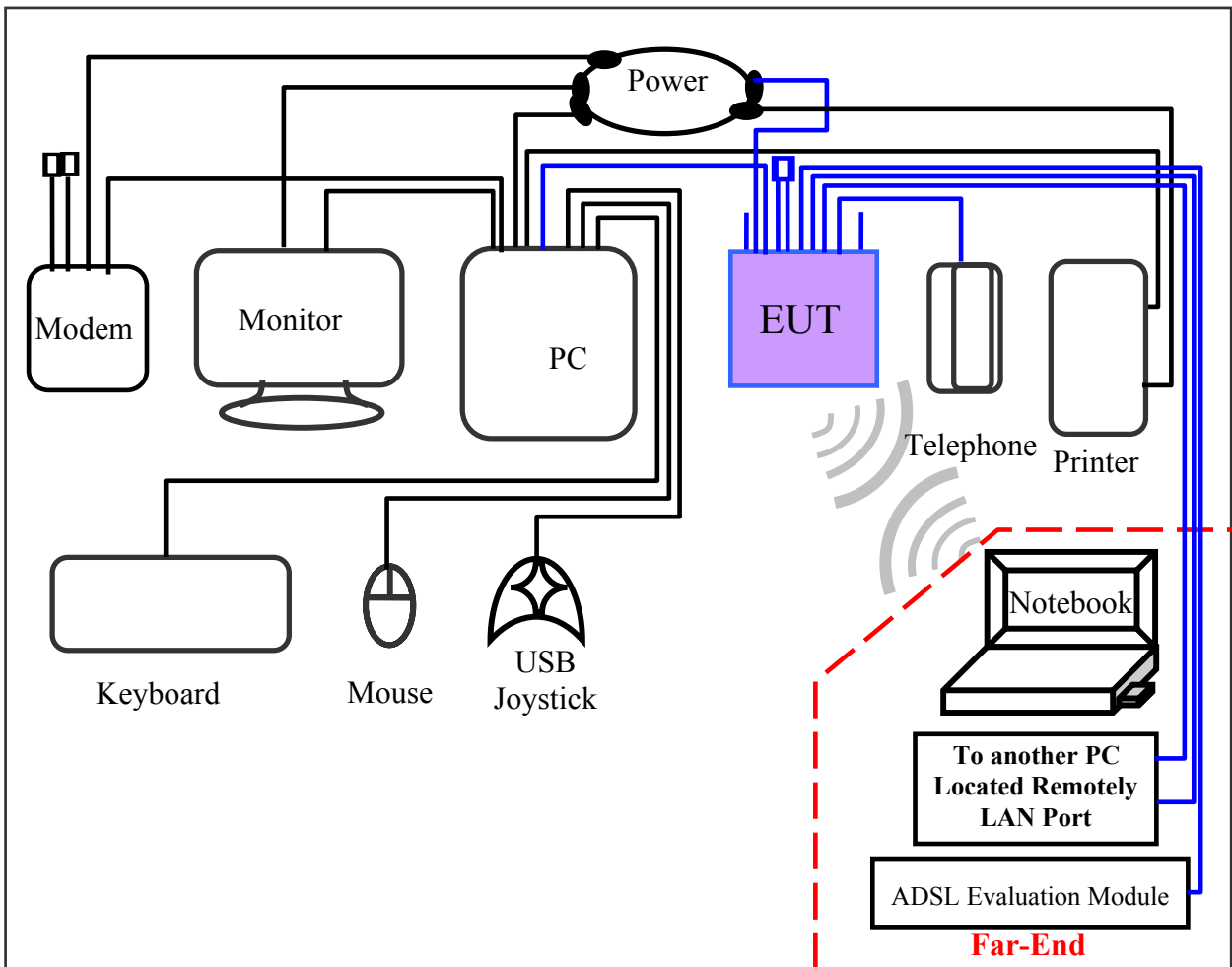
**Telephone** : **Shin-Kan-Sen**  
Model No. : HTT-213  
Serial No. : 2111011508  
FCC ID : N/A  
BSMI : 41016012  
Power type : By ADSL Evaluation Module

**ADSL Evaluation Module:TEXAS INSTRUMENTS**

Model No. : 99-7451-01  
Serial No. : B079915  
FCC ID : N/A  
Power type : 12Vdc



### 1.4 Configuration of System Under Test



(Conduction and Radiation for unintentional test)

The setting up procedure was in Appendix A.

#### Connections of PC:

- \*Serial Port --- via a 110cm shielded RS-232 cable to modem.
- \*Monitor Port --- a monitor with 1.5m length data cable.
- \*Keyboard port --- a keyboard with 1.50m length data cable.
- \*Mouse port --- a mouse with 1.50m length data cable.
- \*USB port A --- to EUT.
- \*USB port B --- a joystick with 1.80m long, shielded and no ferrite bead data cable.
- \*Printer port --- a printer with 1.80m length data cable.

(Each port on notebook is connected with suitable device)

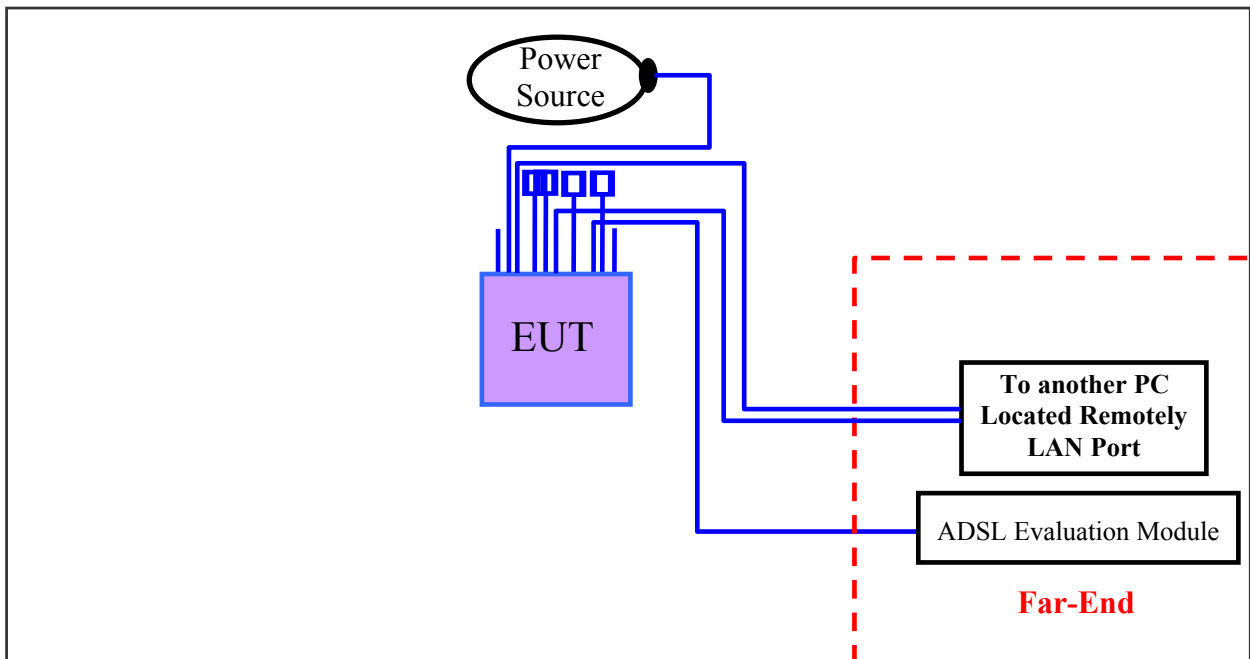
**Connections of EUT:**

**Network Everywhere Wireless Cable/DSL Router:**

- \*RS-232 port --- via a 76 cm length data cable that terminated.
- \*USB port --- via a 1.8m length shielded USB cable to the USB port A of PC.
- \*LAN port 1, 4 --- via a 5.0m length data cable to the LAN port of PC Located Remotely.
- \*LAN port 2, 3 --- via a 1.0m length data cable to the dummy load.
- \*DSL jack --- via a 15m length RJ-11C cable to the ADSL Evaluation Module located remotely.
- \*PHONE jack --- via a 1.5m length RJ-11C cable to the Telephone.
- \*Power jack --- with a power adaptor.

**Power adaptor:**

- M/N: MW41-1200800A
- I/P: 120Vac, 60Hz
- O/P: 12Vac, 800mA
- \*Power cable of adaptor x 1 --- 193 cm length, non-shielded



(Conduction & Radiation of intentional test)

The setting up procedure was recorded in Appendix A.

### Connections of EUT:

#### Network Everywhere Wireless Cable/DSL Router:

- \*RS-232 port --- via a 76 cm length data cable that terminated.
- \*LAN port 1, 4 --- via a 5.0m length data cable to the LAN port of PC Located Remotely.
- \*LAN port 2, 3 --- via a 1.0m length data cable to the dummy load.
- \*DSL jack --- via a 15m length RJ-11C cable to the ADSL Evaluation Module located remotely.
- \*PHONE jack --- with a 1.5m length RJ-11C cable that terminated.
- \*Power jack --- with a power adaptor.

#### Power adaptor:

- M/N: MW41-1200800A
- I/P: 120Vac, 60Hz
- O/P: 12Vac, 800mA
- \*Power cable of adaptor x 1 --- 193 cm length, non-shielded

### 1.5 Verify the Frequency and Channel

Channel	Frequency (GHz)
1	2.412
2	2.417
3	2.422
4	2.427
5	2.432
6	2.437
7	2.442
8	2.447
9	2.452
10	2.457
11	2.462

Note:

- 1.This is for confirming that all frequencies are in 2.412GHz to 2.462GHz.
- 2.Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz.  
(The locations of these frequencies one near the top, one near the middle and one near the bottom.)
- 3.After test, the EUT operating frequencies are in 2.412GHz to 2.462GHz. So all the items as followed in testing report are need to test these three frequencies:  
Top: Channel – 1; Middle: Channel – 6; Bottom: Channel – 11.

## **1.6 Test Procedure**

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (1992) and the pre-setup was written on Appendix A, the detail setup was written on each test item.

## **1.7 Location of the Test Site**

The radiated emissions measurements (above 1GHz) required by the rules were performed on the **three-meter, Anechoic Chamber (Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F, No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and radiated emissions measurements below 1 GHz were performed in an OATS located at Pa-Lian His-chih Training Research Co., Ltd.

No. 15, Lane 530, Pa-Lian RD., Sec. 1, Hsichih City, Taipei Hsien, Taiwan, R.O.C. (Registration No.: 91035) *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

## **1.8 General Test Condition**

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

In test, they were set in high power and continuously transmitting mode that controlled by computer. The ch01, ch06 and ch11 of EUT were all tested. The setting up procedure is recorded on Appendix A.

## **II. Section 15.101(a): Equipment authorization of unintentional radiators**

The EUT equipped with an Internet interface and should be operated with the computer. It was categorized to *Class B personal computers and peripherals* as cannot be operated stand-alone. The authorization requires Certification and the items required such as Sect.15.107 (Conducted limits) and Sect.15.109 (Radiated emission limits) is same as Sect.15.207 and 15.247(C) we'd performed respectively. So in this test report we have "unintentional" and "intentional" setup and test. The "intentional test" was making the RF device to transmit continuously. The "unintentional test" was making the EUT as a usual status. (See Appendix A setup)

## **III. Section 15.203: Antenna requirement**

The EUT has an integrated antenna permanently attached on the PCB. In addition, there is no external antenna or connector employed. The antenna requirement stated in Sect.15.203 is inapplicable to this EUT. **The antenna specification listed in the Appendix B of the test report.**

**IV. Section 15.207: Power Line Conducted Emissions for AC Powered Units**

**4.1 Test Condition & Setup**

The EUT was assembled on a wooden table, which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and Line Impedance Stabilization Networks (LISNs). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer (or EMI receiver) was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPER quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed.

There are two test conditions applied in this test item, the test procedure description as the following:

1.EUT transmit only: (intentional test)

Using the LAN card install in Notebook and use software to control the EUT. Then making access to the mode of continuous transmission and setting the testing channel. Three channels were tested, one in the top (CH01), one in the middle (CH06) and the other in bottom (CH11). The CH 1 was the worst case which was recorded.

2.EUT as a class B peripheral, see Appendix A.

Above, the 110V/230V were tested individually.

**4.2 List of Test Instruments**

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Receiver	SCR3102	SCHAFFNER	012	04/22/03	04/21/04
LISN (EUT)	3825/2	EMCO	9411-2284	07/21/03	07/20/04
LISN (Support E.)	3825/2	EMCO	9210-2007	09/03/03	09/02/04
Preamplifier	EQ3-006	TRC	-----	05/29/03	05/28/04
Line switch box	EQ3-007	TRC	-----	05/29/03	05/28/04

The level of confidence of 95% , the uncertainty of measurement of conducted emission is ± 2.02 dB .

**4.3 Test configuration**

*Conducted Emissions Test Placement of Unintentional*





***Conducted Emissions Test Placement of Intentional***



4.4 Test Result of Conducted Emissions

Test Mode: Intentional CH-1

Testing room : Temperature : 26 ° C Humidity : 60 % RH

**Line 1**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	
331.00	44.74	***.**	***.**	60.83	50.83	-6.09
345.00	44.74	***.**	***.**	60.43	50.43	-5.69
359.00	44.92	***.**	***.**	60.03	50.03	-5.11
366.00	44.69	***.**	***.**	59.83	49.83	-5.14
380.00	45.04	***.**	***.**	59.43	49.43	-4.39
387.00	45.25	***.**	***.**	59.23	49.23	-3.98
411.00	44.62	***.**	***.**	58.54	48.54	-3.92
436.00	44.25	***.**	***.**	57.83	47.83	-3.58
480.00	41.74	***.**	***.**	56.57	46.57	-4.83
496.00	40.37	***.**	***.**	56.11	46.11	-5.74

**Line 2**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	Quasi-Peak (dBµV)	Average (dBµV)	
306.00	48.09	***.**	***.**	61.54	51.54	-3.45
322.00	48.31	***.**	***.**	61.09	51.09	-2.77
335.00	48.55	***.**	***.**	60.71	50.71	-2.17
349.00	48.04	***.**	***.**	60.31	50.31	-2.27
366.00	47.77	***.**	***.**	59.83	49.83	-2.06
375.00	47.35	***.**	***.**	59.57	49.57	-2.22
390.00	47.01	***.**	***.**	59.14	49.14	-2.14
405.00	46.78	***.**	***.**	58.71	48.71	-1.93
444.00	45.12	***.**	***.**	57.60	47.60	-2.48
457.00	43.77	***.**	***.**	57.23	47.23	-3.46

\*The reading amplitudes are all under limit.

**Test Mode: Intentional CH-6**

Testing room : Temperature : 26 ° C Humidity : 60 % RH

**Line 1**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	
352.00	44.99	***.***	***.***	60.23	50.23	-5.24
368.00	45.04	***.***	***.***	59.77	49.77	-4.73
375.00	44.88	***.***	***.***	59.57	49.57	-4.69
390.00	44.83	***.***	***.***	59.14	49.14	-4.31
397.00	44.90	***.***	***.***	58.94	48.94	-4.04
414.00	44.57	***.***	***.***	58.46	48.46	-3.88
430.00	44.23	***.***	***.***	58.00	48.00	-3.77
441.00	43.51	***.***	***.***	57.69	47.69	-4.18
455.00	43.04	***.***	***.***	57.29	47.29	-4.24
467.00	42.02	***.***	***.***	56.94	46.94	-4.93

**Line 2**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	
302.00	48.02	***.***	***.***	61.66	51.66	-3.63
318.00	47.54	***.***	***.***	61.20	51.20	-3.66
329.00	47.85	***.***	***.***	60.89	50.89	-3.03
349.00	47.43	***.***	***.***	60.31	50.31	-2.88
366.00	47.14	***.***	***.***	59.83	49.83	-2.69
383.00	47.28	***.***	***.***	59.34	49.34	-2.06
408.00	46.42	***.***	***.***	58.63	48.63	-2.21
430.00	45.24	***.***	***.***	58.00	48.00	-2.76
444.00	44.17	***.***	***.***	57.60	47.60	-3.43
455.00	43.70	***.***	***.***	57.29	47.29	-3.59

\*The reading amplitudes are all under limit.

**Test Mode: Intentional CH-11**

Testing room : Temperature : 26 ° C Humidity : 60 % RH

**Line 1**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	
340.00	45.21	***.**	***.**	60.57	50.57	-5.36
352.00	45.06	***.**	***.**	60.23	50.23	-5.17
371.00	45.18	***.**	***.**	59.69	49.69	-4.51
378.00	45.21	***.**	***.**	59.49	49.49	-4.28
403.00	45.06	***.**	***.**	58.77	48.77	-3.71
425.00	44.46	***.**	***.**	58.14	48.14	-3.69
449.00	43.44	***.**	***.**	57.46	47.46	-4.02
461.00	42.76	***.**	***.**	57.11	47.11	-4.35
489.00	40.42	***.**	***.**	56.31	46.31	-5.89
502.00	39.71	***.**	***.**	56.00	46.00	-6.29

**Line 2**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	
295.00	47.53	***.**	***.**	61.86	51.86	-4.33
312.00	47.70	***.**	***.**	61.37	51.37	-3.67
322.00	47.70	***.**	***.**	61.09	51.09	-3.38
329.00	47.56	***.**	***.**	60.89	50.89	-3.32
349.00	47.57	***.**	***.**	60.31	50.31	-2.74
366.00	47.33	***.**	***.**	59.83	49.83	-2.50
387.00	46.64	***.**	***.**	59.23	49.23	-2.59
411.00	46.03	***.**	***.**	58.54	48.54	-2.51
436.00	44.63	***.**	***.**	57.83	47.83	-3.20
464.00	42.89	***.**	***.**	57.03	47.03	-4.14

\*The reading amplitudes are all under limit.

**Test Mode: Unintentional 100 x 100 Mbps**

Testing room : Temperature : 26 ° C Humidity : 60 % RH

**Line 1**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	
161.00	46.32	***.**	***.**	65.69	55.69	-9.37
314.00	45.70	***.**	***.**	61.31	51.31	-5.62
322.00	44.69	***.**	***.**	61.09	51.09	-6.40
331.00	44.01	***.**	***.**	60.83	50.83	-6.82
340.00	44.41	***.**	***.**	60.57	50.57	-6.16
349.00	43.71	***.**	***.**	60.31	50.31	-6.61
366.00	43.14	***.**	***.**	59.83	49.83	-6.69
378.00	41.65	***.**	***.**	59.49	49.49	-7.84
387.00	41.70	***.**	***.**	59.23	49.23	-7.53
408.00	39.62	***.**	***.**	58.63	48.63	-9.01

**Line 2**

Frequency (KHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	
331.00	44.95	***.**	***.**	60.83	50.83	-5.87
340.00	45.03	***.**	***.**	60.57	50.57	-5.54
349.00	45.13	***.**	***.**	60.31	50.31	-5.18
368.00	44.78	***.**	***.**	59.77	49.77	-4.99
385.00	43.97	***.**	***.**	59.29	49.29	-5.31
397.00	43.53	***.**	***.**	58.94	48.94	-5.41
422.00	41.13	***.**	***.**	58.23	48.23	-7.10
430.00	40.38	***.**	***.**	58.00	48.00	-7.62
929.00	37.74	***.**	***.**	56.00	46.00	-8.26
991.00	37.81	***.**	***.**	56.00	46.00	-8.19

\*The reading amplitudes are all under limit.

## **V. Section 15.247 (a): Technical description of the EUT**

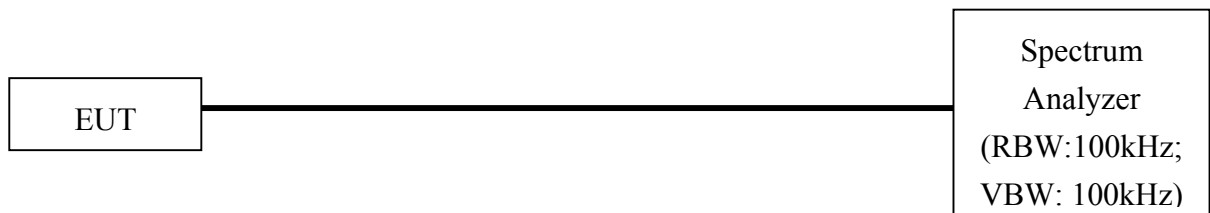
Based on the Section 2.1, *Direct Sequence System* is a spread spectrum system in which the carrier has been modulated by a high speed spreading code and an information data stream. The high speed code sequence dominates the “modulating function” and is the direct cause of the wide spreading of the transmitted signal. In attachment, operational description demonstrates the operation principles of the Baseband processor employed by the EUT, shows that which is a complete DSSS baseband processor and meets the definition of the Direct sequence spread spectrum system.

**VI. Section 15.247(a)(2): Bandwidth for Direct Sequence System.**

**6.1 Test Condition & Setup**

The transmitter bandwidth measurements were performed by the contact manner. The EUT was set to transmit continuously, also various channels were investigated to find the maximum occupied bandwidth.. The output of the EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency is observed by the spectrum analyzer with 100kHz RBW and 100kHz VBW.

**6.2 Test Instruments Configuration**



Test Configuration of Bandwidth for Direct Sequence System

*P.S.: Notebook computer to control the EUT at maximal power output and channel Number and set antenna kit*

**6.3 List of Test Instruments**

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum Analyzer	8592A	H P	3003AD1401	01/01/03	12/31/04

## 6.4 Test Result of Bandwidth

### Bandwidth of Channel 1

Bandwidth : 9.76 MHz

The min. 6 dB BW at least : 500 KHz

### Bandwidth of Channel 6

Bandwidth : 9.16 MHz

The min. 6 dB BW at least : 500 KHz

### Bandwidth of Channel 11

Bandwidth : 9.76 MHz

The min. 6 dB BW at least : 500 KHz

Note:

1. The data in the above table are summarizing the following attachment spectrum analyzer hard copy. According to the guidance, we'd made the measurement with the spectrum analyzer's resolution bandwidth ( $RBW$ )=100kHz, ( $VBW$ )=100kHz and set the  $span \gg RBW$ . The results show the measured 6dB bandwidth comply with the minimum 500kHz requirement.
2. The attachments show these on the following pages.

### Bandwidth of Channel 1

Bandwidth : 17.08 MHz

The min. 20 dB BW at least: 500 KHz

### Bandwidth of Channel 6

Bandwidth : 17.08 MHz

The min. 20 dB BW at least: 500 KHz

### Bandwidth of Channel 11

Bandwidth : 17.00 MHz

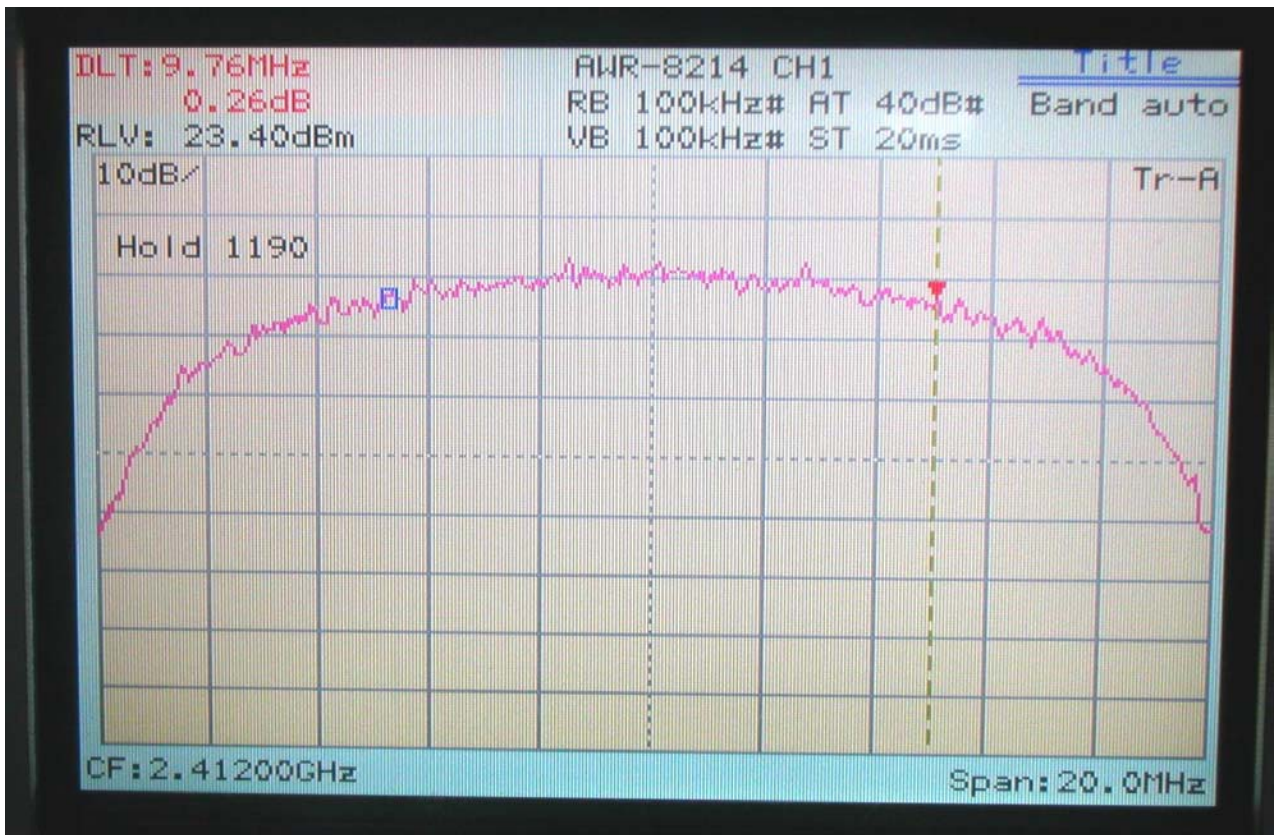
The min. 20 dB BW at least: 500 KHz

Note:

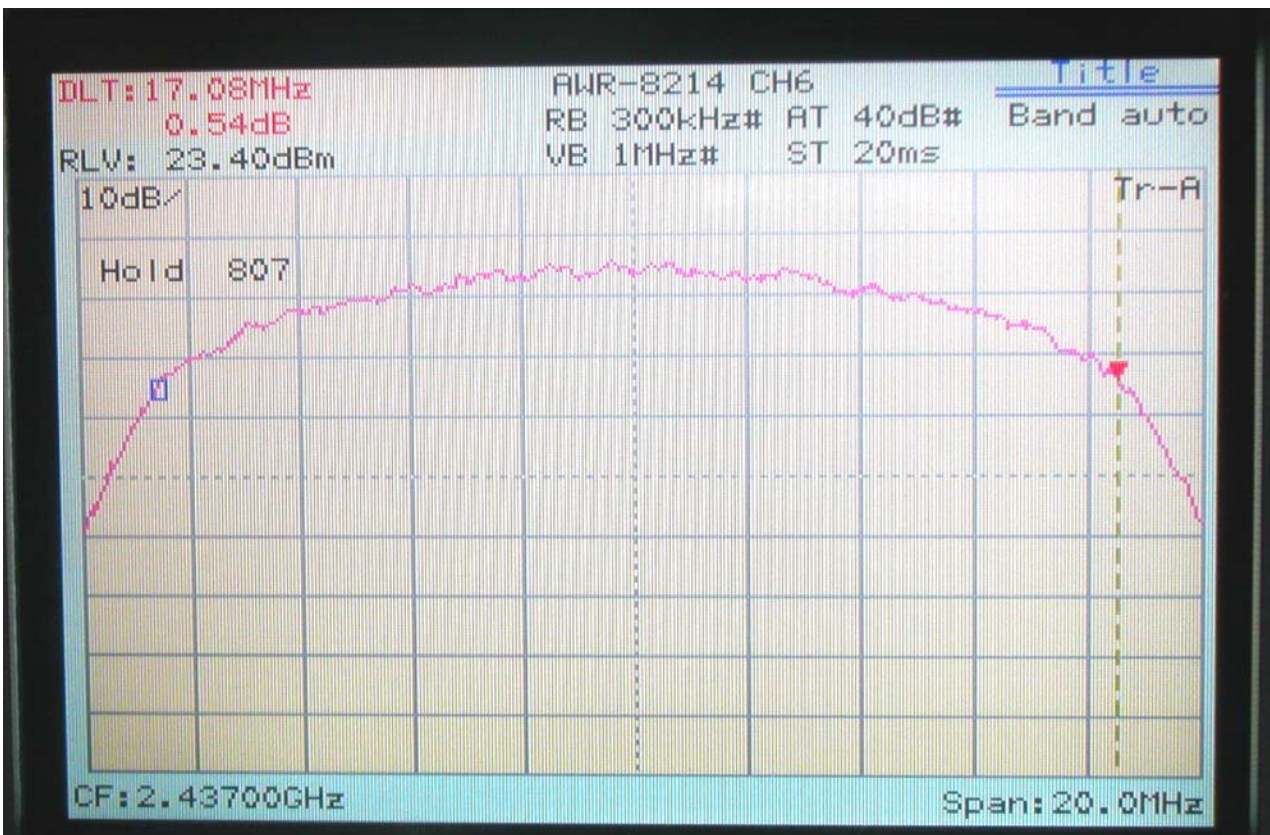
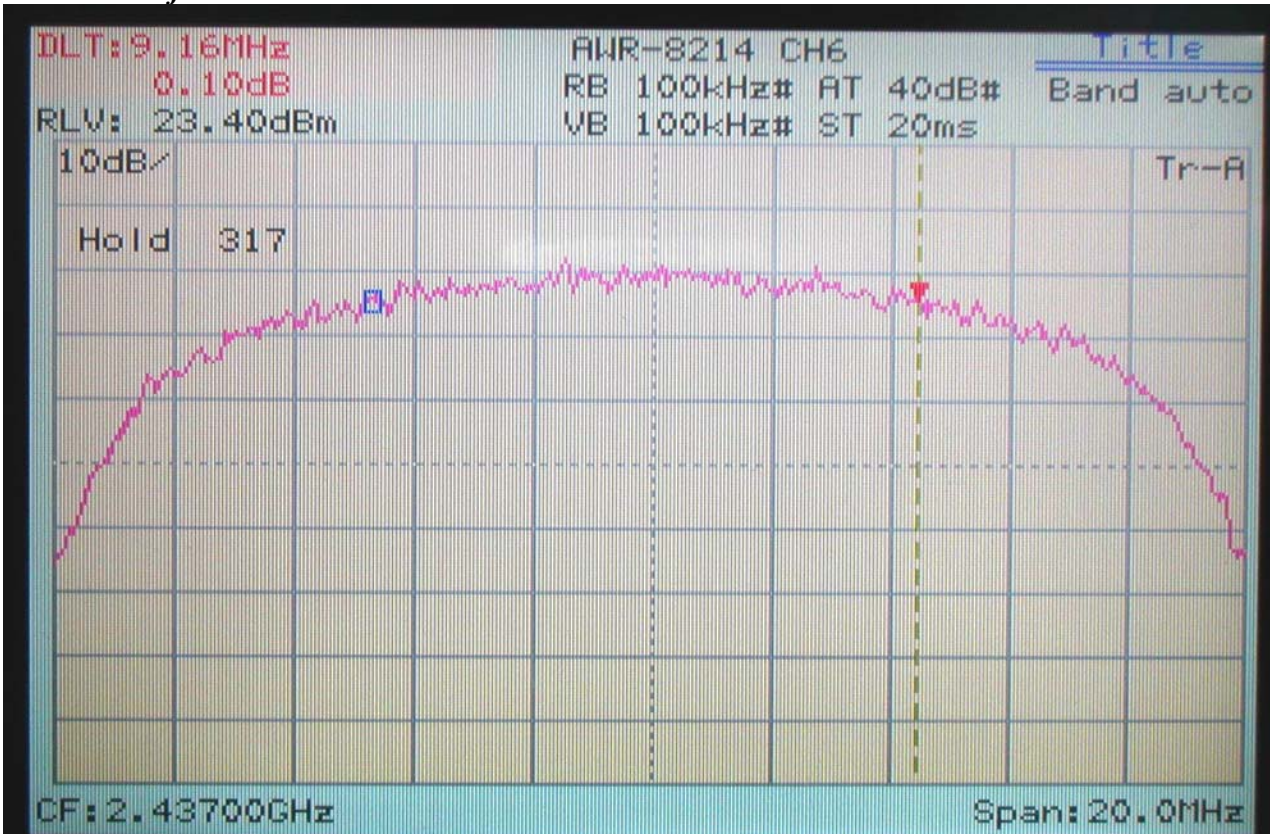
1. The data in the above table are summarizing the following attachment spectrum analyzer hard copy. According to the guidance, we'd made the measurement with the spectrum analyzer's resolution bandwidth ( $RBW$ )=300kHz, ( $VBW$ )=1MHz and set the  $span \gg RBW$ . The results show the measured 6dB bandwidth comply with the minimum 500kHz requirement.
2. The attachments show these on the following pages.



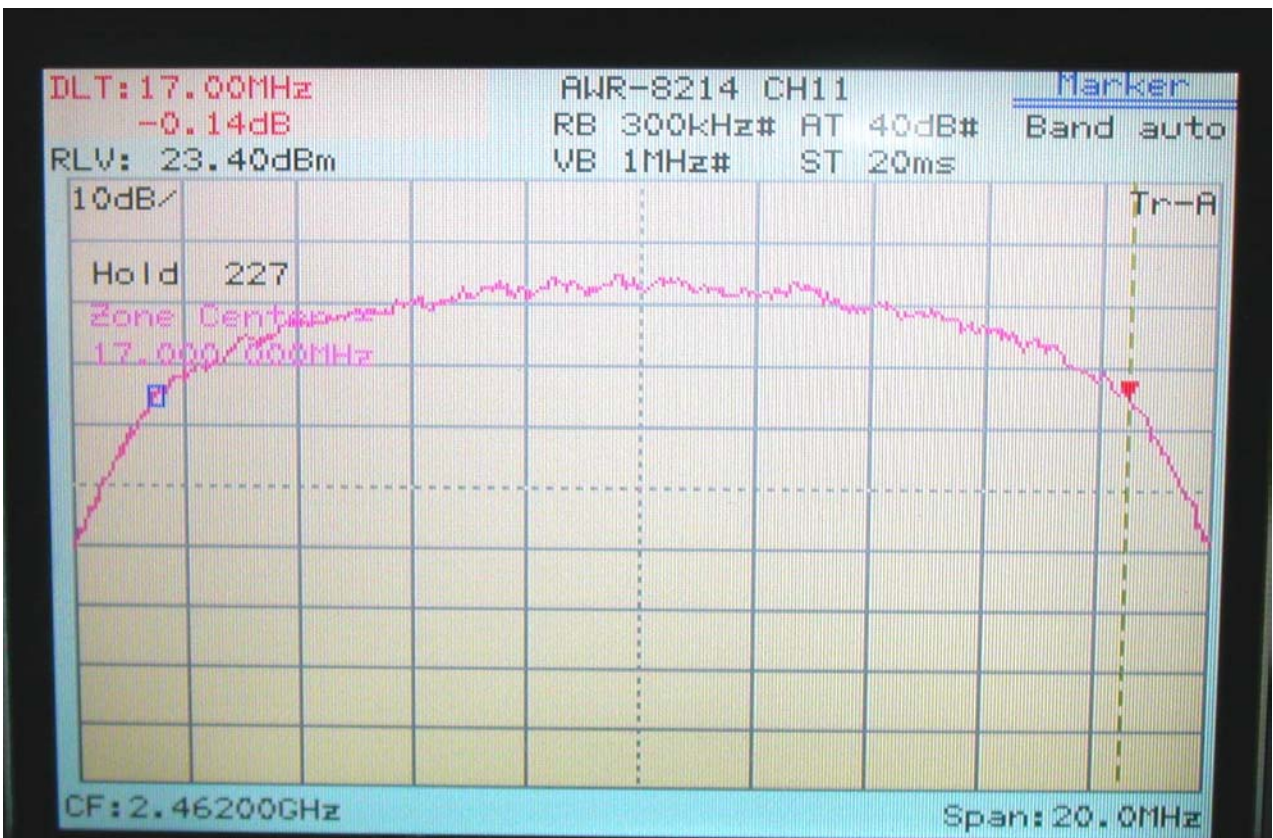
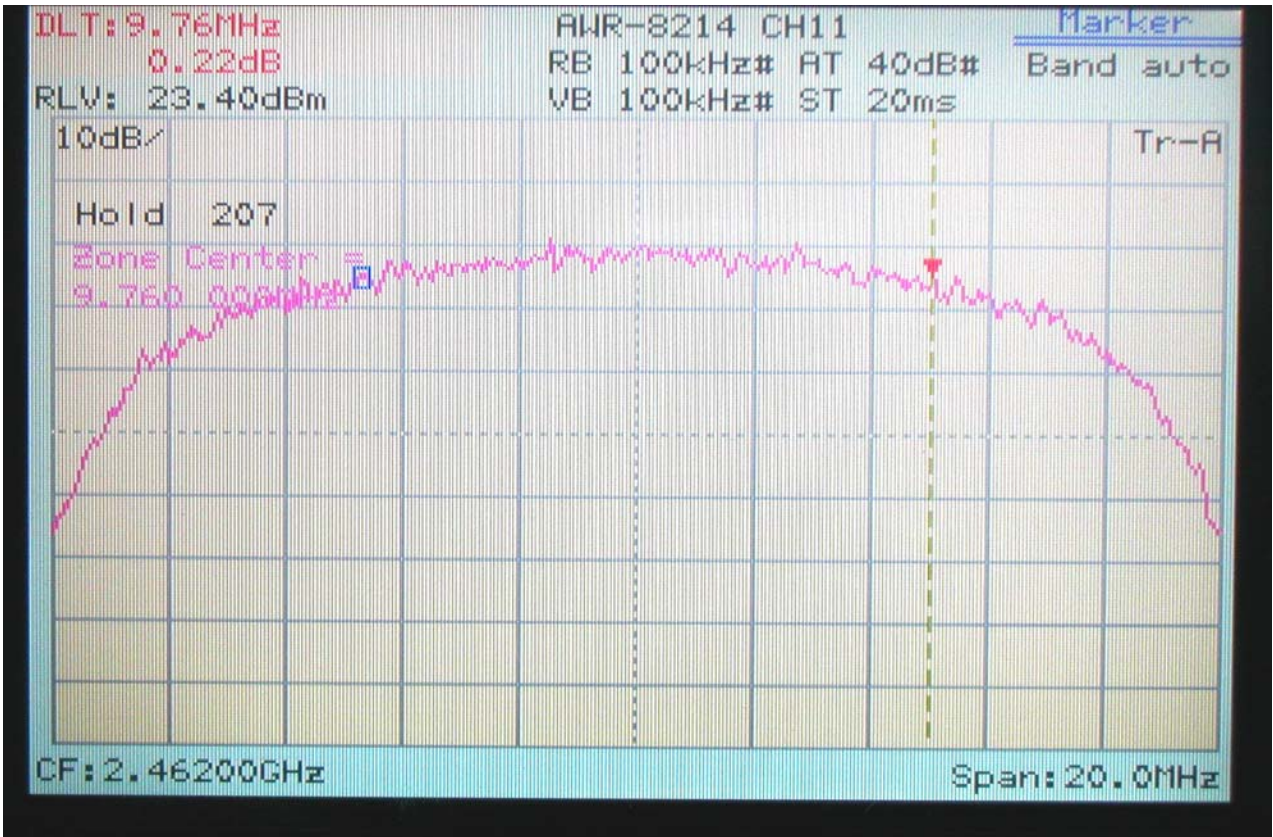
**Bandwidth of Channel 1:**



**Bandwidth of Channel 6:**

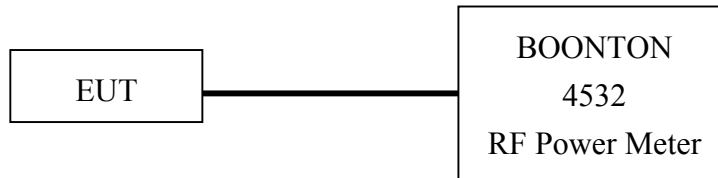


Bandwidth of Channel 11:



## VII. Section 15.247(b): Power Output

### 7.1 Test Condition & Setup



1. The output of the transmitter is connected to the BOONTON RF Power Meter.
2. The calibration is performed before every tests. The values of the output power of the EUT will shown in the dBm directly are the transmitter output peak power. Recording as follows.

**7.2 List of Test Instruments**

Instrument Name	Model No.	Brand	Serial No.
RF Power Meter	4532	BOONTON	117501

**7.3 Test Result**

**Formula:**  
 Signal generator + |Cable loss| = Output peak power

Channel	Signal Generator	Cable Loss	DTS Limit	Output peak power	
	dBm	dBm	mW	dBm	mW
CH 1	16.890	0.7	100	17.590	57.412
CH 6	16.575	0.7	100	17.275	53.395
CH 11	16.785	0.7	100	17.485	56.040

Note:

The limit is vary according to the equipment class, listed below:

1. Digital Transmission System (DTS): 100mW
2. Spread Spectrum Transmitter (DSS): 1W

## VIII. Section 15.247 (C): Spurious Emissions (Radiated)

### 8.1 Test Condition & Setup

We'd performed the test by the *radiated emission* skill: The EUT was placed in an anechoic chamber, and set the EUT transmitting continuously and scanned at 3-meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration, which produced the highest emissions was noted so it could be reproduced later during the final tests. For the measurement above 1GHz, according to the guidance we'd set the spectrum analyzer's 6dB bandwidth RBW to 1MHz.

This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements (below 1 GHz) was made at an OATS. The EUT system was placed on a nonconductive turntable, which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The receiver was examined from 30 MHz to 1000 MHz using the Receiver (SCHAFFNER) and Bi-Log antenna (Model No.: CBL6141A). Above 1 GHz test was using the Hewlett Packard 8564E Spectrum Analyzer, EMCO Horn Antenna (Model 3115) for 1G ~ 18GHz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. The receiver's 6dB bandwidth was set to 120KHz and the QP data recorded, the spectrum analyzer's 6 dB bandwidth was set to 1 MHz (spectrum was examined from 1GHz to 18GHz) and the analyzer was operated in the maximum hold mode. There is a test condition apply in this test item, the test procedure description as the following:

Making access to the mode of continuous transmission by the software in the computer via the LAN port. Three channels were tested, one in the top (CH01), one in the middle (CH06) and the other in bottom (CH11).

With the transmitter operating from a AC source and using the internal of EUT, radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to upper, middle and bottom channels in the 2400 ~ 2483.5 MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBµV/m) is determined by algebraically adding the measured reading in dBµV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency. Since the EUT was set to transmit continuously, no *duty cycle* is present.

**For frequency between 30MHz to 1000MHz**

$$F_{Ia} \text{ (dBuV/m)} = F_{Ir} \text{ (dBuV)} - \text{Correction Factors}$$

F<sub>Ia</sub> : Actual Field Intensity

F<sub>Ir</sub> : Reading of the Field Intensity

$$\text{Correction Factors} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

**For frequency between 1 GHz to 18 GHz**

$$F_{Ia} \text{ (dBuV/m)} = F_{Ir} \text{ (dBuV)} + \text{Correction Factor}$$

F<sub>Ia</sub> : Actual Field Intensity

F<sub>Ir</sub> : Reading of the Field Intensity

$$\text{Correction Factors} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The setting up procedure is recorded on Appendix A.

**8.2 List of Test Instruments**

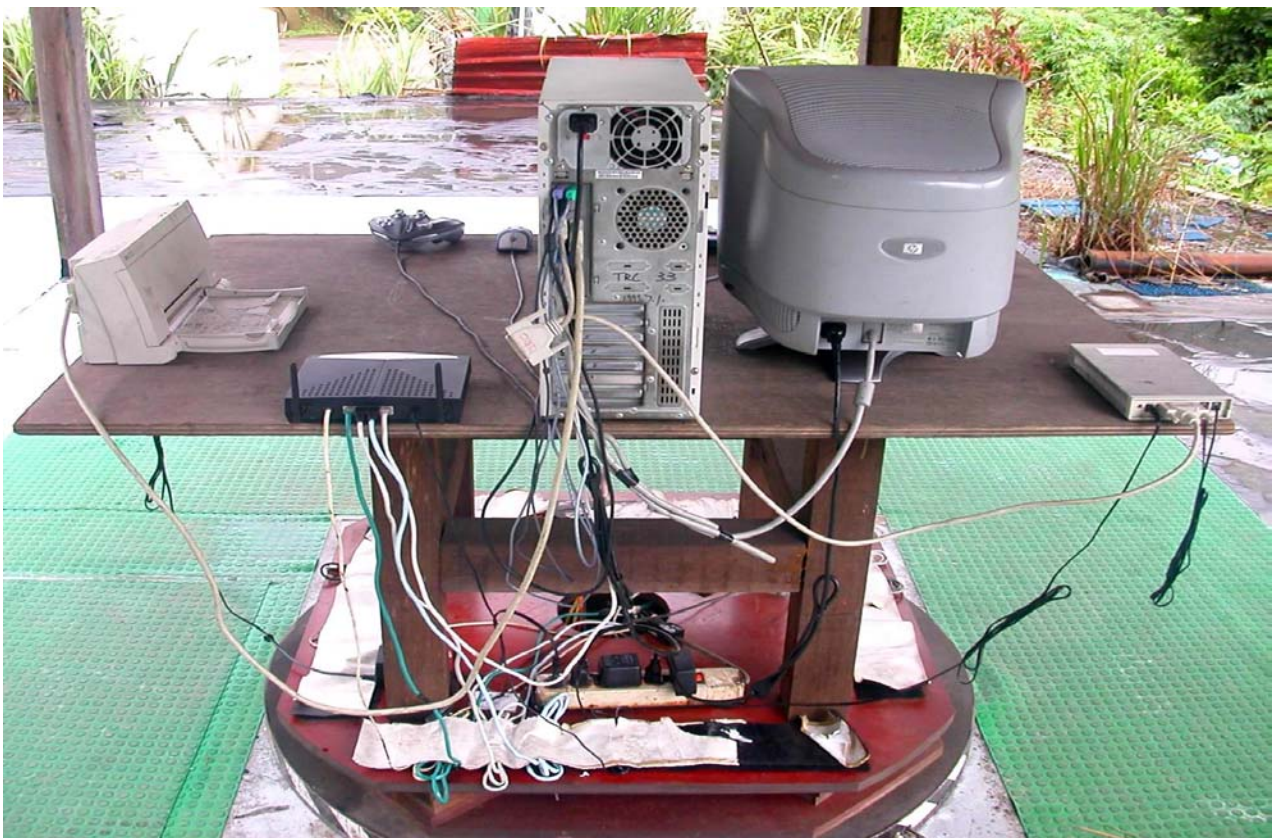
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Receiver	SCR3102	SCHAFFNER	012	04/22/03	04/21/04
Antenna	CBL6141A	SCHAFFNER	4188	05/29/03	05/28/04
Open test side (Antenna, Amplify, cable calibrated together)				05/29/03	05/29/04
Spectrum Analyzer	8564E	HP	US36433002	11/03/02	11/03/03
Microwave	83051A	HP	3232A00347	08/01/03	07/31/04
Preamplifier					
Horn Antenna	3115	EMCO	9704 – 5178	12/27/02	12/27/03

The level of confidence of 95% , the uncertainty of measurement of radiated emission is ± 3.44dB .

### 8.3 Test Instruments Configuration



Front View of the Test Configuration of Unintentional



Rear View of the Test Configuration Unintentional





Front View of the Test Configuration of **Intentional**



Rear View of the Test Configuration **Intentional**

### 8.4 Test Result of Spurious Radiated Emissions

#### Worst case : Intentional test (CH1)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarizations, EUT orientation, etc. are recorded on the following. (the unintentional test also has been verified which was better)

Test Conditions:

Testing room : Temperature : 25 ° C Humidity : 73 % RH

Testing site : Temperature : 25 ° C Humidity : 73 % RH

*Table 1 Radiated Emissions for 30MHz ~ 1GHz [Horizontal]*

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBμV/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV/m)	Ant. H. (m)	Table ( )			Limit (dBμV/m)	Margin (dB)
125.0138	45.15	2.51	249	-4.70	40.45	43.52	-3.07
250.0288	45.11	0.98	68	-1.80	43.31	46.02	-2.71
400.0475	34.08	0.98	247	4.60	38.68	46.02	-7.34
500.0125	35.47	0.98	11	6.80	42.27	46.02	-3.75
597.2525	34.80	0.98	209	9.71	44.51	46.02	-1.51
601.7575	31.23	0.98	26	9.84	41.07	46.02	-4.95
750.0750	26.78	0.98	358	14.30	41.08	46.02	-4.94

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain)

Table 2 Radiated Emissions For 30MHz ~ 1GHz [Vertical]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBμV/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV/m)	Ant. H. (m)	Table ( )			Limit (dBμV/m)	Margin (dB)
125.0125	45.52	1.00	318	-4.70	40.82	43.52	-2.70
137.2525	37.05	1.00	326	-4.40	32.65	43.52	-10.87
250.0250	45.04	1.00	356	-1.80	43.24	46.02	-2.78
500.0488	28.80	1.00	132	6.80	35.60	46.02	-10.42
750.0750	22.37	1.00	335	14.30	36.67	46.02	-9.35

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain)

Table 3 Radiated Emissions [Channel 1 Horizontal]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dB $\mu$ V/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dB $\mu$ V/m)	Ant. H. (m)	Table ( )			Limit (dB $\mu$ V/m)	Margin (dB)
2568.75 <sub>PK</sub>	35.33 <sub>PK</sub>	1.00	87	3.59	38.92	53.96	-15.04
7227.71 <sub>PK</sub>	38.28 <sub>PK</sub>	1.00	254	10.04	48.32	53.96	-5.64
9650.42 <sub>PK</sub>	38.27 <sub>PK</sub>	1.00	63	11.47	49.74	53.96	-4.22

Table 4 Radiated Emissions [Channel 6 Horizontal]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dB $\mu$ V/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dB $\mu$ V/m)	Ant. H. (m)	Table ( )			Limit (dB $\mu$ V/m)	Margin (dB)
7300.21 <sub>PK</sub>	35.78 <sub>PK</sub>	1.00	86	10.27	46.05	53.96	-7.91
9747.08 <sub>PK</sub>	38.44 <sub>PK</sub>	1.00	128	11.89	50.33	53.96	-3.63

Table 5 Radiated Emissions [Channel 11 Horizontal]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dB $\mu$ V/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dB $\mu$ V/m)	Ant. H. (m)	Table ( )			Limit (dB $\mu$ V/m)	Margin (dB)
2300.00 <sub>PK</sub>	36.00 <sub>PK</sub>	1.00	301	2.84	38.84	53.96	-15.12
7378.75 <sub>PK</sub>	35.94 <sub>PK</sub>	1.00	28	10.43	46.37	53.96	-7.59
9837.71 <sub>PK</sub>	35.27 <sub>PK</sub>	1.00	169	11.93	47.20	53.96	-6.76

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain)

**Table 6 Radiated Emissions [Channel 1 Vertical]**

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBµV/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dBµV/m)	Ant. H. (m)	Table ( )			Limit (dBµV/m)	Margin (dB)
2568.75 <sub>PK</sub>	43.00 <sub>PK</sub>	1.00	8	3.59	46.59	53.96	-7.37
7228.06 <sub>PK</sub>	49.44 <sub>PK</sub>	1.00	42	10.04	59.48	74.00	-14.52
7228.06 <sub>AV</sub>	42.77 <sub>AV</sub>	1.00	42	10.04	52.81	53.96	-1.15
9650.42 <sub>PK</sub>	39.77 <sub>PK</sub>	1.00	143	11.47	51.24	53.96	-2.72

**Table 7 Radiated Emissions [Channel 6 Vertical]**

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBµV/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dBµV/m)	Ant. H. (m)	Table ( )			Limit (dBµV/m)	Margin (dB)
2275.00 <sub>PK</sub>	39.00 <sub>PK</sub>	1.00	194	2.75	41.75	53.96	-12.21
2595.83 <sub>PK</sub>	41.50 <sub>PK</sub>	1.00	172	3.63	45.13	53.96	-8.83
7303.40 <sub>PK</sub>	47.60 <sub>PK</sub>	1.00	15	10.28	57.88	74.00	-16.12
7303.40 <sub>AV</sub>	41.94 <sub>AV</sub>	1.00	15	10.28	52.22	53.96	-1.74
7319.31 <sub>PK</sub>	46.10 <sub>PK</sub>	1.00	68	10.32	56.42	74.00	-17.58
7319.31 <sub>AV</sub>	40.44 <sub>AV</sub>	1.00	68	10.32	50.76	53.96	-3.20
9741.04 <sub>PK</sub>	38.44 <sub>PK</sub>	1.00	312	11.86	50.30	53.96	-3.66

**Table 8 Radiated Emissions [Channel 11 Vertical]**

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBµV/m)	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dBµV/m)	Ant. H. (m)	Table ( )			Limit (dBµV/m)	Margin (dB)
2300.00 <sub>PK</sub>	42.83 <sub>PK</sub>	1.00	41	2.84	45.67	53.96	-8.29
2620.83 <sub>PK</sub>	39.33 <sub>PK</sub>	1.00	87	3.66	42.99	53.96	-10.97
7379.03 <sub>PK</sub>	47.44 <sub>PK</sub>	1.00	158	10.43	57.87	74.00	-16.13
7379.03 <sub>AV</sub>	40.27 <sub>AV</sub>	1.00	158	10.43	50.70	53.96	-3.26
7394.19 <sub>PK</sub>	45.44 <sub>PK</sub>	1.00	199	10.41	55.85	74.00	-3.78
7394.19 <sub>AV</sub>	39.77 <sub>AV</sub>	1.00	199	10.41	50.18	53.96	-3.78
9837.71 <sub>PK</sub>	37.94 <sub>PK</sub>	1.00	281	11.93	49.87	53.96	-4.09

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain)

## **8.5 Test Result of the Bandedge**

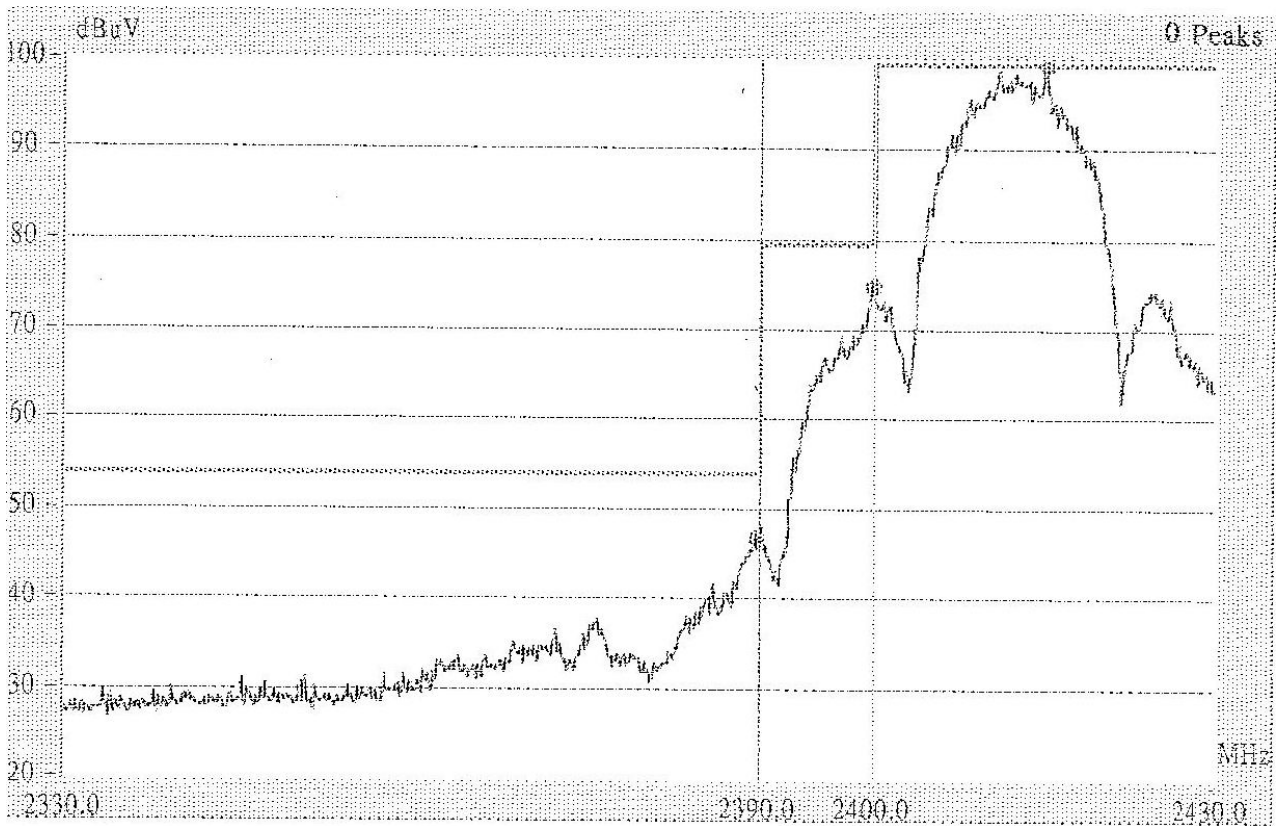
If any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either *at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in § 15.209(a)*,

We perform this section by the *conducted* manner, the RBW is set to 100kHz and VBW>RBW. We'd made the observation *up to 10<sup>th</sup> harmonics and the criterion is all the harmonic/spurious emissions must be 20dB below the highest emission level measured*. If the emissions fall in the restricted bands stated in the Part 15.205(a) must also *comply with the radiated emission limits specified in Part 15.209(a)*.

The following pages show our observations referring to the channel 1 and 11 respectively.

Test Condition & Setup: same as 8.1

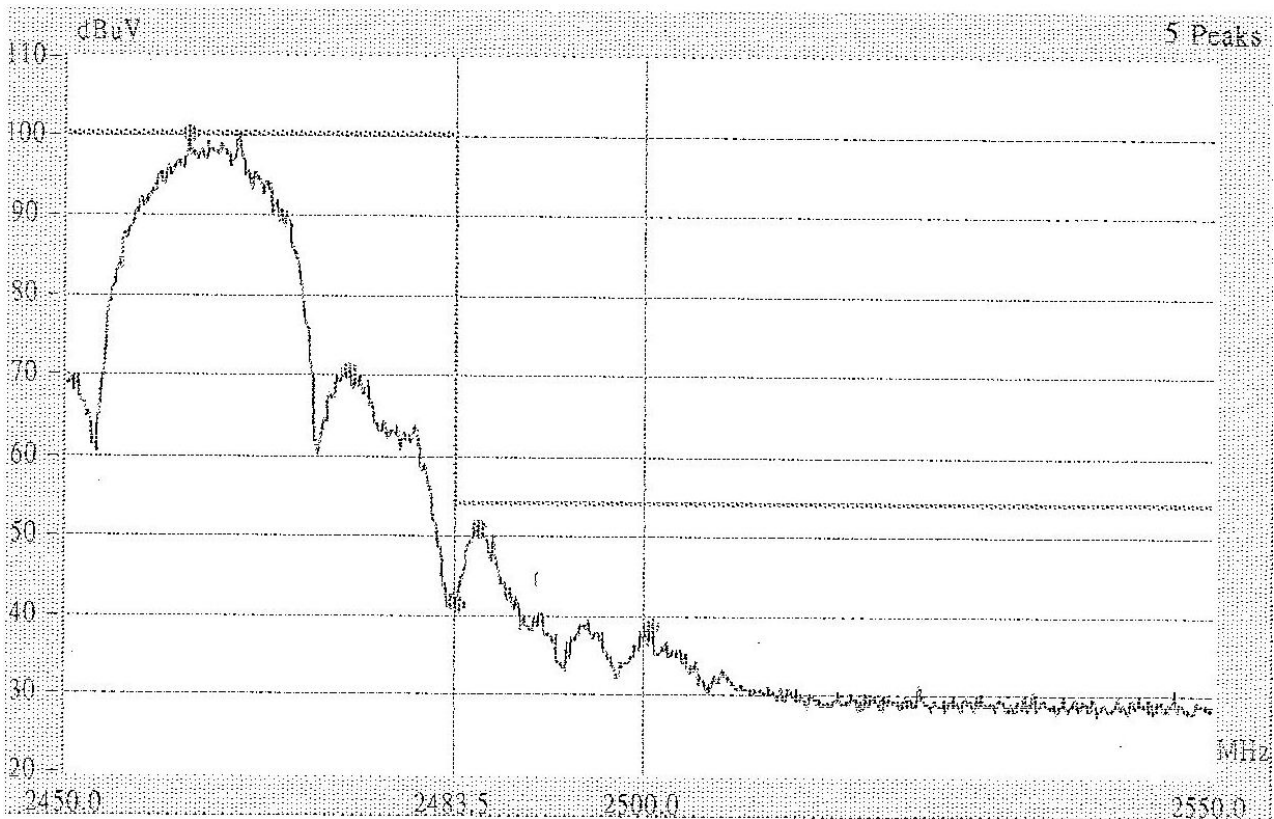
**Channel 1**



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The picture shown above is the bandedge of channel 1.

1. The lobe right by the fundamental side is already 20dB below the highest emission level.
2. The emissions recorded in the restricted band (<2400MHz) is do comply with the Part 15.209(a) – under the limited line marked in red color.

## Channel 11



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The picture shown above is the bandedge of channel 11.

1. The lobe right by the fundamental side is already 20dB below the highest emission level.
2. The emissions recorded in the restricted band (>2483.5MHz) is do comply with the Part 15.209(a) – under the limited line marked in red color.



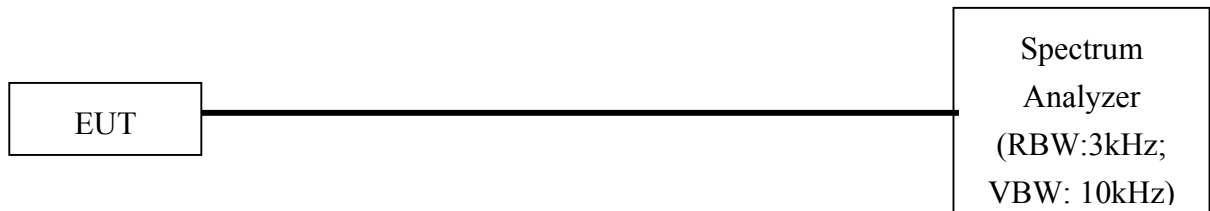
## **IX. Section 15.247(d): Power Spectral Density**

### **9.1 Test Condition & Setup**

The tests below are running with the EUT transmitter set at high power in TDD mode . The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

The attachments below show our observation.

### **9.2 Test Instruments Configuration**



Test Configuration of Power Spectral Density

***P.S.: Notebook computer to control the EUT at maximal power output and channel Number and set antenna kit***

### **9.3 List of Test Instruments**

<u>Instrument Name</u>	<u>Model No.</u>	<u>Brand</u>	<u>Serial No.</u>	<u>Last time</u>	<u>Next time</u>
Spectrum Analyzer	8594EM	H P	3619A00198	06/04/02	06/04/03

**9.4 Test Result of Power spectral density**

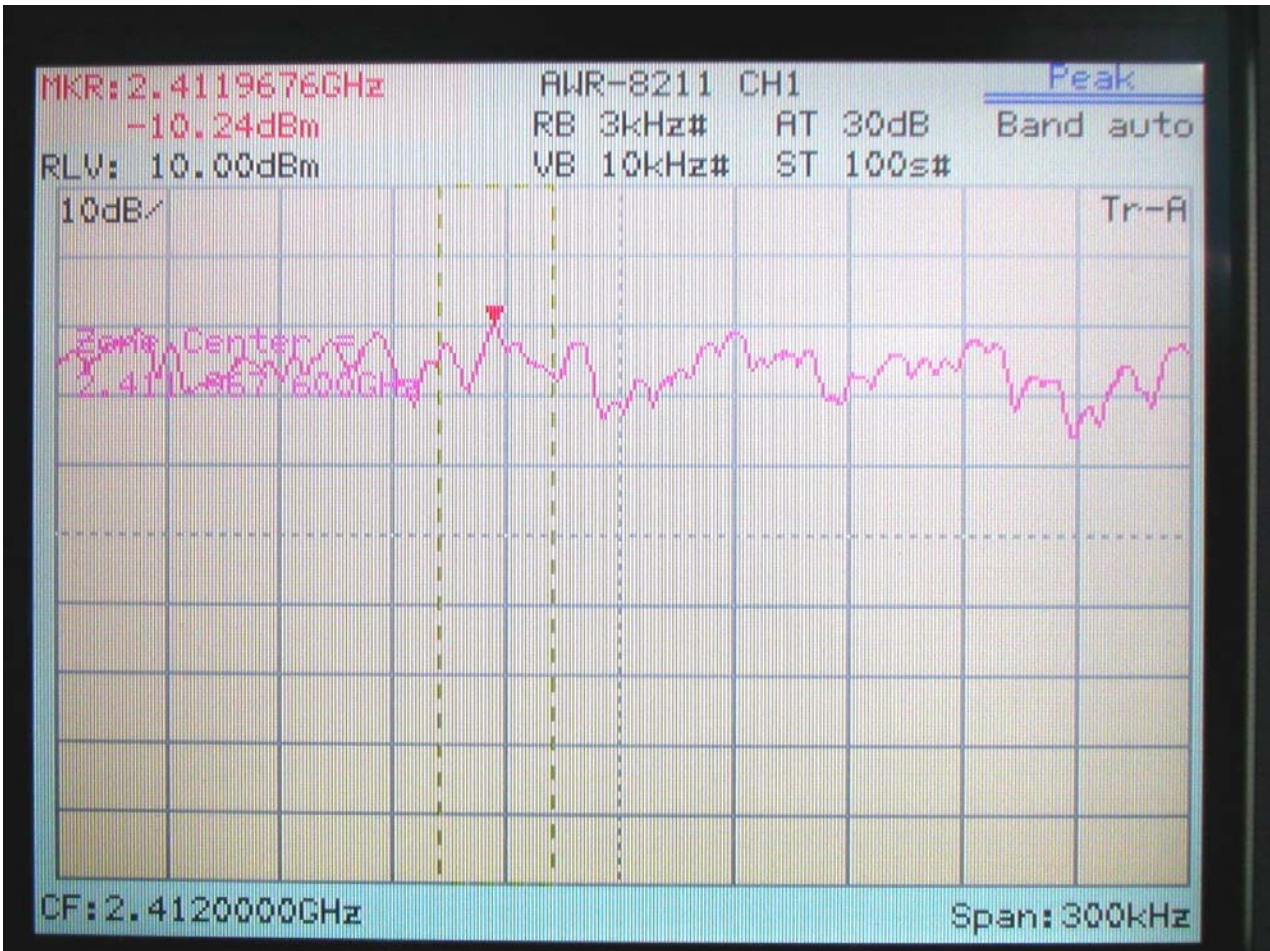
The following table shows a summary of the test results of the Power Spectral Density.

<i>Channel</i>	<i>Frequency (GHz)</i>	<i>Ppr (dBm)</i>	<i>Cable Loss (dB)</i>	<i>Ppq (dBm)</i>	<i>Limit (dB)</i>	<i>Margin (dB)</i>
CH 01	2.4119	-10.24	1.80	-8.44	8.00	-16.44
CH 06	2.4619	-11.41	1.85	-9.56	8.00	-17.56
CH 11	2.4369	-12.11	1.93	-10.18	8.00	-18.18

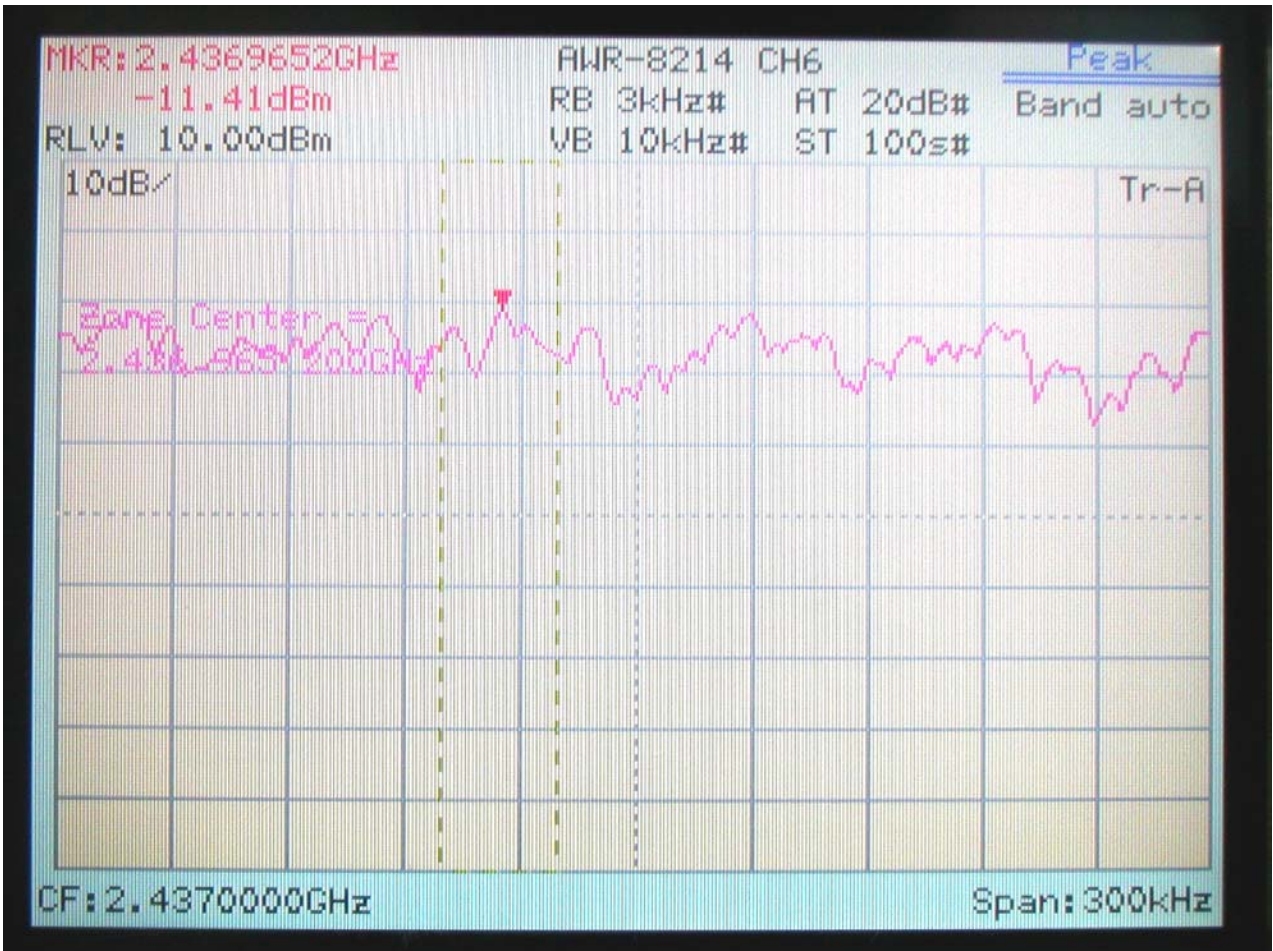
Note:

1. The attachment follow by this page and there is no page number.
2. Ppr: spectrum read power density (using peak search mode),  
     Ppq: actual peak power density in the spread spectrum band.
3.  $Ppq = Ppr + |Cable Loss|$

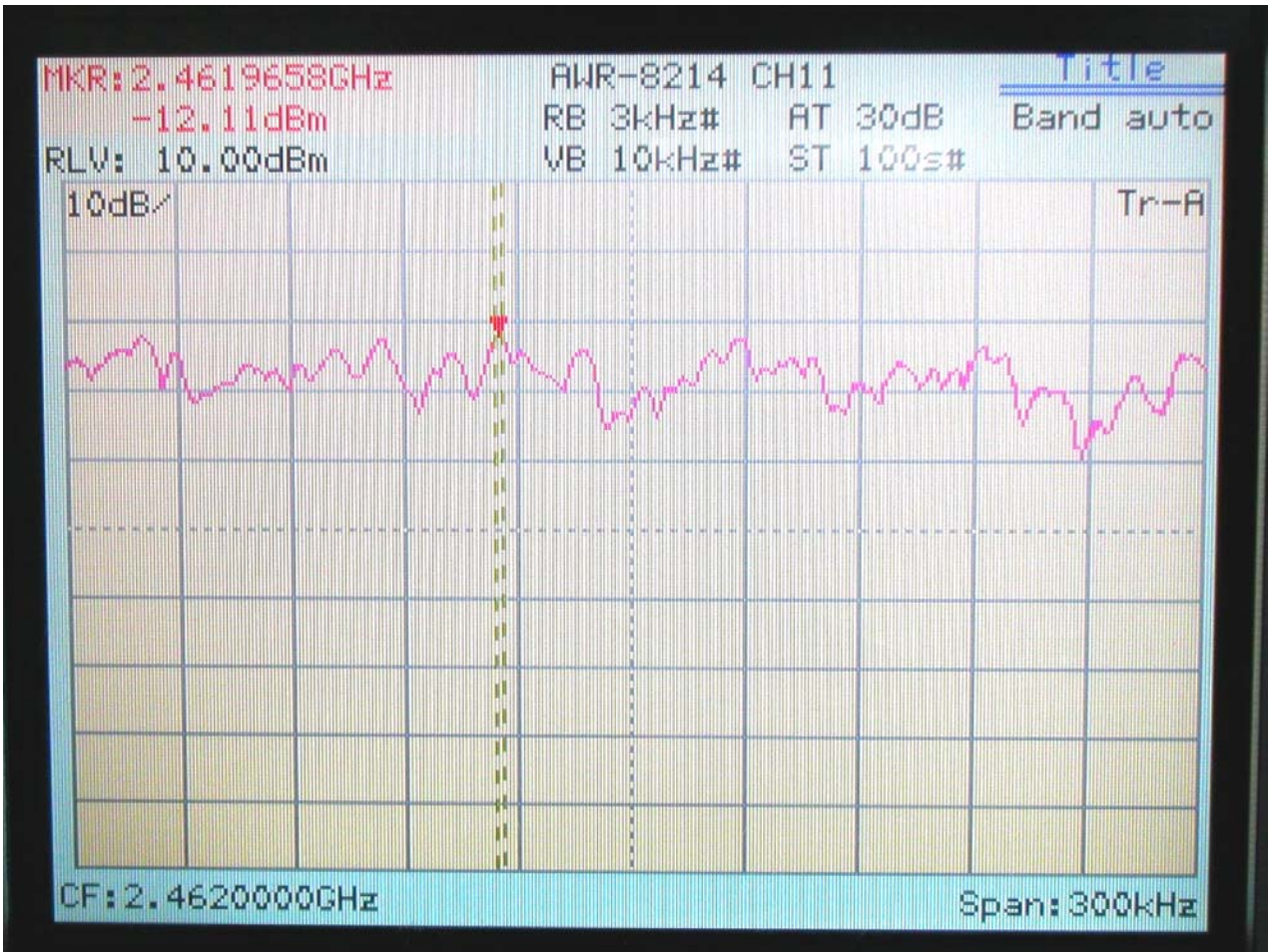
Channel 01



Channel 06



Channel 11



## *Appendix A*

### **Setting up Procedure**

#### **<A> Intentional test set up**

1. Connect the EUT with the notebook computer through the LAN port. Using the LAN port of Notebook Computer and software to control the wireless gateway.
2. Use the software provided by the manufacturer and operated in the windows to control the EUT's continuous transmission.
3. Then making access to the mode of continuous transmission and set the testing channel.
4. The conducted and Radiated spurious emissions were recorded only the worst cases data.

#### **<B> Unintentional test set up**

1. The internet port connected to the PC nearby and the two of LAN ports connected to the PC located remotely. Set the PC transmitting and receiving data with 10M and 100M respectively. (100M test data recorded)
2. The DSL jack via a 15m length RJ-11C cable to the ADSL Evaluation Module located remotely.
3. The PHONE jack via a 1.5m length RJ-11C cable to the Telephone.
4. Other LAN ports connected with the dummy load.
5. There was a Notebook which was with a PCMCIA WLAN Card located remotely to keep to communicate with the EUT.

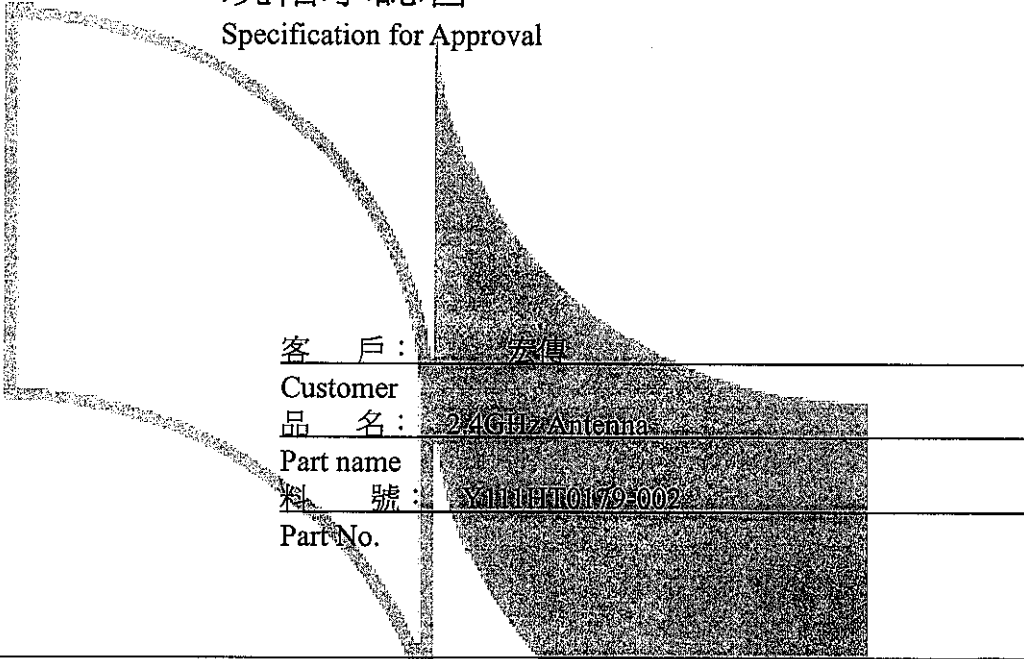
## *Appendix B*

### **Antenna Specification**



# 規格承認書

Specification for Approval



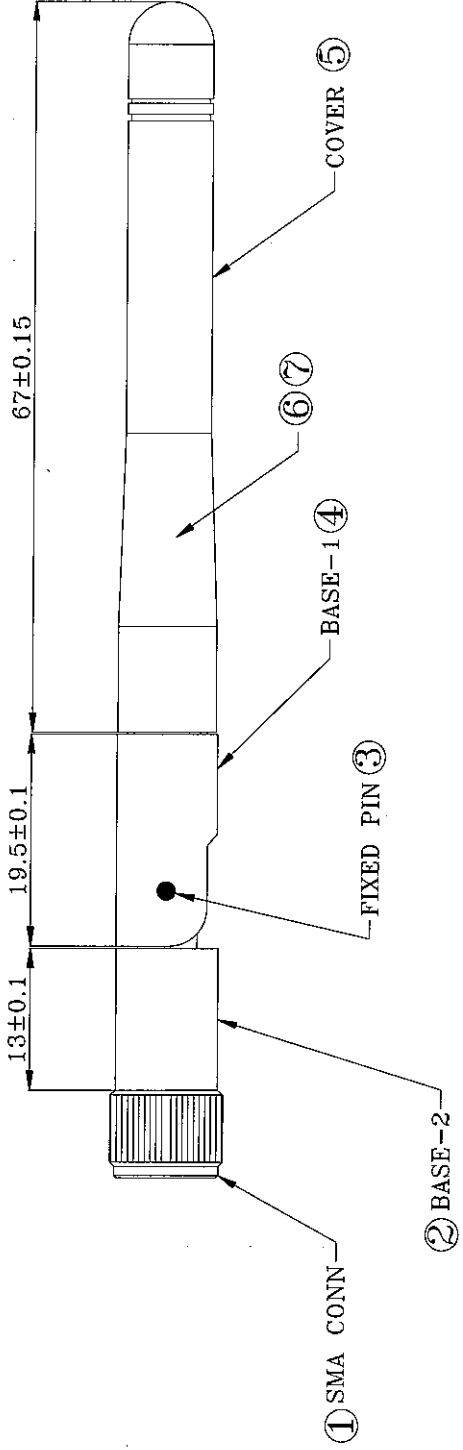
客戶: 宏傳  
 Customer  
 品名: 24GHz Antenna  
 Part name  
 料號: WHT0179-002  
 Part No.

客戶承認印 CUSTOMER APPROVED BY		
APPROVAL	CHIEF	SUPERVISOR
Approval No.		
Model		
Part No.		

CHIEF	SALES	R&D	DESIGN
Wayne	Sunny	Leo	Wen
Date: OCT.01.03		Date: OCT.01.03	
驊陞科技股份有限公司 <b>WIESON TECHNOLOGIES CO., LTD.</b>			



REV	DATE	DESCRIPTION	ECN NO.	NAME
A	03.02.21	NEW RELEASE		Leo
B	03.08.06	△ CHANGE P/N NO.	TECR03000861	WEN

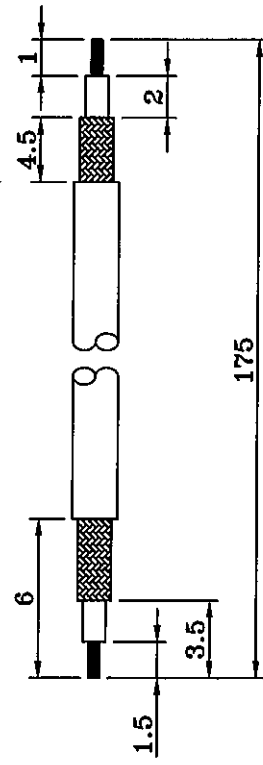
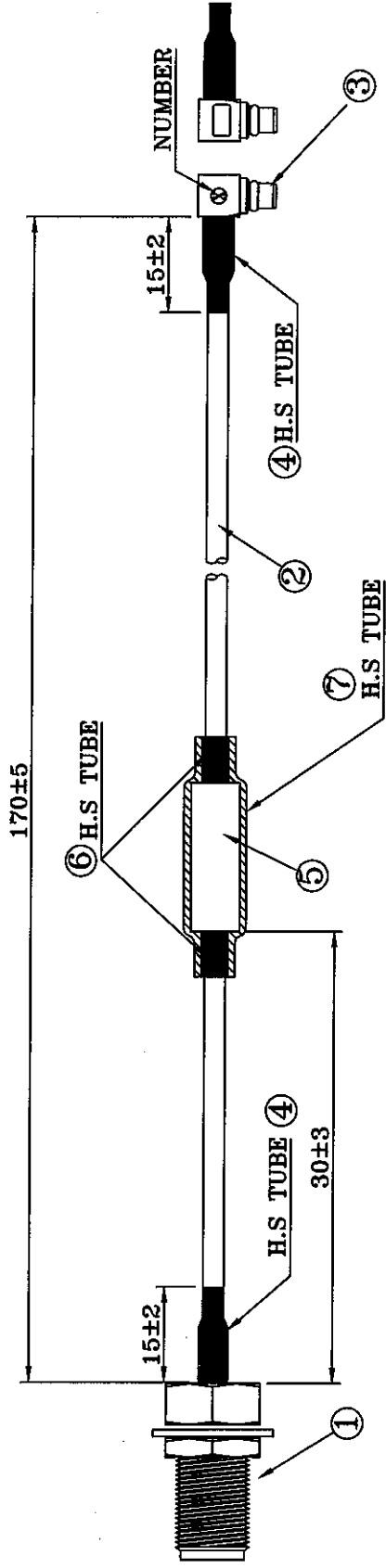


NOTES:  
 CABLE SUPPLY FROM : WONDERFUL  
 VSWR 2.0 MAX

		CUST NO.:	A1 TYPE
		PART NO.:	
7.	0140-120101	WIESON TECHNOLOGIES CO., LTD	Y111HT0215-002
6.	RG-178BUN02D18W	WIESON	
5.	MY111-B010101/△	TITLE:	
4.	MY111-B020100	SMA 2.4GHz Antenna	
3.	0102-780101	DRAWN BY	Leo (WST)
2.	MY111-B030100	CHECKED BY	LEO
1.	7109-01010400	APPROVED BY	WAYNE
	ITEM	QTY	SORTING NO.
	DESCRIPTION		WST,WSC
			UNIT
			mm
			PAGE
			1 OF 2

ISSUED [ARTICLE: 044032 V4]

REV	DATE	DESCRIPTION	ECN NO.	NAME
A	03.02.07	NEW RELEASE		
B	03.03.10	CHANGE P/N	10303003	WEN

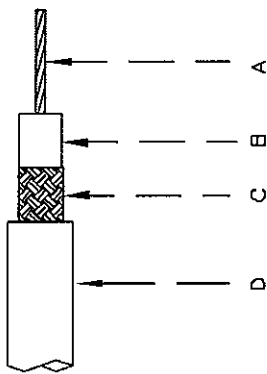
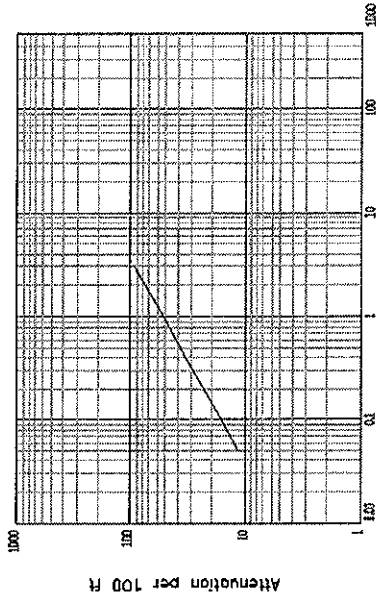


Notes:  
 Cable Supply From : Harbour  
 Ferrite Core Supply From : CORE-TECH

		WIBSON TECHNOLOGIES CO., LTD		PART NO.:	
		WIBSON		9851HT0217-004	
		TITLE:		DRAWING NO. 985HT0217-004	
1	H.S. TUBE	BLACK $\phi 6.0\text{mm}$ , L=45mm	WEN(WST)	DRAWING SIZE	A3
2	H.S. TUBE	BLACK $\phi 3.5\text{mm}$ , L=9mm	LEO	UNIT	mm
3	FERRITE CORE	FERRITE CORE SIZE=OD=6.0 , ID=2.0 , L=25mm	WAYNE	PAGE	1 OF 1
4	H.S. TUBE	BLACK $\phi 3.5\text{mm}$ , L=15mm	WST;WSC		
5	7134-12010000	MMCX R/A PLUG , GOLD PLATED. (Molding Type)			
6	RG-176BUN01D16H/Δ	Harbour RG178 , OD:1.8mm , COLOR:TINT BROWN			
7	7109-62010001	SMA FEMALE BULKHEAD (RP) , GOLD PLATED.			
NO	ITEM	DESCRIPTION	QTY	SORTING NO.	

Rev	Change	Date
A	Chd P/n	2/9/98
B	Format Change	10/16/01

Attenuation (Max per 100 ft):



Construction:

- A) Center Conductor:  
30 7/38 SPCW  
OD .012" ± .001"
- B) Dielectric:  
Extruded PTFE  
OD .033" ± .002"

C) Shield:

- 38 AWG SPC 95.9% Coverage  
OD .054" Max.

D) Jacket:

- FEP - Brown Tint  
OD .071" ± .004"

Surface Printed: "M17/93-RG178 MIL-C-17 27478 HARBOUR INDUSTRIES"

Gain = 2 dbi Min

Electricals:

- Impedance: 50 ± 2 Ohms
- Capacitance: 32 pF/ft Max.
- Velocity of Prop.: 69.5% Nom.
- Time Delay: 1.50 ns Max.
- Cut off Frequency: 116.14 GHz

Physical Properties:

- Weight per 1000 ft: 6.3 lbs Max.
- Minimum Bend Radius: .35"
- Operating Temperature Range: -55°C to 200°C

**Harbour Industries**

Date: 01/08/92	Scale: None	Drawn By: Joann McVeigh
Drawing Name: M17/93-RG178	Rev: B	Approved By:
Part Number: J109B	Drawing Number: 032196_1	Sheet 1 of 1



**WIESON TECHNOLOGIES CO.,LTD**

**BILL OF MATERIAL**

Cust.	TITLE		2.4GHz Antenna
Cust.P/N	WIESON P/N		Y111HT0179-002
NO.	DESCRIPTION	SUPPLIER	SUPPLIER PART NO.
1	RG 178/U COAXIAL CABLE	Harbour	mm
2	COVER , GRAY	華亞	MYMHT-B010401 1PCS
3	BASE-1, GRAY	華亞	MYMHT-B020400 1PCS
4	BASE-2, GRAY, DETENT TYPE	華亞	MYMHT-C030401 1PCS
5	FIXED PIN		2PCS 0102-780102
6	COPPER TUBE		1PCS 0140-120101
7	FERRITE CORE		1PCS CORE-210007
8	HEAT SHRINK TUBE OD=2.0mm		mm HS-BB020
9	HEAT SHRINK TUBE OD=5.0mm		mm HS-BB050

**APPROVED BY: Wayne**

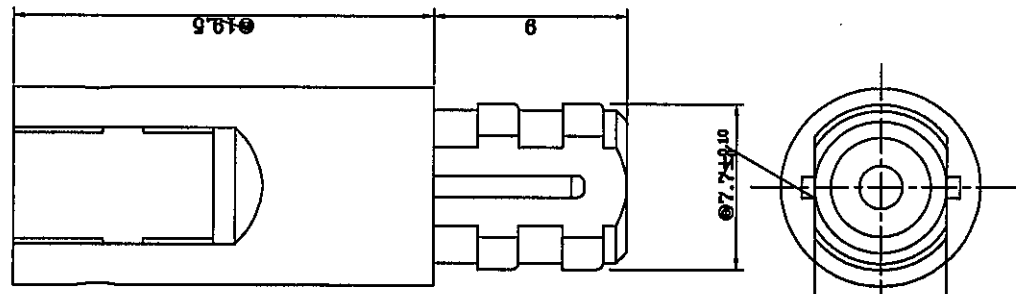
**CKED BY: Leo**

**SIGNED BY: Wen**

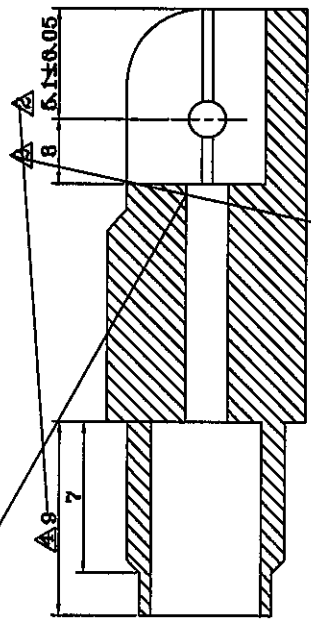
1 2 3 4 5

# Y111 SERIES 2.4GHZ ANTENNA WITH SMA CONN.

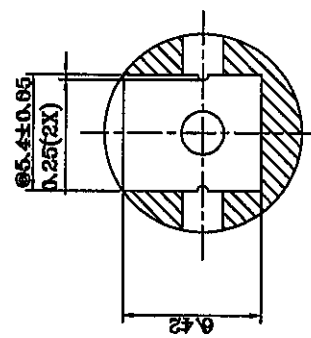
A B C D E



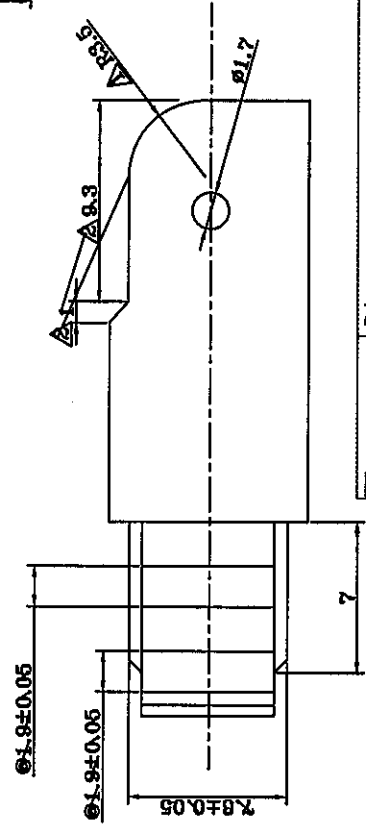
檢驗暫行圖面



SECTION X-X



SECTION Y-Y



**NOTE:**  
 1.一般尺度公差±0.10mm  
 2.最大毛邊0.05mm  
 3.表面為細放電花

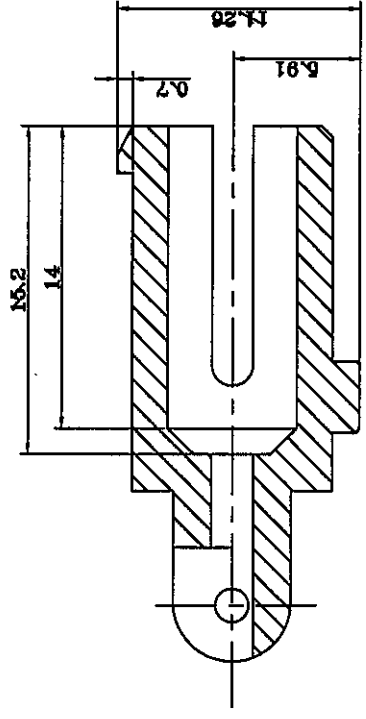
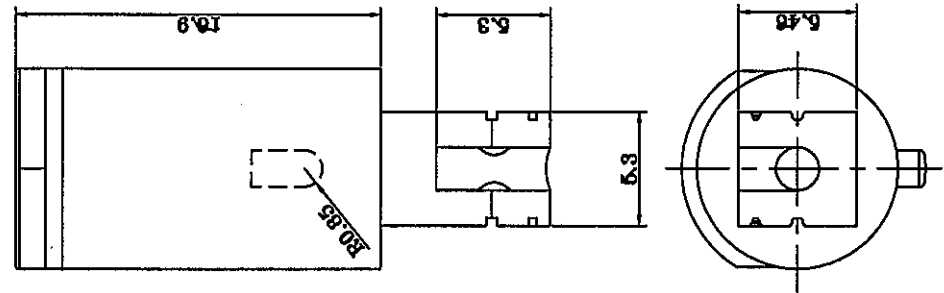
版本	日期	說明	ECN NO.	NAME
1	02.12.22	研發資料		Frank Lau
2	03.01.06	變更尺寸	RD680001	Frank Lau
3	03.01.08	變更尺寸	RD680002	Frank Lau
4	03.01.29	變更尺寸	RD680006	Frank Lau
5	03.02.18	變更尺寸 取消做變更	RD680009	Frank Lau

Critical Dim.		PART NO.:	
⑧: Major 8	WISON	WISON TECHNOLOGIES CO., LTD	
一般尺度公差 ±0.10 mm	DRAWN BY	Z-MY111-B02**00	
一般角度公差 ±2°	CHECKED BY	DRAWING NO. MY111Z-002	
	APPROVED BY	DRAWING SIZE 4:1 AB	
	SORTING NO.	UNIT mm	
		PAGE 1 OF 1	

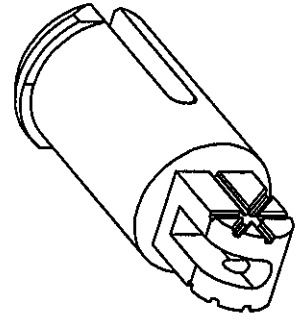
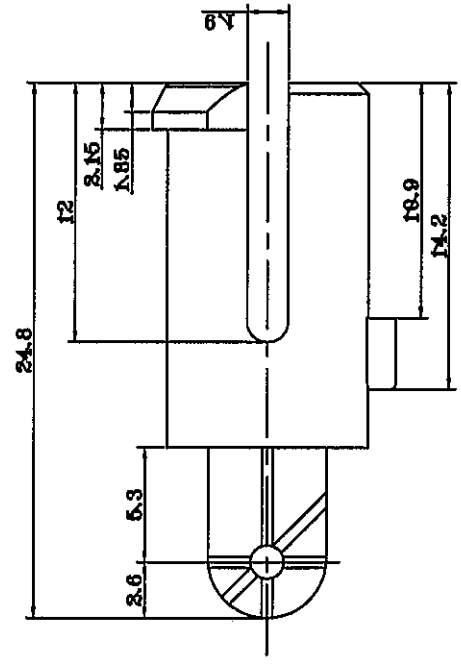
1	2	3	4	5
版本	日期	說明	ECN NO.	NAME
7	08.03.27	研發資料		Speed Seal

# SMA BASE-2 FOR A0 TYPE

A B C D E



SECTION X-X



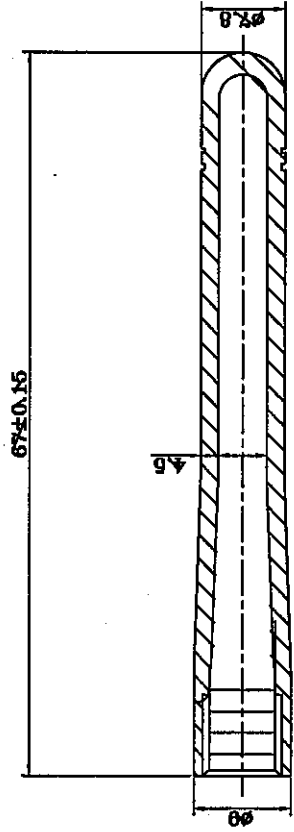
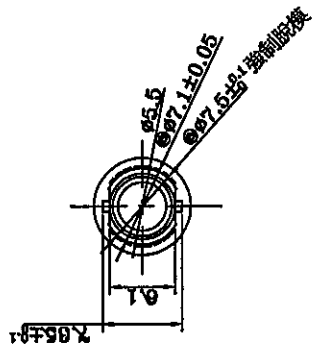
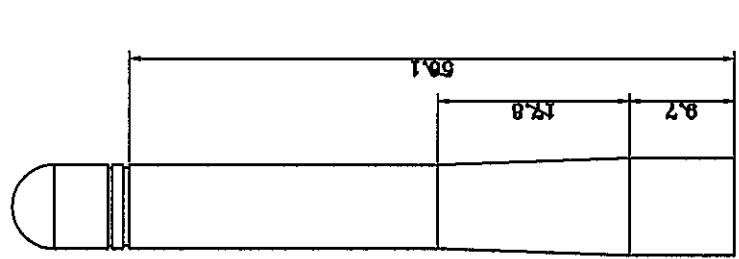
∇ : Critical Dim Ⓞ : Major 8 一般尺規公差 $\pm 0.10$ mm 一般角度公差 $\pm 2^\circ$	WISON MESON TECHNOLOGIES CO., LTD		PART NO.:	
	DRAWN BY Speed Seal	CHECKED BY	DRAWING NO.	DRAWING SIZE
	APPROVED BY	UNIT	4-1	A8
	SORTING NO.	WSC	PAGE	1 OF 1

1 2 3 4 5

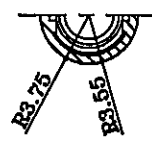
# Y111 SERIES 2.4GHz ANTENNA WITH SMA CONN.

版本	日期	說明	ECN NO.	NAME
1	08.12.22	研發資料		Spec Lee
2	08.01.29	變更尺寸	RD6800086	Spec Lee
3	08.02.18	取消2版變更	RD6800089	Spec Lee

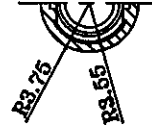
檢驗暫行圖面



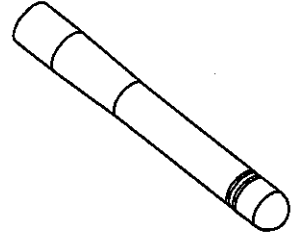
SECTION X-X



SECTION Y-Y



SECTION Z-Z



MY111-B 01 \*\* 00

01: BLACK  
02: WHITE

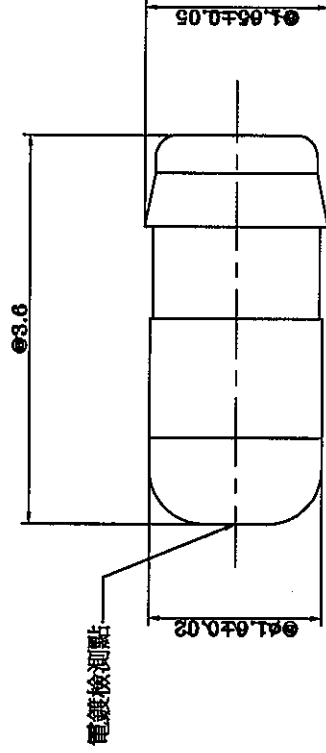
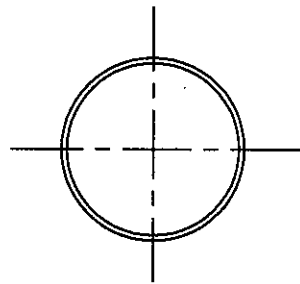
- NOTE:
1. 一般尺度公差 ± 0.10mm
  2. 最大毛邊 0.10mm
  3. 分線線最大毛邊 0.05mm
  4. 表面需細放電花

▽: Critical Dim	PART NO.:	
⊙: Major 8	WESON TECHNOLOGIES CO., LTD	
一般尺度公差 ± 0.10 mm	DRAWN BY	Z-MY111-B01**00
一般角度公差 ± 2°	CHECKED BY	Spec Lee
	APPROVED BY	DRAWING NO. MY111Z-001
		DRAWING SIZE 2:1 AB
		UNIT mm
		PAGE 1 OF 1
		WSC

1 2 3 4 5

# FIXED PIN(FOR SMA ANTENNA BASE1 & BASE2)

版本	日期	說明	ECN NO.	NAME
A	08.04.08	原始版本		JERRY
B	08.06.18	變更銅釘型式及供應商	I0309005	JERRY
C	08.08.19	修正電鍍		JERRY



NOTE: 最大毛邊0.05mm

▽: Critical Dim		WISON TECHNOLOGIES CO., LTD		PART NO.:	
●: Major		WISON	JERRY(WST)	Z-0102-780101	
一般尺度公差		DRAWN BY		DRAWING NO.	0102-780101
$\pm 0.10$ mm		CHECKED BY		DRAWING SIZE	20-1 A8
一般角度公差		APPROVED BY		UNIT	mm
$\pm 2^\circ$		SORTING NO.	P4135(WST)	PAGE	1 OF 1

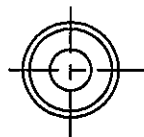
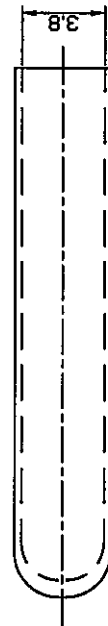
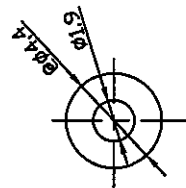
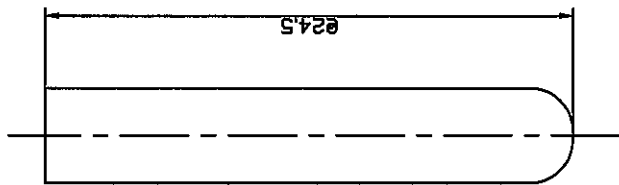


1 2 3 4 5

# Copper Tube

## MATERIAL:

(1) BSBM (黄铜)  
C3601;C3602;C3603;C3604



版本	日期	說明	ECN NO.	NAME
1	02.12.81	研發資料		Fred Lee
2	06.04.17	變更工程	RD880082	Fred Lee

▽: Critical Dim	WISON TECHNOLOGIES CO., LTD	PART NO.:
●: Major	DRAWN BY	0140-I20101
一般尺度公差 ±0.10 mm	CHECKED BY	DRAWING NO.
一般角度公差 ±2°	APPROVED BY	DRAWING SIZE
		4:1 AS
		UNIT
		mm
		PAGE
		1 OF 1

NOTE:

1.最大毛邊0.02mm

# SPECIFICATION FOR APPROVAL

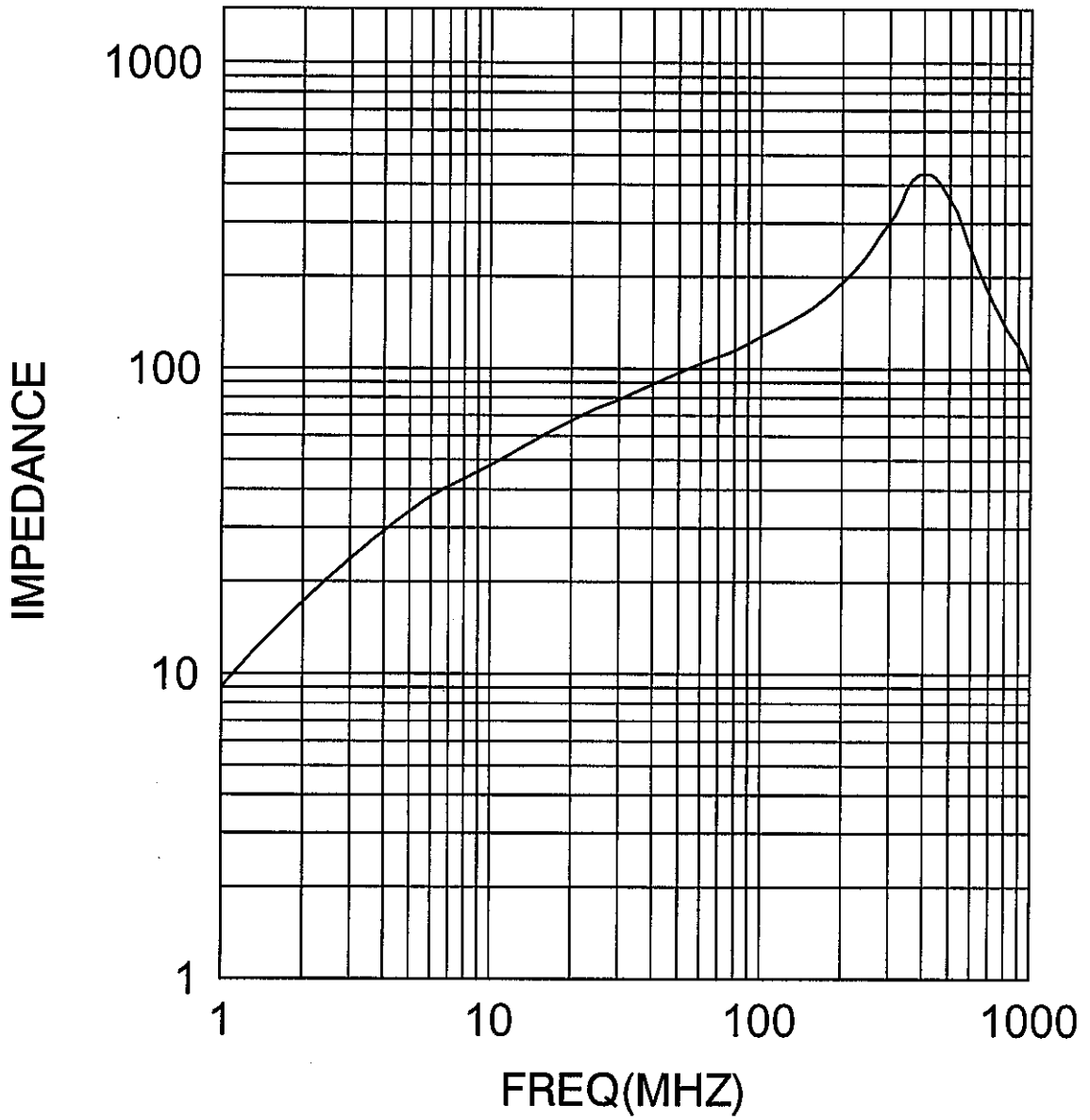
<b>CUSTOMER:</b>		<b>CUST.P/N:</b>
<b>ITEM:</b>	<b>K5B RH 5x12x2.15</b>	<b>K.C.P/N: PS05251A</b>
(1) SHAPE :		<b>A</b> 5.0±0.2    m/m
		<b>B</b> 12.0±0.4    m/m
		<b>C</b> 2.15±0.15    m/m
		<b>D</b> m/m
		<b>E</b> m/m
		<b>F</b> m/m
		<b>G</b> m/m
(2)ELECTRICAL REQUIREMENTS:		(3) TEST CONDITIONS:
$Z_1 = 55^{-0}$ OHM AT 25 MHz		1 IMPEDANCE ANALYZE IHP4191A
$Z_2 = 95^{-0}$ OHM AT 100 MHz		TEST FIXTURE: HP16092A
		2.WIRE: Ø0.65 2UEW*100m/m1/2TS
		3.DRAWING:
(4)PACKING		(5) APPEARANCE
<input type="checkbox"/> IN BULK <input type="checkbox"/> VACUUM <input type="checkbox"/> INSERTION		(1)AREA OF BREAK      : <2 m/m <sup>2</sup>
PCS/BAGS*      BAG/INNER BOX*      BOXES/CARTON =      PCS		(2)SUM OF BREAKING AREA      : <3 m/m <sup>2</sup>
PCS/PLATE*      PLATES/CARTON=      PCS		(3)DEPTH OF BREAK      : <1 m/m
PCS/TRAY*      TRAYS/CARTON=      PCS		
(6)REMARK:		Approved by
		Checked by
		Drawn by
		DWG.NO.    20018006A

## TEST DATA FOR PREPRODUCTION SAMPLES

CUSTOMER				CUST. P/N		
ITEM	<b><i>K5B RH 5x12x2.15</i></b>			K.C. P/N	<b><i>PS0525IA</i></b>	
TEMP.	<b>24 °C</b>	RH	<b>69</b> %	DWG.NO.	<b><i>20018006A</i></b>	
WIRE	<b>0.65x100m/m</b> $\phi_{21EW}$	WINDING	<b>1/2</b> Ts	Q'TY		
Test Instruments						
Meas. Item.	<b>Z (OHM)</b>	<b>Z (OHM)</b>	<b>A m/m</b>	<b>B m/m</b>	<b>C m/m</b>	
Spec./ Yours.						
Spec./Suggest.	<b>55<sup>-0</sup></b>	<b>95<sup>-0</sup></b>	<b>5.0±0.2</b>	<b>12.0±0.4</b>	<b>2.15±0.15</b>	
Test Freq.	<b>25 MHZ</b>	<b>100 MHZ</b>				
1	<b>74</b>	<b>127</b>	<b>5.00</b>	<b>12.06</b>	<b>2.10</b>	
2	<b>75</b>	<b>128</b>	<b>4.98</b>	<b>12.06</b>	<b>2.04</b>	
3	<b>73</b>	<b>127</b>	<b>5.00</b>	<b>12.08</b>	<b>2.02</b>	
4	<b>74</b>	<b>127</b>	<b>5.00</b>	<b>12.08</b>	<b>2.04</b>	
5	<b>74</b>	<b>128</b>	<b>5.00</b>	<b>12.08</b>	<b>2.02</b>	
6						
7						
8						
9						
10						
$\bar{X}$	<b>74</b>	<b>127</b>	<b>5.00</b>	<b>12.07</b>	<b>2.04</b>	
R	<b>2</b>	<b>1</b>	<b>0.02</b>	<b>0.02</b>	<b>0.08</b>	
Your Sample.						
REMARK:				Approved by:		
				Checked by:		
				Drawn by:		

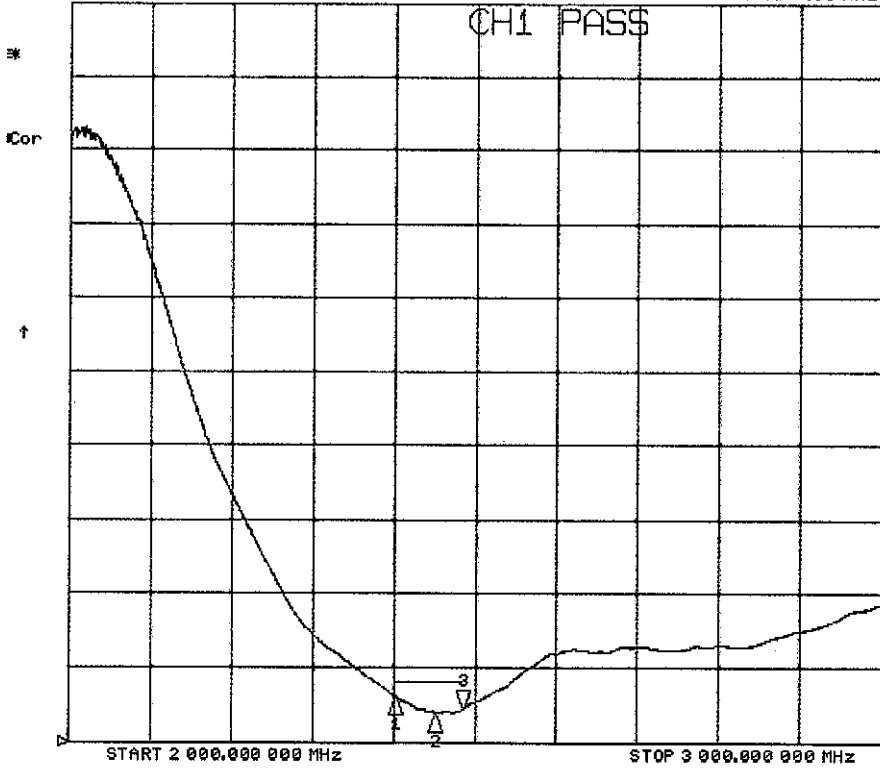
***KING CORE ELECTRONICS INC.***

# K5B RH 5x12x2.15



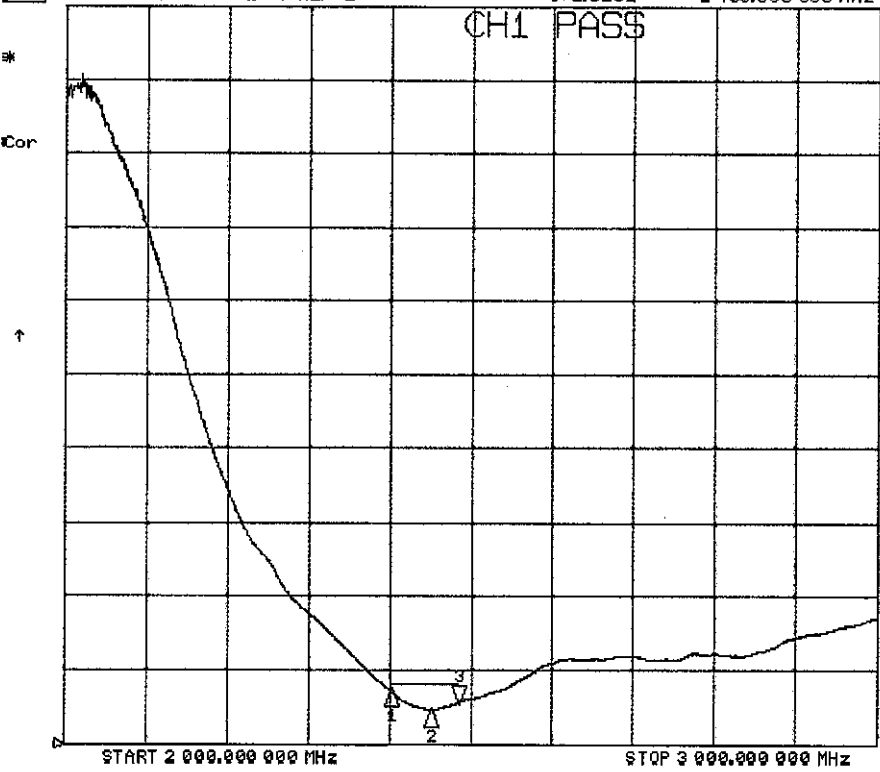
鈞寶工程 部

1 Oct 2003 10:51:18  
[CH1] S11/M SWR 1 / REF 1 3: 1.4521 2 483.500 000 MHz



CH1 Markers  
1: 1.6118  
2.40000 GHz  
2: 1.3681  
2.45000 GHz

1 Oct 2003 10:54:55  
[CH1] S11/M SWR 1 / REF 1 3: 1.5232 2 483.500 000 MHz



CH1 Markers  
1: 1.7283  
2.40000 GHz  
2: 1.4578  
2.45000 GHz

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ CERTIFICADO ◆ CERTIFICAT

# CERTIFICATE



No. Q1 99 10 27082 002

TÜV PRODUCT SERVICE GMBH certifies that

## Wieson Electronic Co., Ltd.

7F., No. 276, Sec. 1, Ta Tung Road,  
Hsi Chih Town, Taipei Hsien, Taiwan, R.O.C.

in the facility:

7F., No. 276, Sec. 1, Ta Tung Road,  
Hsi Chih Town, Taipei Hsien, Taiwan, R.O.C.

for the following area:  
development, production and distribution of  
Connector and Cable Assembly

has established and is maintaining a quality system which meets the requirements of:

## DIN EN ISO 9001 08.94

as documented in audit report no. 61021915701.

This certificate is valid until 09/2002.

Munich, 11-15-1999

TÜV PRODUCT SERVICE GMBH  
ACCREDITED CERTIFICATION BODY  
FOR QUALITY SYSTEMS



*J. Leechke*



TGA-ZQ-008/93