



TEST REPORT

Product Name : Satellite Radio Receiver

Model Number : UPA-US

Brand Name : Xact

FCC ID : NKRUPAUS007

Applicant : Wistron NeWeb Corporation

Address : No. 10-1, Li-hsin Road I, Hsinchu Science Park,
Hsinchu 300, Taiwan, R.O.C.

Received Date : June 24, 2004

Tested Date : June 24 ~ 30, 2004

Notes :

1. This report will be invalid if duplicated or photocopied in part.
2. This report refers only to the specimen(s) submitted to testing, and be invalid as separately used.
3. This report is invalid without examination stamp and signature of this institute.
4. The tested specimen(s) will be preserved for thirty days from the data issued.
5. The report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.





Ecom Sertech Corp.

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing
Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 2 of 42

Test Report Certification

Product Name : Satellite Radio Receiver
Model Number : UPA-US
Brand Name : Xact
FCC ID : NKRUPAUS007
Applicant : Wistron NeWeb Corporation

Measurement Standard :

FCC 47 C.F.R. Part 15, Subpart B and Subpart C (2003)
ANSI C63.4 (2001)

Tested By : Ken Tu, **Date** : June 30, 2004
(Ken Tu)

Reviewed By : Roger Sheng, **Date** : June 30, 2004
(Roger Sheng)

Approved By : Chieh-De Tsai, **Date** : June 30, 2004
(Chieh-De Tsai, Manager)



WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.



Ecom Sertech Corp.

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007
Report No. : ER04-06-064FRF
Page 3 of 42

TABLE OF CONTENTS

TITLE	PAGE NO.
1. GENERAL INFORMATION	5
1.1 General Statement	5
1.2 General Description of EUT & Power	5
1.3 EUT & Peripherals Setup Diagram	6
1.4 EUT & Peripherals Setup Diagram	6
1.5 Description of Laboratory	6
1.6 Summary of Test Results	7
2. CONDUCTED POWERLINE TEST	8
2.1 Test Equipments	8
2.2 Test Setup	8
2.3 Conducted Power Line Emission Limit	9
2.4 Test Procedure	9
2.5 Uncertainty of Conducted Emission	9
2.6 Conducted RF Voltage Measurement	10-11
2.7 Photos of Conduction Test	12
3. RADIATED EMISSION TEST	13
3.1 Test Equipments	13
3.2 Test Setup	13
3.3 Radiation Limit	14
3.4 Test Procedures	15
3.5 Uncertainty of Radiated Emission	15
3.6 Radiated RF Noise Measurement	16-34
3.7 Photos of Open Site	35-36
4. OCCUPIED BANDWIDTH MEASUREMENT	37
4.1 Test Equipments	37
4.2 Test Setup	37
4.3 Limits of 6dB Bandwidth Measurement	37
4.4 Test Procedure	37
4.5 Uncertainty of Conducted Emission	37
4.6 Test Results	38
4.7 Photo of 26db Bandwidth Measurement	39



Ecom Sertech Corp.

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing
Rd., ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 4 of 42

TABLE OF CONTENTS

TITLE	PAGE NO.
5. MAXIMUM PEAK OUTPUT POWER	40
5.1 Test Equipments	40
5.2 Test Setup	40
5.3 Test Procedure	40
5.4 Uncertainty of Conducted Emission	40
5.5 Test Results	41
6. ANTENNA REQUIREMENT	42
6.1 Standard Applicable	42
6.2 Antenna Connected Construction	42



1. GENERAL INFORMATION

1.1 General Statement

MEASUREMENT DEVIATION : Comply with standard in full

TRACEABILITY : This test result is traceable to National or International std.

1.2 General Description of EUT & Power

PRODUCT NAME	: Satellite Radio Receiver
MODEL NUMBER	: UPA-US
TX FREQUENCY RANGE	: 88.1MHz ~ 107.9MHz for Transmitting
TX FREQUENCY CHANNEL	: $88.1\text{MHz} + 0.2 \times n$ (MHz), $n=0, 1, 2, \dots, 99$
RX FREQUENCY RANGE	: 2320MHz~2332.5MHz
CHANNEL NUMBER	: 100
CHANNEL SPACING	: 0.2MHz
TYPE OF MODULATION	: Frequency Modulation
FREQUENCY SELECTION	: selected by the button on EUT panel.
EUT DESCRIPTION	: This EUT is a Satellite Radio receiver and FM transmitter that can receive satellite signal at 2320MHz~2332.5MHz and transmit signal within 88.1MHz ~ 107.9MHz
ANTENNA TYPE	: Monopole Antenna , Antenna Gain : -7dBi.
POWER SOURCE	: 6VDC (From Adapter)

Power Adapter :

MANUFACTURER	: HONOR
MODEL NUMBER	: ADS-0615PC
INPUT POWER	: 100-240VAC, 0.3A
OUTPUT POWER	: 6VDC, 1.5A

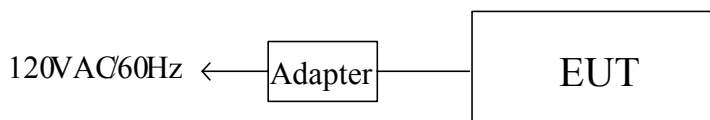


Ecom Sertech Corp.

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007
Report No. : ER04-06-064FRF
Page 6 of 42

1.3 EUT & Peripherals Setup Diagram



1.4 EUT & Peripherals Setup Diagram

1. Transmitting mode : power on → to select FM Transmitter → to select frequency
→ to turn on the transmitting mode
2. Receiving mode : power on

1.5 Description of Laboratory

SITE DESCRIPTION :

FCC Certificate NO. : 90585
BSMI Certificate NO. : SL2-IN-E-0002
NVLAP Lab Code : 200118-0
CNLA Certificate NO. : CNLA-ZL97018
VCCI Certificate NO. : R-1229, C-1250
TÜV Rheinland Certificate NO. : 10008375

NAME OF SITE : Ecom Sertech Corp. Hsin-Chu Lab.
(Spin-off from ITRI / ERSO on Apr. 01, 2003)
SITE LOCATION : Rm.258, Bldg.17, NO.195, Sec. 4, Chung Hsing Rd.,
Chu-Tung Chen. Hsin-Chu, Taiwan 310 R.O.C.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing
Rd., ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 7 of 42

1.6 Summary of Test Results

The EUT has been tested according to the following specifications :

APPLIED STANDARD : FCC 47 C.F.R. Part 15, Subpart B and Subpart C			
Standard Section	Test Item and Limit	Result	REMARK
15.107 15.207	AC Power Conducted Emission Limit : Sec 15.107	PASS	Meet the requirement of limit
15.239(b)	Spectrum Bandwidth Limit : Occupied bandwidth < 200KHz	PASS	Meet the requirement of limit
15.109 15.205 15.209	Transmitter Radiated Emissions Limit : Table 15.209	PASS	Meet the requirement of limit

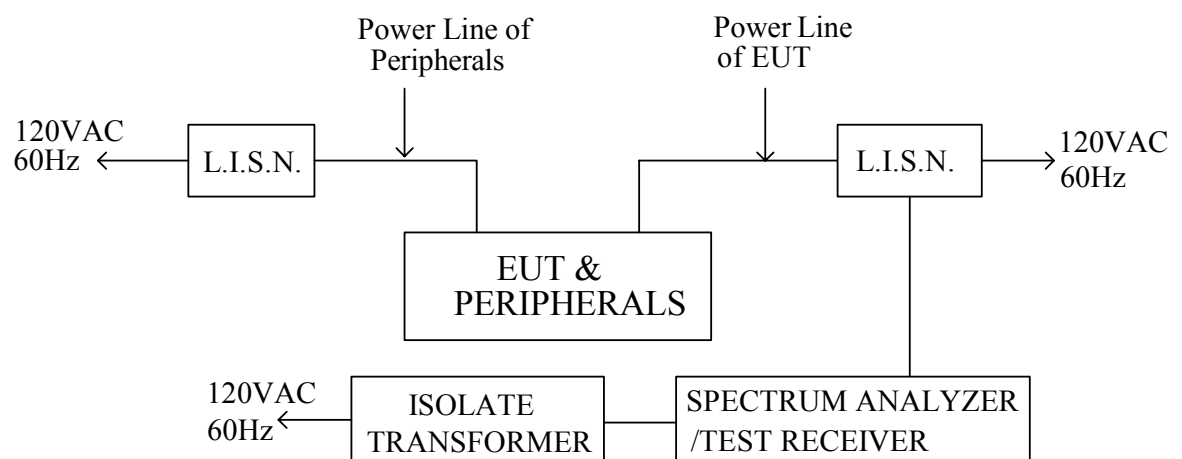
2. CONDUCTED POWERLINE TEST

2.1 Test Equipments

The following test equipments are used during the conducted powerline tests :

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
HP SPECTRUM ANALYZER & DISPLAY	8568A	2235A02320	November 14, 2003	1 Year	PRETEST
HP QUASI-PEAK ADAPTER	85650 A	2341A00672	November 14, 2003	1 Year	PRETEST
SOLAR ISOLATION TRANSFORMER	7032-1	N/A	N/A	N/A	FINAL
EMCO L.I.S.N.	3850/2	9311-1025 9401-1028	January 08, 2004 For Characteristic impedance	1 Year	FINAL
			May 18, 2004 For Insertion loss		
R & S TEST RECEIVER	ESHS 30	838550/003	February 11, 2004	1 Year	FINAL
KEENE SHIELDED ROOM	5983	No.1	N/A	N/A	FINAL
R & S PULSE LIMIT	EHS3Z2	357.8810.52	July 10, 2003	1 Year	FINAL
N TYPE COAXIAL CABLE	-----	-----	July 10, 2003	1 Year	FINAL
50Ω TERMINATOR	-----	-----	July 10, 2003	1 Year	FINAL

2.2 Test Setup



2.3 Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dB μ v)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56	56-46
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

For intentional device, according to § 15.207(a) Line Conducted Emission Limit is same as above table.

2.4 Test Procedure

The test procedure is performed in a 12ft×12ft×8ft(L×W×H) shielded room. The EUT along with its peripherals were placed on a 1.0m(W)× 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

2.5 Uncertainty of Conducted Emission

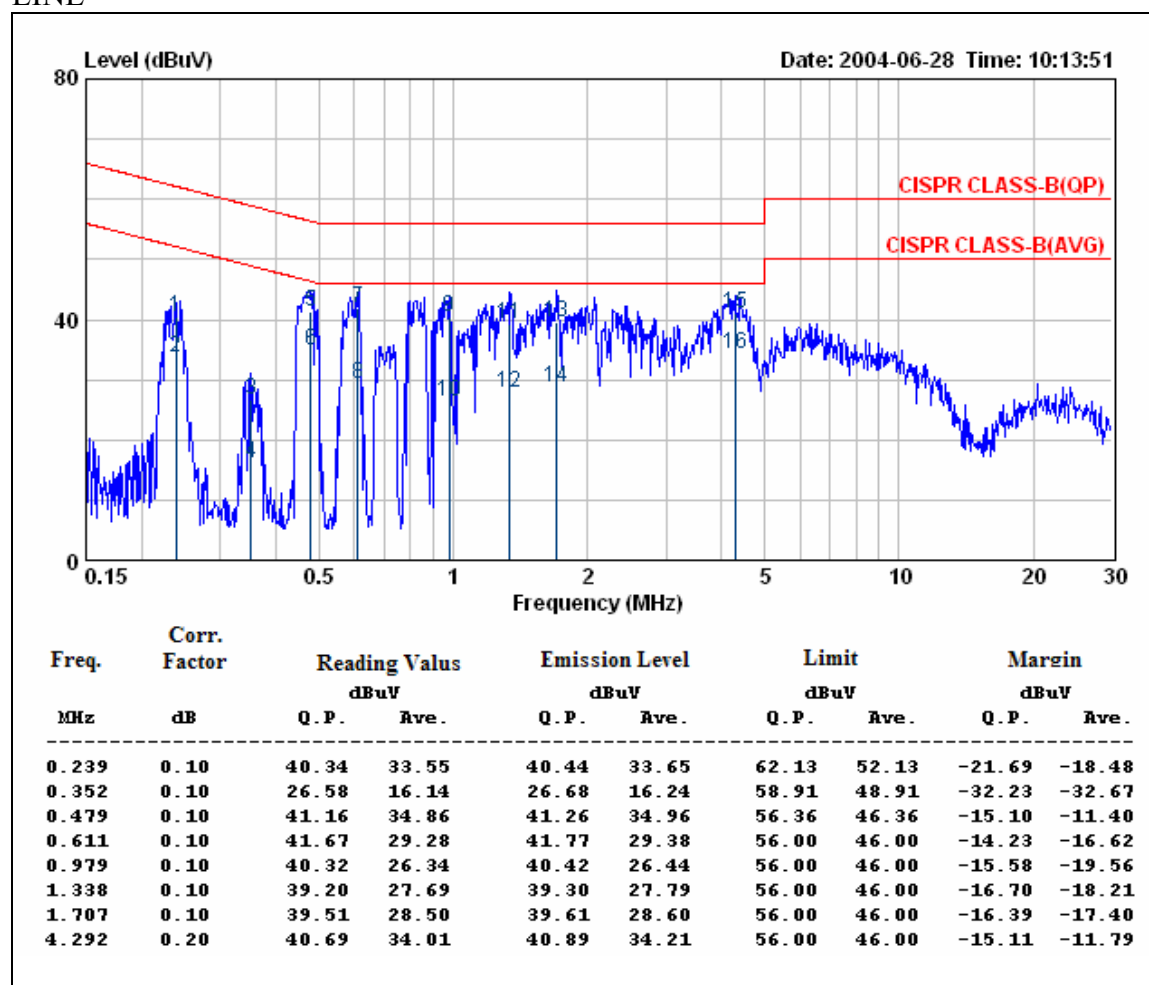
The uncertainty of conducted emission is ± 1.36 dB.

2.6 Conducted RF Voltage Measurement

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

Company:	Wistron NeWeb Corporation	Test Date :	2004/06/28
Product Name:	Satellite Radio Receiver	Test By:	Ken Tu
Model Name:	UPA-US	TEMP&Humidity :	25°C, 60%

LINE



REMARKS :

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value
3. TX mode.
4. The EUT can be operated in transmitting, and receiving mode. After preliminary scan, EUT in transmitting mode has highest emission. The EUT was set in transmitting mode at final test to get the worst case test results.



Ecom Sertech Corp.

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

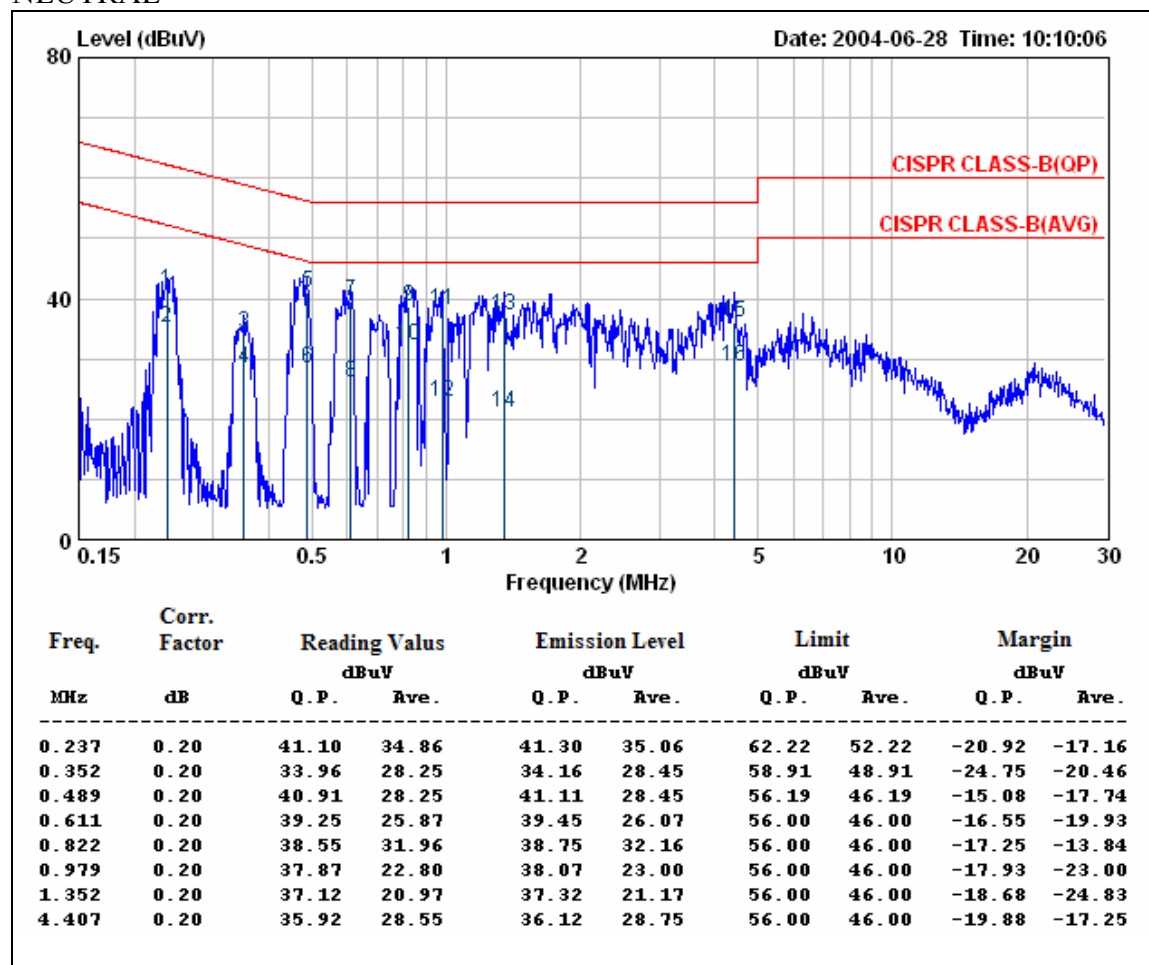
Report No. : ER04-06-064FRF

Page 11 of 42

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

Company:	Wistron NeWeb Corporation	Test Date :	2004/06/28
Product Name:	Satellite Radio Receiver	Test By:	Ken Tu
Model Name:	UPA-US	TEMP&Humidity :	25°C, 60%

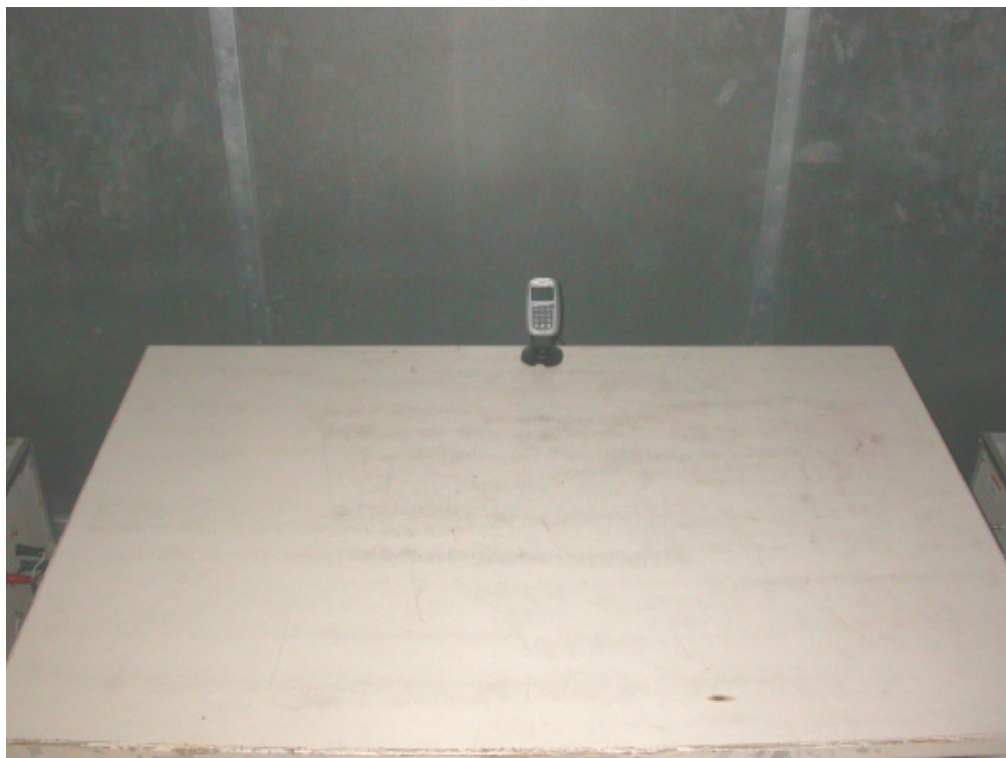
NEUTRAL



REMARKS :

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value
3. TX mode.
4. The EUT can be operated in transmitting, and receiving mode. After preliminary scan, EUT in transmitting mode has highest emission. The EUT was set in transmitting mode at final test to get the worst case test results.

2.7 Photos of Conduction Test



3. RADIATED EMISSION TEST

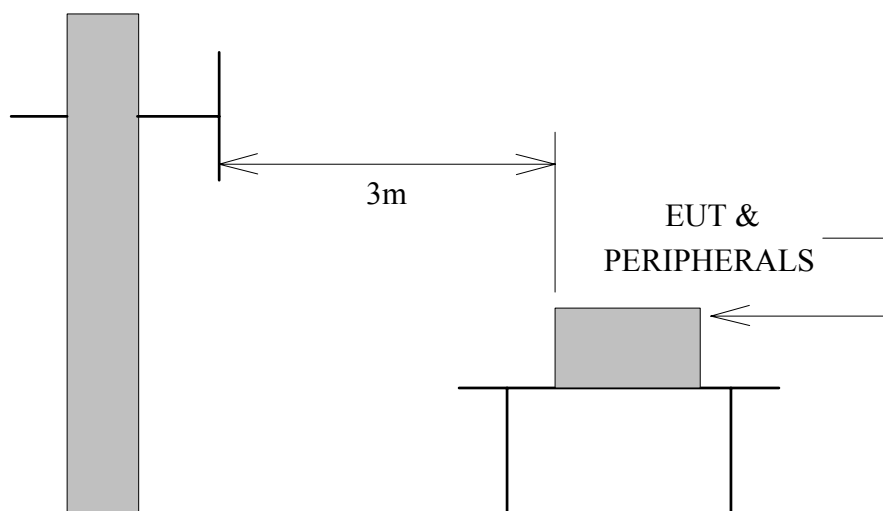
3.1 Test Equipments

The following test equipments are utilized in making the measurements contained in this report.

Manufacturer or Type	Model No	Serial No	Date of Calibration	Calibration Period	Remark
CHASE BI-LOG ANTENNA	CBL6112B	2421	May 07, 2004	1 Year	FINAL
R/S SPECTRUM ANALYZER	FSEK30	835253/002	June 17, 2004	1 Year	FINAL
OPEN SITE	-----	No.2	May 07, 2004	1 Year	FINAL
N TYPE COAXIAL CABLE	CHA9525	4	July 13, 2003	1 Year	FINAL
Horn Antenna	AH-118	10089	February 25, 2004	1 Year	FINAL
HP Pre-amplifier	8449B	3008A01471	October 11, 2003	1 Year	FINAL
HP High pass filter	84300/80038	011	CAL. ON USE	1 Year	FINAL
Horn Antenna	AH-840	03077	February 25, 2004	1 Year	FINAL

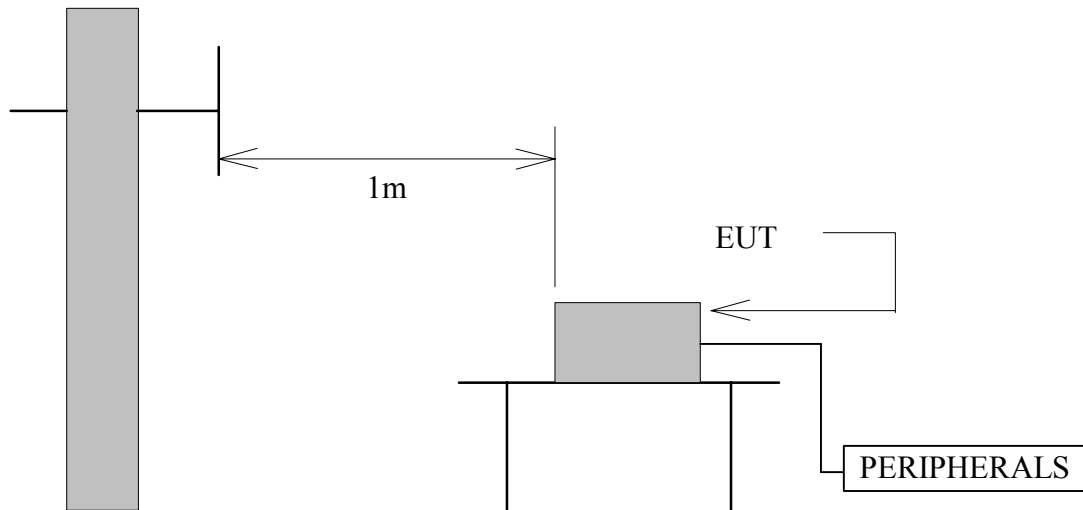
3.2 Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 to 1GHz.



Antenna Elevation Variable

The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



Antenna Elevation Variable

3.3 Radiation Limit

For unintentional device, according to § 15.109(a), and 15.239 except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values :

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/M)	Radiated (μV/M)
30-88	3	40.0	100
88-108	3	48.0	250
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table. According to § 15.239(b). The field strength of any emissions within the permitted 200kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

3.4 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. During performing radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1GHz, the EUT was set 1 meters away from the interference-receiving antenna
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE :

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

3.5 Uncertainty of Radiated Emission

The uncertainty of radiated emission is ± 2.72 dB.



3.6 Radiated RF Noise Measurement

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
88.10	10.31	0.83	40.42	68.00	27.55	24.01(PK)
88.10	10.31	0.83	36.10	48.00	27.55	19.69(AVG)
176.20	10.53	1.35	32.79	43.50	26.92	17.75
264.22	13.66	1.76	31.46	46.00	26.69	20.19
352.32	15.34	2.07	27.18	46.00	26.88	17.71
440.42	16.94	2.50	28.29	46.00	28.01	19.72
528.52	17.63	2.65	35.32	46.00	28.44	27.16
616.62	19.01	3.00	26.56	46.00	28.60	19.97
704.72	19.09	5.92	10.55	46.00	8.84	26.72
792.82	20.14	3.44	26.19	46.00	28.52	21.25
880.92	20.78	3.80	25.63	46.00	28.32	21.89
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 88.1MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 17 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
88.10	10.31	0.83	57.94	68.00	27.55	41.53(PK)
88.10	10.31	0.83	55.22	48.00	27.55	38.81(AVG)
176.20	10.53	1.35	33.43	43.50	26.92	18.39
264.22	13.66	1.76	36.20	46.00	26.69	24.93
352.32	15.34	2.07	28.38	46.00	26.88	18.91
440.42	16.94	2.50	28.12	46.00	28.01	19.55
528.52	17.63	2.65	32.91	46.00	28.44	24.75
616.62	19.01	3.00	27.01	46.00	28.60	20.42
704.72	19.09	3.39	26.70	46.00	28.56	20.62
792.82	20.14	3.44	25.85	46.00	28.52	20.91
880.92	20.78	3.80	25.98	46.00	28.32	22.24
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 88.1MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 18 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
92.10	10.89	0.94	36.90	68.00	27.49	21.24(PK)
92.10	10.89	0.94	32.45	48.00	27.49	16.79(AVG)
184.32	9.92	1.37	34.40	43.50	26.87	18.82
276.14	13.18	1.75	30.34	46.00	26.61	18.66
368.24	16.11	1.98	27.42	46.00	27.17	18.34
460.34	17.29	2.45	26.72	46.00	28.14	18.32
552.44	18.62	2.77	27.32	46.00	28.53	20.18
644.54	19.03	3.07	27.05	46.00	28.66	20.49
736.64	20.05	3.37	26.71	46.00	28.56	21.57
828.74	20.42	3.58	26.81	46.00	28.49	22.32
920.84	20.75	3.91	26.52	46.00	28.23	22.95
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 92.1MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 19 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
92.10	10.89	0.94	57.48	68.00	27.49	41.82(PK)
92.10	10.89	0.94	53.96	48.00	27.49	38.30(AVG)
184.32	9.92	1.37	35.06	43.50	26.87	19.48
276.14	13.18	1.75	34.30	46.00	26.61	22.62
368.24	16.11	1.98	27.42	46.00	27.17	18.34
460.34	17.29	2.45	27.71	46.00	28.14	19.31
552.44	18.62	2.77	27.27	46.00	28.53	20.13
644.54	19.03	3.07	26.98	46.00	28.66	20.42
736.64	20.05	3.37	26.66	46.00	28.56	21.52
828.74	20.42	3.58	25.88	46.00	28.49	21.39
920.84	20.75	3.91	26.36	46.00	28.23	22.79
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 92.1MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 20 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
95.10	11.42	1.01	37.59	68.00	27.44	22.58(PK)
95.10	11.42	1.01	34.14	48.00	27.44	19.13(AVG)
190.20	9.74	1.36	31.63	43.50	26.86	15.87
285.30	13.38	1.74	29.97	46.00	26.52	18.57
380.40	16.17	2.26	29.61	46.00	27.39	20.65
475.50	17.55	2.52	27.22	46.00	28.16	19.13
570.60	18.50	2.87	27.60	46.00	28.55	20.42
665.70	18.84	3.10	26.52	46.00	28.61	19.85
760.80	20.14	3.68	27.38	46.00	28.42	22.78
855.90	20.63	3.62	26.98	46.00	28.44	22.79
951.00	21.01	4.12	26.08	46.00	28.11	23.10
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 95.1MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 21 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
95.10	11.42	1.01	54.32	68.00	27.49	39.26(PK)
95.10	11.42	1.01	52.36	48.00	27.49	37.30(AVG)
190.20	9.74	1.36	32.80	43.50	26.86	17.04
285.30	13.38	1.74	32.49	46.00	26.52	21.09
380.40	16.17	2.26	29.69	46.00	27.39	20.73
475.50	17.55	2.52	27.79	46.00	28.16	19.70
570.60	18.50	2.87	26.42	46.00	28.55	19.24
665.70	18.84	3.10	26.79	46.00	28.61	20.12
760.80	20.14	3.68	26.24	46.00	28.42	21.64
855.90	20.63	3.61	27.91	46.00	28.46	23.69
951.00	21.01	4.12	26.17	46.00	28.11	23.19
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 95.1MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 22 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
98.10	11.87	0.99	34.84	68.00	27.39	20.31(PK)
98.10	11.87	0.99	33.11	48.00	27.39	18.58(AVG)
196.20	9.87	1.39	30.85	43.50	26.91	15.20
294.30	13.46	1.82	28.01	46.00	26.49	16.80
392.40	16.24	2.07	27.56	46.00	27.59	18.28
490.50	17.62	2.41	27.53	46.00	28.37	19.19
588.60	18.57	2.89	27.45	46.00	28.55	20.36
686.70	19.05	3.25	26.24	46.00	28.64	19.90
784.80	20.20	3.42	28.02	46.00	28.51	23.13
882.90	20.72	3.83	26.26	46.00	28.31	22.50
981.00	21.27	4.28	26.54	54.00	28.00	24.09
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 98.1MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 23 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
98.10	11.87	0.99	52.22	68.00	27.39	37.69(PK)
98.10	11.87	0.99	50.80	48.00	27.39	36.27(AVG)
196.20	9.87	1.39	33.10	43.50	26.91	17.45
294.30	13.46	1.82	30.60	46.00	26.49	19.39
392.40	16.24	2.07	27.16	46.00	27.59	17.88
490.50	17.62	2.41	28.17	46.00	28.37	19.83
588.60	18.57	2.89	27.01	46.00	28.55	19.92
686.70	19.05	3.25	26.45	46.00	28.64	20.11
784.80	20.20	3.42	29.35	46.00	28.51	24.46
882.90	20.72	3.83	25.21	46.00	28.31	21.45
981.00	21.27	4.28	26.55	54.00	28.00	24.10
1000.00	21.27	4.00	-----	54.00	27.16	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 98.1MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
102.10	12.35	0.99	31.44	68.00	27.32	17.46(PK)
102.10	12.35	0.99	28.22	48.00	27.32	14.24(AVG)
204.20	10.38	1.44	29.25	43.50	26.95	14.12
306.30	13.56	1.83	27.39	46.00	26.62	16.16
408.40	17.14	2.27	27.53	46.00	27.63	19.31
510.50	17.53	2.68	27.38	46.00	28.44	19.15
612.60	18.83	2.98	35.88	46.00	28.60	29.09
714.70	19.45	3.40	27.54	46.00	28.56	21.83
816.80	20.33	3.65	26.76	46.00	28.42	22.32
918.90	20.75	3.92	26.98	46.00	28.23	23.42
1021.00	23.25	4.15	-----	74.00	27.30	-----
1021.00	23.25	4.15	-----	54.00	27.30	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 102.1MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 25 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
102.10	12.35	0.99	50.44	68.00	27.32	36.46(PK)
102.10	12.35	0.99	49.21	48.00	27.32	35.23(AVG)
204.20	10.38	1.44	30.04	43.50	26.95	14.91
306.30	13.56	1.83	28.78	46.00	26.62	17.55
408.40	17.14	1.83	27.92	46.00	27.63	19.26
510.50	17.53	1.83	26.74	46.00	28.44	17.66
612.60	18.83	1.83	26.45	46.00	28.60	18.51
714.70	19.45	1.83	26.02	46.00	28.56	18.74
816.80	20.33	1.83	26.64	46.00	28.42	20.38
918.90	20.75	1.83	26.56	46.00	28.23	20.91
1021.00	23.25	4.15	-----	74.00	27.30	-----
1021.00	23.25	4.15	-----	54.00	27.30	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 102.1MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 26 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
104.10	12.52	0.99	33.31	68.00	27.29	19.53(PK)
104.10	12.52	0.99	29.90	48.00	27.29	16.12(AVG)
208.20	10.33	1.47	30.47	43.50	26.95	15.32
312.30	13.72	1.82	27.94	46.00	26.71	16.77
416.40	17.21	2.33	27.21	46.00	27.69	19.06
520.50	17.53	2.69	30.68	46.00	28.42	22.48
624.60	19.05	3.03	26.88	46.00	28.63	20.33
728.70	19.89	3.38	26.36	46.00	28.56	21.07
832.80	20.42	3.55	26.05	46.00	28.52	21.50
936.90	20.99	3.93	26.43	46.00	28.25	23.10
1041.00	21.86	4.20	-----	74.00	27.35	-----
1041.00	21.86	4.20	-----	54.00	27.35	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 104.1MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 27 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
104.10	12.52	0.99	51.02	68.00	27.29	37.24(PK)
104.10	12.52	0.99	47.61	48.00	27.29	33.83(AVG)
208.20	10.33	1.47	31.69	43.50	26.95	16.54
312.30	13.72	1.82	28.70	46.00	26.71	17.53
416.40	17.21	2.33	27.62	46.00	27.69	19.47
520.50	17.53	2.69	31.54	46.00	28.42	23.34
624.60	19.05	3.03	26.44	46.00	28.63	19.89
728.70	19.89	3.38	26.01	46.00	28.56	20.72
832.80	20.42	3.55	25.56	46.00	28.52	21.01
936.90	20.99	3.93	26.14	46.00	28.25	22.81
1041.00	21.86	4.20	-----	74.00	27.35	-----
1041.00	21.86	4.20	-----	54.00	27.35	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 104.1MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
107.10	12.68	1.00	35.58	68.00	27.25	22.01(PK)
107.10	12.68	1.00	31.73	48.00	27.25	18.16(AVG)
214.20	10.14	1.50	28.35	43.50	26.86	13.13
321.30	14.04	1.97	27.68	46.00	26.81	16.88
428.40	17.11	2.28	27.88	46.00	27.85	19.42
535.50	17.88	2.61	27.62	46.00	28.46	19.65
642.60	19.05	3.07	27.16	46.00	28.67	20.61
749.70	20.10	3.51	26.38	46.00	28.49	21.50
856.80	20.61	3.63	26.52	46.00	28.43	22.33
963.90	21.16	4.29	30.33	54.00	27.98	27.80
1071.00	22.25	4.25	-----	74.00	27.40	-----
1071.00	22.25	4.25	-----	54.00	27.40	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 107.1MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 29 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
107.10	12.68	1.00	49.21	68.00	27.25	35.64(PK)
107.10	12.68	1.00	45.99	48.00	27.25	32.42(AVG)
214.20	10.14	1.50	29.85	43.50	26.86	14.63
321.30	14.04	1.97	28.91	46.00	26.81	18.11
428.40	17.11	2.28	28.03	46.00	27.85	19.57
535.50	17.88	2.61	27.29	46.00	28.46	19.32
642.60	19.05	3.07	27.30	46.00	28.67	20.75
749.70	20.10	3.51	26.80	46.00	28.49	21.92
856.80	20.61	3.63	26.25	46.00	28.43	22.06
963.90	21.16	4.29	27.23	54.00	27.98	24.70
1071.00	22.25	4.25	-----	74.00	27.40	-----
1071.00	22.25	4.25	-----	54.00	27.40	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 107.1MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 30 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Horizontal			Horizontal
30.00	20.39	0.90	-----	40.00	28.23	-----
107.90	12.74	1.00	32.02	68.00	27.24	18.52(PK)
107.90	12.74	1.00	30.50	48.00	27.24	17.00(AVG)
215.80	10.14	1.52	28.08	43.50	26.81	12.93
323.70	14.04	1.94	27.68	46.00	26.87	16.79
431.60	17.11	2.31	26.92	46.00	27.89	18.45
539.50	18.13	2.59	27.99	46.00	28.47	20.24
647.40	19.52	3.07	27.08	28.65	28.65	21.02
755.30	20.12	3.60	26.34	46.00	28.45	21.61
863.20	20.72	3.69	26.38	46.00	28.39	22.40
971.10	21.21	4.29	26.18	54.00	27.99	23.69
1079.00	22.27	4.27	-----	74.00	28.00	-----
1079.00	22.27	4.27	-----	54.00	28.00	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 107.9MHz.
5. Horizontal polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 31 of 42

For FM transmitter mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values except the 88MHz~108MHz readings.

This frequency spectrum above 1GHz was investigated, Reading and both peak and Average values.

Temperature : 21.5 °C

Humidity : 76 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)	Limits (dBμV/M)	Pre-Amp Gain (dB)	Emission Level at 3m(dBμV/M)
			Vertical			Vertical
30.00	20.39	0.90	-----	40.00	28.23	-----
107.90	12.74	1.00	43.59	68.00	27.24	30.09(PK)
107.90	12.74	1.00	40.86	48.00	27.24	27.36(AVG)
215.80	10.14	1.52	31.82	43.50	26.81	16.67
323.70	14.04	1.94	28.14	46.00	26.87	17.25
431.60	17.11	2.31	27.67	46.00	27.89	19.20
539.50	18.13	2.59	29.19	46.00	28.47	21.44
647.40	19.52	3.07	26.63	46.00	28.65	20.57
755.30	20.12	3.60	26.60	46.00	28.45	21.87
863.20	20.72	3.69	25.83	46.00	28.39	21.85
971.10	21.21	4.29	26.36	54.00	27.99	23.87
1079.00	22.27	4.27	-----	74.00	28.00	-----
1079.00	22.27	4.27	-----	54.00	28.00	-----

REMARKS :

1. The measurement was searched to 10th harmonic, remark “---” means that the emissions level is too low to be measured.
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV) – Pre-Amp Gain (dB).
3. The test limit distance is 3m.
4. The test data marked in gray background means the emission data of the fundamental frequency of the EUT, 107.9MHz.
5. Vertical polarization.
6. The emission value of fundamental emission is peak value and average value.
PK : Peak value ; AVG : Average value.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 32 of 42

For Satellite Receiver mode :

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values.

Temperature : 17 °C

Humidity : 71 % RH

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Meter Reading at 3m(dBμV/M)		Limits at 3m (dBμV/M)	Emission Level at 3m(dBμV/M)	
			Horizontal	Vertical		Horizontal	Vertical
30.00	21.39	0.90	*	*	40.00	*	*
60.00	5.97	1.40	18.30	21.70	40.00	25.67	29.07
119.99	13.31	2.00	10.30	10.00	43.50	25.61	25.31
180.00	10.18	2.60	16.00	5.00	43.50	28.78	17.78
240.02	12.55	3.12	12.60	12.90	46.00	28.27	28.57
299.99	13.50	3.60	3.60	3.00	46.00	20.70	20.10
360.03	15.75	3.96	4.00	2.00	46.00	23.71	21.71
419.99	17.46	4.34	3.20	1.80	46.00	25.00	23.60
479.99	18.10	4.76	1.10	2.10	46.00	23.96	24.96
540.00	18.81	5.10	1.40	1.00	46.00	25.31	24.91
599.99	19.54	5.40	2.00	2.20	46.00	26.94	27.14
559.99	19.05	5.20	1.00	1.30	46.00	25.25	25.55
719.99	19.65	6.00	2.50	1.40	46.00	28.15	27.05
779.99	20.31	6.30	6.60	2.00	46.00	33.21	28.61
839.99	20.73	6.48	3.00	0.80	46.00	30.21	28.01
899.99	21.04	6.60	1.00	7.50	46.00	28.64	35.14
959.990	21.36	6.84	16.20	16.00	46.00	44.40	44.20
1000.000	21.58	7.00	*	*	54.00	*	*

REMARKS :

1. * Undetectable
2. Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB)
+ Meter Reading (dBμV).
3. For receiving mode below 1GHz.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007
Report No. : ER04-06-064FRF
Page 33 of 42

For Satellite Receiver mode :

The frequency spectrum above 1 GHz was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company :	Wistron NeWeb Corporation	Test Date :	2004/2/17
Product Name :	Satellite Radio Receiver	Test By:	Ken Tu
Model Name :	UPA-US	TEMP&Humidity :	19°C , 71%

RX				Measurement Distance at 1m Horizontal polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1499.99	54.62	28.10	2.89	35.60	9.50	0.00	40.51	74	-33.49	P	1.0
1499.99	51.70	28.10	2.89	35.60	9.50	0.00	37.59	54	-16.41	A	1.0
2011.23	51.19	32.19	3.40	35.30	9.50	0.00	41.98	74	-32.02	P	1.0
2011.23	47.06	32.19	3.40	35.30	9.50	0.00	37.85	54	-16.15	A	1.0
2520.01	55.78	31.70	3.63	35.32	9.50	0.00	46.28	74	-27.72	P	1.0
2520.01	53.66	31.70	3.63	35.32	9.50	0.00	44.16	54	-9.84	A	1.0
2580.02	54.56	31.70	3.66	35.40	9.50	0.00	45.02	74	-28.98	P	1.0
2580.02	52.23	31.70	3.66	35.40	9.50	0.00	42.69	54	-11.31	A	1.0
2639.97	50.73	31.70	3.68	35.47	9.50	0.00	41.14	74	-32.86	P	1.0
2639.97	46.18	31.70	3.68	35.47	9.50	0.00	36.59	54	-17.41	A	1.0
4022.44	52.91	32.59	4.83	34.90	9.50	0.00	45.92	74	-28.08	P	1.0
4022.44	49.98	32.59	4.83	34.90	9.50	0.00	42.99	54	-11.01	A	1.0
6033.98	46.98	37.17	6.41	34.30	9.50	0.00	46.75	74	-27.25	P	1.0
6033.98	40.13	37.17	6.41	34.30	9.50	0.00	39.90	54	-14.10	A	1.0
8044.86	46.66	39.56	7.29	36.76	9.50	0.00	47.24	74	-26.76	P	1.0
8044.86	38.39	39.56	7.29	36.76	9.50	0.00	38.97	54	-15.03	A	1.0
10056.15	46.02	38.57	8.44	36.88	9.50	0.00	46.65	74	-27.35	P	1.0
10056.15	37.84	38.57	8.44	36.88	9.50	0.00	38.47	54	-15.53	A	1.0
12067.50	-----	41.31	9.23	35.73	9.50	0.00	-----	74	-----	P	1.0
12067.50	-----	41.31	9.23	35.73	9.50	0.00	-----	54	-----	A	1.0

Note :

1. The measurement was searched to 10th harmonic, Remark "---" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
5. The result basic equation calculation is as follow:
Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
6. The other emission levels were very low against the limit.
7. The test limit distance is 3M limit.
8. For receiving mode above 1GHz.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007
Report No. : ER04-06-064FRF
Page 34 of 42

For Satellite Receiver mode :

The frequency spectrum above 1 GHz was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company :	Wistron NeWeb Corporation	Test Date :	2004/2/17
Product Name :	Satellite Radio Receiver	Test By:	Ken Tu
Model Name :	UPA-US	TEMP&Humidity :	19°C , 71%

RX				Measurement Distance at 1m Vertical polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1499.95	47.81	28.10	2.89	35.60	9.50	0.00	33.70	74	-40.30	P	1.0
1499.95	38.78	28.10	2.89	35.60	9.50	0.00	24.67	54	-29.33	A	1.0
2011.25	47.43	32.19	3.40	35.30	9.50	0.00	38.22	74	-35.78	P	1.0
2011.25	39.45	32.19	3.40	35.30	9.50	0.00	30.24	54	-23.76	A	1.0
2520.04	48.79	31.70	3.63	35.32	9.50	0.00	39.29	74	-34.71	P	1.0
2520.04	44.42	31.70	3.63	35.32	9.50	0.00	34.92	54	-19.08	A	1.0
2579.94	49.08	31.70	3.66	35.40	9.50	0.00	39.54	74	-34.46	P	1.0
2579.94	44.13	31.70	3.66	35.40	9.50	0.00	34.59	54	-19.41	A	1.0
2639.99	48.33	31.70	3.68	35.47	9.50	0.00	38.74	74	-35.26	P	1.0
2639.99	40.09	31.70	3.68	35.47	9.50	0.00	30.50	54	-23.50	A	1.0
4022.46	50.71	32.59	4.83	34.90	9.50	0.00	43.72	74	-30.28	P	1.0
4022.46	47.17	32.59	4.83	34.90	9.50	0.00	40.18	54	-13.82	A	1.0
6033.73	47.16	37.17	6.41	34.30	9.50	0.00	46.93	74	-27.07	P	1.0
6033.73	40.13	37.17	6.41	34.30	9.50	0.00	39.90	54	-14.10	A	1.0
8044.95	46.14	39.56	7.29	36.76	9.50	0.00	46.72	74	-27.28	P	1.0
8044.95	38.55	39.56	7.29	36.76	9.50	0.00	39.13	54	-14.87	A	1.0
10056.09	45.96	38.57	8.44	36.88	9.50	0.00	46.59	74	-27.41	P	1.0
10056.09	36.43	38.57	8.44	36.88	9.50	0.00	37.06	54	-16.94	A	1.0
12067.50	-----	41.31	9.23	35.73	9.50	0.00	-----	74	-----	P	1.0
12067.50	-----	41.31	9.23	35.73	9.50	0.00	-----	54	-----	A	1.0

Note :

1. The measurement was searched to 10th harmonic, Remark “---” means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
5. The result basic equation calculation is as follow:
Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
6. The other emission levels were very low against the limit.
7. The test limit distance is 3M limit.
8. For receiving mode above 1GHz.

3.7 Photos of Open Site





Ecom Sertech Corp.

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing
Rd., ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007
Report No. : ER04-06-064FRF
Page 36 of 42





Ecom Sertech Corp.

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
TEL:886-3-5918012 FAX : 886-3-5825720

FCC ID : NKRUPAUS007
Report No. : ER04-06-064FRF
Page 37 of 42

4. OCCUPIED BANDWIDTH MEASUREMENT

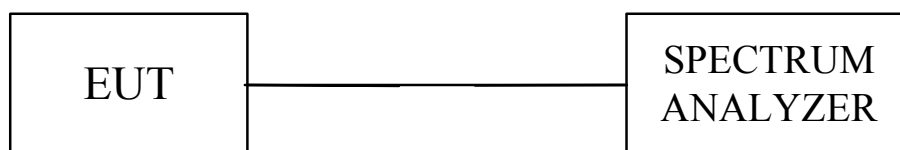
4.1 Test Equipments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	June 17, 2004

Note : 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.2 Test Setup



4.3 Limits of 6dB Bandwidth Measurement

The max of Occupied Bandwidth Measurement is $< 200\text{KHz}$

4.4 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 10 KHz RBW and 10KHz VBW. The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

4.5 Uncertainty of Conducted Emission

The uncertainty of conducted emission is $\pm 20\text{KHz}$.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., ChuTung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 38 of 42

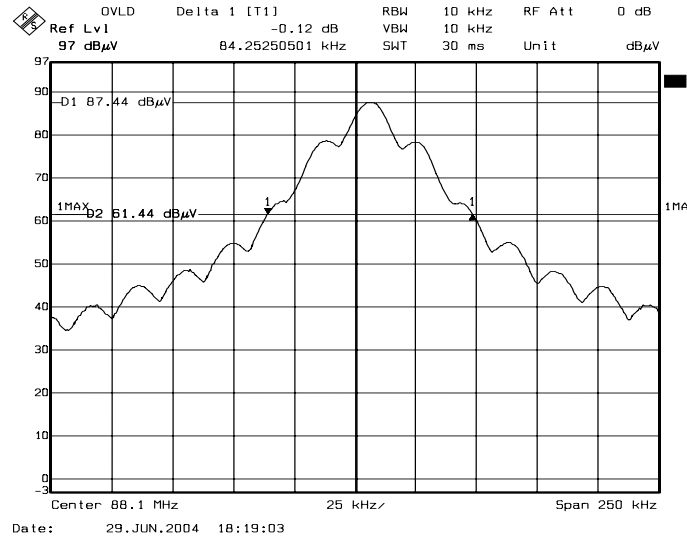
4.6 Test Results

Input Power (System)	6VDC (From Adapter)	Environmental Conditions	16°C, 84%RH
Tested By	Ken Tu		

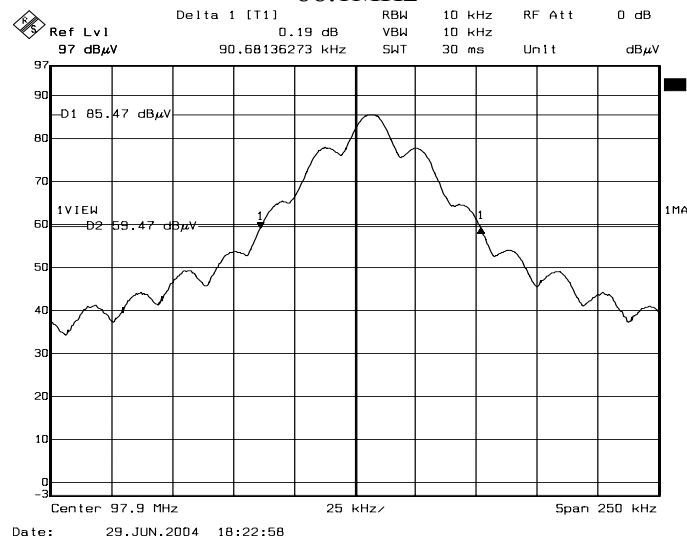
	Frequency (MHz)	26dB Bandwidth (kHz)	Maximum Limit (kHz)	Pass / Fail
Lowest	88.10	84.25	200	PASS
Middle	97.90	90.68	200	PASS
Upper	107.90	72.65	200	PASS

Note : For Transmitting Mode.

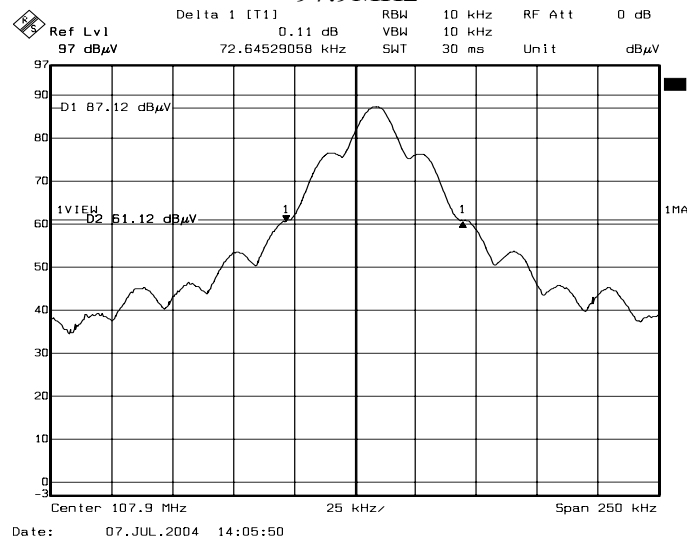
4.7 Photo of 26db Bandwidth Measurement



88.1MHz



97.9MHz



107.9MHz



5. MAXIMUM PEAK OUTPUT POWER

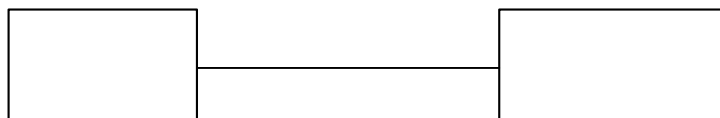
5.1 Test Equipments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	June 17, 2004
ANRITSU	ML2487A	6K00001783	May 24, 2004

Note : 1. The measurement uncertainty is less than $\pm 2.6\text{dB}$, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

5.2 Test Setup



5.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency.

5.4 Uncertainty of Conducted Emission

The uncertainty of conducted emission is $\pm 1.82\text{dB}$.

**Ecom Sertech Corp.**

Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd., Chu Tung Chen, Hsinchu, Taiwan 310, R.O.C
TEL: 886-3-5918012 FAX: 886-3-5825720

FCC ID : NKRUPAUS007

Report No. : ER04-06-064FRF

Page 41 of 42

5.5 Test Results

Input Power (System)	6VDC (From Adaptor)	Environmental Conditions	16°C, 84%RH
Tested By	Ken Tu		

Channel	Channel Frequency (MHz)	Peak Power Reading (dBm)	Cable Closs (dB)	Peak Power Output (dBm)
Lowest	88.1	-11.86	0.5	-11.36
Middle	97.9	-12.80	0.5	-12.30
Upper	107.9	-13.70	0.5	-13.20

Note : 1. For TX Mode.

2. Cable loss = 0.5dB

3. The results are calculated as the following equation :

Peak Power Output = Peak Power Reading + Cable loss



6. ANTENNA REQUIREMENT

6.1 Standard Applicable

According to Section 15.203 an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The use of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section

6.2 Antenna Connected Construction

The antenna used for EUT is Monopole antenna. The maximum Gain of this antenna is only -7dBi.