NF-TA-R060006

**NEX1 Future Co., Ltd.** 

# FCC TEST REPORT

The Reputation of LG Defense Industry Continues with NEX1 Future.

**Locations & Offices** 

NEX GUMI

133 Gongdan-dong, Gumi, Gyongsangbuk-do, 730-030, Korea

Tel: +82-54-469-8213
Fax: +82-54-469-8065

February 27, 2006
NEX 1 Future Co., Ltd.

Revision No: 1.2 Page: 1 of 1



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

#### TEST REPORT CERTIFICATION

Applicant : Remote Solution Co., Ltd.

Adderss : 92, Chogokri, Nammyun, Kimchon city, Kyungbuk, 740-871, Korea

EUT Name : Color LCD Touch screen universal remote control

Model No. : RH60A and XTR39
Serial No. : Engineering Sample

FCCID : TX4RH60A

Testing location : Nex1 Future Co., Ltd.

133, Kongdan-Dong, Gumi-City, Kyeongsangbuk-Do, 730-030, R.O.K

Applied : FCC Part 15

specification

Test result : The above mentioned test item passed.

Test Date February 27, 2006 Review Date February 27, 2006

Tested by Hyo-Jeung, Cho Reviewed by Jeong-Hi, Jin

Title Engineer Title EMC Manager

Signature / Signature

I HEREBY CERTIFY THAT the data shown in this report were made in accordance with the procedures given in the applied specification and I assume full responsibility for accuracy and completeness of these data.

Note: This test report relates to the a. m. test item. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products.

Revision No: 1.2 Page: 2 of 2



### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

## **Contents**

| 1. GENERAL INFORMATION                         | 5    |
|--|------|
| 1.1 PRODUCT DESCRIPTION                        | 5    |
| 1.2 Project data                               | 5    |
| 1.3 APPLICANT                                  | 5    |
| 1.4 MANUFACTURER                               | 5    |
| 2. EUT Information                             | 6    |
| 2.1 GENERAL EUT INFORMATION                    | 6    |
| 2.2 CENTER FREQUENCY OF TESTED CHANNEL         | 6    |
| 2.3 Test Environment                           | 6    |
| 2.4 ACCESSORIES AND ANCILLARY EQUIPMENT        | 6    |
| 3. TESTING FACILITIES                          | 7    |
| 4. EUT DESCRIPTION AND OPERATIONAL DESCRIPTION | 7    |
| 5. Test Set-up                                 | 8    |
| 5.1 Principle of configuration                 | 8    |
| 5.2 OPERATIONAL MODES                          | 8    |
| 5.3 APPLIED SPECIFICATION                      | 8    |
| 6. TEST REPORT SUMMARY                         | 9    |
| 7. Test Results                                | . 10 |
| 7.1 ANTENNA CONNECTOR REQUIREMENTS             | . 10 |
| 7.2 AC CONNECTED EMISSION                      | . 11 |
| 7.3 6dB Bandwidth                              |      |
| 7.4 Power Spectral Density                     | . 18 |
| 7.5 PEAK OUTPUT POWER                          | . 22 |
| 7.6 BAND-EDGE COMPLIANCE                       | . 26 |
| 7.7 Spurious Conducted emissions               | . 30 |
| 7.8 Spurious Radiated emissions                | . 41 |



### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

| 8. LIST OF TEST AND MEASUREMENT INSTRUMENTS | . 44 |
|---|------|
| 9. Notes                                    | . 45 |

Revision No : 1.2 Page: 4 of 4



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

#### 1. General Information

**1.1 Product Description** 

Product Name : Color LCD Touch screen universal remote control

Product ID : RH60A and XTR39

Serial No. : Prototype FCC ID : TX4RH60A

1.2 Project data

Receipt of EUT : February 13, 2006

Date of Test : February 27, 2006

Data of report : February 27, 2006

1.3 Applicant

Company Name : Remote Solution Co., Ltd.

Address : 92, Chogokri, Nammyun, Kimchon city, Kyungbuk,

740-871, Korea

Contact Person : Mr. Byung-Cheol, Kim

1.4 Manufacturer

Company Name : Remote Solution Co., Ltd.

Address : 92, Chogokri, Nammyun, Kimchon city, Kyungbuk,

740-871, Korea

Contact Person : Mr. Byung-Cheol, Kim

Revision No: 1.2 Page: 5 of 5



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

#### 2. EUT Information

#### 2.1 General EUT Information

| Туре                      | Transmitter                     | Receiver                |  |  |
|---------------------------|---------------------------------|-------------------------|--|--|
| FCC Classification        | Direct Sequence Spread          | Direct Sequence Spread  |  |  |
|                           | Spectrum(DSSS)                  | Spectrum(DSSS)          |  |  |
| EUT Type                  | Zigbee (802.15.4)               | Zigbee (802.15.4)       |  |  |
| Modulation Type           | OQPSK                           | OQPSK                   |  |  |
| Operating frequency range | 2405 – 2475 MHz 2405 – 2475 MHz |                         |  |  |
| Bands of operation        | 2.400 - 2.4835 GHz              |                         |  |  |
| Number of Channels        | 15 15                           |                         |  |  |
| Channel Separation        | 5MHz                            | 5MHz                    |  |  |
| Type of Antenna           | Dielectric Chip Antenna         | Dielectric Chip Antenna |  |  |
| Power Supply              | DC 3.7 V Lithium Ion            | DC 3.7 V Lithium Ion    |  |  |

### 2.2 Center Frequency of Tested Channel

| Frequency | Frequency Tx ( MHz ) |      |
|-----------|----------------------|------|
| Lowest    | 2405                 | 2405 |
| Middle    | 2440                 | 2440 |
| Highest   | 2475                 | 2475 |

#### 2.3 Test Environment

| Temperature       | 25°C           |
|-------------------|----------------|
| Relative Humidity | 30 ~ 60%       |
| Voltage(DC)       | DC 3.7V        |
| Voltage(AC)       | 115V AC , 50Hz |

## 2.4 Accessories and Ancillary Equipment

| Equipment | Model No.    | Serial Number | Maker   |
|-----------|--------------|---------------|---------|
| Laptop PC | PS428L-OE142 | 30014068J     | Toshiba |
|           |              |               |         |
|           |              |               |         |
|           |              |               |         |
|           |              |               |         |
|           |              |               |         |

Revision No: 1.2 Page: 6 of 6



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

#### 3. Testing Facilities

Nex1 Future Co., Ltd.

133, Kongdan-Dong, Gumi-City, Kyeongsangbuk-Do, 730-030, R.O.K

#### 4. EUT Description and Operational Description

The RH60 is designed to control various home appliances and sensor equipment safely and easily.

Using 3.9" full color touch screen makes everyone use easily the product and allows to redesign and recompose the control button according to the uses of each user.

The control system for the appliances is the infrared, and the 2.4GHz Zigbee is available as well.

The RH60 is designed to control all home appliances with only the 2.4GHz RF by Using the Zigbee to IR converter instead of using the infrared, which solve the distance and space problem caused by using the infrared.

There are various entertainment features. The alarm, clock, bio-rhythm, memo pad and game are supported.

With the manager program, the database and firmware are upgraded and the LCD screen and button are recomposed simply via USB.

It is possible to use the product for around 100 hours without charging because of The excellent power management and the high capacity rechargeable battery.

While the RH60 is sitting on the charging cradle, the appliances control is allowed in case of using its sub-remote.

Revision No: 1.2 Page: 7 of 7



NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### 5. Test Set-up

#### 5.1 Principle of configuration

**Conducted**: The equipment under test (EUT) was configured with a temporary SMA Connector and EUT transmits its maximum power level.

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes and test settings were adapted accordingly in reference to the instructions for use.

For details, please refer to the Operation mode in chapter 7.

### **5.2 Operational Modes**

Fixed mode ( 2405Mhz, 2440Mhz and 2475Mhz )

#### 5.3 Applied Specification

FCC Part 15

Revision No: 1.2 Page: 8 of 8



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

## **6. Test Report Summary**

| Related | Test Cases                     | FCC Part     | Result   |
|---------|--------------------------------|--------------|----------|
| Clause  |                                | Sections     | ( Note1) |
| 7.1     | Antenna Connector Requirements | 15.203       | С        |
|         |                                | 15.204       |          |
| 7.2     | AC Connected Emission          | 15.207       | Pass     |
| 7.3     | 6dB Bandwidth                  | 15.247(a)(2) | Pass     |
| 7.4     | Power Spectral Density         | 15.247(e)    | Pass     |
| 7.5     | Peak Output Power              | 15.247(b)(3) | Pass     |
| 7.6     | Band-edge Compliance           | 15.247(d)    | Pass     |
| 7.7     | Spurious Conducted emissions   | 15.247(d)    | Pass     |
| 7.8     | Spurious Radiated emissions    | 15.247(d)    | Pass     |

<sup>\*</sup> Note1: C: Complies, Pass: Passed, Fail : Failed and NA : Not Applicable

Revision No: 1.2 Page: 9 of 9



NF-TA-R060006

**NEX1 Future Co., Ltd.** 

#### 7. Test Results

#### 7.1 Antenna Connector Requirements

#### Requirements

**Subclause 15.203 and 15.204(c)** 

According to the Part 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 a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. And according to the Part 15.204(c), only the antenna with which an intentional radiator is authorized may be used with the intentional radiator.

#### **Test results**

RESULT: Complies

The antenna is permanently attached on the PCB.

The EUT has a Dielectric Chip Antenna.

For more information on the antenna:

Antenna gain : 0 dBi

Manufacturer : AMOTECH Co., Ltd.

Model No. : AMAN903010U2P5

Type : Dielectric Chip Antenna

Revision No: 1.2 Page: 10 of 10



NF-TA-R060006

**NEX1 Future Co., Ltd.** 

#### 7.2 AC Connected Emission

#### **Test Mode and conditions**

The power is supplied by a DC 3.7 V Lithium Ion or it can be charged with AC/DC adaptor.

#### **Requirements**

Subclause15.207(a)

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN).

| Frequency of Emission (M | Conducted Limit (dBµV) |         |  |  |  |
|--------------------------|------------------------|---------|--|--|--|
| Hz)                      | Quasi-peak             | Average |  |  |  |
| 0.15-0.5                 | 66-56*                 | 56-46*  |  |  |  |
| 0.5-5                    | 56                     | 46      |  |  |  |
| 5-30                     | 60                     | 50      |  |  |  |

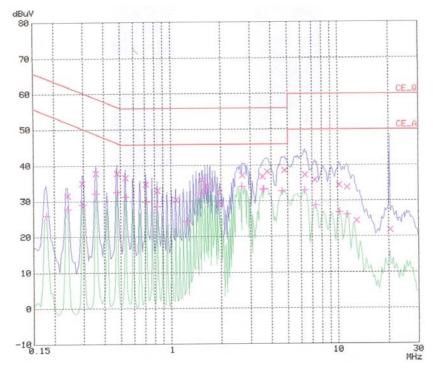
<sup>\*</sup> Decreases with the logarithm of the frequency.

### **Test results**

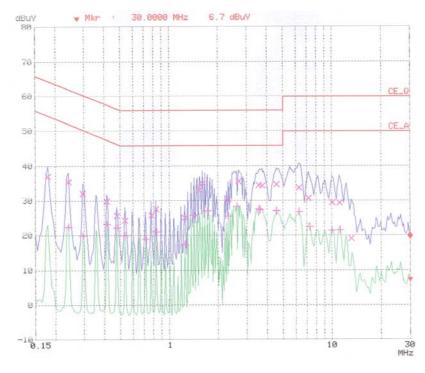
Revision No: 1.2 Page: 11 of 11

#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**



< Fig 1.Conducted emission-Hot line>



< Fig 2. Conducted emission-Neutral line >

Revision No: 1.2 Page: 12 of 12



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

| Frequency | Insertion | Cable | Pol. | Quasi-Peak[dBuV] |         |        | Av    | verage[dB | uV]    | Margin | ı[dBuV] |
|-----------|-----------|-------|------|------------------|---------|--------|-------|-----------|--------|--------|---------|
| (MHz)     | Loss      | Loss  | Pol. | Limit            | Reading | Result | Limit | Reading   | Result | Quasi  | Average |
| 0.240     | 0.11      | -0.21 | N    | 62.10            | 35.5    | 35.40  | 52.10 | 22.5      | 22.40  | 26.69  | 29.69   |
| 0.475     | 0.14      | -0.16 | Н    | 56.43            | 37.8    | 37.78  | 46.43 | 32.6      | 32.58  | 18.65  | 13.85   |
| 0.535     | 0.14      | -0.19 | Н    | 56.00            | 36.5    | 36.45  | 46.00 | 31.3      | 31.25  | 19.55  | 14.75   |
| 0.710     | 0.15      | -0.23 | Н    | 56.00            | 34.7    | 34.62  | 46.00 | 29.8      | 29.72  | 21.38  | 16.28   |
| 0.830     | 0.15      | -0.23 | Н    | 56.00            | 32.9    | 32.82  | 46.00 | 28.5      | 28.42  | 23.18  | 17.58   |
| 1.540     | 0.17      | -0.28 | Н    | 56.00            | 35.9    | 35.79  | 46.00 | 32.1      | 31.99  | 20.21  | 14.01   |
| 2.670     | 0.21      | -0.20 | Н    | 56.00            | 37.2    | 37.21  | 46.00 | 34.1      | 34.11  | 18.79  | 11.89   |
| 3.795     | 0.24      | -0.14 | Н    | 56.00            | 38.2    | 38.30  | 46.00 | 33.4      | 33.50  | 17.70  | 12.50   |
| 4.800     | 0.27      | -0.16 | Н    | 56.00            | 38.6    | 38.72  | 46.00 | 32.8      | 32.92  | 17.28  | 13.08   |
| 6.350     | 0.32      | -0.15 | Н    | 60.00            | 37.3    | 37.47  | 50.00 | 33.0      | 33.17  | 22.53  | 16.83   |
| 7.290     | 0.34      | -0.06 | Н    | 60.00            | 35.8    | 36.08  | 50.00 | 28.7      | 28.98  | 23.92  | 21.02   |
| 10.190    | 0.40      | 0.00  | Н    | 60.00            | 34.4    | 34.80  | 50.00 | 26.8      | 27.20  | 25.20  | 22.80   |
| 11.320    | 0.45      | 0.00  | Н    | 60.00            | 33.9    | 34.35  | 50.00 | 26.1      | 26.55  | 25.65  | 23.45   |

\*Comment: Pol: H (Live), N(Neut)

Insertion Loss : Insertion Loss of LISN

Cable Loss : Cable Loss + Pulse Limiter Insertion loss value

Revision No : 1.2 Page: 13 of 13



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

#### 7.3 6dB Bandwidth

#### **Test Mode and conditions**

Mode of operation : Tx mode Measurement Method : Conducted

Detector : PK

Trace : Max hold

RBW/VBW : 100kHz/100kHz

#### **Requirements**

**Subclause 15.247(a)(2)** 

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

#### **Test results**

| Test frequency | 6dB Bandwidth | Limit | Results |
|----------------|---------------|-------|---------|
| (MHz)          | (MHz)         | (MHz) |         |
| 2405.000       | 1.61          | > 0.5 | Pass    |
| 2440.000       | 1.62          | > 0.5 | Pass    |
| 2475.000       | 1.60          | > 0.5 | Pass    |

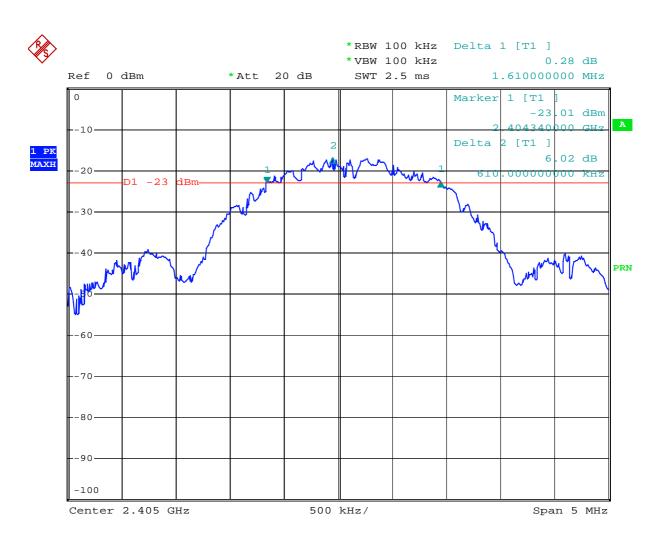
Revision No: 1.2 Page: 14 of 14



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

#### 6dB Bandwidth Plot-2405



Date: 23.FEB.2006 18:22:05

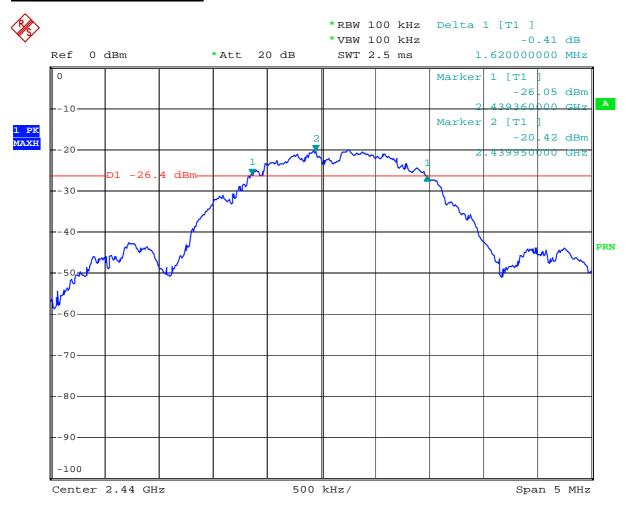
Revision No: 1.2 Page: 15 of 15



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

#### 6dB Bandwidth Plot-2440



Date: 23.FEB.2006 18:25:11

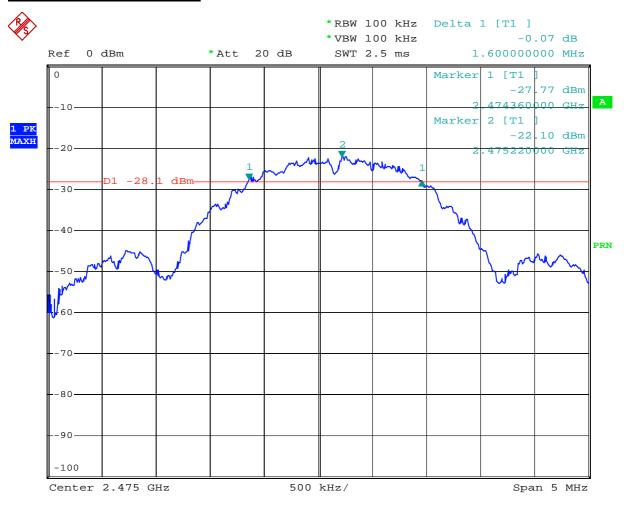
Revision No: 1.2 Page: 16 of 16



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

#### 6dB Bandwidth Plot-2475



Date: 23.FEB.2006 18:27:50

Revision No: 1.2 Page: 17 of 17



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### 7.4 Power Spectral Density

#### **Test Mode and conditions**

Mode of operation : Tx mode

Measurement Method : Conducted

Detector : PK

Trace : Max hold RBW/VBW : 3kHz/10kHz

#### **Requirements**

**Subclause 15.247(e)** 

For digitally modulated systems, the power spectral density conducted from the intenti onal radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band duri ng any time interval of continuous transmission.

#### **Test results**

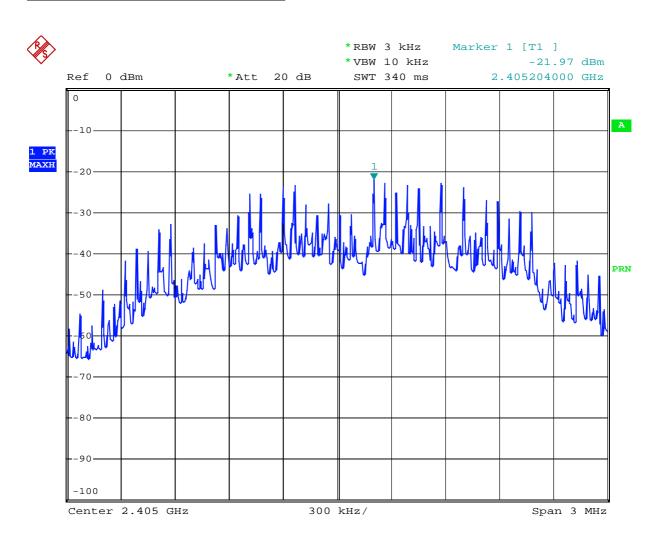
| Test frequency | Reading | Cable Power Spectral |                     | Limit | Results |
|----------------|---------|----------------------|---------------------|-------|---------|
| (MHz)          | (dBm)   | attenuation          | attenuation Density |       |         |
|                |         | (dB)                 | (dBm)               |       |         |
| 2405.000       | -21.97  | 1.80                 | -20.170             | 8     | Pass    |
| 2440.000       | -25.59  | 1.83                 | -23.760             | 8     | Pass    |
| 2475.000       | -27.59  | 1.85                 | -25.740             | 8     | Pass    |

Revision No: 1.2 Page: 18 of 18

#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

### **Power Spectral Density Plot- 2405**



Date: 23.FEB.2006 18:38:00

Revision No: 1.2 Page: 19 of 19



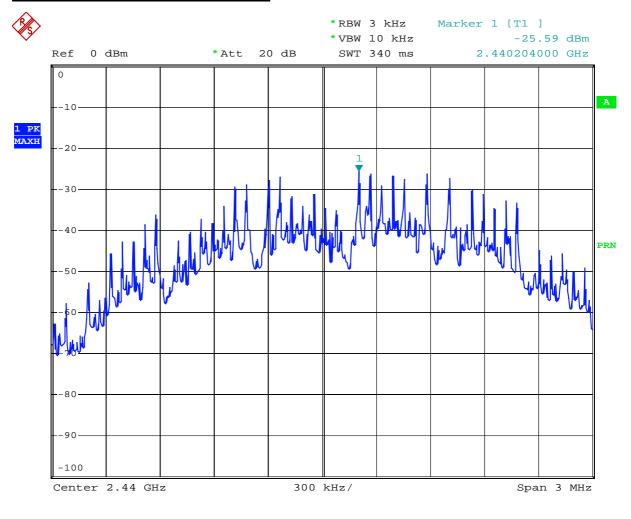
#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

## **Power Spectral Density Plot- 2440**

23.FEB.2006 19:55:54

Date:



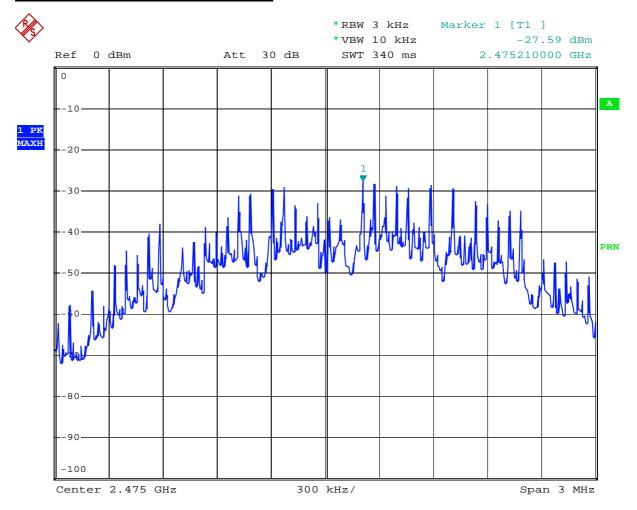
Revision No: 1.2 Page: 20 of 20



### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

## **Power Spectral Density Plot- 2475**



Date: 23.FEB.2006 10:05:38

Revision No: 1.2 Page: 21 of 21



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### 7.5 Peak Output Power

### **Test Mode and conditions**

Mode of operation : Tx mode

Measurement Method : Conducted

Detector : PK

Trace : Max hold RBW/VBW : 3MHz/3MHz

### **Requirements**

Subclause 15.247(b)(3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

### **Test results**

| Test      | Reading | Cable             | Peak Output | Limit | Results |
|-----------|---------|-------------------|-------------|-------|---------|
| Frequency | (dBm)   | attenuation Power |             | (W)   |         |
| (MHz)     |         | (dB)              | (W)         |       |         |
| 2405      | -12.38  | 1.80              | 0.00000875  | 1.0   | Pass    |
| 2440      | -15.44  | 1.83              | 0.00000435  | 1.0   | Pass    |
| 2475      | -17.70  | 1.85              | 0.00000260  | 1.0   | Pass    |

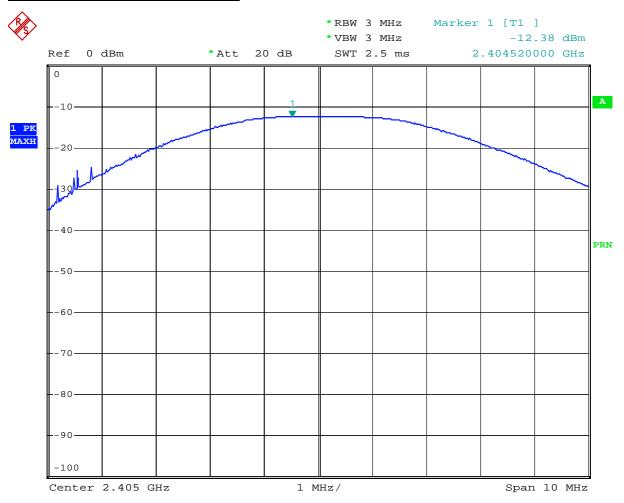
Revision No: 1.2 Page: 22 of 22



### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

### Peak Output Power Plot - 2405



Date: 23.FEB.2006 18:33:36

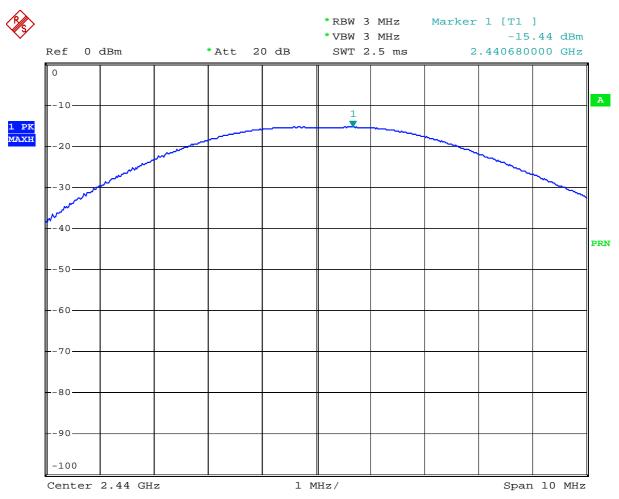
Revision No: 1.2 Page: 23 of 23



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

### Peak Output Power Plot - 2440



Date: 23.FEB.2006 18:34:15

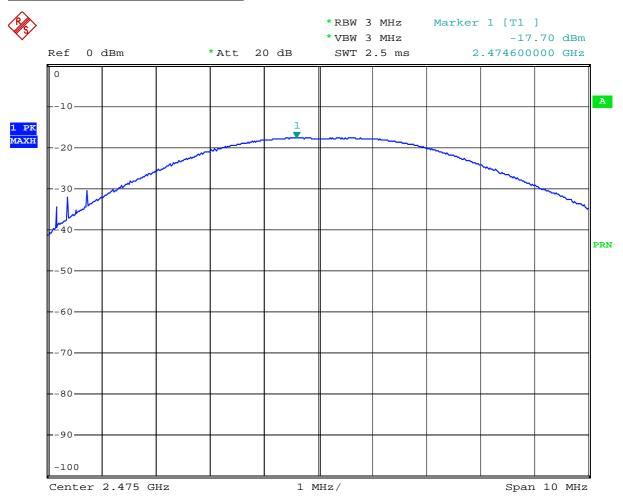
Revision No: 1.2 Page: 24 of 24



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

### Peak Output Power Plot - 2475



Date: 23.FEB.2006 18:35:07

Revision No: 1.2 Page: 25 of 25



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### 7.6 Band-edge Compliance

#### **Test Mode and conditions**

Mode of operation : Tx mode

Measurement Method : Conducted

Detector : PK

Trace : Max hold

RBW/VBW : 100kHz/300kHz

#### **Requirements**

Subclause 15.247(d)

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100k Hz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

#### **Test results**

There is no peak found outside any 100kHz bandwidth of the operating frequency band in the three transmit frequency.

| Tx Frequency<br>(MHz) | RF power outside<br>100kHz BW (MHz) | Limit      | Results |
|-----------------------|-------------------------------------|------------|---------|
| 2405                  | No peak above 20dB                  | 20dB below | Pass    |
| 2440                  | No peak above 20dB                  | 20dB below | Pass    |
| 2475                  | No peak above 20dB                  | 20dB below | Pass    |

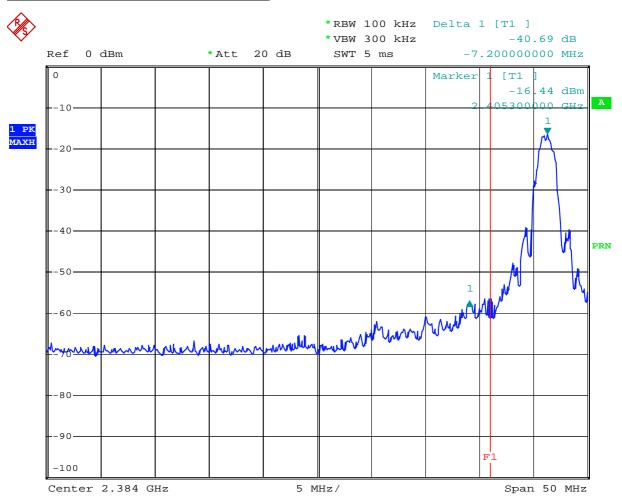
Revision No: 1.2 Page: 26 of 26



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### **Band-edge Compliance Plot - 2405**



Date: 23.FEB.2006 18:50:42

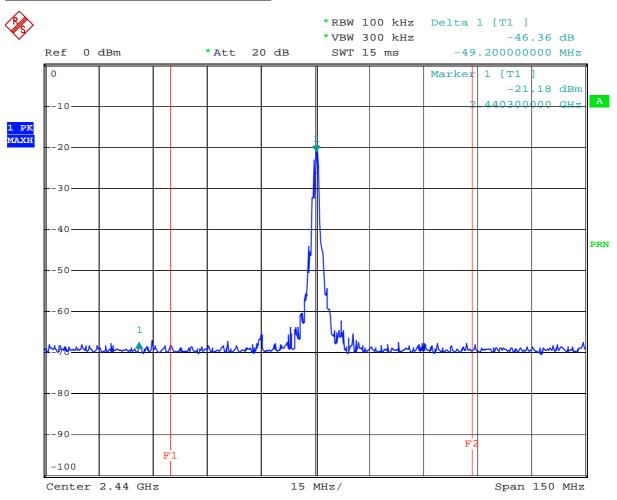
Revision No: 1.2 Page: 27 of 27



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Band-edge Compliance Plot - 2440



Date: 23.FEB.2006 18:52:45

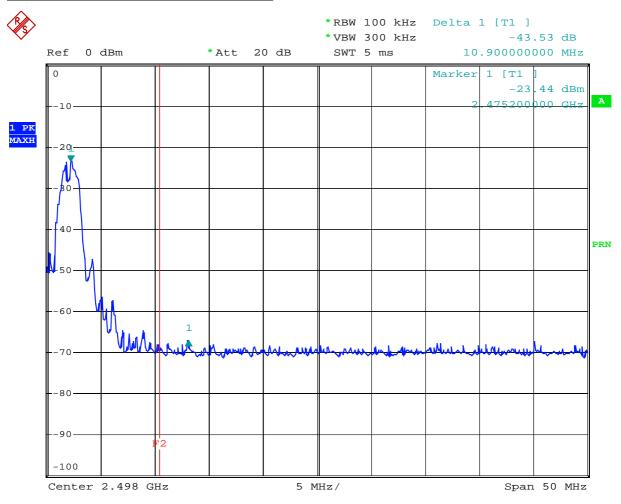
Revision No: 1.2 Page: 28 of 28



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Band-edge Compliance Plot - 2475



Date: 23.FEB.2006 18:54:07

Revision No: 1.2 Page: 29 of 29



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### 7.7 Spurious Conducted emissions

#### **Test Mode and conditions**

Mode of operation : Tx mode

Measurement Method : Conducted

Detector : PK

Trace : Max hold

RBW/VBW : 100kHz/300kHz

### Requirements Subclause 15.247(d)

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100k Hz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

#### **Test results**

| Frequency<br>(MHz) | Reading<br>Value<br>(dBm)     | Correction<br>Factor<br>(dB) | Results<br>(dBm) | Reference<br>Value (dBm) | Delta to<br>Reference<br>(dB) |  |  |  |  |
|--------------------|-------------------------------|------------------------------|------------------|--------------------------|-------------------------------|--|--|--|--|
|                    | Operating frequency : 2405MHz |                              |                  |                          |                               |  |  |  |  |
| 7228.34            | -44.04                        | 3.4                          | -40.64           | -30.580                  | 10.06                         |  |  |  |  |
| 13960              | -53.4                         | 6.7                          | -46.7            | -30.580                  | 16.12                         |  |  |  |  |
| 20090              | -49.44                        | 6.7                          | -42.74           | -30.580                  | 12.16                         |  |  |  |  |
|                    |                               |                              |                  |                          |                               |  |  |  |  |
|                    |                               |                              |                  |                          |                               |  |  |  |  |

Revision No: 1.2 Page: 30 of 30



### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

| Frequency<br>(MHz) | Reading<br>Value<br>(dBm)    | Correction<br>Factor<br>(dB) | Results<br>(dBm) | Reference<br>Value (dBm) | Delta to<br>Reference<br>(dB) |  |  |  |  |
|--------------------|------------------------------|------------------------------|------------------|--------------------------|-------------------------------|--|--|--|--|
|                    | Operating frequency: 2440MHz |                              |                  |                          |                               |  |  |  |  |
| 7328.04            | -48.14                       | 3.4                          | -44.74           | -33.610                  | 11.13                         |  |  |  |  |
| 14800              | -53.62                       | 6.7                          | -46.92           | -33.610                  | 13.31                         |  |  |  |  |
| 20040              | -48.75                       | 6.7                          | -42.05           | -35.850                  | 6.2                           |  |  |  |  |
|                    |                              |                              |                  |                          |                               |  |  |  |  |
|                    |                              |                              |                  |                          |                               |  |  |  |  |

| Frequency<br>(MHz) | Reading<br>Value<br>(dBm)     | Correction<br>Factor<br>(dB) | Results<br>(dBm) | Reference<br>Value (dBm) | Delta to<br>Reference<br>(dB) |  |  |  |
|--------------------|-------------------------------|------------------------------|------------------|--------------------------|-------------------------------|--|--|--|
|                    | Operating frequency : 2475MHz |                              |                  |                          |                               |  |  |  |
| 7427.74            | -49.2                         | 3.4                          | -45.8            | -35.850                  | 9.95                          |  |  |  |
| 15060              | -53.39                        | 6.0                          | -47.39           | -35.850                  | 11.54                         |  |  |  |
| 20050              | -48.36                        | 6.7                          | -41.66           | -35.850                  | 5.81                          |  |  |  |
|                    |                               |                              |                  |                          |                               |  |  |  |
|                    |                               |                              |                  |                          |                               |  |  |  |

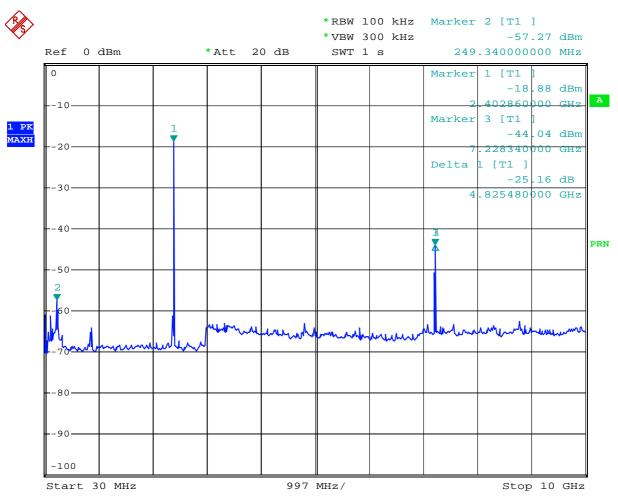
Revision No : 1.2 Page: 31 of 31



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2405 (30MHz~10GHz)



Date: 23.FEB.2006 18:57:30

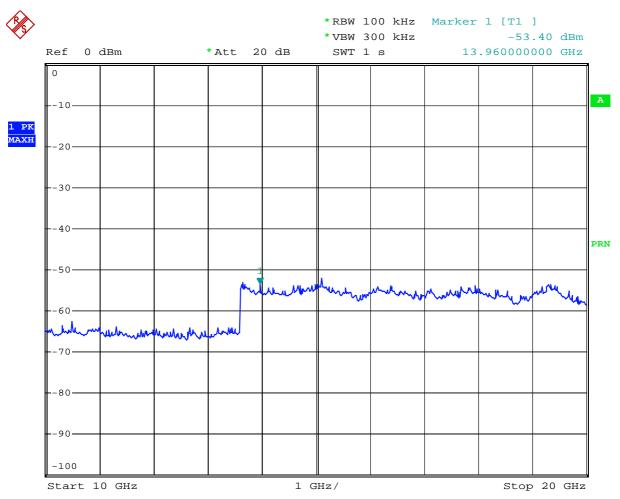
Revision No: 1.2 Page: 32 of 32



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2405 (10GHz~20GHz)



Date: 23.FEB.2006 18:58:35

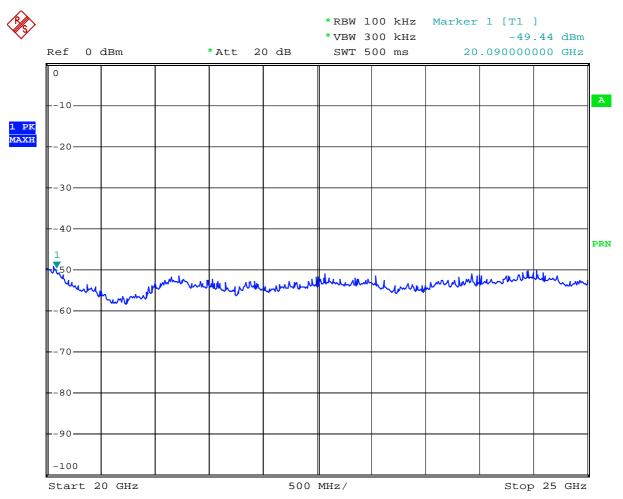
Revision No: 1.2 Page: 33 of 33



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2405 (20GHz~25GHz)



Date: 23.FEB.2006 18:59:19

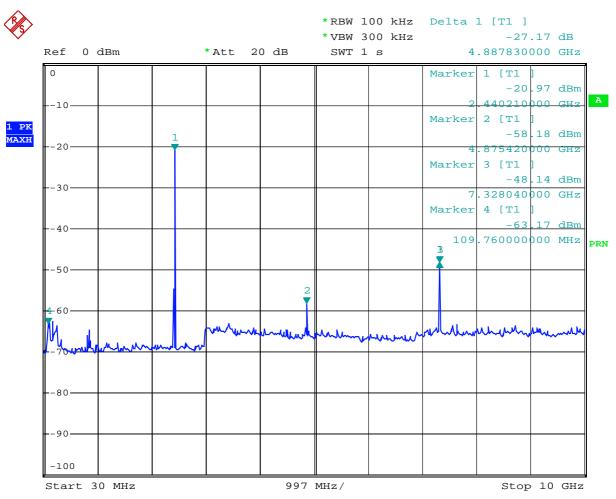
Revision No: 1.2 Page: 34 of 34



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2440 (30MHz~10GHz)



Date: 23.FEB.2006 19:42:47

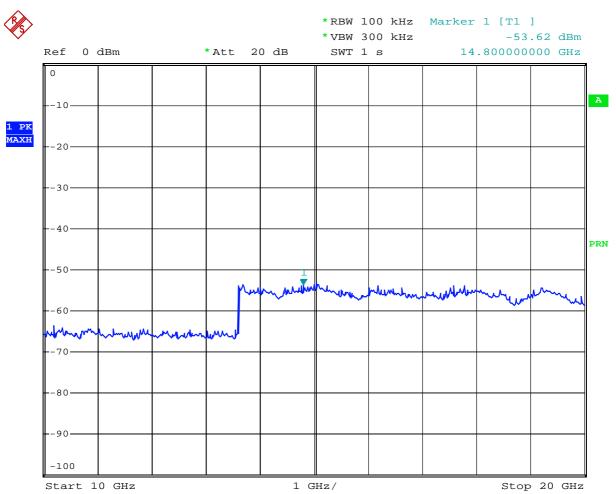
Revision No: 1.2 Page: 35 of 35



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2440 (10GHz~20GHz)



Date: 23.FEB.2006 19:06:48

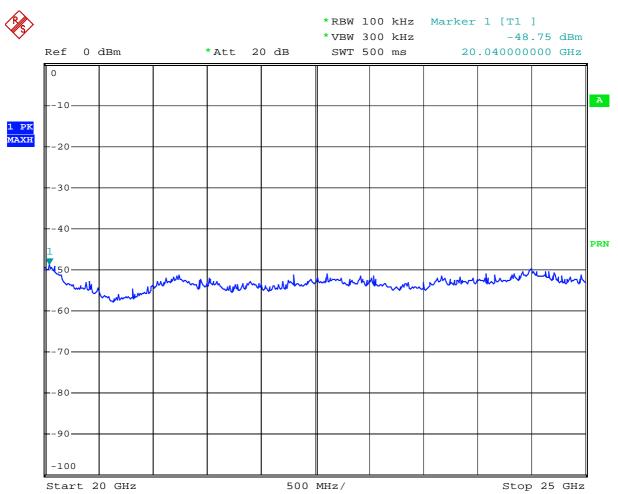
Revision No: 1.2 Page: 36 of 36



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2440 (20GHz~25GHz)



Date: 23.FEB.2006 10:07:21

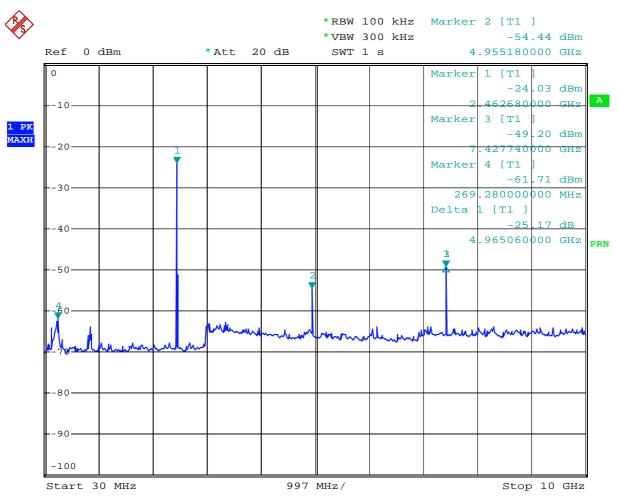
Revision No: 1.2 Page: 37 of 37



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2475 (30MHz~10GHz)



Date: 23.FEB.2006 19:12:22

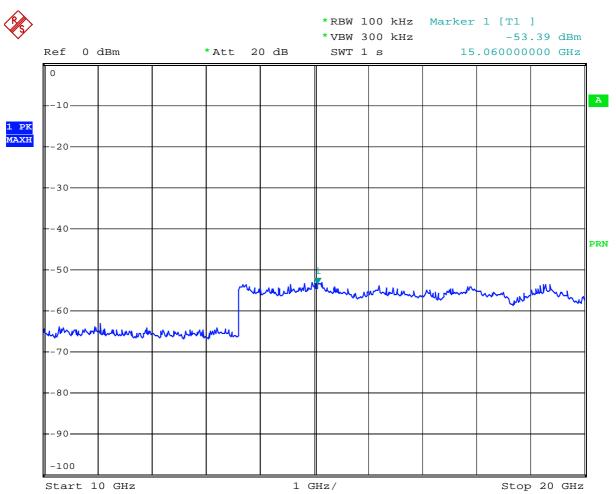
Revision No: 1.2 Page: 38 of 38



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2475 (10GHz~20GHz)



Date: 23.FEB.2006 19:14:26

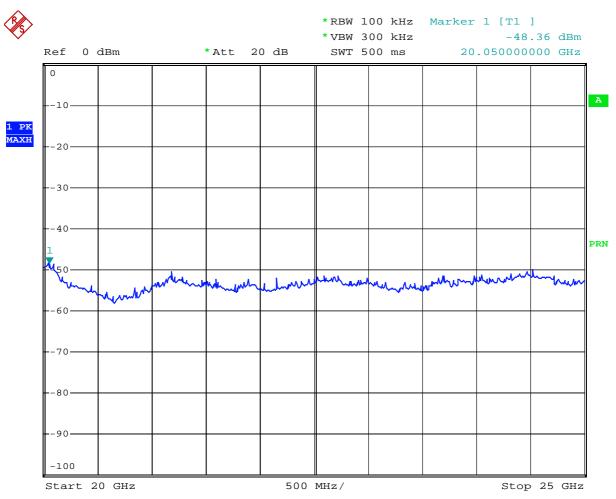
Revision No: 1.2 Page: 39 of 39



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

### Spurious Conducted emissions plot- 2475 (20GHz~25GHz)



Date: 23.FEB.2006 19:44:52

Revision No: 1.2 Page: 40 of 40



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

#### 7.8 Spurious Radiated emissions

#### **Test Mode and conditions**

Mode of operation : Tx mode

Detector : PK

Trace : Max hold

Measurement Method : Radiated- Enclosure

Measurement Distance: 3m

Measurement BW : 1 MHz for  $f \ge 1$  GHz, 100kHz for f < 1 GHz

#### **Requirements**

Subclause 15.247(c)

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

According to Section 15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency | Field strength     | Field strength        | Measurement |
|-----------|--------------------|-----------------------|-------------|
| (MHz)     | (microvolts/meter) | (dBμV/m)              | distance    |
|           |                    |                       | (meters)    |
| 30-88     | 100**              | $20*\log(100) = 40.0$ | 3           |
| 88-216    | 150**              | 20*log(150) = 43.5    | 3           |
| 216-960   | 200                | 20*log(200) = 46.0    | 3           |
| 960-2500  | 500                | $20*\log(500) = 54.0$ | 3           |

<sup>\*\*</sup> Except as provided in paragraph(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72Mhz, 76-88Mhz, 174-216Mhz or 470-806Mhz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241. According to section 15.35(b), on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurements are specified in this part, including emission measurements below

Revision No: 1.2 Page: 41 of 41



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated

#### **Test results**

| Frequ- | Polariz- | Corr.  | Re     | sult    | Lir    | nit   | Mai  | rgin | Table  | Ant.   |
|--------|----------|--------|--------|---------|--------|-------|------|------|--------|--------|
| ency   | ation    | Factor | (dBu   | V/m)    | (dBuV  | /m)   | (d   | B)   | Angle  | Height |
| (MHz)  | (H/V)    | (dB)   | Α      | Р       | Α      | Р     | Α    | Р    | (Deg.) | (m)    |
|        |          |        | ·      |         |        | 0.46  |      |      |        |        |
|        |          |        | peratı | ng free | quency | : 240 | 5Mhz |      |        |        |
| 7215   | V        | 20.1   | 38.1   | 56.4    | 54     | 74    | 15.9 | 17.6 | 110    | 1.9    |
| 7215   | Н        | 20.1   | 37.9   | 56.6    | 54     | 74    | 16.1 | 17.4 | 60     | 1.6    |
|        |          |        |        |         |        |       |      |      |        |        |
|        |          |        |        |         |        |       |      |      |        |        |
|        |          |        |        |         |        |       |      |      |        |        |
|        |          |        |        |         |        |       |      |      |        |        |
|        |          |        |        |         |        |       |      |      |        |        |
|        |          |        |        |         |        |       |      |      |        |        |

| Frequ- | Polariz- | Corr.  |         | sult    |        | mit   | Mai  | _    | Table  | Ant.   |
|--------|----------|--------|---------|---------|--------|-------|------|------|--------|--------|
| ency   | ation    | Factor | (dBu    | V/m)    | (dBuV  | /m)   | (d   | В)   | Angle  | Height |
| (MHz)  | (H/V)    | (dB)   | Α       | Р       | Α      | Р     | Α    | Р    | (Deg.) | (m)    |
|        |          | (      | Operati | ng free | quency | : 244 | 0Mhz |      |        |        |
| 7335   | V        | 20.2   | 37.3    | 54.8    | 54     | 74    | 16.7 | 19.2 | 110    | 1.9    |
| 7335   | Н        | 20.2   | 37.6    | 54.9    | 54     | 74    | 16.4 | 19.1 | 60     | 1.6    |
|        |          |        |         |         |        |       |      |      |        |        |
|        |          |        |         |         |        |       |      |      |        |        |
|        |          |        |         |         |        |       |      |      |        |        |
|        |          |        |         |         |        |       |      |      |        |        |
|        |          |        |         |         |        |       |      |      |        |        |
|        |          |        |         |         |        |       |      |      |        |        |

Revision No: 1.2 Page: 42 of 42



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

| Frequ- | Polariz-                              | Corr.  |         | sult    |        | mit   | Mai   | •    | Table  | Ant.   |
|--------|---------------------------------------|--------|---------|---------|--------|-------|-------|------|--------|--------|
| ency   | ation                                 | Factor | (dBu    | V/m)    | (dBuV  | /m)   | (d    | В)   | Angle  | Height |
| (MHz)  | (H/V)                                 | (dB)   | Α       | Р       | Α      | Р     | Α     | Р    | (Deg.) | (m)    |
|        |                                       |        |         |         |        |       |       |      |        |        |
|        |                                       | (      | Operati | ng fred | quency | : 247 | '5Mhz |      |        |        |
| 7440   | V                                     | 20.5   | 37.4    | 54.5    | 54     | 74    | 16.6  | 19.5 | 110    | 1.9    |
| 7440   | Н                                     | 20.5   | 37.8    | 54.8    | 54     | 74    | 16.2  | 19.2 | 60     | 1.6    |
|        |                                       |        |         |         |        |       |       |      |        |        |
|        |                                       |        |         |         |        |       |       |      |        |        |
|        |                                       |        |         |         |        |       |       |      |        |        |
|        |                                       |        |         |         |        |       |       |      |        |        |
|        |                                       |        |         |         |        |       |       |      |        |        |
|        | · · · · · · · · · · · · · · · · · · · |        |         |         |        |       |       |      |        |        |

#### \* Note:

- 1. Remark "\*" means that the emission frequency is produced by local oscillator.
- 2. Remark"- " means that the emission level is too low to be measured.
- 3. The measurement uncertainty of the radiated emission test is  $\pm 3 dB$
- 4. "A" and "P" mean average and peak measurement respectively.
- 5. There are no spurious emissions found between the lowest internal oscillating frequency and 30 MHz.

Revision No: 1.2 Page: 43 of 43



#### NF-TA-R060006

# **NEX1 Future Co., Ltd.**

### 8. List of Test and Measurement Instruments

|             | Kind of Equipment       | Туре     | Manufacturer | S/N          |
|-------------|-------------------------|----------|--------------|--------------|
|             | EMI Test Receiver       | ESI26    | R/S          | 8340.0010.02 |
|             | Spectrum Analyzer       | FSP30    | R/S          | 1093.4495.30 |
|             | Tracking Generator      | ESMI-B1  | R/S          | 1033.3240.52 |
|             | Spectrum Analyzer       | 8566B    | HP           | 3638A0857E   |
|             | Spectrum Analyzer       | E4407B   | HP           | MY41310181   |
|             | Wave Dipole Antenn<br>a | HZ-12    | R/S          | 842006/0012  |
|             | Wave Dipole Antenn<br>a | HZ-12    | R/S          | 846556/0004  |
|             | Biconical Antenna       | 3104C    | EMCO         | 9408-4667    |
|             | Biconical Antenna       | 3109     | EMCO         | 9405-2812    |
|             | Log-Periodic Antenna    | 3146A    | EMCO         | 1064         |
|             | Biconilog Antenna       | HLP2603  | EMC          | 080100       |
|             |                         |          | Automaion    |              |
|             | V-Network               | ESH3-Z5  | R/S          | 847265/030   |
|             | V-Network               | ESH3-Z6  | R/S          | 847250/016   |
|             | T-Network               | E-Z10    | R/S          | 84480/011    |
|             | LISN                    | 3825/2   | EMCO         | 9502-2334    |
|             | Turn Table              | 2081     | EMCO         |              |
|             | Antenna Tower           | 1072-5   | EMCO         | 9202-1651    |
|             | Positioning Controller  | 1090     | EMCO         |              |
|             | Printer                 | C4569A   | HP           | SG78K1H1FS   |
|             | Absorbing Clamp         | MDS 21   | R/S          | 847905/005   |
|             | Signal Generator        | 2023     | MARCONI      | 112246067    |
|             | Swept Signal Genera tor | 83620B   | HP           | 3722A00549   |
|             | 10dB Attenuator         | 23-10-34 | Weinschel co | BD4316       |
|             | 10dB Attenuator         | 33-10-34 | Weinschel co | BB9784       |
| $\boxtimes$ | Antenna                 | 3142     | EMCO         | 9710-1220    |
| $\boxtimes$ | Antenna                 | 3115     | EMCO         | 9202-3820    |
|             | Antenna                 | 3160-08  | EMCO         | 1168         |

Revision No: 1.2 Page: 44 of 44



#### NF-TA-R060006

## **NEX1 Future Co., Ltd.**

| $\boxtimes$ | Antenna                | 3160-09  | EMCO          | 1304       |
|-------------|------------------------|----------|---------------|------------|
|             | Loop Antenna           | 6507     | EMCO          | 9408-1327  |
|             | Amplifier              | HP8447F  | HP            | 3113A06911 |
|             | Amplifier              | HP83006  | HP            | 3104A00611 |
|             | Amplifier              | HP8449B  | HP            | 3008A00859 |
|             | EMI test receiver      | ESCS30   | R&S           | 839809/003 |
|             | Artificial mains netwo | ESH2-Z5  | R&S           | 829991/009 |
|             | rk                     |          |               |            |
|             | Artificial hand        | FCC-AH-1 | Fischer custo | 2008       |
|             |                        |          | m communicat  |            |
|             |                        |          | ions Inc.     |            |

### 9. Notes

The test was conducted with XTR39 model which has additional UEI Controller( 8Mhz clock ) compared to RH60A.

The other designs to be effected to the electrical characteristics are identical for both models.

Revision No: 1.2 Page: 45 of 45