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NVLAP
NVLAP Lab code: 200068-0
ISO/IEC 17025:1999, ISO 9002:1994

# FCC CERTIFICATION RADIO MEASUREMENT TECHNICAL REPORT

On Model Name: RF remote control handset

Model Number: ETX 6-1

Trademark: Elegine

FCC ID: TMF-ETX6-1-200509

Prepared for Elegine. Co., Ltd.

According to FCC Part 15 (2004), Subpart C

*Test Report #:* *ELE-0509-5901-FCC*

*Prepared by:* *Chris Huang*

*QC Manager:* *Dream Cao*

*Test Report Released by:* Dream Cao *2005, Sep 8*

*Dream Cao* *Date*

## *Test Location*

*Tests performed at EMC Compliance Management Group (China) in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.*

***Test Site Location:*** *Audix Technology (Shanghai) Co., Ltd.*
*3F 34 Bldg 680 Guiping Rd,*
*Caohejing Hi-Tech Park,*
*Shanghai, China 200233*

***Registration Number:*** *91789*

## *Accreditation Bodies*

*EMC Compliance Management Group is a fully accredited Test Laboratory for ITE, ISM and Telecommunications Products.*

*In compliance with the site registration requirements of Section 2.948 of the FCC Rules to perform EMI measurements for the general public.*

*Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code # 200068-0.*

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## *Administrative Data*

*Test Sample : RF remote control handset*

*Model Number : ETX 6-1*

*Models Tested : ETX 6-1*

*Trade Mark : Elegine*

*Date Tested : 2005, Sep 5*

*Applicant : Elegine. Co., Ltd.*
*Zhong Shan Science-Tec Industrial Park,*
*Nanjing Yanjiang Development P.R. China*

*Telephone : 86-25-58379967*

*Fax : 86-25-58379967*

*Manufacturer : Elegine. Co., Ltd.*
*Zhong Shan Science-Tec Industrial Park,*
*Nanjing Yanjiang Development P.R. China*

## *EUT Description*

*Elegine. Co., Ltd. Model number ETX 6-1 (referred to as the EUT in this test report) is an RF remote Control handset*

## *Test Summary*

*The Electromagnetic Compatibility requirements on ETX 6-1 for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.*

| ***EMC Test Item*** *Reference FCC Part 15 (2004), Subpart C* | | | |
|---|---|---|---|
| ***Specification*** | ***Description*** | ***Test Results*** | ***Remark*** |
| *FCC Part 15.203* | *Antenna Requirement* | *Compliance* | *Attachment 1* |
| *FCC Part 15.205* | *Restricted Band of Operation* | *Compliance* | *Attachment 2* |
| *FCC Part 15.207* | *Conducted Limits* | *Test is not applicable, because EUT only employ battery power for operation.* | |
| *FCC Part 15.209* | *Radiated Emission Limits* | *Compliance* | *Refer to Attachment 4* |
| *FCC Part 15.231* | *Periodic Operation in the Band 40.66-40.70MHz and above 70MHz* | -- | -- |
| *(a)* | *Operation Mode* | *Compliance* | *Attachment 3* |
| *(b)* | *Field Strength of Fundamental and Spurious Emissions* | *Compliance* | *Attachment 4* |
| *(c)* | *Bandwidth* | *Compliance* | *Attachment 5* |

## *Test Mode Justification*

*The test modes (Lying, Side, Stand) were done for testing.*
*Note: Lying mode means let the EUT put flat*
*Side mode means let the EUT on the edge*
*Stand mode means let the EUT up right*

## *EUT Exercise Software*

*The device is not programmable and does not use software.*

## *Equipment Modification*

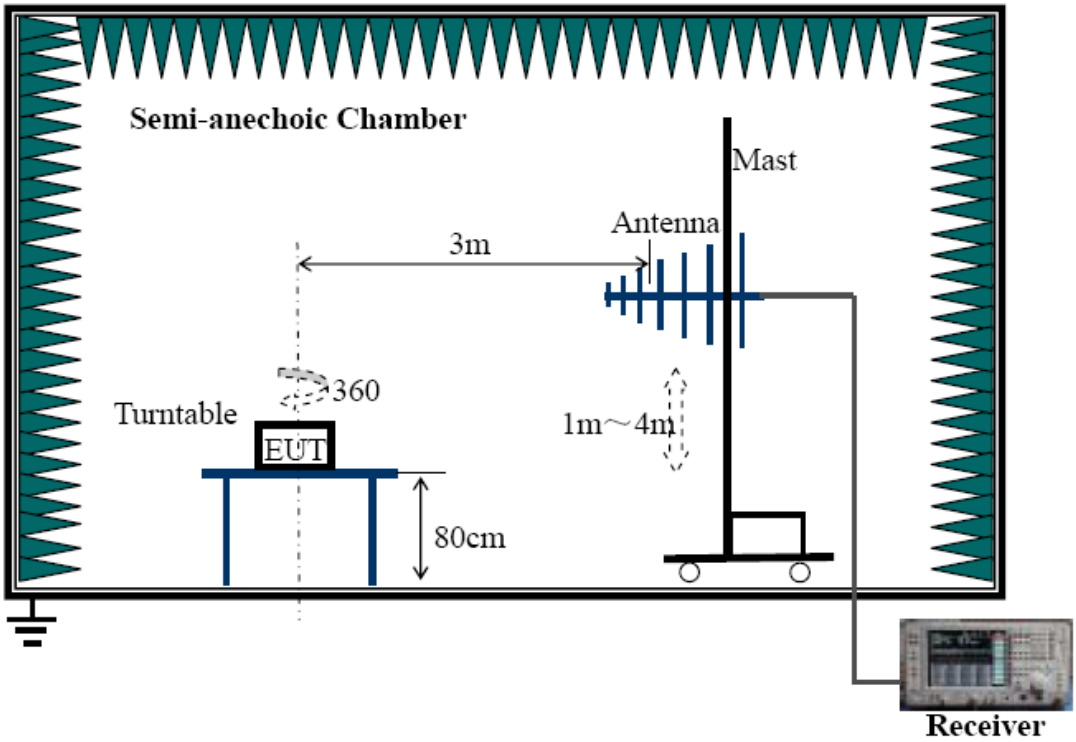
*Any modifications installed previous to testing by Elegine. Co., Ltd. will be incorporated in each production model sold or leased in United States.*

*There were no modifications installed by EMC Compliance Management Group (China) test personnel.*

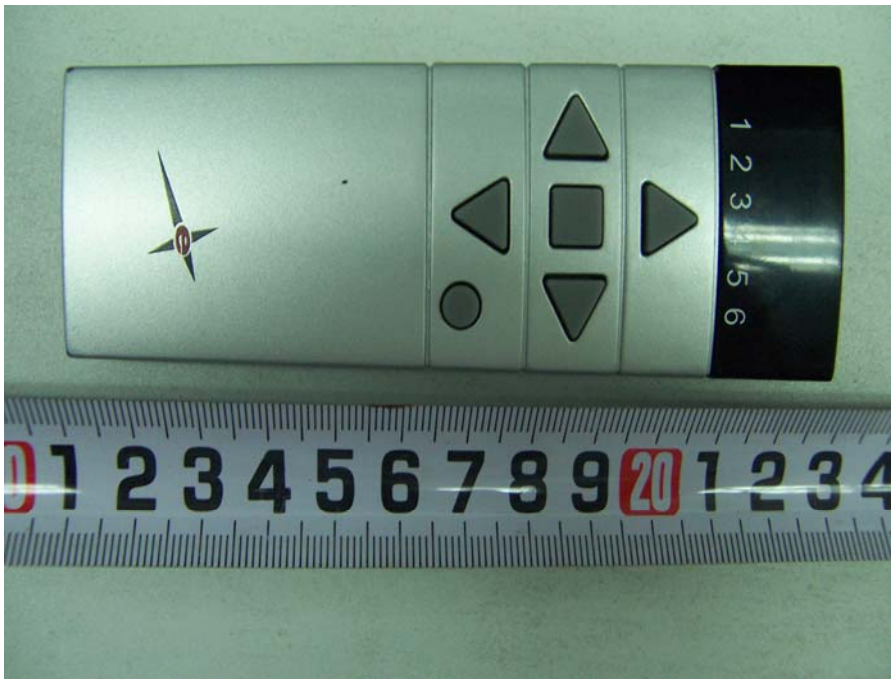
## Test System Details

| EUT | |
|---|---|
| Model Number: | ETX 6-1 |
| Model Tested: | ETX 6-1 |
| Trademark:: | Elegine |
| Serial Number: | 001 |
| Input Voltage: | 1x12V DC Battery |
| Description: | RF remote control handset |
| Manufacturer: | Elegine. Co., Ltd. |
| **Support Equipment** | |
| None | |
| **Cable Description** | |
| None | |

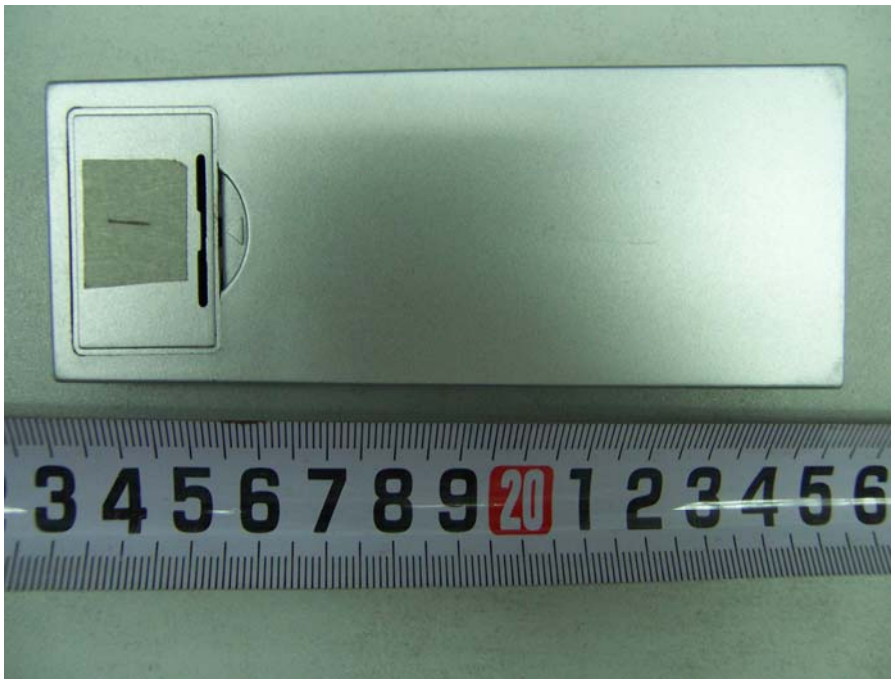
## *Configuration of Tested System*



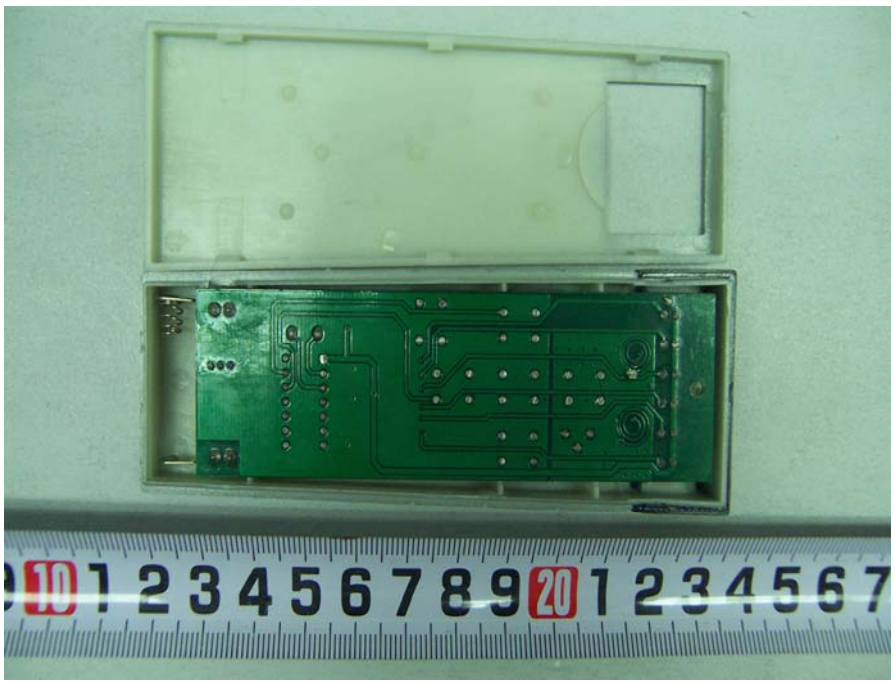
## *EUT Sample Photos of ETX 6-1*



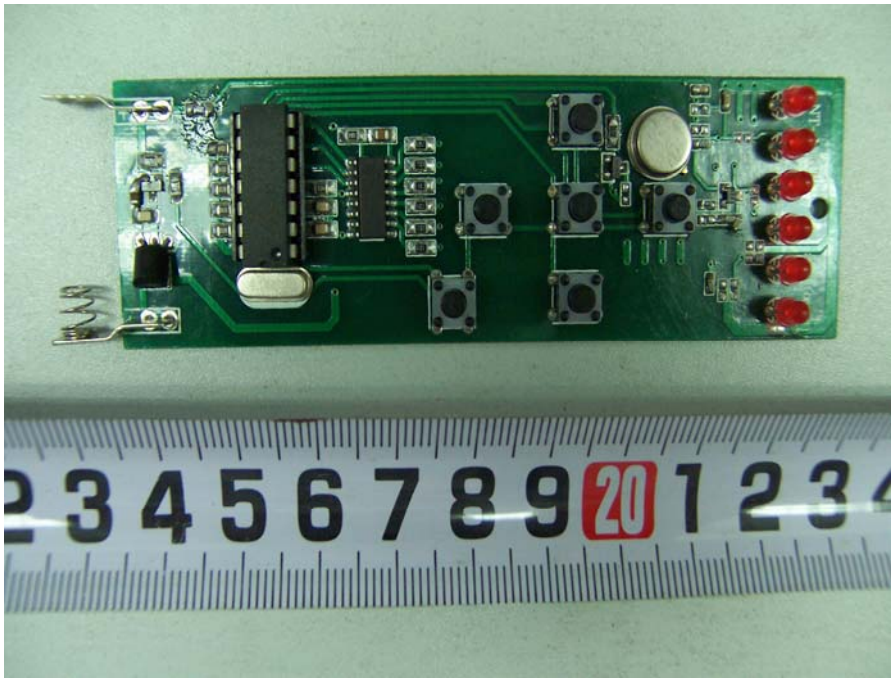

***Front View***



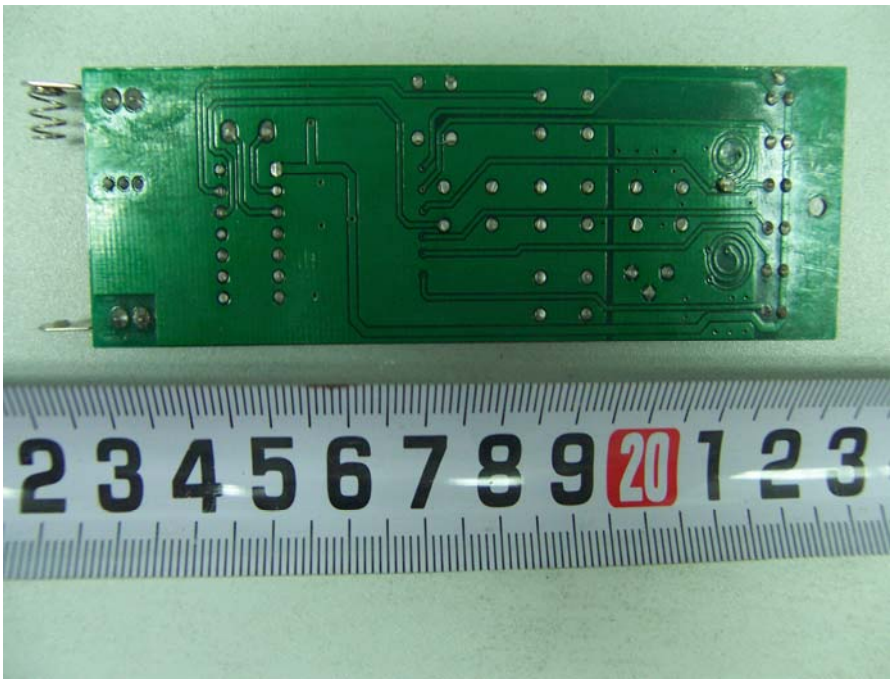

***Back View***



***Uncovered View***



***Main Board Front View***



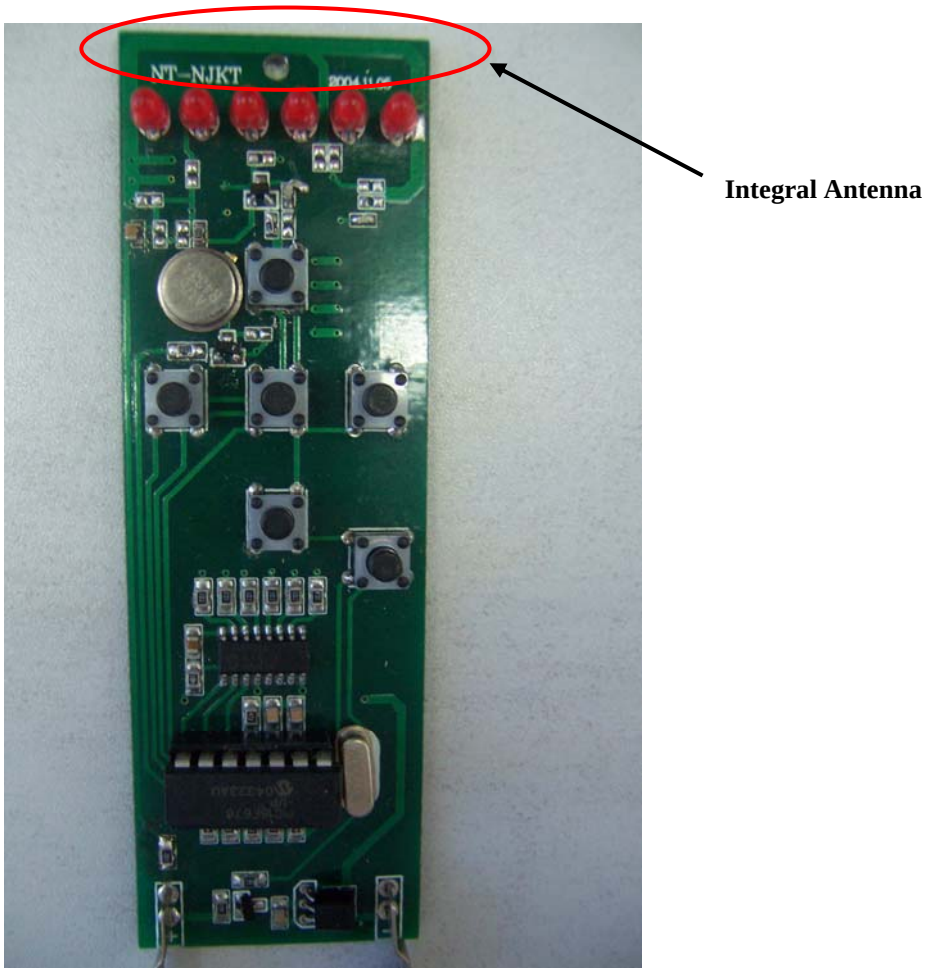

***Main Board Back View***

# ATTACHMENT 1 – ANTENNA REQUIREMENT

| | | | |
|---|---|---|---|
| **CLIENT:** | Elegine. Co., Ltd. | **TEST STANDARD:** | FCC Part 15.203 (2004) |
| **MODEL TESTED:** | ETX 6-1 | **PRODUCT:** | RF remote control handset |
| **SERIAL NO.:** | 001 | **EUT DESIGNATION:** | RF Equipment |
| **TEMPERATURE:** | 25°C | **HUMIDITY:** | 55%RH |
| **ATM PRESSURE:** | 101.8 kPa | **GROUNDING:** | No Grounding |
| **TESTED BY:** | Harry Zhao | **DATE OF TEST:** | 2005, Sep 5 |

| | |
|---|---|
| **SETUP METHOD:** | N/A |
| **ANTENNA REQUIREMENT:** | An intentional radiator shall be designed to ensure that no antenna other than 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded. |
| **TEST VOLTAGE:** | 1x12V DC Battery |
| **TEST STATUS:** | Normal Operation As Usual |
| **RESULTS:** | The EUT meets the Antenna requirement. The test results relate only to the equipment under test provided by client. |
| **CHANGES OR MODIFICATIONS:** | There were no modifications installed by EMC Compliance Management Group (China) test personnel. |
| **M. UNCERTAINTY:** | N/A |

| FCC Section | FCC Rules | Conclusion |
|---|---|---|
| 15.203 | *Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.*<br><br>*The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:*<br><br>● *The application (or intended use) of the EUT*<br><br>● *The installation requirements of the EUT*<br><br>● *The method by which the EUT will be marketed* | *The RF Device is used an integral antenna without connector* |




*Integral Antenna without Connector View*

# ATTACHMENT 2 – RESTRICTED BAND OF OPERATION

| | | | |
|---|---|---|---|
| **CLIENT:** | Elegine. Co., Ltd. | **TEST STANDARD:** | FCC Part 15.205 (2004) |
| **MODEL TESTED:** | ETX 6-1 | **PRODUCT:** | RF remote control handset |
| **SERIAL NO.:** | 001 | **EUT DESIGNATION:** | RF Equipment |
| **TEMPERATURE:** | 21°C | **HUMIDITY:** | 53%RH |
| **ATM PRESSURE:** | 101.6 kPa | **GROUNDING:** | No Grounding |
| **TESTED BY:** | Harry Zhao | **DATE OF TEST:** | 2005, Sep 5 |

| | |
|---|---|
| **SETUP METHOD:** | ANSI C63.4 - 2003 |
| **RESTRICTED BANDS OF OPERATION REQUIREMENT:** | The only spurious emissions are permitted in any of the frequency bands listed below table of next page. |
| **TESTED RANGE:** | 30MHz to 5000MHz |
| **TEST VOLTAGE:** | 1x12V DC Battery |
| **TEST STATUS:** | Keep Tx in continuous transmission mode, modulated |
| **RESULTS:** | The EUT meets the restricted bands of operation requirement. The test results relate only to the equipment under test provided by client. |
| **CHANGES OR MODIFICATIONS:** | There were no modifications installed by EMC Compliance Management Group (China) test personnel. |
| **M. UNCERTAINTY:** | Freq. $\pm$ 2x$10^{-7}$ x Center Freq., Amp $\pm$ 2.6 dB |

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| [1]0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | ([2]) |
| 13.36 - 13.41 | | | |

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

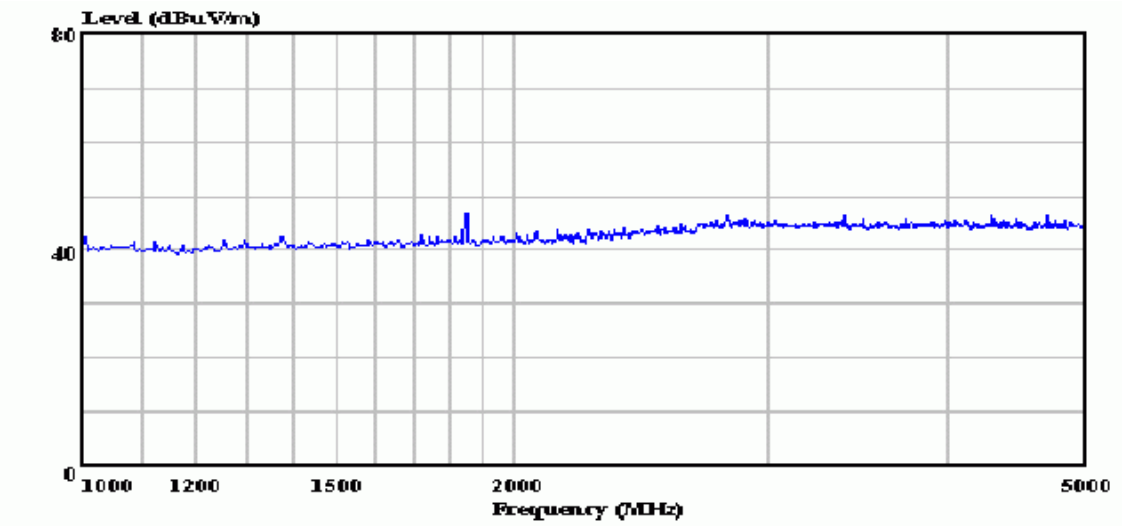
## *Test Data (Below 1GHz)*

Site : Chamber 3
Condition : 3m
Project No. : Ele-0509-5901-FCC
Applicant : Elegine Co., Ltd.
EUT : RF Remote Control Handset
M/N : ETX 6-1
S/N : 001
Power Supply : 1*12V DC Battery
Ambient : 21'C,53%RH,101.6kPa
Test Mode : Continous Transmission Mode,Modulated
Test Engineer: HarryZhao
Memo :

Page: 1

| | Freq | Level | Limit Line | Over Limit | Read Level | Probe Factor | Cable Loss | Preamp Factor |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB | dB |
| 1 | 434.490 | 57.83 | ------ | ------ | 64.51 | -6.68 | 17.85 | 4.03 | 28.56 |
| 2 | 866.140 | 48.00 | ------ | ------ | 46.30 | 1.70 | 23.98 | 6.08 | 28.36 |

## *Test Data (Above 1GHz)*




```
Site          : Chamber 3
Condition     : 3m
Project No.   : Ele-0509-5901-FCC
Applicant     : Elegine Co., Ltd.
EUT           : RF Remote Control Handset
M/N           : ETX 6-1
S/N           : 001
Power Supply  : 1*12V DC Battery
Ambient       : 21'C,53%RH,101.6kPa
Test Mode     : Continous Transmission Mode,Modulated
Test Engineer: HarryZhao
Memo          :
```

| Test Equipment | Manufacturer | Model | Serial No. | Last Cal. | Cal. Due Date |
|---|---|---|---|---|---|
| Spectrum Analyzer | HP | 8593EM | 3628A00167 | 04/22/05 | 04/21/06 |
| Test Receiver | R&S | ESVS10 | 844594/001 | 09/20/04 | 09/19/05 |
| Preamplifier (30MHz-1000MHz) | HP | 8447D | 2944A06849 | 09/20/04 | 09/19/05 |
| Preamplifier (1GHz-26.5GHz) | HP | 8449B | 3008A00864 | 04/20/05 | 04/19/06 |
| Bilog Antenna | Chase | CBL611 | 1145 | 09/18/04 | 09/17/05 |
| Horn Antenna | EMCO | 3115 | 9607-4878 | 04/20/05 | 04/19/06 |
| 50ΩCoaxial Switch | Anritsu | MP59B | M73389 | 09/20/04 | 09/19/05 |
| 3m Semi-Anechoic Chamber | Audix | 9*6*6 | N/A | 11/25/04 | 11/24/05 |
| Note: All testing were performed using internationally recognized standards. All test instruments were calibrated. | | | | | |

**SIGNED BY:** _____ **REVIEWED BY:** _____

**ENGINEER** **QC**

*Radiated Emissions Test Set-up (Below 1GHz)*

*Radiated Emissions Test Set-up (Above 1GHz)*

# ATTACHMENT 3 – OPERATION MODE

| | | | |
|---|---|---|---|
| **CLIENT:** | Elegine. Co., Ltd. | **TEST STANDARD:** | FCC Part 15.203 (2004) |
| **MODEL TESTED:** | ETX 6-1 | **PRODUCT:** | RF remote control handset |
| **SERIAL NO.:** | 001 | **EUT DESIGNATION:** | RF Equipment |
| **TEMPERATURE:** | 25°C | **HUMIDITY:** | 55%RH |
| **ATM PRESSURE:** | 101.8 kPa | **GROUNDING:** | No Grounding |
| **TESTED BY:** | Harry Zhao | **DATE OF TEST:** | 2005, Sep 5 |

| | |
|---|---|
| **SETUP METHOD:** | N/A |
| **OPERATION MODE REQUIREMENT:** | (1) A manually operated transmitter shall employ a switch that will automatically the transmitter within not more than 5 seconds of being released.<br><br>(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.<br><br>(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used on security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.<br><br>(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition. |
| **TEST VOLTAGE:** | 1x12V DC Battery |
| **TEST STATUS:** | Normal Operation As Usual |
| **RESULTS:** | The EUT meets the operation mode requirement. The test results relate only to the equipment under test provided by client. |
| **CHANGES OR MODIFICATIONS:** | There were no modifications installed by EMC Compliance Management Group (China) test personnel. |
| **M. UNCERTAINTY:** | N/A |

| FCC Section | FCC Rules | Conclusion |
|---|---|---|
| 15.231 (a) | The provisions of this Section are restricted to periodic operation within the band 40.66 – 40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of 15.231 Section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:<br><br>(1) A manually operated transmitter shall employ a switch that will automatically the transmitter within not more than 5 seconds of being released<br><br>(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.<br><br>(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used on security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.<br><br>(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition. | The transmitter operate manually and employ a switch that automatically deactivates the transmitter and ceases transmission within 5 seconds after deactivation.<br><br>The transmitter does not perform periodic transmissions. |

# ATTACHMENT 4 –FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSIONS

| | | | |
|---|---|---|---|
| **CLIENT:** | Elegine. Co., Ltd. | **TEST STANDARD:** | FCC Part 15.209 (2004) |
| **MODEL TESTED:** | ETX 6-1 | **PRODUCT:** | RF remote control handset |
| **SERIAL NO.:** | 001 | **EUT DESIGNATION:** | RF Equipment |
| **TEMPERATURE:** | 21°C | **HUMIDITY:** | 53%RH |
| **ATM PRESSURE:** | 101.6 kPa | **GROUNDING:** | No Grounding |
| **TESTED BY:** | Harry Zhao | **DATE OF TEST:** | 2005, Sep 5 |

| | |
|---|---|
| **SETUP METHOD:** | ANSI C63.4 - 2003 |
| **TEST PROCEDURE:** | a. The EUT was placed on a rotatable table with 0.8 meters above ground.<br>b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.<br>c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement.<br>d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading.<br>e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.<br>f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz.<br>g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHZ above 1000 MHz<br>Explanation of the Correction Factor are given as follows:<br>FS= RA + AF + CF - AG - DC<br>Where: FS = Field Strength<br>RA = Receiver Amplitude<br>AF = Antenna Factor<br>CF = Cable Attenuation Factor<br>AG = Amplifier Gain<br>DC = Duty Cycle Correction Factor |

**Continue on to next page…**

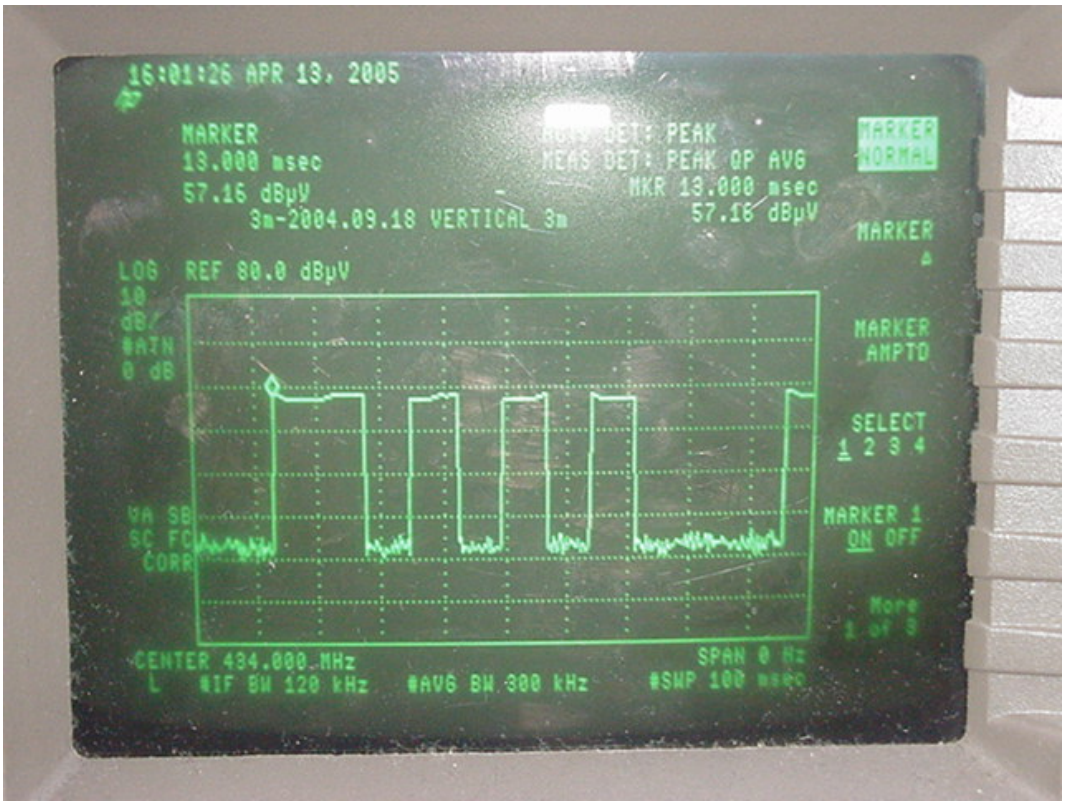
| | |
|---|---|
| **TESTED RANGE:** | 30MHz to 5000MHz |
| **TEST VOLTAGE:** | 1x12V battery |
| **TEST STATUS:** | Keep Tx in continuous transmission mode, modulated |
| **RESULTS:** | The EUT meets the requirements of field strength test. The test results relate only to the equipment under test provided by client. |
| **CHANGES OR MODIFICATIONS:** | There were no modifications installed by EMC Compliance Management Group (China) test personnel. |
| **M. UNCERTAINTY:** | Freq. $\pm$ $2x10^{-7}$ x Center Freq., Amp $\pm$ 2.6 dB |

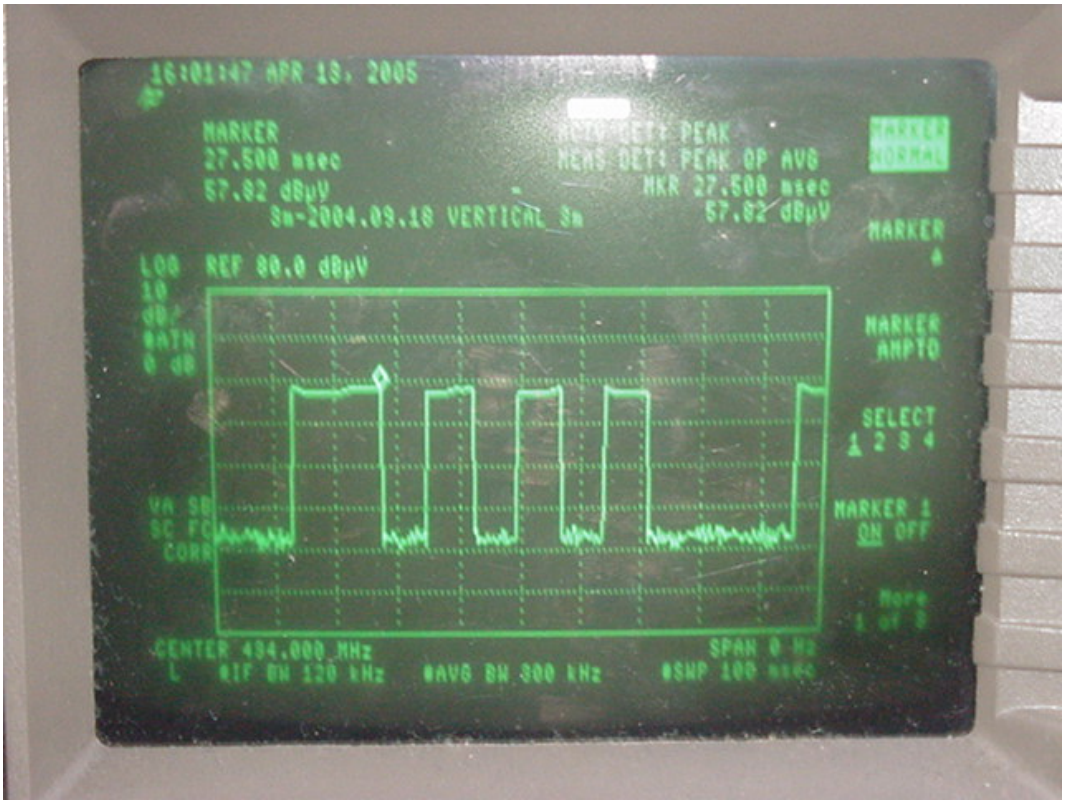
| Direction | Polarization | Frequency Type | Frequency (MHz) | Field Strength dB(μV/m) | Limit dB(μV/m) | Over Limit dB(μV/m) | Read Level dB(μV) | Factor (dB) | Duty cycle Correction Factor (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Lying | Horizontal | Fundamental | 433.842 | 52.20 | 80.82 | -28.62 | 66.51 | -6.68 | 7.63 |
| | | Spurious | 153.190 | 18.93 | 60.82 | -41.89 | 40.69 | -14.13 | 7.63 |
| | | Spurious | 867.684 | 34.04 | 60.82 | -26.78 | 47.60 | 1.70 | 7.63 |
| | | Spurious | 1852.000 | 39.09 | 60.82 | -21.73 | 45.80 | 0.92 | 7.63 |
| | Vertical | Fundamental | 433.842 | 50.20 | 80.82 | -30.62 | 64.51 | -6.68 | 7.63 |
| | | Spurious | 153.190 | 22.34 | 60.82 | -38.48 | 44.10 | -14.13 | 7.63 |
| | | Spurious | 867.684 | 40.37 | 60.82 | -20.45 | 46.30 | 1.70 | 7.63 |
| | | Spurious | 1852.000 | 36.57 | 60.82 | -24.25 | 43.28 | 0.92 | 7.63 |
| Side | Horizontal | Fundamental | 433.840 | 43.88 | 80.82 | -36.94 | 30.89 | -6.68 | 7.63 |
| | | Spurious | 153.190 | 14.97 | 60.82 | -45.85 | 36.73 | -14.13 | 7.63 |
| | | Spurious | 867.684 | 39.94 | 60.82 | -20.88 | 45.87 | 1.70 | 7.63 |
| | | Spurious | 1852.000 | 33.47 | 60.82 | -27.35 | 40.18 | 0.92 | 7.63 |
| | Vertical | Fundamental | 433.842 | 47.40 | 80.82 | -33.42 | 61.71 | -6.68 | 7.63 |
| | | Spurious | 153.190 | 22.54 | 60.82 | -38.28 | 44.30 | -14.13 | 7.63 |
| | | Spurious | 867.684 | 31.08 | 60.82 | -29.74 | 37.01 | 1.70 | 7.63 |
| | | Spurious | 1852.000 | 35.77 | 60.82 | -25.05 | 42.48 | 0.92 | 7.63 |
| Stand | Horizontal | Fundamental | 433.842 | 42.66 | 80.82 | -38.16 | 56.97 | -6.87 | 7.63 |
| | | Spurious | 153.190 | 18.01 | 60.82 | -42.81 | 39.77 | -14.13 | 7.63 |
| | | Spurious | 867.684 | 27.80 | 60.82 | -33.02 | 33.73 | 1.70 | 7.63 |
| | | Spurious | 1852.000 | 33.07 | 60.82 | -27.75 | 39.78 | 0.92 | 7.63 |
| | Vertical | Fundamental | 433.842 | 50.57 | 80.82 | -30.25 | 64.88 | -6.68 | 7.63 |
| | | Spurious | 153.190 | 22.51 | 60.82 | -38.31 | 44.27 | -14.13 | 7.63 |
| | | Spurious | 867.684 | 37.58 | 60.82 | -23.24 | 43.51 | 1.70 | 7.63 |
| | | Spurious | 1852.000 | 38.77 | 60.82 | -22.05 | 45.48 | 0.92 | 7.63 |

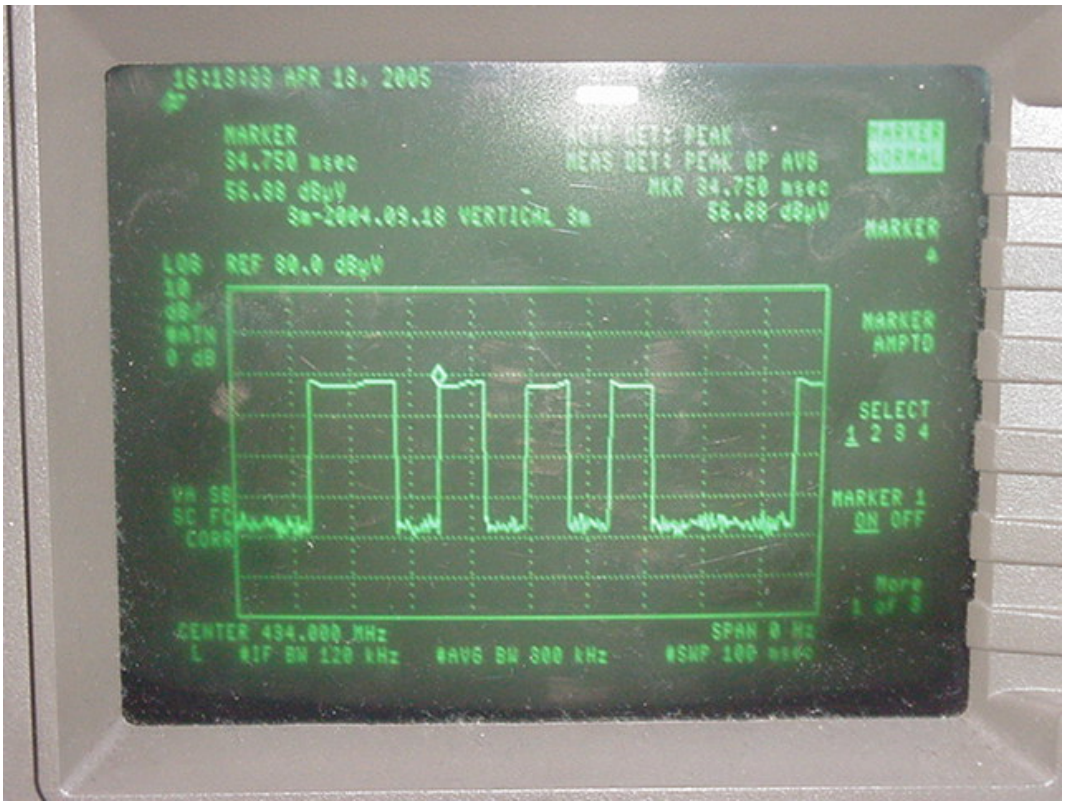
*Note:*

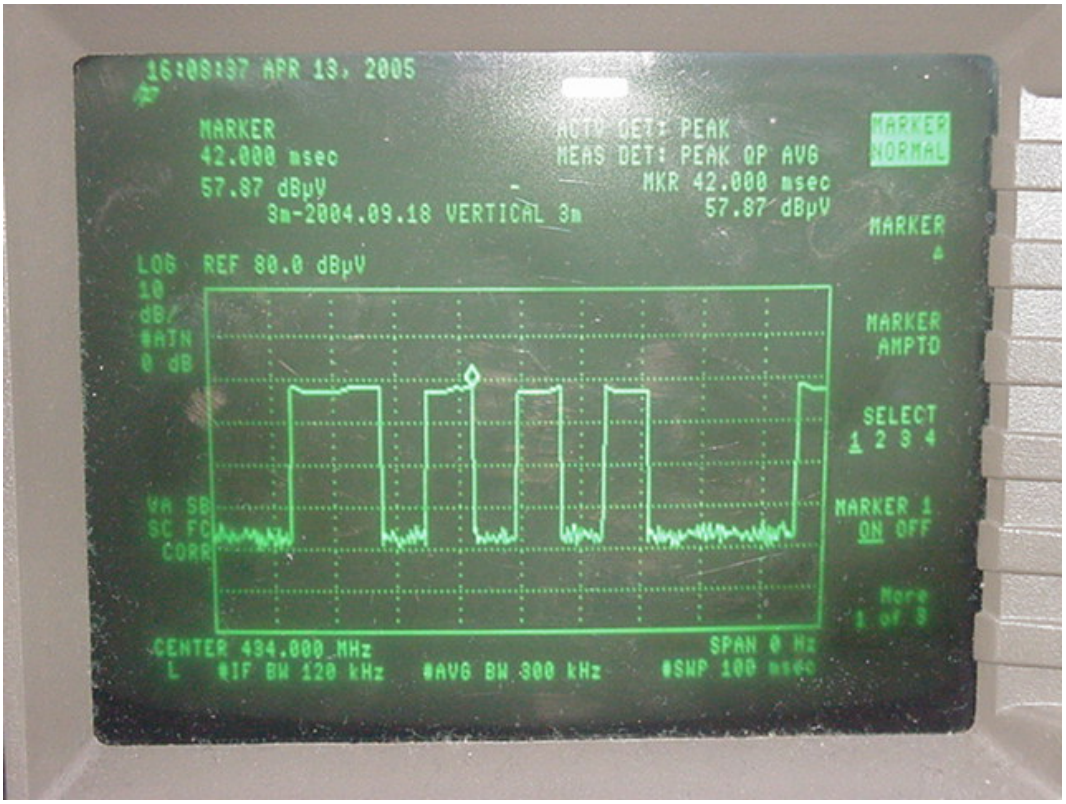
1. *Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follow:*
   *For fundamental frequency (F=433.842MHz)*
   *Field Strength of Fundamental (dBuV/m) =20log (41.6667 x F – 7083.3333)*
   *=20log (41.6667 x 433.842 – 7083.333)*
   *=80.82 dBuV/m*
   *Field Strength of Spurious (dBuV/m) = 80.82 – 20 = 60.82 dBuV/m*

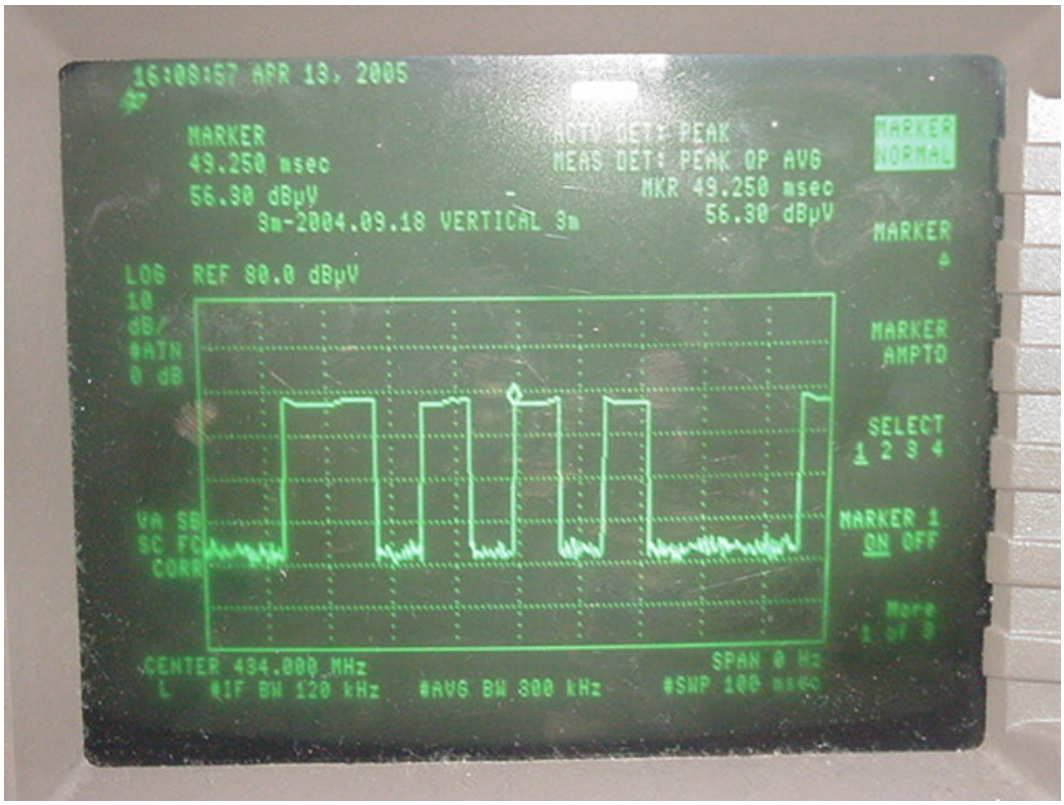
2. *Field Strength=Read Level + Fact – Duty Cycle Correction Fact*
   *Fact = Antenna Factor + Cable Loss - Preamp Factor*
   *Duty Cycle Correction Fact is calculated by averaging the sum of the pulse train. Correction factor is measured as follows:*
   *Keep the EUT in continuous transmission mode (modulated), and set the spectrum to the fundamental frequency and set the span width to 0 Hz. Then connect a storage oscilloscope to the video output of the spectrum that is used to detect the pulse train. Adjust the oscilloscope settings to observe the pulse train and determine the number and width of the pulses, as well as the period of the train.*
   *Duty Cycle Correction Factor = |20log [(14.5*1+7.25*3)/87.25]| =7.63 dB*
   *(please refer to the following test graph of next page)*

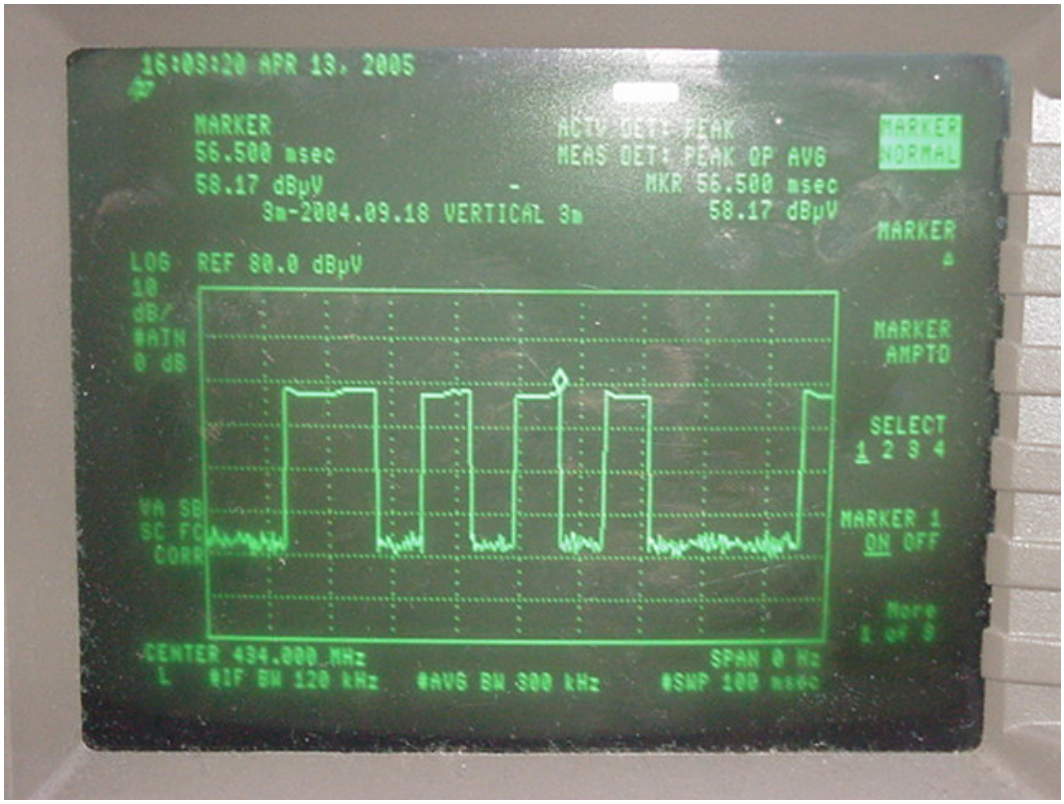

16:01:26 APR 13, 2005
MARKER
13.000 msec
57.16 dBµV
3m-2004.09.18 VERTICAL 3m
MEAS DET: PEAK OP AVG
MKR 13.000 msec
57.16 dBµV
MARKER NORMAL
MARKER
MARKER AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 3
LOG REF 80.0 dBµV
10
dB/
#ATN
0 dB
VA SB
SC FC
CORR
CENTER 434.000 MHz
L #IF BW 120 kHz #AVG BW 300 kHz
SPAN 0 Hz
#SWP 100 msec

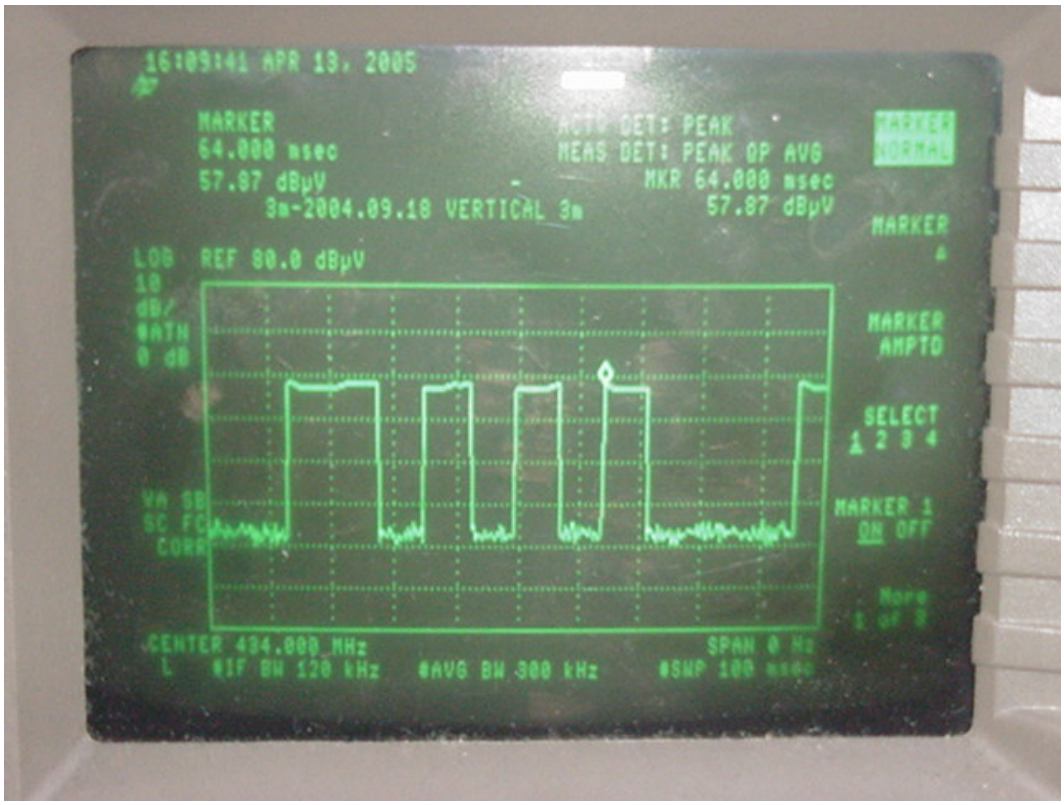

16:01:47 APR 13, 2005
MARKER
27.500 msec
57.82 dBµV
3m-2004.09.18 VERTICAL 3m
MEAS DET: PEAK OP AVG
MKR 27.500 msec
57.82 dBµV
MARKER NORMAL
MARKER
MARKER AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 3
LOG REF 80.0 dBµV
10
dB/
#ATN
0 dB
VA SB
SC FC
CORR
CENTER 434.000 MHz
L #IF BW 120 kHz #AVG BW 300 kHz
SPAN 0 Hz
#SWP 100 msec


16:13:33 APR 13, 2005
MARKER
34.750 msec
56.88 dBµV
3m-2004.09.18 VERTICAL 3m
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 34.750 msec
56.88 dBµV
MARKER NORMAL
MARKER
LOG REF 80.0 dBµV
10
dB/
#ATN
0 dB
MARKER AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 3
CENTER 434.000 MHz
L #IF BW 120 kHz #AVG BW 300 kHz
SPAN 0 Hz
#SWP 100 msec

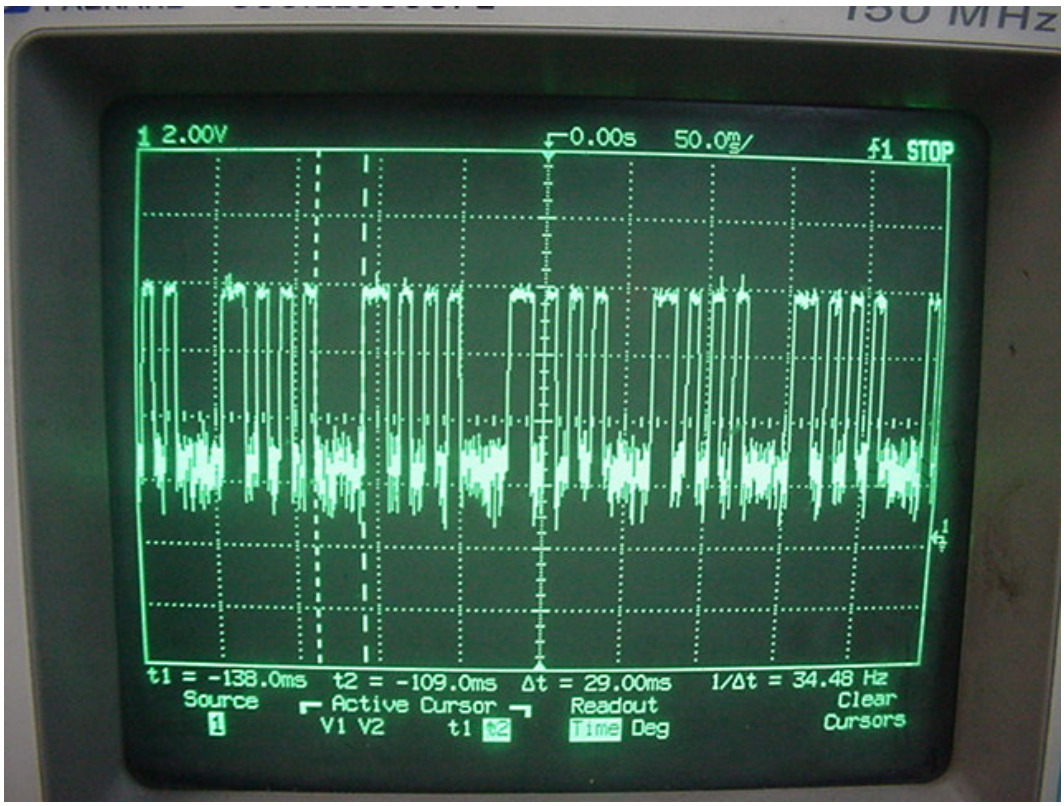

16:08:37 APR 13, 2005
MARKER
42.000 msec
57.87 dBµV
3m-2004.09.18 VERTICAL 3m
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 42.000 msec
57.87 dBµV
MARKER NORMAL
MARKER
LOG REF 80.0 dBµV
10
dB/
#ATN
0 dB
MARKER AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 3
CENTER 434.000 MHz
L #IF BW 120 kHz #AVG BW 300 kHz
SPAN 0 Hz
#SWP 100 msec

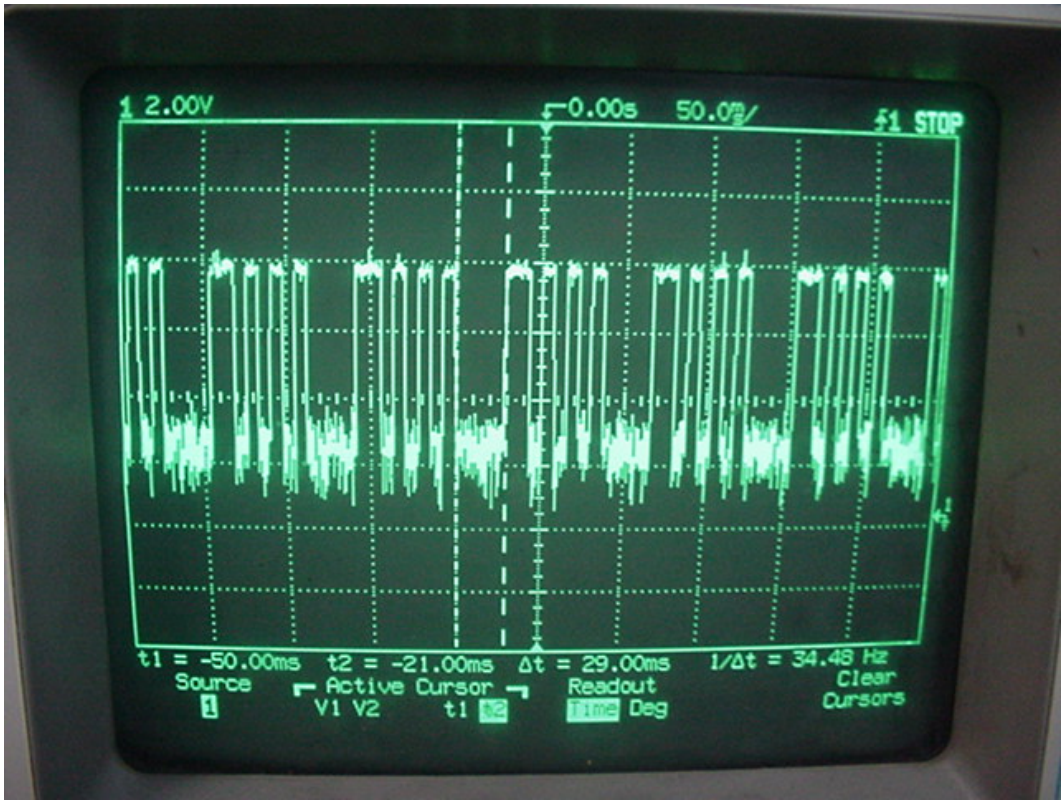

16:08:57 APR 13, 2005
MARKER
49.250 msec
56.30 dBµV
3m-2004.09.18 VERTICAL 3m
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 49.250 msec
56.30 dBµV
MARKER NORMAL
MARKER
MARKER AMPTD
SELECT 1 2 3 4
MARKER 1 ON OFF
More 1 of 3
LOG 10 dB/
#ATN 0 dB
VA SB
SC FC
CORR
CENTER 434.000 MHz
L #IF BW 120 kHz #AVG BW 300 kHz
SPAN 0 Hz
#SWP 100 msec

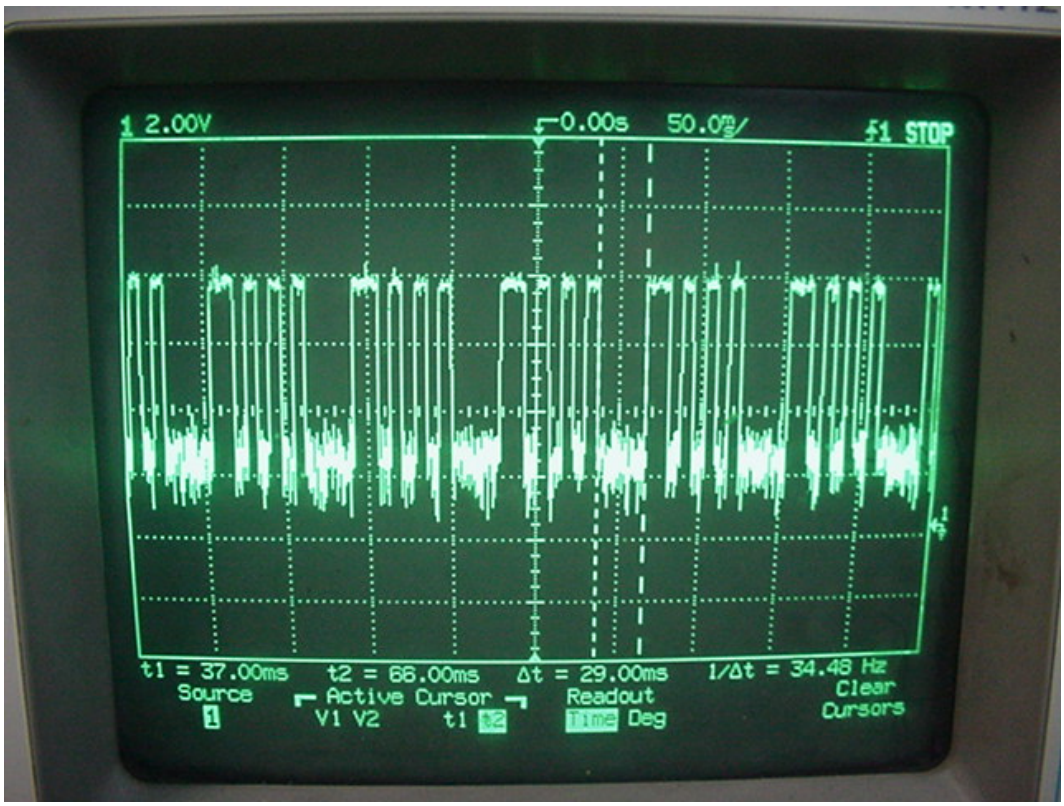

16:03:20 APR 13, 2005
MARKER
56.500 msec
58.17 dBµV
3m-2004.09.18 VERTICAL 3m
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 56.500 msec
58.17 dBµV
MARKER NORMAL
MARKER
MARKER AMPTD
SELECT 1 2 3 4
MARKER 1 ON OFF
More 1 of 3
LOG 10 dB/
#ATN 0 dB
VA SB
SC FC
CORR
CENTER 434.000 MHz
L #IF BW 120 kHz #AVG BW 300 kHz
SPAN 0 Hz
#SWP 100 msec

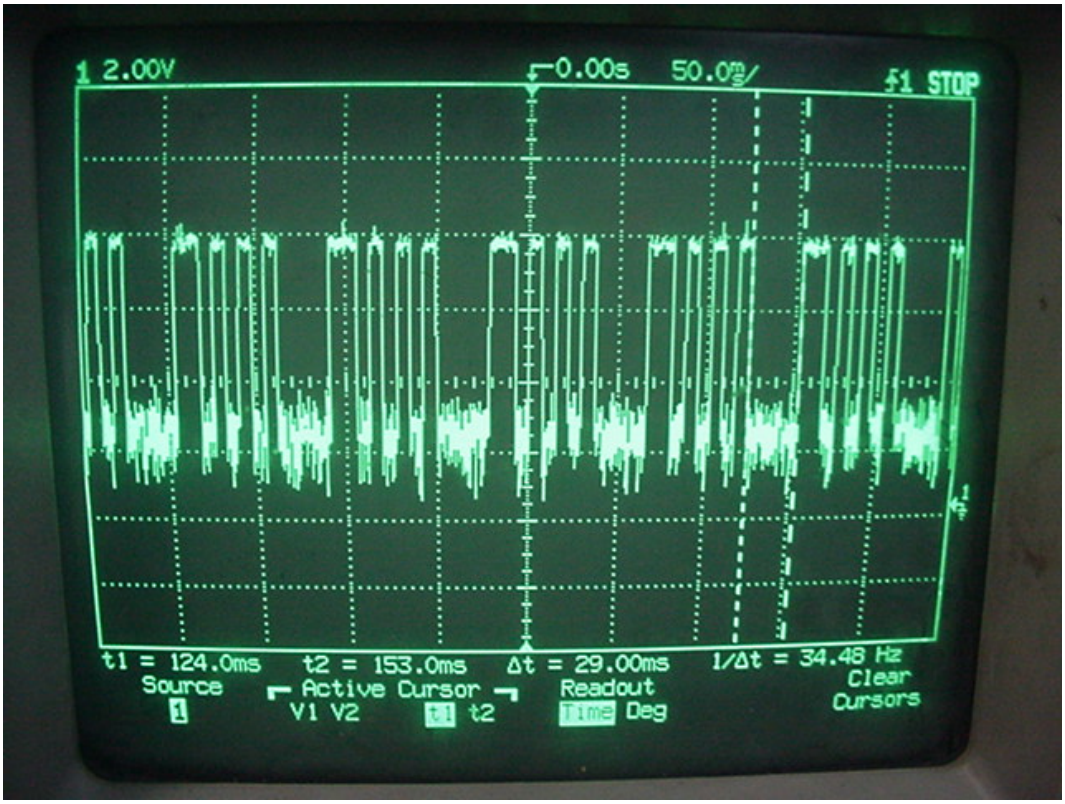

16:09:41 APR 13, 2005
MARKER
64.000 msec
57.87 dBµV
3m-2004.09.18 VERTICAL 3m
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 64.000 msec
57.87 dBµV
MARKER NORMAL
MARKER
LOG 10 dB/
REF 80.0 dBµV
MARKER AMPTD
SELECT 1 2 3 4
MARKER 1 ON OFF
CENTER 434.000 MHz
SPAN 0 Hz
#IF BW 120 kHz
#AVG BW 300 kHz

16:10:15 APR 13, 2005
MARKER
71.250 msec
21.31 dBµV
3m-2004.09.18 VERTICAL 3m
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 71.250 msec
21.31 dBµV
MARKER NORMAL
MARKER
LOG 10 dB/
REF 80.0 dBµV
MARKER AMPTD
SELECT 1 2 3 4
MARKER 1 ON OFF
CENTER 434.000 MHz
SPAN 0 Hz
#IF BW 120 kHz
#AVG BW 300 kHz


1 2.00V
0.00s
50.0
1 STOP
t1 = -138.0ms t2 = -109.0ms Δt = 29.00ms 1/Δt = 34.48 Hz
Source
1
Active Cursor
V1 V2 t1 t2
Readout
Time Deg
Clear
Cursors


1 2.00V
0.00s
50.0
1 STOP
t1 = -50.00ms t2 = -21.00ms Δt = 29.00ms 1/Δt = 34.48 Hz
Source
1
Active Cursor
V1 V2 t1 t2
Readout
Time Deg
Clear
Cursors


1 2.00V
0.00s
50.0ms/
1 STOP
t1 = 37.00ms
t2 = 66.00ms
Δt = 29.00ms
1/Δt = 34.48 Hz
Source
1
Active Cursor
V1 V2
t1 t2
Readout
Time Deg
Clear
Cursors


1 2.00V
0.00s
50.0ms/
1 STOP
t1 = 124.0ms
t2 = 153.0ms
Δt = 29.00ms
1/Δt = 34.48 Hz
Source
1
Active Cursor
V1 V2
t1 t2
Readout
Time Deg
Clear
Cursors

| Test Equipment | Manufacturer | Model | Serial No. | Last Cal. | Cal. Due Date |
|---|---|---|---|---|---|
| Spectrum Analyzer | HP | 8593EM | 3628A00167 | 04/22/05 | 04/21/06 |
| Test Receiver | R&S | ESVS10 | 844594/001 | 09/20/04 | 09/19/05 |
| Preamplifier (30MHz-1000MHz) | HP | 8447D | 2944A06849 | 09/20/04 | 09/19/05 |
| Preamplifier (1GHz-26.5GHz) | HP | 8449B | 3008A00864 | 04/20/05 | 04/19/06 |
| Bilog Antenna | Chase | CBL611 | 1145 | 09/18/04 | 09/17/05 |
| Horn Antenna | EMCO | 3115 | 9607-4878 | 04/20/05 | 04/19/06 |
| 50ΩCoaxial Switch | Anritsu | MP59B | M73389 | 09/20/04 | 09/19/05 |
| Oscilloscope | HP | 54602B | US36181094 | 03/20/05 | 03/19/06 |
| 3m Semi-Anechoic Chamber | Audix | 9*6*6 | N/A | 11/25/04 | 11/24/05 |
| Note: All testing were performed using internationally recognized standards. All test instruments were calibrated. | | | | | |

**SIGNED BY:** _____ **REVIEWED BY:** _____

**ENGINEER** **QC**

*Field Strength Emissions Test Set-up (Below 1GHz)*

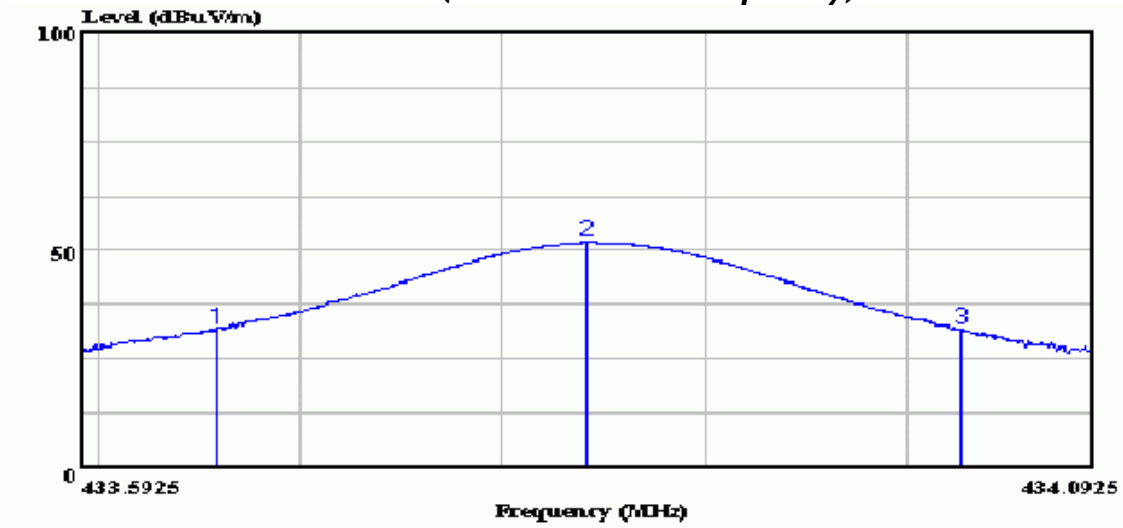
*Field Strength Emissions Test Set-up (Above 1GHz)*

# ATTACHMENT 5 – BANDWIDTH

| | | | |
|---|---|---|---|
| **CLIENT:** | Elegine. Co., Ltd. | **TEST STANDARD:** | FCC Part 15.231 (2004) |
| **MODEL TESTED:** | ETX 6-1 | **PRODUCT:** | RF remote control handset |
| **SERIAL NO.:** | 001 | **EUT DESIGNATION:** | RF Equipment |
| **TEMPERATURE:** | 21°C | **HUMIDITY:** | 53%RH |
| **ATM PRESSURE:** | 101.6 kPa | **GROUNDING:** | No Grounding |
| **TESTED BY:** | Harry Zhao | **DATE OF TEST:** | 2005, Sep 5 |

| | |
|---|---|
| **SETUP METHOD:** | ANSI C63.4 - 2003 |
| **BANDWIDTH REQUIREMENT:** | The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, The emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier. |
| **TEST VOLTAGE:** | 1x12V DC Battery |
| **TEST STATUS:** | Keep Tx in continuous transmission mode, modulated |
| **RESULTS:** | The EUT meets the bandwidth requirement. The test results relate only to the equipment under test provided by client. |
| **CHANGES OR MODIFICATIONS:** | There were no modifications installed by EMC Compliance Management Group (China) test personnel. |
| **M. UNCERTAINTY:** | Freq. $\pm$ 2x$10^{-7}$ x Center Freq., Amp $\pm$ 2.6 dB |

## *Test Data (Fundamental Frequency)*




```
Site          : Chamber 3
Condition     : 3m
Project No.   : Ele-0509-5901-FCC
Applicant     : Elegine Co., Ltd.
EUT           : RF Remote Control Handset
M/N           : ETX 6-1
S/N           : 001
Power Supply  : 1*12V DC Battery
Ambient       : 21'C,53%RH,101.6kPa
Test Mode     : Continous Transmission Mode,Modulated
Test Engineer: HarryZhao
Memo          :
```

Page: 1

| | Freq | Level | Limit Line | Over Limit | Read Level | Factor | Probe Factor | Cable Loss | Preamp Factor |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB | dB | dB |
| 1 | 433.659 | 31.97 | ------ | ------ | 38.68 | -6.71 | 17.85 | 4.00 | 28.56 |
| 2 | 433.842 | 51.99 | ------ | ------ | 58.70 | -6.71 | 17.85 | 4.00 | 28.56 |
| 3 | 434.027 | 31.97 | ------ | ------ | 38.68 | -6.71 | 17.85 | 4.00 | 28.56 |

| *Frequency (MHz)* | | | *Bandwidth Limit (MHz) ($F_{cente}$ x 0.25%)* | *Test Result (MHz) ($F_{end}$-$F_{start}$)* | *Conclusion* |
|---|---|---|---|---|---|
| *Start* | *Center* | *End* | | | |
| *433.659* | *433.842* | *434.027* | *1.084605* | *0.368* | *Compliance* |

| Test Equipment | Manufacturer | Model | Serial No. | Last Cal. | Cal. Due Date |
|---|---|---|---|---|---|
| Spectrum Analyzer | HP | 8593EM | 3628A00167 | 04/22/05 | 04/21/06 |
| Test Receiver | R&S | ESVS10 | 844594/001 | 09/20/04 | 09/19/05 |
| Preamplifier (30MHz-1000MHz) | HP | 8447D | 2944A06849 | 09/20/04 | 09/19/05 |
| Bilog Antenna | Chase | CBL611 | 1145 | 09/18/04 | 09/17/05 |
| 50ΩCoaxial Switch | Anritsu | MP59B | M73389 | 09/20/04 | 09/19/05 |
| 3m Semi-Anechoic Chamber | Audix | 9*6*6 | N/A | 11/25/04 | 11/24/05 |
| Note: All testing were performed using internationally recognized standards. All test instruments were calibrated. | | | | | |

**SIGNED BY:** _____ **REVIEWED BY:** _____

**ENGINEER** **QC**

***Bandwidth Test Set-up***