# Measurement Report

Part 15 Subpart C (15.247), ANSI C63.4-2003

***Product*** ***: GPS Bluetooth Receiver***
***Applicant*** ***: KWEN SHENG MACHINERY ELECTRIC CORP.***
***FCC ID*** ***: UC9KG508***
***Model No.*** ***: KG508 / KG608***
***Report No.*** ***: MLT0605P15001***
***Issue Date*** ***: July 03, 2006***



***Test By***

**Max Light Technology Co.,Ltd.**

*Room 5, 8F, No.125, Section 3 Roosevelt Road,*

*Taipei, Taiwan., R.O.C.*

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# CERTIFICATION

*We here by verify that :*

The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003. All test were conducted by *MLT(Max Light Technology Co.,Ltd) Room 5, 8F, No.125, Section 3 Roosevelt Road, Taipei, Taiwan, R.O.C* Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is in compliance with Class B radiated and conducted emission limit of FCC Rules Part 15 Subpart C (15.247).

EUT : GPS Bluetooth Receiver

Applicant : KWEN SHENG MACHINERY ELECTRIC CORP.
NO33-3, CHU KU 3RD LANE CHU HOU VILL JEN WU HSIANG, KAOHSIUNG HSIEN TAIWAN.

Manufacturer : KWEN SHENG MACHINERY ELECTRIC CORP.
NO33-3, CHU KU 3RD LANE CHU HOU VILL JEN WU HSIANG, KAOHSIUNG HSIEN TAIWAN.

Model No : KG508 / KG608

FCC ID : UC9KG508

*Prepared by :* Jesse Tien *Approved by :* Roger Chen
Jesse Tien Roger Chen

# I. GENERAL

## 1.1 Introduction

The following measurement report is submitted on behalf of KWEN SHENG MACHINERY ELECTRIC CORP. In support of a Class B Digital Device certification in accordance with Part2 Subpart J and Part 15 Subpart C of the Commission's and Regulations.

## 1.2 Description of EUT

EUT : GPS Bluetooth Receiver

Applicant : KWEN SHENG MACHINERY ELECTRIC CORP.
NO33-3, CHU KU 3RD LANE CHU HOU VILL JEN WU HSIANG, KAOHSIUNG HSIEN TAIWAN.

Manufacturer : KWEN SHENG MACHINERY ELECTRIC CORP.
NO33-3, CHU KU 3RD LANE CHU HOU VILL JEN WU HSIANG, KAOHSIUNG HSIEN TAIWAN.

Model No : KG508 / KG608

FCC ID : UC9KG508

Power Type : Powered by AC Adapter
Input : AC100~240V 0.11A 50~60Hz
Output : DC5V 1A
Model No.: HK-F205-A05

Frequency of Channel: See Next page

Type of Modulation : FHSS ( GFSK )

Type of Antenna : printed Antenna 0.0dBi

During testing the EUT was operated at Tx or Rx mode for each emission measured. This was done in order to ensure that maximum emission levels were attained.

*GPS Bluetooth Receiver Frequency of Each Channel (Working Frequency)*

| Channel | Frequency ( MHz ) | Channel | Frequency ( MHz ) | Channel | Frequency ( MHz ) | Channel | Frequency ( MHz ) |
|---|---|---|---|---|---|---|---|
| 0 | 2402 | 20 | 2422 | 40 | 2442 | 60 | 2462 |
| 1 | 2403 | 21 | 2423 | 41 | 2443 | 61 | 2463 |
| 2 | 2404 | 22 | 2424 | 42 | 2444 | 62 | 2464 |
| 3 | 2405 | 23 | 2425 | 43 | 2445 | 63 | 2465 |
| 4 | 2406 | 24 | 2426 | 44 | 2446 | 64 | 2466 |
| 5 | 2407 | 25 | 2427 | 45 | 2447 | 65 | 2467 |
| 6 | 2408 | 26 | 2428 | 46 | 2448 | 66 | 2468 |
| 7 | 2409 | 27 | 2429 | 47 | 2449 | 67 | 2469 |
| 8 | 2410 | 28 | 2430 | 48 | 2450 | 68 | 2470 |
| 9 | 2411 | 29 | 2431 | 49 | 2451 | 69 | 2471 |
| 10 | 2412 | 30 | 2432 | 50 | 2452 | 70 | 2472 |
| 11 | 2413 | 31 | 2433 | 51 | 2453 | 71 | 2473 |
| 12 | 2414 | 32 | 2434 | 52 | 2454 | 72 | 2474 |
| 13 | 2415 | 33 | 2435 | 53 | 2455 | 73 | 2475 |
| 14 | 2416 | 34 | 2436 | 54 | 2456 | 74 | 2476 |
| 15 | 2417 | 35 | 2437 | 55 | 2457 | 75 | 2477 |
| 16 | 2418 | 36 | 2438 | 56 | 2458 | 76 | 2478 |
| 17 | 2419 | 37 | 2439 | 57 | 2459 | 77 | 2479 |
| 18 | 2420 | 38 | 2440 | 58 | 2460 | 78 | 2480 |
| 19 | 2421 | 39 | 2441 | 59 | 2461 | | |

## 1.3 Summary Of Tests

| 47 CFR Part 15 Subpart C | | | |
|---|---|---|---|
| Reference | Test | Results | Note |
| 15.207 | AC Power Conducted Emission | PASS | |
| 15.247(c) | Transmitter Radiated Emissions | PASS | |
| 15.247(b) | Max. Output Power | PASS | |
| 15.247(a)(1)(1)-(ii) | Number of Hopping Frequency Used: At leaser 75 Channel | PASS | |
| 15.247(a)(1)(ii) | Dwell Time on Each Channel | PASS | |
| 15.247(a)(1)(1)-(ii) | Hopping Channel Separation | PASS | |
| 15.247(a)(2) | Spectrum Bandwidth of a Frequency Hopping Sequence | PASS | |
| 15.247(c) | Band Edge Measurement | PASS | |
| 15.203 | Antenna Requirement | PASS | |

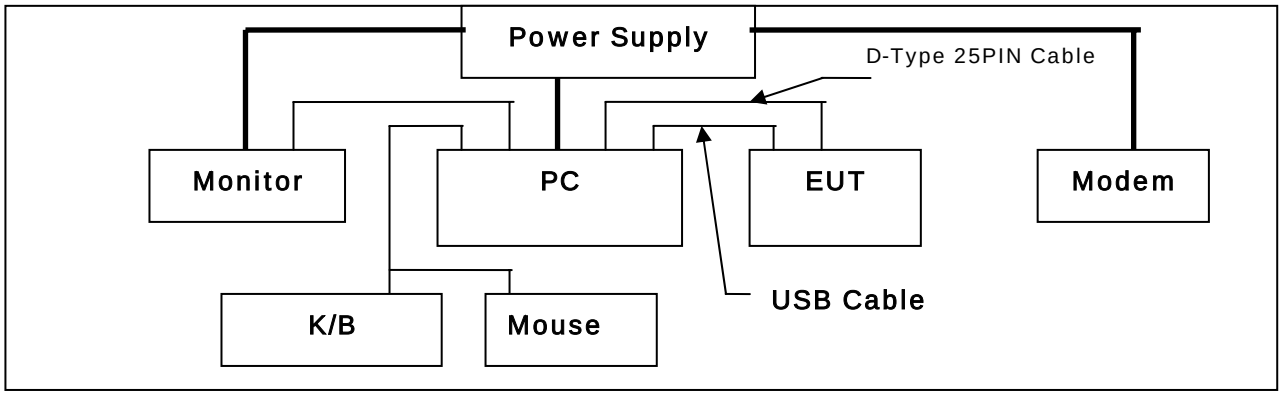
## 1.4 Description of Support Equipment

In order to construct the minimum system which required by the ANSI C63.4-2003, following equipments were used as the support units.

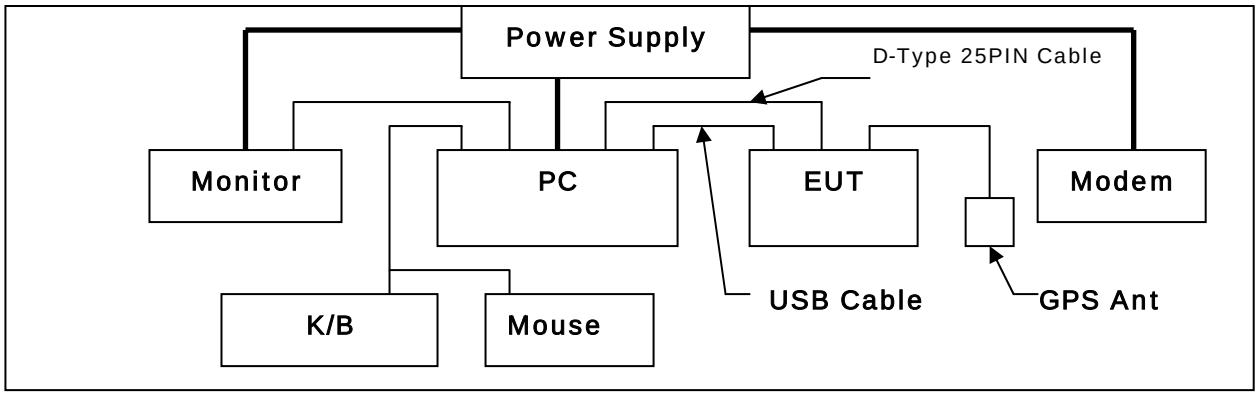
| | |
|---|---|
| *Computer* | : DELL |
| Model No. | : DMC |
| Serial No. | : CD6Y91S |
| FCC ID | : FCC DOC |
| | |
| *Monitor* | : DELL |
| Model No. | : E551 |
| Serial No. | : MY-0724JR-46632-28Q-91C7 |
| FCC ID | : FCC DOC |
| | |
| *Keyboard* | : IBM |
| Model No. | : KB-9930 |
| Serial No. | : 09N5395 |
| FCC ID | : FCC DOC |
| | |
| *Mouse* | : IBM |
| Model No. | : 0180-05N |
| Serial No. | : 23-96142 |
| FCC ID | : FCC DOC |
| | |
| *Modem* | : ASKEY |
| Model No. | : 141428 |
| Serial No. | : N/A |
| FCC ID | : FCC DOC |
| | |
| *Printer* | : Panasonic |
| Model No. | : KX-P1121 |
| Serial No. | : 7CKAKE98933 |
| FCC ID | : FCC DOC |

## 1.5 Configuration of System Under Test

Bluetooth Mode




GPS Mode



## 1.6 Test Procedure

All measurements contained in this report were performed according to the techniques described in Measurement procedure ANSI C63.4-2003 "Measurement of un-Intentional Radiators."

## 1.7 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions which the EUT was considered likely to encounter in normal use were investigated. The system's radiated and conducted emissions were investigated while the computer alternately transferred data to the EUT as well as to the monitor and printer. Using a test program which sent a continuous data and transferred data to and from the EUT was proven to worst case emissions. The system's physical layout and cabling was randomly arranged to ensure that maximum emission levels were attained.

# II. Conducted Emissions Requirements

## 2.1 General & Setup :

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back-wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3825/2 Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

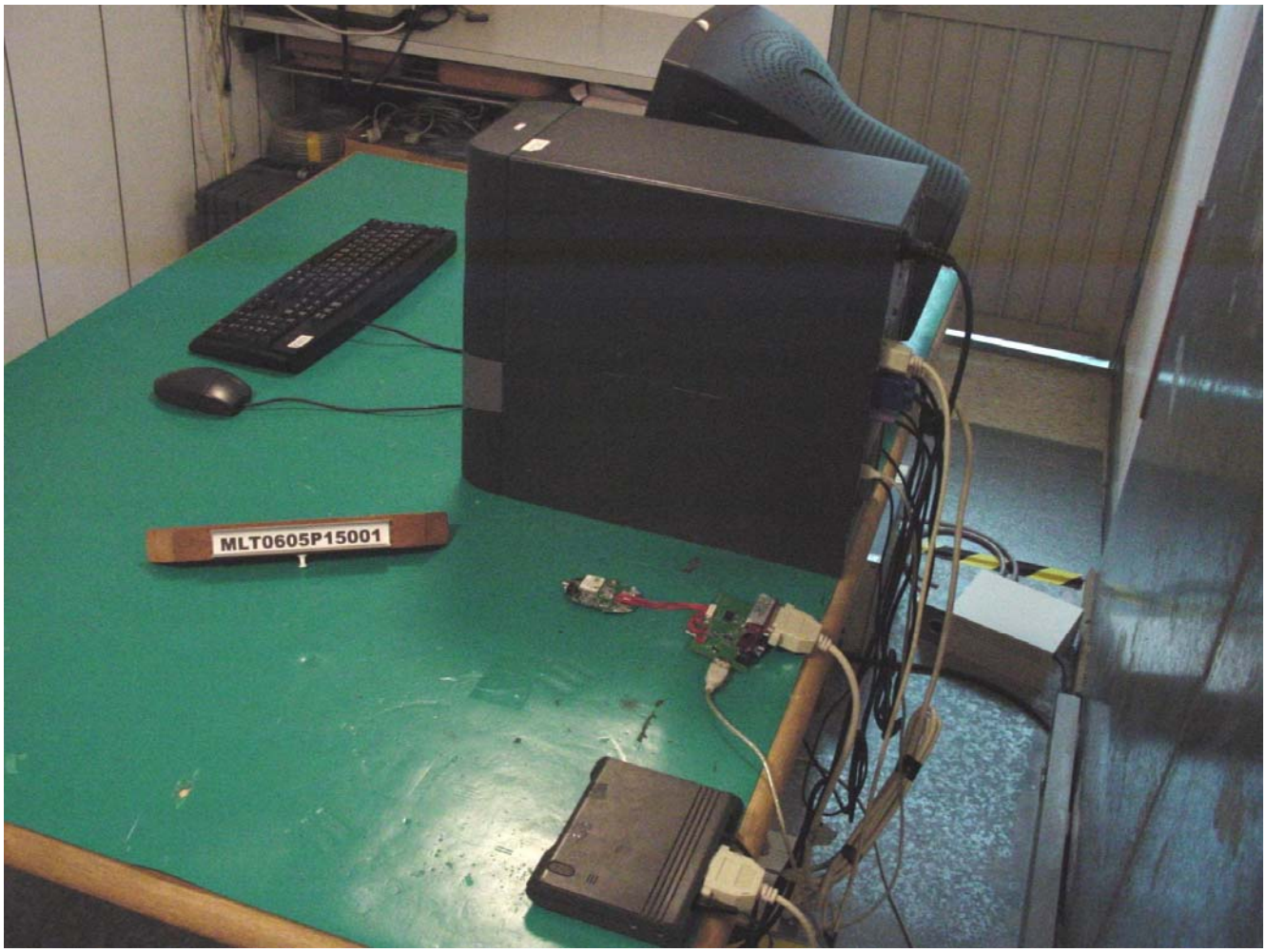
The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 2.6.

## 2.2 Test Equipment List:

| *Item* | *Mfr/Brand* | *Instruments* | *Serial No.* | *Model/Type No.* | *Calibrated Date* | *Next Cali. Date* |
|---|---|---|---|---|---|---|
| 1. | ADVANTEST | Spectrum Analyzer | 91780529 | R3131 | 2006/01/17 | 2007/01/17 |
| 2. | AFJ | EMI Receiver | 55090002141 | ER 55C | 2006/03/31 | 2007/03/31 |
| 3. | EMCO | LISN | 2654 | 3825/2 | 2006/03/25 | 2007/03/25 |
| 4. | EMCO | LISN | 2658 | 3825/2 | 2006/03/25 | 2007/03/25 |
| 5. | SCHAFFNER | ISN | 16831 | ISN T400 | N/A | N/A |

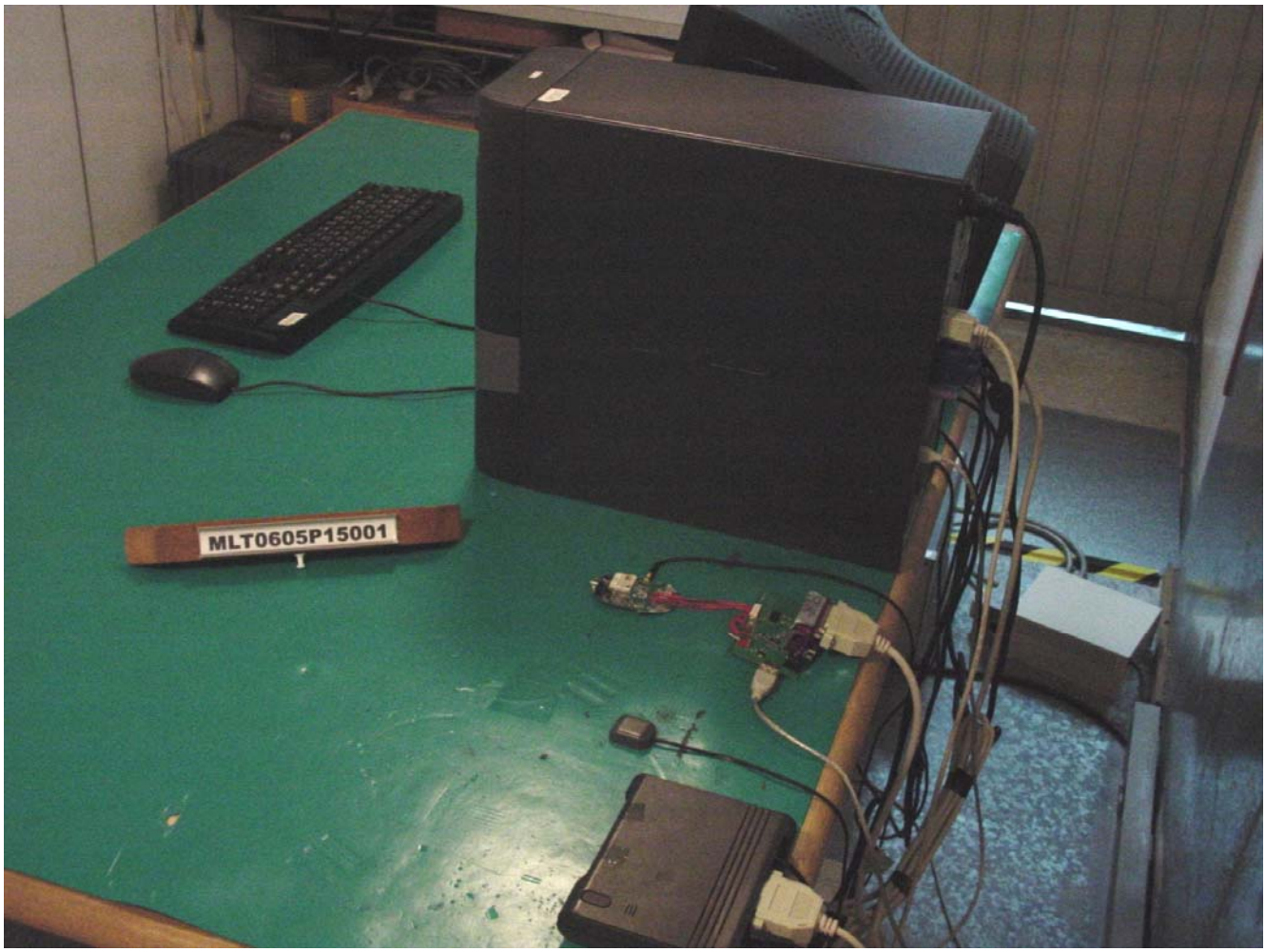
## 2.3 Test Configuration:


Front View of The Test Configuration
(Bluetooth Mode)




Rear View of The Test Configuration
(Bluetooth Mode)


Front View of The Test Configuration
(GPS Mode)




Rear View of The Test Configuration
(GPS Mode)

## 2.4 Test condition:

EUT tested in accordance with the specifications given by the Manufacturer , and exercised in the most unfavorable manner.

## 2.5 Conducted Emissions Limits:

| Frequency range (MHz) | Limits (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5.0 | 56 | 46 |
| 5.0 to 30 | 60 | 50 |

## 2.6 Measurement Data Of Conducted Emissions:

### 2.6.1 Conducted Emissions (Subpart C)

The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

*Applicant* : *KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* : *KG508 / KG608*
*EUT* : *GPS Bluetooth Receiver*
*Test Mode* : *Bluetooth (CH0)*
*Test Date* : *05/24/2006*

| Power Line Conducted Emissions (Class B) | | | | | |
|---|---|---|---|---|---|
| Conductor | Frequency (MHz) | Quasi-Peak (dBuV) | Limits | Average (dBuV) | Limits |
| L1 | 0.16 | 54.63 | 65.38 | 46.35 | 55.38 |
| | 0.43 | 52.50 | 57.24 | 39.64 | 47.24 |
| | 0.55 | 46.89 | 56 | 38.18 | 46 |
| | 0.72 | 47.66 | 56 | 40.16 | 46 |
| | 1.09 | 47.54 | 56 | 37.66 | 46 |
| | 1.97 | 49.60 | 56 | 41.30 | 46 |
| | 3.06 | 42.62 | 56 | -- | 46 |
| L2 | 0.16 | 60.46 | 65.38 | 52.63 | 55.38 |
| | 0.25 | 51.41 | 61.56 | 47.99 | 51.56 |
| | 0.37 | 48.10 | 58.39 | 42.74 | 48.39 |
| | 0.49 | 48.09 | 56.01 | 41.19 | 46.01 |
| | 0.62 | 48.67 | 56 | 42.60 | 46 |
| | 0.98 | 47.51 | 56 | 38.97 | 46 |
| | 1.22 | 47.09 | 56 | 42.15 | 46 |

*Notes : 1.*L1: One end & Ground L2: The other end & Ground
*2.*Height of table on which the EUT was placed : 0.8 m.
*3.*The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
*4.*The above test results are obtained under the normal condition.

2.6.2 Conducted Emissions (Subpart C)

The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

*Applicant* : *KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* : *KG508 / KG608*
*EUT* : *GPS Bluetooth Receiver*
*Test Mode* : *Bluetooth (CH39)*
*Test Date* : *05/24/2006*

| Power Line Conducted Emissions (Class B) | | | | | |
|---|---|---|---|---|---|
| Conductor | Frequency (MHz) | Quasi-Peak (dBuV) | Limits | Average (dBuV) | Limits |
| L1 | 0.15 | 55.20 | 65.69 | 48.33 | 55.69 |
| | 0.36 | 47.84 | 58.61 | 42.52 | 48.61 |
| | 0.72 | 46.66 | 56 | 39.92 | 46 |
| | 1.09 | 47.54 | 56 | 40.16 | 46 |
| | 1.97 | 48.60 | 56 | 42.08 | 46 |
| | 2.87 | 43.01 | 56 | -- | 46 |
| | 6.32 | 42.97 | 56 | -- | 46 |
| L2 | 0.15 | 57.29 | 65.69 | 49.77 | 55.69 |
| | 0.17 | 56.01 | 64.90 | 47.26 | 54.90 |
| | 0.37 | 46.10 | 58.39 | -- | 48.39 |
| | 0.45 | 45.94 | 56.85 | 39.06 | 46.85 |
| | 1.22 | 45.09 | 56 | 38.26 | 46 |
| | 2.07 | 45.30 | 56 | 38.41 | 46 |
| | 7.69 | 44.63 | 60 | -- | 50 |

*Notes : 1.*L1: One end & Ground L2: The other end & Ground
*2.*Height of table on which the EUT was placed : 0.8 m.
*3.*The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
*4.*The above test results are obtained under the normal condition.

2.6.3 Conducted Emissions (Subpart C)

The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

*Applicant* : *KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* : *KG508 / KG608*
*EUT* : *GPS Bluetooth Receiver*
*Test Mode* : *Bluetooth (CH78)*
*Test Date* : *05/24/2006*

| Power Line Conducted Emissions (Class B) | | | | | |
|---|---|---|---|---|---|
| Conductor | Frequency (MHz) | Quasi-Peak (dBuV) | Limits | Average (dBuV) | Limits |
| L1 | 0.15 | 55.35 | 65.60 | 47.54 | 55.60 |
| | 0.43 | 48.36 | 57.11 | 39.97 | 47.11 |
| | 0.62 | 46.50 | 56 | 40.06 | 46 |
| | 0.81 | 47.99 | 56 | 40.50 | 46 |
| | 1.20 | 47.21 | 56 | 40.71 | 46 |
| | 1.96 | 49.55 | 56 | 41.75 | 46 |
| | 2.87 | 43.01 | 56 | -- | 46 |
| L2 | 0.16 | 56.70 | 65.25 | 48.54 | 55.25 |
| | 0.25 | 49.41 | 61.56 | -- | 51.56 |
| | 0.37 | 46.10 | 58.39 | -- | 48.39 |
| | 0.45 | 45.94 | 56.85 | 37.11 | 46.85 |
| | 0.62 | 46.67 | 56 | 40.68 | 46 |
| | 0.85 | 46.01 | 56 | 40.59 | 46 |
| | 2.00 | 47.55 | 56 | 41.66 | 46 |

*Notes : 1.*L1: One end & Ground L2: The other end & Ground
*2.*Height of table on which the EUT was placed : 0.8 m.
*3.*The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
*4.*The above test results are obtained under the normal condition.

2.6.4 Conducted Emissions (Subpart C)

The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NEUTRAL conductor of the EUT power.

*Applicant* : *KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* : *KG508 / KG608*
*EUT* : *GPS Bluetooth Receiver*
*Test Mode* : *GPS (Receiver)*
*Test Date* : *05/24/2006*

| Power Line Conducted Emissions (Class B) | | | | | |
|---|---|---|---|---|---|
| Conductor | Frequency (MHz) | Quasi-Peak (dBuV) | Limits | Average (dBuV) | Limits |
| L1 | 0.36 | 47.84 | 58.61 | 40.72 | 48.61 |
| | 0.44 | 51.16 | 57.02 | 40.79 | 47.02 |
| | 0.55 | 46.89 | 56 | 38.99 | 46 |
| | 0.62 | 46.50 | 56 | 39.53 | 46 |
| | 0.81 | 47.99 | 56 | 40.85 | 46 |
| | 1.09 | 47.54 | 56 | 40.73 | 46 |
| | 1.97 | 49.60 | 56 | 41.61 | 46 |
| L2 | 0.16 | 56.46 | 65.38 | 47.22 | 55.38 |
| | 0.25 | 49.41 | 61.56 | -- | 51.56 |
| | 0.44 | 47.30 | 57.02 | 39.55 | 47.02 |
| | 0.63 | 46.95 | 56 | 38.67 | 46 |
| | 0.73 | 45.40 | 56 | 38.12 | 46 |
| | 1.22 | 45.09 | 56 | 37.42 | 46 |
| | 1.89 | 45.81 | 56 | 40.06 | 46 |

*Notes : 1.*L1: One end & Ground L2: The other end & Ground
*2.*Height of table on which the EUT was placed : 0.8 m.
*3.*The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
*4.*The above test results are obtained under the normal condition.

# III. Radiated Emissions Requirements

## 3.1 General Configuration:

Prior to open-field testing, the EUT was placed in a shielded enclosure and scanned at a close distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration which produced the highest emissions was noted so it could be reproduced later during the open-field tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

## 3.2 General Configuration:

Final radiation measurements were made on a three-meter, open-field test site. The EUT system was placed on a nonconductive turntable which was 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

The field strength below 1 GHz was measured by EMCO Biconilog Antenna (mode 3142) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 40 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvlt (dBuV) into field intensity in microvolts pre meter(uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in microcolts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m)= FI(dBuV)+AF(dBuV)+CL(dBuV)-Gain(dB)

FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.

*P.S Amplitude is auto calculate in spectrum analyzer.*

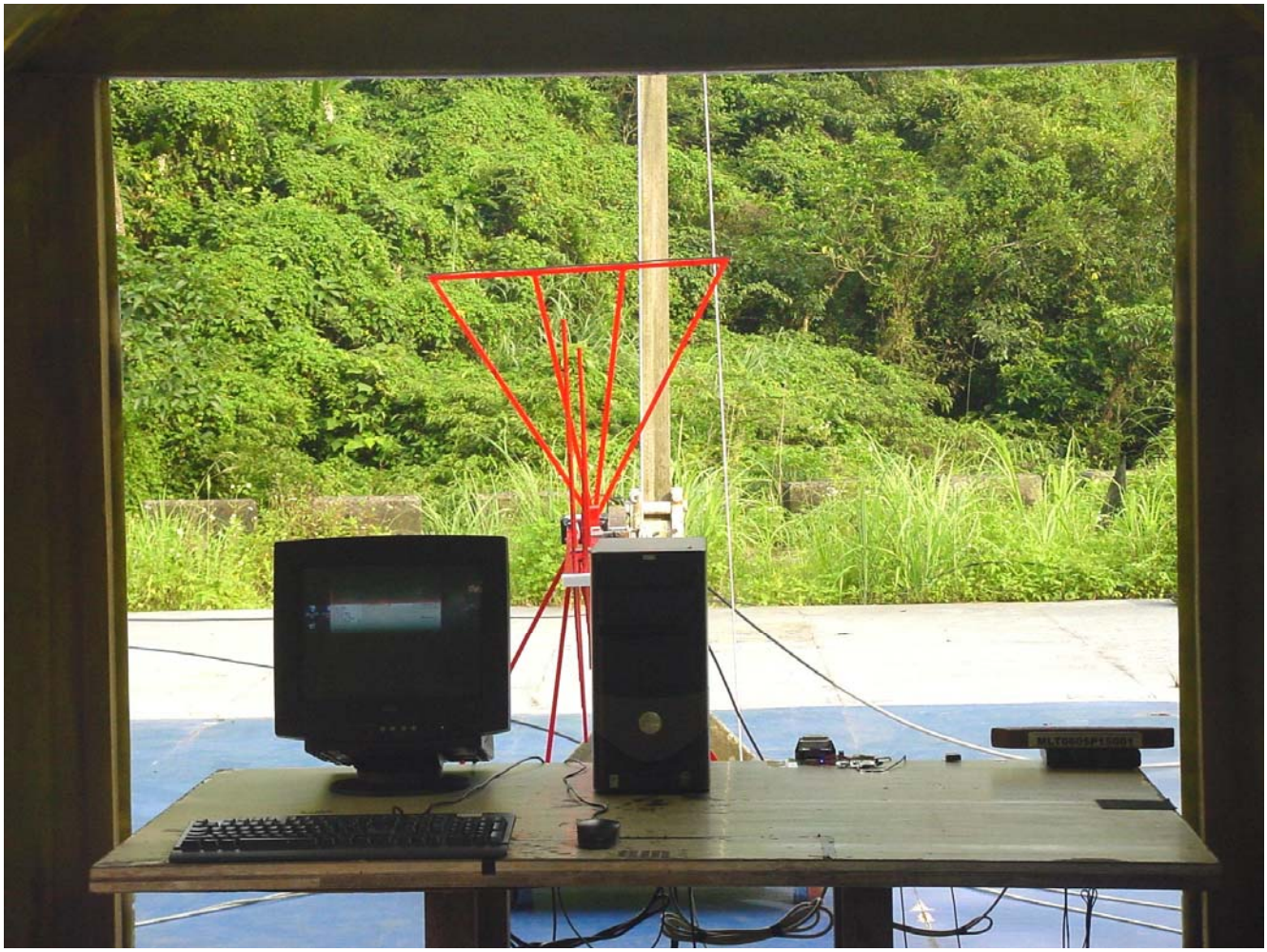
(2) Actual Amplitude (dBuV/m)= Amplitude (dBuV)-Dis(dB)

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(1) For fundamental frequency :
Transmitter Output < +30dBm
(2) For spurious frequency :
Spurious emission limits = fundamental emission limit /10

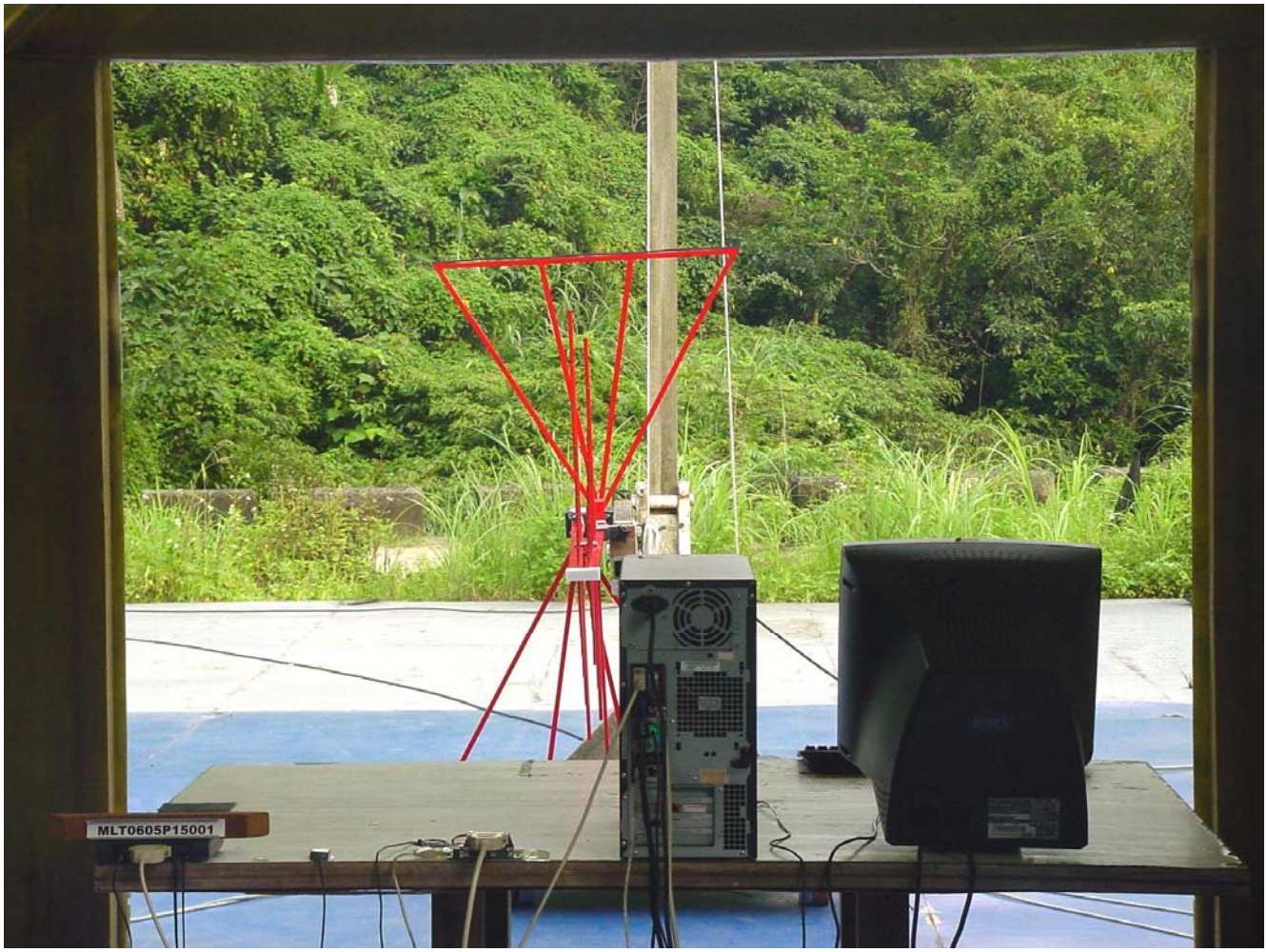
## 3.3 Test Equipment List:

| *Item* | *Mfr/Brand* | *Instruments* | *Serial No.* | *Model/Type No.* | *Calibrated Date* | *Next Cali. Date* |
|---|---|---|---|---|---|---|
| 1. | HP | Spectrum Analyzer | 73412A00110 | 8591EM | 2006/01/17 | 2007/01/17 |
| 2. | HP | Pre Amplifier | 2944A08954 | 8447D | 2006/04/14 | 2007/04/14 |
| 3. | HP | Pre Amplifier | 3113A05475 | 8447F | 2006/01/10 | 2007/01/10 |
| 4. | R&S | EMI Receiver | 881121/010 | 354.3000.52 | 2005/12/10 | 2006/12/10 |
| 5. | EMCO | Biconilog Antenna | 1184 | 3142 | 2006/02/03 | 2007/02/03 |
| 6. | Agilent | Spectrum Analyzer | US39240419 | E4407B | 2006/02/01 | 2007/02/01 |
| 7. | HP | Pre Amplifier | 3008A01463 | 8449B | 2006/02/23 | 2006/02/23 |
| 8. | SCHWARZBECK | Horn Antenna | 181 | BBHA 9170 | 2005/07/06 | 2006/07/06 |
| 9. | SCHWARZBECK | Horn Antenna | 304 | BBHA 9120 D | 2005/07/06 | 2006/07/06 |

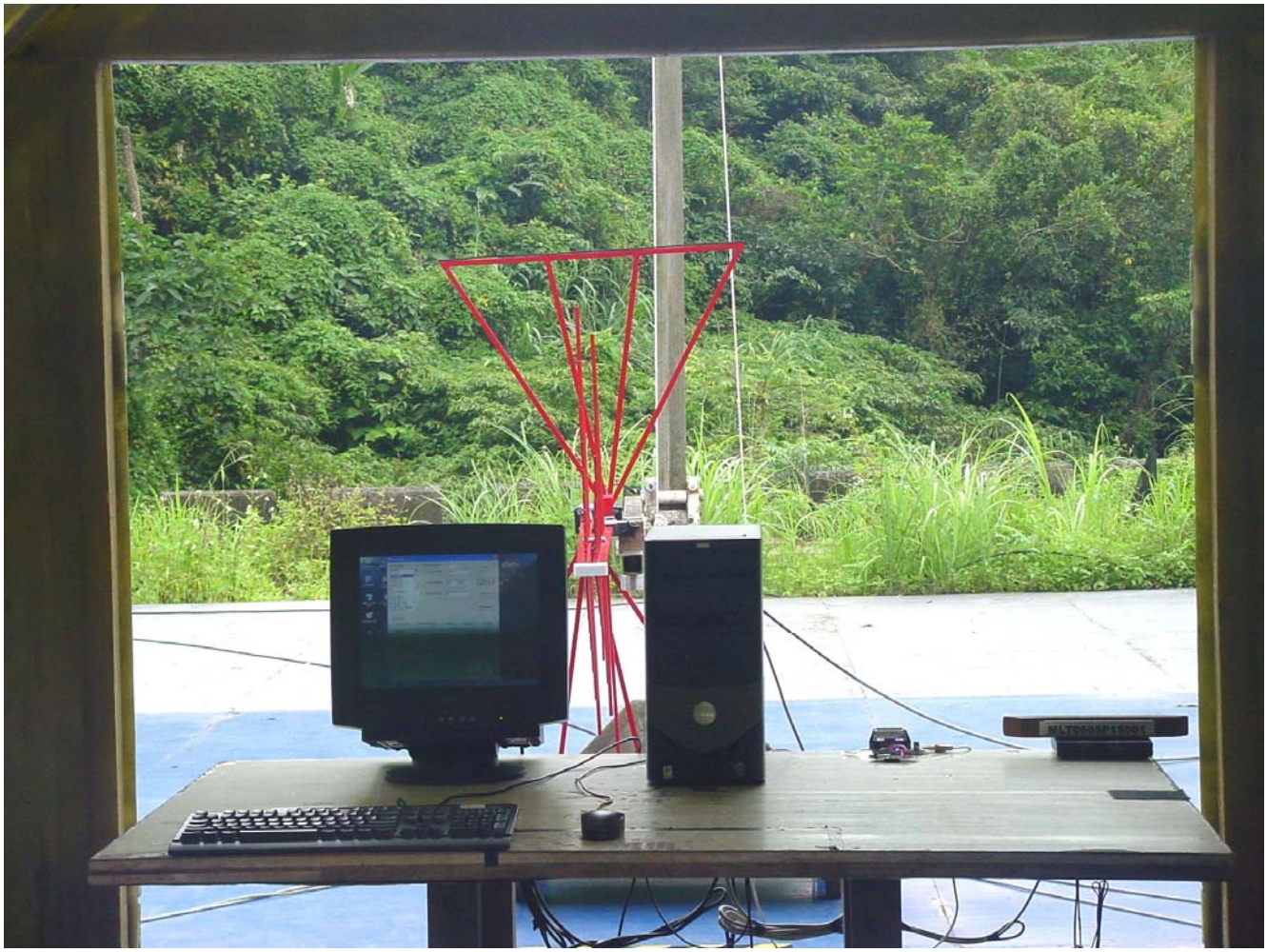
## 3.4 Test Configuration:



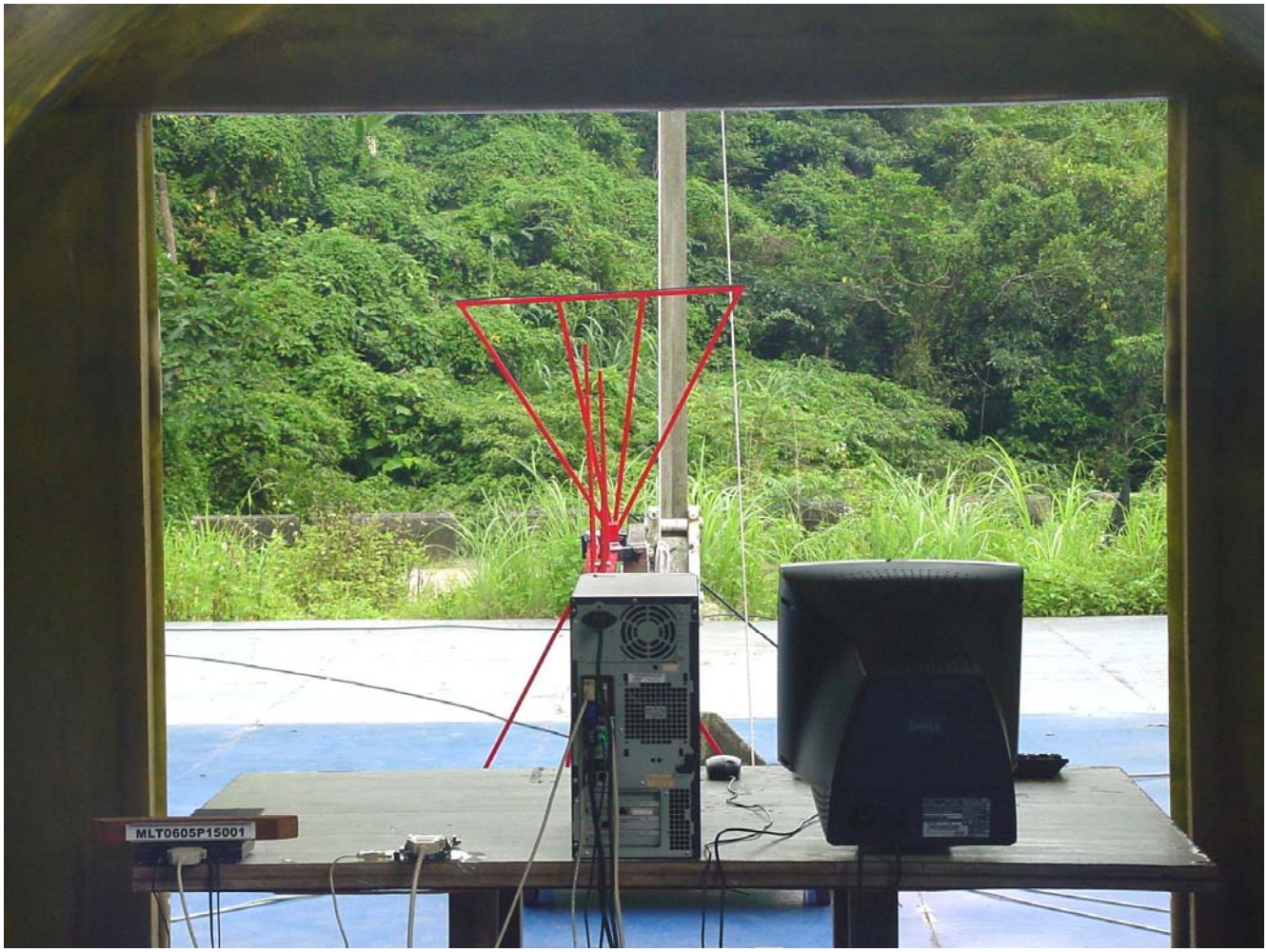
Front View of The Test Configuration
(Bluetooth Mode)




Rear View of The Test Configuration
(Bluetooth Mode)



Front View of The Test Configuration
(GPS Mode)




Rear View of The Test Configuration
(GPS Mode)

## 3.5 Test condition:

EUT tested in accordance with the specifications given by the manufacturer , and exercised in the most unfavorable manner.

## 3.6 Radiated Emissions Limits:

| *Frequency range (MHz)* | *Peak(dBuV/m)* |
|---|---|
| 30 to 88 | 40 |
| 88 to 216 | 43.5 |
| 216 to 960 | 46 |
| Above 960 | 54 |

## 3.7 Measurement Data Of Radiated Emissions:

### 3.7.1 Open Field Radiated Emissions (Subpart B)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

*Applicant* : *KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* : *KG508 / KG608*
*EUT* : *GPS Bluetooth Receiver*
*Test Mode* : *Bluetooth (CH78)*
*Test Date* : *05/30/2006*

| Radiated Emissions (HORIZONTAL) | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Limits(Class B) (dBuV/m) | Margin (dB) |
| 80.01 | 28.03 | 2 | 200 | 40 | -11.97 |
| 95.96 | 27.95 | 1.5 | 250 | 43.5 | -15.55 |
| 127.42 | 27.51 | 1.8 | 320 | 43.5 | -15.99 |
| 159.87 | 29.61 | 2 | 140 | 43.5 | -13.89 |
| 191.76 | 29.97 | 1 | 210 | 43.5 | -13.53 |
| 319.27 | 33.28 | 1 | 240 | 46 | -12.72 |
| 391.27 | 36.41 | 1.1 | 350 | 46 | -9.59 |
| 480.00 | 37.75 | 1 | 300 | 46 | -8.25 |
| 527.50 | 34.33 | 1 | 190 | 46 | -11.67 |
| 644.98 | 34.11 | 1.2 | 270 | 46 | -11.89 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 10 Meter (30-1000MHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*Amplitude= Reading Amplitude –Amplifier gain+ Cable loss +Antenna factor (Auto calculate in spectrum analyzer)

3.7.2 Open Field Radiated Emissions (Subpart B)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following.

*Applicant* : *KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* : *KG508 / KG608*
*EUT* : *GPS Bluetooth Receiver*
*Test Mode* : *Bluetooth (CH78)*
*Test Date* : *05/30/2006*

| Radiated Emissions (VERTICAL) | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Limits(Class B) (dBuV/m) | Margin (dB) |
| 60.00 | 30.68 | 1 | 220 | 40 | -9.32 |
| 80.02 | 31.03 | 1.3 | 320 | 40 | -8.97 |
| 120.00 | 27.45 | 1 | 300 | 43.5 | -16.05 |
| 128.02 | 30.04 | 1 | 160 | 43.5 | -13.46 |
| 160.02 | 27.94 | 1 | 140 | 43.5 | -15.56 |
| 367.29 | 37.84 | 1.3 | 280 | 46 | -8.16 |
| 432.07 | 33.70 | 1.4 | 250 | 46 | -12.30 |
| 480.00 | 37.76 | 1 | 310 | 46 | -8.24 |
| 531.00 | 34.69 | 1 | 200 | 46 | -11.31 |
| 640.38 | 33.47 | 1.1 | 240 | 46 | -12.53 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 10 Meter (30-1000MHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*Amplitude= Reading Amplitude –Amplifier gain+ Cable loss +Antenna factor (Auto calculate in spectrum analyzer)

3.7.3 Open Field Radiated Emissions (Subpart B)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: GPS (Receiver)*
*Test Date* *: 06/14/2006*

| Radiated Emissions (HORIZONTAL) | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Limits(Class B) (dBuV/m) | Margin (dB) |
| 80.00 | 29.52 | 2.1 | 300 | 40 | -10.48 |
| 95.99 | 28.13 | 1.8 | 250 | 43.5 | -15.37 |
| 135.00 | 29.31 | 2 | 260 | 43.5 | -14.19 |
| 166.02 | 28.66 | 1.3 | 200 | 43.5 | -14.84 |
| 191.75 | 29.35 | 1.7 | 210 | 43.5 | -14.15 |
| 415.28 | 36.15 | 1 | 100 | 46 | -9.85 |
| 480.00 | 36.64 | 1 | 340 | 46 | -9.36 |
| 519.10 | 33.42 | 1 | 140 | 46 | -12.58 |
| 644.88 | 34.19 | 1 | 170 | 46 | -11.81 |
| 720.00 | 33.90 | 1 | 330 | 46 | -12.10 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 10 Meter (30-1000MHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*Amplitude= Reading Amplitude –Amplifier gain+ Cable loss +Antenna factor (Auto calculate in spectrum analyzer)

3.7.4 Open Field Radiated Emissions (Subpart B)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following.

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: GPS (Receiver)*
*Test Date* *: 06/14/2006*

| Radiated Emissions (VERTICAL) | | | | | |
|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Limits(Class B) (dBuV/m) | Margin (dB) |
| 80.02 | 28.28 | 1.1 | 320 | 40 | -11.72 |
| 96.15 | 30.11 | 1 | 350 | 43.5 | -13.39 |
| 127.41 | 26.33 | 1 | 200 | 43.5 | -17.17 |
| 134.91 | 26.58 | 1 | 170 | 43.5 | -16.92 |
| 175.92 | 25.54 | 1.8 | 180 | 43.5 | -17.96 |
| 367.27 | 36.76 | 1.3 | 240 | 46 | -9.24 |
| 432.06 | 36.70 | 1 | 200 | 46 | -9.30 |
| 480.00 | 36.69 | 1 | 140 | 46 | -9.31 |
| 533.11 | 37.65 | 1.2 | 260 | 46 | -8.35 |
| 640.83 | 35.20 | 1 | 300 | 46 | -10.80 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 10 Meter (30-1000MHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*Amplitude= Reading Amplitude –Amplifier gain+ Cable loss +Antenna factor (Auto calculate in spectrum analyzer)

3.7.5 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: Bluetooth (CH0)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (HORIZONTAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 50.21 PK | 1 | 320 | 0 | 9.54 | 40.67 | 74.00 | -33.33 |
| 1851.0 | 54.38 PK | 1 | 250 | 0 | 9.54 | 44.84 | 74.00 | -29.16 |
| 4804.5 | 64.34 PK | 1 | 200 | 0 | 9.54 | 54.80 | 74.00 | -19.20 |
| 4804.5 | 50.50 AV | 1 | 310 | 0 | 9.54 | 40.96 | 74.00 | -33.04 |
| 7205.5 | 61.34 PK | 1 | 300 | 0 | 9.54 | 51.80 | 74.00 | -22.20 |
| 7205.5 | 49.05 AV | 1 | 240 | 0 | 9.54 | 39.51 | 74.00 | -34.49 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dist= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dist.
*9.*The other emission levels were very low against the limit.

3.7.6 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following.

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: Bluetooth (CH0)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (VERTICAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 54.88 PK | 1 | 300 | 0 | 9.54 | 45.34 | 74.00 | -28.66 |
| 1851.0 | 56.92 PK | 1 | 350 | 0 | 9.54 | 47.38 | 74.00 | -26.62 |
| 4804.5 | 63.20 PK | 1 | 260 | 0 | 9.54 | 53.66 | 74.00 | -20.34 |
| 4804.5 | 52.15 AV | 1 | 320 | 0 | 9.54 | 42.61 | 74.00 | -31.39 |
| 7205.5 | 65.31 PK | 1 | 240 | 0 | 9.54 | 55.77 | 74.00 | -18.23 |
| 7205.5 | 53.88 AV | 1 | 160 | 0 | 9.54 | 44.34 | 74.00 | -29.66 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dis= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dis.
*9.*The other emission levels were very low against the limit.

3.7.7 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: Bluetooth (CH39)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (HORIZONTAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 52.40 PK | 1 | 210 | 0 | 9.54 | 42.86 | 74.00 | -31.14 |
| 1851.0 | 51.29 PK | 1 | 220 | 0 | 9.54 | 41.75 | 74.00 | -32.25 |
| 4882.5 | 66.84 PK | 1 | 300 | 0 | 9.54 | 57.30 | 74.00 | -16.70 |
| 4882.5 | 56.98 AV | 1 | 280 | 0 | 9.54 | 47.44 | 74.00 | -26.56 |
| 7231.0 | 61.24 PK | 1 | 200 | 0 | 9.54 | 51.70 | 74.00 | -22.30 |
| 7231.0 | 50.82 AV | 1 | 320 | 0 | 9.54 | 41.28 | 74.00 | -32.72 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dis= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dis.
*9.*The other emission levels were very low against the limit.

3.7.8 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following.

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: Bluetooth (CH39)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (VERTICAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 55.28 PK | 1 | 300 | 0 | 9.54 | 45.74 | 74.00 | -28.26 |
| 1851.0 | 57.03 PK | 1 | 290 | 0 | 9.54 | 47.49 | 74.00 | -26.51 |
| 4882.5 | 64.14 PK | 1 | 260 | 0 | 9.54 | 54.60 | 74.00 | -19.40 |
| 4882.5 | 52.91 AV | 1 | 350 | 0 | 9.54 | 43.37 | 74.00 | -30.63 |
| 7231.0 | 63.44 PK | 1 | 340 | 0 | 9.54 | 53.90 | 74.00 | -20.10 |
| 7231.0 | 51.83 AV | 1 | 280 | 0 | 9.54 | 42.29 | 74.00 | -31.71 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dis= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dis.
*9.*The other emission levels were very low against the limit.

3.7.9 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: Bluetooth (CH78)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (HORIZONTAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 49.97 PK | 1 | 350 | 0 | 9.54 | 40.43 | 74.00 | -33.57 |
| 1851.0 | 50.31 PK | 1 | 120 | 0 | 9.54 | 40.77 | 74.00 | -33.23 |
| 4961.5 | 66.14 PK | 1 | 170 | 0 | 9.54 | 56.60 | 74.00 | -17.40 |
| 4961.5 | 52.96 AV | 1 | 210 | 0 | 9.54 | 43.42 | 74.00 | -30.58 |
| 7441.0 | 64.72 PK | 1 | 250 | 0 | 9.54 | 55.18 | 74.00 | -18.82 |
| 7441.0 | 51.77 AV | 1 | 310 | 0 | 9.54 | 42.23 | 74.00 | -31.56 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dis= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dis.
*9.*The other emission levels were very low against the limit.

3.7.10 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following.

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: Bluetooth (CH78)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (VERTICAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 55.28 PK | 1 | 200 | 0 | 9.54 | 45.74 | 74.00 | -28.26 |
| 1851.0 | 55.99 PK | 1 | 340 | 0 | 9.54 | 46.45 | 74.00 | -27.55 |
| 4961.5 | 65.75 PK | 1 | 320 | 0 | 9.54 | 56.21 | 74.00 | -17.79 |
| 4961.5 | 54.73 AV | 1 | 100 | 0 | 9.54 | 45.19 | 74.00 | -28.81 |
| 7441.0 | 65.98 PK | 1 | 180 | 0 | 9.54 | 56.44 | 74.00 | -17.56 |
| 7441.0 | 57.82 AV | 1 | 150 | 0 | 9.54 | 48.28 | 74.00 | -25.72 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dis= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dis.
*9.*The other emission levels were very low against the limit.

3.7.11 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: GPS(Receiver)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (HORIZONTAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 50.25 PK | 1 | 300 | 0 | 9.54 | 40.71 | 74.00 | -33.29 |
| 1851.0 | 52.76 PK | 1 | 320 | 0 | 9.54 | 43.22 | 74.00 | -30.78 |
| 3265.5 | 47.82 PK | 1 | 280 | 0 | 9.54 | 38.28 | 74.00 | -35.72 |
| 4820.0 | 48.11 PK | 1 | 260 | 0 | 9.54 | 38.57 | 74.00 | -35.43 |
| 6242.5 | 49.08 PK | 1 | 300 | 0 | 9.54 | 39.54 | 74.00 | -34.46 |
| 7802.5 | 47.61 PK | 1 | 200 | 0 | 9.54 | 38.07 | 74.00 | -35.93 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dis= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dis.
*9.*The other emission levels were very low against the limit.

3.7.12 Open Field Radiated Emissions (Subpart C)

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation , etc. are recorded on the following.

*Applicant* *: KWEN SHENG MACHINERY ELECTRIC CORP.*
*Model No* *: KG508 / KG608*
*EUT* *: GPS Bluetooth Receiver*
*Test Mode* *: GPS(Receiver)*
*Test Date* *: 06/15/2006*

| Radiated Emissions (VERTICAL) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV/m) | Ant. (m) | Table (Degree) | Duty (dB) | Dist (dB) | Actual Amp (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 1082.5 | 54.19 PK | 1 | 350 | 0 | 9.54 | 44.65 | 74.00 | -29.35 |
| 1851.0 | 55.28 PK | 1 | 340 | 0 | 9.54 | 45.74 | 74.00 | -28.26 |
| 3265.5 | 49.36 PK | 1 | 300 | 0 | 9.54 | 39.82 | 74.00 | -34.18 |
| 4820.0 | 48.91 PK | 1 | 320 | 0 | 9.54 | 39.37 | 74.00 | -34.63 |
| 6242.5 | 50.21 PK | 1 | 210 | 0 | 9.54 | 40.67 | 74.00 | -33.33 |
| 7802.5 | 48.99 PK | 1 | 240 | 0 | 9.54 | 39.45 | 74.00 | -34.55 |

*Notes : 1.*Margin= Amplitude - Limits
*2.*Distance of Measurement : 1 Meter (1G-26.5GHz)
*3.*Height of table for EUT placed: 0.8 Meter.
*4.*ANT= Antenna height.
*5.*Duty= Duty cycle correction factor.
*6.*Dis= Distance extrapolation factor.
*7.*Amplitude= Reading Amplitude – Amplifier gain+ Cable loss +Antenna factor
(Auto calculate in spectrum analyzer)
*8.*Actual Amp= Amplitude – Duty – Dis.
*9.*The other emission levels were very low against the limit.

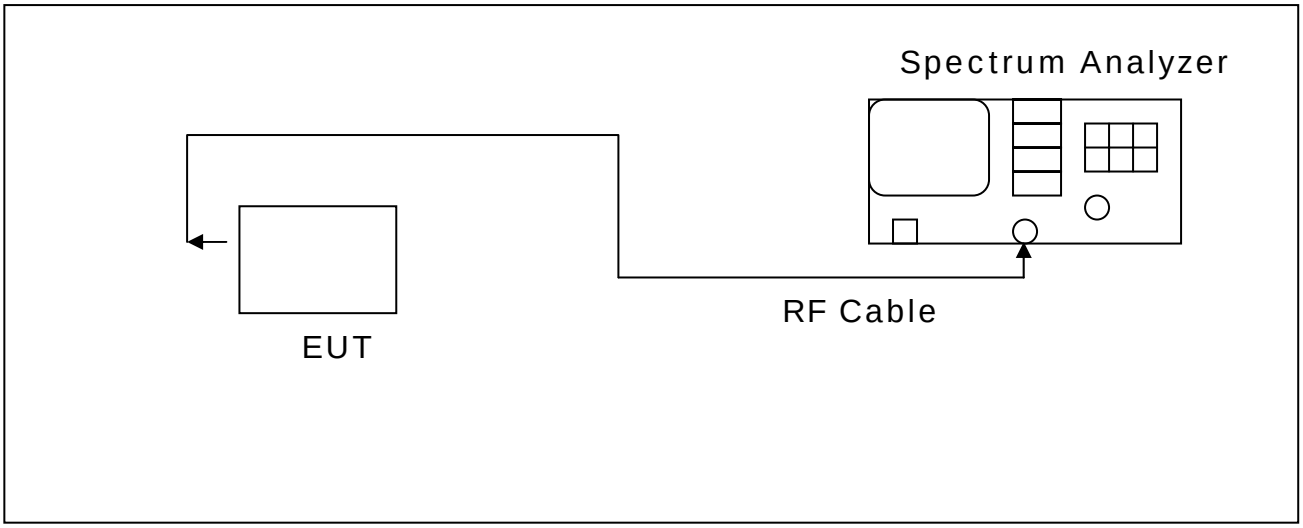
# IV. Maximum Conducted Output Power Requirements

## 4.1 Test Condition & Setup :

The tests below are run with the EUT's transmitter set at high power in single frequency. A USB port from a computer to the EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to spectrum analyzer.

Use a direct connection between the antenna port of transmitter and the spectrum Analyzer. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

## 4.2 Test Instruments Configuration:




## 4.3 Test Equipment List:

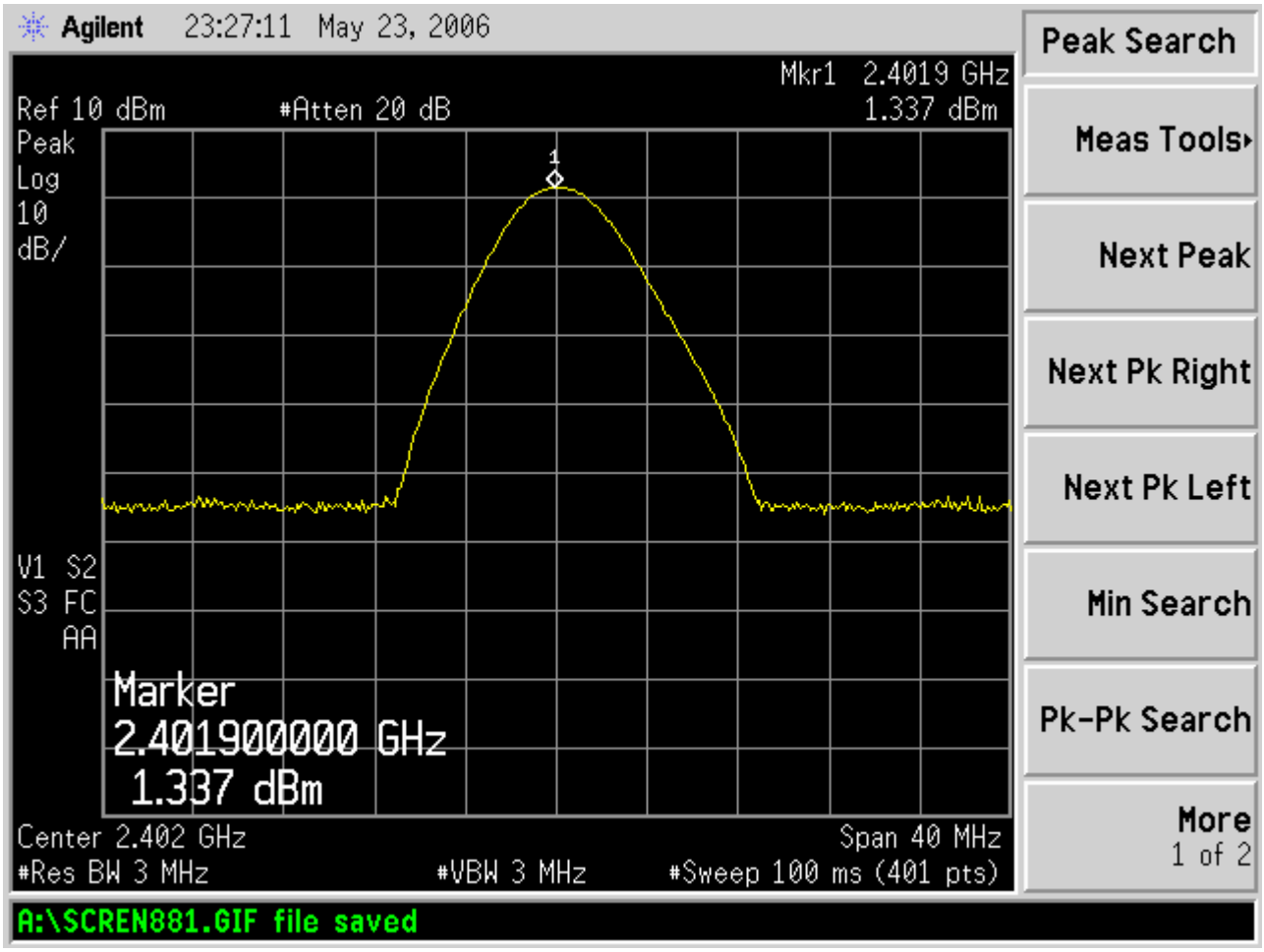
| Item | Mfr/Brand | Instruments | Serial No. | Model/Type No. | Calibrated Date | Next Cali. Date |
|---|---|---|---|---|---|---|
| 1. | Agilent | Spectrum Analyzer | US39240419 | E4407B | 2006/01/17 | 2007/01/17 |

## 4.4 Test Result:

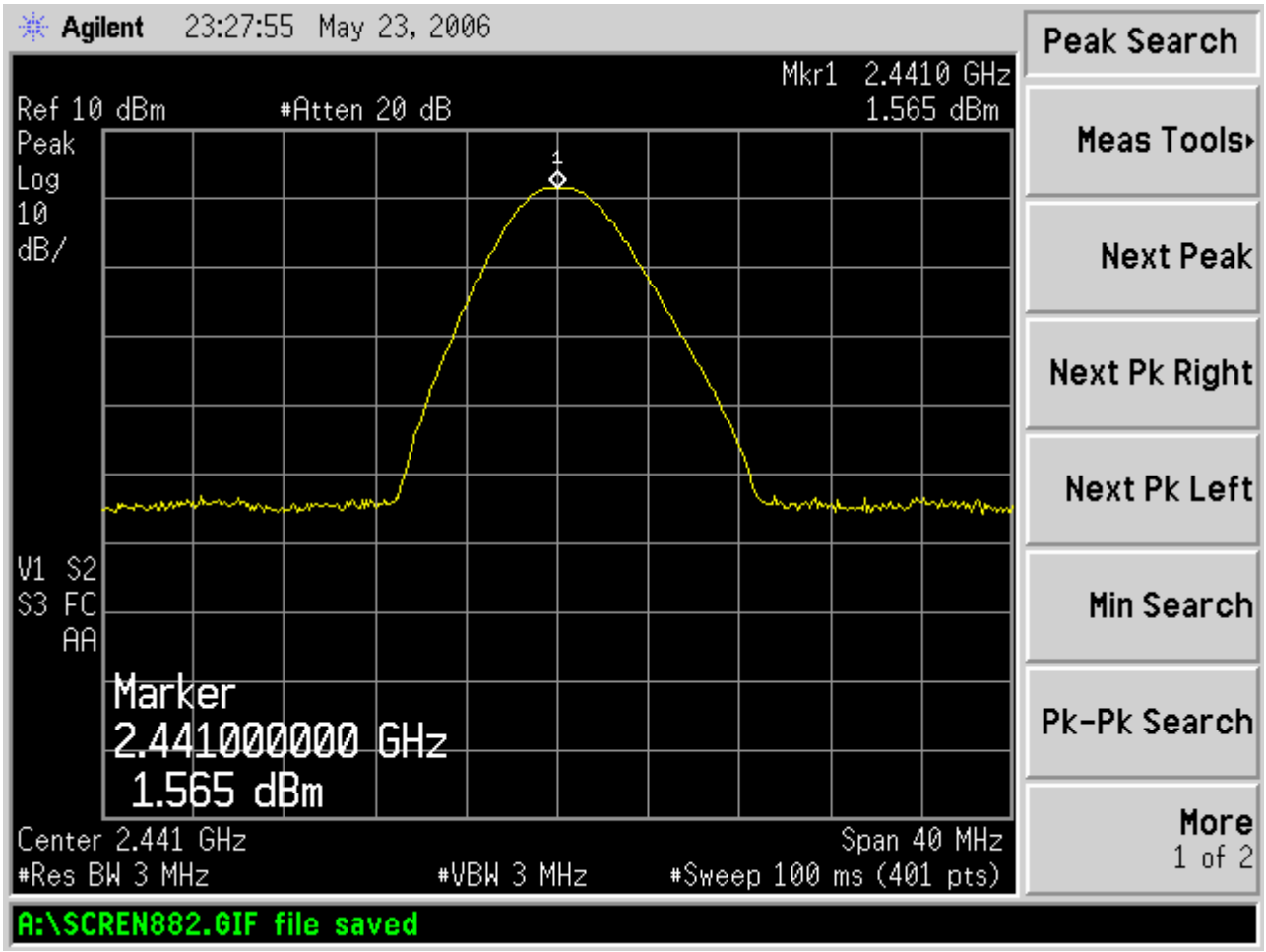
| Frequency (MHz) | Output(dBm) | Required Limit |
|---|---|---|
| 2402 | 1.377 | <30dBm |
| 2441 | 1.565 | <30dBm |
| 2480 | 0.894 | <30dBm |

*Note :Test Graphs See next page.*

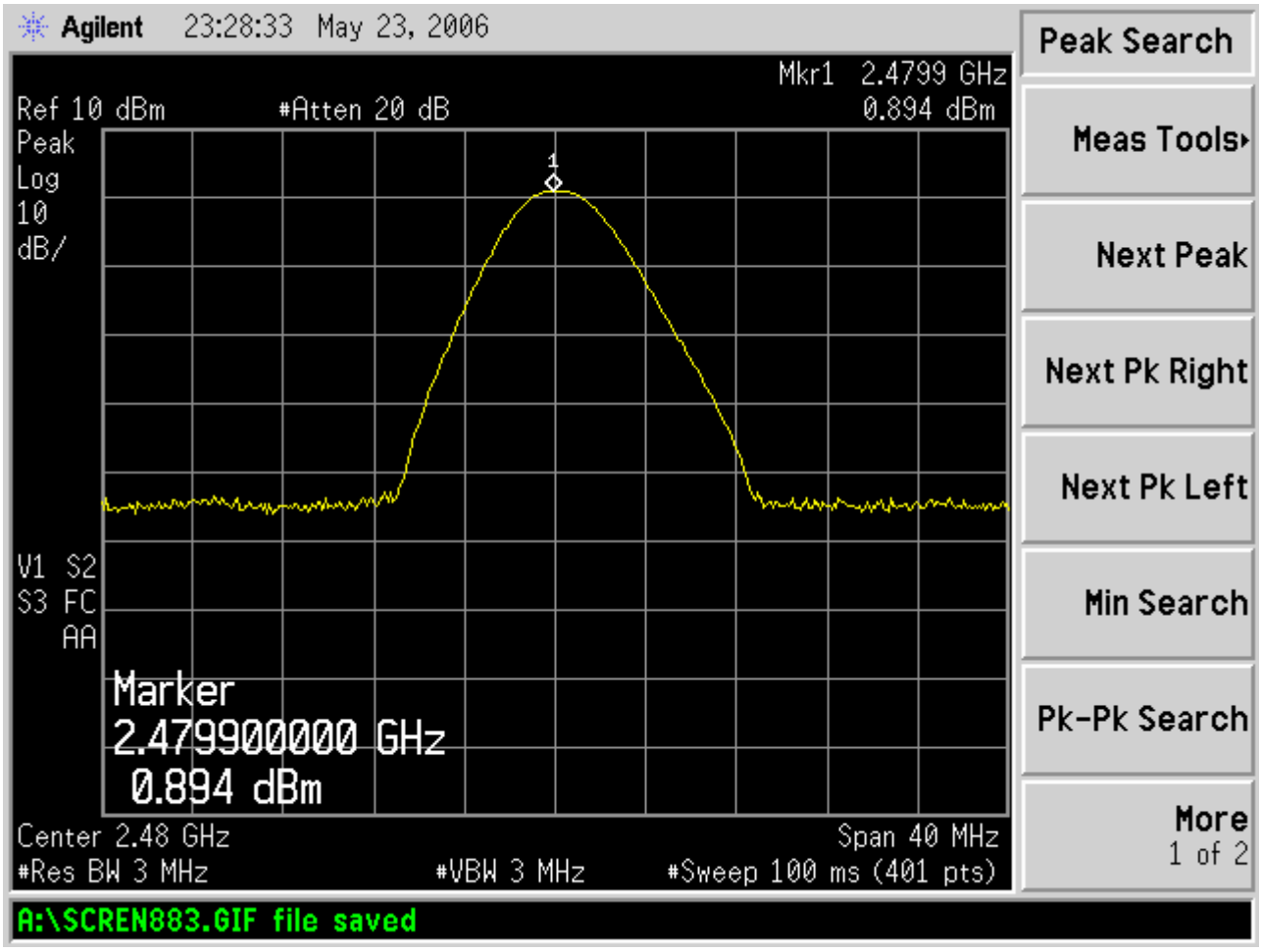
(2402MHz)


Agilent 23:27:11 May 23, 2006
Mkr1 2.4019 GHz
1.337 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Marker
2.401900000 GHz
1.337 dBm
Center 2.402 GHz
#Res BW 3 MHz
#VBW 3 MHz
Span 40 MHz
#Sweep 100 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2
A:\SCREN881.GIF file saved

(2441MHz)


Agilent 23:27:55 May 23, 2006
Mkr1 2.4410 GHz
1.565 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Marker
2.441000000 GHz
1.565 dBm
Center 2.441 GHz
#Res BW 3 MHz
#VBW 3 MHz
Span 40 MHz
#Sweep 100 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2
A:\SCREN882.GIF file saved

(2480MHz)


Agilent 23:28:33 May 23, 2006
Mkr1 2.4799 GHz
0.894 dBm
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Marker
2.479900000 GHz
0.894 dBm
Center 2.48 GHz
#Res BW 3 MHz
#VBW 3 MHz
Span 40 MHz
#Sweep 100 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2
A:\SCREN883.GIF file saved

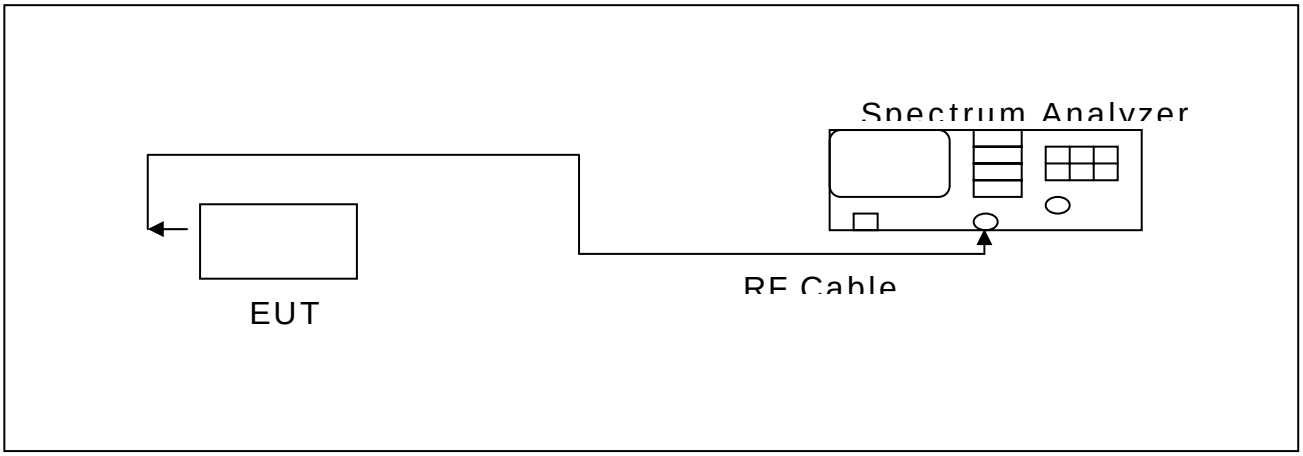
# V. Number of Hopping Frequency Requirements

## 5.1 Test Condition & Setup :

The tests below are run with the EUT's transmitter set at hopping mode. Use a direct connection between the antenna port of transmitter and the spectrum Analyzer.

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the result. On the plots, it shows that the hopping frequencies are equally spaced.

## 5.2 Test Instruments Configuration:



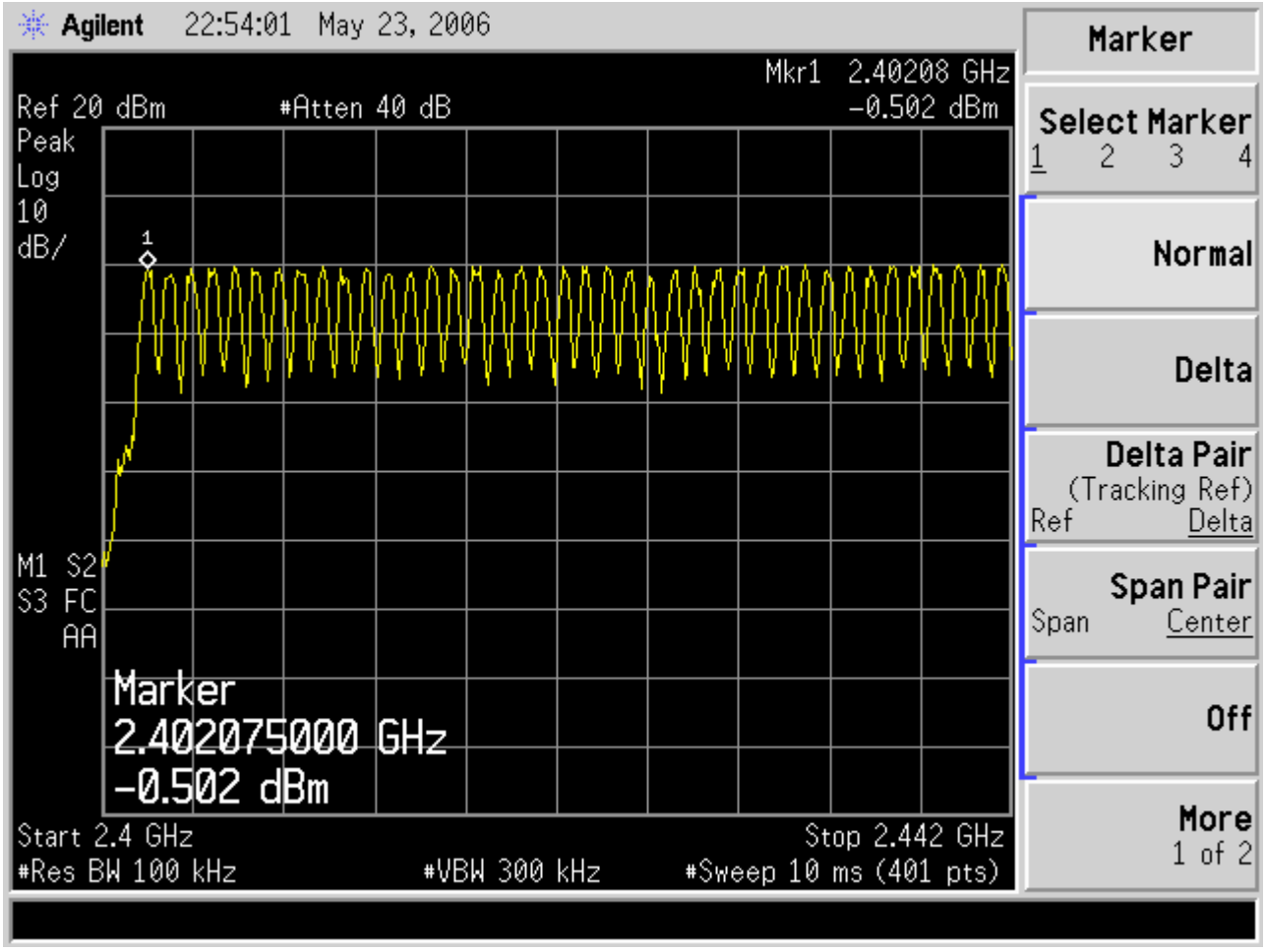

## 5.3 Test Equipment List:

| Item | Mfr/Brand | Instruments | Serial No. | Model/Type No. | Calibrated Date | Next Cali. Date |
|---|---|---|---|---|---|---|
| 1. | Agilent | Spectrum Analyzer | US39240419 | E4407B | 2006/01/17 | 2007/01/17 |

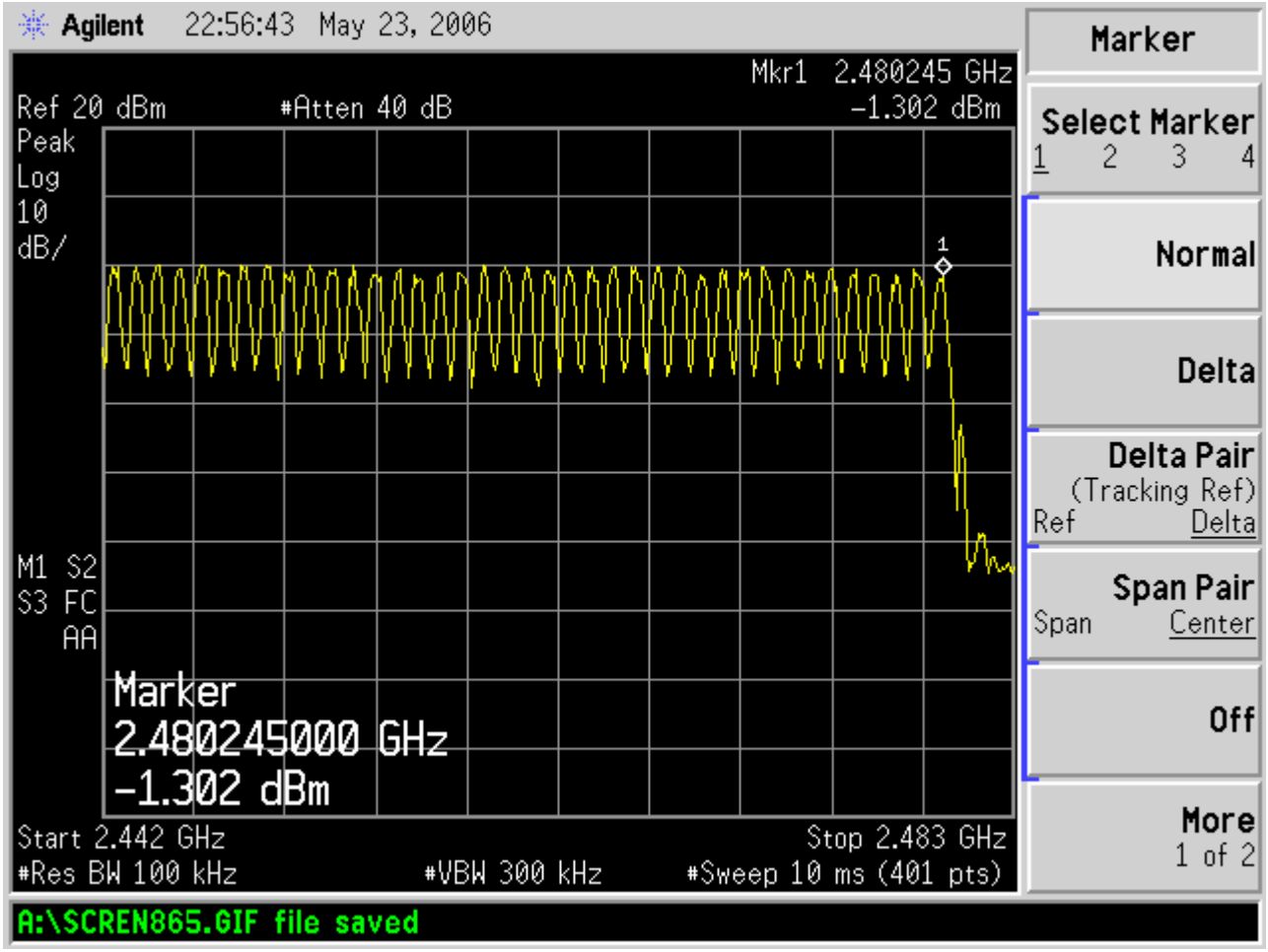
## 5.4 Test Result:

*There are 79 hopping frequencies in the hopping .Refer to two page .*
*Note :Test Graphs See next page.*

PAGE 1


Agilent 22:54:01 May 23, 2006
Mkr1 2.40208 GHz
-0.502 dBm
Ref 20 dBm
#Atten 40 dB
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Marker
2.402075000 GHz
-0.502 dBm
Start 2.4 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.442 GHz
#Sweep 10 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

PAGE 2


Agilent 22:56:43 May 23, 2006
Mkr1 2.480245 GHz
-1.302 dBm
Ref 20 dBm
#Atten 40 dB
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Marker
2.480245000 GHz
-1.302 dBm
Start 2.442 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.483 GHz
#Sweep 10 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2
A:\SCREN865.GIF file saved

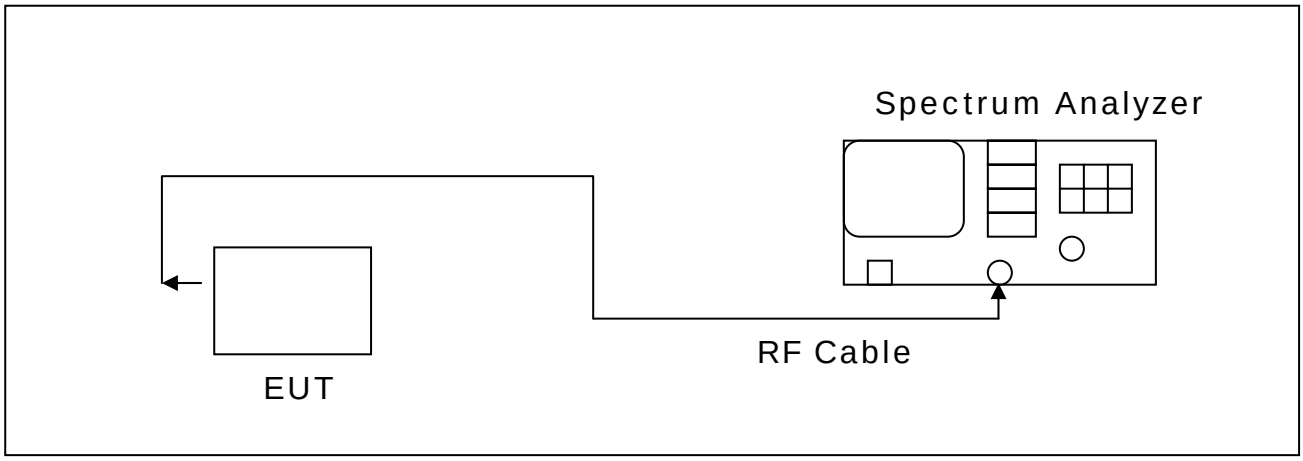
# VI. Dwell Time on Each Channel Requirements

## 6.1 Test Condition & Setup :

Dwell Time On Each Channel

For FHSS, the average time of occupancy on any frequency shall not be great than 0.4seconds within a 31.6 seconds period.For hybrid system. The average time of occupancy on any frequency should not exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4.

## 6.2 Test Instruments Configuration:




## 6.3 Test Equipment List:

| Item | Mfr/Brand | Instruments | Serial No. | Model/Type No. | Calibrated Date | Next Cali. Date |
|---|---|---|---|---|---|---|
| 1. | Agilent | Spectrum Analyzer | US39240419 | E4407B | 2006/01/17 | 2007/01/17 |

## 6.4 Test Result:

DH1-Packet

| Frequency ( MHz ) | Result ( ms ) | Limit ( ms ) |
|---|---|---|
| 2402 | 0.4125 * 10.12 * 31.6= 131.9 | 400 |
| 2441 | 0.4125 * 10.12 * 31.6= 131.9 | 400 |
| 2480 | 0.4200 * 10.12 * 31.6= 134.3 | 400 |

DH3-Packet

| Frequency ( MHz ) | Result ( ms ) | Limit ( ms ) |
|---|---|---|
| 2402 | 1.65 * 5.06 * 31.6= 263.8 | 400 |
| 2441 | 1.65 * 5.06 * 31.6= 263.8 | 400 |
| 2480 | 1.65 * 5.06 * 31.6= 263.8 | 400 |

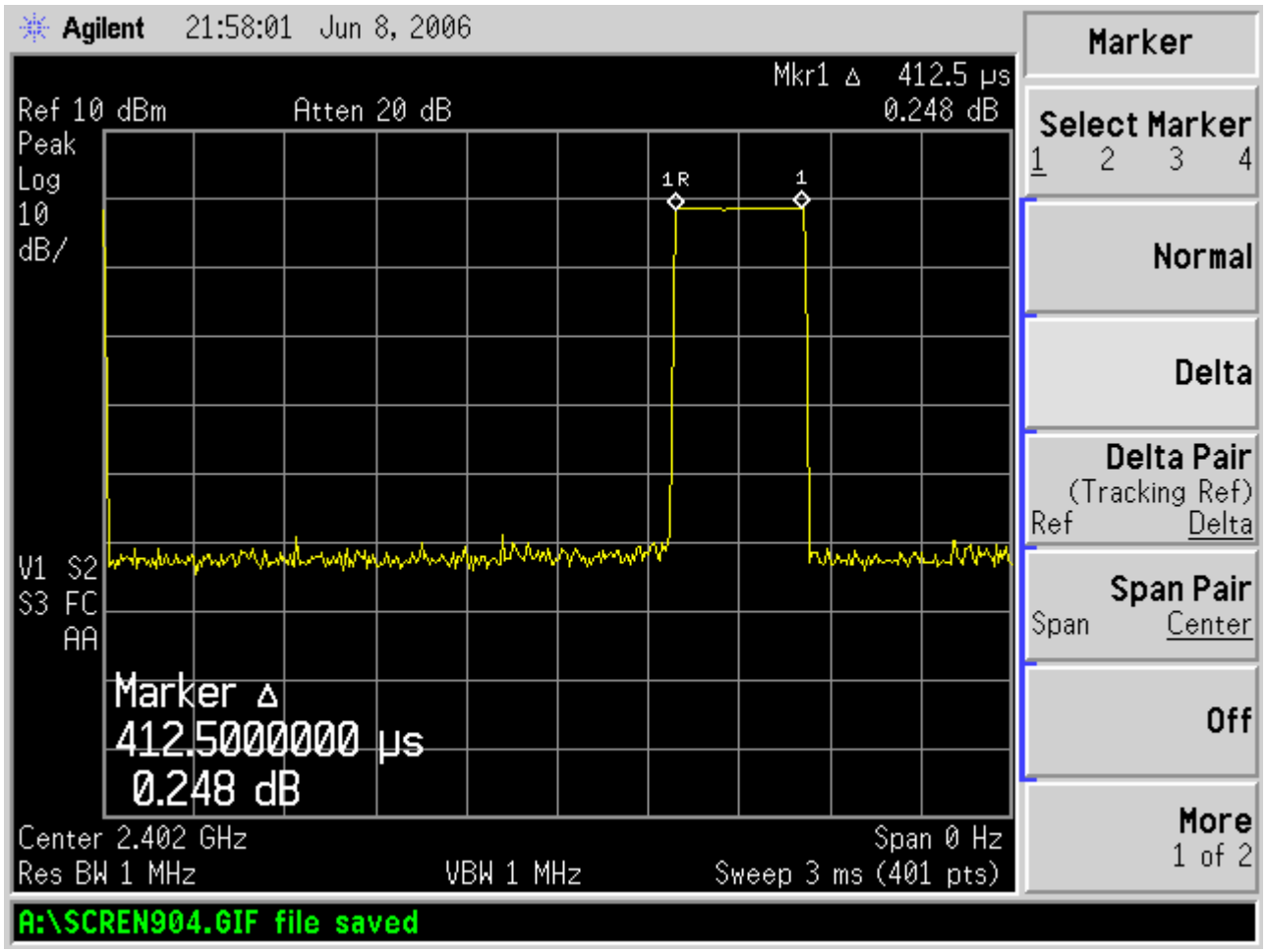
DH5-Packet

| Frequency ( MHz ) | Result ( ms ) | Limit ( ms ) |
|---|---|---|
| 2402 | 2.913 * 3.37 * 31.6= 310.2 | 400 |
| 2441 | 2.913 * 3.37 * 31.6= 310.2 | 400 |
| 2480 | 2.925 * 3.37 * 31.6= 311.5 | 400 |

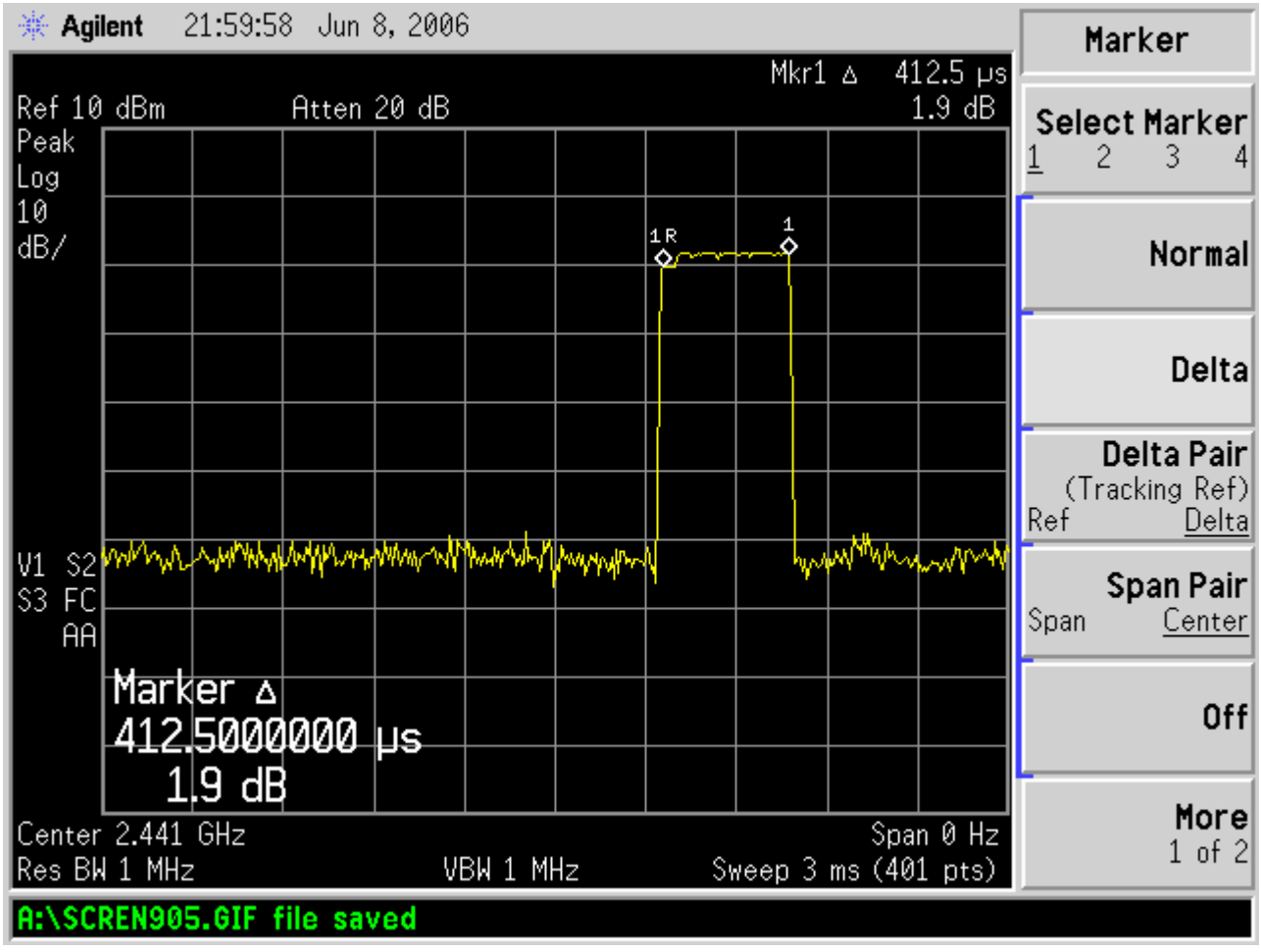
*Note :*

1. DH1-Packet : (1600 / 79 / 2 = 10.12 )
2. DH3-Packet : (1600 / 79 / 4 = 5.06 )
3. DH5-Packet : (1600 / 79 / 6 = 3.37 )
4. ( 0.4 * 79 = 31.6 second )
5. Test Graphs See next page.

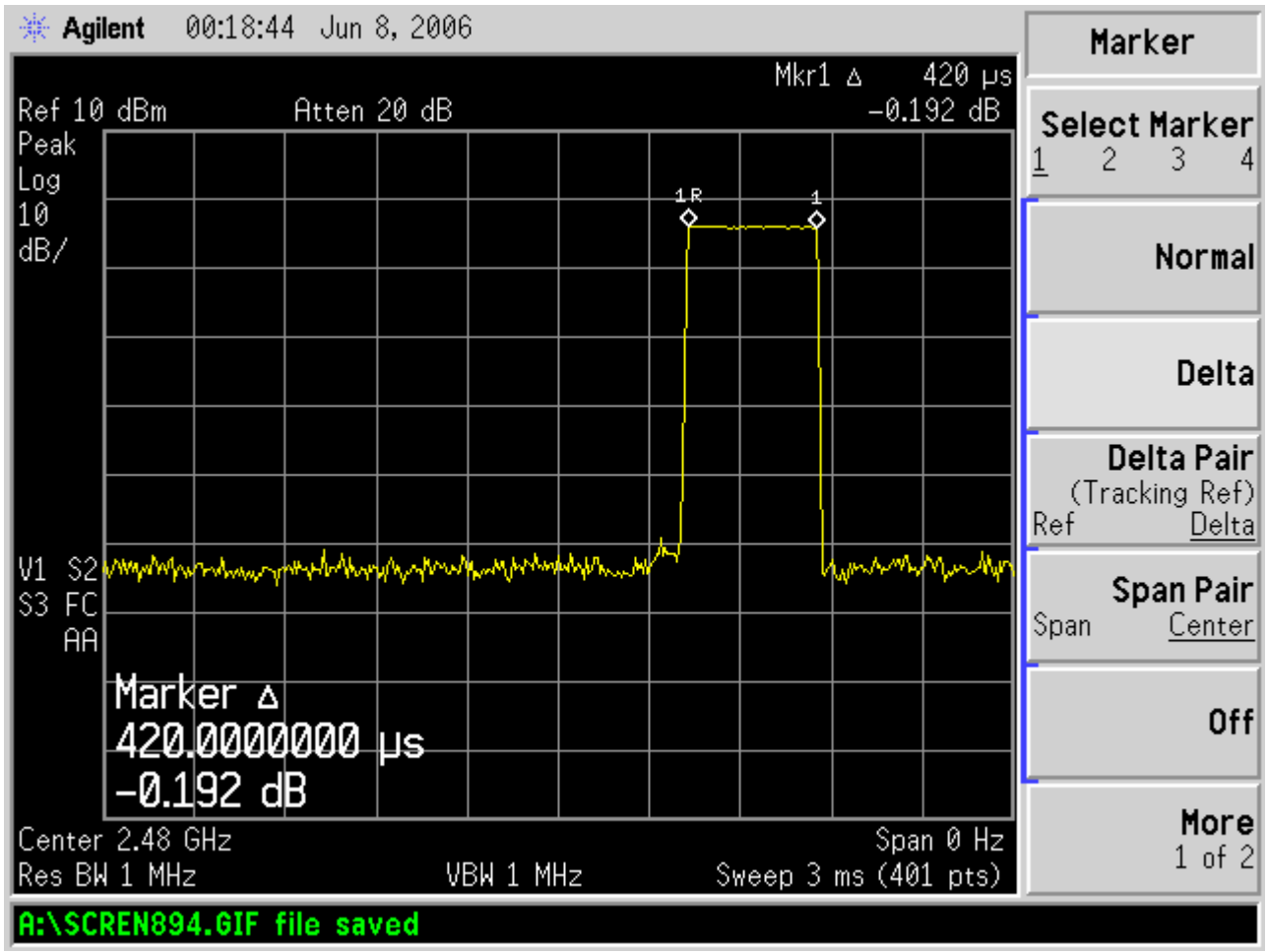
DH1 ( 2402MHz )


Agilent 21:58:01 Jun 8, 2006
Mkr1 Δ 412.5 µs
0.248 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
412.5000000 µs
0.248 dB
Center 2.402 GHz
Res BW 1 MHz
VBW 1 MHz
Span 0 Hz
Sweep 3 ms (401 pts)
A:\SCREN904.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

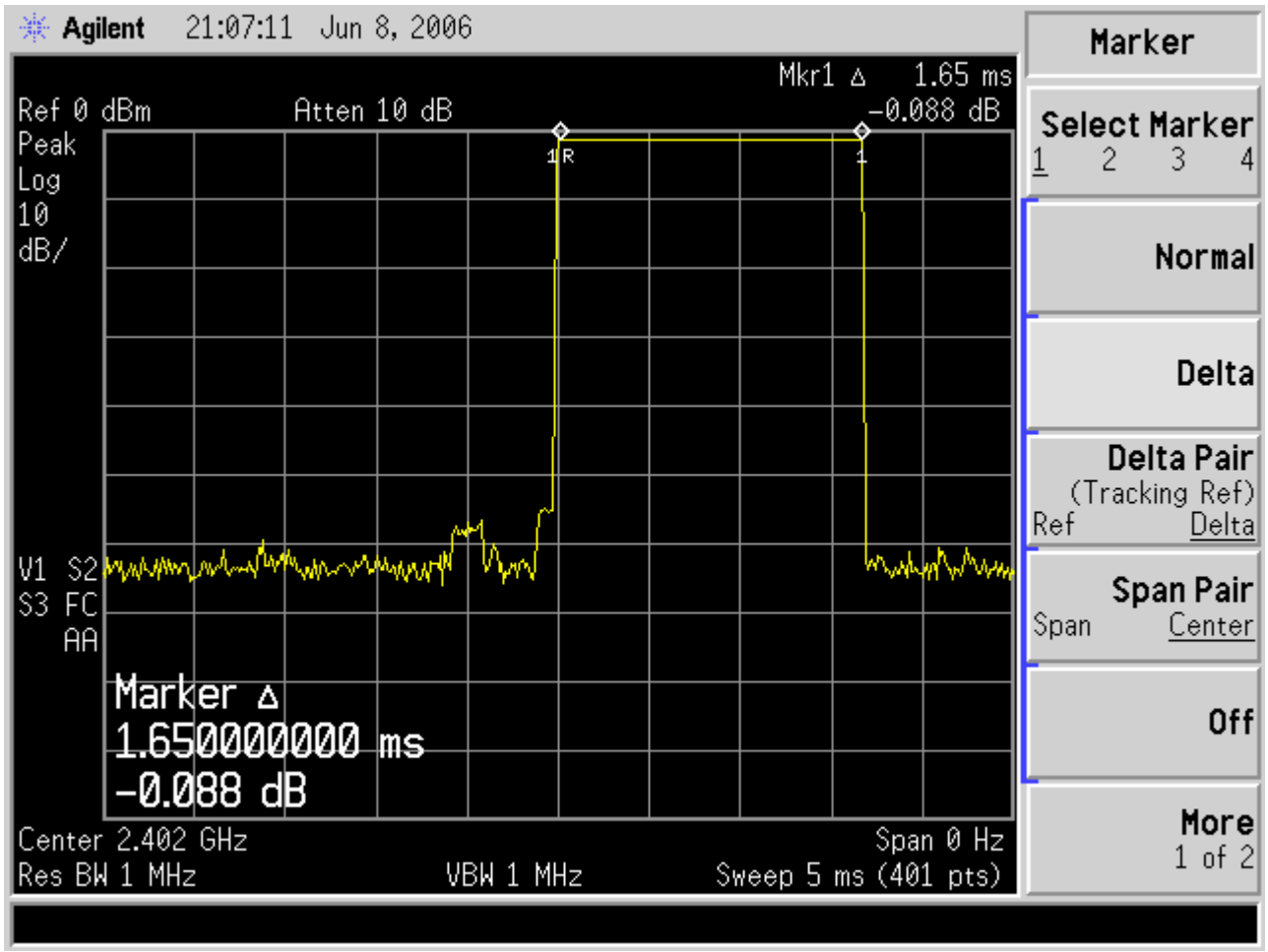
DH1 ( 2441MHz )


Agilent 21:59:58 Jun 8, 2006
Mkr1 Δ 412.5 µs
1.9 dB
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
412.5000000 µs
1.9 dB
Center 2.441 GHz
Res BW 1 MHz
VBW 1 MHz
Span 0 Hz
Sweep 3 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2
A:\SCREN905.GIF file saved

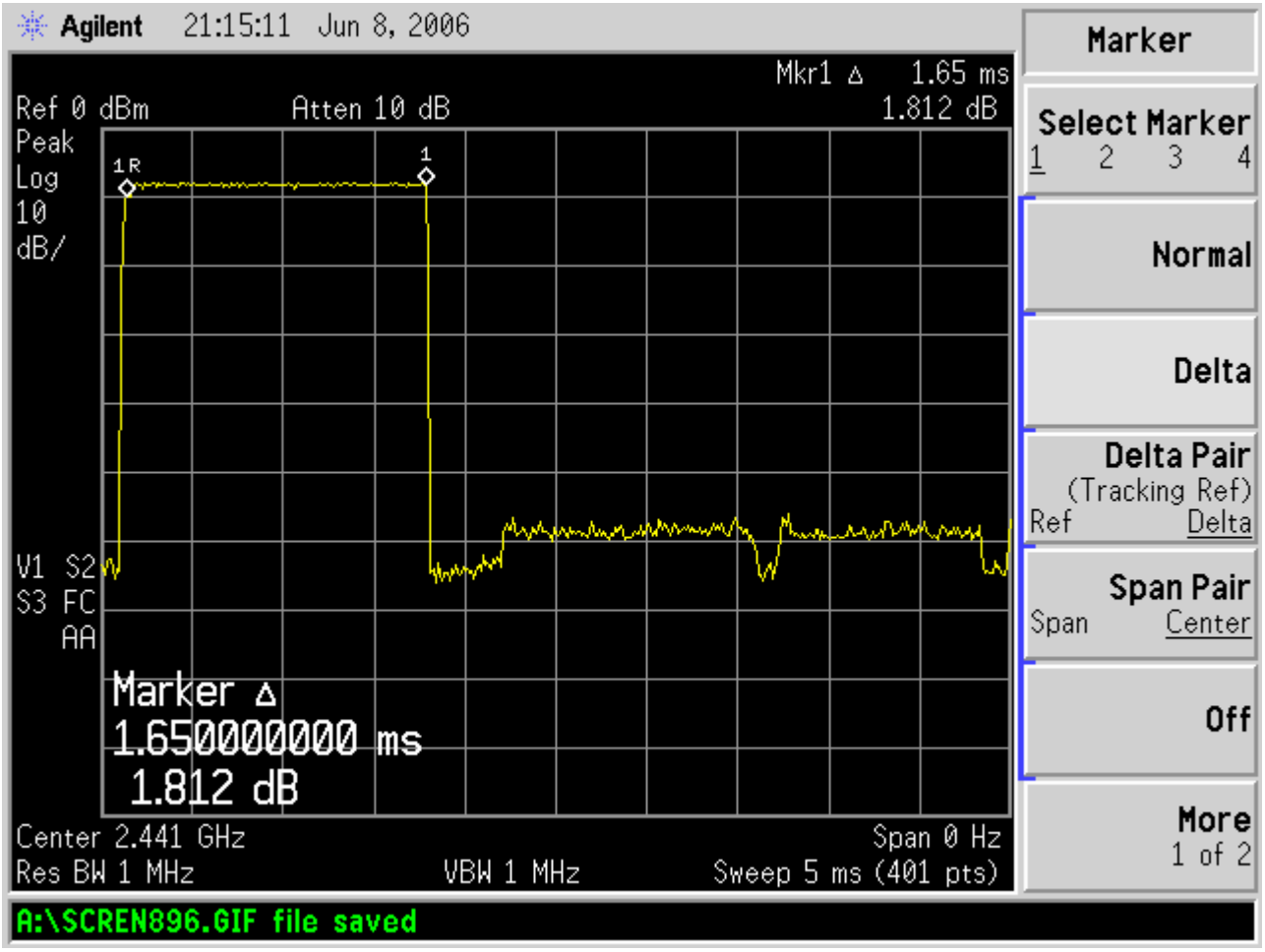
DH1 ( 2480MHz )


Agilent 00:18:44 Jun 8, 2006
Mkr1 Δ 420 µs
Ref 10 dBm Atten 20 dB −0.192 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
420.0000000 µs
−0.192 dB
Center 2.48 GHz Span 0 Hz
Res BW 1 MHz VBW 1 MHz Sweep 3 ms (401 pts)
A:\SCREN894.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

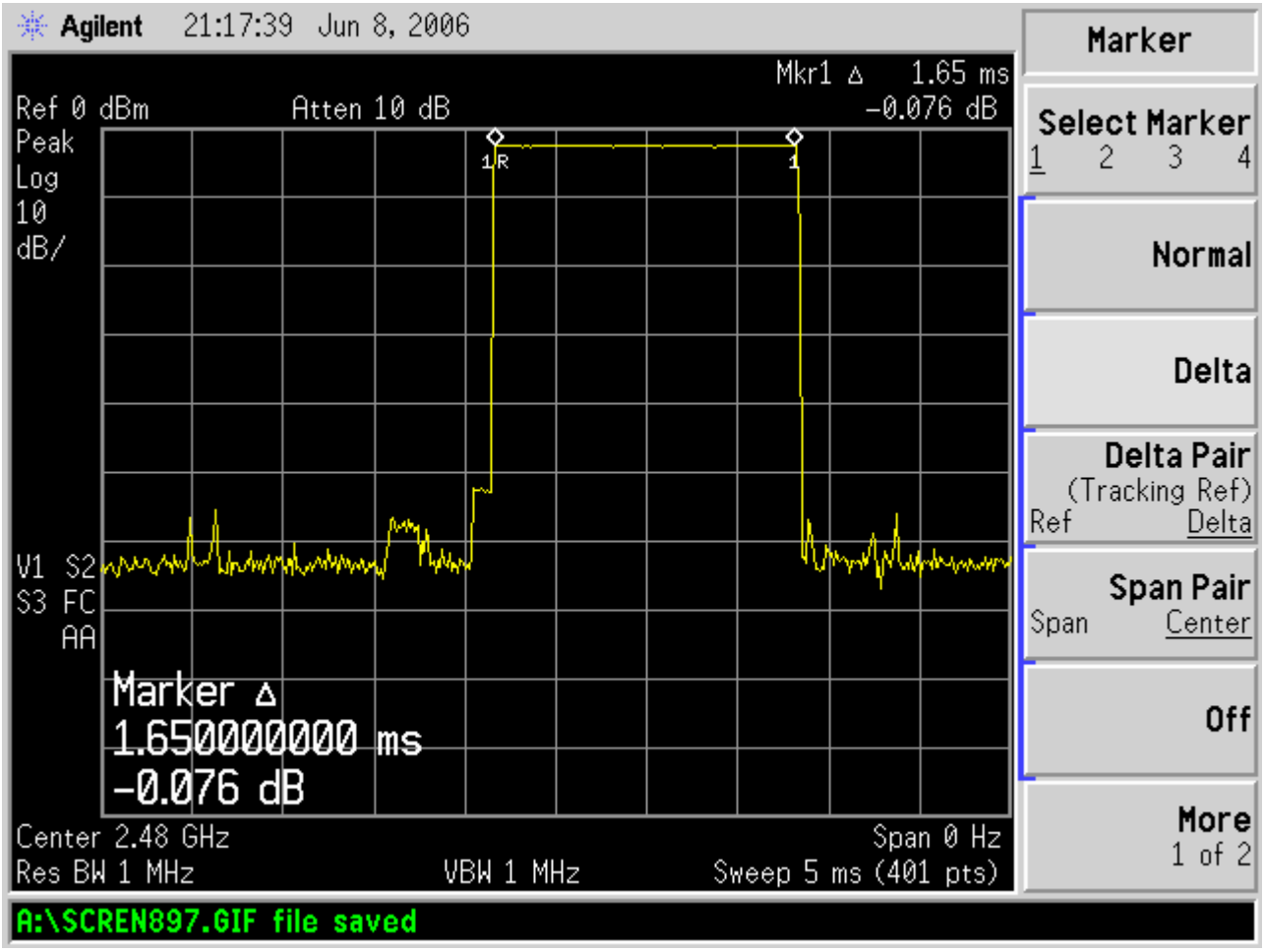
DH3 ( 2402MHz )


Agilent 21:07:11 Jun 8, 2006
Mkr1 Δ 1.65 ms
Ref 0 dBm
Atten 10 dB
-0.088 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
1.650000000 ms
-0.088 dB
Center 2.402 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 5 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

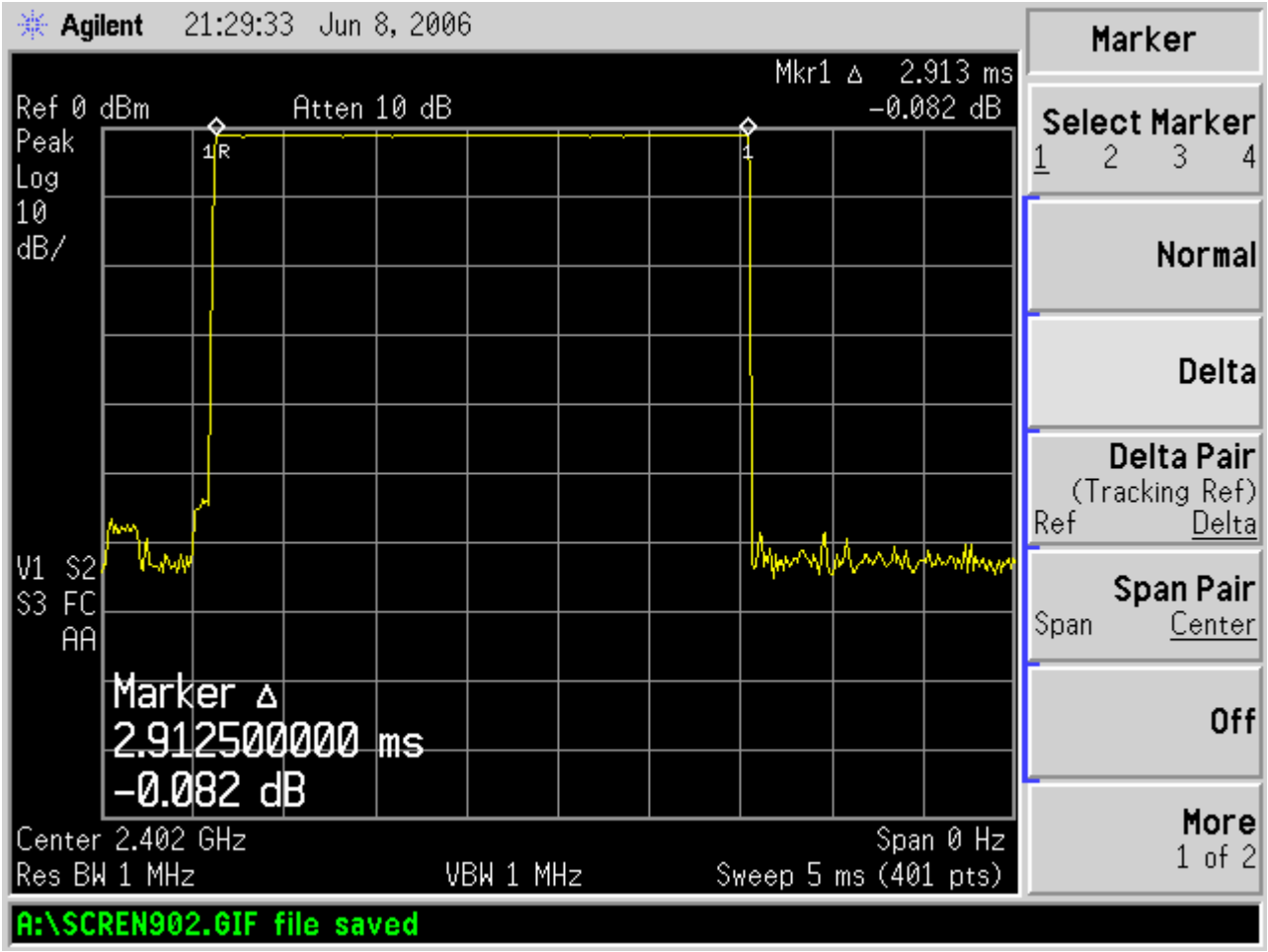
DH3 ( 2441MHz )


Agilent 21:15:11 Jun 8, 2006
Mkr1 Δ 1.65 ms
Ref 0 dBm
Atten 10 dB
1.812 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
1.650000000 ms
1.812 dB
Center 2.441 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 5 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2
A:\SCREN896.GIF file saved

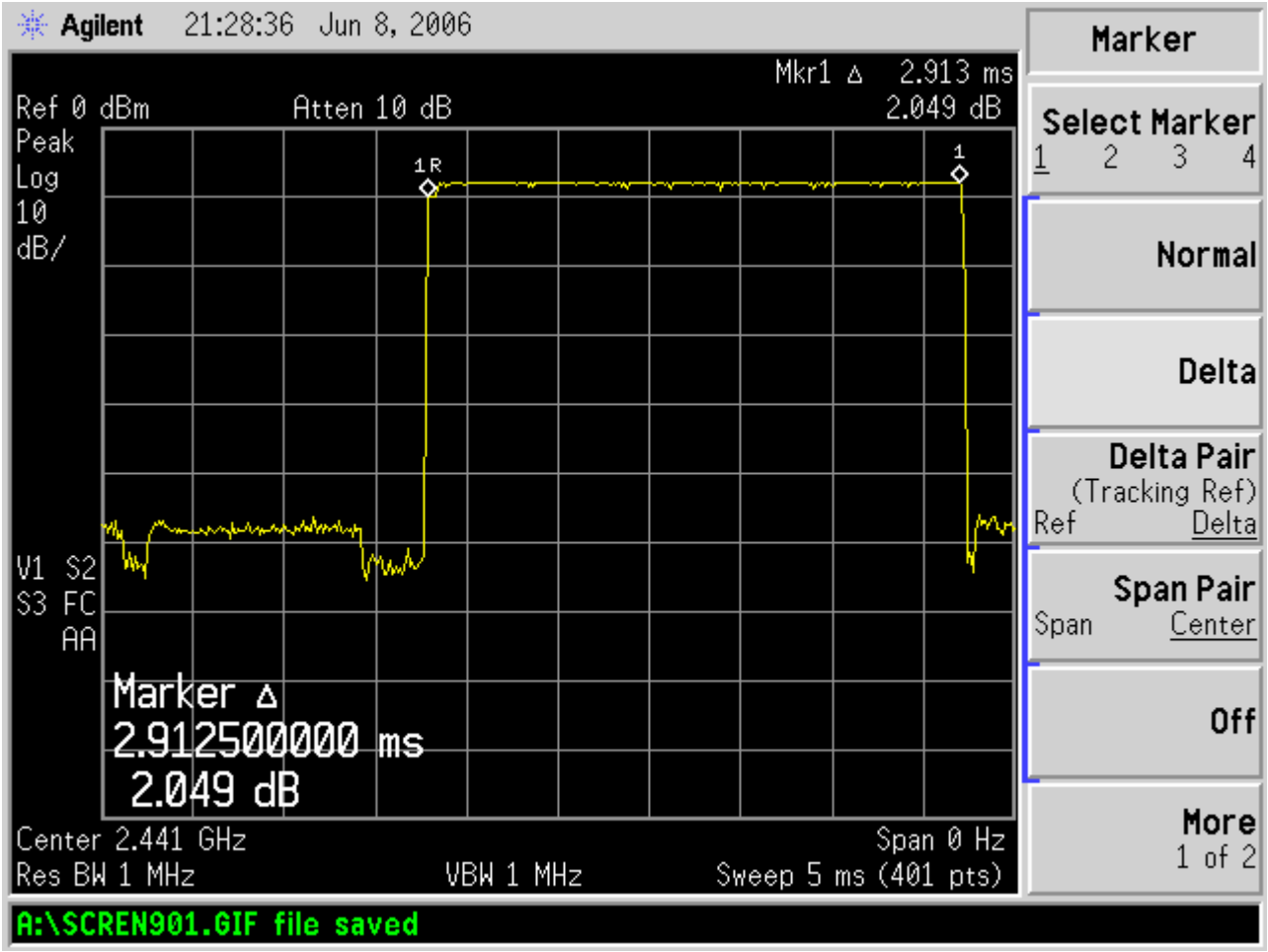
DH3 ( 2480MHz )


Agilent 21:17:39 Jun 8, 2006
Mkr1 Δ 1.65 ms
Ref 0 dBm
Atten 10 dB
-0.076 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
1.650000000 ms
-0.076 dB
Center 2.48 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 5 ms (401 pts)
A:\SCREN897.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

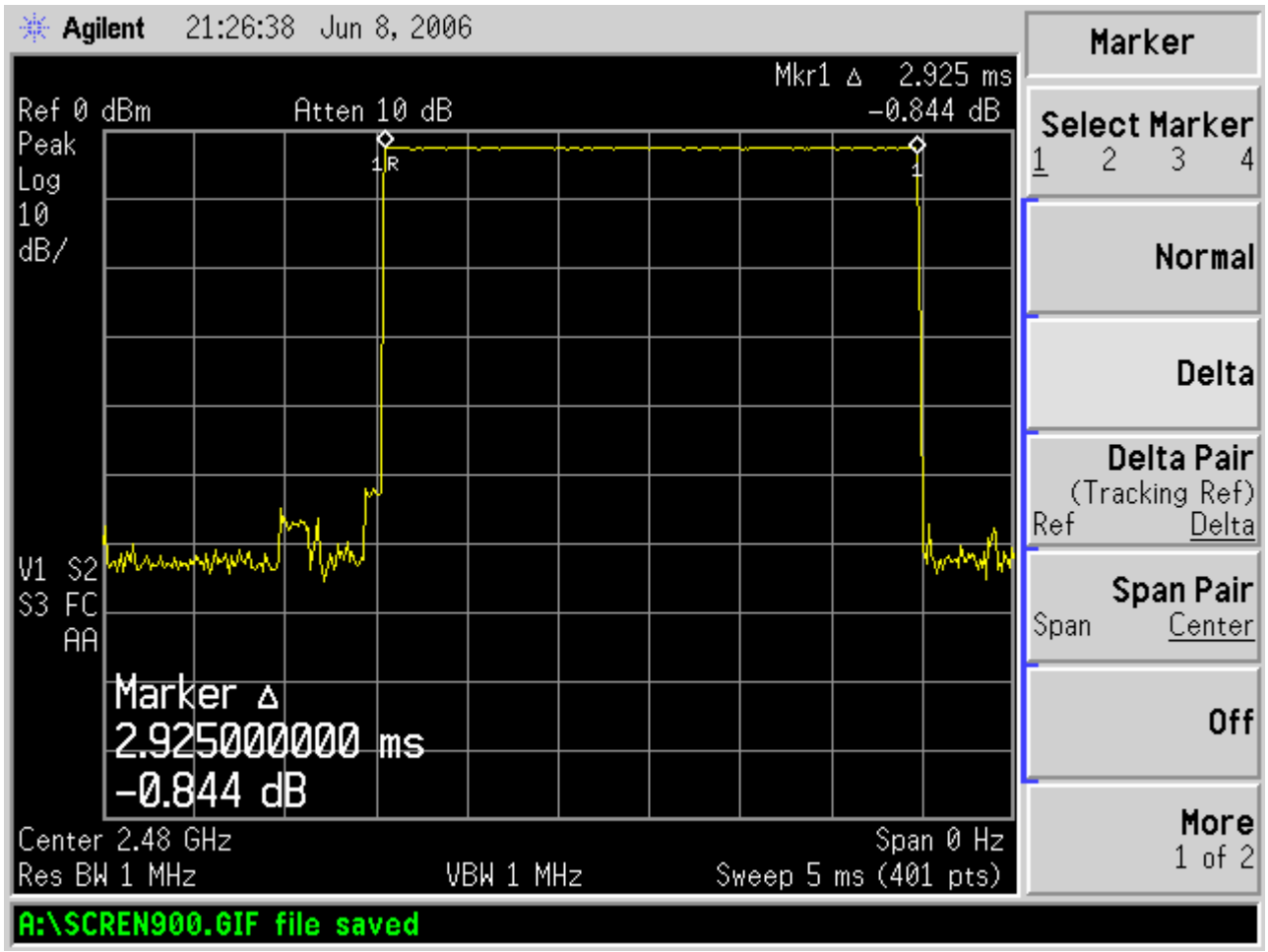
DH5 ( 2402MHz )


Agilent 21:29:33 Jun 8, 2006
Mkr1 Δ 2.913 ms
Ref 0 dBm
Atten 10 dB
−0.082 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
2.912500000 ms
−0.082 dB
Center 2.402 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 5 ms (401 pts)
A:\SCREN902.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

DH5 ( 2441MHz )


Agilent 21:28:36 Jun 8, 2006
Mkr1 Δ 2.913 ms
2.049 dB
Ref 0 dBm
Atten 10 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
2.912500000 ms
2.049 dB
Center 2.441 GHz
Res BW 1 MHz
VBW 1 MHz
Span 0 Hz
Sweep 5 ms (401 pts)
A:\SCREN901.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

DH5 ( 2480MHz )


Agilent 21:26:38 Jun 8, 2006
Mkr1 Δ 2.925 ms
Ref 0 dBm
Atten 10 dB
−0.844 dB
Peak
Log
10
dB/
V1 S2
S3 FC
AA
Marker Δ
2.925000000 ms
−0.844 dB
Center 2.48 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 5 ms (401 pts)
A:\SCREN900.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

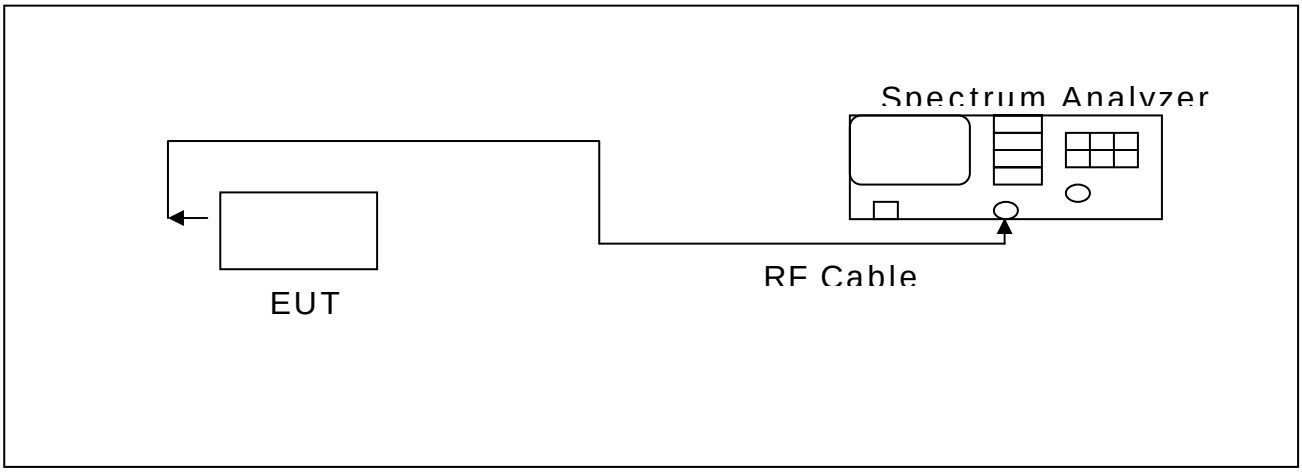
# VII. Hopping Channel Bandwidth Requirements

## 7.1 Test Condition & Setup :

The tests below are run with the EUT's transmitter set at high power in single frequency. A USB port from a computer to the EUT is needed to force selection of output power level and select frequency. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to spectrum analyzer.

Measeure the frequency difference of two frequencies that were attenuated 20dB from the reference level .Record the frequency difference as the emission bandwidth.

## 7.2 Test Instruments Configuration:




## 7.3 Test Equipment List:

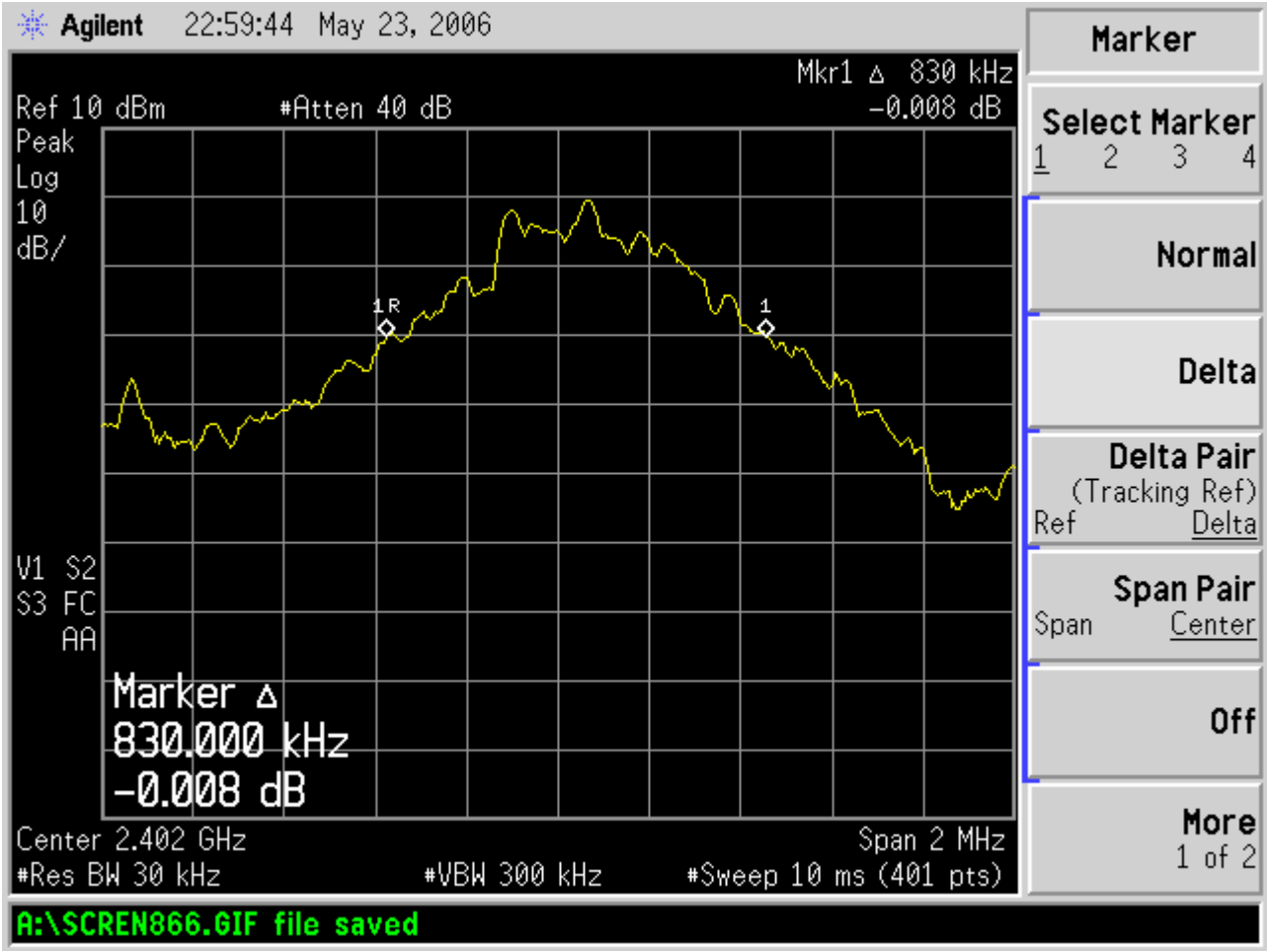
| Item | Mfr/Brand | Instruments | Serial No. | Model/Type No. | Calibrated Date | Next Cali. Date |
|---|---|---|---|---|---|---|
| 1. | Agilent | Spectrum Analyzer | US39240419 | E4407B | 2006/01/17 | 2007/01/17 |

## 7.4 Test Result:

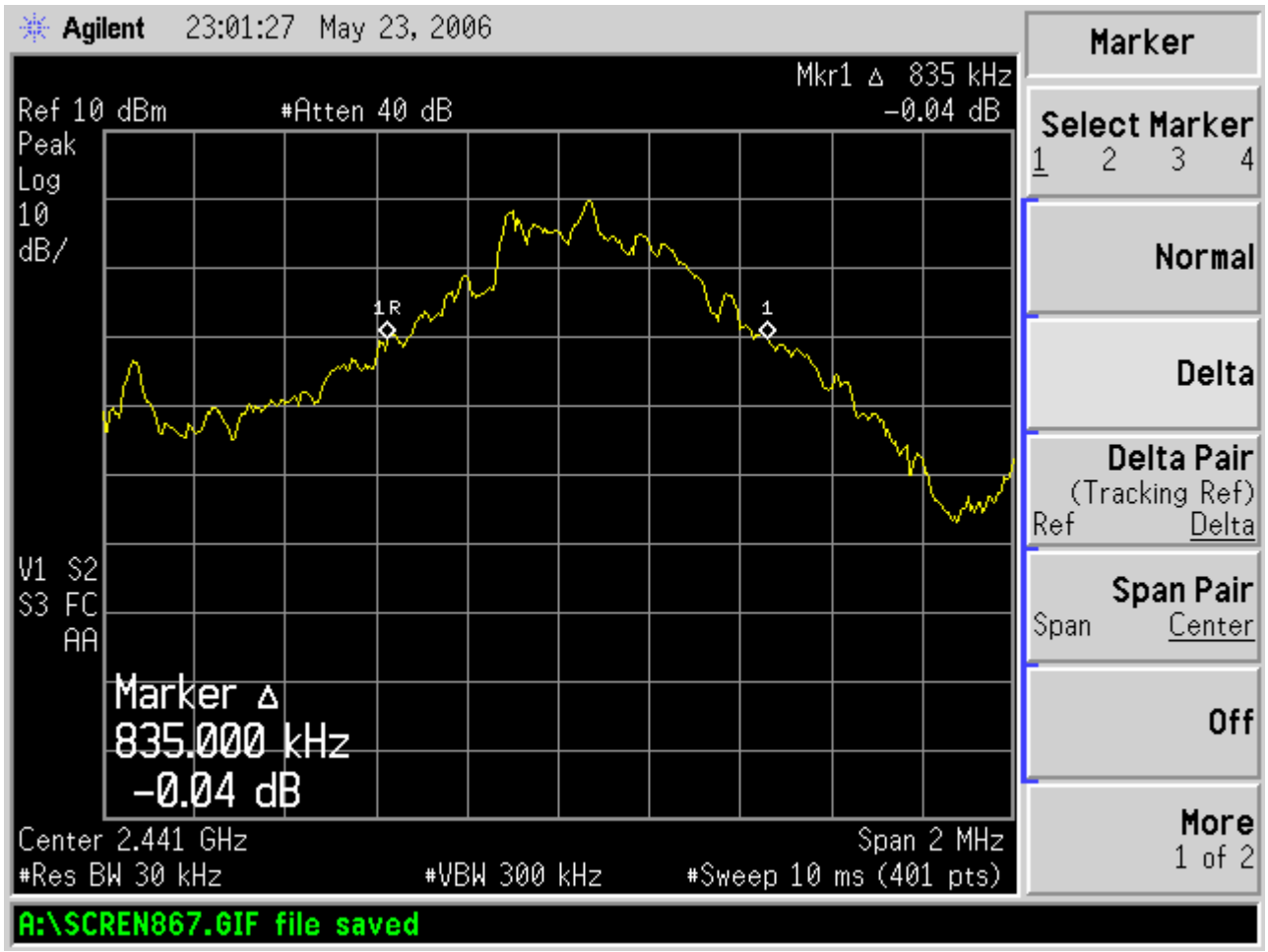
| Frequency (MHz) | 20dB Bandwidth ( kHz ) | Limit |
|---|---|---|
| 2402 | 830 | < 1 MHz |
| 2441 | 835 | < 1 MHz |
| 2480 | 835 | < 1 MHz |

Note : Test Graphs See next page.

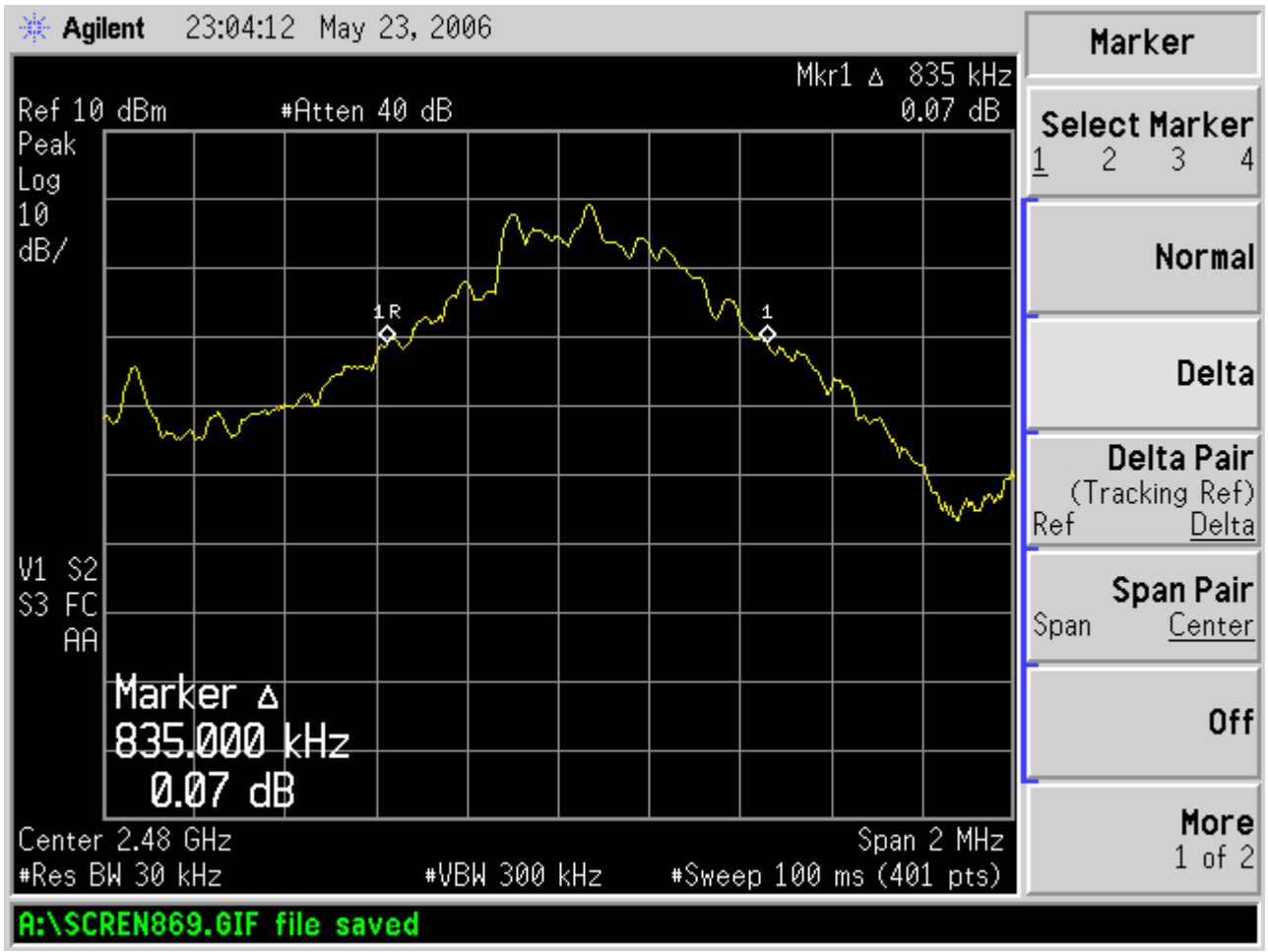
( 2402 MHz )


Agilent 22:59:44 May 23, 2006
Mkr1 Δ 830 kHz
Ref 10 dBm
#Atten 40 dB
−0.008 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
830.000 kHz
−0.008 dB
Center 2.402 GHz
Span 2 MHz
#Res BW 30 kHz
#VBW 300 kHz
#Sweep 10 ms (401 pts)
A:\SCREN866.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

( 2441 MHz )


Agilent 23:01:27 May 23, 2006
Mkr1 Δ 835 kHz
-0.04 dB
Ref 10 dBm
#Atten 40 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
835.000 kHz
-0.04 dB
Center 2.441 GHz
Span 2 MHz
#Res BW 30 kHz
#VBW 300 kHz
#Sweep 10 ms (401 pts)
A:\SCREN867.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

( 2480 MHz )


Agilent 23:04:12 May 23, 2006
Mkr1 Δ 835 kHz
0.07 dB
Ref 10 dBm
#Atten 40 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
835.000 kHz
0.07 dB
Center 2.48 GHz
#Res BW 30 kHz
#VBW 300 kHz
Span 2 MHz
#Sweep 100 ms (401 pts)
A:\SCREN869.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

# VIII. Hopping Channel Separation Requirements

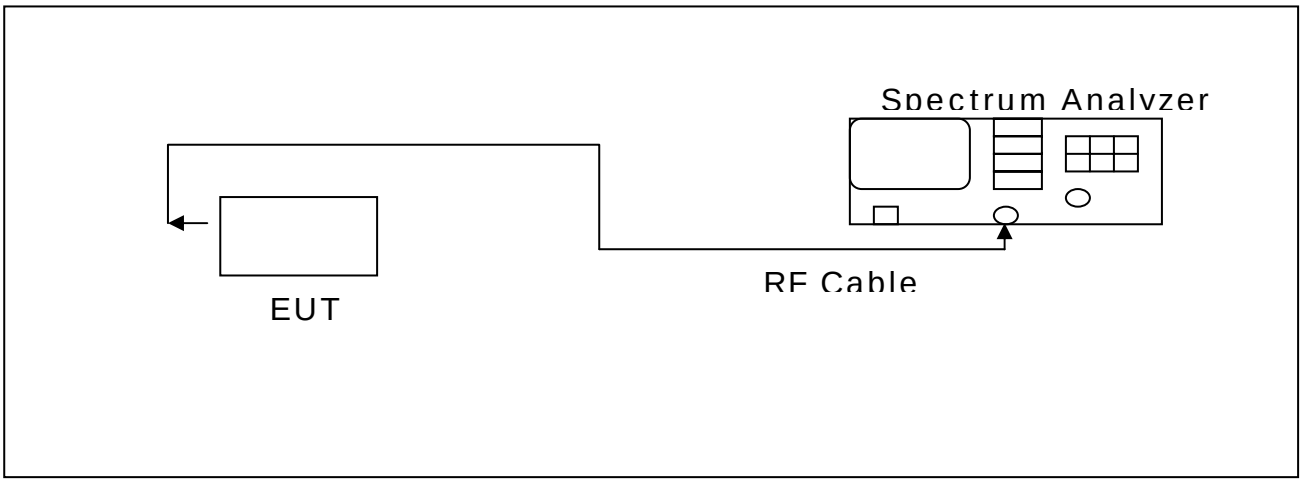
## 8.1 Test Condition & Setup :

At least 25kHz or 20dB bandwidth (which is greater).

The tests below are run with the EUT's transmitter set at hopping mode. Use a direct connection between the antenna port of transmitter and the spectrum Analyzer.

Record the separation of two adjacent channels.

## 8.2 Test Instruments Configuration:




## 8.3 Test Equipment List:

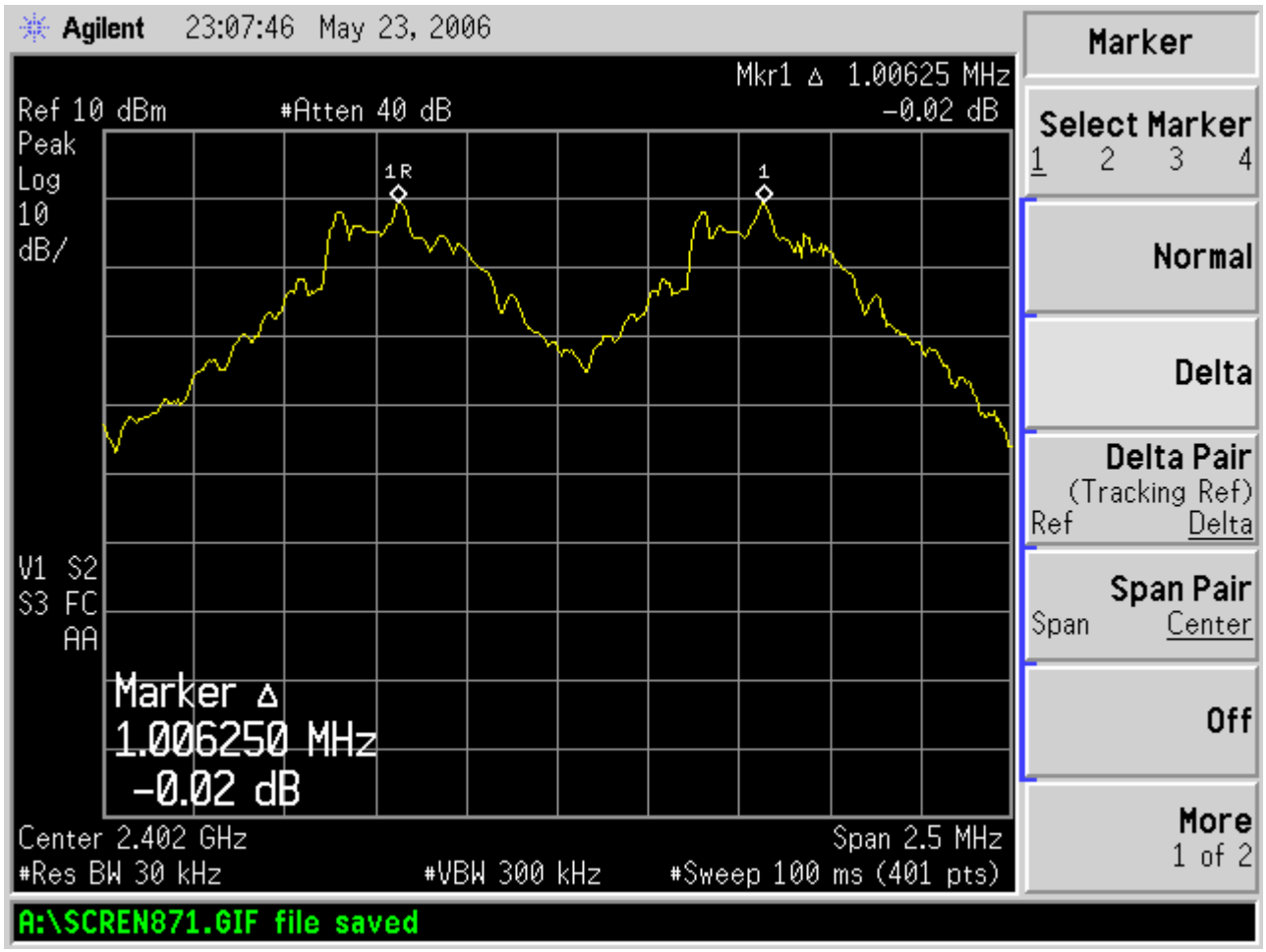
| Item | Mfr/Brand | Instruments | Serial No. | Model/Type No. | Calibrated Date | Next Cali. Date |
|---|---|---|---|---|---|---|
| 1. | Agilent | Spectrum Analyzer | US39240419 | E4407B | 2006/01/17 | 2007/01/17 |

## 8.4 Test Result:

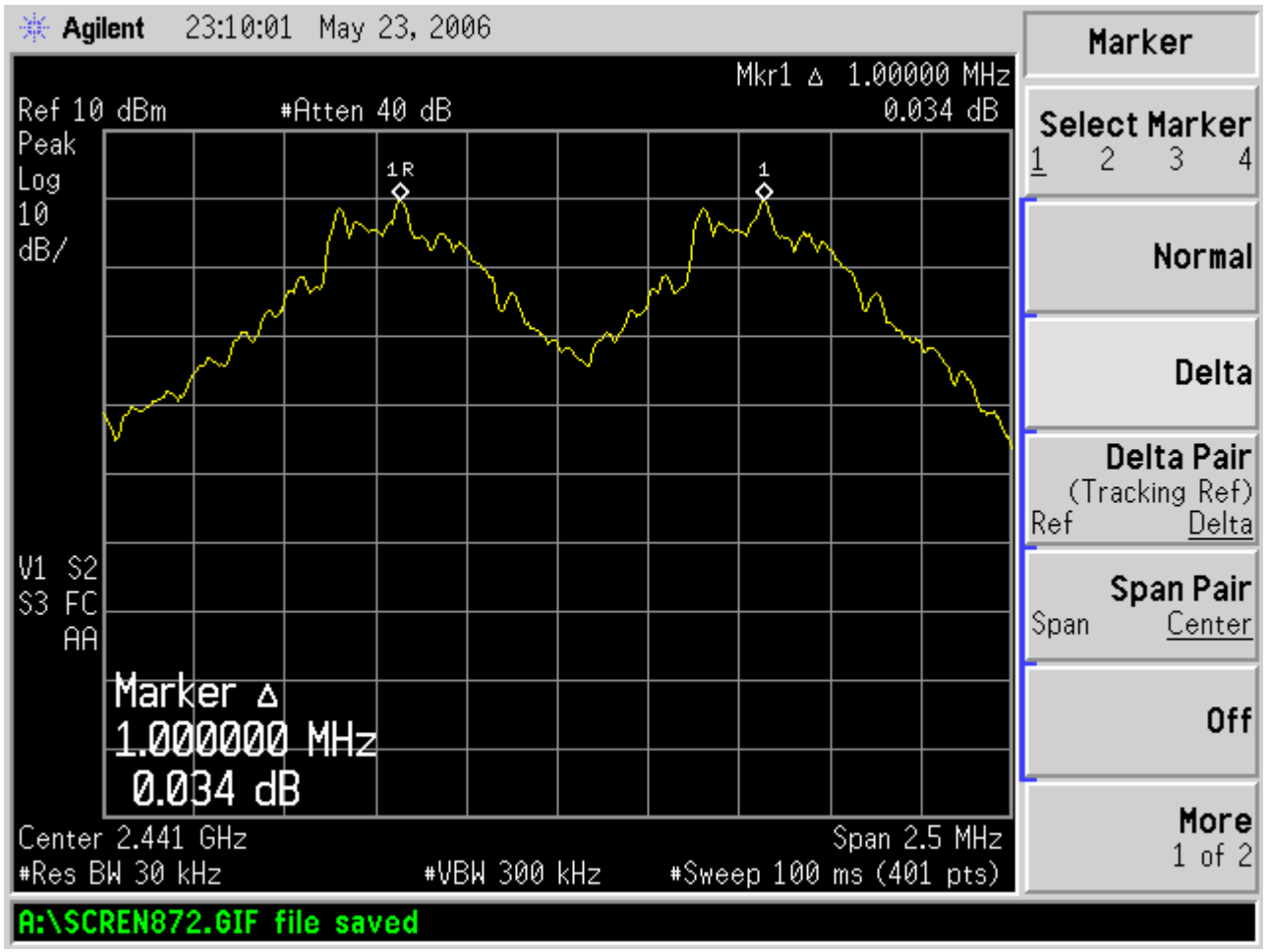
| Frequency (MHz) | Min. Limit ( kHz ) | Adjacent Channel Separation |
|---|---|---|
| 2402 | 830 | 1 MHz |
| 2441 | 835 | 1 MHz |
| 2480 | 835 | 1 MHz |

*Note : Test Graphs See next page.*

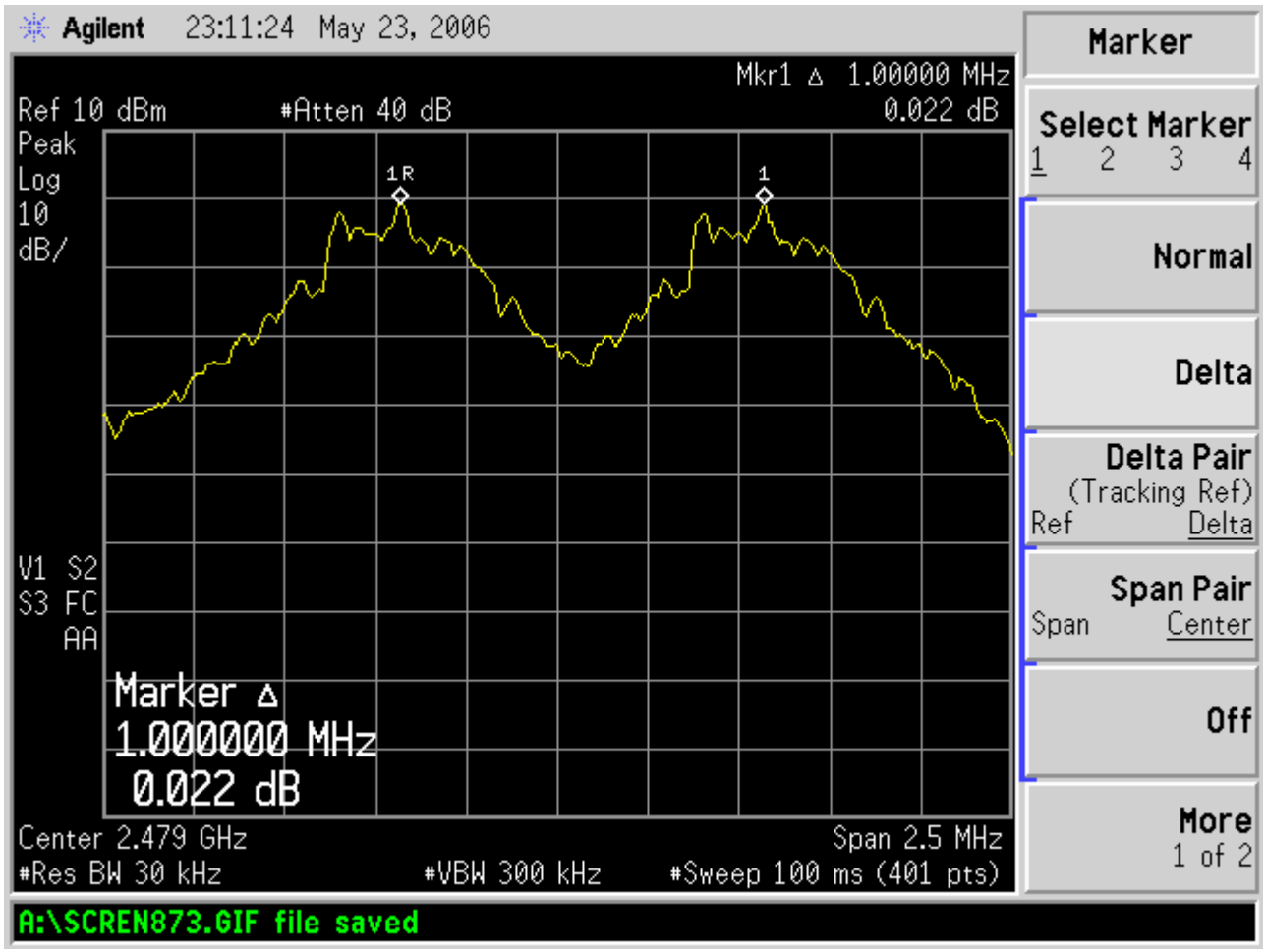
( 2402MHz )


Agilent 23:07:46 May 23, 2006
Mkr1 Δ 1.00625 MHz
Ref 10 dBm #Atten 40 dB -0.02 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
1.006250 MHz
-0.02 dB
Center 2.402 GHz
Span 2.5 MHz
#Res BW 30 kHz
#VBW 300 kHz
#Sweep 100 ms (401 pts)
A:\SCREN871.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

( 2441MHz )


Agilent 23:10:01 May 23, 2006
Mkr1 Δ 1.00000 MHz
0.034 dB
Ref 10 dBm
#Atten 40 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
1.000000 MHz
0.034 dB
Center 2.441 GHz
#Res BW 30 kHz
#VBW 300 kHz
Span 2.5 MHz
#Sweep 100 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2
A:\SCREN872.GIF file saved

( 2480MHz )


Agilent 23:11:24 May 23, 2006
Mkr1 Δ 1.00000 MHz
0.022 dB
Ref 10 dBm
#Atten 40 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
1.000000 MHz
0.022 dB
Center 2.479 GHz
#Res BW 30 kHz
#VBW 300 kHz
Span 2.5 MHz
#Sweep 100 ms (401 pts)
A:\SCREN873.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

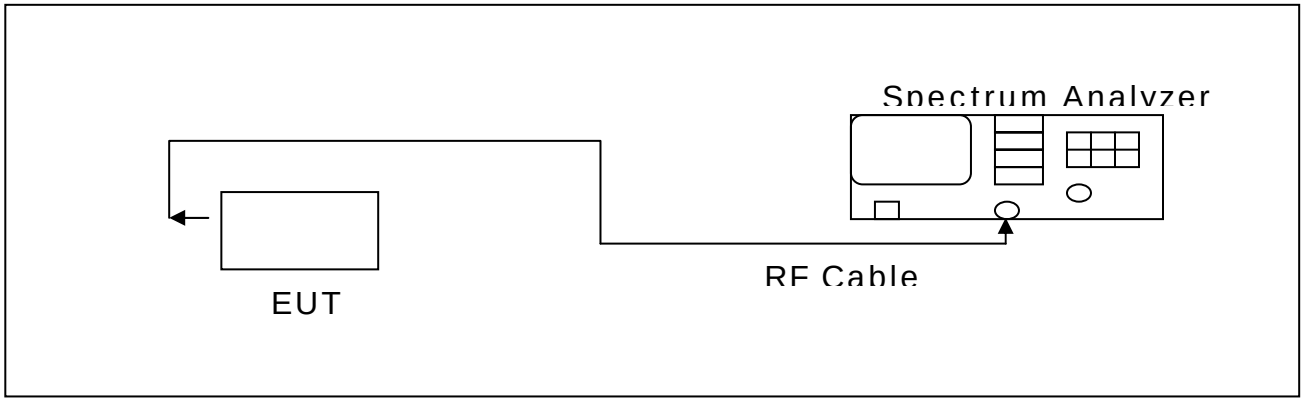
# IX. Band Edges Requirements

## 9.1 Test Condition & Setup :

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer.

Set RBW and VBW of spectrum analyzer to 100kHz.

## 9.2 Test Instruments Configuration:




## 9.3 Test Equipment List:

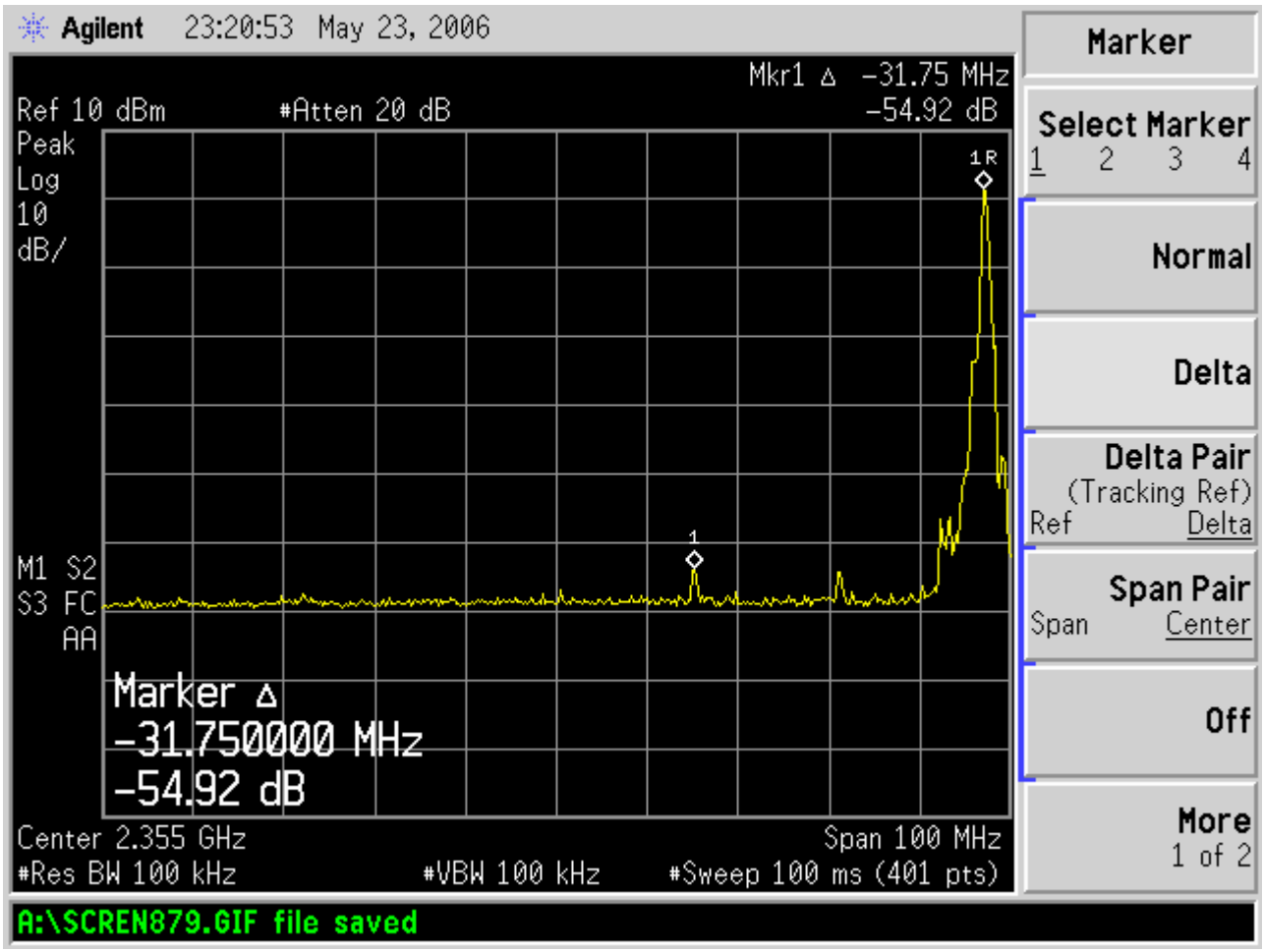
| Item | Mfr/Brand | Instruments | Serial No. | Model/Type No. | Calibrated Date | Next Cali. Date |
|---|---|---|---|---|---|---|
| 1. | Agilent | Spectrum Analyzer | US39240419 | E4407B | 2006/01/17 | 2007/01/17 |

## 9.4 Test Result:

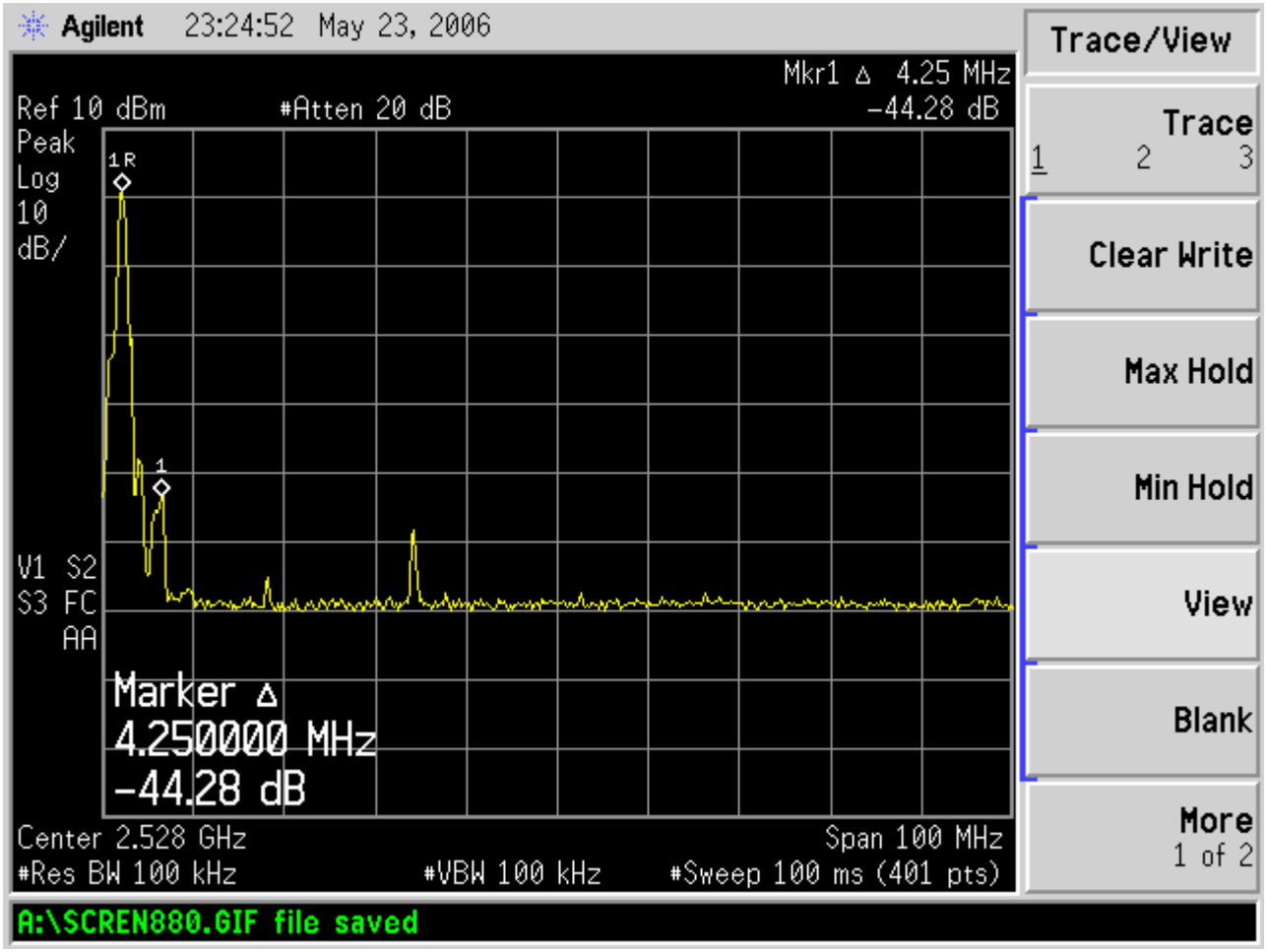
Refer to attached data sheets. Data shows out of band emissions are suppressed well below the -20 dBc minimum required by the Rules.

*Note : Test Graphs See next page.*

( 2402MHz )


Agilent 23:20:53 May 23, 2006
Mkr1 Δ -31.75 MHz
-54.92 dB
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
1R
M1 S2
S3 FC
AA
Marker Δ
-31.750000 MHz
-54.92 dB
Center 2.355 GHz
Span 100 MHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 100 ms (401 pts)
A:\SCREN879.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

( 2480MHz )


Agilent 23:24:52 May 23, 2006
Mkr1 Δ 4.25 MHz
-44.28 dB
Ref 10 dBm
#Atten 20 dB
Peak
Log
10
dB/
1R
1
V1 S2
S3 FC
AA
Marker Δ
4.250000 MHz
-44.28 dB
Center 2.528 GHz
#Res BW 100 kHz
#VBW 100 kHz
Span 100 MHz
#Sweep 100 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
A:\SCREN880.GIF file saved

# X. Antenna Requirements

## 10.1 Standard Applicable :

For intentional device, according to 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.

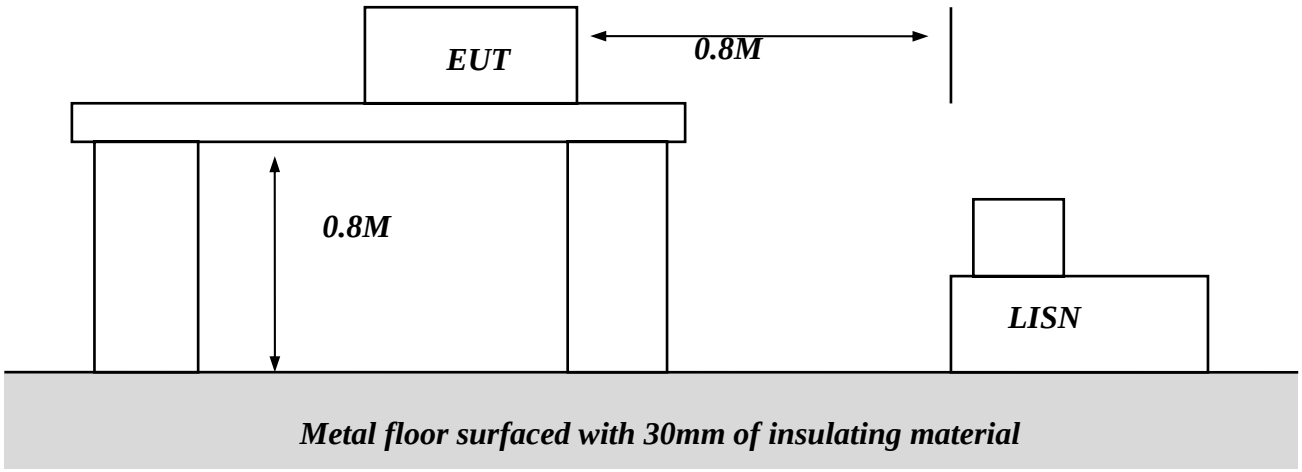
And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

## 10.2 Antenna Connector Construction

The antenna used in this product is printed antenna . And the maximum Gain of this antenna is only 0.0dBi .

# Appendix I- EUT Test SETUP

## MEASUREMENT OF POWER LINE CONDUCTED RFI VOLTAGE



# Appendix I- EUT Test SETUP

## MEASUREMENT OF RADIATED EMISSION