



Appendix B. Attachment of Report for additional measurement data

EQUIPMENT: Bluetooth Headset-H3

TRADE NAME : Motorola

MODEL NO. : H3


FCC ID: QVZ-H500

APPLICANT: Motorola Inc.

600 North US Highway 45, Room AN2, Libertyville, Illinois, 60048, U.S.A.

The test result shown in the test report is the same with that of the original one in test report no. **FR531503-02**, except the different printed antenna with 4.27dBi. All test results have been modified

This attachment should be filed together with original test report **FR531503-02** for reference.



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1. Test Result

1.1. Test of Hopping Channel Bandwidth

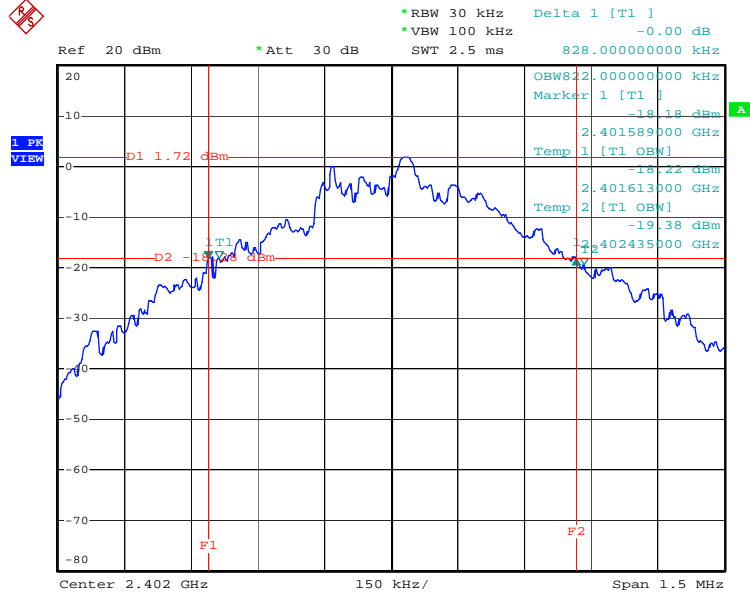
1.1.1. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 46.80%
- Test Engineer: Steven Lu

| Modulation Type | Channel No. | Frequency (MHz) | 20dB Bandwidth (kHz) | 99% Occupied BW (kHz) | Min. Limit (kHz) |
|-----------------|-------------|-----------------|----------------------|-----------------------|------------------|
| GFSK | 00 | 2402 MHz | 828.00 | 822.00 | 25 |
| GFSK | 39 | 2441 MHz | 822.00 | 837.00 | 25 |
| GFSK | 78 | 2480 MHz | 852.00 | 831.00 | 25 |

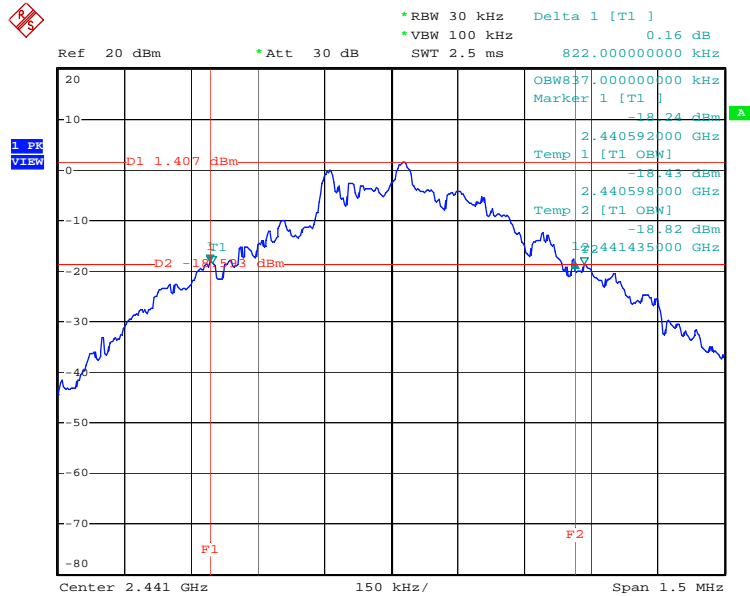


Modulation Type: GFSK (Channel 00) :



Date: 7.OCT.2005 17:43:01

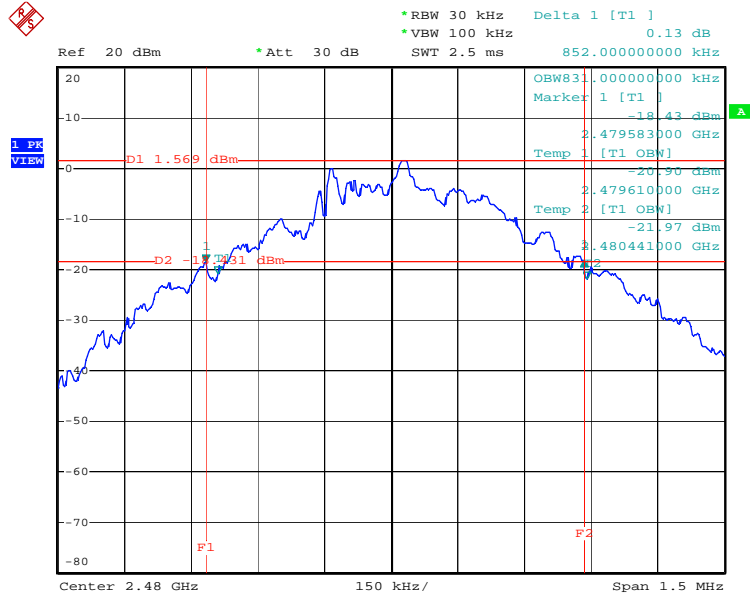
Modulation Type: GFSK (Channel 39) :



Date: 7.OCT.2005 17:45:46



Modulation Type: GFSK (Channel 78) :



Date: 7.OCT.2005 17:47:19



1.2. Test of Hopping Channel Separation

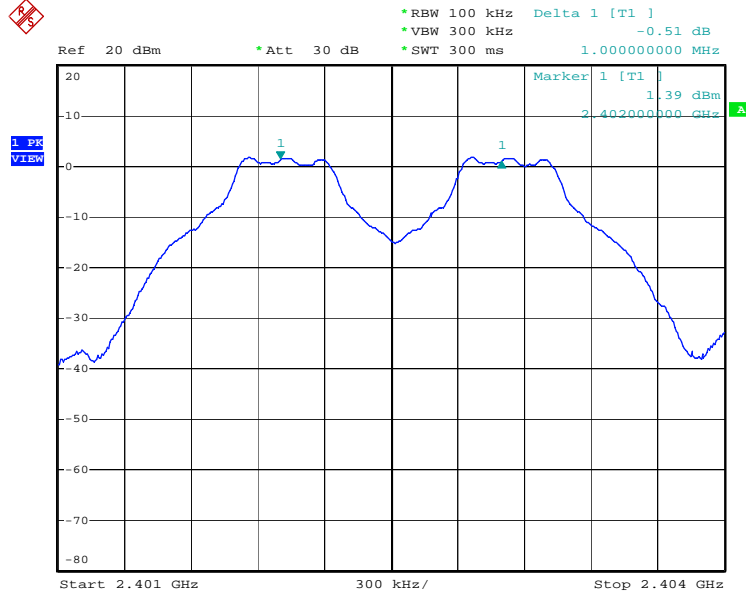
1.2.1. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 46.80%
- Test Engineer: Steven Lu

| Modulation Type | Channel No. | Frequency (MHz) | Hopping Channel Separation (kHz) | Min. Limit (kHz) |
|-----------------|-------------|-----------------|----------------------------------|------------------|
| GFSK | 00 | 2402 MHz | 1000 | 828.00 |
| GFSK | 39 | 2441 MHz | 1000 | 822.00 |
| GFSK | 78 | 2480 MHz | 1000 | 852.00 |

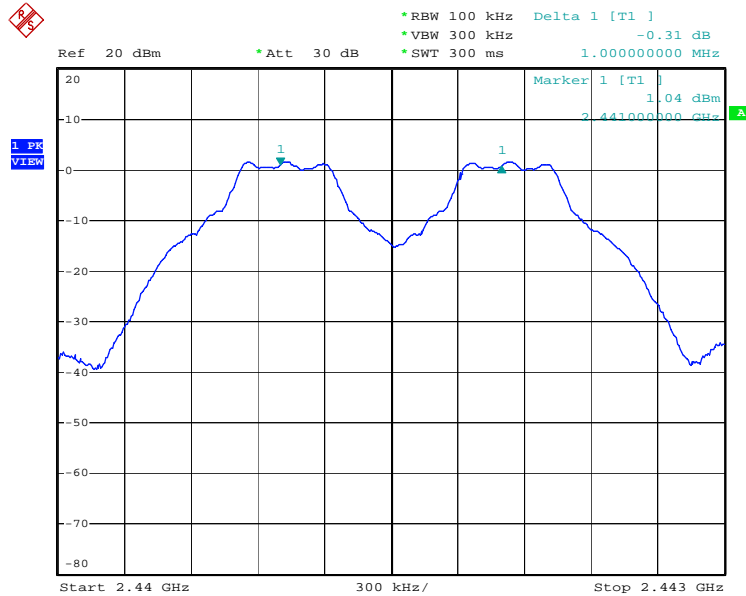


Modulation Type: GFSK (Channel 00) :



Date: 7.OCT.2005 17:42:53

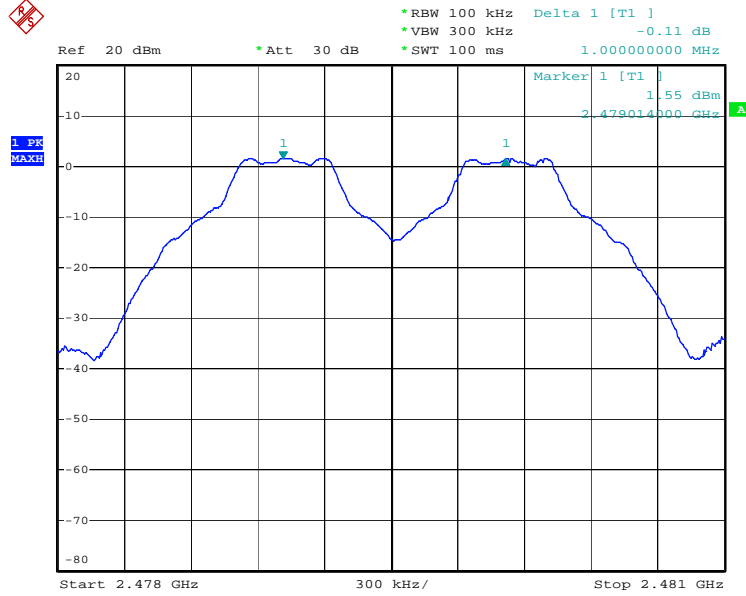
Modulation Type: GFSK (Channel 39) :



Date: 7.OCT.2005 17:45:39



Modulation Type: GFSK (Channel 78) :



Date: 7.OCT.2005 17:59:57

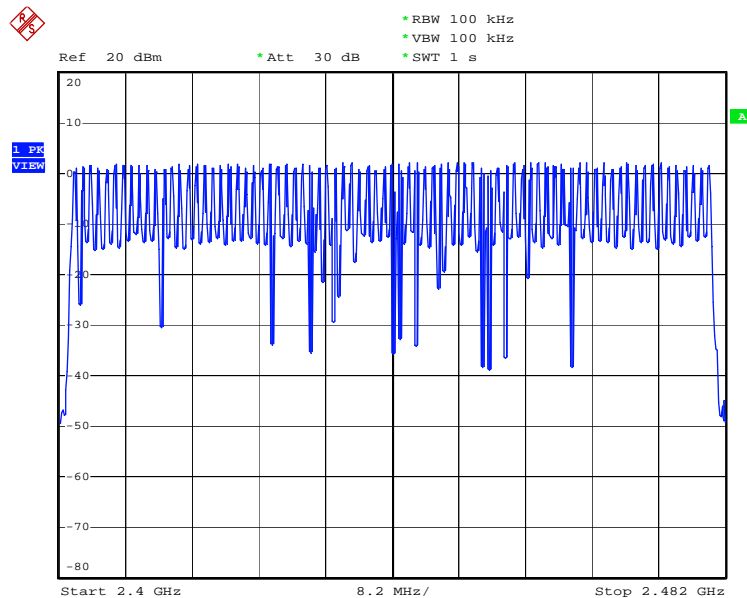
1.3. Test of Number of Hopping Frequency

1.3.1. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 46.80%
- Test Engineer: Steven Lu

| Modulation Type | Channel No. | Frequency (MHz) | Number of Hopping Ch. (Channels) | Min. Limit (Channels) |
|-----------------|-------------|---------------------|----------------------------------|-----------------------|
| GFSK | 00 ~ 78 | 2402 MHz ~ 2480 MHz | 79 | 75 |

Modulation Type: GFSK (Channel 00 ~ Channel 78) :



Date: 7.OCT.2005 17:44:47



1.4. Test of Dwell Time of Each Frequency

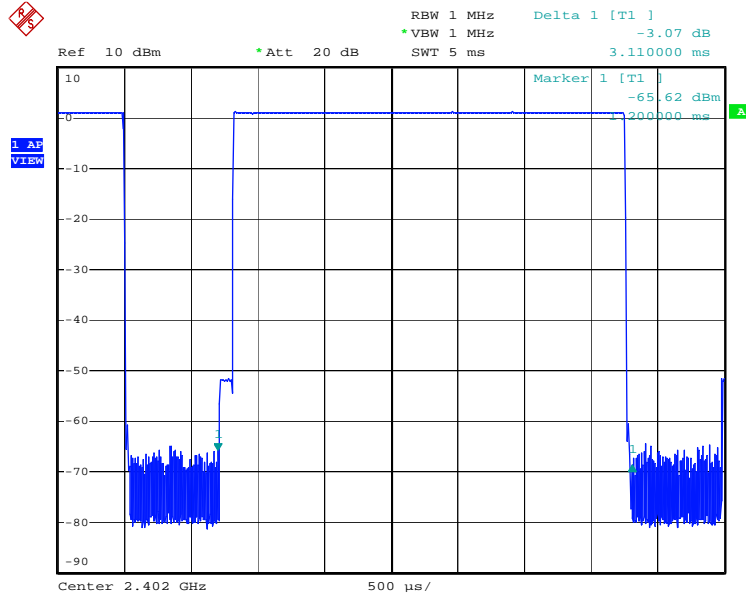
1.4.1. Test Result

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 46.80%
- Test Engineer: Steven Lu

| Data Packet | Frequency (MHz) | Pulse Duration (ms) | Dwell Time (s) | Limits (s) |
|-------------|-----------------|---------------------|----------------|------------|
| DH5 | 2402 MHz | 3.1000 | 0.3307 | 0.4000 |
| DH3 | 2402 MHz | 1.8500 | 0.2960 | 0.4000 |
| DH1 | 2402 MHz | 0.5800 | 0.1856 | 0.4000 |
| DH5 | 2441 MHz | 3.1000 | 0.3307 | 0.4000 |
| DH3 | 2441 MHz | 1.8500 | 0.2960 | 0.4000 |
| DH1 | 2441 MHz | 0.5800 | 0.1856 | 0.4000 |
| DH5 | 2480 MHz | 3.1000 | 0.3307 | 0.4000 |
| DH3 | 2480 MHz | 1.8500 | 0.2960 | 0.4000 |
| DH1 | 2480 MHz | 0.5850 | 0.1872 | 0.4000 |

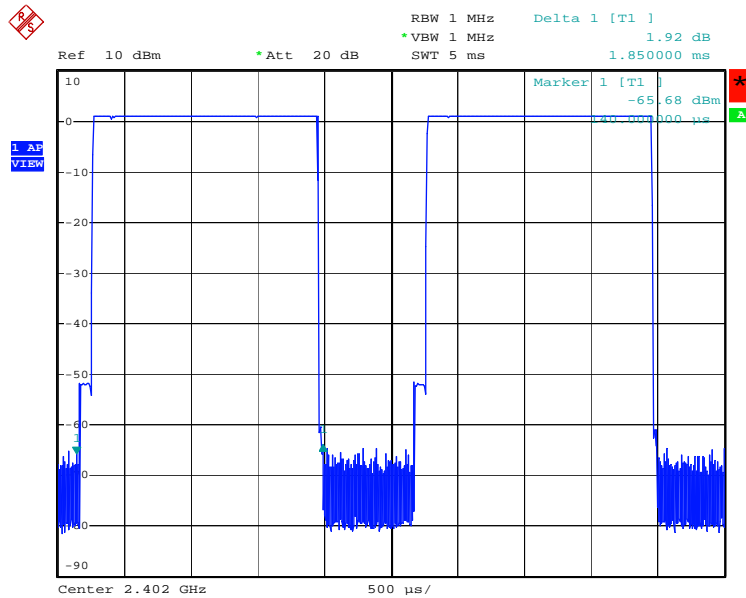


DH5 Modulation Type: GFSK (Channel 00) :



Date: 7.OCT.2005 17:55:01

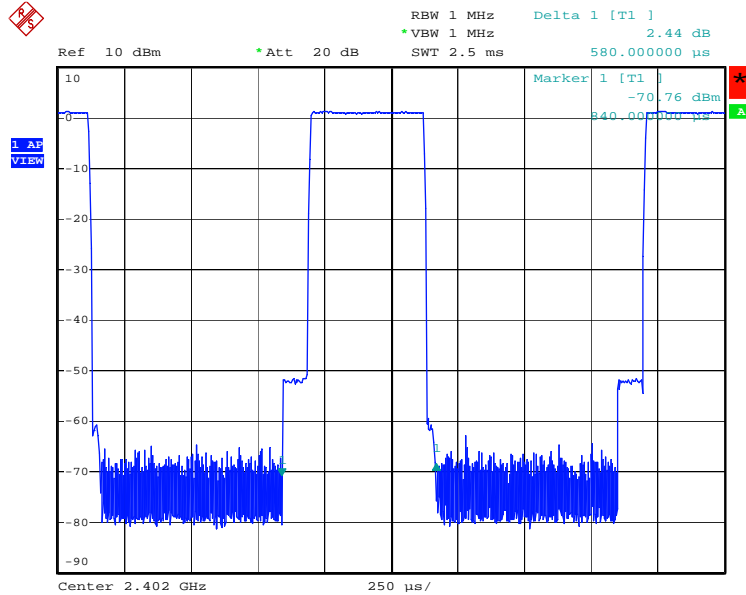
DH3 Modulation Type: GFSK (Channel 00) :



Date: 7.OCT.2005 17:52:36

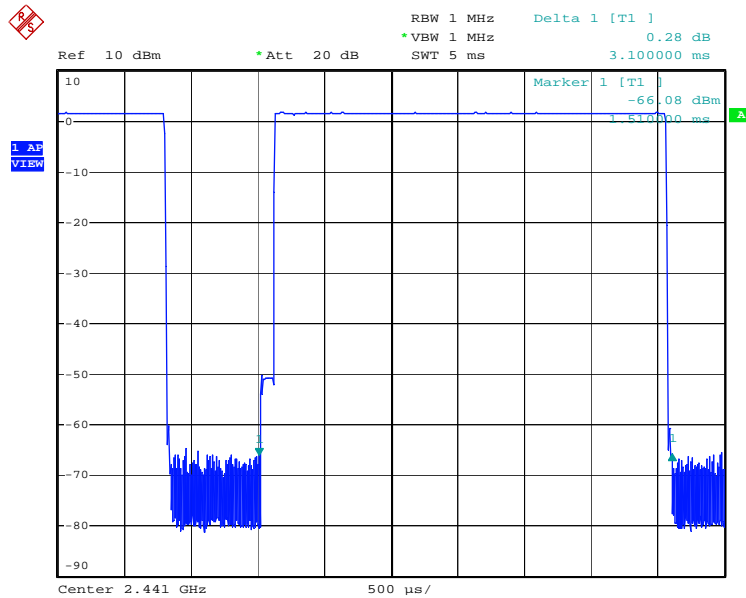


DH1 Modulation Type: GFSK (Channel 00) :



Date: 7.OCT.2005 17:52:03

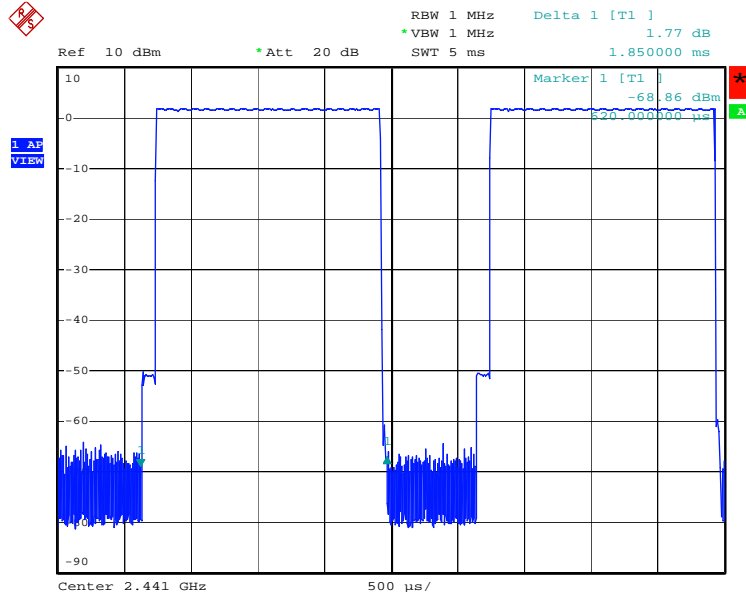
DH5 Modulation Type: GFSK (Channel 39) :



Date: 7.OCT.2005 17:54:33

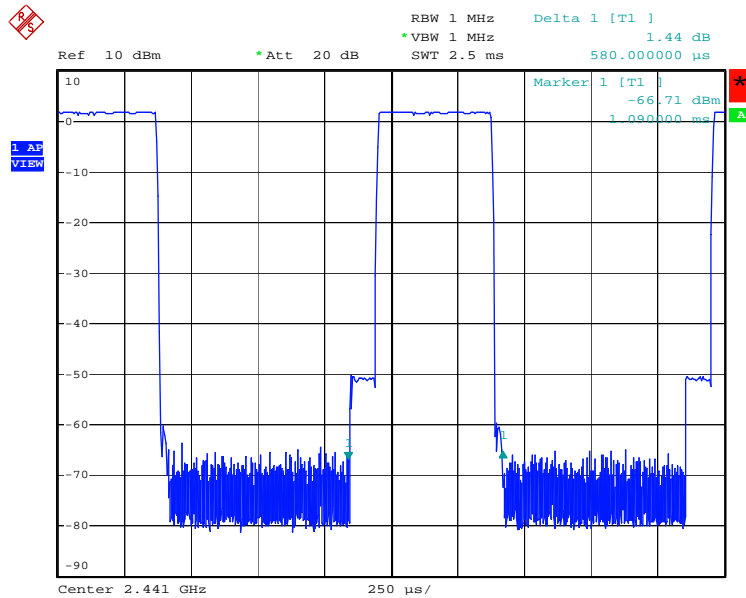


DH3 Modulation Type: GFSK (Channel 39) :



Date: 7.OCT.2005 17:53:02

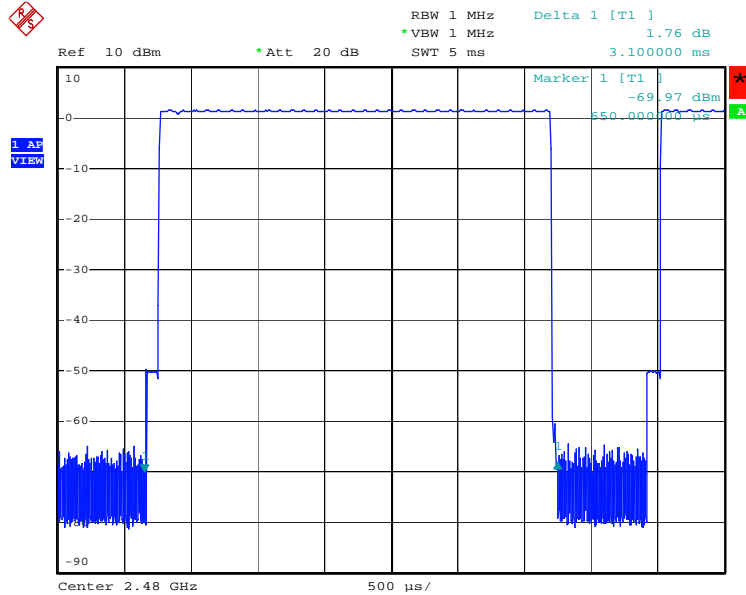
DH1 Modulation Type: GFSK (Channel 39) :



Date: 7.OCT.2005 17:51:42

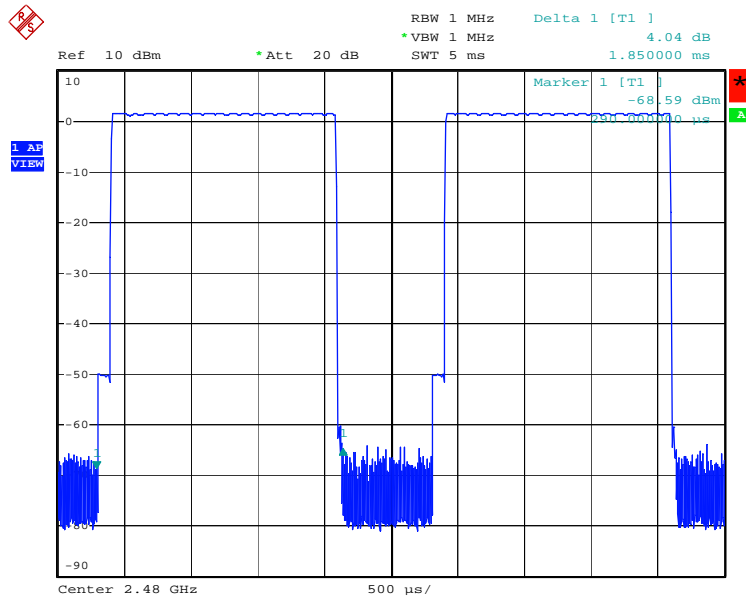


DH5 Modulation Type: GFSK (Channel 78) :



Date: 7.OCT.2005 17:54:00

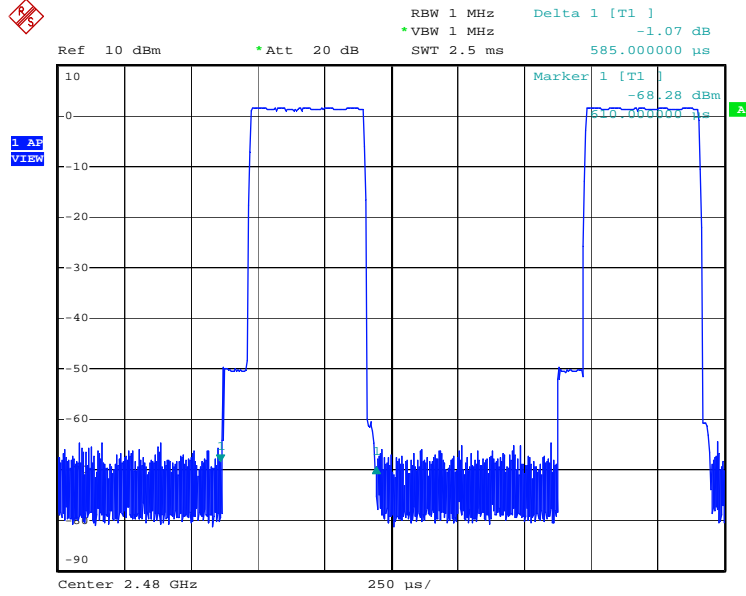
DH3 Modulation Type: GFSK (Channel 78) :



Date: 7.OCT.2005 17:53:24



DH1 Modulation Type: GFSK (Channel 78) :



Date: 7.OCT.2005 17:51:20



1.5. Maximum Peak Output Power

1.5.1. Test Result of Conducted Peak Power

- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 46.80%
- Test Engineer: Steven Lu

| Modulation Type | Channel No. | Frequency (MHz) | Output Power (dBm) | Limits (dBm) |
|-----------------|-------------|-----------------|--------------------|--------------|
| GFSK | 00 | 2402 MHz | 0.58 | 30 |
| GFSK | 39 | 2441 MHz | 0.52 | 30 |
| GFSK | 78 | 2480 MHz | -1.58 | 30 |



1.6. Test of Band Edges Emission

1.6.1. Test Result of Radiated Emission

- Test Channel: 00
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 46.80%
- Test Engineer: Steven Lu

| | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|----------|--------|------------|------------|-------------------|----------------|------------|---------------|---------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 2390.000 | 51.30 | -22.70 | 74.00 | 15.70 | 28.88 | 6.72 | 0.00 | PEAK | --- | --- |
| 2 | 2390.000 | 23.99 | -30.01 | 54.00 | -11.61 | 28.88 | 6.72 | 0.00 | Average | --- | --- |

- Test Channel: 78
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 46.80%
- Test Engineer: Steven Lu

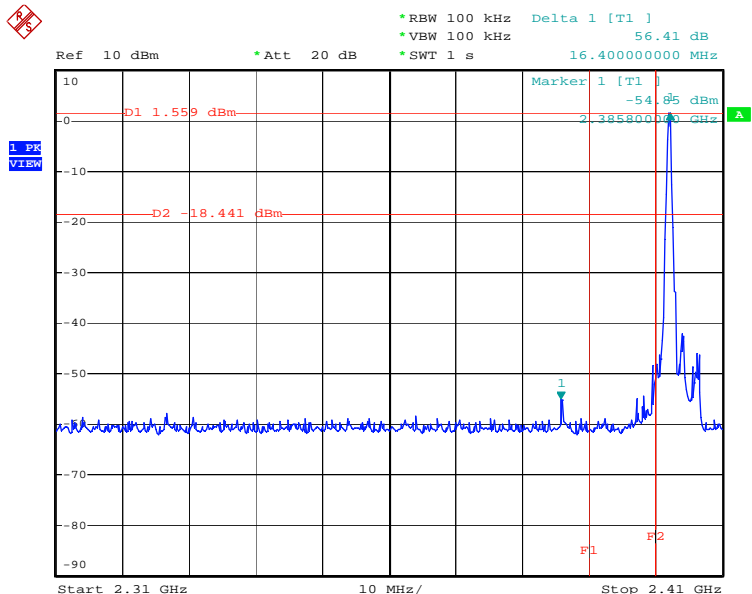
| | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|-----|----------|--------|------------|------------|-------------------|----------------|------------|---------------|---------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 @ | 2483.500 | 24.52 | -29.48 | 54.00 | -11.40 | 28.98 | 6.94 | 0.00 | Average | --- | --- |
| 2 @ | 2483.500 | 57.43 | -16.57 | 74.00 | 21.51 | 28.98 | 6.94 | 0.00 | Peak | --- | --- |

Level* : The max field strength in the restricted bands.



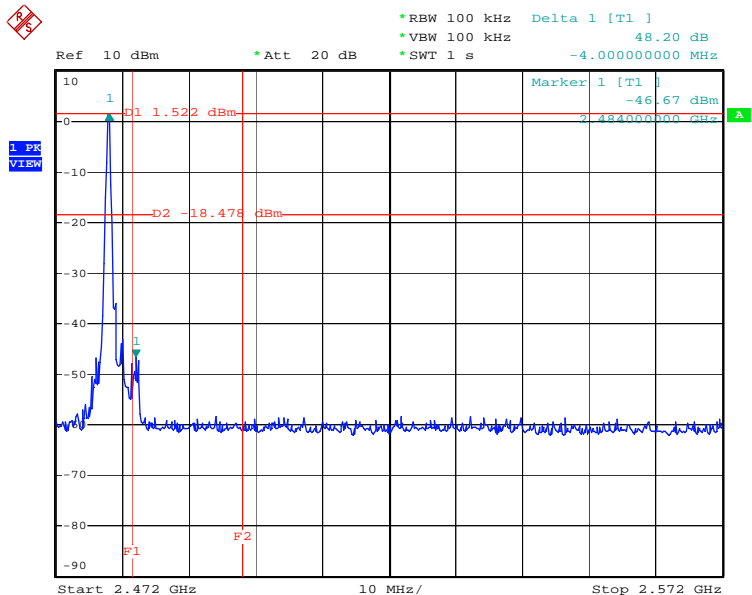
Test Result of Conducted Emission

Modulation Type: GFSK (Channel 00) :



Date: 7.OCT.2005 17:43:43

Modulation Type: GFSK (Channel 78) :



Date: 7.OCT.2005 17:48:01

1.7. Test of Spurious Radiated Emission

1.7.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009~0.490 | 2400/F(KHz) | 300 |
| 0.490~1.705 | 24000/F(KHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

1.7.2. Measuring Instruments and Setting

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter | Setting |
|---------------------------------------|--|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RB / VB (emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average |
| RB / VB (other emission) | 100KHz / 100KHz for peak |

| Receiver Parameter | Setting |
|------------------------|----------------------------------|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

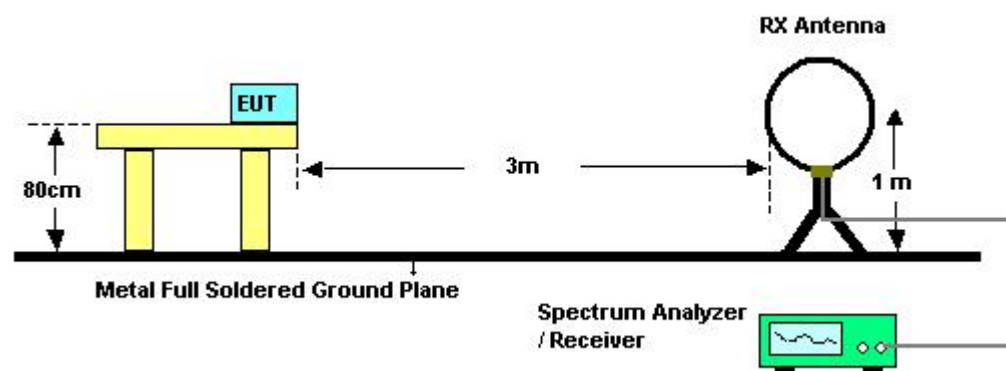
1.7.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.

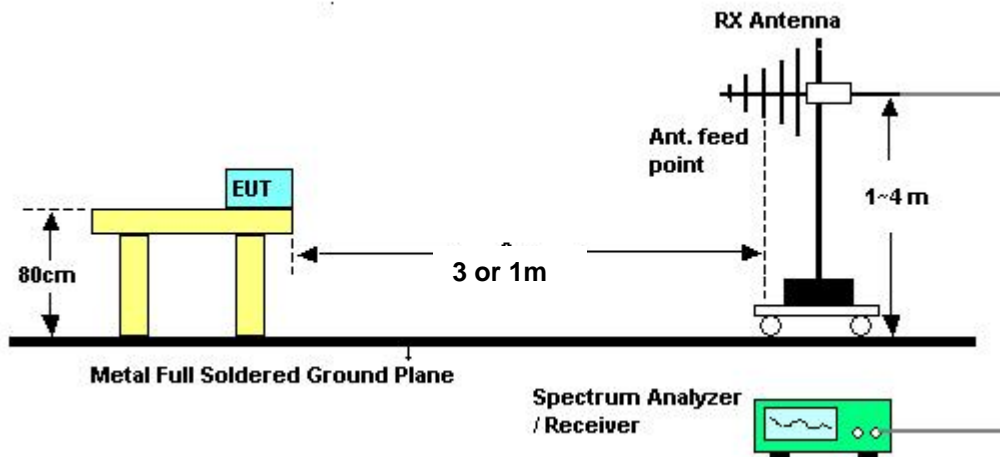
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions 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.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

1.7.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = $20 \log(\text{specific distance [3m]} / \text{test distance [1m]})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

1.7.5. Test Deviation

There are no deviations with the original standard.

1.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

1.7.7. Results of Radiated Emissions (9kHz~30MHz)

| | | | |
|----------------------|-----------|-----------------------|------------|
| Temperature | 24°C | Humidity | 55% |
| Test Engineer | Steven Lu | Configurations | channel 39 |

| Freq. (MHz) | Level (dBuV) | Over Limit (dB) | Limit Line (dBuV) | Remark |
|-------------|--------------|-----------------|-------------------|----------|
| - | - | - | - | See Note |

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

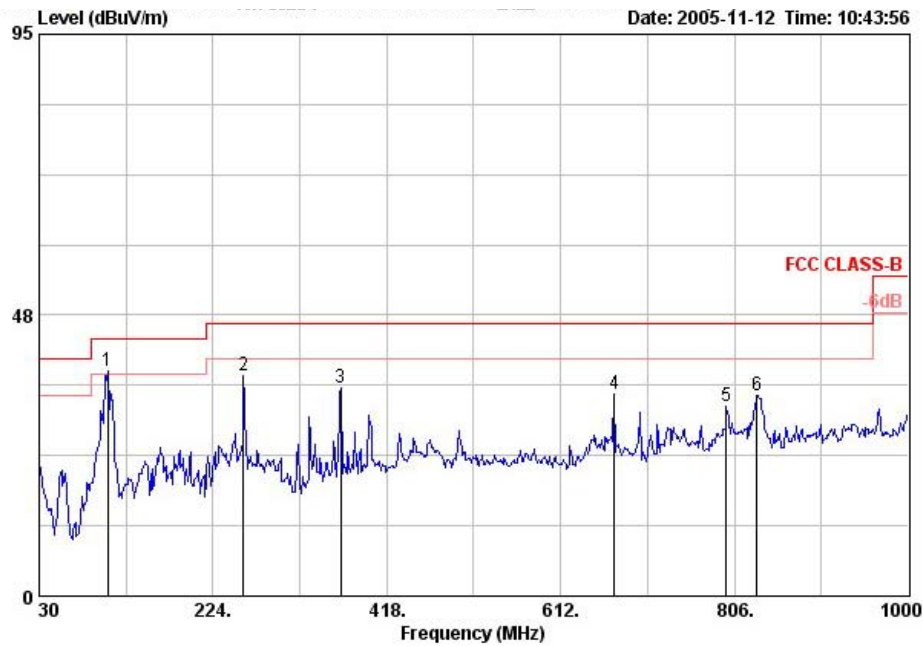
Limit line = specific limits (dBuV) + distance extrapolation factor.



1.7.8. Test Results for CH 39 / 2441 MHz (for emission below 1GHz)

- Temperature: 24°C
- Relative Humidity: 55%
- Test Engineer: Steven Lu

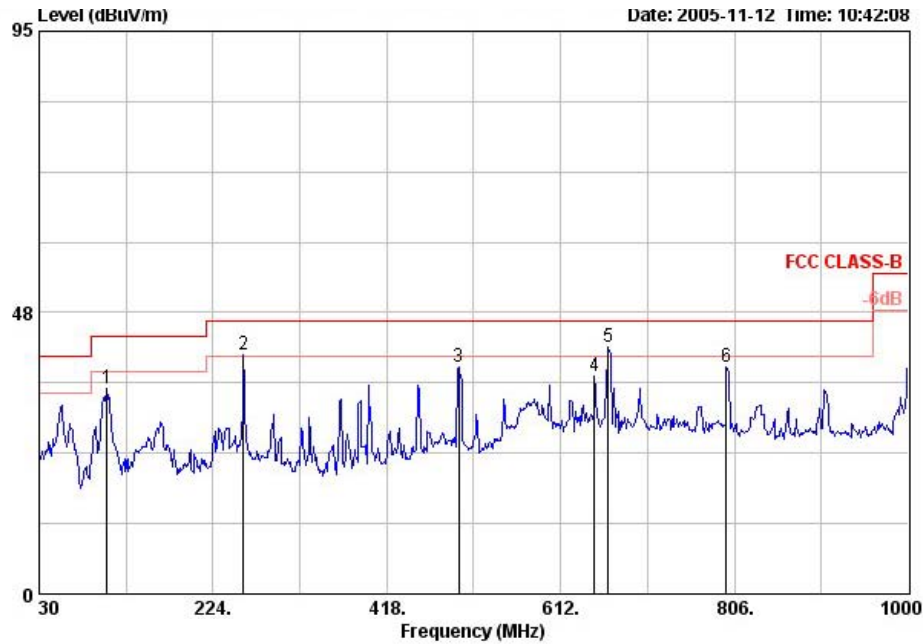
(A) Polarization: Horizontal



| | Freq | Level | Over | Limit | ReadAntenna | Cable | Preamp | Remark | Ant | Table |
|-----|---------|--------|--------|--------|-------------|-------|--------|------------|-----|-------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | | cm | deg |
| 1 @ | 106.630 | 38.03 | -5.47 | 43.50 | 57.19 | 11.07 | 1.50 | 31.73 Peak | --- | --- |
| 2 | 257.950 | 37.30 | -8.70 | 46.00 | 53.54 | 12.63 | 2.48 | 31.35 Peak | --- | --- |
| 3 | 366.590 | 35.24 | -10.76 | 46.00 | 49.05 | 14.85 | 2.50 | 31.17 Peak | --- | --- |
| 4 | 672.140 | 34.28 | -11.72 | 46.00 | 42.40 | 18.74 | 3.54 | 30.40 Peak | --- | --- |
| 5 | 797.270 | 32.03 | -13.97 | 46.00 | 38.39 | 20.02 | 3.81 | 30.19 Peak | --- | --- |
| 6 | 831.220 | 34.00 | -12.00 | 46.00 | 39.80 | 20.41 | 3.93 | 30.14 Peak | --- | --- |



(B) Polarization: Vertical



| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---------|--------|------------|------------|------------|----------------|------------|---------------|--------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 105.660 | 34.66 | -8.84 | 43.50 | 53.93 | 10.95 | 1.50 | 31.72 | Peak | --- | --- |
| 2 | 257.950 | 40.26 | -5.74 | 46.00 | 56.49 | 12.63 | 2.48 | 31.35 | Peak | --- | --- |
| 3 | 498.510 | 38.42 | -7.58 | 46.00 | 48.90 | 17.18 | 3.28 | 30.94 | Peak | --- | --- |
| 4 | 649.830 | 36.88 | -9.12 | 46.00 | 44.90 | 18.78 | 3.50 | 30.30 | Peak | --- | --- |
| 5 | 665.350 | 41.80 | -4.20 | 46.00 | 49.90 | 18.73 | 3.53 | 30.37 | Peak | --- | --- |
| 6 | 797.270 | 38.34 | -7.66 | 46.00 | 44.69 | 20.02 | 3.81 | 30.19 | Peak | --- | --- |

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

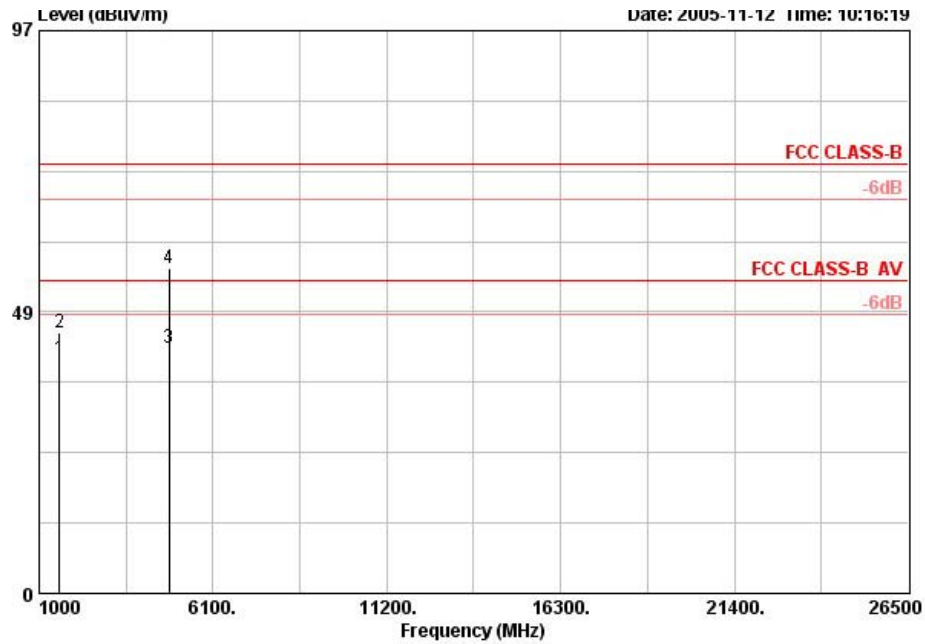
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



1.7.9. Test Results for CH 00 / 2402 MHz (for emission above 1GHz)

- Temperature: 24°C
- Relative Humidity: 55%
- Test Engineer: Steven Lu

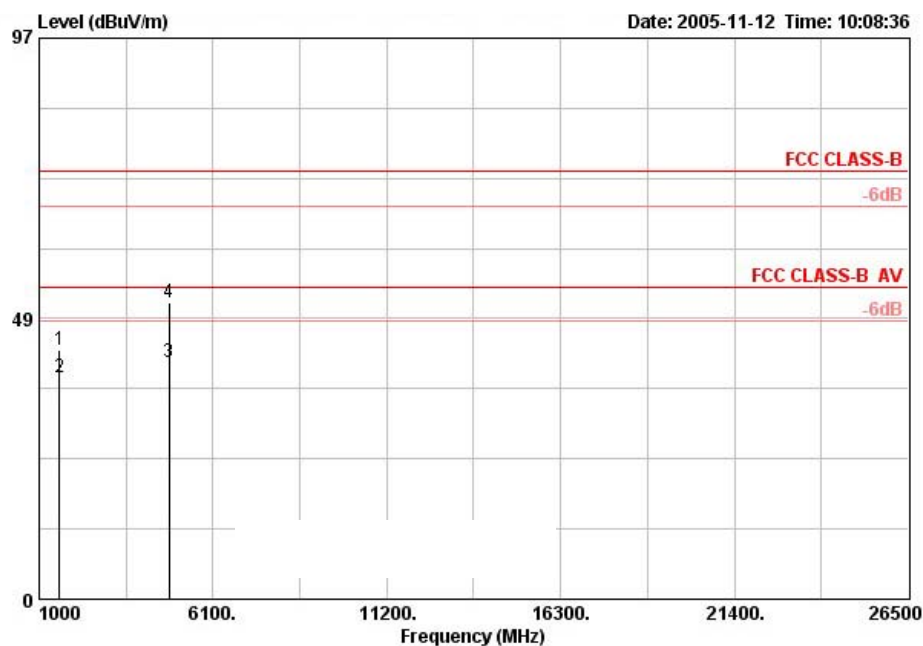
(A) Polarization: Horizontal



| | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|----------|--------|------------|------------|-------------------|----------------|------------|---------------|---------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 1601.930 | 40.31 | -13.69 | 54.00 | 43.72 | 25.92 | 5.38 | 34.72 | AVERAGE | --- | --- |
| 2 | 1602.070 | 44.88 | -29.12 | 74.00 | 48.29 | 25.92 | 5.38 | 34.72 | PEAK | --- | --- |
| 3 | 4803.950 | 42.26 | -11.74 | 54.00 | 33.54 | 32.81 | 11.07 | 35.17 | AVERAGE | --- | --- |
| 4 | 4803.950 | 56.10 | -17.90 | 74.00 | 47.39 | 32.81 | 11.07 | 35.17 | PEAK | --- | --- |



(B) Polarization: Vertical



| | Freq | Level | Over | Limit | ReadAntenna | Cable | Preamp | Remark | Ant | Table |
|---|----------|--------|--------|--------|-------------|-------|--------|---------------|-----|-------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | Pos | Pos |
| 1 | 1601.880 | 43.09 | -30.91 | 74.00 | 46.51 | 25.92 | 5.38 | 34.72 PEAK | --- | --- |
| 2 | 1601.990 | 38.38 | -15.62 | 54.00 | 41.79 | 25.92 | 5.38 | 34.72 AVERAGE | --- | --- |
| 3 | 4804.050 | 40.89 | -13.11 | 54.00 | 32.17 | 32.81 | 11.07 | 35.17 AVERAGE | --- | --- |
| 4 | 4804.260 | 51.34 | -22.66 | 74.00 | 42.62 | 32.81 | 11.07 | 35.17 PEAK | --- | --- |

Note:

Emission level (dBUV/m) = 20 log Emission level (uV/m)

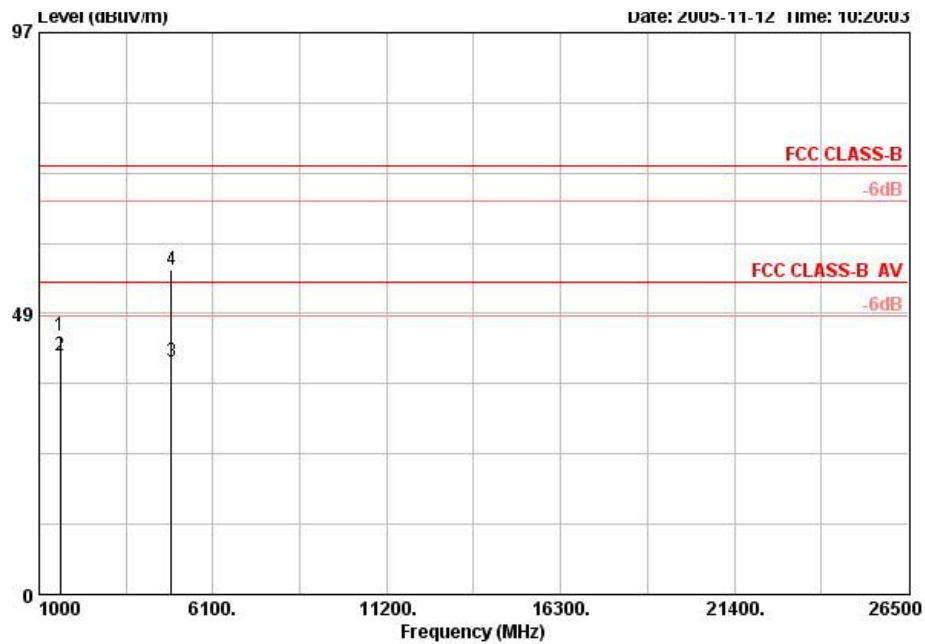
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



1.7.10. Test Results for CH 39 / 2441 MHz (for emission above 1GHz)

- Temperature: 24°C
- Relative Humidity: 55%
- Test Engineer: Steven Lu

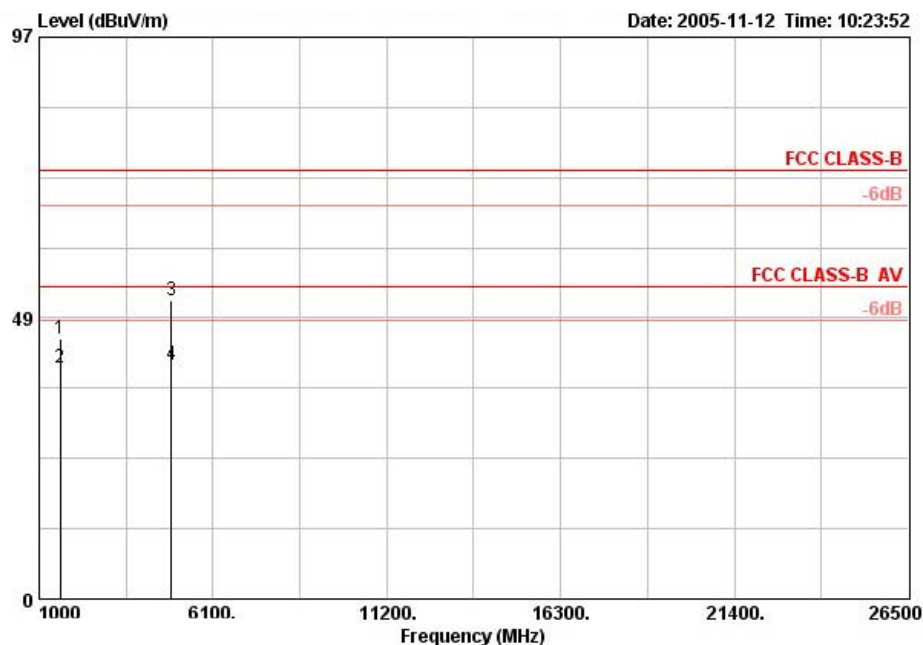
(A) Polarization: Horizontal



| | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|----------|--------|------------|------------|-------------------|----------------|------------|---------------|---------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 1627.920 | 44.60 | -29.40 | 74.00 | 47.81 | 26.13 | 5.38 | 34.73 | PEAK | --- | --- |
| 2 | 1628.000 | 41.14 | -12.86 | 54.00 | 44.36 | 26.13 | 5.38 | 34.73 | AVERAGE | --- | --- |
| 3 | 4881.810 | 40.22 | -13.78 | 54.00 | 31.37 | 32.88 | 11.12 | 35.15 | AVERAGE | --- | --- |
| 4 | 4881.810 | 55.96 | -18.04 | 74.00 | 47.11 | 32.88 | 11.12 | 35.15 | PEAK | --- | --- |



(B) Polarization: Vertical



| | Freq | Level | Over | Limit | ReadAntenna | Cable | Preamp | Remark | Ant | Table |
|---|----------|--------|--------|--------|-------------|-------|--------|---------------|-----|-------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg |
| 1 | 1627.970 | 44.81 | -29.19 | 74.00 | 48.03 | 26.13 | 5.38 | 34.73 PEAK | --- | --- |
| 2 | 1628.000 | 39.79 | -14.21 | 54.00 | 43.01 | 26.13 | 5.38 | 34.73 AVERAGE | --- | --- |
| 3 | 4881.270 | 51.46 | -22.54 | 74.00 | 42.61 | 32.88 | 11.12 | 35.15 PEAK | --- | --- |
| 4 | 4881.270 | 40.46 | -13.54 | 54.00 | 31.61 | 32.88 | 11.12 | 35.15 AVERAGE | --- | --- |

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

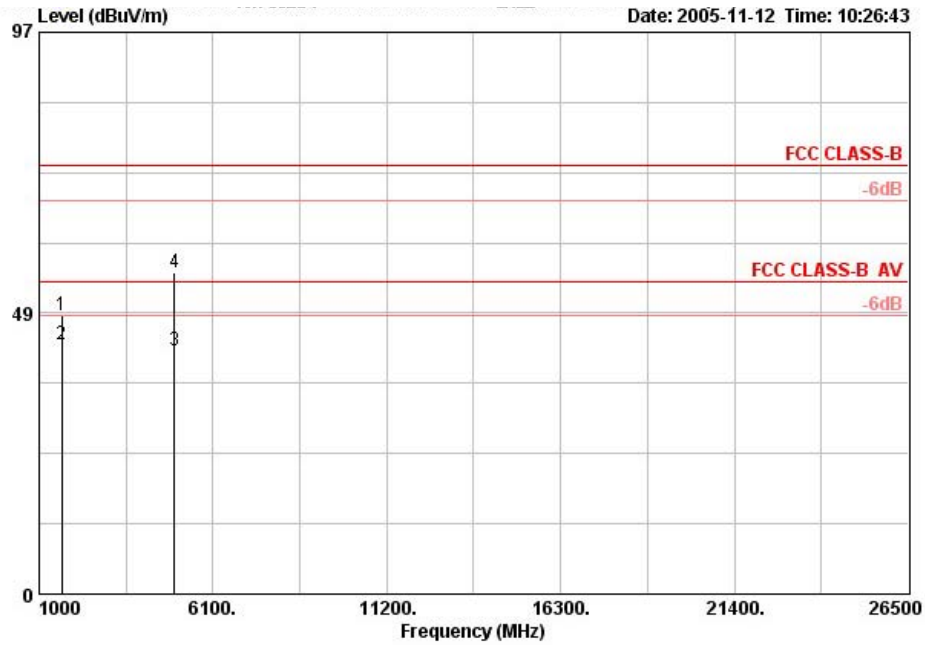
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



1.7.11. Test Results for CH 79 / 2480 MHz (for emission above 1GHz)

- Temperature: 24°C
- Relative Humidity: 55%
- Test Engineer: Steven Lu

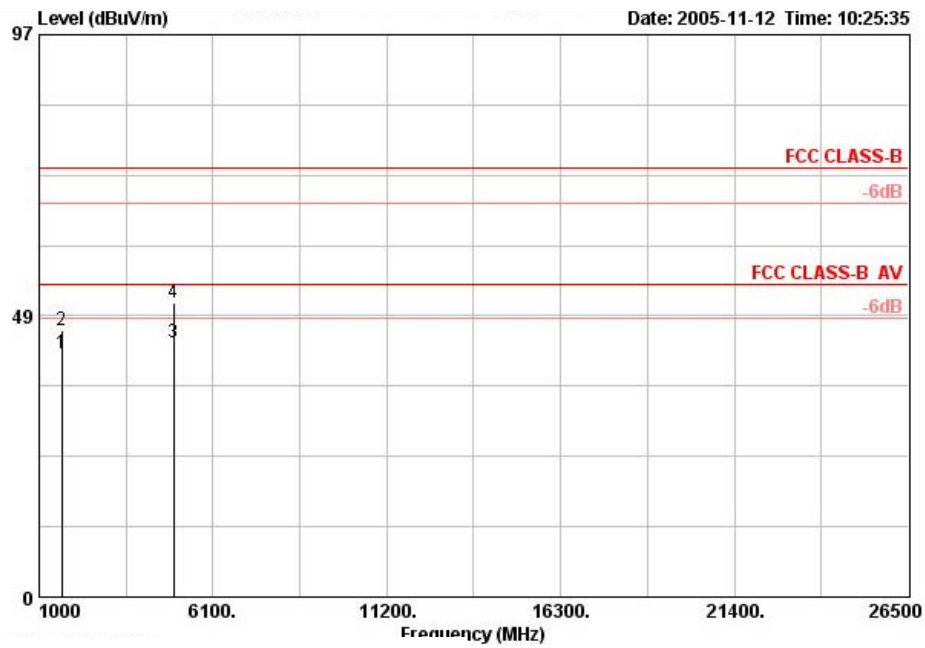
(A) Polarization: Horizontal



| | Freq | Level | Over Limit | Limit Line | ReadAntenna | Cable | Preamp | Remark | Ant Pos | Table Pos |
|---|----------|--------|------------|------------|-------------|-------|--------|---------------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg |
| 1 | 1653.950 | 48.04 | -25.96 | 74.00 | 51.11 | 26.23 | 5.45 | 34.74 PEAK | --- | --- |
| 2 | 1653.950 | 43.04 | -10.96 | 54.00 | 46.11 | 26.23 | 5.45 | 34.74 AVERAGE | --- | --- |
| 3 | 4961.510 | 42.07 | -11.93 | 54.00 | 33.07 | 32.97 | 11.17 | 35.14 AVERAGE | --- | --- |
| 4 | 4961.510 | 55.49 | -18.51 | 74.00 | 46.48 | 32.97 | 11.17 | 35.14 PEAK | --- | --- |



(B) Polarization: Vertical



| | Freq | Level | Over | Limit | ReadAntenna | Cable | Preamp | Remark | Ant | Table |
|---|----------|--------|--------|--------|-------------|-------|--------|---------------|-----|-------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB | dB | | cm | deg |
| 1 | 1653.950 | 41.93 | -12.07 | 54.00 | 45.00 | 26.23 | 5.45 | 34.74 AVERAGE | --- | --- |
| 2 | 1653.950 | 45.93 | -28.07 | 74.00 | 49.00 | 26.23 | 5.45 | 34.74 PEAK | --- | --- |
| 3 | 4957.500 | 43.79 | -10.21 | 54.00 | 34.79 | 32.97 | 11.17 | 35.14 AVERAGE | --- | --- |
| 4 | 4957.500 | 50.79 | -23.21 | 74.00 | 41.79 | 32.97 | 11.17 | 35.14 PEAK | --- | --- |

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

1.8. Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW

