# Bluetooth Radio Test Report

## FCC ID: Q3N-8230

**This report concerns (check one) :** ■ **Original Grant** □ **Class II Change**

**Issued Date** : May 25, 2011
**Project No.** : R1105001
**Equipment** : Terminal
**Model Name** : 8230

**Applicant** : CIPHERLAB CO., LTD.
**Address** : 12F, 333, Dunhua S. Rd., Sec. 2, Taipei, Taiwan

**Tested by:** Neutron Engineering Inc. EMC Laboratory
**Date of Receipt:** Apr. 28, 2011
**Date of Test:** Apr. 28, 2011 ~ May 23, 2011

Testing Engineer : Gary Chou
(Gary Chou)

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(Jeff Yang)

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NVLAP Lab Code: 200145-0

ilac-MRA

TAF Testing Laboratory 0659

## Declaration

**Neutron** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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## 1. CERTIFICATION

Equipment: Terminal
Brand Name: CIPHERLAB
Model Name: 8230
Applicant: CIPHERLAB CO., LTD.
Date of Test: Apr. 28, 2011 ~ May 23, 2011
Standards: FCC Part15, Subpart C / ANCI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-2-R1105001) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15, Subpart C | | | |
|---|---|---|---|
| Standard Section | Test Item | Judgment | Remark |
| **15.207** | Conducted Emission | PASS | |
| **15.247 (c)** | Antenna conducted Spurious Emission | PASS | |
| **15.247 (a)(1)** | Hopping Channel Separation | PASS | |
| **15.247 (b)** | Peak Output Power | PASS | |
| **15.247 (c)** | Radiated Spurious Emission | PASS | |
| **15.247 (b)(1)** | Number of Hopping Frequency | PASS | |
| **15.247 (a)(1)** | Dwell Time | PASS | |
| **15.205** | Restricted Bands | PASS | |
| **15.203** | Antenna Requirement | PASS | |
| **1.1307 1.1310 2.1091 2.1093** | RF Exposure Compliance | PASS | |

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

**C01:** (VCCI RN: C-2918; T-1666; FCC RN: 95335; FCC DN: TW1010)
No.132-1, Lane 329, Sec. 2, Palian Road, Shijr City, Taipei, Taiwan.

**CB08:** (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054;
IC Assigned Code: 4428C-1)
1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95**%.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted Measurement :

| Test Site | Method | Measurement Frequency Range | U，(dB) | NOTE |
|---|---|---|---|---|
| C01 | ANSI | 150 kHz ~ 30 MHz | 1.94 | |

B. Radiated Measurement :

| Test Site | Item | Measurement Frequency Range | | Uncertainty | NOTE |
|---|---|---|---|---|---|
| CB08 | Radiated Emission at 3m | Horizontal Polarization | 30 - 00MHz | 3.35 dB | |
| | | | 200 - 1000MHz | .11 dB | |
| | | | 1 - 18GHz | 3.97 dB | |
| | | | 18 - 40GHz | 4.01 dB | |
| | | Vertical Polarization | 30 - 200MHz | 3.22 dB | |
| | | | 200 - 1000MHz | 3.24 dB | |
| | | | 1 - 18GHz | 4.05 dB | |
| | | | 18 - 40GHz | 4.04 dB | |

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our $U_{lab}$ values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called $U_{CISPR}$, as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our $U_{lab}$ values are smaller than $U_{CISPR}$.

# 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| Equipment | Terminal |
| Brand Name | CIPHERLAB |
| Model Name | 8230 |
| OEM Brand/Model Name | N/A |
| Model Difference | Model 8230 contains three optional scanner types: 2D, LASER and CCD.<br>All the above types were tested, and the model:<br>8230 (Scanner Type: 2D) was found to be the worst case during the pre-scanning test. This model of the worst case was used for final testing and collecting test data included in this report. |
| Product Description | The EUT is a Terminal.<br>Operation Frequency: 2402~2480 MHz<br>Modulation Type: FHSS(GFSK)<br>Bit Rate of Transmitter: 1/3 Mbps<br>Number Of Channel: Please see Note 2.<br>Antenna Designation: Please see Note 3.<br>Antenna Gain(Peak): Please see Note 3.<br>EIRP Power: 1 Mbps: -2.29 dBm (Max.)<br>3 Mbps: -0.29 dBm (Max.)<br>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. |
| Power Source | Battery supplied or<br>DC Voltage supplied from External Power Supply. |
| Power Rating | Battery: DC 3.7V 1200Am 4.44Wh<br>AC ADAPTER:<br>I/P: AC 100-240V 47-63Hz 0.48A MAX /<br>O/P: DC 5V 3A 15W MAX |
| Products Covered | Please refer to the User's Manual |
| Connecting I/O Port(s) | 1 * Li-ion BATTERY PACK: CIPHERLAB BA-80S1A2<br>1 * AC ADAPTER: ADAPTER TECH. STD-05030V<br>1 * Connect Cable |
| EUT Modification(s) | N/A |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. **Bluetooth:**

| Channel List | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 00 | 2402 | 27 | 2429 | 54 | 2456 |
| 01 | 2403 | 28 | 2430 | 55 | 2457 |
| 02 | 2404 | 29 | 2431 | 56 | 2458 |
| 03 | 2405 | 30 | 2432 | 57 | 2459 |
| 04 | 2406 | 31 | 2433 | 58 | 2460 |
| 05 | 2407 | 32 | 2434 | 59 | 2461 |
| 06 | 2408 | 33 | 2435 | 60 | 2462 |
| 07 | 2409 | 34 | 2436 | 61 | 2463 |
| 08 | 2410 | 35 | 2437 | 62 | 2464 |
| 09 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 65 | 2467 |
| 12 | 2414 | 39 | 2441 | 66 | 2468 |
| 13 | 2415 | 40 | 2442 | 67 | 2469 |
| 14 | 2416 | 41 | 2443 | 68 | 2470 |
| 15 | 2417 | 42 | 2444 | 69 | 2471 |
| 16 | 2418 | 43 | 2445 | 70 | 2472 |
| 17 | 2419 | 44 | 2446 | 71 | 2473 |
| 18 | 2420 | 45 | 2447 | 72 | 2474 |
| 19 | 2421 | 46 | 2448 | 73 | 2475 |
| 20 | 2422 | 47 | 2449 | 74 | 2476 |
| 21 | 2423 | 48 | 2450 | 75 | 2477 |
| 22 | 2424 | 49 | 2451 | 76 | 2478 |
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 | | |
| 26 | 2428 | 53 | 2455 | | |

3. Table for Filed Antenna

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 1 | CIPHERLAB | KXAN000000005 | PIFA | Soldered | 1.79 |

## 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Test Mode | Description |
|---|---|
| Mode 1 | CH00 |
| Mode 2 | CH39 |
| Mode 3 | CH78 |

| **For Conducted Test** | |
|---|---|
| Final Test Mode | Description |
| Mode 2 | CH39 |

| **For Radiated Emission** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | CH00 |
| Mode 2 | CH39 |
| Mode 3 | CH78 |

Note:
(1) The measurements are performed at the highest, middle, lowest available channels.

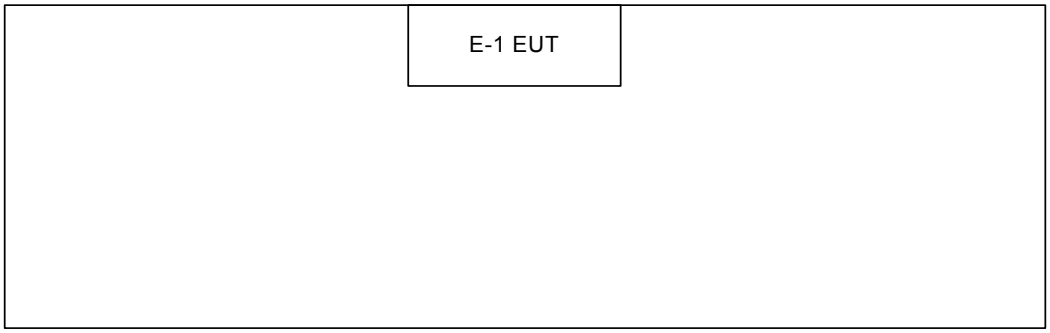
## 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

| Data Rate | 1 Mbps | | |
|---|---|---|---|
| Test software Version | 1.01a | | |
| Frequency | 2402 MHz | 2441 MHz | 2480 MHz |
| Power Parameters | default | default | default |

| Data Rate | 3 Mbps | | |
|---|---|---|---|
| Test software Version | 1.01a | | |
| Frequency | 2402 MHz | 2441 MHz | 2480 MHz |
| Power Parameters | default | default | default |

## 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



### 3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|---|---|---|---|---|---|---|
| E-1 | Terminal | CIPHERLAB | 8230 (Scanner Type: 2D) | Q3N-8230 | N/A | EUT |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| | | | | |

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) ”※”denotes the support equipment by applicant.

# 4. EMC EMISSION TEST

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 |

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

(3) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
Margin Level = Measurement Value – Limit Value

### 4.1.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | LISN | EMCO | 3816/2 | 00042991 | Feb. 16, 2012 |
| 2 | Test Cable | TIMES | LMR-400 | SR03_C_01&02 | Aug. 20, 2011 |
| 3 | Pulse Limiter | Electro-Metrics | EM-7600 | 112647 | Dec. 13, 2011 |
| 4 | EMI Test Receiver | R&S | ESCI | 100082 | Mar. 15, 2012 |
| 5 | 50Ω BNC TYPE Terminator | N/A | N/A | 01 | May 25, 2011 |
| 6 | 50Ω BNC TYPE Terminator | N/A | N/A | 03 | May 25, 2011 |
| 7 | LISN | EMCO | 4825/2 | 00028234 | Jul. 22, 2011 |

Remark: ” N/A” denotes No Model Name , Serial No. or No Calibration specified.

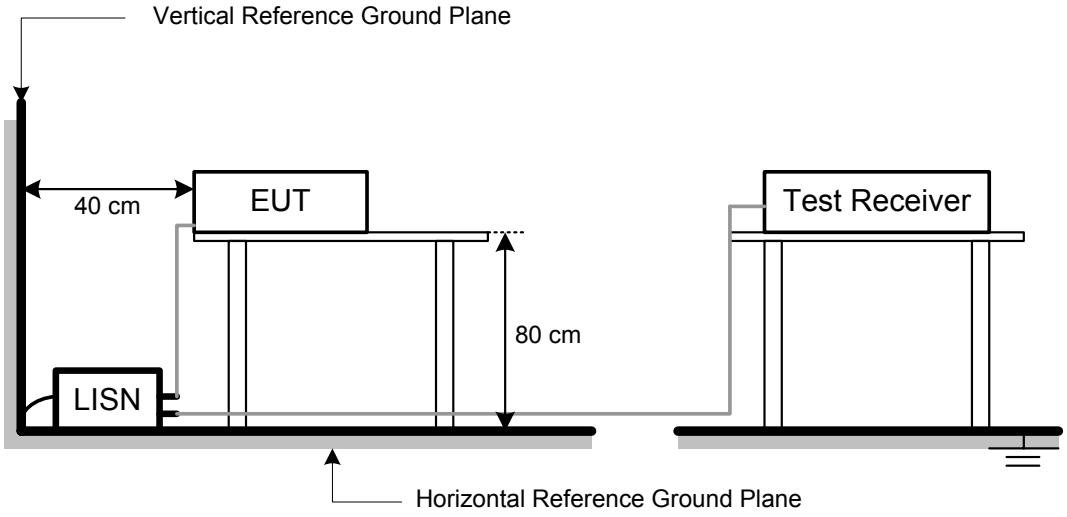
### 4.1.3 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.1.5 TEST SETUP



### 4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

### 4.1.7 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name： | 8230 (Scanner Type: 2D) |
| Temperature： | 24°C | Relative Humidity： | 48% |
| Test Voltage： | AC 120V/60Hz | | |
| Test Mode ： | CH39 | | |

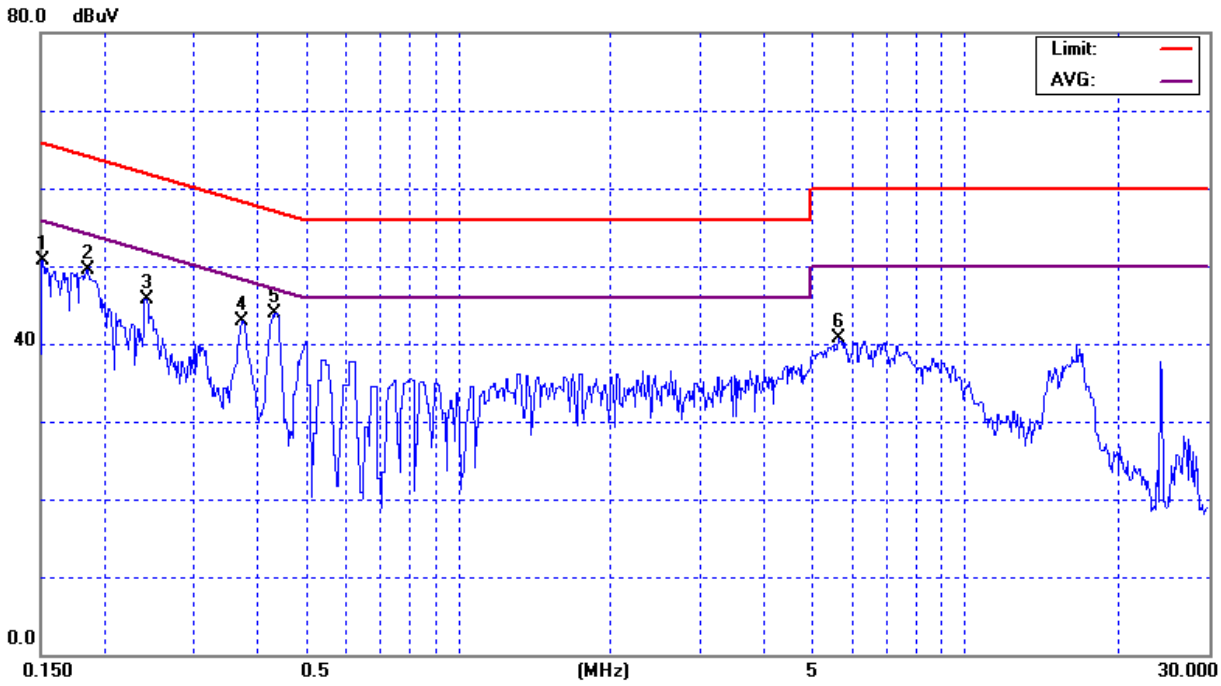
| Freq. (MHz) | Terminal L/N | Reading Level(dBuV) | | Correct Factor(dB) | Measurement(dBuV) | | Limit(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.1514 | Line | 41.10 | * | 9.62 | 50.72 | * | 65.92 | 55.92 | -15.20 | (QP) |
| 0.1850 | Line | 39.93 | * | 9.62 | 49.55 | * | 64.26 | 54.26 | -14.71 | (QP) |
| 0.2417 | Line | 36.16 | * | 9.62 | 45.78 | * | 62.04 | 52.04 | -16.26 | (QP) |
| 0.3740 | Line | 33.29 | * | 9.61 | 42.90 | * | 58.41 | 48.41 | -15.51 | (QP) |
| 0.4328 | Line | 34.33 | * | 9.61 | 43.94 | * | 57.20 | 47.20 | -13.26 | (QP) |
| 5.6500 | Line | 31.04 | * | 9.75 | 40.79 | * | 60.00 | 50.00 | -19.21 | (QP) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.2 sec./ MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.2 sec./ MHz.

(2) All readings are QP Mode value unless otherwise stated AVG in column of Note. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.

(3) In the "Note" column, QP means the margin value of QP is higher than Average and the "Margin" column shows the margin value of QP; AV means the margin value of Average is higher than QP and the "Margin" column shows the margin value of Average.



| EUT： | Terminal | Model Name : | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 24°C | Relative Humidity : | 48% |
| Test Voltage： | AC 120V/60Hz | | |
| Test Mode ： | CH39 | | |

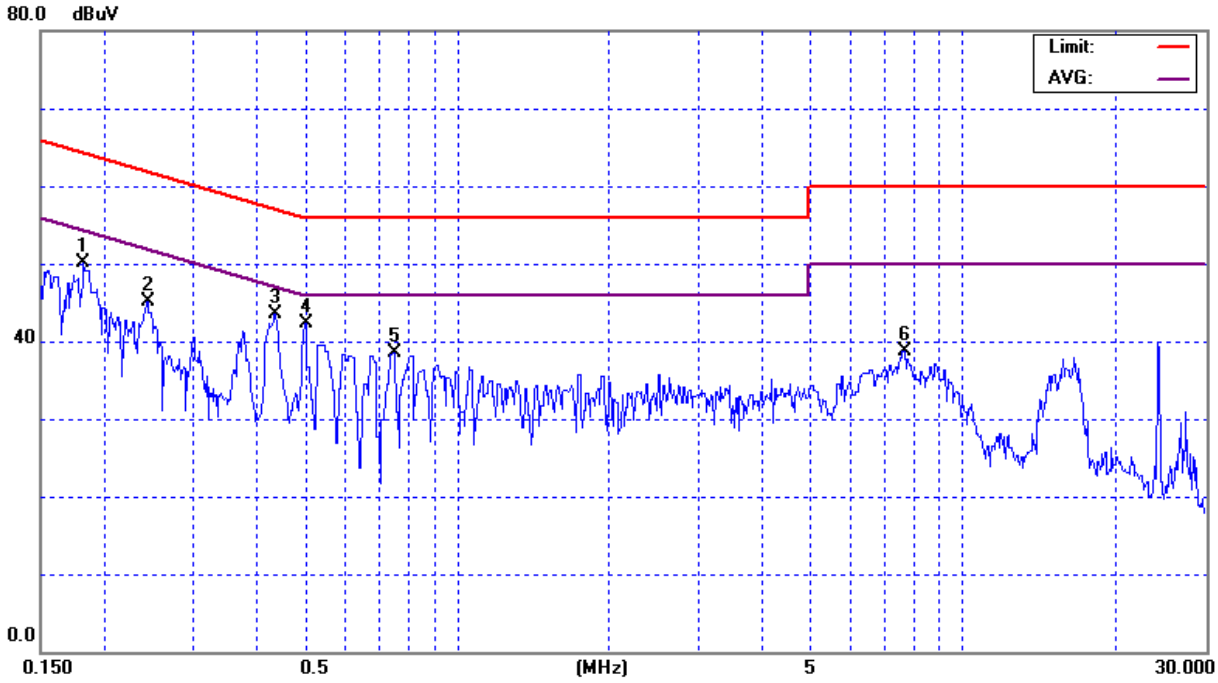
| Freq. (MHz) | Terminal L/N | Reading Level(dBuV) | | Correct Factor(dB) | Measurement(dBuV) | | Limit(dBuV) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | QP-Mode | AV-Mode | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | |
| 0.1822 | Neutral | 40.52 | * | 9.64 | 50.16 | * | 64.38 | 54.38 | -14.22 | (QP) |
| 0.2438 | Neutral | 35.52 | * | 9.64 | 45.16 | * | 61.97 | 51.97 | -16.81 | (QP) |
| 0.4356 | Neutral | 33.80 | * | 9.63 | 43.43 | * | 57.15 | 47.15 | -13.72 | (QP) |
| 0.5000 | Neutral | 32.68 | * | 9.63 | 42.31 | * | 56.00 | 46.00 | -13.69 | (QP) |
| 0.7520 | Neutral | 28.84 | * | 9.62 | 38.46 | * | 56.00 | 46.00 | -17.54 | (QP) |
| 7.6500 | Neutral | 28.90 | * | 9.81 | 38.71 | * | 60.00 | 50.00 | -21.29 | (QP) |

Remark

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.2 sec./ MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.2 sec./ MHz.

(2) All readings are QP Mode value unless otherwise stated AVG in column of Note. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.

(3) In the "Note" column, QP means the margin value of QP is higher than Average and the "Margin" column shows the margin value of QP; AV means the margin value of Average is higher than QP and the "Margin" column shows the margin value of Average.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on15.205(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 |

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) | | Class B (dBuV/m) (at 3m) | |
|---|---|---|---|---|
| | PEAK | AVERAGE | PEAK | AVERAGE |
| Above 1000 | 80 | 60 | 74 | 54 |

Notes:

(1) The limit for radiated test was performed according to FCC PART 15B.

(2) The tighter limit applies at the band edges.

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

(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain(if use)
Margin Level = Measurement Value – Limit Value

### 4.2.2 MEASUREMENT INSTRUMENTS LIST ANS SETTING

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Aug. 31, 2011 |
| 2 | Horn Antenna | Schwarzbeck | BBHA 9120 | D-325 | Dec. 08, 2011 |
| 3 | Microwave Pre_amplifier | Agilent | 8449B | 3008A01714 | Apr. 18, 2012 |
| 4 | Microflex Cable | N/A | N/A | 1m | May. 18, 2012 |
| 5 | Microflex Cable | AISI | S104-SMAP-1 | 10m | Aug. 22, 2011 |
| 6 | Microflex Cable | N/A | N/A | 3m | Aug. 22, 2011 |
| 7 | Test Cable | N/A | LMR-400 | 966_12m | Jun. 17, 2011 |
| 8 | Test Cable | N/A | LMR-400 | 966_3m | Jun. 17, 2011 |
| 9 | Pre-Amplifier | EMC | EMC-330 | 980001 | Jun. 03, 2011 |
| 10 | Log-Bicon Antenna | Schwarzbeck | VULB9168-352 | 9168-352 | Jun. 17, 2011 |

Remark: ” N/A” denotes No Model Name / Serial No. and No Calibration specified.

| 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 |

### 4.2.3 TEST PROCEDURE

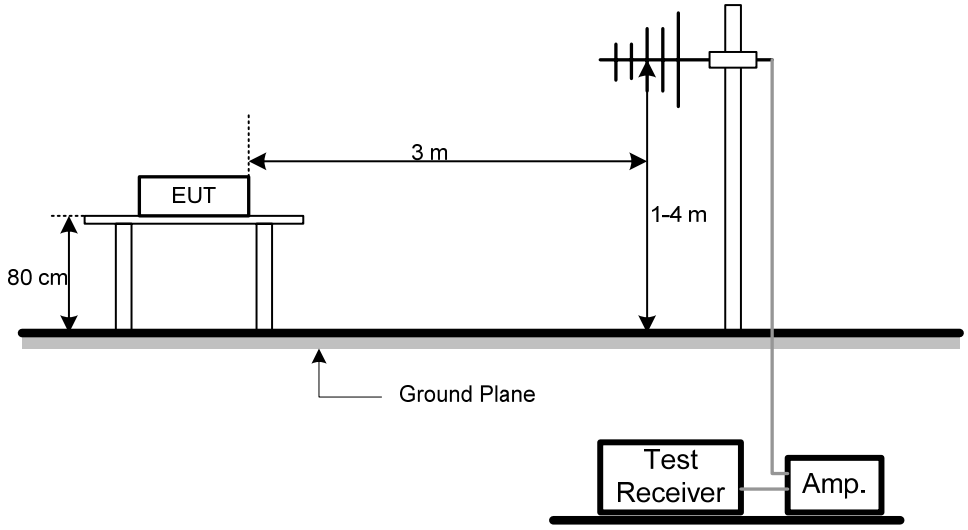
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
g. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines. In case the emission is fail due to the used RBW / VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

### 4.2.4 DEVIATION FROM TEST STANDARD

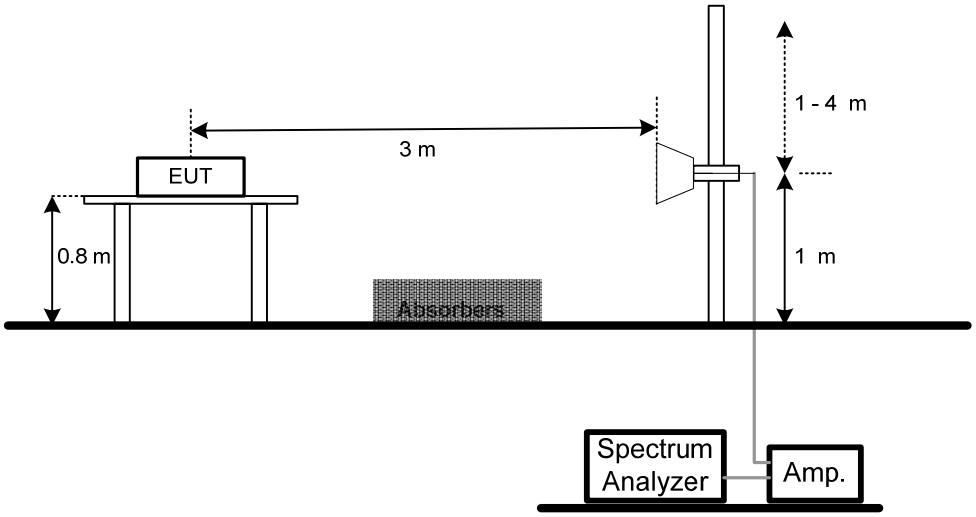
No deviation

### 4.2.5 TEST SETUP

**Radiated Emission Test Set-Up Frequency 30 - 1000MHz**




**Radiated Emission Test Set-Up Frequency Above 1 GHz**




### 4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

### 4.2.7 TEST RESULTS-BETWEEN 30MHZ - 1000MHZ - TX

| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | | |
| Test Mode ： | CH39 | | |

| Freq. (MHz) | Polarization H/V | Reading Level (dBuV) | Correct Factor(dB) | Measurement (dBuV/m) | Limit(Quasi-Peak) (dBuV/m) | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| 171.6199 | V | 49.83 | -17.18 | 32.65 | 43.50 | - 10.85 | |
| 282.2000 | V | 41.17 | -16.30 | 24.87 | 46.00 | - 21.13 | |
| 307.4200 | V | 38.19 | -15.62 | 22.57 | 46.00 | - 23.43 | |
| 402.4800 | V | 41.68 | -13.20 | 28.48 | 46.00 | - 17.52 | |
| 480.0798 | V | 34.28 | -11.36 | 22.92 | 46.00 | - 23.08 | |
| 699.2999 | V | 35.57 | -7.39 | 28.18 | 46.00 | - 17.82 | |

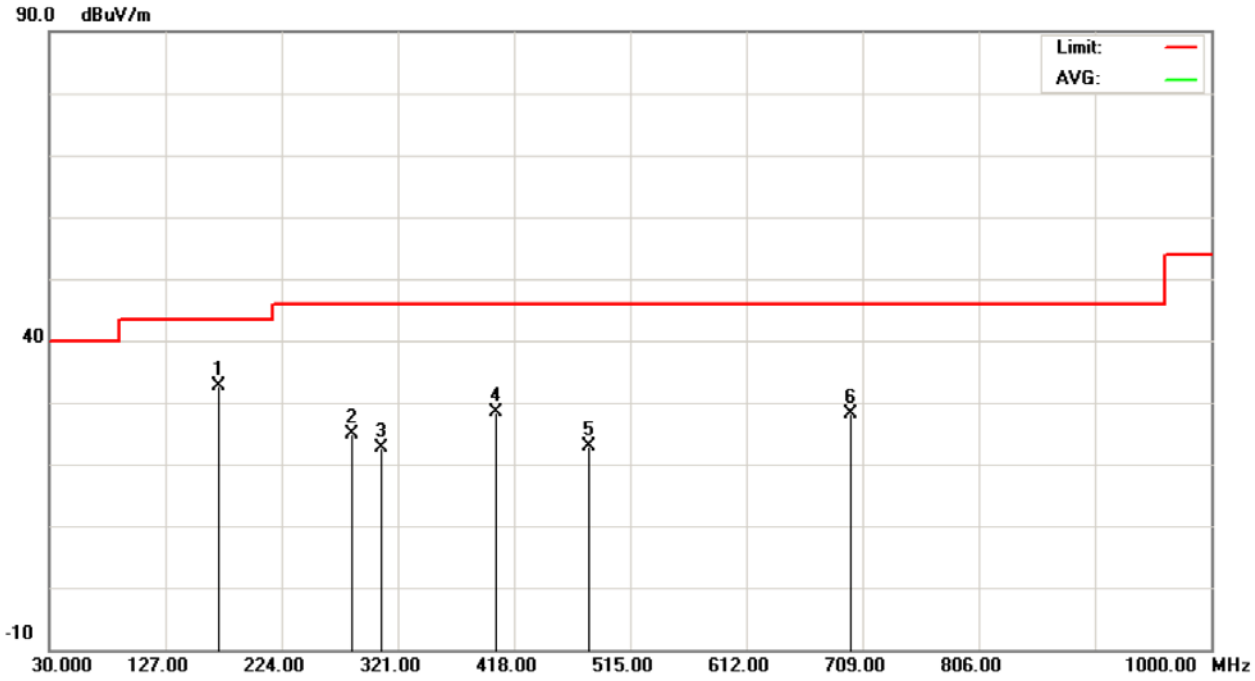
Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。

(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | | |
| Test Mode ： | CH39 | | |

| Freq. (MHz) | Polarization H/V | Reading Level (dBuV) | Correct Factor(dB) | Measurement (dBuV/m) | Limit(Quasi-Peak) (dBuV/m) | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|
| 179.3800 | H | 40.44 | -18.10 | 22.34 | 43.50 | - 21.16 | |
| 256.9800 | H | 39.77 | -17.39 | 22.38 | 46.00 | - 23.62 | |
| 291.8999 | H | 40.94 | -15.99 | 24.95 | 46.00 | - 21.05 | |
| 394.7200 | H | 34.03 | -13.40 | 20.63 | 46.00 | - 25.37 | |
| 410.2398 | H | 34.76 | -12.99 | 21.77 | 46.00 | - 24.23 | |
| 472.3200 | H | 31.22 | -11.49 | 19.73 | 46.00 | - 26.27 | |

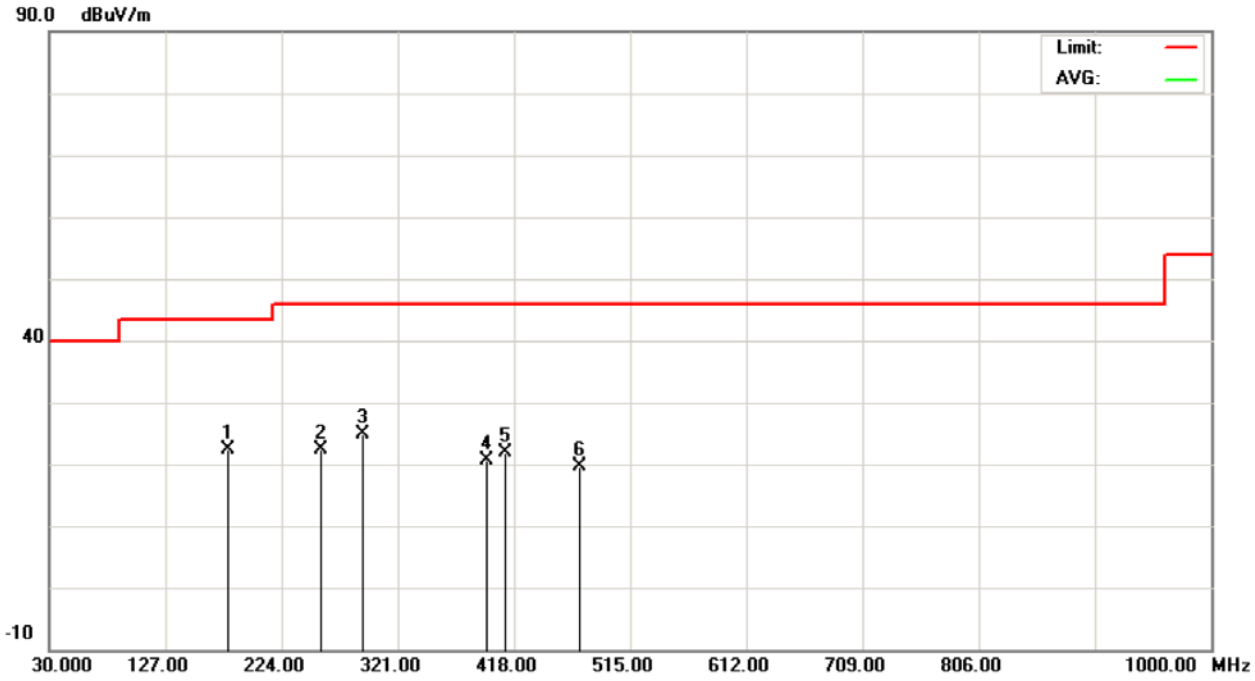
Remark：

(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。

(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



### 4.2.8 TEST RESULTS - ABOVE 1000MHZ- TX

| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M/CH00 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | 2390.000 | V | 21.24 | 11.57 | 30.89 | 52.13 | 42.46 | 74.00 | 54.00 | - 11.54 | AV |
| F | 2402.200 | V | 61.03 | 35.70 | 30.94 | 91.97 | 66.64 | | | | |
| H | 4804.030 | V | 44.04 | 33.16 | 2.64 | 46.68 | 35.80 | 74.00 | 54.00 | - 18.20 | AV |
| H | 7206.020 | V | 44.34 | 31.92 | 8.26 | 52.60 | 40.18 | 74.00 | 54.00 | - 13.82 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

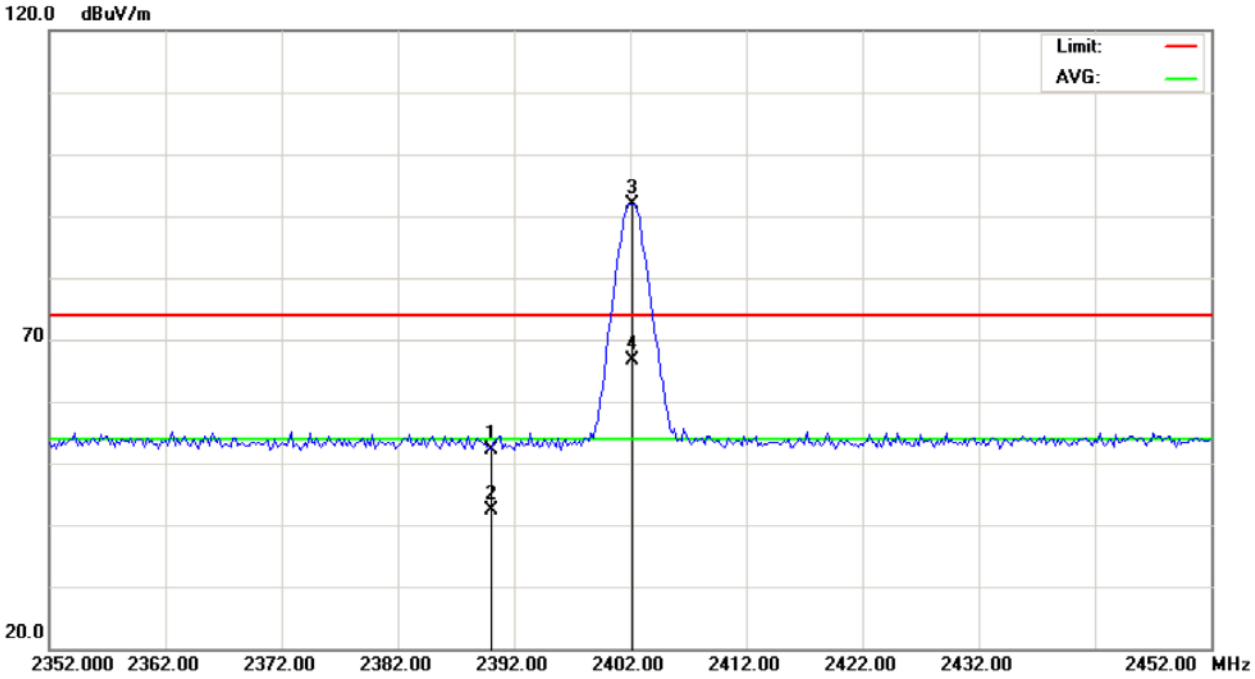
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

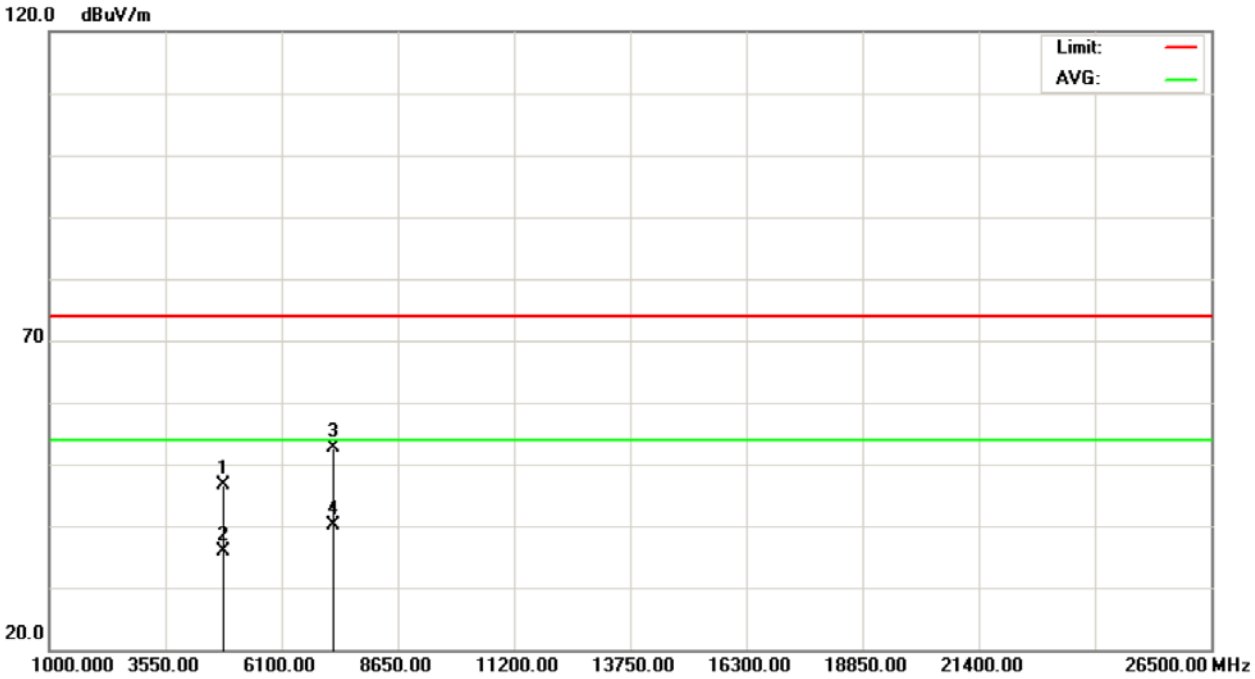
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**1M/CH00(Above 1000 MHz, Vertical)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M/CH00 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | 2390.000 | H | 22.90 | 11.58 | 30.89 | 53.79 | 42.47 | 74.00 | 54.00 | - 11.53 | AV |
| F | 2402.000 | H | 65.38 | 38.17 | 30.94 | 96.32 | 69.11 | | | | |
| H | 4803.550 | H | 42.55 | 31.24 | 2.64 | 45.19 | 33.88 | 74.00 | 54.00 | - 20.12 | AV |
| H | 7206.020 | H | 43.64 | 31.85 | 8.26 | 51.90 | 40.11 | 74.00 | 54.00 | - 13.89 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

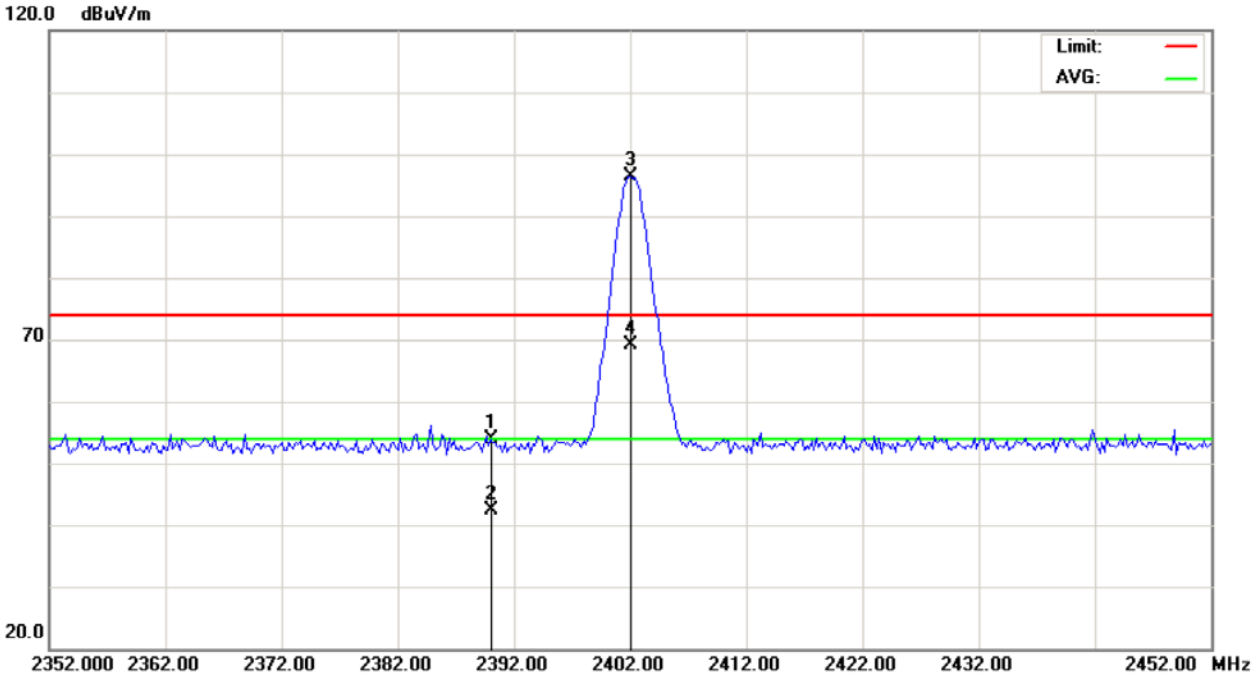
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

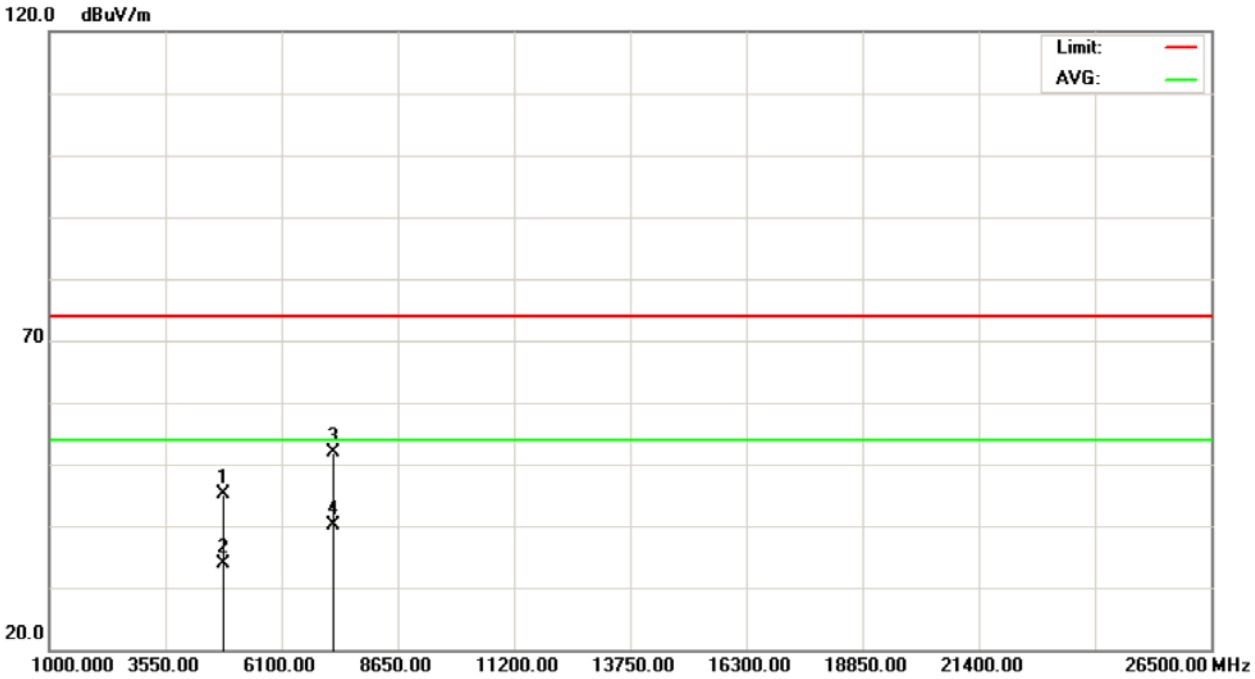
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**1M/CH00(Above 1000 MHz, Horizontal)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M/CH39 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 2440.800 | V | 57.27 | 34.06 | 31.10 | 88.37 | 65.16 | | | | |
| H | 4882.050 | V | 43.52 | 32.45 | 2.89 | 46.41 | 35.34 | 74.00 | 54.00 | - 18.66 | AV |
| H | 7322.940 | V | 42.12 | 31.05 | 8.43 | 50.55 | 39.48 | 74.00 | 54.00 | - 14.52 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

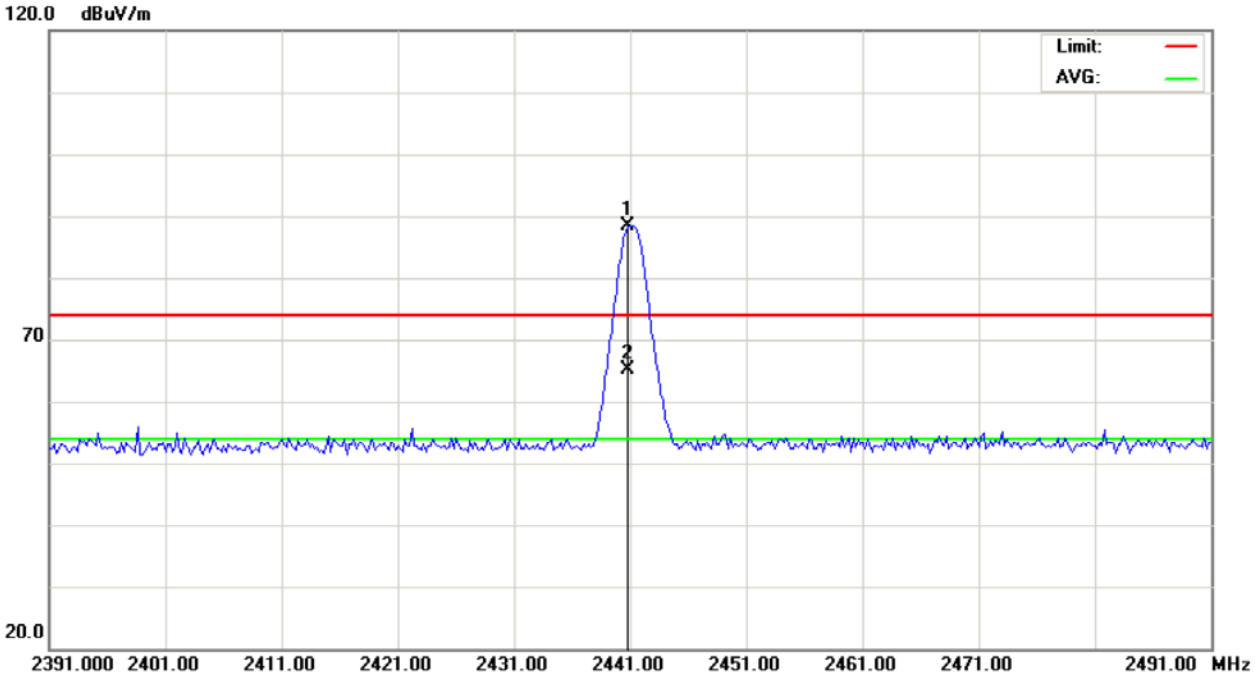
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

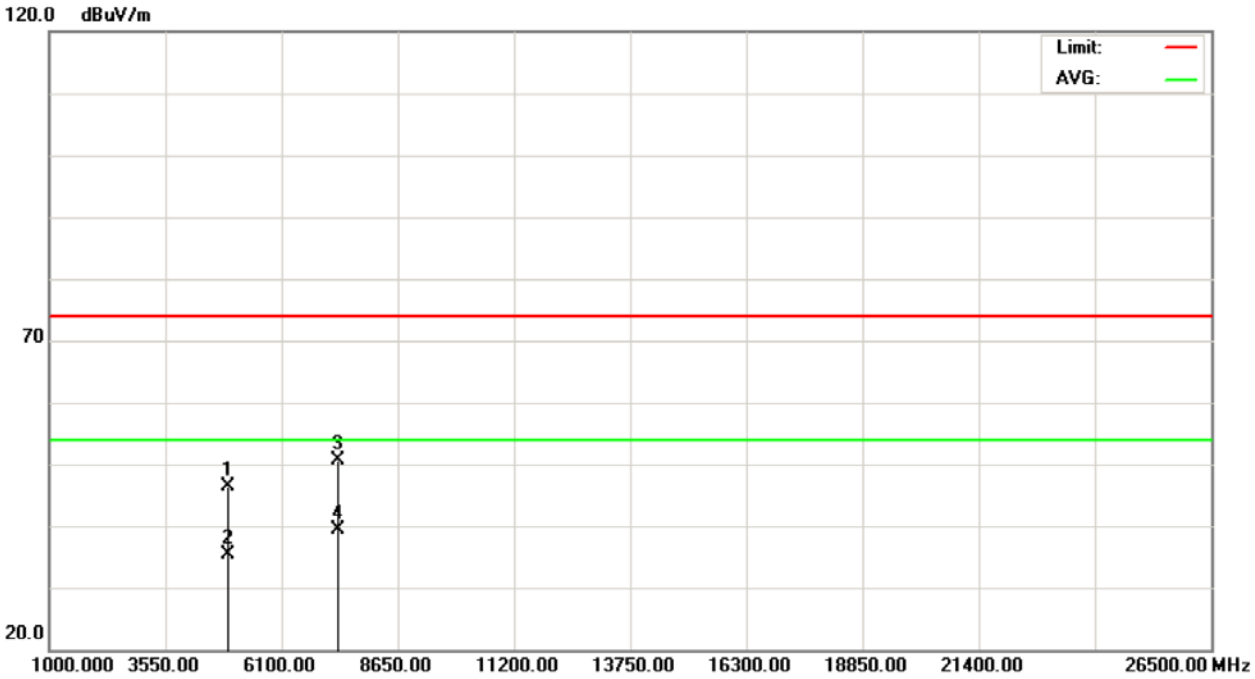
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**1M/CH39(Above 1000 MHz, Vertical)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M/CH39 | | |

| Type | Freq. | Polarization | Reading Level(dBuV) | | Correct | Measurement(dBuV/m) | | Limit(dBuV/m) | | Margin | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F/H/E | (MHz) | H/V | Peak | AV | Factor(dB) | Peak | AV | Peak | AV | (dB) | |
| F | 2441.000 | H | 65.27 | 38.17 | 31.10 | 96.37 | 69.27 | | | | |
| H | 4881.870 | H | 42.27 | 31.30 | 2.89 | 45.16 | 34.19 | 74.00 | 54.00 | - 19.81 | AV |
| H | 7323.030 | H | 41.91 | 31.04 | 8.43 | 50.34 | 39.47 | 74.00 | 54.00 | - 14.53 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

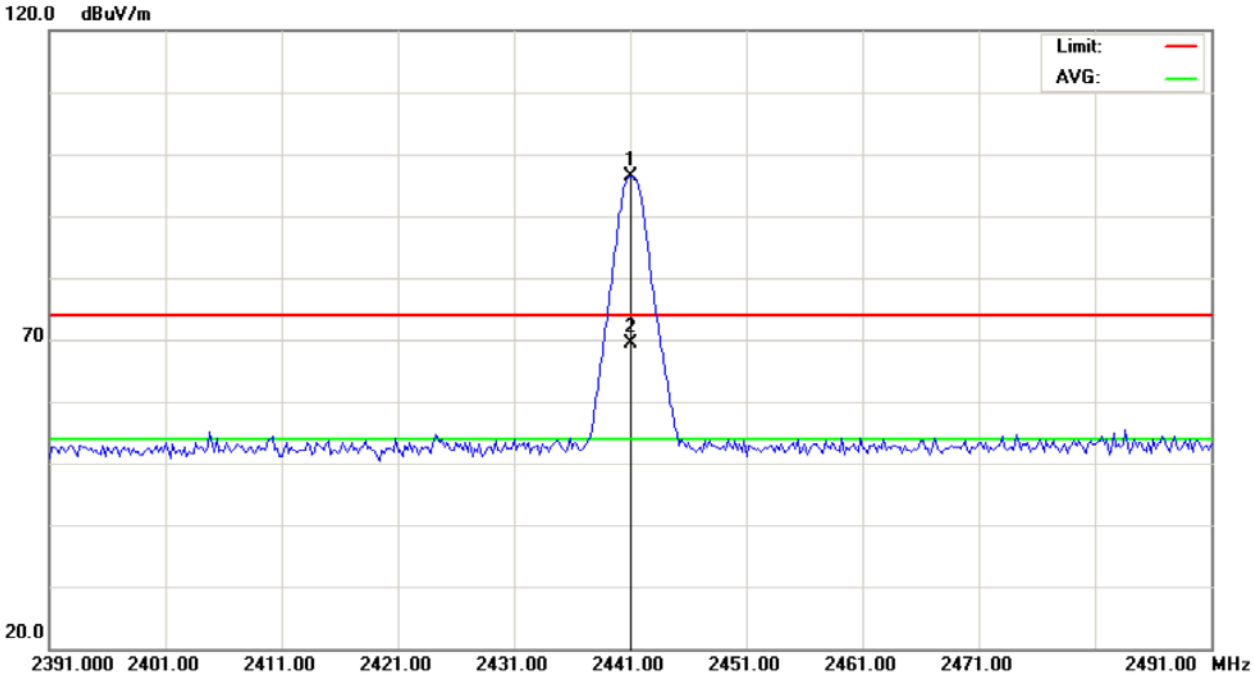
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

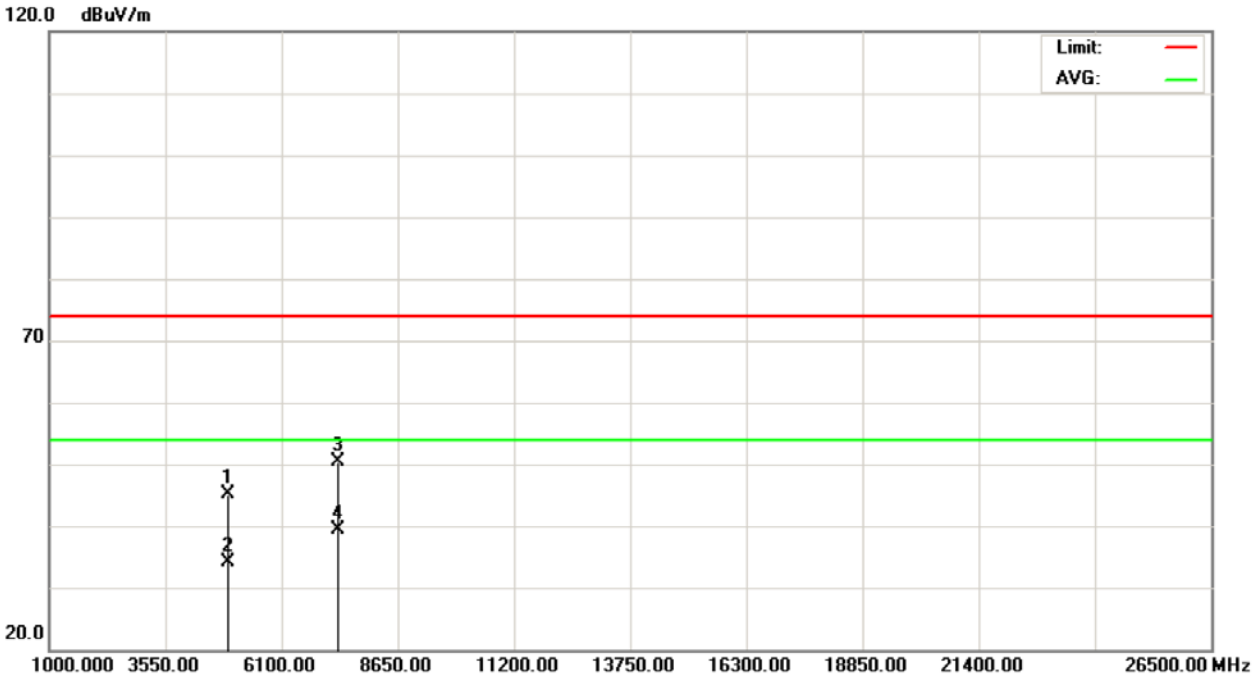
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**1M/CH39(Above 1000 MHz, Horizontal)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M/CH78 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 2480.200 | V | 67.03 | 56.93 | 31.27 | 98.30 | 88.20 | | | | |
| E | 2483.500 | V | 28.42 | 19.50 | 31.28 | 59.70 | 50.78 | 74.00 | 54.00 | - 3.22 | AV |
| H | 4959.960 | V | 43.79 | 33.02 | 3.15 | 46.94 | 36.17 | 74.00 | 54.00 | - 17.83 | AV |
| H | 7440.080 | V | 41.17 | 31.35 | 8.59 | 49.76 | 39.94 | 74.00 | 54.00 | - 14.06 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

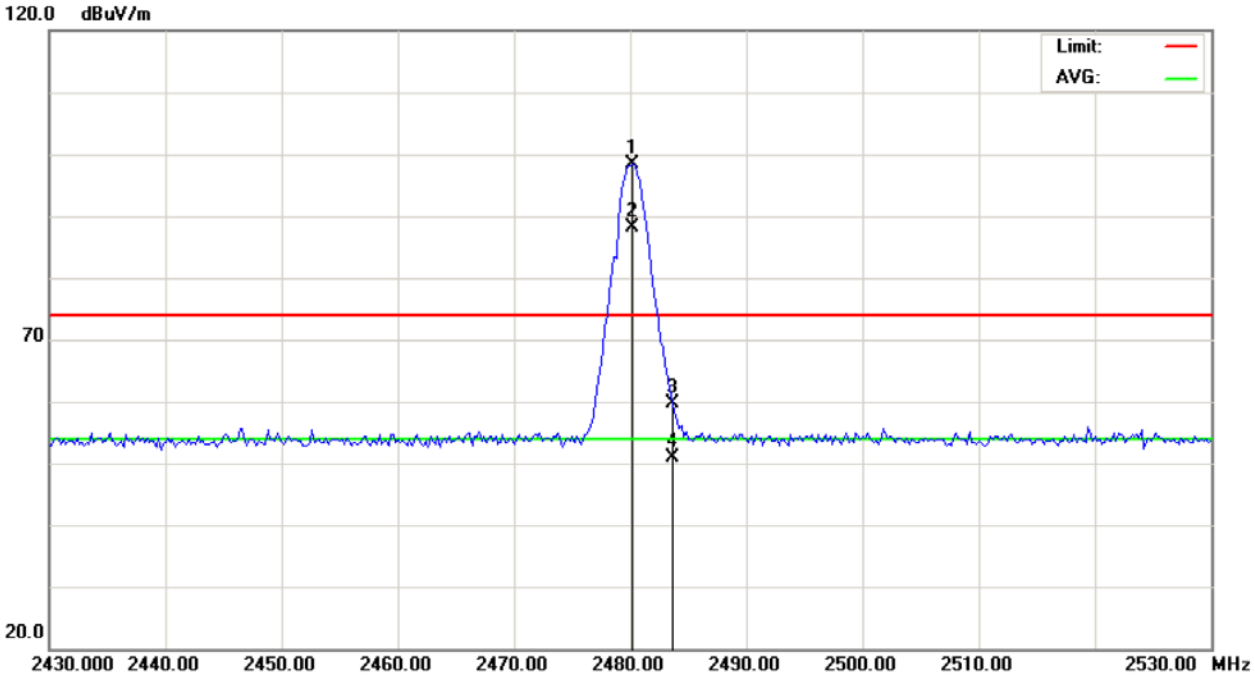
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

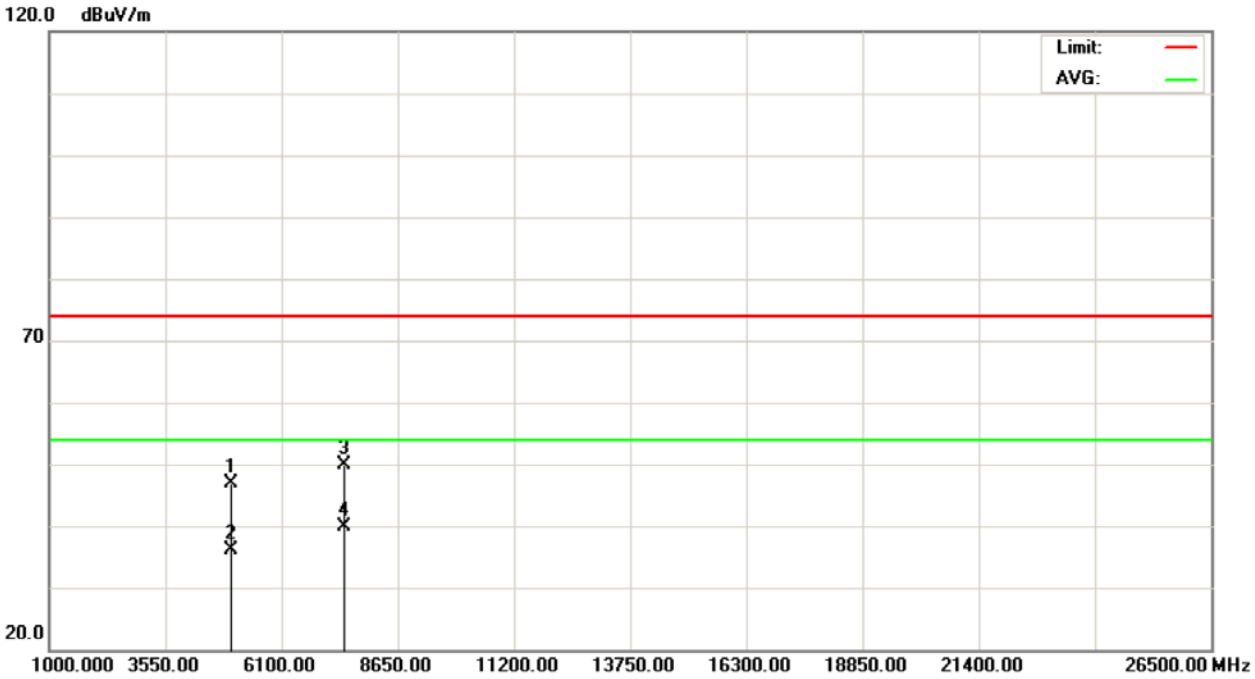
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**1M/CH78(Above 1000 MHz, Vertical)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M/CH78 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 2479.800 | H | 62.33 | 57.17 | 31.26 | 93.59 | 88.43 | | | | |
| E | 2483.500 | H | 24.87 | 19.19 | 31.28 | 56.15 | 50.47 | 74.00 | 54.00 | - 3.53 | AV |
| H | 4959.940 | H | 41.03 | 31.03 | 3.15 | 44.18 | 34.18 | 74.00 | 54.00 | - 19.82 | AV |
| H | 7439.880 | H | 1.46 | 31.19 | 8.59 | 10.05 | 39.78 | 74.00 | 54.00 | - 14.22 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

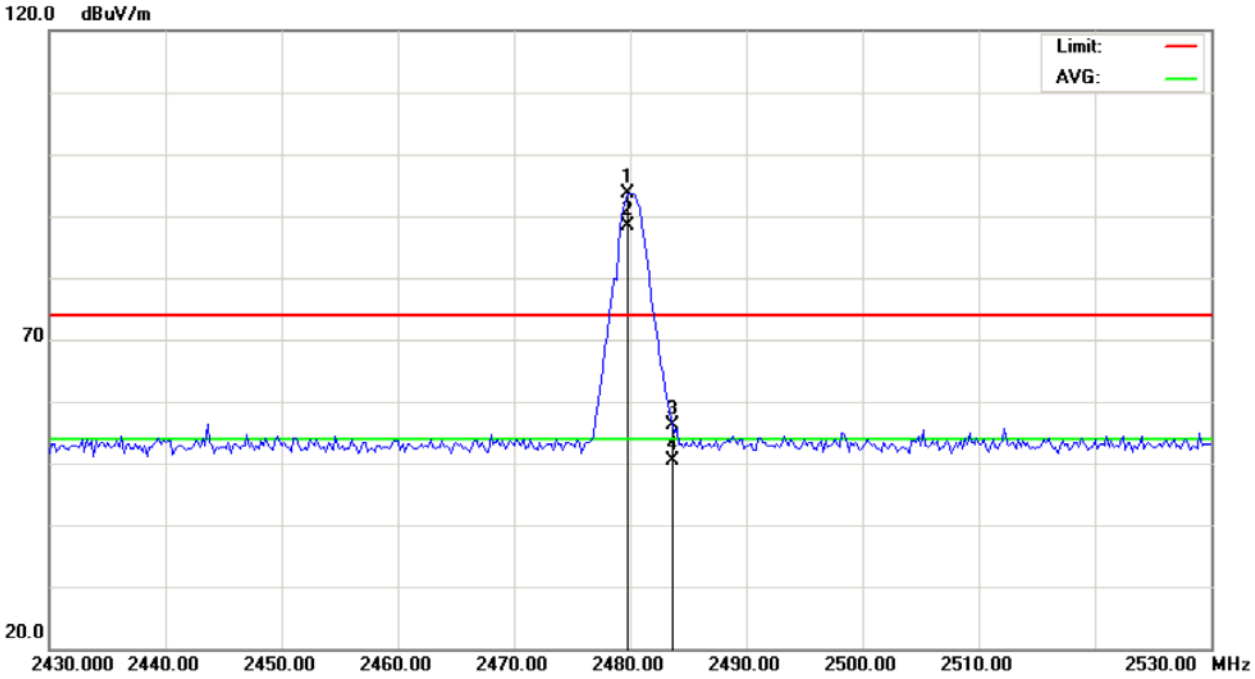
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

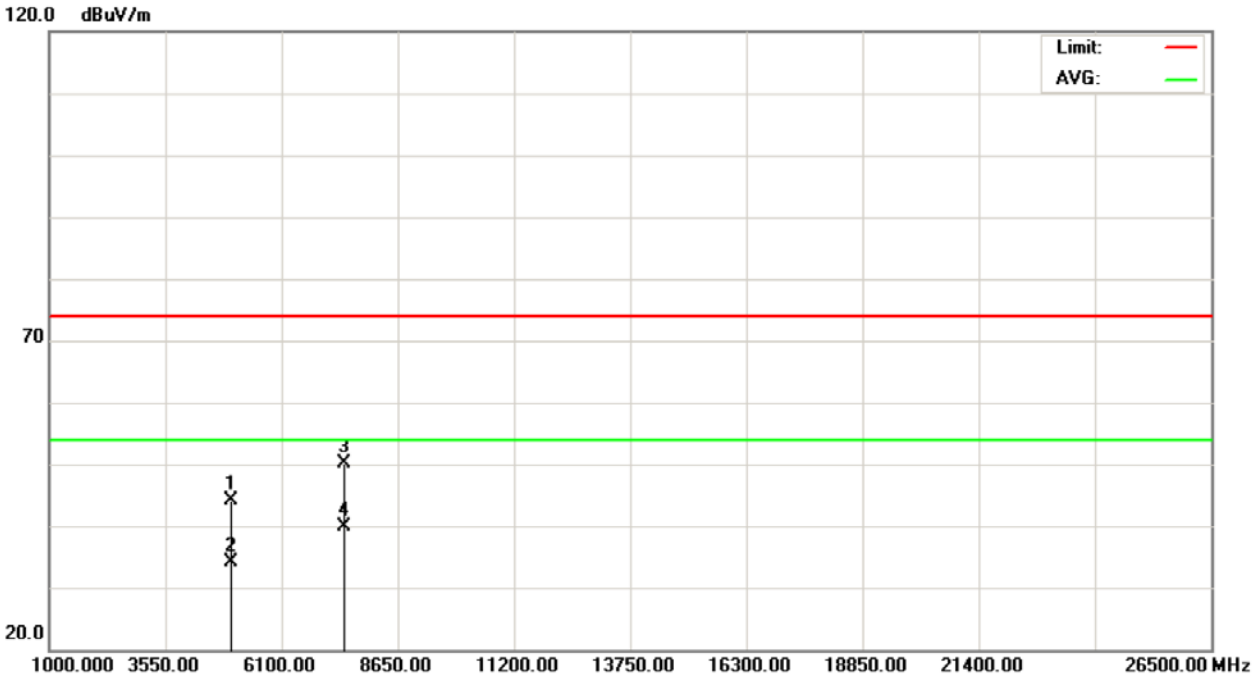
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**1M/CH78(Above 1000 MHz, Horizontal)**



| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M/CH00 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) | | Correct Factor(dB) | Measurement(dBuV/m) | | Limit(dBuV/m) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Peak | AV | | Peak | AV | Peak | AV | | |
| E | 2390.000 | V | 22.81 | 11.55 | 30.89 | 53.70 | 42.44 | 74.00 | 54.00 | - 11.56 | AV |
| F | 2402.200 | V | 65.28 | 16.69 | 30.94 | 96.22 | 47.63 | | | | |
| H | 4803.960 | V | 42.94 | 31.34 | 2.64 | 45.58 | 33.98 | 74.00 | 54.00 | - 20.02 | AV |
| H | 7205.920 | V | 42.12 | 31.78 | 8.26 | 50.38 | 40.04 | 74.00 | 54.00 | - 13.96 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

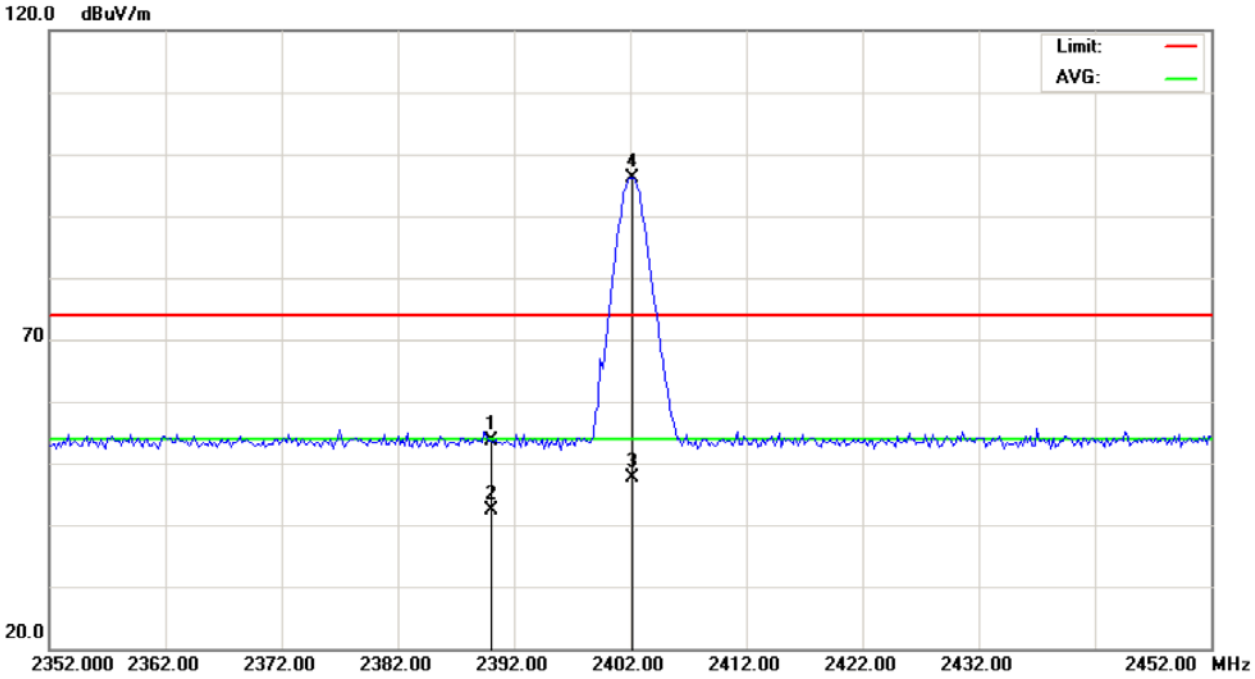
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

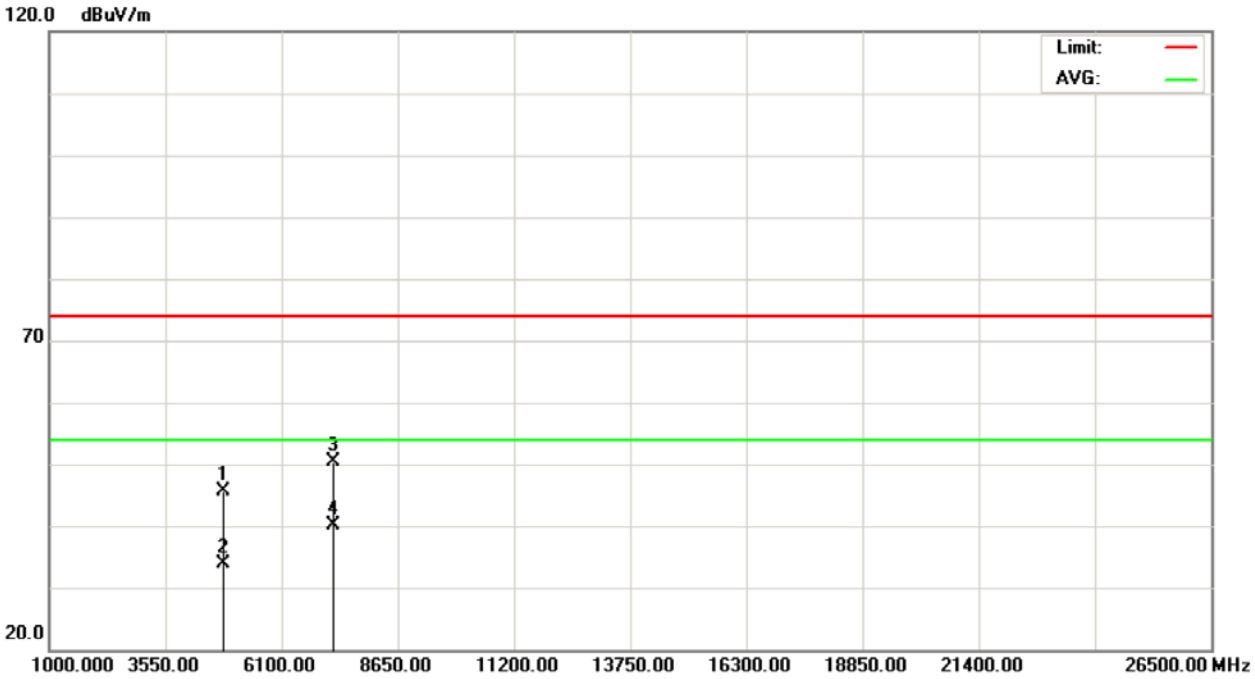
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**3M/CH00(Above 1000 MHz, Vertical)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M/CH00 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | 2390.000 | H | 21.63 | 11.59 | 30.89 | 52.52 | 42.48 | 74.00 | 54.00 | - 11.52 | AV |
| F | 2402.200 | H | 66.34 | 13.82 | 30.94 | 97.28 | 44.76 | | | | |
| H | 4804.120 | H | 41.57 | 31.24 | 2.64 | 44.21 | 33.88 | 74.00 | 54.00 | - 20.12 | AV |
| H | 7206.100 | H | 43.05 | 31.69 | 8.26 | 51.31 | 39.95 | 74.00 | 54.00 | - 14.05 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

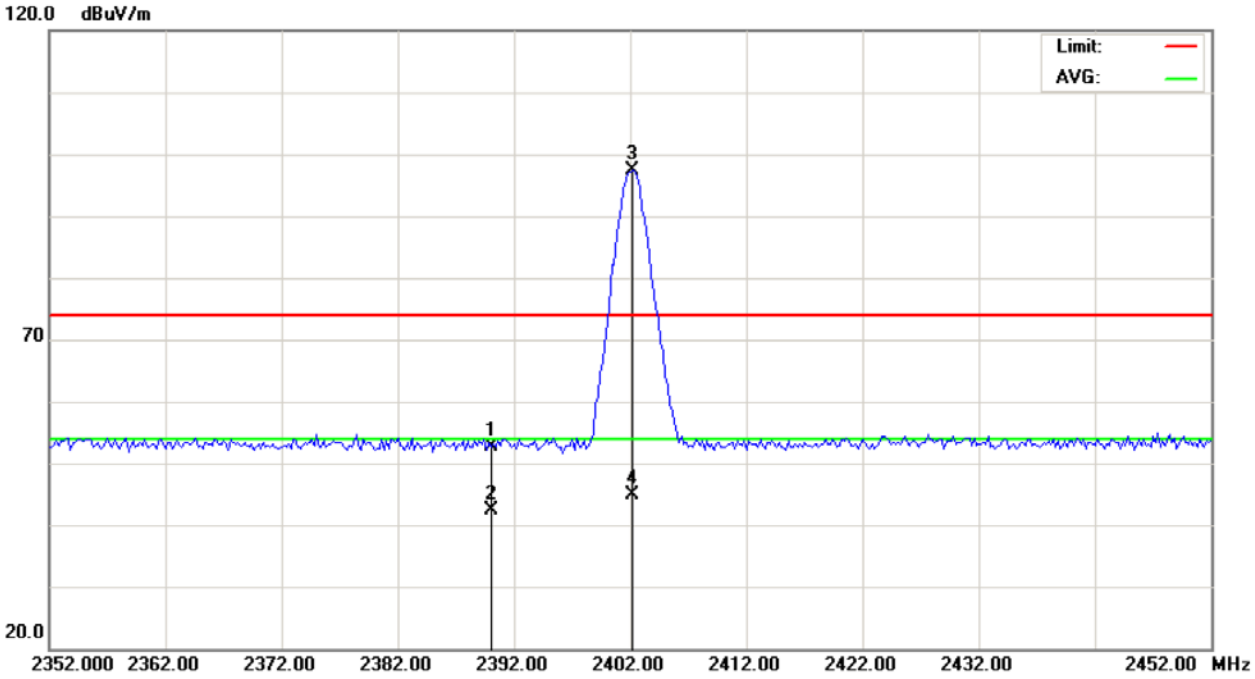
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

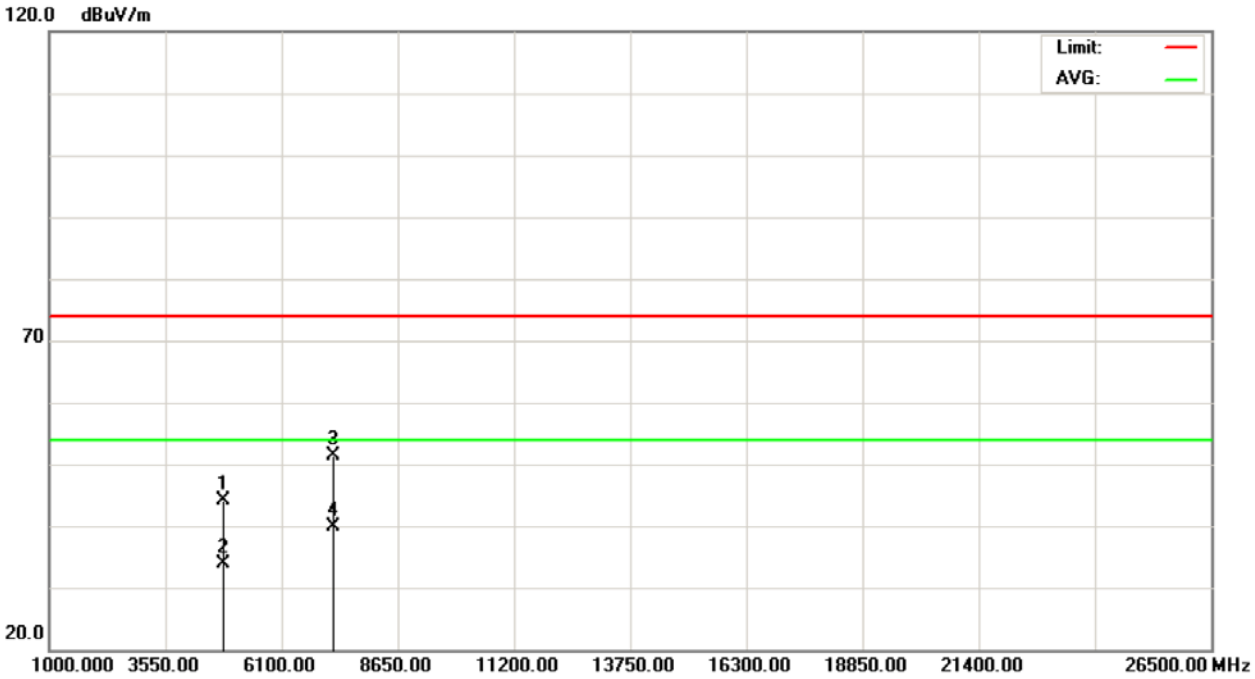
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**3M/CH00(Above 1000 MHz, Horizontal)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M/CH39 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 2441.200 | V | 64.31 | 24.25 | 31.10 | 95.41 | 55.35 | | | | |
| H | 4881.820 | V | 41.67 | 31.19 | 2.89 | 44.56 | 34.08 | 74.00 | 54.00 | - 19.92 | AV |
| H | 7322.920 | V | 42.50 | 31.20 | 8.43 | 50.93 | 39.63 | 74.00 | 54.00 | - 14.37 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

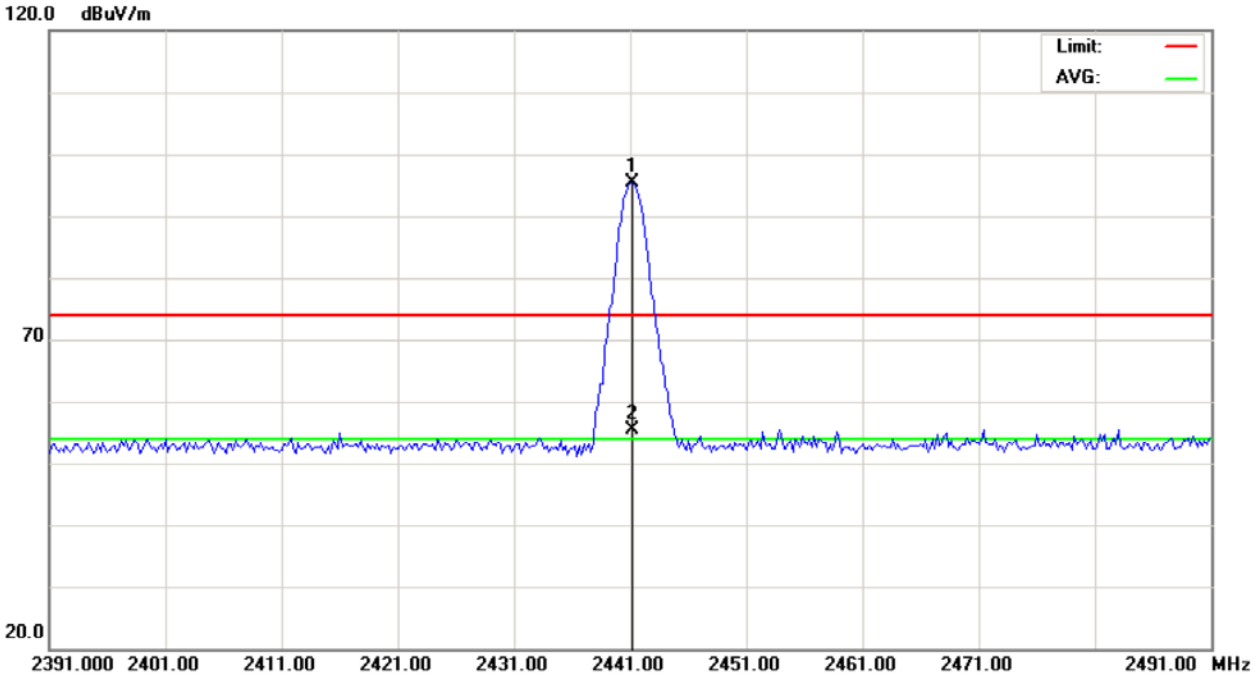
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

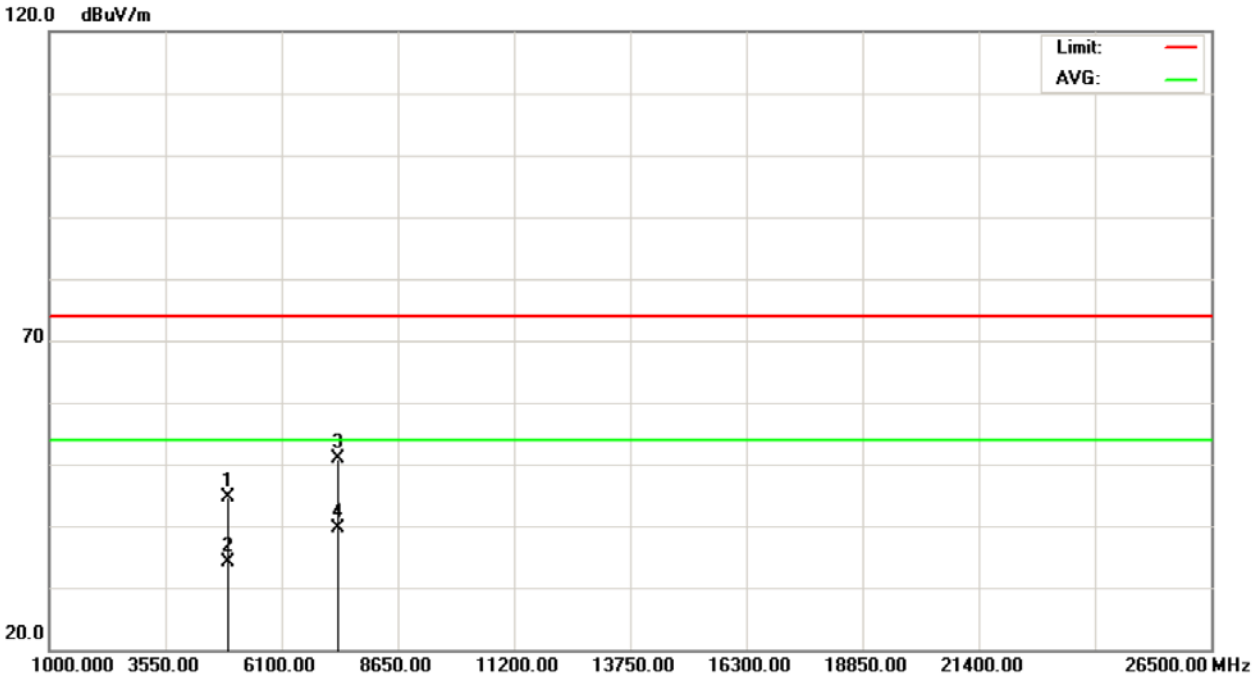
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**3M/CH39(Above 1000 MHz, Vertical)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M/CH39 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 2441.200 | H | 63.74 | 25.19 | 31.10 | 94.84 | 56.29 | | | | |
| H | 4882.160 | H | 41.56 | 30.90 | 2.89 | 44.45 | 33.79 | 74.00 | 54.00 | - 20.21 | AV |
| H | 7323.080 | H | 40.99 | 31.17 | 8.43 | 49.42 | 39.60 | 74.00 | 54.00 | - 14.40 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

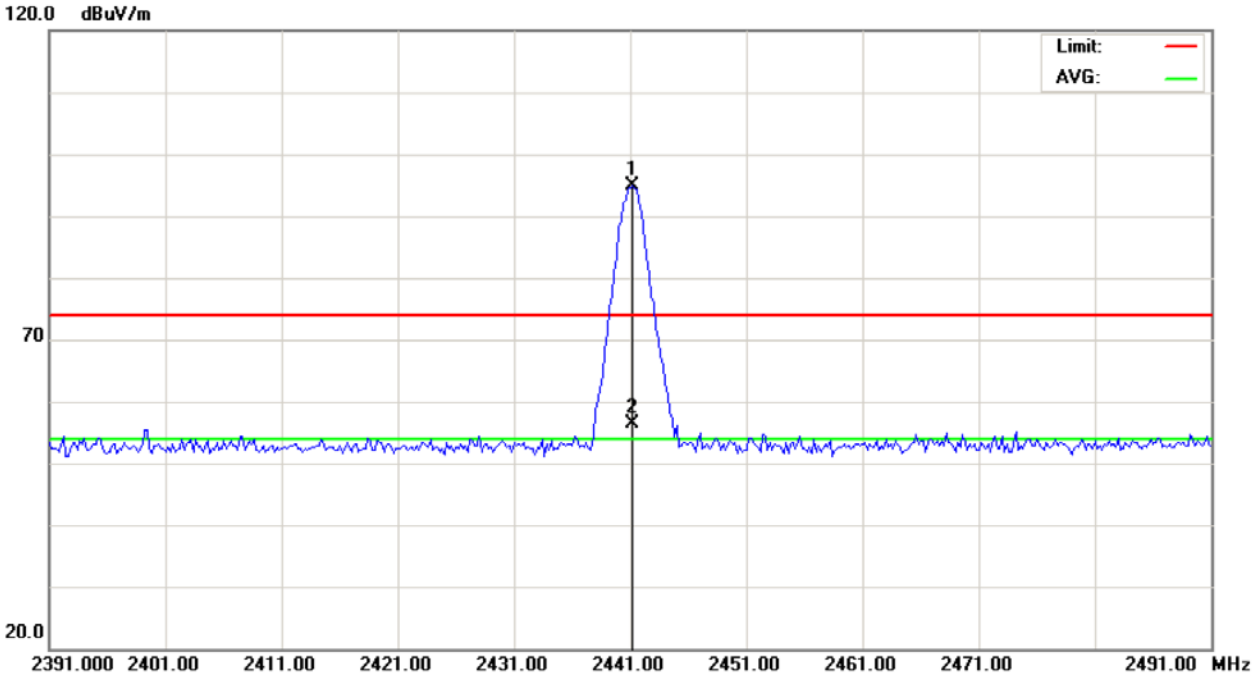
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

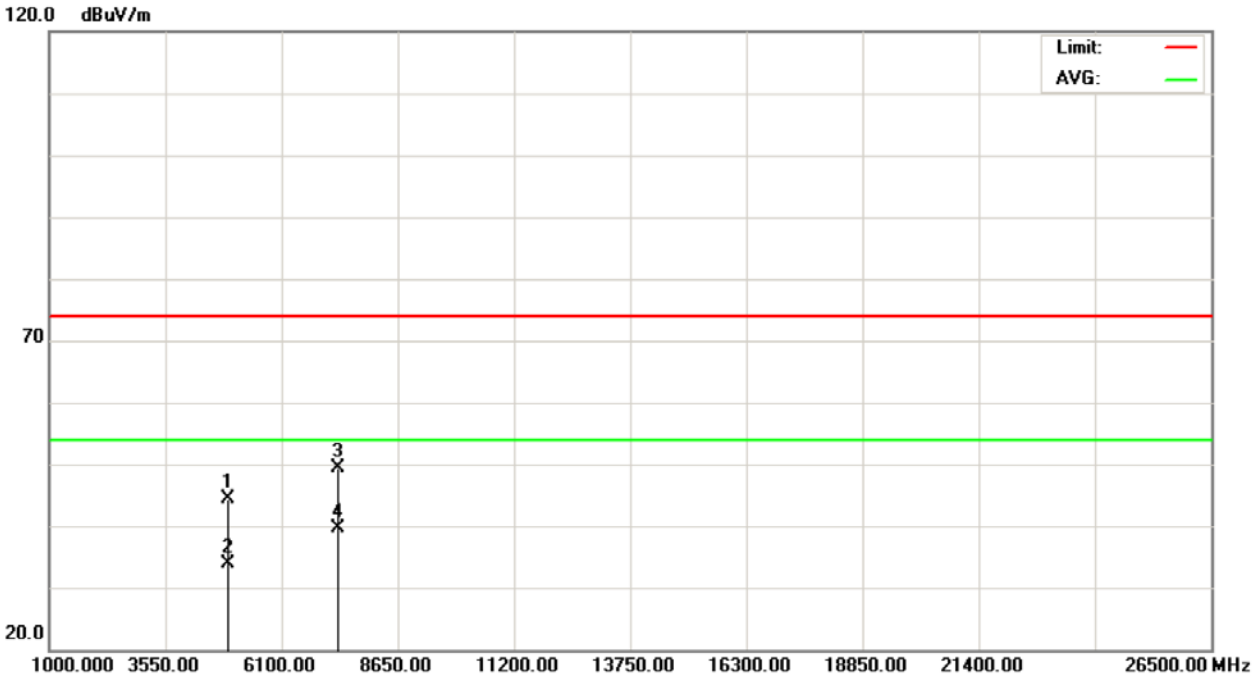
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**3M/CH39(Above 1000 MHz, Horizontal)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M/CH78 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 2480.200 | V | 56.46 | 23.78 | 31.27 | 87.73 | 55.05 | | | | |
| E | 2483.500 | V | 22.66 | 12.31 | 31.28 | 53.94 | 43.59 | 74.00 | 54.00 | - 10.41 | AV |
| H | 4960.100 | V | 42.29 | 31.15 | 3.15 | 45.44 | 34.30 | 74.00 | 54.00 | - 19.70 | AV |
| H | 7440.180 | V | 42.01 | 31.33 | 8.59 | 50.60 | 39.92 | 74.00 | 54.00 | - 14.08 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

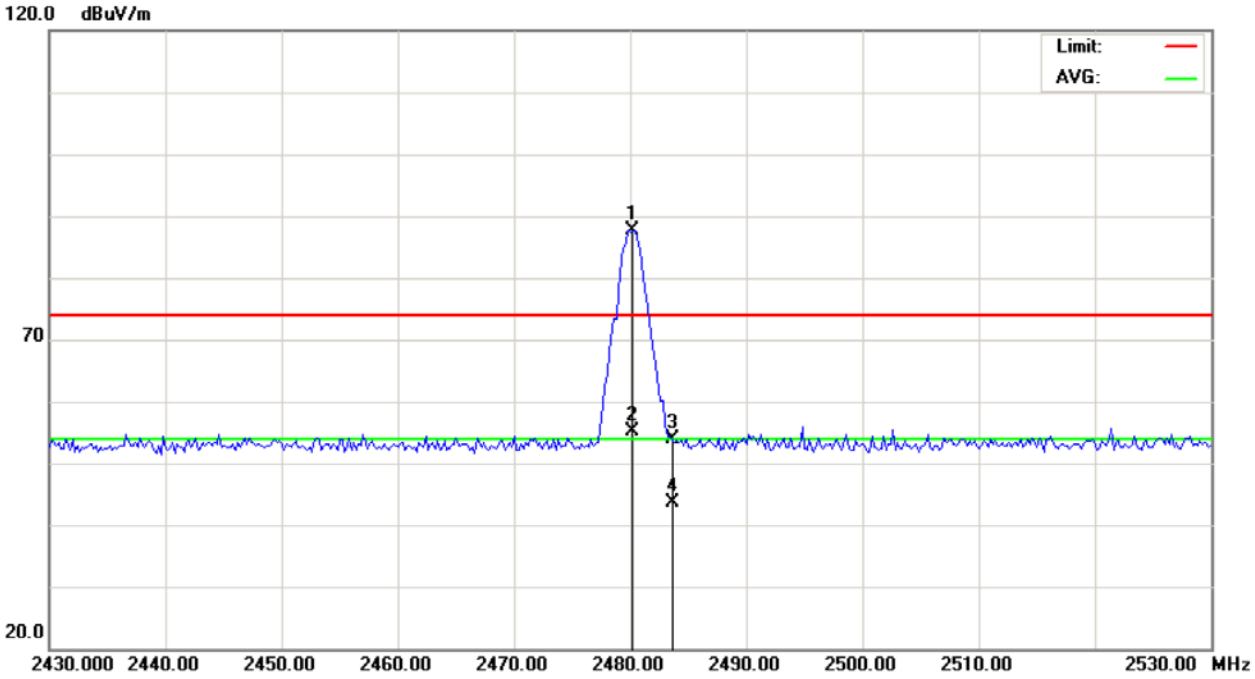
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

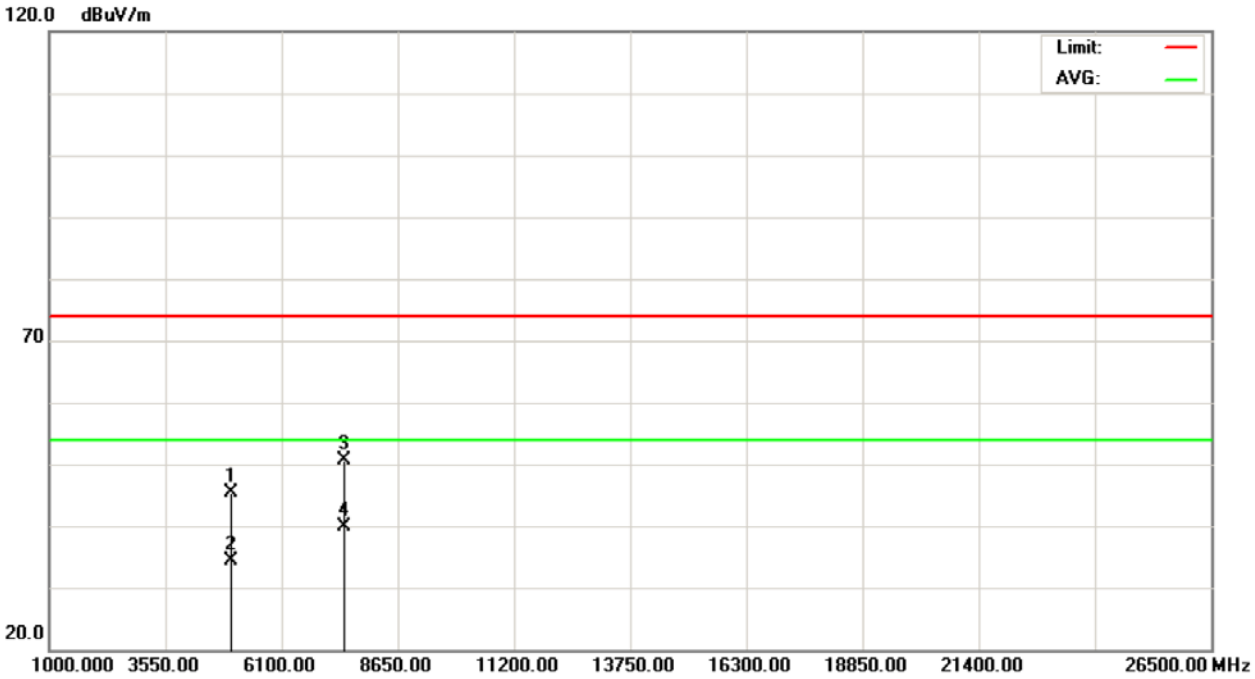
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**3M/CH78(Above 1000 MHz, Vertical)**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M/CH78 | | |

| Type F/H/E | Freq. (MHz) | Polarization H/V | Reading Level(dBuV) Peak | Reading Level(dBuV) AV | Correct Factor(dB) | Measurement(dBuV/m) Peak | Measurement(dBuV/m) AV | Limit(dBuV/m) Peak | Limit(dBuV/m) AV | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 2480.000 | H | 60.59 | 25.69 | 31.27 | 91.86 | 56.96 | | | | |
| E | 2483.500 | H | 23.05 | 13.34 | 31.28 | 54.33 | 44.62 | 74.00 | 54.00 | - 9.38 | AV |
| H | 4959.940 | H | 42.20 | 31.02 | 3.15 | 45.35 | 34.17 | 74.00 | 54.00 | - 19.83 | AV |
| H | 7439.920 | H | 43.80 | 31.34 | 8.59 | 52.39 | 39.93 | 74.00 | 54.00 | - 14.07 | AV |

Remark：

(1) All readings are Peak unless otherwise stated AV in column of『Note』. Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

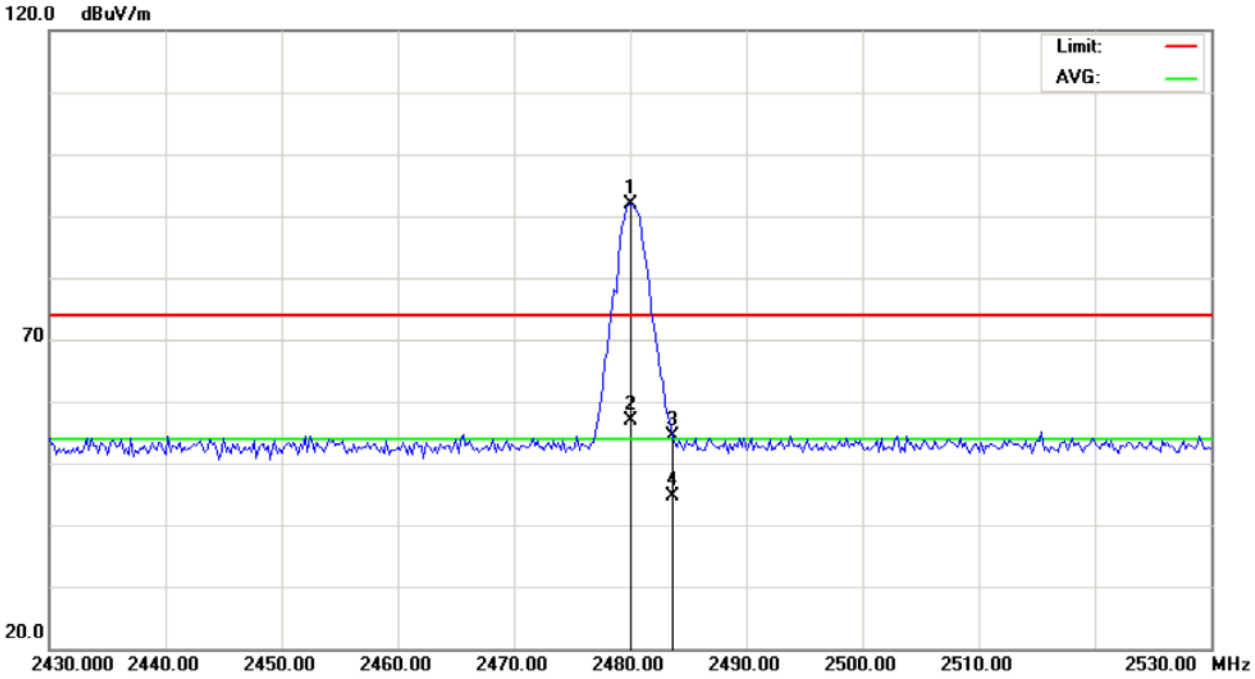
(4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

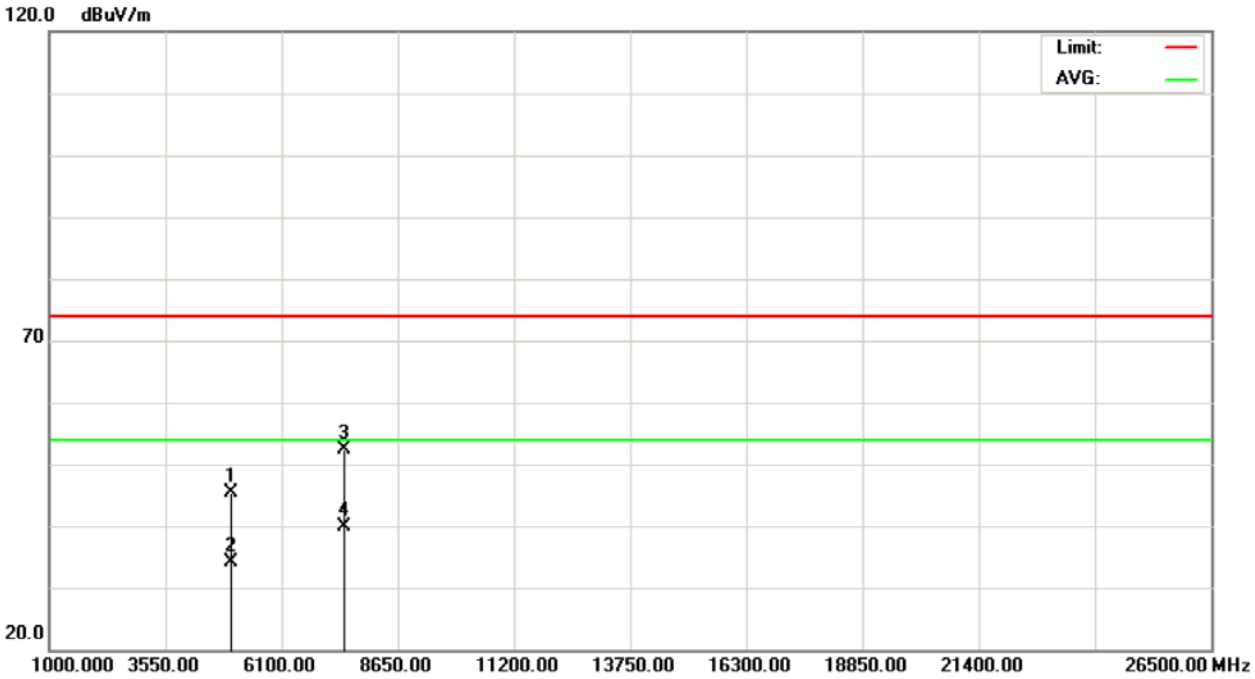
(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axes：
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

(7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.

**Orthogonal Axis：X**
**3M/CH78(Above 1000 MHz, Horizontal)**



### 4.2.9 TEST RESULTS-Restricted Bands Requirements

| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M (Vertical) | | |
| Note： | The emission of the carrier radiated field strength is measured for CH00/CH78 (Peak and AV) as following:<br>1. The transmitter was setup to transmit at the lowest channel (CH00). Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel (CH78). Then the field strength was measured at 2483.5-2500 MHz. | | |

| Freq. (MHz) | Polarization H/V | Reading Level(dBuV) | | Correct Factor(dB) | Measurement(dBuV/m) | | Limit(dBuV/m) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | AV | | Peak | AV | Peak | AV | | |
| 2390.000 | V | 21.24 | 11.57 | 30.89 | 52.13 | 42.46 | 74.00 | 54.00 | - 11.54 | AV |
| 2483.500 | V | 28.42 | 19.50 | 31.28 | 59.70 | 50.78 | 74.00 | 54.00 | - 3.22 | AV |

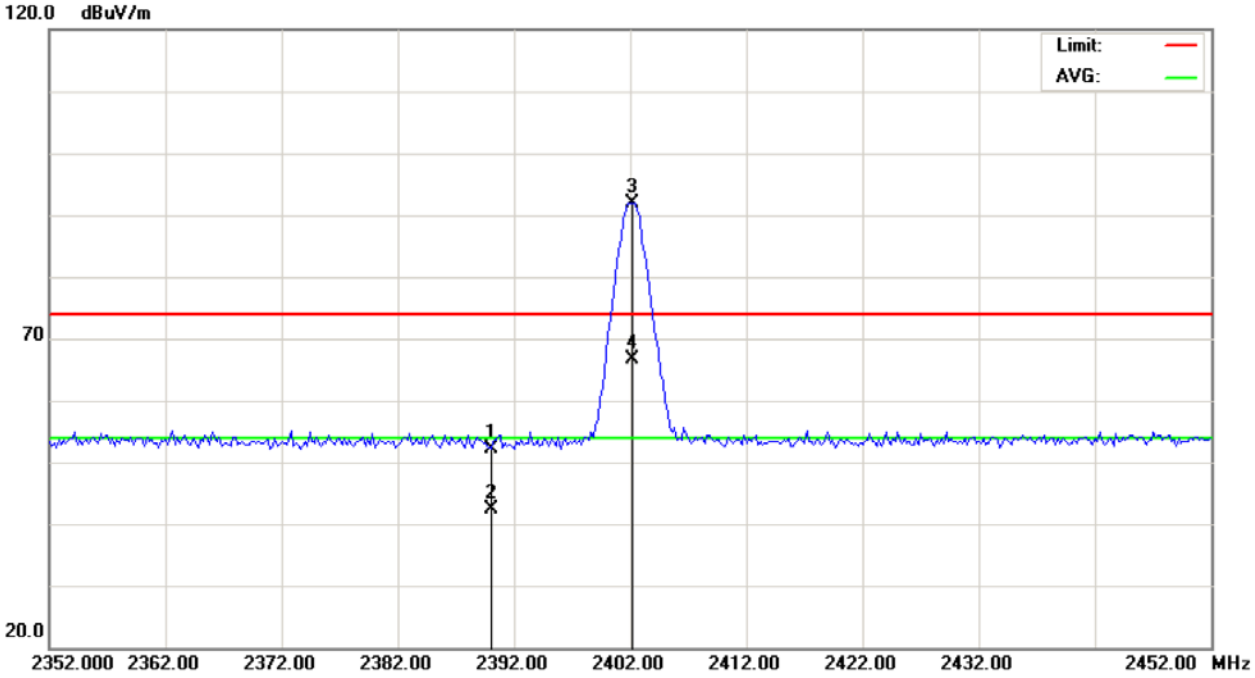
Remark：

(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦

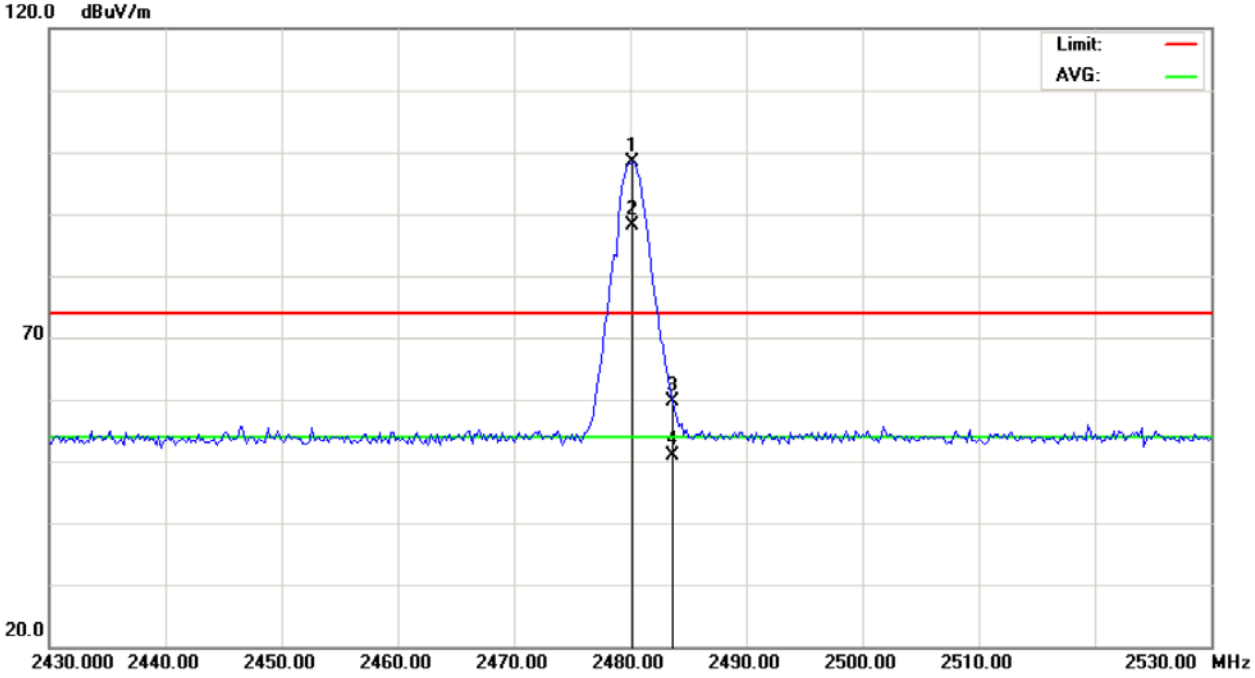
(2) EUT Orthogonal Axes：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

**1M(Restricted Bands Requirements, Vertical)**
**CH00**




**CH78**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 1M (Horizontal) | | |
| Note： | The emission of the carrier radiated field strength is measured for CH00/CH78 (Peak and AV) as following:<br>1. The transmitter was setup to transmit at the lowest channel (CH00). Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel (CH78). Then the field strength was measured at 2483.5-2500 MHz. | | |

| Freq. (MHz) | Polarization H/V | Reading Level(dBuV) | | Correct Factor(dB) | Measurement(dBuV/m) | | Limit(dBuV/m) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | AV | | Peak | AV | Peak | AV | | |
| 2390.000 | H | 22.90 | 11.58 | 30.89 | 53.79 | 42.47 | 74.00 | 54.00 | - 11.53 | AV |
| 2483.500 | H | 24.87 | 19.19 | 31.28 | 56.15 | 50.47 | 74.00 | 54.00 | - 3.53 | AV |

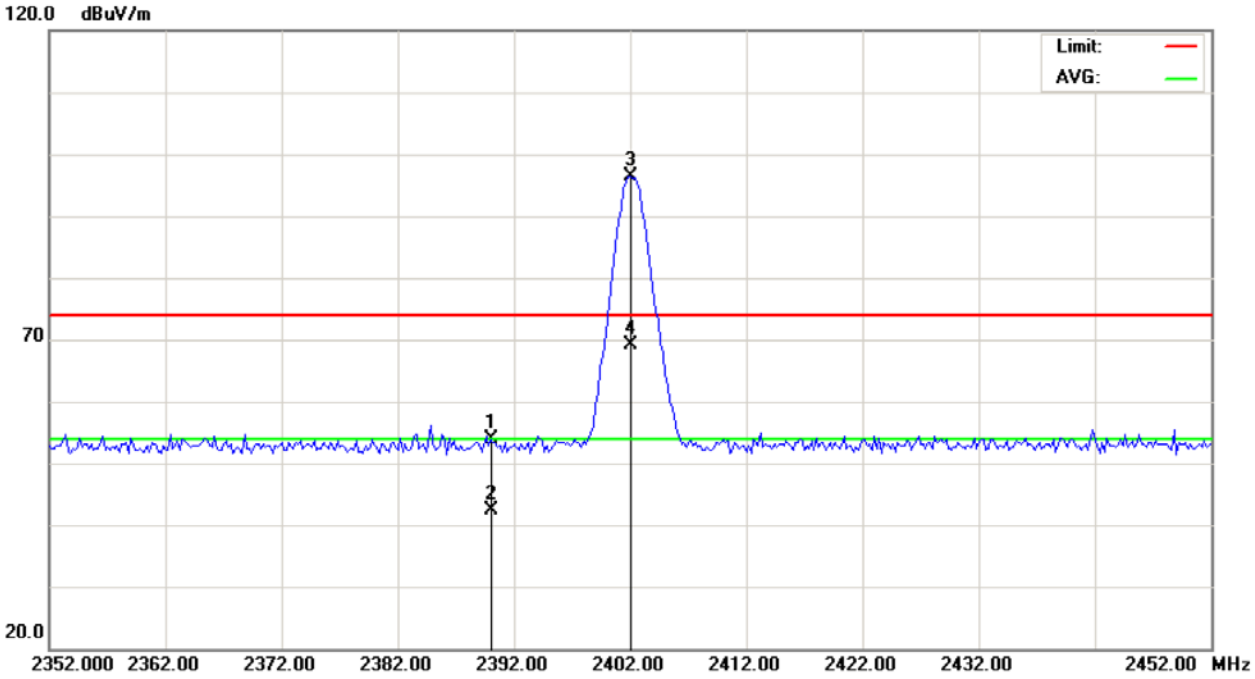
Remark：

(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

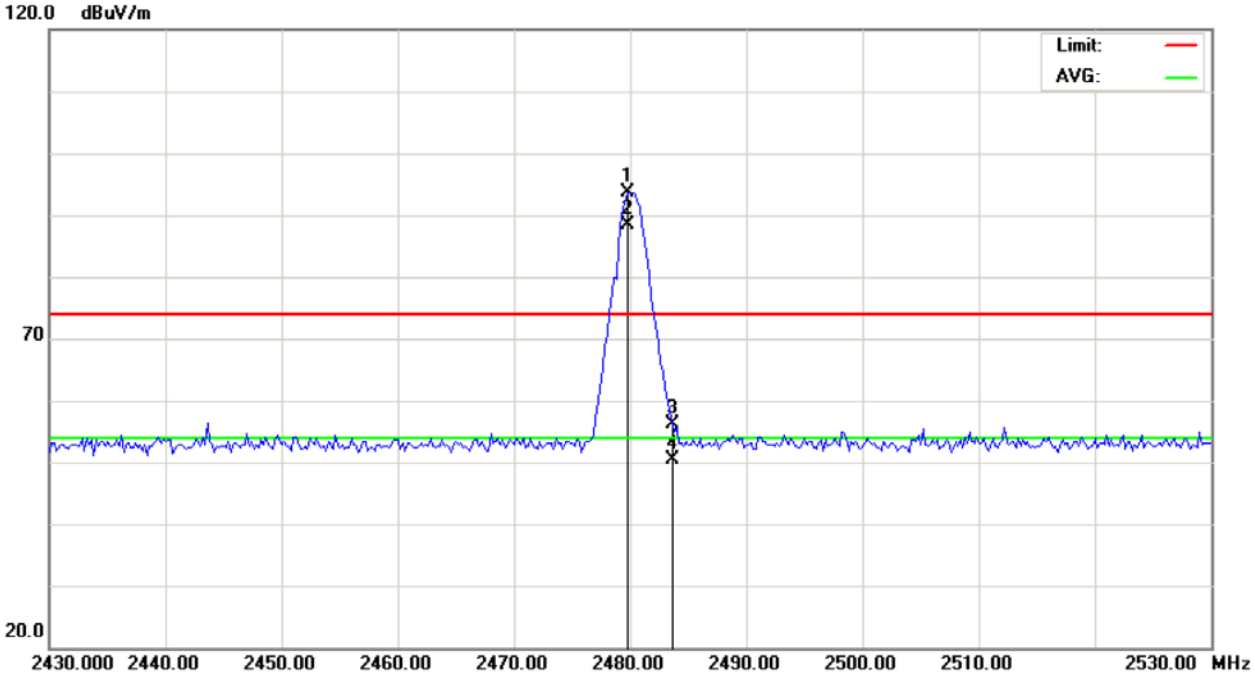
(2) EUT Orthogonal Axes：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

**1M(Restricted Bands Requirements, Horizontal)**
**CH00**




**CH78**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M (Vertical) | | |
| Note： | The emission of the carrier radiated field strength is measured for CH00/CH78 (Peak and AV) as following:<br>1. The transmitter was setup to transmit at the lowest channel (CH00). Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel (CH78). Then the field strength was measured at 2483.5-2500 MHz. | | |

| Freq. (MHz) | Polarization H/V | Reading Level(dBuV) | | Correct Factor(dB) | Measurement(dBuV/m) | | Limit(dBuV/m) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | AV | | Peak | AV | Peak | AV | | |
| 2390.000 | V | 22.81 | 11.55 | 30.89 | 53.70 | 42.44 | 74.00 | 54.00 | - 11.56 | AV |
| 2483.500 | V | 22.66 | 12.31 | 31.28 | 53.94 | 43.59 | 74.00 | 54.00 | - 10.41 | AV |

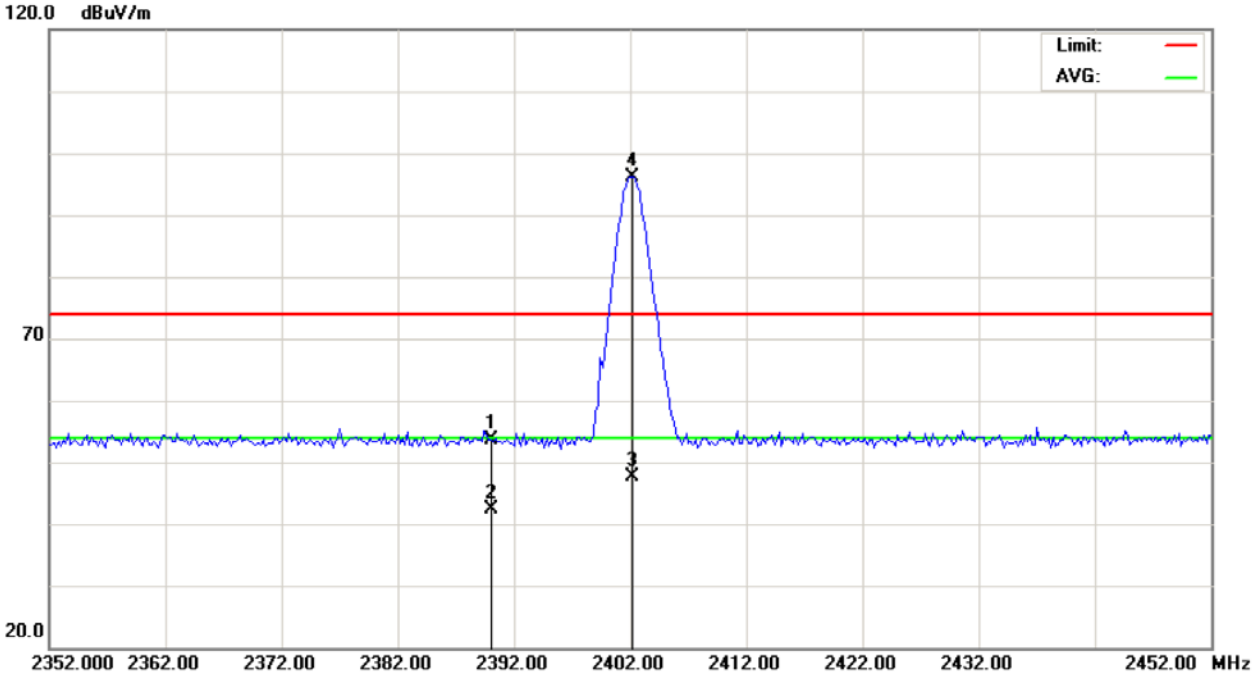
Remark：

(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦

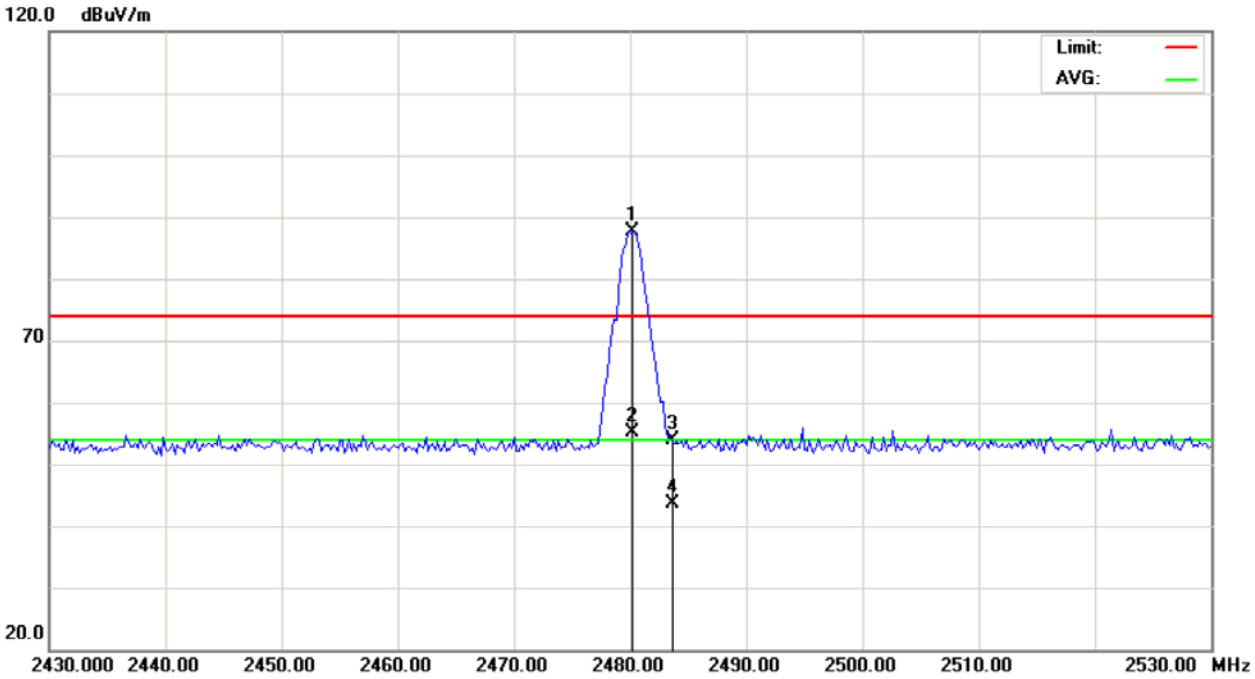
(2) EUT Orthogonal Axes：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

**3M(Restricted Bands Requirements, Vertical)**
**CH00**




**CH78**



| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage： | AC 120V/60Hz | Orthogonal Axes: | X |
| Test Mode ： | 3M (Horizontal) | | |
| Note： | The emission of the carrier radiated field strength is measured for CH00/CH78 (Peak and AV) as following:<br>1. The transmitter was setup to transmit at the lowest channel (CH00). Then the field strength was measured at 2310-2390 MHz.<br>2. The transmitter was setup to transmit at the highest channel (CH78). Then the field strength was measured at 2483.5-2500 MHz. | | |

| Freq. (MHz) | Polarization H/V | Reading Level(dBuV) | | Correct Factor(dB) | Measurement(dBuV/m) | | Limit(dBuV/m) | | Margin (dB) | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | AV | | Peak | AV | Peak | AV | | |
| 2390.000 | H | 21.63 | 11.59 | 30.89 | 52.52 | 42.48 | 74.00 | 54.00 | - 11.52 | AV |
| 2483.500 | H | 23.05 | 13.34 | 31.28 | 54.33 | 44.62 | 74.00 | 54.00 | - 9.38 | AV |

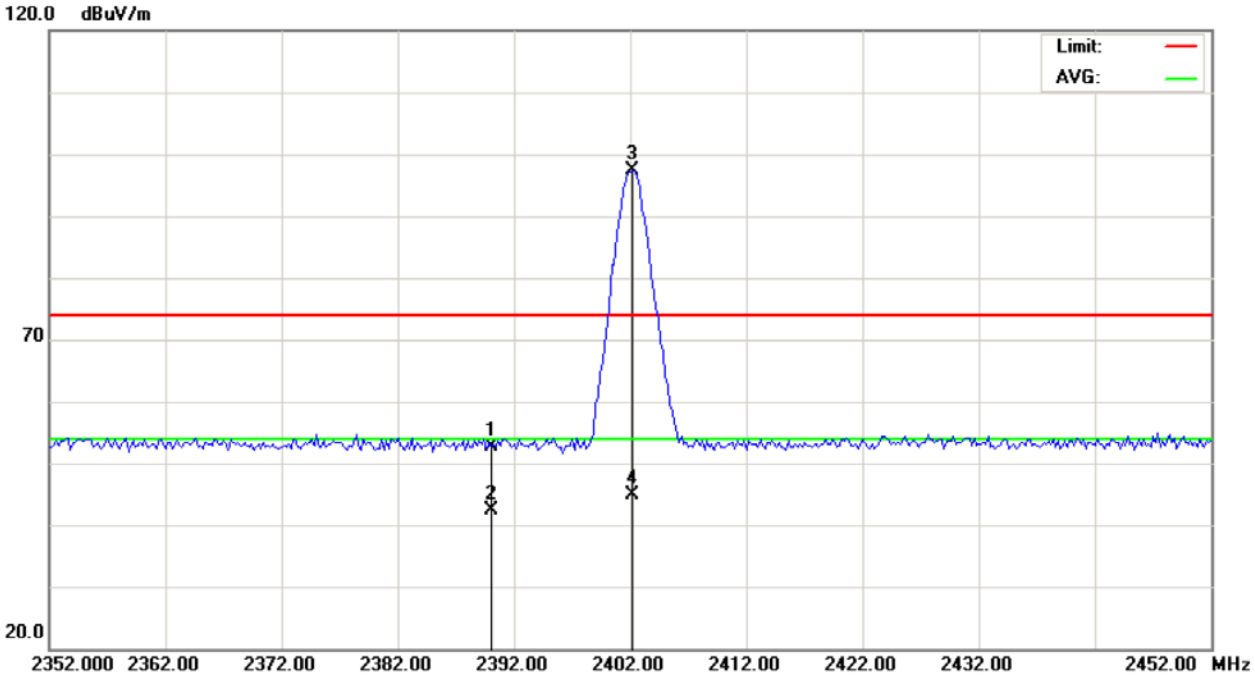
Remark：

(1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission 。

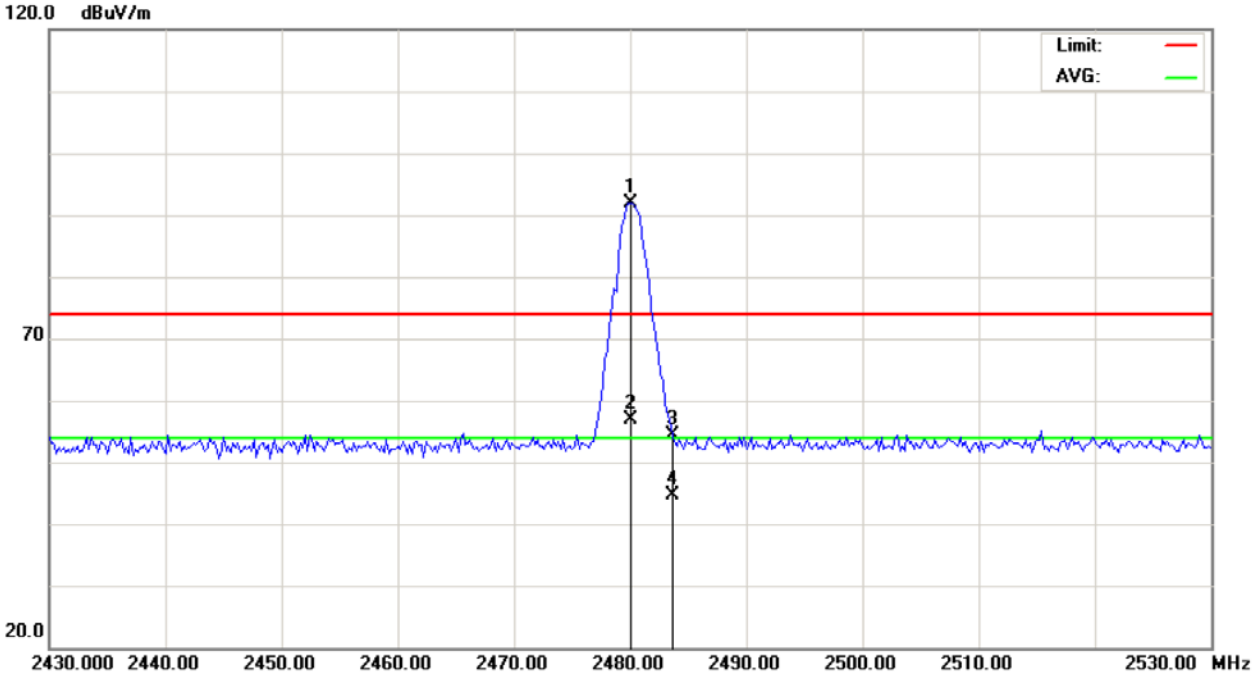
(2) EUT Orthogonal Axes：

"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand

**3M(Restricted Bands Requirements, Horizontal)**
**CH00**




**CH78**



## 5. NUMBER OF HOPPING CHANNEL

### 5.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C | | | |
|---|---|---|---|
| Section | Test Item | Frequency Range (MHz) | Result |
| 15.247 (a)(1)(ii) | Number of Hopping Channel | 2400-2483.5 | PASS |

### 5.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Aug. 31, 2011 |

Remark: ” N/A” denotes No Model Name, Serial No. or No Calibration specified.

| Spectrum Parameters | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > Operating Frequency Range |
| RB | 100 kHz |
| VB | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

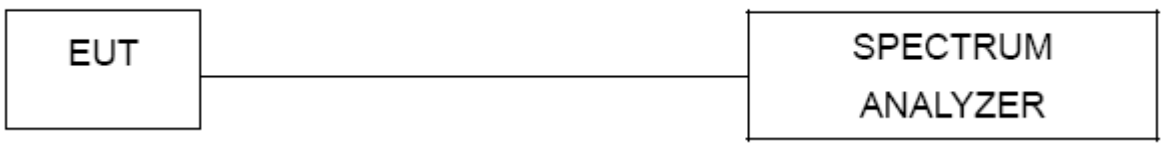
### 5.1.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

### 5.1.3 DEVIATION FROM STANDARD

No deviation.

### 5.1.4 TEST SETUP



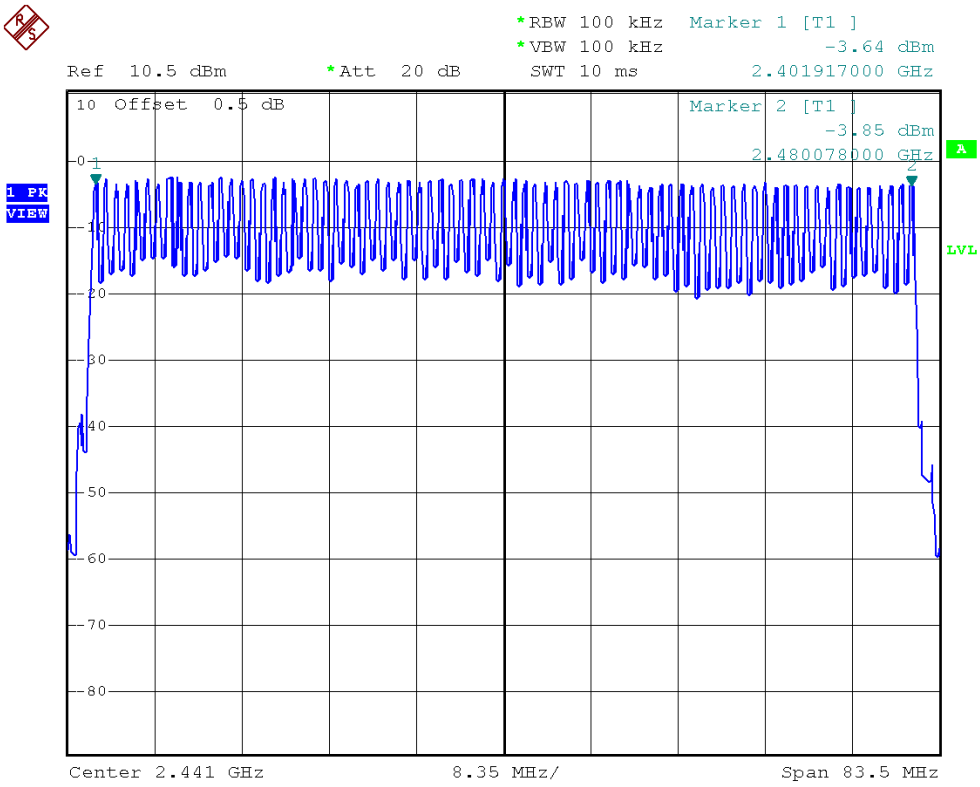

### 5.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

### 5.1.6 TEST RESULTS

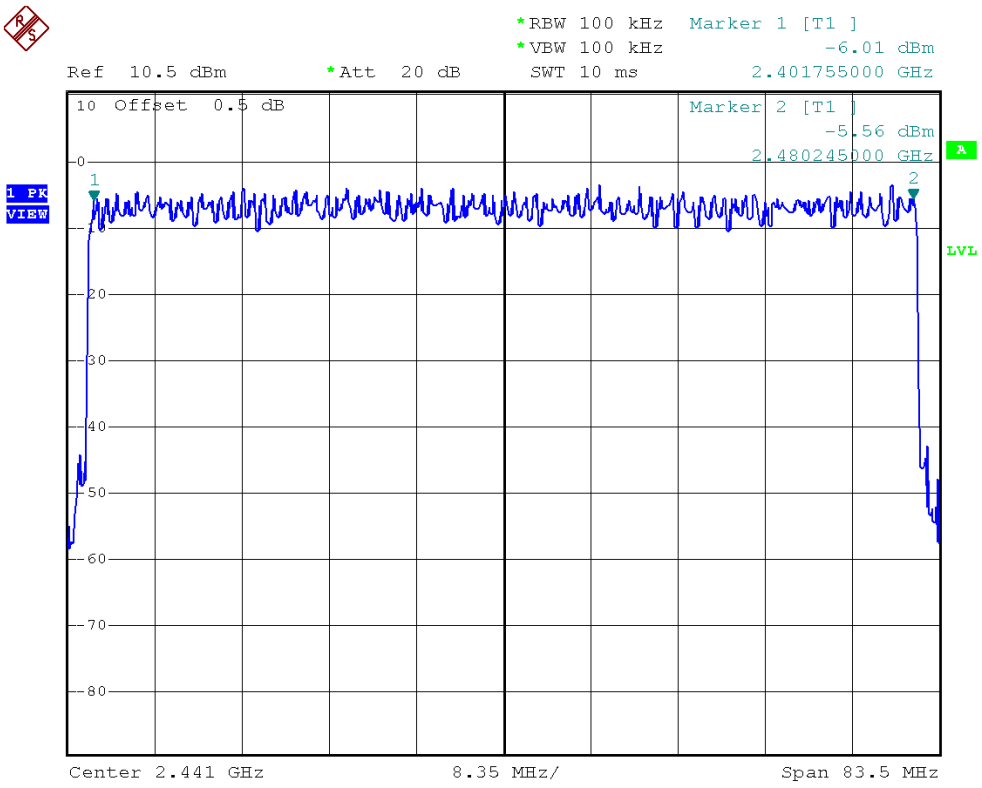
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 1M/Hopping Mode | | |

| Number of Hopping Channel | 79 |
|---|---|



| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 3M/Hopping Mode | | |

| Number of Hopping Channel | 79 |
|---|---|



# 6. AVERAGE TIME OF OCCUPANCY

## 6.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C | | | | |
|---|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) | Result |
| 15.247 (a)(1)(ii) | Average Time of Occupancy | < = 0.4 sec (a 30 second period) | 2400-2483.5 | PASS |

### 6.1.1 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Aug. 31, 2011 |

Remark: ” N/A” denotes No Model Name , Serial No. or No Calibration specified.

### 6.1.2 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyser
b. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
i. DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds.
j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds.
k. DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds.

### 6.1.3 DEVIATION FROM STANDARD

No deviation.

### 6.1.4 TEST SETUP


### 6.1.5 EUT OPERATION CONDITIONS

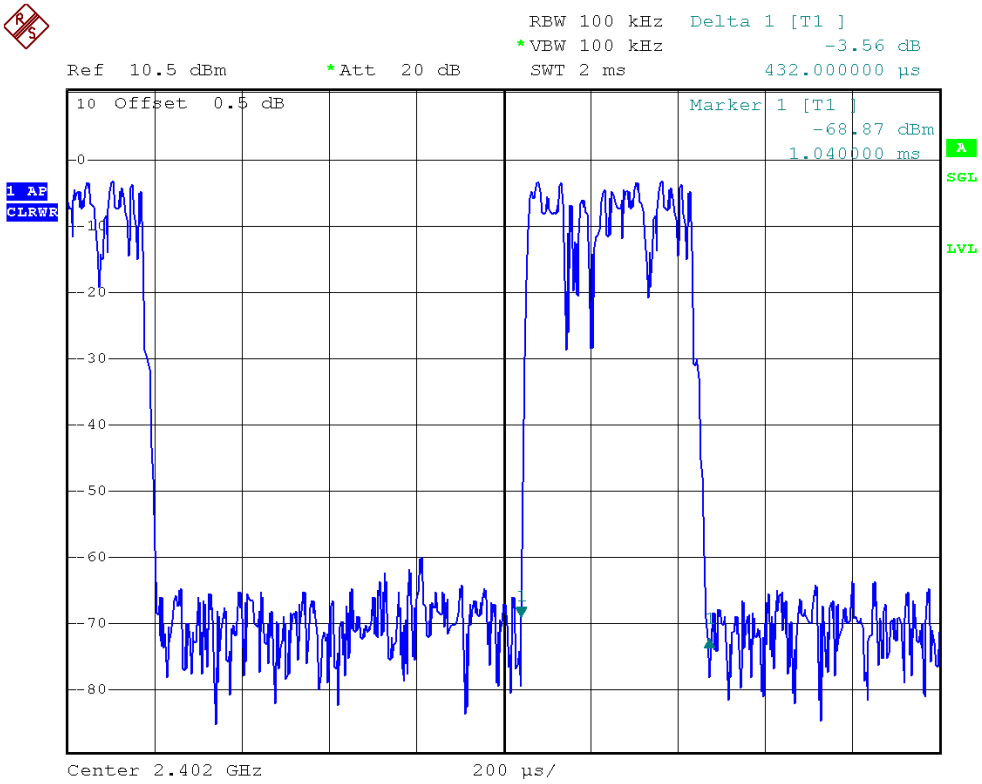
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

### 6.1.6 TEST RESULTS

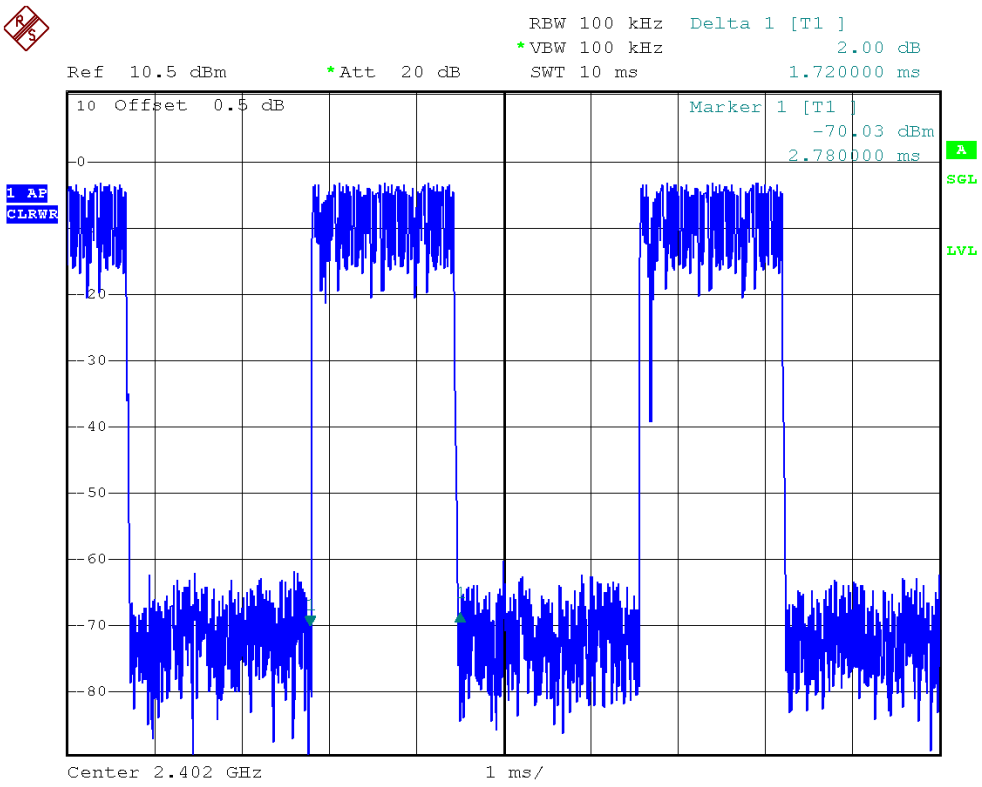
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 1M/CH00-DH1/DH3/DH5 | | |

| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits (s) |
|---|---|---|---|---|
| DH1 | 2402 MHz | 0.4800 | 0.1536 | 0.4000 |
| DH3 | 2402 MHz | 1.7400 | 0.2784 | 0.4000 |
| DH5 | 2402 MHz | 3.0000 | 0.3200 | 0.4000 |

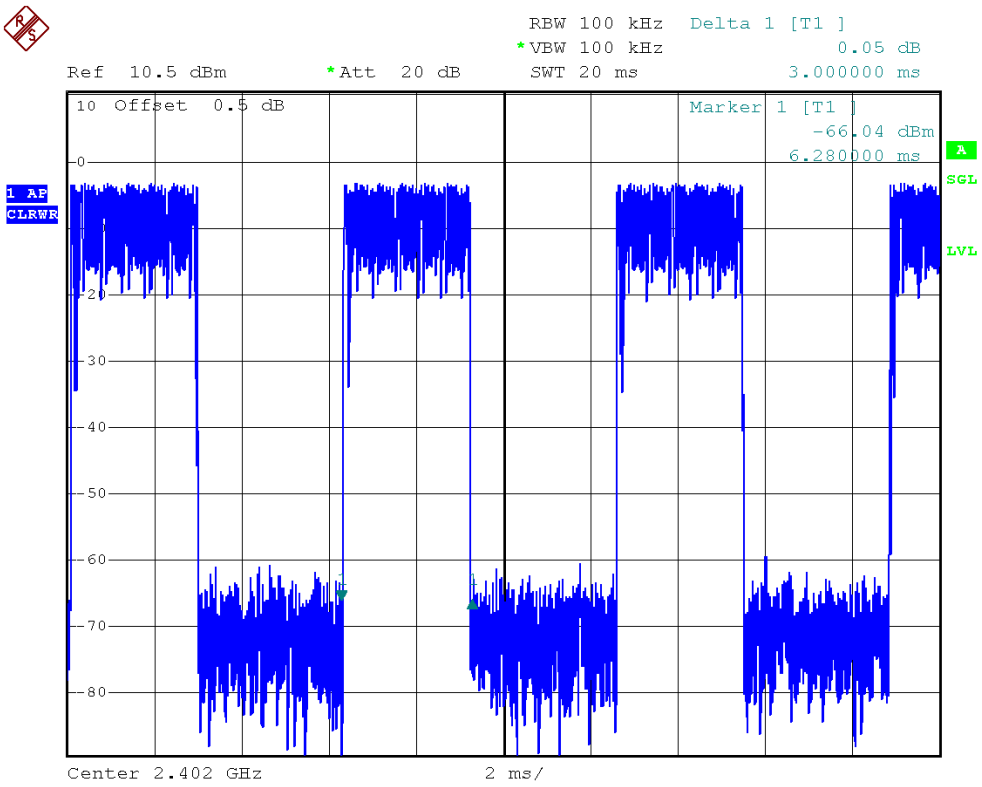
**CH00-DH1**



## CH00-DH3



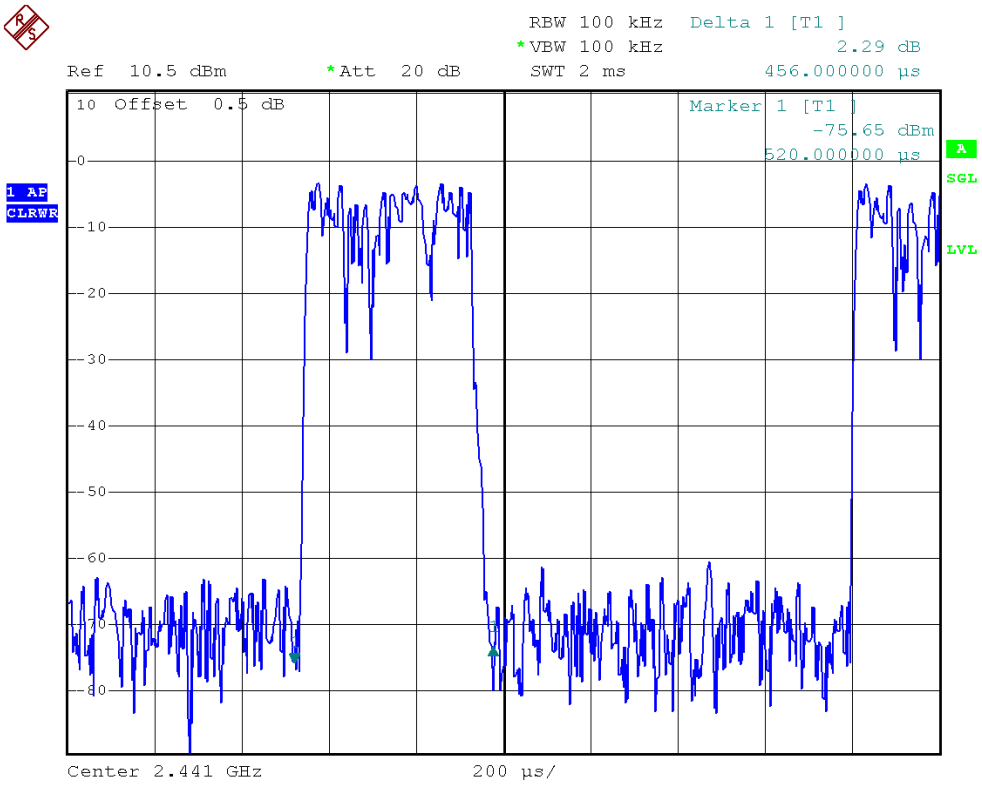

## CH00-DH5



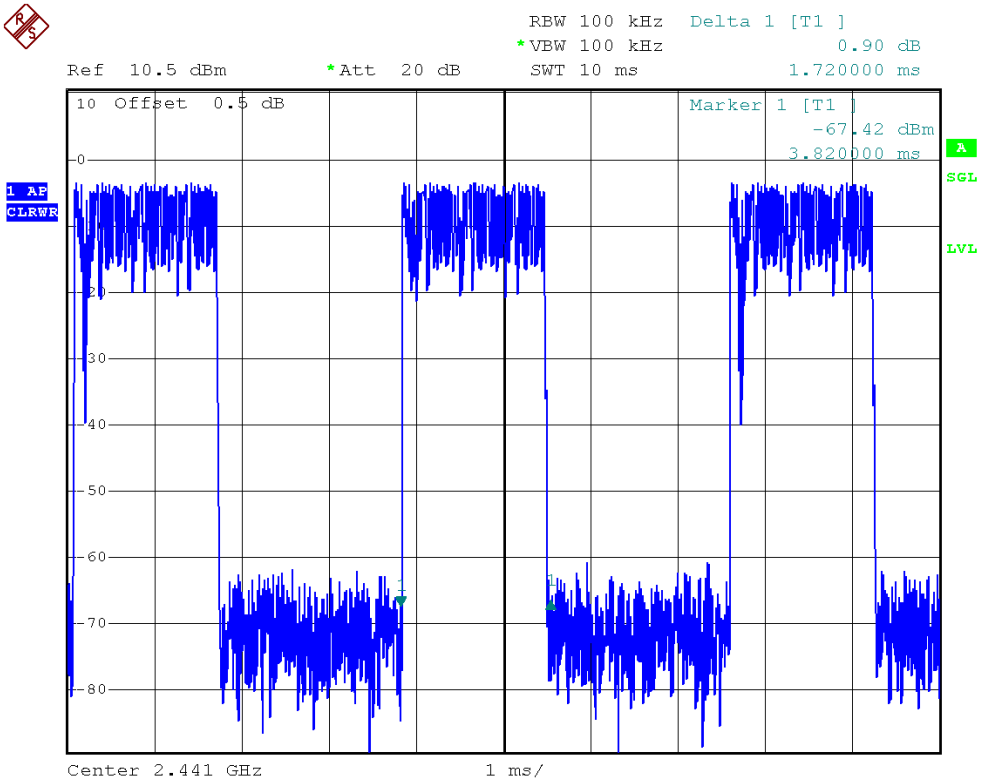
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 1M/CH39 -DH1/DH3/DH5 | | |

| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits (s) |
|---|---|---|---|---|
| DH1 | 2441 MHz | 0.4560 | 0.1459 | 0.4000 |
| DH3 | 2441 MHz | 1.7200 | 0.2752 | 0.4000 |
| DH5 | 2441 MHz | 3.0400 | 0.3243 | 0.4000 |

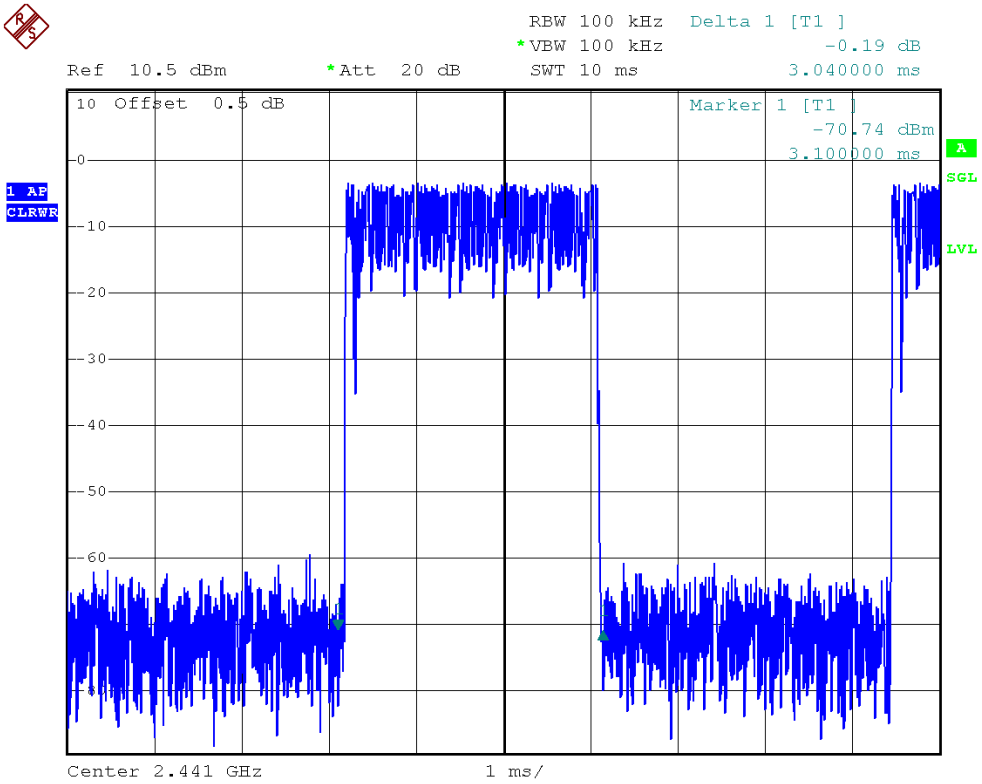
**CH39-DH1**



## CH39-DH3



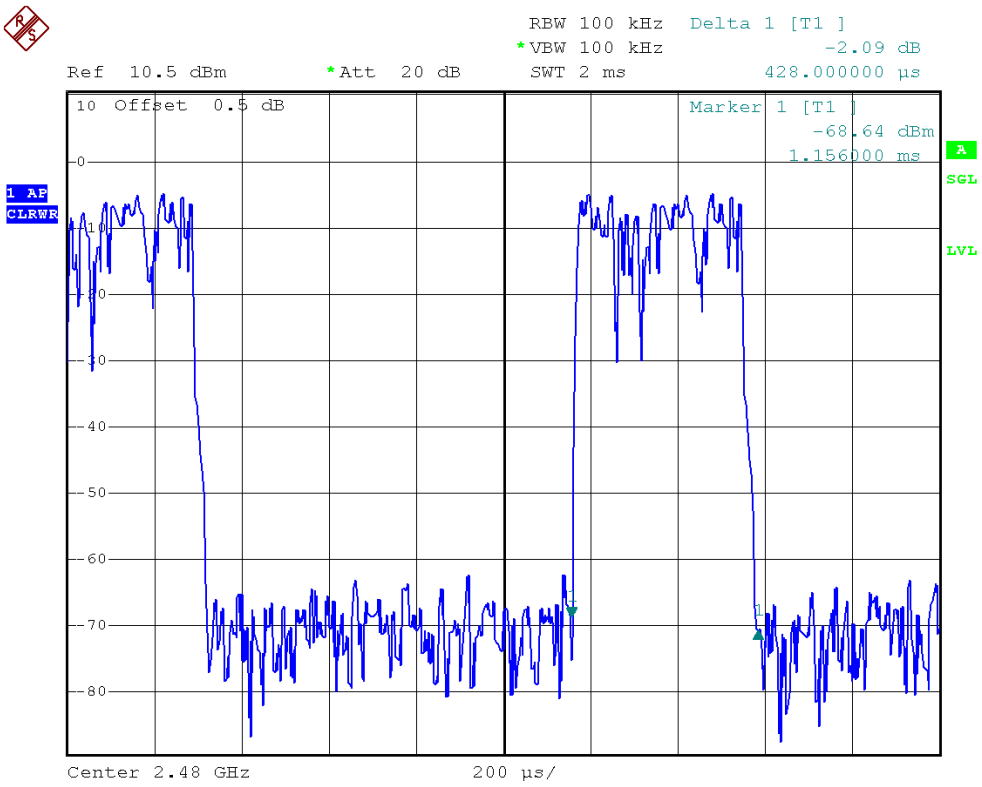

## CH39-DH5



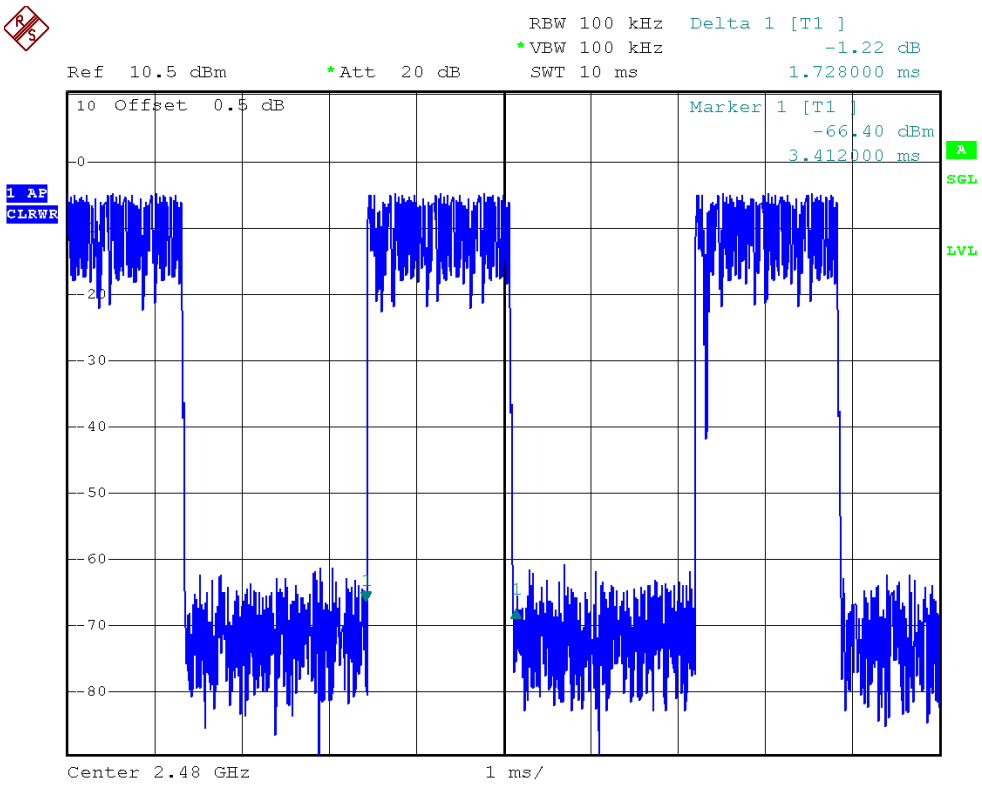
| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 1M/CH78 -DH1/DH3/DH5 | | |

| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits (s) |
|---|---|---|---|---|
| DH1 | 2480 MHz | 0.4560 | 0.1459 | 0.4000 |
| DH3 | 2480 MHz | 1.7200 | 0.2752 | 0.4000 |
| DH5 | 2480 MHz | 3.0400 | 0.3243 | 0.4000 |

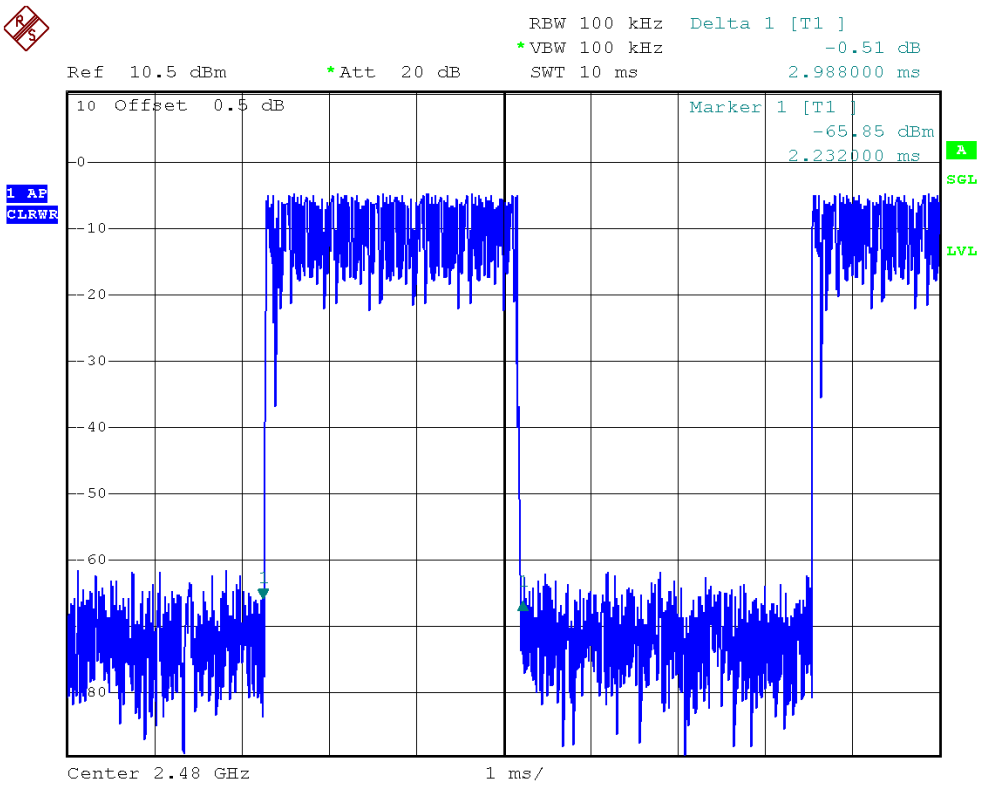
**CH78-DH1**



## CH78-DH3



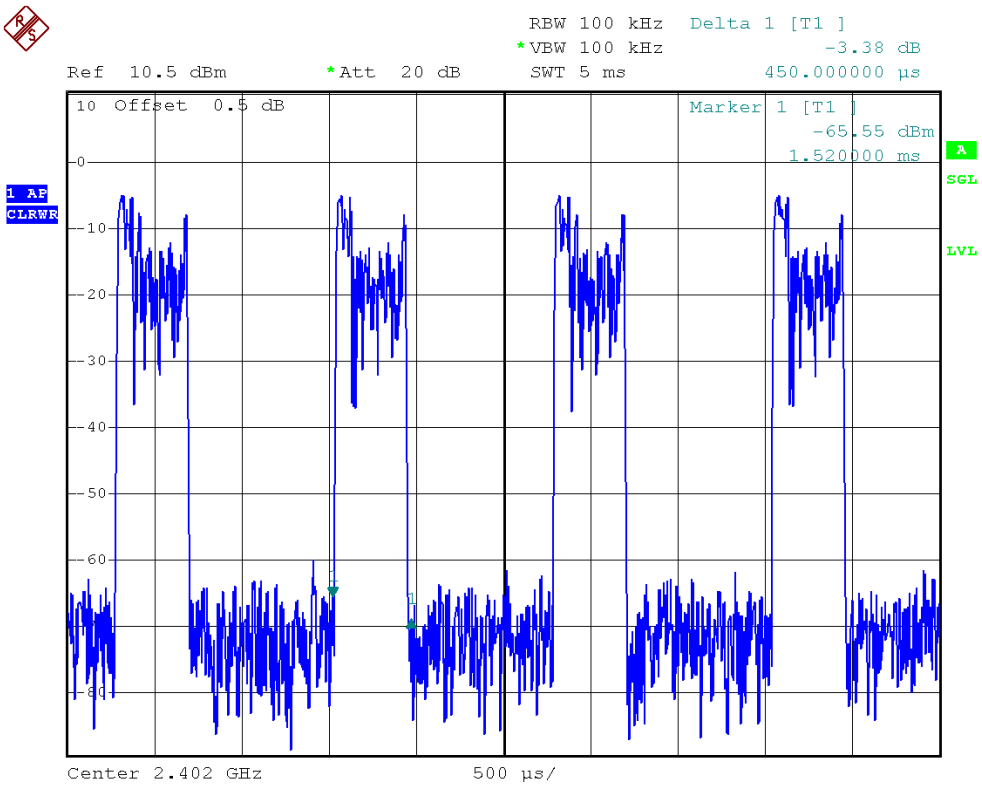

## CH78-DH5



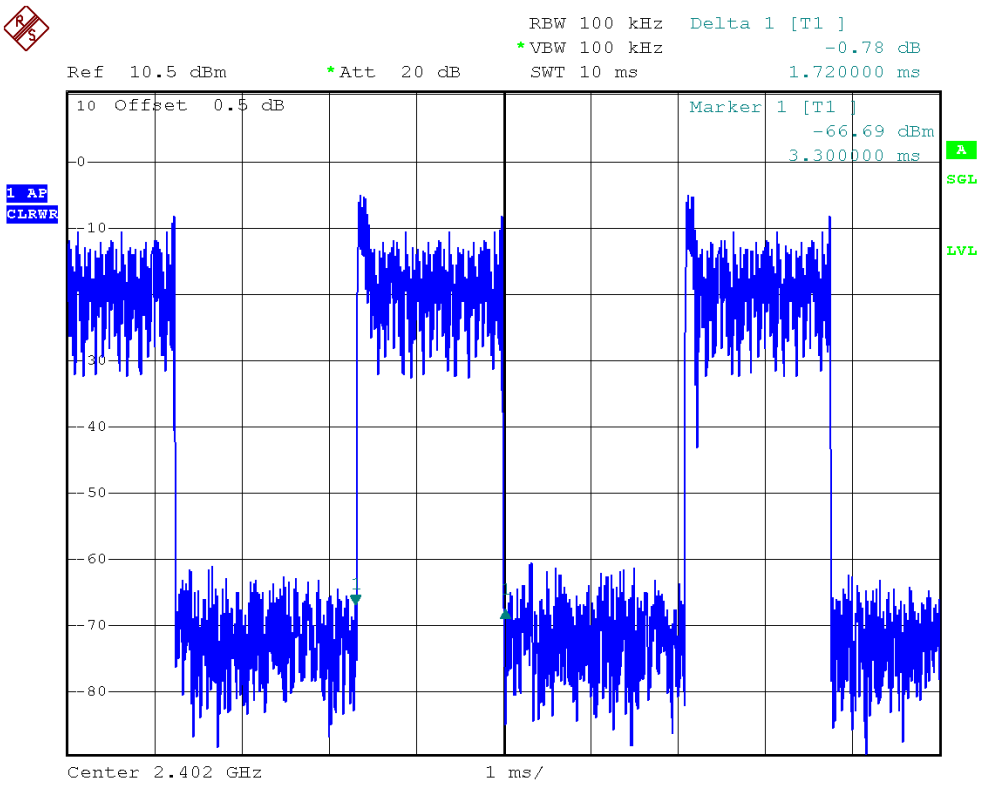
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 3M/CH00-DH1/DH3/DH5 | | |

| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits (s) |
|---|---|---|---|---|
| DH1 | 2402 MHz | 0.4500 | 0.1440 | 0.4000 |
| DH3 | 2402 MHz | 1.7200 | 0.2752 | 0.4000 |
| DH5 | 2402 MHz | 3.0000 | 0.3200 | 0.4000 |

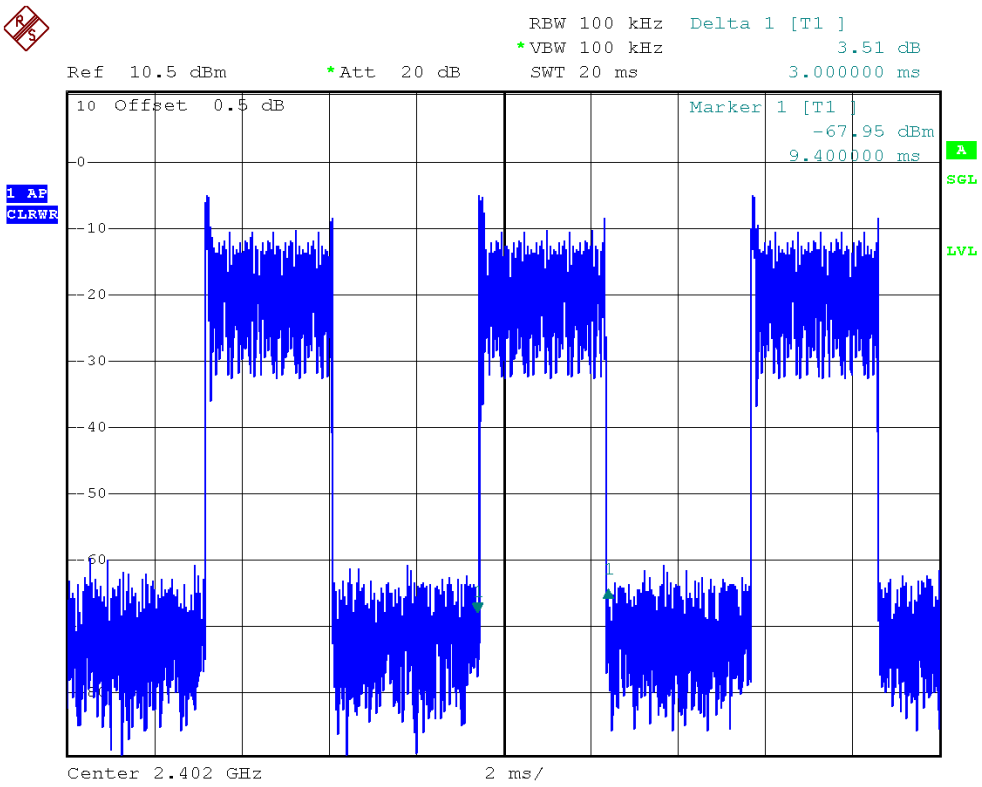
**CH00-DH1**



## CH00-DH3



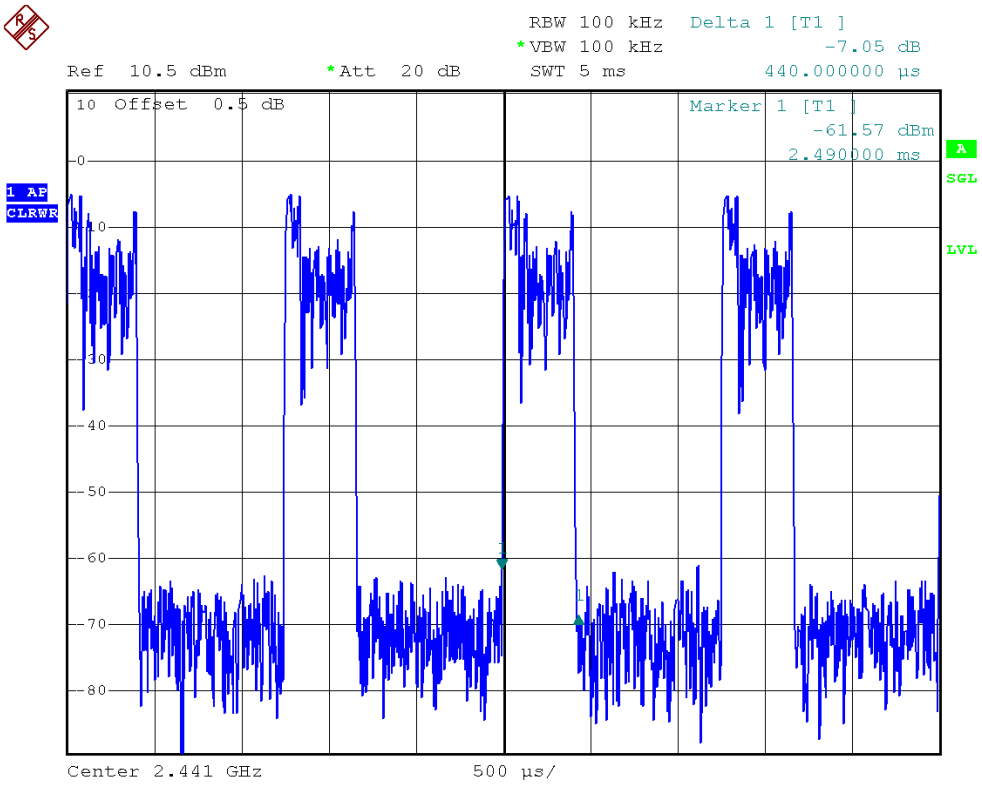

## CH00-DH5



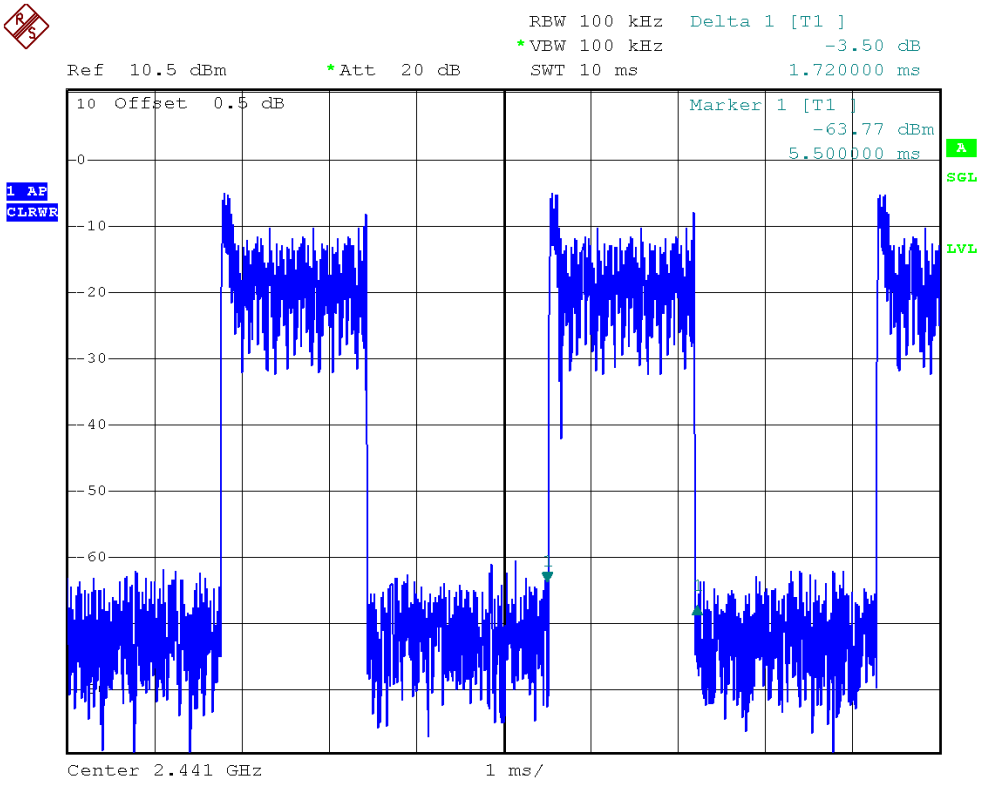
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 3M/CH39 -DH1/DH3/DH5 | | |

| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits (s) |
|---|---|---|---|---|
| DH1 | 2441 MHz | 0.4400 | 0.1408 | 0.4000 |
| DH3 | 2441 MHz | 1.7200 | 0.2752 | 0.4000 |
| DH5 | 2441 MHz | 3.0000 | 0.3200 | 0.4000 |

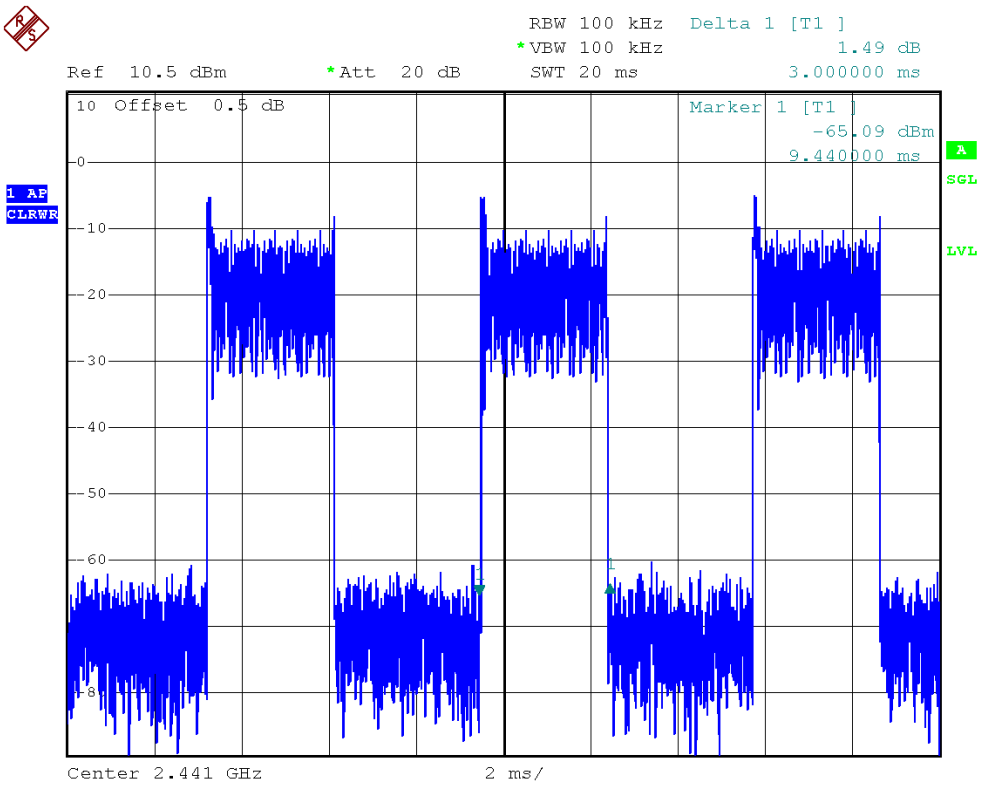
**CH39-DH1**



## CH39-DH3



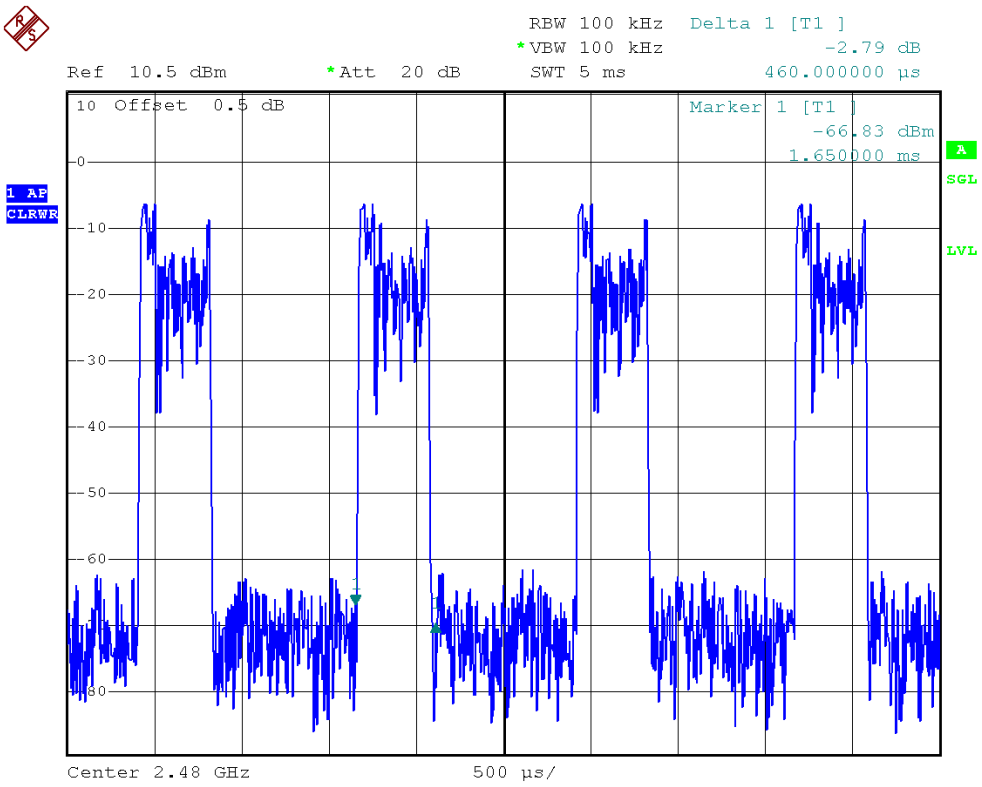

## CH39-DH5



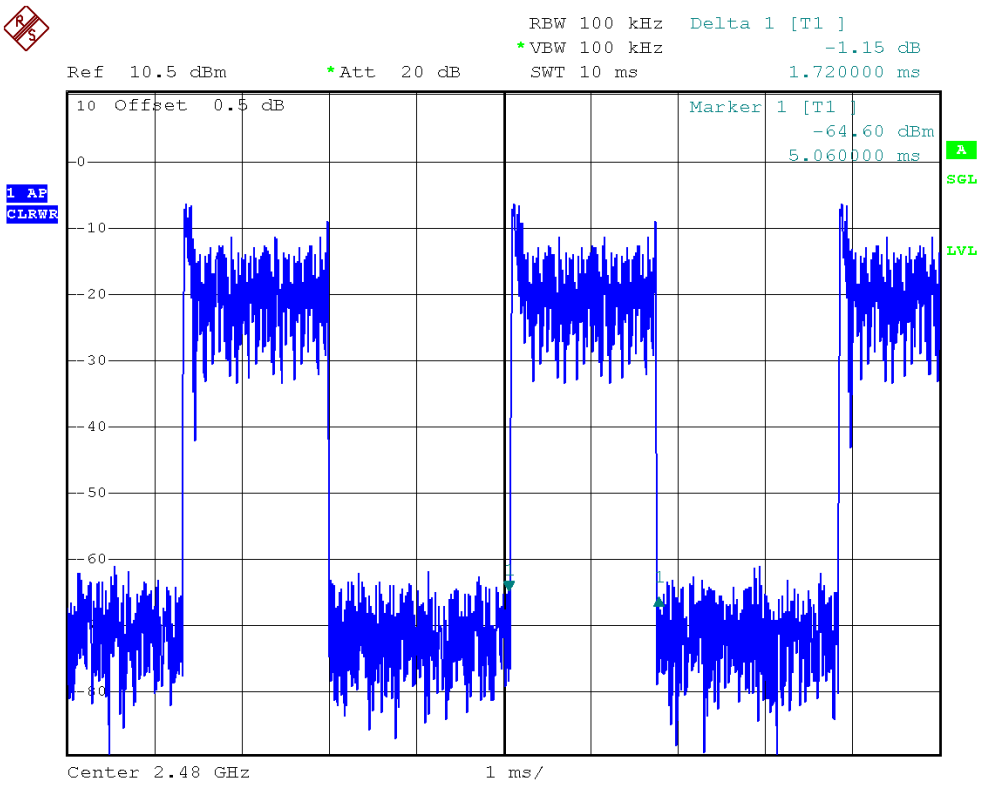
| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 3M/CH78 -DH1/DH3/DH5 | | |

| Data Packet | Frequency | Pulse Duration (ms) | Dwell Time (s) | Limits (s) |
|---|---|---|---|---|
| DH1 | 2480 MHz | 0.4600 | 0.1472 | 0.4000 |
| DH3 | 2480 MHz | 1.7200 | 0.2752 | 0.4000 |
| DH5 | 2480 MHz | 3.0200 | 0.3221 | 0.4000 |

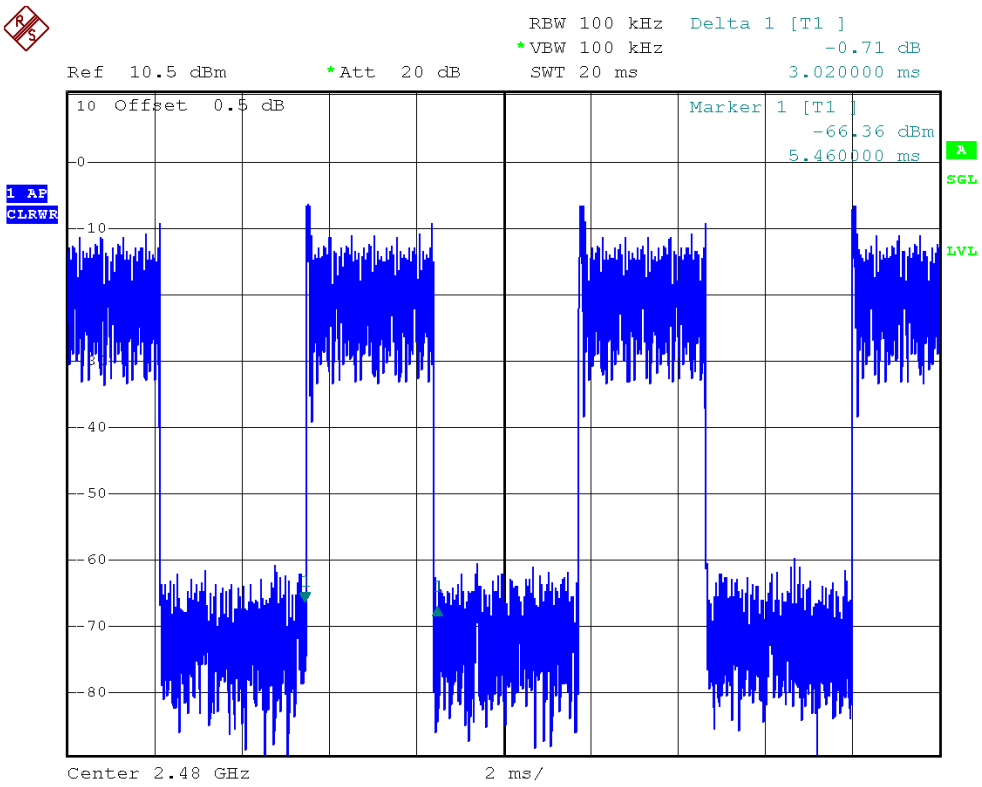
**CH78-DH1**



## CH78-DH3




## CH78-DH5



# 7. HOPPING CHANNEL SEPARATION MEASUREMENT & BANDWITH TEST

## 7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

### 7.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Aug. 31, 2011 |

Remark: ” N/A” denotes No Model Name , Serial No. or No Calibration specified.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > Measurement Bandwidth or Channel Separation |
| RB | 30 kHz (20dB Bandwidth) / 100 kHz (Channel Separation) |
| VB | 100 kHz (20dB Bandwidth) / 300 kHz (Channel Separation) |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

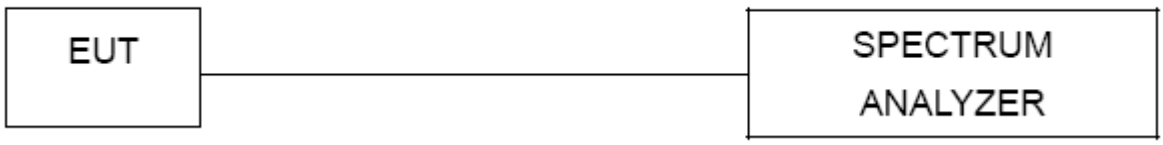
### 7.1.2 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
c. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

### 7.1.3 DEVIATION FROM STANDARD

No deviation.

### 7.1.4 TEST SETUP




### 7.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

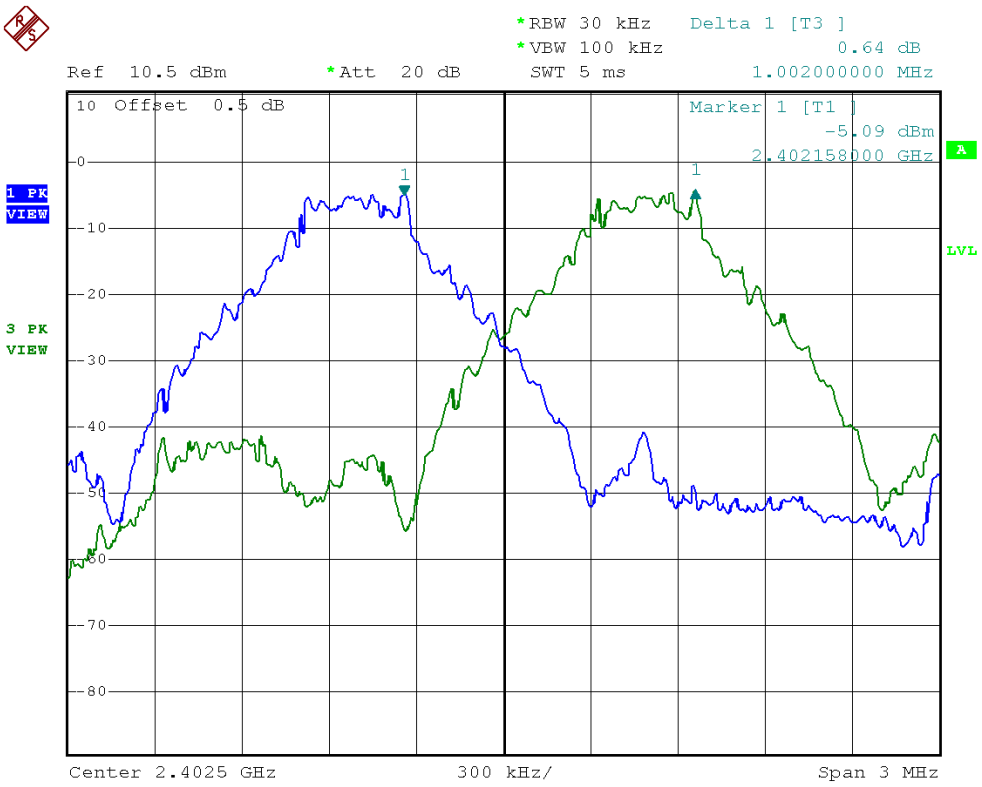
### 7.1.6 TEST RESULTS

| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
|---|---|---|---|
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 1M/CH00 / CH39 / CH78 | | |

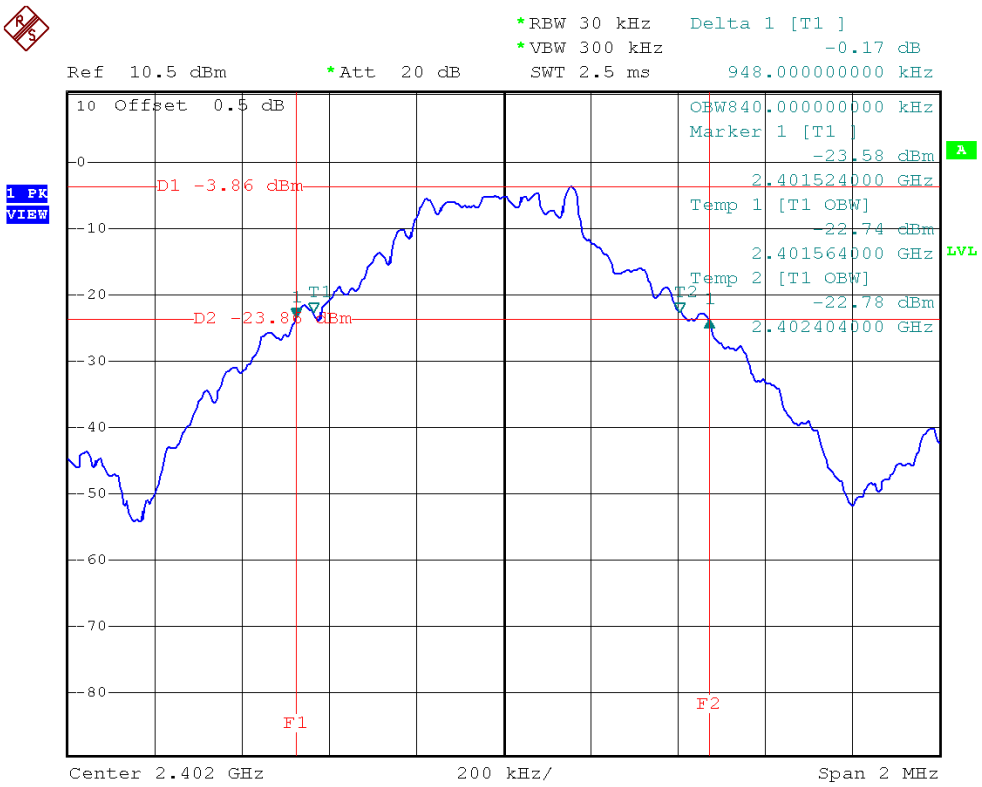
| Frequency | Ch. Separation (MHz) | 99% Occupied BW (MHz) | 20d Bandwidth (MHz) | two-thirds of the 20 dB bandwidth | Result |
|---|---|---|---|---|---|
| 2402 MHz | 1.002 | 0.840 | 0.948 | 0.632 | **PASS** |
| 2441 MHz | 1.014 | 0.836 | 0.956 | 0.637 | **PASS** |
| 2480 MHz | 1.002 | 0.792 | 0.884 | 0.589 | **PASS** |

**Ch. Separation Limits: >25 KHz or >2/3 of 20dB bandwidth**

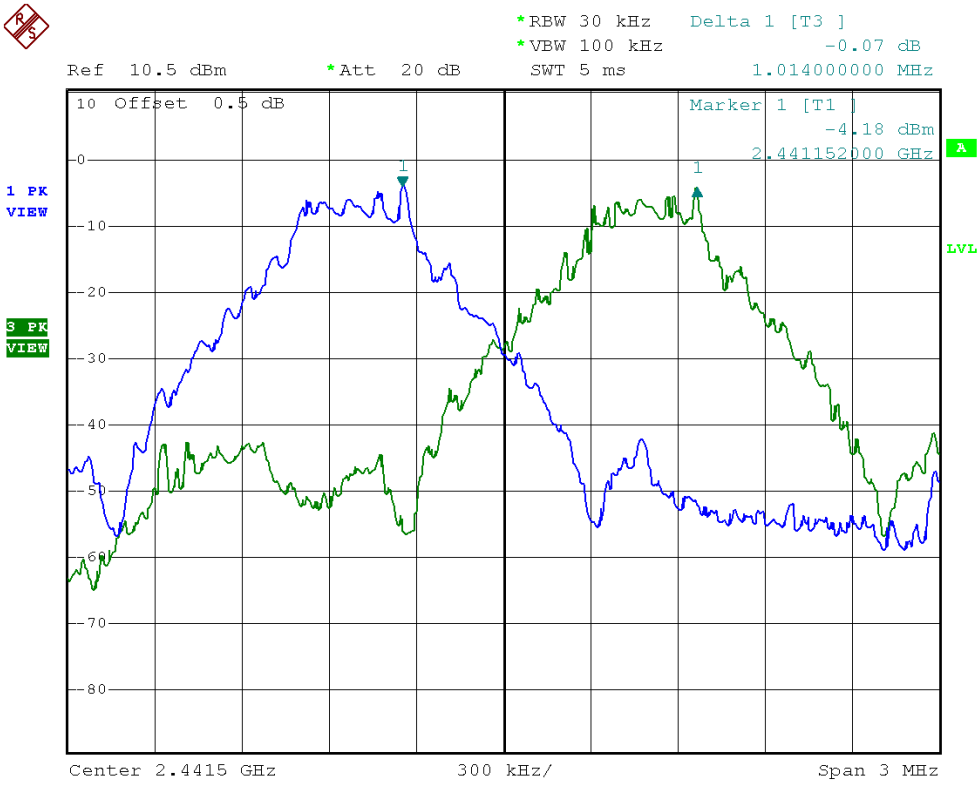
**CH00**


*RBW 30 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 5 ms
Delta 1 [T3 ]
0.64 dB
1.002000000 MHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-5.09 dBm
2.402158000 GHz
1 PK VIEW
3 PK VIEW
A
LVL
Center 2.4025 GHz
300 kHz/
Span 3 MHz

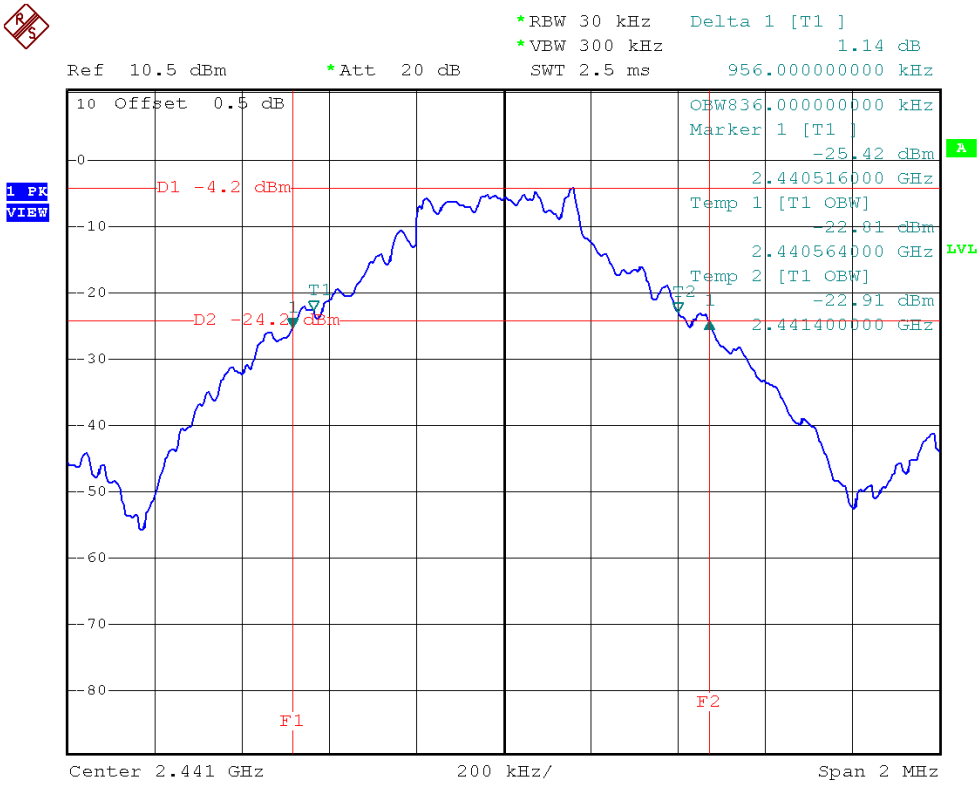
**CH00**


*RBW 30 kHz
*VBW 300 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 ms
Delta 1 [T1 ]
-0.17 dB
948.000000000 kHz
10 Offset 0.5 dB
OBW840.000000000 kHz
Marker 1 [T1 ]
-23.58 dBm
2.401524000 GHz
Temp 1 [T1 OBW]
-22.74 dBm
2.401564000 GHz
Temp 2 [T1 OBW]
-22.78 dBm
2.402404000 GHz
D1 -3.86 dBm
D2 -23.86 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.402 GHz
200 kHz/
Span 2 MHz

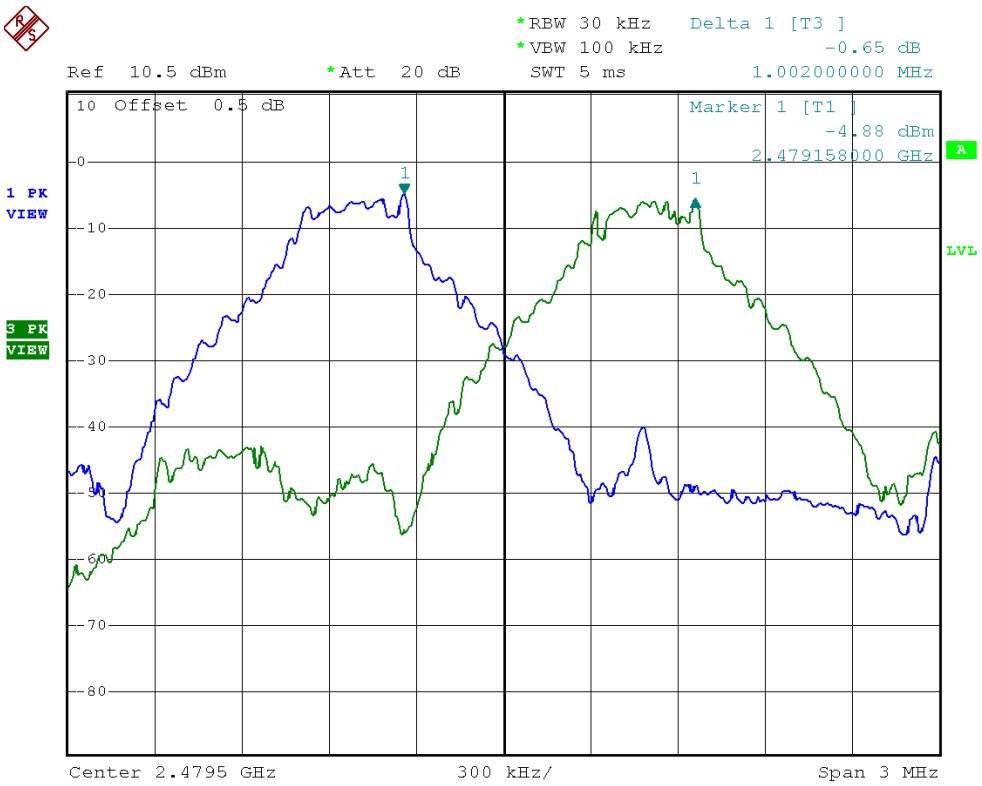
**CH39**


*RBW 30 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 5 ms
Delta 1 [T3 ]
-0.07 dB
1.014000000 MHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-4.18 dBm
2.441152000 GHz
1 PK VIEW
3 PK VIEW
A
LVL
Center 2.4415 GHz
300 kHz/
Span 3 MHz

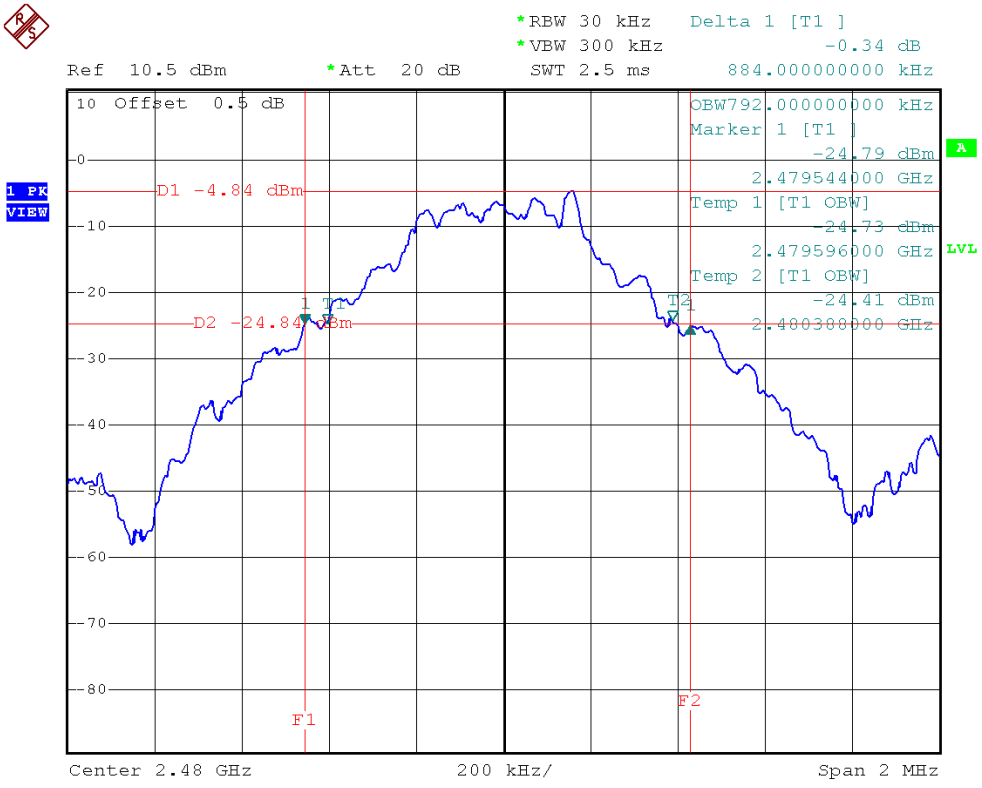
**CH39**


*RBW 30 kHz
*VBW 300 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 ms
Delta 1 [T1 ]
1.14 dB
956.000000000 kHz
10 Offset 0.5 dB
OBW836.000000000 kHz
Marker 1 [T1 ]
-25.42 dBm
2.440516000 GHz
Temp 1 [T1 OBW]
-22.01 dBm
2.440564000 GHz
Temp 2 [T1 OBW]
-22.91 dBm
2.441400000 GHz
D1 -4.2 dBm
D2 -24.2 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.441 GHz
200 kHz/
Span 2 MHz

## CH78


*RBW 30 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 5 ms
Delta 1 [T3 ]
-0.65 dB
1.002000000 MHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-4.88 dBm
2.479158000 GHz
1 PK VIEW
3 PK VIEW
A
LVL
Center 2.4795 GHz
300 kHz/
Span 3 MHz

## CH78

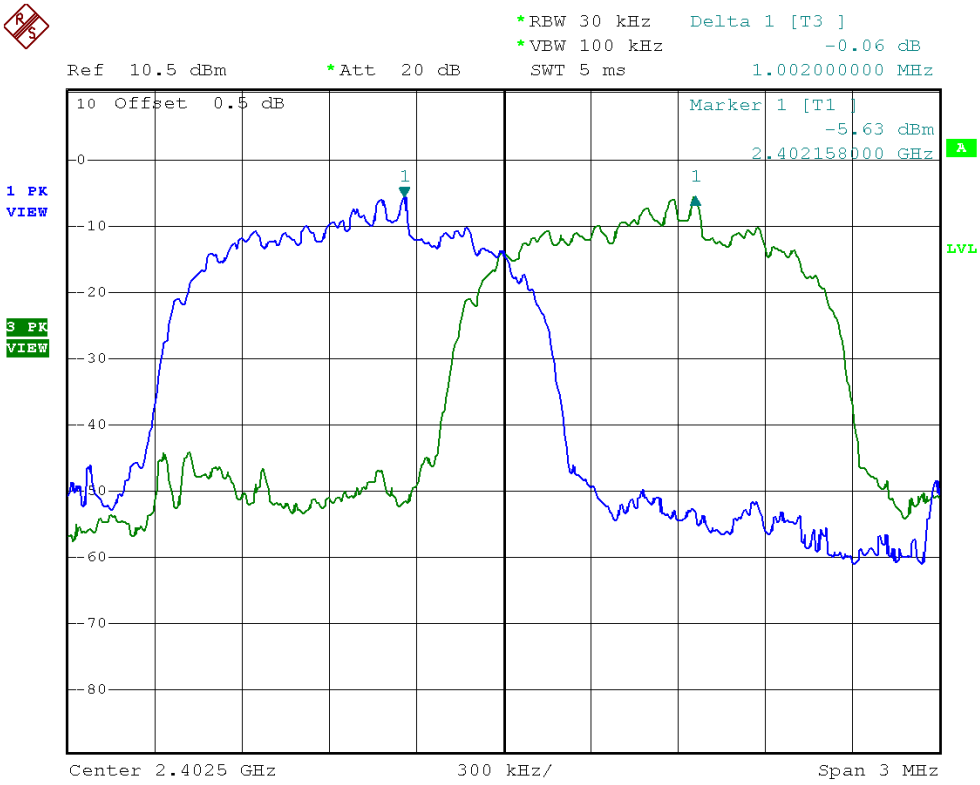

*RBW 30 kHz
*VBW 300 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 ms
Delta 1 [T1 ]
-0.34 dB
884.000000000 kHz
10 Offset 0.5 dB
OBW792.000000000 kHz
Marker 1 [T1 ]
-24.79 dBm
2.479544000 GHz
Temp 1 [T1 OBW]
-24.73 dBm
2.479596000 GHz
Temp 2 [T1 OBW]
-24.41 dBm
2.480308000 GHz
D1 -4.84 dBm
D2 -24.84 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.48 GHz
200 kHz/
Span 2 MHz

| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 3M/CH00 / CH39 / CH78 | | |

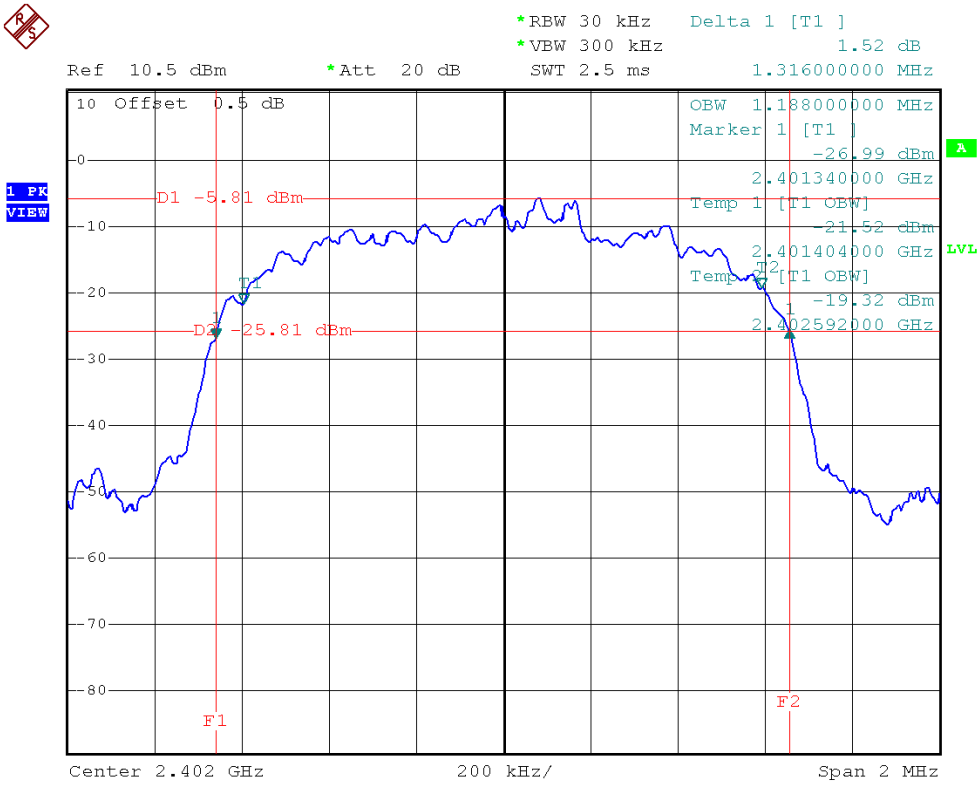
| Frequency | Ch. Separation (MHz) | 99% Occupied BW (MHz) | 20d Bandwidth (MHz) | two-thirds of the 20 dB bandwidth | Result |
|---|---|---|---|---|---|
| 2402 MHz | 1.002 | 1.188 | 1.316 | 0.877 | **PASS** |
| 2441 MHz | 1.002 | 1.188 | 1.314 | 0.876 | **PASS** |
| 2480 MHz | 1.008 | 1.192 | 1.316 | 0.877 | **PASS** |

**Ch. Separation Limits: >25 KHz or >2/3 of 20dB bandwidth**

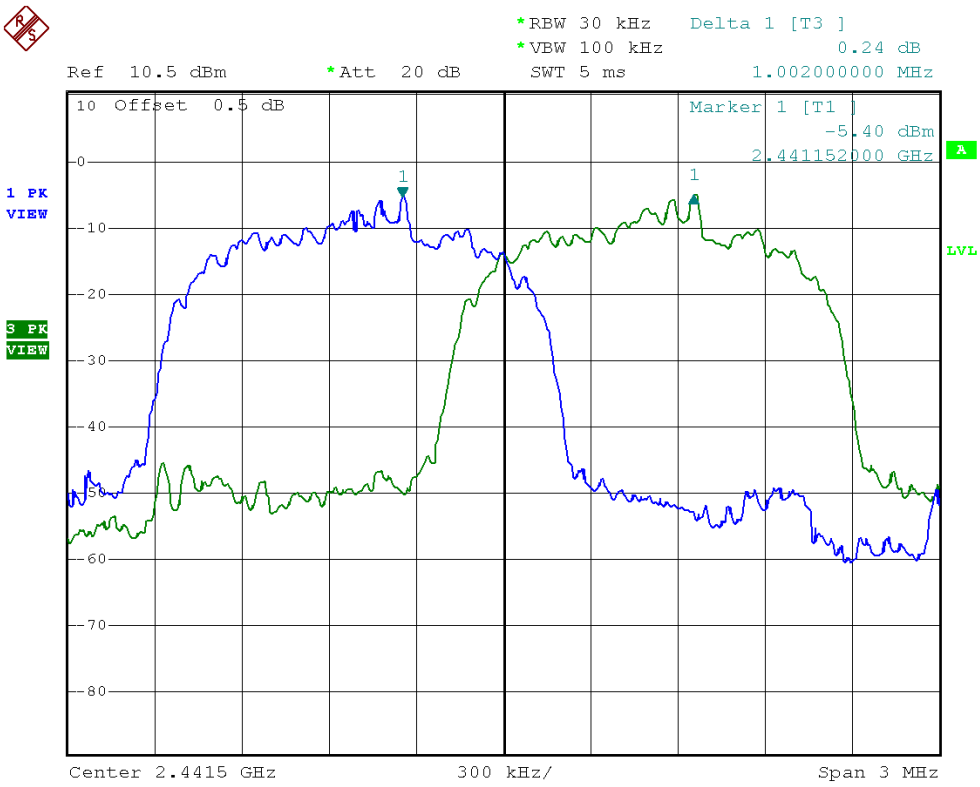
**CH00**


*RBW 30 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 5 ms
Delta 1 [T3 ]
-0.06 dB
1.002000000 MHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-5.63 dBm
2.402158000 GHz
1 PK VIEW
3 PK VIEW
A
LVL
Center 2.4025 GHz
300 kHz/
Span 3 MHz

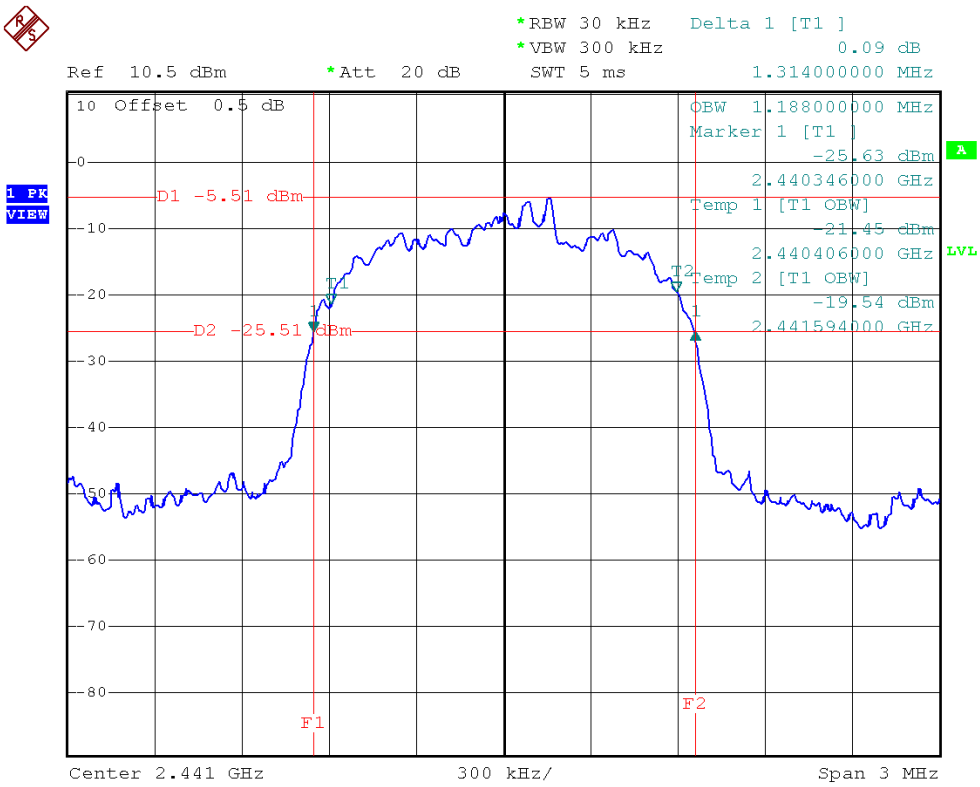
**CH00**


*RBW 30 kHz
*VBW 300 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 ms
Delta 1 [T1 ]
1.52 dB
1.316000000 MHz
10 Offset 0.5 dB
OBW 1.188000000 MHz
Marker 1 [T1 ]
-26.99 dBm
2.401340000 GHz
Temp 1 [T1 OBW]
-21.52 dBm
2.401404000 GHz
Temp 2 [T1 OBW]
-19.32 dBm
2.402592000 GHz
D1 -5.81 dBm
D2 -25.81 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.402 GHz
200 kHz/
Span 2 MHz

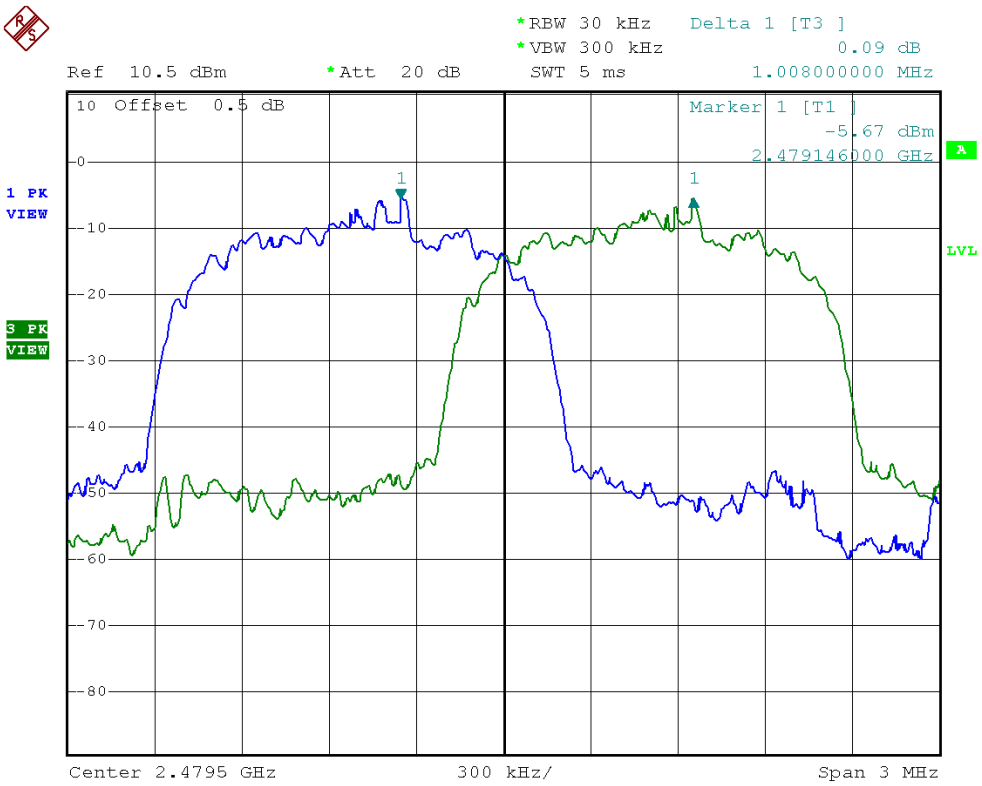
## CH39


*RBW 30 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 5 ms
Delta 1 [T3 ]
0.24 dB
1.002000000 MHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-5.40 dBm
2.441152000 GHz
1 PK VIEW
3 PK VIEW
A
LVL
Center 2.4415 GHz
300 kHz/
Span 3 MHz

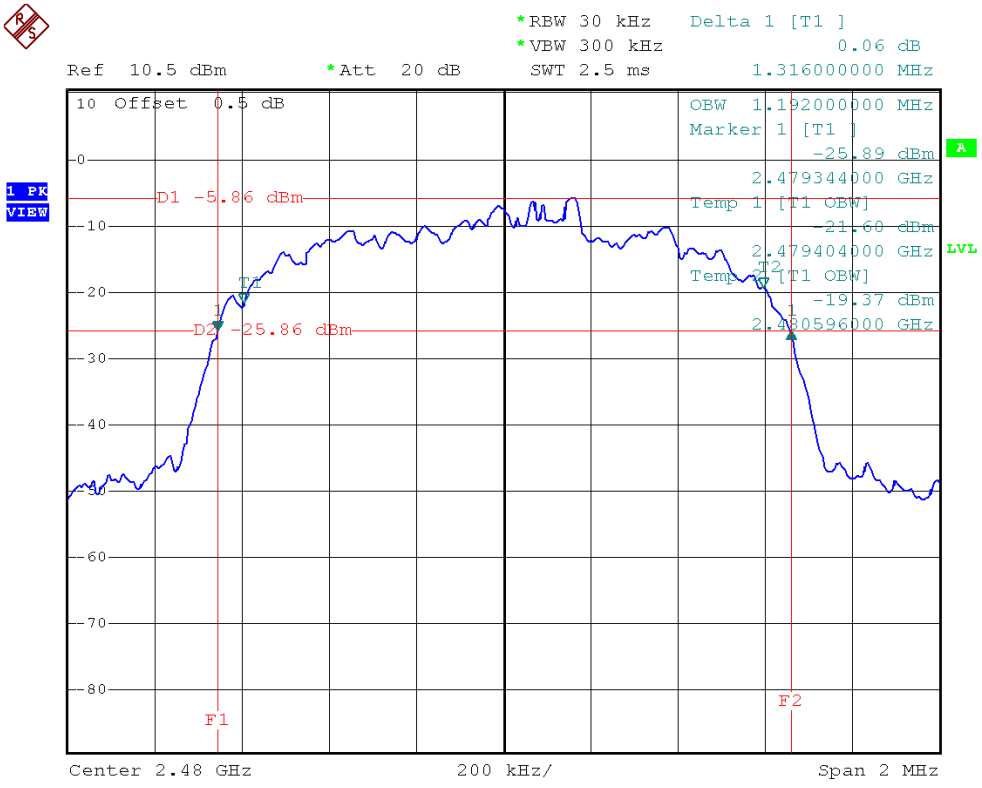
## CH39


*RBW 30 kHz
*VBW 300 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 5 ms
Delta 1 [T1 ]
0.09 dB
1.314000000 MHz
10 Offset 0.5 dB
OBW 1.188000000 MHz
Marker 1 [T1 ]
-25.63 dBm
2.440346000 GHz
Temp 1 [T1 OBW]
-21.45 dBm
2.440406000 GHz
Temp 2 [T1 OBW]
-19.54 dBm
2.441594000 GHz
D1 -5.51 dBm
D2 -25.51 dBm
1 PK VIEW
A
LVL
Center 2.441 GHz
300 kHz/
Span 3 MHz

## CH78


*RBW 30 kHz
*VBW 300 kHz
SWT 5 ms
Delta 1 [T3 ]
0.09 dB
1.008000000 MHz
Ref 10.5 dBm
*Att 20 dB
10 Offset 0.5 dB
Marker 1 [T1 ]
-5.67 dBm
2.479146000 GHz
1 PK VIEW
3 PK VIEW
A
LVL
Center 2.4795 GHz
300 kHz/
Span 3 MHz

## CH78


*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 1 [T1 ]
0.06 dB
1.316000000 MHz
Ref 10.5 dBm
*Att 20 dB
10 Offset 0.5 dB
OBW 1.192000000 MHz
Marker 1 [T1 ]
-25.89 dBm
2.479344000 GHz
Temp 1 [T1 OBW]
-21.60 dBm
2.479404000 GHz
Temp 2 [T1 OBW]
-19.37 dBm
2.480596000 GHz
D1 -5.86 dBm
D2 -25.86 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.48 GHz
200 kHz/
Span 2 MHz

# 8. PEAK OUTPUT POWER TEST

## 8.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C | | | | |
|---|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) | Result |
| 15.247 (b)(1) | Peak Output Power | 1 watt or 30dBm | 2400-2483.5 | PASS |

### 8.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Aug. 31, 2011 |

Remark: ” N/A” denotes No Model Name , Serial No. or No Calibration specified.

### 8.1.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.

### 8.1.3 DEVIATION FROM STANDARD

No deviation.

### 8.1.4 TEST SETUP


### 8.1.5 EUT OPERATION CONDITIONS

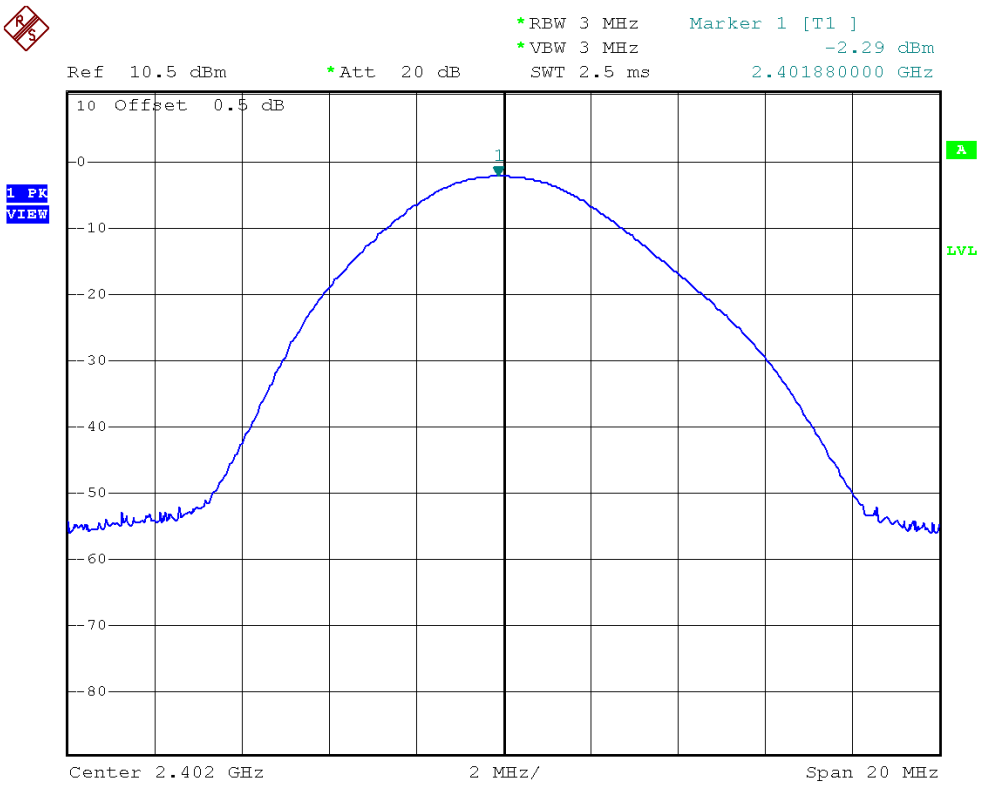
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

### 8.1.6 TEST RESULTS

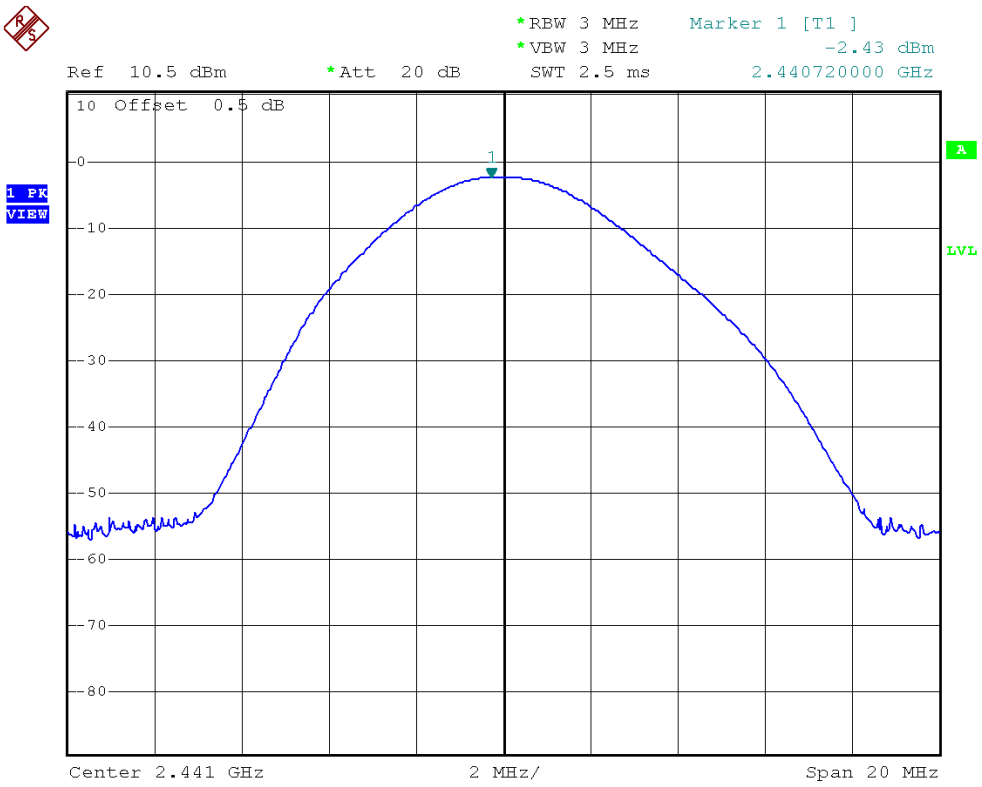
| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 1M/CH00 / CH39 / CH78 | | |

| Frequency (MHz) | Peak Output Power (dBm) | LIMIT (dBm) | LIMIT (W) |
|---|---|---|---|
| 2402 | -2.29 | 30 | 1 |
| 2441 | -2.43 | 30 | 1 |
| 2480 | -3.97 | 30 | 1 |

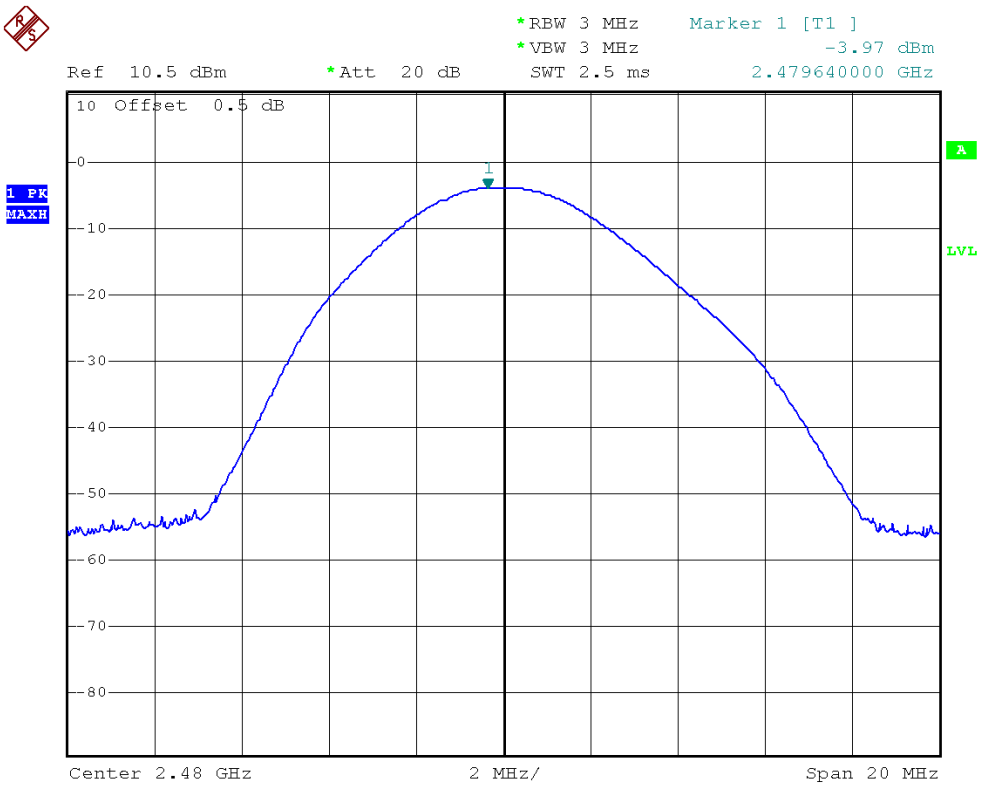
**CH00**



## CH39


*RBW 3 MHz
Marker 1 [T1 ]
*VBW 3 MHz
-2.43 dBm
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 ms
2.440720000 GHz
10 Offset 0.5 dB
1 PK
VIEW
A
LVL
Center 2.441 GHz
2 MHz/
Span 20 MHz

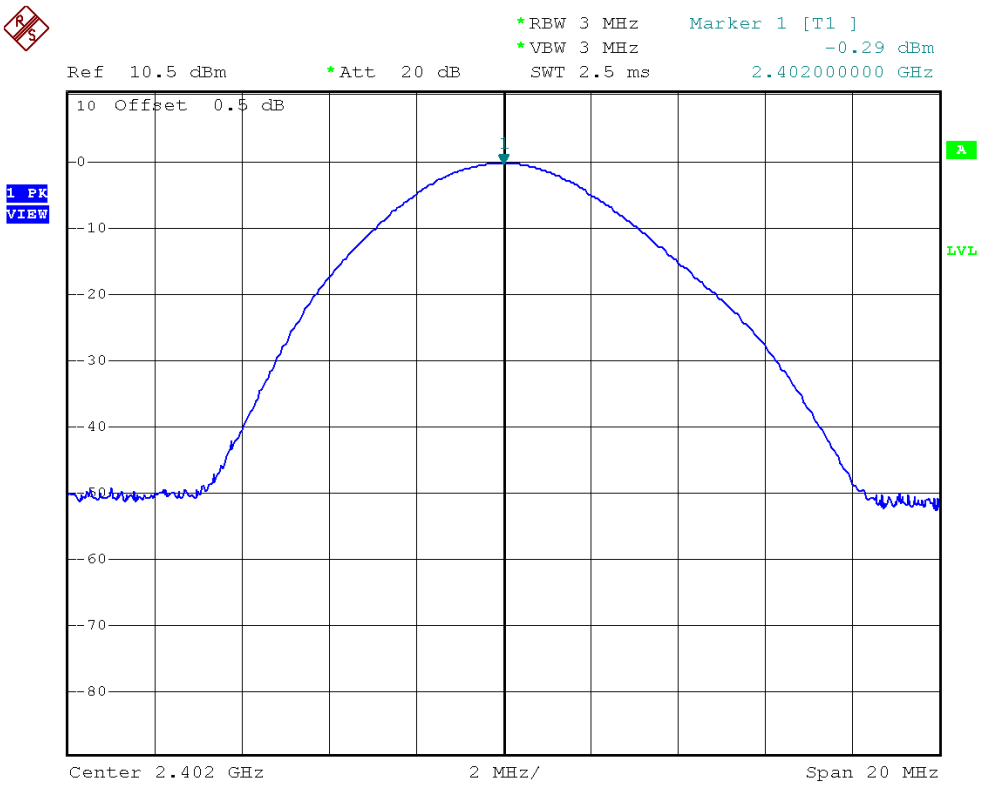
## CH78


*RBW 3 MHz
Marker 1 [T1 ]
*VBW 3 MHz
-3.97 dBm
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 ms
2.479640000 GHz
10 Offset 0.5 dB
1 PK
MAXH
A
LVL
Center 2.48 GHz
2 MHz/
Span 20 MHz

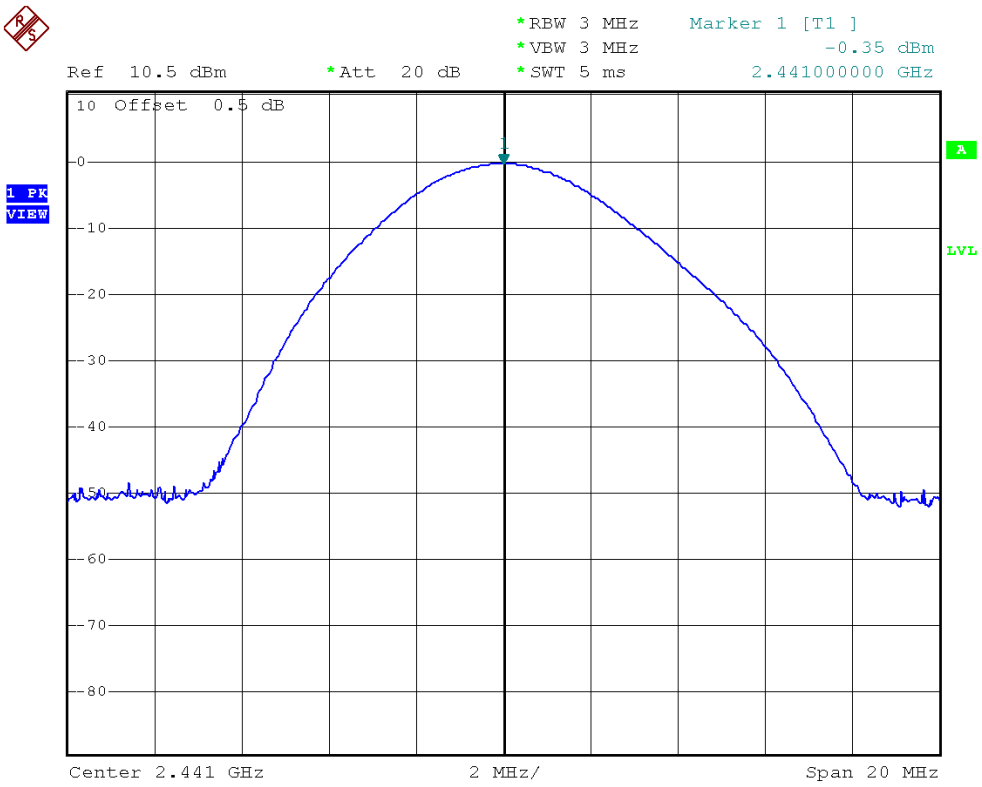
| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 3M/CH00 / CH39 / CH78 | | |

| Frequency (MHz) | Peak Output Power (dBm) | LIMIT (dBm) | LIMIT (W) |
|---|---|---|---|
| 2402 | -0.29 | 30 | 1 |
| 2441 | -0.35 | 30 | 1 |
| 2480 | -0.41 | 30 | 1 |

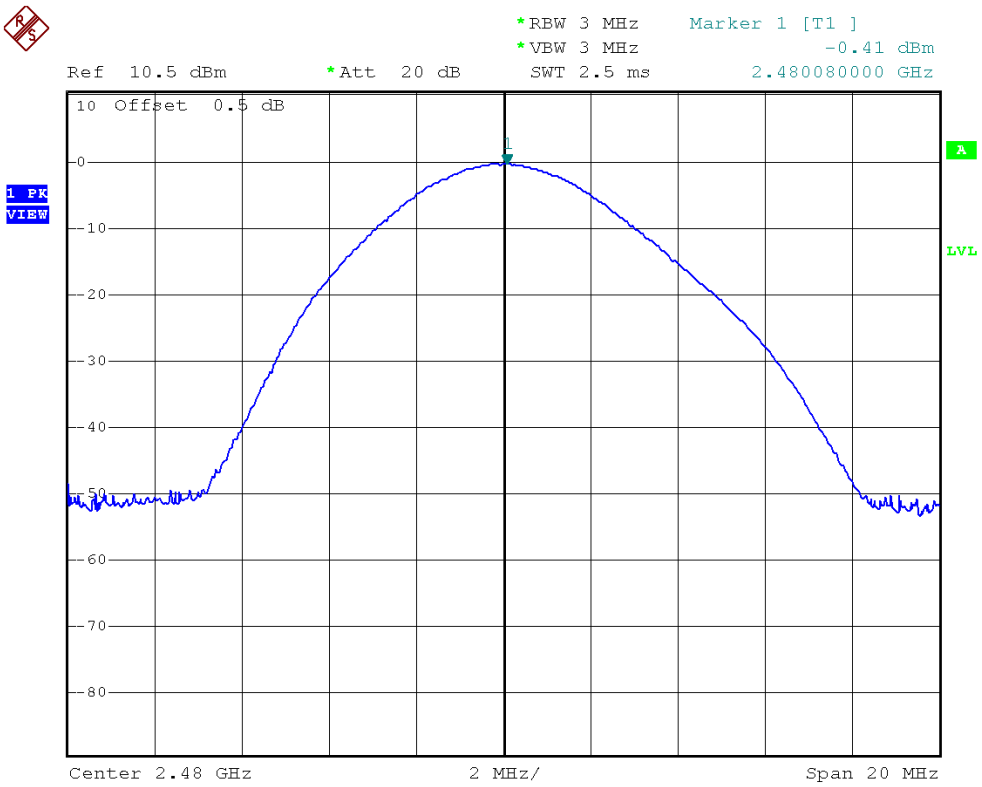
**CH00**



## CH39


*RBW 3 MHz
Marker 1 [T1 ]
*VBW 3 MHz
-0.35 dBm
Ref 10.5 dBm
*Att 20 dB
*SWT 5 ms
2.441000000 GHz
10 Offset 0.5 dB
1 PK
VIEW
A
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.441 GHz
2 MHz/
Span 20 MHz

## CH78


*RBW 3 MHz
Marker 1 [T1 ]
*VBW 3 MHz
-0.41 dBm
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 ms
2.480080000 GHz
10 Offset 0.5 dB
1 PK
VIEW
A
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.48 GHz
2 MHz/
Span 20 MHz

# 9. ANTENNA CONDUCTED SPURIOUS EMISSION

## 9.1 APPLIED PROCEDURES / 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 |

### 9.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Aug. 31, 2011 |

Remark: ” N/A” denotes No Model Name , Serial No. or No Calibration specified.

The following table is the setting of the spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | 100 MHz |
| RB / VB (emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average |
| RB / VB (other emission) | 100 KHz /100 KHz for Peak |

### 9.1.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

### 9.1.3 DEVIATION FROM STANDARD

No deviation.

### 9.1.4 TEST SETUP


### 9.1.5 EUT OPERATION CONDITIONS

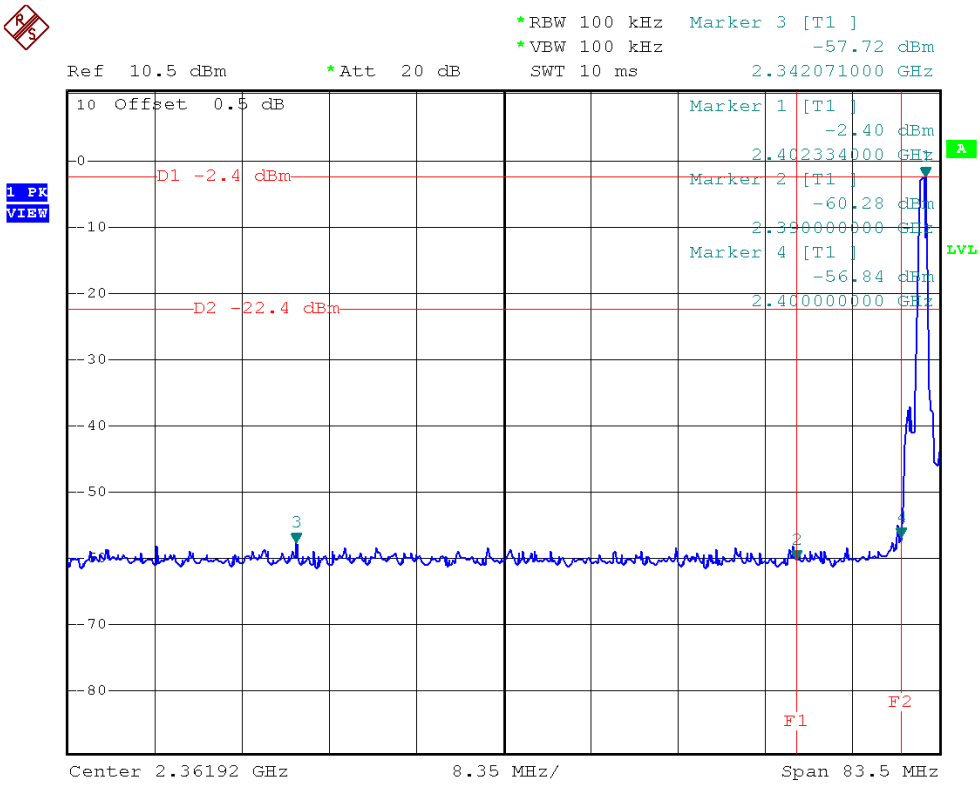
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

### 9.1.6 TEST RESULTS

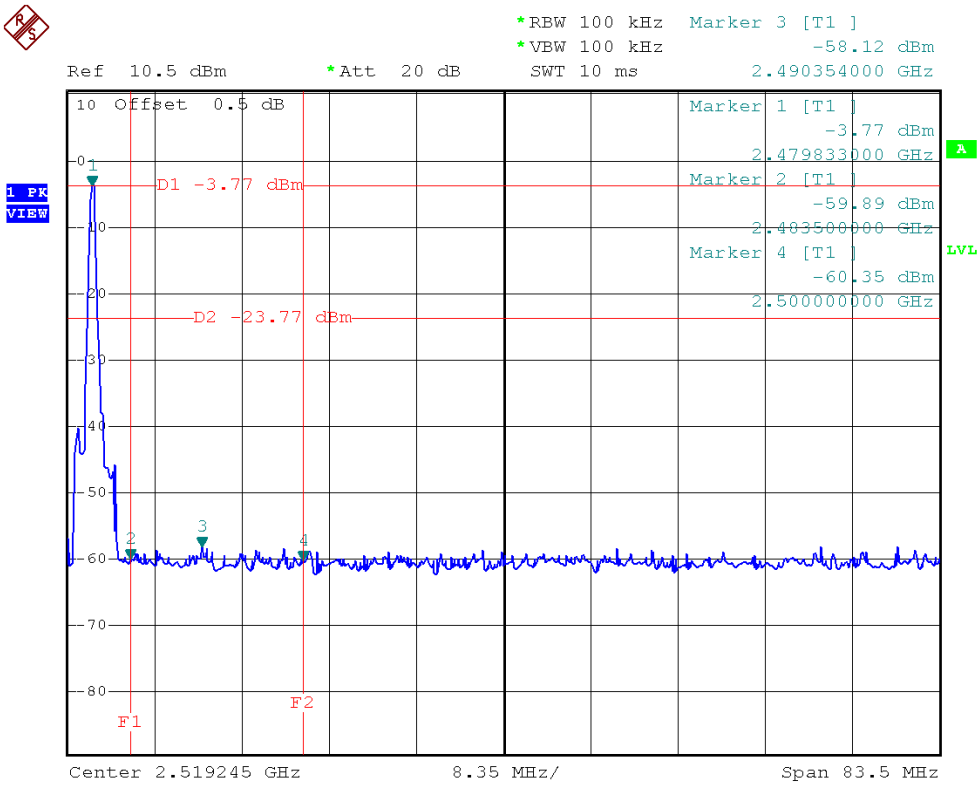
| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 1M/CH00 / CH39 / CH78 | | |

| The max. radio frequency power in any 100kHz bandwidth outside the frequency band | | The max. radio frequency power in any 100 kHz bandwidth within the frequency band. | |
|---|---|---|---|
| FREQUENCY(MHz) | POWER(dBm) | FREQUENCY(MHz) | POWER(dBm) |
| 2342.071 | -57.72 | 2490.354 | -58.12 |
| Result | | | |
| In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power. | | | |

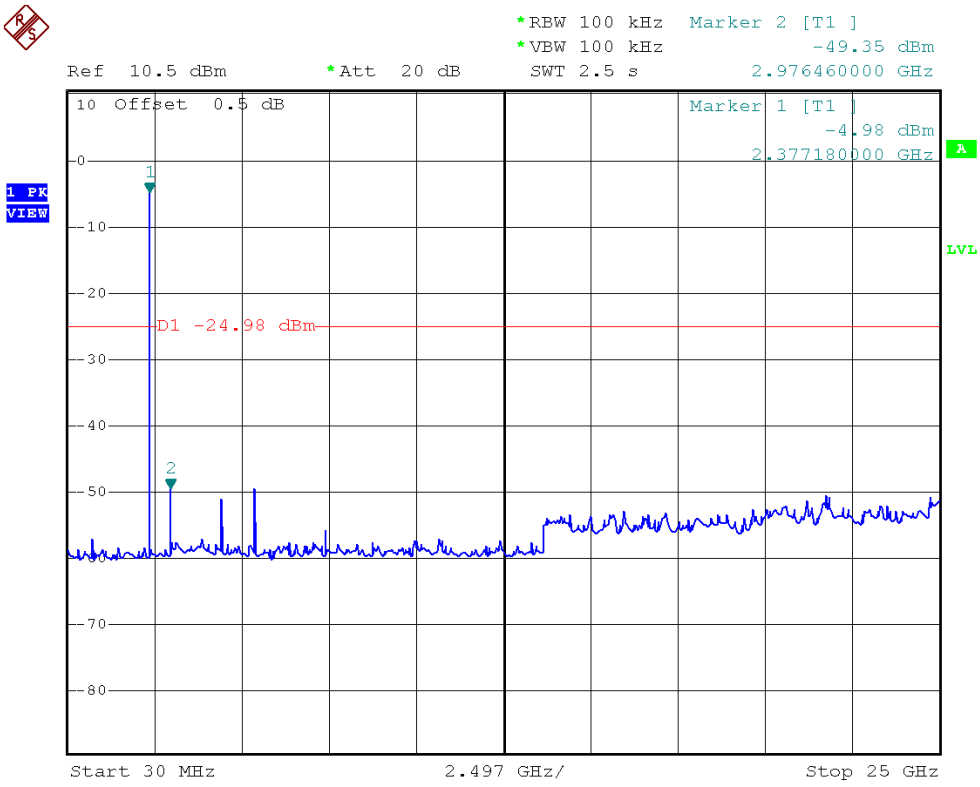
## CH00 (Lower)



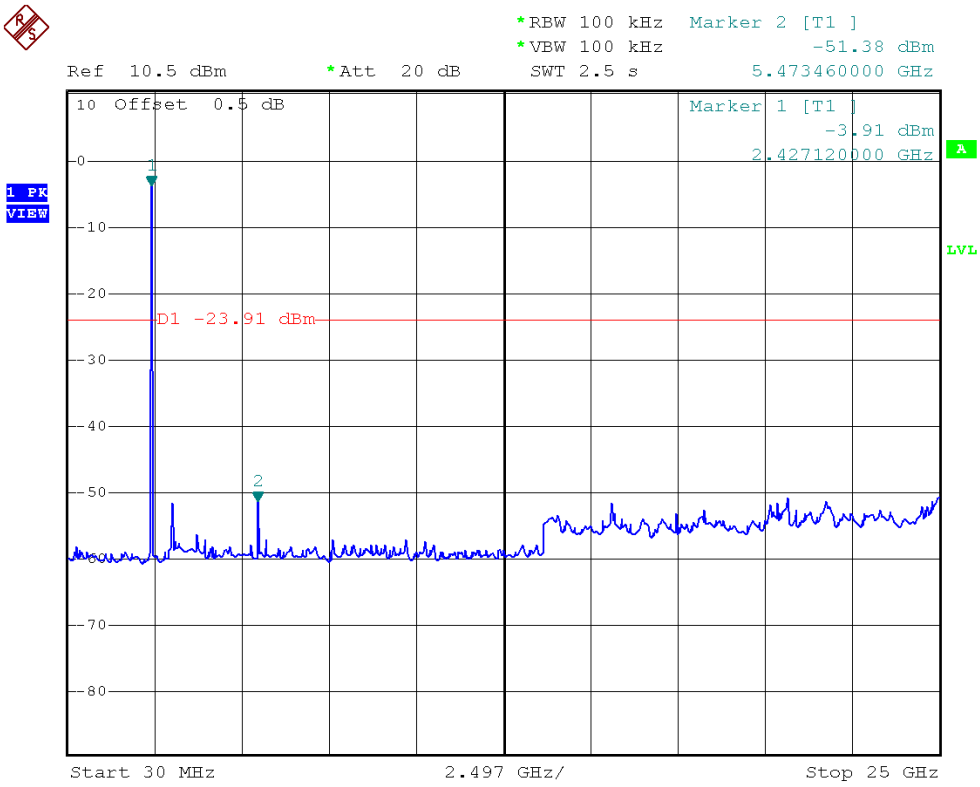

## CH78 (Upper)



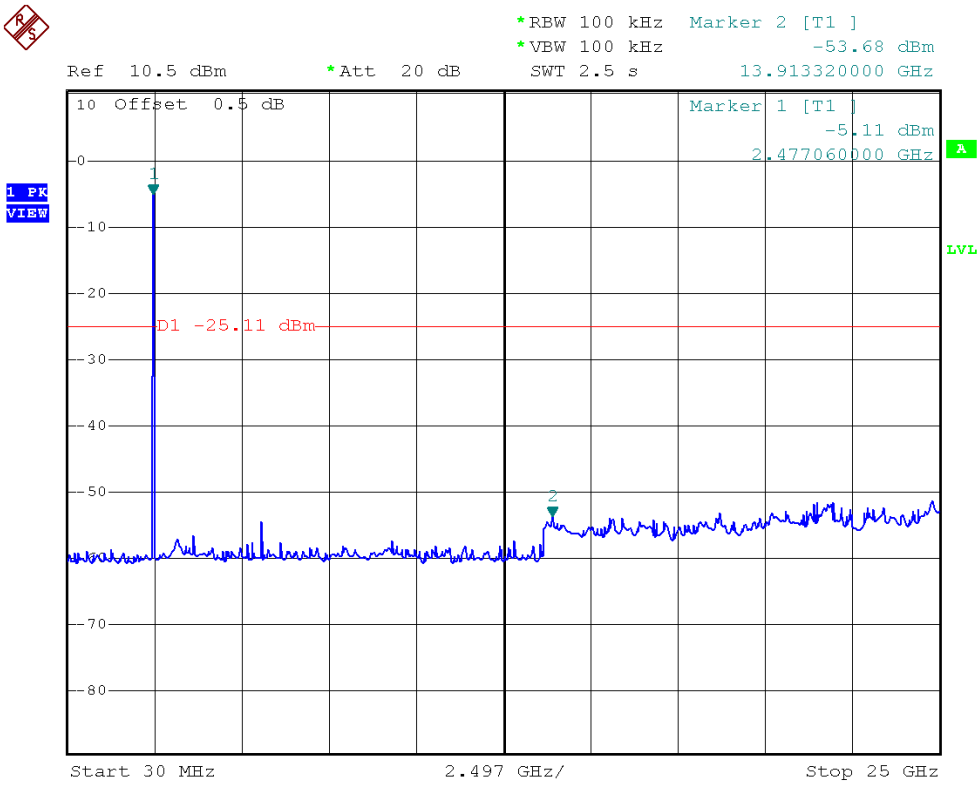
## CH00


*RBW 100 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 s
Marker 2 [T1 ]
-49.35 dBm
2.976460000 GHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-4.98 dBm
2.377180000 GHz
1 PK
VIEW
A
LVL
D1 -24.98 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

## CH39


*RBW 100 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 s
Marker 2 [T1 ]
-51.38 dBm
5.473460000 GHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-3.91 dBm
2.427120000 GHz
1 PK
VIEW
A
LVL
D1 -23.91 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

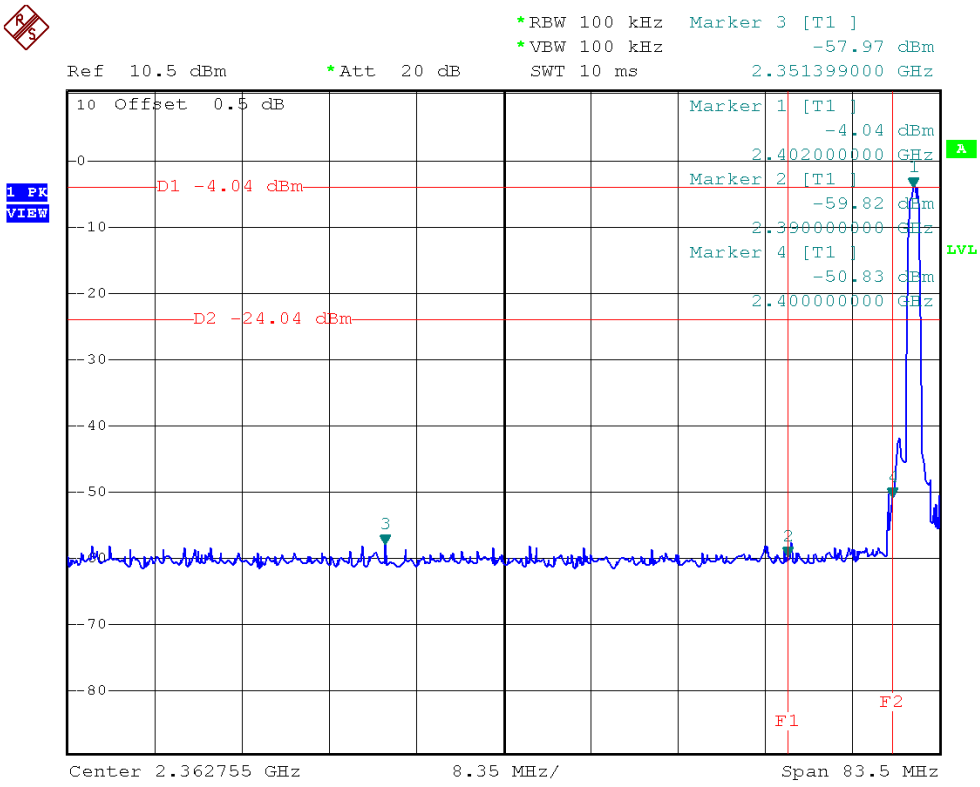
## CH78


*RBW 100 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 s
Marker 2 [T1 ]
-53.68 dBm
13.913320000 GHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-5.11 dBm
2.477060000 GHz
1 PK
VIEW
A
LVL
D1 -25.11 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

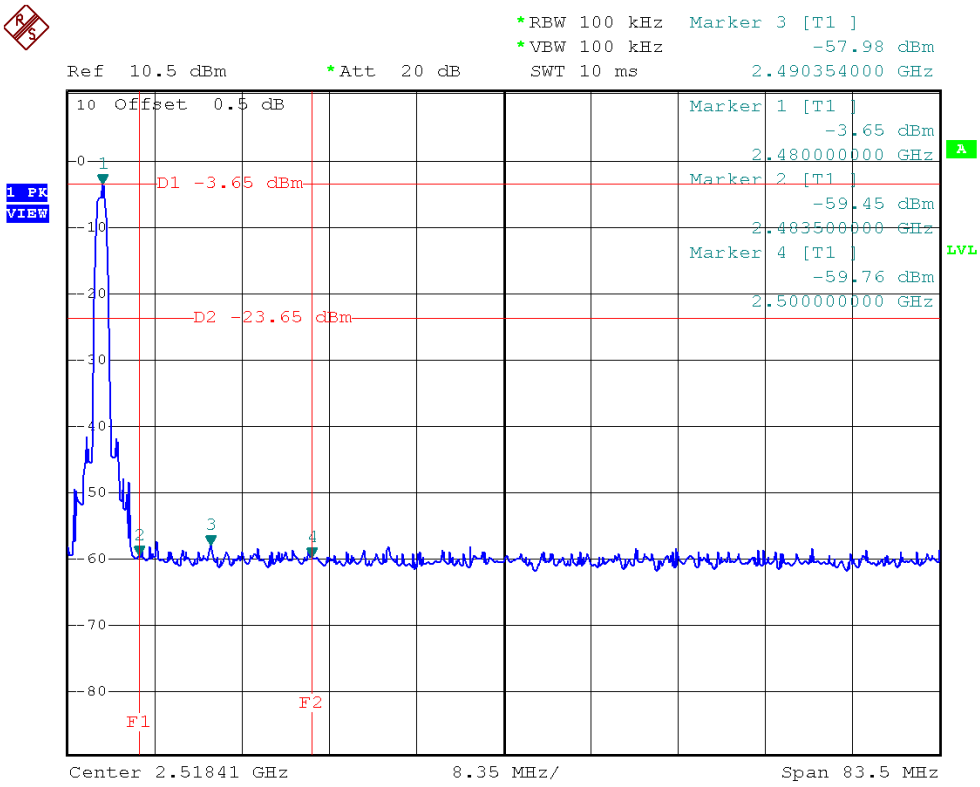
| | | | |
|---|---|---|---|
| EUT： | Terminal | Model Name ： | 8230 (Scanner Type: 2D) |
| Temperature： | 25°C | Relative Humidity： | 31% |
| Test Voltage ： | AC 120V/60Hz | | |
| Test Mode ： | 3M/CH00 / CH39 / CH78 | | |

| The max. radio frequency power in any 100kHz bandwidth outside the frequency band | | The max. radio frequency power in any 100 kHz bandwidth within the frequency band. | |
|---|---|---|---|
| FREQUENCY(MHz) | POWER(dBm) | FREQUENCY(MHz) | POWER(dBm) |
| 2351.399 | -57.97 | 2490.354 | -57.97 |
| Result | | | |
| In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power. | | | |

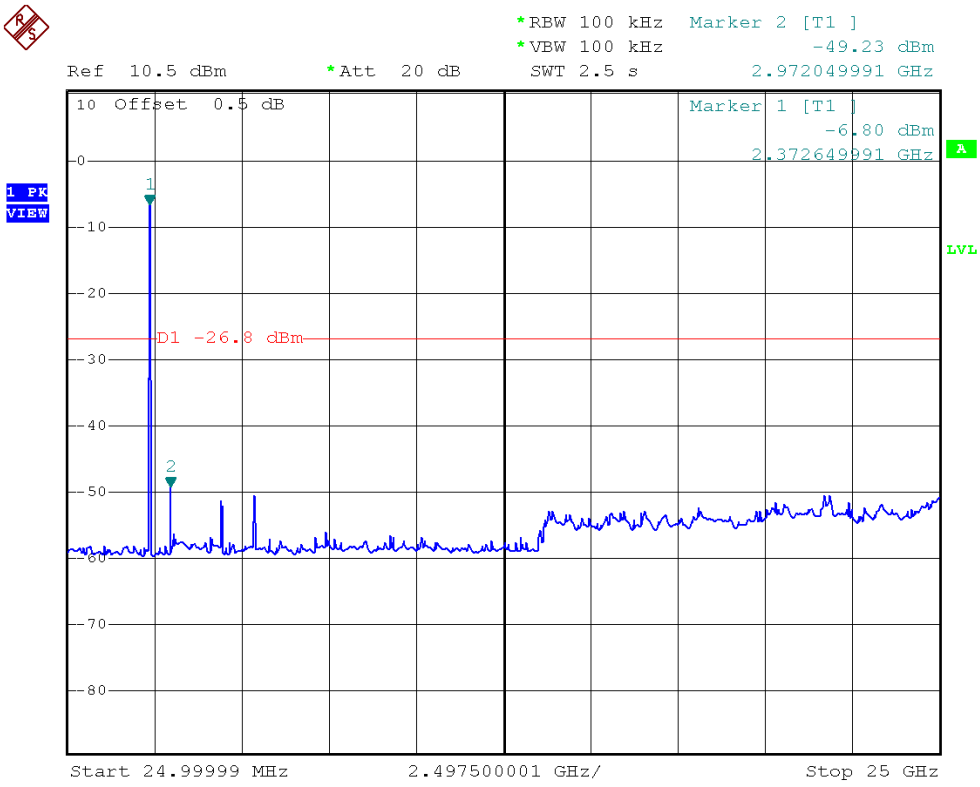
## CH00 (Lower)



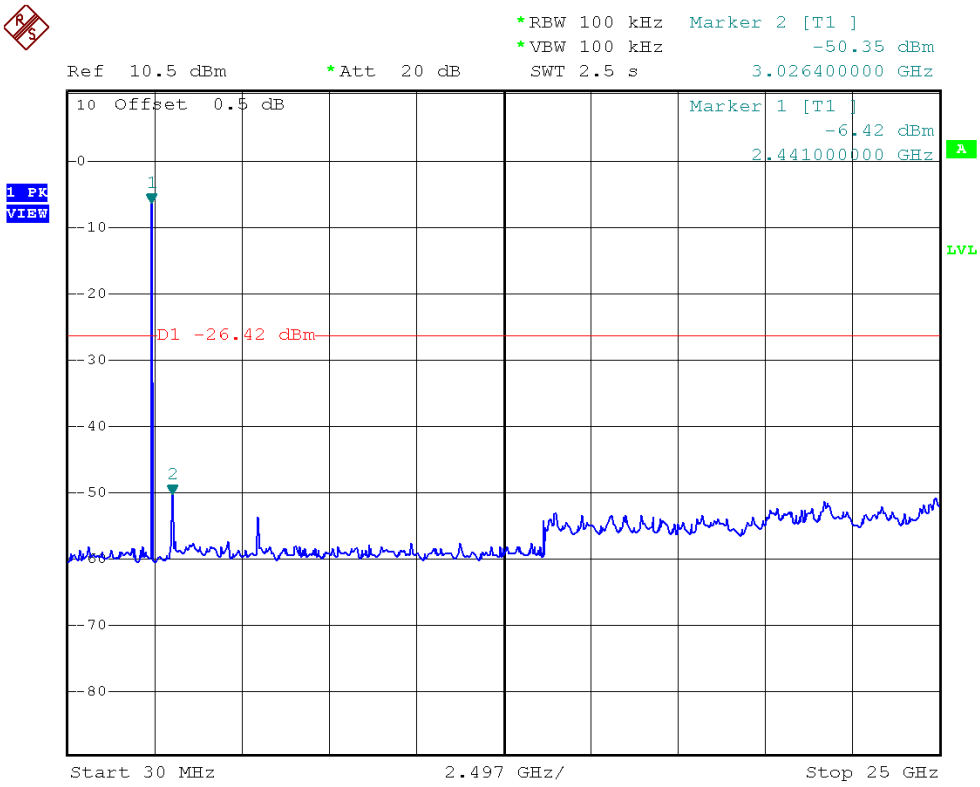

## CH 78(Upper)



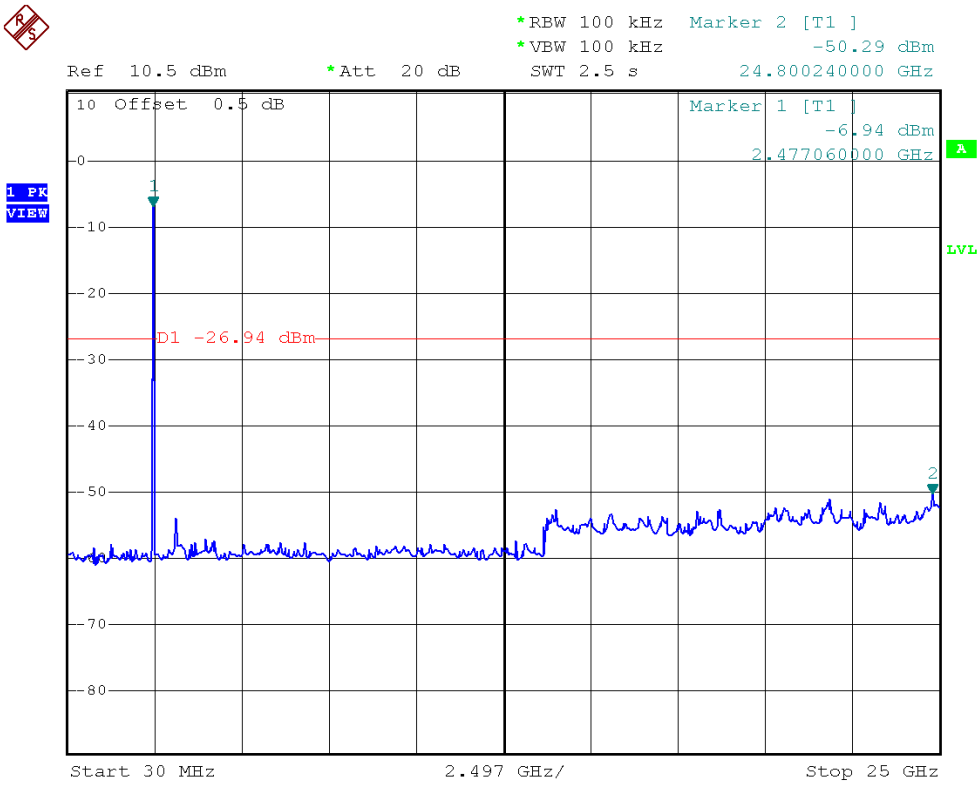
## CH00


*RBW 100 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 s
Marker 2 [T1 ]
-49.23 dBm
2.972049991 GHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-6.80 dBm
2.372649991 GHz
1 PK
VIEW
A
LVL
D1 -26.8 dBm
Start 24.99999 MHz
2.497500001 GHz/
Stop 25 GHz

## CH39


*RBW 100 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 s
Marker 2 [T1 ]
-50.35 dBm
3.026400000 GHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-6.42 dBm
2.441000000 GHz
1 PK
VIEW
A
LVL
D1 -26.42 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

## CH78


*RBW 100 kHz
*VBW 100 kHz
Ref 10.5 dBm
*Att 20 dB
SWT 2.5 s
Marker 2 [T1 ]
-50.29 dBm
24.800240000 GHz
10 Offset 0.5 dB
Marker 1 [T1 ]
-6.94 dBm
2.477060000 GHz
1 PK
VIEW
A
LVL
D1 -26.94 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

## 10. RF EXPOSURE TEST

### 10.1 Applied procedures / limit

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ $cm^2$) | Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes) |
|---|---|---|---|---|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842 / f | 4.89 / f | (900 / f)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | | | F/300 | 6 |
| 1500-100,000 | | | 5 | 6 |

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ $cm^2$) | Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes) |
|---|---|---|---|---|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | (180/f)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | | | F/1500 | 30 |
| 1500-100,000 | | | 1.0 | 30 |

Note: f = frequency in MHz ; *Plane-wave equivalent power density

### 10.1.1 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|---|---|---|---|---|---|
| 1 | Power Meter | Anritsu | ML2487A | 6K00004714 | Feb. 17, 2012 |
| 2 | Power Meter Sensor | Anritsu | MA2491A | 34138 | Feb. 17, 2012 |

Remark: ” N/A” denotes No Model Name , Serial No. or No Calibration specified.

### 10.1.2 MPE CALCULATION METHOD

E (V/m) $= \frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) $= \frac{E^2}{377}$

**E** = Electric field (V/m)

**P** = Peak RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

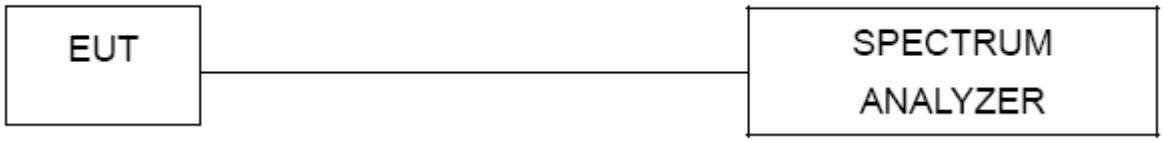
***Pd*** $= \frac{30 \times P \times G}{377 \times d^2}$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

### 10.1.3 DEVIATION FROM STANDARD

No deviation.

### 10.1.4 TEST SETUP




### 10.1.5 EUT OPERATION CONDITIONS

**The power is too low, so no RF calculations are needed.**

## 12. HISTORY

| | |
|---|---|
| Original Issue Date: | |
| Report No.: | |
| ■ No additional attachment | |
| ☐ Additional attachment were issued as following record: | |

| Attachment No. | Issue Date | Description |
|---|---|---|
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