



# FCC PART 15C TEST REPORT

No. 2013TAR067

for

**TCT Mobile Limited**

**HSDPA/HSUPA/UMTS dual band / GSM quad bands mobile phone**

**Model Name: Smart III 4**

**Marketing Name: Vodafone 975**

**FCC ID : RAD351**

with

**Hardware Version: PIO**

**Software Version: G6B**

**Issued Date: 2013-03-11**



**DAR accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01**

**FCC 2.948 Listed: No.733176**

**IC O.A.T.S listed: No.6629B**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

**Test Laboratory:**

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## 1. Test Laboratory

### 1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: Shouxiang Science Building, No 51, Xueyuan Road, Haidian District,  
Beijing, P.R.China  
Postal Code: 100191  
Telephone: 00861062304633  
Fax: 00861062304793

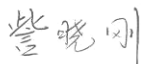
### 1.2. Testing Environment

Normal Temperature: 15-35℃  
Extreme Temperature: -20/+55℃  
Relative Humidity: 20-75%

### 1.3. Project data

Project Leader: Zi Xiaogang  
Testing Start Date: 2013-02-08  
Testing End Date: 2013-03-08

### 1.4. Signature



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**Zi Xiaogang**  
**(Prepared this test report)**



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**Sun Xiangqian**  
**(Reviewed this test report)**



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**Lu Bingsong**  
**Deputy Director of the laboratory**  
**(Approved this test report)**

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
Contact: Gong Zhizhou  
Email: zhizhou.gong@jrdcom.com  
Telephone: 0086 21 68897541  
Fax: 0086 21 50801070

### **2.2. Manufacturer Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
Contact: Gong Zhizhou  
Email: zhizhou.gong@jrdcom.com  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

### 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1. About EUT

|                             |                                                          |
|-----------------------------|----------------------------------------------------------|
| Description                 | HSDPA/HSUPA/UMTS dual band / GSM quad bands mobile phone |
| Model Name                  | Smart III 4                                              |
| Marketing Name              | Vodafone 975                                             |
| FCC ID                      | RAD351                                                   |
| Frequency Band              | ISM 2400MHz~2483.5MHz                                    |
| Type of Modulation(LE mode) | GFSK                                                     |
| Number of Channels(LE mode) | 40                                                       |
| Power Supply                | 3.8V DC by Battery                                       |

#### 3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI      | HW Version | SW Version |
|---------|-----------------|------------|------------|
| N17     | 869531010050734 | PIO        | G6B        |
| N33     | 869531010050908 | PIO        | G6B        |

\*EUT ID: is used to identify the test sample in the lab internally.

#### 3.3. Internal Identification of AE used during the test

| AE ID* | Description    |
|--------|----------------|
| AE1    | Battery        |
| AE2    | Battery        |
| AE3    | Travel Adapter |
| AE4    | Travel Adapter |

##### AE1

|                 |              |
|-----------------|--------------|
| Model           | CAB32A0004C1 |
| Manufacturer    | BYD          |
| Capacitance     | 1500mAh      |
| Nominal voltage | 3.7V         |

##### AE2

|                 |              |
|-----------------|--------------|
| Model           | CAB32A0004C2 |
| Manufacturer    | SCUD         |
| Capacitance     | 1500mAh      |
| Nominal voltage | 3.7V         |

##### AE3

|       |              |
|-------|--------------|
| Model | CBA3001AG0C1 |
|-------|--------------|

|                 |       |
|-----------------|-------|
| Manufacturer    | BYD   |
| Length of cable | 105cm |

AE4

|                 |              |
|-----------------|--------------|
| Model           | CBA3001AG0C2 |
| Manufacturer    | TenPao       |
| Length of cable | 105cm        |

\*AE ID: is used to identify the test sample in the lab internally.

### 3.4. Normal Accessory Setting

1. Fully charged battery was used during the test;
2. A microSD card was being installed in the device during the test;

### 3.5. General Description

The Equipment Under Test (EUT) is a model of HSDPA/HSUPA/UMTS dual band / GSM quad bands mobile phone with integrated antenna. It consists of normal options: lithium battery, charger Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

## **4. Reference Documents**

### **4.1. Documents supplied by applicant**

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

### **4.2. Reference Documents for testing**

The following documents listed in this section are referred for testing.

|             |                                                                                                                     |                           |
|-------------|---------------------------------------------------------------------------------------------------------------------|---------------------------|
| FCC Part15  | FCC CFR 47, Part 15, Subpart C:                                                                                     | Oct,10<br>2009<br>Edition |
|             | 15.205 Restricted bands of operation;                                                                               |                           |
|             | 15.209 Radiated emission limits, general requirements;                                                              |                           |
|             | 15.247 Operation within the bands 902–928MHz,<br>2400–2483.5 MHz, and 5725–5850 MHz.                                |                           |
| ANSI C63.10 | Procedures for testing compliance of a wide variety<br>of unlicensed wireless devices                               | 2009                      |
| KDB 558074  | Guidance for Performing Compliance Measurements on<br>Digital Transmission Systems (DTS) Operating Under<br>§15.247 | V01                       |

## 5. LABORATORY ENVIRONMENT

**Shielding Room1** (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

|                              |                                            |
|------------------------------|--------------------------------------------|
| Temperature                  | Min. = 15 °C, Max. = 30 °C                 |
| Relative humidity            | Min. = 30 %, Max. = 60 %                   |
| Shielding effectiveness      | > 110 dB                                   |
| Ground system resistance     | < 0.5 Ω                                    |
| Uniformity of field strength | Between 0 and 6 dB, from 80MHz to 3000 MHz |

**Control room** did not exceed following limits along the EMC testing:

|                          |                            |
|--------------------------|----------------------------|
| Temperature              | Min. = 15 °C, Max. = 35 °C |
| Relative humidity        | Min. = 30 %, Max. = 60 %   |
| Shielding effectiveness  | > 110 dB                   |
| Electrical insulation    | > 10 kΩ                    |
| Ground system resistance | < 0.5 Ω                    |

**Semi-anechoic chamber** (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

|                                   |                                               |
|-----------------------------------|-----------------------------------------------|
| Temperature                       | Min. = 15 °C, Max. = 30 °C                    |
| Relative humidity                 | Min. = 30 %, Max. = 60 %                      |
| Shielding effectiveness           | > 110 dB                                      |
| Electrical insulation             | > 10 kΩ                                       |
| Ground system resistance          | < 0.5 Ω                                       |
| Normalised site attenuation (NSA) | < ±3.2 dB, 10 m distance, from 30 to 1000 MHz |
| Uniformity of field strength      | Between 0 and 6 dB, from 80 to 2000 MHz       |



## 6. SUMMARY OF TEST RESULTS

### 6.1. Summary of Test Results

Abbreviations used in this clause:

**P** Pass, The EUT complies with the essential requirements in the standard.

**F** Fail, The EUT does not comply with the essential requirements in the standard

**NA** Not Applicable, The test was not applicable

**NP** Not Performed, The test was not performed by TMC

| SUMMARY OF MEASUREMENT RESULTS       | Sub-clause             | Verdict  |
|--------------------------------------|------------------------|----------|
| Peak Output Power - Conducted        | 15.247 (b)(1)          | <b>P</b> |
| Frequency Band Edges                 | 15.247 (d)             | <b>P</b> |
| Conducted Emission                   | 15.247 (d)             | <b>P</b> |
| Radiated Emission                    | 15.247, 15.205, 15.209 | <b>P</b> |
| 6dB Bandwidth                        | 15.247 (a)(2)          | <b>P</b> |
| Maximum Power Spectral Density Level | 15.247(e)              | <b>P</b> |
| AC Powerline Conducted Emission      | 15.107, 15.207         | <b>P</b> |

Please refer to **ANNEX A** for detail.

The measurement is made according to KDB 558074 and ANSI C63.10.

### 6.2. Statements

TMC has evaluated the test cases requested by the applicant /manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.2

## 7. Test Equipments Utilized

### Conducted test system

| No. | Equipment              | Model | Serial Number | Manufacturer    | Calibration Due date |
|-----|------------------------|-------|---------------|-----------------|----------------------|
| 1   | Vector Signal Analyzer | FSU26 | 200030        | Rohde & Schwarz | 2013-06-19           |
| 2   | Bluetooth Tester       | CBT32 | 100649        | Rohde & Schwarz | 2014-02-03           |

### Radiated emission test system

| No. | Equipment                            | Model     | Serial Number | Manufacturer    | Calibration Due date |
|-----|--------------------------------------|-----------|---------------|-----------------|----------------------|
| 1   | Test Receiver                        | ESI40     | 831564/002    | Rohde & Schwarz | 2013-08-11           |
| 2   | EMI Antenna                          | VULB 9163 | 9163 301      | Schwarzbeck     | 2013-08-30           |
| 3   | EMI Antenna                          | 3117      | 00034610      | EMCO            | 2013-07-01           |
| 4   | Dual-Ridge Waveguide Horn Antenna    | 3116      | 2663          | EMCO            | 2013-07-10           |
| 5   | Dual-Ridge Waveguide Horn Antenna    | 3116      | 2661          | EMCO            | 2013-07-05           |
| 6   | Universal Radio Communication Tester | CMU200    | 105948        | Rohde & Schwarz | 2013-08-14           |
| 7   | LISN                                 | ESH2-Z5   | 829991/012    | Rohde & Schwarz | 2013-03-18           |
| 8   | Pre-amplifier(18GHz)                 | /         | 1005277       | Rohde & Schwarz | /                    |
| 9   | Pre-amplifier(26.5GHz)               | /         | 1005277       | Rohde & Schwarz | /                    |

### Anechoic chamber

Fully anechoic chamber by Frankonia German.

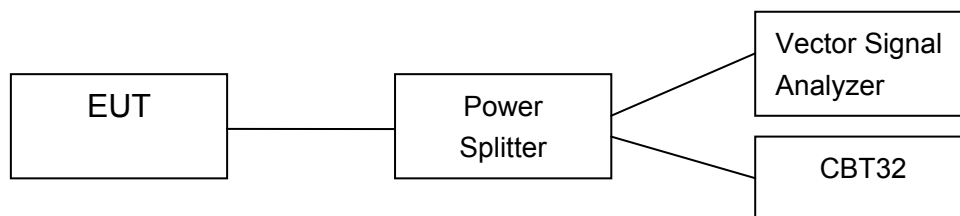
## ANNEX A: MEASUREMENT RESULTS

### A.1. Measurement Method

#### A.1.1. Conducted Measurements

The measurement is made according to KDB 558074 and ANSI C63.10.

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode (Transmitter, receiver or transmitter & receiver).
- 3). Set the EUT to the required channel.
- 4). Set the EUT hopping mode (hopping or hopping off).
- 5). Set the spectrum analyzer to start measurement.
- 6). Record the values. Vector Signal Analyzer



#### A.1.2. Radiated Emission Measurements

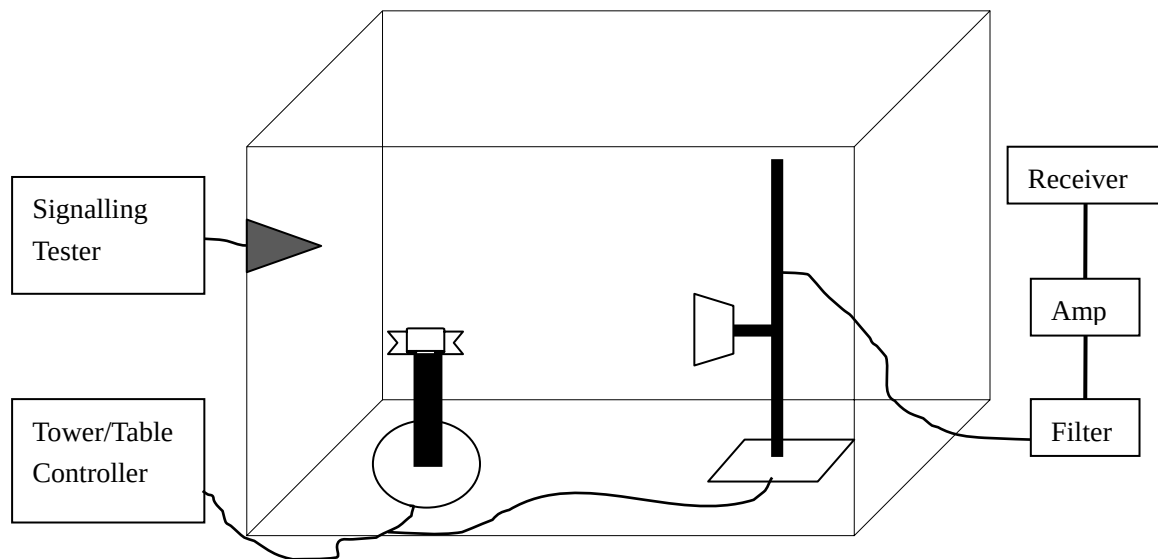
The measurement is made according to KDB 558074 and ANSI C63.10.

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 1MHz;



## A.2. Peak Output Power - Conducted

### Measurement Limit:

| Standard              | Limit (dBm) |
|-----------------------|-------------|
| FCC Part 15.247(b)(1) | < 30        |

The measurement is made according to KDB 558074 and ANSI C63.10.

### Test Condition

| Hopping Mode | RBW  | VBW  | Span | Sweptime |
|--------------|------|------|------|----------|
| Hopping OFF  | 1MHz | 5MHz | 0    | 5ms      |

### Measurement Results:

#### For GFSK

| Frequency                         | 2402 MHz | 2440 MHz | 2480 MHz | Conclusion |
|-----------------------------------|----------|----------|----------|------------|
| Peak Conducted Output Power (dBm) | 0.66     | -0.22    | -2.28    | P          |

**Conclusion: PASS**

### A.3. Frequency Band Edges - Conducted

#### Measurement Limit:

| Standard                   | Limit (dBc) |
|----------------------------|-------------|
| FCC 47 CFR Part 15.247 (d) | > 20        |

The measurement is made according to KDB 558074 and ANSI C63.10.

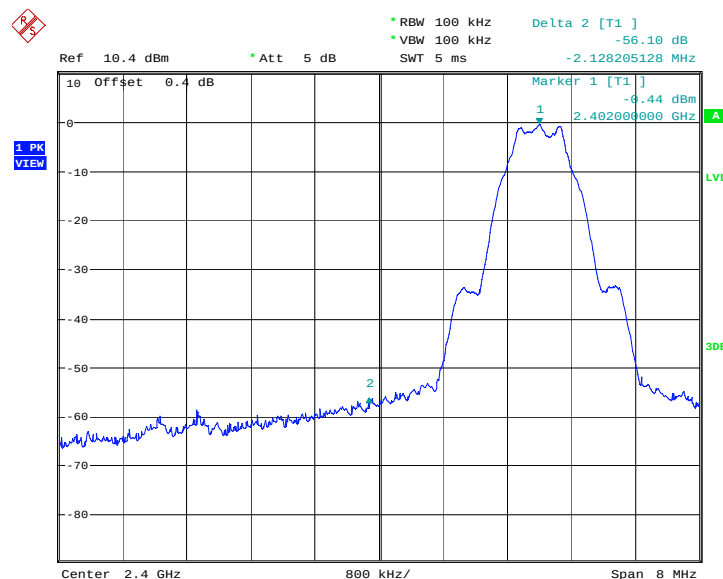
#### Measurement Result:

##### For GFSK

| Frequency | Hopping     | Band Edge Power ( dBc) | Conclusion |
|-----------|-------------|------------------------|------------|
| 2402MHz   | Hopping OFF | Fig.1                  | P          |
| 2480MHz   | Hopping OFF | Fig.2                  | P          |

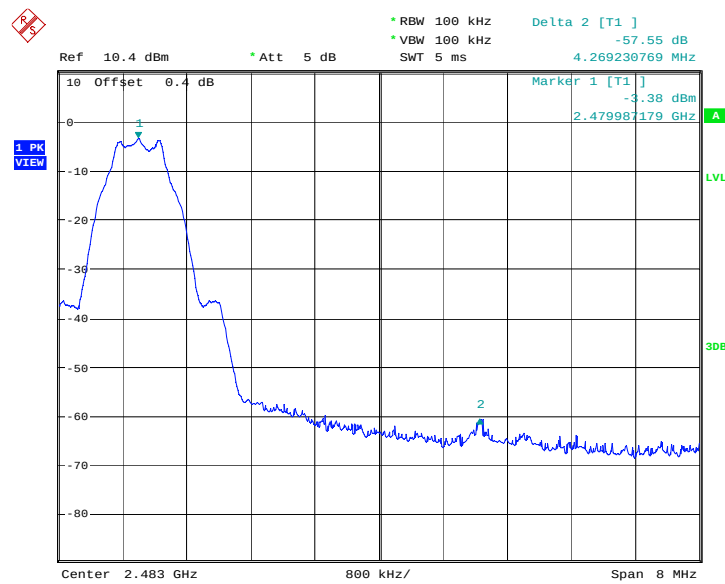
**Conclusion: PASS**

Test graphs as below



Date: 18.FEB.2013 05:43:47

Fig.1. Frequency Band Edges: GFSK, 2402 MHz, Hopping Off



Date: 18.FEB.2013 05:53:38

Fig.2. Frequency Band Edges: GFSK, 2480 MHz, Hopping Off

#### A.4. Conducted Emission

##### Measurement Limit:

| Standard                   | Limit                                             |
|----------------------------|---------------------------------------------------|
| FCC 47 CFR Part 15.247 (d) | 20dB below peak output power in 100 kHz bandwidth |

The measurement is made according to KDB 558074 and ANSI C63.10.

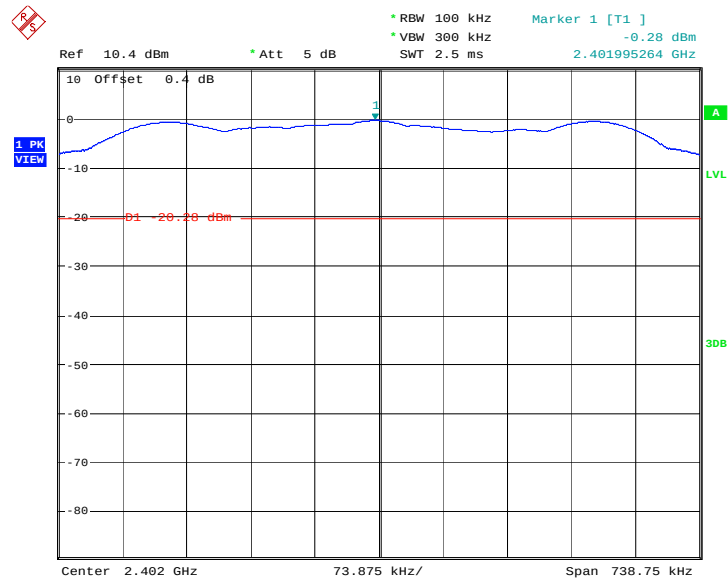
##### Measurement Results:

##### For GFSK

| Frequency | Frequency Range  | Test Results | Conclusion |
|-----------|------------------|--------------|------------|
| 2402 MHz  | Center Frequency | Fig.3        | P          |
|           | 30 MHz ~ 1 GHz   | Fig.4        | P          |
|           | 1 GHz ~ 3 GHz    | Fig.5        | P          |
|           | 3 GHz ~ 10 GHz   | Fig.6        | P          |
|           | 10GHz ~ 26 GHz   | Fig.7        | P          |
| 2440 MHz  | Center Frequency | Fig.8        | P          |
|           | 30 MHz ~ 1 GHz   | Fig.9        | P          |
|           | 1 GHz ~ 3 GHz    | Fig.10       | P          |
|           | 3 GHz ~ 10 GHz   | Fig.11       | P          |
|           | 10GHz ~ 26 GHz   | Fig.12       | P          |
| 2480 MHz  | Center Frequency | Fig.13       | P          |
|           | 30 MHz ~ 1 GHz   | Fig.14       | P          |
|           | 1 GHz ~ 3GHz     | Fig.15       | P          |
|           | 3 GHz ~ 10 GHz   | Fig.16       | P          |
|           | 10 GHz ~ 26 GHz  | Fig.17       | P          |

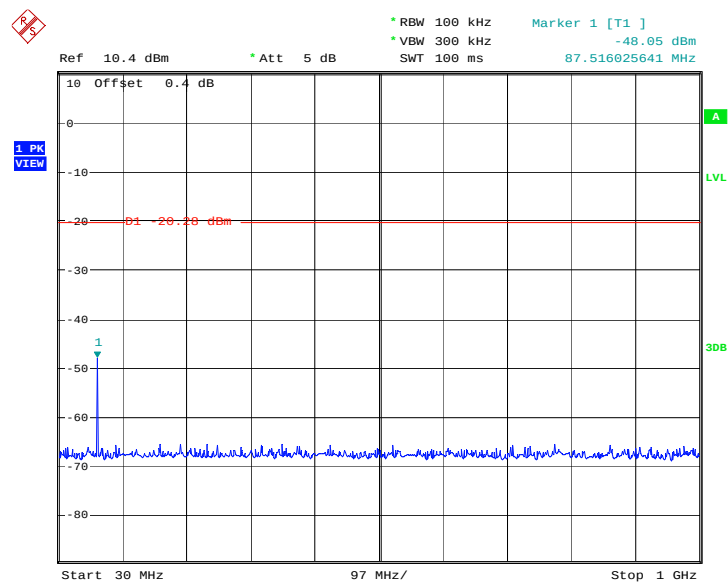
**Conclusion: PASS**

**Test graphs as below**



Date: 18.FEB.2013 05:42:07

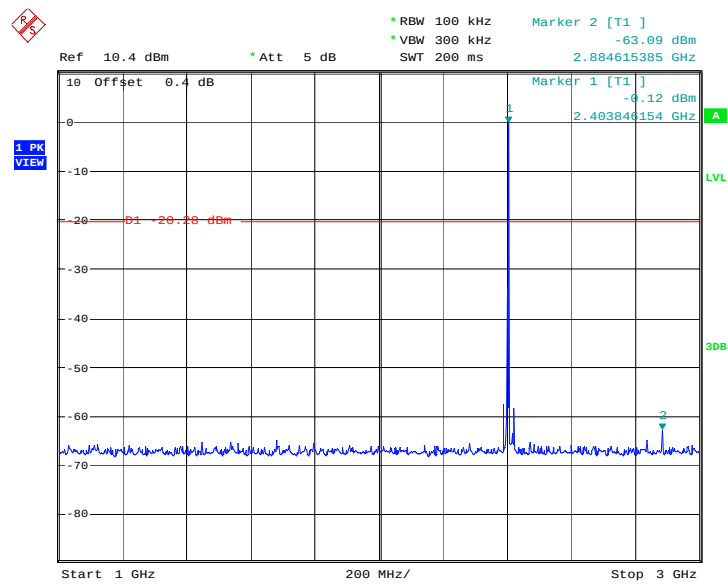
Fig.3. Conducted spurious emission: GFSK,2402MHz



Date: 18.FEB.2013 05:42:23

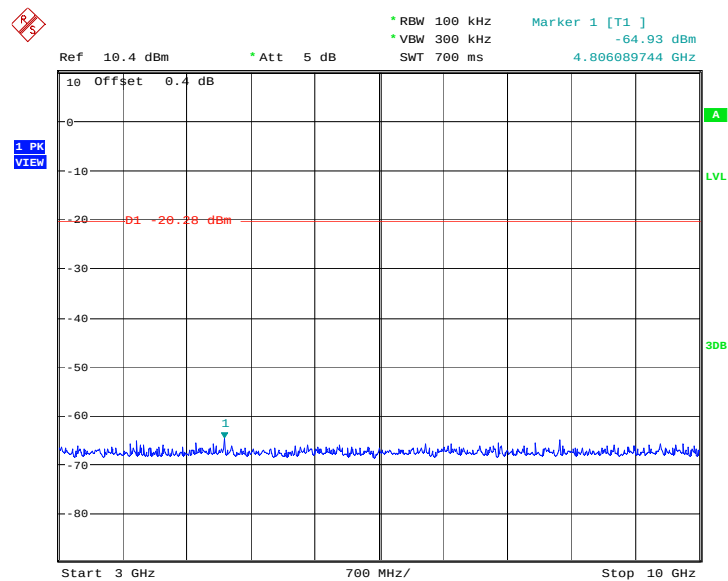
Fig.4. Conducted spurious emission: GFSK, 2402 MHz, 30MHz - 1GHz





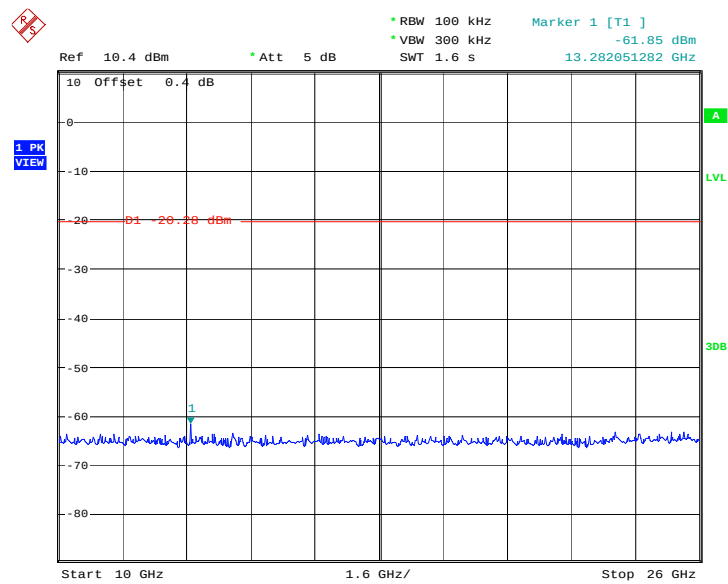
Date: 18.FEB.2013 05:42:55

Fig.5. Conducted spurious emission: GFSK, 2402 MHz, 1GHz - 3GHz



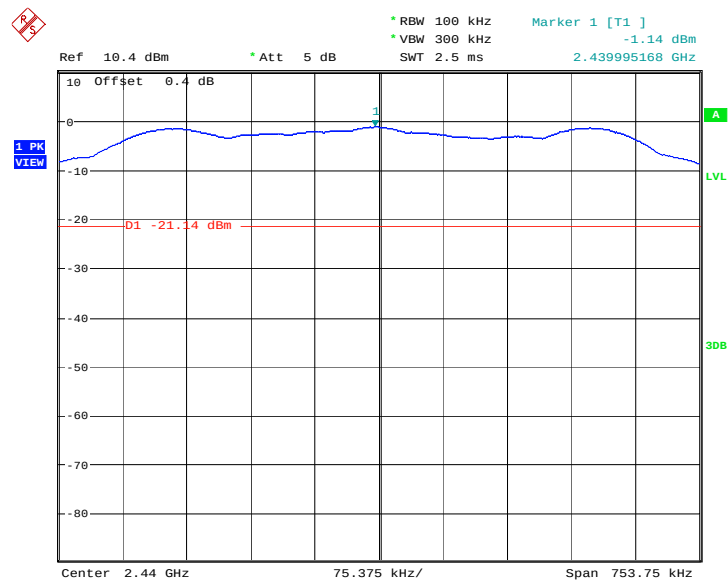
Date: 18.FEB.2013 05:43:12

Fig.6. Conducted spurious emission: GFSK, 2402 MHz, 3GHz - 10GHz



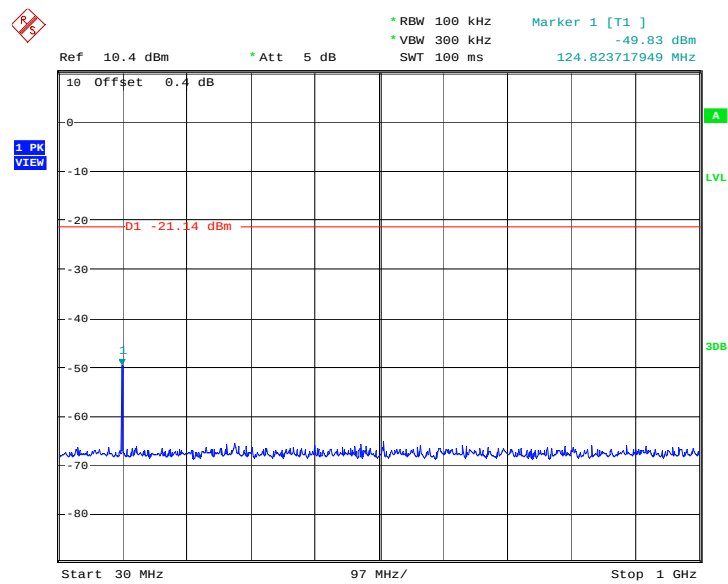
Date: 18.FEB.2013 05:43:28

Fig.7. Conducted spurious emission: GFSK, 2402 MHz, 10GHz - 26GHz



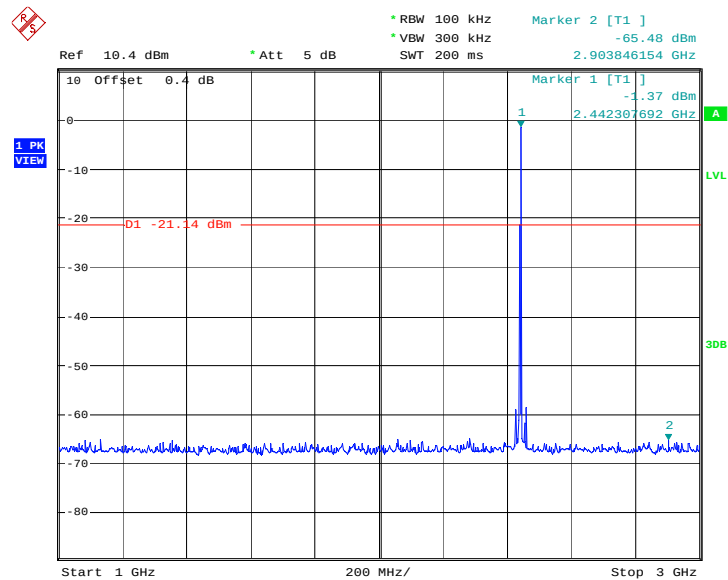
Date: 18.FEB.2013 05:47:15

Fig.8. Conducted spurious emission: GFSK, 2440MHz



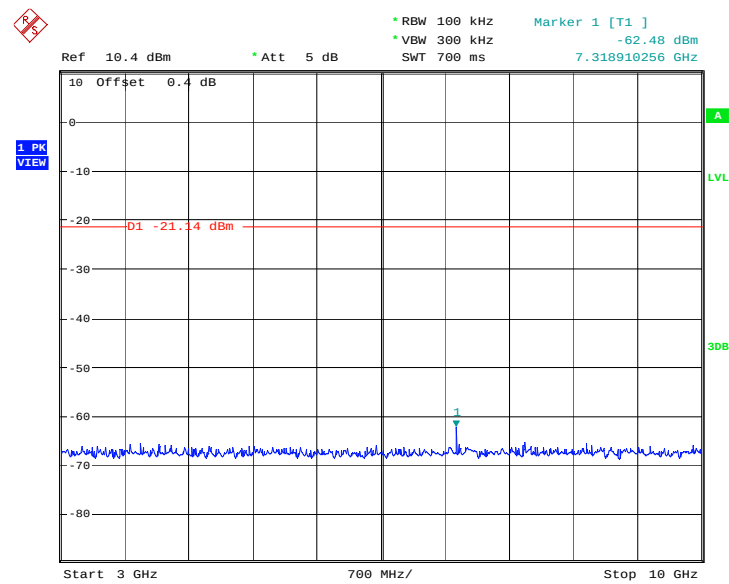
Date: 18.FEB.2013 05:47:32

Fig.9. Conducted spurious emission: GFSK, 2440 MHz, 30MHz - 1GHz



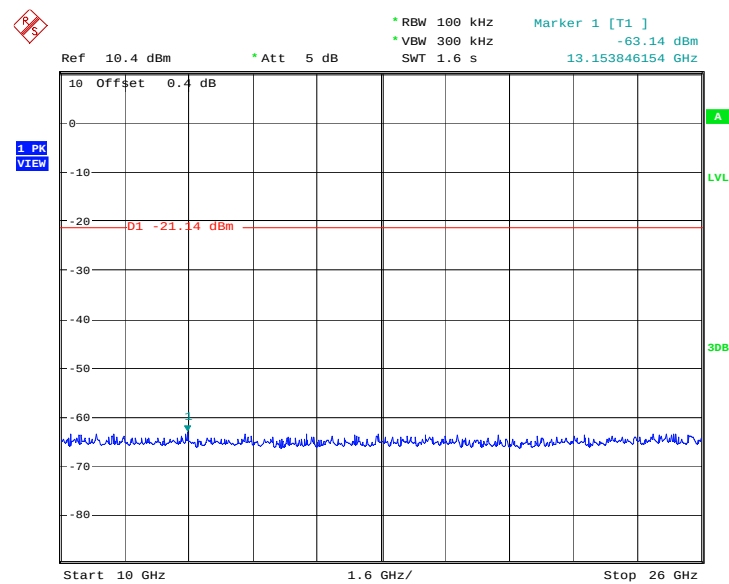
Date: 18.FEB.2013 05:48:03

Fig.10. Conducted spurious emission: GFSK, 2440 MHz, 1GHz - 3GHz



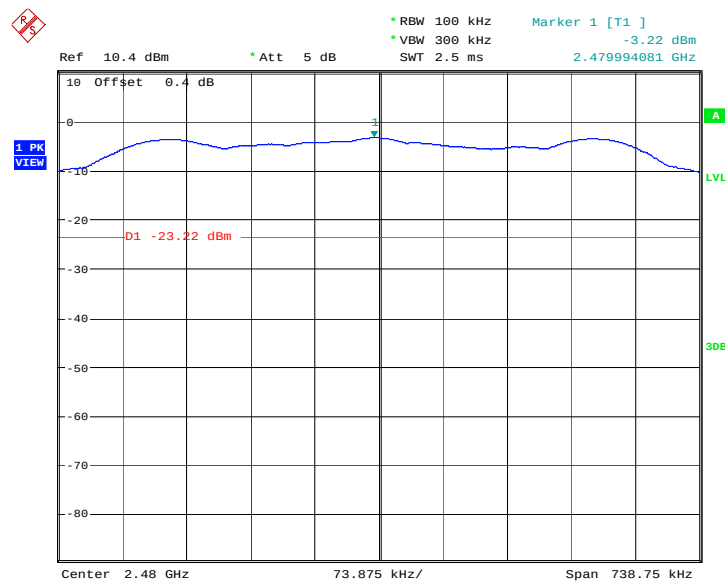
Date: 18.FEB.2013 05:48:20

Fig.11. Conducted spurious emission: GFSK, 2440 MHz, 3GHz – 10GHz



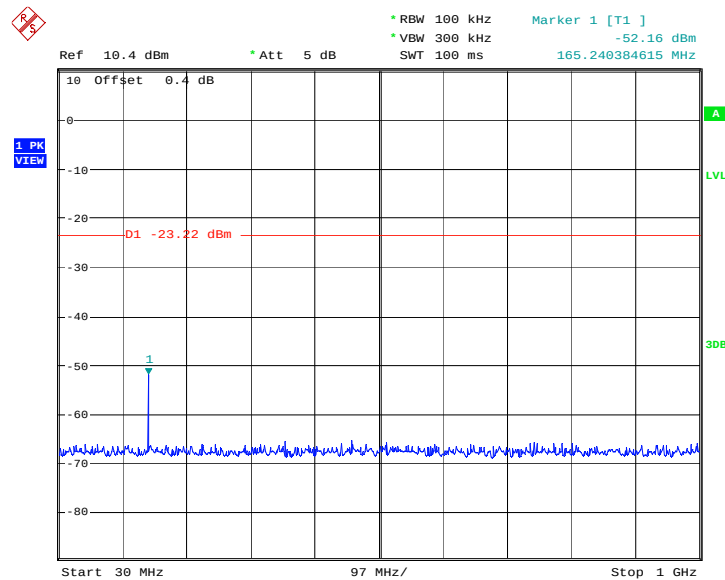
Date: 18.FEB.2013 05:48:37

Fig.12. Conducted spurious emission: GFSK, 2440 MHz, 10GHz – 26GHz



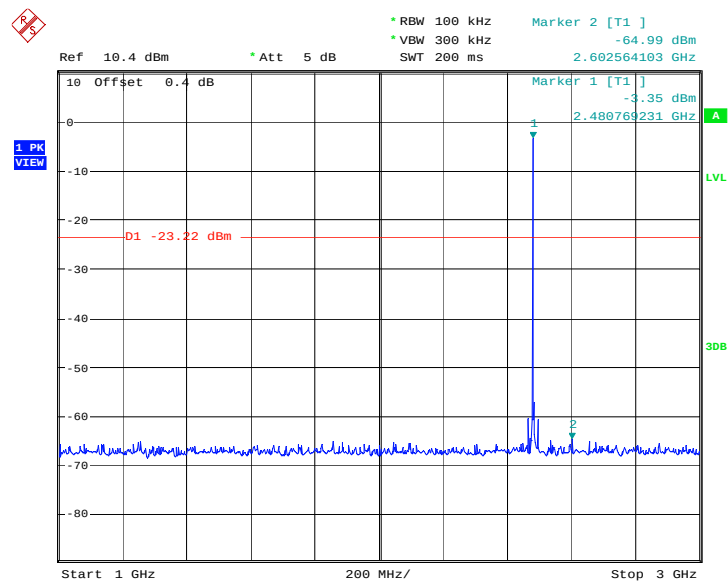
Date: 18.FEB.2013 05:51:57

Fig.13. Conducted spurious emission: GFSK, 2480 MHz



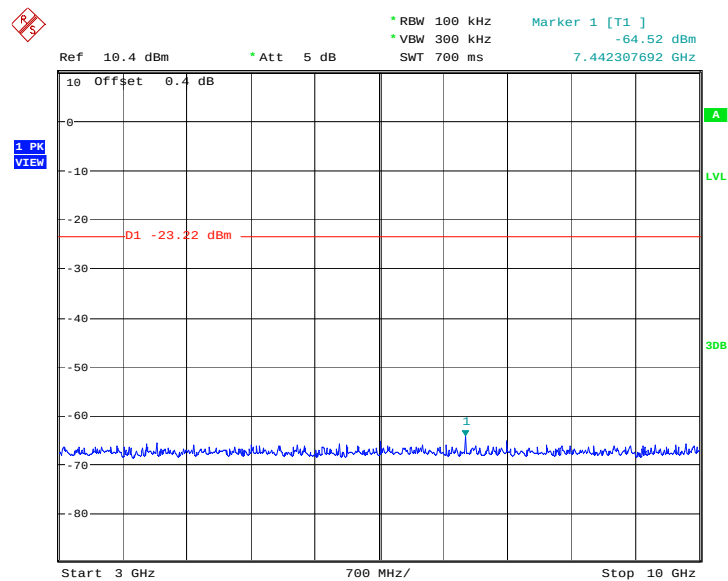
Date: 18.FEB.2013 05:52:13

Fig.14. Conducted spurious emission: GFSK, 2480 MHz, 30MHz - 1GHz



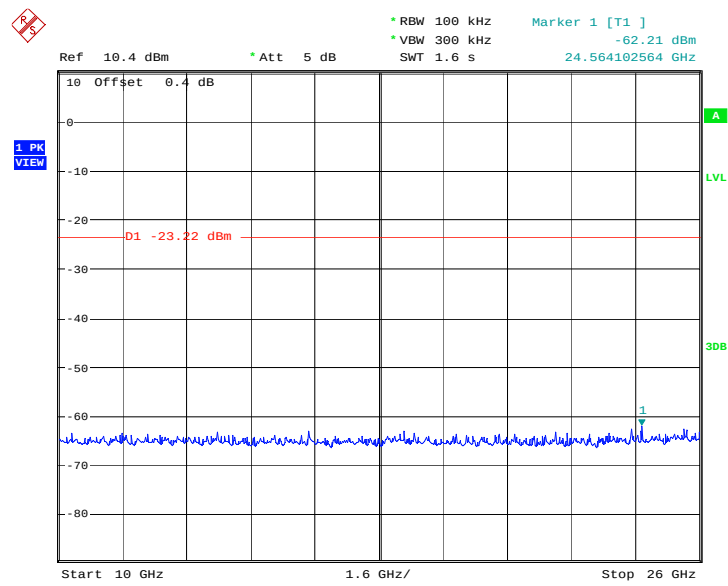
Date: 18.FEB.2013 05:52:45

Fig.15. Conducted spurious emission: GFSK, 2480 MHz, 1GHz - 3GHz



Date: 18.FEB.2013 05:53:02

Fig.16. Conducted spurious emission: GFSK, 2480 MHz, 3GHz - 10GHz



Date: 18.FEB.2013 05:53:18

Fig.17. Conducted spurious emission: GFSK, 2480 MHz, 10GHz - 26GHz

## A.5. Radiated Emission

### Measurement Limit:

| Standard                               | Limit                        |
|----------------------------------------|------------------------------|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dB below peak output power |

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

The measurement is made according to KDB 558074 and ANSI C63.10

### Limit in restricted band:

| Frequency of emission (MHz) | Field strength(uV/m) | Field strength(dBuV/m) |
|-----------------------------|----------------------|------------------------|
| 30-88                       | 100                  | 40                     |
| 88-216                      | 150                  | 43.5                   |
| 216-960                     | 200                  | 46                     |
| Above 960                   | 500                  | 54                     |

### Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

| Frequency of emission (MHz) | RBW/VBW       | Sweep Time(s) |
|-----------------------------|---------------|---------------|
| 30-1000                     | 100KHz/300KHz | 5             |
| 1000-4000                   | 1MHz/1MHz     | 15            |
| 4000-18000                  | 1MHz/1MHz     | 40            |
| 18000-26500                 | 1MHz/1MHz     | 20            |

### Measurement Results:

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable los.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}}$$

### For GFSK

| Frequency | Frequency Range | Test Results | Conclusion |
|-----------|-----------------|--------------|------------|
| 2402 MHz  | 30 MHz ~ 1 GHz  | Fig.18       | P          |
|           | 1 GHz ~ 3 GHz   | Fig.19       | P          |
|           | 3 GHz ~ 18 GHz  | Fig.20       | P          |
| 2441 MHz  | 30 MHz ~ 1 GHz  | Fig.21       | P          |
|           | 1 GHz ~ 3 GHz   | Fig.22       | P          |
|           | 3 GHz ~ 18 GHz  | Fig.23       | P          |



|                  |                    |        |   |
|------------------|--------------------|--------|---|
| 2480 MHz         | 30 MHz ~ 1 GHz     | Fig.24 | P |
|                  | 1 GHz ~ 3 GHz      | Fig.25 | P |
|                  | 3 GHz ~ 18 GHz     | Fig.26 | P |
| Power            | 2.38GHz~2.4GHz---L | Fig.27 | P |
| Power            | 2.45GHz~2.5GHz---H | Fig.28 | P |
| For all channels | 18 GHz ~ 26 GHz    | Fig.29 | P |

#### GFSK 2402MHz

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|-----------|--------------|----------|
| 17491.500      | 43.6           | 17.7      | 25.857       | V        |
| 17977.500      | 43.6           | 17.0      | 26.568       | V        |
| 17497.500      | 43.6           | 17.7      | 25.857       | V        |
| 17511.000      | 43.5           | 17.5      | 26.027       | V        |
| 18000.000      | 43.5           | 18.1      | 25.404       | H        |
| 17997.750      | 43.5           | 17.5      | 25.954       | H        |

#### GFSK 2440MHz

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|-----------|--------------|----------|
| 17493.750      | 43.8           | 17.7      | 26.057       | H        |
| 17991.750      | 43.6           | 17.5      | 26.054       | V        |
| 17983.500      | 43.6           | 17.0      | 26.568       | H        |
| 17460.750      | 43.6           | 17.3      | 26.297       | H        |
| 17535.750      | 43.6           | 17.6      | 25.967       | V        |
| 17523.750      | 43.6           | 17.5      | 26.127       | V        |

#### GFSK 2480MHz

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|-----------|--------------|----------|
| 17496.750      | 43.6           | 17.7      | 25.857       | H        |
| 17992.500      | 43.6           | 17.5      | 26.054       | V        |
| 17504.250      | 43.6           | 17.5      | 26.127       | H        |
| 17503.500      | 43.6           | 17.5      | 26.127       | H        |
| 17999.250      | 43.6           | 17.5      | 26.054       | H        |
| 17506.500      | 43.5           | 17.5      | 26.027       | V        |

**Conclusion: PASS**

**Test graphs as below:**

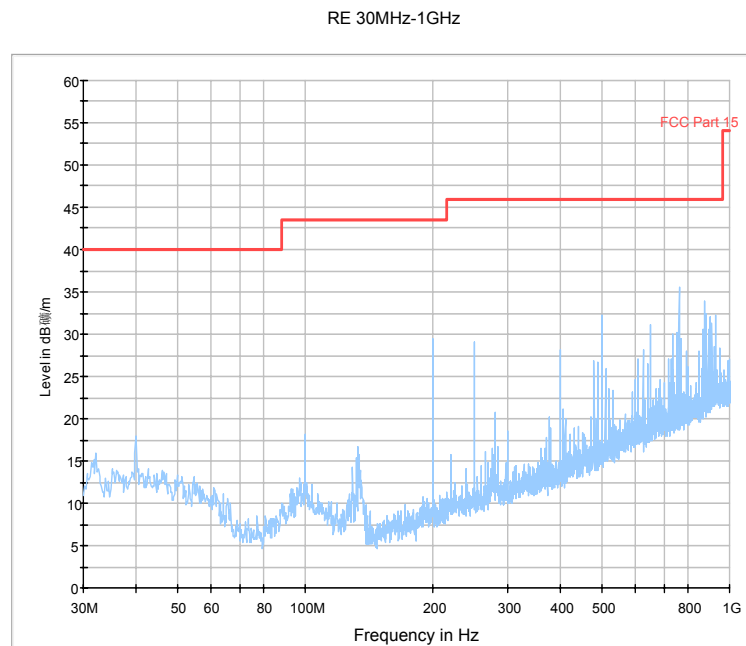


Fig.18. Radiated emission: GFSK, 2402MHz, 30 MHz - 1 GHz

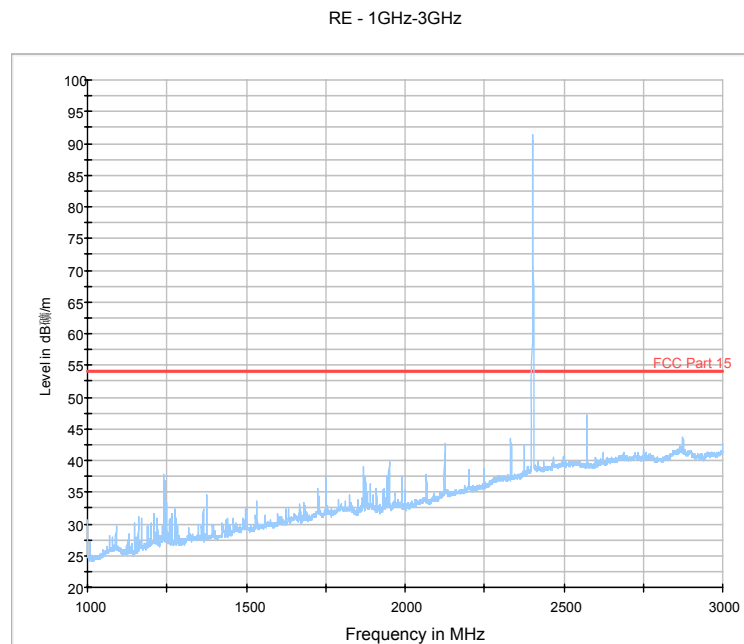


Fig.19. Radiated emission: GFSK, 2402MHz, 1 GHz - 3GHz

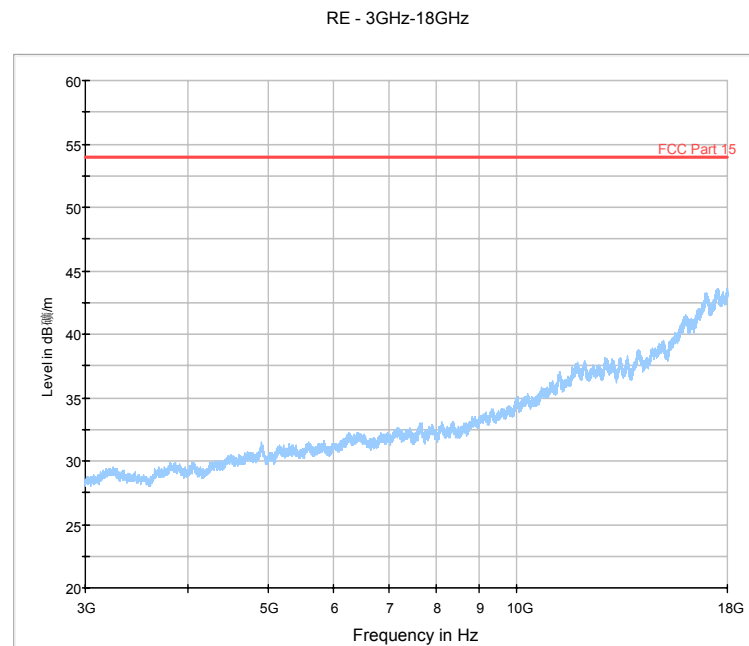


Fig.20. Radiated emission: GFSK, 2402MHz, 3 GHz - 18 GHz

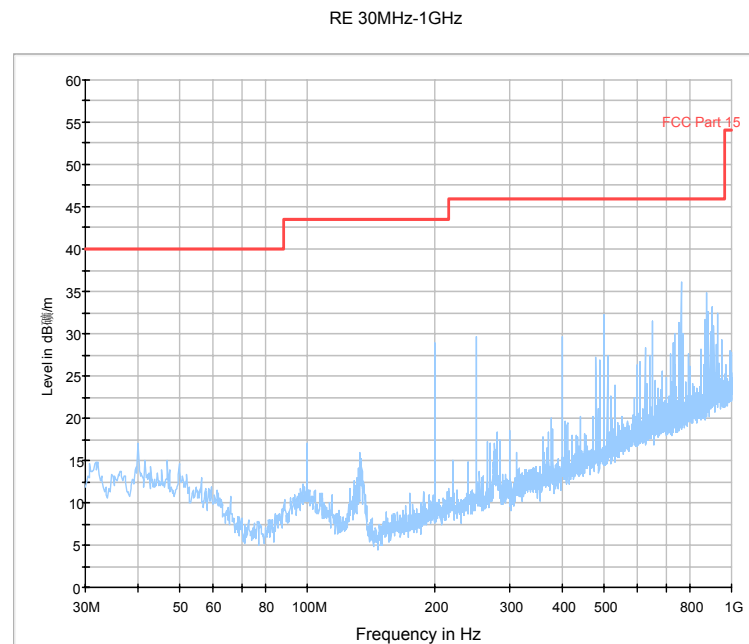


Fig.21. Radiated emission: GFSK, 2440MHz, 30 MHz - 1 GHz

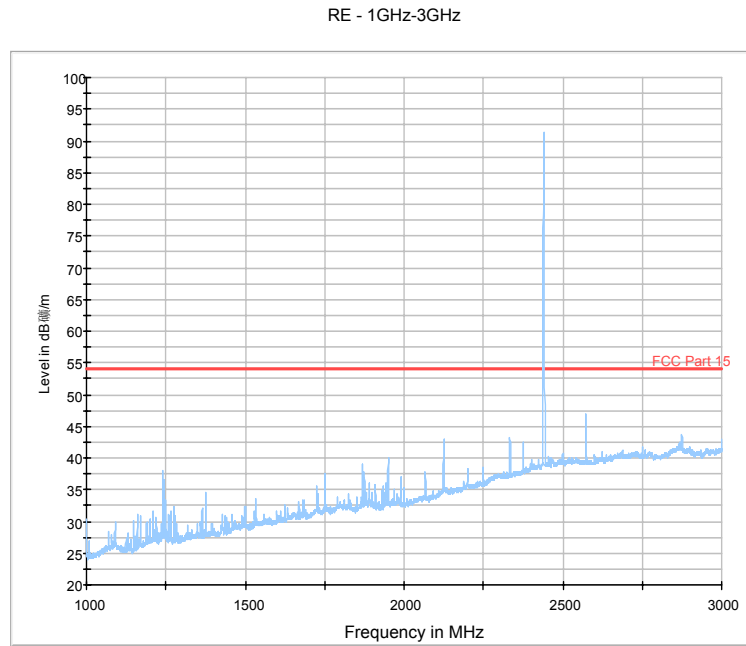


Fig.22. Radiated emission: GFSK, 2440MHz, 1 GHz - 3 GHz

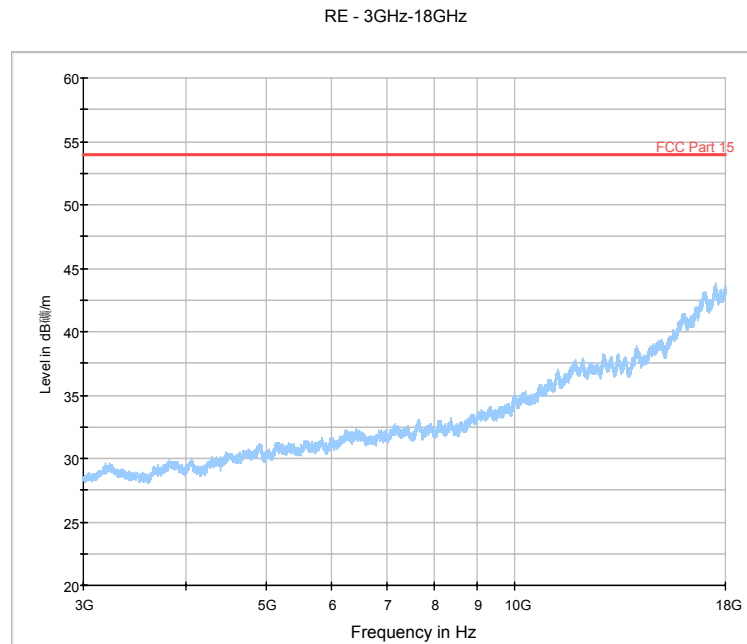


Fig.23. Radiated emission: GFSK, 2440MHz, 3 GHz - 18 GHz

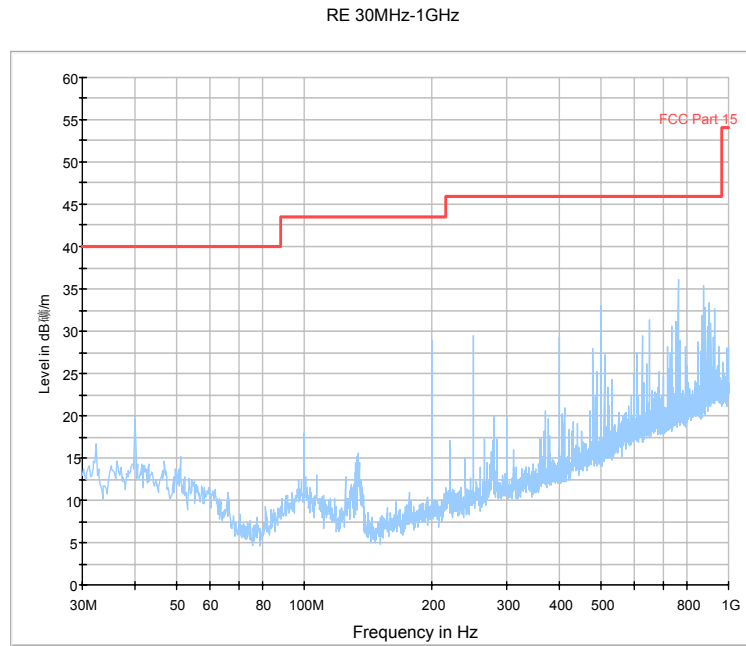


Fig.24. Radiated emission: GFSK, 2480MHz, 30 MHz - 1 GHz

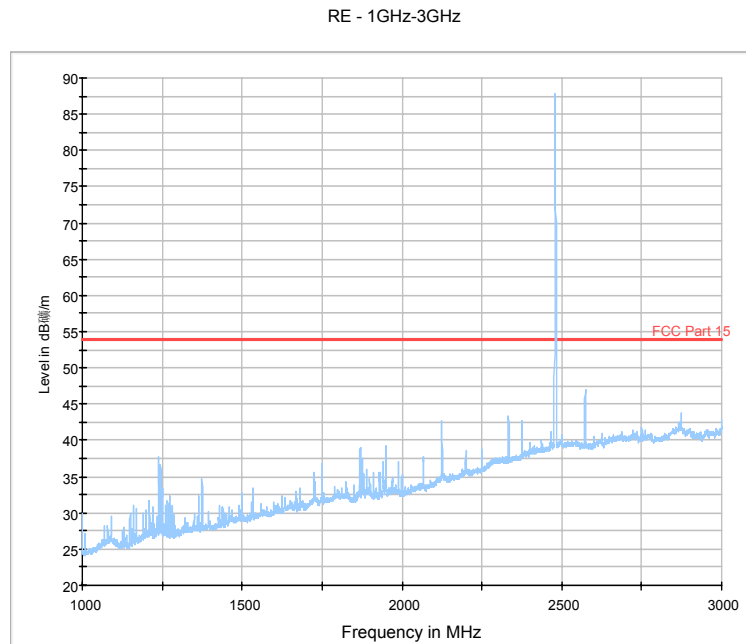


Fig.25. Radiated emission: GFSK, 2480MHz, 1 GHz - 3 GHz

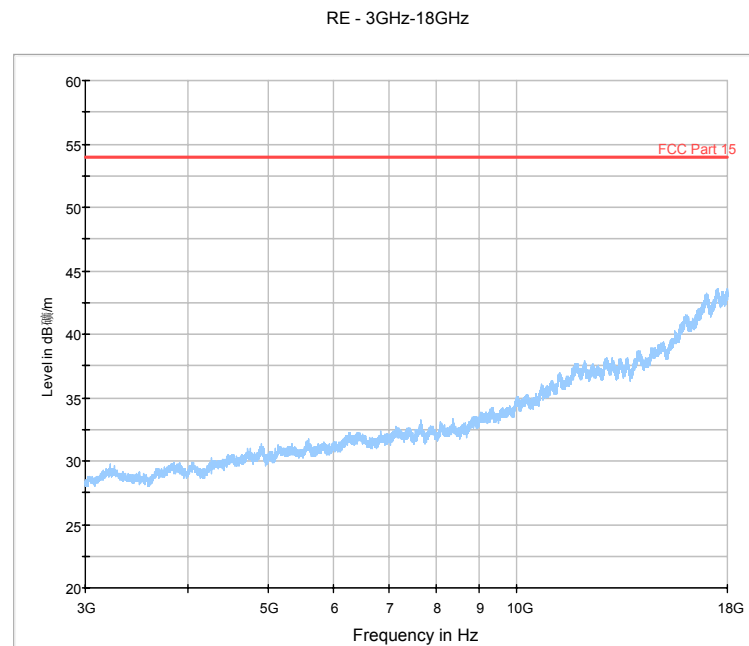


Fig.26. Radiated emission: GFSK, 2480MHz, 3 GHz - 18 GHz

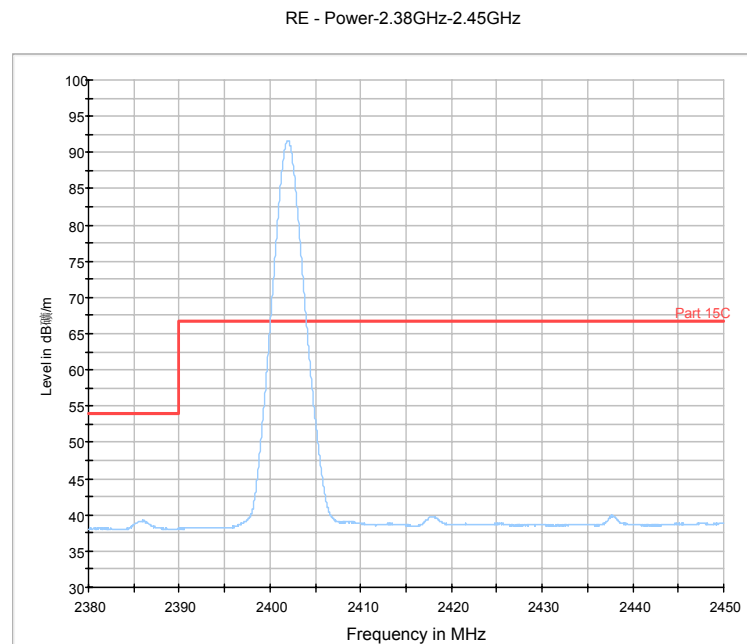


Fig.27. Radiated emission (Power): GFSK low channel

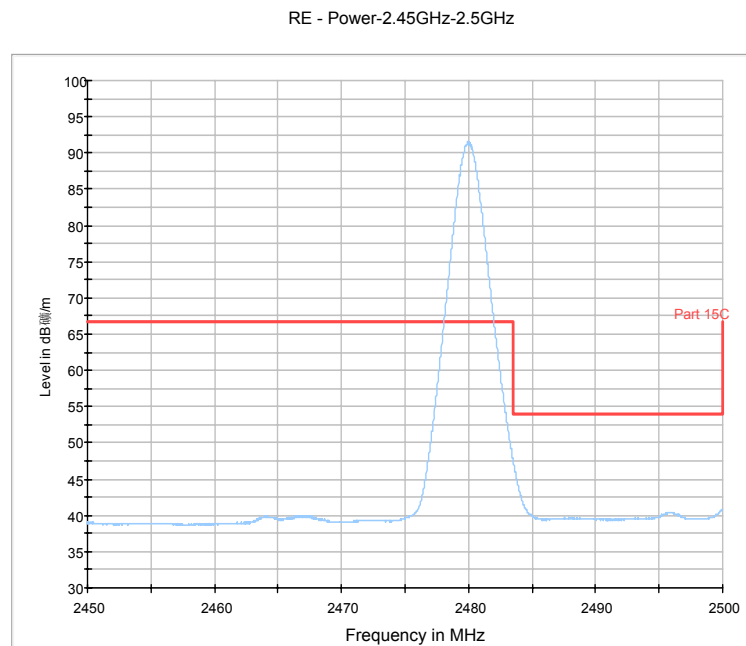


Fig.28. Radiated emission (Power): GFSK high channel

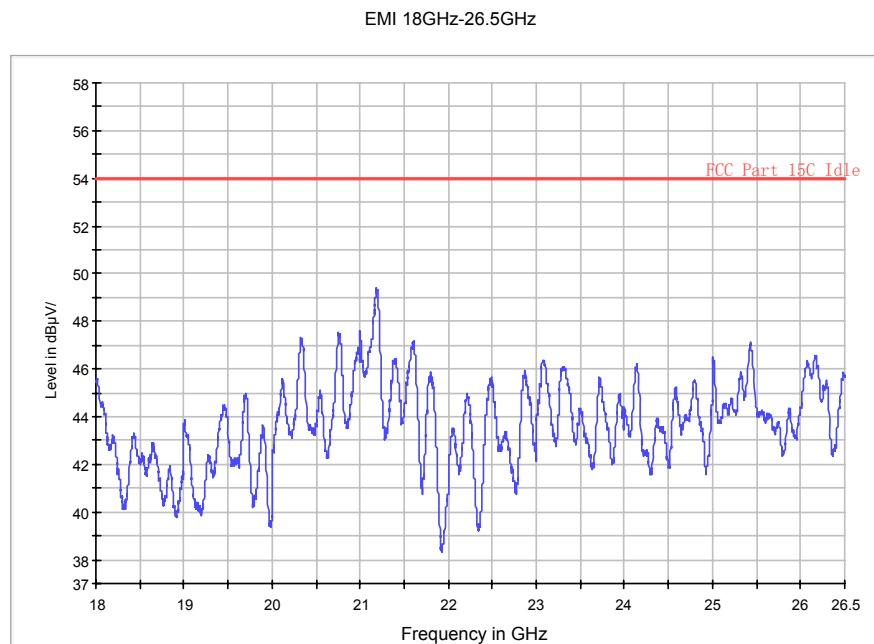


Fig.29. Radiated emission: GFSK, 18 GHz - 26 GHz

## A.6. 6dB Bandwidth

### Measurement Limit:

| Standard                     | Limit                |
|------------------------------|----------------------|
| FCC 47 CFR Part 15.247(a)(2) | $\geq 500\text{KHz}$ |

The measurement is made according to KDB 558074 and ANSI C63.10

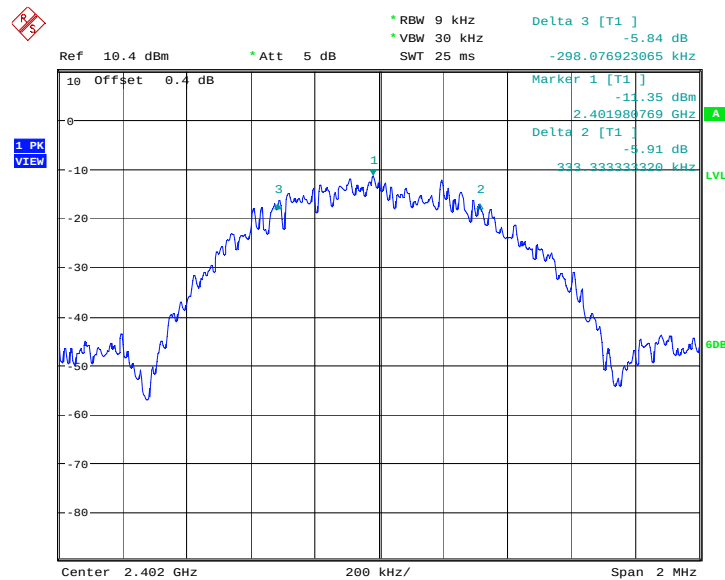
### Measurement Results:

#### For GFSK

| Frequency | 6dB Bandwidth (kHz) |        | Conclusion |
|-----------|---------------------|--------|------------|
| 2402MHz   | Fig.30              | 631.41 | P          |
| 2440MHz   | Fig.31              | 644.23 | P          |
| 2480MHz   | Fig.32              | 631.41 | P          |

**Conclusion: PASS**

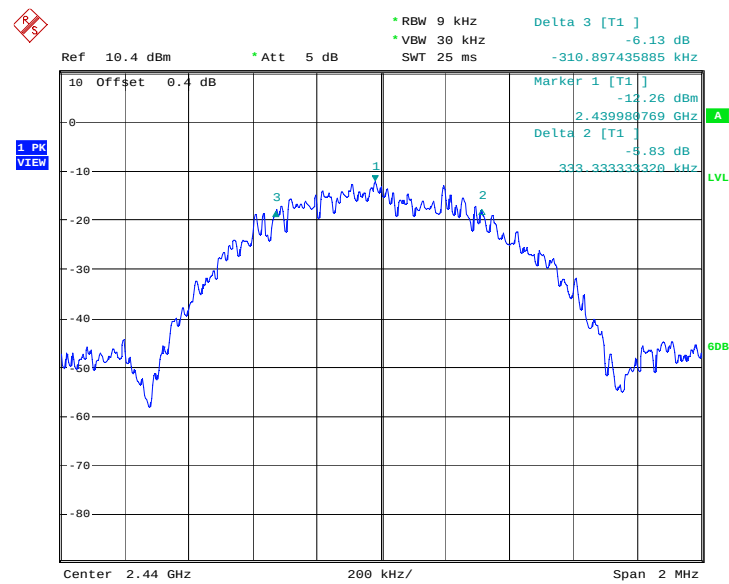
Test graphs as below:



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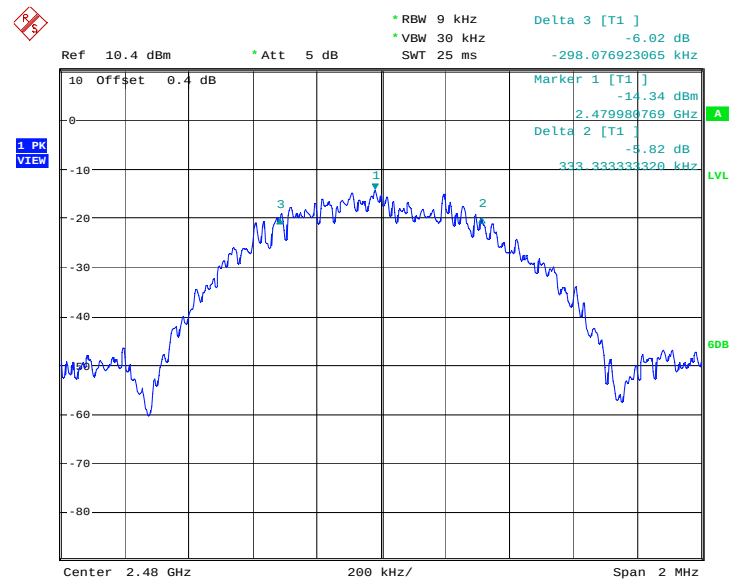
Fig.30. 6dB Bandwidth: GFSK, 2402 MHz





Date: 18.FEB.2013 05:46:29

Fig.31. 6dB Bandwidth: GFSK, 2440 MHz



Date: 18.FEB.2013 05:51:11

Fig.32. 6dB Bandwidth: GFSK, 2480 MHz

## A.7. Maximum Power Spectral Density Level

### Measurement Limit:

| Standard                  | Limit                |
|---------------------------|----------------------|
| FCC 47 CFR Part 15.247(e) | $\leq 8.0\text{dBm}$ |

The measurement is made according to the section 5.3.1 of KDB 558074: Use the peak marker function of spectrum analyzer to determine the maximum power level in any 100 kHz band. Then Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $\text{BWCF} = 10\log(3\text{ kHz}/100\text{kHz}) = -15.2\text{ dB}$

### Measurement Results:

#### For GFSK

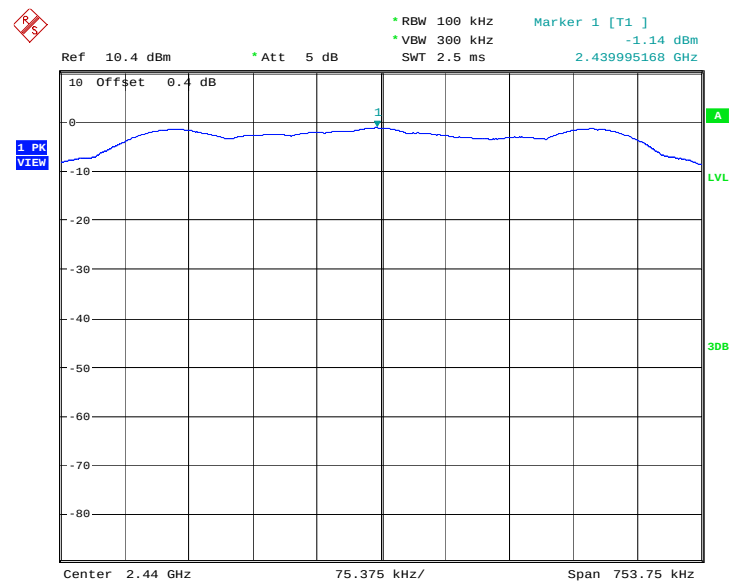
| Frequency | Maximum Power Spectral Density Level(dBm) |        | Conclusion |
|-----------|-------------------------------------------|--------|------------|
| 2402MHz   | Fig.33                                    | -15.47 | P          |
| 2440MHz   | Fig.34                                    | -16.34 | P          |
| 2480MHz   | Fig.35                                    | -18.42 | P          |

### Test graphs as below:



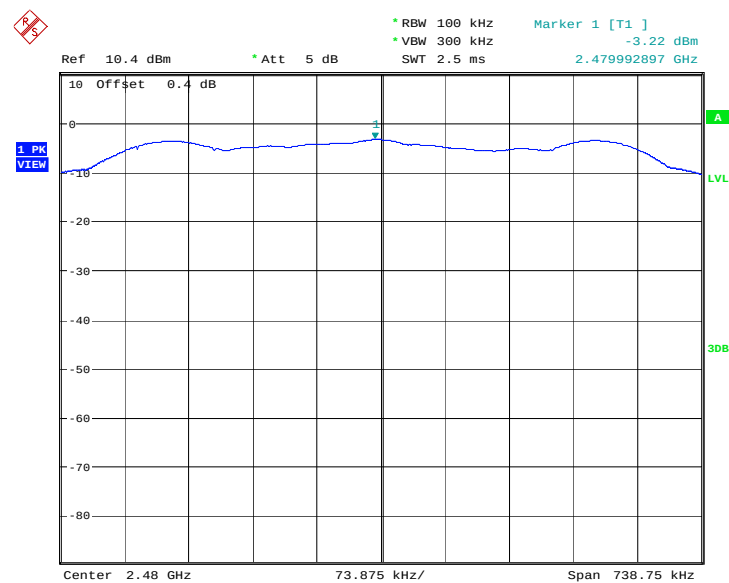
Date: 18.FEB.2013 05:41:48

Fig.33. Maximum Power Spectral Density Level Function: GFSK, 2402 MHz



Date: 18.FEB.2013 05:46:56

Fig.34. Maximum Power Spectral Density Level Function: GFSK, 2440 MHz



Date: 18.FEB.2013 05:51:38

Fig.35. Maximum Power Spectral Density Level Function: GFSK, 2480 MHz

## A.8. AC Powerline Conducted Emission

### Test Condition

| Voltage (V) | Frequency (Hz) |
|-------------|----------------|
| 120         | 60             |

### Measurement Result and limit:

#### Bluetooth (Quasi-peak Limit)

| Frequency range (MHz) | Quasi-peak Limit (dB $\mu$ V) | Conclusion |
|-----------------------|-------------------------------|------------|
| 0.15 to 0.5           | 66 to 56                      | P          |
| 0.5 to 5              | 56                            |            |
| 5 to 30               | 60                            |            |

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

#### Bluetooth (Average Limit)

| Frequency range (MHz) | Quasi-peak Limit (dB $\mu$ V) | Conclusion |
|-----------------------|-------------------------------|------------|
| 0.15 to 0.5           | 56 to 46                      | P          |
| 0.5 to 5              | 46                            |            |
| 5 to 30               | 50                            |            |

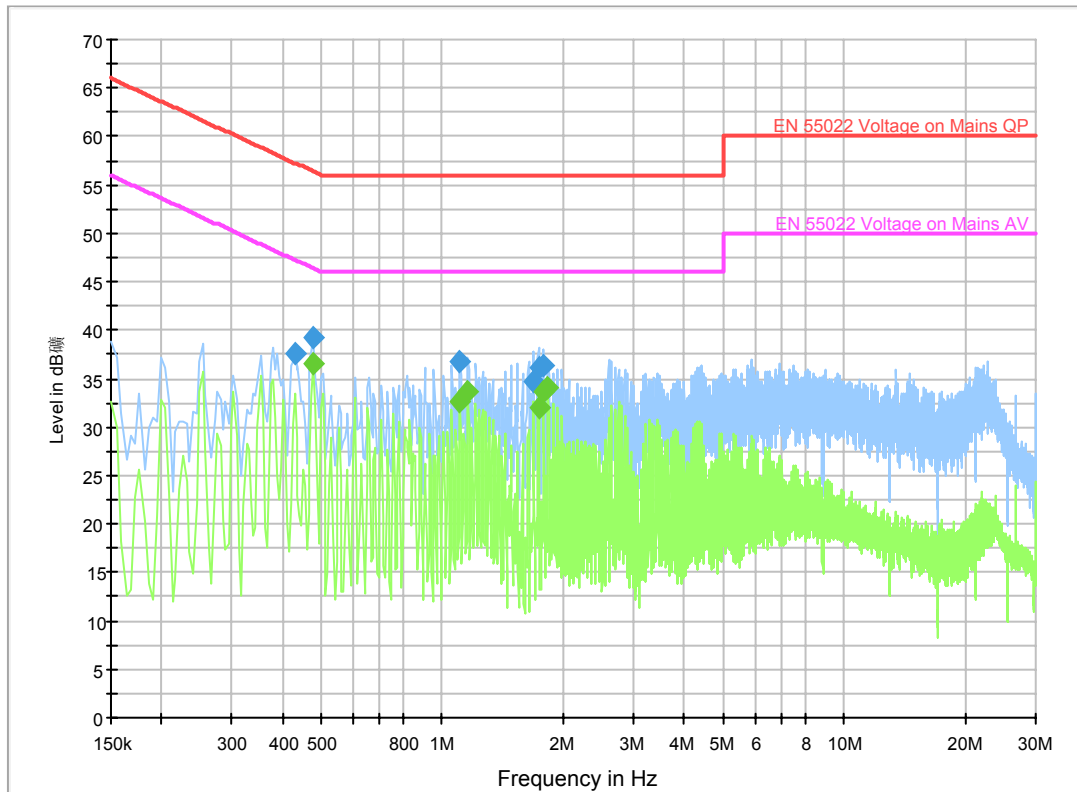
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

The measurement is made according to KDB 558074 and ANSI C63.10

**Conclusion: PASS**

**Test graphs as below:**

### Traffic:

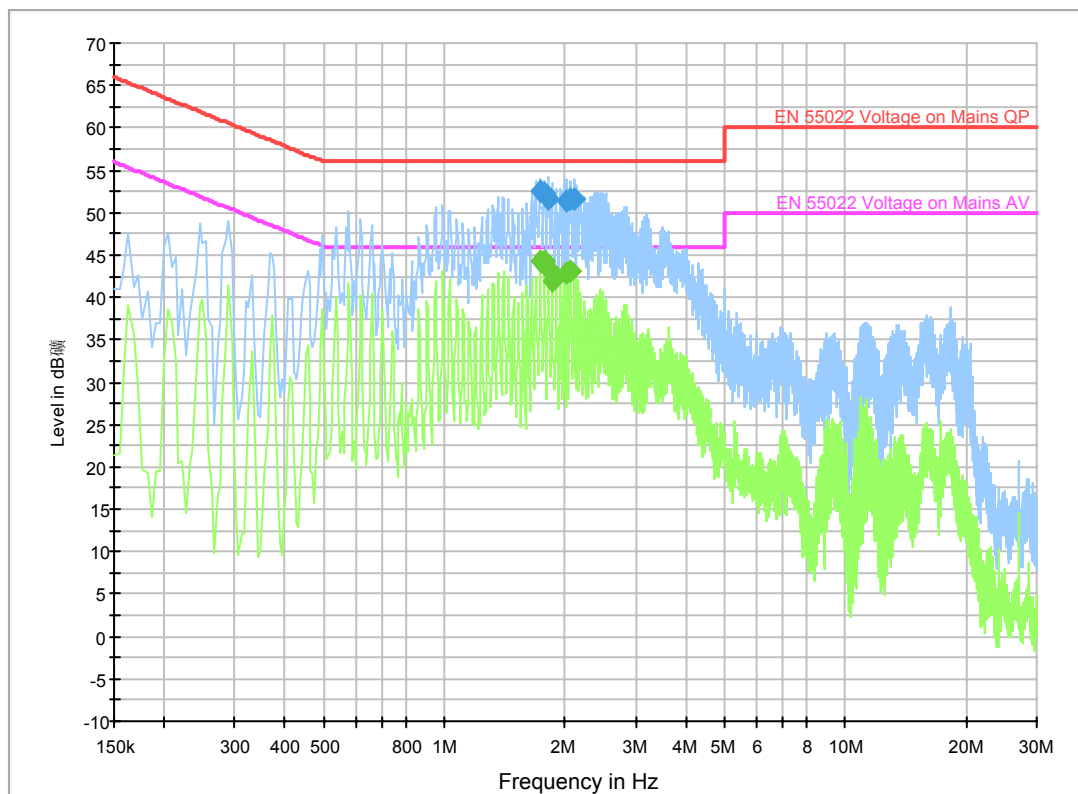


### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.429000        | 37.5             | GND | L1   | 10.0       | 19.8        | 57.3         |
| 0.478500        | 39.2             | GND | N    | 10.0       | 17.2        | 56.4         |
| 1.108500        | 36.7             | GND | N    | 10.0       | 19.3        | 56.0         |
| 1.689000        | 34.7             | GND | N    | 10.0       | 21.3        | 56.0         |
| 1.738500        | 36.0             | GND | N    | 10.0       | 20.0        | 56.0         |
| 1.788000        | 36.3             | GND | N    | 10.0       | 19.7        | 56.0         |

### Final Result 2

| Frequency (MHz) | Average (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|-----|------|------------|-------------|--------------|
| 0.478500        | 36.5           | GND | N    | 10.0       | 9.8         | 46.4         |
| 1.108500        | 32.5           | GND | N    | 10.0       | 13.5        | 46.0         |
| 1.158000        | 33.7           | GND | N    | 10.0       | 12.3        | 46.0         |
| 1.738500        | 32.1           | GND | N    | 10.0       | 13.9        | 46.0         |
| 1.788000        | 33.6           | GND | N    | 10.0       | 12.4        | 46.0         |
| 1.837500        | 34.1           | GND | N    | 10.0       | 12.0        | 46.0         |



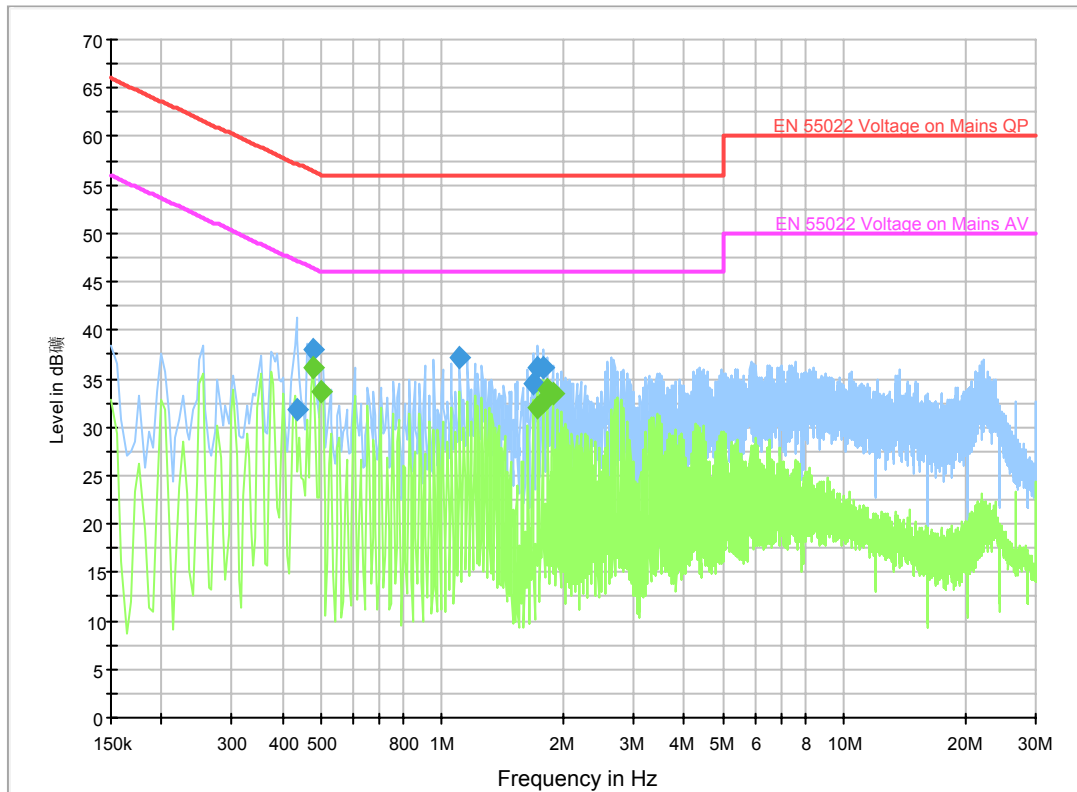
## Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 1.734000        | 52.5             | GND | L1   | 10.0       | 3.5         | 56.0         |
| 1.774500        | 52.4             | GND | L1   | 10.0       | 3.6         | 56.0         |
| 1.815000        | 51.6             | GND | L1   | 10.0       | 4.4         | 56.0         |
| 2.017500        | 51.3             | GND | L1   | 10.0       | 4.7         | 56.0         |
| 2.062500        | 51.6             | GND | L1   | 10.0       | 4.4         | 56.0         |
| 2.103000        | 51.5             | GND | L1   | 10.0       | 4.5         | 56.0         |

## Final Result 2

| Frequency (MHz) | Average (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|-----|------|------------|-------------|--------------|
| 1.734000        | 44.3           | GND | L1   | 10.0       | 1.7         | 46.0         |
| 1.774500        | 44.3           | GND | L1   | 10.0       | 1.7         | 46.0         |
| 1.815000        | 43.4           | GND | L1   | 10.0       | 2.6         | 46.0         |
| 1.855500        | 41.9           | GND | L1   | 10.0       | 4.1         | 46.0         |
| 2.022000        | 42.8           | GND | L1   | 10.0       | 3.2         | 46.0         |
| 2.062500        | 43.0           | GND | L1   | 10.0       | 3.0         | 46.0         |

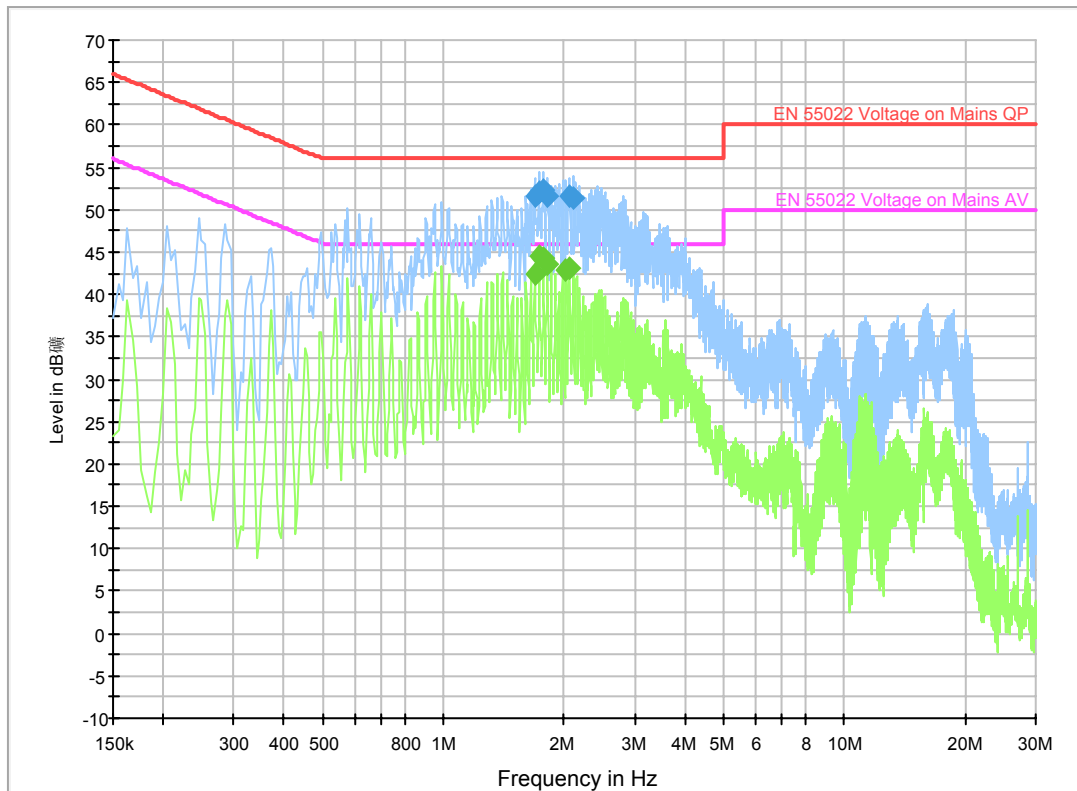
Idle:

**Final Result 1**

| Frequency (MHz) | QuasiPeak (dBµV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.433500        | 31.9             | GND | N    | 10.0       | 25.3        | 57.2         |
| 0.478500        | 38.1             | GND | L1   | 10.0       | 18.3        | 56.4         |
| 1.104000        | 37.2             | GND | N    | 10.0       | 18.8        | 56.0         |
| 1.684500        | 34.4             | GND | N    | 10.0       | 21.6        | 56.0         |
| 1.734000        | 36.1             | GND | N    | 10.0       | 19.9        | 56.0         |
| 1.783500        | 36.1             | GND | N    | 10.0       | 19.9        | 56.0         |

**Final Result 2**

| Frequency (MHz) | Average (dBµV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|-----|------|------------|-------------|--------------|
| 0.478500        | 36.1           | GND | L1   | 10.0       | 10.3        | 46.4         |
| 0.501000        | 33.7           | GND | N    | 10.0       | 12.3        | 46.0         |
| 1.734000        | 32.0           | GND | N    | 10.0       | 14.0        | 46.0         |
| 1.783500        | 32.6           | GND | N    | 10.0       | 13.4        | 46.0         |
| 1.833000        | 33.9           | GND | N    | 10.0       | 12.1        | 46.0         |
| 1.882500        | 33.5           | GND | N    | 10.0       | 12.5        | 46.0         |



### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 1.689000        | 51.6             | GND | L1   | 10.0       | 4.4         | 56.0         |
| 1.729500        | 52.2             | GND | L1   | 10.0       | 3.8         | 56.0         |
| 1.774500        | 52.3             | GND | L1   | 10.0       | 3.7         | 56.0         |
| 1.815000        | 51.7             | GND | L1   | 10.0       | 4.3         | 56.0         |
| 2.062500        | 51.7             | GND | L1   | 10.0       | 4.3         | 56.0         |
| 2.103000        | 51.4             | GND | L1   | 10.0       | 4.6         | 56.0         |

### Final Result 2

| Frequency (MHz) | Average (dBμV) | PE  | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|-----|------|------------|-------------|--------------|
| 1.693500        | 42.4           | GND | L1   | 10.0       | 3.6         | 46.0         |
| 1.734000        | 44.5           | GND | L1   | 10.0       | 1.5         | 46.0         |
| 1.774500        | 44.3           | GND | L1   | 10.0       | 1.7         | 46.0         |
| 1.815000        | 43.5           | GND | L1   | 10.0       | 2.5         | 46.0         |
| 2.022000        | 42.9           | GND | L1   | 10.0       | 3.1         | 46.0         |
| 2.062500        | 43.2           | GND | L1   | 10.0       | 2.8         | 46.0         |

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