



# FCC PART 15C TEST REPORT

No. 2013TAR064

for

**TCT Mobile Limited**

**HSDPA/HSUPA/UMTS triband / GSM quad bands mobile phone**

**Model Name: Beetle Lite 2SIM US**

**Marketing Name: ONE TOUCH 4010E**

**FCC ID: RAD318**

with

**Hardware Version: Proto**

**Software Version: vDA5**

**Issued Date: 2013-03-05**



*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:**

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology  
Shouxiang Science Building, No 51, Xueyuan Road, Haidian District, Beijing, P.R.China 100191

Tel:+86(0)10-62304633-2678, Fax:+86(0)10-62304793 Email:welcme@emcite.com. www.emcite.com

©Copyright. All rights reserved by TMC Beijing.

## **CONTENTS**

<b>CONTENTS .....</b>	<b>2</b>
<b>1. TEST LABORATORY .....</b>	<b>3</b>
1.1. TESTING LOCATION .....	3
1.2. TESTING ENVIRONMENT.....	3
1.3. PROJECT DATA .....	3
1.4. SIGNATURE .....	3
<b>2. CLIENT INFORMATION.....</b>	<b>4</b>
2.1. APPLICANT INFORMATION.....	4
2.2. MANUFACTURER INFORMATION .....	4
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>5</b>
3.1. ABOUT EUT .....	5
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....	5
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST .....	5
3.4. NORMAL ACCESSORY SETTING .....	6
3.5. GENERAL DESCRIPTION.....	6
<b>4. REFERENCE DOCUMENTS.....</b>	<b>7</b>
4.1. DOCUMENTS SUPPLIED BY APPLICANT .....	7
4.2. REFERENCE DOCUMENTS FOR TESTING.....	7
<b>5. LABORATORY ENVIRONMENT .....</b>	<b>8</b>
<b>6. SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
6.1. SUMMARY OF TEST RESULTS.....	9
6.2. STATEMENTS.....	9
<b>7. TEST EQUIPMENTS UTILIZED .....</b>	<b>10</b>
<b>ANNEX A: MEASUREMENT RESULTS.....</b>	<b>11</b>
A.1. MEASUREMENT METHOD .....	11
A.2. PEAK OUTPUT POWER - CONDUCTED .....	12
A.3. FREQUENCY BAND EDGES - CONDUCTED.....	13
A.4. CONDUCTED EMISSION.....	15
A.5. RADIATED EMISSION.....	24
A.6. 6dB BANDWIDTH.....	32
A.7. MAXIMUM POWER SPECTRAL DENSITY LEVEL .....	34
A.8. AC POWERLINE CONDUCTED EMISSION .....	36

## 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

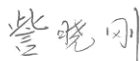
### 1.2. Testing Environment

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

### 1.3. Project data

Project Leader: Zi Xiaogang  
Testing Start Date: 2012-12-18  
Testing End Date: 2013-01-14

### 1.4. Signature



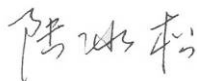
---

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



---

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



---

**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 triband / GSM quad bands mobile phone
Model Name	Beetle Lite 2SIM US
Marketing Name	ONE TOUCH 4010E
FCC ID	RAD318
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

Note: The EUT is a variant model of ONE TOUCH 4010A. All the result is coming from the ONE TOUCH 4010A.

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

EUT ID*	SN or IMEI	HW Version	SW Version
N07	013462000050713	Proto	vDA5
N08	013462000050051	Proto	vDA5

\*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	TLi014A1
Manufacturer	BYD
Capacitance	1400 mAh
Nominal Voltage	3.7 V

##### AE2

Model	TLiB50B
Manufacturer	BAK
Capacitance	1400 mAh
Nominal Voltage	3.7 V

##### AE3

Model	CBA3007AG0C1
-------	--------------

Manufacturer	BYD
Length of cable	150 cm
AE4	
Model	CBA3007AG0C3
Manufacturer	Yingju
Length of cable	150 cm

\*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. Only SIM slot 1 was used during testing, since this product supports only single module single channel, two SIM card slots cannot work simultaneously, we believe it does not impact the test result. SIM card was installed in slot 1 during testing.

### 3.5. General Description

The Equipment Under Test (EUT) is a model of HSDPA/HSUPA/UMTS triband / 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 CFR 47, Part 15, Subpart C:	
	15.205 Restricted bands of operation;	Oct,10
FCC Part15	15.209 Radiated emission limits, general requirements;	2009
	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	Edition
ANSI C63.10	Procedures for testing compliance of a wide variety of unlicensed wireless devices	2009
KDB 558074	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §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	2014-02-02

### 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.

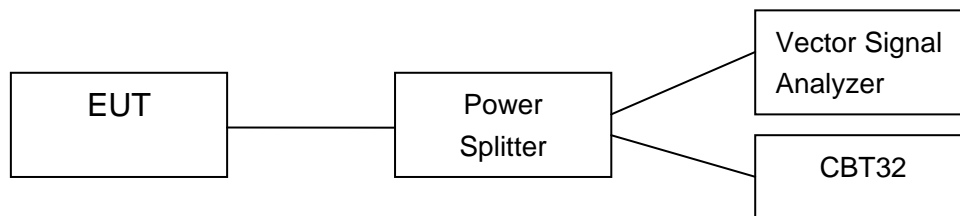
## ANNEX A: MEASUREMENT RESULTS

### 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

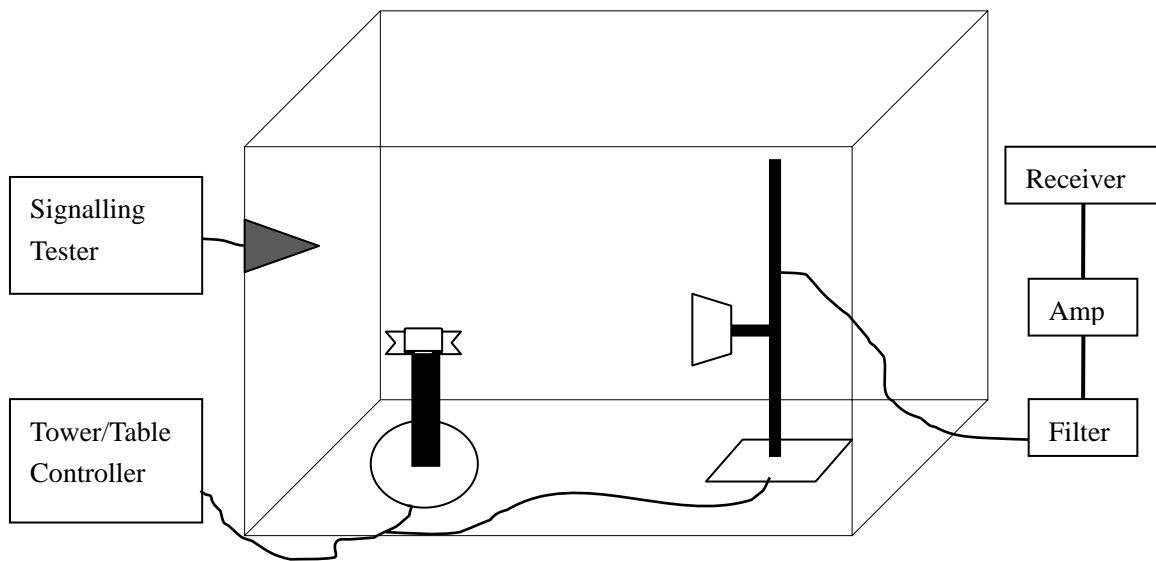
The measurement is made according to KDB 558074 and ANSI C63.10.

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	Sweeptime
Hopping OFF	1MHz	5MHz	0	5ms

#### Measurement Results:

##### For GFSK

Frequency	2402 MHz	2440 MHz	2480 MHz	Conclusion
Peak Conducted Output Power (dBm)	-1.37	-0.46	2.01	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.

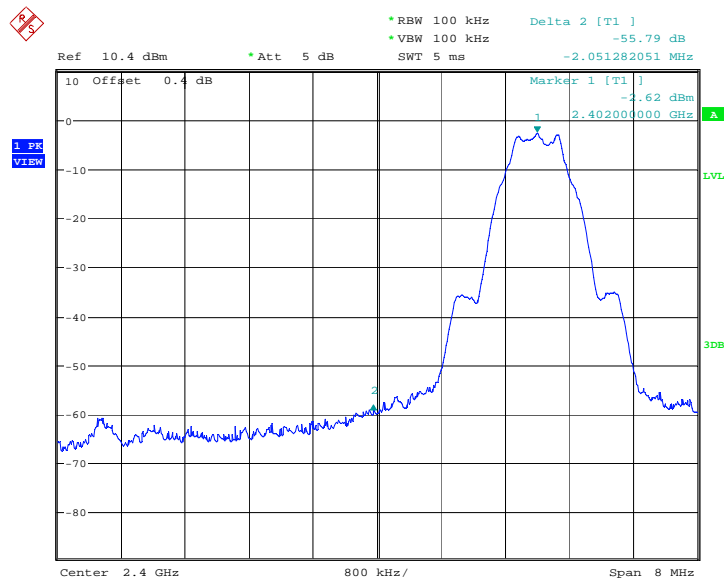
#### Measurement Result:

##### For GFSK

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

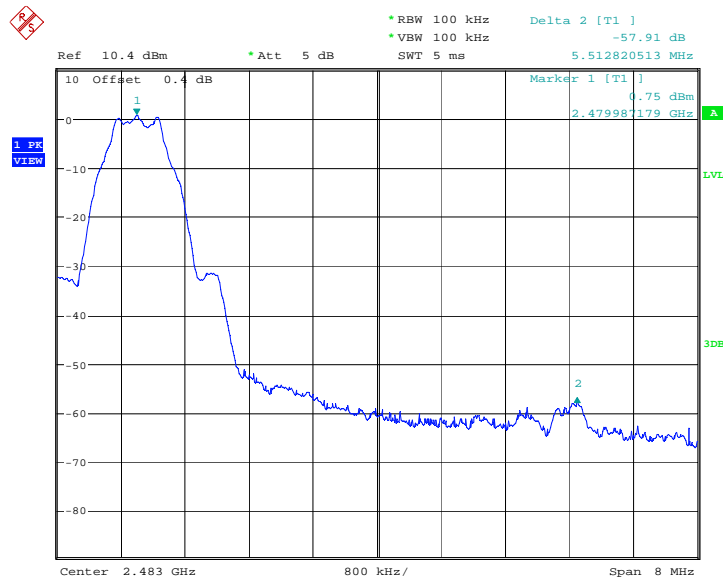
**Conclusion: PASS**

Test graphs as below



Date: 30.DEC.2012 23:38:53

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



Date: 30.DEC.2012 23:47:40

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.

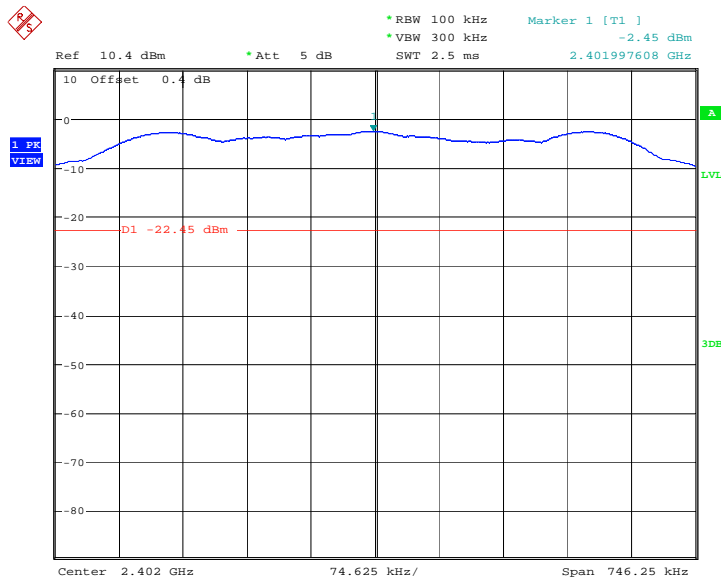
##### Measurement Results:

##### 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

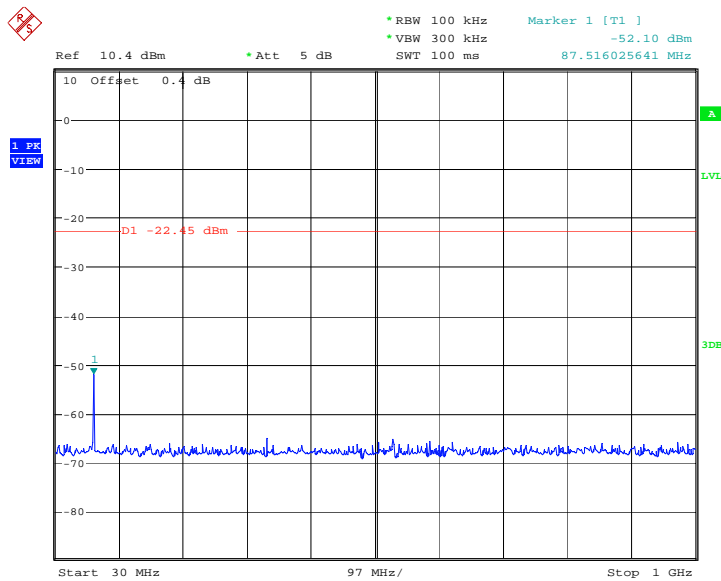
**Conclusion: PASS**

**Test graphs as below**



Date: 30.DEC.2012 23:37:12

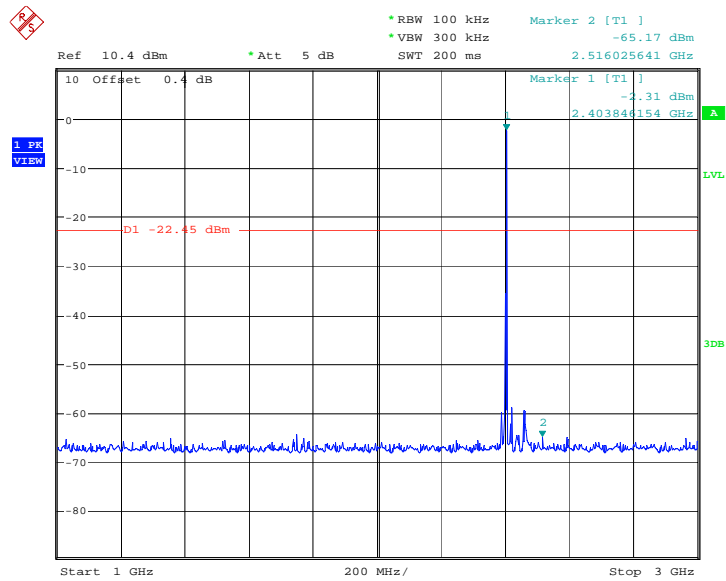
Fig.3. Conducted spurious emission: GFSK,2402MHz



Date: 30.DEC.2012 23:37:28

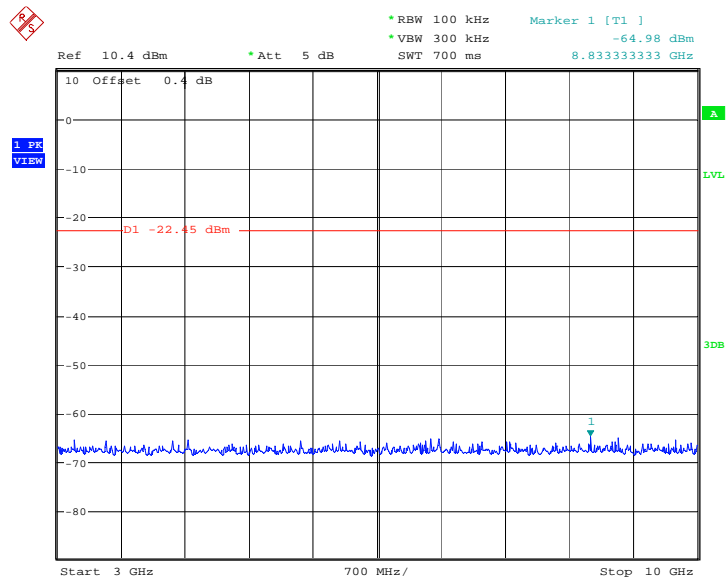
Fig.4. Conducted spurious emission: GFSK, 2402 MHz, 30MHz - 1GHz





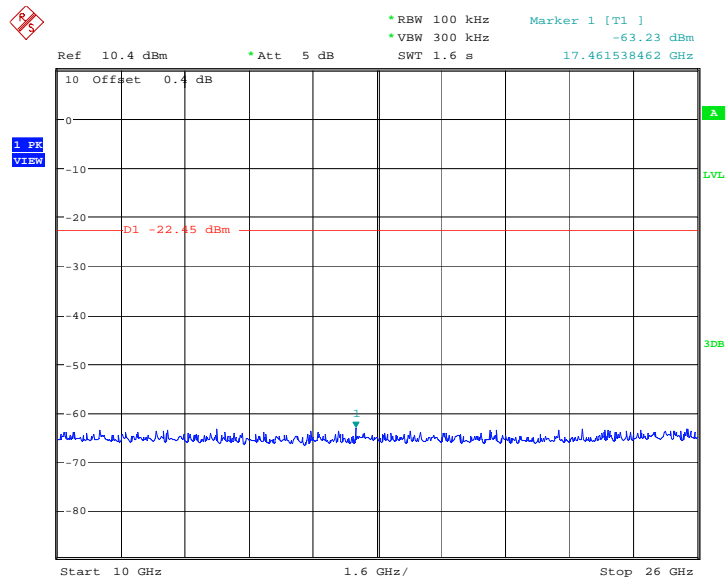
Date: 30.DEC.2012 23:38:00

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



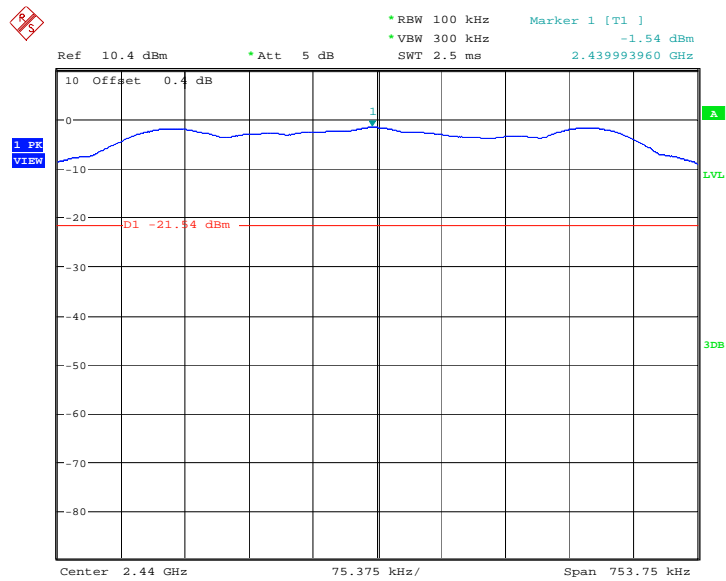
Date: 30.DEC.2012 23:38:17

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



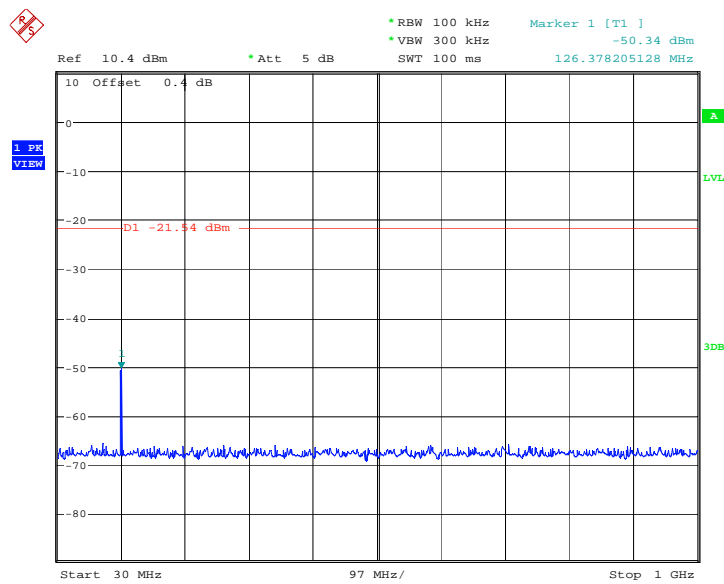
Date: 30.DEC.2012 23:38:33

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



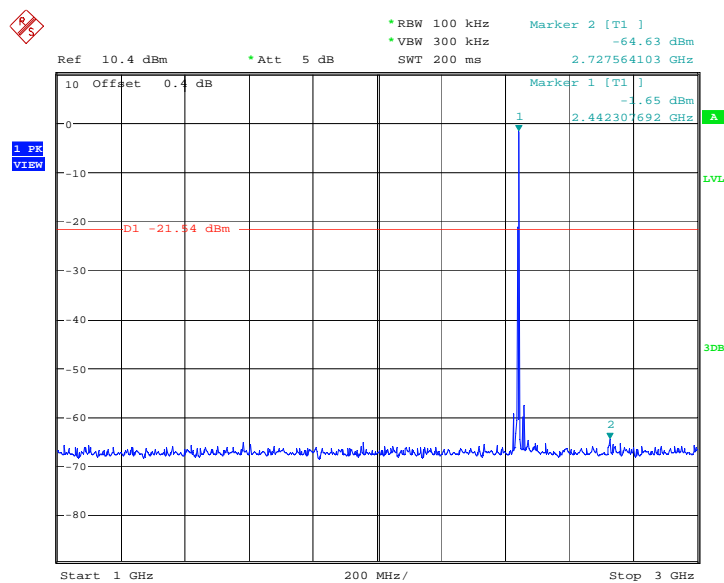
Date: 30.DEC.2012 23:50:55

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



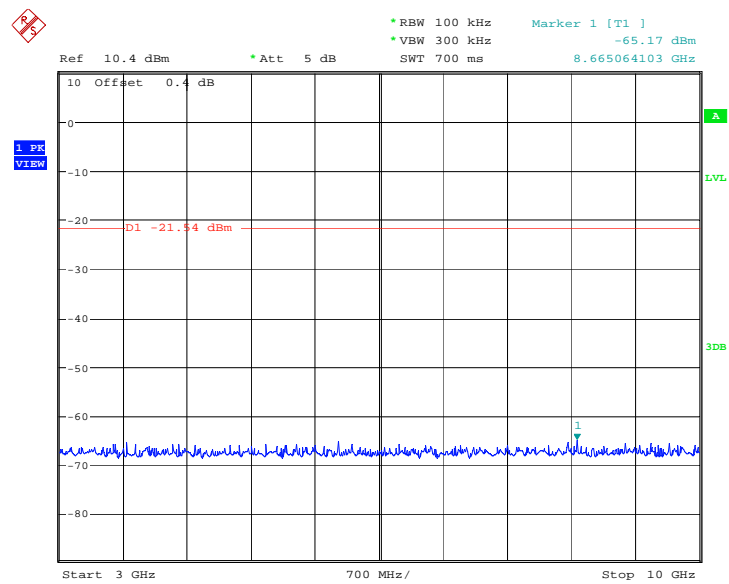
Date: 30.DEC.2012 23:51:11

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



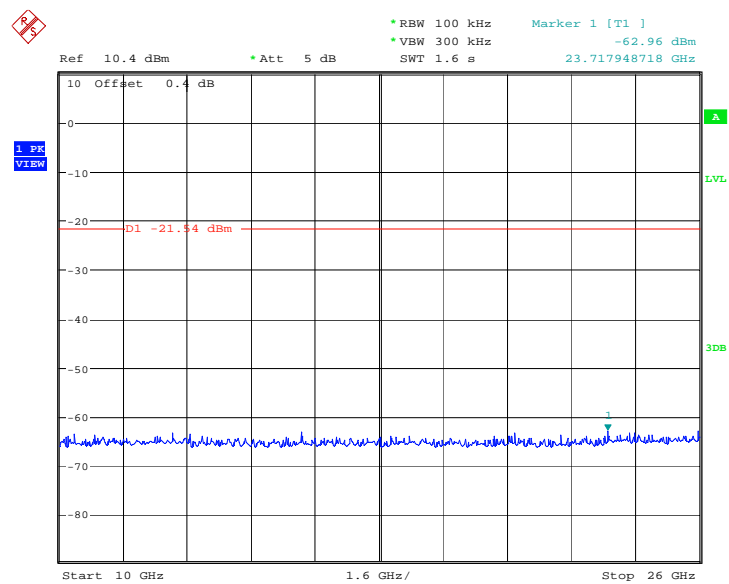
Date: 30.DEC.2012 23:51:43

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



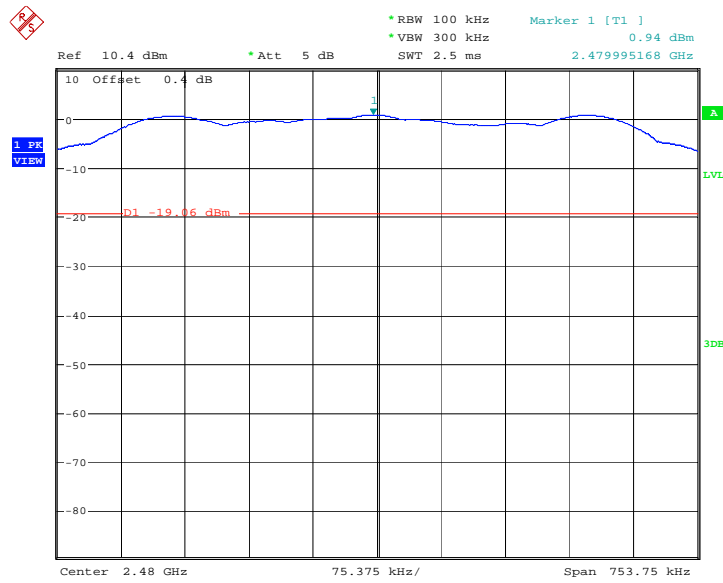
Date: 30.DEC.2012 23:52:00

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



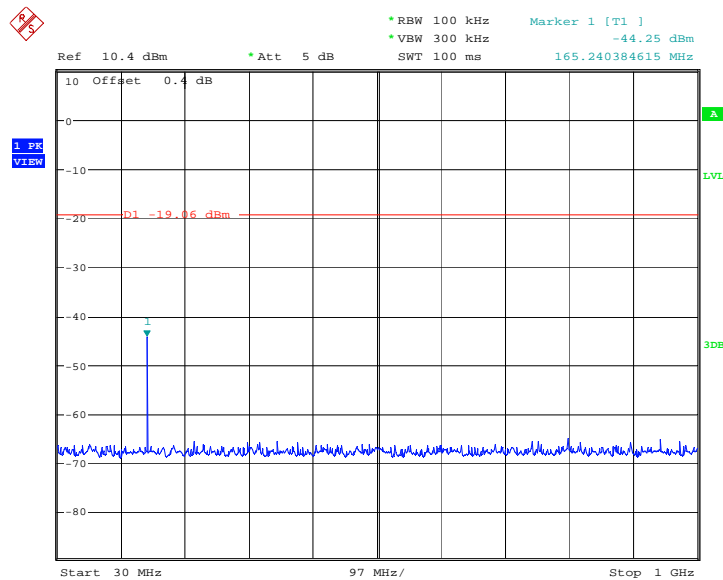
Date: 30.DEC.2012 23:52:16

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



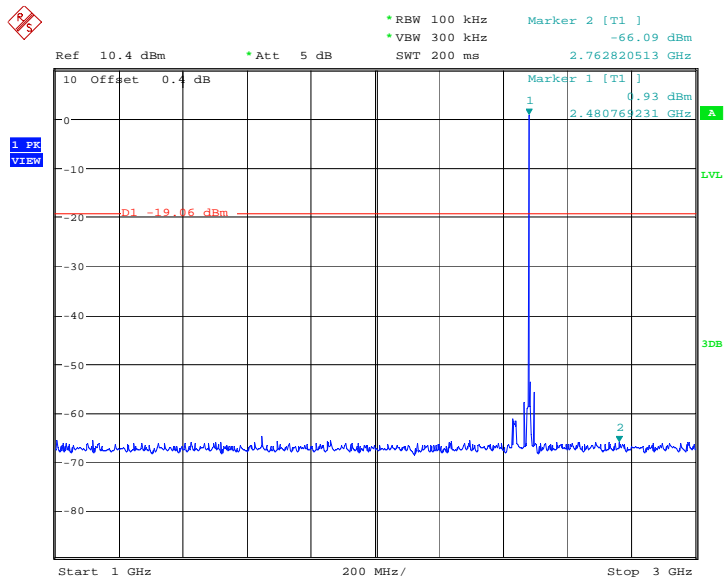
Date: 30.DEC.2012 23:45:59

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



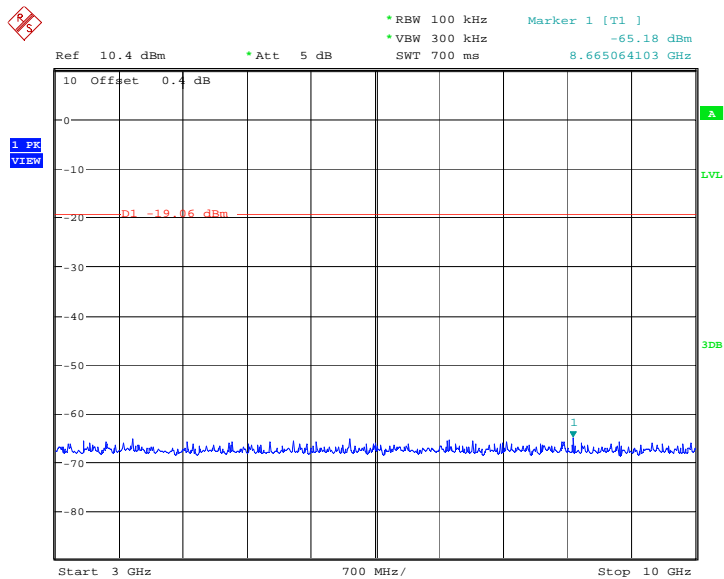
Date: 30.DEC.2012 23:46:16

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



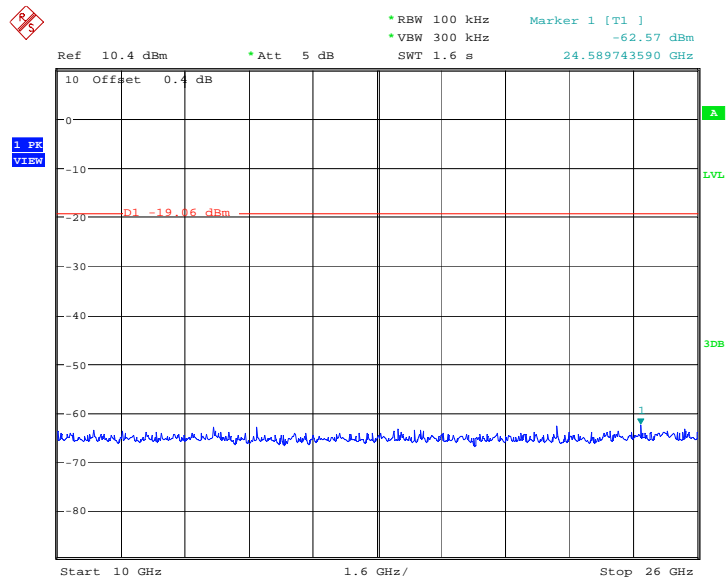
Date: 30.DEC.2012 23:46:47

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



Date: 30.DEC.2012 23:47:04

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



Date: 30.DEC.2012 23:47:21

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)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dBuV)	Polarity
2993.800	46.7	-29.0	33.8	41.879	H
2994.400	46.6	-29.0	33.8	41.779	V
2950.800	46.6	-28.6	33.8	41.415	H
2993.400	46.5	-29.0	33.8	41.679	H
2984.800	46.5	-29.0	33.8	41.679	H
2998.200	46.5	-29.0	33.8	41.679	H

**GFSK 2440MHz**

Frequency(MHz)	Result(dBuV/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dBuV)	Polarity
2999.800	46.7	-29.0	33.8	41.879	V
2993.600	46.6	-29.0	33.8	41.779	H
2999.600	46.6	-29.0	33.8	41.779	H
2998.400	46.5	-29.0	33.8	41.679	V
2998.800	46.5	-29.0	33.8	41.679	H
2991.600	46.5	-29.0	33.8	41.679	V

**GFSK 2480MHz**

Frequency(MHz)	Result(dBuV/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dBuV)	Polarity
2998.200	46.6	-29.0	33.8	41.779	V
2944.600	46.6	-28.1	33.8	40.911	H
2992.000	46.6	-29.0	33.8	41.779	H
2995.400	46.5	-29.0	33.8	41.679	V
2999.200	46.5	-29.0	33.8	41.679	H
2998.800	46.5	-29.0	33.8	41.679	H

**Conclusion: PASS**

**Test graphs as below:**

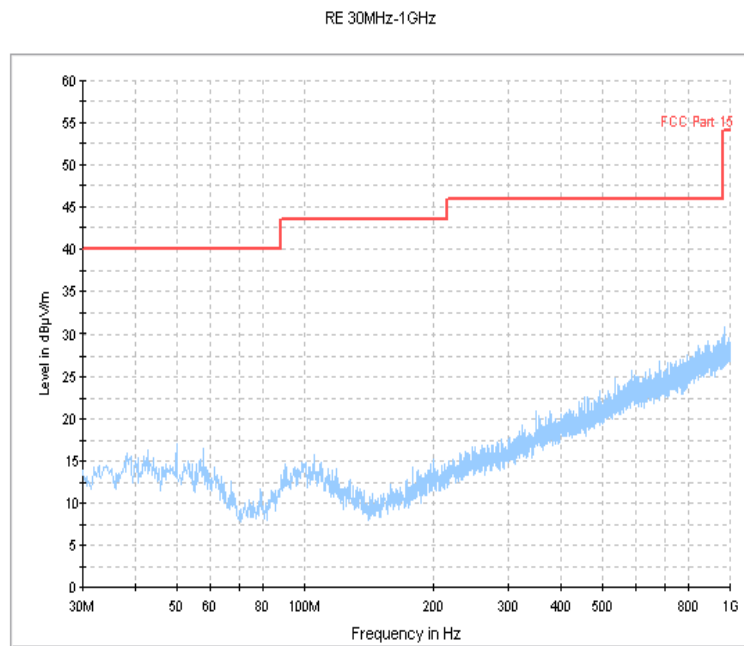


Fig.18. Radiated emission: GFSK, 2402MHz, 30 MHz - 1 GHz

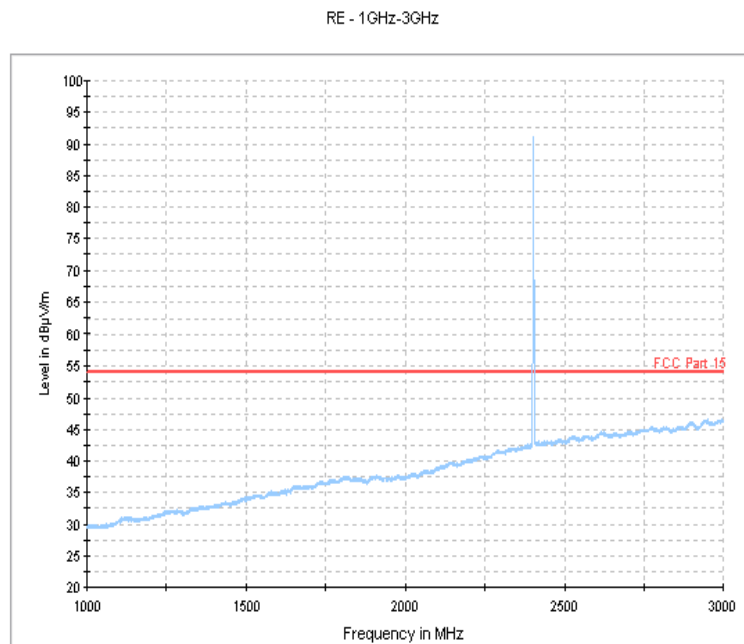


Fig:19. Radiated emission: GFSK, 2402MHz, 1 GHz - 3GHz

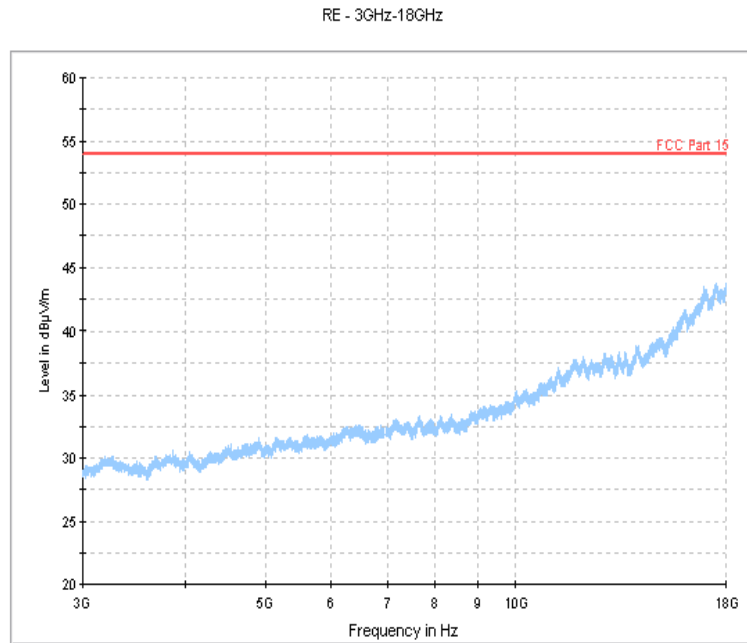


Fig.20. Radiated emission: GFSK, 2402MHz, 3 GHz - 18 GHz

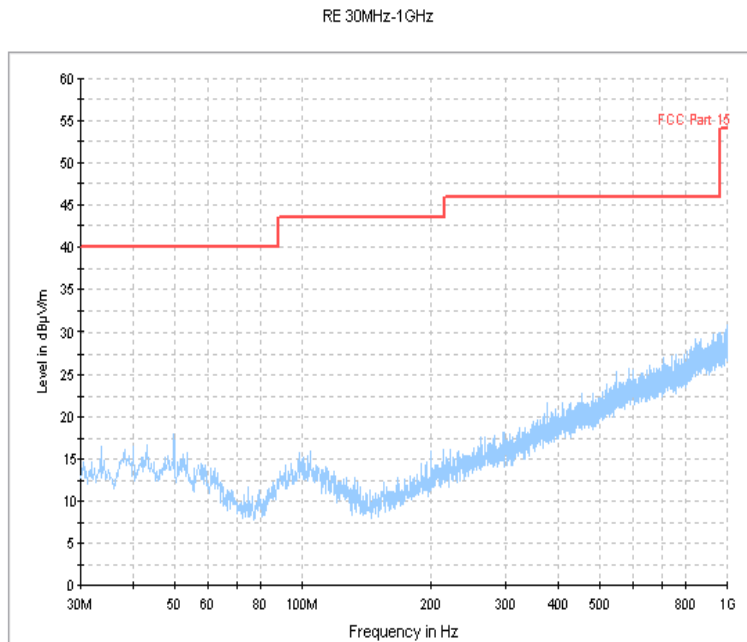


Fig.21. Radiated emission: GFSK, 2440MHz, 30 MHz - 1 GHz

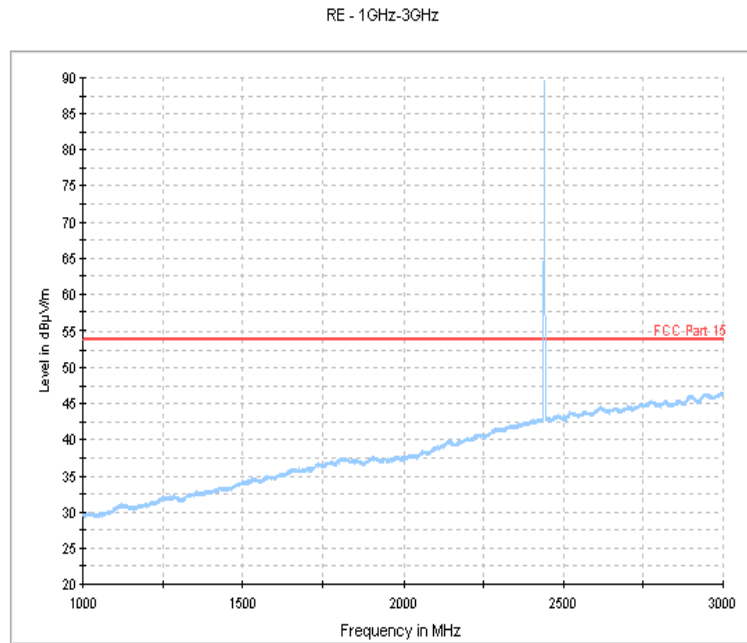


Fig.22. Radiated emission: GFSK, 2440MHz, 1 GHz - 3 GHz

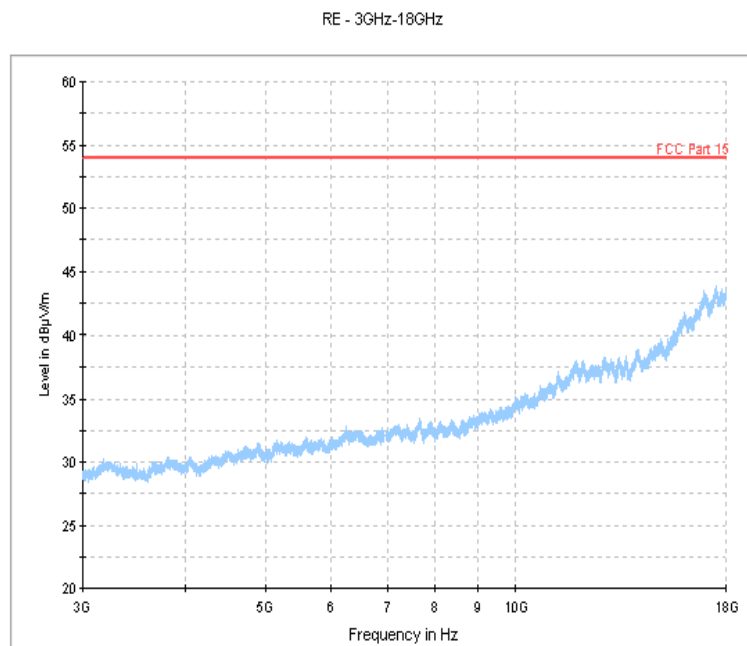


Fig.23. Radiated emission: GFSK, 2440MHz, 3 GHz - 18 GHz

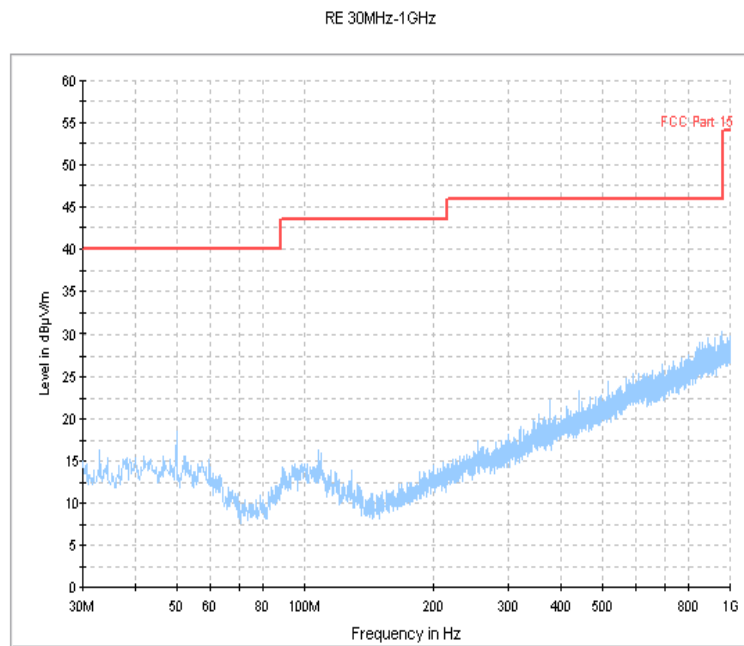


Fig.24. Radiated emission: GFSK, 2480MHz, 30 MHz - 1 GHz

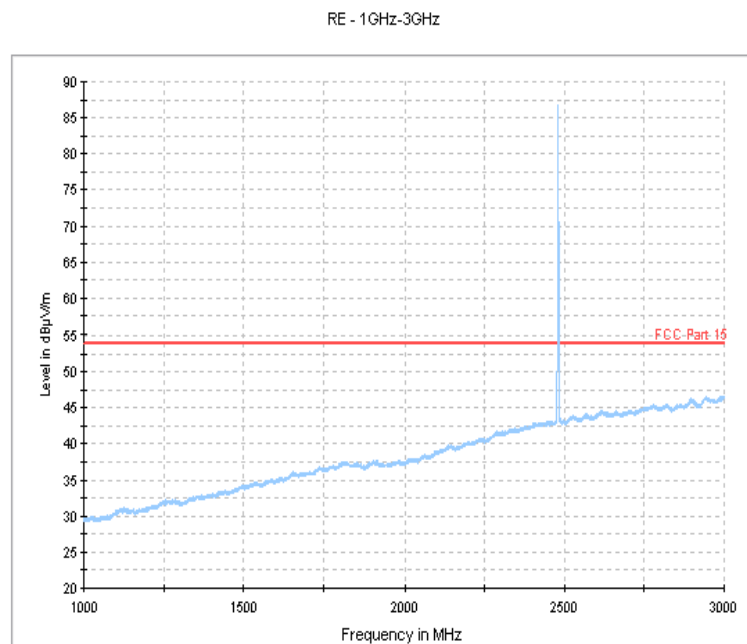


Fig.25. Radiated emission: GFSK, 2480MHz, 1 GHz - 3 GHz

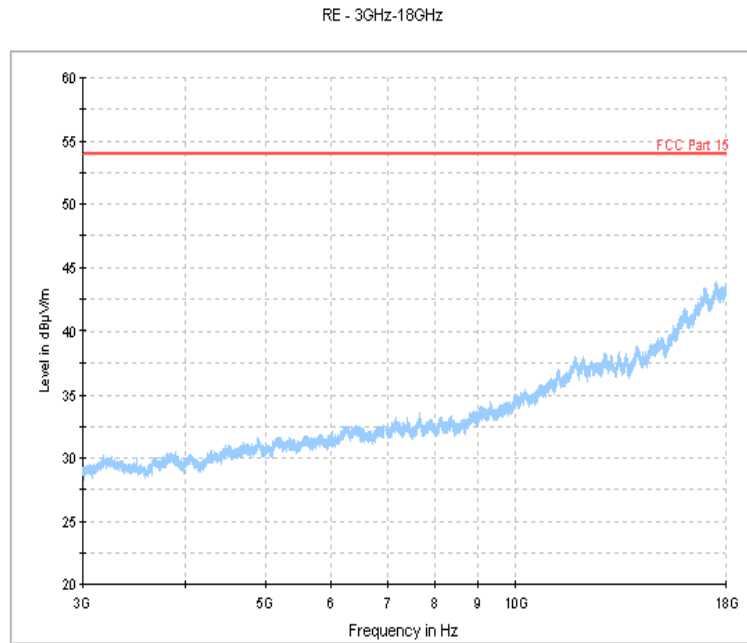


Fig.26. Radiated emission: GFSK, 2480MHz, 3 GHz - 18 GHz

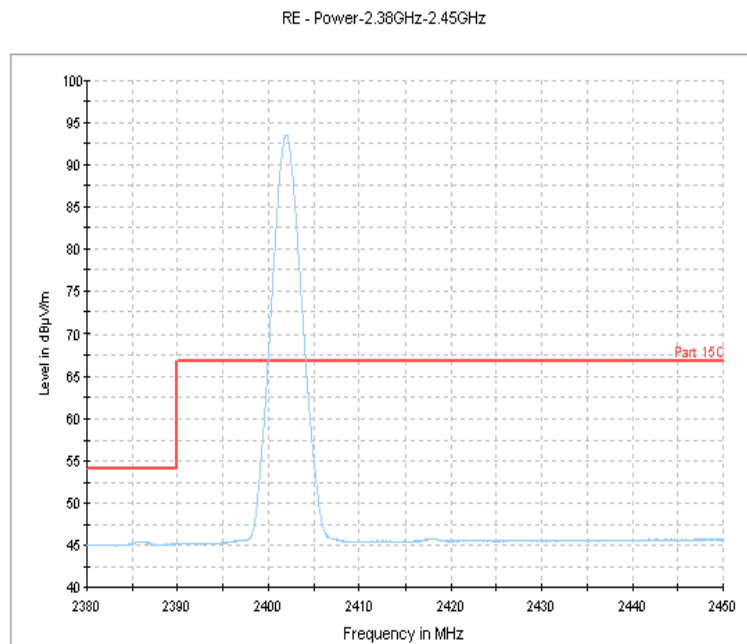


Fig.27. Radiated emission (Power): GFSK low channel

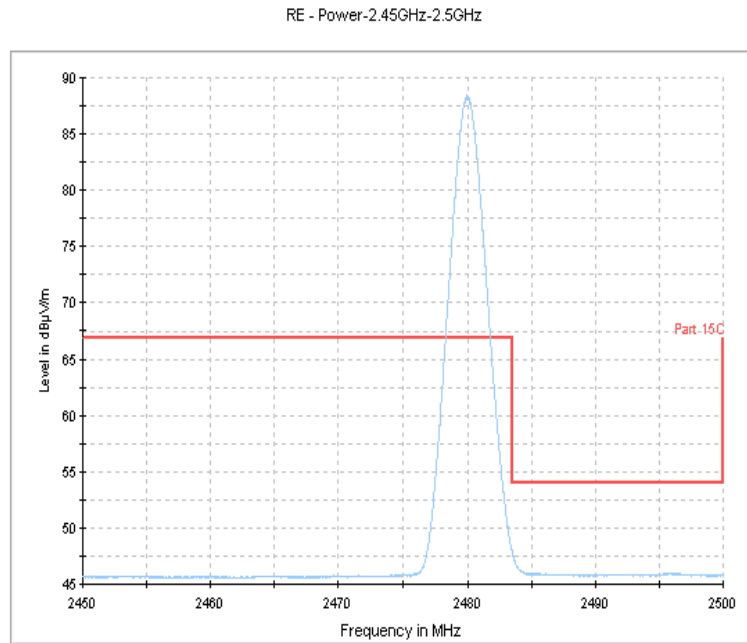


Fig.28. Radiated emission (Power): GFSK high channel

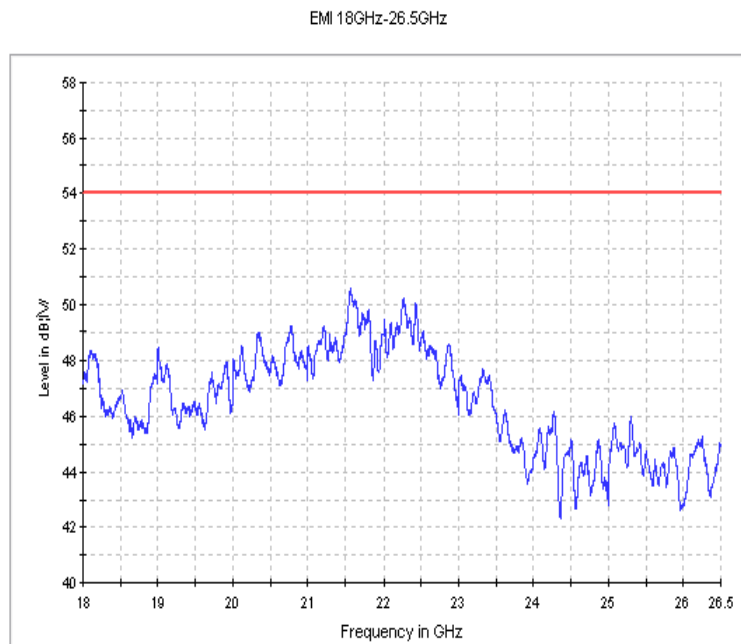


Fig.29. Radiated emission: GFSK, 18 GHz - 26 GHz

### 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

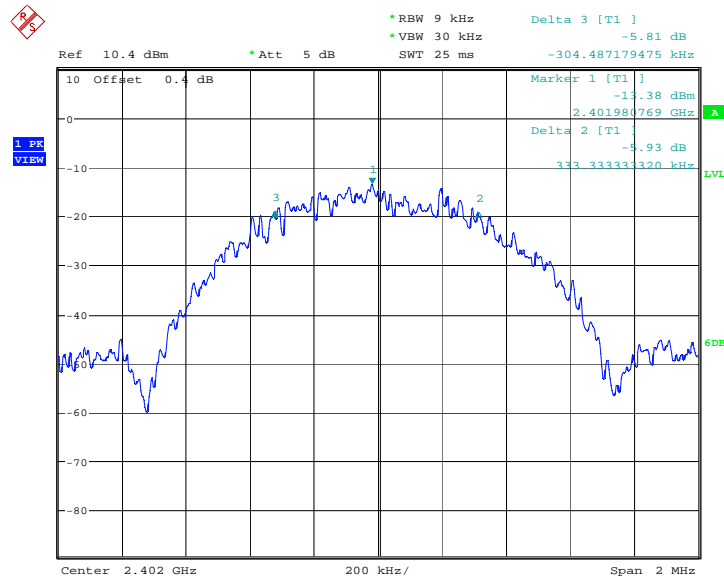
#### Measurement Results:

##### For GFSK

Frequency	6dB Bandwidth (kHz)		Conclusion
2402MHz	Fig.30	637.82	P
2440MHz	Fig.31	644.23	P
2480MHz	Fig.32	644.23	P

**Conclusion: PASS**

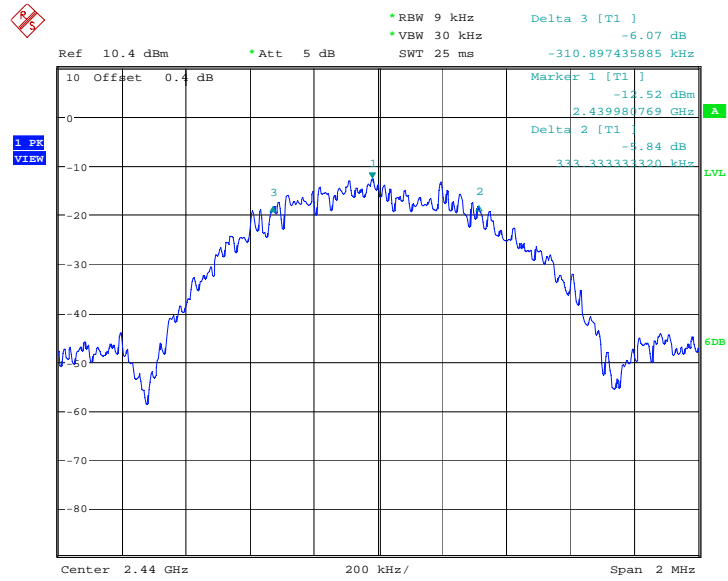
Test graphs as below:



Date: 30.DEC.2012 23:36:25

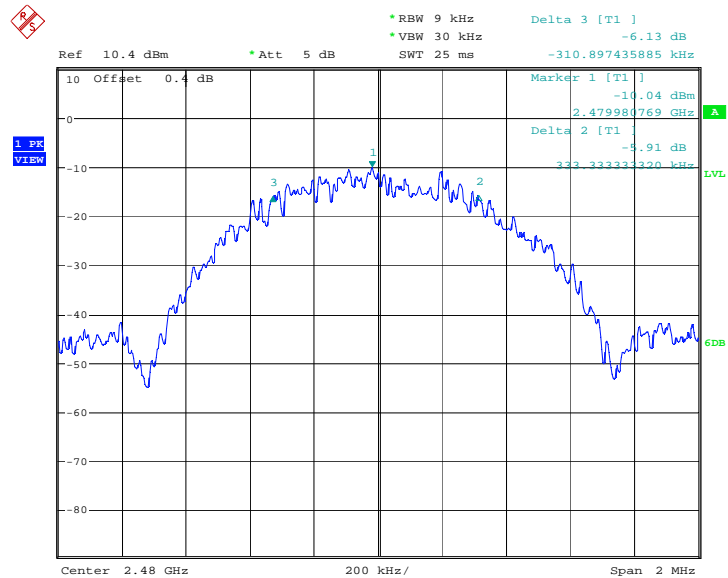
Fig.30. 6dB Bandwidth: GFSK, 2402 MHz





Date: 30.DEC.2012 23:50:09

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



Date: 30.DEC.2012 23:45:12

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)	<=8.0dBm

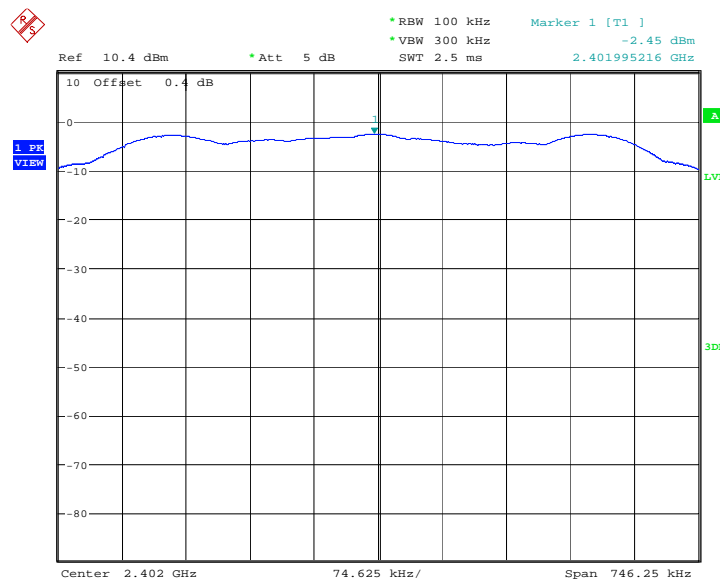
The measurement is made according to the section 5.3.1 of KDB 558074: Use the peak marker function of spectrum analyzer to determine the maximum power level in any 100 kHz band. Then Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth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

#### Measurement Results:

##### For GFSK

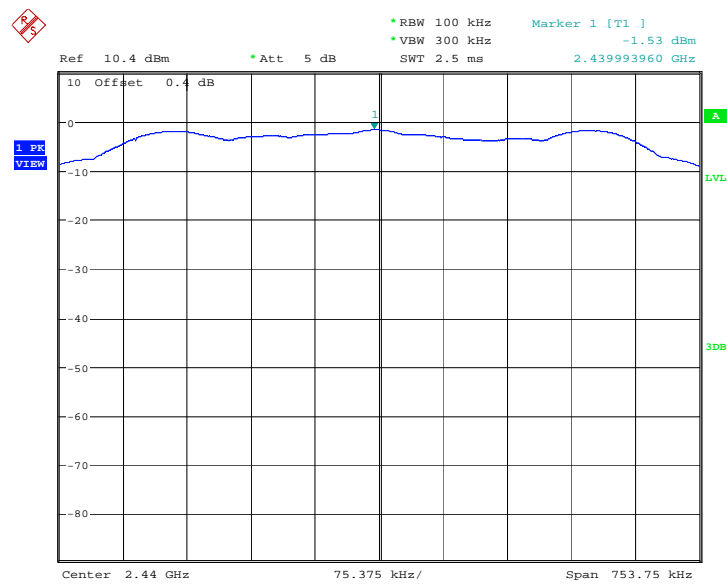
Frequency	Maximum Power Spectral Density Level(dBm)	Conclusion
2402MHz	Fig.33	P
2440MHz	Fig.34	P
2480MHz	Fig.35	P

#### Test graphs as below:



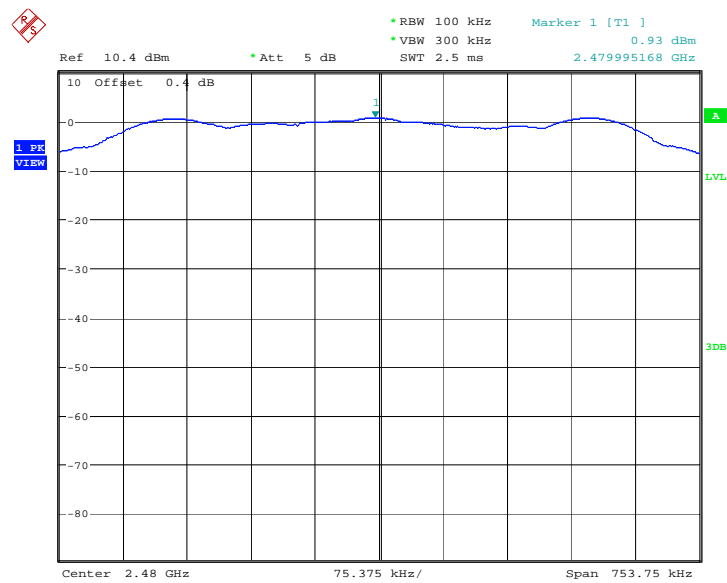
Date: 30.DEC.2012 23:36:53

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



Date: 30.DEC.2012 23:50:36

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



Date: 30.DEC.2012 23:45:40

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)

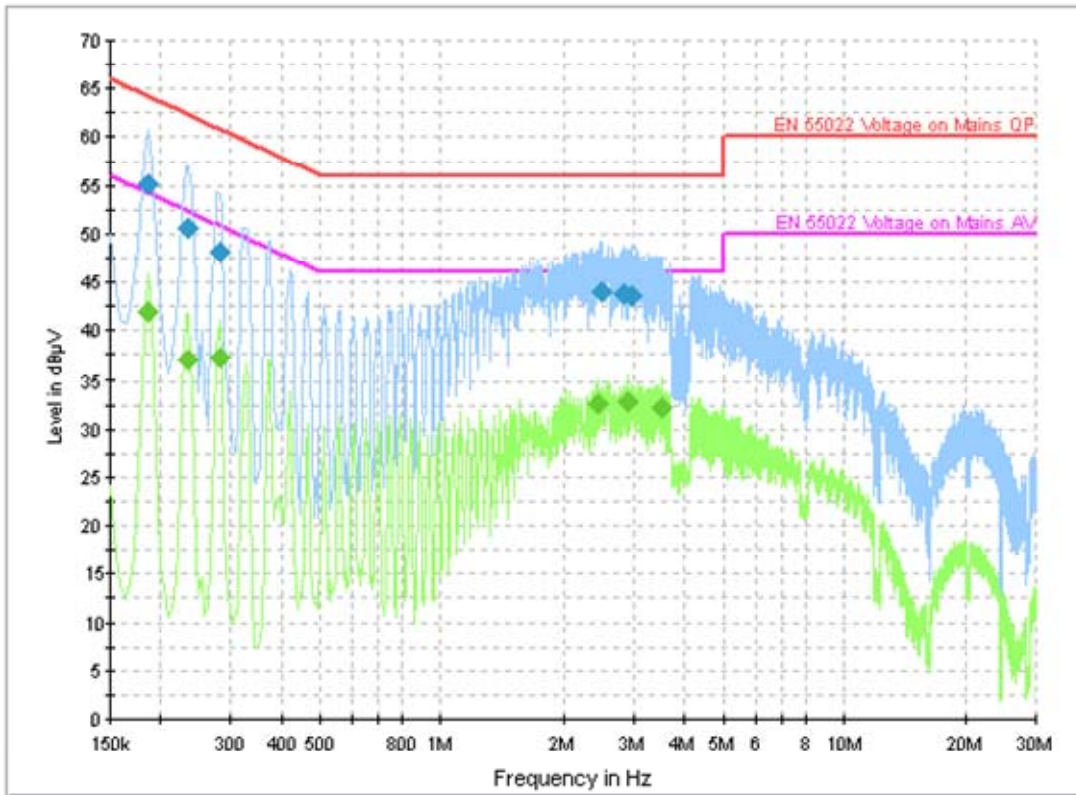
Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	

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:

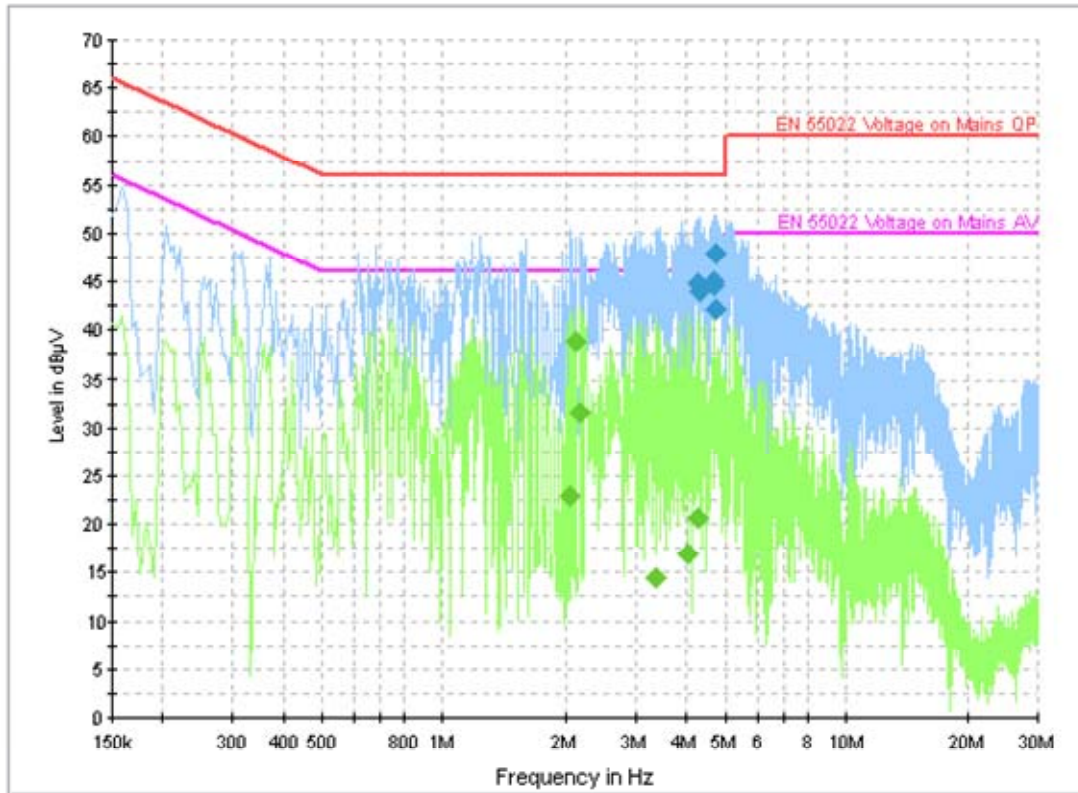


### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186000	55.1	GND	L1	10.0	9.1	64.2
0.235500	50.5	GND	L1	10.0	11.7	62.3
0.280500	48.2	GND	L1	10.0	12.6	60.8
2.494500	43.9	GND	L1	10.0	12.1	56.0
2.814000	43.7	GND	L1	10.0	12.3	56.0
2.953500	43.6	GND	L1	10.0	12.4	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186000	41.9	GND	L1	10.0	12.3	54.2
0.235500	36.9	GND	L1	10.0	15.3	52.3
0.280500	37.1	GND	L1	10.0	13.7	50.8
2.445000	32.6	GND	L1	10.0	13.4	46.0
2.904000	32.8	GND	L1	10.0	13.2	46.0
3.507000	32.2	GND	L1	10.0	13.8	46.0



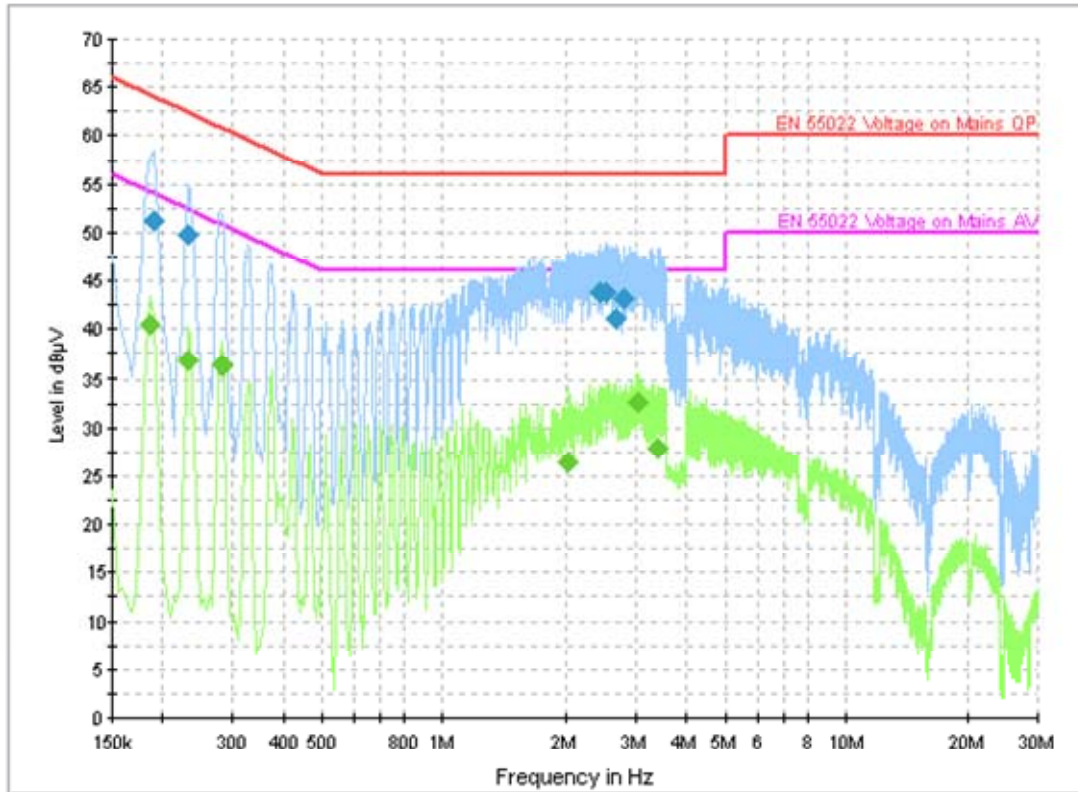
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.276500	44.8	GND	L1	10.0	11.2	56.0
4.339500	44.0	GND	N	10.0	12.0	56.0
4.672500	45.0	GND	L1	10.0	11.0	56.0
4.681500	44.5	GND	L1	10.0	11.5	56.0
4.713000	47.9	GND	L1	10.0	8.1	56.0
4.722000	42.2	GND	L1	10.0	13.8	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.058000	22.9	GND	L1	10.0	23.1	46.0
2.116500	38.7	GND	L1	10.0	7.3	46.0
2.179500	31.6	GND	L1	10.0	14.4	46.0
3.363000	14.4	GND	L1	10.0	31.6	46.0
4.011000	17.0	GND	L1	10.0	29.0	46.0
4.263000	20.7	GND	L1	10.0	25.3	46.0

Idel:

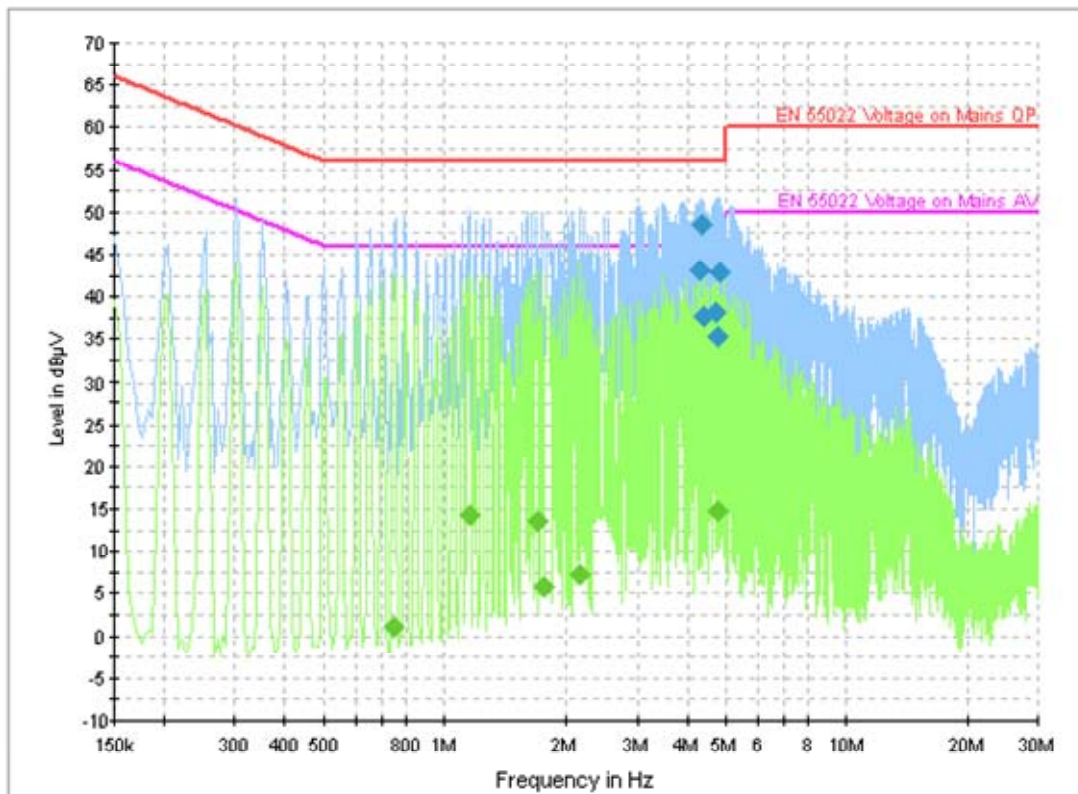


### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190500	51.2	GND	L1	10.0	12.8	64.0
0.231000	49.7	GND	L1	10.0	12.7	62.4
2.436000	43.8	GND	L1	10.0	12.2	56.0
2.521500	43.8	GND	L1	10.0	12.2	56.0
2.670000	41.1	GND	L1	10.0	14.9	56.0
2.805000	43.2	GND	L1	10.0	12.8	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186000	40.5	GND	L1	10.0	13.7	54.2
0.231000	36.7	GND	L1	10.0	15.7	52.4
0.280500	36.3	GND	L1	10.0	14.5	50.8
2.017500	26.3	GND	L1	10.0	19.7	46.0
3.039000	32.6	GND	L1	10.0	13.4	46.0
3.376500	27.9	GND	L1	10.0	18.1	46.0



### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.276500	43.1	GND	L1	10.0	12.9	56.0
4.335000	48.6	GND	L1	10.0	7.4	56.0
4.393500	37.7	GND	N	10.0	18.3	56.0
4.695000	38.1	GND	L1	10.0	17.9	56.0
4.744500	35.2	GND	L1	10.0	20.8	56.0
4.798500	42.7	GND	L1	10.0	13.3	56.0

### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.753000	1.2	GND	L1	10.0	44.8	46.0
1.158000	14.3	GND	L1	10.0	31.7	46.0
1.698000	13.6	GND	L1	10.0	32.4	46.0
1.752000	5.8	GND	L1	10.0	40.2	46.0
2.152500	7.3	GND	L1	10.0	38.7	46.0
4.794000	14.8	GND	L1	10.0	31.2	46.0

\*\*\* END OF REPORT BODY \*\*\*