



# FCC PART 15C TEST REPORT

**BLUETOOTH LOW ENERGY (BLE) PART**

**No. I15Z41460-SRD03**

**for**

**TCL Communication Ltd**

**HSUPA/HSDPA/UMTS Tri band/GSM Quad band mobile phone**

**MODEL NAME: 4014A**

**with**

**FCC ID: 2ACCJH021**

**Hardware Version: PIO**

**Software Version: v5B60**

**Issued Date: 2015-06-26**



**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 CTTL.

**Test Laboratory:**

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT.

No.52, HuayuanNorth Road, Haidian District, Beijing, P. R. China 100191.

[Tel:+86\(0\)10-62304633-2512](tel:+86(0)10-62304633-2512), [Fax:+86\(0\)10-62304633-2504](tel:+86(0)10-62304633-2504)

Email: [ctl\\_terminals@catr.cn](mailto:ctl_terminals@catr.cn), website: [www.chinattl.com](http://www.chinattl.com)



## **REPORT HISTORY**

Report Number	Revision	Description	Issue Date
I15Z41460-SRD03	Rev.0	1st edition	2015-06-26

## **CONTENTS**

<b>1. TEST LABORATORY</b>	<b>4</b>
1.1. TESTING LOCATION	4
1.2. TESTING ENVIRONMENT	5
1.3. PROJECT DATA	5
1.4. SIGNATURE	5
<b>2. CLIENT INFORMATION</b>	<b>6</b>
2.1. APPLICANT INFORMATION	6
2.2. MANUFACTURER INFORMATION	6
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)</b>	<b>7</b>
3.1. ABOUT EUT	7
3.2. INTERNAL IDENTIFICATION OF EUT	7
3.3. INTERNAL IDENTIFICATION OF AE	7
3.4. NORMAL ACCESSORY SETTING	7
3.5. GENERAL DESCRIPTION	7
<b>4. REFERENCE DOCUMENTS</b>	<b>8</b>
4.1. DOCUMENTS SUPPLIED BY APPLICANT	8
4.2. REFERENCE DOCUMENTS FOR TESTING	8
<b>5. TEST RESULTS</b>	<b>9</b>
5.1. SUMMARY OF TEST RESULTS	9
5.2. STATEMENTS	9
<b>6. TEST FACILITIES UTILIZED</b>	<b>10</b>
<b>ANNEX A: DETAILED TEST 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. TRANSMITTER SPURIOUS EMISSION - CONDUCTED	15
A.5. TRANSMITTER SPURIOUS EMISSION - RADIATED	24
A.6. 6dB BANDWIDTH	32
A.7. MAXIMUM POWER SPECTRAL DENSITY LEVEL	35
A.8. AC POWERLINE CONDUCTED EMISSION	38
<b>ANNEX B: ACCREDITATION CERTIFICATE</b>	<b>42</b>



## **1. Test Laboratory**

### **1.1. Testing Location**

Location 1:CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China100191

Location 2:CTTL(Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road,  
Haidian District, Beijing, P. R. China100191

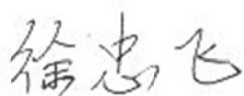
## 1.2. Testing Environment

Normal Temperature: 15-35℃  
Extreme Temperature: -10/+55℃  
Relative Humidity: 20-75%

## 1.3. Project data

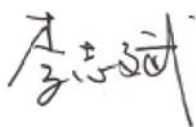
Testing Start Date: 2014-11-24  
Testing End Date: 2014-12-10

## 1.4. Signature



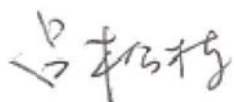
---

Xu Zhongfei  
(Prepared this test report)



---

Li Zhibin  
(Reviewed this test report)



---

Lv Songdong  
(Approved this test report)

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCL Communication Ltd  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: China  
Contact Person: Gong Zhizhou  
Contact Email: zhizhou.gong@tcl.com  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: China  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

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

#### **3.1. About EUT**

Description	HSUPA/HSDPA/UMTS Tri band/GSM Quad band mobile phone
Model Name	4014A
FCC ID	2ACCJH021
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation(LE mode)	GFSK (Bluetooth Low Energy)
Number of Channels(LE mode)	40
Power Supply	3.8v DC by Battery

#### **3.2. Internal Identification of EUT**

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	/	PIO	v5B60
EUT2	/	PIO	v5B60

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

#### **3.3. Internal Identification of AE**

AE ID*	Description	SN
AE1	Battery	---
AE2	Battery	---

AE1

Commercial name	Battery
Type	CAB1300015C2
Manufacturer	/
Length of cable	/

AE2

Commercial name	Battery
Type	CAB31P0000C1
Manufacturer	/
Length of cable	/

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

#### **3.4. Normal Accessory setting**

Fully charged battery is used during the test.

#### **3.5. General Description**

The Equipment Under Test (EUT) is a model of HSUPA/HSDPA/UMTS Tri band/GSM Quad band 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.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C:	
	15.205 Restricted bands of operation;	
	15.209 Radiated emission limits, general requirements;	June,2014
	15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	
ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices	June,2013



## 5. Test Results

### 5.1. 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 CTTL

SUMMARY OF MEASUREMENT RESULTS	Sub-clause	Verdict
6dB Bandwidth	15.247 (a)(2)	<b>P</b>
Peak Output Power - Conducted	15.247 (b)(1)	<b>P</b>
Maximum Power Spectral Density Level	15.247(e)	<b>P</b>
Conducted Emission	15.247 (d)	<b>P</b>
Radiated Emission	15.247, 15.205, 15.209	<b>P</b>
Frequency Band Edges	15.247 (d)	<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 ANSI C63.10.

### 5.2. Statements

CTTL has evaluated the test cases requested by the applicant /manufacturer as listed in section 5.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.2

This model is a variant product which market name is 4013M; all the test results have been derived from test report of 4013M.

## 6. Test Facilities Utilized

### Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ26	200136	Rohde & Schwarz	1 year	2016-01-06

### Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	1 year	2015-11-05
2	EMI Antenna	VULB 9163	9163 175	Schwarzbeck	3 years	2015-07-13
3	EMI Antenna	3117	00119021	ETS-Lindgren	3 years	2015-04-19
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	3 years	2015-06-30
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	3 years	2015-06-30
6	Bluetooth Tester	CBT	100153	Rohde & Schwarz	1 year	2015-09-15
7	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	1 year	2015-04-14
8	Pre-amplifier (18GHz)	HFH2-Z2	829324/007	Rohde & Schwarz	/	/
9	Pre-amplifier (26.5GHz)	SCU18	1005277	Rohde & Schwarz	/	/
10	Loop Antenna	SCU26	1006788	Rohde & Schwarz	3 years	2015-12-12
11	Fully-anechoic chamber	S81	CT00008 3-1030	ETS-Lindgren	/	/

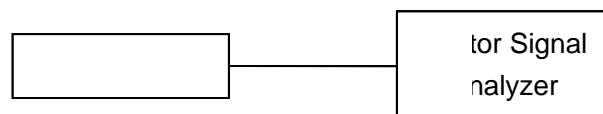
## **ANNEX A: Detailed Test Results**

### **A.1. Measurement Method**

#### **A.1.1. Conducted Measurements**

The measurement is made according to 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**

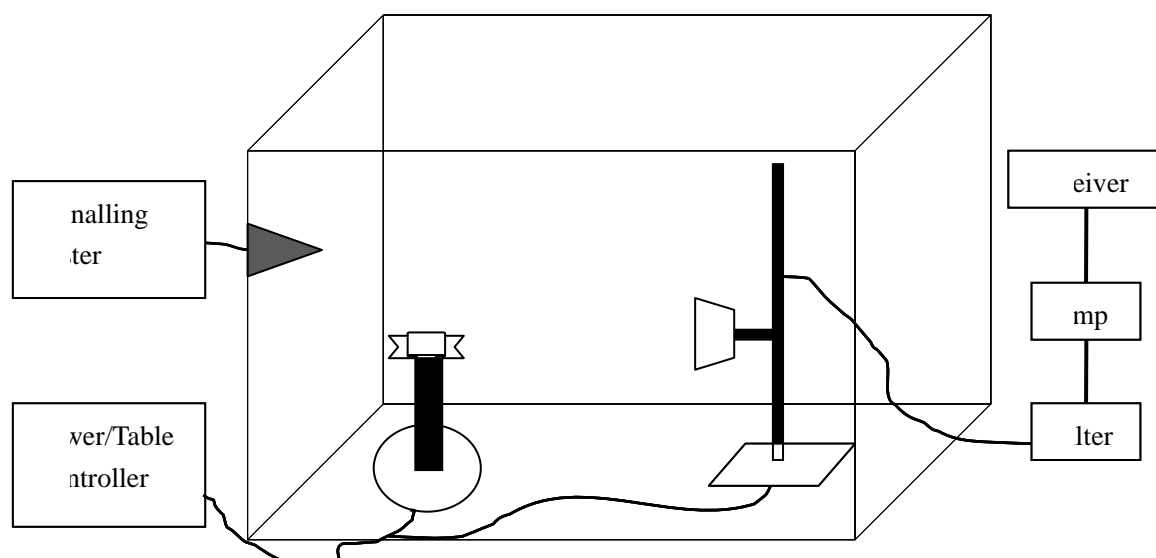
The measurement is made according to ANSI C63.10.

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

**Method of Measurement:** See ANSI C63.10-clause 11.9.1.1

- a) Set the RBW = 1 MHz.
- b) Set VBW = 3 MHz.
- c) Set span = 3 MHz.
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

**Measurement Limit:**

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

**Measurement Results:**

**For GFSK**

Channel No.	Frequency (MHz)	Peak Conducted Output Power (dBm)	Conclusion
0	2402	-0.94	P
19	2440	-0.36	P
39	2480	-0.50	P

**Conclusion: PASS**

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

**Method of Measurement:** See ANSI C63.10-clause 6.10.4

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below.

- a) Set Span = 8MHz
- b) Sweep Time: coupled
- c) Set the RBW= 100 kHz
- c) Set the VBW= 300 kHz
- d) Detector: Peak
- e) Trace: Max hold

Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not an absolute field strength measurement; it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.

**Measurement Limit:**

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

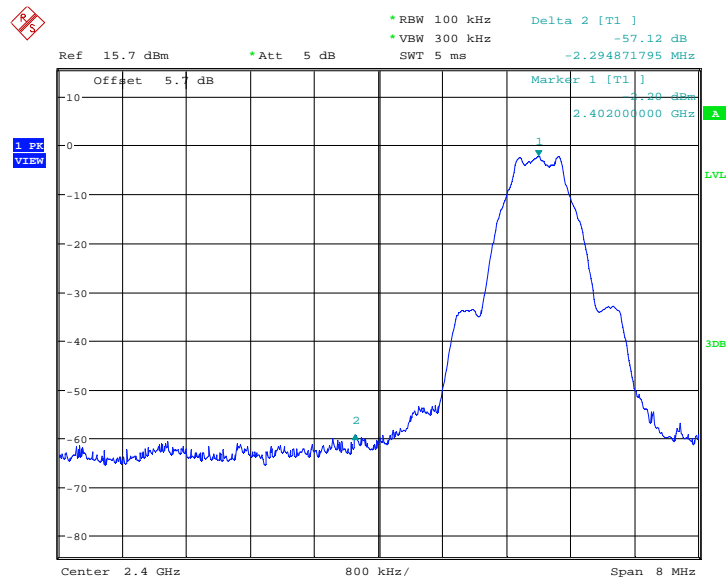
**Measurement Result:**

**For GFSK**

Channel No.	Frequency (MHz)	Hopping	Band Edge Power ( dBc)		Conclusion
0	2402	Hopping OFF	Fig.1	-57.12	P
39	2480	Hopping OFF	Fig.2	-57.99	P

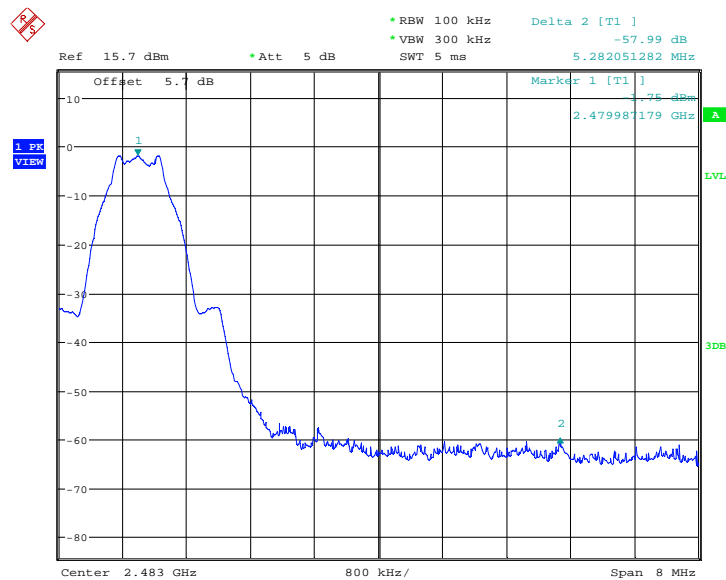
**Conclusion: PASS**

Test graphs as below



Date: 1.DEC.2014 14:21:05

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



Date: 1.DEC.2014 14:56:05

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

#### A.4. Transmitter Spurious Emission - Conducted

**Method of Measurement:** See ANSI C63.10-clause 11.11.2 and clause 11.11.3

**Measurement Procedure – Reference Level**

1. Set the RBW = 100 kHz.
2. Set the VBW = 300 kHz.
3. Set the span to  $\geq 1.5$  times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum PSD level. Next, determine the power in 100 kHz band segments outside of the authorized frequency band using the following measurement:

**Measurement Procedure - Unwanted Emissions**

1. Set RBW = 100 kHz.
  2. Set VBW = 300 kHz.
  3. Set span to encompass the spectrum to be examined.
  4. Detector = peak.
  5. Trace Mode = max hold.
  6. Sweep = auto couple.
  7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
- Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified above.

**Measurement Limit:**

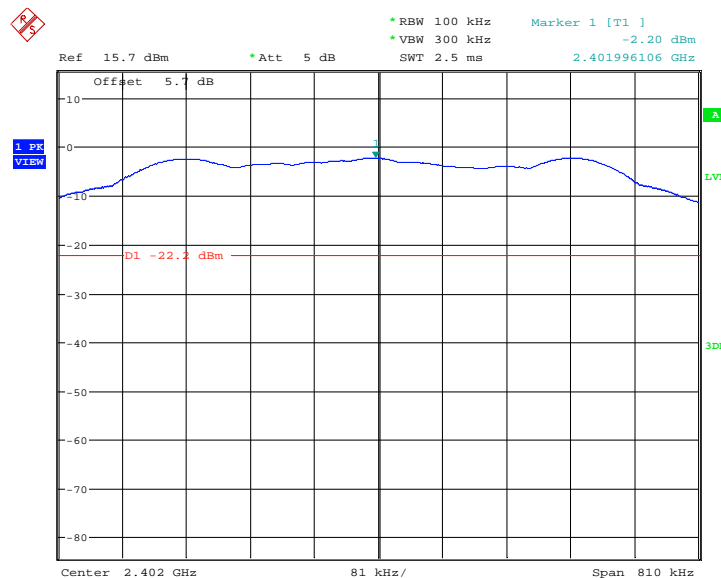
Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

**Measurement Results:**  
**For GFSK**

Channel No.	Frequency (MHz)	Frequency Range	Test Results	Conclusion
0	2402	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
19	2440	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
39	2480	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**

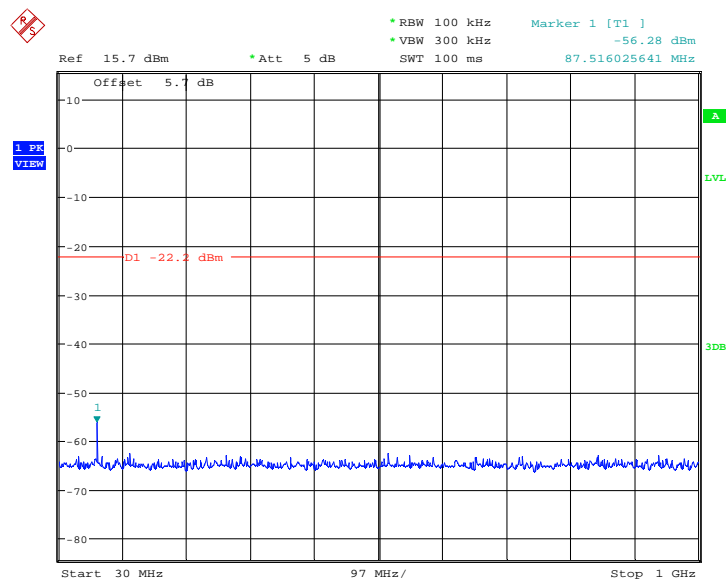
**Test graphs as below**



Date: 1.DEC.2014 14:19:24

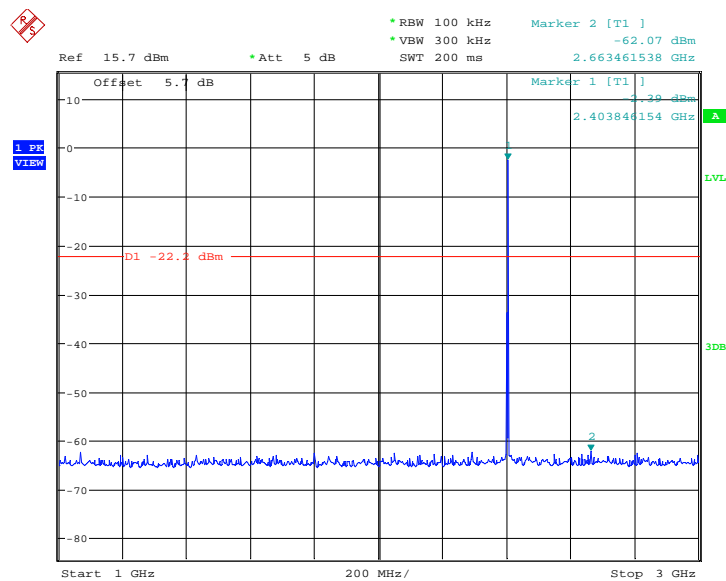
Fig.3. Transmitter Spurious Emission - Conducted: GFSK,2402MHz





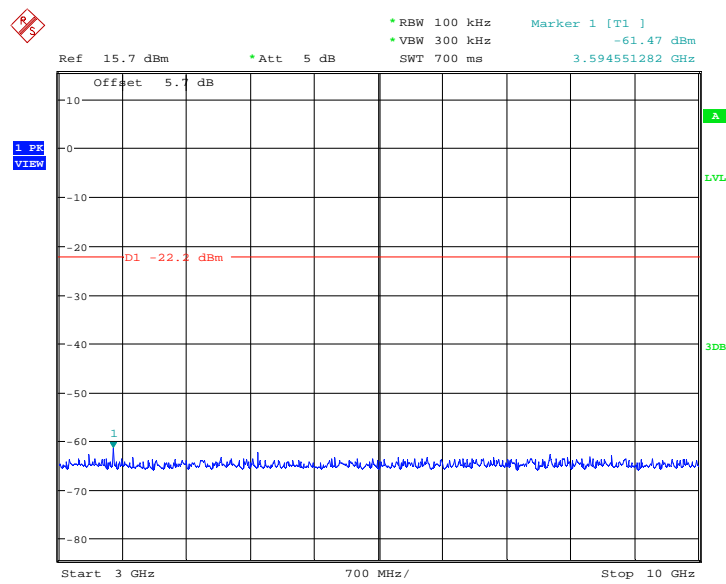
Date: 1.DEC.2014 14:19:41

Fig.4. Transmitter Spurious Emission - Conducted: GFSK, 2402 MHz, 30MHz - 1GHz



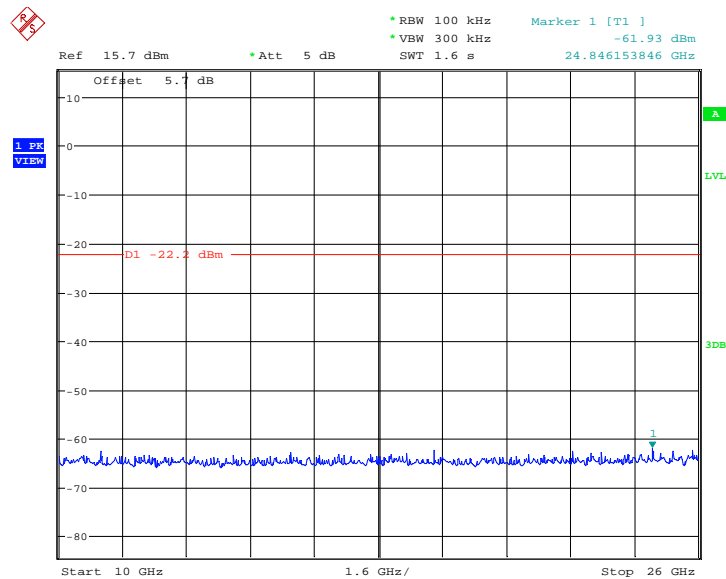
Date: 1.DEC.2014 14:20:13

Fig.5. Transmitter Spurious Emission - Conducted: GFSK, 2402 MHz, 1GHz - 3GHz



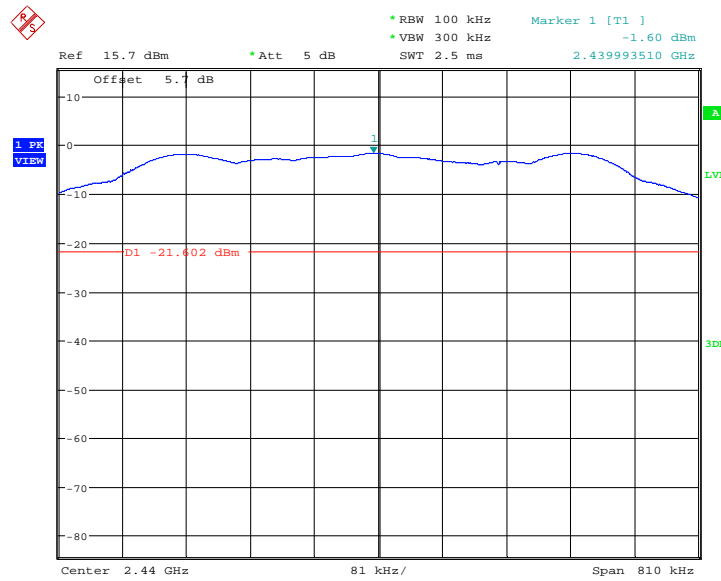
Date: 1.DEC.2014 14:20:29

Fig.6. Transmitter Spurious Emission - Conducted: GFSK, 2402 MHz,3GHz - 10GHz



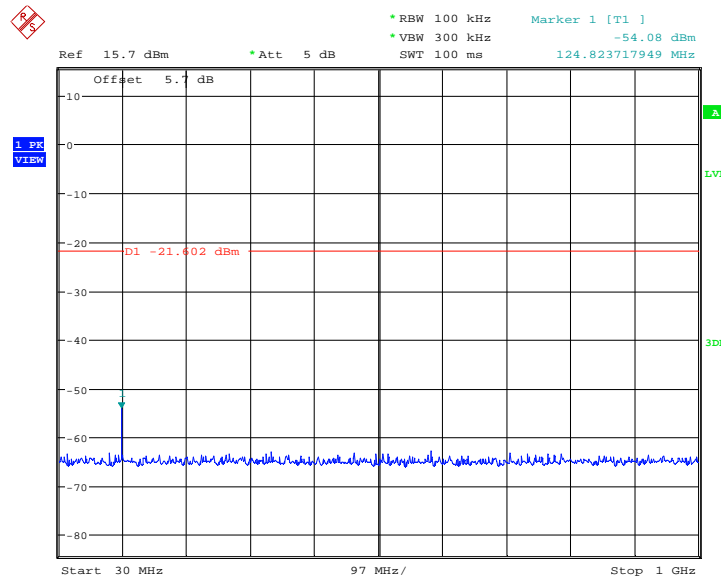
Date: 1.DEC.2014 14:20:46

Fig.7. Transmitter Spurious Emission - Conducted: GFSK, 2402 MHz,10GHz - 26GHz



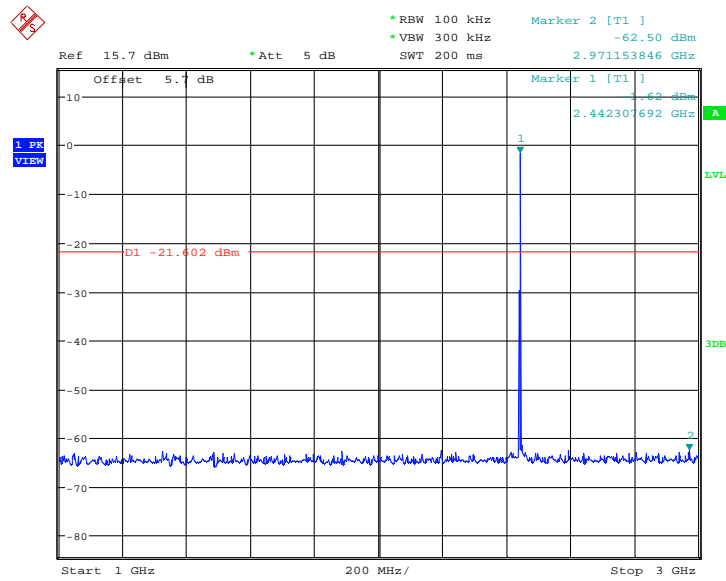
Date: 1.DEC.2014 14:47:34

Fig.8. Transmitter Spurious Emission - Conducted: GFSK, 2440MHz



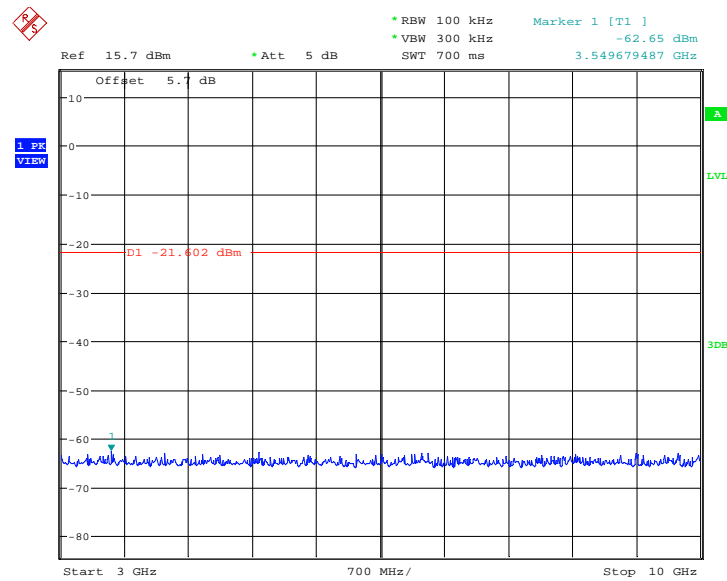
Date: 1.DEC.2014 14:47:51

Fig.9. Transmitter Spurious Emission - Conducted: GFSK, 2440 MHz, 30MHz - 1GHz



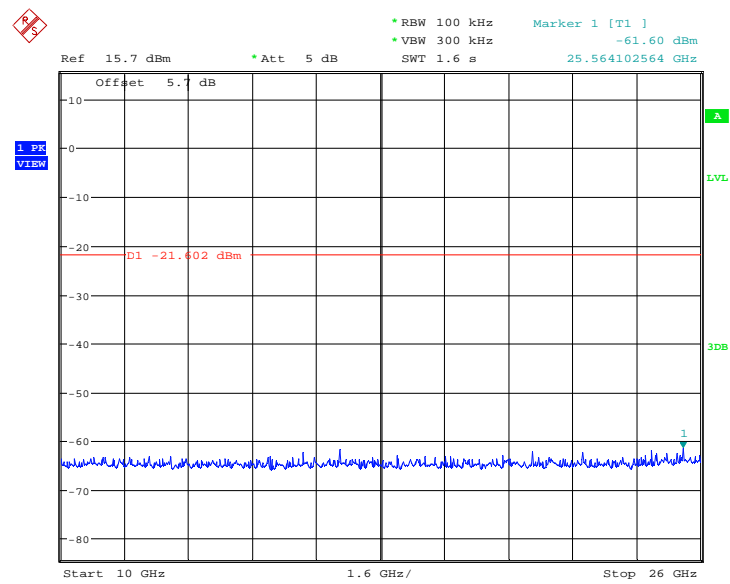
Date: 1.DEC.2014 14:48:22

Fig.10. Transmitter Spurious Emission - Conducted: GFSK, 2440 MHz, 1GHz – 3GHz



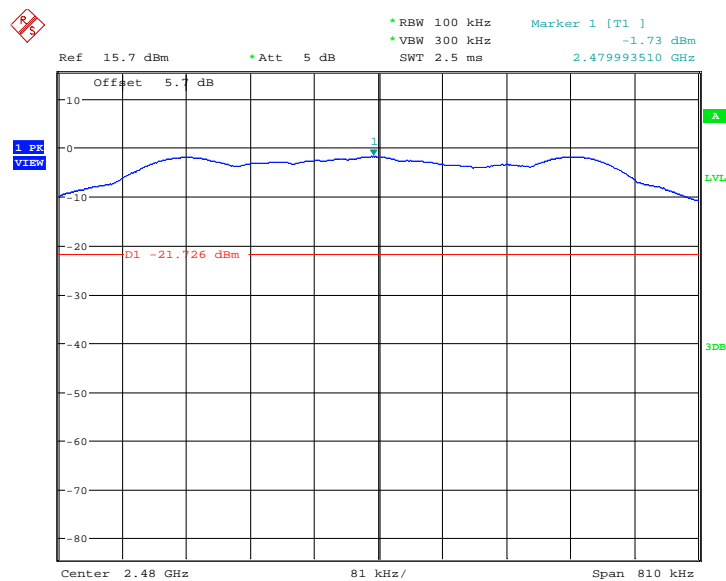
Date: 1.DEC.2014 14:48:39

Fig.11. Transmitter Spurious Emission - Conducted: GFSK, 2440 MHz, 3GHz – 10GHz



Date: 1.DEC.2014 14:48:55

Fig.12. Transmitter Spurious Emission - Conducted: GFSK, 2440 MHz, 10GHz – 26GHz



Date: 1.DEC.2014 14:54:25

Fig.13. Transmitter Spurious Emission - Conducted: GFSK, 2480 MHz

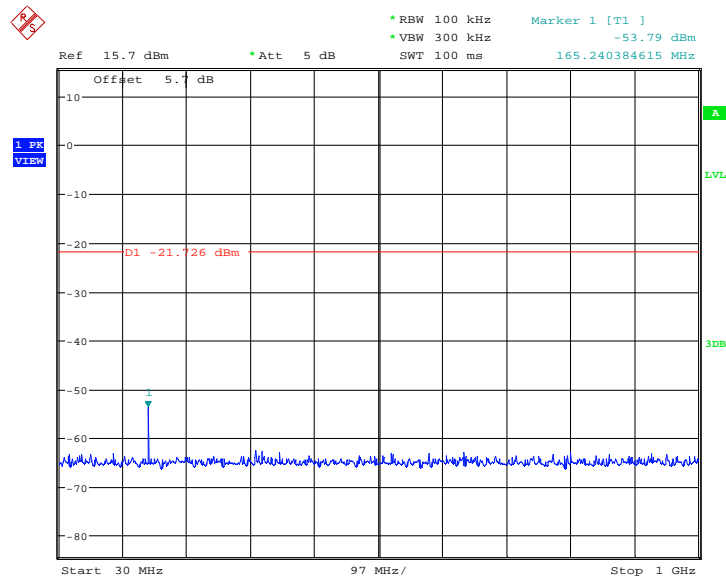


Fig.14. Transmitter Spurious Emission - Conducted: GFSK, 2480 MHz, 30MHz - 1GHz

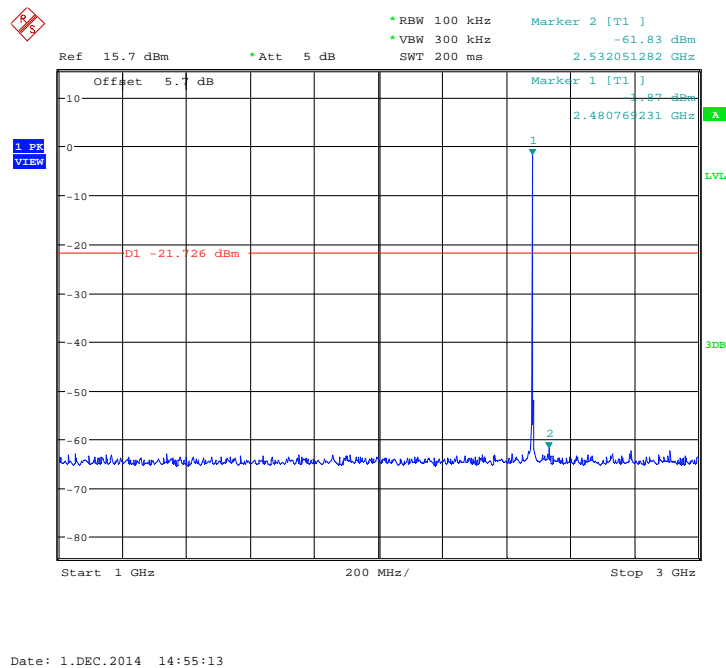
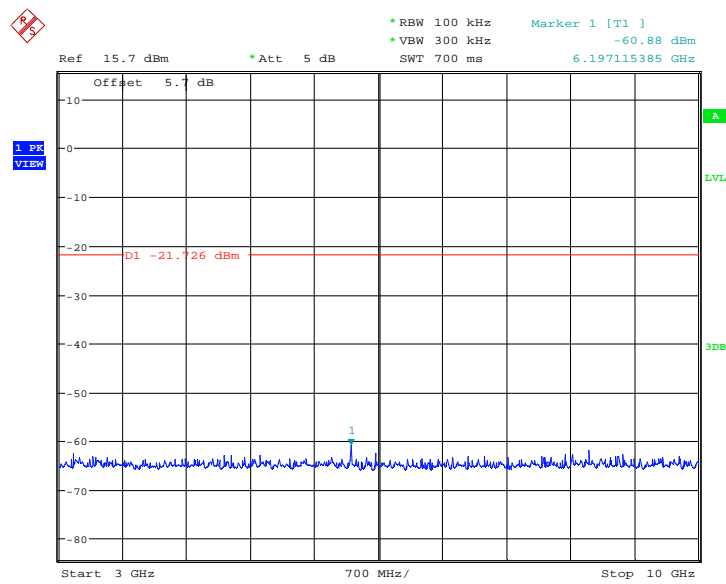
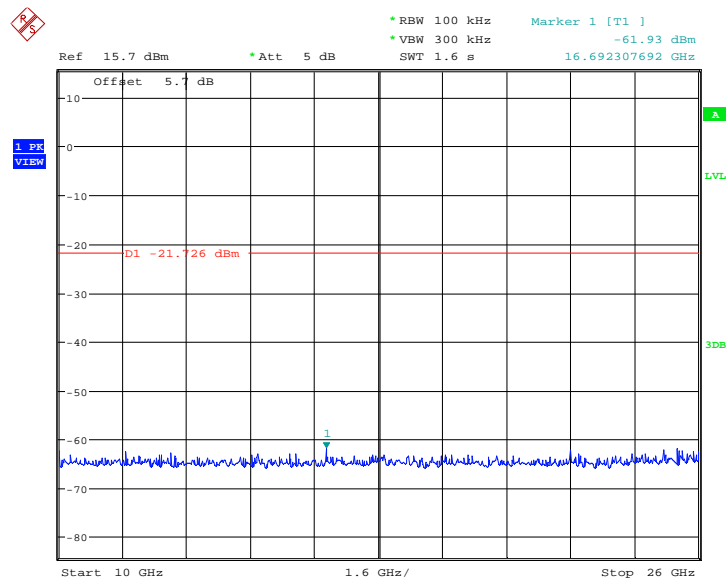


Fig.15. Transmitter Spurious Emission - Conducted: GFSK, 2480 MHz, 1GHz - 3GHz



Date: 1.DEC.2014 14:55:30

Fig.16. Transmitter Spurious Emission - Conducted: GFSK, 2480 MHz, 3GHz - 10GHz



Date: 1.DEC.2014 14:55:46

Fig.17. Transmitter Spurious Emission - Conducted: GFSK, 2480 MHz, 10GHz - 26GHz

### A.5. Transmitter Spurious Emission - Radiated

**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 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	1 GHz ~ 3 GHz	Fig.18	P
	3 GHz ~ 18 GHz	Fig.19	P
2441 MHz	9 kHz ~ 30 MHz	Fig.20	P
	30 MHz ~ 1 GHz	Fig.21	P
	1 GHz ~ 3 GHz	Fig.22	P
	3 GHz ~ 18 GHz	Fig.23	P
2480 MHz	1 GHz ~ 3 GHz	Fig.24	P



	3 GHz ~ 18 GHz	Fig.25	P
Power	2.38GHz~2.4GHz---L	Fig.26	P
Power	2.45GHz~2.5GHz---H	Fig.27	P
For all channels	18 GHz ~ 26.5 GHz	Fig.28	P

#### GFSK 2402MHz–Average

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2389.400	33.3	-11.1	44.400	V
17998.500	43.0	27.9	15.100	H
17997.000	42.9	27.9	15.000	H
17994.000	42.8	27.9	14.900	H
17992.500	42.8	27.9	14.900	V
17967.000	42.8	27.9	14.900	H

#### GFSK 2440MHz–Average

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
17997.000	43.1	27.9	15.200	H
17935.500	43.1	27.9	15.200	H
17934.000	42.9	27.9	15.000	V
17991.000	42.9	27.9	15.000	H
17998.500	42.9	27.9	15.000	H
17973.000	42.9	27.9	15.000	H

#### GFSK 2480MHz–Average

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2483.738	36.3	-11.2	47.500	V
17998.500	43.1	27.9	15.200	H
18000.000	43.1	-1.1	44.166	V
17997.000	43.0	27.9	15.100	V
17968.500	42.9	27.9	15.000	V
17974.500	42.9	27.9	15.000	H

**Conclusion: PASS**

**Test graphs as below:**

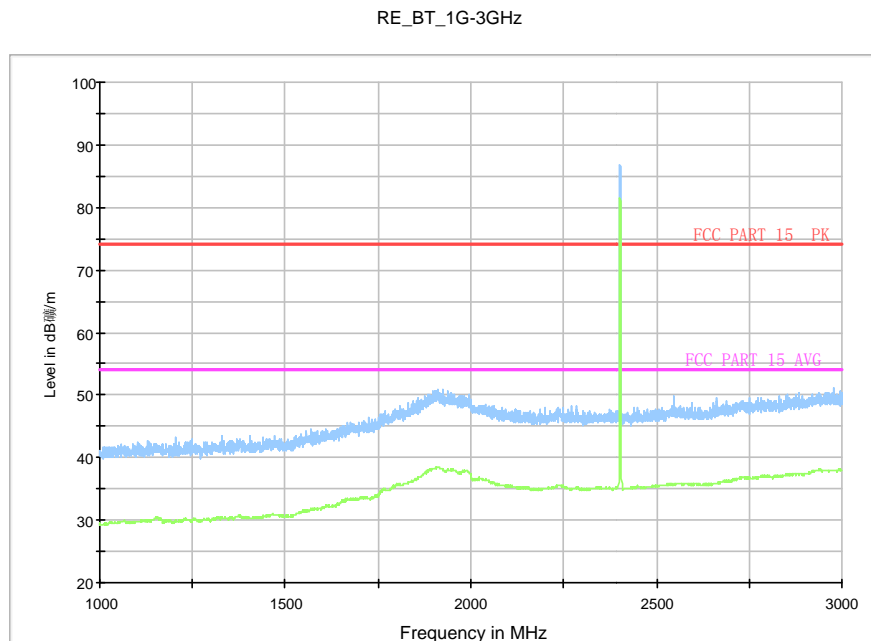


Fig.18. Transmitter Spurious Emission - Radiated: GFSK, 2402MHz, 1 GHz - 3GHz

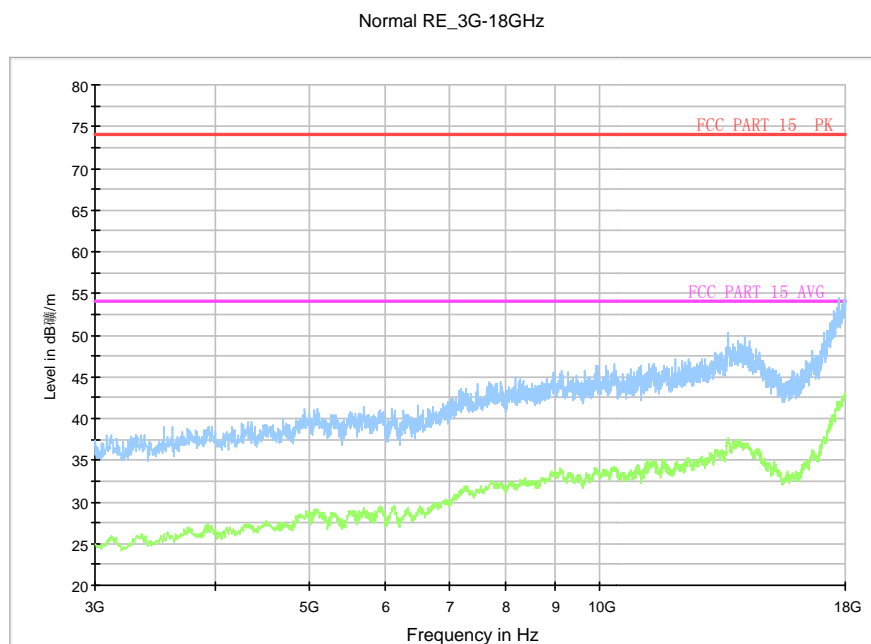


Fig.19. Transmitter Spurious Emission - Radiated: GFSK, 2402MHz, 3 GHz - 18 GHz

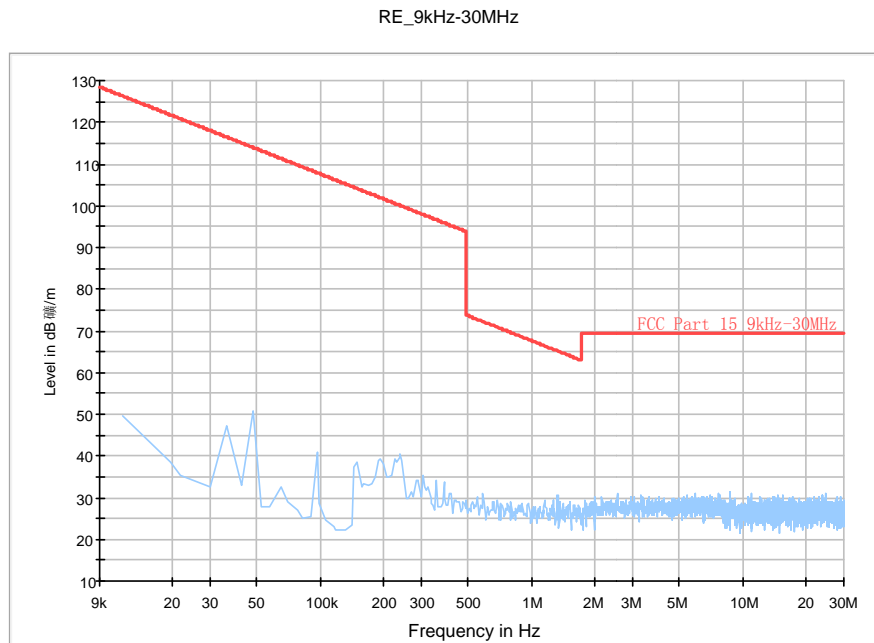


Fig.20. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 9 kHz - 30 MHz

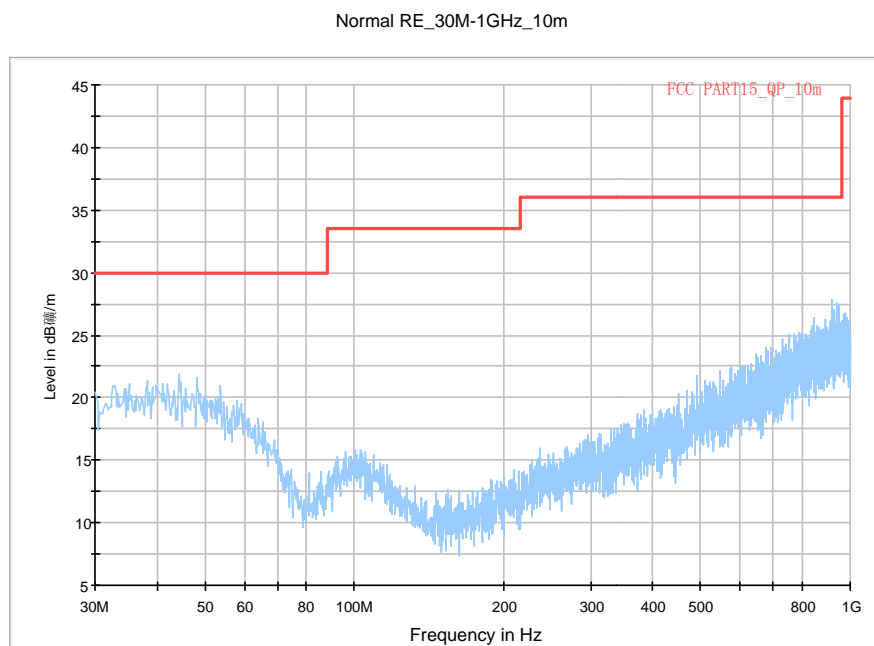


Fig.21. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 30 MHz - 1 GHz

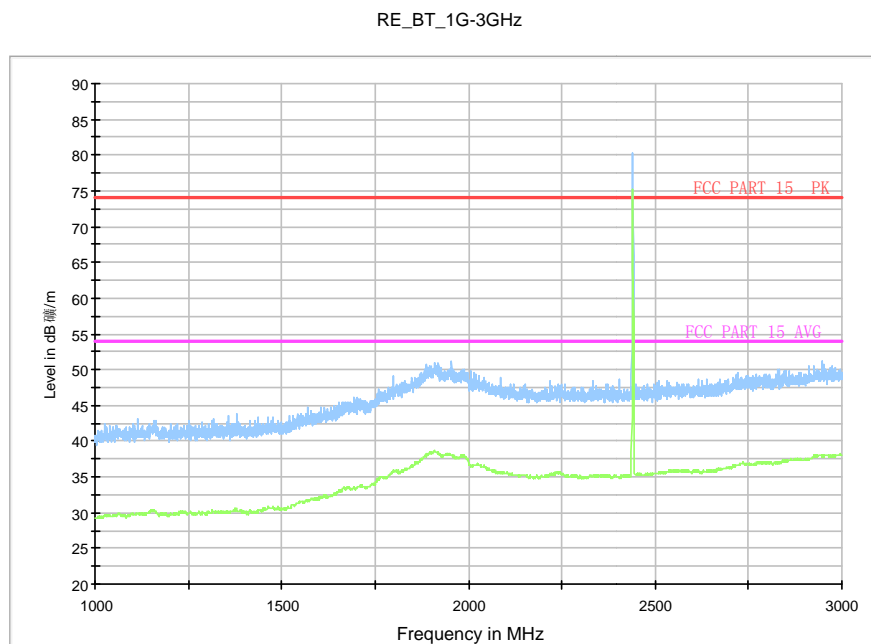


Fig.22. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 1 GHz - 3 GHz

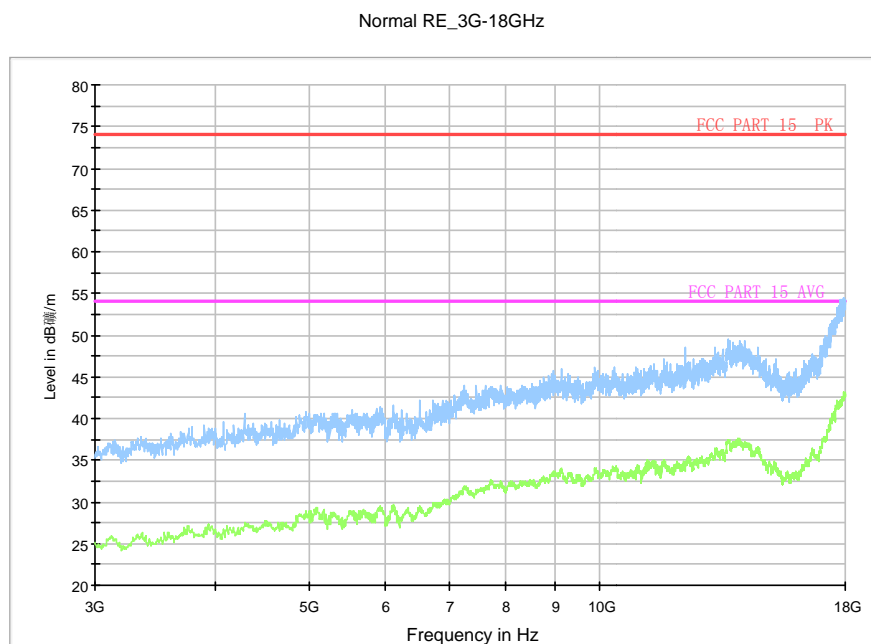


Fig.23. Transmitter Spurious Emission - Radiated: GFSK, 2440MHz, 3 GHz - 18 GHz

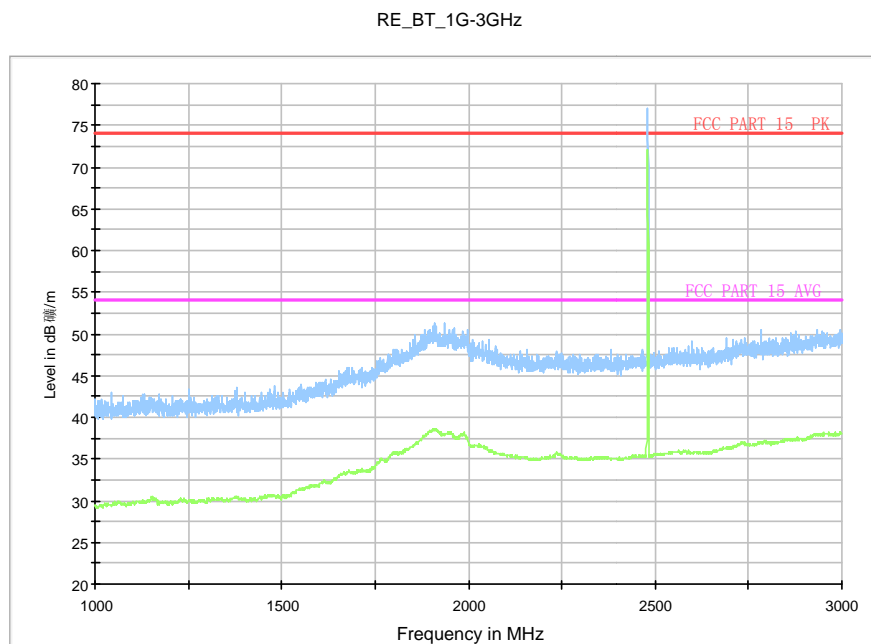


Fig.24. Transmitter Spurious Emission - Radiated: GFSK, 2480MHz, 1 GHz - 3 GHz

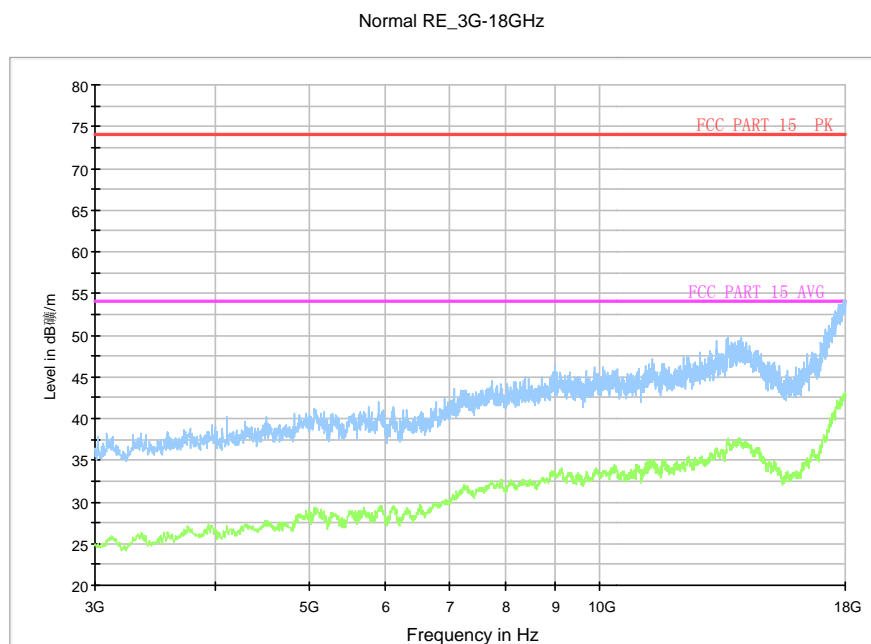


Fig.25. Transmitter Spurious Emission - Radiated: GFSK, 2480MHz, 3 GHz - 18 GHz

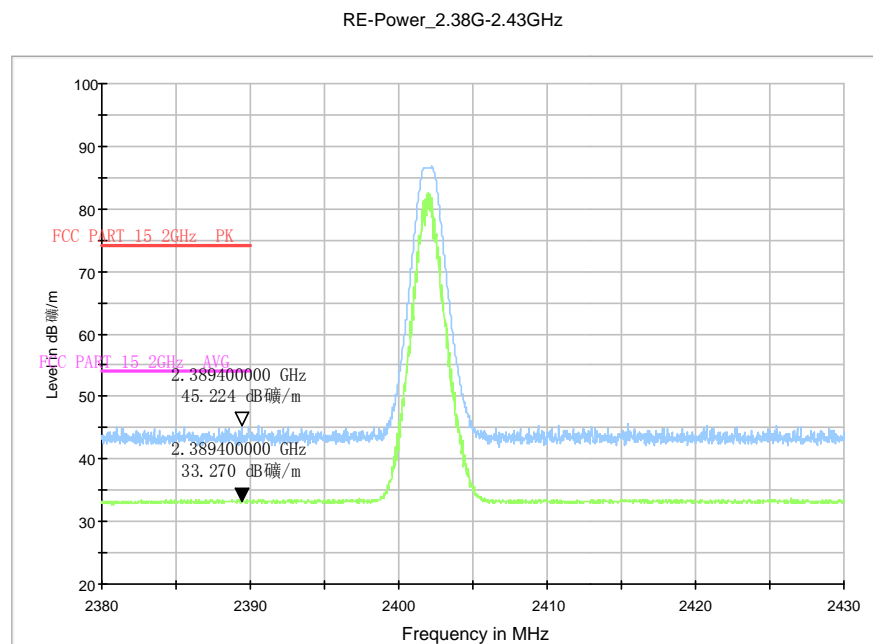


Fig.26. Transmitter Spurious Emission - Radiated (Power): GFSK low channel

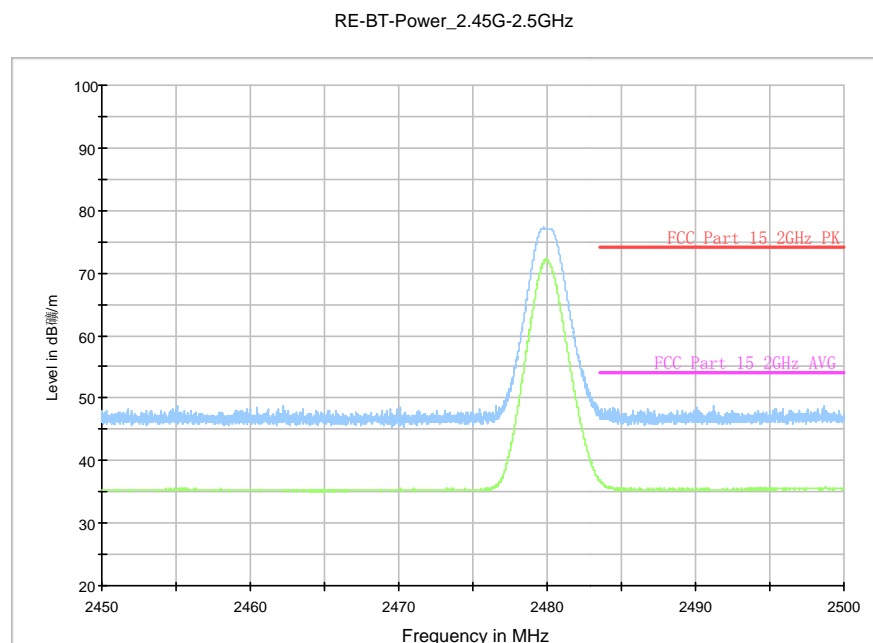


Fig.27. Transmitter Spurious Emission - Radiated (Power): GFSK high channel

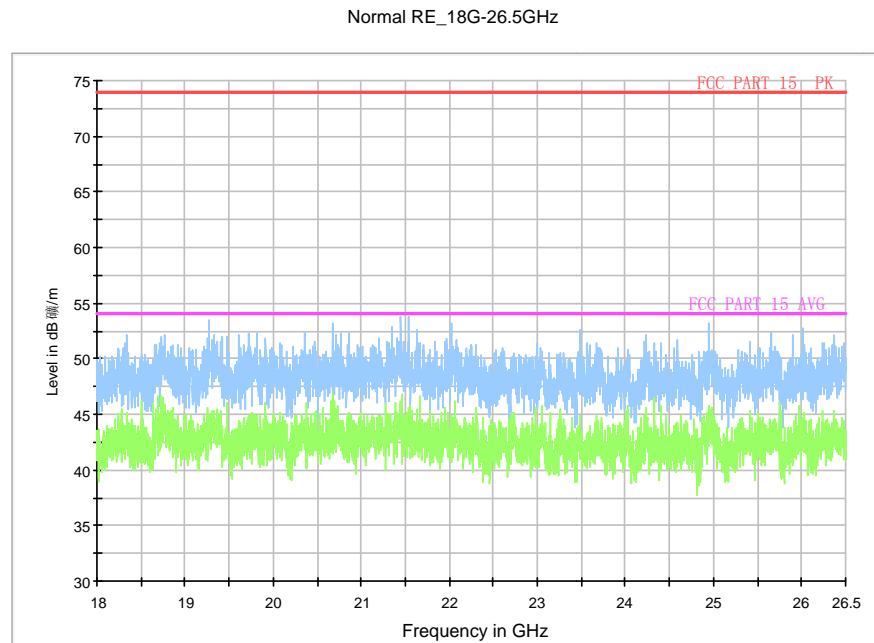


Fig.28. Transmitter Spurious Emission - Radiated: GFSK, 18 GHz - 26 GHz

## A.6. 6dB Bandwidth

### Method of Measurement:

The measurement is made according to ANSI C63.10 clause 11.8.1

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) = 300 kHz.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### Measurement Limit:

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

### Measurement Results:

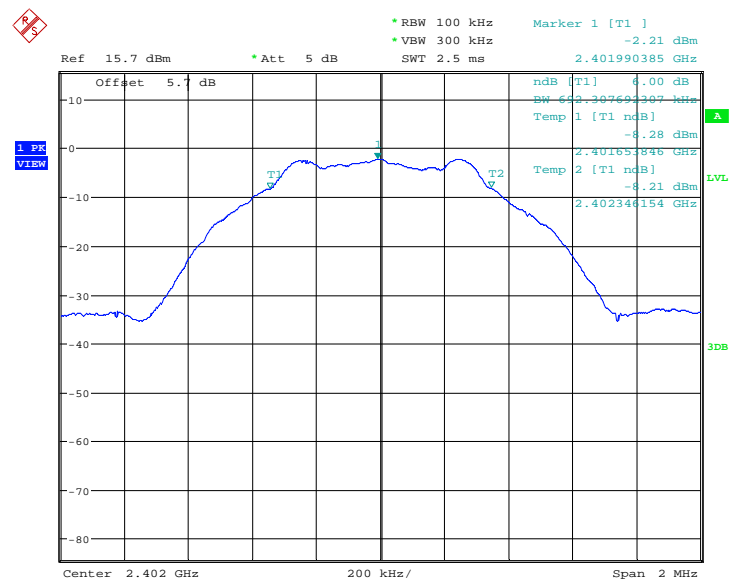
#### For GFSK

Channel No.	Frequency (MHz)	6dB Bandwidth (kHz)		Conclusion
0	2402	Fig.29	692.31	P
19	2440	Fig.30	692.31	P
39	2480	Fig.31	692.31	P

**Conclusion: PASS**

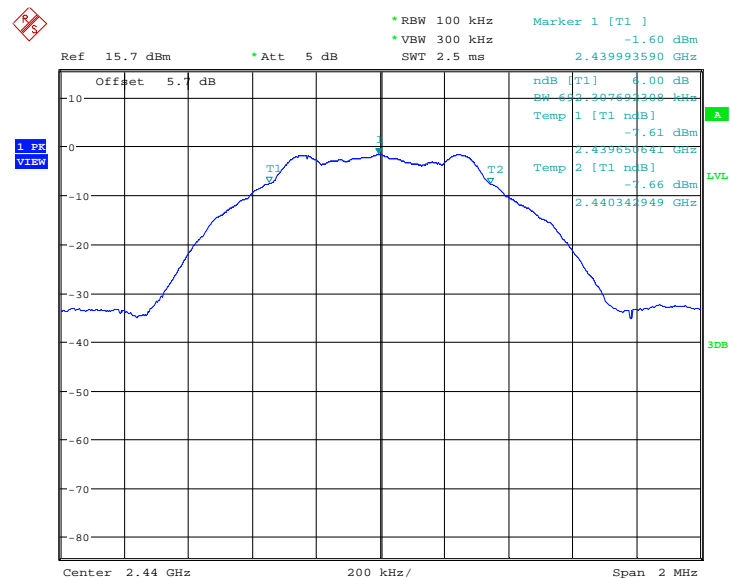
**Test graphs as below:**





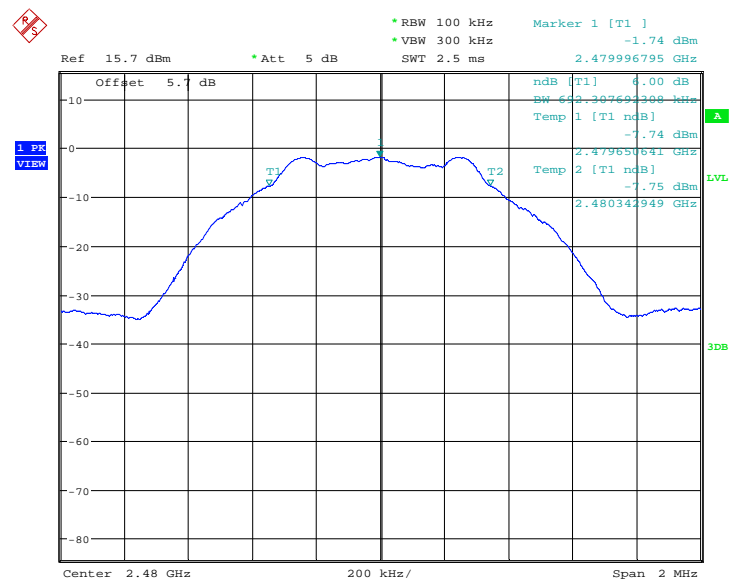
Date: 1.DEC.2014 14:18:38

Fig.29. 6dB Bandwidth: GFSK, 2402 MHz



Date: 1.DEC.2014 14:46:48

Fig.30. 6dB Bandwidth: GFSK, 2440 MHz



Date: 1.DEC.2014 14:53:39

Fig.31. 6dB Bandwidth: GFSK, 2480 MHz

## A.7. Maximum Power Spectral Density Level

### Method of Measurement:

The measurement is made according to ANSI C63.10 clause 11.10.2

1. Set the RBW = 100 kHz.
2. Set the VBW = 300 kHz.
3. Set the span to 1.5 times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level within the RBW. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
9. 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 Limit:

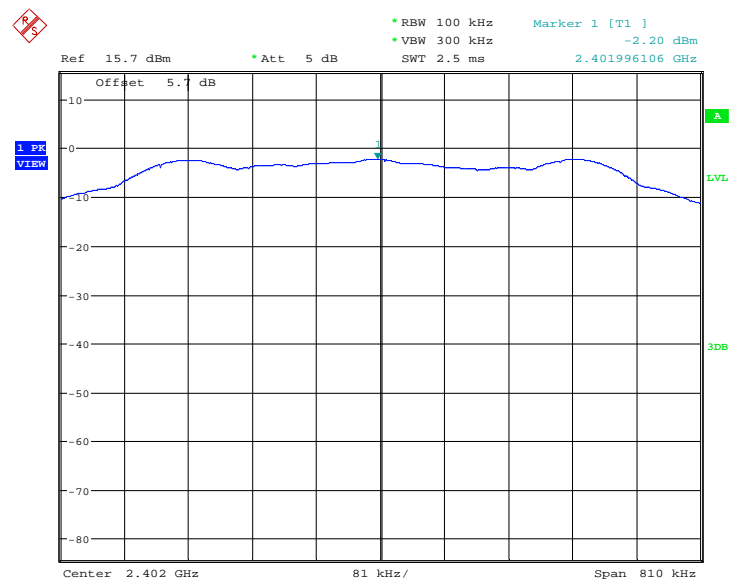
Standard	Limit
FCC 47 CFR Part 15.247(e)	$\leq -8.0\text{ dBm}/3\text{ kHz}$

### Measurement Results:

#### For GFSK

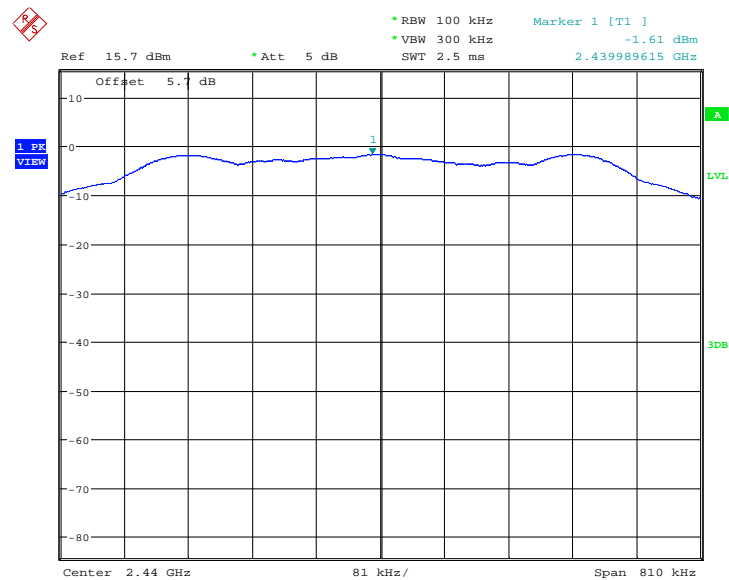
Channel No.	Frequency (MHz)	Maximum Power Spectral Density Level(dBm)		Conclusion
0	2402	Fig.32	-17.40	P
19	2440	Fig.33	-16.81	P
39	2480	Fig.34	-16.93	P

Test graphs as below:



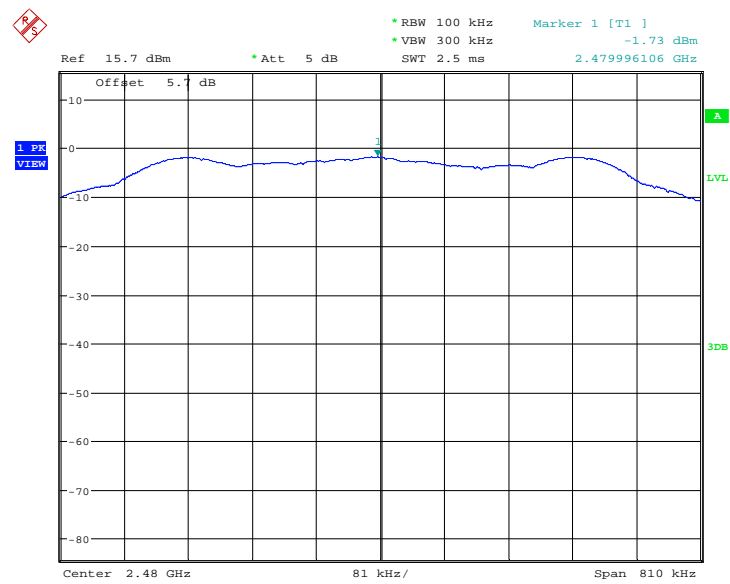
Date: 1.DEC.2014 14:19:06

Fig.32. Maximum Power Spectral Density Level Function: GFSK, 2402 MHz



Date: 1.DEC.2014 14:47:15

Fig.33. Maximum Power Spectral Density Level Function: GFSK, 2440 MHz



Date: 1.DEC.2014 14:54:06

Fig.34. Maximum Power Spectral Density Level Function: GFSK, 2480 MHz

## A.8. AC Powerline Conducted Emission

**Method of Measurement: See ANSI C63.10-clause 6.2**

1. the one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.
2. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.
3. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.
4. If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.
5. If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.<sup>36</sup> Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

### Test Condition

Voltage (V)	Frequency (Hz)
120	60

### Measurement Result and limit:

#### Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	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)**

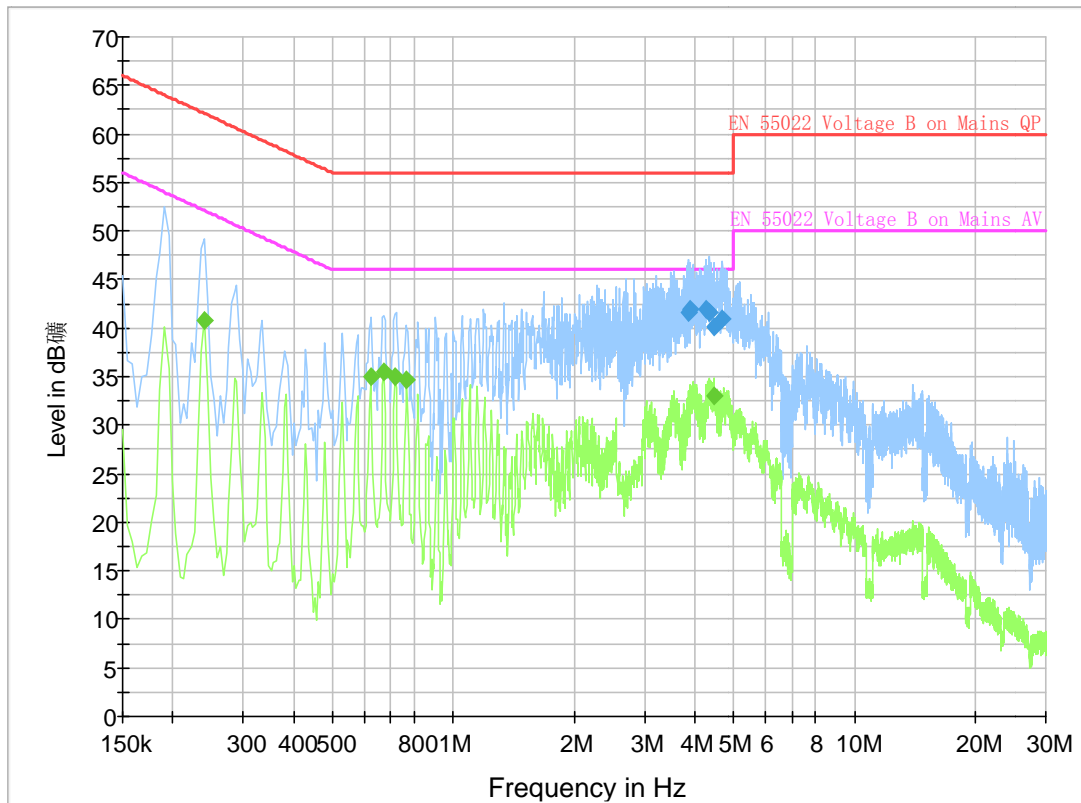
Frequency range (MHz)	Average Limit (dB $\mu$ V)	Conclusion
0.15 to 0.5	56 to 46	P
0.5 to 5	46	
5 to 30	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

The measurement is made according to ANSI C63.10

**Conclusion: PASS**

**Test graphs as below:**

### Traffic:



### Final Result 1

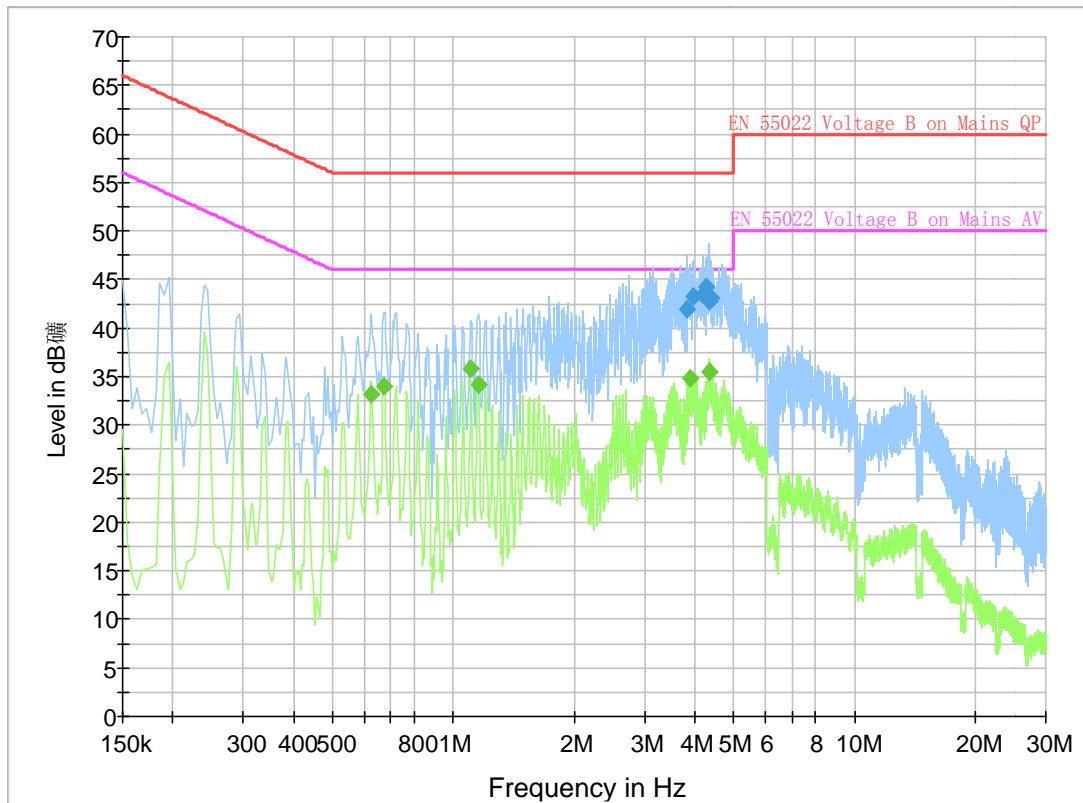
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
3.862500	41.6	2000.0	9.000	On	L1	19.7	14.4	56.0	
3.894000	41.9	2000.0	9.000	On	L1	19.7	14.1	56.0	
4.254000	41.9	2000.0	9.000	On	L1	19.6	14.1	56.0	
4.353000	41.7	2000.0	9.000	On	L1	19.7	14.3	56.0	
4.456500	40.1	2000.0	9.000	On	L1	19.7	15.9	56.0	
4.699500	41.0	2000.0	9.000	On	L1	19.7	15.0	56.0	

### Final Result 2

ncy (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.240000	40.8	2000.0	9.000	On	L1	19.8	11.3	52.1	
0.622500	35.1	2000.0	9.000	On	L1	19.9	10.9	46.0	
0.672000	35.6	2000.0	9.000	On	L1	19.9	10.4	46.0	
0.717000	35.0	2000.0	9.000	On	L1	19.9	11.0	46.0	
0.766500	34.6	2000.0	9.000	On	L1	19.9	11.4	46.0	
4.456500	33.1	2000.0	9.000	On	L1	19.7	12.9	46.0	



Idle:



## Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
3.813000	42.0	2000.0	9.000	Local	L1	19.7	14.0	56.0	
3.957000	43.2	2000.0	9.000	Local	L1	19.7	12.8	56.0	
4.200000	43.4	2000.0	9.000	Local	L1	19.7	12.6	56.0	
4.249500	44.3	2000.0	9.000	Local	L1	19.6	11.7	56.0	
4.335000	42.8	2000.0	9.000	Local	L1	19.7	13.2	56.0	
4.393500	43.1	2000.0	9.000	Local	L1	19.7	12.9	56.0	

## Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.622500	33.2	2000.0	9.000	Local	L1	19.9	12.8	46.0	
0.672000	33.9	2000.0	9.000	Local	L1	19.9	12.1	46.0	
1.104000	35.8	2000.0	9.000	Local	L1	19.8	10.2	46.0	
1.158000	34.1	2000.0	9.000	Local	L1	19.7	11.9	46.0	
3.903000	34.8	2000.0	9.000	Local	L1	19.7	11.2	46.0	
4.344000	35.5	2000.0	9.000	Local	L1	19.7	10.5	46.0	

**ANNEX B: Accreditation Certificate**

<div></div> <div><p><b>China National Accreditation Service for Conformity Assessment</b></p><p><b>LABORATORY ACCREDITATION CERTIFICATE</b></p><p><b>(Registration No. CNAS L0570 )</b></p><p><b>Telecommunication Technology Labs,</b> <b>Academy of Telecommunication Research, MIIT</b> <u>No.52, Huayuan North Road, Haidian District, Beijing, China</u></p><p><i>is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence of testing and calibration.</i></p><p><i>The scope of accreditation is detailed in the attached appendices bearing the same registration number as above. The appendices form an integral part of this certificate.</i></p><p>Date of Issue: 2014-06-20 Date of Expiry: 2017-06-19 Date of Initial Accreditation: 1998-07-03 Date of Update: 2014-06-20</p><div></div><p>Signed on behalf of China National Accreditation Service for Conformity Assessment</p><p><small>China National Accreditation Service for Conformity Assessment (CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA) and Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).</small></p><div><div>No.CNAS AL 2</div><div>0010044</div></div></div>
--

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