FCC PART 15C
TEST REPORT
No. 2013TAR076

for

Sony Mobile Communications (China) Co. Ltd

GSM/UMTS/LTE mobile phone

Type: PM-0350-BV

With

FCC ID: PY7PM-0350

IC ID: 4170B-PM0350

Hardware Version: A

Software Version: 12.0.A.1.18

Issued Date: 2013-05-02

DAkkS Deutsche Akkreditierungsstelle D-PL-12123-01-01

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 the 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, Fax:+86(0)10-62304633 Email:welcome@emcite.com. www.emcite.com

CONTENTS

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:	00861062304633

1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-20/+55℃
Relative Humidity:	30-60%
Air Pressure	990hPa-1040hPa

Note:The climatic requirements above are general exclude the special requirements for dedicated test environments listed in section 5 and some specific test cases in other parts of this report.

1.3. Project data

Project Leader:	Zi Xiaogang
Testing Start Date:	2013-02-18
Testing End Date:	2013-03-16

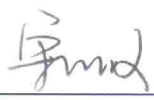
1.4. Signature

Zi Xiaogang

(Prepared this test report)

Sun Xiangqian

(Reviewed this test report)



Song Chongwen

Deputy Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Sony Mobile Communications (China) Co. Ltd
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact	Ma, Gang
Telephone:	+86-10-58656312
Fax:	+86-10-58659049

2.2. Manufacturer Information

Company Name:	Sony Mobile Communications (China) Co. Ltd
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact	Ma, Gang
Telephone:	+86-10-58656312
Fax:	+86-10-58659049

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

3.1. About EUT

Description	GSM/UMTS/LTE mobile phone
Type	PM-0350-BV
FCC ID	PY7PM-0350
IC ID	4170B-PM0350
Frequency Range	ISM 2400MHz~2483.5MHz
Type of Modulation	GFSK
Number of Channels	40
Cellular Frequency Band	GSM 850/GSM900/DCS1800/PCS1900 WCDMA FDD bands 1/5/8 LTE FDD bands 1/3/5/7/8/20
Support Functions	NFC,MP3, camera, FM radio, USB memory, GPS receiver, Mobile High-Definition Link (MHL),Bluetooth (EDR and Bluetooth Low Energy), WLAN (802.11 a/b/g/n) and Wi-Fi hotspot functions
Antenna	Integrated Antenna
MAX Radiated Power	1.21dBm EIRP
MAX Conducted Power	-0.58dBm
Power Supply	3.7V DC by Battery

Note: Photographs of EUT are shown in ANNEX D of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	S/N	IMEI	HW Version	SW Version
#23595	CB5123BN2D	004402450616176	A	12.0.A.1.18
#23593	CB5123BN3A	004402450615822	A	12.0.A.1.18

*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	SN	Revision
#22972	Travel Charger	8512W19100199	1
#22533	USB Cable	121607D30000D64	SP1

#22972

commercial name	EP880
Type	AC-0400-EU
Manufacturer	SALCOMP

#22533

Commercial name	EC801
Type	AI-0401
Manufacturer	Sony Mobile
Length of cable	96.5cm

*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 GSM/UMTS/LTE mobile phone with integrated antenna and inbuilt Li-Polymer battery.

The EUT supports GSM 850/900/1800/1900MHz bands, WCDMA FDD bands 1/5/8 and LTE FDD bands 1/3/5/7/8/20. It also supports GPRS service with multi-slots class 33 and EGPRS service with multi-slots class 33.The HSDPA and HSUPA features are also supported.

It has NFC,MP3, camera, FM radio, USB memory, GPS receiver, Mobile High-Definition Link (MHL),Bluetooth (EDR and Bluetooth Low Energy), WLAN (802.11 a/b/g/n) and Wi-Fi hotspot functions.

It includes normal options: travel charger and USB cable.

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: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	10–1–12 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	v02
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009
RSS - Gen Issue3	Spectrum Management and Telecommunications - Radio Standards Specification General Requirements and Information for the Certification of Radiocommunication Equipment	2010-12
RSS -210 Issue8	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment	2010-12

5. LABORATORY ENVIRONMENT

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

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
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

Control room/ conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.8 meters × 3.08 meters × 3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Fully-anechoic chamber2 (8.6 meters × 6.1 meters × 3.85 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 1 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

Fully-anechoic chamber3 (10 meters × 6.7 meters × 6.15 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz

Additional Humidity Requirements for Electrostatic Discharge Test: Min. = 30%, Max. = 60%.

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	IC	Verdict
Peak Output Power - Conducted	15.247 (b)(1)	RSS-210 A8.4 (2)	**P**
Frequency Band Edges	15.247 (d)	RSS-210 A8.5	**P**
Conducted Emission	15.247 (d)	RSS-210 A8.5	**P**
Radiated Emission	15.247, 15.205, 15.209	RSS-210 A8.5	**P**
6dB Bandwidth	15.247 (a)(2)	RSS-210 A8.1	**P**
Maximum Power Spectral Density Level	15.247(e)	RSS-210 A8.1	**P**
Time of occupancy (dwell time)	15.247(a)(1) (iii)	RSS-210 A8.1(4)	**P**
Carrier frequency separation	15.247(a)(1)	RSS-210 A8.1 (2)	**P**
Number of hopping channels	15.247(a)(1)	RSS-210 A8.1 (4)	**P**
20dB Bandwidth	15.247 (a)(1)	RSS-210 A8.1 (1)	**P**
AC Powerline Conducted Emission	15.107, 15.207	RSS-Gen *7.2.2*	**P**

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

The EUT met all requirements of the standards or reference documents.

This report only deals with the Bluetooth LE functions among the features described in section 3.

6.3. Test Conditions

T nom	Normal Temperature
T min	Low Temperature
T max	High Temperature
V nom	Normal Voltage
V min	Low Voltage
V max	High Voltage
H nom	Norm Humidity
A nom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	T nom	24℃
Voltage	V nom	3.7V(By battery)
Humidity	H nom	37%
Air Pressure	A nom	1020hPa

7. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyzer	FSU26	200030	Rohde & Schwarz	2013-12-18
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	ESU26	100376	Rohde & Schwarz	2013-11-07
2	EMI Antenna	VULB 9163	514	Schwarzbeck	2014-11-10
3	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	2014-06-30
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	2014-06-30
6	Universal Radio Communication Tester	CMU200	109914	Rohde & Schwarz	2014-04-18
7	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2014-04-15
8	Pre-amplifier(18GHz)	SCU18	1005277	Rohde & Schwarz	/
9	Pre-amplifier(26.5GHz)	SCU26	1006788	Rohde & Schwarz	/

Anechoic chamber

Fully anechoic chamber by Frankonia German.

Note : The pre amplifiers is calibrated with routes calibration every time before test, therefore no need for the calibration date.

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

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

1). Connect the EUT to the test system correctly.

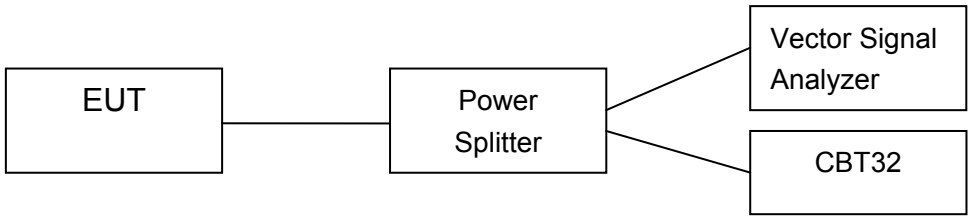
2). Set the EUT to the required work mode (Transmitter, receiver or transmitter & receiver).

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

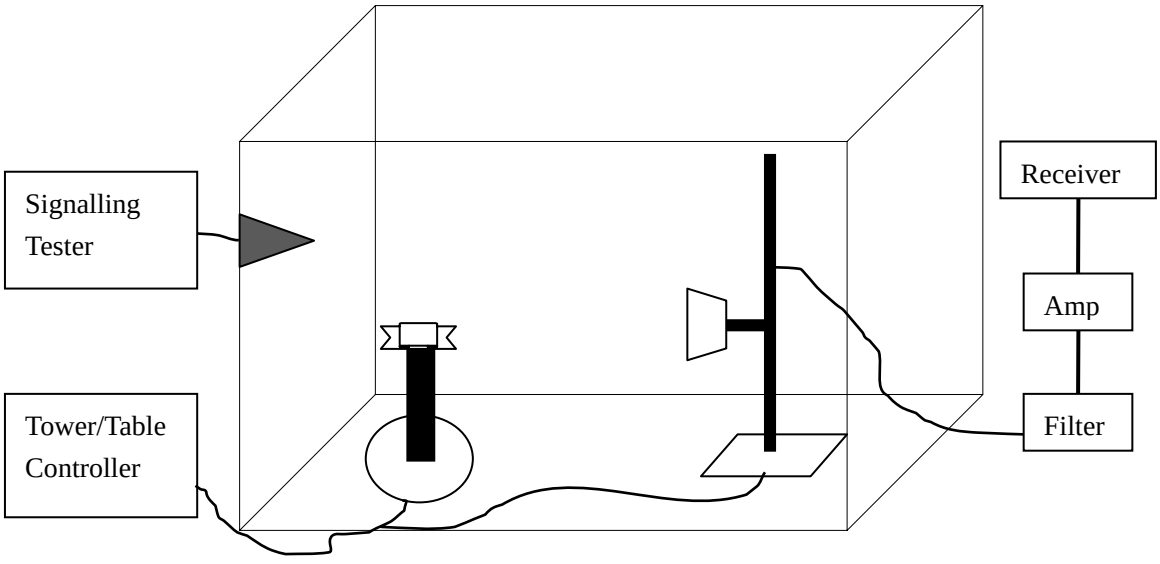
The measurement is made according to Public notice KDB 558074 and ANSI C63.10

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

Measurement Limit:

Standard	Limit (dBm)
FCC Part 15.247(b)(1)/ RSS-210 A8.4 (2)	< 30

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

Measurement Results:

A.2.1 Antenna gain

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the EUT.

Frequency	2402 MHz	2440 MHz	2480 MHz
GFSK (Conducted)	-1.39	-0.58	-2.74
GFSK (Radiated)	0.87	1.21	0.92
Gain(dBi)	2.26	1.79	3.66

Conclusion: PASS

A.2.2 Conducted Output Power

EUT ID: #23595

Peak(RBW=1MHz;VBW=5MHz;SPAN=0;Detector:Peak)

Frequency	2402 MHz	2440 MHz	2480 MHz	Conclusion
GFSK (dBm)	-1.39	-0.58	-2.74	P

Average(RBW=1MHz;VBW=5MHz;SPAN=0;Detector:RMS)

Frequency	2402 MHz	2440 MHz	2480 MHz	Conclusion
GFSK (dBm)	-1.49	-0.62	-3.12	P

Measurement Uncertainty: ±1.17dB

Conclusion: PASS

A.2.3 Radiated Output Power

EUT ID: #23593

Peak(RBW=1MHz;VBW=5MHz;SPAN=0;Detector:Peak)

Frequency	2402 MHz	2440 MHz	2480 MHz	Conclusion
GFSK (dBm)	0.87	1.21	0.92	P

Average

Frequency	2402 MHz	2440 MHz	2480 MHz	Conclusion
GFSK * (dBm)	0.77	1.17	0.54	P

Note:* These values are calculated with the antenna gain

Measurement Uncertainty: ±1.98dB

Conclusion: PASS

A.3. Frequency Band Edges

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d) RSS-210 A8.5	<-20 Note：The measurement results are calculated as power measured in any 100KHz bandwidth outside the frequency band in dBm minus power measured in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

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

Measurement Condition：

RBW=VBW=100KHz; SPAN=8MHz; Detector: peak

Measurement Result:

EUT ID: #23595

For GFSK

Frequency	Hopping	Band Edge Power (dBc)		Conclusion
2402MHz	Hopping OFF	Fig.1	-43.20	P
2480MHz	Hopping OFF	Fig.2	-61.48	P

Measurement Uncertainty: ±1.37dB

Conclusion: PASS

Test graphs as below

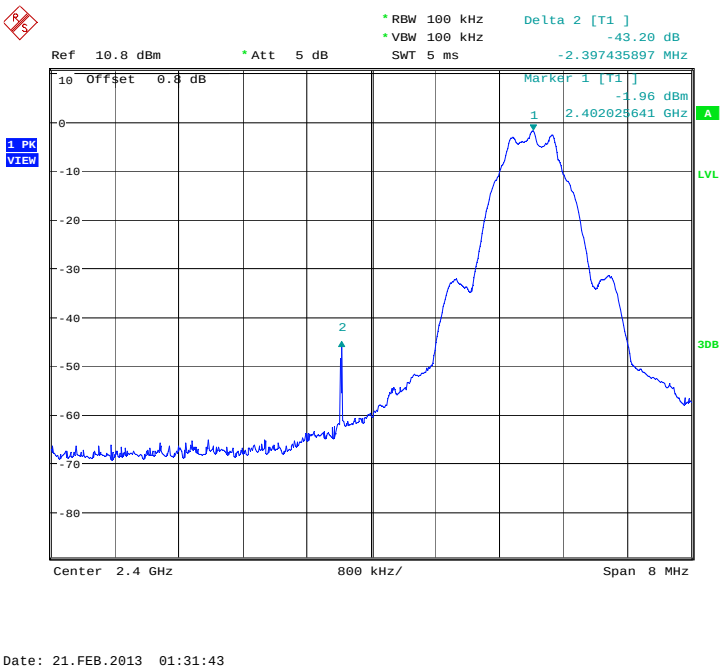


Fig.1. Frequency Band Edges: GFSK, 2402 MHz, Hopping Off

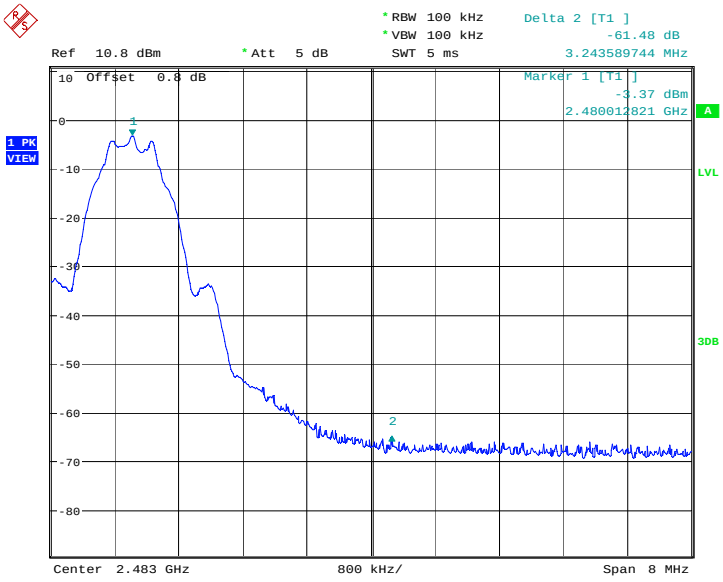


Fig.2. Frequency Band Edges: GFSK, 2480 MHz, Hopping Off

A.4. Conducted Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d) RSS-210 A8.5	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
	10 GHz ~ 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
	10 GHz ~ 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

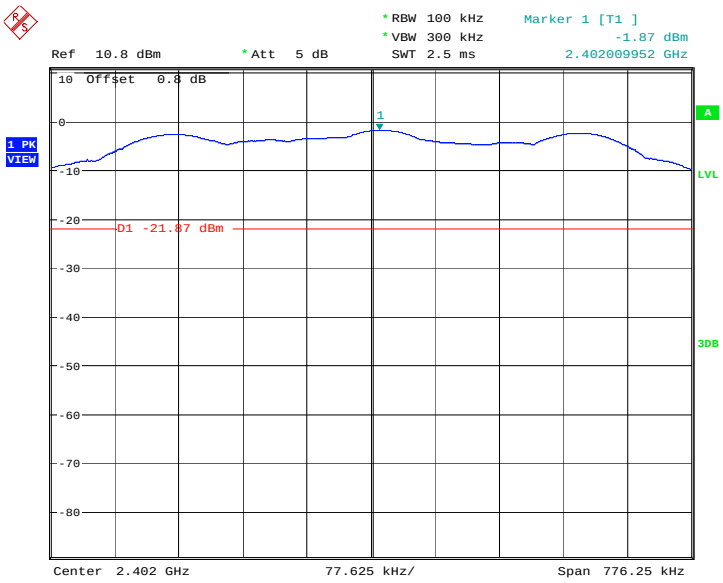


Fig.3. Conducted spurious emission: GFSK,2402MHz

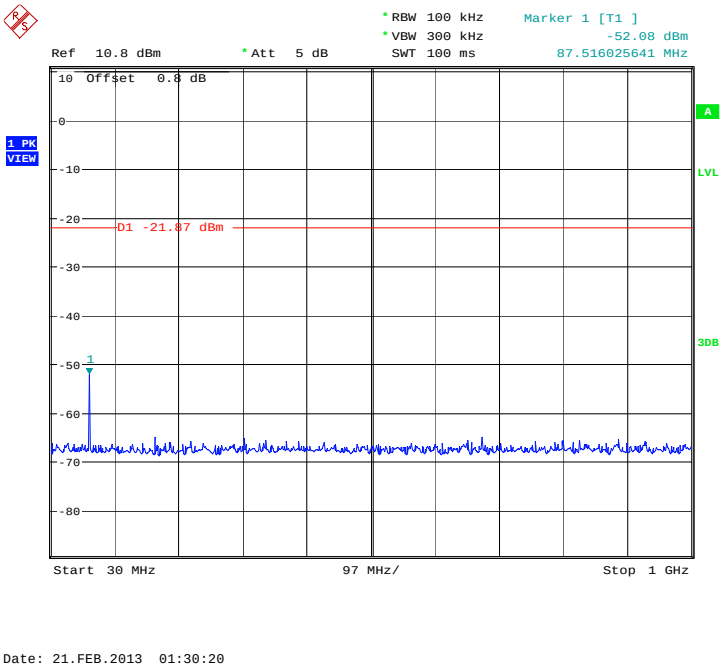


Fig.4. Conducted spurious emission: GFSK, 2402 MHz, 30MHz - 1GHz

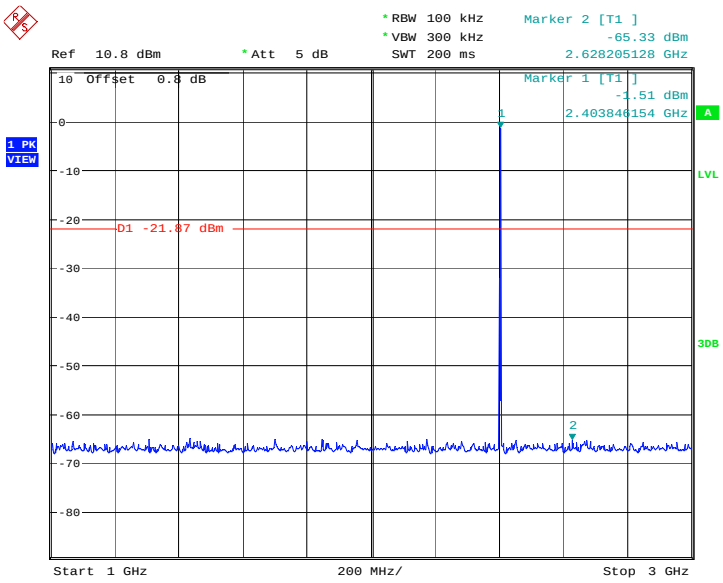


Fig.5. Conducted spurious emission: GFSK, 2402 MHz,1GHz - 3GHz

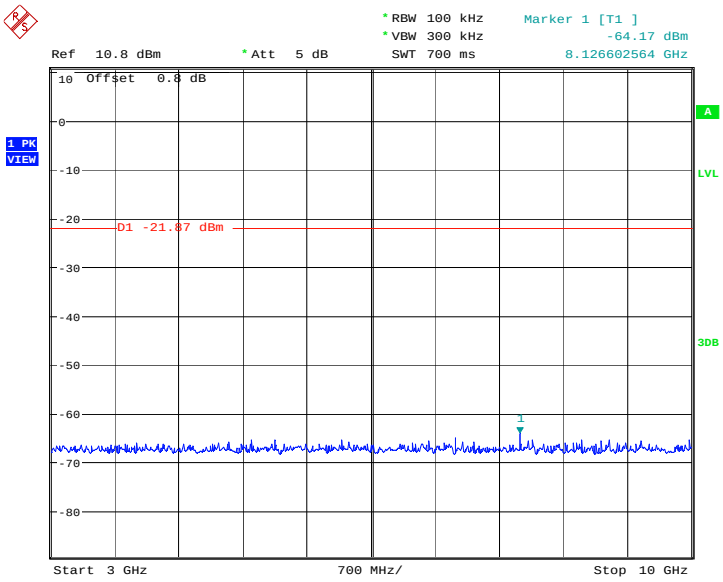


Fig.6. Conducted spurious emission: GFSK, 2402 MHz,3GHz - 10GHz

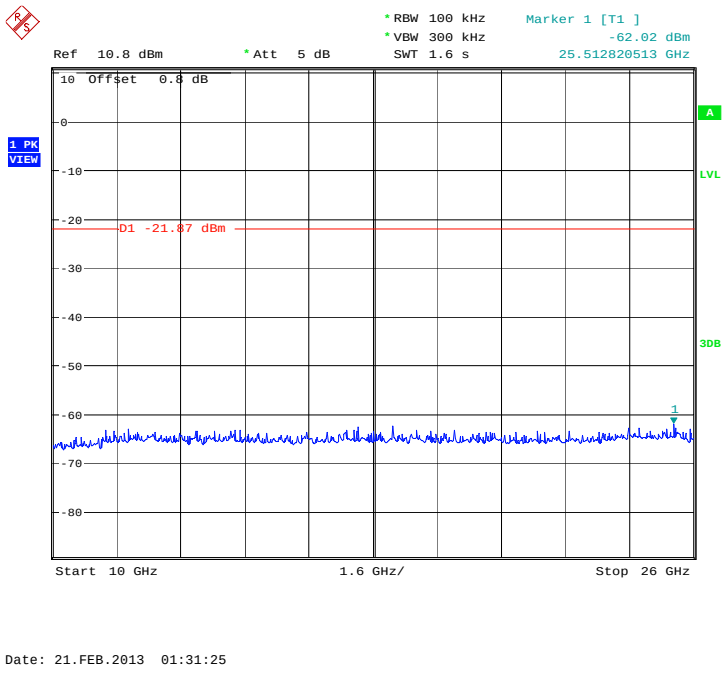


Fig.7. Conducted spurious emission: GFSK, 2402 MHz,10GHz - 26GHz

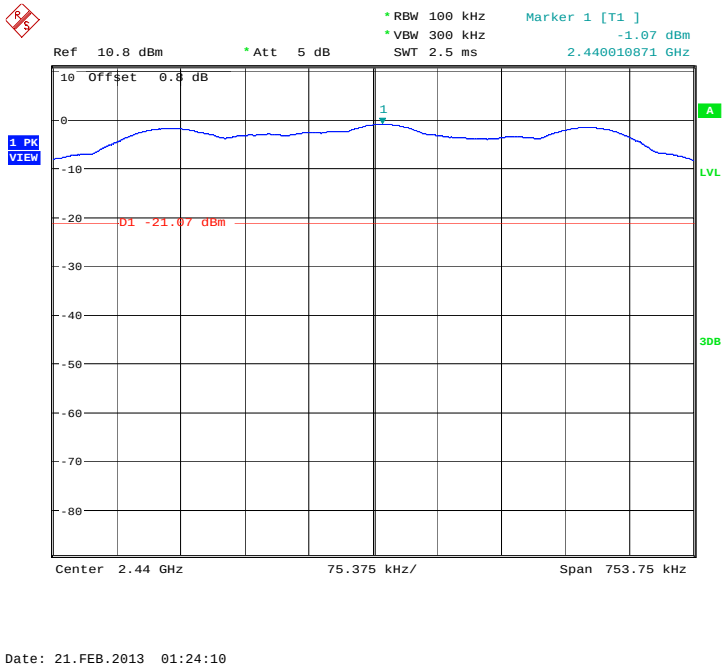


Fig.8. Conducted spurious emission: GFSK, 2440MHz

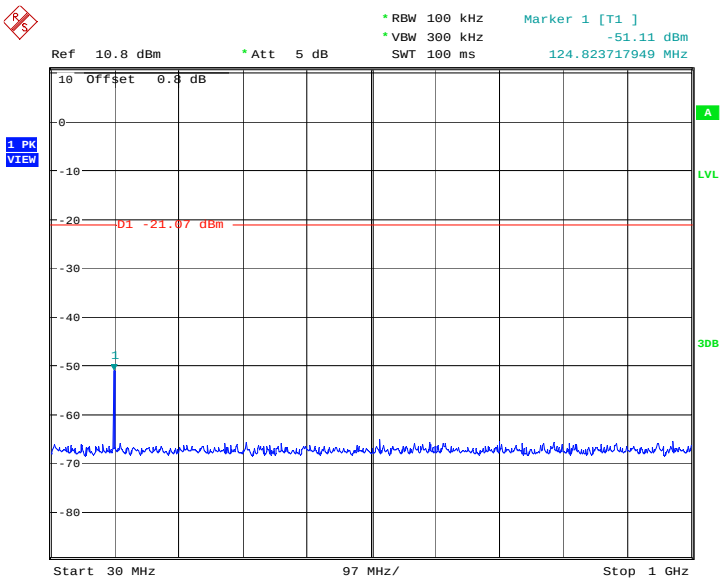


Fig.9. Conducted spurious emission: GFSK, 2440 MHz, 30MHz - 1GHz

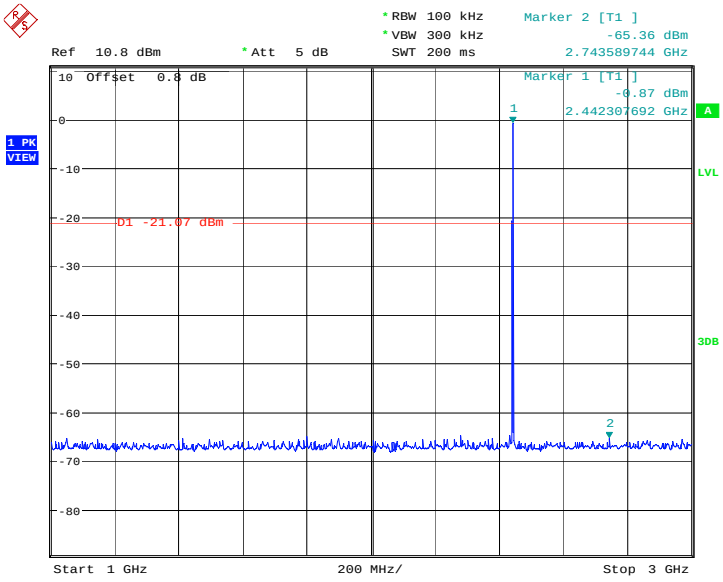


Fig.10. Conducted spurious emission: GFSK, 2440 MHz, 1GHz – 3GHz

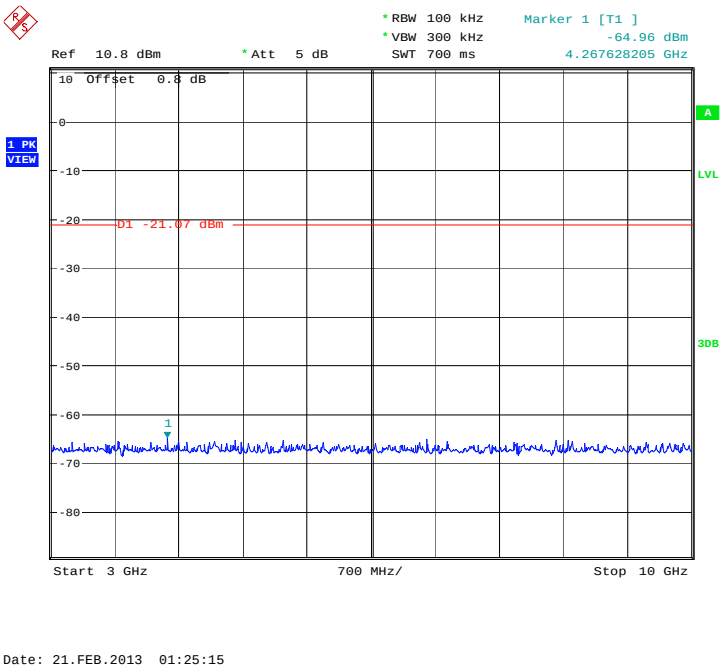


Fig.11. Conducted spurious emission: GFSK, 2440 MHz, 3GHz – 10GHz

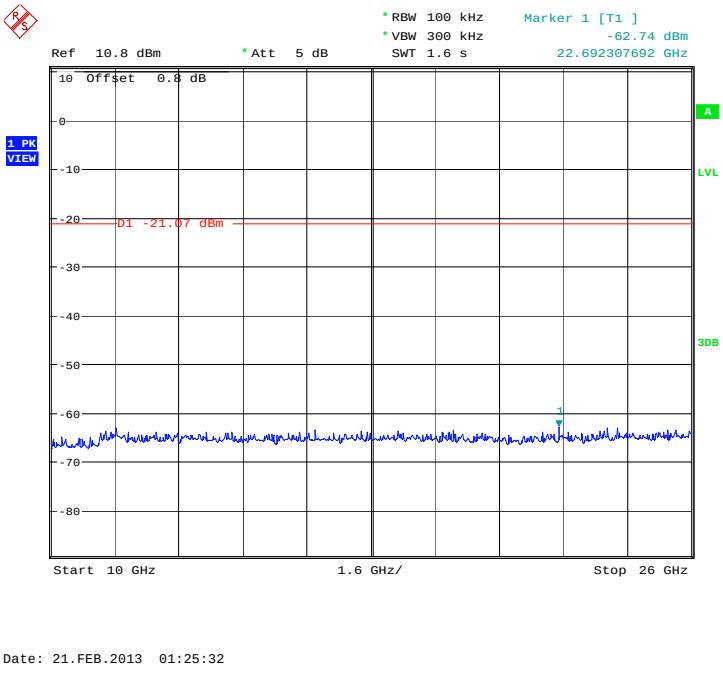


Fig.12. Conducted spurious emission: GFSK, 2440 MHz, 10GHz – 26GHz

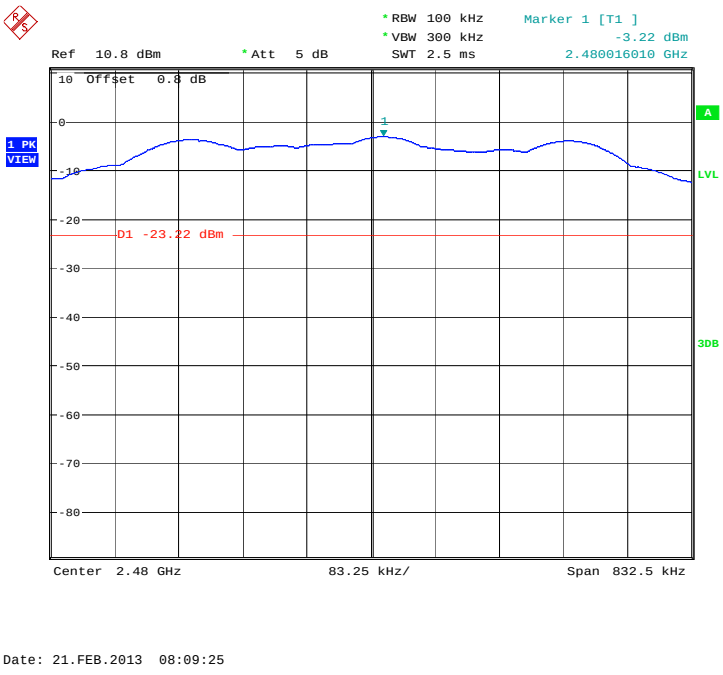


Fig.13. Conducted spurious emission: GFSK, 2480 MHz

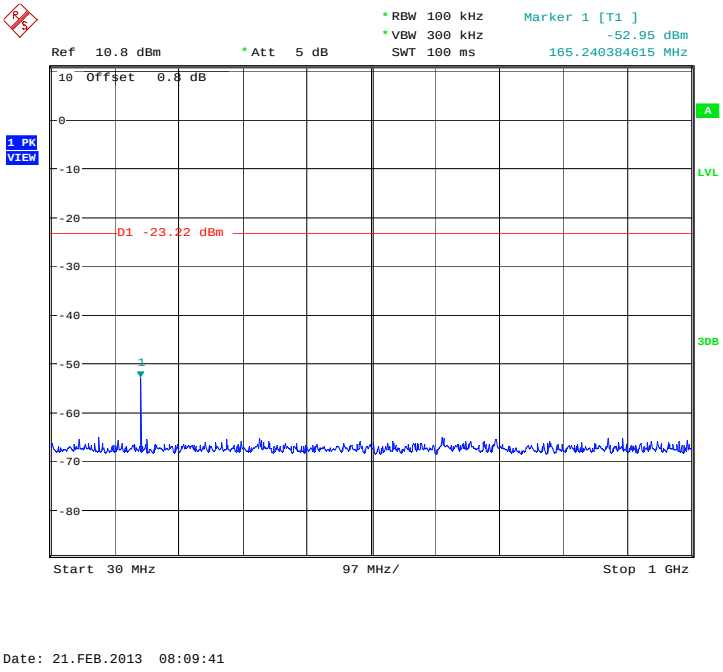


Fig.14. Conducted spurious emission: GFSK, 2480 MHz, 30MHz - 1GHz

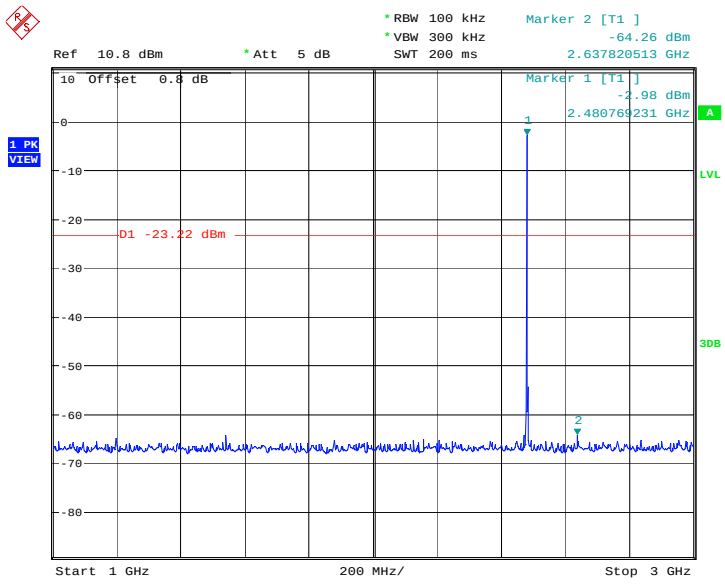


Fig.15. Conducted spurious emission: GFSK, 2480 MHz, 1GHz - 3GHz

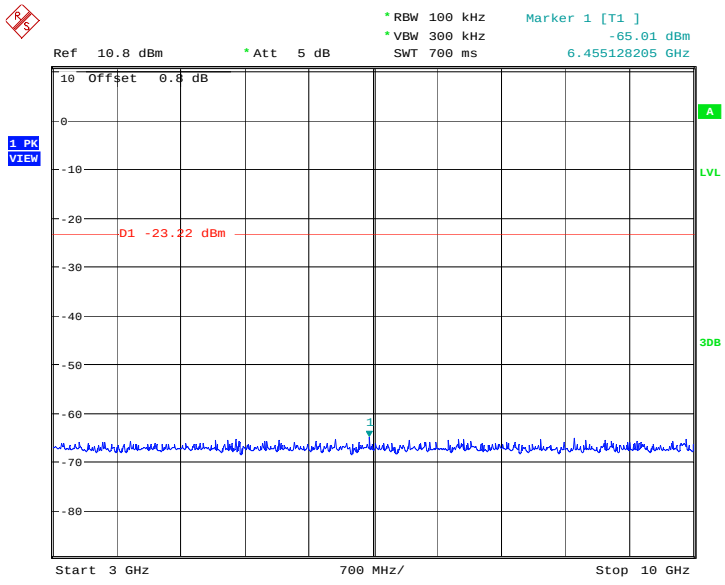


Fig.16. Conducted spurious emission: GFSK, 2480 MHz, 3GHz - 10GHz

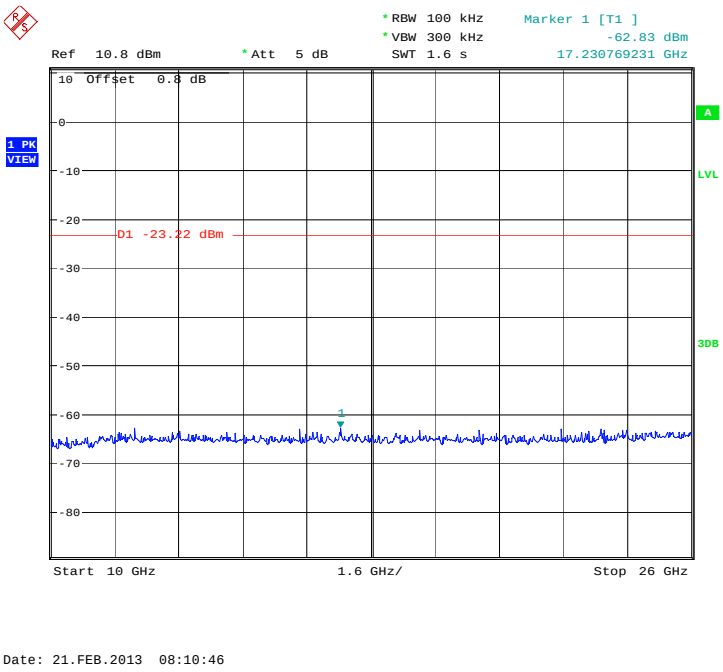


Fig.17. Conducted spurious emission: GFSK, 2480 MHz, 10GHz - 26GHz

A.5. Radiated Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209 RSS-210 A8.5	Listed as follows

Frequency (MHz) Field strength	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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 Public notice 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)
0.009-30	100KHz/300KHz	5
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:

Result=P_{Mea}+A_{Rpl}

For GFSK

Frequency	Frequency Range	Test Results	Conclusion
2402MHz	30 MHz ~ 1 GHz	Fig.18	P
	1 GHz ~ 3 GHz	Fig.19	P
	3 GHz ~ 18 GHz	Fig.20	P
2440 MHz	9 kHz ~ 30 MHz	Fig.21	P
	30 MHz ~ 1 GHz	Fig.22	P
	1 GHz ~ 3 GHz	Fig.23	P
	3 GHz ~ 18 GHz	Fig.24	P
2480 MHz	30 MHz ~ 1 GHz	Fig.25	P
	1 GHz ~ 3 GHz	Fig.26	P
	3 GHz ~ 18 GHz	Fig.27	P
Power	2.38GHz~2.4GHz---L	Fig.28	P
Power	2.45GHz~2.5GHz---H	Fig.29	P
For all channels	18 GHz ~ 26 GHz	Fig.30	P

Note: Only worst case result is given.

Conclusion: PASS

Test graphs as below:

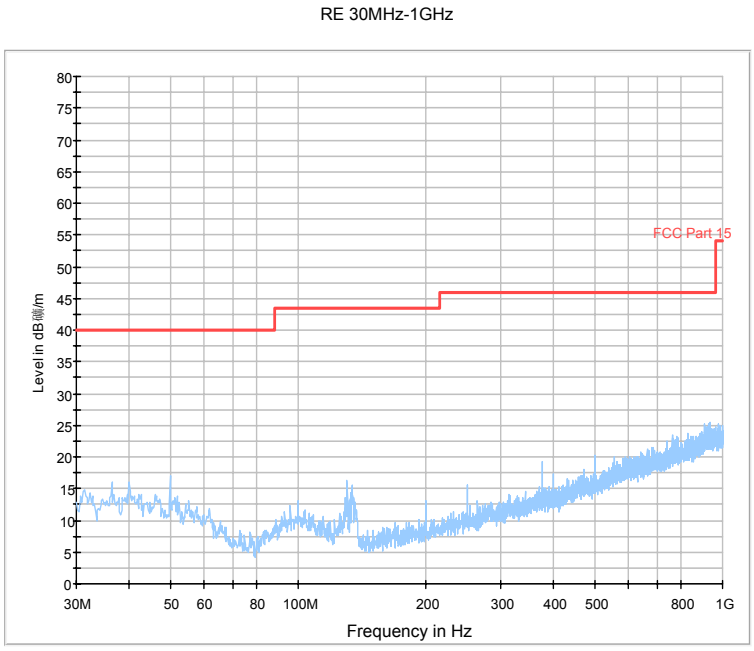


Fig.18. Radiated emission: GFSK, 2402MHz, 30 MHz - 1 GHz

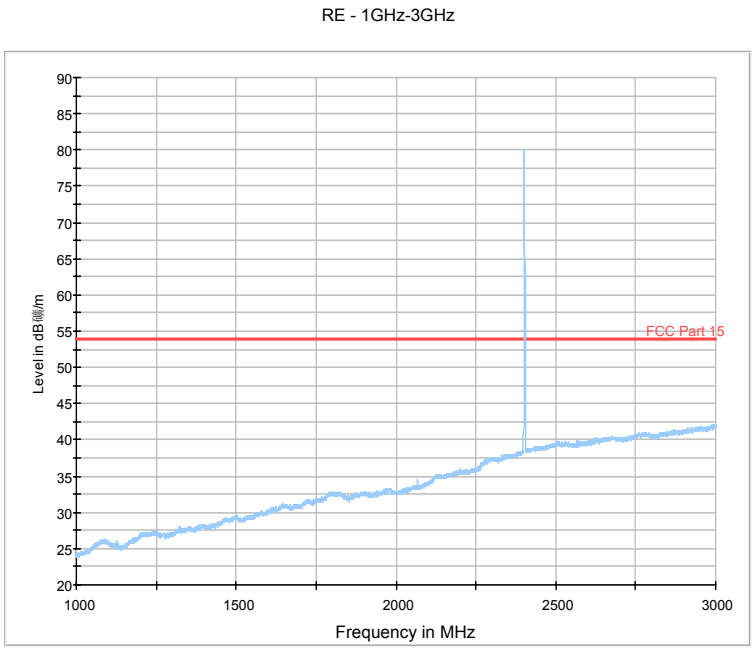


Fig.19. Radiated emission: GFSK, 2402MHz, 1 GHz - 3 GHz

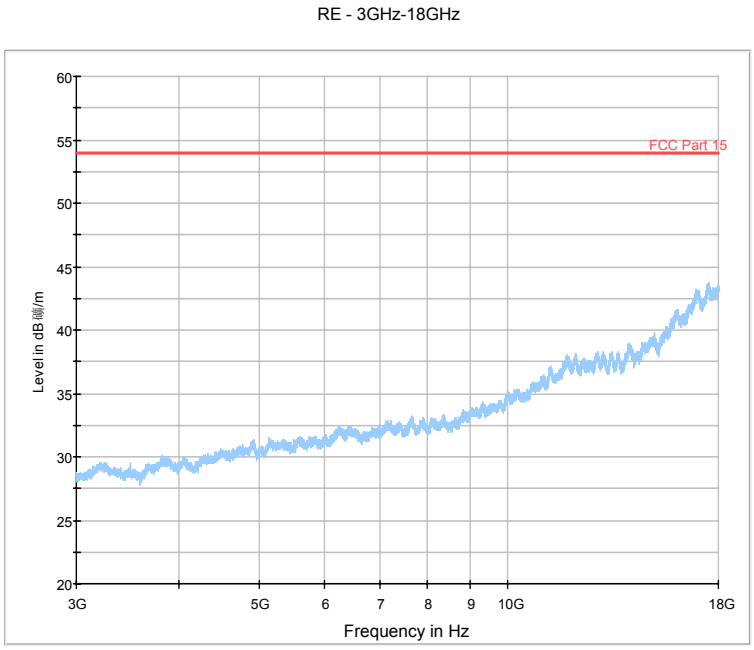


Fig.20. Radiated emission: GFSK, 2402MHz, 3 GHz - 18 GHz

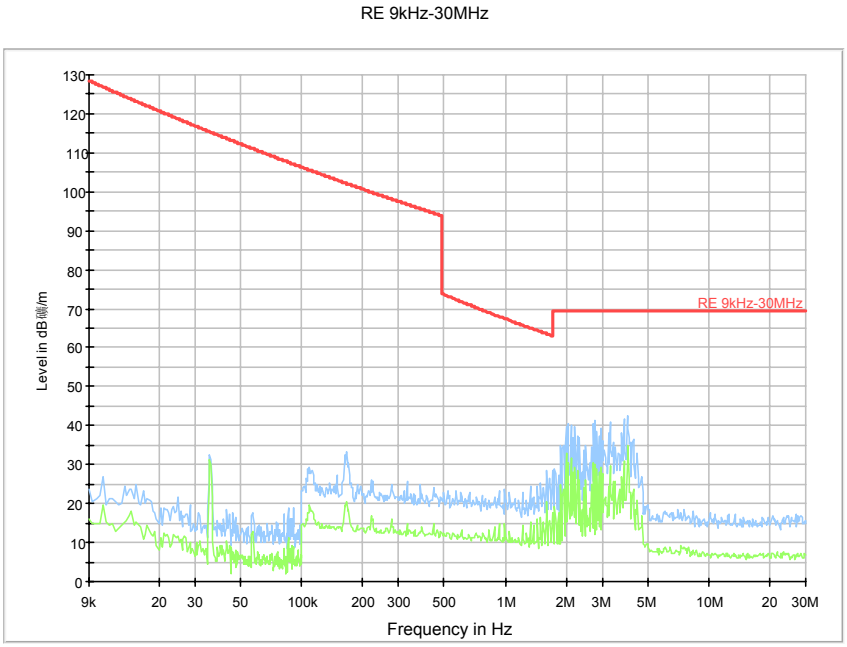


Fig.21. Radiated emission: GFSK, 2440MHz, 9 kHz - 30 MHz

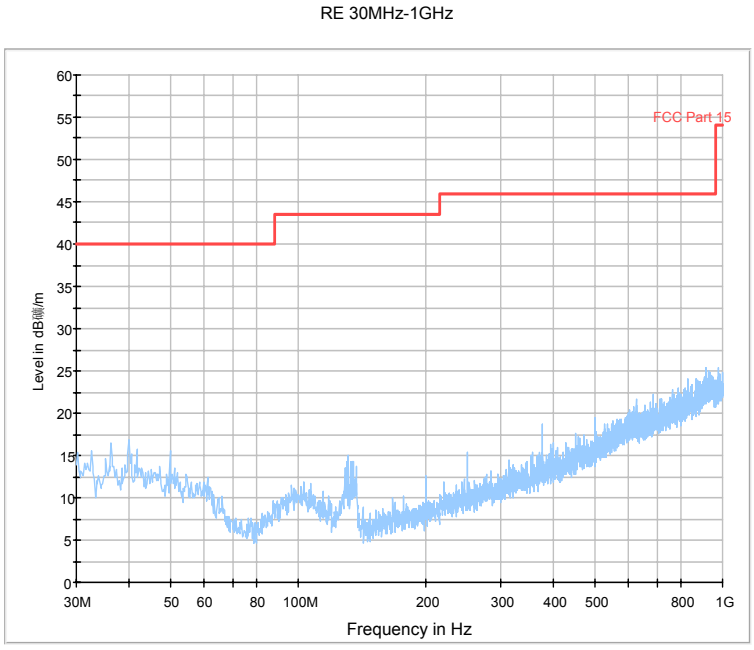


Fig.22. Radiated emission: GFSK, 2440MHz, 30 MHz - 1 GHz

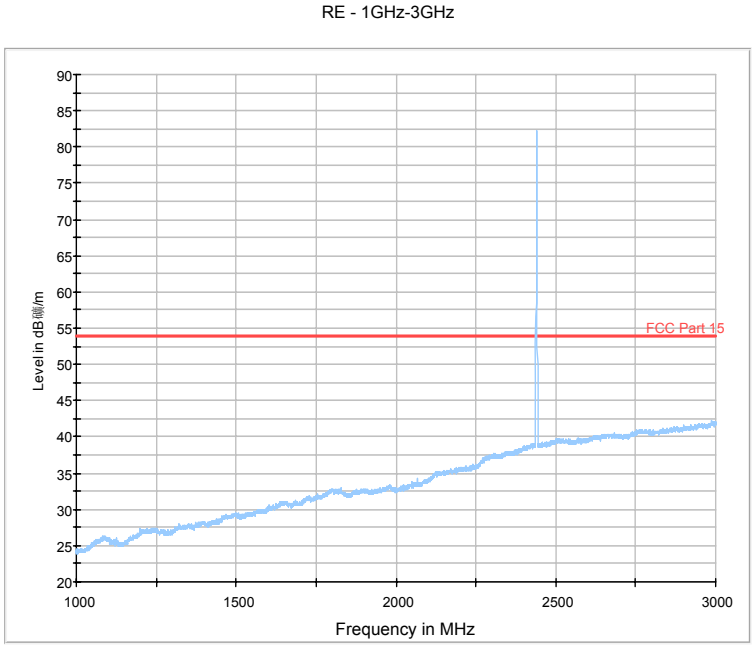


Fig.23. Radiated emission: GFSK, 2440MHz, 1 GHz - 3 GHz

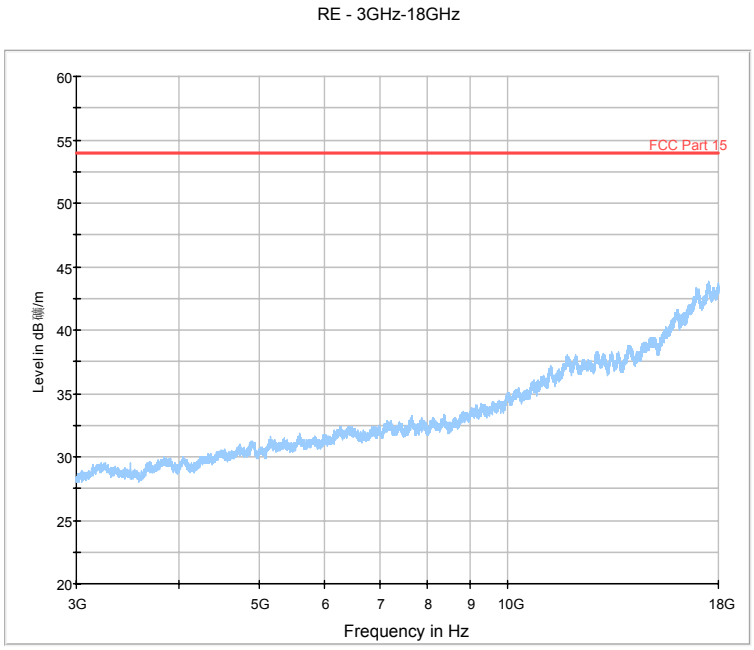


Fig.24. Radiated emission: GFSK, 2440MHz, 3 GHz - 18 GHz

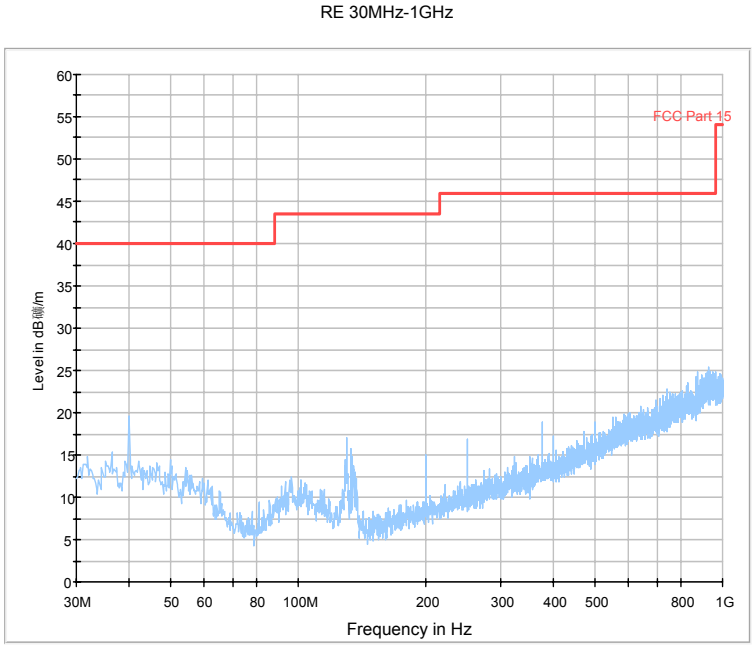


Fig.25. Radiated emission: GFSK, 2480MHz, 30 MHz - 1 GHz

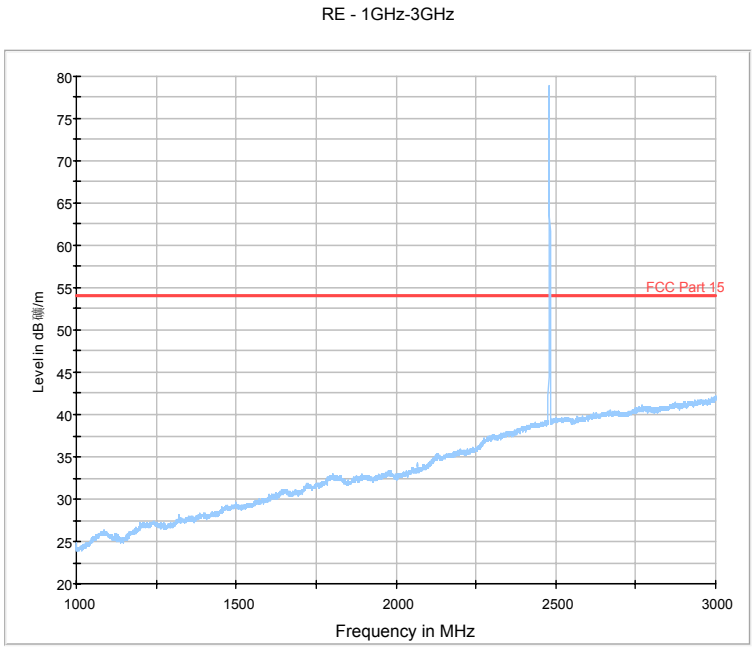


Fig.26. Fig.47 Radiated emission: GFSK, 2480MHz, 1 GHz - 3 GHz

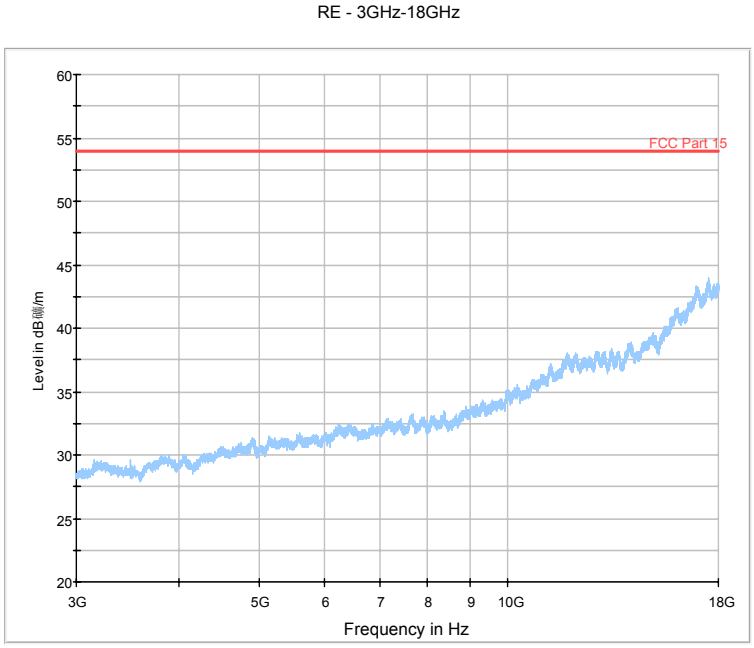


Fig.27. Radiated emission: GFSK, 2480MHz, 3 GHz - 18 GHz

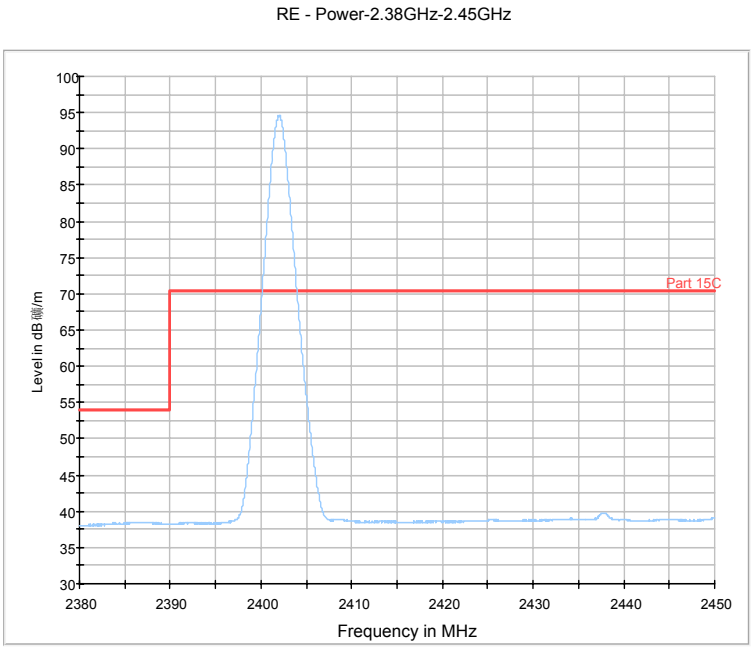


Fig.28. Radiated emission (Power): GFSK, low channel

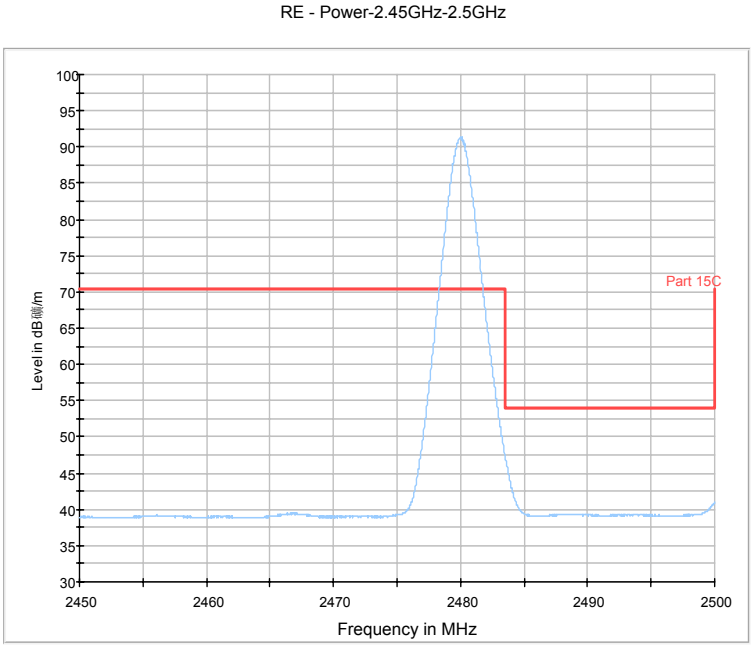


Fig.29. Radiated emission (Power) GFSK, high channel

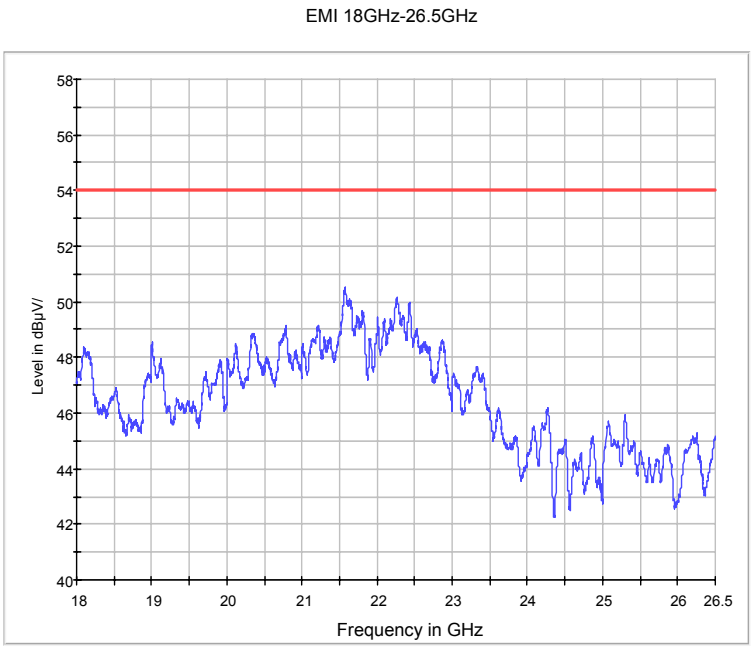


Fig.30. Radiated emission: GFSK, 18 GHz - 26 GHz

A.6. 6dB Bandwidth

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(2) RSS-210 A8.1	>= 500KHz

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

Measurement Condition：

RBW=10KHz; VBW=30KHz; SPAN=2MHz; Detector: peak

Measurement Results:

EUT ID: #23595

For GFSK

Channel	6dB Bandwidth (kHz)		Conclusion
2402MHz	Fig.31.	663.46	P
2440MHz	Fig.32.	644.23	P
2480MHz	Fig.33.	711.54	P

Measurement Uncertainty:±1.1KHz

Conclusion:PASS

Test graphs as below:

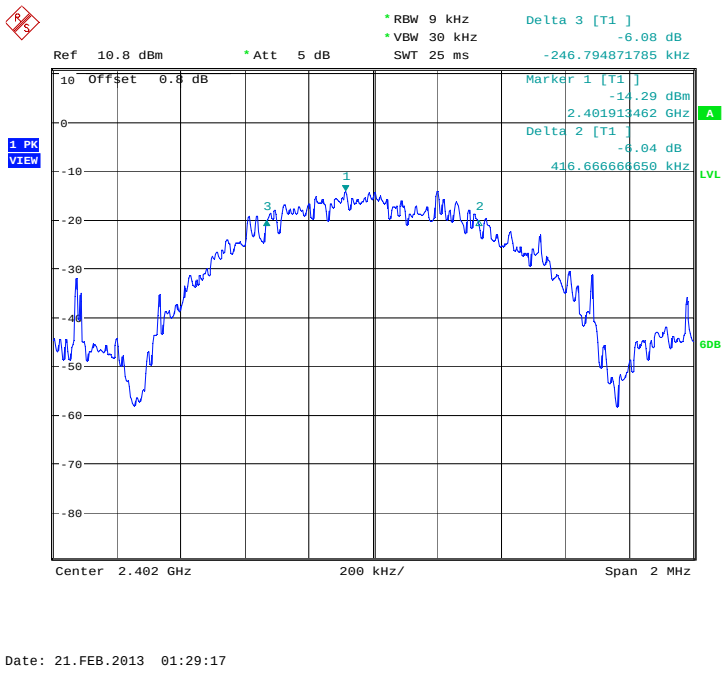


Fig.30. 6dB Bandwidth: GFSK, 2402 MHz

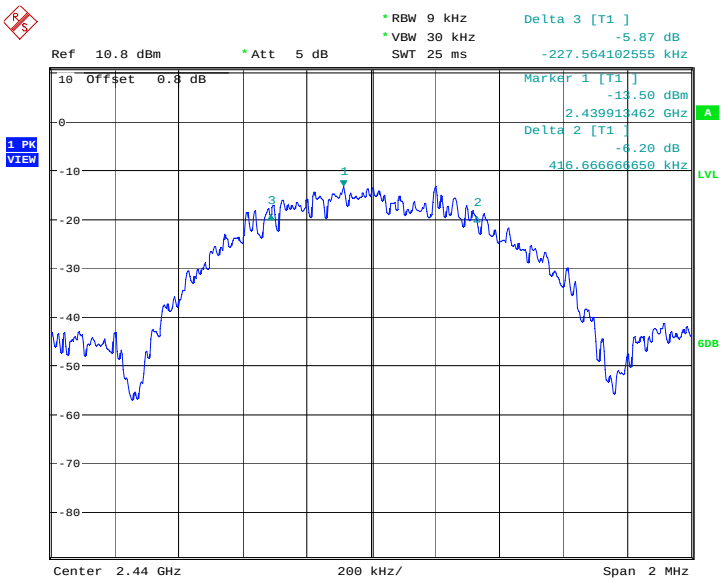


Fig.31. 6dB Bandwidth: GFSK, 2440 MHz

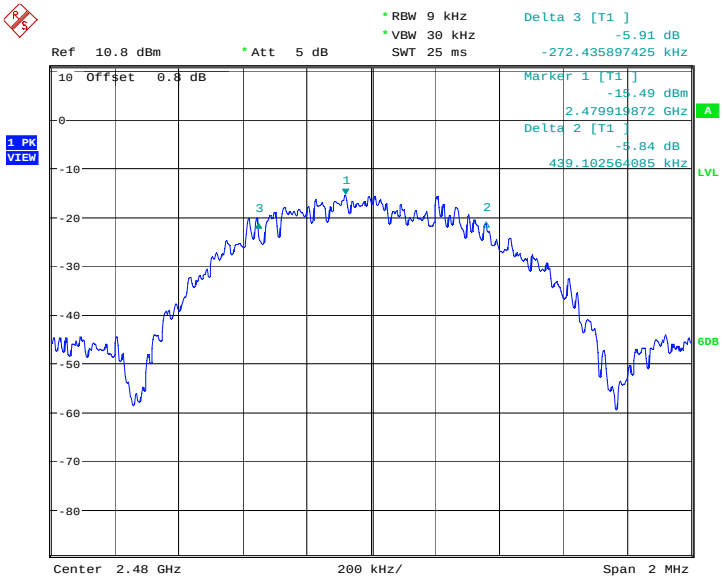


Fig.32. 6dB Bandwidth: GFSK, 2480 MHz

A.7. Maximum Power Spectral Density Level

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(e) RSS-210 A8.1	<=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 = 10log (3 kHz/100kHz = -15.2 dB)

Measurement Results:

EUT ID: #23595

For GFSK

Frequency	Maximum Power Spectral Density Level(dBm)		Conclusion
2402MHz	Fig.33.	-17.07	P
2440MHz	Fig.34.	-16.28	P
2480MHz	Fig.35.	-18.41	P

Test graphs as below:

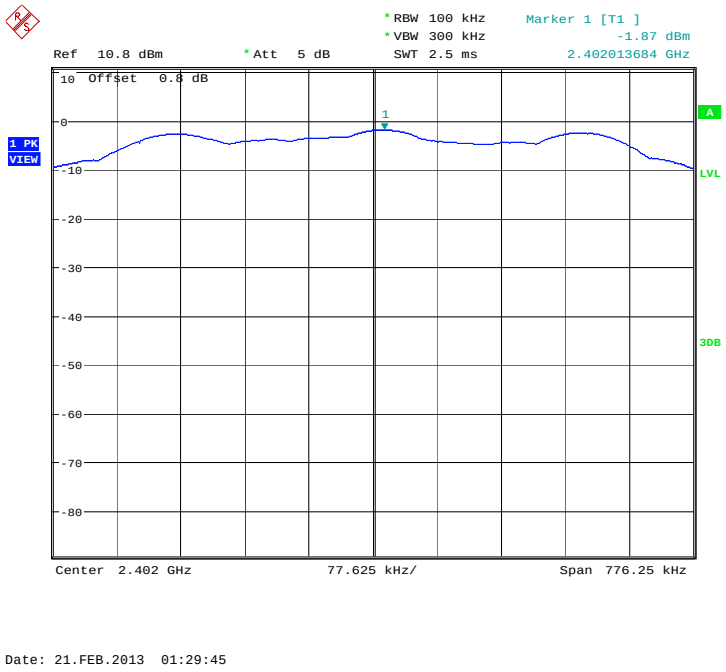


Fig.33. Maximum Power Spectral Density Level Function: GFSK, 2402 MHz

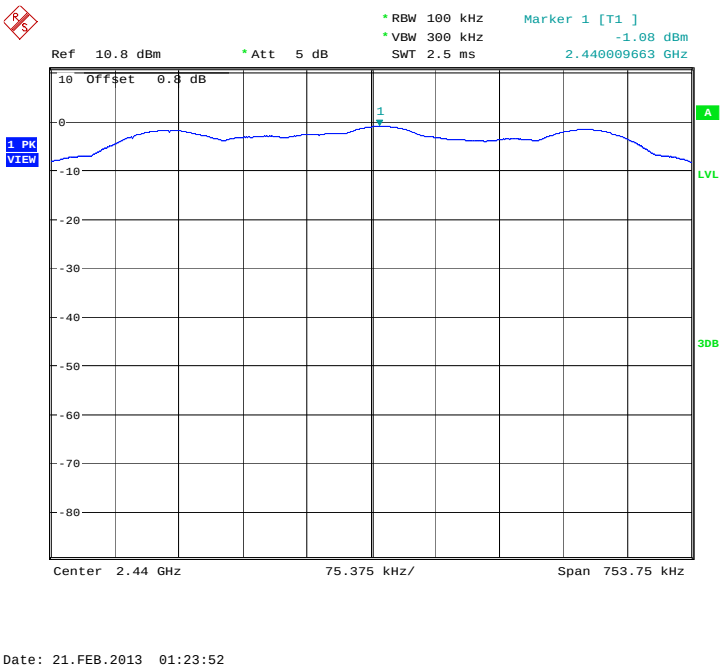


Fig.34. Maximum Power Spectral Density Level Function: GFSK, 2440 MHz

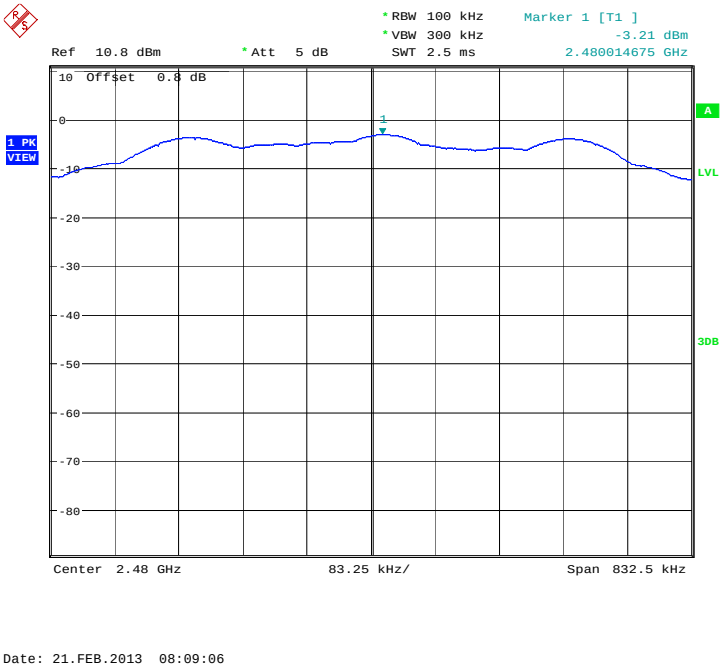


Fig.35. Maximum Power Spectral Density Level Function: GFSK, 2480 MHz

A.8. Time of Occupancy (Dwell Time)

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) (1)(iii) RSS-210 A8.1 (4)	< 400 ms

Measurement Condition：

RBW=1MHz; VBW=1MHz; SPAN=0; Detector: peak

Measurement Results:

EUT ID: #23595

For GFSK

Channel	Packet	Pulse Time(μs)		Conclusion
2440MHz	DH1	Fig.36	397.44	**P**

Time slot length: 625us

Number of channels: 40

Number of time slots per second: 1600/s

Number of transmitter's time slots per second: 1600/2/s

Max. number of transmissions per channel in 1s: 1600/2/s / 40 = 20

Period: Number of channels × 0.4s = 40× 0.4s = 16s

Max. number of transmissions per channel in 16s: 20 ×16 = 320

Dwell time = Pulse Time × number of transmission per channel in 16 seconds = 0.39744 × (1600/2/40) × 0.4 × 40 = 127.18 ms

See test graphs as following.

Conclusion: PASS

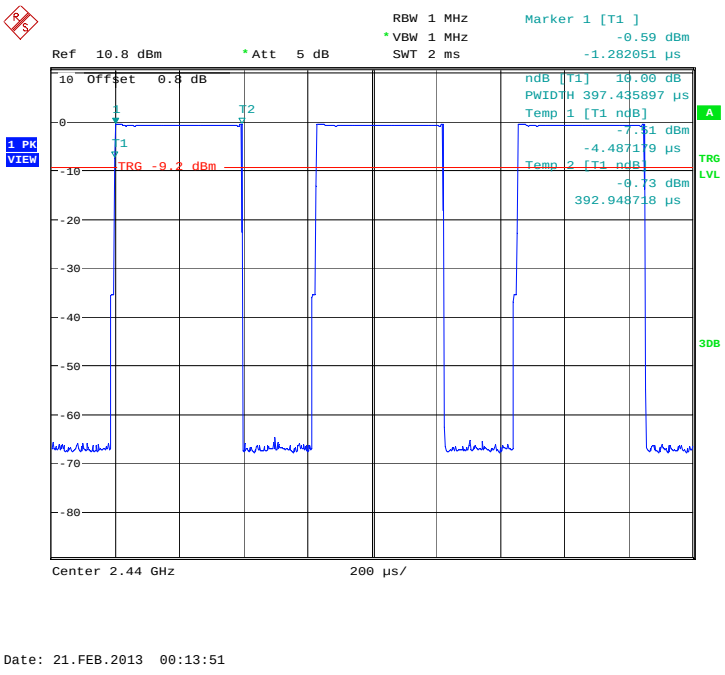


Fig.36. Pulse Time Measurement at 2440MHz

A.9. Carrier Frequency Separation

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(1) RSS-210 A8.1 (2)	over 25 kHz or (2/3) * 20dB bandwidth

Measurement Condition：

RBW=300KHz; VBW=300KHz; SPAN=6MHz; Detector: peak

Measurement Results:

EUT ID: #23595

For GFSK

Channel	Carrier frequency separation (kHz)		Conclusion
2440MHz	Fig.37	2000.00	**P**

See test graphs as following.

Conclusion: PASS

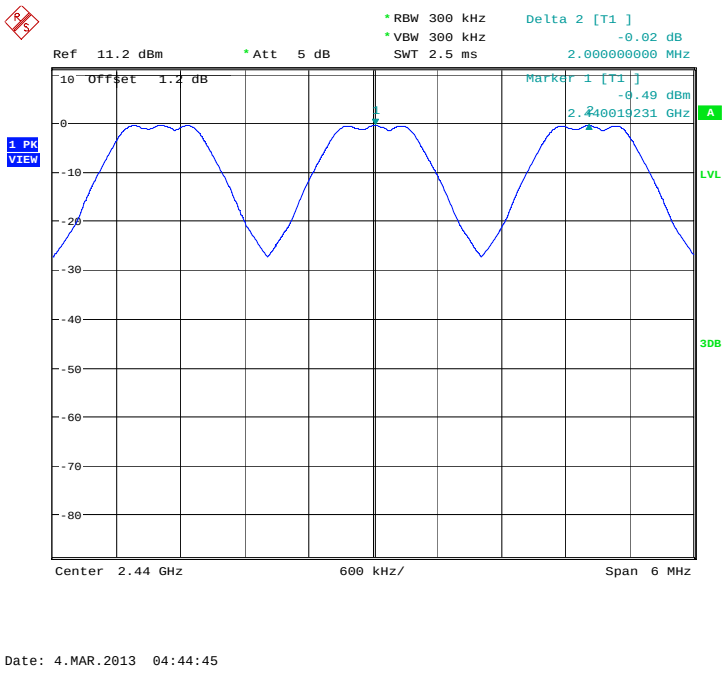


Fig.37. Carrier frequency separation

A.10. Number of Hopping Channels

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(1) RSS-210 A8.1 (4)	At least 15 non-overlapping channels

Measurement Condition：

RBW=500KHz; VBW=500KHz; Start Frequency=2400MHz; Stop Frequency=2485MHz; Detector: peak

Measurement Results:

EUT ID: #23595

For GFSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.38	40	**P**

Conclusion: Pass

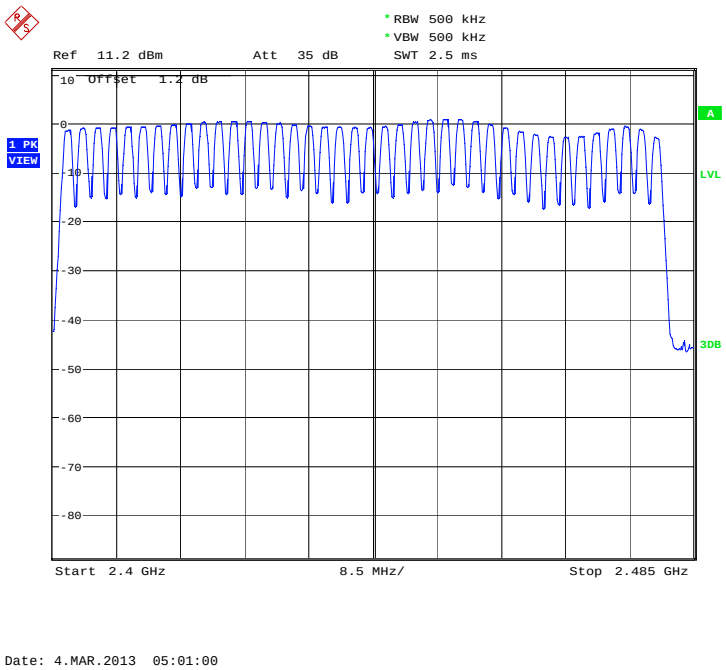


Fig.38. Number of hopping frequencies, Channel 0 ~39

A.11. 20dB Bandwidth

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(1) RSS-210 A8.5	Bandwidth < 3/2 * Channel spacing

Measurement Condition：

RBW=30KHz; VBW=30KHz; SPAN = 2MHz; Detector:peak

Measurement Results:

EUT ID: #23595

For GFSK

Channel	20dB Bandwidth (kHz)		Conclusion
2402MHz	Fig.39.	1137.82	**P**
2440MHz	Fig.40.	1137.82	**P**
2480MHz	Fig.41.	1137.82	**P**

Conclusion:PASS

Test graphs as below:

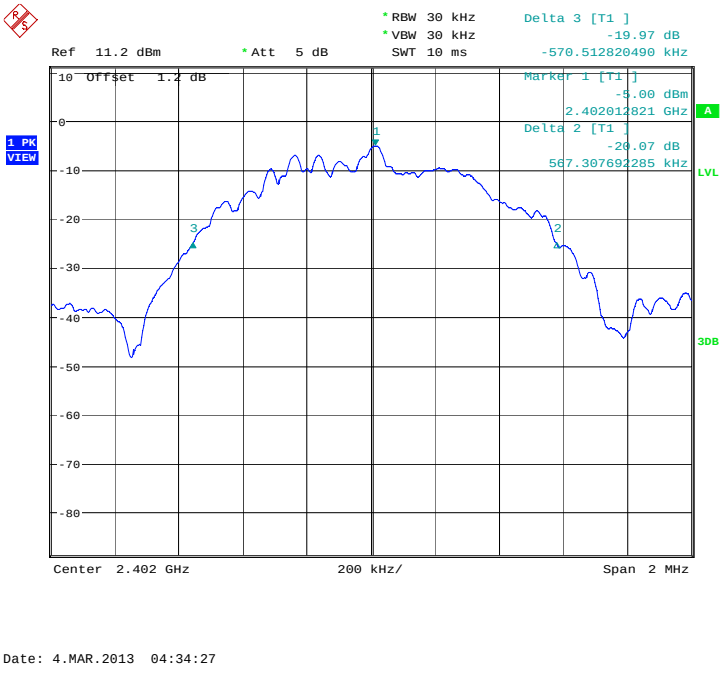


Fig.39. 20dB Bandwidth: GFSK, 2402 MHz

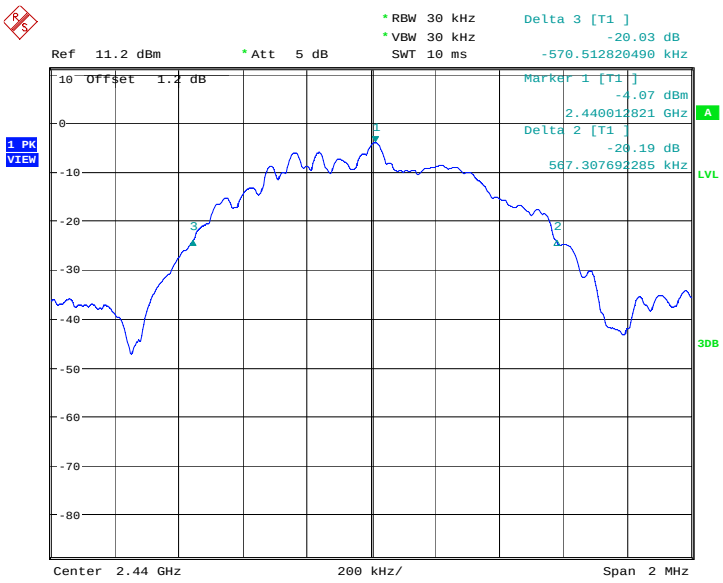


Fig.40. 20dB Bandwidth: GFSK, 2440 MHz

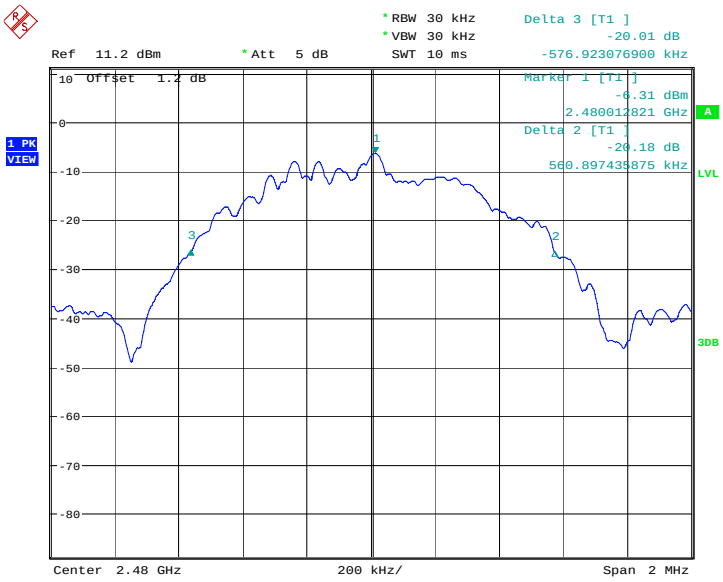


Fig.41. 20dB Bandwidth: GFSK, 2480 MHz

A.12. AC Powerline Conducted Emission

Test Condition

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

EUT ID: #23593

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With Charger		
0.15 to 0.5	66 o 56	Fig.42. (TX Mode)	Fig.43. (Idle Mode)	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 (dBμV)	Result (dBμV)		Conclusion
		With Charger		
0.15 to 0.5	56 to 46	Fig.42 (TX Mode)	Fig.43 (Idle Mode)	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

Note: the graphic result above is the maximum of the measurements for both phase line and neutral line.

Conclusion: PASS

Test graphs as below:

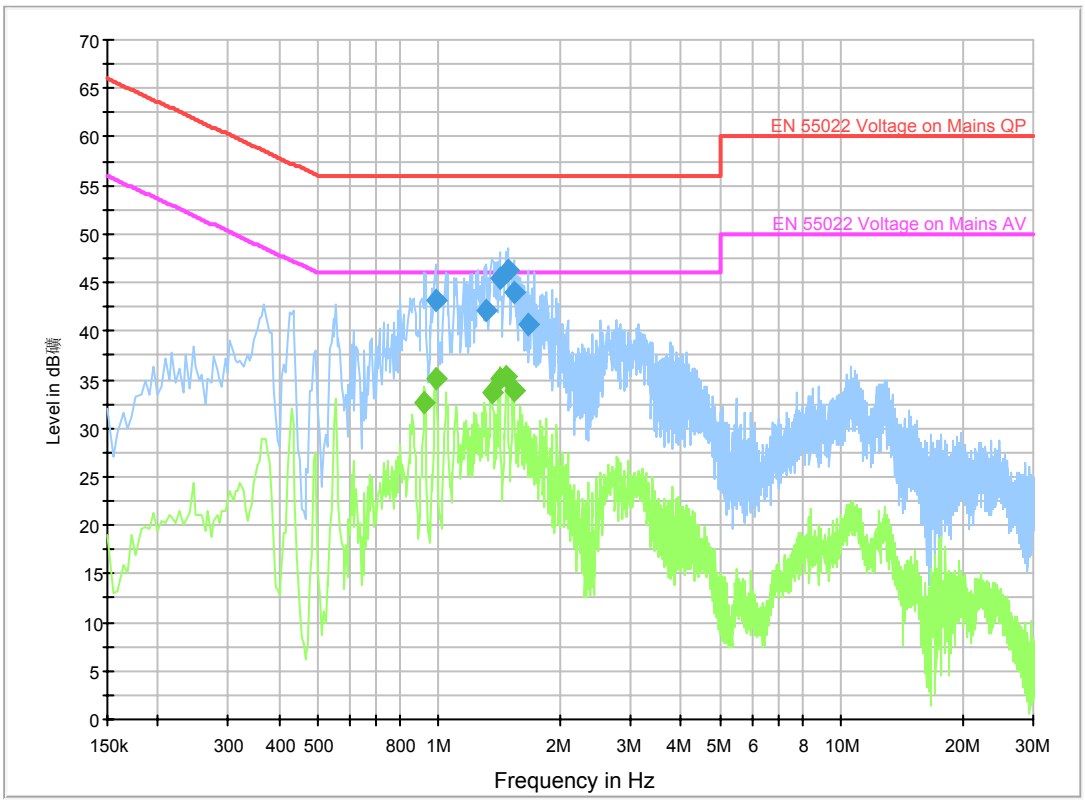


Fig.42 AC Powerline Conducted Emission with charger-TX Mode

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.982500	43.2	GND	L1	10.0	12.8	56.0
1.306500	42.1	GND	L1	10.0	13.9	56.0
1.414500	45.4	GND	L1	10.0	10.6	56.0
1.482000	46.3	GND	L1	10.0	9.7	56.0
1.531500	44.0	GND	L1	10.0	12.0	56.0
1.662000	40.7	GND	L1	10.0	15.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.919500	32.6	GND	L1	10.0	13.4	46.0
0.982500	35.2	GND	L1	10.0	10.8	46.0
1.351500	33.6	GND	L1	10.0	12.4	46.0
1.414500	35.1	GND	L1	10.0	10.9	46.0
1.473000	35.2	GND	L1	10.0	10.8	46.0
1.531500	34.0	GND	L1	10.0	12.0	46.0

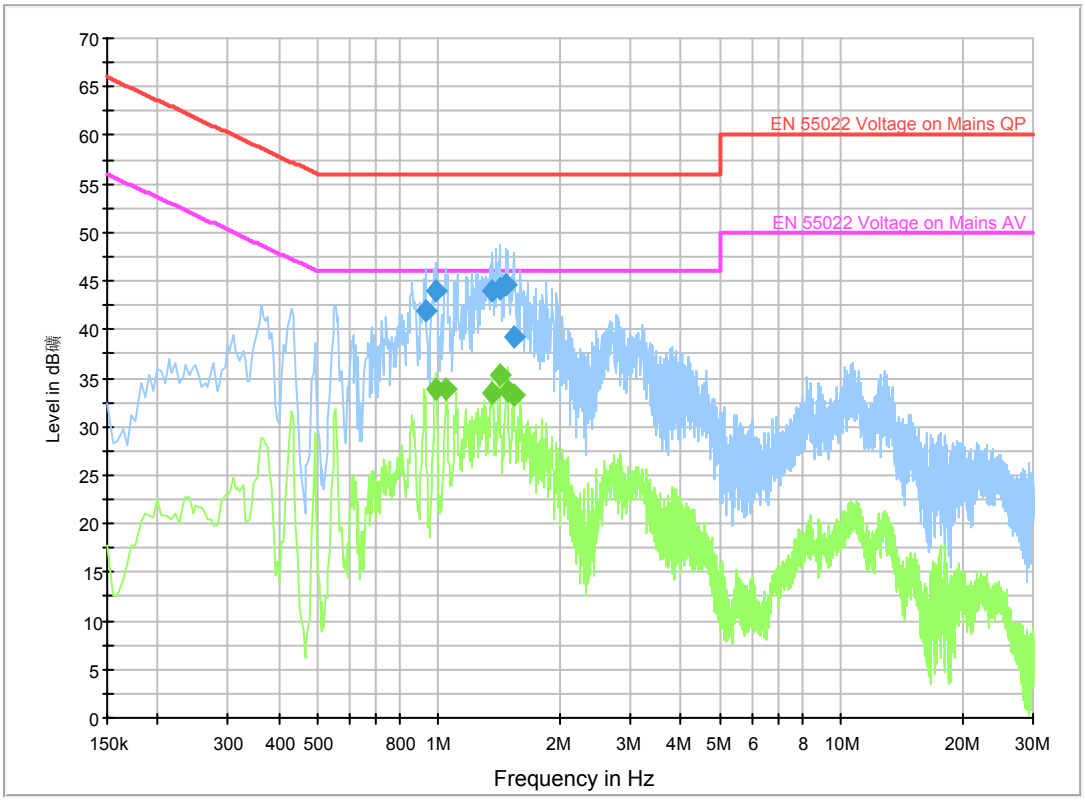


Fig.43 AC Powerline Conducted Emission with charger-Idle Mode

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.928500	42.0	GND	L1	10.0	14.0	56.0
0.987000	44.1	GND	L1	10.0	11.9	56.0
1.360500	44.1	GND	L1	10.0	11.9	56.0
1.423500	44.1	GND	L1	10.0	11.9	56.0
1.473000	44.5	GND	L1	10.0	11.5	56.0
1.531500	39.2	GND	N	10.0	16.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.987000	33.8	GND	L1	10.0	12.2	46.0
1.045500	33.8	GND	L1	10.0	12.2	46.0
1.360500	33.5	GND	L1	10.0	12.5	46.0
1.414500	35.3	GND	L1	10.0	10.7	46.0
1.482000	33.8	GND	L1	10.0	12.2	46.0
1.540500	33.2	GND	L1	10.0	12.8	46.0

A.13 Receiver Radiation Emission

Reference

FCC: CFR Part 15.109, 2.1053/ RSS-Gen *7.2.2*

A.13.1 Method of Measurement

The measurement procedure in ANSI C64.4-2003 is used. The EUT is placed on a 80cm height non-conductive table locating on the center of turntable. From 30MHz-1GHz, the measurement distance is 10m. For frequency range above 1GHz, the measurement distance is 3m.

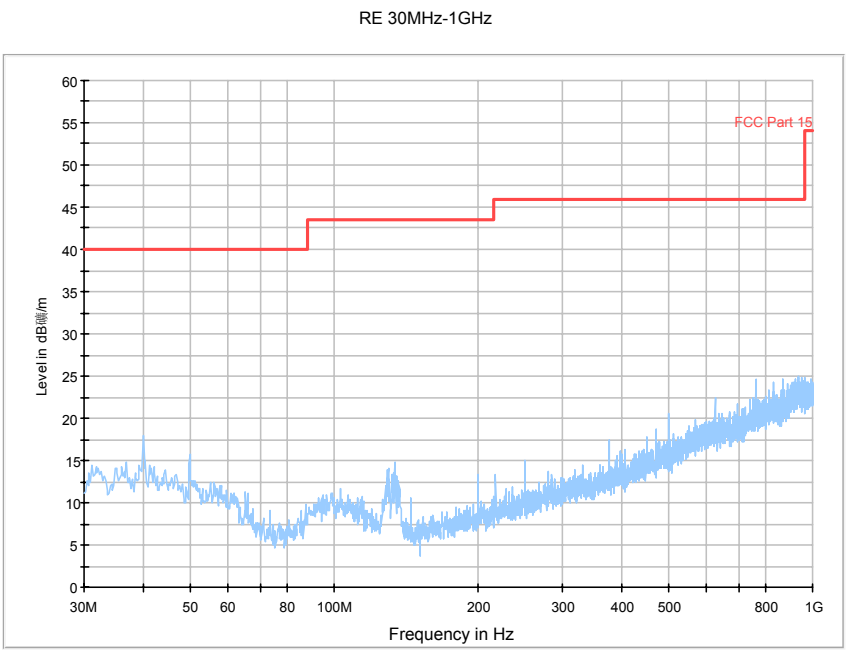
The EUT is measured with travel charger and the operating mode is idle without CMU200's signaling.

A.13.2 Method of Measurement

Frequency of Emission (MHz)	Limit (dBμV/m)	Measurement Distance (m)
30-88	30	10
88-216	33.5	10
216-960	36	10
960-1000	44	10
>1000	54	3

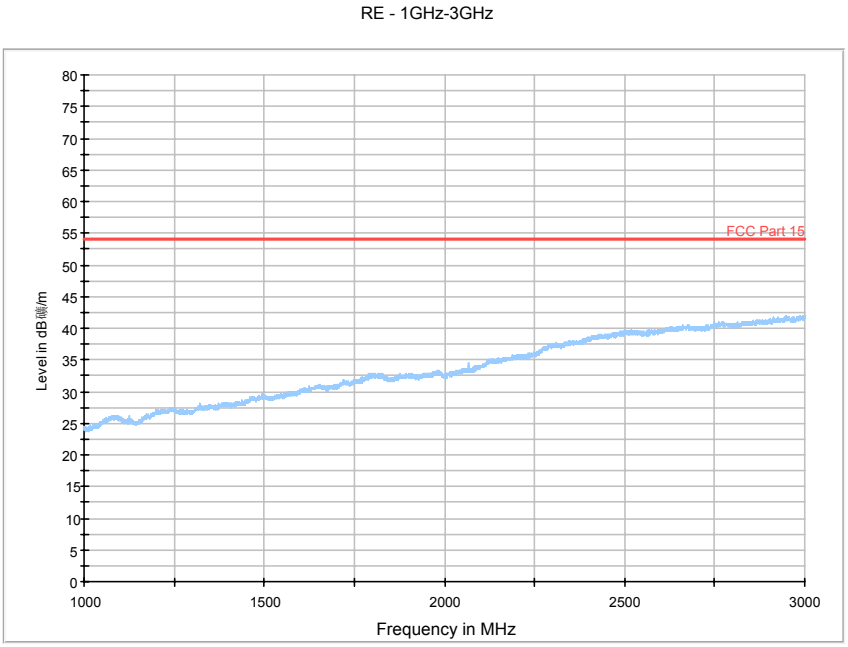
A. 13.3 Measurement results

IF bandwidth: 120 kHz



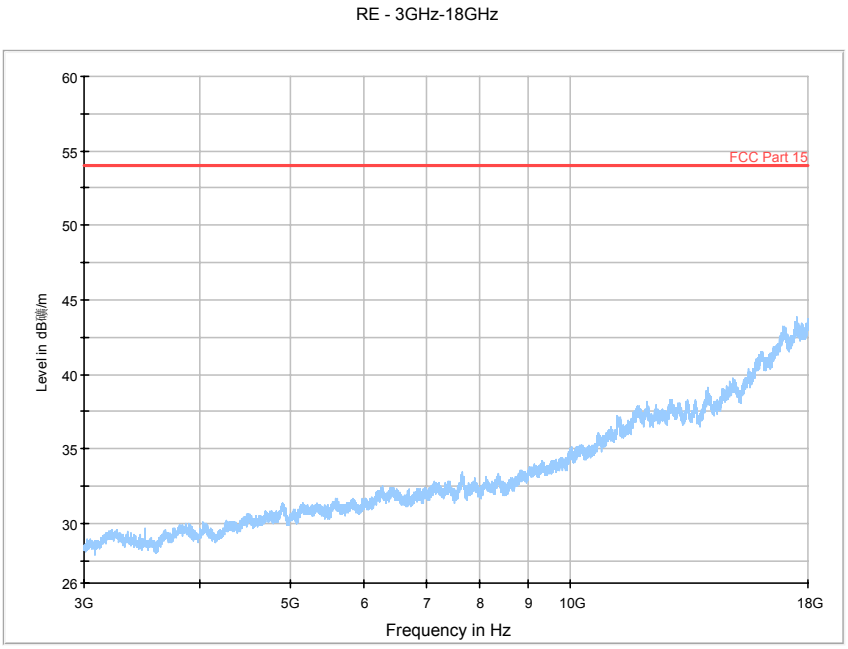
Idle Mode: 30MHz-1GHz

RBW / VBW 1 MHz



Idle Mode: 1GHz-3GHz

RBW / VBW 1 MHz



Idle Mode: 3GHz-18GHz

ANNEX B: Photographs of the Test Set-up

Photo 1:

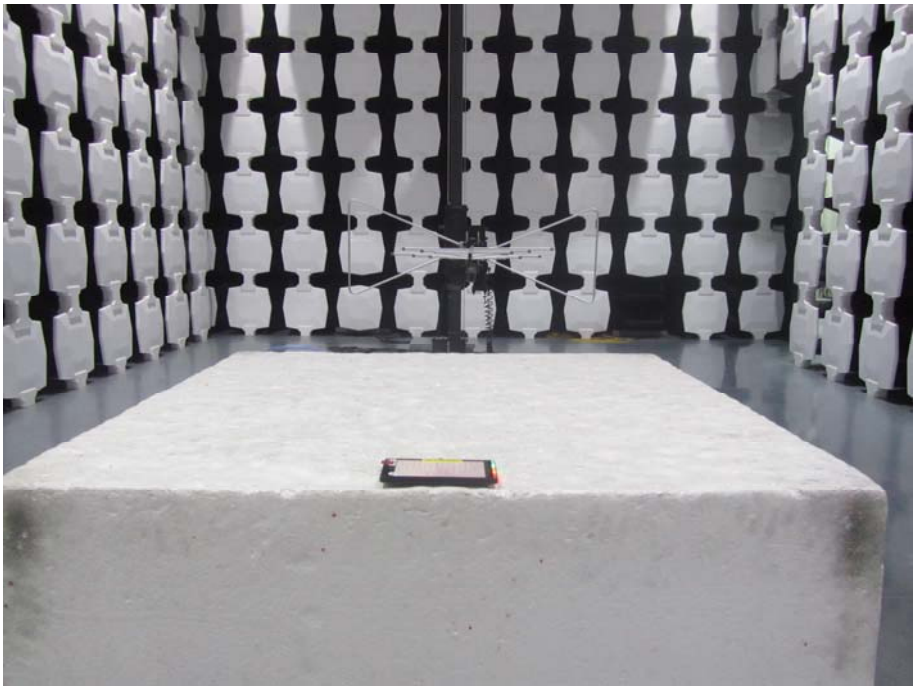
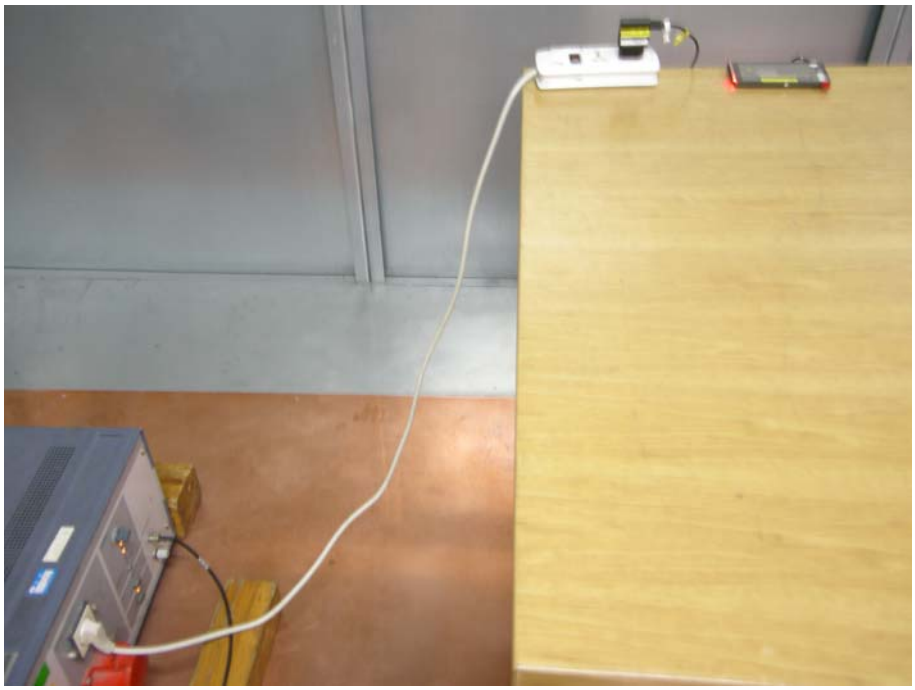


Photo 2:



ANNEX C: Photographs of the EUT

Mobile Phone

Mobile Phone

Mobile Phone

Mobile Phone

Mobile Phone

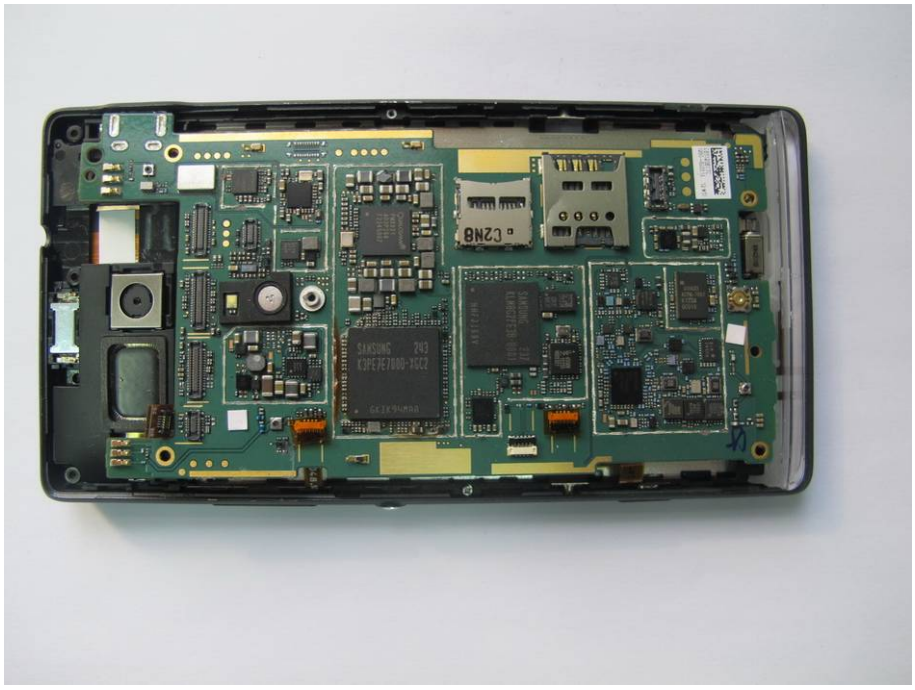
Mobile Phone

Mobile Phone

Label of Mobile Phone

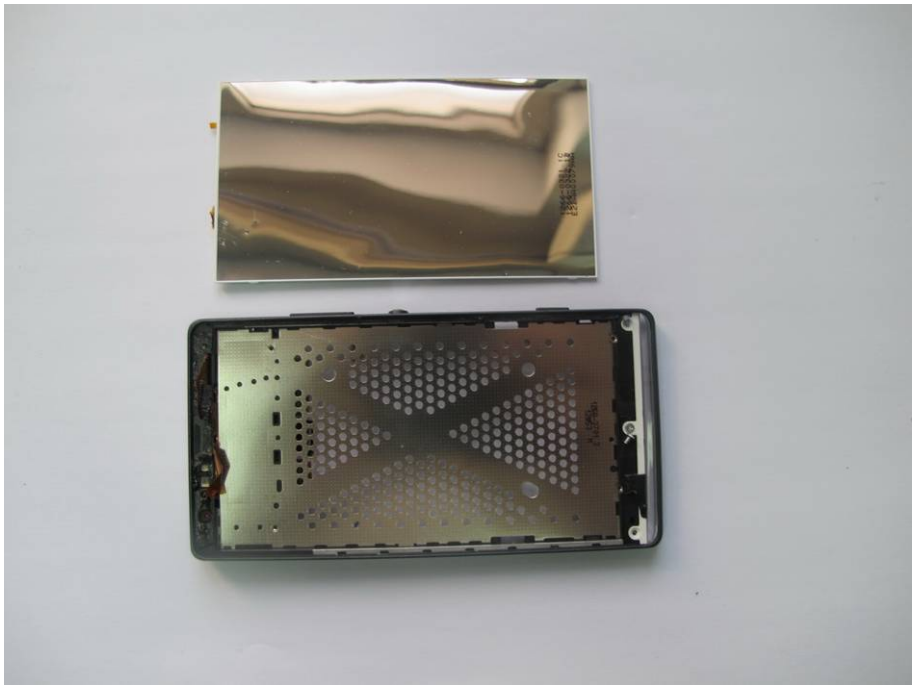
Mobile Phone Disassembly

Mobile Phone Disassembly

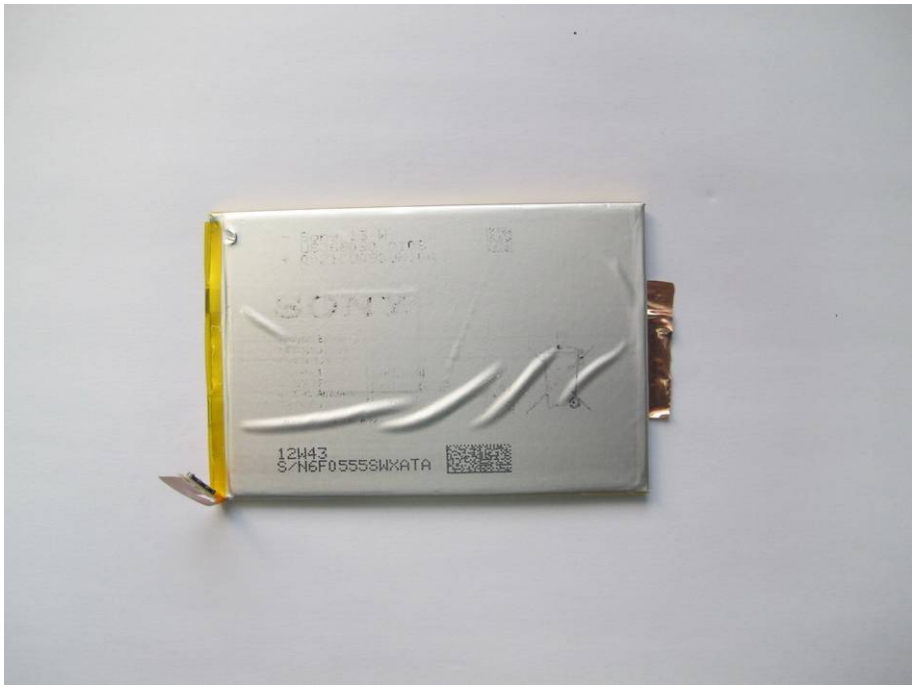


Mobile Phone Disassembly

Mobile Phone Disassembly



Mobile Phone Disassembly



Inbuilt Li-Polymer Battery

USB Cable

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