FCC/ISED RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

P765 Wireless Speaker System

ISSUED TO
One World Technologies, Inc.

1428 Pearman Dairy Rd., Anderson, SC 29625, United States

Tested by: Cao Shaodong (Engineer)
Date: Feb. 22, 2017

Approved by: Wei Yanquan (Chief Engineer)
Date: Feb. 22, 2017

Report No.:	BL-SZ1710163-602
EUT Name:	P765 Wireless Speaker System
Model Name:	P760
Brand Name:	N/A
Test Standard:	47 CFR Part 15 Subpart C
FCC ID:	VMZP760
ISED Number:	9880A-P760
Test conclusion:	Pass
Test Date:	Jan. 15, 2017 ~ Jan. 24, 2017
Date of Issue:	Feb. 22, 2017

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Revision History

Version	Issue Date	Revisions
Rev. 01	Feb. 17, 2017	Initial Issue
Rev. 02	Feb. 22, 2017	List the cable information in section 4.2.

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20 to 25℃
Ambient Relative Humidity	45% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

(1) The test report reference to the report template version v2.0.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	One World Technologies, Inc.
Address	1428 Pearman Dairy Rd., Anderson, SC 29625, United States

2.2 Manufacturer Information

Manufacturer	One World Technologies, Inc.
Address	1428 Pearman Dairy Rd., Anderson, SC 29625, United States

2.3 Factory Information

Factory	Zhao Yang Electronic（Shenzhen）Co., Ltd.
Address	Building 2,De Yong Jia Industrial Park, Guang Qiao Road, Yu Lv Community, Gong Ming Street, Guang Ming New District, Shenzhen, 518132, P.R.China

2.4 General Description for Equipment under Test (EUT)

EUT Name	P765 Wireless Speaker System
Model Name Under Test	P760
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A
Network and Wireless connectivity	Bluetooth 4.1, 2.4G ISM Band(GFSK modulation)

2.5 Ancillary Equipment

Ancillary Equipment 1	Charger 1	
	Brand Name	Ten Pao
	Model Name	S024AMU1800130
	Rated Input	100-240 V ~, 50/60 Hz, 0.6 A
	Rated Output	18 V ⎓, 1.3 A

2.6 Technical Information

The requirement for the following technical information of the EUT was tested in this report:

Modulation Technology	FHSS
Modulation Type	GFSK
Transfer Rate	2 Mbps
Frequency Range	The frequency range used is 2400 MHz to 2483.5 MHz
Number of channel	49 (See note 1)
Tested Channel	Low channel (2.4035 GHz), Middle channel(2.4404 GHz), High channel (2.4773 GHz)
Antenna Type	PIFA Antenna
Antenna Gain	3.4 dBi (All involve the antenna gain test item, has been included in the final results)
Adaptive or non-adaptive	non-adaptive
The Max RF Output power	18.27 dBm
About the Product	The equipment is P765 Wireless Speaker System, it contains Bluetooth and 2.4G ISM Band (GFSK modulation). Only the 2.4G ISM Band (GFSK modulation) was tested in this report.

Channel List

Number	Frequency (GHz)	Number	Frequency (GHz)
1	**2.4035(Low)**	26	2.4420
2	2.4051	27	2.4435
3	2.4066	28	2.4450
4	2.4081	29	2.4466
5	2.4097	30	2.4481
6	2.4112	31	2.4496
7	2.4128	32	2.4512
8	2.4143	33	2.4527
9	2.4158	34	2.4543
10	2.4174	35	2.4558
11	2.4189	36	2.4573
12	2.4204	37	2.4589
13	2.4220	38	2.4604
14	2.4235	39	2.4619
15	2.4251	40	2.4635
16	2.4266	41	2.4650
17	2.4281	42	2.4666
18	2.4297	43	2.4681
19	2.4312	44	2.4696
20	2.4327	45	2.4712
21	2.4343	46	2.4727
22	2.4358	47	2.4742
23	2.4374	48	2.4758
24	2.4389	49	**2.4773(High)**
25	**2.4404(Middle)**		

Note 1: The modulation is GFSK with FHSS, there are total 49 channels (frequency range is 2.4035-2.4773 GHz). But in this report, the equipment select the lowest, middle and highest channel from 49 channels, Which are 2.4035 GHz, 2.4404 GHz and 2.4773 GHz. The more information please refer to the manufacturer's instructions.

2.7 Additional Instructions

EUT Software Settings:

Mode	☒ Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

EUT Software Settings:

Power level setup in software			
Test Software Version	Through the power button to switch channels		
Mode	Channel	Frequency (GHz)	Soft Set
GFSK	Low	2.4035	TX LEVEL is built-in set parameters and cannot be changed and selected.
	Middle	2.4404	
	High	2.4773	

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C (10-1-15 Edition)	Miscellaneous Wireless Communications Services
2	FCC PUBLIC NOTICE DA 00-705 (Mar. 30, 2000)	Filling and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
3	RSS-Gen (Issue 4, Nov. 2014)	General Requirements for Compliance of Radio Apparatus
4	RSS-247 (Issue 1, May 2015)	Digital Transmission Systems (DTSs), Frequency Hopping Systems(FHSs) and Licence-Exemp Local Area Network (LE-LAN) Devices
5	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	ISED Part No.	Test Result	Verdict
1	Antenna Requirement	15.203	RSS-247, 5.4 (6)	--	Pass Note 1
2	Number of Hopping Frequency	15.247(a)	RSS-247, 5.1 (4)	ANNEX A.1	Pass
3	Peak Output Power	15.247(b)	RSS-247, 5.4 (2)	ANNEX A.2	Pass
4	Occupied Bandwidth	15.247(a)	RSS-247, 5.1 (1)	ANNEX A.3	Pass
5	Hopping Frequency Separation	15.247(a)	RSS-247, 5.1 (2)	ANNEX A.4	Pass
6	Time of Occupancy (Dwell time)	15.247(a)	RSS-247, 5.1 (4)	ANNEX A.5	Pass
7	Conducted Spurious Emission& Authorized-band band-edge	15.247(d)	RSS-247, 5.5	ANNEX A.6	Pass
8	Conducted Emission	15.207	RSS-GEN, 8.8	ANNEX A.7	Pass
9	Radiated Spurious Emission	15.209 15.247(d)	RSS-247, 5.5	ANNEX A.8	Pass
10	Band Edge (Restricted-band band-edge)	15.209 15.247(d)	RSS-247, 5.5	ANNEX A.9	Pass
11	Receiver Spurious Emissions	--	RSS-Gen, 7.1.2	--	N/A Note 2

Note 1: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.

Note 2: Only radio communication receivers operating in stand-alone mode within the band 30-960 MHz, as well as scanner receivers, are subject to Industry Canada requirements, so this test is not applicable.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	45% - 55%	
Atmospheric Pressure	100 kPa - 102 kPa	
Temperature	NT (Normal Temperature)	20℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	18 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2016.07.13	2017.07.12
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	177746	2016.07.13	2017.07.12
Signal Generator	ROHDE&SCHWARZ	SMB100A	260592	2016.07.13	2017.07.12
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2016.07.13	2017.07.12
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2016.11.08	2017.11.07
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2016.07.05	2017.07.04
LISN	SCHWARZBECK	NSLK 8127	8127-687	2016.07.05	2017.07.04
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2016.07.13	2017.07.12
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2016.07.13	2017.07.12
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	18141664	2016.07.13	2017.07.12
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2016.07.13	2017.07.12
Test Antenna-Rod(9 kHz-30 MHz)	SCHWARZBECK	VAMP 9243	9243-556	2015.07.22	2017.07.21
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2015.07.22	2017.07.21
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2015.07.22	2017.07.21
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2015.07.22	2017.07.21
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2015.02.28	2017.02.27
Anechoic Chamber	EMC TECHNOLOGY LTD	21.1m*11.6m *7.35m	N/A	2016.08.09	2018.08.08
Shielded Enclosure	ChangNing	CN-130701	130703	--	--
Switch unit	Haiboer	BRITS-IMT-01	BL-BT-L014	2016.07.13	2017.07.12
SRD-Cable 1	N/A	N/A	BL-SRD-001	2016.07.13	2017.07.12

4.3 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

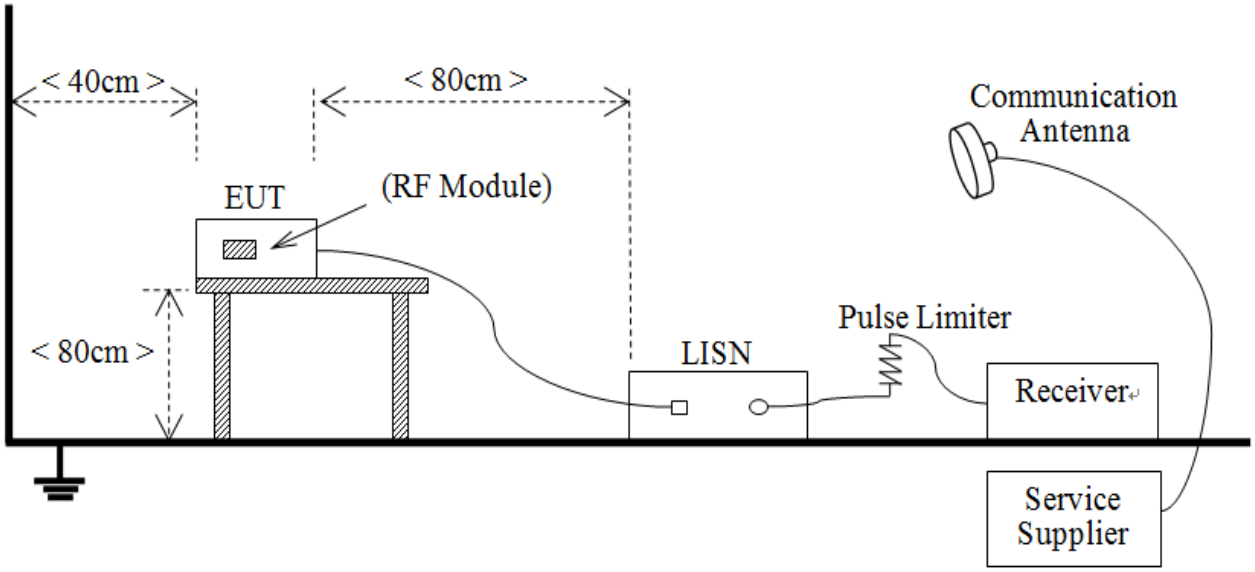
Measurement	Value
Occupied Channel Bandwidth	±4%
RF output power, conducted	±1.4 dB
Power Spectral Density, conducted	±2.5 dB
Unwanted Emissions, conducted	±2.8 dB
All emissions, radiated	±5.4 dB
Temperature	±1°C
Humidity	±4%

4.4 Description of Test Setup

4.4.1 For Antenna Port Test

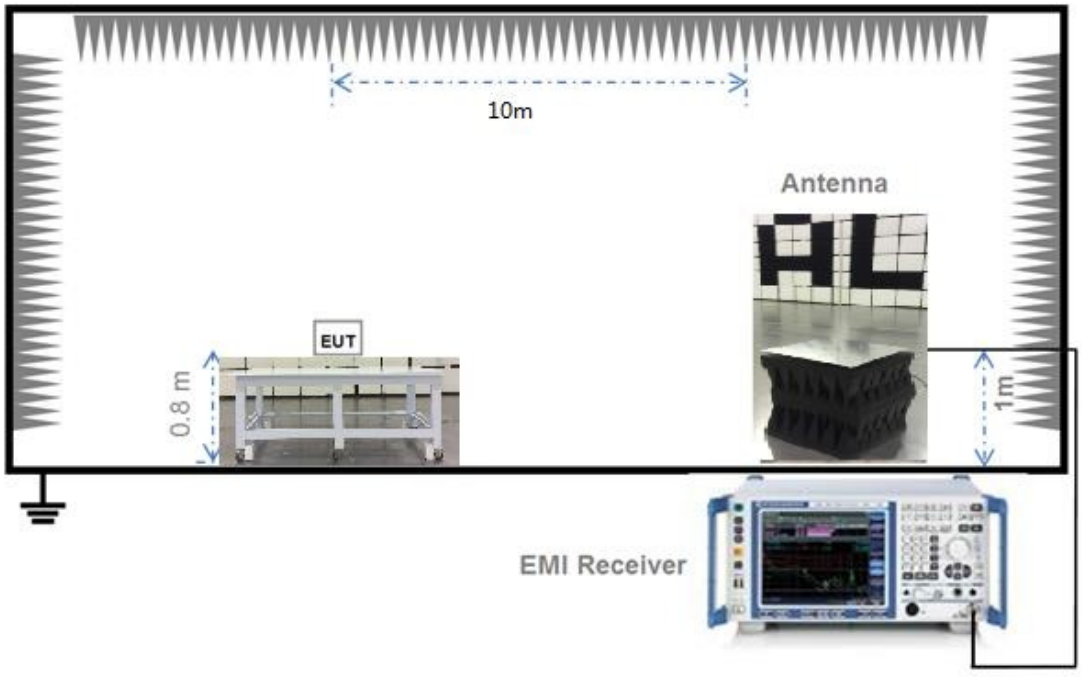
(Diagram 1)

4.4.2 For AC Power Supply Port Test



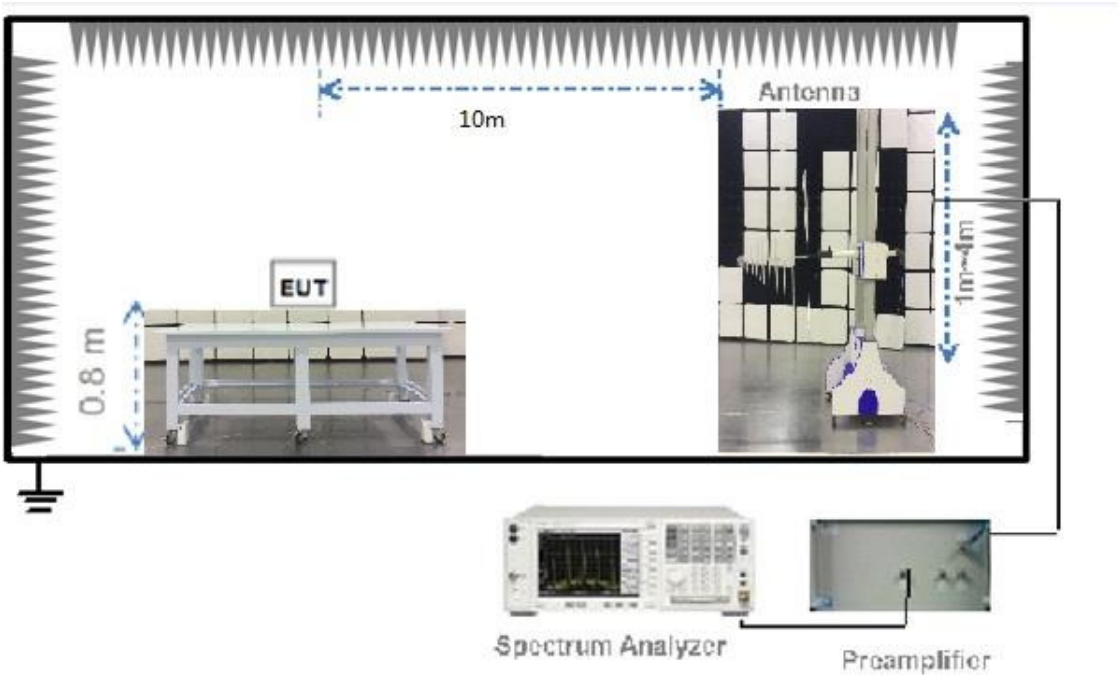
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



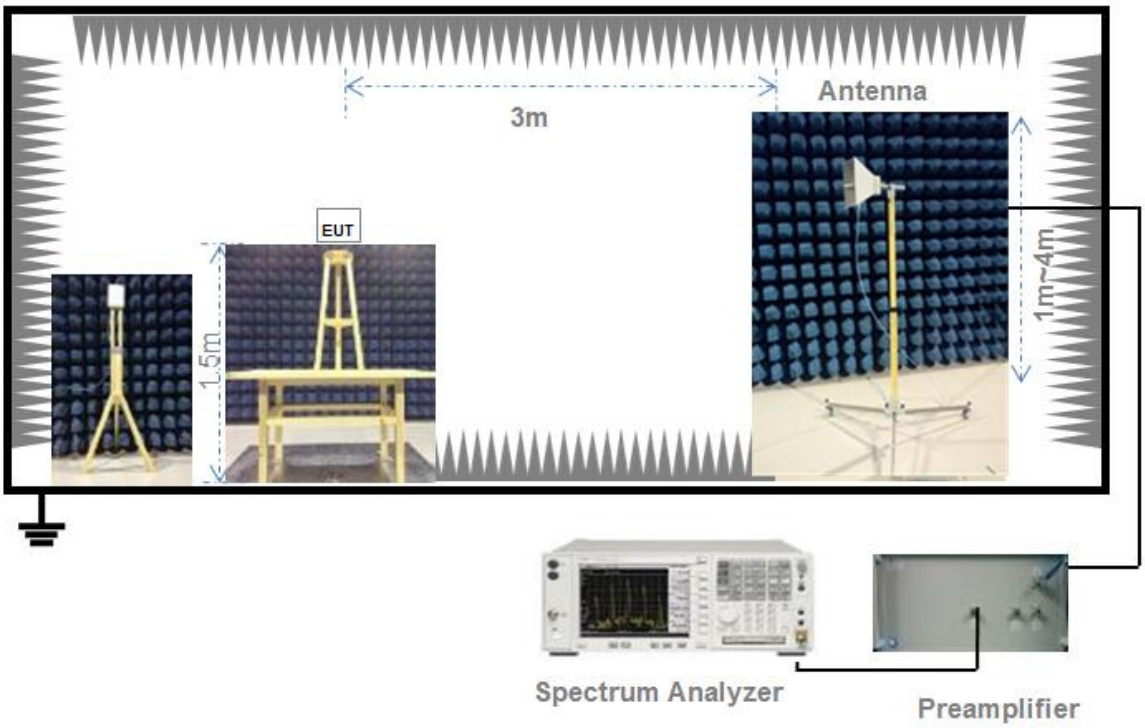
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

4.5 Measurement Results Explanation Example

4.5.1 For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.

4.5.2 For radiated band edges and spurious emission test:

Per part 15.35(c), the EUT Bluetooth average emission level could be determined by the peak emission level applying duty cycle correction factor, to represent averaging over the whole pulse train.
The average level is derived from the peak level corrected with “Duty cycle correction factor”.
Average Emission Level (dBuV/m) = Peak Emission Level (dBuV/m) + Duty cycle correction factor (dB)
Duty cycle correction factor (dB) = 20 * log (Duty cycle).
Duty cycle = on time / 100 milliseconds
On time = dwell time * hopping number in 100 ms
For example: bluetooth with dwell time 2.9 ms and 3 hops in 100 ms, then
Duty cycle correction factor (dB) = 20 * log ((2.9 * 3) / 100) = -21.21 dB
Following shows an average computation example with duty cycle correction factor = -21.21 dB, and the peak emission level is 45.61 dBuV/m.
Example:
Average Emission Level (dBuV/m) = Peak Emission Level (dBuV/m) + duty cycle correction factor (dB)
= 45.61 + (-21.21) = 24.4 (dBuV/m)

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Standard Applicable

FCC §15.203 & 15.247(b); RSS-247, 5.4 (6)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

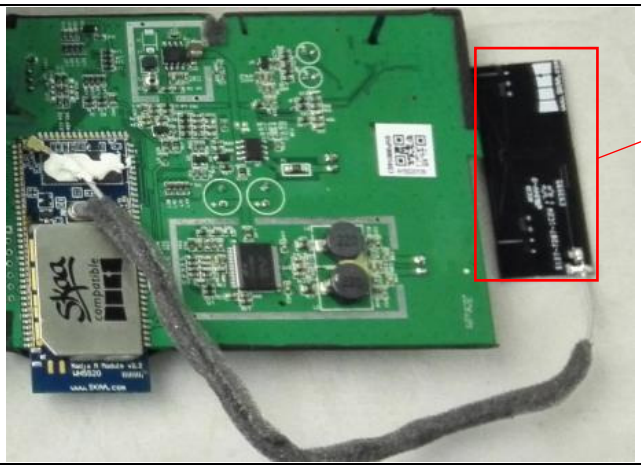
If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is An embedded-in	The antenna is welded on the mainboard, can't be replaced by the consumer

Reference Documents	Item
Photo	

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5.2 Number of Hopping Frequency

5.2.1 Limit

FCC §15.247(a) (1) (iii); RSS-247, 5.1 (4)

Frequency hopping systems operating in the 2400 MHz to 2483.5 MHz bands shall use at least 15 hopping frequencies.

5.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = the frequency band of operation

RBW ≥ 1% of the span

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 Peak Output Power

5.3.1 Test Limit

FCC § 15.247(b)

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

RSS-247, 5.4 (2)

For FHSs operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W and the e.i.r.p. shall not exceed 4 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W and the e.i.r.p. shall not exceed 0.5 W if the hopset uses less than 75 hopping channels (see Section 5.4(5) for exceptions).

5.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

The Bluetooth Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

Use the following spectrum analyzer settings:

Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel

RBW > the 20 dB bandwidth of the emission being measured

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Occupied Bandwidth

5.4.1 Limit

FCC §15.247(a); RSS-247, 5.1 (1)

Measurement of the 20dB bandwidth of the modulated signal.

5.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW ≥ 1% of the 20 dB bandwidth

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate, Allow the trace to stabilize.

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Hopping Frequency Separation

5.5.1 Limit

FCC §15.247(a); RSS-247, 5.1 (2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

5.5.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span

Video (or Average) Bandwidth (VBW) ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Time of Occupancy (Dwell time)

5.6.1 Limit

FCC §15.247(a); RSS-247, 5.1 (4)

Frequency hopping systems in the 2400 MHz - 2483.5 MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

5.6.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.

5.6.4 Test Result

Please refer to ANNEX A.5

5.7 Conducted Spurious Emission & Authorized-band band-edge

5.7.1 Limit

FCC §15.247(d); RSS-247, 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.7.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 100 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize

5.7.4 Test Result

Please refer to ANNEX A.6.

5.8 Conducted Emission

5.8.1 Limit

FCC §15.207; RSS-GEN, 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.8.2 Test Setup

See section 4.4.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.8.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

5.8.4 Test Result

Please refer to ANNEX A.7.

5.9 Radiated Spurious Emission

5.9.1 Limit

FCC §15.209&15.247(d); RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
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

Note:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.
3. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
4. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.9.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.9.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW

Sweep = auto
Detector function = peak
Trace = max hold
For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.9.4 Test Result

Please refer to ANNEX A.8.

5.10 Band Edge (Restricted-band band-edge)

5.10.1 Limit

FCC §15.209&15.247(d); RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

5.10.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.10.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.10.4 Test Result

Please refer to ANNEX A.9.

ANNEX A TEST RESULT

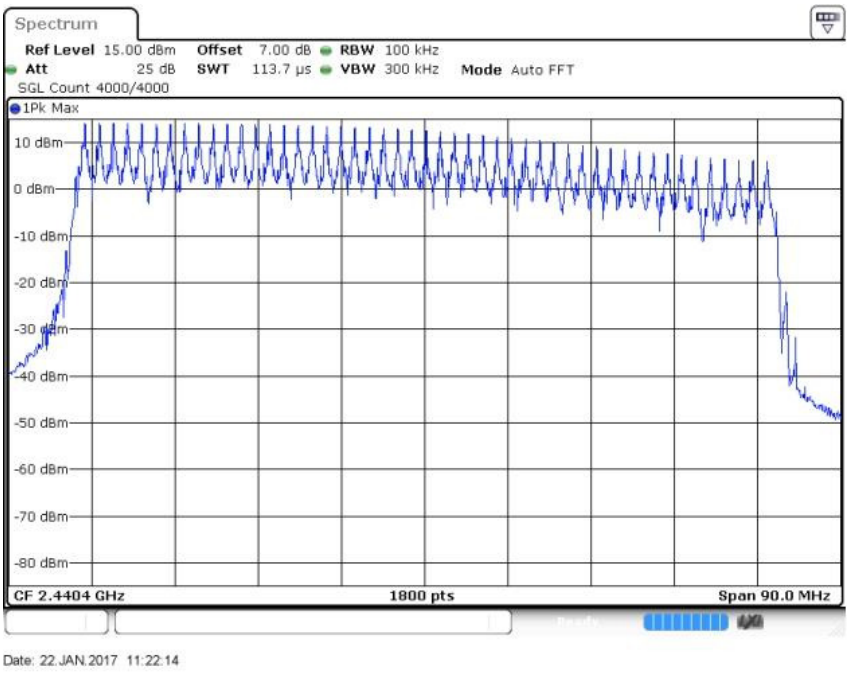
A.1 Number of Hopping Frequency

Test Data

Test Mode	Frequency Block (GHz)	Measured Channel Numbers	Min. Limit	Verdict
GFSK	2400 - 2483.5	49	15	Pass

Test plots

GFSK 2.4035 GHz ~ 2.4773 GHz



A.2 Peak Output Power and E.I.R.P

Peak Power Test Data

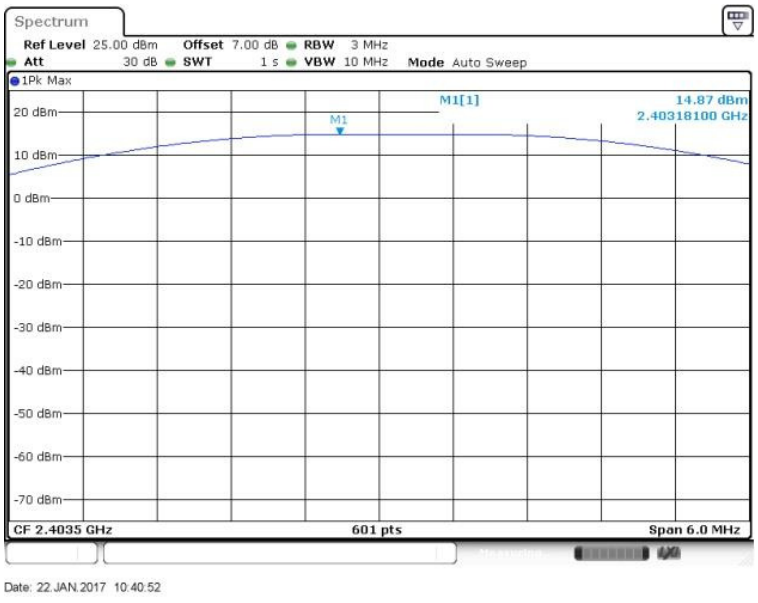
Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.87	30.69	21	125	Pass
Middle	13.19	20.84			Pass
High	6.50	4.47			Pass

E.I.R.P Test Data (For ISED)

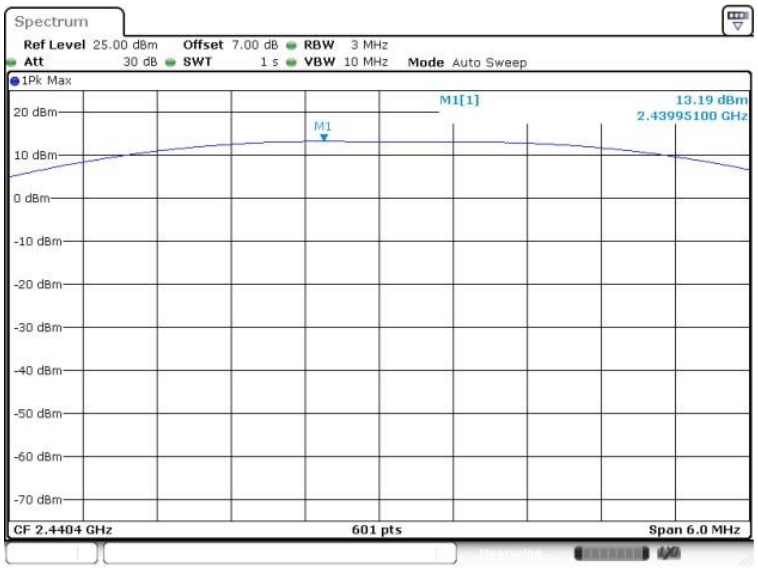
Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.27	67.14	27	500	Pass
Middle	16.59	45.60			Pass
High	9.90	9.77			Pass

Test plots

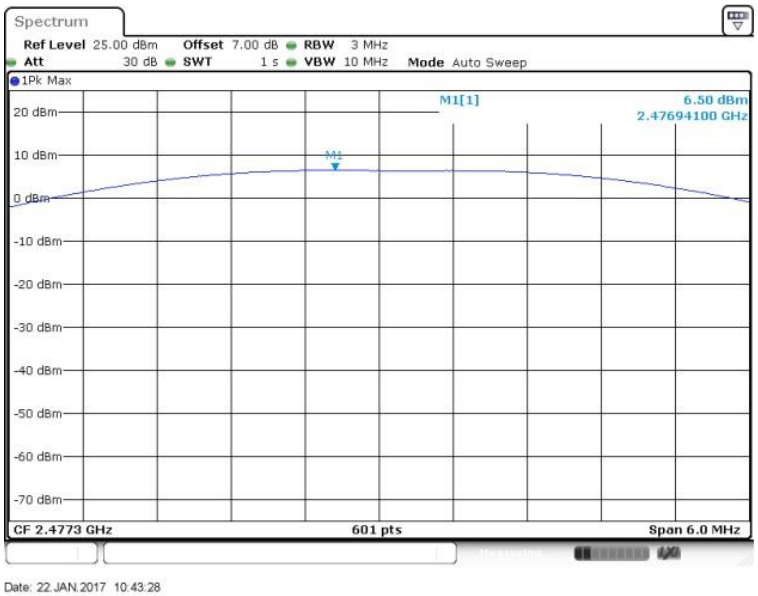
GFSK LOW CHANNEL



GFSK MIDDLE CHANNEL



GFSK HIGH CHANNEL



A.3 20 dB and 99% bandwidth

Test Data

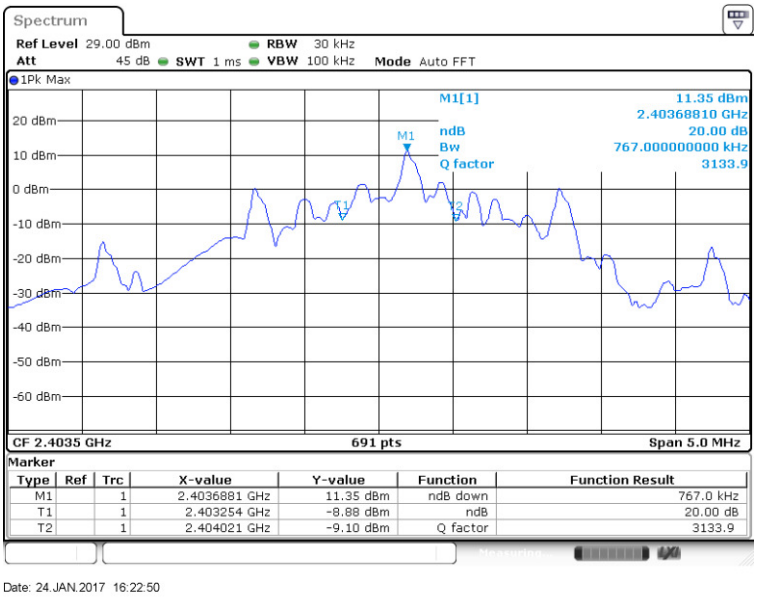
GFSK Mode:

Channel	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	0.767	2.161
Middle	1.056	2.341
High	0.738	2.209

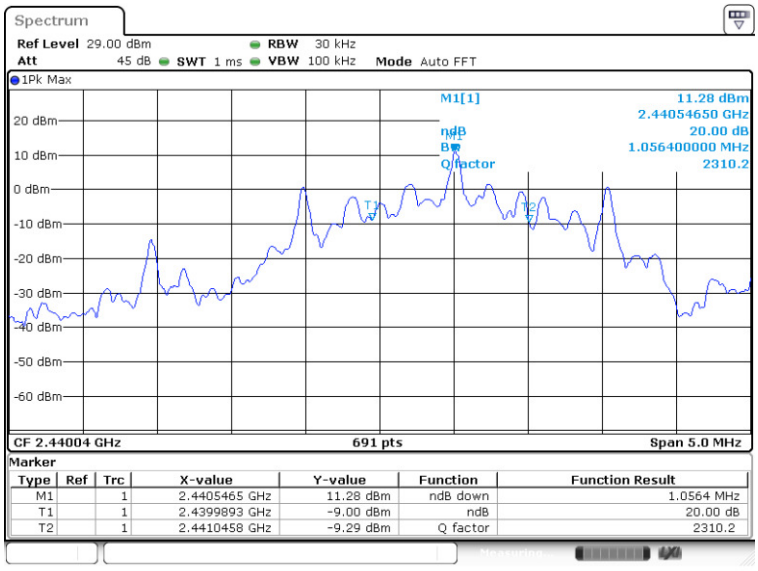
Test plots

20 dB Bandwidth

GFSK LOW CHANNEL

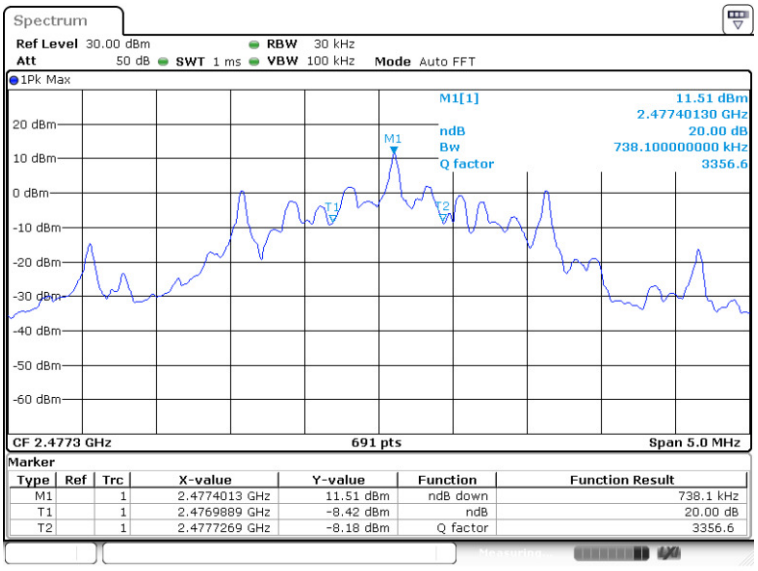


GFSK MIDDLE CHANNEL



Date: 24.JAN.2017 16:24:17

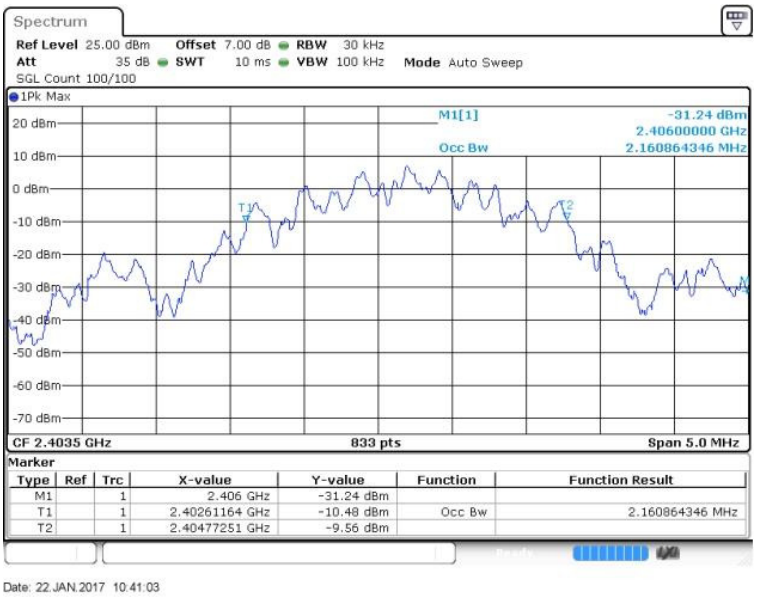
GFSK HIGH CHANNEL



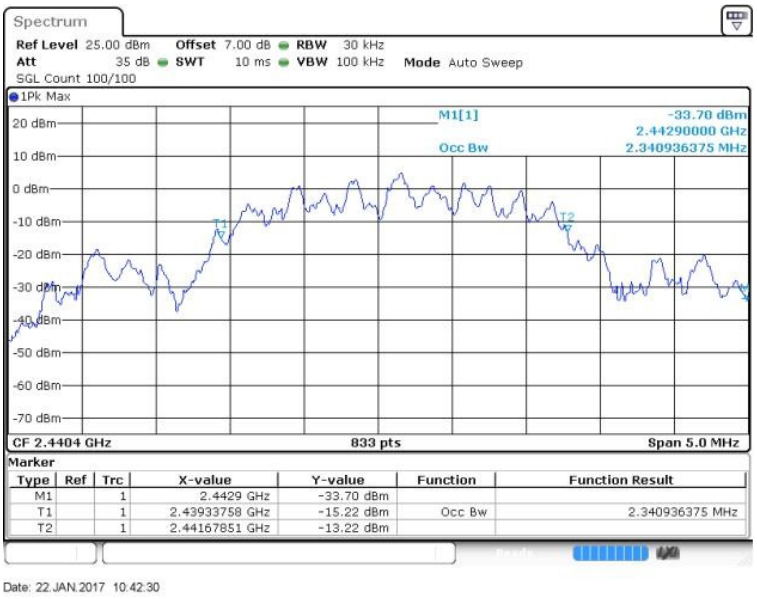
Date: 24.JAN.2017 16:26:01

99% Bandwidth

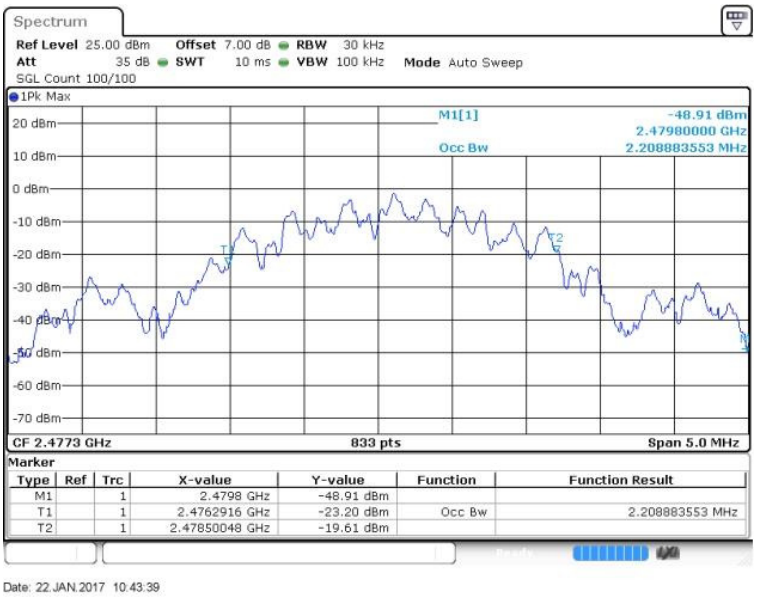
GFSK LOW CHANNEL



GFSK MIDDLE CHANNEL



GFSK HIGH CHANNEL



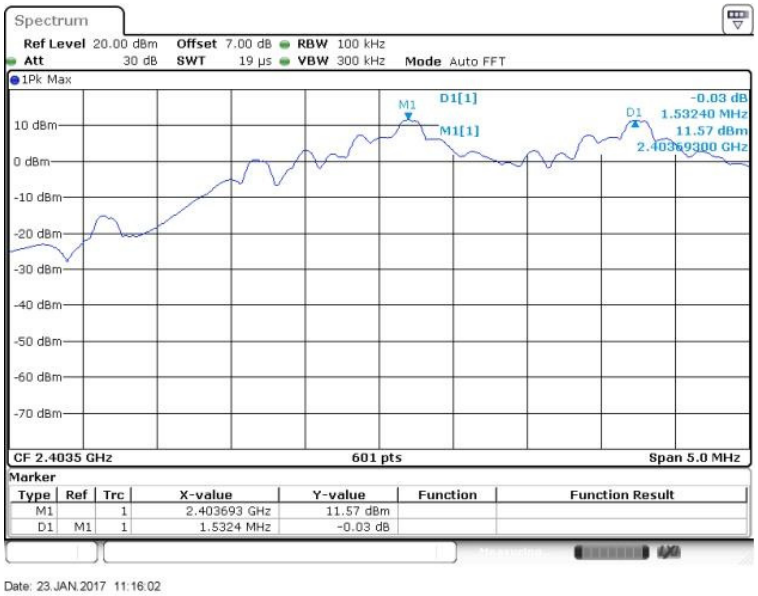
A.4 Hopping Frequency Separation

Test Data

Mode	Frequency separation (MHz)	Max 20 dB Bandwidth (MHz)	Two-thirds of the 20 dB bandwidth (MHz)	Verdict
GFSK	1.532	1.056	0.704	Pass

Test Plots

GFSK



A.5 Average Time of Occupancy

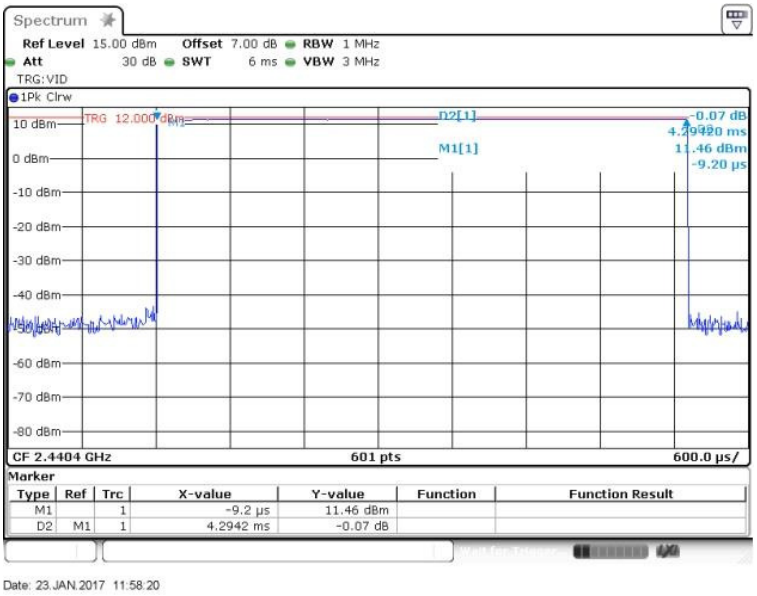
Test Data

GFSK Mode:

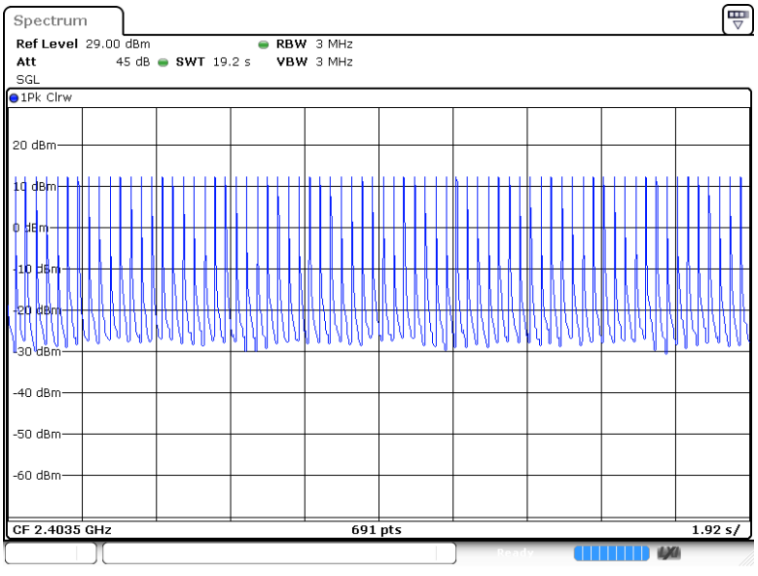
Pulse Width (ms)	Hopping Number	Total of Dwell (ms)	Limit (sec)	Verdict
4.2942	70	300.594	0.4	Pass

Test Plots

GFSK 1 Pulse Width



GFSK 2 Hopping Number



A.6 Conducted Spurious Emissions & Authorized-band band-edge

Test Data

GFSK Mode:

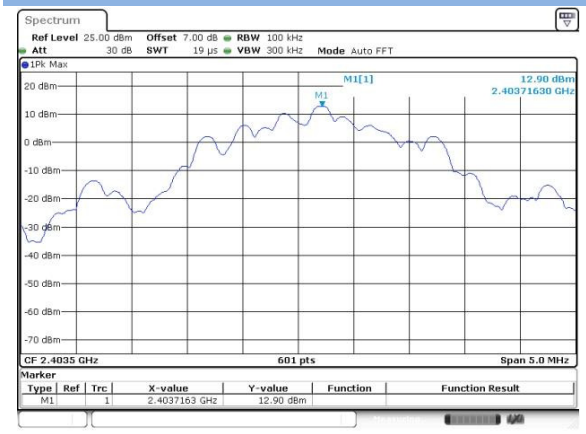
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-48.01	12.90	-7.10	Pass
Middle	-48.42	10.90	-9.10	Pass
High	-49.87	4.37	-15.63	Pass

Hopping Mode:

Model	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Hopping Mode:	-50.74	14.29	-5.71	Pass

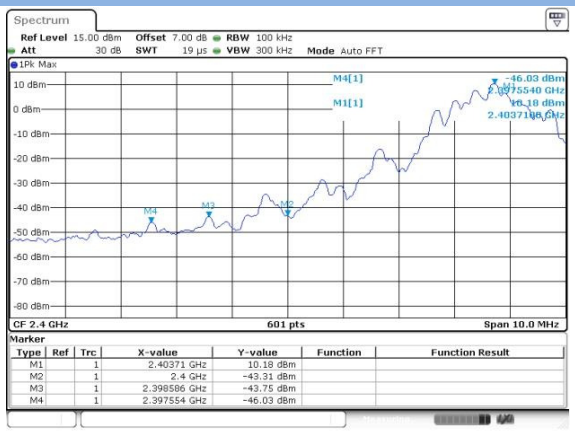
Test Plots

GFSK LOW CHANNEL, CARRIER LEVEL



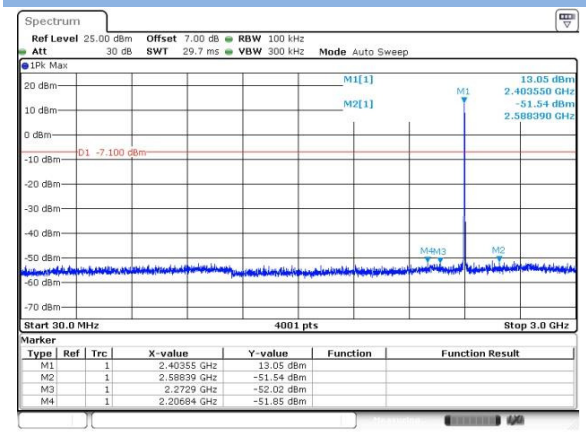
Date: 22.JAN.2017 10:41:17

GFSK LOW CHANNEL , BAND EDGE



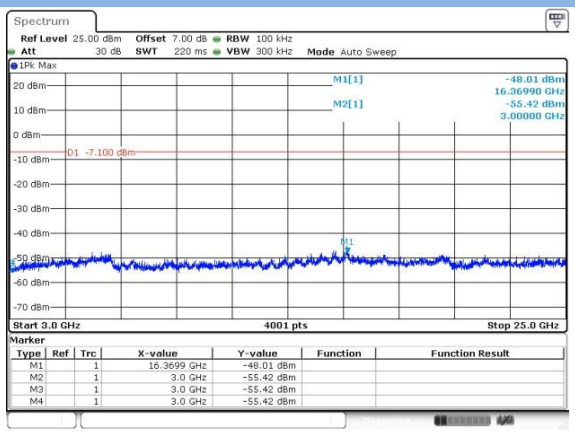
Date: 23.JAN.2017 11:28:06

GFSK LOW CHANNEL , SPURIOUS 30 MHz ~ 3 GHz



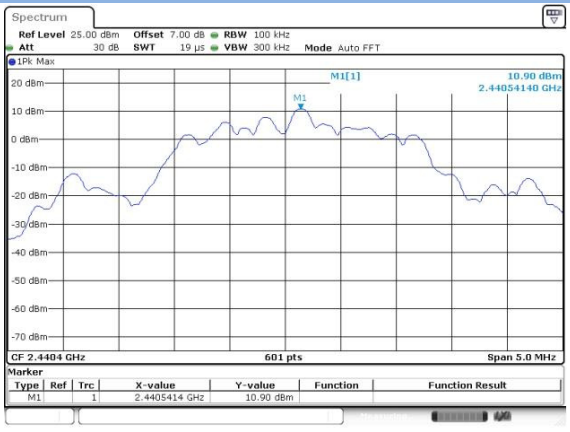
Date: 22.JAN.2017 10:41:32

GFSK LOW CHANNEL , SPURIOUS 3 GHz ~ 25 GHz



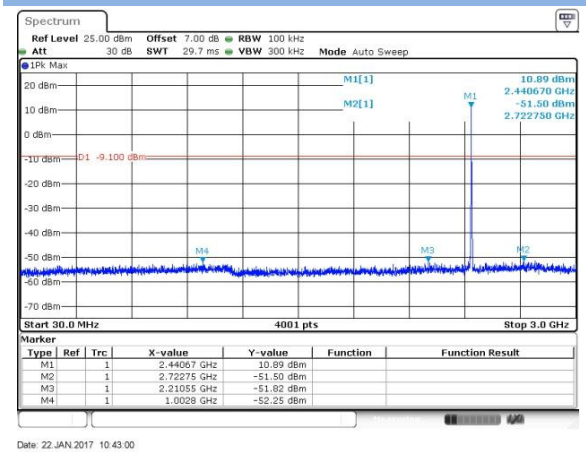
Date: 22.JAN.2017 10:41:41

GFSK MIDDLE CHANNEL, CARRIER LEVEL



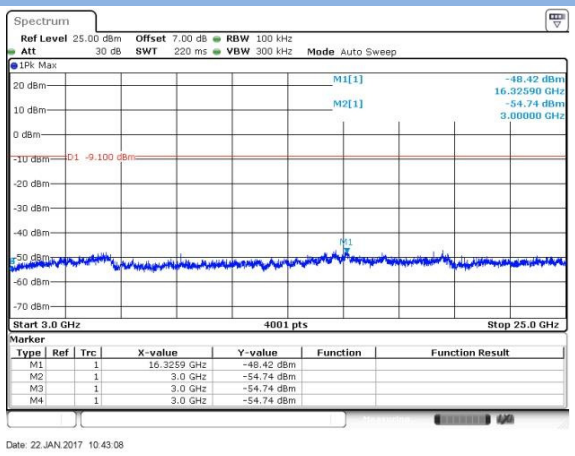
Date: 22.JAN.2017 10:42:42

GFSK MIDDLE CHANNEL , SPURIOUS 30 MHz ~ 3 GHz



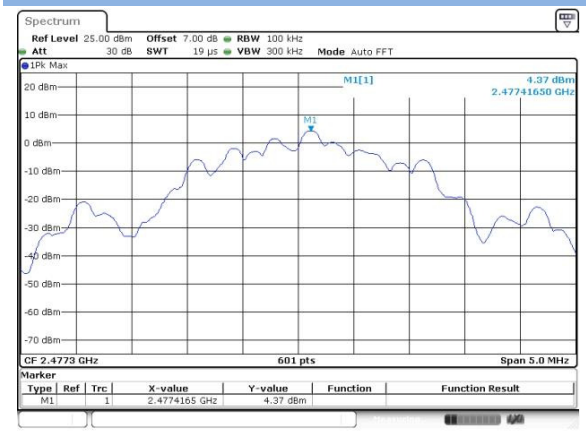
Date: 22.JAN.2017 10:43:00

GFSK MIDDLE CHANNEL , SPURIOUS 3 GHz ~ 25 GHz



Date: 22.JAN.2017 10:43:08

GFSK HIGH CHANNEL, CARRIER LEVEL

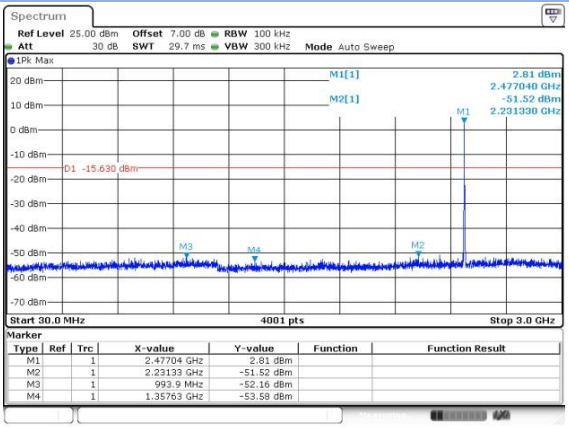


Date: 22.JAN.2017 10:43:50

GFSK HIGH CHANNEL , BAND EDGE

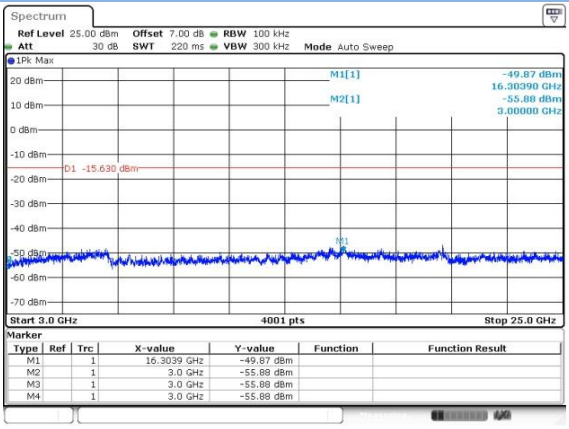
Date: 23.JAN.2017 11:29:29

GFSK HIGH CHANNEL , SPURIOUS 30 MHz ~ 3 GHz



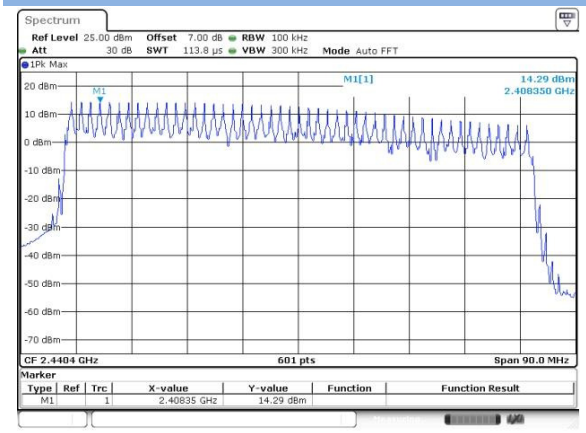
Date: 22.JAN.2017 10:44:07

GFSK HIGH CHANNEL , SPURIOUS 3 GHz ~ 25 GHz

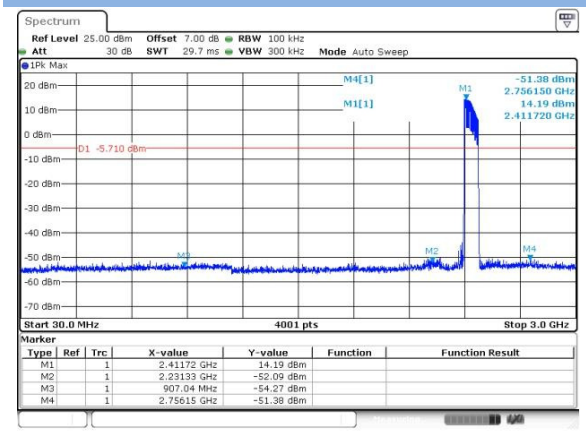


Date: 22.JAN.2017 10:44:15

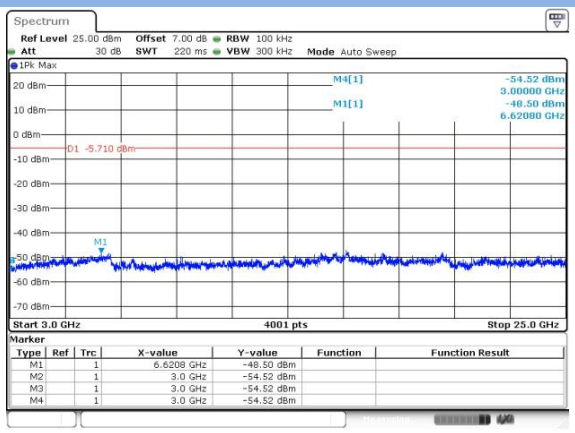
GFSK Hopping Mode, CARRIER LEVEL



GFSK Hopping Mode, SPURIOUS 30 MHz ~ 3 GHz



GFSK Hopping Mode, SPURIOUS 30 3GHz ~ 25 GHz



GFSK HIGH CHANNEL , BAND EDGE-LEFT

GFSK HIGH CHANNEL , BAND EDGE-RIGHT

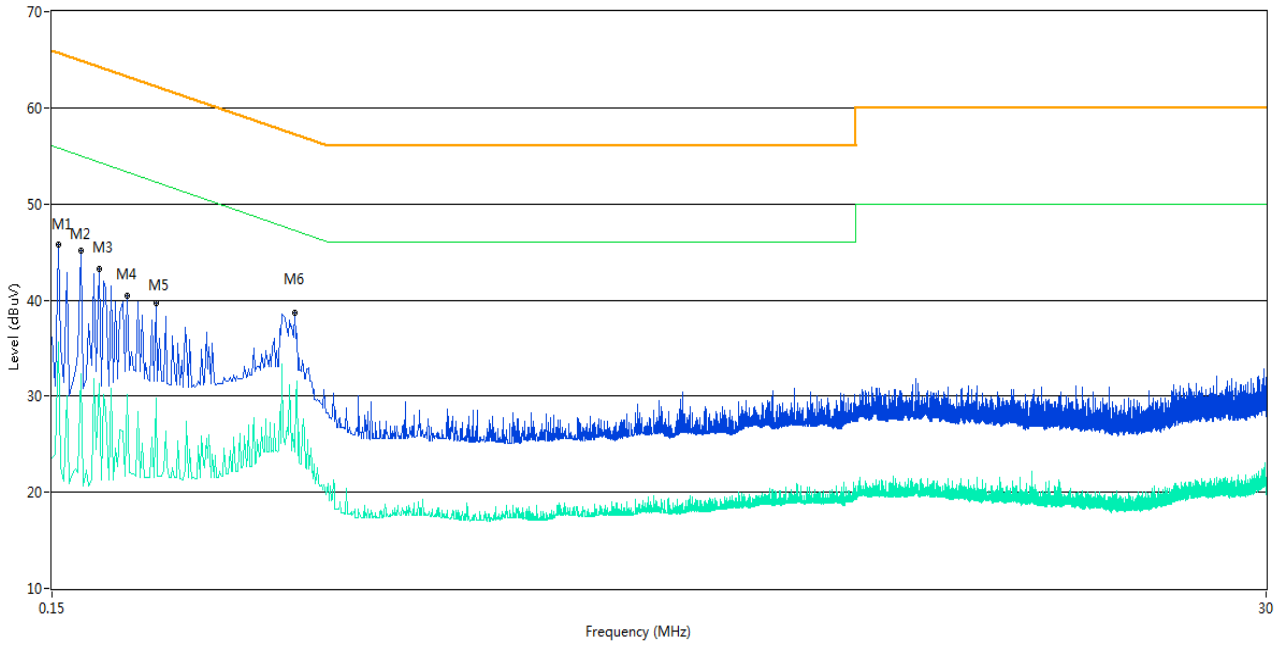
A.7 Conducted Emissions

Note 1: All configurations have been tested, only the worst configuration (GFSK High Channel) shown here.

Note 2: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

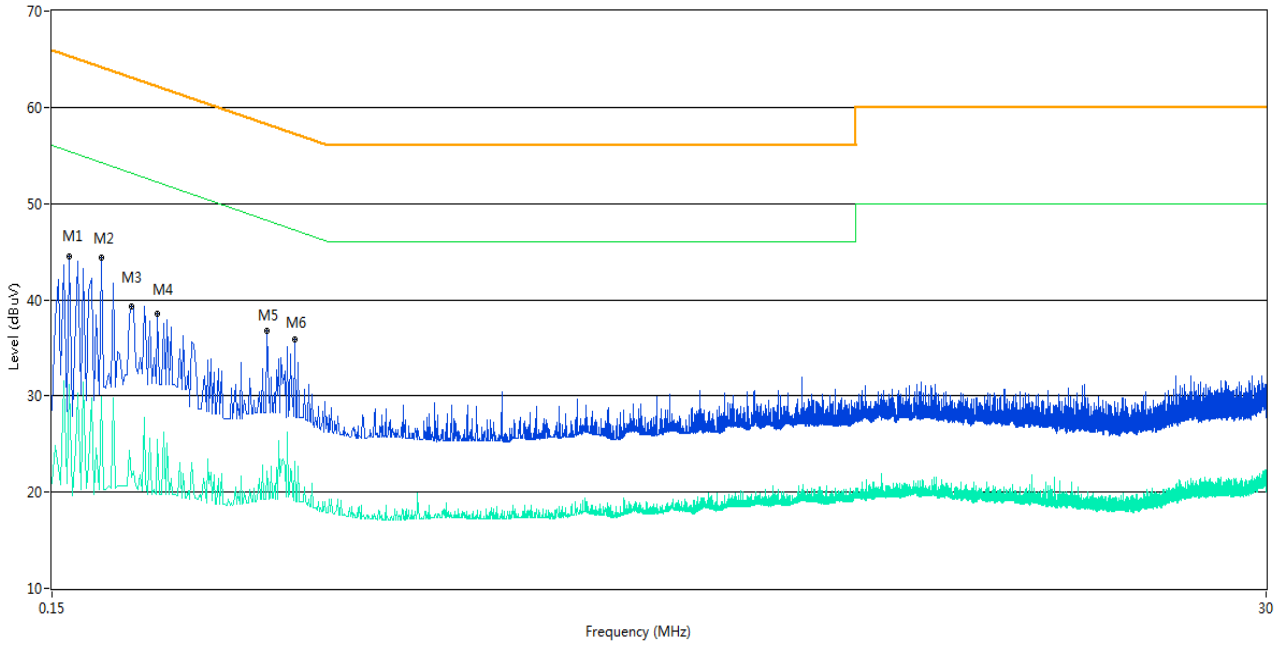
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.154	45.8	11.00	65.8	20.00	Peak	L Line	Pass
1**	0.154	35.7	11.00	55.8	20.10	AV	L Line	Pass
2	0.170	45.1	11.00	65.0	19.90	Peak	L Line	Pass
2**	0.170	32.3	11.00	55.0	22.70	AV	L Line	Pass
3	0.184	43.2	11.00	64.3	21.10	Peak	L Line	Pass
3**	0.184	31.3	11.00	54.3	23.00	AV	L Line	Pass
4	0.208	40.4	11.00	63.3	22.90	Peak	L Line	Pass
4**	0.208	30.2	11.00	53.3	23.10	AV	L Line	Pass
5	0.236	39.6	11.00	62.2	22.60	Peak	L Line	Pass
5**	0.236	29.7	11.00	52.2	22.50	AV	L Line	Pass
6	0.432	38.7	11.00	57.2	18.50	Peak	L Line	Pass
6**	0.432	24.2	11.00	47.2	23.00	AV	L Line	Pass

PHASE N



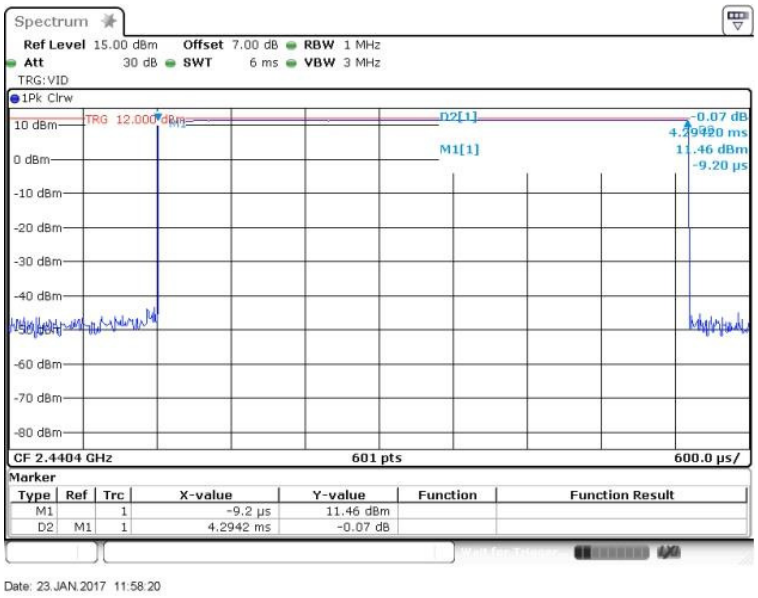
No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.162	44.4	11.00	65.4	21.00	Peak	N Line	Pass
1**	0.162	31.2	11.00	55.4	24.20	AV	N Line	Pass
2	0.186	44.3	11.00	64.2	19.90	Peak	N Line	Pass
2**	0.186	29.9	11.00	54.2	24.30	AV	N Line	Pass
3	0.212	39.3	11.00	63.1	23.80	Peak	N Line	Pass
3**	0.212	21.6	11.00	53.1	31.50	AV	N Line	Pass
4	0.238	38.5	11.00	62.2	23.70	Peak	N Line	Pass
4**	0.238	25.5	11.00	52.2	26.70	AV	N Line	Pass
5	0.384	36.8	11.00	58.2	21.40	Peak	N Line	Pass
5**	0.384	22.2	11.00	48.2	26.00	AV	N Line	Pass
6	0.432	35.9	11.00	57.2	21.30	Peak	N Line	Pass
6**	0.432	23.1	11.00	47.2	24.10	AV	N Line	Pass

A.8 Radiated Emission

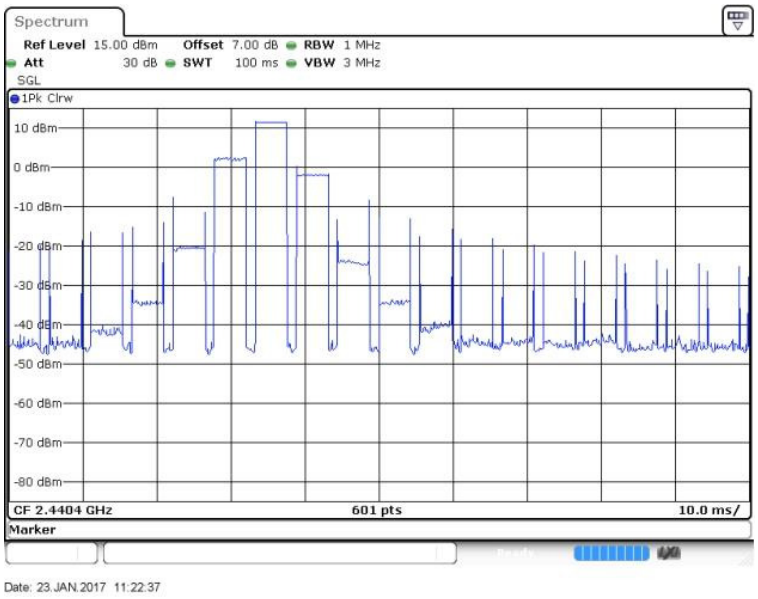
Duty cycle correction factor for average measurement.

Test Plots

GFSK on time/100 ms (One Pulse) Plot on Channel 49



GFSK on time/100 ms (Count Pulses) Plot on Channel 49



Note:

1. Duty cycle = on time/100 milliseconds =3* 4.2942 / 100 =12.88 %
2. Duty cycle correction factor = 20*log (Duty cycle) = -17.80 dB
3. GFSK has the highest duty cycle and is reported.

Note 1: The symbol of "--" in the table which means not application.

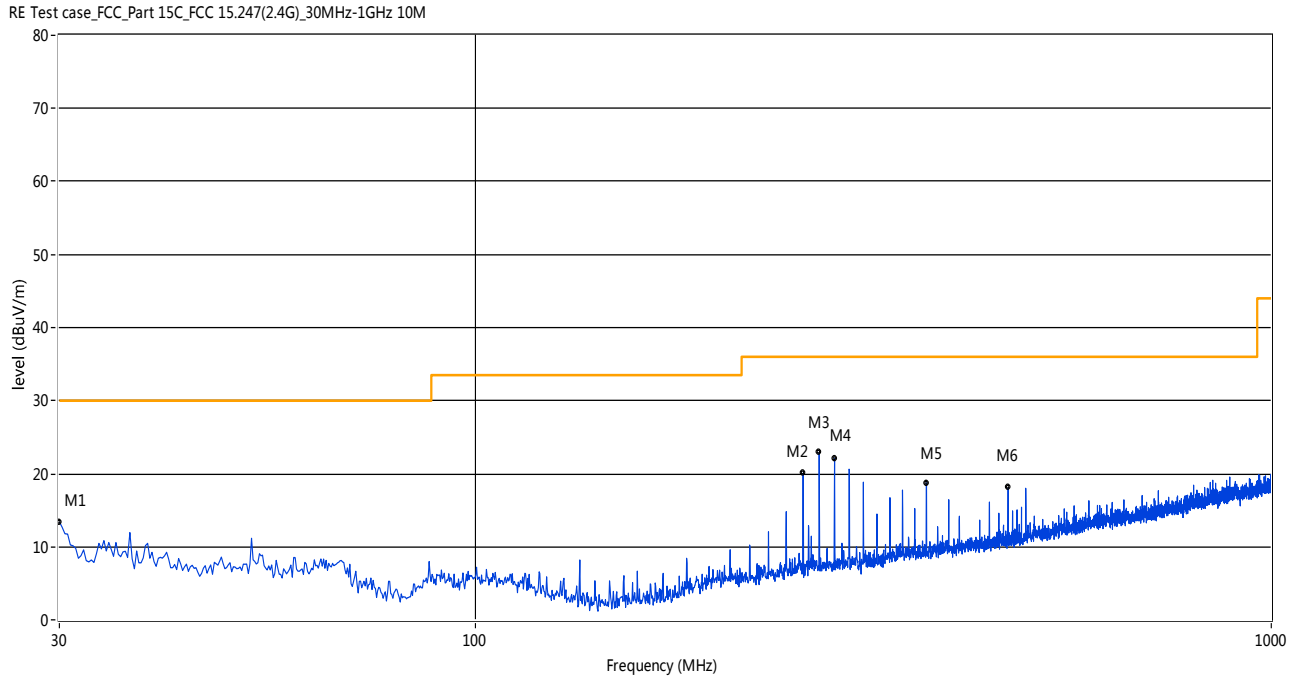
Note 2: For the test data above 1 GHz, according the ANSI C63.4-2014, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note 3: All configurations have been tested, only the worst configuration (GFSK High Channel) shown here.

Test Data and Plots

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

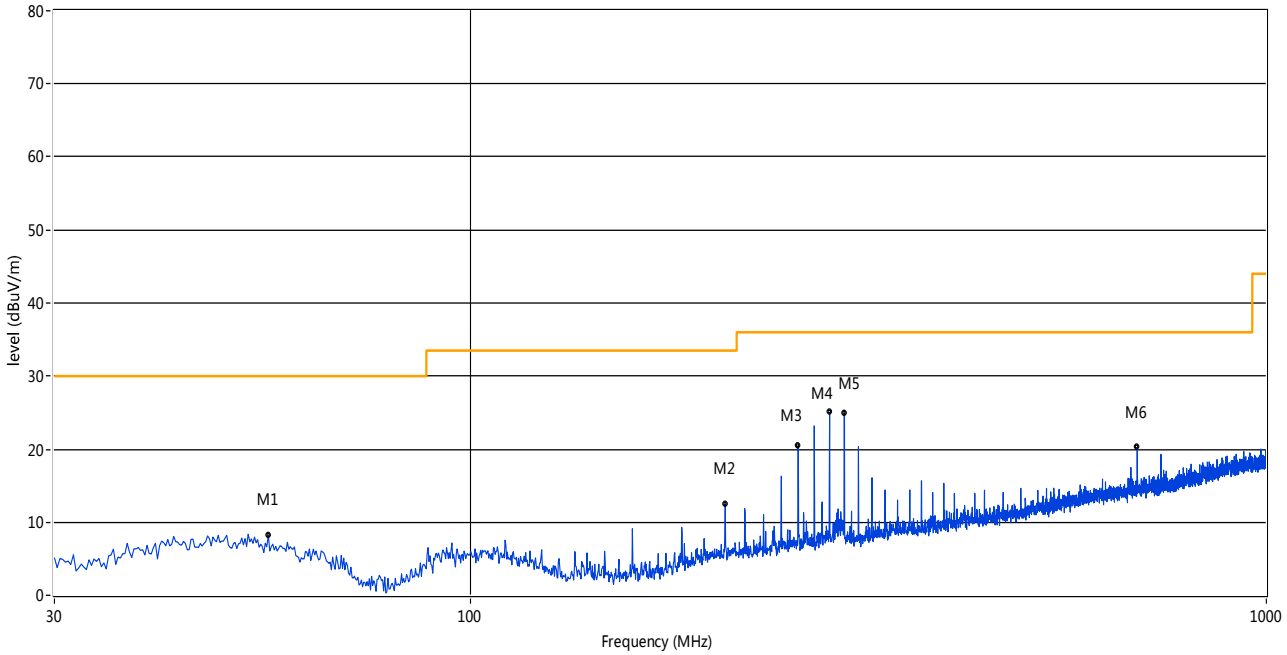
30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.00	13.40	-22.04	30.0	16.60	Peak	20.00	200	Vertical	Pass
2	257.95	20.08	-20.07	36.0	15.92	Peak	251.00	200	Vertical	Pass
3	270.32	22.87	-19.82	36.0	13.13	Peak	139.00	200	Vertical	Pass
4	282.69	25.06	-19.55	36.0	10.94	Peak	270.00	100	Vertical	Pass
5	368.53	18.75	-17.33	36.0	17.25	Peak	139.00	200	Vertical	Pass
6	466.99	18.05	-15.61	36.0	17.95	Peak	98.00	100	Vertical	Pass

30 MHz to 1 GHz, ANT H

RE Test case_FCC_Part 15C_FCC 15.247(2.4G)_30MHz-1GHz 10M



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	55.70	8.20	-20.18	30.0	21.80	Peak	160.00	200	Horizontal	Pass
2	208.97	12.51	-21.21	33.5	20.99	Peak	283.00	100	Horizontal	Pass
3	257.95	20.46	-20.07	36.0	15.54	Peak	255.00	100	Horizontal	Pass
4	282.69	25.06	-19.55	36.0	10.94	Peak	270.00	100	Horizontal	Pass
5	294.81	24.95	-19.17	36.0	11.05	Peak	30.00	100	Horizontal	Pass
6	688.14	20.18	-10.90	36.0	15.82	Peak	330.00	100	Horizontal	Pass

Note: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Test Data and Plots (1 GHz ~ 10th Harmonic)

GFSK LOW CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1167.500	42.47	-3.69	74.0	31.53	Peak	0.00	150	Vertical	Pass
2	2075.500	44.62	0.39	74.0	29.38	Peak	232.20	150	Vertical	Pass
3	2403.000	104.02	0.84	74.0	-30.02	Peak	95.30	150	Vertical	N/A
4	3476.000	46.61	6.98	74.0	27.39	Peak	184.90	150	Vertical	Pass
5**	4806.354	34.79	10.50	54.0	19.21	AV	28.80	150	Vertical	Pass
5	4806.354	59.75	10.50	74.0	14.25	Peak	28.80	150	Vertical	Pass
6	6554.000	51.00	12.44	74.0	23.00	Peak	305.00	150	Vertical	Pass
7**	7209.359	31.78	14.26	54.0	22.22	AV	152.00	150	Vertical	Pass
7	7209.359	59.25	14.26	74.0	14.75	Peak	152.00	150	Vertical	Pass
8	8575.750	47.03	16.76	74.0	26.97	Peak	140.60	150	Vertical	Pass
9	9615.250	48.06	15.86	74.0	25.94	Peak	359.90	150	Vertical	Pass
10	11598.000	50.24	18.23	74.0	23.76	Peak	185.80	150	Vertical	Pass
11	12733.750	50.25	19.31	74.0	23.75	Peak	129.50	150	Vertical	Pass
12	23976.750	51.72	20.59	74.0	22.28	Peak	5.00	150	Vertical	Pass

GFSK LOW CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1285.000	41.87	-2.18	74.0	32.13	Peak	300.50	150	Horizontal	Pass
2	1684.000	42.51	-0.56	74.0	31.49	Peak	105.00	150	Horizontal	Pass
3	2403.000	105.18	0.84	74.0	-31.18	Peak	139.50	150	Horizontal	N/A
4	2764.000	46.33	3.50	74.0	27.67	Peak	70.80	150	Horizontal	Pass
5	3764.250	44.91	8.10	74.0	29.09	Peak	152.70	150	Horizontal	Pass
6**	4808.399	33.54	10.68	54.0	20.46	AV	105.60	150	Horizontal	Pass
6	4808.399	58.59	10.68	74.0	15.41	Peak	105.60	150	Horizontal	Pass
7**	7211.750	32.91	14.26	54.0	21.09	AV	63.00	150	Horizontal	Pass
7	7211.750	59.60	14.26	74.0	14.40	Peak	63.00	150	Horizontal	Pass
8	8542.750	47.22	16.15	74.0	26.78	Peak	63.00	150	Horizontal	Pass
9	9615.250	47.66	15.86	74.0	26.34	Peak	29.50	150	Horizontal	Pass
10	11364.250	48.82	17.87	74.0	25.18	Peak	233.40	150	Horizontal	Pass
11	12678.750	49.81	19.28	74.0	24.19	Peak	266.60	150	Horizontal	Pass
12	24040.001	52.47	21.77	74.0	21.53	Peak	277.70	150	Horizontal	Pass

GFSK MIDDLE CHANNEL 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1306.500	41.91	-2.09	74.0	32.09	Peak	160.20	150	Vertical	Pass
2	1684.000	40.73	-0.56	74.0	33.27	Peak	69.10	150	Vertical	Pass
3	2441.000	104.13	0.20	74.0	-30.13	Peak	91.90	150	Vertical	N/A
4	3148.000	44.12	6.77	74.0	29.88	Peak	358.50	150	Vertical	Pass
5**	4880.063	35.93	10.55	54.0	18.07	AV	114.60	150	Vertical	Pass
5	4880.063	60.64	10.55	74.0	13.36	Peak	114.60	150	Vertical	Pass
6	6073.000	50.92	12.00	74.0	23.08	Peak	150.90	150	Vertical	Pass
7**	7319.000	31.92	13.08	54.0	14.50	AV	161.70	150	Vertical	Pass
7	7319.000	57.27	13.08	74.0	16.73	Peak	161.70	150	Vertical	Pass
8	9070.750	46.35	17.34	74.0	27.65	Peak	36.90	150	Vertical	Pass
9	9763.750	48.63	16.32	74.0	25.37	Peak	306.90	150	Vertical	Pass
10	10564.000	46.53	18.50	74.0	27.47	Peak	360.00	150	Vertical	Pass
11	12123.250	47.84	18.46	74.0	26.16	Peak	195.20	150	Vertical	Pass
12	23635.750	49.97	20.39	74.0	24.03	Peak	25.20	150	Vertical	Pass

GFSK MIDDLE CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1081.000	40.24	-3.83	74.0	33.76	Peak	253.60	150	Horizontal	Pass
2	1685.500	41.07	-1.06	74.0	32.93	Peak	321.30	150	Horizontal	Pass
3	2441.000	104.62	0.20	74.0	-30.62	Peak	128.30	150	Horizontal	N/A
4	3705.750	42.82	8.04	74.0	31.18	Peak	143.00	150	Horizontal	Pass
5**	4879.722	31.00	10.60	54.0	23.00	AV	202.00	150	Horizontal	Pass
5	4879.722	56.62	10.60	74.0	17.38	Peak	202.00	150	Horizontal	Pass
6	5695.500	47.55	11.63	74.0	26.45	Peak	249.40	150	Horizontal	Pass
7**	7321.000	34.82	13.08	54.0	19.18	AV	61.60	150	Horizontal	Pass
7	7321.000	54.48	13.08	74.0	19.52	Peak	61.60	150	Horizontal	Pass
8	9128.500	46.38	17.94	74.0	27.62	Peak	95.10	150	Horizontal	Pass
9	9763.750	48.95	16.32	74.0	25.05	Peak	39.80	150	Horizontal	Pass
10	11358.750	47.64	17.92	74.0	26.36	Peak	84.30	150	Horizontal	Pass
11	12310.250	48.40	18.72	74.0	25.60	Peak	1.70	150	Horizontal	Pass
12	24029.000	50.88	21.56	74.0	23.12	Peak	354.10	150	Horizontal	Pass

GFSK HIGH CHANNEL 1 GHz to 25 GHz, ANT V

1	1213.500	42.52	-2.69	74.0	31.48	Peak	265.40	150	Vertical	Pass
2	2477.500	105.42	0.82	74.0	-31.42	Peak	93.90	150	Vertical	N/A
3	3046.000	45.85	6.39	74.0	28.15	Peak	153.20	150	Vertical	Pass
4	3666.000	44.28	7.87	74.0	29.72	Peak	129.30	150	Vertical	Pass
5**	4953.776	38.08	11.09	54.0	15.92	AV	113.90	150	Vertical	Pass
5	4953.776	62.71	11.09	74.0	11.29	Peak	113.90	150	Vertical	Pass
6	5719.000	49.47	11.83	74.0	24.53	Peak	359.90	150	Vertical	Pass
7**	7434.247	35.15	14.28	54.0	18.85	AV	160.90	150	Vertical	Pass
7	7434.247	54.66	14.28	74.0	19.34	Peak	160.90	150	Vertical	Pass
8	8545.500	45.10	16.20	74.0	28.90	Peak	93.20	150	Vertical	Pass
9	9070.750	46.80	17.34	74.0	27.20	Peak	116.00	150	Vertical	Pass
10	10586.000	46.26	18.77	74.0	27.74	Peak	360.00	150	Vertical	Pass
11	12186.500	47.24	18.54	74.0	26.76	Peak	352.80	150	Vertical	Pass
12	23699.000	50.84	20.42	74.0	23.16	Peak	286.00	150	Vertical	Pass

GFSK HIGH CHANNEL 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1236.500	41.32	-3.00	74.0	32.68	Peak	263.20	150	Horizontal	Pass
2	1744.000	40.08	-1.01	74.0	33.92	Peak	25.40	150	Horizontal	Pass
3	2477.500	101.96	0.82	74.0	-27.96	Peak	104.90	150	Horizontal	N/A
4	3148.000	46.27	6.77	74.0	27.73	Peak	138.10	150	Horizontal	Pass
5**	4953.775	35.38	10.94	54.0	18.62	AV	282.90	150	Horizontal	Pass
5	4953.775	60.28	10.94	74.0	13.72	Peak	282.90	150	Horizontal	Pass
6	6075.000	49.80	12.00	74.0	24.20	Peak	114.80	150	Horizontal	Pass
7**	7434.500	35.27	14.34	54.0	18.74	AV	346.50	150	Horizontal	Pass
7	7434.500	52.03	14.34	74.0	21.97	Peak	346.50	150	Horizontal	Pass
8	8559.250	45.64	16.45	74.0	28.36	Peak	132.60	150	Horizontal	Pass
9	9197.250	46.20	16.37	74.0	27.80	Peak	40.00	150	Horizontal	Pass
10	10577.750	46.28	18.83	74.0	27.72	Peak	358.80	150	Horizontal	Pass
11	12109.500	48.17	18.46	74.0	25.83	Peak	233.70	150	Horizontal	Pass
12	23710.000	50.36	20.42	74.0	23.64	Peak	73.90	150	Horizontal	Pass

Hopping Mode:

GFSK MODE 1 GHz to 25 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1291.500	44.21	-2.17	74.0	29.79	Peak	1.30	150	Vertical	Pass
2	1714.500	44.32	-1.55	74.0	29.68	Peak	105.50	150	Vertical	Pass
3	2437.500	106.24	1.24	74.0	-32.24	Peak	93.80	150	Vertical	N/A
4	3560.000	46.78	7.62	74.0	27.22	Peak	223.30	150	Vertical	Pass
5**	4951.730	37.17	10.77	54.0	16.83	AV	113.00	150	Vertical	Pass
5	4951.730	60.47	10.77	74.0	13.53	Peak	113.00	150	Vertical	Pass
6	6184.000	51.80	12.23	74.0	22.20	Peak	295.10	150	Vertical	Pass
7**	7274.540	38.63	13.72	54.0	15.37	AV	160.40	150	Vertical	Pass
7	7274.540	57.25	13.72	74.0	16.75	Peak	160.40	150	Vertical	Pass
8	8540.000	47.27	16.09	74.0	26.73	Peak	360.00	150	Vertical	Pass
9	9857.250	47.20	15.90	74.0	26.80	Peak	305.70	150	Vertical	Pass
10	11342.250	48.50	18.05	74.0	25.50	Peak	36.00	150	Vertical	Pass
11	12931.750	49.76	19.20	74.0	24.24	Peak	171.80	150	Vertical	Pass
12	23693.500	52.11	20.41	74.0	21.89	Peak	357.30	150	Vertical	Pass

GFSK MODE 1 GHz to 25 GHz, ANT H

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1234.000	41.62	-1.85	74.0	32.38	Peak	81.20	150	Horizontal	Pass
2	1946.500	41.66	-0.51	74.0	32.34	Peak	309.50	150	Horizontal	Pass
3	2423.500	105.59	1.08	74.0	-31.59	Peak	115.40	150	Horizontal	N/A
4	2950.000	46.26	3.59	74.0	27.74	Peak	275.60	150	Horizontal	Pass
5**	4956.826	35.55	11.09	54.0	18.45	AV	199.20	150	Horizontal	Pass
5	4956.826	52.15	11.09	74.0	21.85	Peak	199.20	150	Horizontal	Pass
6	5837.000	49.93	12.11	74.0	24.07	Peak	307.10	150	Horizontal	Pass
7	7261.250	52.96	13.93	74.0	21.04	Peak	356.50	150	Horizontal	Pass
8	8592.250	45.98	16.80	74.0	28.02	Peak	281.20	150	Horizontal	Pass
9	9092.750	46.30	17.84	74.0	27.70	Peak	134.30	150	Horizontal	Pass
10	10814.250	46.61	18.48	74.0	27.39	Peak	190.60	150	Horizontal	Pass
11	11600.750	47.68	18.21	74.0	26.32	Peak	0.00	150	Horizontal	Pass
12	24642.250	52.62	23.56	74.0	21.38	Peak	88.90	150	Horizontal	Pass

A.9 Band Edge (Restricted-band band-edge)

Test Data

Note 1: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

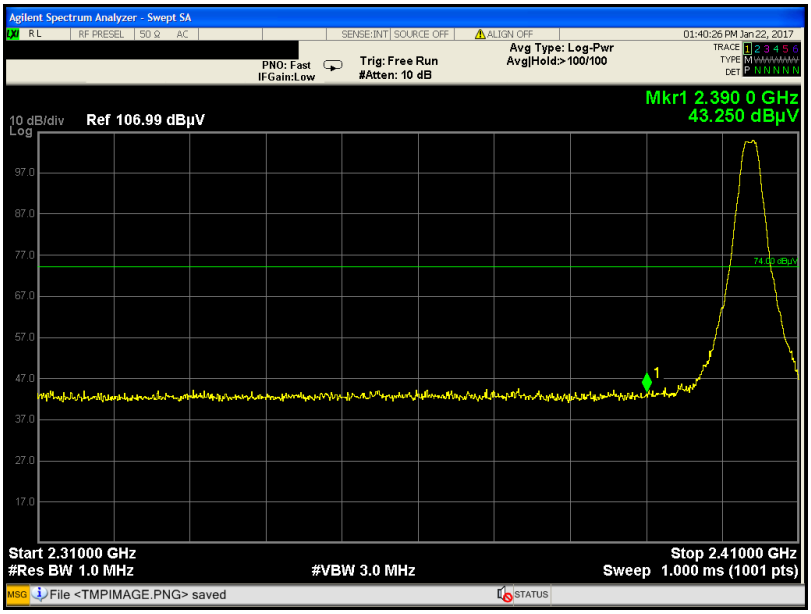
Note 2: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Test Data

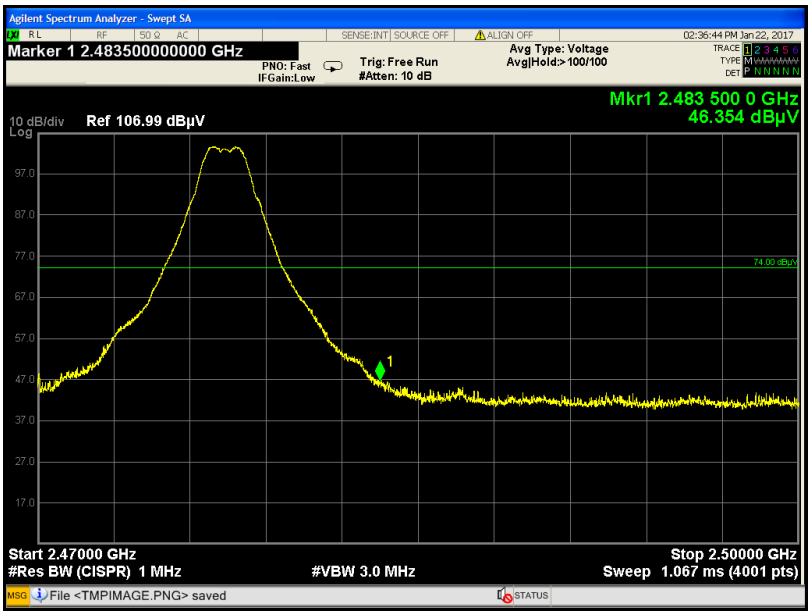
Test Mode	Test Channel	Frequency (GHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Remark	Verdict
GFSK	Low	2.390	43.25	74	30.75	PEAK	Pass
		2.390	N/A	54	N/A	AVERAGE	N/A
GFSK	HIGH	2.4835	46.35	74	27.65	PEAK	Pass
		2.4835	N/A	54	N/A	AVERAGE	N/A
GFSK(Hopping)	Low	2.390	57.36	74	16.64	PEAK	Pass
		2.390	31.79	54	22.21	AVERAGE	Pass
GFSK(Hopping	HIGH	2.4835	68.02	74	5.98	PEAK	Pass
		2.4835	31.64	54	22.36	AVERAGE	Pass

Test Plots

GFSK LOW CHANNEL , PEAK

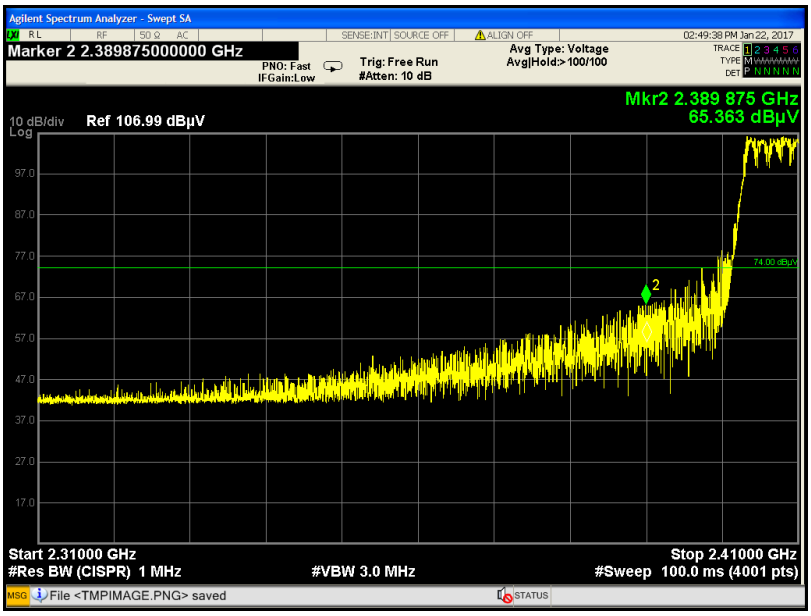


GFSK HIGH CHANNEL , PEAK

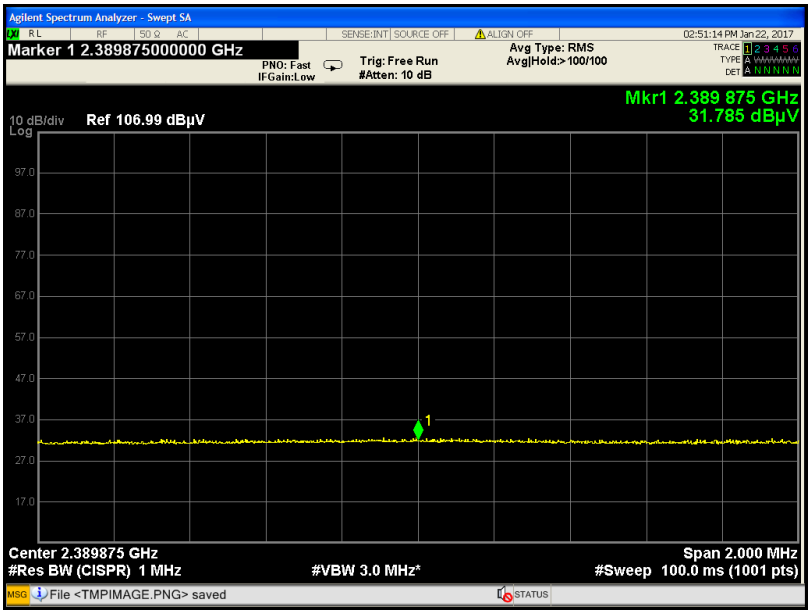


Hopping Mode:

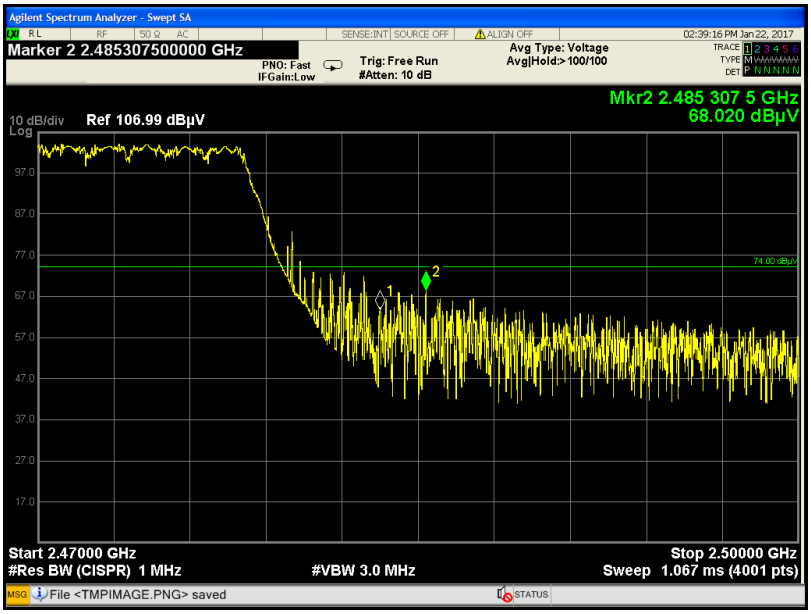
GFSK LOW FREQUENCY BAND, PEAK



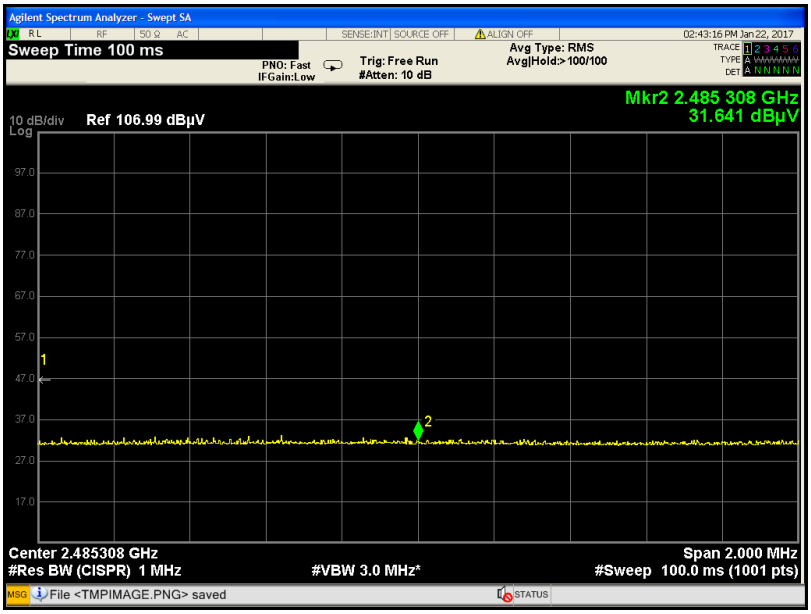
GFSK LOW FREQUENCY BAND, AVERAGE



GFSK HIGH FREQUENCY BAND, PEAK



GFSK HIGH FREQUENCY BAND, AVERAGE



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ1710163-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL- SZ1710163-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL- SZ1710163-AI.PDF”.

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