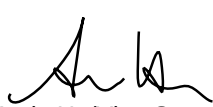


Prüfbericht-Nr.: <i>Test Report No.:</i>	50169070 001	Auftrags-Nr.: <i>Order No.:</i>	114079121	Seite 1 von 44 <i>Page 1 of 44</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	25-Jun-2018	
Auftraggeber: <i>Client:</i>	Kingston Technology Company, Inc., 17600 Newhope St, Fountain Valley, CA 92708, USA			
Prüfgegenstand: <i>Test item:</i>	HyperX Cloud MIX Bluetooth Headset			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	HX-HSCAM, HX-HSCAM-GM, HX-HSCAM***** (* = 0-9, A-Z, a-z, - or blank; to indicate different colors, packaging and shipping locations)			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C/ISED RSS-247 Test report (BDR/EDR)			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.247 RSS-247 ISSUE 2 FEB 2017			
Wareneingangsdatum: <i>Date of receipt:</i>	27-Jun-2018			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000765976-001 A000765976-002			
Prüfzeitraum: <i>Testing period:</i>	29-Jun-2018 - 20-Jul-2018			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Laboratory Taipei			
Prüflaboratorium: <i>Testing laboratory:</i>	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
Report date / tested by:		kontrolliert von / reviewed by:		
 i.A. 2018-08-06 Ryan W. T. Chen / Project Manager		 2018-08-06 Arvin Ho/Vice General Manager		
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT*RESULT: Passed***5.1.2 PEAK OUTPUT POWER***RESULT: Passed***5.1.3 20dB BANDWIDTH***RESULT: Passed***5.1.4 99% BANDWIDTH***RESULT: Passed***5.1.5 CONDUCTED SPURIOUS EMISSIONS AND FREQUENCY BAND EDGE MEASURED IN 100kHz BANDWIDTH***RESULT: Passed***5.1.6 SPURIOUS EMISSION***RESULT: Passed***5.1.7 FREQUENCY SEPARATION***RESULT: Passed***5.1.8 NUMBER OF HOPPING FREQUENCY***RESULT: Passed***5.1.9 TIME OF OCCUPANCY***RESULT: Passed***5.2.1 MAINS CONDUCTED EMISSIONS***RESULT: Passed***6.1.1 ELECTROMAGNETIC FIELDS***RESULT: Passed*

Contents

1.	GENERAL REMARKS	5
1.1	COMPLEMENTARY MATERIALS.....	5
2.	TEST SITES	6
2.1	TEST LABORATORY	6
2.2	TEST FACILITY.....	6
2.3	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	7
2.4	TRACEABILITY	8
2.5	CALIBRATION	8
2.6	MEASUREMENT UNCERTAINTY	8
3.	GENERAL PRODUCT INFORMATION.....	9
3.1	PRODUCT FUNCTION AND INTENDED USE	9
3.2	SYSTEM DETAILS AND RATINGS.....	9
3.3	INDEPENDENT OPERATION MODES.....	11
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS	12
3.5	SUBMITTED DOCUMENTS.....	12
4.	TEST SET-UP AND OPERATION MODES.....	13
4.1	PRINCIPLE OF CONFIGURATION SELECTION	13
4.2	TEST OPERATION AND TEST SOFTWARE.....	13
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	13
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	14
4.5	TEST SETUP DIAGRAM	14
5.	TEST RESULTS	16
5.1	TRANSMITTER REQUIREMENT & TEST SUITES.....	16
5.1.1	<i>Antenna Requirement</i>	<i>16</i>
5.1.2	<i>Peak Output Power</i>	<i>17</i>
5.1.3	<i>20dB Bandwidth</i>	<i>18</i>
5.1.4	<i>99% Bandwidth</i>	<i>22</i>
5.1.5	<i>Conducted spurious emissions and Frequency Band Edge measured in 100kHz Bandwidth.....</i>	<i>23</i>
5.1.6	<i>Spurious Emission</i>	<i>31</i>
5.1.7	<i>Frequency Separation.....</i>	<i>32</i>
5.1.8	<i>Number of hopping frequency.....</i>	<i>34</i>
5.1.9	<i>Time of Occupancy</i>	<i>36</i>
5.2	MAINS EMISSIONS.....	39
5.2.1	<i>Mains Conducted Emissions.....</i>	<i>39</i>

Prüfbericht - Nr.: 50169070 001

Test Report No.

Seite 4 von 44

Page 4 of 44

6.	SAFETY HUMAN EXPOSURE	40
6.1	RADIO FREQUENCY EXPOSURE COMPLIANCE	40
6.1.1	Electromagnetic Fields.....	40
7.	PHOTOGRAPHS OF THE TEST SET-UP.....	41
8.	LIST OF TABLES	44
9.	LIST OF PHOTOGRAPHS.....	44

1. General Remarks

1.1 Complementary Materials

The following attachments are integral parts of this test report:

Appendix P: Photo Documentation
(File Name: 50169070APPENDIX P)

Appendix D: Test Result of Radiated Emissions
(File Name: 50169070APPENDIX D)

Test Specifications

The following standards were applied

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.247 RSS-247 Issue 2 Feb 2017 RSS-Gen, Issue 4, November 2014 ANSI C63.10:2013

2. Test Sites

2.1 Test Laboratory

TUV Rheinland Taiwan Ltd.
Taichung Branch Office

No.9, Lane 36, Minsheng Rd., Sec. 3, Daya District,
Taichung City 428
Taiwan (R.O.C.)

2.2 Test Facility

TUV Rheinland Taiwan Ltd.
Taipei Office

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC RegistrationNo.: 340738
IC Canada Registration No.: 9465A-1
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2016-Jul-1st to 2019-Jun-30th



Testing Laboratory
0759

2.3 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manu-facturer	Type	S/N	Last Calibration	Next Calibration
Test Software	Farad	EZ_EM C	Ver. TUV3A1	N/A	N/A
EMI Test Receiver	R&S	ESR 7	101549	2017/11/10	2018/11/09
Spectrum Analyzer	R&S	FSV 40	100921	2018/05/02	2019/05/01
EXA Signal Analyzer	KEYSIGHT	N9010A	MY52221334	2018/02/05	2019/02/04
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	2017/08/14	2018/08/13
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	2018/01/18	2019/01/17
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM01G18G	60558	2017/11/21	2018/11/20
Bilog Antenna	TESEQ	CBL6111D	29804	2017/08/18	2018/08/17
Horn Antenna	ETS-Lindgren	3117	201918	2017/08/18	2018/08/17
Horn Antenna (18GHz~40GHz)	COM-POWER	AH-840	101029	2017/11/28	2018/11/27
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2018/06/14	2019/06/13
EMI Test Receiver	R&S	ESR 7	101549	2017/11/10	2018/11/09
Temp. & Humid. Chamber	Giant Force	GCT-099-40-S	MAF0103-007	2017/03/09	2019/03/09
LISN (1 phase)	R&S	ENV216	101243	2018/06/18	2019/06/17
LISN	R&S	ENV216	101262	2018/06/22	2019/06/21
Spectrum Analyzer	Agilent	N9010A	MY53470241	2018/06/04	2019/06/03

2.4 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.5 Calibration

requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.6 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements:.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 0.1 ppm
RF power, conducted	± 1.5 dB
Adjacent channel power	± 3 dB
Radiated emission of transmitter, valid up to 26 GHz	± 6 dB
Radiated emission of receiver, valid up to 26 GHz	± 6 dB
Temperature	± 2 °C
Humidity	± 10 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Wireless headset. It contains a Bluetooth compatible chip enabling the user to communicate data through a Wireless interface.
For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	HyperX Cloud MIX Bluetooth Headset
Type Identification	HX-HSCAM, HX-HSCAM-GM, HX-HSCAM***** (*= 0-9, A-Z, a-z, - or blank; to indicate different colors, packaging and shipping locations)
Brand Name	Kingston
FCC ID	JIC-HSCAM
Canada ID	3880A-HSCAM
Canada HVIN	HX-HSCAM-GM

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequency	2402 MHz ~ 2480 MHz
Channel Spacing	1 MHz
Channel number	79
Operation Voltage	3.7 Vdc
Modulation	GFSK, $\pi/4$ DQPSK, 8 DPSK
Antenna gain	2.53 dBi

Table 6: Frequency hopping information

Technical Specification	Description
Hopping Range	Hereby we declare that the maximum frequency of this device is: 2402-2480MHz. This is according the Bluetooth Core Specification V2.1+EDR for devices which will be operated in the USA. This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/04).
Hopping Sequence	Example of a 79 hopping sequence in data mode: 33,04,21,44,23,42,53,46,55,48,40,59,72,29,76,31,08,73,07,75,09,45,60,39,58,13,47,11,77,52,35,50,65,54,67,56,69,62,71,64, 7,25,27,66,57,70,74,61,78,63,10,41,05,43,15,44,64,68,02,70,06,01,51,03,55,05,03,66,53,49,36,47,
Receiver input bandwidth	The input bandwidth of the receiver is 1MHz. In every connection one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings. Repeating of a packer has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

3.3 Independent Operation Modes

The basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Receiving
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- C. Hopping

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 4. All testing were performed according to the procedures in ANSI C63.10: 2013

The samples were used as follows:

Conducted: **A000765976-002**

Radiation: **A000765976-001**

Full test was applied on all test modes, but only worst case was shown.

Test Software	CSR bluetest3
---------------	---------------

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

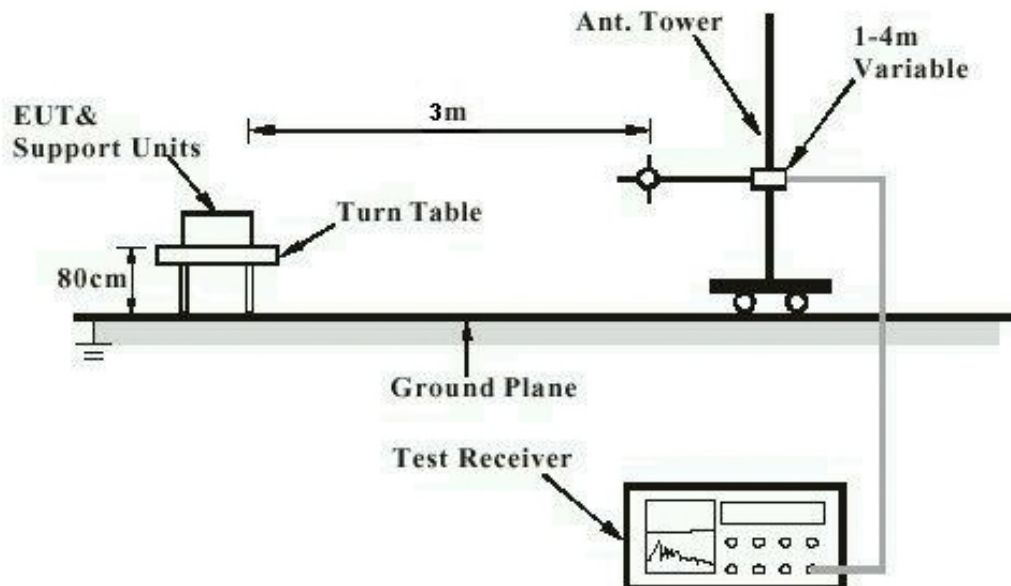
Description	Manufacturer	Model No.	Serial No.
Notebook(EMC-06)	Lenovo	TP00048A	PB-0F8B2

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested containing the noise suppression parts as in the Photo Appendix and the Test Setup Photos. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1 GHz are done with a table height of 1.5m

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement

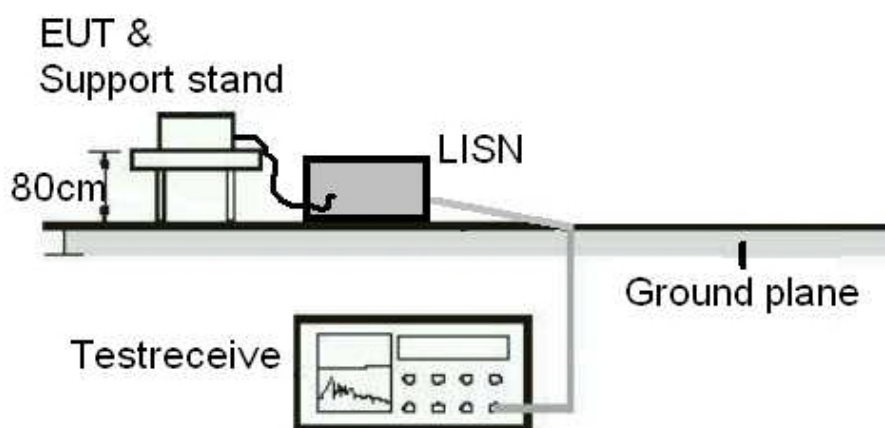
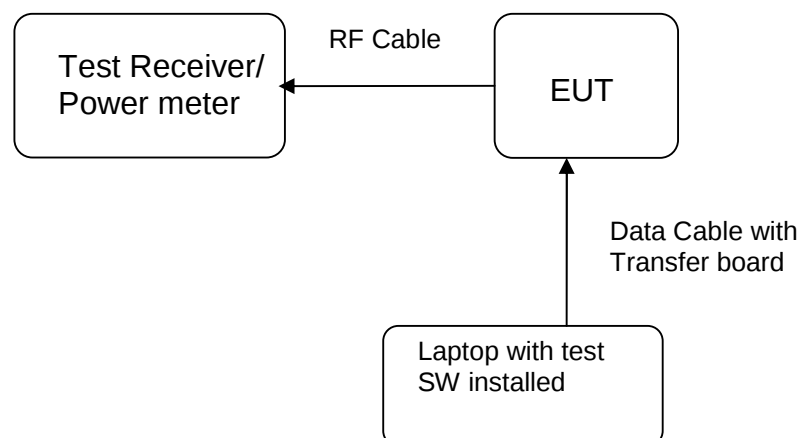


Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Passed**

Test standard	:	LP0002(2018): 2.2, 3.10.1, (3) FCC Part 15.247(b)(4), Part 15.203 and RSS- Gen 8.3
Requirement	:	use of approved antennas only with directional gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 2.53 dBi . The antenna is a printed PCB trace with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Peak Output Power

RESULT:

Passed

Test standard : FCC Part 15.247(b)(1),
 RSS-247 5.4(2)
 LP0002(2018): 3.10.1, (2)

Basic standard : ANSI C63.10:2013
 LP0002(2018) Appendix II

Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
 Operation Mode : A

Ambient temperature : 22-26 °C
 Relative humidity : 50-65 %
 Atmospheric pressure : 100-103 kPa

Table 7: Test result of Peak Output Power, GFSK modulation

Channel	Channel Frequency	Peak Output Power		Limit
	(MHz)	(dBm)	(W)	(W)
Low Channel	2402	6.72	0.00470	0.125
Middle Channel	2441	7.49	0.00561	0.125
High Channel	2480	7.39	0.00548	0.125

Table 8: Test result of Peak Output Power, 8DPSK modulation

Channel	Channel Frequency	Peak Output Power		Limit
	(MHz)	(dBm)	(W)	(W)
Low Channel	2402	5.83	0.00383	0.125
Middle Channel	2441	6.52	0.00449	0.125
High Channel	2480	6.31	0.00428	0.125

Pmax: 5.6105 mW

5.1.3 20dB Bandwidth

RESULT:
Passed

Test standard : FCC Part 15.247(a)(1),
 RSS-247 5.1(1)
 LP0002(2018): 3.10.1, (6.1.1)

Basic standard : ANSI C63.10:2013
 LP0002(2018) Appendix II

Kind of test site : Shielded room

Test setup

Test Channel : Low/ Middle/ High
 Operation Mode : A

Ambient temperature : 22-26°C
 Relative humidity : 50-65%
 Atmospheric pressure : 100-103kPa

Table 9: Test result of 20dB Bandwidth, GFSK modulation

Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)	Limit (MHz)	Result
Low Channel	2402	945.9	1.5	Pass
Mid Channel	2441	944.3	1.5	Pass
High Channel	2480	944.9	1.5	Pass

Note: Limit is for Channel Separation of 1 MHz and a power limit of 125 mW.

Table 10: Test result of 20dB Bandwidth, 8DPSK modulation

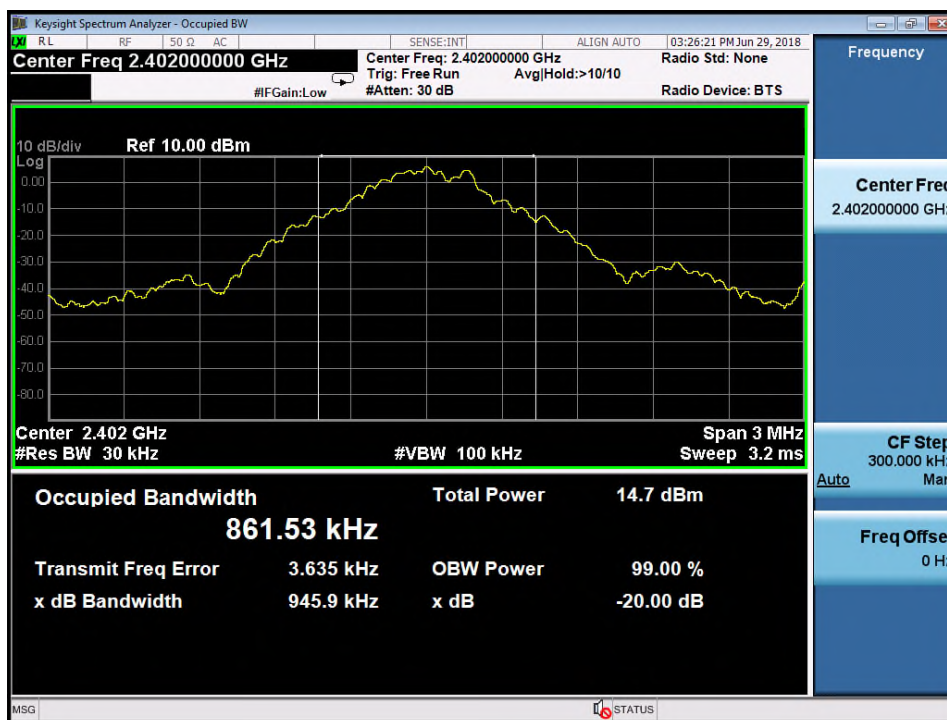
Channel	Channel Frequency (MHz)	20dB Bandwidth (kHz)	Limit (MHz)	Result
Low Channel	2402	1264	1.5	Pass
Mid Channel	2441	1264	1.5	Pass
High Channel	2480	1263	1.5	Pass

Note: Limit is for Channel Separation of 1 MHz and a power limit of 125 mW.

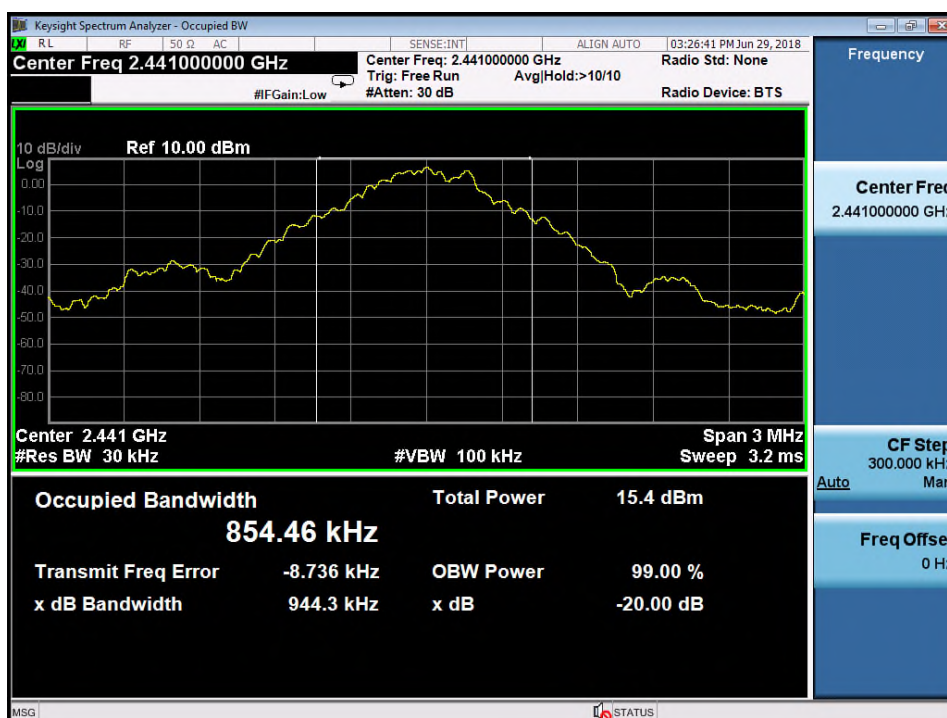
If the carrier separation frequency of a Bluetooth Device is set at 1 MHz due to the firmware setting and the Bluetooth Standard, then for power <125 mW the limit for the 20 dB Bandwidth, becomes 1 MHz / 0.66666 = 1.5 MHz.

Test Plot of 20dB Bandwidth, GFSK modulation

Low Channel



Middle Channel

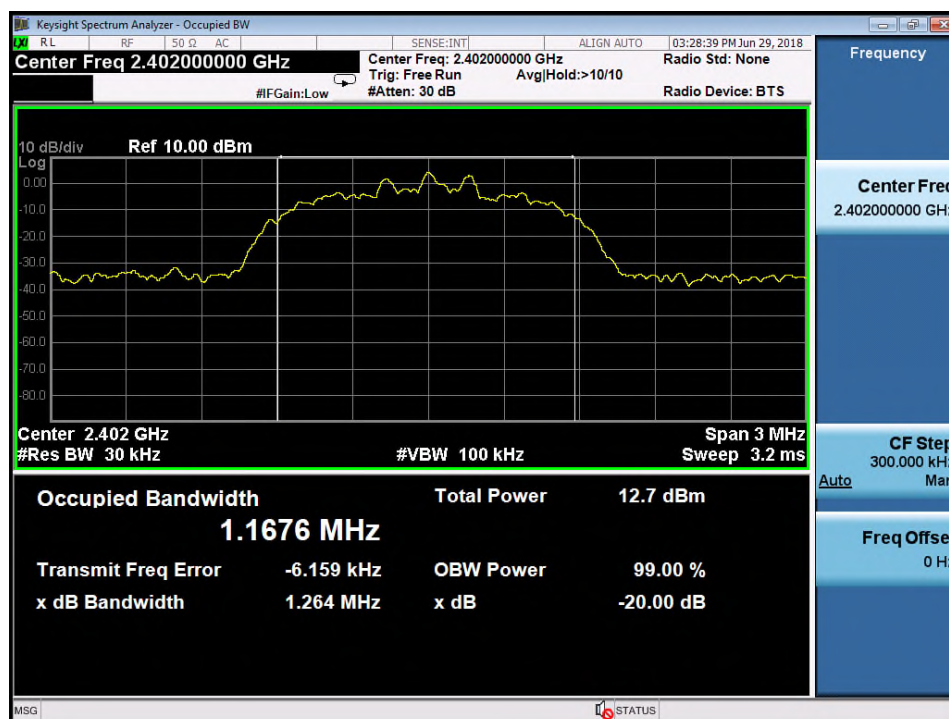


High Channel

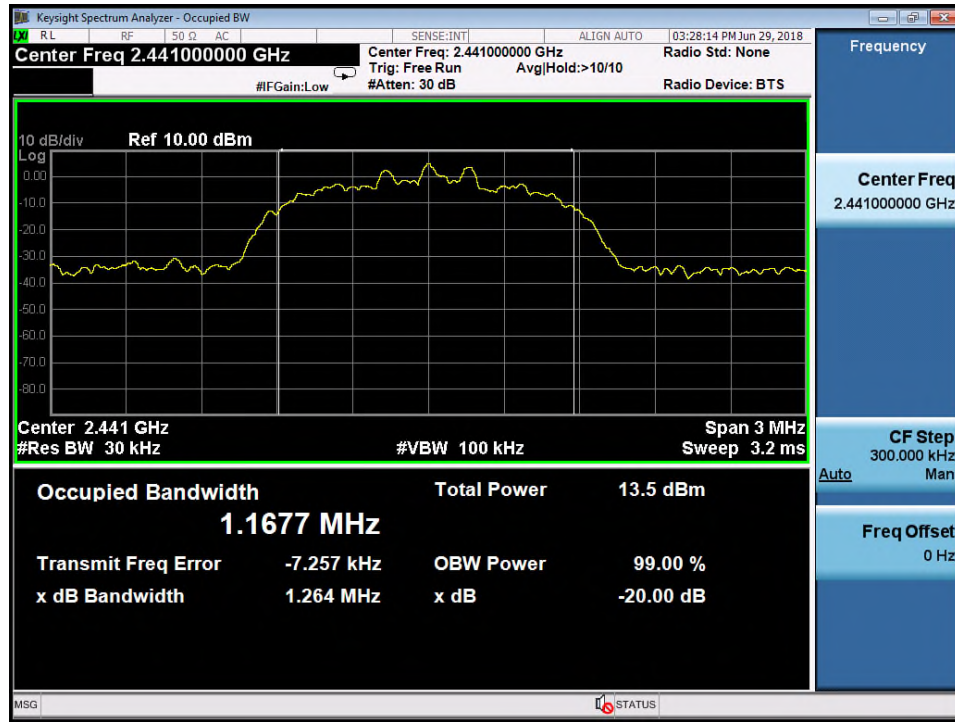


Test Plot of 20dB Bandwidth, 8DPSK modulation

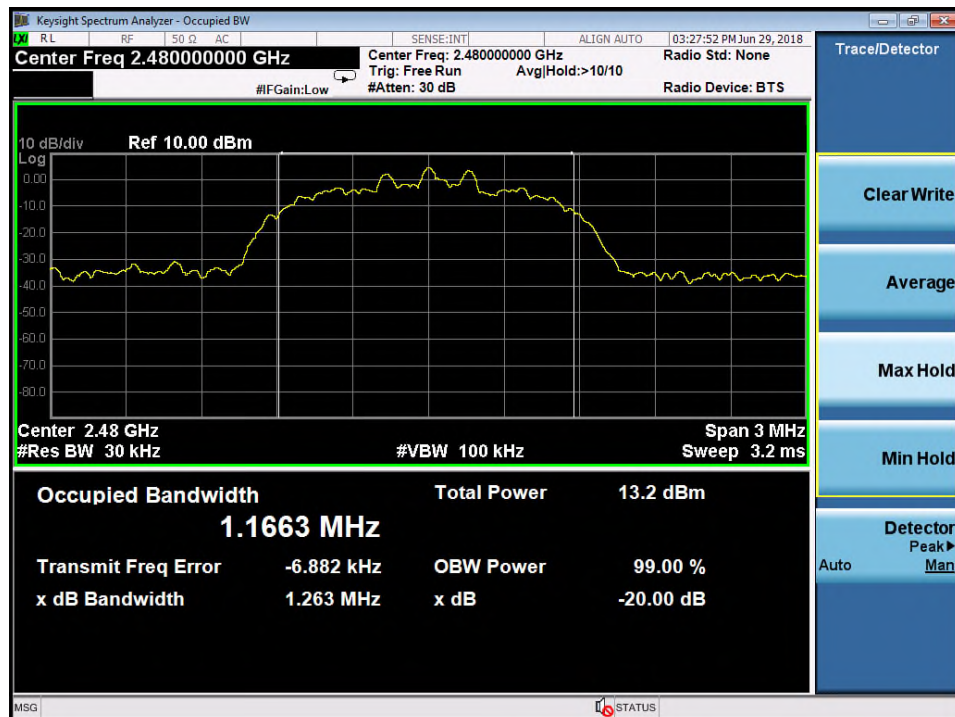
Low Channel



Middle Channel



High Channel



5.1.4 99% Bandwidth**RESULT:****Passed**

Test standard : RSS-Gen (Issue 4)
Basic standard : RSS-Gen (Issue 4)
Kind of test site : Shielded room

Test setup

Test Channel : Middle
Operation Mode : A

Ambient temperature : 22-26°C
Relative humidity : 50-65%
Atmospheric pressure : 100-103kPa

Table 11: Test result of 99% Bandwidth, GFSK modulation

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Mid Channel	2441	854.46

Table 12: Test result of 99% Bandwidth, PSK modulation

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Mid Channel	2441	1167.7

5.1.5 Conducted spurious emissions and Frequency Band Edge measured in 100kHz Bandwidth

RESULT:**Passed**

Test standard	:	FCC part 15.247(d), RSS-247 5.5 LP0002(2018): 3.10.1, (5)
Basic standard	:	ANSI C63.10:2013 LP0002(2018) Appendix II
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power)
Kind of test site	:	Shielded room

Test setup

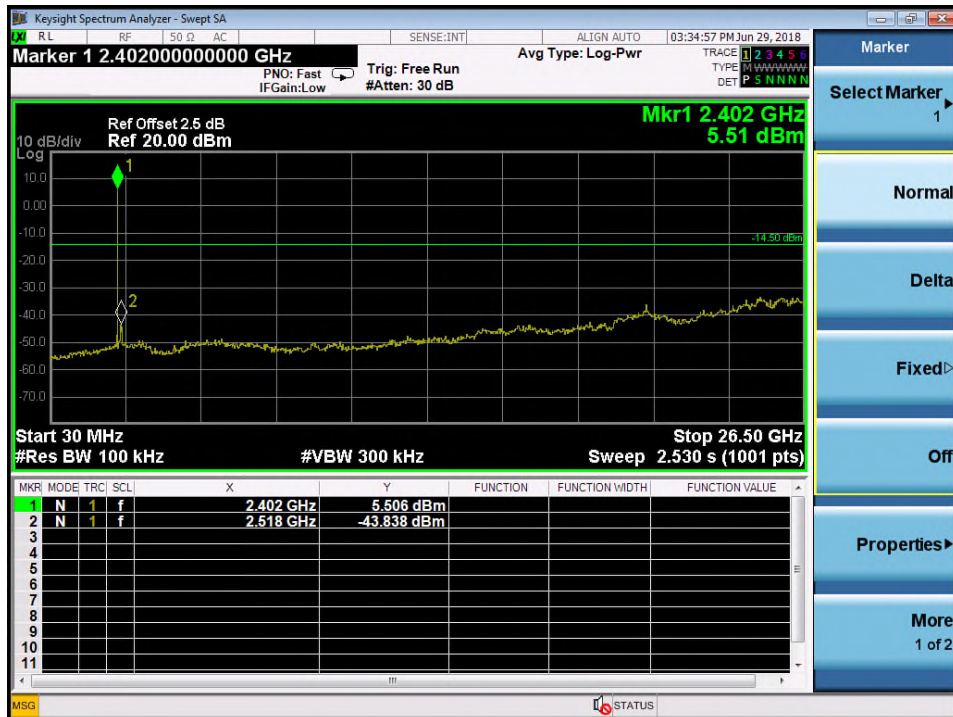
Test Channel	:	Low/ Middle/ High for Conducted Spurious Emissions Low/ High/ Hopping on for Frequency Band Edge
Operation Mode	:	A
Ambient temperature	:	22-26°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103 kPa

All emissions are more than 20dB below fundamental, details refer to following test plot, and compliance is achieved as well.

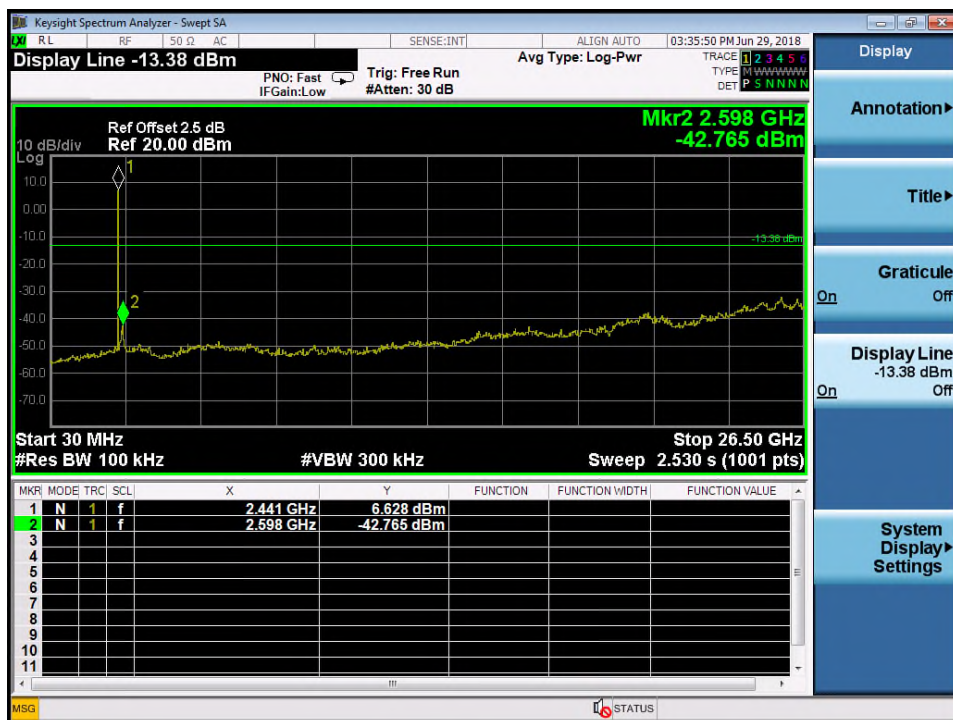
Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

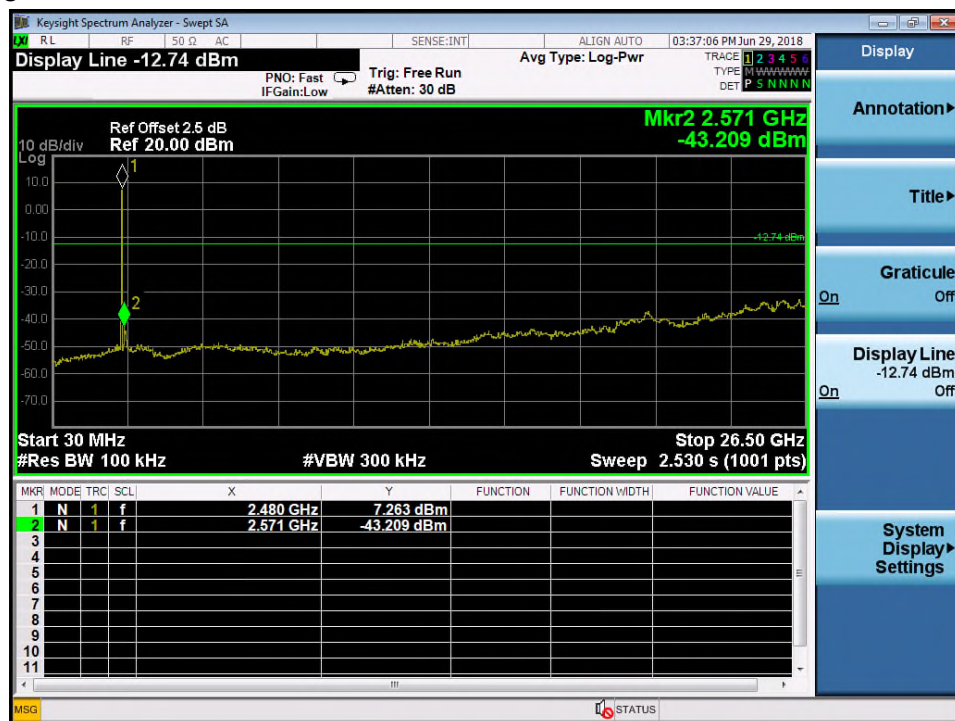
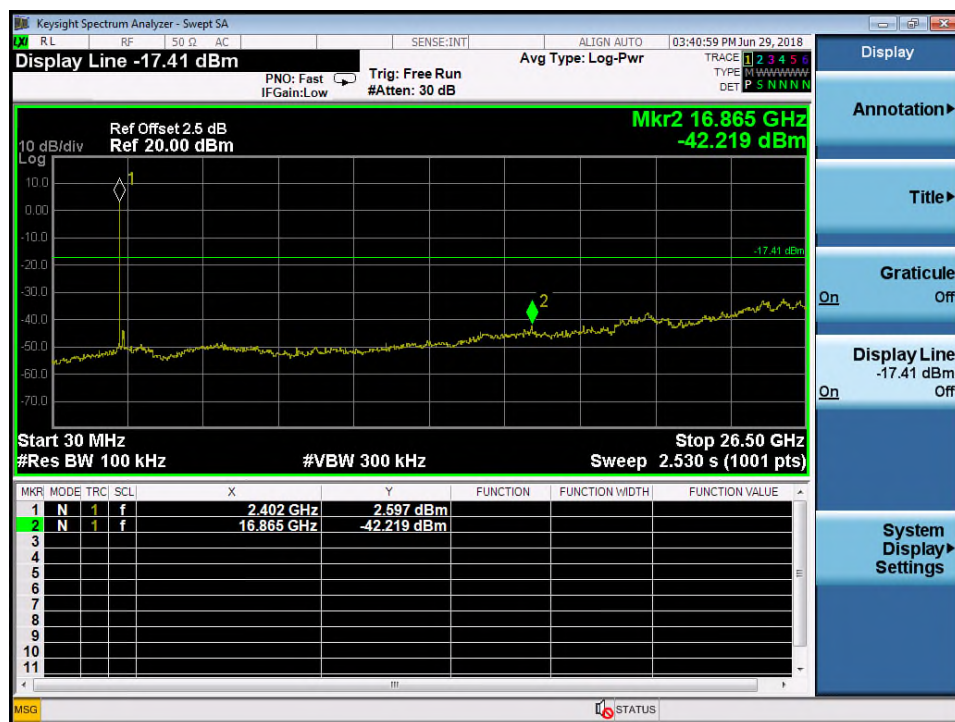
Test Plot of 100kHz Conducted Emissions, GFSK modulation

Low Channel

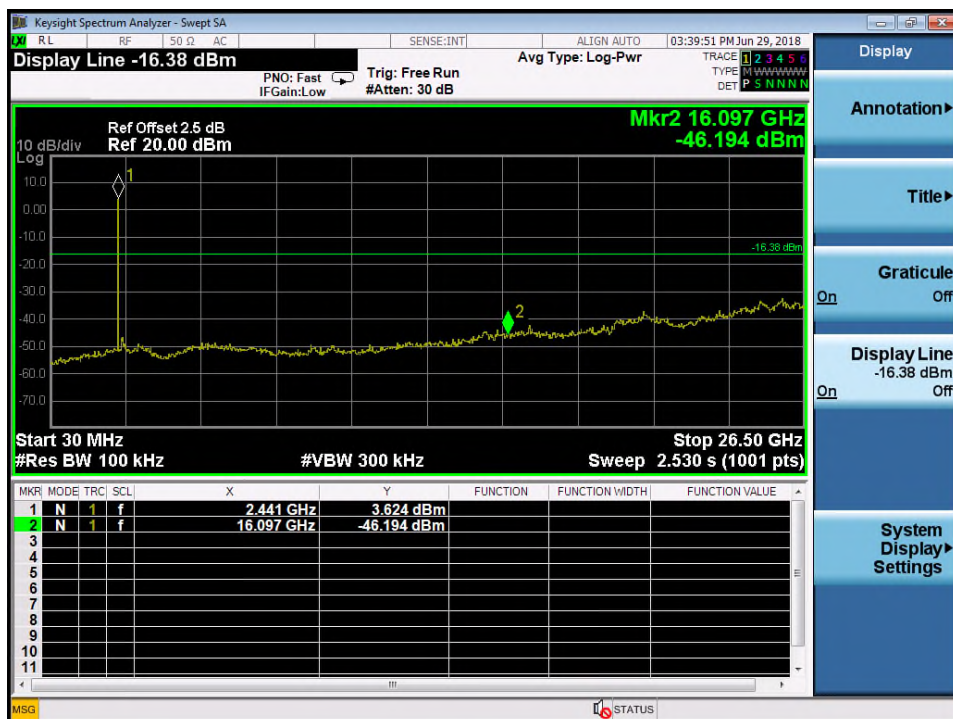


Middle Channel

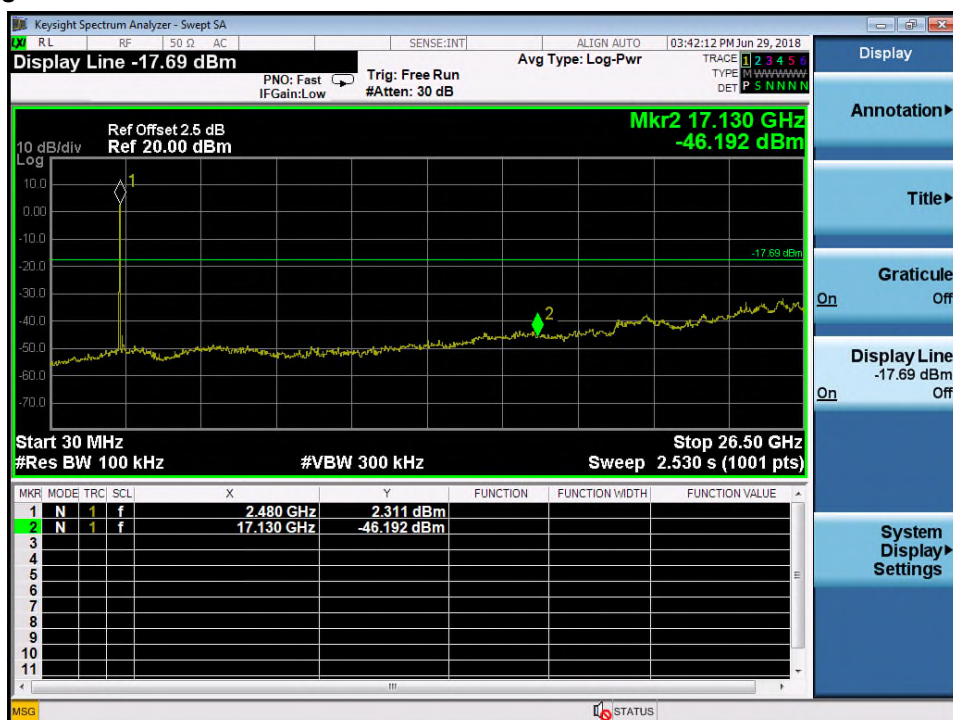


High Channel

Test Plot of 100kHz Conducted Emissions, 8DPSK modulation
Low Channel


Middle Channel

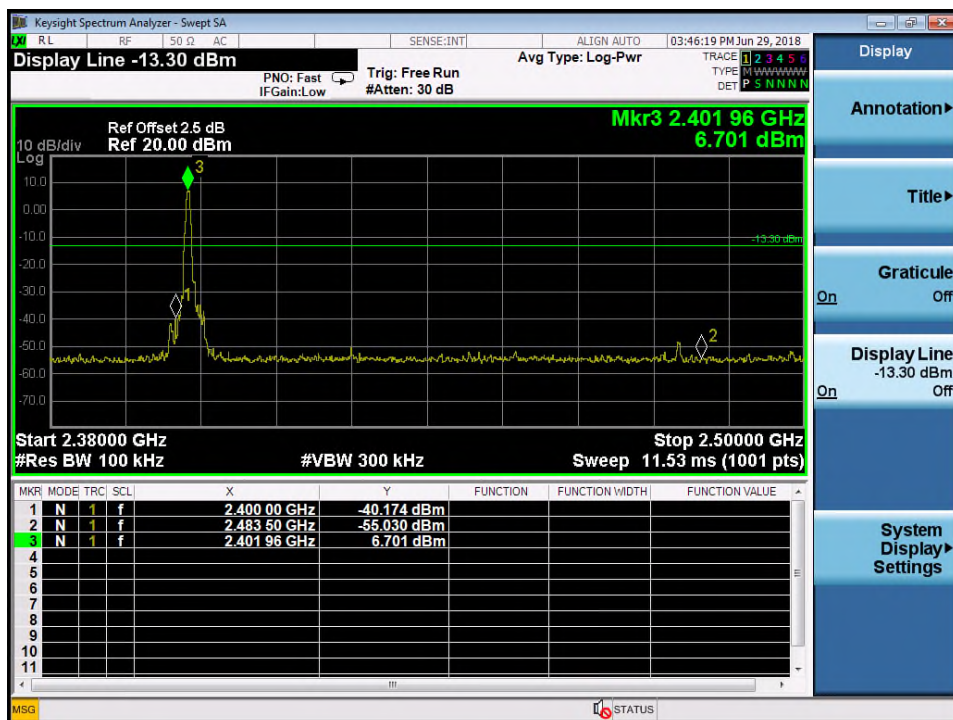


High Channel

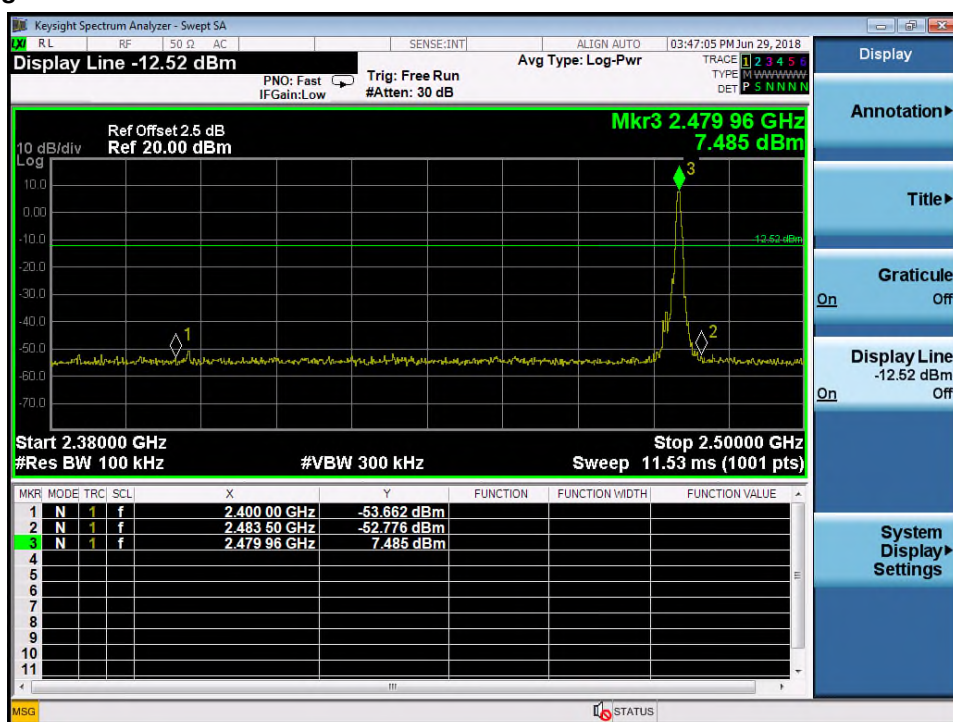


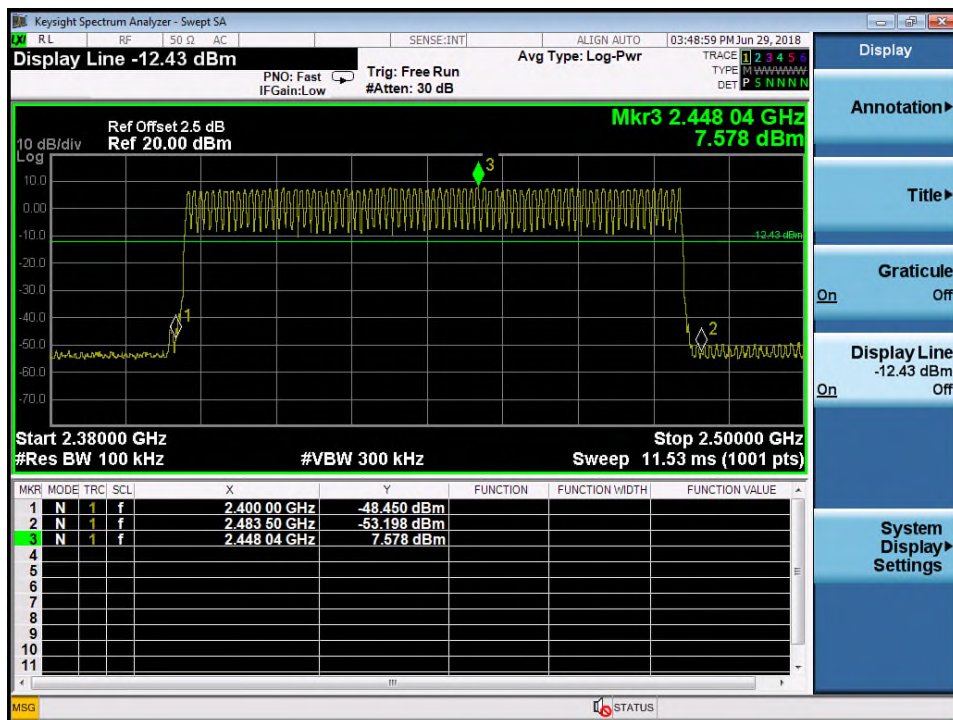
Test Plot of 100kHz Bandwidth of Frequency Band Edge, GFSK modulation

Low Channel



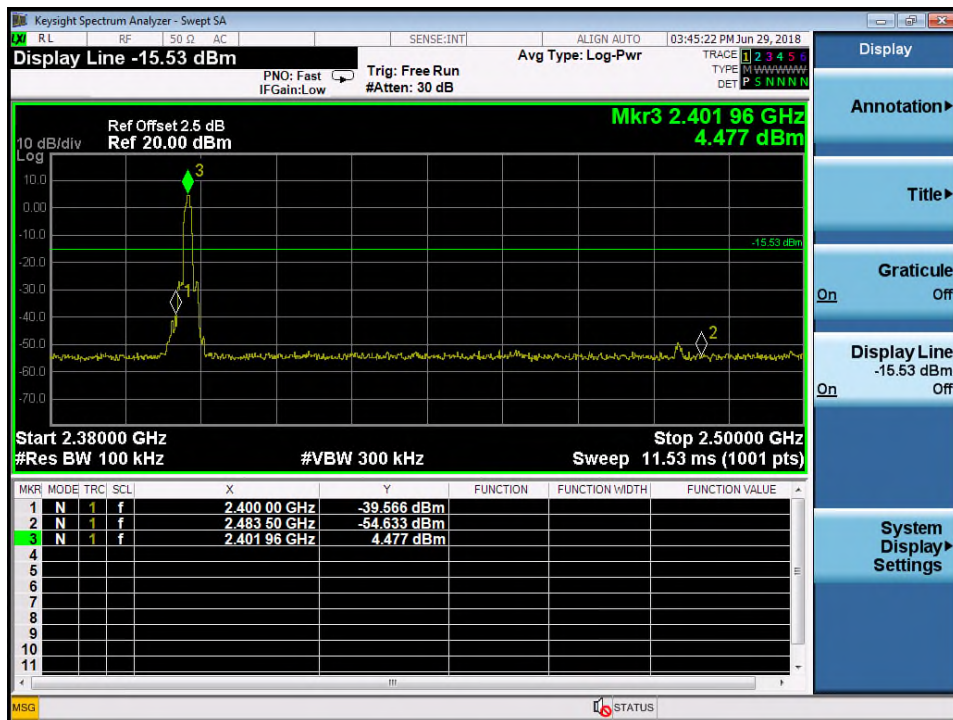
High Channel



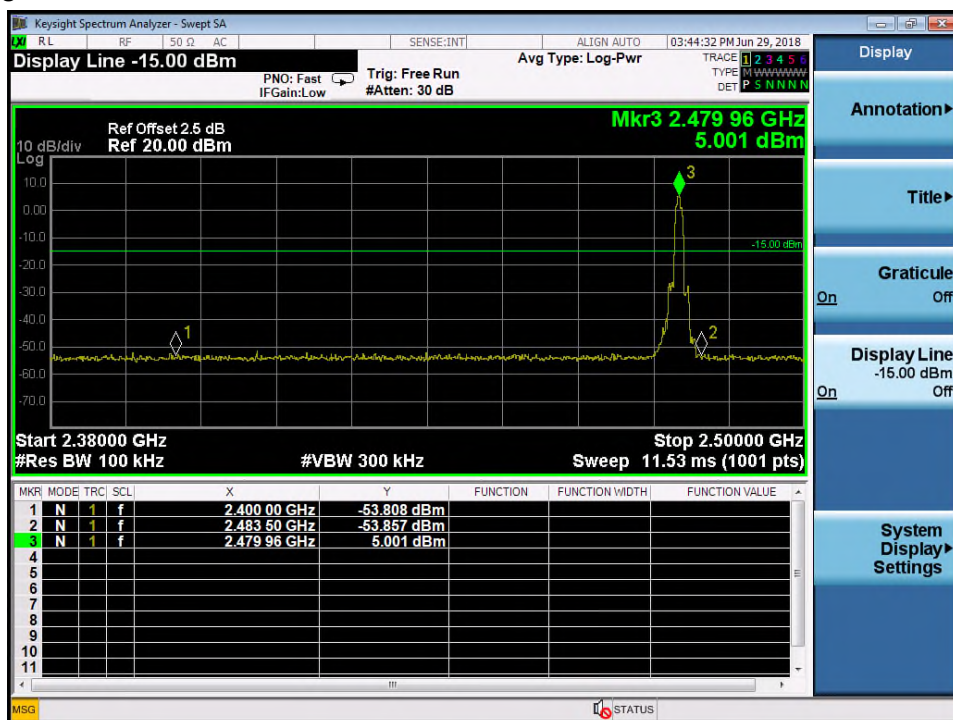
Hopping ON


Test Plot of 100kHz Bandwidth of Frequency Band Edge, 8DPSK modulation

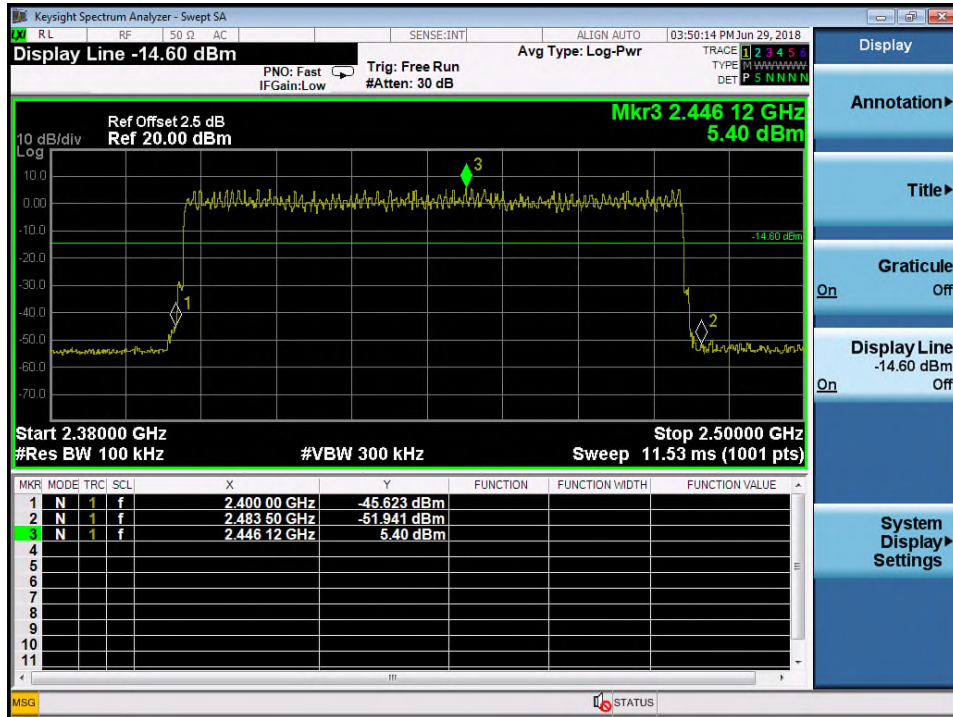
Low Channel



High Channel



Hopping ON



5.1.6 Spurious Emission

RESULT:**Passed**

Test standard	:	FCC part 15.247(d), FCC 15.205, FCC 15.209, RSS-210 2.2, RSS-247 5.5 and RSS-Gen 8.9 LP0002(2018): 3.10.1, (5)
Basic standard	:	ANSI C63.10
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i4, 8.9 (Table 6), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen i4, 8.9 (Table 4 and 5). Radiated emissions which fall in the restricted bands, as defined in LP0002(2018): 2.7 , must comply with the radiated emission limits specified in LP0002(2018): 2.8 Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) and FCC 15.249(a), RSS-Gen i4, 8.9 (Table 4 and 5) and RSS-210 A2.9(a). Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in LP0002(2018): 2.8
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A, B
Ambient temperature	:	22-26°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103 kPa

Remark: Testing was carried out within frequency range 30MHz to the tenth harmonic. For details refer to Appendix D. The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report. Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

5.1.7 Frequency Separation

RESULT:
Passed

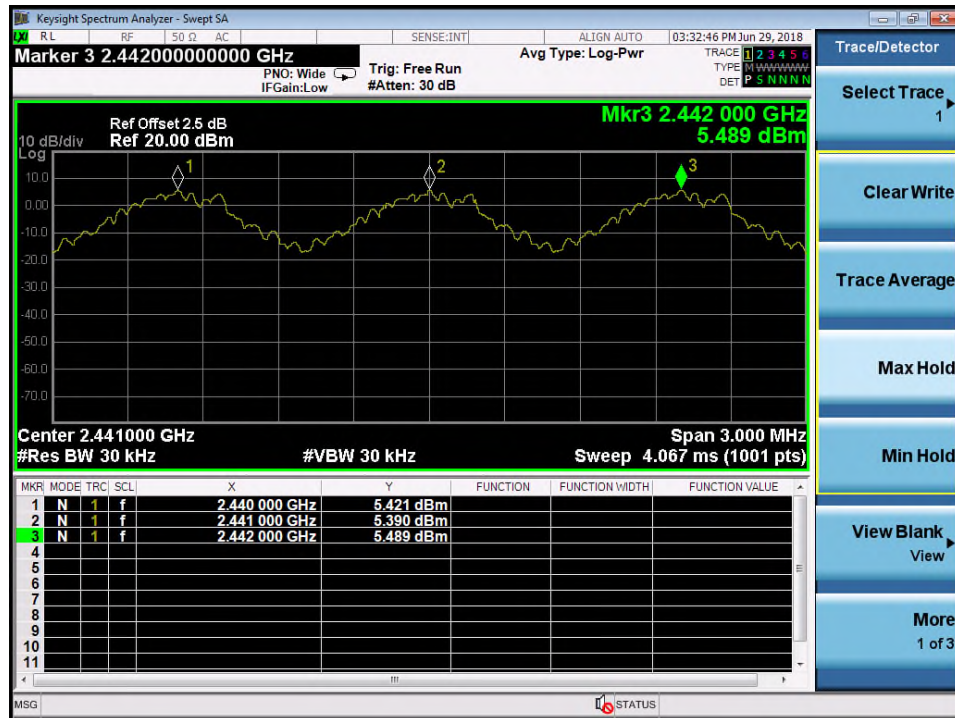
Test standard	:	FCC part 15.247(a)(1) RSS-247 5.1 LP0002(2018): 3.10.1, (6.1.1)
Basic standard	:	ANSI C63.10:2013 LP0002(2018) Appendix II
Limit	:	≥ 25kHz or 2/3 of 20dB bandwidth, whichever is greater
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Hopping On
Operation Mode	:	C
Ambient temperature	:	22-26°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103 kPa

Table 13: Test result of Frequency Separation

Channel	Channel Frequency (MHz)	Measured Channel Separation (MHz)	Limit (kHz)	Result
Record Channel	2441	1	≥ 25kHz or 2/3 of 20dB bandwidth	Pass
Record Channel adj 1	2440			
Record Channel adj 2	2442			



5.1.8 Number of hopping frequency

RESULT:
Passed

Test standard : FCC part 15.247(a)(1)(iii)
 RSS-247 5.1(5)
 LP0002(2018): 3.10.1, (6.1.2)

Basic standard : ANSI C63.10:2013
 LP0002(2018) Appendix II

Kind of test site : Shielded room

Test setup

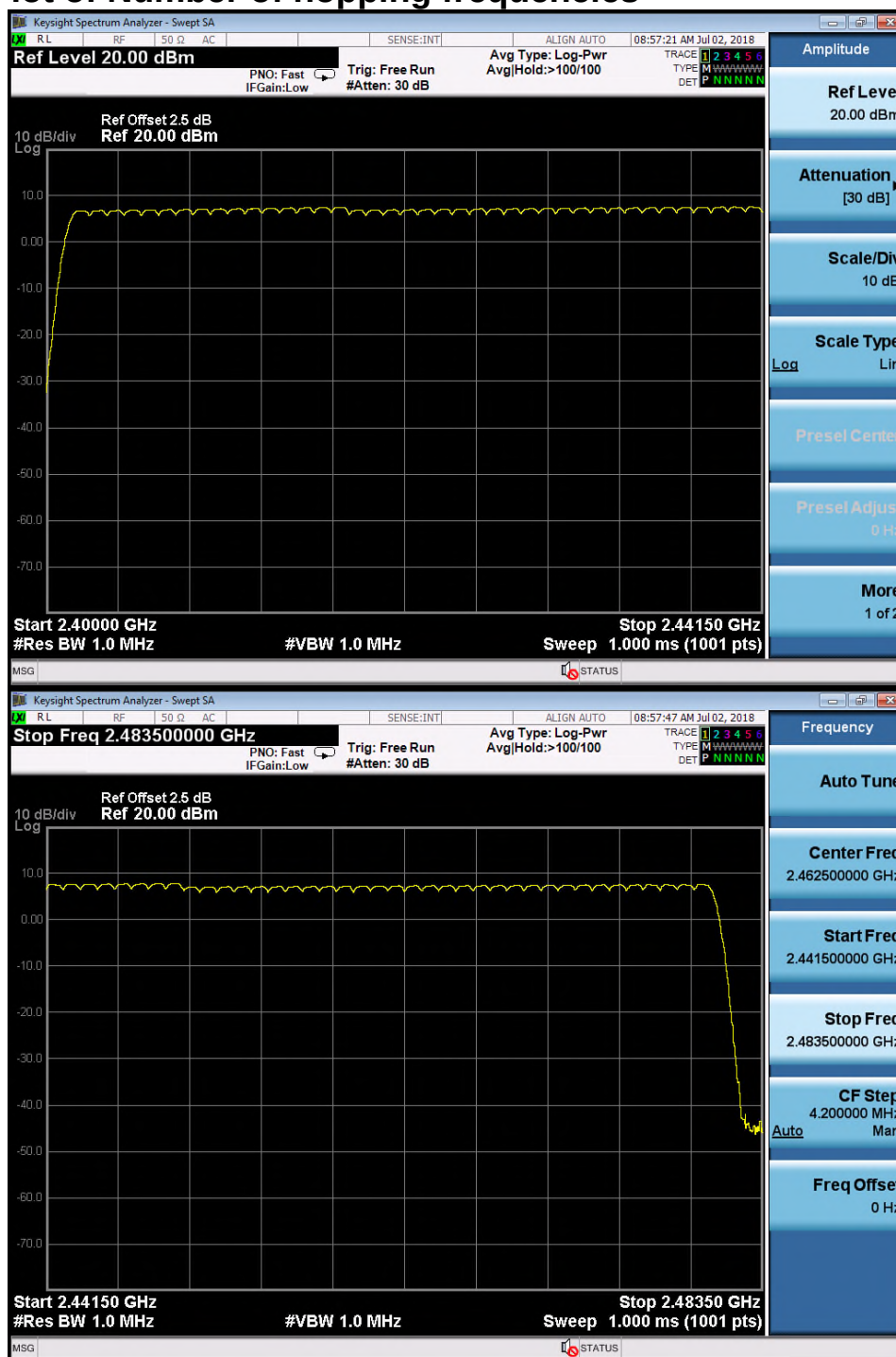
Test Channel : Hopping On
 Operation Mode : C

Ambient temperature : 22-26°C
 Relative humidity : 50-65%
 Atmospheric pressure : 100-103 kPa

Table 14: Test result of Number of hopping frequency

Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
<u>2400</u> to <u>2483.5</u> MHz	79	≥15	Pass

Test Plot of Number of hopping frequencies



5.1.9 Time of Occupancy

RESULT:
Passed

Test standard : FCC part 15.247(a)(1)(iii)
 RSS-247 5.1(5)
 LP0002(2018): 3.10.1, (6.1.2)
 Basic standard : ANSI C63.10:2013
 LP0002(2018) Appendix II
 Limits : 0.4s
 Kind of test site : Shield room

Test setup

Test Channel : Low
 Operation Mode : A
 Ambient temperature : 22-26°C
 Relative humidity : 50-65%
 Atmospheric pressure : 100-103 kPa

Table 15: Test result of Time of Occupancy

Data Mode	Captured Burst (s)	Dwell time (s)	On+Off time (s)	Limit (s)	Result
DH5	0.00289	0.3116	0.00371	0.4	Pass
3DH5	0.00289	0.3141	0.00368	0.4	Pass

Note:

Dwell time = Pulse width x (Hopping rate / Number of channels) x Period

Period = 0.4 (seconds/ channel) x 79 (channel) = 31.6 seconds.

Hopping rate = 1 / (On+Off time) = 266 Hz

Test Plot of Time of Occupancy, GFSK modulation



Test Plot of Time of Occupancy, 8DPSK modulation



5.2 Mains Emissions

5.2.1 Mains Conducted Emissions

RESULT:**Passed**

Test standard	:	FCC Part 15.207 FCC Part 15.107 RSS-Gen 8.8 LP0002: 2.3
Limits	:	Mains Conducted emissions as defined in above test standards must comply with the mains conducted emission limits specified
Kind of test site	:	Shielded Room

Test setup

Test Channel	:	Normal link
Operation mode	:	Normal link
Ambient temperature	:	22-26°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103 kPa

Remark: For details refer to Appendix D.

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Passed**

Test standard : FCC KDB Publication 447498 D01
RSS-102 issue 5, Table 1

FCC:

Since maximum peak output power of the transmitter is 5.6015 mW < 10mW, hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498: Mobile Portable RF Exposure

Canada:

Maximum conducted peak power: 5.6105 mW

Antenna Gain: 2.53 db -> x 1.79

Maximum EIRP available 4.52 mW

=====
Maximum Power available: 10.04 mW
(higher of EIRP or conducted)

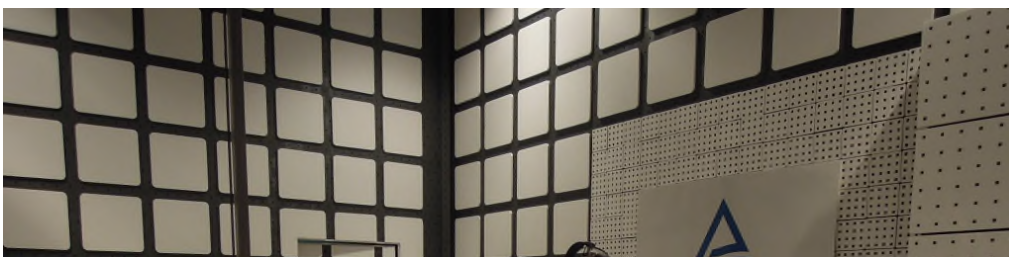
Since maximum output power of the transmitter is 10.04 mW < 30mW at 20mm, hence the EUT is excluded from SAR evaluation according to Table 1 in RSS-102

7. Photographs of the Test Set-Up

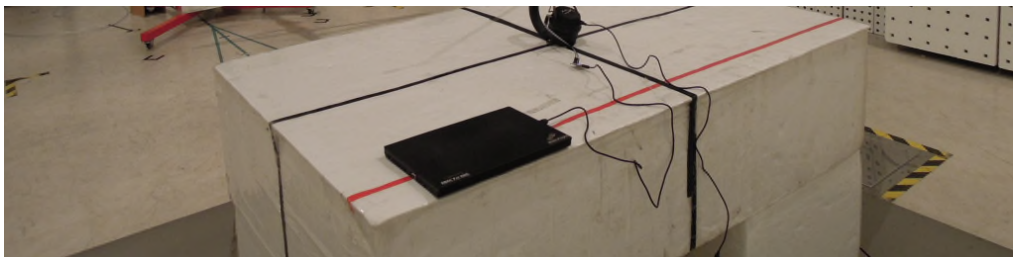
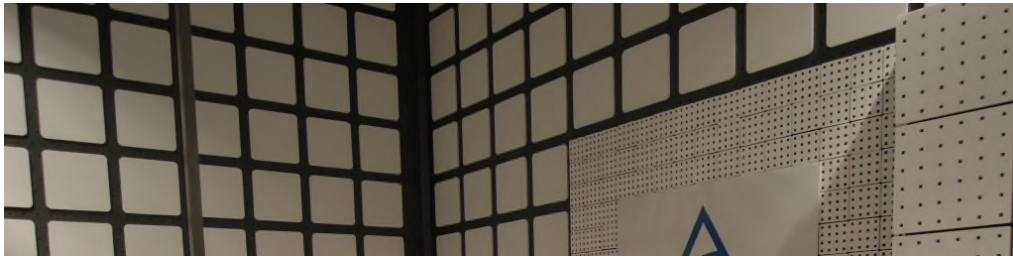
Photograph 1: Set-up for Spurious Emissions (Front View)



Photograph 2: Set-up for Spurious Emissions (Back View 1)



Photograph 3: Set-up for Spurious Emissions (Back View 2)



Photograph 4: Set-up for Conducted testing



Photograph 5: Set-up for for Mains Conducted testing Back



Photograph 6: Set-up for for Mains Conducted testing Front



8. List of Tables

Table 1: Applied Standard and Test Levels	5
Table 2: List of Test and Measurement Equipment	7
Table 3: Emission Measurement Uncertainty.....	8
Table 4: Basic Information of EUT	9
Table 5: Technical Specification of EUT	9
Table 6: Frequency hopping information	10
Table 7: Test result of Peak Output Power, GFSK modulation.....	17
Table 8: Test result of Peak Output Power, 8DPSK modulation.....	17
Table 9: Test result of 20dB Bandwidth, GFSK modulation.....	18
Table 10: Test result of 20dB Bandwidth, 8DPSK modulation.....	18
Table 11: Test result of 99% Bandwidth, GFSK modulation	22
Table 12: Test result of 99% Bandwidth, PSK modulation.....	22
Table 13: Test result of Frequency Separation	32
Table 14: Test result of Number of hopping frequency	34
Table 15: Test result of Time of Occupancy.....	36

9. List of Photographs

Photograph 1: Set-up for Spurious Emissions (Front View).....	41
Photograph 2: Set-up for Spurious Emissions (Back View 1)	41
Photograph 3: Set-up for Spurious Emissions (Back View 2)	42
Photograph 4: Set-up for Conducted testing	42
Photograph 5: Set-up for for Mains Conducted testing Back.....	43
Photograph 6: Set-up for for Mains Conducted testing Front.....	43