

Prüfbericht-Nr.: <i>Test Report No.:</i>	50209102 001	Auftrags-Nr.: <i>Order No.:</i>	114083527	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>	01-Nov-2018	
Auftraggeber: <i>Client:</i>	Microchip Technology Inc. 2355 West Chandler Blvd. Chandler, Arizona 85224-6199, United States.			
Prüfgegenstand: <i>Test item:</i>	Bluetooth Module			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	BM83SM1, BM83SL1, BM83AM1, BM83AL1			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part15C / IC RSS-247 Test report (BT)			
Prüfgrundlage: <i>Test specification:</i>	FCC 47 CFR Part 15: Subpart C Section 15.247(FHSS) RSS-247 (02-2017)			
Wareneingangsdatum: <i>Date of receipt:</i>	02-Aug-2018			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000821901-002 A000785697-004, 005			
Prüfzeitraum: <i>Testing period:</i>	12-Nov-2018 – 04-Dec-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: <i>25-Feb-2019 Jack Chang/Project Manager</i> Datum Name / Stellung Unterschrift <i>Date Name / Position Signature</i>		kontrolliert von / reviewed by: <i>25-Feb-2019 Arvin Ho/Vice General Manager</i> Datum Name / Stellung Unterschrift <i>Date Name / Position Signature</i>		
Sonstiges / Other: BM83SM1 : main module with shield-can. BM83SL1 : variant module with shield-can. With Audio codec feature Enabled. BM83AM1 : module without shield-can. BM83AL1 : variant module without shield-can. With Audio codec feature Enabled.				
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>		
<p>* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</p> <p>Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested</p>				
<p>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></p>				

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Passed

5.1.2 MAXIMUM CONDUCTED OUTPUT POWER (AVERAGE)

RESULT: Passed

5.1.3 20dB BANDWIDTH

RESULT: N/A

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

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1. General Remarks

1.1 Complementary Materials

The following attachments are integral parts of this test report:

Appendix P: Photo Documentation
(File Name: 50209102 001 APPENDIXP)

Appendix D: Test Result of Radiated Emissions
(File Name: 50209102 001 APPENDIXD)

Appendix S: Photo Test Setup
(File Name: 50209102 001 APPENDIXS)

Test Specifications

The following standards were applied

Table 1: Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.247 FCC 47CFR Part 2: Subpart J Section 2.1091 RSS-247 Issue 2, Feb 2017 RSS-102 Issue 5, March 2015 RSS-Gen, Issue 5, April 2018 ANSI C63.10:2013 KDB558074 D01 DTS Meas Guidance v05r01 KDB447498 D01 General RF Exposure Guidance v06

1.2 Decision Rule of conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

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 Registration No.: 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_EMC	Ver. TUV3A1	N/A	N/A
EMI Test Receiver	R&S	ESR 7	101062	2018/10/01	2019/10/01
Spectrum Analyzer	R&S	FSV 40	100921	2018/05/02	2019/05/02
EXA Signal Analyzer	KEYSIGHT	N9010A	MY52221334	2018/02/05	2019/02/05
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	2018/08/22	2019/08/22
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM01G18G	060649	2018/08/24	2019/08/24
Bilog Antenna	TESEQ	CBL 6111D	29802	2018/08/22	2019/08/22
Horn Antenna	ETS-Lindgren	3117	00138160	2018/06/01	2019/06/01
Horn Antenna (18GHz~40GHz)	COM-POWER	AH-840	101031	2018/01/16	2019/01/16
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2018/06/21	2019/06/21
LISN (1 phase)	R&S	ENV216	101243	2018/06/18	2019/06/18
LISN	R&S	ENV216	101262	2018/06/22	2019/06/22
Test Software	Agilent	300328 testsystem	V1.9.1	N/A	N/A
Power sensor	Agilent	U2021XA	MY54020001	2018/03/31	2019/03/31

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

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. 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 are $\pm 3\text{dB}$.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
RF power, conducted	$\pm 1.5 \text{ dB}$
Adjacent channel power	$\pm 3 \text{ dB}$
Radiated emission of transmitter, valid up to 26 GHz	$\pm 6 \text{ dB}$
Radiated emission of receiver, valid up to 26 GHz	$\pm 6 \text{ dB}$
Temperature	$\pm 2 \text{ }^{\circ}\text{C}$
Humidity	$\pm 10 \text{ \%}$

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Bluetooth Module. It contains a Bluetooth compatible module 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	Bluetooth Module
Type Identification	BM83SM1, BM83SL1, BM83AM1, BM83AL1
FCC ID	2ADHKBM83SM1
IC	20266-BM83SM1
HVIN	BM83SM1

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequency	2402 MHz ~ 2480 MHz
Channel Spacing	1 MHz
Channel number	79
Operation Voltage	#1) 3.2Vdc to 4.2Vdc BAT_IN pin . #2) 4.5 Vdc to 5.5Vdc ADAP_IN pin. Tested with 3.8Vdc at BAT_IN pin
Modulation	GFSK, $\pi/4$ DQPSK, 8DPSK
Antenna gain	3.5dBi

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 v5.0 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	<p>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.</p> <p>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.</p> <p>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.</p> <p>That means a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.</p>

3.3 Independent Operation Modes

The basic operation modes are:

- A. Transmitting
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. Receiver
 - 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

- Photo Document
- Technical Description
- Rating Label
- Circuit Diagram
- Block Diagram

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

Setup for testing: The module is mounted on an Evaluation Board provided by the manufacturer. The EVB is provided with an USB interface which makes it possible to control the module through the test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate.

The samples were used as follows:

Conducted sample (with shield – D831417): A000821901-002

Radiation sample (with shield – D2545): A000785697-005

Radiation sample (without shield – D33C7): A000785697-004

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

Test Software	ISRT_V2.1.32.5452
Power setting for Class 1	PL0
Power setting for Class 2	PL2

4.3 Special Accessories and Auxiliary Equipment

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

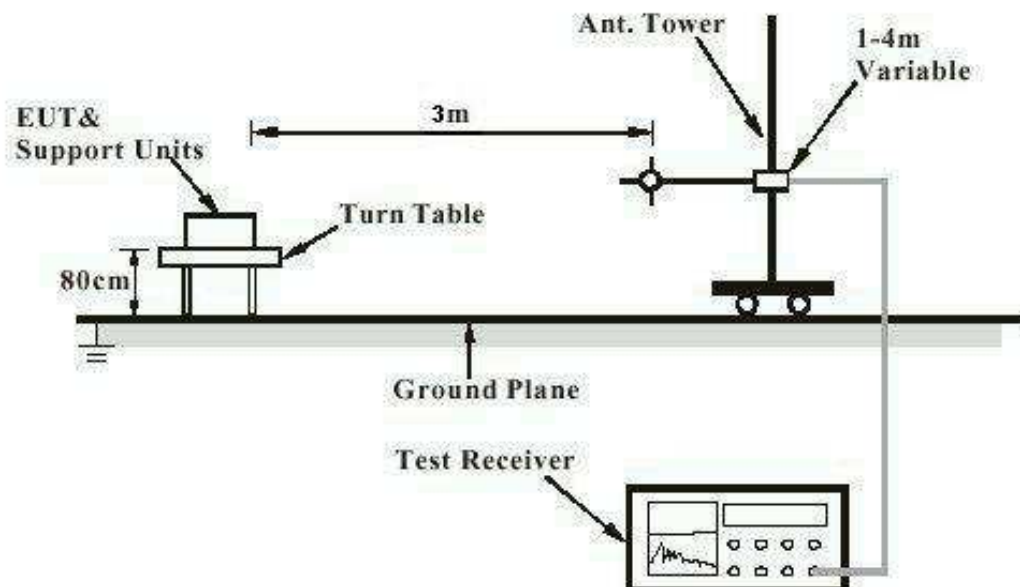
Description	Manufacturer	Model No.	Serial No.
Notebook(EMC-06)	Lenovo	TP00048A	PB-0F8B2
Test tool	Microchip	ISRT	ISRT_V2.1.32.5452

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

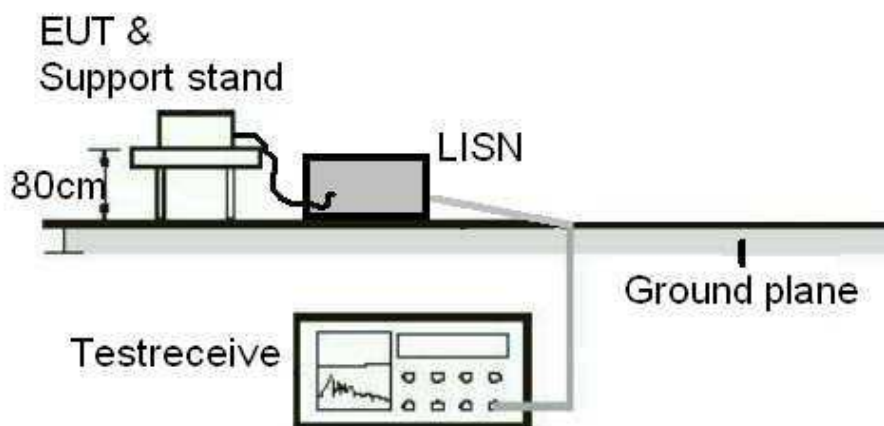
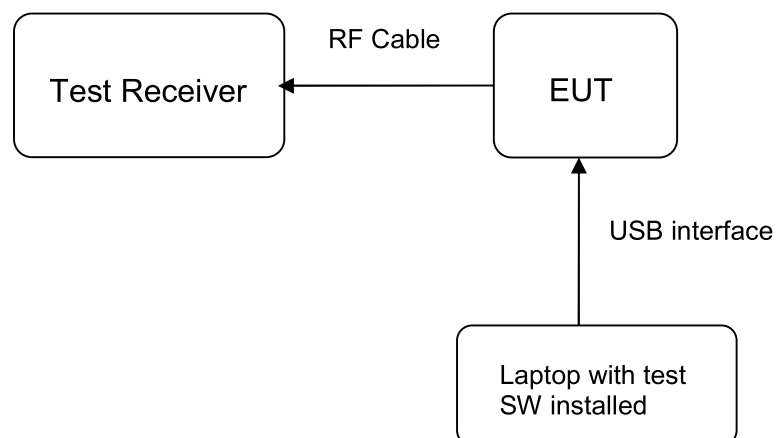


Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement



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 6.8
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 3.5dBi. 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 Maximum conducted output power (average)

RESULT:
Passed

Test standard : FCC Part 15.247(b)(1),
 RSS-247 5.4(b)
 LP0002(2018): 3.10.1.2

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

Kind of test site : Shielded room/Conducted room

Test setup

Test Channel : Low/ Middle/ High

Operation Mode : A

Ambient temperature : 18-25 °C

Relative humidity : 50-65 %

**Table 7: Test result of Maximum conducted output power (average),
 GFSK modulation – Class 1**

Channel	Channel Frequency	Peak Output Power		Limit
	(MHz)	(dBm)	(W)	(W)
Low Channel	2402	10.43	0.01104	0.125
Middle Channel	2441	10.05	0.01012	0.125
High Channel	2480	9.40	0.00871	0.125

**Table 8: Test result of Maximum conducted output power (average),
 8DPSK modulation – Class 1**

Channel	Channel Frequency	Peak Output Power		Limit
	(MHz)	(dBm)	(W)	(W)
Low Channel	2402	9.12	0.00817	0.125
Middle Channel	2441	8.69	0.00740	0.125
High Channel	2480	8.01	0.00632	0.125

Maximum Output power: 11.04mW

**Table 9: Test result of Maximum conducted output power (average),
GFSK modulation – Class 2**

Channel	Channel Frequency	Peak Output Power		Limit
	(MHz)	(dBm)	(W)	(W)
Middle Channel	2441	1.53	0.00142	0.125

**Table 10: Test result of Maximum conducted output power (average),
8DPSK modulation – Class 2**

Channel	Channel Frequency	Peak Output Power		Limit
	(MHz)	(dBm)	(W)	(W)
Middle Channel	2441	0.55	0.00114	0.125

5.1.3 20dB Bandwidth

RESULT:**N/A**

Test standard : FCC Part 15.247(a)(1),
RSS-247 5.1(a)
LP0002(2018): 3.10.1.6 (1) (A)

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

Test setup

Test Channel : Low/ Middle/ High

Operation Mode : A

Ambient temperature : 18-25°C

Relative humidity : 50-65%

Table 11: Test result of 20dB Bandwidth, GFSK modulation

Channel	Channel Frequency (MHz)	20dB Bandwidth (MHz)
Low Channel	2402	0.9513
Mid Channel	2441	0.9504
High Channel	2480	0.9516

Note: For reporting purposes only.

Table 12: Test result of 20dB Bandwidth, 8DPSK modulation

Channel	Channel Frequency (MHz)	20dB Bandwidth (KHz)
Low Channel	2402	1.286
Mid Channel	2441	1.282
High Channel	2480	1.275

Note: For reporting purposes only.

Test Plot of 20dB Bandwidth, GFSK modulation

Low Channel



Middle Channel

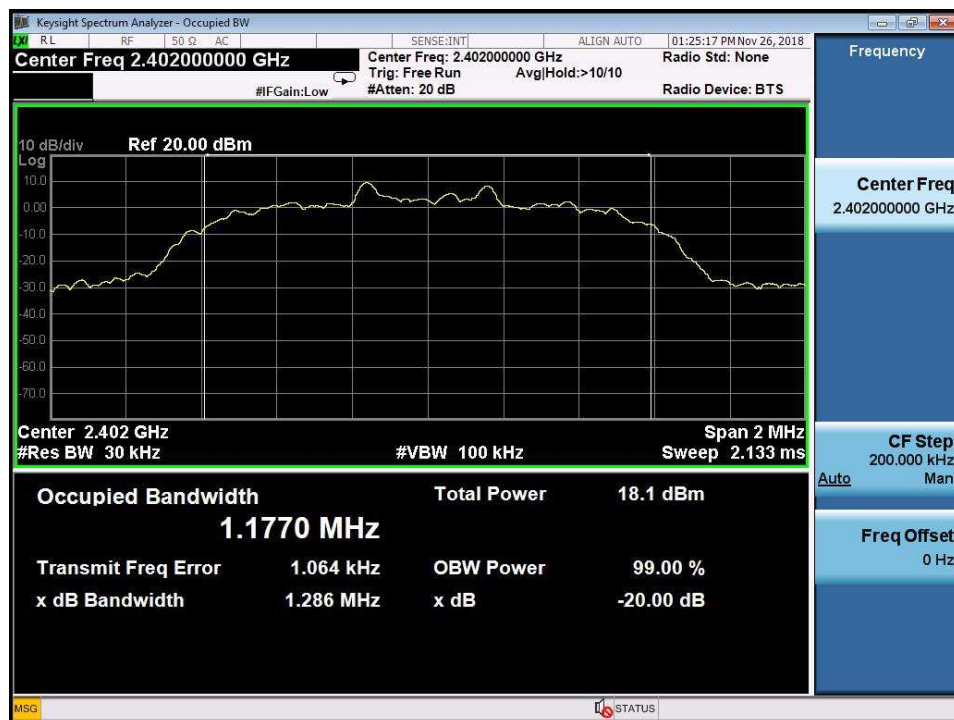


High Channel



Test Plot of 20dB Bandwidth, 8DPSK modulation

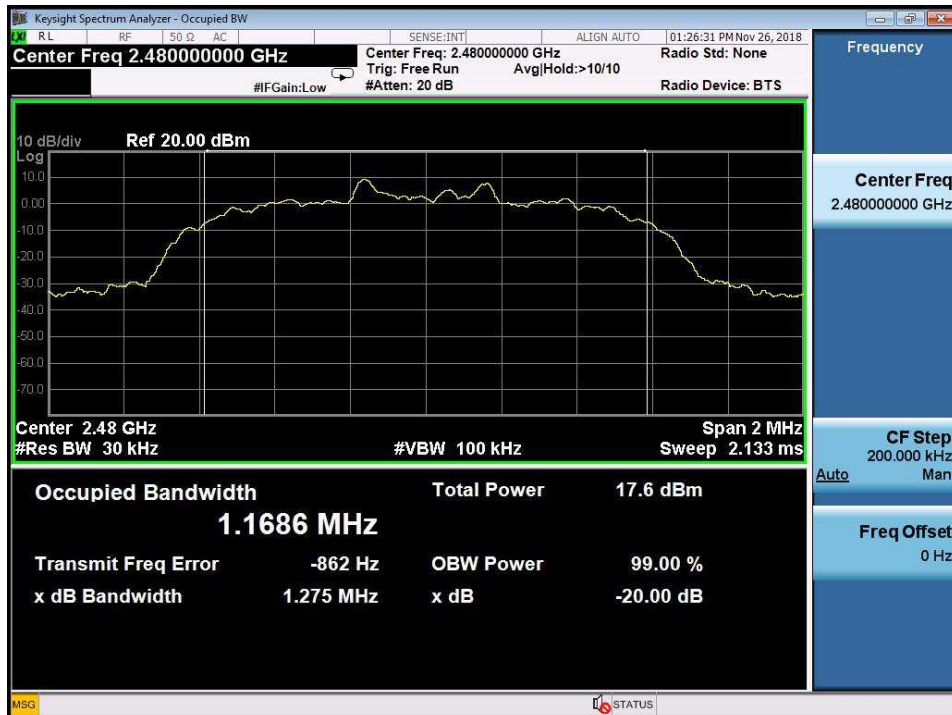
Low Channel



Middle Channel



High Channel



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

Test standard : RSS-Gen (Issue 5) 6.7
Basic standard : RSS-Gen (Issue 5) 6.7
Kind of test site : Shielded room/Conducted room

Test setup

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

Ambient temperature : 18-25°C
Relative humidity : 50-65%

Table 13: Test result of 99% Bandwidth, GFSK modulation

Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)
Mid Channel	2441	0.87997

Table 14: Test result of 99% Bandwidth, PSK modulation

Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)
Mid Channel	2441	1.1769

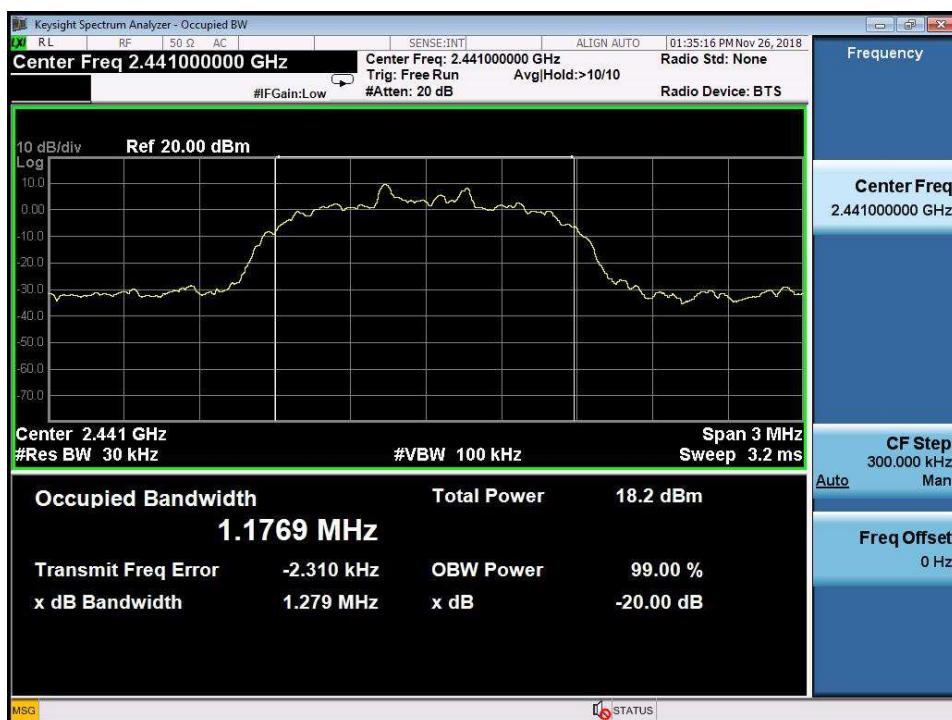
Test Plot of 99% Bandwidth, GFSK modulation

Middle Channel



Test Plot of 99% Bandwidth, 8DPSK modulation

Middle Channel



**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/Conducted room

Test setup

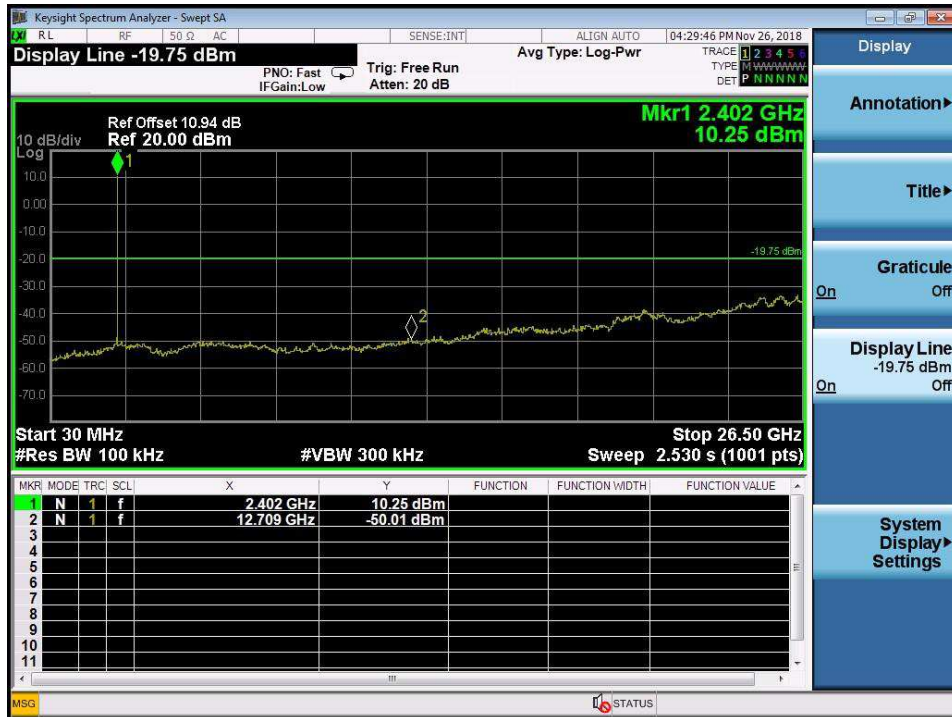
Test Channel	:	Low/ Mid/ High for spurious, Low/ High for Band Edge
Operation Mode	:	A
Ambient temperature	:	18-25°C
Relative humidity	:	50-65%
Atmospheric pressure	:	100-103kPa

All emissions are more than 30dB 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 – Class 1

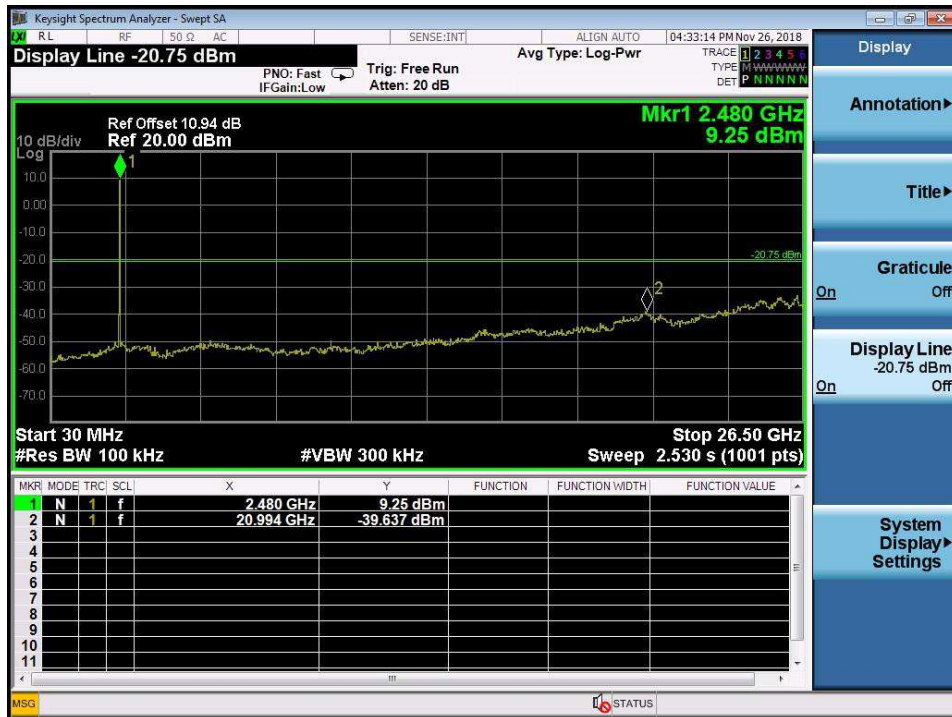
Low Channel



Middle Channel



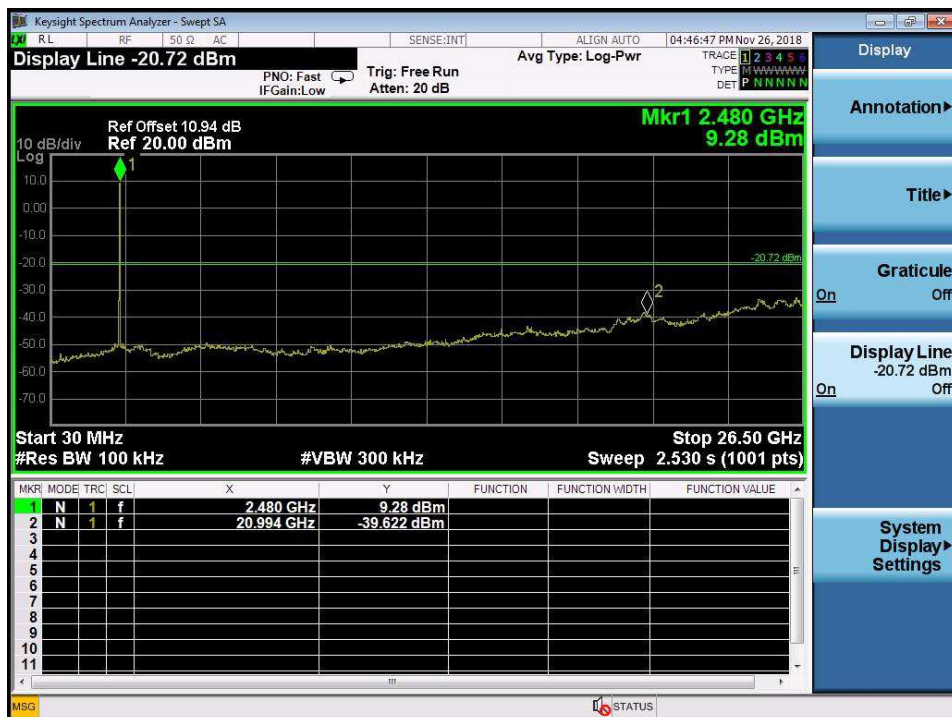
High Channel



Test Plot of 100kHz Conducted Emissions, 8DPSK modulation – Class 1

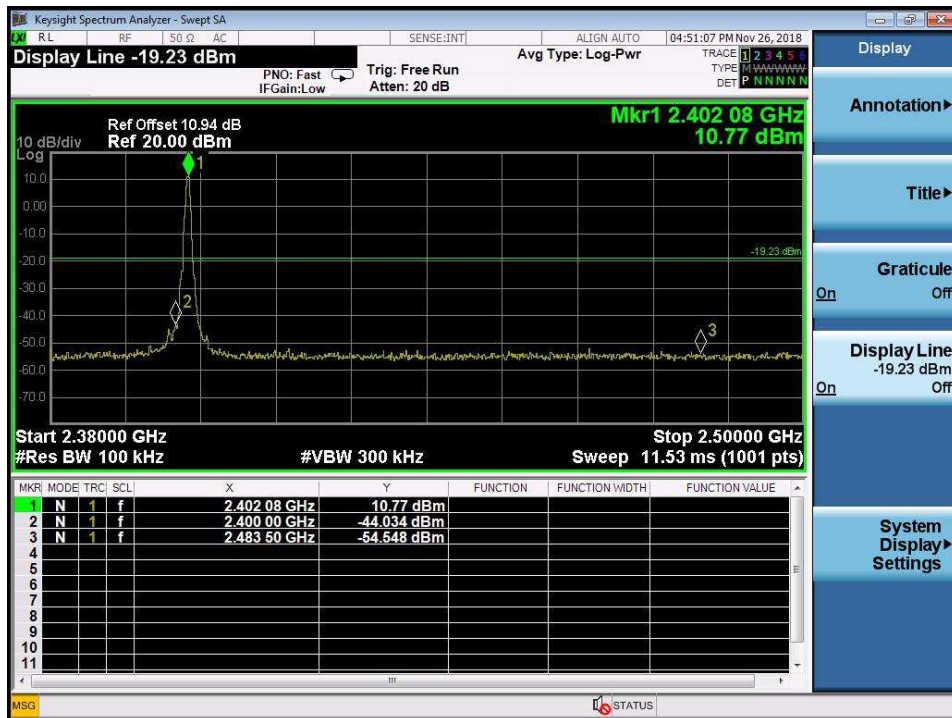
Low Channel



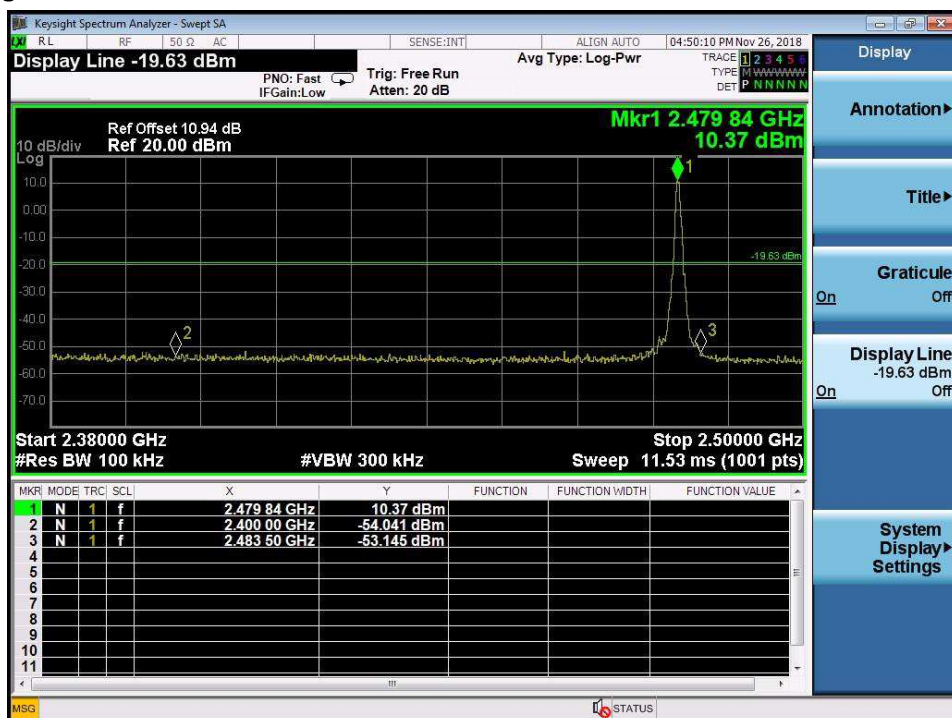


Test Plot of 100kHz Bandwidth of Frequency Band Edge, GFSK modulation – Class 1

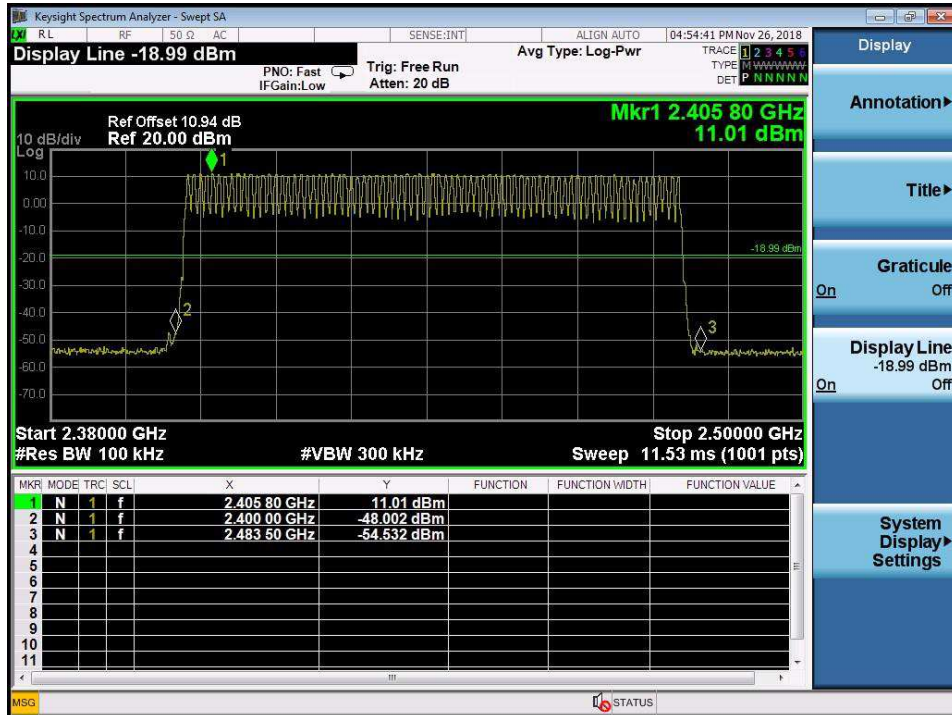
Low Channel



High Channel

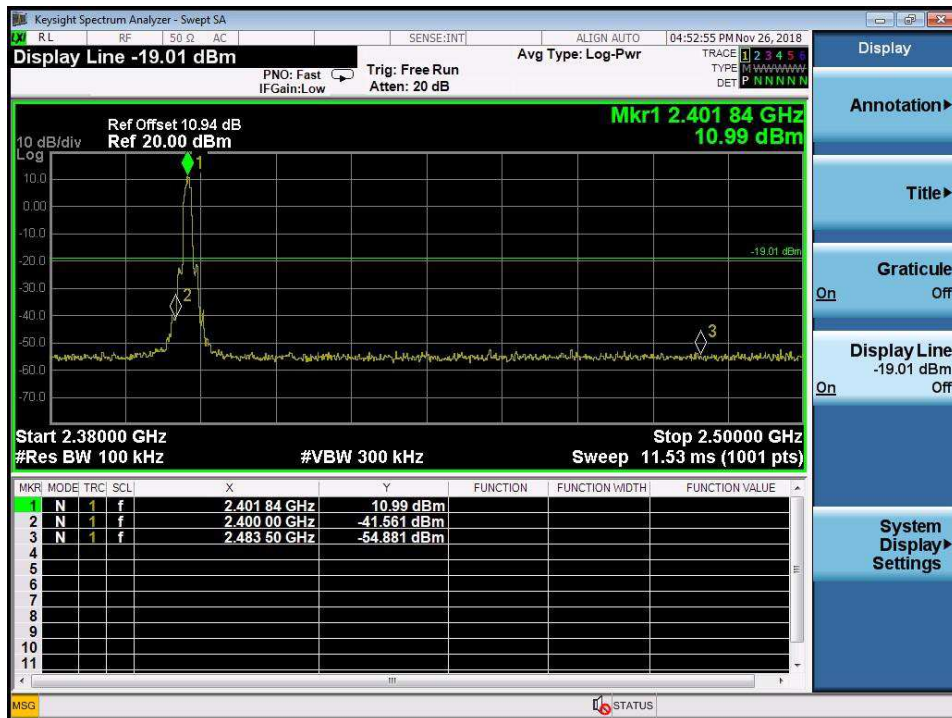


Hopping ON

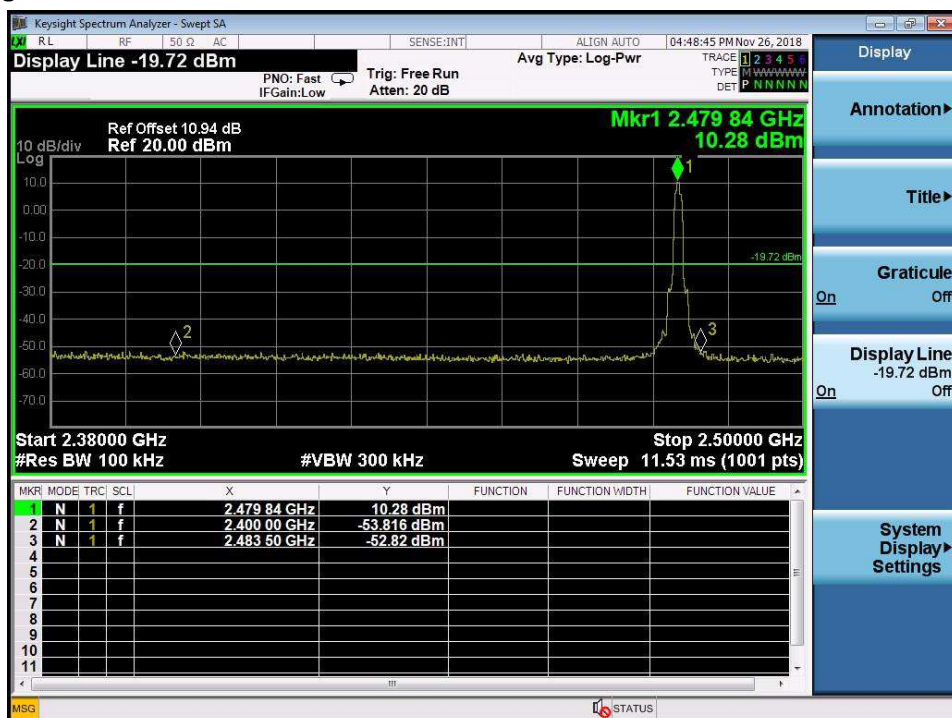


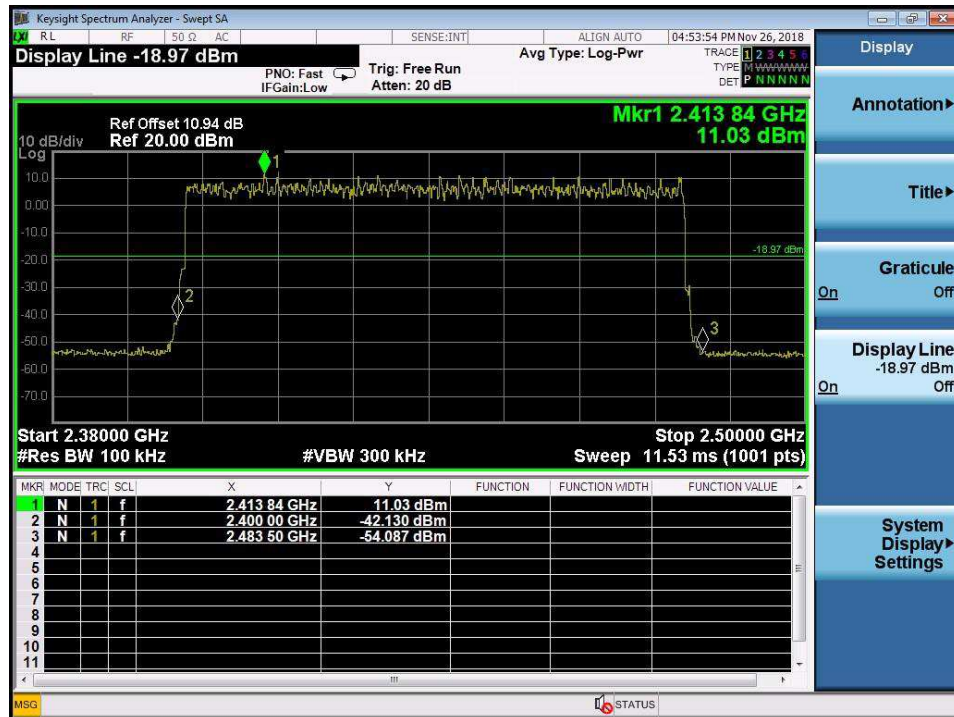
Test Plot of 100kHz Bandwidth of Frequency Band Edge, 8DPSK modulation – Class 1

Low Channel



High Channel





Test Plot of 100kHz Conducted Emissions, GFSK modulation – Class2

Middle Channel



Test Plot of 100kHz Conducted Emissions, 8DPSK modulation – Class2

Middle Channel



5.1.6 Spurious Emission

RESULT:**Passed**

Test standard	:	FCC part 15.247(d), FCC 15.205, FCC 15.209, RSS-247 5.5 and RSS-Gen issue 5 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 i5, 8.10 (Table 7), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen i5, 8.9 (Table 5 and 6). 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 RSS-Gen i5, 8.9 (Table 5 and 6). 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

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.

5.1.7 Frequency Separation

RESULT:
Passed

Test standard	:	FCC part 15.247(a)(1) RSS-247 5.1(b) LP0002(2018): 3.10.1.6 (1) (A)
Basic standard	:	ANSI C63.10:2013 LP0002(2018) Appendix II
Limit	:	≥ 25kHz or 2/3 of 20dB bandwidth, whichever is greater

Test setup

Operation Mode	:	C
Ambient temperature	:	18-25°C
Relative humidity	:	50-65%

Table 15: Test result of Frequency Separation (GFSK)

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

Table 16: Test result of Frequency Separation (8DPSK)

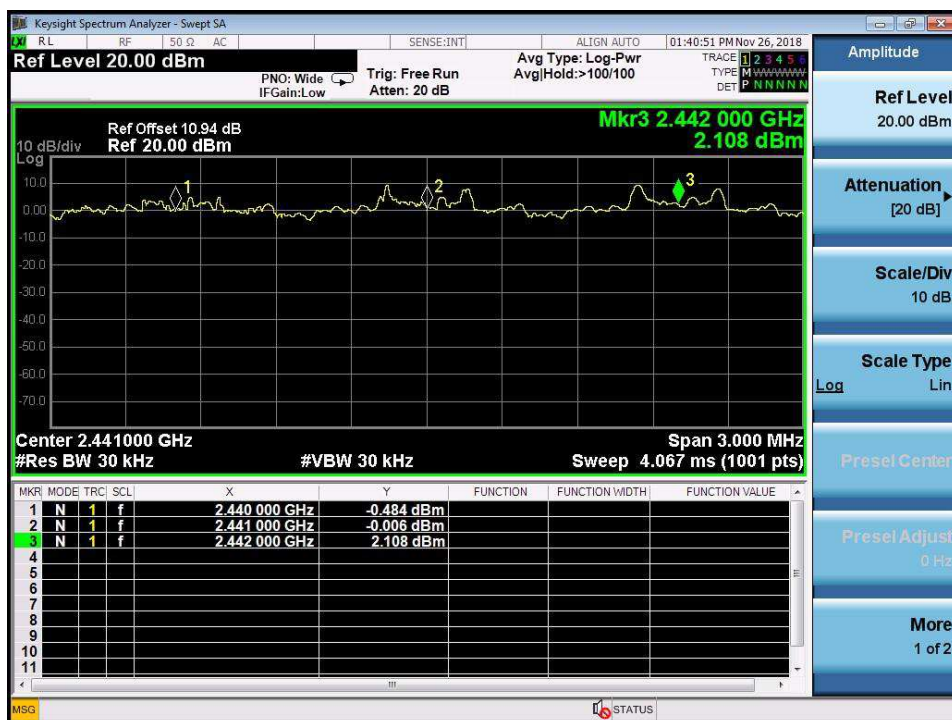
Channel	Channel Frequency (MHz)	Measured Channel Separation (MHz)	Limit (kHz)	Result
Record Channel	2440	1	≥ 25kHz or 2/3 of 20dB bandwidth	Pass
Record Channel adj 1	2441			
Record Channel adj 2	2442			

Test Plot of Frequency Separation

GFSK



8DPSK



5.1.8 Number of hopping frequency

RESULT:**Passed**

Test standard : FCC part 15.247(a)(1)(iii)
RSS-247 5.1(b)
LP0002(2018): 3.10.1.6 (1) (B)

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

Test setup

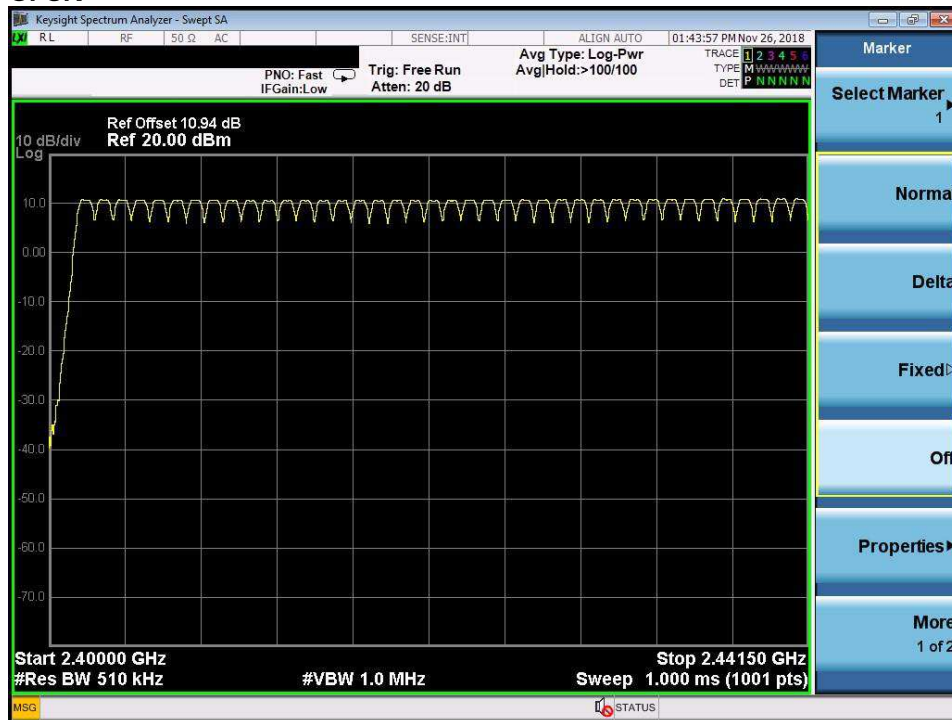
Test Channel : Hopping On

Ambient temperature : 18-25°C
Relative humidity : 50-65%

Table 17: 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 GFSK



8DPSK


5.1.9 Time of Occupancy

RESULT:
Passed

Test standard : FCC part 15.247(a)(1)(iii)
 RSS-247 5.1(d)
 LP0002(2018): 3.10.1.6 (1) (B)
 Basic standard : ANSI C63.10:2013
 LP0002(2018) Appendix II
 Limits : 0.4s
 Kind of test site : Shielding room/Conducted room

Test setup

Test Channel : Low
 Operation Mode : A
 Ambient temperature : 18-25°C
 Relative humidity : 50-65%

Table 18: Test result of Time of Occupancy

Data Mode	Captured Burst (s)	Dwell time (s)	On+Off time (s)	Limit (s)	Result
DH5	0.00291	0.2925	0.00398	0.4	Pass
3DH5	0.00292	0.3131	0.00373	0.4	Pass

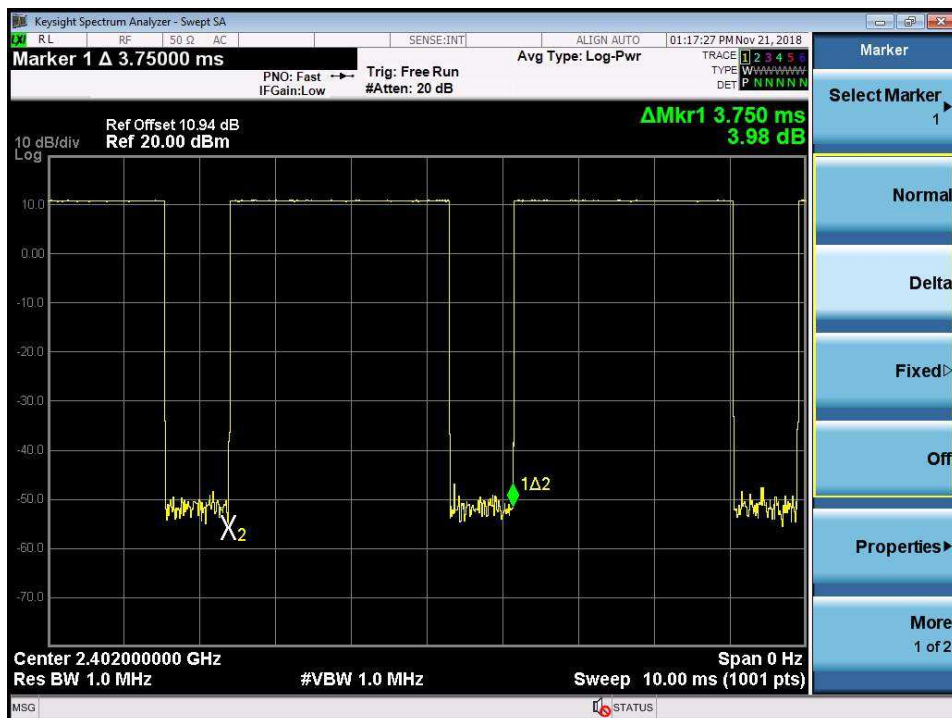
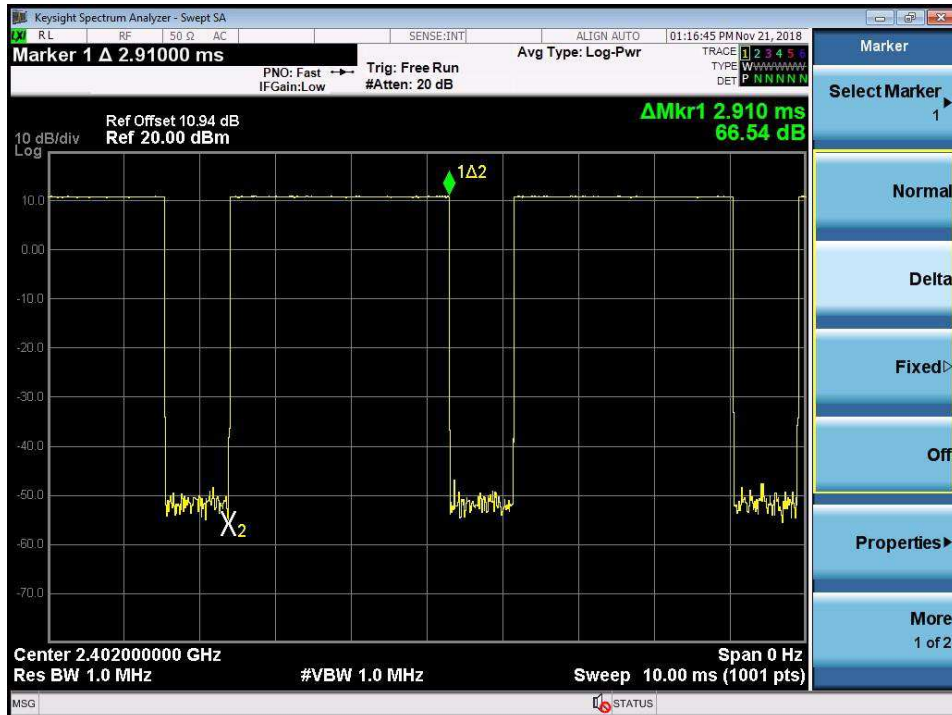
Note:

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

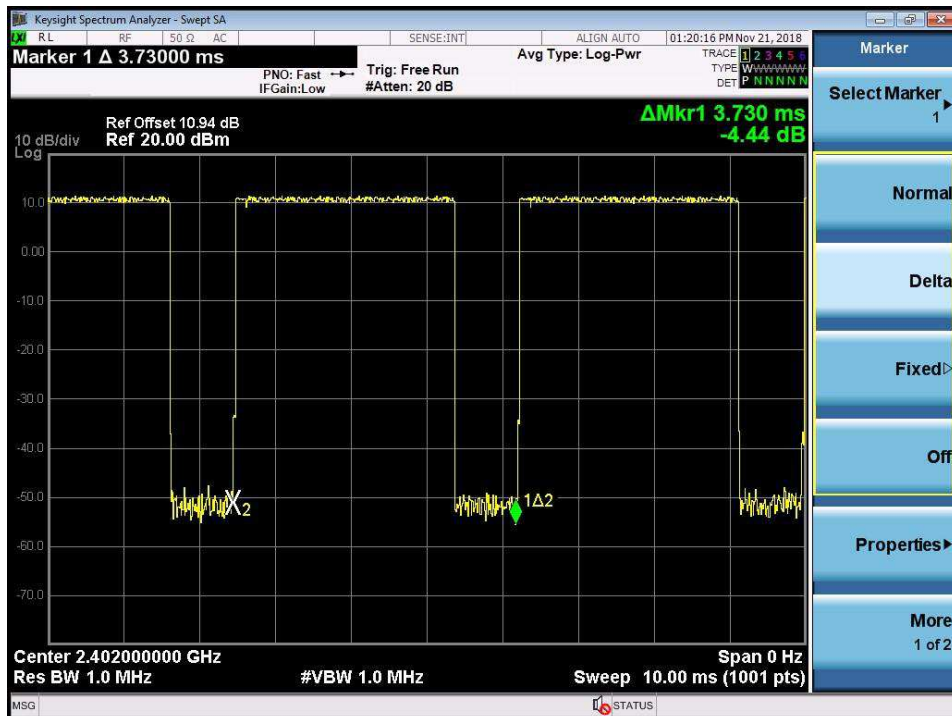
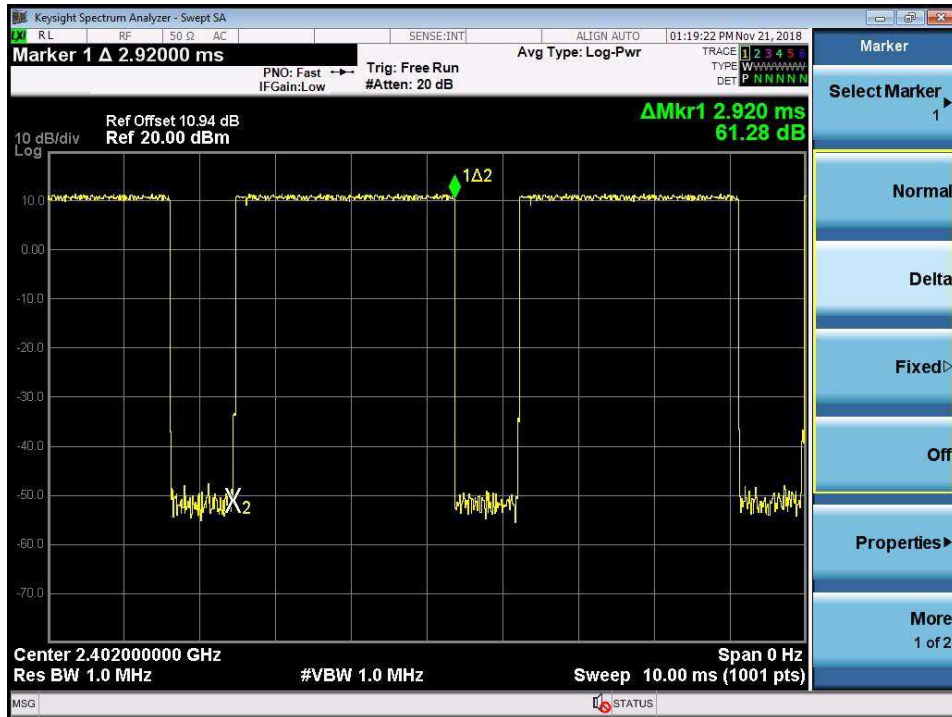
Period = 0.4 (seconds/ channel) x 79 (channel) = 31.6 seconds.

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 i5: 8.8 LP0002 (2018): 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	:	Middle
Operation mode	:	A

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 v06
47CFR 1.1310
47CFR 2.1091
RSS-102 issue 5
LP0002(2018) 5.20.2.2

FCC:

Class1 mode:

Therefore the maximum output power of the transmitter is 11.04mW < 38mW(Distance: 20 mm), hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile Portable RF Exposure.

Class2 mode:

Therefore the maximum output power of the transmitter is 1.42mW < 38mW(Distance: 20 mm), hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile Portable RF Exposure.

Canada:

Class 1 mode:

Maximum conducted peak power: 11.04 mW
Antenna Gain: 3.5 dbi
Maximum EIRP available 24.7 mW

Since maximum output power of the transmitter is 24.7mW <30mW (distance ≤20 mm), hence the EUT is excluded from SAR evaluation according to Table 1 in RSS-102, For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 of RSS-102 are multiplied by a factor of 2.5.

Class 2 mode:

Maximum conducted peak power: 1.42 mW
Antenna Gain: 3.5 dbi
Maximum EIRP available 3.2 mW

Since maximum output power of the transmitter is 3.2mW <30mW (distance ≤20 mm), hence the EUT is excluded from SAR evaluation according to Table 1 in RSS-102, For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 of RSS-102 are multiplied by a factor of 2.5.

---End---

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