TEST REPORT

ETSI EN300 328 V2.1.1 (2016-11)

Product：	Bluetooth Keyboad
Trade Name：	N/A
Model Name：	HB-030
Serial Model：	HB-028/033/030/098/098D/129/220/250/250C/118/119/092/131/133/141/190/X3/X5/X8/X9/X10

Prepared for

DONGGUAN JINGZUN INTELLIGENT TECHNOLOGY CO.,LTD

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TEST RESULT CERTIFICATION

Applicant's name	:	DONGGUAN JINGZUN INTELLIGENT TECHNOLOGY CO.,LTD
Address	:	208, building B, Xingang Industrial Park, No. 38 Xingang Road, Xin 'an Community, Chang 'an Town, Dongguan
Manufacture's Name	:	DONGGUAN JINGZUN INTELLIGENT TECHNOLOGY CO.,LTD
Address	:	208, building B, Xingang Industrial Park, No. 38 Xingang Road, Xin 'an Community, Chang 'an Town, Dongguan

Product description

Product name	:	Bluetooth Keyboad
Model and/or type reference	:	HB-030
Serial Model	:	HB-028/033/030/098/098D/129/220/250/250C/118/119/092/131/133/141/190/X3/X5/X8/X9/X10
Rating(s)	:	DC 5V⎓, 500mA, 0.25W
Standards	:	ETSI EN 300 328 V2.1.1 (2016-11)

This device described above has been tested by ZCT, and the test results show that the equipment under test (EUT) is in compliance with the 2014/53/EU RED Directive Art.3.1(b) requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test	:	
Date (s) of performance of tests	:	Jun. 22, 2020 ~Jun. 30, 2020
Date of Issue	:	Jun .30, 2020
Test Result	:	Pass

Testing Engineer _____

Authorized Signatory _____

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1. Summary of test results

1.1. Standard description

ETSI EN 300 328 V2.1.1: Electromagnetic Compatibility and Radio Spectrum Matters; Wideband transmission systems; Data transmission equipment operation in the 2.4GHz ISM band and using wide band modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the RED Directive.

1.2. Test result

Harmonized Standard EN300 328 The following essential requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the RED Directive				
No	**Test Parameter**	**Clause No**	**Condition**	**Results**
Transmitter Parameters				
1	RF Output Power	4.3.1.1 or 4.3.2.1	Apply all equipment	PASS
2	Power Special Density	4.3.2.2	Only for modulations other than FHSS	N/A
3	Duty Cycle ,Tx-Sequence, Tx-gap	4.3.1.2 or 4.3.2.3	Only for non-adaptive equipment	N/A
4	Dwell time, Minimum Frequency Occupation &Hopping Sequence	4.3.1.3	Only for FHSS	PASS
5	Hopping Frequency Separation	4.3.1.4	Only for FHSS	PASS
6	Medium Utilisation	4.3.1.5 or 4.3.2.4	Only for non-adaptive equipment	N/A
7	Adaptive	4.3.1.6 or 4.3.2.5	Only for adaptive equipment	N/A
8	Occupied Channel Bandwidth	4.3.1.7 or 4.3.2.6	Apply all equipment	PASS
9	Transmitter unwanted emissions in the OOB domain	4.3.1.8 or 4.3.2.7	Apply all equipment	PASS
10	Transmitter unwanted emissions in the spurious domain	4.3.1.9 or 4.3.2.8	Apply all equipment	PASS
11	Receiver spurious emissions	4.3.1.10 or 4.3.2.9	Apply all equipment	PASS
12	Receiver Blocking	4.3.1.11 or 4.3.2.10	Only for adaptive equipment	N/A
Note: N/A is an abbreviation for Not Applicable and means this test item is not applicable for this device according to the technology characteristic of device.				

2. General test information

2.1. Description of EUT

EUT* Name	:	Bluetooth Keyboad
Model Number	:	HB-030
Serial Number	:	HB-028/033/030/098/098D/129/220/250/250C/118/119/092/131/133/141/190/X3/X5/X8/X9/X10
Model different	:	Just Operating mode different
EUT function description	:	Bluetooth Keyboad
Type of EUT	:	Stand-alone
Hardware Version	:	YC030- LED V10
Software Version	:	467a
Radio Specification	:	Bluetooth V5.0+BLE
Operation frequency	:	2400MHz -2480MHz
Modulation	:	GFSK
Modulation Types	:	Frequency Hopping Spread Spectrum (FHSS) modulation.
Equipment type	:	/
Data rate	:	/
Antenna Type	:	Internal Antenna, Antenna gain:0.5 dBi
Date of Receipt	:	2020/06/22
Sample Type	:	Series product

Note: EUT is the ab. of equipment under test.

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number or Type	Serial No.	Other
/	/	/	/	/

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	SN
/	/	/	/	/

2.4. Block diagram of EUT configuration for test

EUT

The test software was used to control EUT work in Continuous TX mode, and select test channel, wireless mode as below table.

Tested mode, channel, information		
Mode	Channel	Frequency (MHz)
GFSK hopping on Tx Mode	CH0 to CH78	2400 to 2480
GFSK hopping off Tx Mode	CH0	2400
	CH39	2441
	CH78	2480
	CH39	2441
	CH78	2480
	CH39	2441
	CH78	2480

Note: For π/4 QPSK its same modulation type with 8-DPSK, and based exploratory test, there is no significant difference of that two types test result, after the preliminary scan, 8-DPSK will have higher emission, so except output power, all other items final test were only performed with the worse case 8-DPSK and GFSK.

2.5. Test environment conditions

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

	Normal Conditions	Extreme Conditions
Temperature range	21-25℃	-20℃ and 55℃
Humidity range	40-75%	40-75%
Pressure range	86-106kPa	86-106kPa
Note1: The Extreme temperature range and extreme voltages are declared by the manufacturer.		

2.6. Test laboratory

Shenzhen ZCT Technology Co., Ltd.

Add: 3F, 5th Building, Hongsheng Industrial Zone, No.4336 Bao'an Road, Bao'an District, Shenzhen, China. Tel: 400-669-6965; Fax:86-755-23702323; http://www.renzhengjiance.com

2.7. Measurement uncertainty

Test Item	Uncertainty
Occupied Channel Bandwidth	±1%
Uncertainty for radio frequency	1×10^{-9}
RF Output power, conducted	±0.6dB
Power Spectral Density, Conducted	±1.2dB
Unwanted Emissions, Conducted	±0.6dB
Temperature	±0.2℃
Humidity	±1%
DC and Low frequency voltage	±0.5%
Time	±1%
Duty Cycle	±1%
Uncertainty for Unwanted Emission, Radiated (30MHz-1GHz)	2.12 dB (Polarize: V)
	2.42 dB (Polarize: H)
Uncertainty for Unwanted Emission, Radiated (1GHz to 13GHz)	2.08dB(Polarize: V)
	2.16dB (Polarize: H)

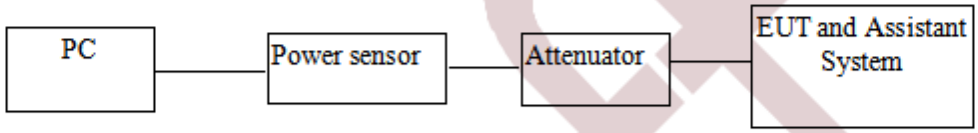
Note:This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. RF Output Power

3.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Power sensor	Agilent Technologies Inc	U2021XA	1457313	2020/08/12	1 Year
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2020/08/12	1 Year
3	RF Cable	Micable	C10-01-01-1	100309	2020/08/12	1 Year

3.2. Block diagram of test setup



3.3. Limits

The RF output power is defined as the mean equivalent isotropically radiated power (e.i.r.p.) of the equipment during a transmission burst.

The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20 dBm.

This limit shall apply for any combination of power level and intended antenna assembly.

3.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 4.2.

(2) Connect each EUT's antenna output to power sensor by RF cable and attenuator.

(3) Configure EUT work in test mode as stated in clause 2.4.

3.5. Test Result

EUT: Bluetooth Keyboad M/N: HB-030						
Test Conditions		EUT Mode	Numbers of burst	Measured Highest Pburst Values (dBm)	Antenna Gain (dBi)	RF Output Power (dBm)
Volt	Volt					
16.5V	Noraml	GFSK	10	5.91	0	5.91
13.5V	55℃	GFSK	10	5.47	0	5.47
13.5V	-20℃	GFSK	10	5.56	0	5.56
16.5V	55℃	GFSK	10	5.65	0	5.65
16.5V	-20℃	GFSK	10	5.45	0	5.45

Limit: 20dBm	Conclusion: Pass
Test Date : 2020.6.29	Test Engineer : KING
Note:RF Output power = Measured Highest Pburst Values + Antenna Gain	

4. Power Special Density

N/A (Not Applicable)

Only for modulations other than FHSS.

5. Duty Cycle ,Tx-Sequence, Tx-gap

N/A (Not Applicable)

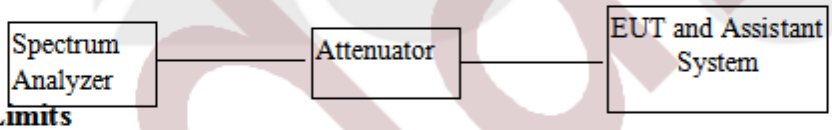
Only for non-adaptive equipment.

6. Dwell time and Minimum Frequency Occupation

6.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2019/08/12	1 Y
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/08/12	1 Y
3	RF Cable	Micable	C10-01-01-1	100309	2019/08/12	1 Y

6.2. Block diagram of test setup



6.3. Limits

The Dwell Time is the time that a particular hopping frequency would be occupied by the transmitter during a single hop. The equipment itself is not required to transmit on this hopping frequency during the Dwell Time.

For this Adaptive frequency hopping systems, the maximum accumulated dwell time on any hopping frequency shall be 400 ms within any period of 400 ms multiplied by the minimum number of hopping frequencies (79) that have to be used.

The Minimum Frequency Occupation Time shall be equal to one dwell time within a period not exceeding four times the product of the dwell time per hop and the number of hopping frequencies in use.

6.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 6.2.

(2) Connect EUT's antenna output to spectrum analyzer by RF cable and an attenuator.

(3) Configure EUT work in test mode as stated in clause 2.4.

(4) Set the spectrum analyzer as follows:

Centre frequency:	2442MHz
Frequency Span:	0Hz
RBW:	~ 50 % of the Occupied Channel Bandwidth
VBW:	≥ RBW
Detector Mode:	RMS
Sweep time:	Equal to the Dwell Time × Minimum number of hopping frequencies (N)
Number of sweep points:	30000
Trace mode:	Clear / Write

(5) Change the sweep time of spectrum analyzer to suitable for measure the occupied time of each hop.

(6) Measure the hopping number and on time of each pulse with spectrum analyzer in zero span set, and calculate dwell time with formula Dwell time = total hops *pulse's on time.

DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, total hops is 10.12 x 31.6 = 320.

DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, total hops is 5.06 x 31.6 = 160.

DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, total hops is 3.37 x 31.6 = 106.6.

3DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, total hops is 10.12 x 31.6 = 320.

3DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, total hops is 5.06 x 31.6 = 160.

3DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, total hops is 3.37 x 31.6 = 106.6.

(7) Calculate Minimum Frequency Occupation Time with formula:

Minimum Frequency Occupation Time = Dwell time * 4

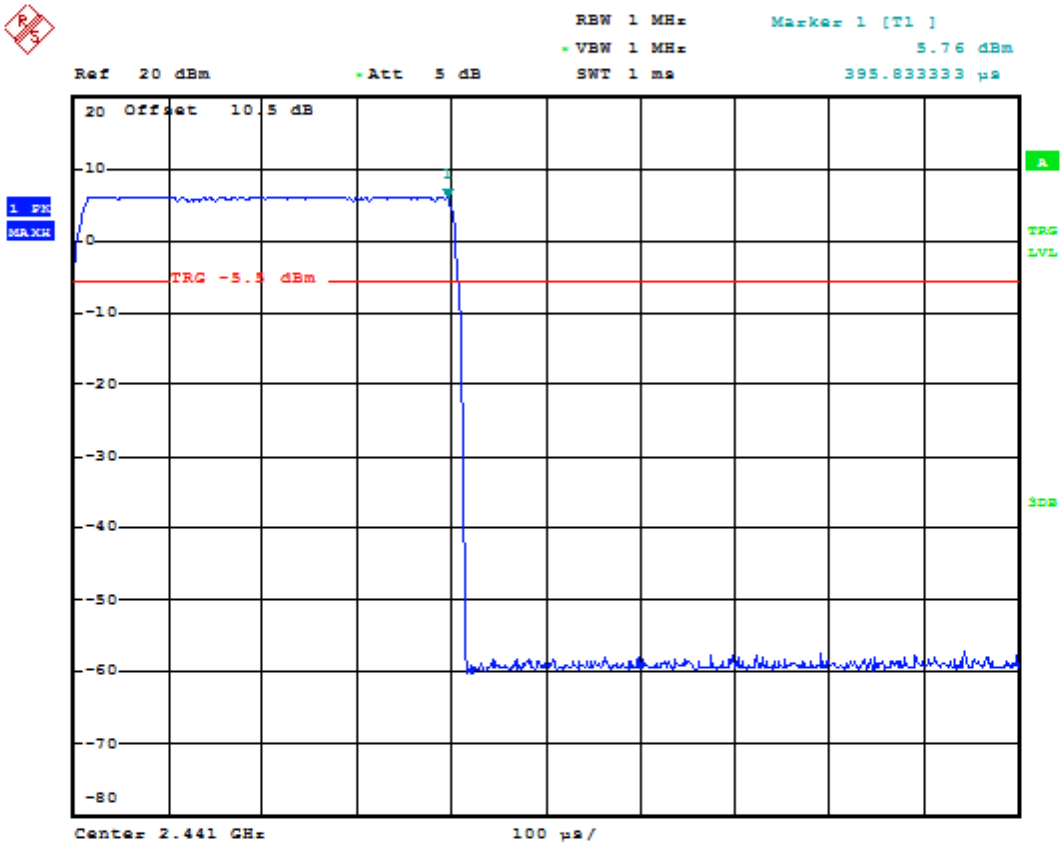
6.5. Test Result

EUT: Bluetooth Keyboad M/N: HB-030				
EUT Mode	Result			
	Pulse's on time	Total hops	Dwell time (ms)	Minimum Frequency Occupation Time(ms)
DH1	0.396ms	320	126.72ms	506.88ms
DH3	1.660ms	160	265.60ms	1026.40ms
DH5	2.902ms	106.6	309.35ms	1237.40ms
3DH1	0.409ms	320	130.88ms	523.52ms
3DH3	1.663ms	160	266.08ms	1064.32ms
3DH5	2.901ms	106.6	309.25ms	1237.00ms

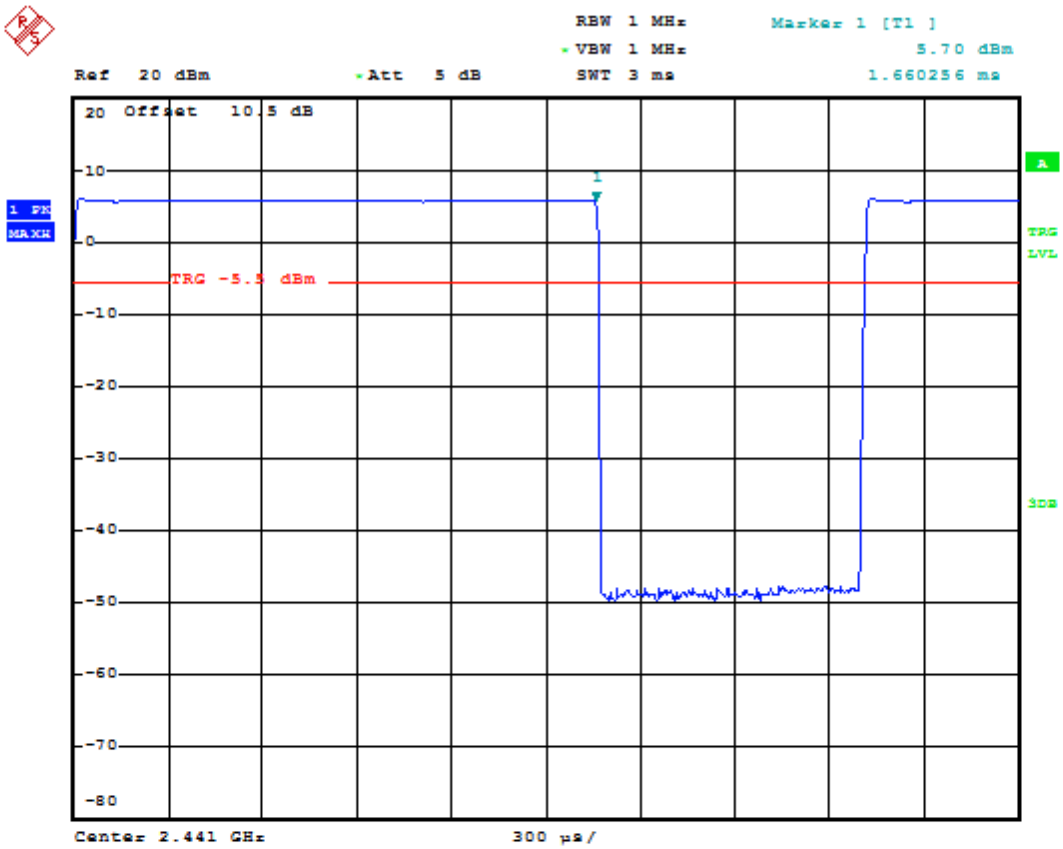
Limit: Dwell time<400ms; Minimum Frequency Occupation Time <1.6s	Conclusion: PASS
Test Date : 2020.6.29	Test Engineer : KING
Note: Dwell time = total hops *pulse's on time. Frequency Occupation = Dwell time*4	

6.6. Original test data

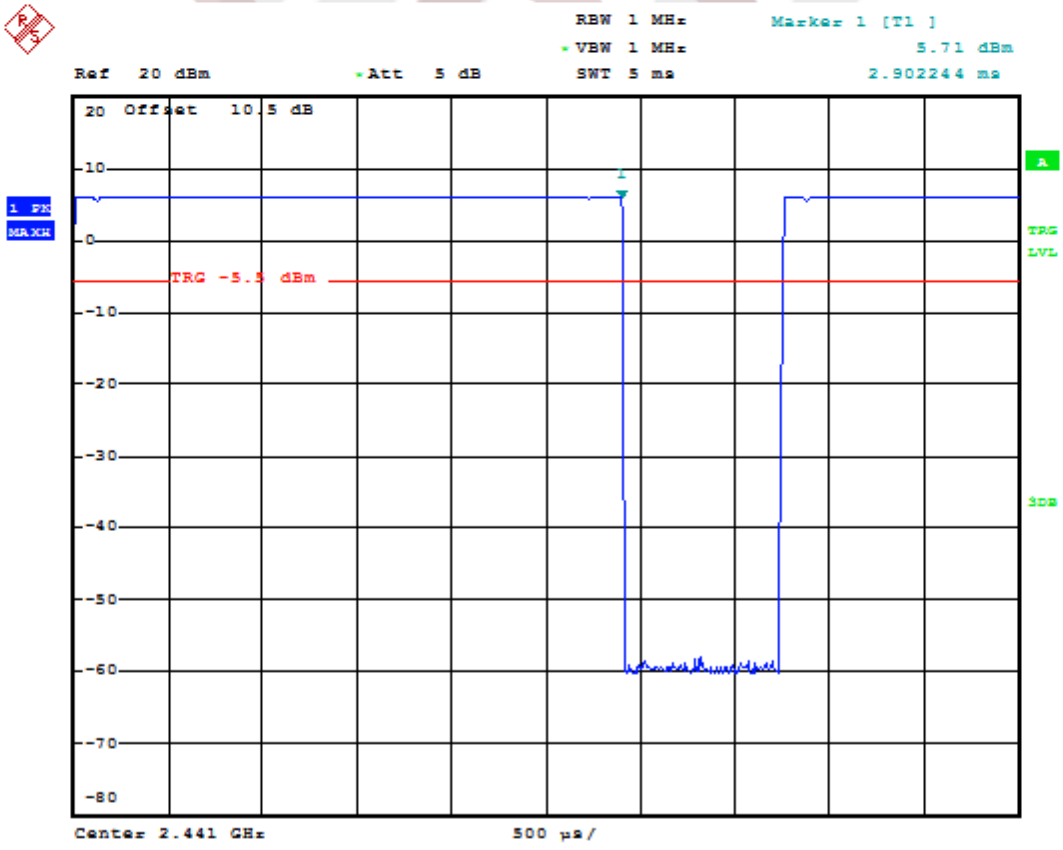
DH1



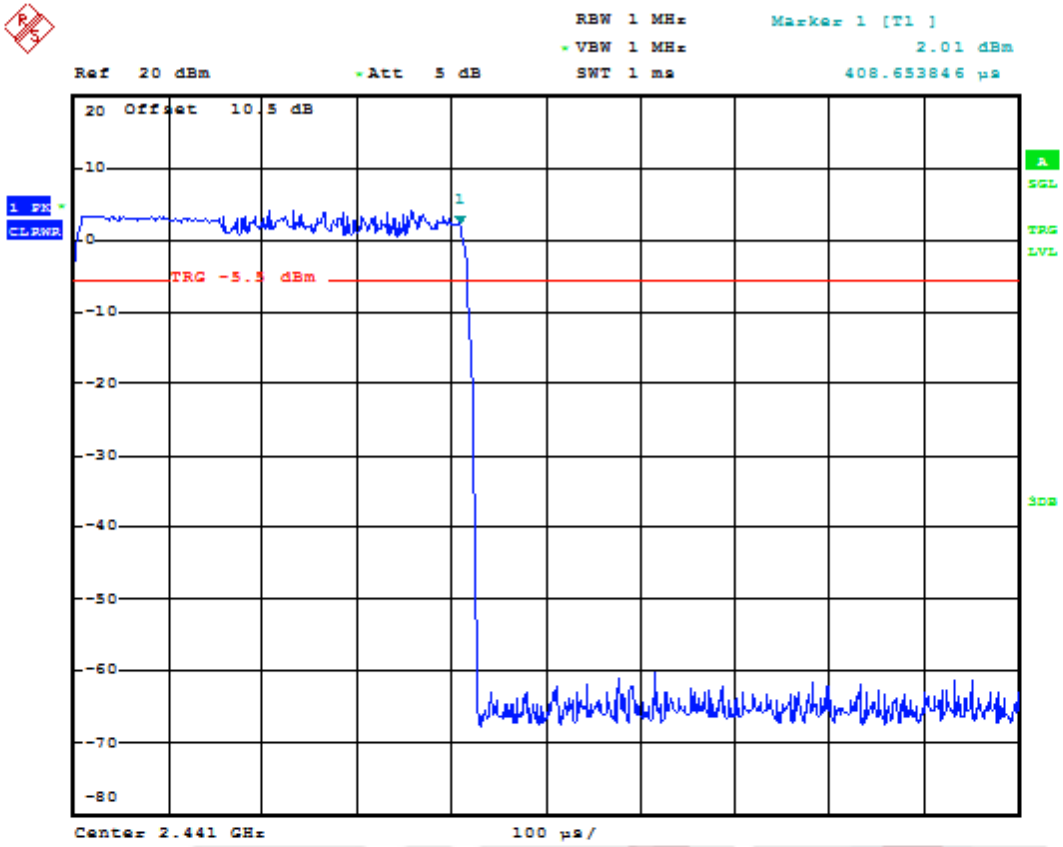
DH3


RBW 1 MHz
VBW 1 MHz
SWT 3 ms
Marker 1 [T1]
5.70 dBm
1.660256 ms
Ref 20 dBm
Att 5 dB
Offset 10.5 dB
TRG -5.5 dBm
Center 2.441 GHz
300 µs/

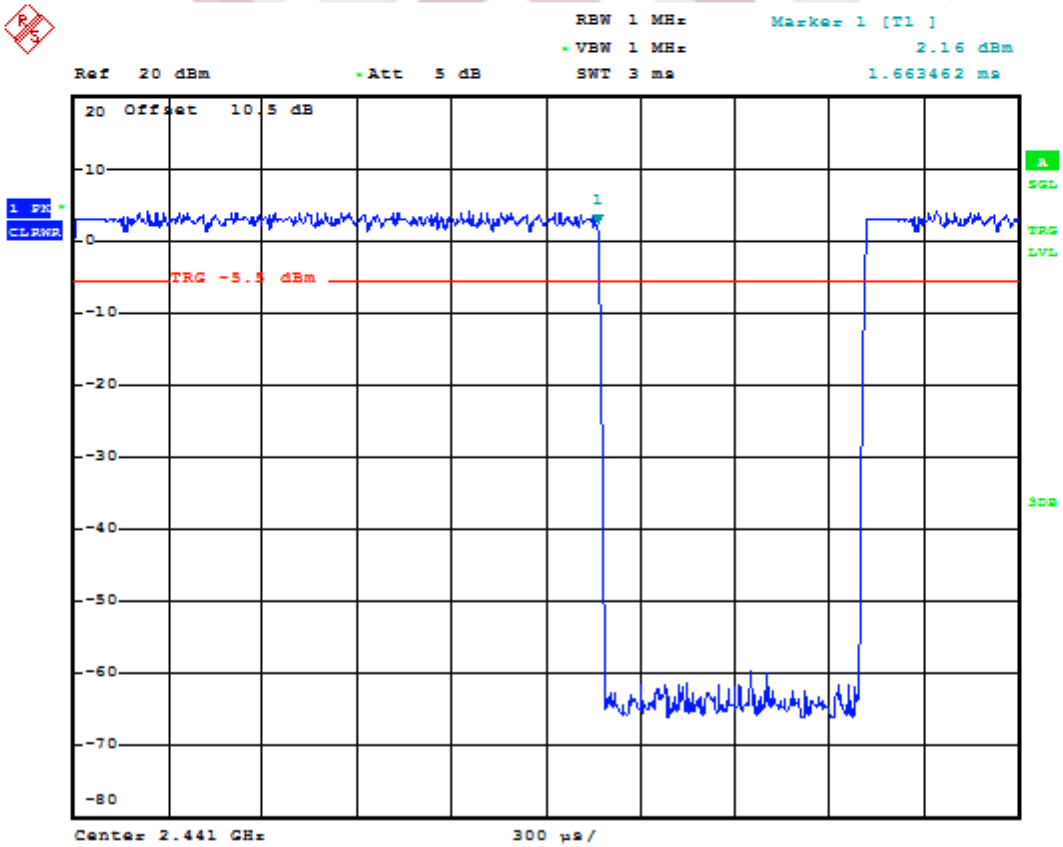
DH5


RBW 1 MHz
VBW 1 MHz
SWT 5 ms
Marker 1 [T1]
5.71 dBm
2.902244 ms
Ref 20 dBm
Att 5 dB
Offset 10.5 dB
TRG -5.5 dBm
Center 2.441 GHz
500 µs/

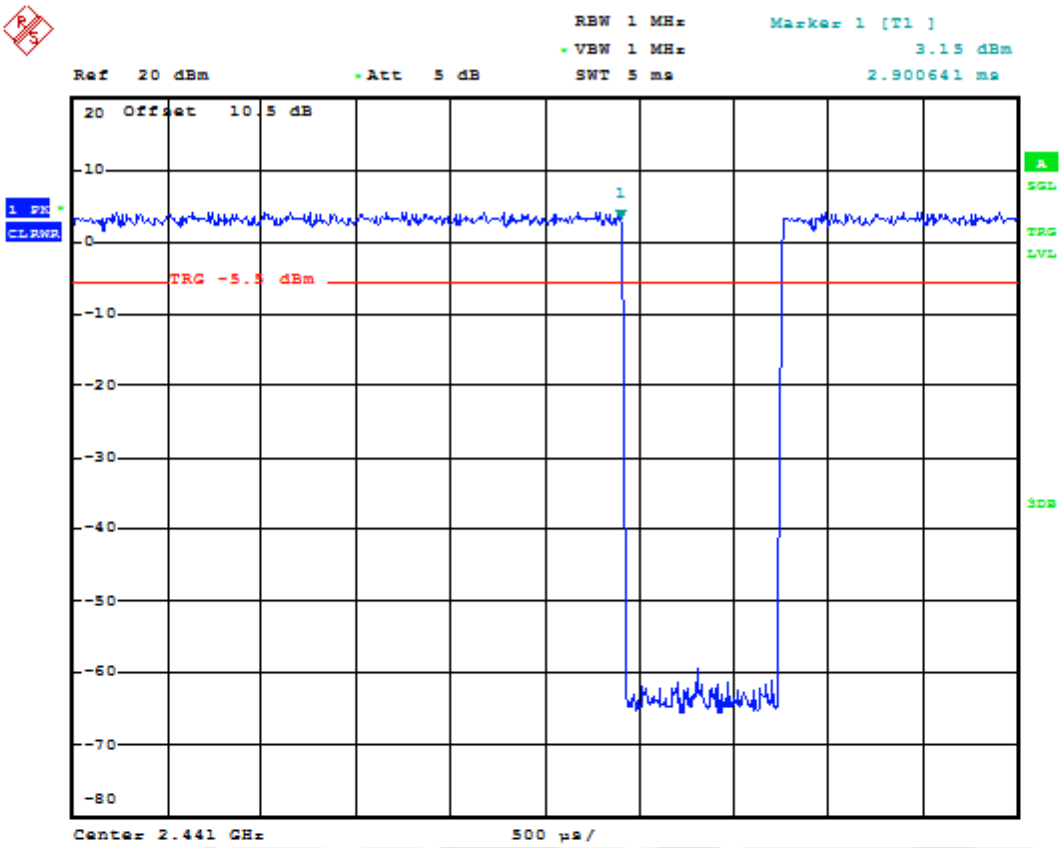
3DH1


RBW 1 MHz
VBW 1 MHz
SWT 1 ms
Marker 1 [T1]
2.01 dBm
408.653846 µs
Ref 20 dBm
Att 5 dB
Offset 10.5 dB
TRG -5.5 dBm
Center 2.441 GHz
100 µs/

3DH3


RBW 1 MHz
VBW 1 MHz
SWT 3 ms
Marker 1 [T1]
2.16 dBm
1.663462 ms
Ref 20 dBm
Att 5 dB
Offset 10.5 dB
TRG -5.5 dBm
Center 2.441 GHz
300 µs/

3DH5


RBW 1 MHz
VBW 1 MHz
SWT 5 ms
Marker 1 [T1]
3.15 dBm
2.900641 ms
Ref 20 dBm
Att 5 dB
Offset 10.5 dB
TRG -5.5 dBm
Center 2.441 GHz
500 µs/
SGL
TRG
LVL

7. Hopping Sequence

7.1. Test equipment

Same with 6.1

7.2. Block diagram of test setup

Same with 6.2

7.3. Limit

Adaptive Frequency Hopping systems shall be capable of operating over a minimum of 70 % of the specified band (2400MHz-2483.5MHz)

The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

7.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 6.2

(2) Connect EUT's antenna output to spectrum analyzer by RF cable and an attenuator.

(3) Configure EUT work in normal hopping mode stated in clause 2.4.

(4) Set the spectrum analyzer as follows:

Start frequency:	2400MHz
Stop Frequency:	2483.5MHz
RBW:	1 % of the Span
VBW:	3* RBW
Detector Mode:	RMS
Sweep time:	Auto
Trace Mode	Max Hold

(5) When the trace has completed, indentify the number of hopping frequencies used by the hopping sequence.

(6) Using the lowest and highest -20 dB points from the total spectrum envelope obtained in step 5, and verified whether the system uses 70 % of the band specified.

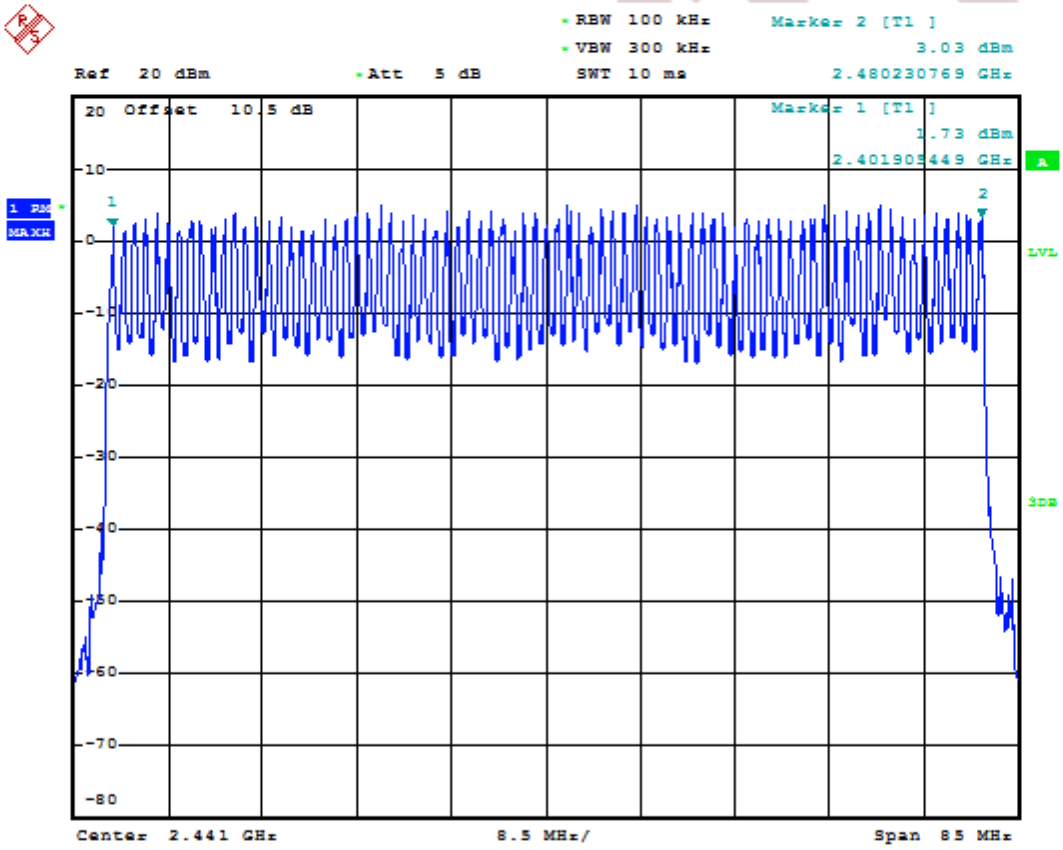
7.5. Test result

EUT: Bluetooth Keyboad M/N: HB-030			
EUT Set Mode	hopping sequence Result	EUT Set Mode	hopping sequence Result
GFSK	79	8-DPSK	79
Limit: >15		Conclusion: Pass	
Test Date : 2020.6.29		Test Engineer : KING	

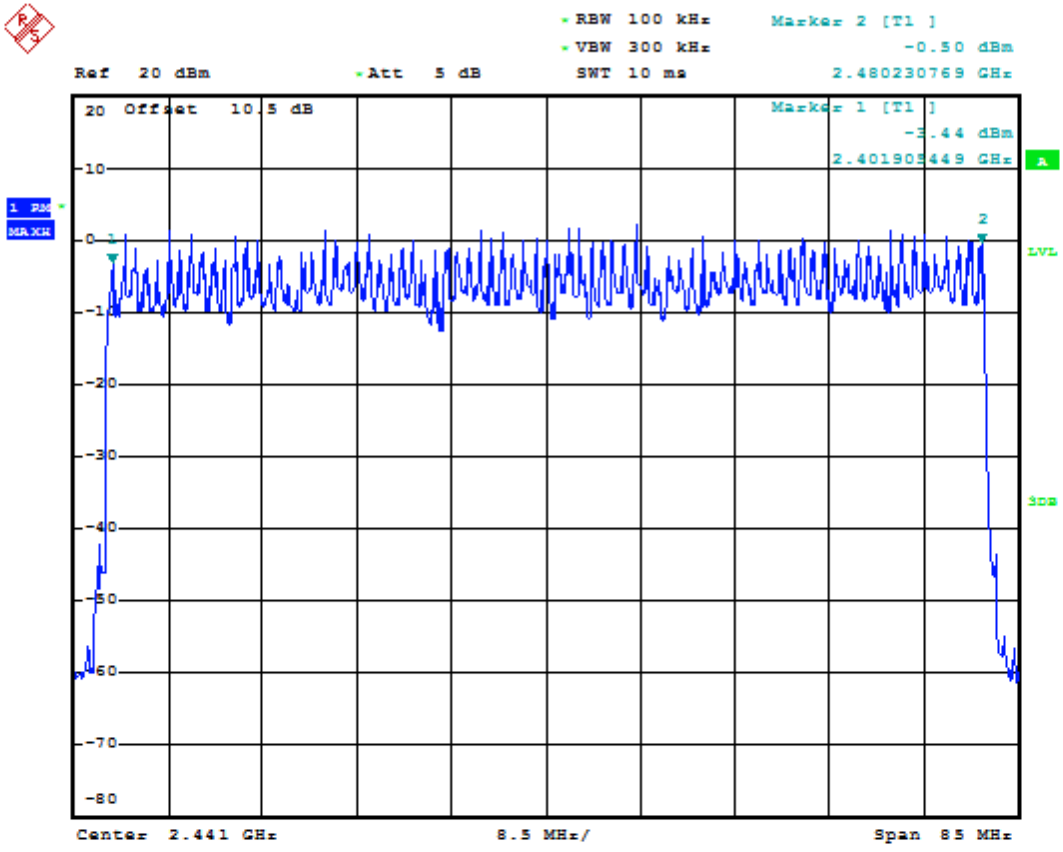
EUT: Bluetooth Keyboad M/N: HB-030			
EUT Set Mode	Operation band (-20dB band)(MHz)	EUT Set Mode	Operation band (-20dB band)(MHz)
GFSK	79.14	8-DPSK	79.27
Limit: > 70%*(2400-2483.5MHz)=58.45MHz		Conclusion: Pass	
Test Date : 2020.6.29		Test Engineer : KING	

7.6. Original test data

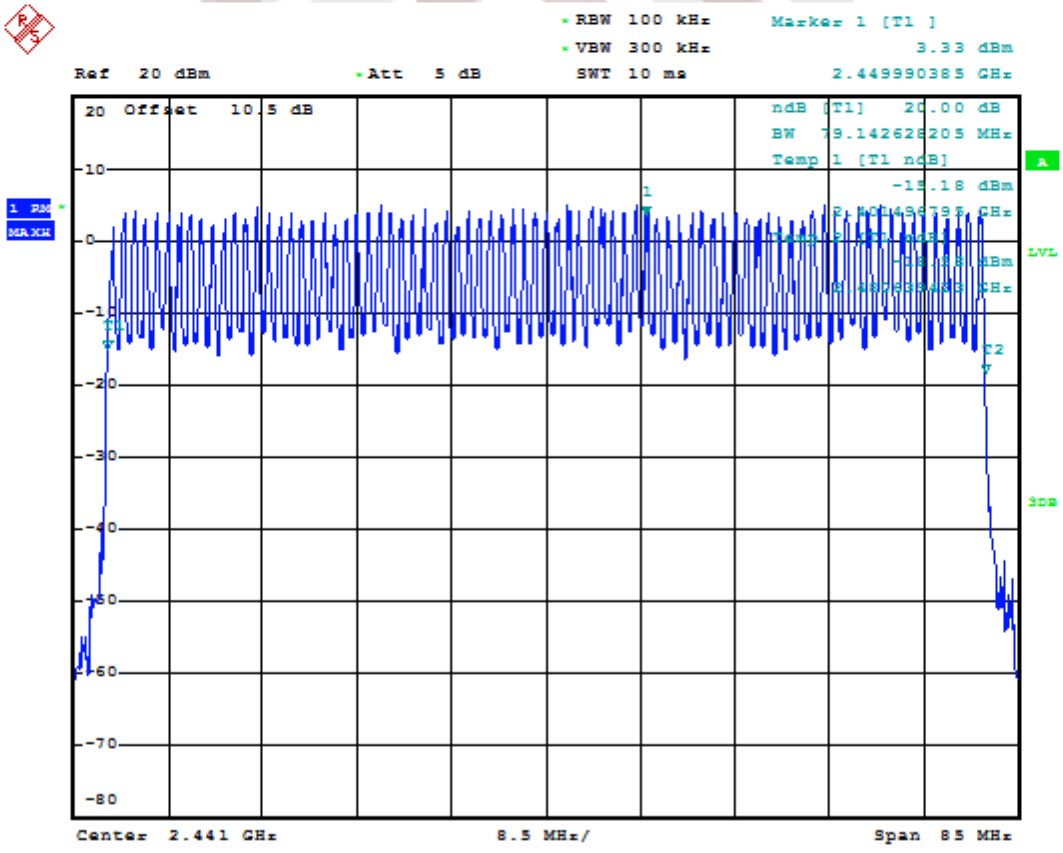
GFSK:



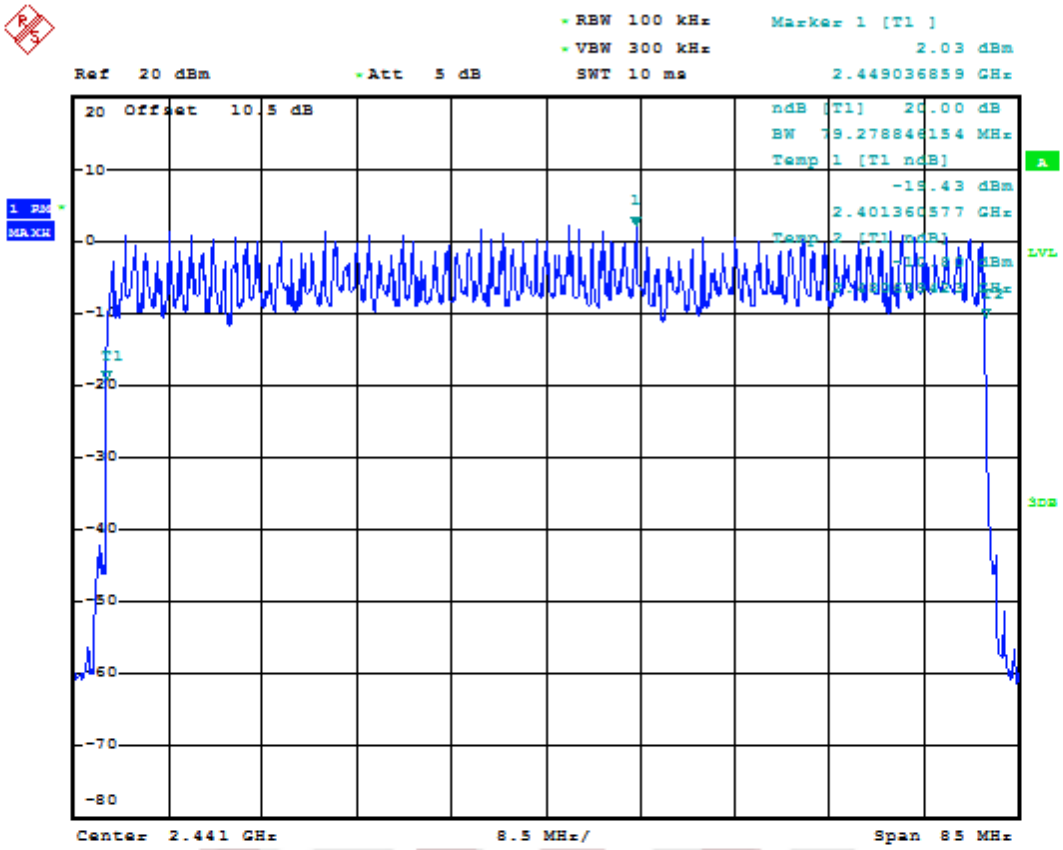
8-DPSK



GFSK 20dB Bandwidth:



8-DPSK 20dB Bandwidth:



8. Hopping Frequency Separation

8.1. Test equipment

Same with 6.1

8.2. Block diagram of test setup

Same with 6.2

8.3. Limits

For adaptive frequency hopping systems the minimum hopping frequency separation shall be 100 KHz.

8.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 6.2

(2) Connect EUT's antenna output to spectrum analyzer by RF cable and attenuator.

(3) Configure EUT work in normal hopping mode.

(4) Set the spectrum analyzer as follows:

Centre Frequency:	Centre of the two adjacent hopping frequencies
Frequency Span:	Sufficient to see the complete power envelope of both hopping frequencies
RBW:	1 % of the Span
VBW:	3 × RBW

Detector Mode: RMS
Sweep time: Auto
Trace Mode: Max Hold

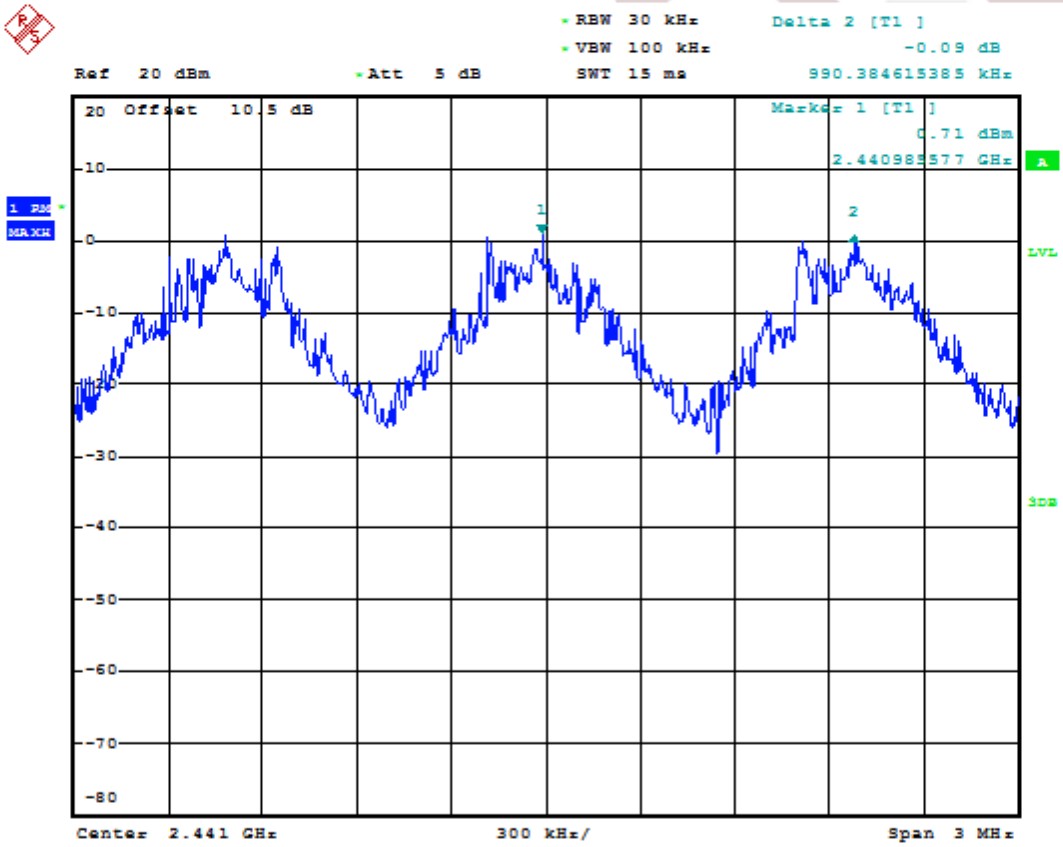
(5) When the trace has completed, Use the marker-delta function to determine the Hopping Frequency Separation between the peaks of the two adjacent hopping frequencies.

8.5. Test Result

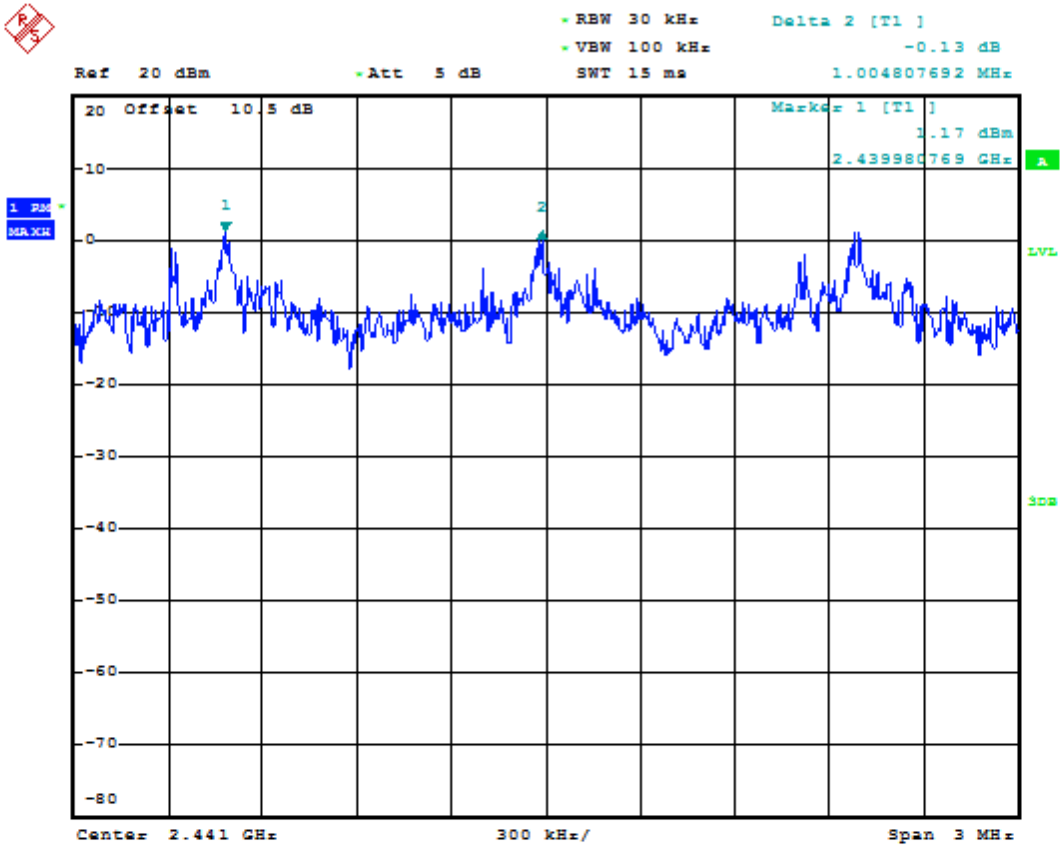
EUT: Bluetooth Keyboad M/N: HB-030			
EUT Set Mode	Hopping Frequency Separation (MHz)	EUT Set Mode	Hopping Frequency Separation (MHz)
GFSK	1	8-DPSK	1
Limit: >100KHz		Conclusion: Pass	
Test Date : 2020.6.29		Test Engineer : KING	

8.6. Original test data

GFSK:



8-DPSK:



9. Medium Utilisation

N/A (Not Applicable)

This requirement only applies to non-adaptive equipment, and this reported device is adaptive device.

10. Adaptivity

N/A (Not Applicable)

This requirement does not apply for equipment with a maximum RF Output power level of less than 10 dBm e.i.r.p, and this reported device's maximum e.i.r.p is 5.91 dBm.

11. Occupied Channel Bandwidth

11.1. Test equipment

Same with 6.1

11.2. Block diagram of test setup

Same with 6.2

11.3. Limits

The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band

2400MHz to 2483.5MHz for this device.

11.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 6.2

(2) Connect EUT's antenna output to spectrum analyzer by RF cable and attenuator.

(3) Configure EUT work in lowest and highest hopping frequency.

(4) Set the spectrum analyzer as follows:

Centre Frequency:	The centre frequency of the channel under test
Frequency Span:	2 × Occupied Channel Bandwidth
RBW:	~ 1 % of the span without going below 1 %
VBW:	3 × RBW
Detector Mode:	RMS
Sweep time:	Auto
Trace Mode:	Max Hold

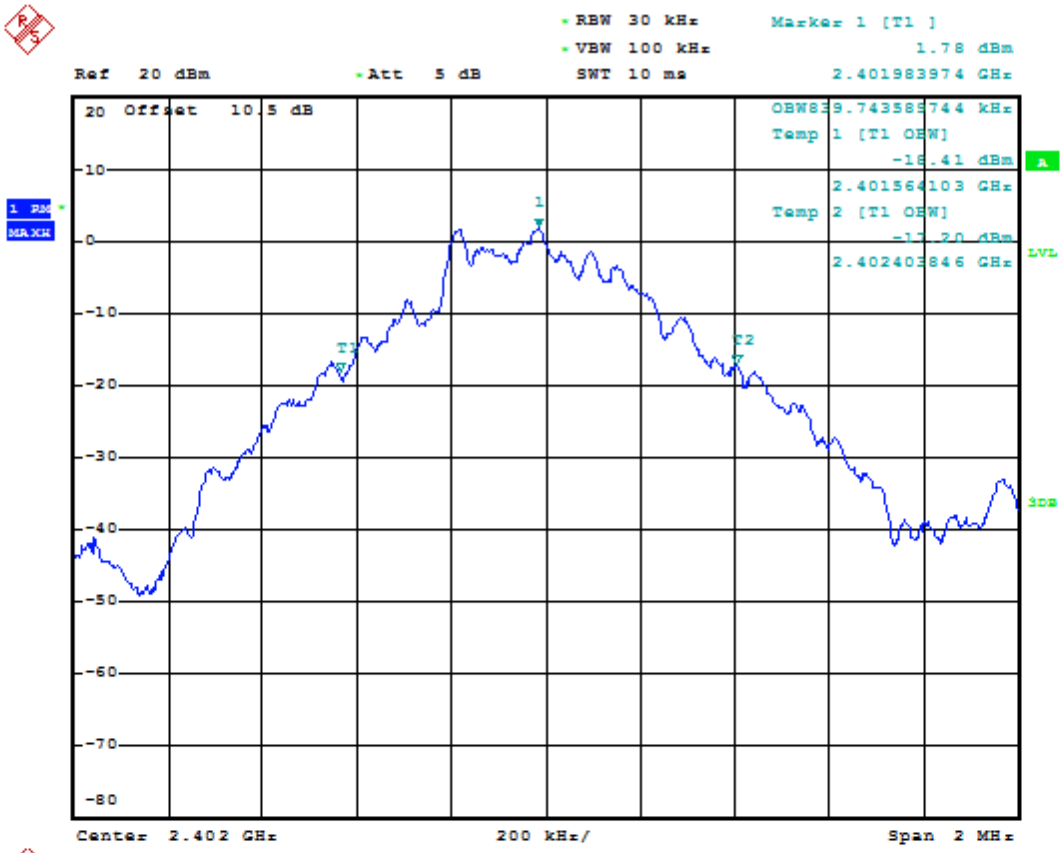
(5) When the trace has completed, Use the 99% bandwidth function of the spectrum analyzer to measure the Occupied channel bandwidth of the EUT.

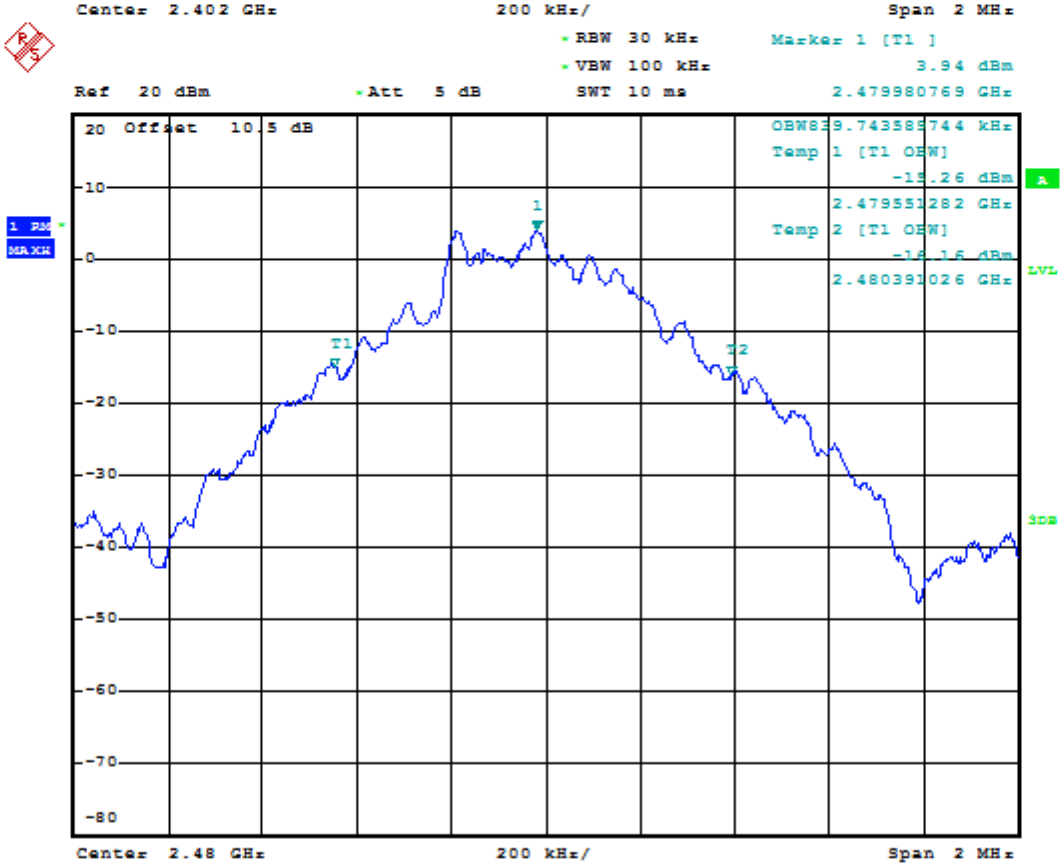
11.5. Test Result

EUT: Bluetooth Keyboad M/N: HB-030			
EUT Set Mode	CH or Frequency	Lowe or Upper 99% bandwidth frequency(MHz)	99% Bandwidth(MHz)
GFSK	CH0	2401.56	0.840
	CH78	2480.39	0.840
	CH79	2480.55	1.141
Limit: within the band 2400MHz to 2483.5MHz		Conclusion: Pass	
Test Date : 2020.6.29		Test Engineer : KING	

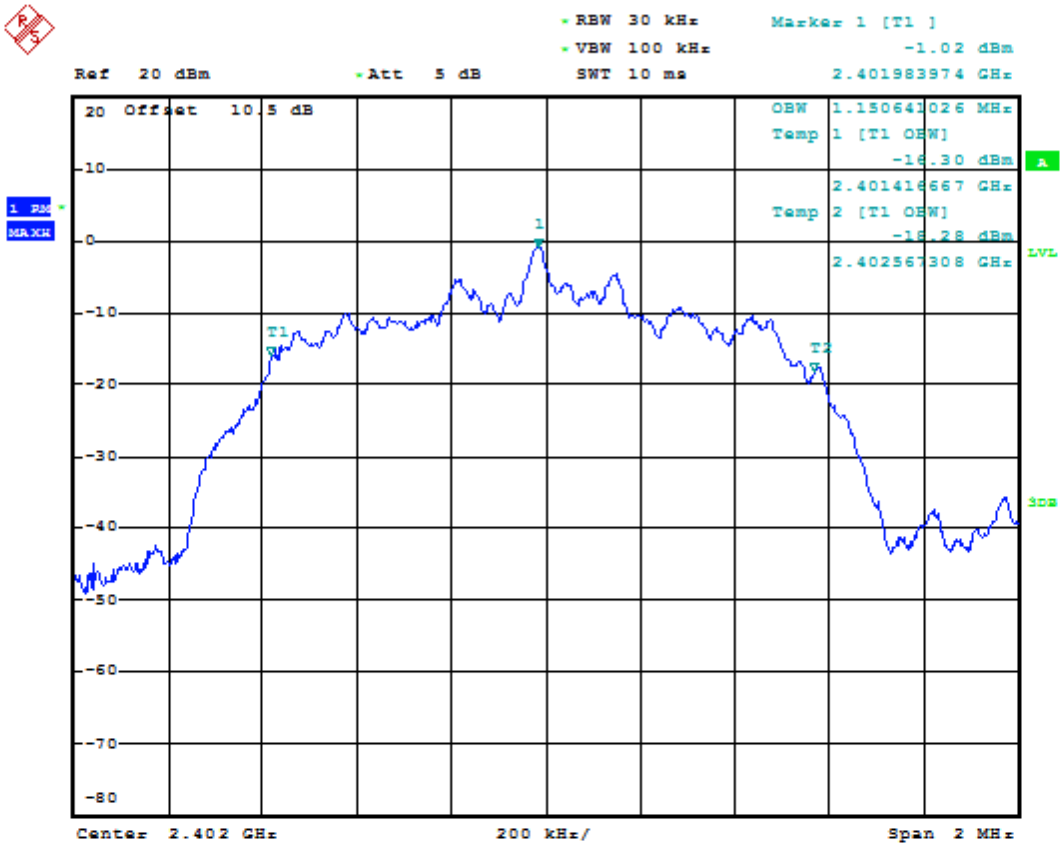
11.6. Original test data

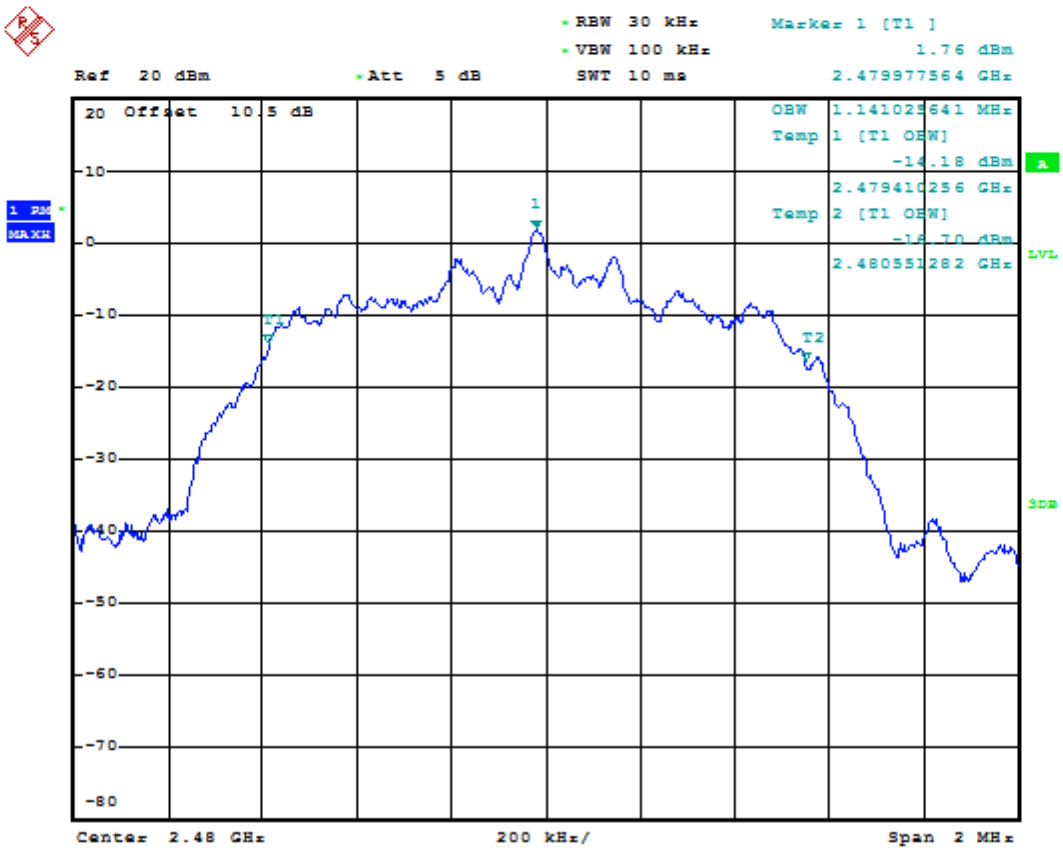
GFSK


RBW 30 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
1.78 dBm
2.401983974 GHz
Ref 20 dBm
Att 5 dB
20 Offset 10.5 dB
OBW839.743585744 kHz
Temp 1 [T1 OBW]
-16.41 dBm
2.401564103 GHz
Temp 2 [T1 OBW]
2.402403846 GHz
1 PM
MAXH
A
LVL
3DB
Center 2.402 GHz
200 kHz/
Span 2 MHz


RBW 30 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
3.94 dBm
2.479980769 GHz
Ref 20 dBm
Att 5 dB
20 Offset 10.5 dB
OBW839.743585744 kHz
Temp 1 [T1 OBW]
-15.26 dBm
2.479551282 GHz
Temp 2 [T1 OBW]
2.480391026 GHz
1 PM
MAXH
A
LVL
3DB
Center 2.48 GHz
200 kHz/
Span 2 MHz

8-DPSK:


RBW 30 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-1.02 dBm
2.401983974 GHz
Ref 20 dBm
Att 5 dB
Offset 10.5 dB
OBW 1.150641026 MHz
Temp 1 [T1 OBW]
-16.30 dBm
2.401416667 GHz
Temp 2 [T1 OBW]
-16.28 dBm
2.402567308 GHz
1 PM MAXH
A
LVL
3DB
T1
T2
Center 2.402 GHz
200 kHz/
Span 2 MHz


RBW 30 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
1.76 dBm
2.479977564 GHz
Ref 20 dBm
Att 5 dB
Offset 10.5 dB
OBW 1.141025641 MHz
Temp 1 [T1 OBW]
-14.18 dBm
2.479410256 GHz
Temp 2 [T1 OBW]
-16.70 dBm
2.480551282 GHz
1 PM MAXH
A
LVL
3DB
T1
T2
Center 2.48 GHz
200 kHz/
Span 2 MHz

12. Transmitter unwanted emissions in the out-of-band domain

12.1. Test equipment

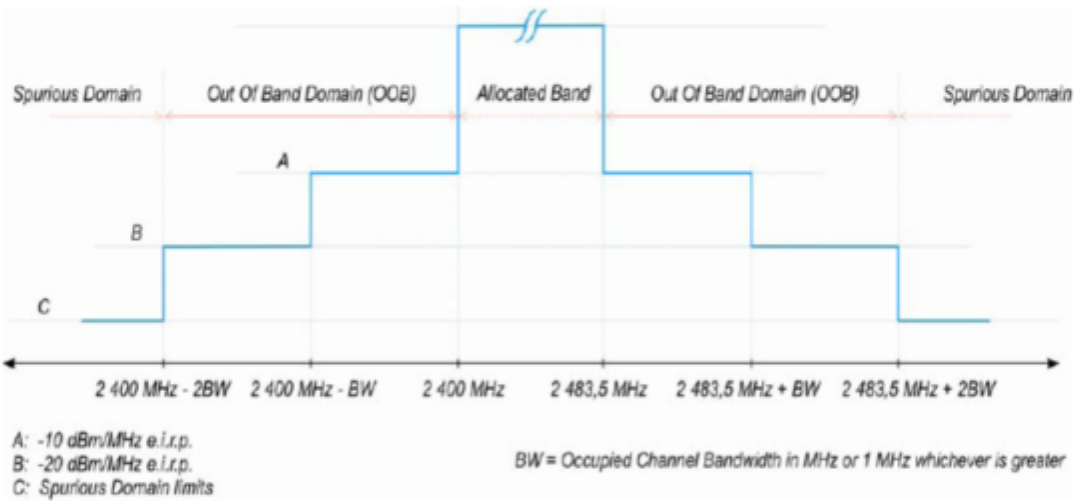
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2019/08/12	1 Y
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2019/08/12	1 Y
3	RF Cable	Micable	C10-01-01-1	100309	2019/08/12	1 Y
4	Temperature controller	Dongguan Bell	BE-TH-150M3	201208153364	2019/08/12	1 Y

12.2. Block diagram of test setup

Same with 6.2

12.3. Limits

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask below:



12.4. Test Procedure

These measurements have to be performed at normal environmental conditions and shall be repeated at the extremes of the operating temperature range.

(1) Configure EUT and assistant system according clause 2.4 and 6.2

(2) Connect EUT's antenna output to spectrum analyzer by RF cable and attenuator.

(3) Configure EUT work in normal hopping mode.

(4) Follow the test procedure description in EN 300 328 HB-030.9.1 clause 5.3.9.2.1, measure out each bands e.i.r.p emissions.

12.5. Test Result

EUT: Bluetooth Keyboad M/N: HB-030				
Test condition: Normal				
EUT Mode and basic information	Segment (Center Frquency)	Results Maximum Measured Level (dBm)	Limit(dBm)	Conclusion
GFSK: BW=1MHz	2484MHz	-56.21	-10	PASS
	2485MHz	-58.21	-20	PASS
	2399.5MHz	-40.51	-10	PASS
	2398.5MHz	-52.34	-20	PASS
	2400-2BW to 2400-BW	-55.12	-20	PASS
	2483.5MHz to 2483.5MHz+BW	-63.23	-10	PASS
	2483.5MHz+BW to 2483.5MHz+2BW	-61.56	-20	PASS
Test condition: -20℃				
EUT Mode and basic information	Segment (Center Frquency)	Results Maximum Measured Level (dBm)	Limit(dBm)	Conclusion
GFSK: BW=1MHz	2484MHz	-56.45	-10	PASS
	2485MHz	-58.12	-20	PASS
	2399.5MHz	-40.42	-10	PASS
	2398.5MHz	-52.23	-20	PASS
	2400-2BW to 2400-BW	-55.32	-20	PASS
	2483.5MHz to 2483.5MHz+BW	-63.12	-10	PASS
	2483.5MHz+BW to 2483.5MHz+2BW	-61.56	-20	PASS
Test condition: 55℃				
EUT Mode and basic information	Segment (Center Frquency)	Results Maximum Measured Level (dBm)	Limit(dBm)	Conclusion
GFSK: BW=1MHz	2484MHz	-56.23	-10	PASS
	2485MHz	-58.31	-20	PASS
	2399.5MHz	-40.51	-10	PASS
	2398.5MHz	-52.23	-20	PASS
	2400-2BW to 2400-BW	-55.41	-20	PASS
	2483.5MHz to 2483.5MHz+BW	-63.12	-10	PASS
	2483.5MHz+BW to 2483.5MHz+2BW	-61.32	-20	PASS
Test Date : 2020.6.29		Test Engineer : KING		

13. Transmitter unwanted emissions in the spurious domain

13.1. Test equipment

Same with 6.1

13.2. Block diagram of test setup

Same with 6.2

13.3. Limits

The transmitter unwanted emissions in the spurious domain shall not exceed the values given in below table.

Frequency range	Maximum power, e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

13.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 6.2

(2) Connect EUT's antenna output to spectrum analyzer by RF cable and attenuator.

(3) Configure EUT work in testing mode.

(4) Follow the test procedure description in EN 300 328 HB-030.9.1 clause 5.3.10.2.1, measure out the transmitter unwanted emissions in the spurious domain.

13.5. Test result

EUT: Bluetooth Keyboad M/N: HB-030				
EUT mode	Frequency	Spurious emissions level (dBm)	Limit	Conclusion
GFSK CH0	52.58MHz	-61.54	-54	PASS
	4.804GHz	-42.15	-30	PASS
GFSK CH78	120.68MHz	-55.24	-36	PASS
	4.960GHz	-40.15	-30	PASS
	4.804GHz	-36.54	-30	PASS
	4.960GHz	-38.25	-30	PASS
Test Date : 2020.6.29		Test Engineer : KING		

14. Receiver Spurious emissions

14.1. Test equipment

Same with 6.1

14.2. Block diagram of test setup

Same with 6.2

14.3. Limits

The spurious emissions of the receiver shall not exceed the values given in below table.

Frequency range	Maximum power e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz)	Measurement bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

14.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 6.2

(2) Connect EUT's antenna output to spectrum analyzer by RF cable and attenuator.

(3) Configure EUT work in testing mode.

(4) Follow the test procedure description in EN 300 328 HB-030.9.1 clause 5.3.11.2.1, measure out the transmitter unwanted spurious emissions.

14.5. Test result

EUT: Bluetooth Keyboad M/N: HB-030				
EUT mode	Frequency	Spurious emissions level (dBm)	Limit	Conclusion
Rx Mode	217.54MHz	-65.41	-57	PASS
	4.901GHz	-61.25	-47	PASS
Test Date : 2020.6.29		Test Engineer : KING		

15. Receiver Blocking

N/A (Not Applicable)

This requirement does not apply for equipment with a maximum RF Output power level of less than 10 dBm e.i.r.p, and this reported device's maximum e.i.r.p is 5.91 dBm.

16. Photos of the EUT

Photo 1

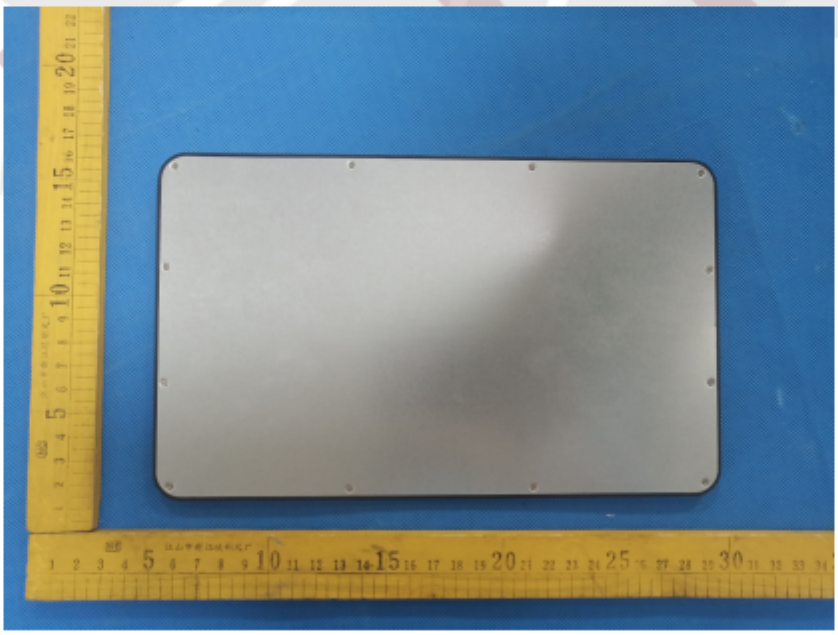


Photo 2

Photo 3

--END OF REPORT--