Radio Test Report

Report No.: AGC08F110701F2

FCC ID	:	ZG8USB06H
IC ID	:	9781A-USB06K
PRODUCT DESIGNATION	:	Bluetooth USB Dongle
BRAND NAME	:	N/A
TEST MODEL	:	USB06H
CLIENT	:	LANYA ELECTRONIC CO., LTD.
DATE OF ISSUE	:	Aug 01, 2011
STANDARD(S)	:	FCC Part 15 Rules RSS-210

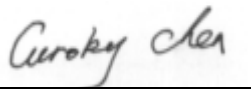
Attestation of ***G***lobal ***C***ompliance Co., Ltd.

VERIFICATION OF COMPLIANCE

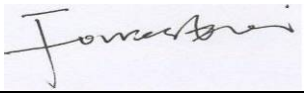
Applicant	LANYA ELECTRONIC CO., LTD.
	6th Building, Lijincheng Industrial Park, East Gongye Road, Longhua Town, Bao'an District, Shenzhen, China.
Manufacturer	LANYA ELECTRONIC CO., LTD.
	6th Building, Lijincheng Industrial Park, East Gongye Road, Longhua Town, Bao'an District, Shenzhen, China.
Product Designation	Bluetooth USB Dongle
Brand Name	N/A
Model Name	FCC : USB06H,USB06K, USB06M IC : USB06K.
Difference description:	All the same except for the shell, and the main test model is USB06H.
Report Number	AGC08F110701F2
Date of Test	July 27, 2011 to July 30, 2011

WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2003 and TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 15 and RSS-210 requirements.

Tested By: 

Curoky Chen Aug 01, 2011

Reviewed By: 

Forrest Lei Aug 01, 2011

Approved By: 

Solger Zhang Aug 01, 2011

TABLE OF CONTENTS

1 GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is a **Bluetooth USB Dongle** designed as an “Communication Device”. It is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz
Rated Output Power	3.61 dBm(max) for GFSK modulation
Bluetooth Version	V2.0 + EDR
Modulation	GFSK, π /4-DQPSK, 8-DPSK
Number of channels	79
Antenna Designation	Integrated Antenna
Antenna Gain	0.85dBi
Power Supply	DC 5V supply by PC

1.2 TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	0	2402MHZ
	1	2403MHZ
	:	:
	38	2440 MHZ
	39	2441 MHZ
	40	2442 MHZ
	:	:
	77	2479 MHZ
	78	2480 MHZ

1.3 RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHZ,In every connection one Bluetooth device is the master and the other one is 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 (e.g. single of multi-slot packet) 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 packet 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.

1.4 EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE

Example of a 79 hopping sequence in data mode:
40,21,44,23,42,53,46,55,48,33,52,35,50,65,54,67
56,37,60,39,58,69,62,71,64,25,68,27,66,57,70,59
72,29,76,31,74,61,78,63,01,41,05,43,03,73,07,75
09,45,13,47,11,77,15,00,64,49,66,53,68,02,70,06
01,51,03,55,05,04

1.5 EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values:
1 LAP/UAP of the master of the connection
2 Internal master clock
The LAP(lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP(upper address part) are the 24MSB's of the 48BD_ADDRESS
The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and Is never turned off. For synchronization with other units only offset are used. It has no relation to the time Of the day. Its resolution is at least half the RX/TX slot length of 312.5us.The clock has a cycle of about One day(23h30).In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire.
LAP(24 bits),4LSB's(4bits)(Input 1) and the 27MSB's of the clock(Input 2) are used. With this input values different mathematical procedures(permutations, additions, XOR-operations)are performed to generate te Sequence. This will be done at the beginning of every new transmission.
Regarding short transmissions the Bluetooth system has the following behavior:
The first connection between the two Devices is established, a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended.
The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmission is longer(and it Cannot be shorter)than the minimum resolution of the clock(312.5us).The hopping sequence will always Differ from the first one.

1.6 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: ZG8USB06H and IC ID: 9781A-USB06K, filing to comply with the FCC Part 15 and RSS-210 requirements.

1.7 TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.8 TEST FACILITY

The test site used to collect the radiated data is located on the address of Attestation of Global Compliance Co., Ltd. 2F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen. The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and IC requirements in documents RS212.
FCC register No.: 259865

1.9 SPECIAL ACCESSORIES

Refer to section 2.2.

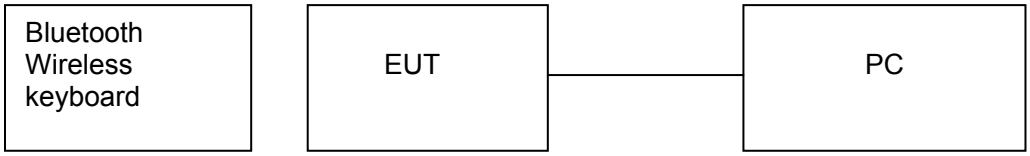
1.10 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

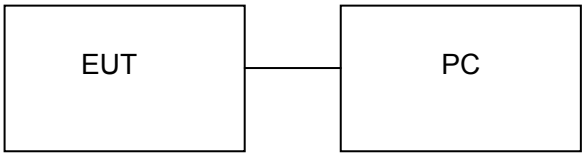
2 SYSTEM TEST CONFIGURATION

2.1 CONFIGURATION OF EUT SYSTEM

Configure: Normal Hopping



Configure: Control by PC to work in specified channel



2.2 EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	Bluetooth USB Dongle	N/A	USB06H	EUT
2	PC	Lenovo	SL410K	A.E
3	Bluetooth wireless Keyboard	N/A	N/A	A.E

Note: All the accessories have been used during the test.
the EUT in test setup diagram means "EUT system".

3 SUMMARY OF TEST RESULTS

FCC RULES	RSS-210	DESCRIPTION OF TEST	RESULT
§15.247	A8	Peak Output Power	Compliant
§15.247	A8	20 dB Bandwidth	Compliant
§15.247	A8	Conducted Spurious Emission	Compliant
§15.209	RS-GEN	Radiated Emission	Compliant
§15.247	A8	Band Edges	Compliant
§15.247	A8	Number of Hopping Frequency	Compliant
§15.247	A8	Time of Occupancy	Compliant
§15.247	A8	Frequency Separation	Compliant
§15.207	RS-GEN	Line Conduction Emission	Compliant

4. DESCRIPTION OF TEST MODES

The EUT has been operated in three modulations: GFSK, π /4-DQPSK, 8-DPSK independently.
The following operating modes were applied for the related test items.

No.	TEST MODES
1	Low Channel(TX)
2	Middle Channel(TX)
3	High Channel(TX)
4	Normal Hopping

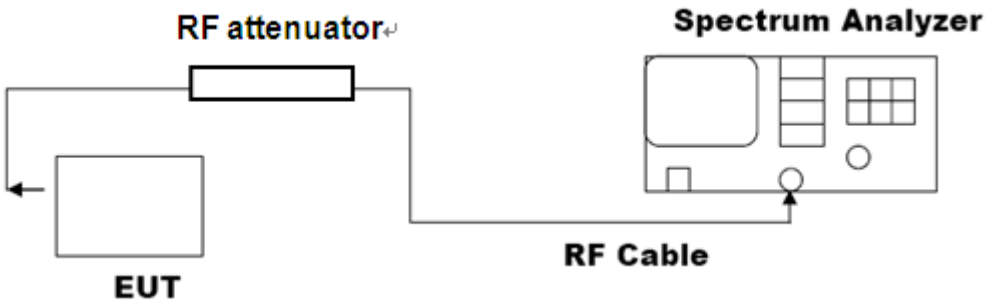
Note: All test modes were performed during the testing with configure in section 2.1, only the result of the worst case was recorded in the report.

5 PEAK OUTPUT POWER

5.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set Span = approximately 5 times the 20 dB bandwidth, centered on a hoping channel
   RBW > the 20 dB bandwidth of the emission being measured
   VBW ≥ RBW; Sweep = auto; Detector function = peak
5. Set SPA Trace 1 Max hold, then View.

5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



5.3 MEASUREMENT EQUIPMENT USED

Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	N/A	06/27/2011	06/26/2012
RF attenuator	N/A	RFA20db	N/A	N/A	N/A

5.4 LIMITS AND MEASUREMENT RESULT

PEAK OUTPUT POWER MEASUREMENT RESULT FOR GFSK MODULATION			
Frequency (GHz)	Result (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	3.61	30	Pass
2.441	3.54	30	Pass
2.480	3.53	30	Pass

PEAK OUTPUT POWER MEASUREMENT RESULT FOR Π /4-DQPSK, 8-DPSK MODULATION				
Frequency (GHz)	Test Result 2 Mbps (dBm)	Test Result 3 Mbps (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	3.26	3.17	30	Pass
2.441	3.23	3.10	30	Pass
2.480	3.20	3.13	30	Pass

6 20 DB BANDWIDTH

6.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hoping channel
   RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW; Sweep = auto; Detector function = peak
5. Set SPA Trace 1 Max hold, then View.

6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in Section 5.2

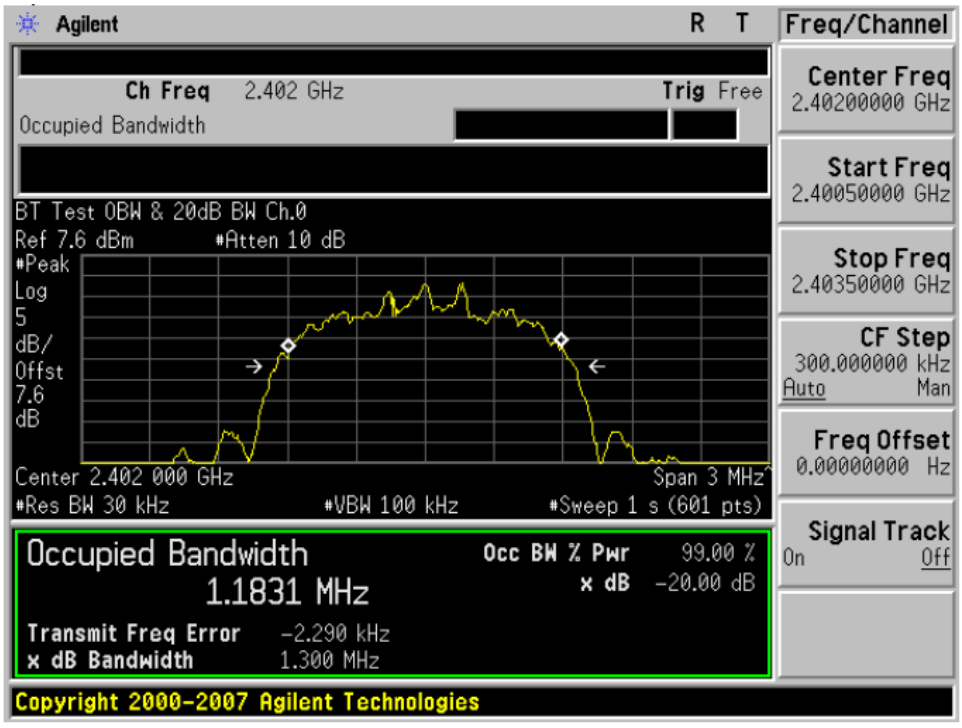
6.3 MEASUREMENT EQUIPMENT USED

The same as described in Section 5.3

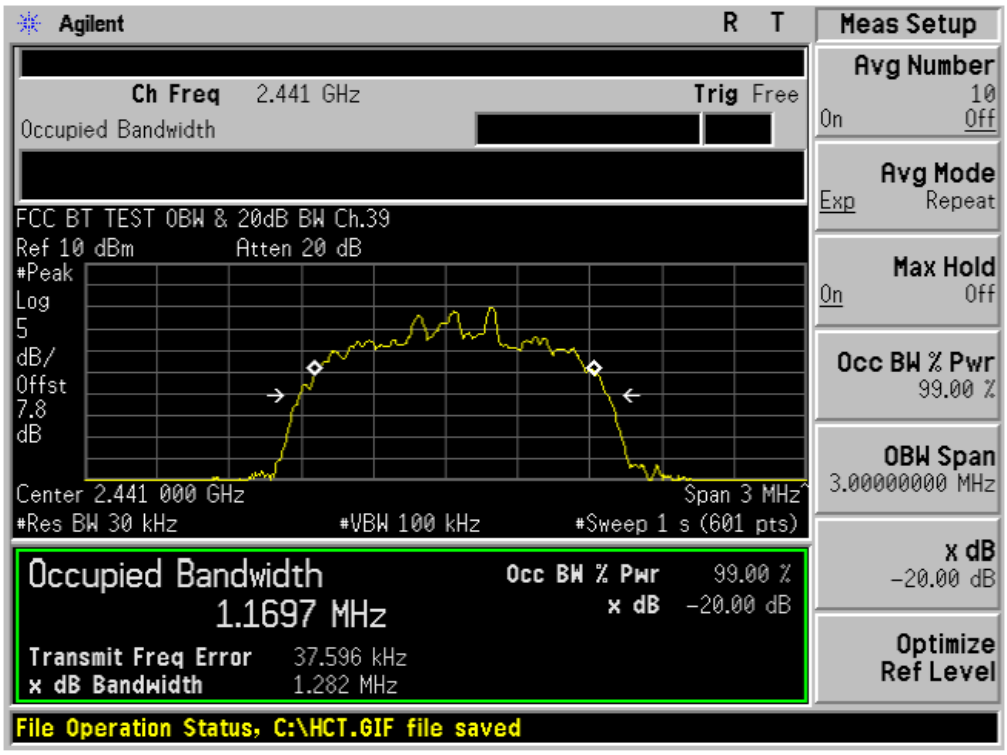
6.4 LIMITS AND MEASUREMENT RESULTS

THE MEASUREMENT RESULT WITH THE WORST CASE OF 3MBPS FOR 8-DPSK MODULATION			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
--	Low Channel	1.300	PASS
	Middle Channel	1.282	PASS
	High Channel	1.298	PASS

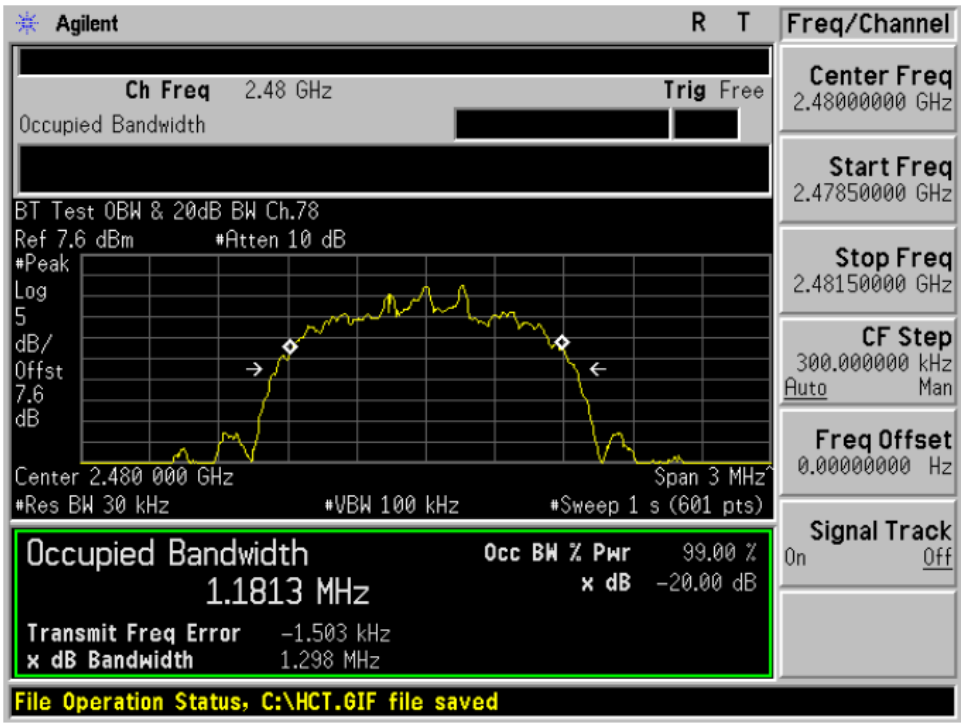
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



7. CONDUCTED SPURIOUS EMISSION

7.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
   RBW = 100 kHz; VBW ≥ RBW; Sweep = auto; Detector function = peak.
5. Set SPA Trace 1 Max hold, then View.

7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in section 5.2

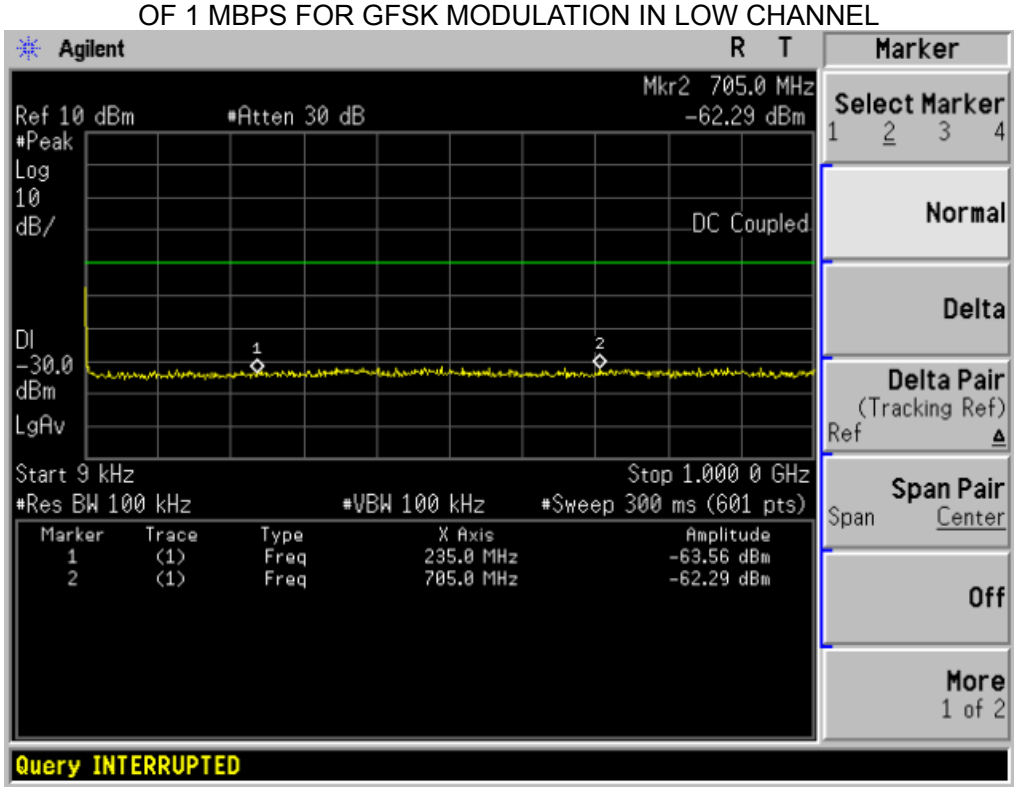
7.3 MEASUREMENT EQUIPMENT USED

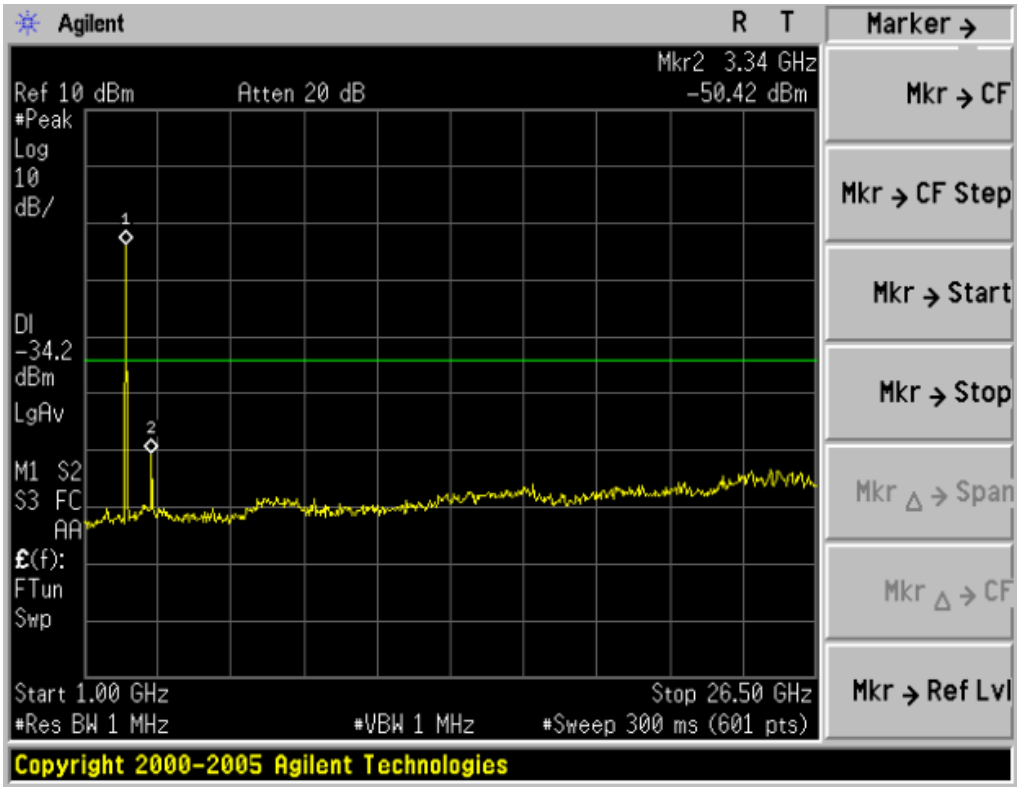
The Same as described in section 5.3

7.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Criteria
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a)/ RS-GEN, must also comply with the radiated emission limits specified in§15.209(a))/RS-GEN	At least -20dBc than the limit Specified on the TOP Channel	PASS

TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE
OF 1 MBPS FOR GFSK MODULATION IN LOW CHANNEL





8. RADIATED EMISSION

8.1 MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.4: 2003 and RS212. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

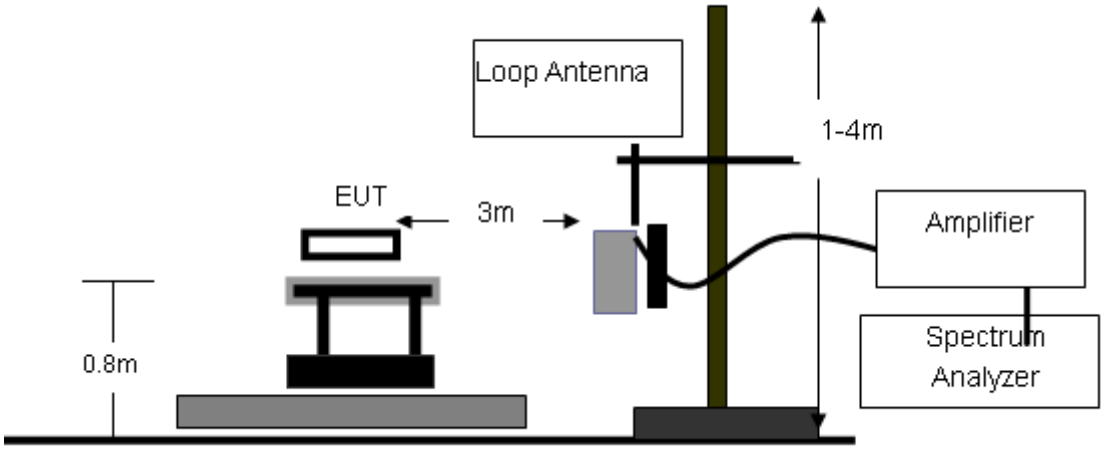
The following table is the setting of spectrum analyzer and receiver.'

Spectrum Parameter	Setting
Start Frequency	1GHz
Stop Frequency	26.5GHz
RB/VB(Emission in restricted band)	1MHz/1MHz for Peak, 1MHz/10Hz for Average
RB/VB(Emission in non-restricted band)	1MHz/1MHz for Peak

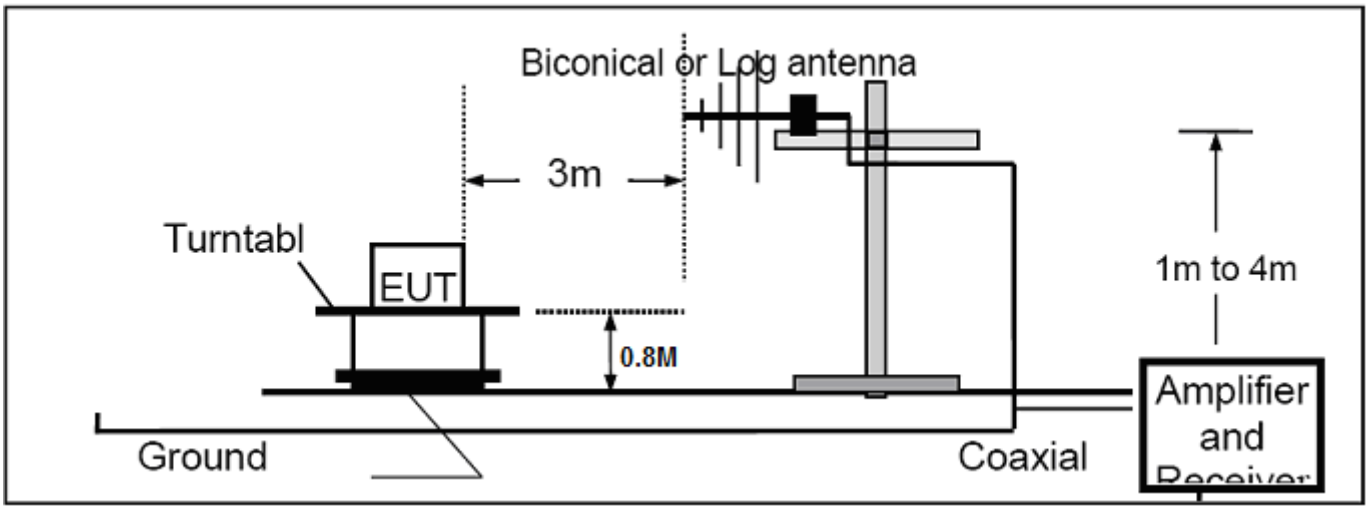
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

8.2 TEST SETUP

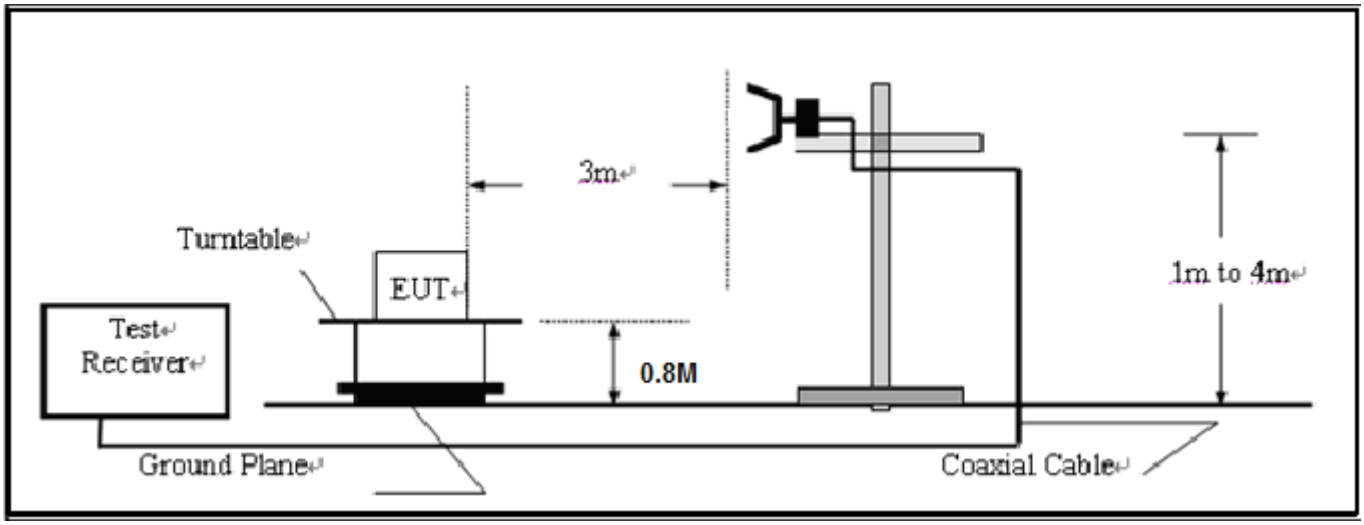
RADIATED EMISSION TEST SETUP BELOW 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



8.2 TEST EQUIMENT LIST

Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	N/A	06/27/2011	06/26/2012
Amplifier	EM	EM30180	0607030	06/27/2011	06/26/2012
Horn Antenna	EM	EM-AH-10180	N/A	06/27/2011	06/26/2012
EMI Test Receiver	Rohde & Schwarz	ESCI	N/A	06/27/2011	06/26/2012
Amplifier	EM	EM30180	N/A	06/27/2011	06/26/2012
Bilogical Antenna	A.H. Systems Inc.	SAS-521-4	N/A	06/27/2011	06/26/2012
Loop Antenna	Daze	ZN30900N	SEL0097	06/27/2011	06/26/2012
Isolation Transformer	LETEAC	LTBK	--	06/27/2011	06/26/2012

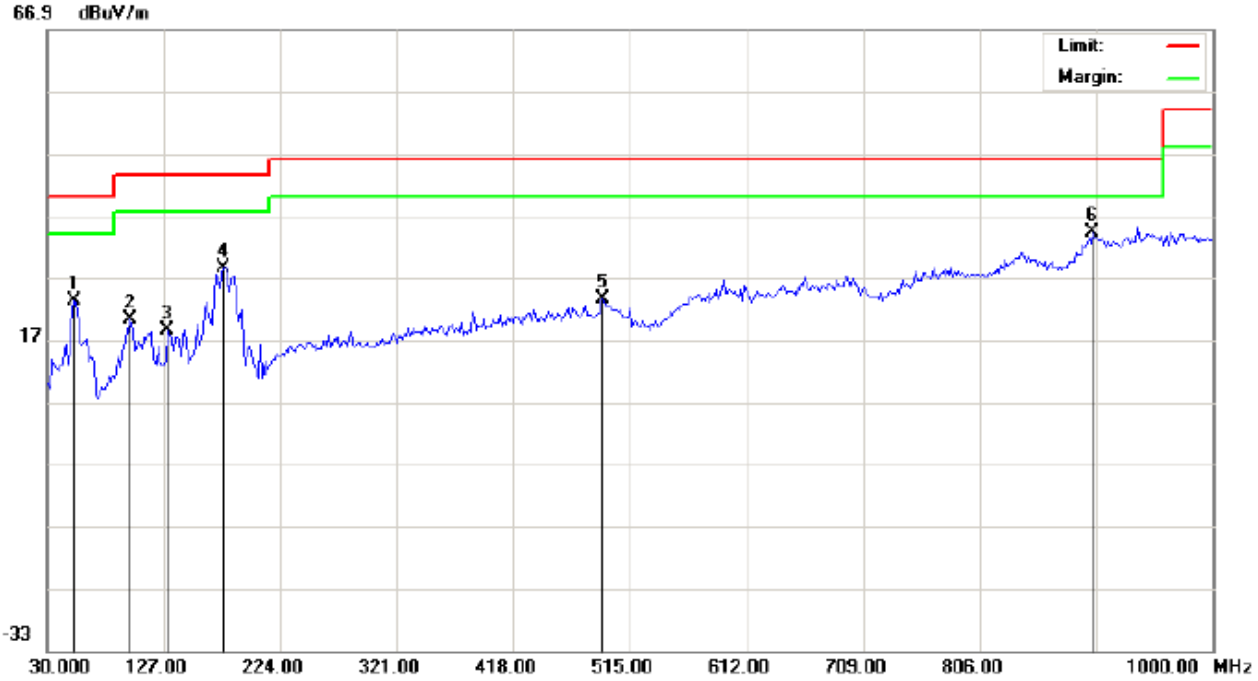
8.3 TEST RESULT

The worst case test result of middle channel on GFSK modulation was reported as following:

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ

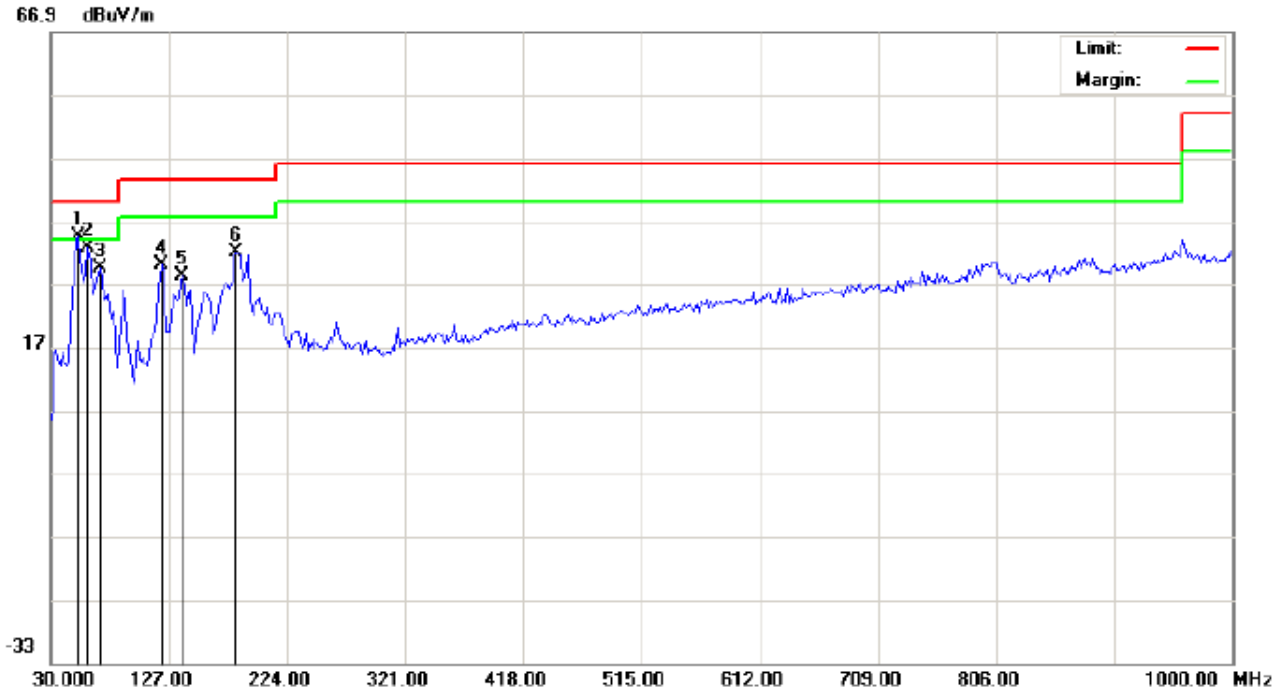


Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		52.6333	11.35	12.01	23.36	40.00	-16.64	peak			
2		99.5167	4.87	15.31	20.18	43.50	-23.32	peak			
3		130.2332	4.19	14.35	18.54	43.50	-24.96	peak			
4		177.1167	10.92	17.53	28.45	43.50	-15.05	peak			
5		492.3667	1.03	22.47	23.50	46.00	-22.50	peak			
6	*	899.7667	0.69	33.56	34.25	46.00	-11.75	peak			



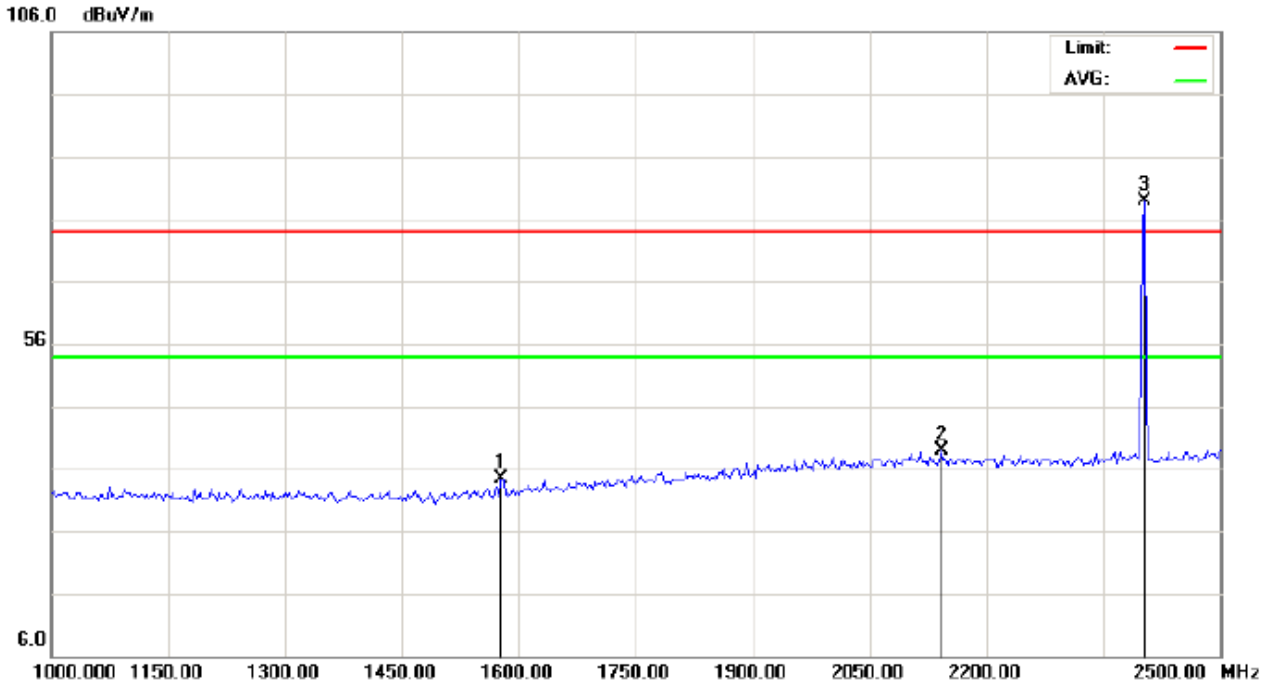
Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	52.6333	20.48	13.94	34.42	40.00	-5.58	peak			
2		60.7167	19.43	13.43	32.86	40.00	-7.14	peak			
3		70.4167	21.42	8.09	29.51	40.00	-10.49	peak			
4		120.5333	15.83	14.22	30.05	43.50	-13.45	peak			
5		138.3167	14.74	13.64	28.38	43.50	-15.12	peak			
6		181.9667	13.69	18.36	32.05	43.50	-11.45	peak			

RADIATED EMISSION ABOVE 1GHZ (1-10th Harmonics)

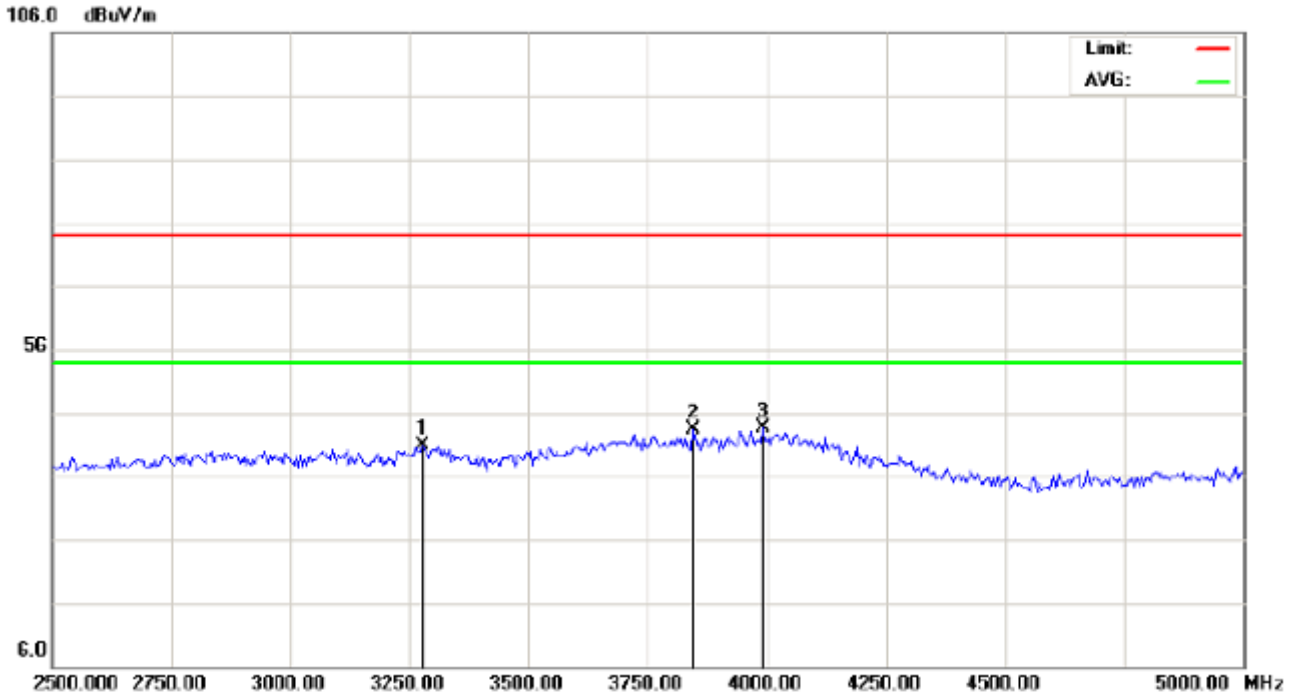


Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1577.500	38.92	-4.56	34.36	74.00	-39.64	peak			
2		2142.500	38.74	0.04	38.78	74.00	-35.22	peak			
3	*	2402.000	78.49	0.32	78.81	74.00	4.81	peak			

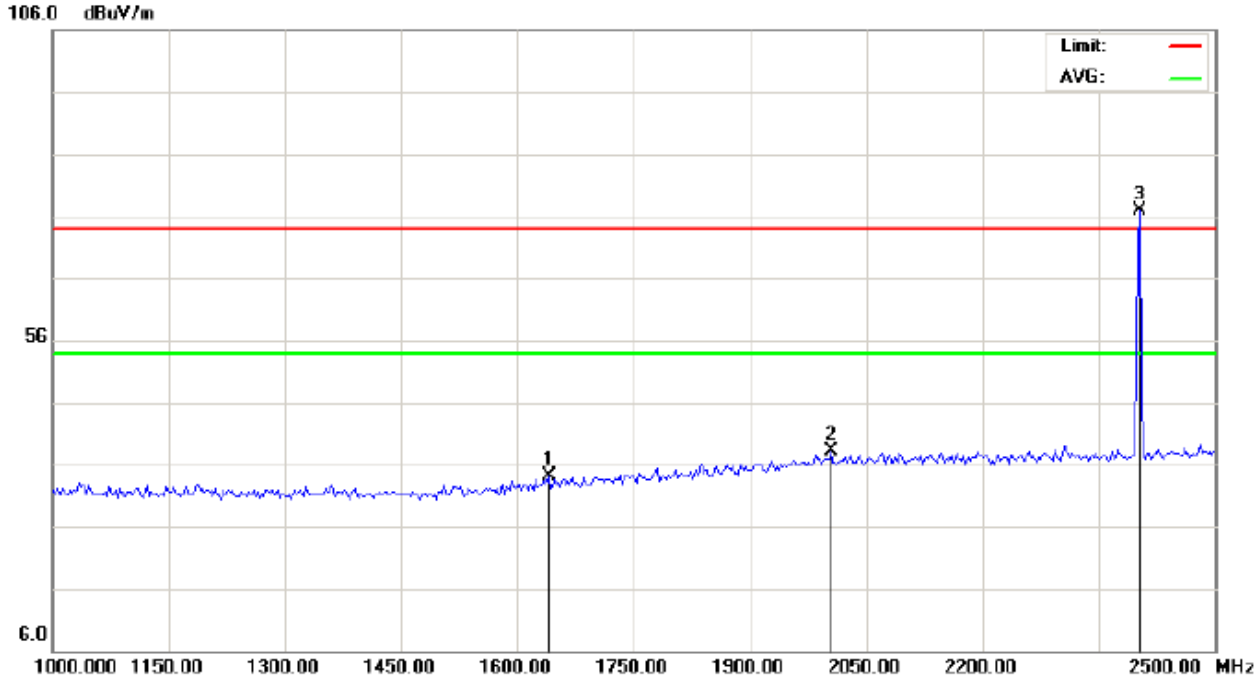


Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		3279.167	38.86	1.90	40.76	74.00	-33.24	peak			
2		3845.833	39.16	4.24	43.40	74.00	-30.60	peak			
3	*	3991.667	38.45	5.14	43.59	74.00	-30.41	peak			

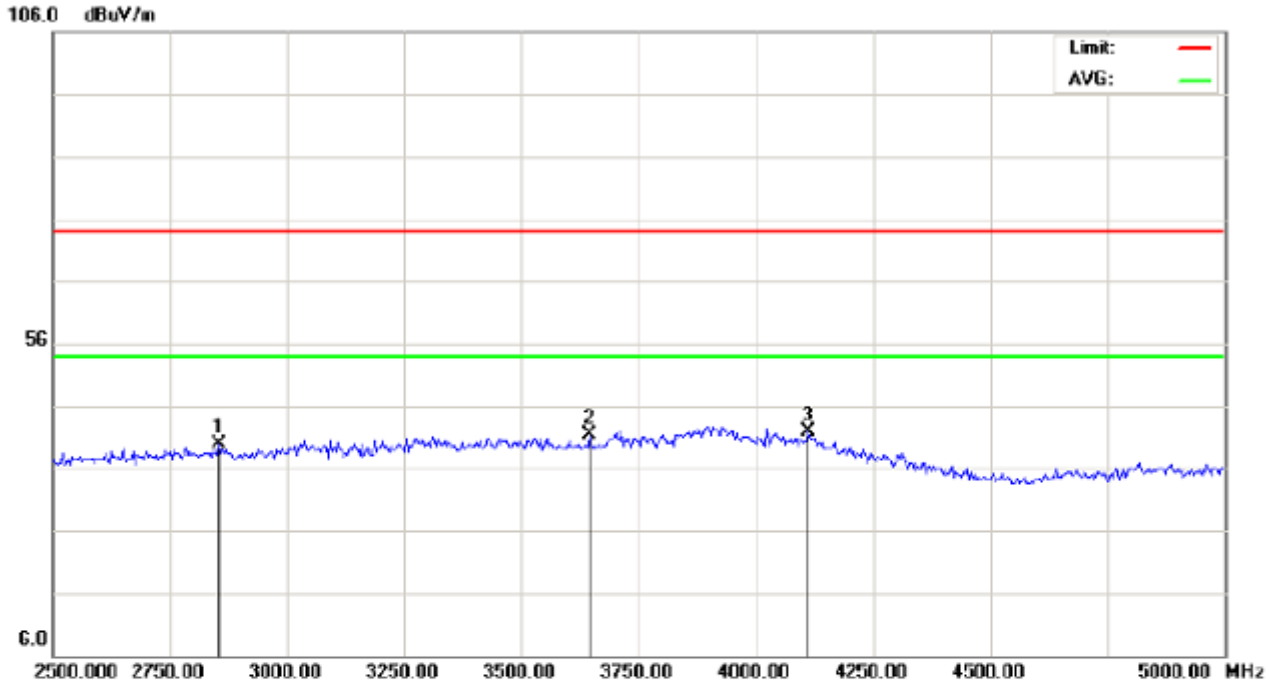


Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1640.000	37.95	-3.91	34.04	74.00	-39.96	peak			
2		2005.000	38.27	-0.11	38.16	74.00	-35.84	peak			
3	*	2402.000	76.56	0.32	76.88	74.00	2.88	peak			



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2854.167	38.63	1.29	39.92	74.00	-34.08	peak			
2		3645.833	38.40	3.01	41.41	74.00	-32.59	peak			
3	*	4112.500	38.48	3.32	41.80	74.00	-32.20	peak			

Note: 5~25GHz at least have 20dB margin. no recording in the test report.
Factor=Antenna Factor+ Cable loss-Amplifier gain, Margin=Measurement-Limit.

9 BAND EDGES EMISSION

9.1 MEASUREMENT PROCEDURE

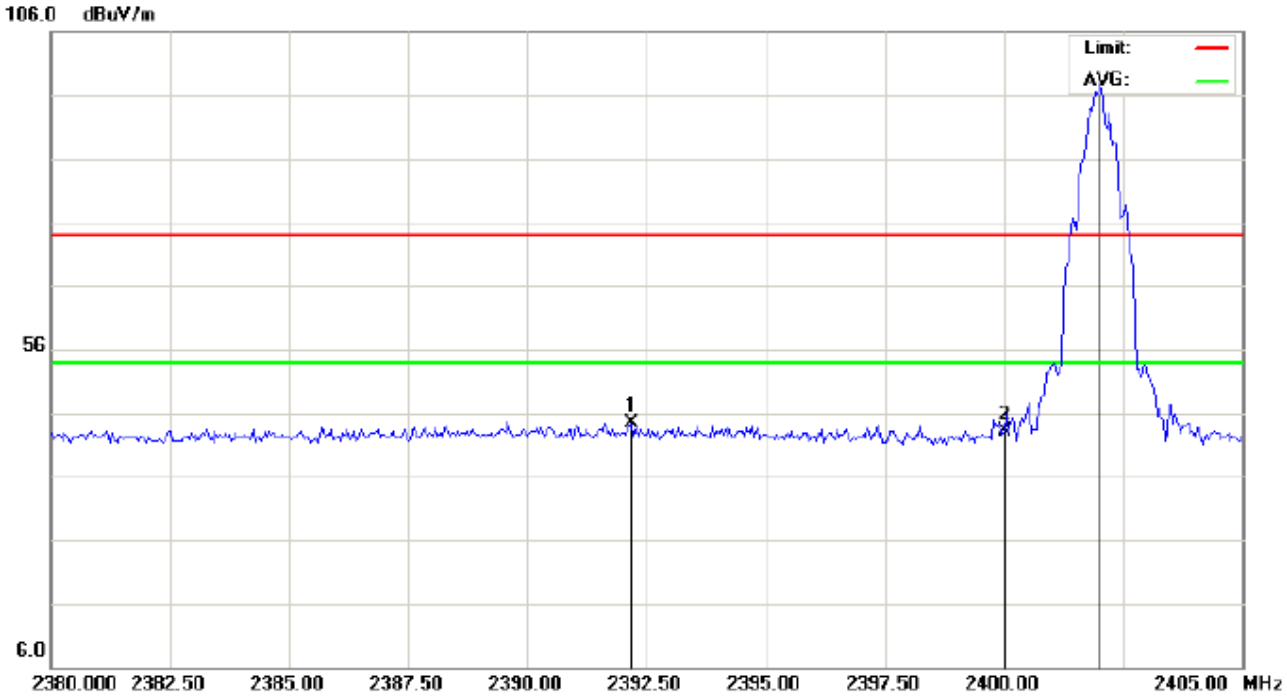
1, Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency = Operation Frequency, RBW>=1%span, VBW>=RBW
3. The band edges was measured and recorded.

9.2 TEST SET-UP

The Same as described in section 8.2

9.3 TEST RESULT

TEST PLOT OF BAND EDGE FOR LOW CHANNEL (1Mbps)

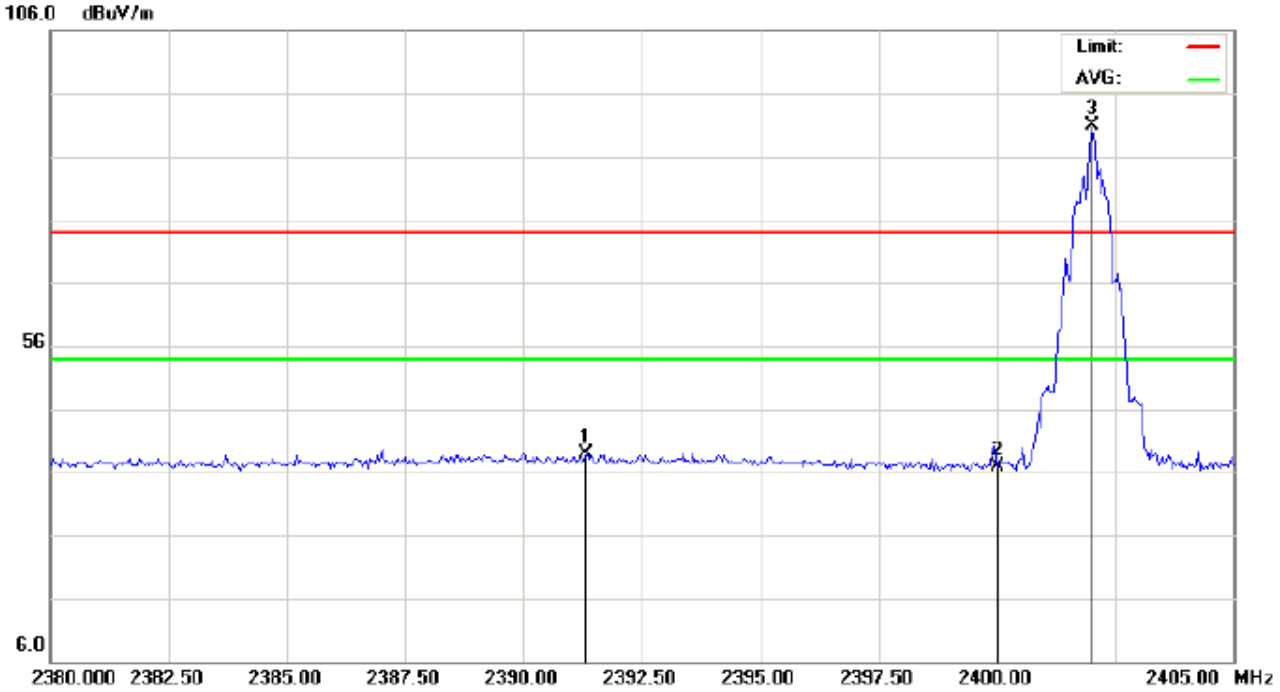


Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2392.167	44.07	0.31	44.38	74.00	-29.62	peak			
2		2400.000	42.73	0.32	43.05	74.00	-30.95	peak			
3	*	2402.000	97.39	0.32	97.71	74.00	23.71	peak			



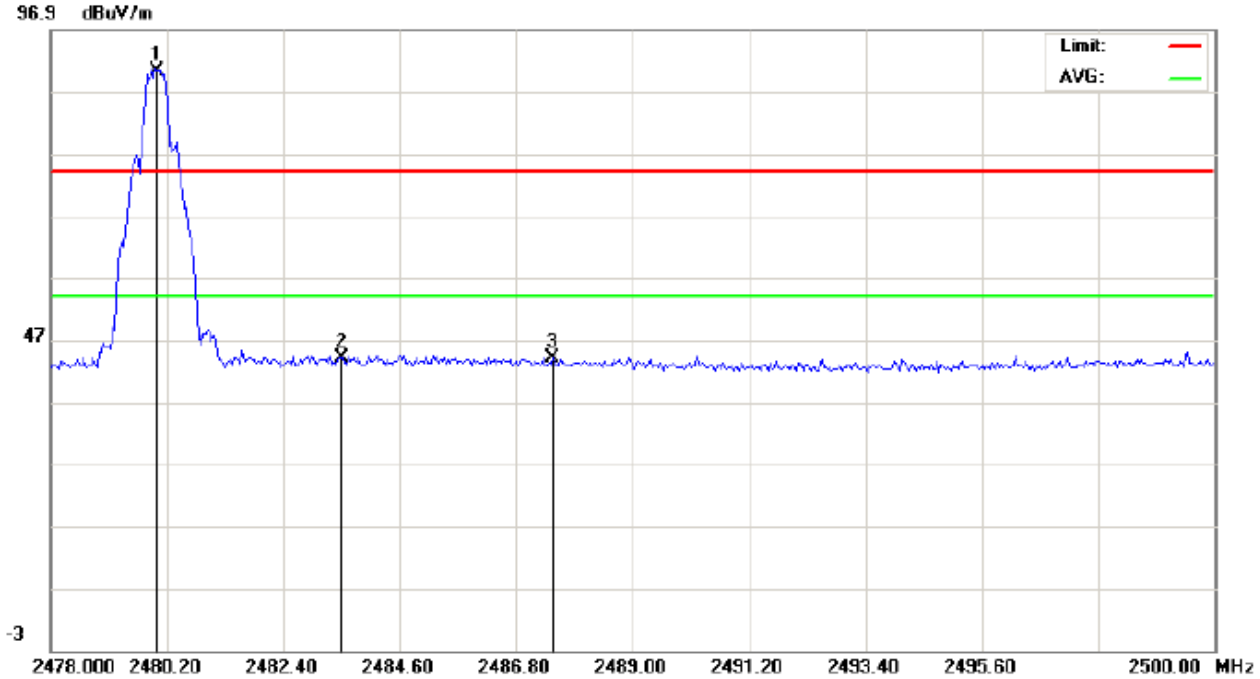
Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2402TX
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2391.333	38.88	0.31	39.19	74.00	-34.81	peak			
2		2400.000	36.83	0.32	37.15	74.00	-36.85	peak			
3	*	2402.000	90.98	0.32	91.30	74.00	17.30	peak			

TEST PLOT OF BAND EDGE FOR HIGH CHANNEL (1Mbps)

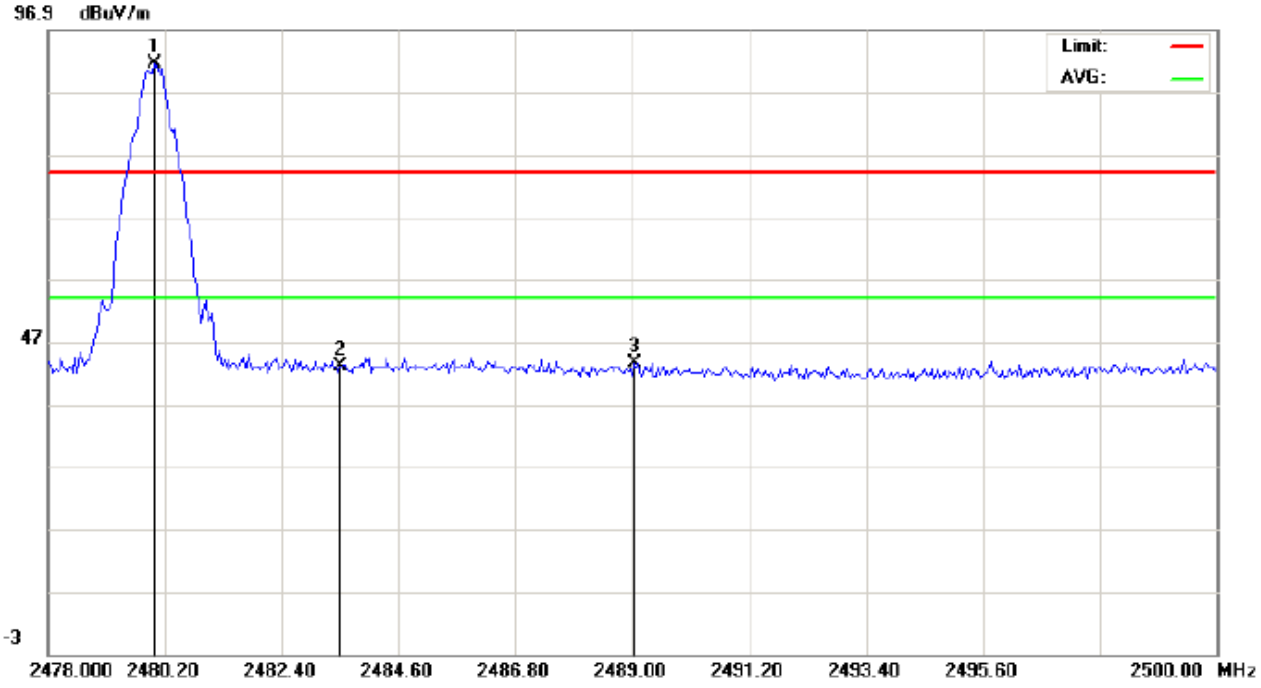


Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2480TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	89.77	0.41	90.18	74.00	16.18	peak			
2		2483.500	43.59	0.41	44.00	74.00	-30.00	peak			
3		2487.497	43.62	0.42	44.04	74.00	-29.96	peak			



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: 2480TX
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	91.04	0.41	91.45	74.00	17.45	peak			
2		2483.500	42.68	0.41	43.09	74.00	-30.91	peak			
3		2489.037	43.16	0.42	43.58	74.00	-30.42	peak			

10. NUMBER OF HOPPING FREQUENCY

10.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer Start = 2.4GHz Stop = 2.4835GHz.
4. Set the Spectrum Analyzer as RBW>=1%span, VBW>=RBW.

10.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2
Conducted Method.

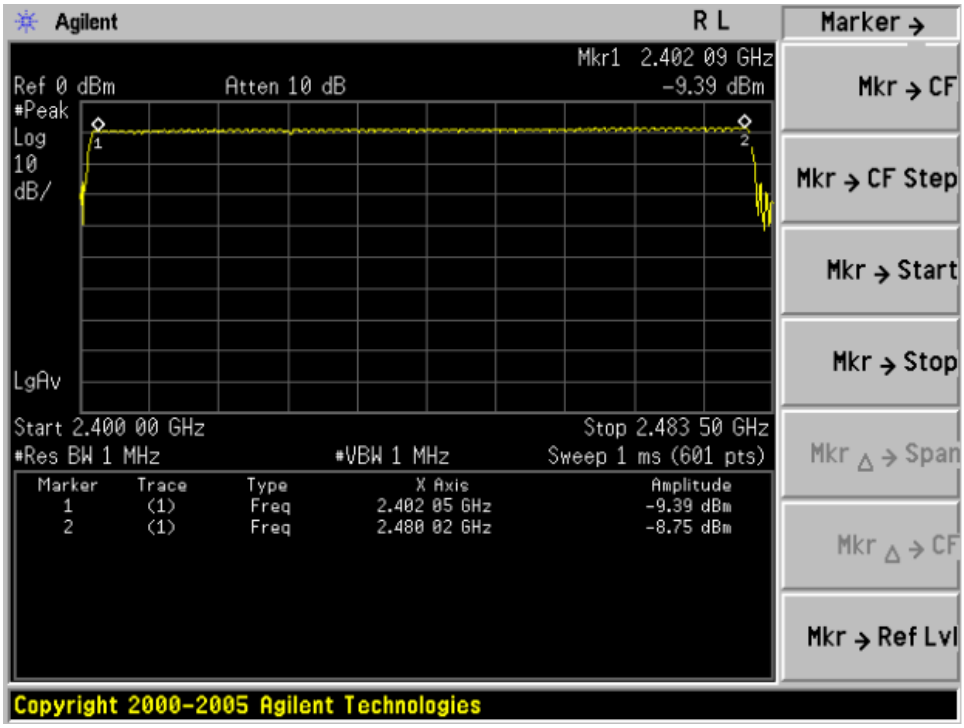
10.3 MEASUREMENT EQUIPMENT USED

The Same as described in section 5.3

10.4 LIMITS AND MEASUREMENT RESULT

TOTAL NO. OF HOPPING CHANNEL	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	>=15	79	PASS

TEST PLOT FOR NO. OF TOTAL CHANNELS



11. TIME OF OCCUPANCY (DWELL TIME)

11.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
3. Set Span = zero span, centered on a hoping channel
4. Set the spectrum analyzer as RBW=1MHz, VBW>=RBW, Span = 0 Hz,.

11.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2
Conducted Method

11.3 MEASUREMENT EQUIPMENT USED

The same as described in section 5.3

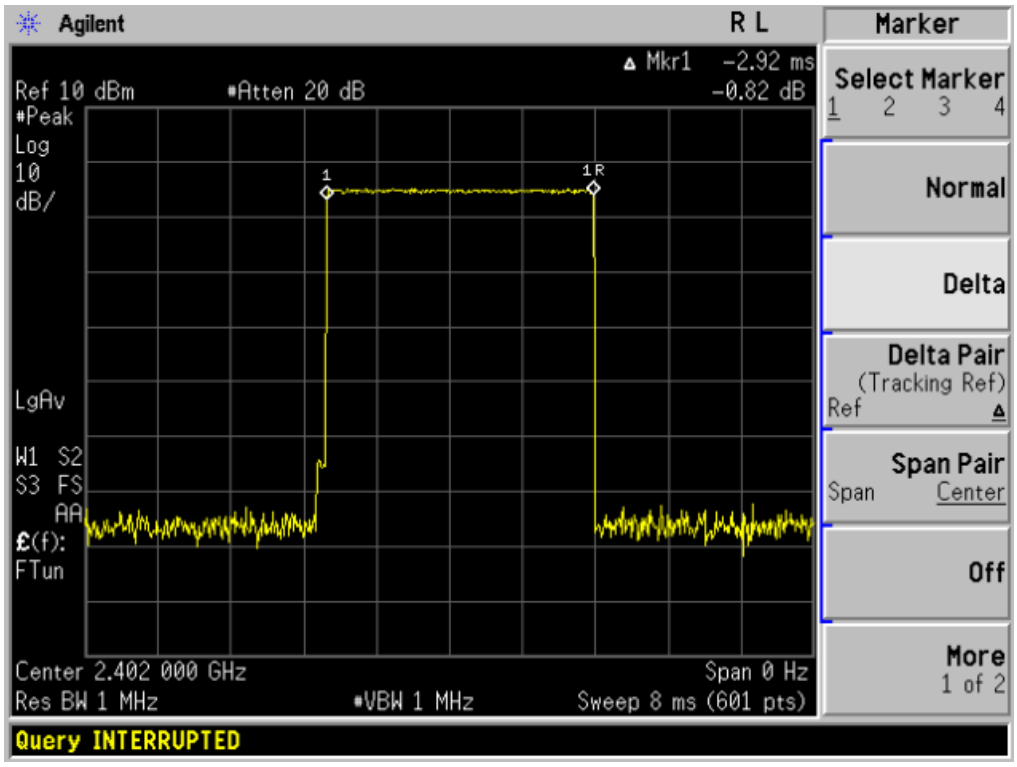
11.4 LIMITS AND MEASUREMENT RESULT

Bluetooth 3Mbps Test Result

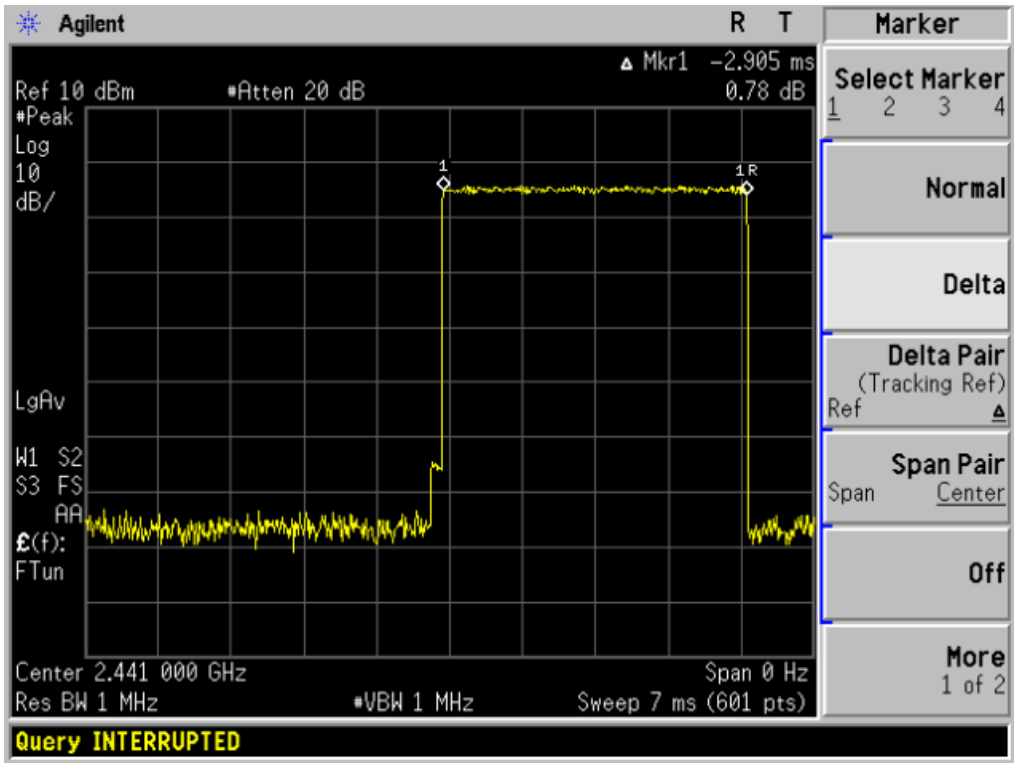
Channel	Time of Pulse for DH5 (ms)	Period Time (s)	Sweep Time (ms)	Limit (ms)
Low	2.920	31.6	311.46	400
Middle	2.905	31.6	309.87	400
High	2.917	31.6	311.15	400

Low Channel Time
2.920*(1600/6)/79*31.6=311.46ms
Middle Channel Time
2.905*(1600/6)/79*31.6=309.87ms
High Channel Time
2.917*(1600/6)/79*31.6=311.15ms

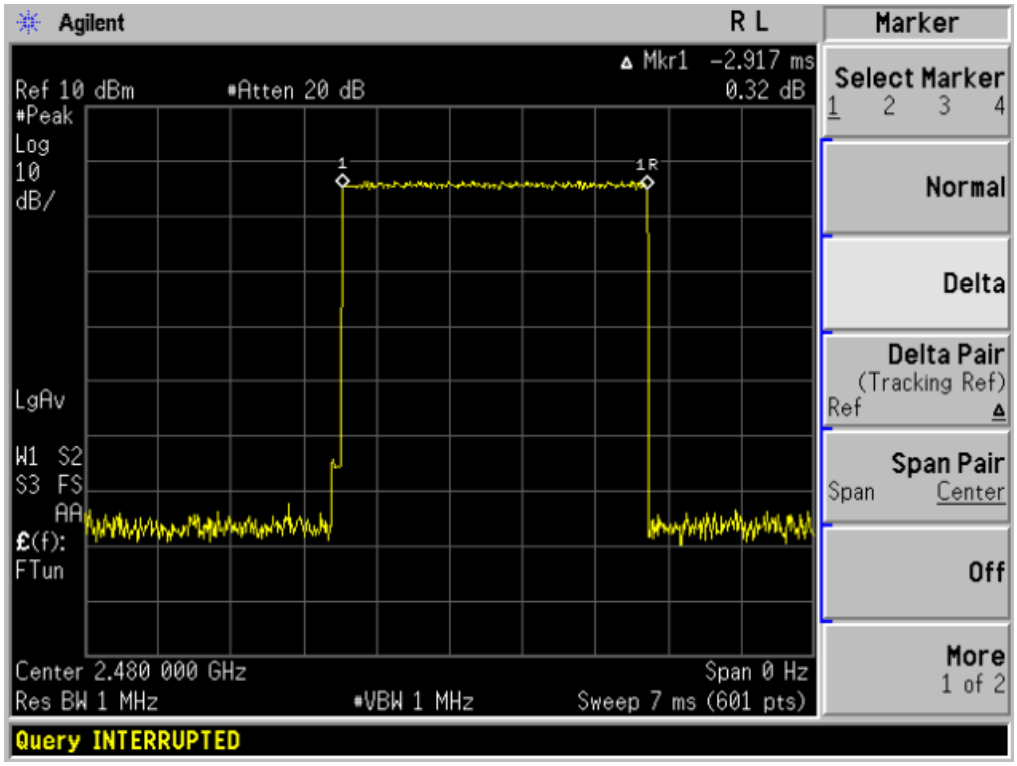
TEST PLOT OF LOW CHANNEL



TEST PLOT OF MIDDLE CHANNEL



TEST PLOT OF HIGH CHANNEL



12. FREQUENCY SEPARATION

12.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set 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.

12.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2

12.3 MEASUREMENT EQUIPMENT USED

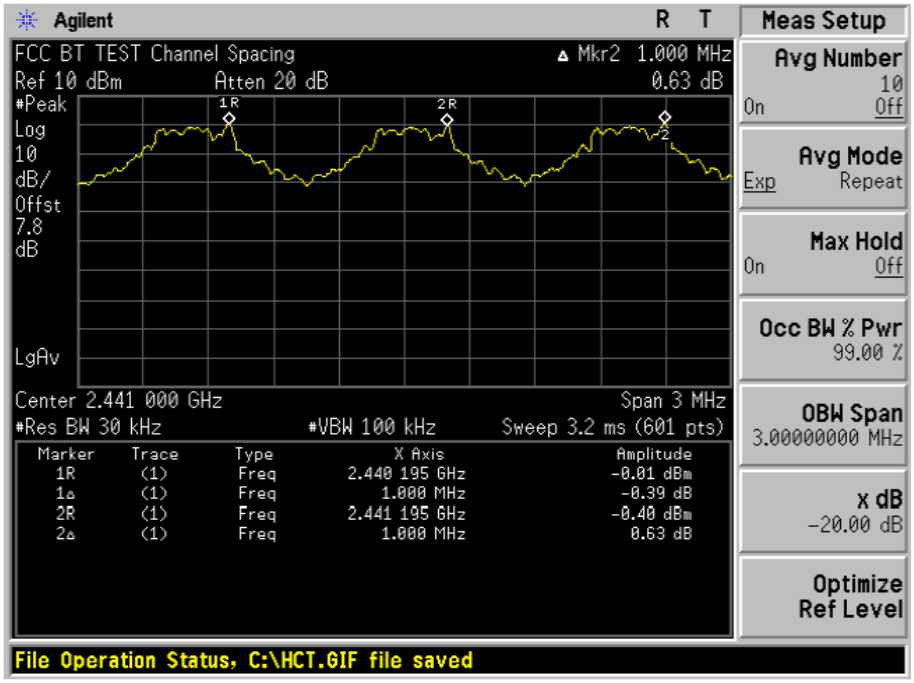
The same as described in section 5.3

12.4 LIMITS AND MEASUREMENT RESULT

BLUETOOTH 3MBPS TEST RESULT

CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT
	KHz	KHz	Pass
CH00-CH01	1000	>=25 KHz or 2/3 20 dB BW	

TEST PLOT FOR FREQUENCY SEPARATION



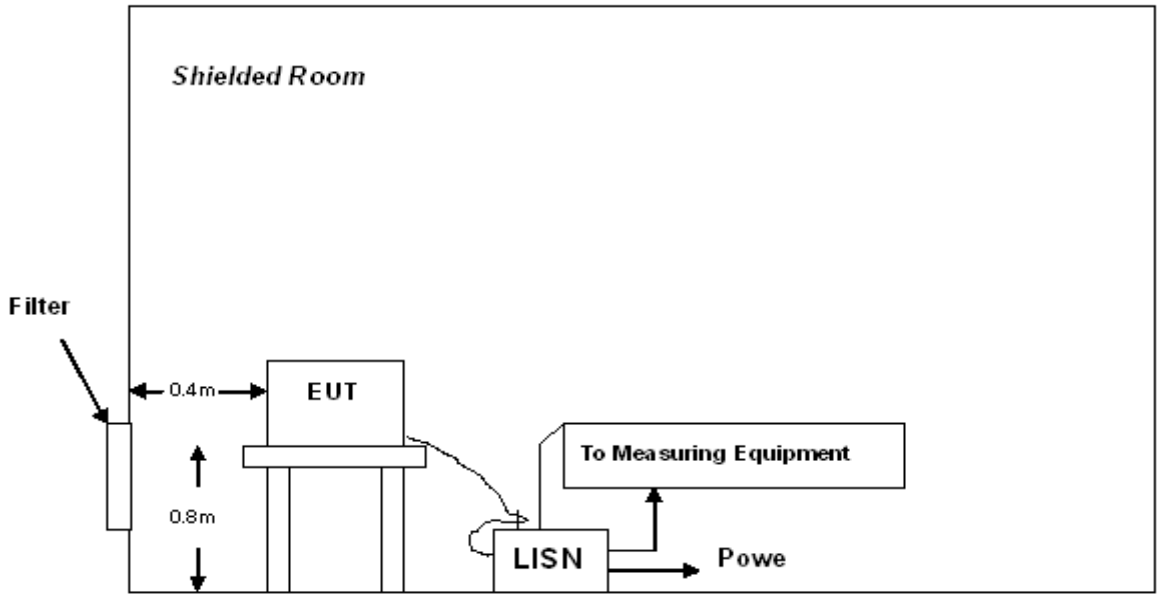
13 FCC LINE CONDUCTED EMISSION TEST

13.1 LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

**Note: 1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

13.2 BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



A: Powered through filter

13.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

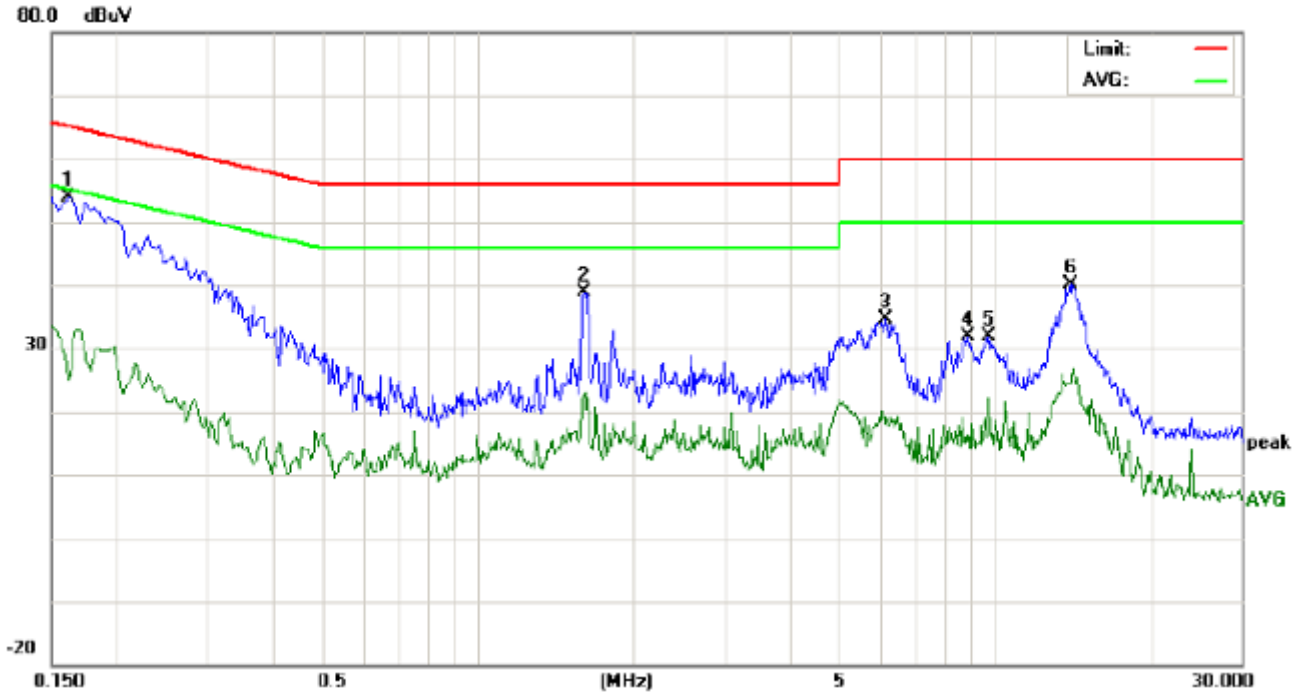
1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per ANSI C63.4.
3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4) All support equipments received AC120V/60Hz power from a LISN, if any.
5) The EUT received power by PC though USB, PC communicated with Bluetooth wireless keyboard through EUT,.
6) The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8) During the above scans, the emissions were maximized by cable manipulation.
9) The test mode(s) were scanned during the preliminary test.
   Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

13.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3) The test data of the worst case condition(s) was reported on the Summary Data page.

13.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



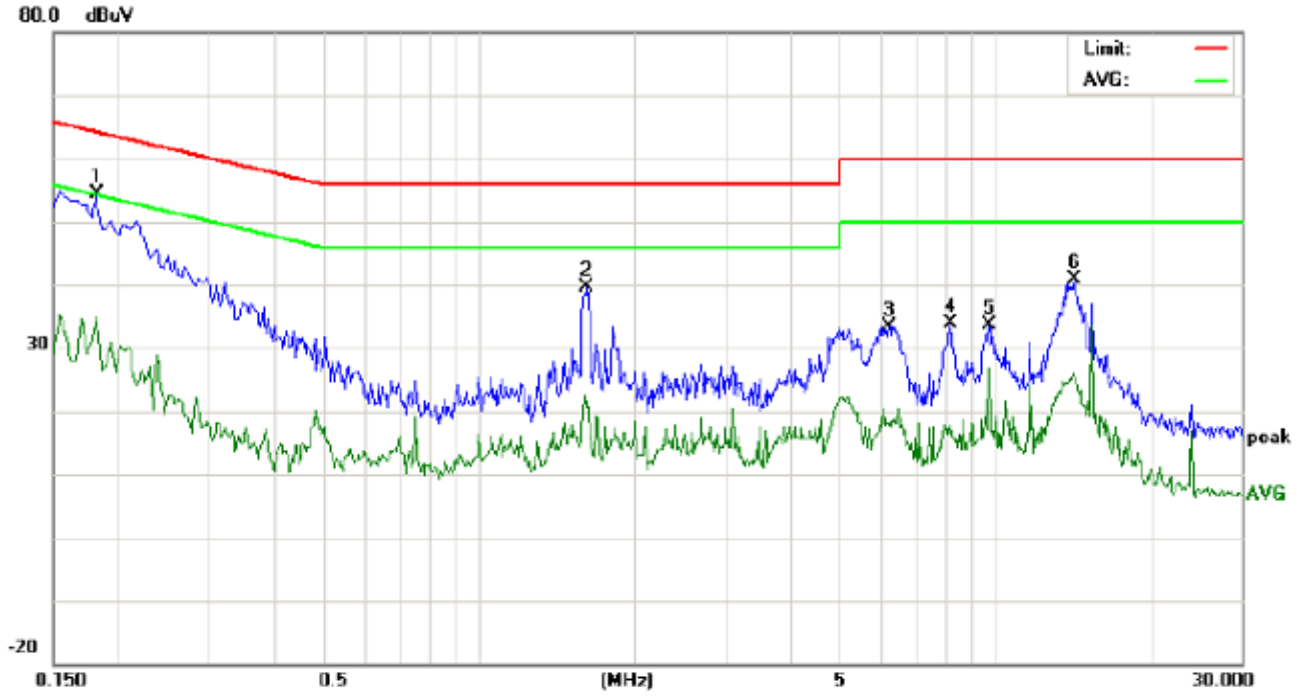
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: Normal Hopping
Note:

Phase: *L1*
Power:

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1620	43.82		15.01	10.17	53.99		25.18	65.36	55.36	-11.37	-30.18	P	
2	1.6019	28.54		12.50	10.35	38.89		22.85	56.00	46.00	-17.11	-23.15	P	
3	6.1340	24.44		8.91	10.29	34.73		19.20	60.00	50.00	-25.27	-30.80	P	
4	8.7500	21.36		4.92	10.27	31.63		15.19	60.00	50.00	-28.37	-34.81	P	
5	9.7460	21.54		11.79	10.24	31.78		22.03	60.00	50.00	-28.22	-27.97	P	
6	13.9980	29.90		14.57	10.12	40.02		24.69	60.00	50.00	-19.98	-25.31	P	

Line Conducted Emission Test Line 2-N

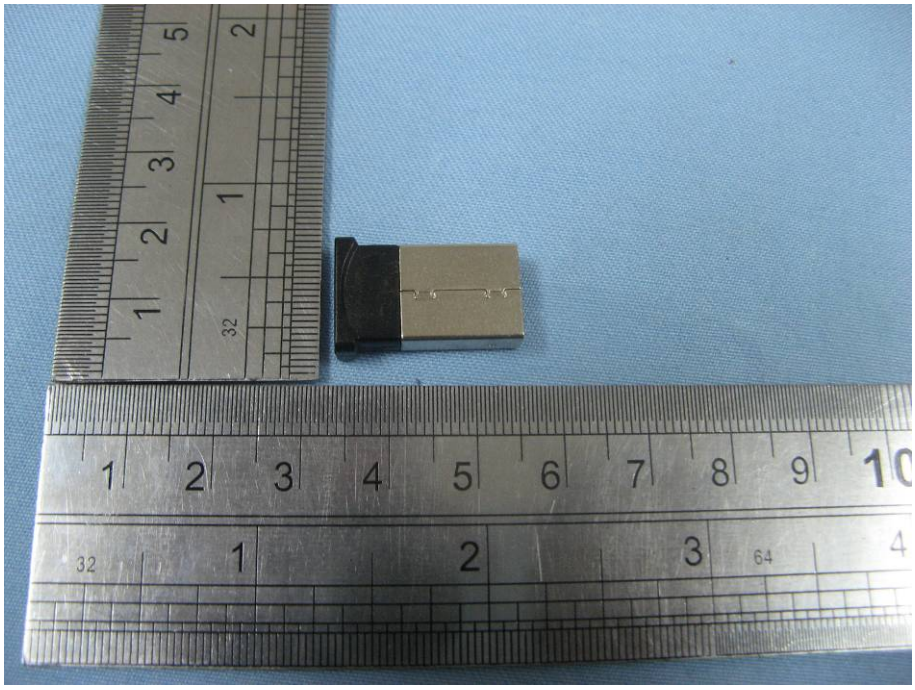


Site: Conduction
Phase: N
Temperature: 26
Limit: EN55022 Class B Conduction(QP)
Power:
Humidity: 60 %
EUT: Bluetooth USB Dongle
M/N: USB06H
Mode: Normal Hopping
Note:

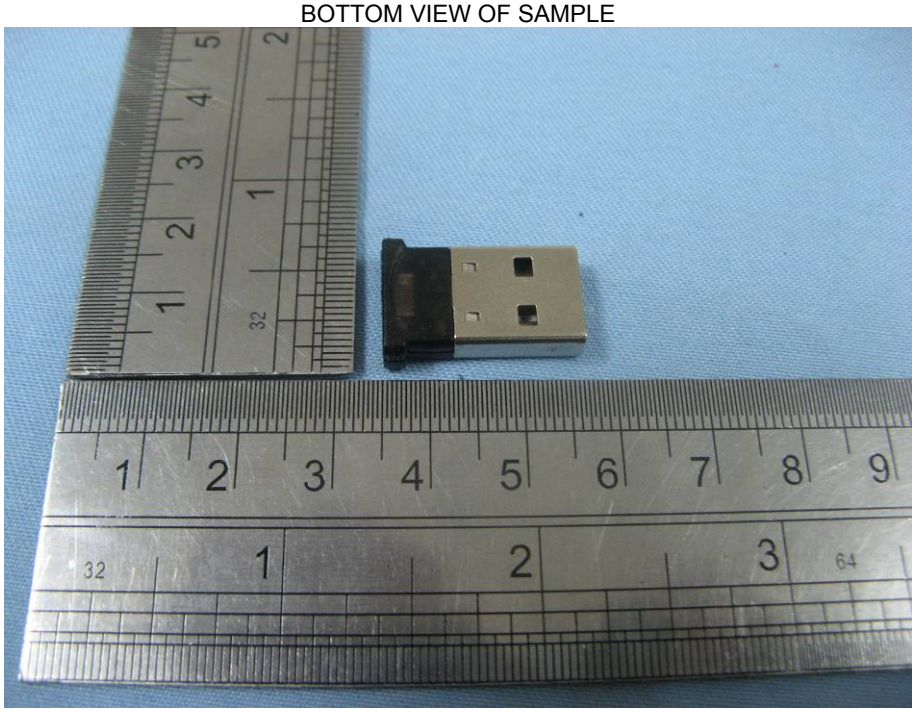
No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1819	44.15		24.62	10.20	54.35		34.82	64.39	54.39	-10.04	-19.57	P	
2	1.6260	29.38		10.19	10.34	39.72		20.53	56.00	46.00	-16.28	-25.47	P	
3	6.2499	23.20		7.80	10.29	33.49		18.09	60.00	50.00	-26.51	-31.91	P	
4	8.2059	23.62		7.41	10.35	33.97		17.76	60.00	50.00	-26.03	-32.24	P	
5	9.7459	23.27		16.60	10.24	33.51		26.84	60.00	50.00	-26.49	-23.16	P	
6	14.2499	30.74		15.27	10.12	40.86		25.39	60.00	50.00	-19.14	-24.61	P	

APPENDIX I
PHOTOGRAPHS OF THE EUT
VIEW OF USB06H

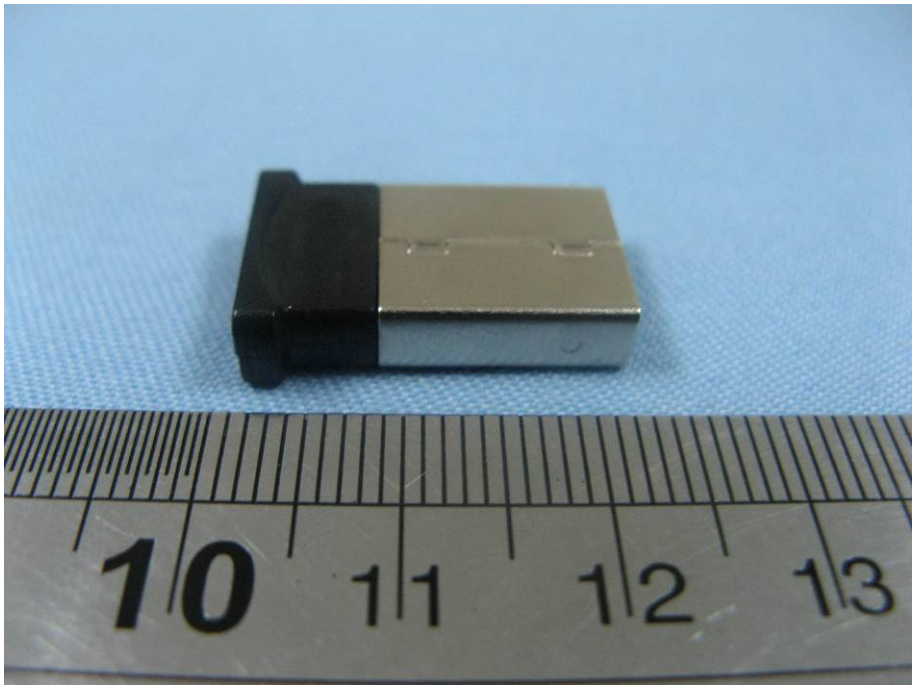
TOP VIEW OF SAMPLE



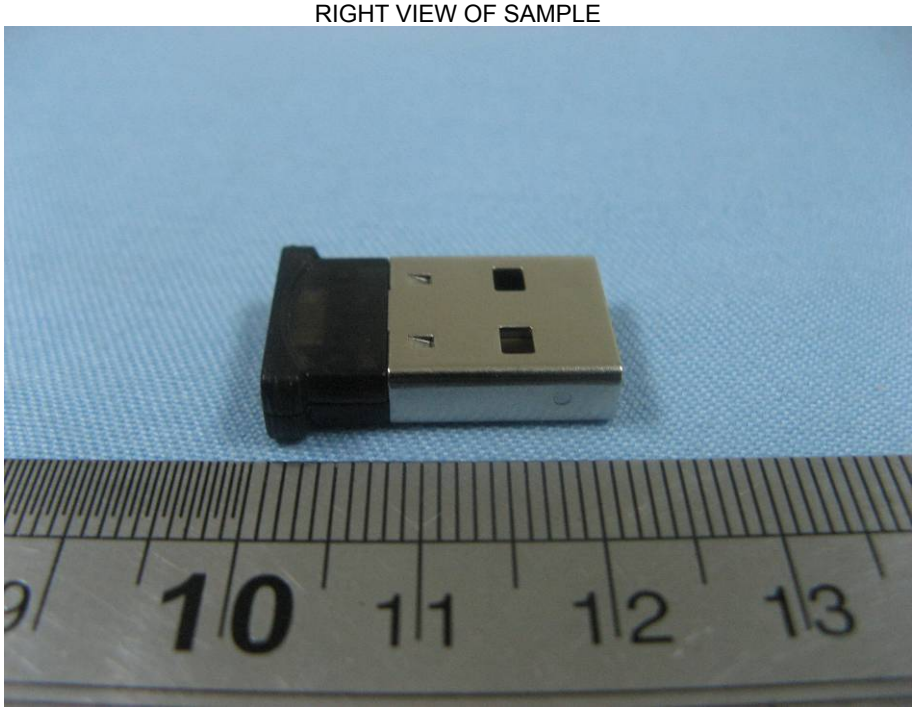
BOTTOM VIEW OF SAMPLE



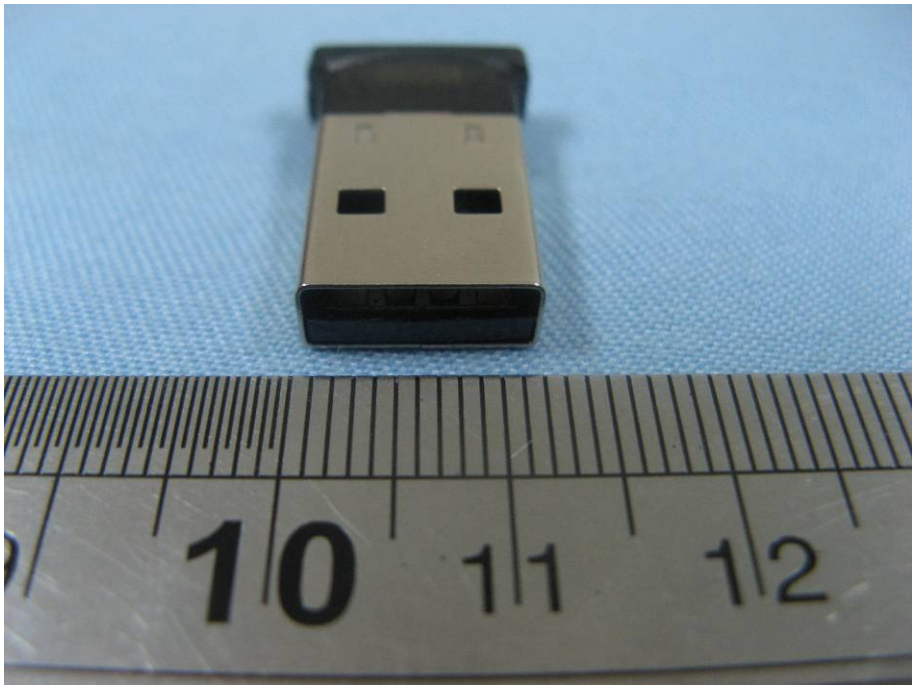
LEFT VIEW OF SAMPLE



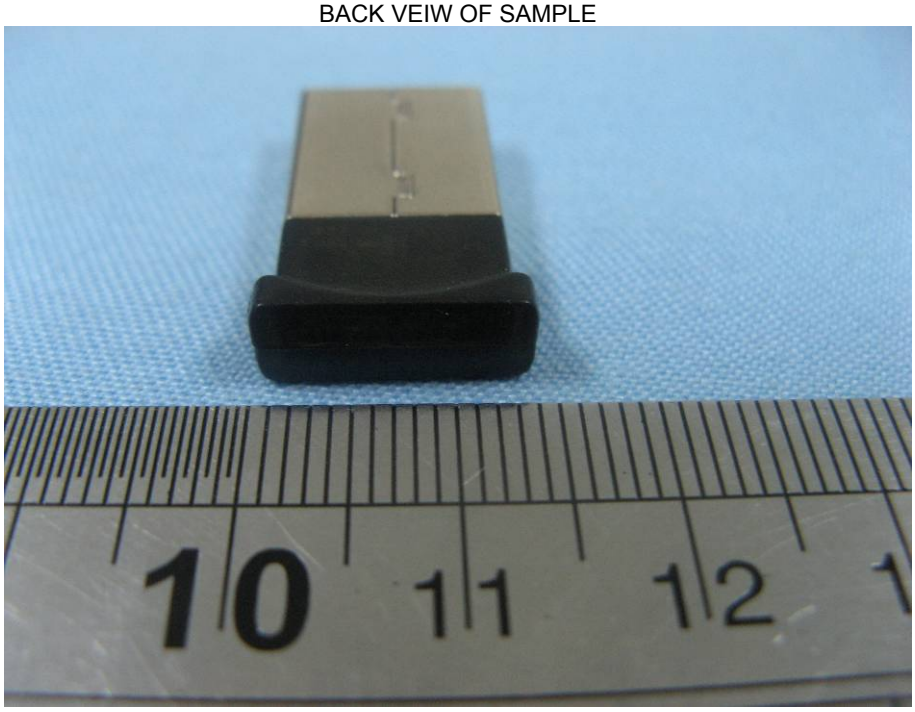
RIGHT VIEW OF SAMPLE



FRONT VIEW OF SAMPLE

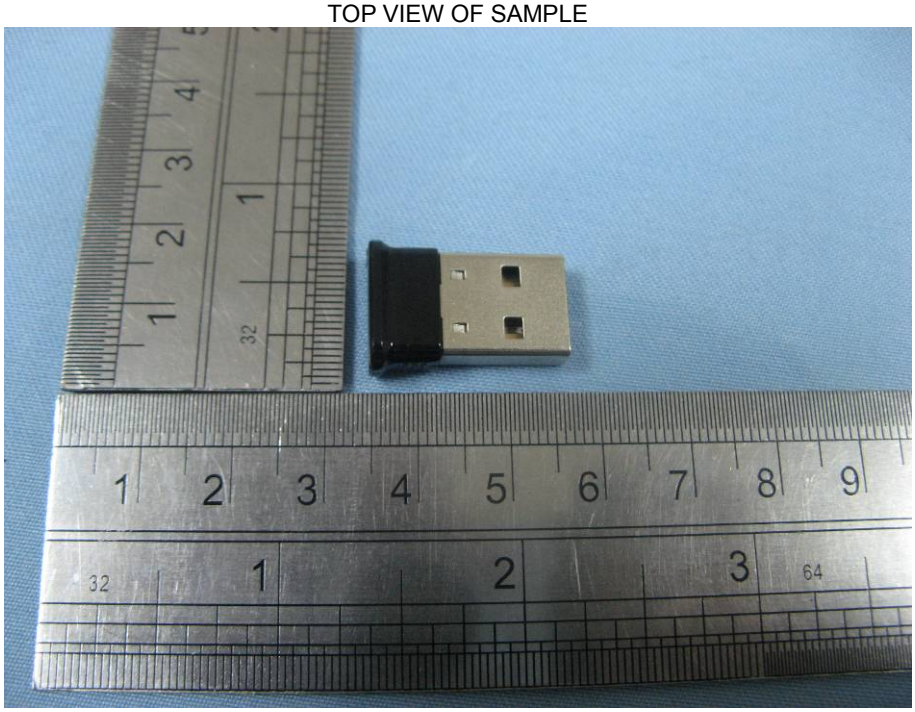


BACK VEIW OF SAMPLE

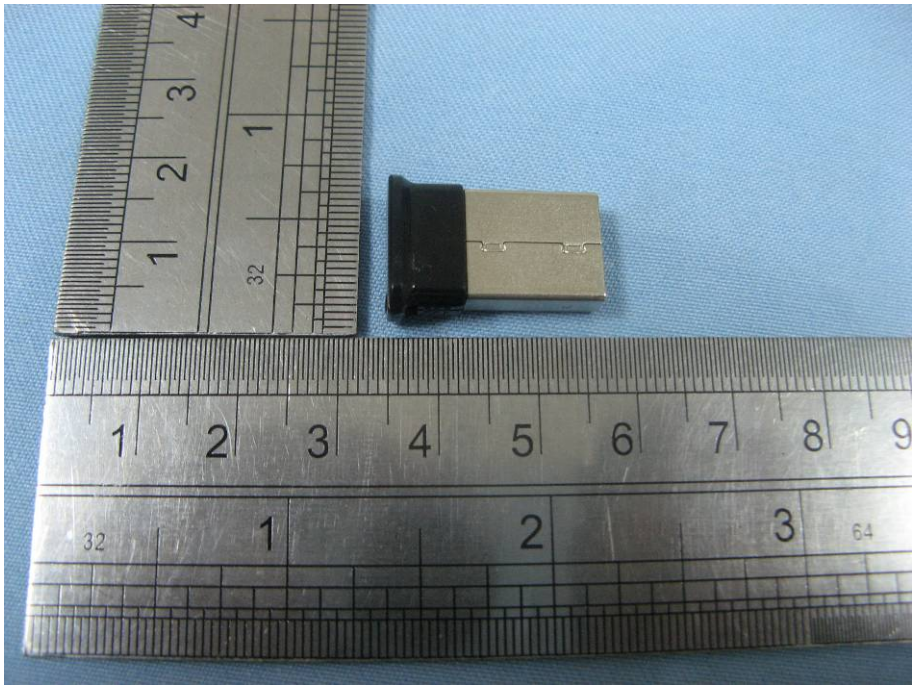


VIEW OF USB06K

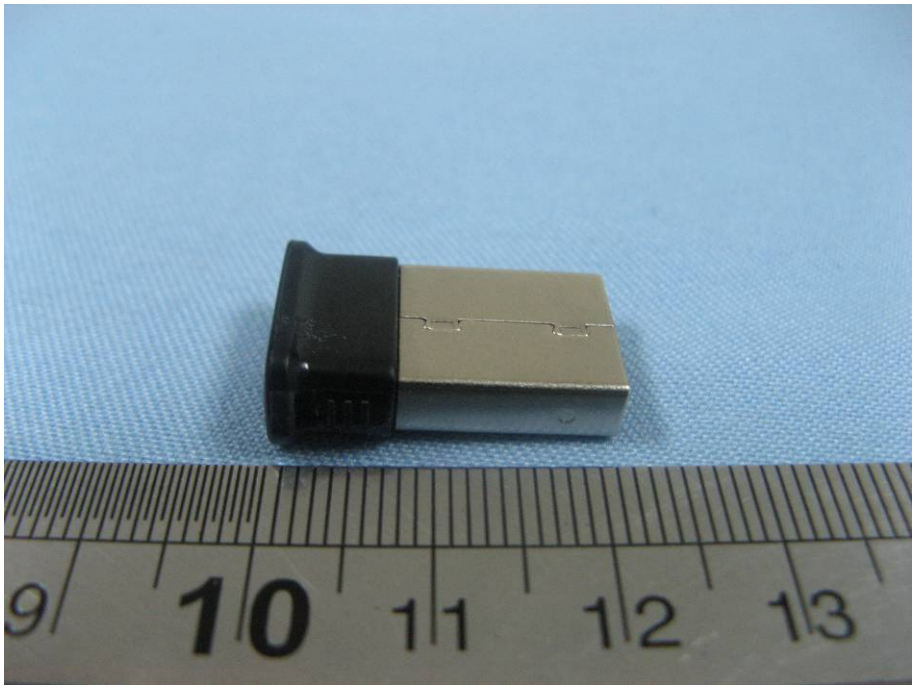
TOP VIEW OF SAMPLE



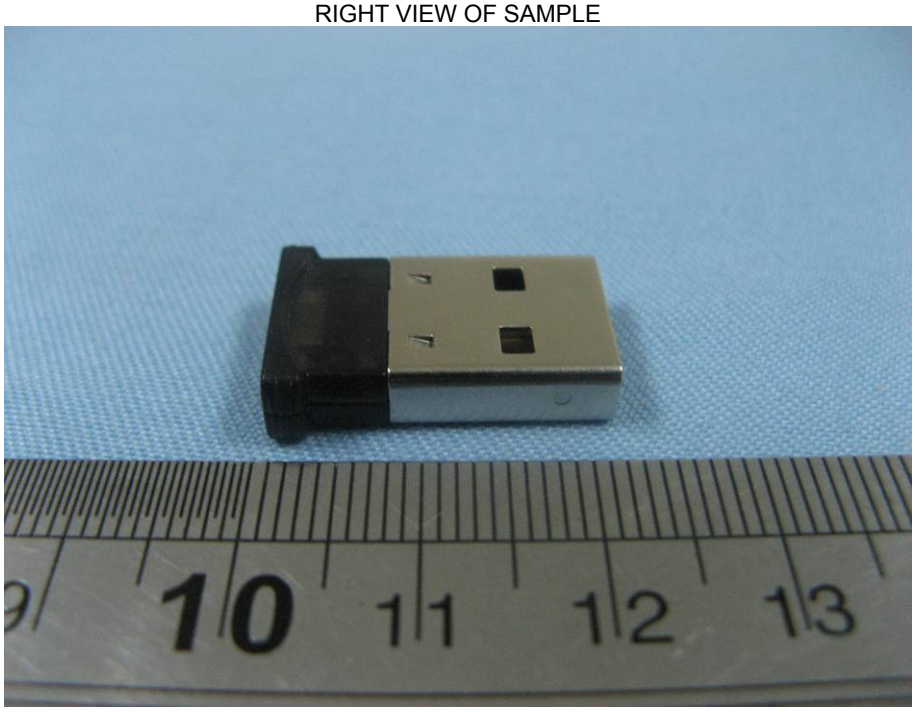
BOTTOM VIEW OF SAMPLE



LEFT VIEW OF SAMPLE

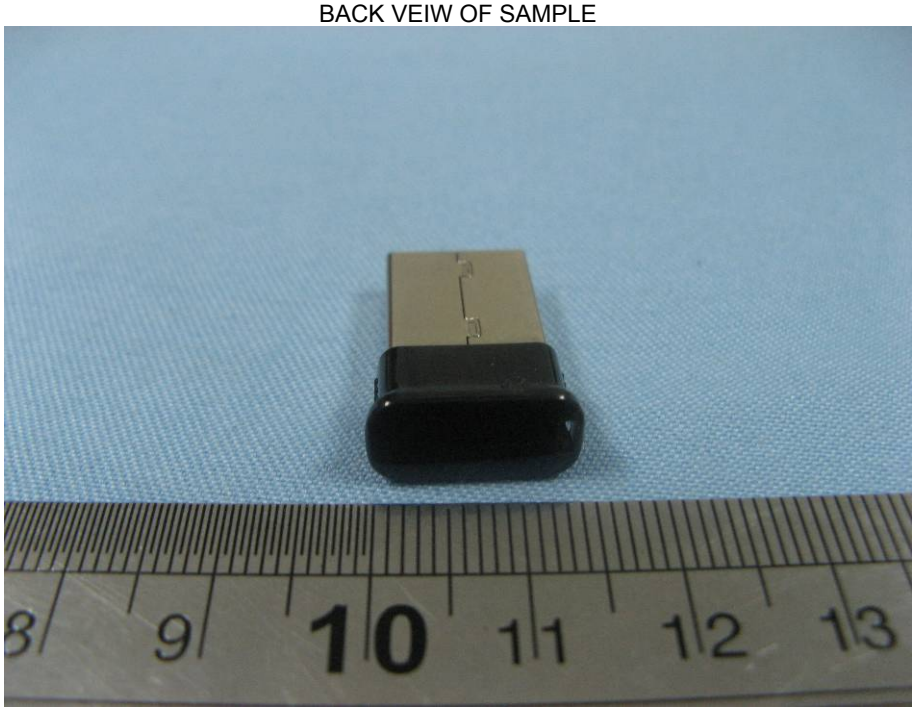


RIGHT VIEW OF SAMPLE

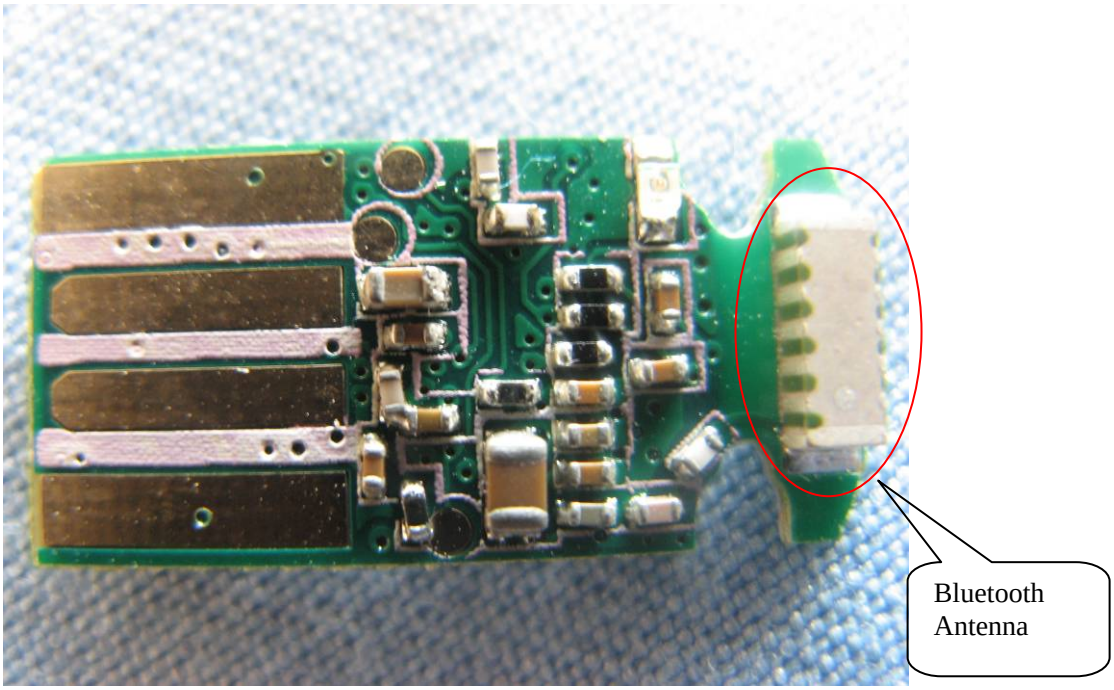


FRONT VIEW OF SAMPLE

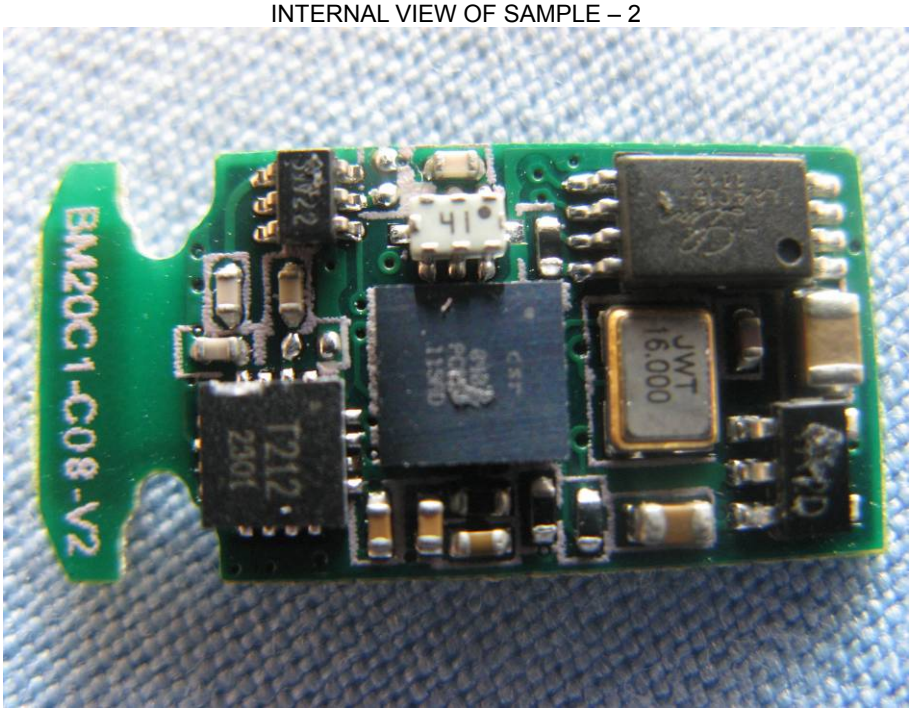
BACK VEIW OF SAMPLE



INTERNAL VIEW OF SAMPLE – 1



INTERNAL VIEW OF SAMPLE – 2



APPENDIX II
PHOTOGRAPHS OF THE TEST SETUP

CONDUCTED EMISSION

RADIATED EMISSION

----END OF REPORT----