Test Report for FCC

FCC ID:TBJNT-BT100

Report Number		ESTF151102-001		
Applicant	Company name	Nextech Co.,Ltd.		
	Address	E&C Venture Dream tower the 3rd, 13th floor, Guro-dong 197-33, Guro-gu, Seoul, Korea		
	Telephone	+82 2 867 3201		
Product	Product name	USB Bluetooth Adapter		
	Model No.	NT-BT100	Manufacturer	Nextech Co.,Ltd.
	Serial No.	NONE	Country of origin	KOREA
Test date	2011-01-03 ~ 2011-01-25		Date of issue	10-Feb-11
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea			
Standard	FCC PART 15 2010 , ANSI C 63.4 2003			
Measurement facility registration number	94696			
Tested by	Engineer H.H.Lee	(Signature)		
Reviewed by	Engineering Manager J.M.Yang	(Signature)		
Abbreviation	OK, Pass = Complied, Fail = Failed, N/A = not applicable			

* Note

- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned

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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.
ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co., Ltd.

Head Office : Rm 1015, World Venture Center II, 426-5, Gasan-dong, Geumcheon-gu, Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 97-1, Hoeok-ri, Majang-myun, Ichion-city, Kyonggi-do, South Korea

1.3 Official Qualification(s)

KCC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements
FCC : Filed Laboratory at Federal Communications Commission
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test (Bluetooth)

Product Name	: USB Bluetooth Adapter
Model Number	: NT-BT100
Modulation Type	: GFSK(FHSS)
Transfer Rate	: 1 Mbps
Number of Channel	: 79 ch
Channel Spacing	: 1 MHz
Output Power	: GFSK : 7.78 dBm
Serial Number	: NONE
Manufacturer	: Nextech Co.,Ltd.
Country of origin	: KOREA
Rating	: DC input : 5 Vd.c.
Receipt Date	: 2010-10-22
X-tal list(s)	: 26 MHz

2.2 General descriptions of EUT

The Bluetooth frequency hoppoing transceiver is designed to operate between 2400 MHz and 2483.5 MHz.
For the detailed features, please refer to the manufacturer's specifications or User's Manual.

- the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) stream. It is also comply with FHSS requirements in Section 15.247(a)(1).
: Its hopping sequence is pseudo random, all channels used equally on average.
The receiver input bandwidth approximately equal the transmit band bandwidth, and its hop in sequence with the transmit signal.
- the system does not coordinate its channel selection/hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

3. Test Standards

Test Standard : FCC PART 15 (2010)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2003)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment These method apply to the measurement of individual units or systems comprised of multiple units

Summary of Test Results

Applied Satandard : 47 CFR Part 15 Subpart C				
FCC Standard	Test Type	Result	Remark	Limit
15.207	AC Power Conducted Emission	Pass	Meet the requirement	
15.205 & 15.209	Intentional Radiated Emission	Pass	Meet the requirement	
15.247(a)(1)	Carrier Frequency Separation &	Pass	Meet the requirement	>25 kHz
	20 Bandwidth			
15.247(b)	Maximum Peak ouput power	Pass	Meet the requirement	30 dBm (1 W)
15.247(a)(1)(ii)	Number of Hopping Frequency	Pass	Meet the requirement	>75
15.247(c)	Transmitter Radiated Emission	Pass	Meet the requirement	
15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Pass	Meet the requirement	<400 ms
15.247(d)	Band Edge Measurement	Pass	Meet the requirement	

4. Measurement Condition

4.1 EUT Operation

a. Channel

Ch.	Frequency	Ch.	Frequency
0	2402 MHz	40	2442 MHz
1	2403 MHz	41	2443 MHz
2	2404 MHz	42	2444 MHz
3	2405 MHz	43	2445 MHz
4	2406 MHz	…	…
…	…	78	2480 MHz
39	2441 MHz		

b. Measurement Channel :Low(2402 MHz), Middle(2441 MHz),High(2480 MHz)

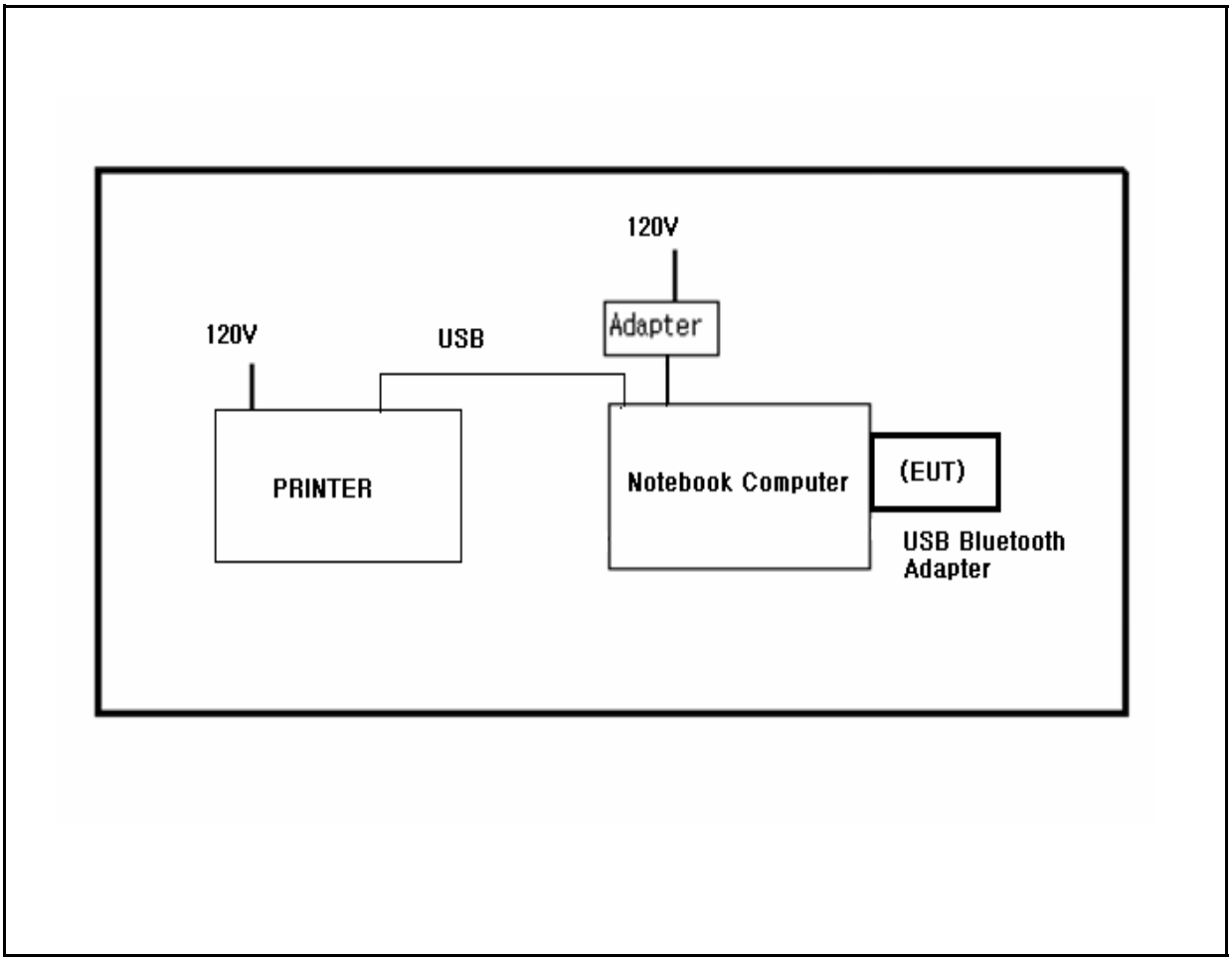
c. Test Mode : GFSK

d. Test rate :1 Mbps

4.2 EUT Operation.

* The EUT was in the following operation mode during all testing
* The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected hightest level of emission
* Execute a RF test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.3 Configuration and Peripherals



4.4 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
USB Bluetooth Adapter	NT-BT100	NONE	Nextech Co.,Ltd.	EUT
Notebook Computer	dv5-1206TX	CNF9100JMW	Hewlett-Packard Company	
Adapter	PPP012L-E	0105624202	Suzhou Li Shin Electronics Co., Ltd.	
Printer	K10229	NONE	Canon Vietnam Co., Ltd.	

4.5 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
USB Bluetooth Adapter	USB	Notebook Computer	USB	-	-	
Notebook Computer	USB	Printer	USB	2	Shielded	
Notebook Computer	Power	Adapter	-	2	Unshielded	

5. Carrier Frequency Separation

5.1 Test procedure

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 300 kHz

. VBW= 300 kHz

. Span= 3 MHz

. Sweep= suitable duration based on the EUT specification.

20dB Bandwidth Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US41421291	2011-09-09
-Spectrum Analyzer <=> EUT	Loss: 0.5 dB	-	

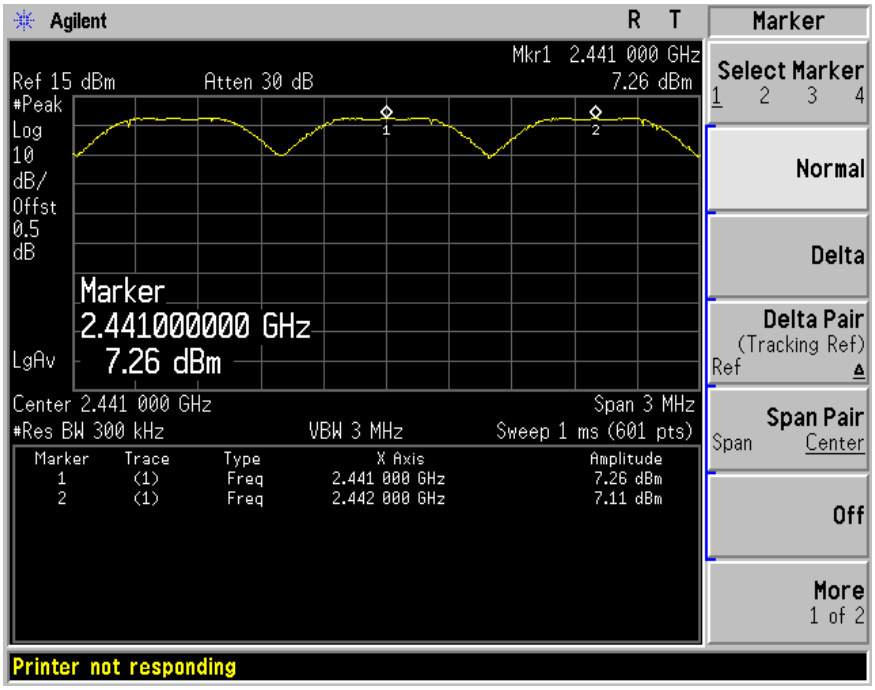
5.3 Measurement results

EUT	USB Bluetooth Adapter	MODEL	NT-BT100
MODE	GFSK DH5	ENVIRONMENTAL CONDITION	26 ℃, 43 % R.H.
INPUT POWER	5 Vd.c.		

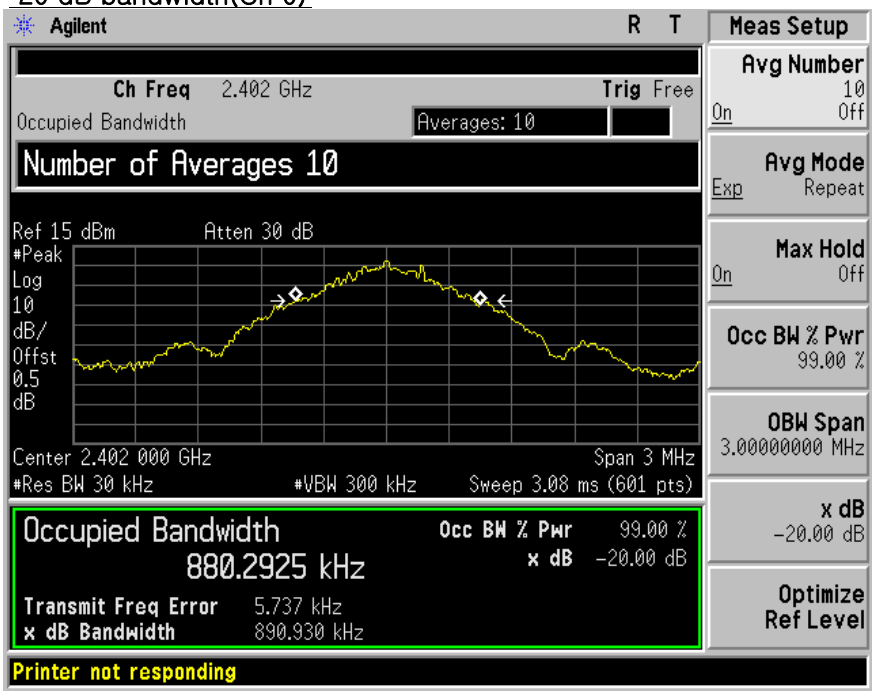
CHANNEL	Channel Frequency (MHz)	Bandwidth at 20dB below(kHz)	Channel Separation (MHz)	Limit (kHz)	PASS/FAIL
0	2402	890	1.0	>25	PASS
39	2441	961	1.0	>25	PASS
78	2480	955	1.0	>25	PASS

5.4 Trace data (GFSK)

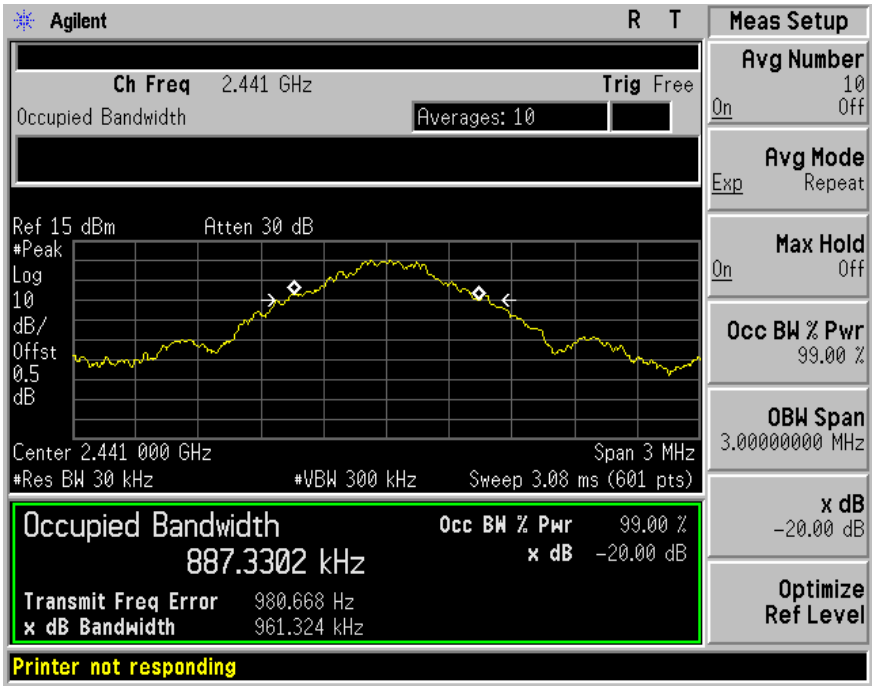
Channel Separation



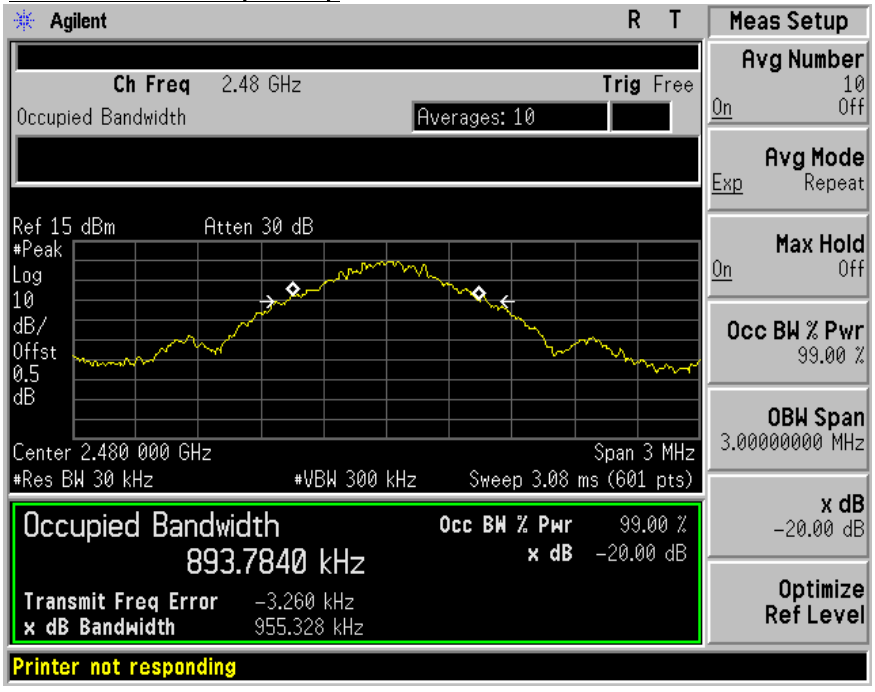
20 dB bandwidth(Ch 0)



20 dB bandwidth(CH 39)



20 dB bandwidth(CH 78)



6. MAXIMUM PEAK OUTPUT POWER

6.1 Test procedure

The transmitter antenna terminal is connected to the input of a Spectrum Analyzer. Measurement is made while EUT is operating in transmission mode at the appropriate center frequency. The maximum peak output power measurement is 30 dBm.

Description	Model	Serial Number	Cal. Due Date
Power Meter	HP	E4418A	2011-02-25
Power Sensor	HP	8481A	2011-02-25
Dual Directional Coupler	778D	16502	2011-02-25
-Spectrum Analyzer <=> EUT	Loss: 0.5dB	-	

6.2 Measurement results

EUT	USB Bluetooth Adapter	MODEL	NT-BT100
MODE	GFSK DH5	ENVIRONMENTAL CONDITION	24 ℃, 43 % R.H.
INPUT POWER	5 Vd.c.		

GFSK

CHANNEL	Channel Frequency (MHz)	Peak Power Output(dBm)		Limit[1W] (dBm)	PASS/ FAIL
		(dBm)	(W)		
0	2402	7.36	0.0054	30.0	PASS
39	2441	7.78	0.0060	30.0	PASS
78	2480	7.36	0.0054	30.0	PASS

7. Number of Hopping Frequency

7.1 Test procedure

According to §15.247(a)(1)(ii), Frequency hopping systems operating in the 2400 MHz-2483.5 MHz bands shall use at least 75 hopping frequencies.

7.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 300 kHz

. VBW= 300 kHz

. Span= the frequency band of operation

. Sweep= suitable duration based on the EUT specification.

The Number of Hopping Frequency Test Instruments

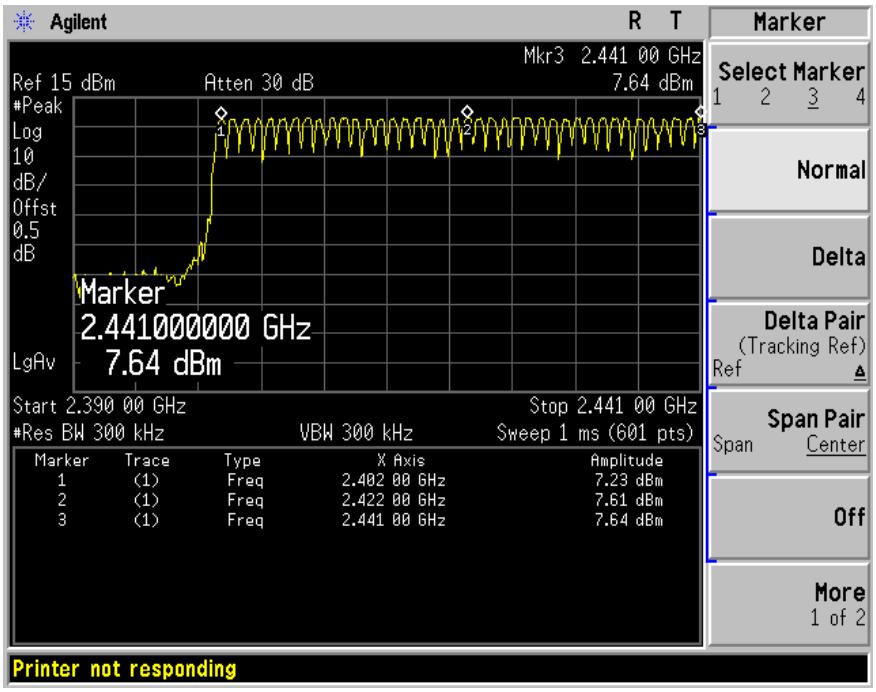
Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2011-09-10
Dual Directional Coupler	778D	16502	2011-02-25
-Spectrum Analyzer <=> EUT	Loss: 0.5dB		

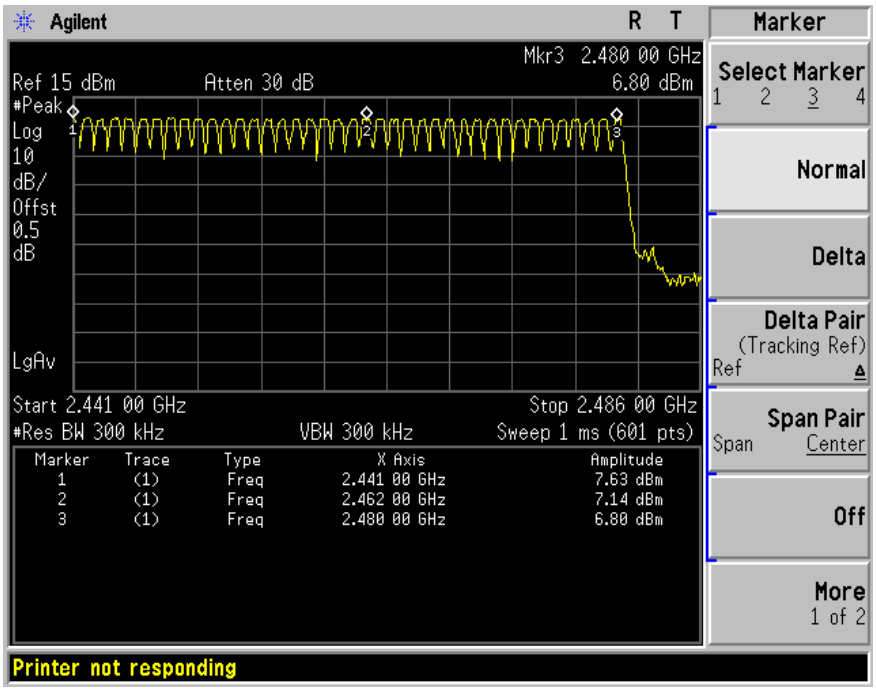
7.3 Measurement results

EUT	USB Bluetooth Adapter	MODEL	NT-BT100
MODE	GFSK DH5	ENVIRONMENTAL CONDITION	26 ℃, 43 % R.H.
INPUT POWER	5 Vd.c.		

Number of CH	Limit (Number of CH)	PASS/FAIL
79	>75	PASS

7.4 Trace data





8. Time of Occupancy (Dwell Time)

8.1 Test procedure

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a
period 0.4 s multiplied by the number of hopping channels employed.

8.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 1 MHz

. VBW≥RBW

. Span= zero span, centered on a hoppong channel

. Sweep = as necessary to capture the entire dwell time per hoppong channel

. Detector function = Peak

. Trace = Max hold

The Time of Occupancy Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2011-09-01
Dual Directional Coupler	778D	16502	2011-02-25
-Spectrum Analyzer <=> EUT	Loss:0.5 dB	-	

8.3 Measurement results

EUT	USB Bluetooth Adapter	MODEL	NT-BT100
MODE	GFSK DH5	ENVIRONMENTAL CONDITION	26 ℃, 43 % R.H.
INPUT POWER	5 Vd.c.		

A. DH1 Mode

One peiod for each particular channel : 0.528 ms X 320.1 = 169.24 ms

Channel	Pulse Time(ms)	Limit (ms)	PASS/FAIL
0	169.24	400	PASS

B. DH3 Mode

One peiod for each particular channel : 1.835 ms X 159.9 = 293.42 ms

Channel	Pulse Time(ms)	Limit (ms)	PASS/FAIL
39	293.42	400	PASS

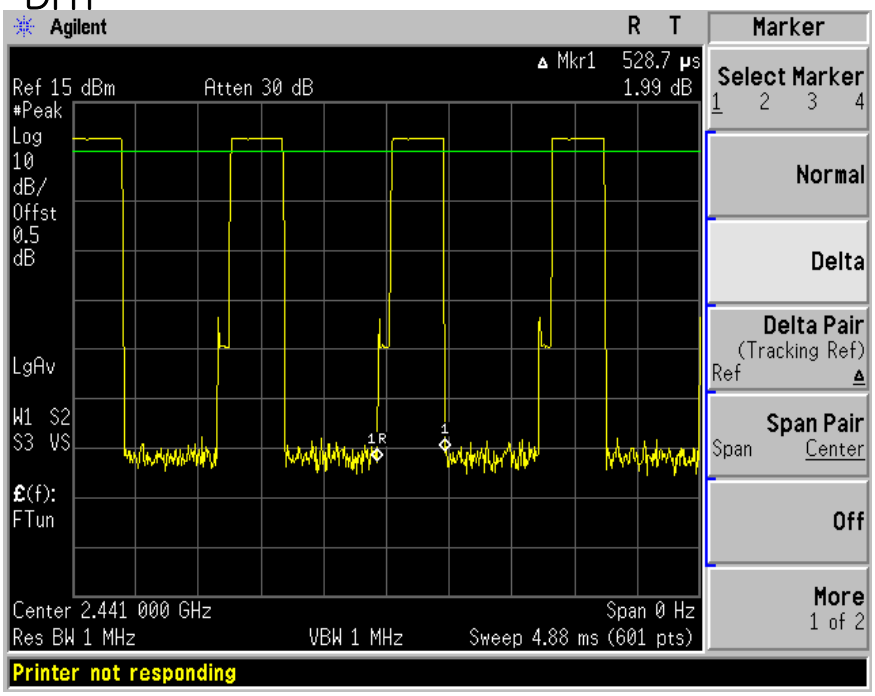
C. DH5 Mode

One peiod for each particular channel : 3.098 ms X 106.81 = 330.897 ms

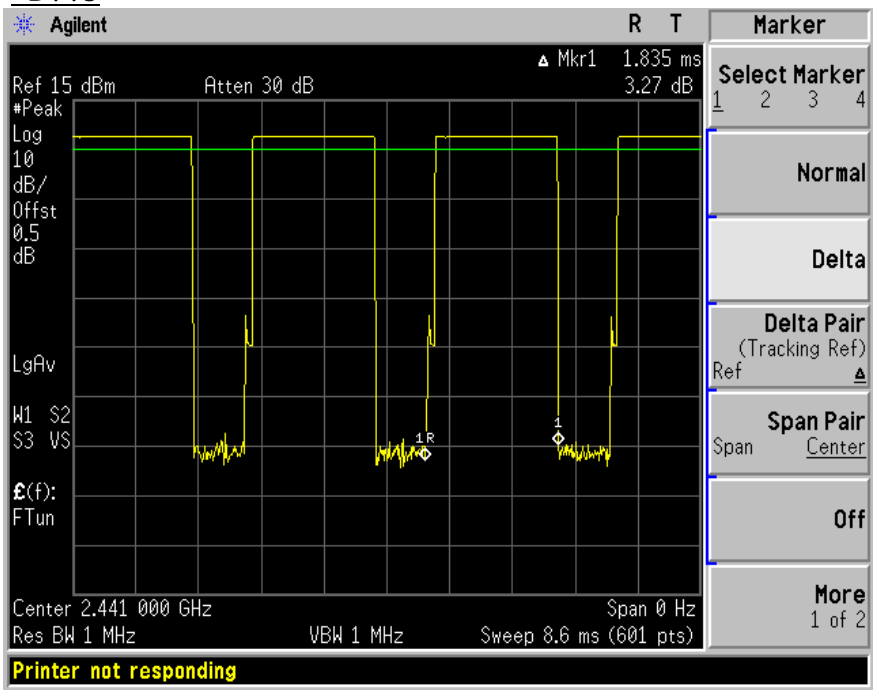
Channel	Pulse Time(ms)	Limit (ms)	PASS/FAIL
78	330.9	400	PASS

8.4 Trace data

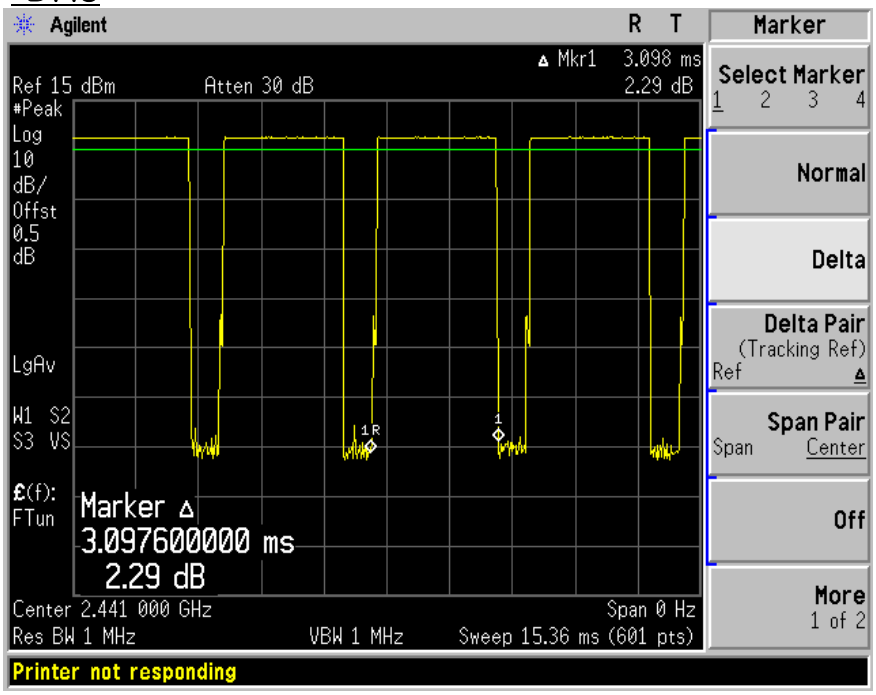
DH1



DH3


Agilent
R T
Marker
Mkr1 1.835 ms
3.27 dB
Ref 15 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
0.5
dB
LgAv
W1 S2
S3 VS
£(f):
FTun
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Center 2.441 000 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 8.6 ms (601 pts)
Printer not responding

DH5


Agilent
R T
Marker
Mkr1 3.098 ms
2.29 dB
Ref 15 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
0.5
dB
LgAv
W1 S2
S3 VS
£(f):
FTun
Marker Δ
3.097600000 ms
2.29 dB
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Center 2.441 000 GHz
Span 0 Hz
Res BW 1 MHz
VBW 1 MHz
Sweep 15.36 ms (601 pts)
Printer not responding

9. band-edge and out of band emissions.

9.1 Test procedure

The radio frequecy power at 20 dB down from the highest inband power level is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency. The band edge&out of band emission shall be at least 20 dB below of the highest inband power level.

9.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 100KHz

. VBW= 100KHz

. Span= suitable frequency span

. Sweep= suitable duration based on the EUT specification.

Band Edge&Out of Emission Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2011-09-10
Dual Directional Coupler	778D	16502	2011-02-25
-Spectrum Analyzer <=> EUT	Loss: 0.5 dB		

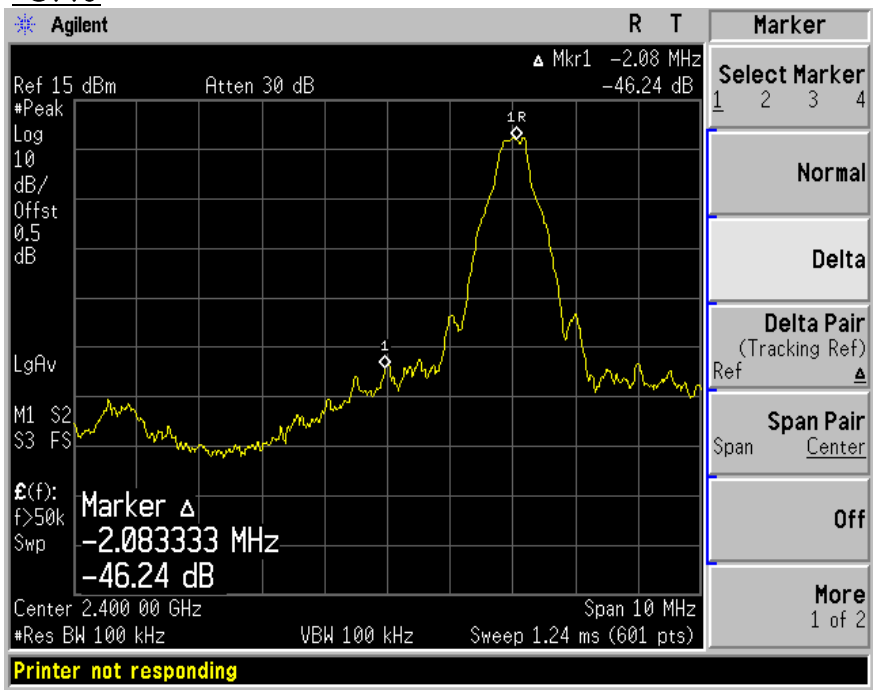
9.3 Measurement results of band-edge & out of emission

EUT	USB Bluetooth Adapter	MODEL	NT-BT100
MODE	GFSK DH5	ENVIRONMENTAL CONDITION	24 ℃, 43 % R.H.
INPUT POWER	5 Vd.c.		

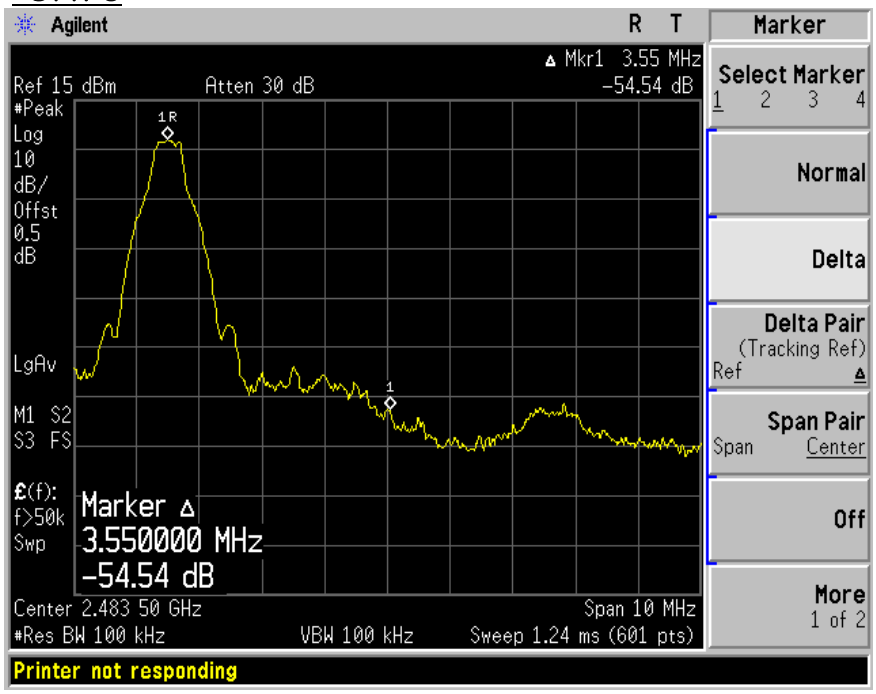
* Refer to attach spectrum analyzer data chart.

9.4 Trace data of band-edge & Out of Emission

CH0

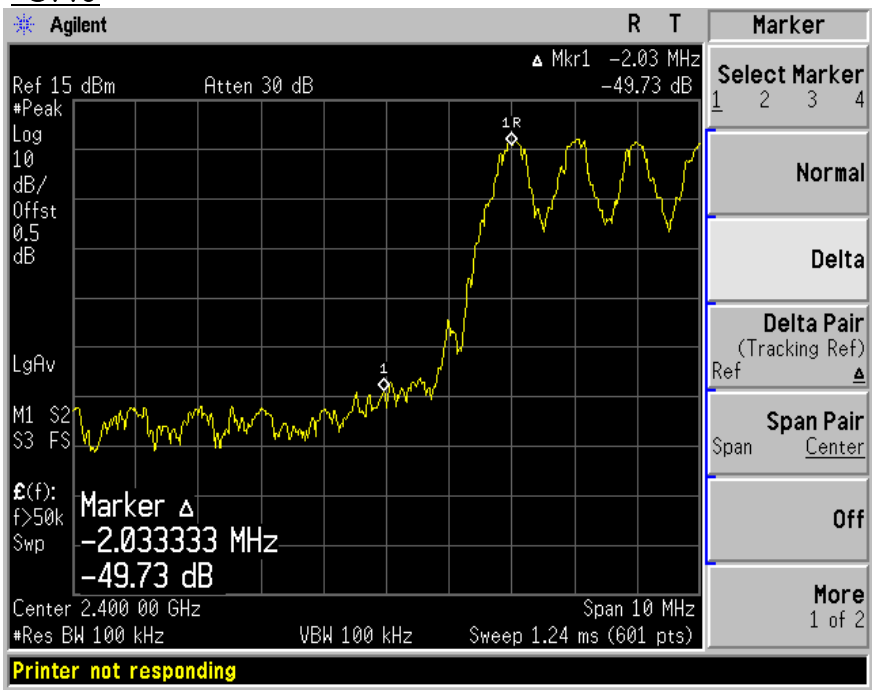


CH78

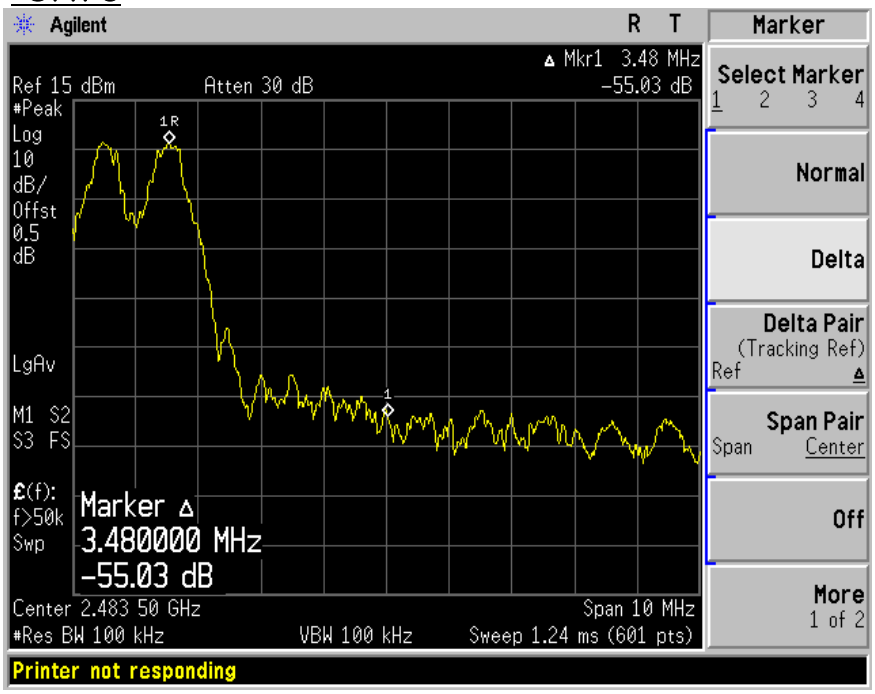


Hopping on

CH0

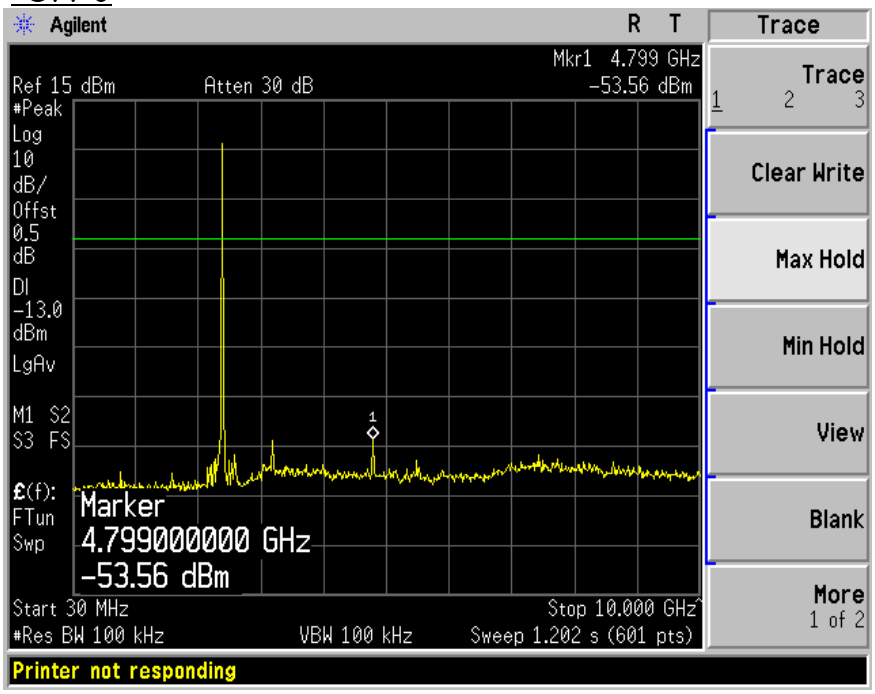


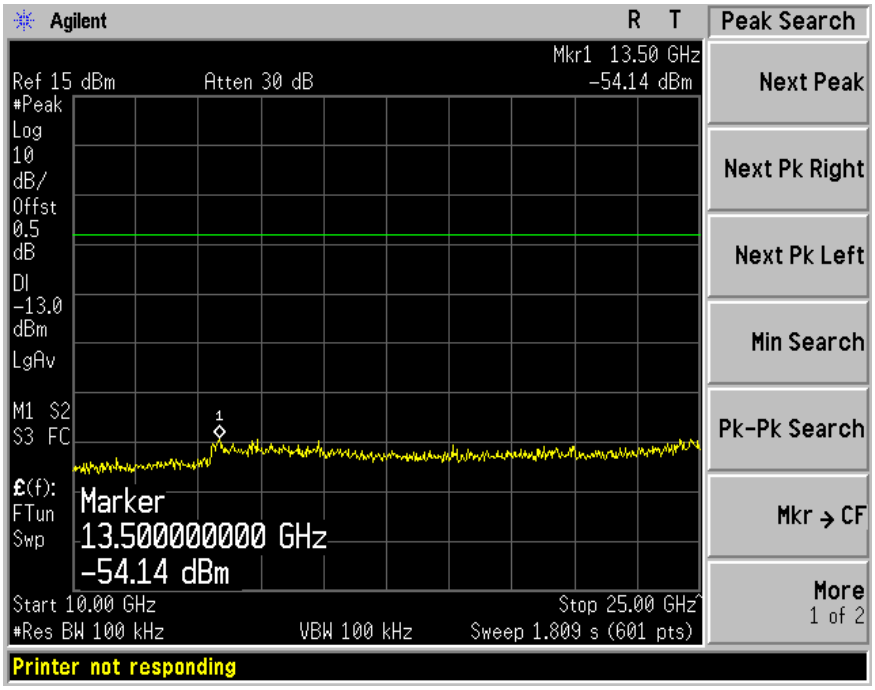
CH78



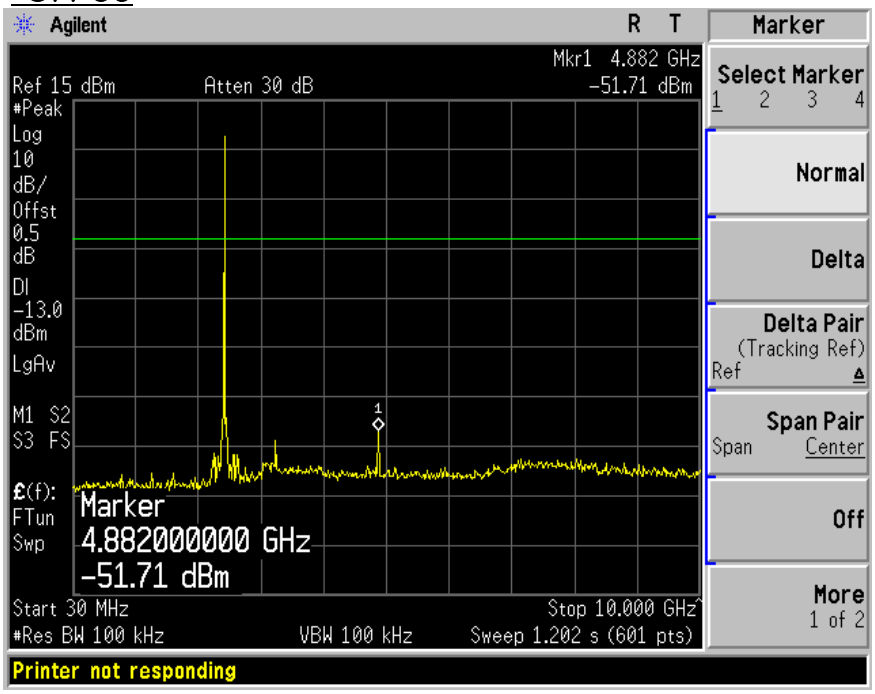
GFSK

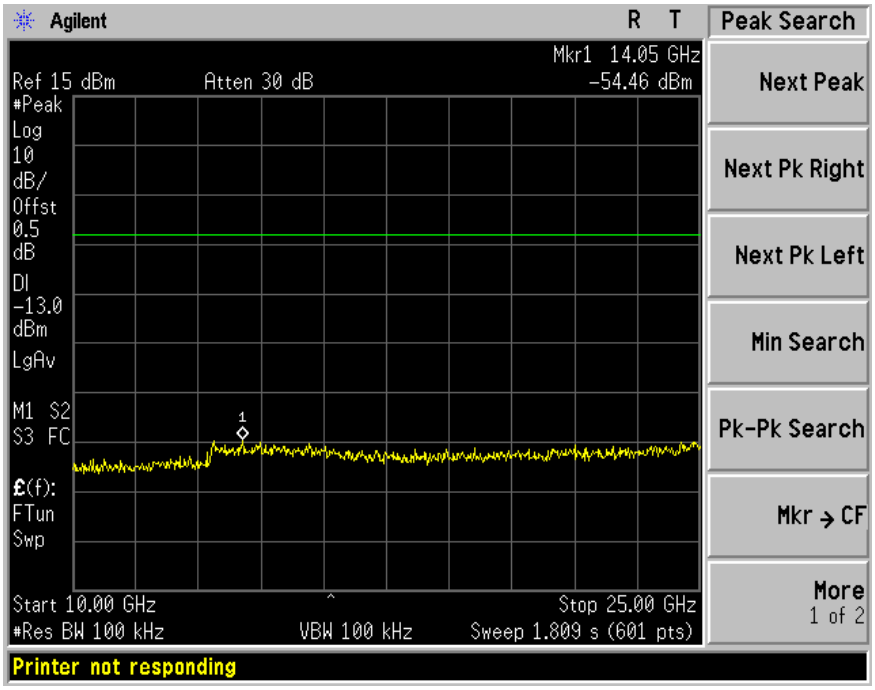
CH 0


Agilent
R T
Mkr1 4.799 GHz
Ref 15 dBm
Atten 30 dB
-53.56 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Marker
4.799000000 GHz
-53.56 dBm
Start 30 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 10.000 GHz
Sweep 1.202 s (601 pts)
Printer not responding
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

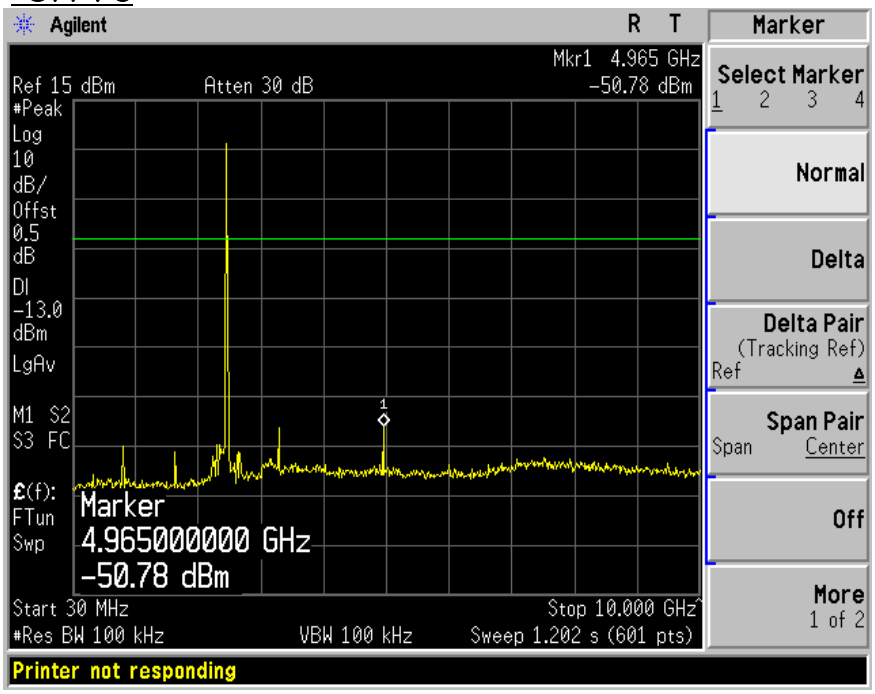

Agilent
R T
Mkr1 13.50 GHz
Ref 15 dBm
Atten 30 dB
-54.14 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
13.500000000 GHz
-54.14 dBm
Start 10.00 GHz
#Res BW 100 kHz
VBW 100 kHz
Stop 25.00 GHz
Sweep 1.809 s (601 pts)
Printer not responding
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2

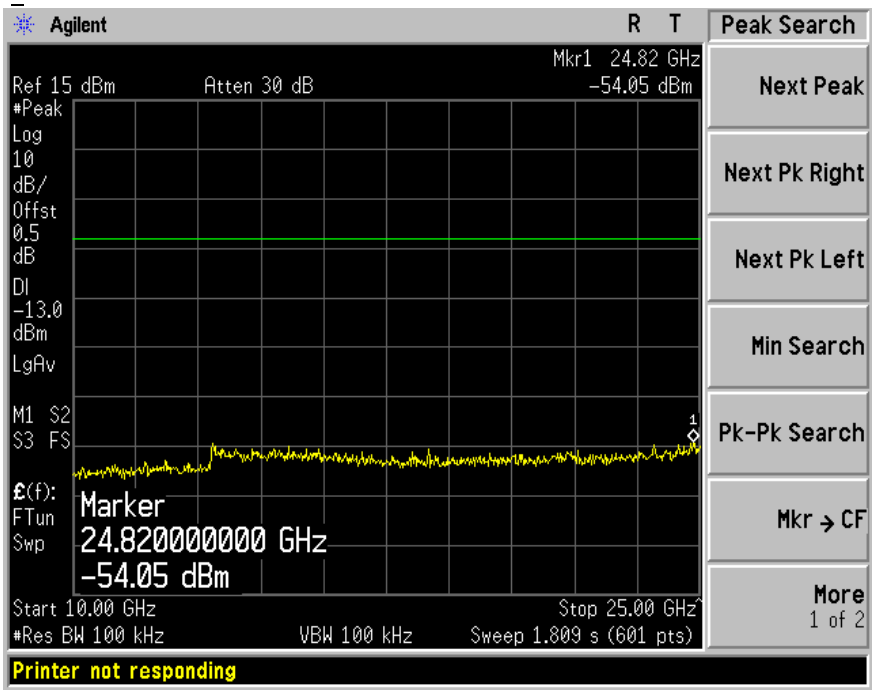
CH 39


Agilent
R T
Marker
Mkr1 4.882 GHz
Ref 15 dBm
Atten 30 dB
-51.71 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Marker
4.882000000 GHz
-51.71 dBm
Start 30 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 10.000 GHz
Sweep 1.202 s (601 pts)
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Printer not responding


Agilent
R T
Peak Search
Mkr1 14.05 GHz
Ref 15 dBm
Atten 30 dB
-54.46 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Start 10.00 GHz
#Res BW 100 kHz
VBW 100 kHz
Stop 25.00 GHz
Sweep 1.809 s (601 pts)
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Printer not responding

CH 78


Agilent
R T
Marker
Mkr1 4.965 GHz
Ref 15 dBm
Atten 30 dB
-50.78 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
4.965000000 GHz
-50.78 dBm
Start 30 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 10.000 GHz
Sweep 1.202 s (601 pts)
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Printer not responding


Agilent
R T
Peak Search
Mkr1 24.82 GHz
Ref 15 dBm
Atten 30 dB
-54.05 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FS
£(f):
FTun
Swp
Marker
24.820000000 GHz
-54.05 dBm
Start 10.00 GHz
#Res BW 100 kHz
VBW 100 kHz
Stop 25.00 GHz
Sweep 1.809 s (601 pts)
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Printer not responding

10. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2010) . The test setup was made according to ANSI C 63.4 (2003) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8 m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test setup.

10.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESVS10	Rohde & Schwarz	838562/002	2012. 1. 27
Spectrum Analyzer	R3273	ADVANTEST	110600592	2012. 1. 27
LogBicon Antenna	VULB 9160	Schwarzbeck	3142	2011. 5. 19
Amplifier	8447F	HP	2805A02972	2012. 1. 27
PREAMPLIFIER	8449B	HP	3008A00581	2011. 7. 14
Horn Antenna	BBHA 9120 D	Schwarzbeck	469	2012. 1. 27
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

10.2 Environmental Condition

Test Place : Open site(3 m)
Temperature : 2 ℃
Humidity : 40 % R.H.

10.3 Test Data for Bluetooth

Test Date : 3-Jan-11 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
34.20	15.10	V	1.0	10.59	0.9	40.0	26.60	-13.40
109.41	16.30	V	1.0	9.92	1.6	43.5	27.83	-15.67
120.00	12.70	H	2.9	10.91	1.8	43.5	25.37	-18.13
183.43	14.60	H	3.0	11.07	2.2	43.5	27.89	-15.61
207.01	13.40	H	3.0	11.41	2.4	43.5	27.20	-16.30
231.10	15.10	V	1.0	11.04	2.6	46.0	28.75	-17.25
240.00	14.80	V	1.0	11.48	2.7	46.0	28.97	-17.03
275.00	18.40	V	1.0	12.76	3.0	46.0	34.20	-11.80
345.13	14.10	V	1.0	14.56	3.6	46.0	32.28	-13.72
420.00	11.10	H	2.0	16.19	4.2	46.0	31.49	-14.51
Remark	H : Horizontal, V : Vertical Bluetooth(39CH) *Checked in all 3 axis and the maximum measured data were reported. *CL = Cable Loss-Amplifier Gain(In case of above1000 MHz) *CL = Cable Loss(In case of below1000 MHz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz. *The resolution bandwidth and video bandwidth of spectrum analyzer is 1 MHz and 10 Hz for average detection at frequency above 1 GHz.							

10.3-1 Test Data for Bluetooth

Test Date : 24-Jan-11 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW:1 MHz VBW:1 MHz)								
2402.0	74.68	H	1.6	27.62	4.5	*OB	106.80	-
4804.0	55.22	H	1.8	30.19	-33.15	74.00	52.26	-21.74
7206.0	44.03	H	1.5	35.26	-32.39	74.00	46.90	-27.10
9608.0	42.28	H	1.5	36.97	-30.67	74.00	48.58	-25.42
2402.0	76.43	V	1.5	27.62	4.5	*OB	108.55	-
4804.0	60.06	V	1.6	30.19	-33.15	74.00	57.10	-16.90
7206.0	46.35	V	1.7	35.26	-32.39	74.00	49.22	-24.78
9608.0	43.04	V	1.5	36.97	-30.67	74.00	49.34	-24.66
AV(RBW:1 MHz VBW:10 Hz)								
2402.0	59.20	H	1.6	27.62	4.5	*OB	91.32	-
4804.0	38.16	H	1.8	30.19	-33.15	54.00	35.20	-18.80
7206.0	31.71	H	1.5	35.26	-32.39	54.00	34.58	-19.42
9608.0	31.38	H	1.5	36.97	-30.67	54.00	37.68	-16.32
2402.0	59.15	V	1.5	27.62	4.5	*OB	91.27	-
4804.0	40.73	V	1.6	30.19	-33.15	54.00	37.77	-16.23
7206.0	33.33	V	1.7	35.26	-32.39	54.00	36.20	-17.80
9608.0	31.94	V	1.5	36.97	-30.67	54.00	38.24	-15.76

Remark	H : Horizontal, V : Vertical TEST MODE : Bluetooth-CH0(2402 MHz) *The TX signal isn't detected from 5th harmonics. *OB = Operating band *Checked in all 3 axis and the maximum measured data were reported. *CL = Cable Loss-Amplifier Gain(In case of above1000 MHz) *CL = Cable Loss(In case of below1000 MHz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz. *The resolution bandwidth and video bandwidth of spectrum analyzer is 1 MHz and 10 Hz for average detection at frequency above 1 GHz.

10.3-2 Test Data for Bluetooth

Test Date : 24-Jan-11 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW:1 MHz VBW:1MHz)								
2441.0	74.51	H	1.6	27.60	4.5	*OB	106.61	-
4882.0	52.84	H	1.6	30.43	-33.14	74.00	50.13	-23.87
7323.0	44.56	H	1.7	35.2	-32.62	74.00	47.14	-26.86
9764.0	42.36	H	1.6	37.05	-31.32	74.00	48.09	-25.91
2441.0	77.01	V	1.5	27.60	4.5	*OB	109.11	-
4882.0	58.15	V	1.6	30.43	-33.14	74.00	55.44	-18.56
7323.0	46.52	V	1.7	35.2	-32.62	74.00	49.10	-24.90
9764.0	43.42	V	1.5	37.05	-31.32	74.00	49.15	-24.85
AV(RBW:1 MHz VBW:10 Hz)								
2441.0	58.12	H	1.6	27.60	4.5	*OB	90.22	-
4882.0	37.71	H	1.6	30.43	-33.14	54.00	35.00	-19.00
7323.0	32.75	H	1.7	35.2	-32.62	54.00	35.33	-18.67
9764.0	31.76	H	1.6	37.05	-31.32	54.00	37.49	-16.51
2441.0	58.12	V	1.5	27.60	4.5	*OB	90.22	-
4882.0	39.92	V	1.6	30.43	-33.14	54.00	37.21	-16.79
7323.0	33.08	V	1.7	35.2	-32.62	54.00	35.66	-18.34
9764.0	32.01	V	1.5	37.05	-31.32	54.00	37.74	-16.26

Remark	H : Horizontal, V : Vertical TEST MODE : Bluetooth-CH39(2441 MHz) *The TX signal isn't detected from 5th harmonics. *OB = Operating band *Checked in all 3 axis and the maximum measured data were reported. *CL = Cable Loss-Amplifier Gain(In case of above1000 MHz) *CL = Cable Loss(In case of below1000 MHz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz. *The resolution bandwidth and video bandwidth of spectrum analyzer is 1 MHz and 10 Hz for average detection at frequency above 1 GHz.

10.3-3 Test Data for Bluetooth

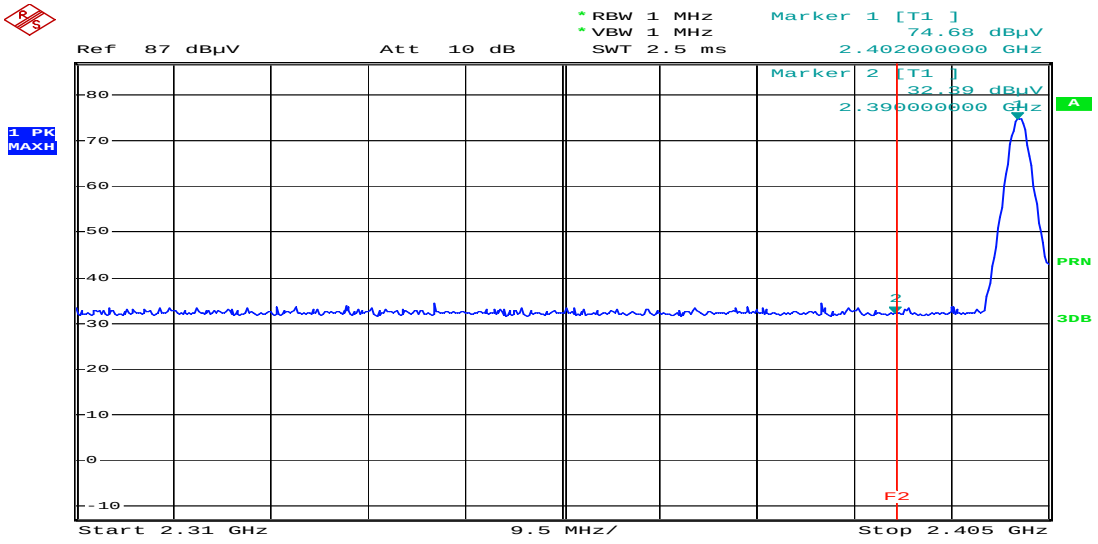
Test Date : 24-Jan-11 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW:1 MHz VBW:1 MHz)								
2480.0	71.10	H	1.6	27.59	4.5	*OB	103.19	-
4960.0	54.99	H	1.6	30.48	-33.12	74.0	52.35	-21.65
7440.0	44.55	H	1.5	35.25	-32.37	74.0	47.43	-26.57
9920.0	42.34	H	1.5	37.10	-31.53	74.0	47.91	-26.09
2480.0	78.01	V	1.7	27.59	4.5	*OB	110.10	-
4960.0	60.96	V	1.3	30.48	-33.12	74.0	58.32	-15.68
7440.0	45.97	V	1.6	35.25	-32.37	74.0	48.85	-25.15
9920.0	43.41	V	1.5	37.10	-31.53	74.0	48.98	-25.02
AV(RBW:1 MHz VBW:10 Hz)								
2480.0	36.09	H	1.6	27.59	4.5	*OB	68.18	-
4960.0	38.16	H	1.6	30.48	-33.12	54.0	35.52	-18.48
7440.0	32.01	H	1.5	35.25	-32.37	54.0	34.89	-19.11
9920.0	31.86	H	1.5	37.10	-31.53	54.0	37.43	-16.57
2480.0	37.48	V	1.7	27.59	4.5	*OB	69.57	-
4960.0	40.57	V	1.3	30.48	-33.12	54.0	37.93	-16.07
7440.0	33.73	V	1.6	35.25	-32.37	54.0	36.61	-17.39
9920.0	32.10	V	1.5	37.10	-31.53	54.0	37.67	-16.33
Remark	H : Horizontal, V : Vertical TEST MODE : Bluetooth-CH78(2480 MHz) *The TX signal isn't detected from 5th harmonics. *OB = Operating band *Checked in all 3 axis and the maximum measured data were reported. *CL = Cable Loss-Amplifier Gain(In case of above1000 MHz) *CL = Cable Loss(In case of below1000 MHz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz. *The resolution bandwidth and video bandwidth of spectrum analyzer is 1 MHz and 10 Hz for average detection at frequency above 1 GHz.								

10.4 Restricted Band Edges for BT

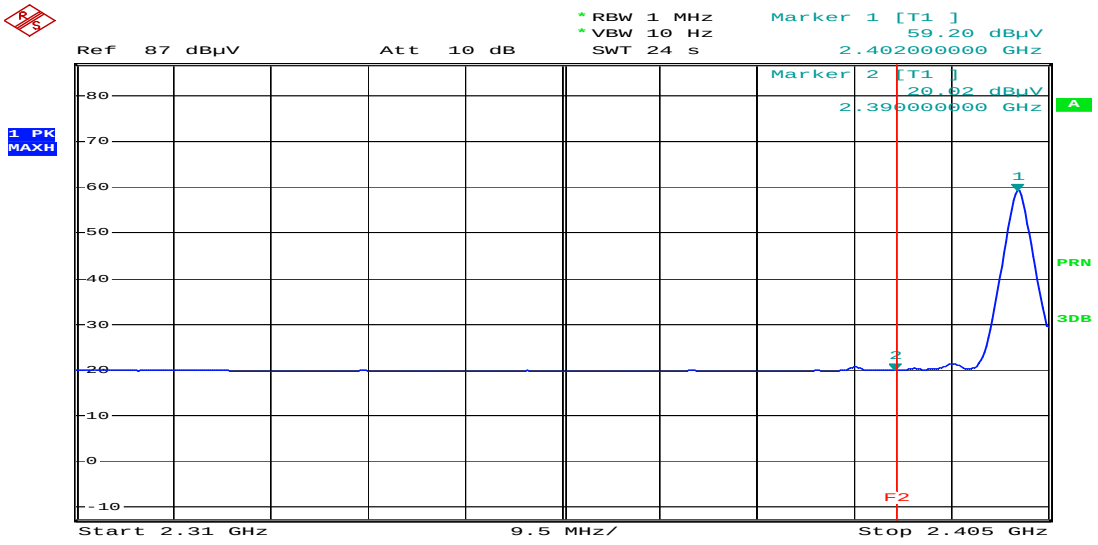
Band Edges(CH Low)

Detector mode:Peak Polarity:Horizontal



Comment: NT-BT100 PK HOR
Date: 24.JAN.2011 09:57:47

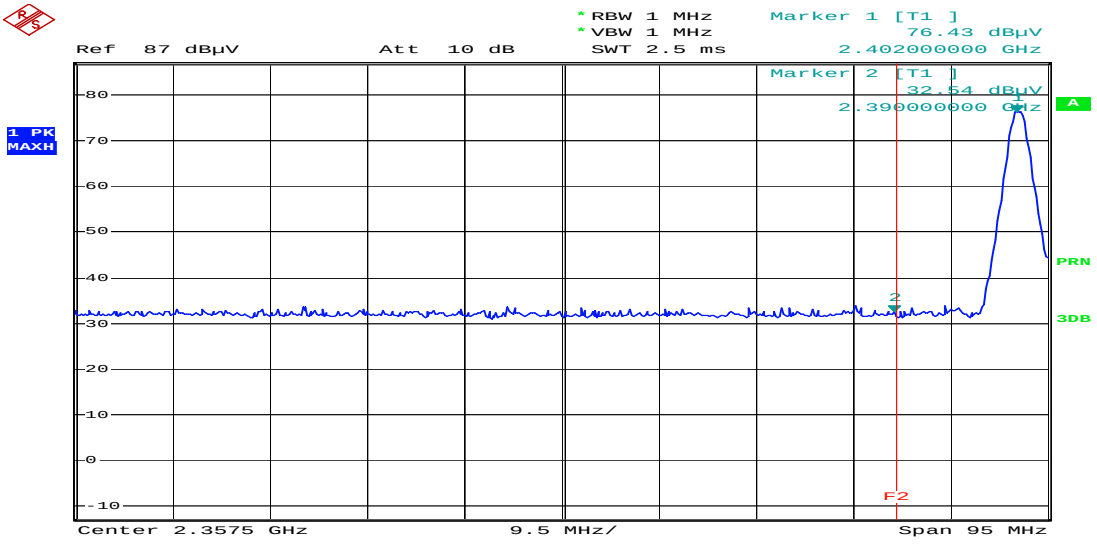
Detector mode:Average Polarity:Horizontal



Comment: NT-BT100 AV HOR
Date: 24.JAN.2011 09:59:43

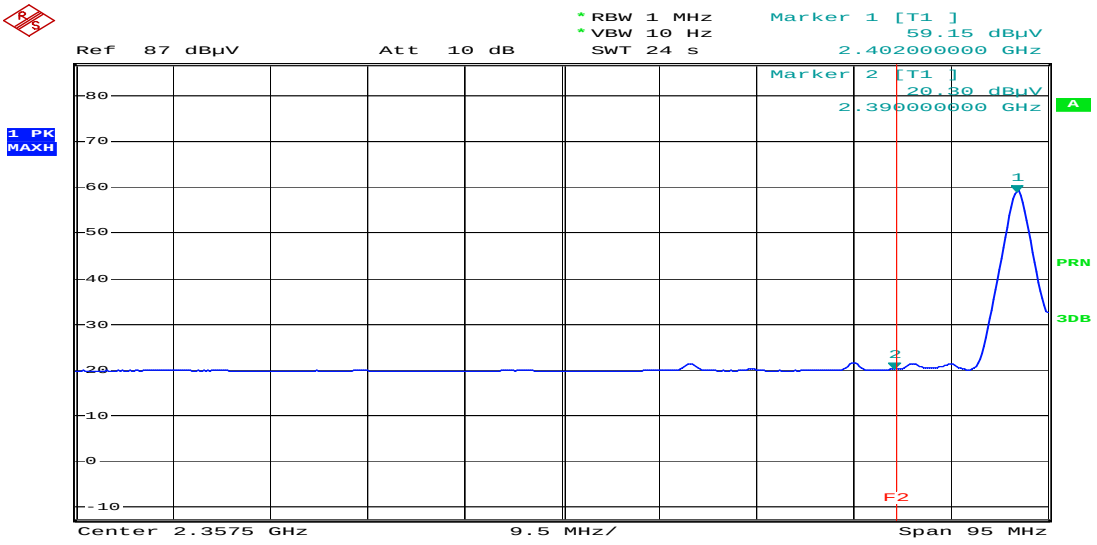
Band Edges(CH Low)

Detector mode:Peak Polarity:Vertical



Comment: NT-BT100 PK VER
Date: 24.JAN.2011 10:05:12

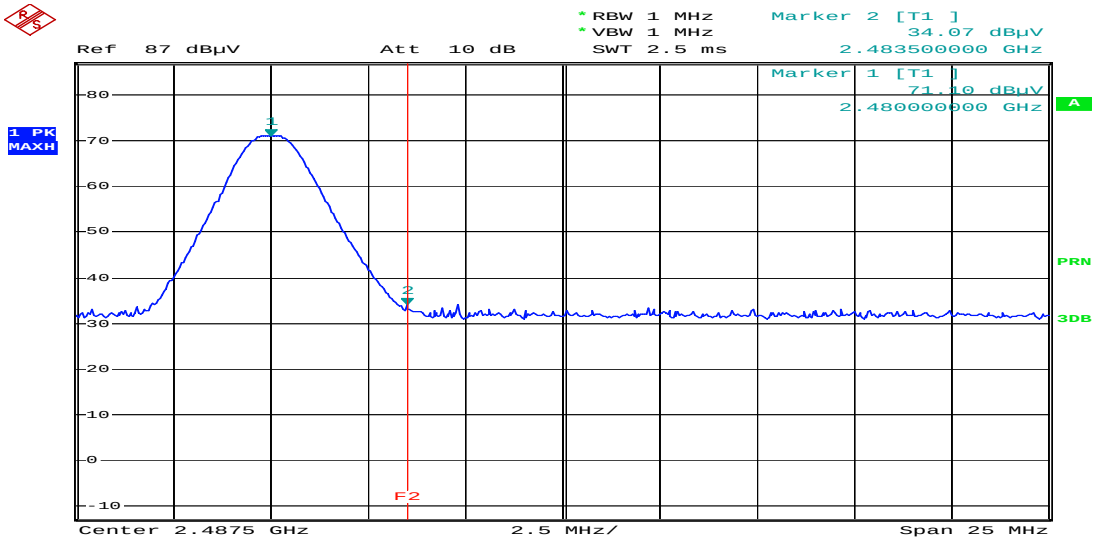
Detector mode:Average Polarity:Vertical



Comment: NT-BT100 AV VER
Date: 24.JAN.2011 10:03:20

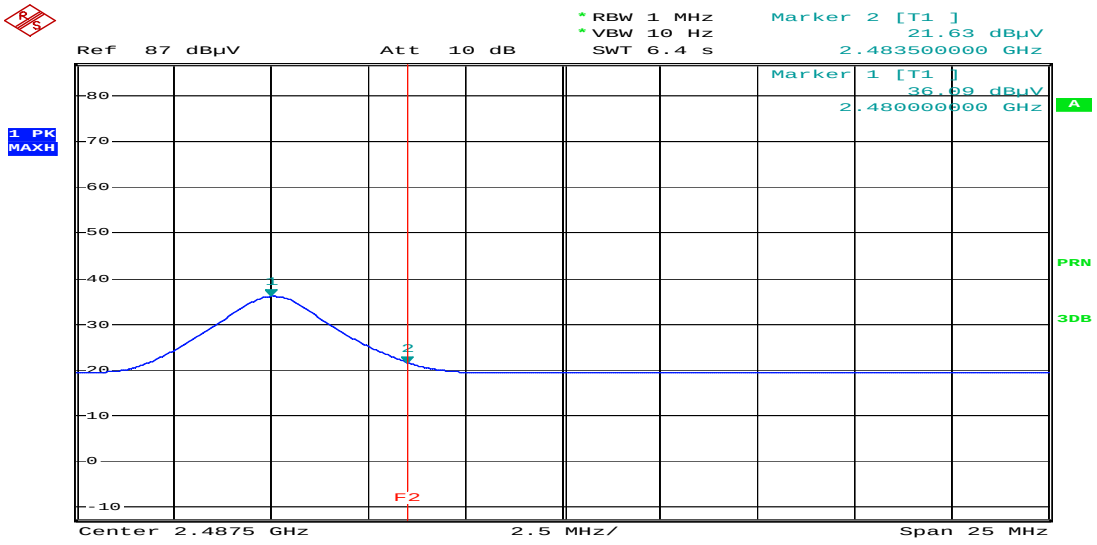
Band Edges(CH High)

Detector mode:Peak Polarity:Horizontal



Comment: NT-BT100 PK HOR
Date: 24.JAN.2011 10:25:34

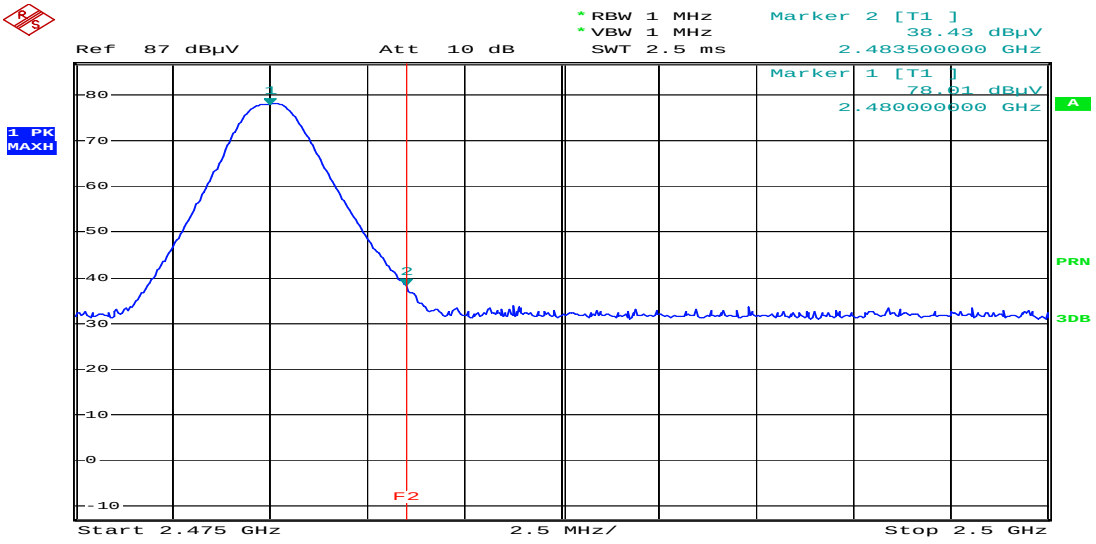
Detector mode:Average Polarity:Horizontal



Comment: NT-BT100 AV HOR
Date: 24.JAN.2011 10:28:24

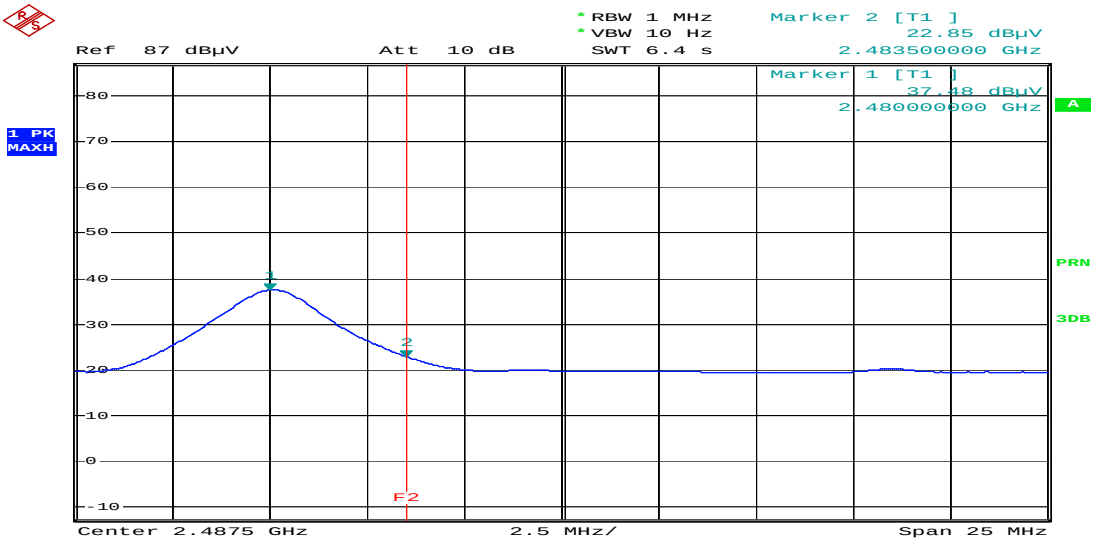
Band Edges(CH High)

Detector mode:Peak Polarity:Vertical



Comment: NT-BT100 PK VER
Date: 24.JAN.2011 10:14:51

Detector mode:Average Polarity:Vertical



Comment: NT-BT100 AV VER
Date: 24.JAN.2011 10:31:24

11. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 MHz to 30 MHz was measured in accordance to FCC Part 15 (2010) . The test setup was made according to ANSI C 63.4 (2003) in a shielded. The EUT was placed on a non-conductive table at least 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0 m. The test receiver with Quasi Peak detector complies with CISPR 16.

11.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2011.8. 24
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	2012.1.27
LISN	ENV 216	Rohde & Schwarz	101231	2011. 8. 13
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2011.1.27

11.2 Environmental Condition

Test Place : Shield Room
Temperature : 19 ℃
Humidity : 40 % R.H.

11.3 Test Data for Bluetooth

Test Date : 3-Jan-11

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.17	0.10	0.4	N	65.06	44.80	45.28	55.06	37.80	38.28
0.18	0.10	0.4	N	64.53	43.44	43.93	54.53	37.32	37.81
0.21	0.10	0.4	N	63.21	39.35	39.84	53.21	34.07	34.56
0.27	0.11	0.4	H	61.27	40.32	40.82	51.27	35.15	35.65
0.35	0.11	0.4	N	58.96	41.15	41.67	48.96	37.41	37.93
0.39	0.11	0.4	H	57.98	42.59	43.12	47.98	41.76	42.29
0.44	0.12	0.4	N	57.08	41.63	42.17	47.08	39.90	40.44
0.94	0.12	0.5	N	56.00	38.33	38.94	46.00	31.70	32.31
1.25	0.14	0.5	H	56.00	37.10	37.74	46.00	27.53	28.17
2.45	0.20	0.6	H	56.00	35.84	36.62	46.00	29.03	29.81
Remark	H : Hot Line, N : Neutral Line TEST MODE : Bluetooth-CH39(2441 MHz)								

12. Photographs of test setup

12.1.Setup for Radiated Test : 30 MHz ~ 1000 MHz

[Front]

[Rear]

12.2. Setup for Radiated Test :Above 1000 MHz

[Front]

12.3. Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]

[Rear]

12.4. Photographs of EUT

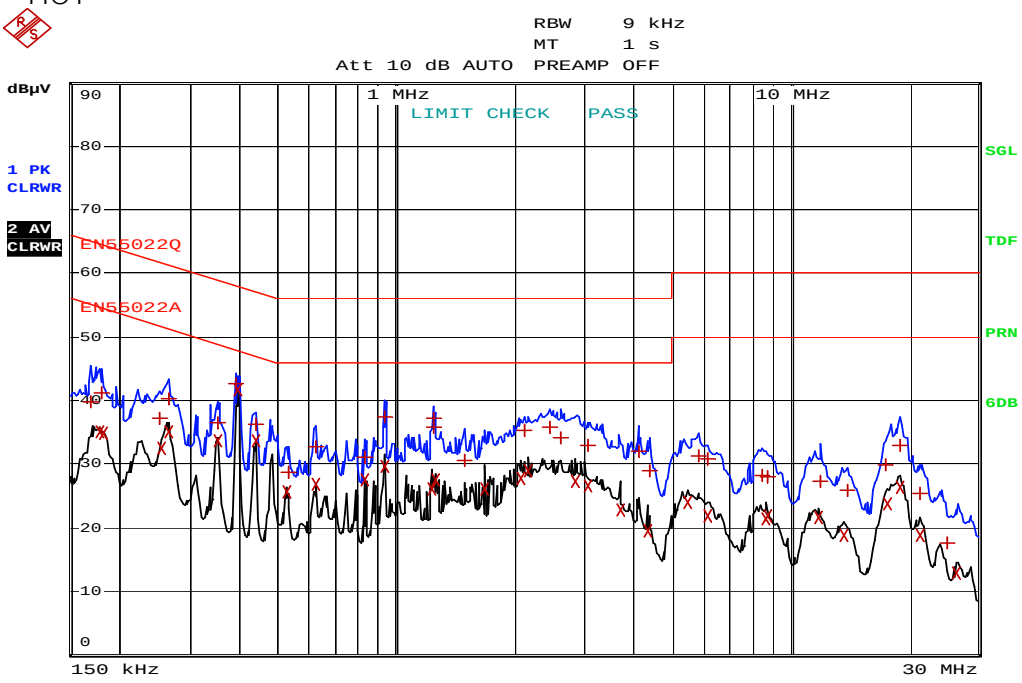
[Front]

[Rear]

Appendix 1. Spectral diagram for Bluetooth 1.2

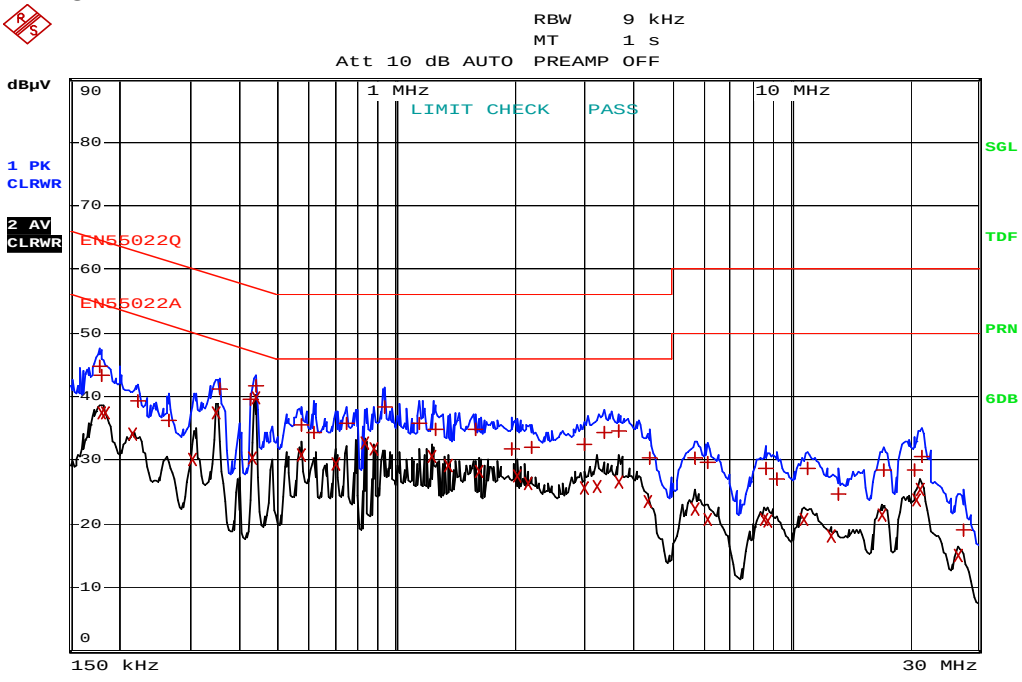
Bluetooth - CH 39

*HOT



Comment: NT-BT100 HOT
Date: 3.JAN.2011 10:48:34

*NEUTRAL



Comment: NT-BT100 NEUTRAL
Date: 3.JAN.2011 10:44:27

Appendix 2. Antenna Requirement

1. Antenna Requirement

1.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.24

1.2 Antenna Connected Construction

The antenna types used in this product are Intergrated Sandwich antenna . The maximum Gain of this antenna is 1.60 dBi.