Test Report for FCC

FCC ID:V2X-PM155

Report Number		ESTF150801-012		
Applicant	Company name	POINTMOBILE CO., LTD		
	Address	1412, World Meridian Venture Center-1, 60-24, Gasan-dong, Geumcheon-gu, Seoul, Korea 153-781		
	Telephone	82-2-2113-7275		
Product	Product name	PDA		
	Model No.	CHD FiVE	Manufacturer	POINTMOBILE CO., LTD
	Serial No.	NONE	Country of origin	KOREA
Test date	2007-11-15 ~ 2007-11-16		Date of issue	31-Jan-08
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea			
Standard	FCC PART 15 2007 , ANSI C 63.4 2003			
Measurement facility registration number	94696			
Tested by	Engineer J.H.Kim	(Signature)		
Reviewed by	Engineering Manager J.M.Yang	(Signature)		
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable			

* Note

- Basic model is CHD Five and additional model is Metrologic SP58xx Series.
- 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

Contents

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 : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Official Qualification(s)

MIC : 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

Product Name	: PDA
Model Number	: CHD FiVE
Modulation Type	: BT(GFSK)
Transfer Rate	: 1Mbps
Number of Channel	: BT: 79
Channel Spacing	: BT: 1MHz
Output Power	: BT: 1.74dBm
Serial Number	: NONE
Manufacturer	: POINTMOBILE CO., LTD
Country of origin	: KOREA
Rating	: AC 120V ~ /60Hz 0.3A , OUTPUT : DC 5V 2.0A
Receipt Date	: 2007-11-21
X-tal list(s)	: 32.768KHz/3.6864MHz/24.576MHz/29.4912MHz

2.2 General descriptions of EUT

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The Bluetooth frequency hoppoing transceiver is designed to operate between 2400 and 2483.5MHz.
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 (2007)

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				
Standard	Test Type	Result	Remark	Limit
15.207	AC Power Conducted Emission	Pass	Meet the requirement	
15.209	Intentional Radiated Emission	Pass	Meet the requirement	
15.247(a)(1)	Carrier Frequency Separation &	Pass	Meet the requirement	>25kHz
	20 Bandwidth			
15.247(b)	Maximum Peak ouput power	Pass	Meet the requirement	30dBm(1W)
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	<400ms
15.247(d)	Band Edge Measurement	Pass	Meet the requirement	

4. Measurement Condition

4.1 EUT Operation(For **Bluetooth**)

BT

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(2402MHz), Middle(2441MHz),High(2480MHz)

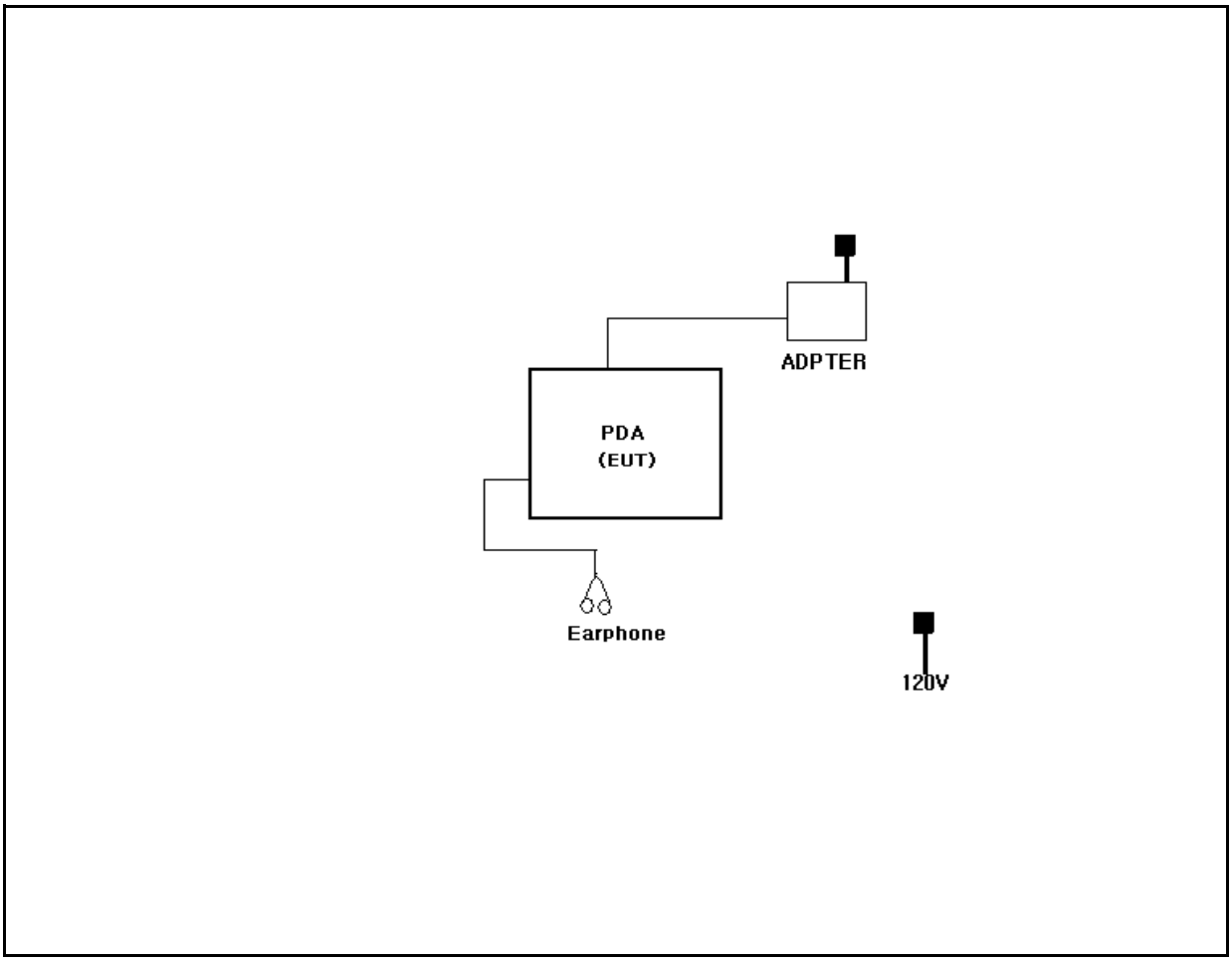
c. Test Mode : GFSK

d. Test rate :1Mbps

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
* The computer system ran a 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)
PDA	CHD FiVE	NONE	POINTMOBILE CO., LTD	EUT
ADAPTER	PSC11R-05D	P72010387A1	Phihong(Dongguan)Electronics Co.,Ltd	
Earphone	NONE	NONE	LG Electronics Inc.	

4.5 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
PDA	POWER	Adapter	-	2	Unshielded	
PDA	Earphone	Earphone	-	1	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 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

5.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 300KHz

. VBW= 300KHz

. Span= 3MHz

. Sweep= suitable duration based on the EUT specification.

20dB Bandwidth Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2008-03-02
Bluetooth Tester	TC-3000A	3000A570224	2008-12-12
Dual Directional Coupler	778D	16502	2008-03-02
-Spectrum Analyzer <=> EUT	Loss: 21.0dB	-	

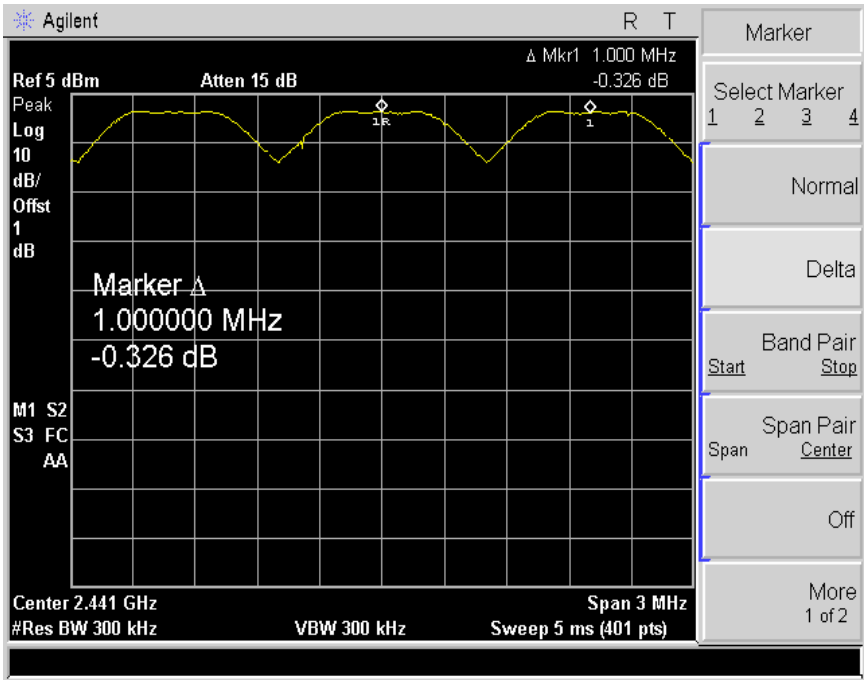
5.3 Measurement results

EUT	PDA	MODEL	CHD FiVE
MODE	FHSS	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

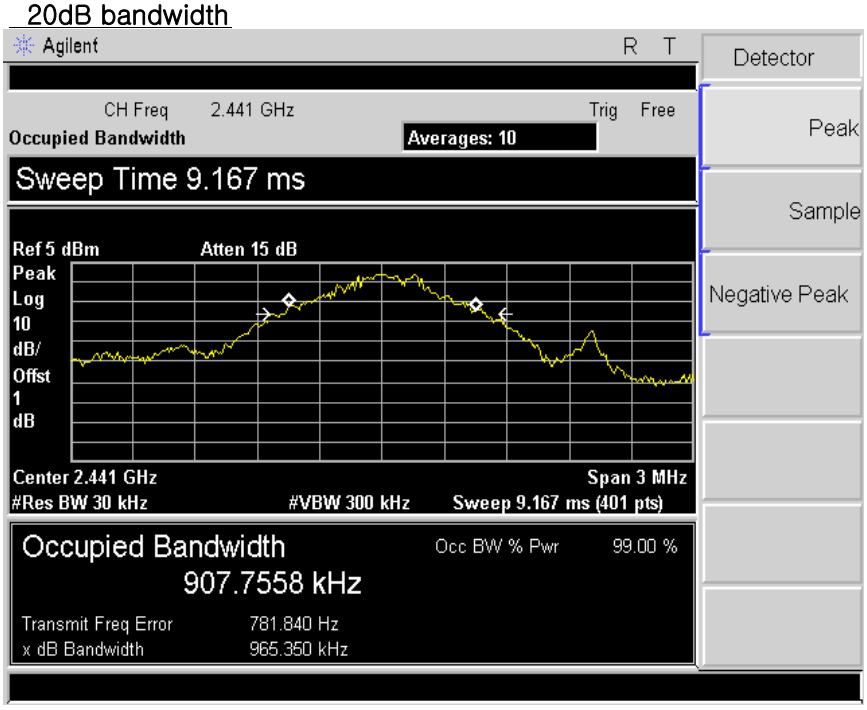
CHANNEL	Channel Frequency (MHz)	Bandwidth at 20dB below(kHz)	Channel Separation (MHz)	Limit (kHz)	PASS/FAIL
39	2441	965.4	1.0	>25	PASS

5.4 Trace data

Channel Separation



20dB bandwidth



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 30dBm.

The spectrum analyzer is set to as following.

. RBW= 1MHz

. VBW= 1MHz

. Span= 1MHz

. Sweep= 1.6s

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2008-03-02
Bluetooth Tester	TC-3000A	3000A570224	2008-12-12
Dual Directional Coupler	778D	16502	2008-03-02
-Spectrum Analyzer <=> EUT	Loss: 21.0dB	-	

6.2 Measurement results

EUT	PDA	MODEL	MSB-100
MODE	GFSK, DH5	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

CHANNEL	Channel Frequency (MHz)	Peak Power Output(dBm)		Limit[1W] (dBm)	PASS/ FAIL
		(dBm)	(W)		
0	2402	1.14	0.0013	30.0	PASS
39	2441	1.39	0.0014	30.0	PASS
78	2480	1.74	0.0015	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 2400MHz-2483.5MHz bands shall use at least 75 hopping frequencies.

7.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 300KHz

. VBW= 300KHz

. Span= the frequency band of operation

. Sweep= suitable duration based on the EUT specification.

The Number of Hopping Frequency Test Instruments

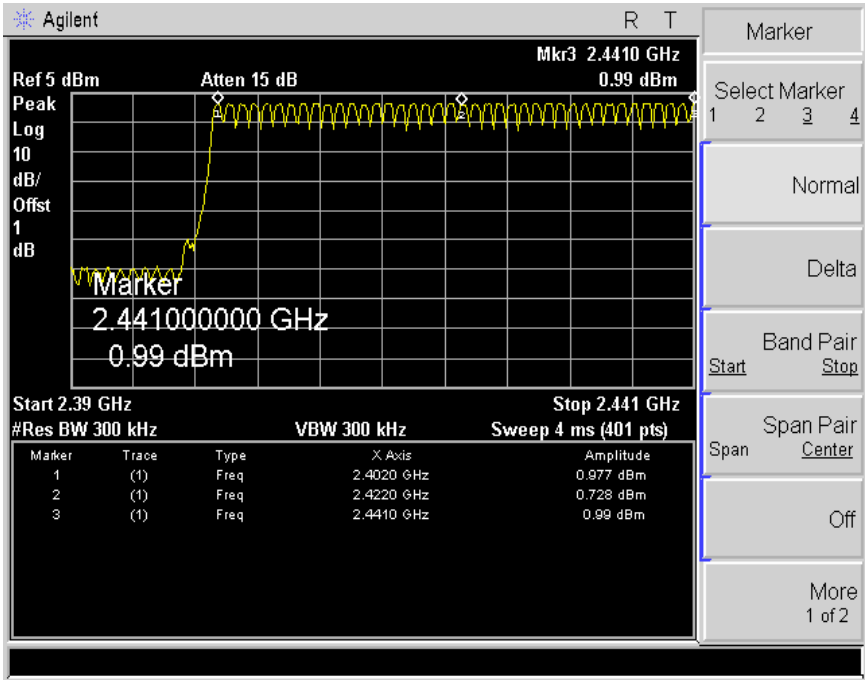
Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2008-03-02
Bluetooth Tester	TC-3000A	3000A570224	2008-12-12
Dual Directional Coupler	778D	16502	2008-03-02
-Spectrum Analyzer <=> EUT	Loss: 21.0dB		

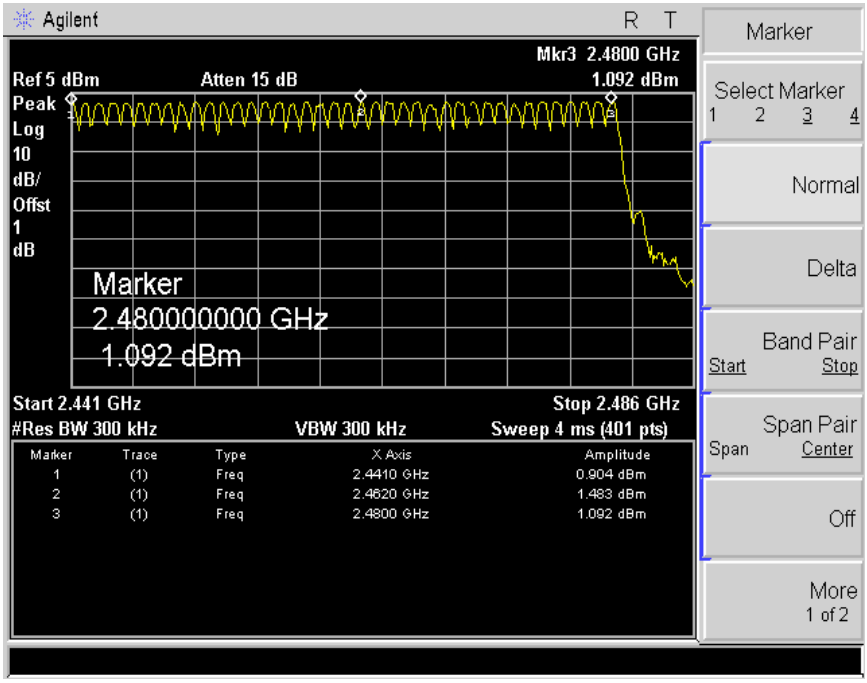
7.3 Measurement results

EUT	PDA	MODEL	CHD FiVE
MODE	FHSS	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

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 2400MHz-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= 1MHz

. 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	2008-03-02
Bluetooth Tester	TC-3000A	3000A570224	2008-12-12
Dual Directional Coupler	778D	16502	2008-03-02
-Spectrum Analyzer <=> EUT	Loss: 21.0dB	-	

8.3 Measurement results

EUT	PDA	MODEL	CHD FiVE
MODE	FHSS	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

A. DH1 Mode

One peiod for each particular channel : 0.570 ms X 320.1 = 182.5 ms

Channel	Pulse Time(ms)	Limit (ms)	PASS/FAIL
39	182.5	400	PASS

B. DH3 Mode

One peiod for each particular channel : 1.832 ms X 159.9 = 292.9 ms

Channel	Pulse Time(ms)	Limit (ms)	PASS/FAIL
39	292.9	400	PASS

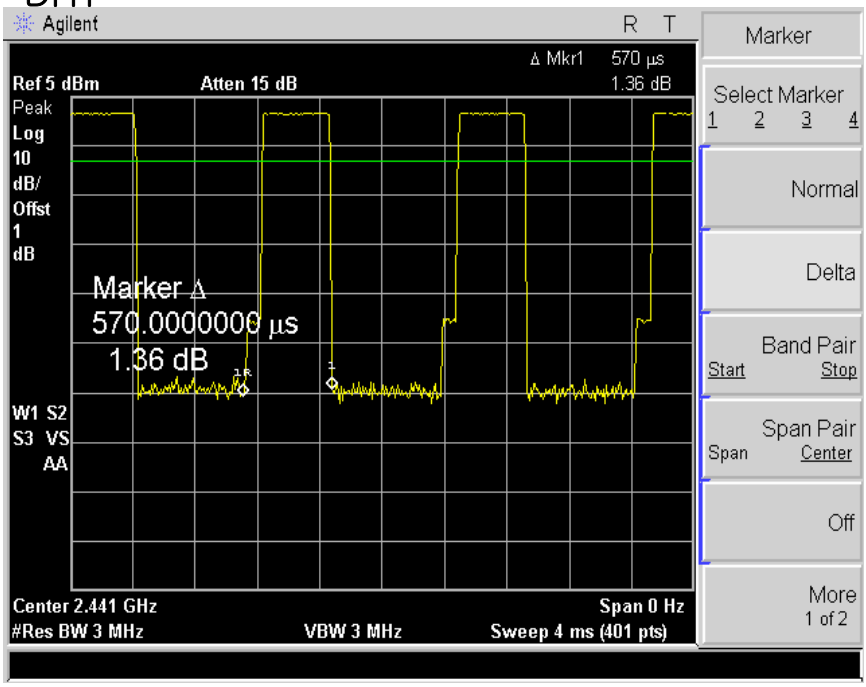
C. DH5 Mode

One peiod for each particular channel : 3.089 ms X 106.81 = 329.9 ms

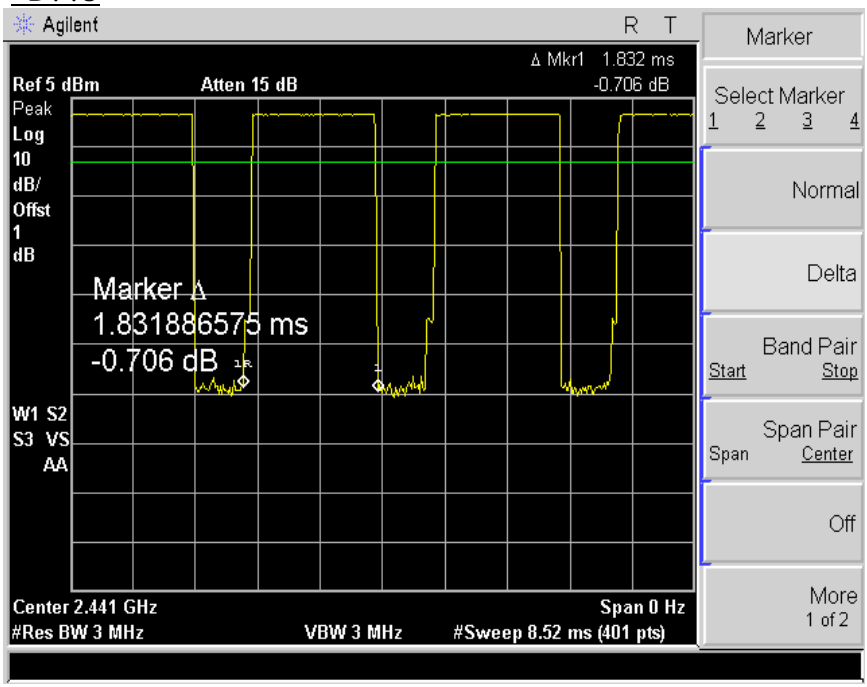
Channel	Pulse Time(ms)	Limit (ms)	PASS/FAIL
39	329.9	400	PASS

8.4 Trace data

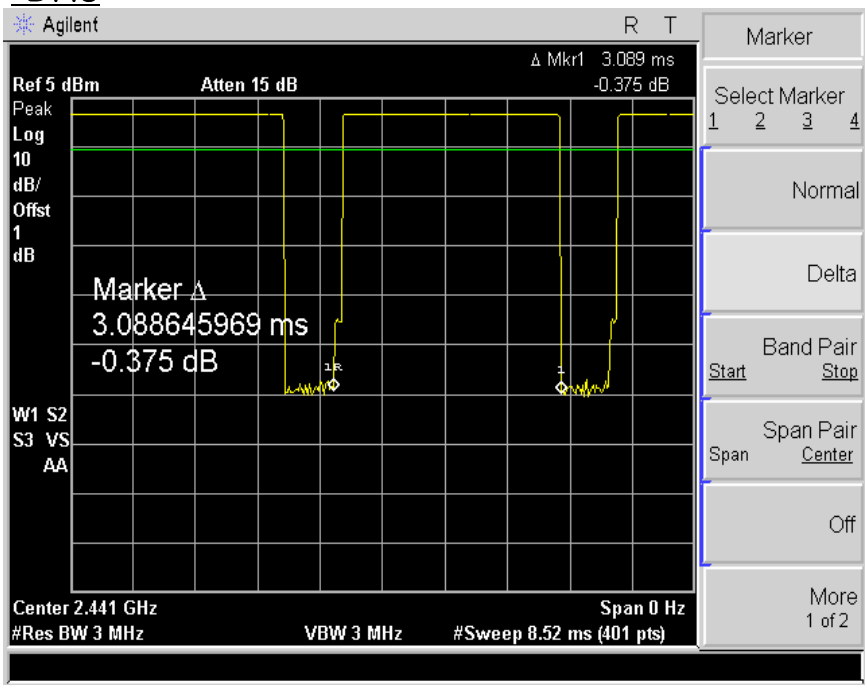
DH1



DH3


Agilent
R T
Δ Mkr1 1.832 ms
Ref 5 dBm
Atten 15 dB
-0.706 dB
Peak
Log
10
dB/
Offst
1
dB
Marker Δ
1.831886575 ms
-0.706 dB
W1 S2
S3 VS
AA
Center 2.441 GHz
Span 0 Hz
#Res BW 3 MHz
VBW 3 MHz
#Sweep 8.52 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Band Pair
Start Stop
Span Pair
Span Center
Off
More
1 of 2

DH5


Agilent
R T
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Ref 5 dBm
Atten 15 dB
-0.375 dB
Peak
Log
10
dB/
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1
dB
Marker Δ
3.088645969 ms
-0.375 dB
W1 S2
S3 VS
AA
Center 2.441 GHz
Span 0 Hz
#Res BW 3 MHz
VBW 3 MHz
#Sweep 8.52 ms (401 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Band Pair
Start Stop
Span Pair
Span Center
Off
More
1 of 2

9. band-edge and out of band emissions.

9.1 Test procedure

The radio frequecy power at 20dB 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 20dB 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	2008-03-02
Bluetooth Tester	TC-3000A	3000A570224	2008-12-12
Dual Directional Coupler	778D	16502	2008-03-02
-Spectrum Analyzer <=> EUT	Loss: 21.0dB		

9.3 Measurement results of band-edge & out of emission

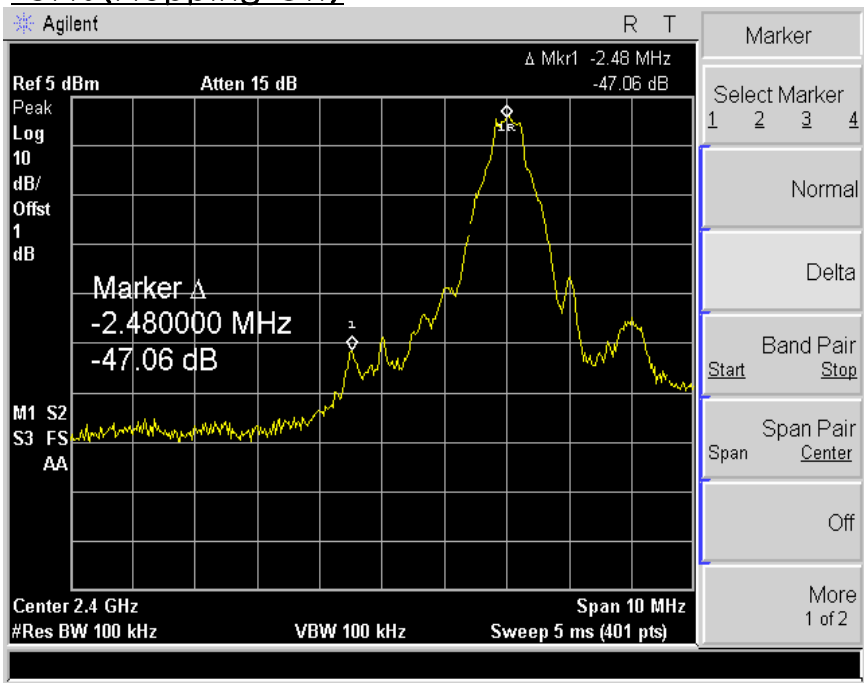
EUT	PDA	MODEL	CHD FiVE
MODE	GFSK	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

* Refer to attach spectrum analyzer data chart.

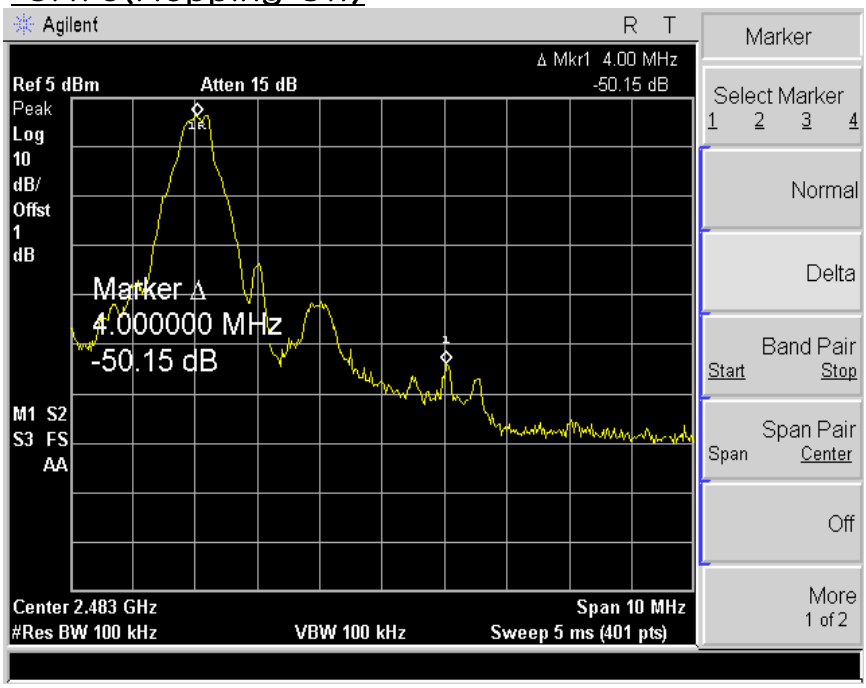
9.4 Trace data of band-edge & Out of Emission

band-edge

CH0(Hopping Off)

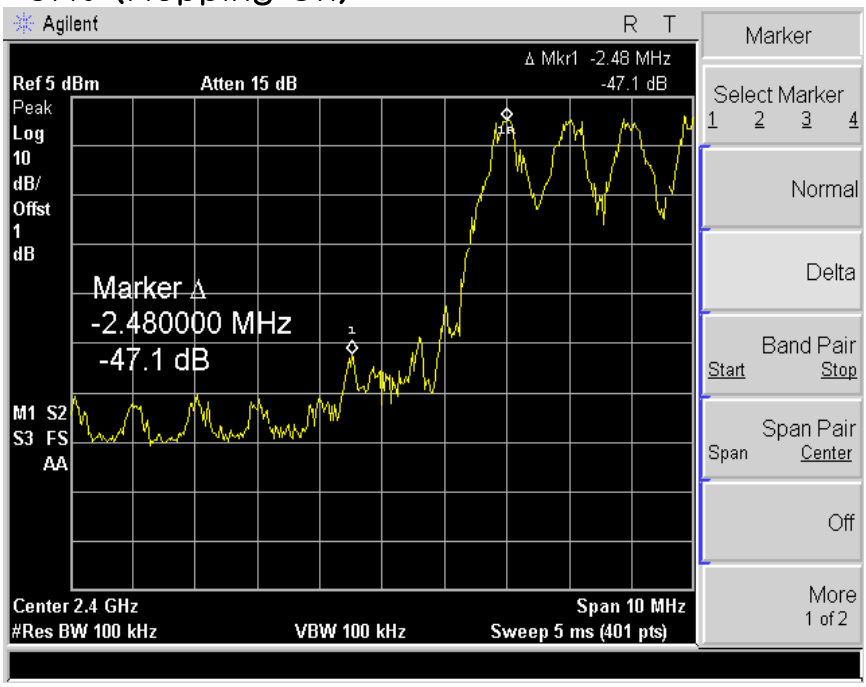


CH78(Hopping Off)

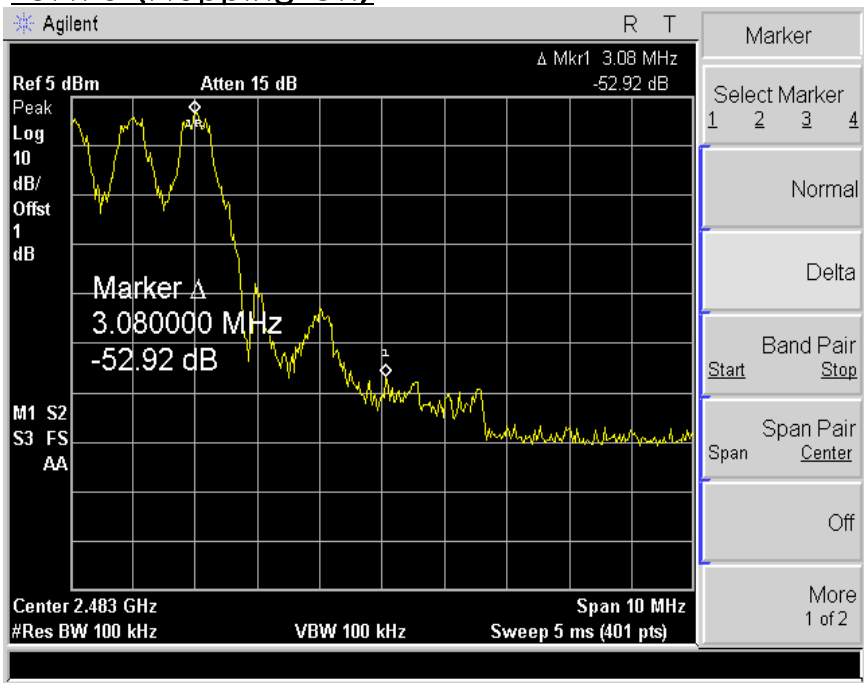


band-edge

CH0 (Hopping On)

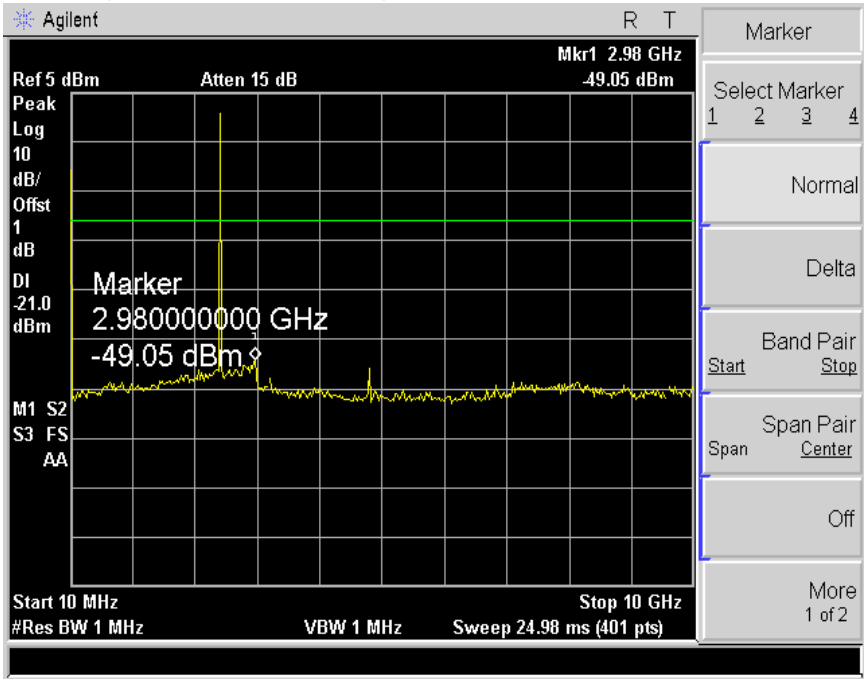


CH78 (Hopping On)

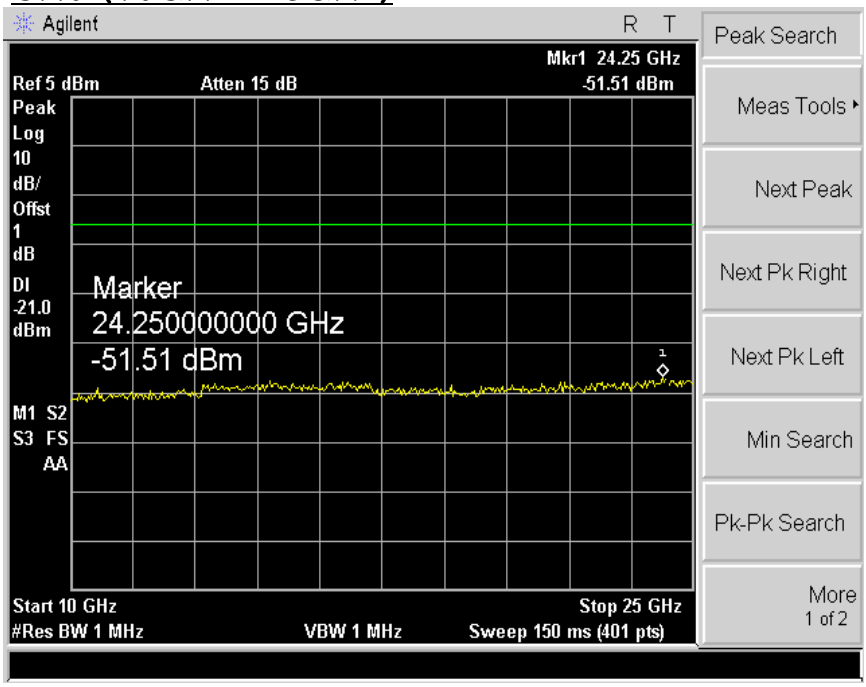


Out of Band Emissions

CH0 (30MHz~10GHz)

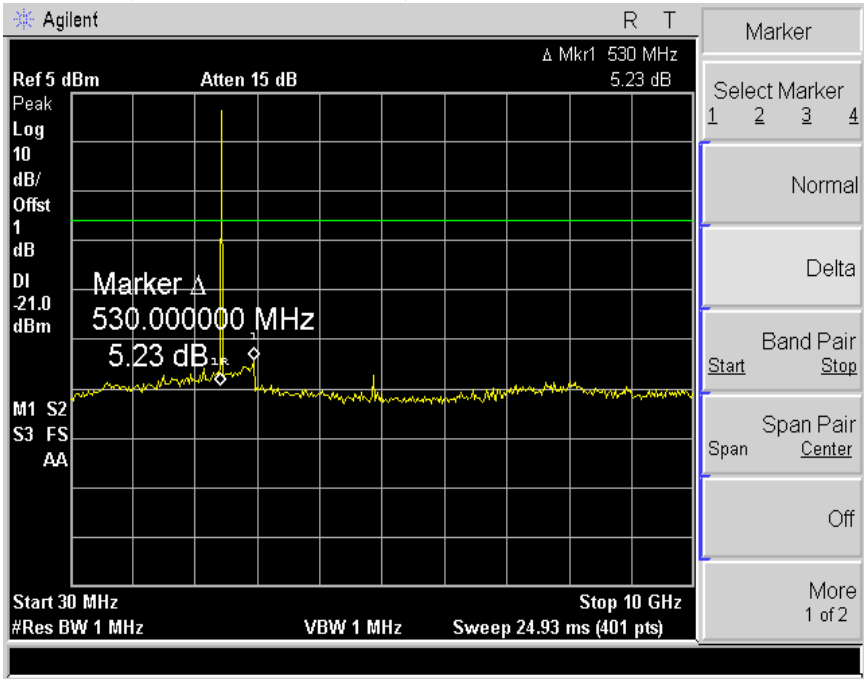


CH0 (10GHz~25GHz)

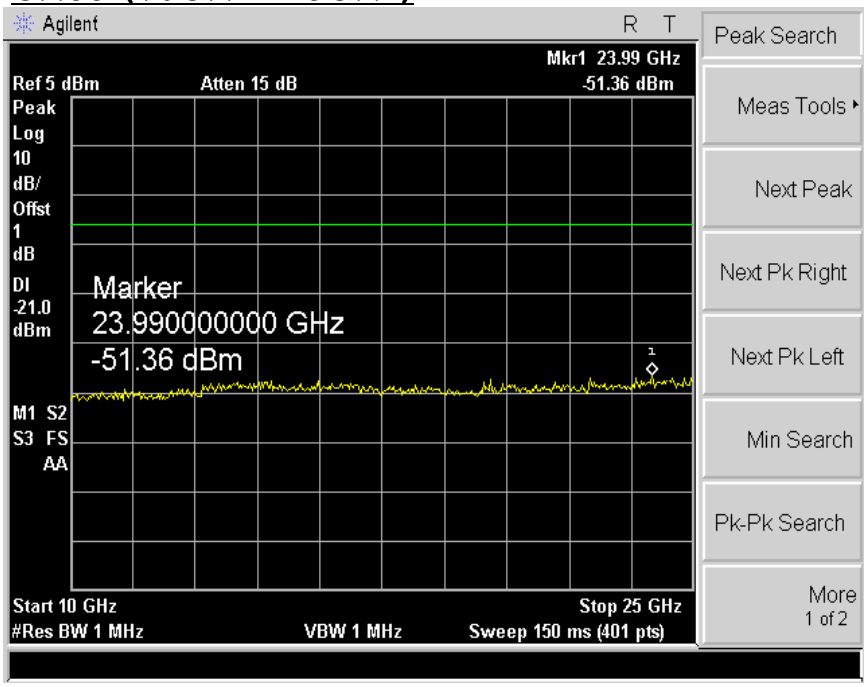


Out of Band Emissions

CH39 (30MHz~10GHz)

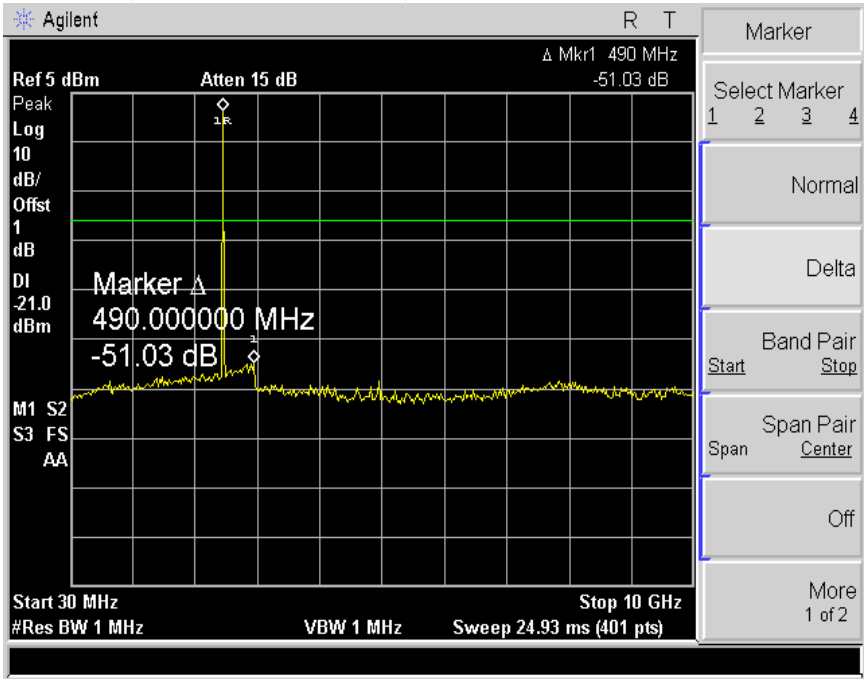


CH39 (10GHz~25GHz)

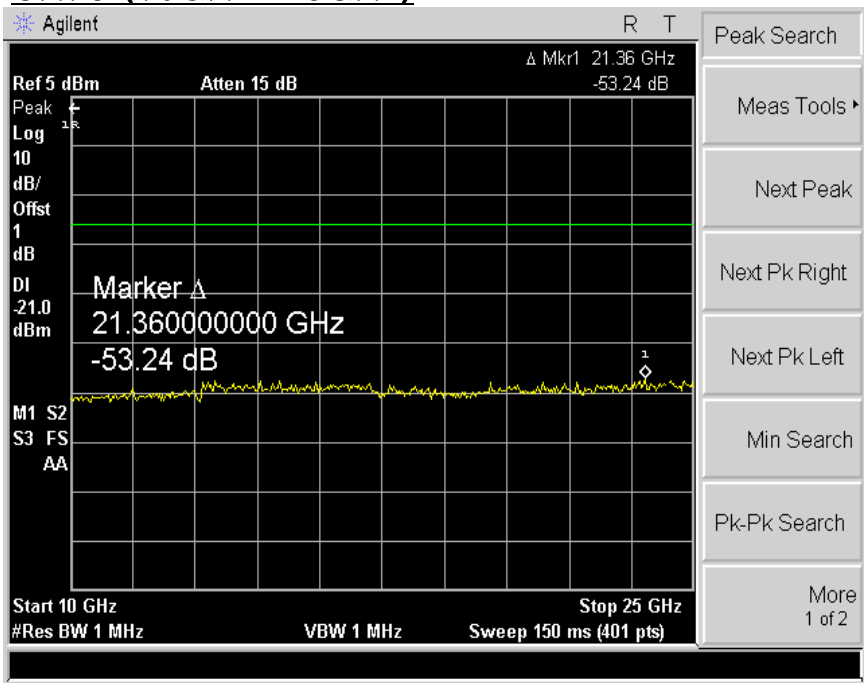


Out of Band Emissions

CH78 (30MHz~10GHz)



CH78 (10GHz~25GHz)



10. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2007) & ANSI C 63.4 (2003). The test setup was made according to FCC Part 15 (2007) & 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 0.8m. 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	23-Jan-08
Spectrum Analyzer	R3261C	ADVANTEST	61720116	20-Apr-08
LogBicon Antenna	VULB 9160	S/B	3142	7-May-08
Amplifier	8447F	HP	2805A02972	26-Jun-08
PREAMPLIFIER	8449B	HP	3008A00581	6-May-08
Horn Antenna	BBHA 9120 D	Schwarzbeck	352	5-Jun-08
Spectrum Analyzer	R3273	ADVANTEST	121200664	27-Nov-08
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(3m)
Temperature (°C) : 6 ℃
Humidity (%) : 49 %

10.3 Test Data for Bluetooth

Test Date : 16-Nov-07 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)
79.62	6.90	V	1.0	8.85	1.4	40.0	17.14	-22.86
110.16	11.20	H	2.4	11.09	1.6	43.5	23.92	-19.58
140.41	13.60	V	1.0	13.38	1.8	43.5	28.82	-14.68
170.36	12.70	V	1.0	13.30	2.0	43.5	28.01	-15.49
196.86	6.90	V	1.0	10.61	2.2	43.5	19.71	-23.79
200.62	8.20	V	1.0	10.39	2.2	43.5	20.83	-22.67
220.12	12.20	V	1.0	10.77	2.4	46.0	25.37	-20.63
245.71	11.60	H	1.3	11.83	2.6	46.0	26.01	-19.99
262.14	12.20	H	1.4	12.20	2.7	46.0	27.08	-18.92
299.85	11.80	H	1.2	13.19	3.0	46.0	27.97	-18.03
333.05	9.20	H	1.1	13.94	3.2	46.0	26.32	-19.68
362.88	8.40	H	1.0	14.46	3.4	46.0	26.26	-19.74
403.02	10.20	V	1.0	15.38	3.6	46.0	29.18	-16.82
497.64	14.40	H	1.0	17.04	4.2	46.0	35.66	-10.34
563.29	5.90	H	1.0	18.24	4.5	46.0	28.69	-17.31
796.01	7.10	H	1.0	21.73	5.9	46.0	34.73	-11.27
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 above1000Mhz) *CL = Cable Loss(In case of below1000Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz.							

10.3-1 Test Data for Bluetooth

Test Date : 16-Nov-07 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:1Mhz VBW:1MHz)								
2386	20.97	H	1.4	27.65	2.3	74.0	50.89	-23.11
2402	60.10	H	1.4	27.62	2.3	*OB	89.99	-
4804	45.86	H	1.3	31.27	-28.9	74.0	48.24	-25.76
2386	21.00	V	1.4	27.65	2.3	74.0	50.92	-23.08
2402	58.40	V	1.5	27.62	2.3	*OB	88.29	-
4804	49.33	V	1.4	31.27	-28.9	74.0	51.71	-22.29
AV(RBW:1Mhz VBW:10Hz)								
2386	8.99	H	1.4	27.65	2.3	54.0	38.91	-15.09
2402	26.50	H	1.4	27.62	2.3	*OB	56.39	-
4804	40.69	H	1.3	31.27	-28.9	54.0	43.07	-10.93
2386	9.02	V	1.4	27.65	2.3	54.0	38.94	-15.06
2402	25.40	V	1.5	27.62	2.3	*OB	55.29	-
4804	45.46	V	1.4	31.27	-28.9	54.0	47.84	-6.16
Remark	H : Horizontal, V : Vertical TEST MODE : Bluetooth-CH0(2402MHz) *The TX signal isn't detected from 2th harmonics. *OB = Operating band *Checked in all 3 axis and the maximum measured data were reported. *CL = Cable Loss-Amplifier Gain(In case of above1000Mhz) *CL = Cable Loss(In case of below1000Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz.								

10.3-2 Test Data for Bluetooth

Test Date : 16-Nov-07 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:1Mhz VBW:1MHz)								
2441	66.84	H	1.4	27.60	2.3	*OB	96.71	-
4882	48.02	H	1.1	31.38	-28.7	74.0	50.73	-23.27
2441	64.45	V	1.4	27.60	2.3	*OB	94.32	-
4882	48.86	V	1.3	31.38	-28.7	74.0	51.57	-22.43
AV(RBW:1Mhz VBW:10Hz)								
2441	60.50	H	1.4	27.60	2.3	*OB	90.37	-
4882	40.75	H	1.1	31.38	-28.7	54.0	43.46	-10.54
2441	63.86	V	1.4	27.60	2.3	*OB	93.73	-
4882	43.02	V	1.3	31.38	-28.7	54.0	45.73	-8.27
Remark	H : Horizontal, V : Vertical TEST MODE : Bluetooth-CH39(2441MHz) *The TX signal isn't detected from 2th harmonics. *OB = Operating band *Checked in all 3 axis and the maximum measured data were reported. *CL = Cable Loss-Amplifier Gain(In case of above1000Mhz) *CL = Cable Loss(In case of below1000Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz.								

10.3-3 Test Data for Bluetooth

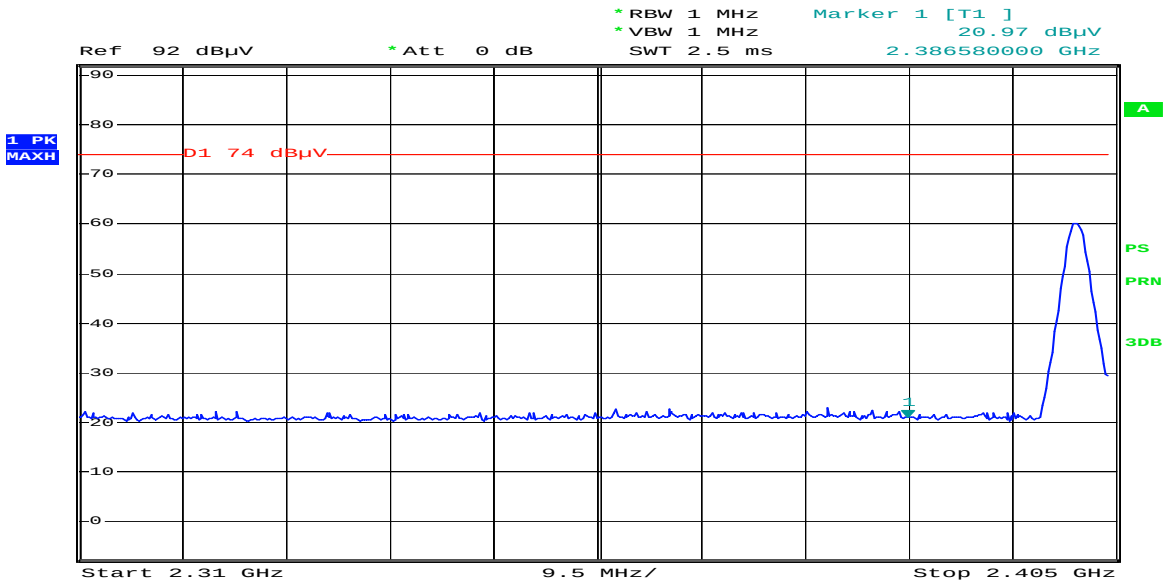
Test Date : 16-Nov-07 Measurement Distance : 3 m

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:1Mhz VBW:1MHz)								
2480	60.80	H	1.6	27.59	2.3	*OB	90.66	-
2483.5	23.33	H	1.2	27.59	2.3	74.0	53.19	-20.81
4960	44.55	H	1.3	31.49	-28.5	74.0	47.51	-26.49
2480	61.20	V	1.4	27.59	2.3	*OB	91.06	-
2483.5	22.92	V	1.3	27.59	2.3	74.0	52.78	-21.22
4960	47.11	V	1.2	31.49	-28.5	74.0	50.07	-23.93
AV(RBW:1Mhz VBW:10Hz)								
2480	26.10	H	1.6	27.59	2.3	*OB	55.96	-
2483.5	11.52	H	1.2	27.59	2.3	54.0	41.38	-12.62
4960	32.90	H	1.3	31.49	-28.5	54.0	35.86	-18.14
2480	26.40	V	1.4	27.59	2.3	*OB	56.26	-
2483.5	11.11	V	1.3	27.59	2.3	54.0	40.97	-13.03
4960	35.69	V	1.2	31.49	-28.5	54.0	38.65	-15.35
Remark	H : Horizontal, V : Vertical TEST MODE : Bluetooth-CH78(2480MHz) *The TX signal isn't detected from 2th harmonics. *OB = Operating band *Checked in all 3 axis and the maximum measured data were reported. *CL = Cable Loss-Amplifier Gain(In case of above1000Mhz) *CL = Cable Loss(In case of below1000Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz.								

10.4 Restricted Band Edges for BT

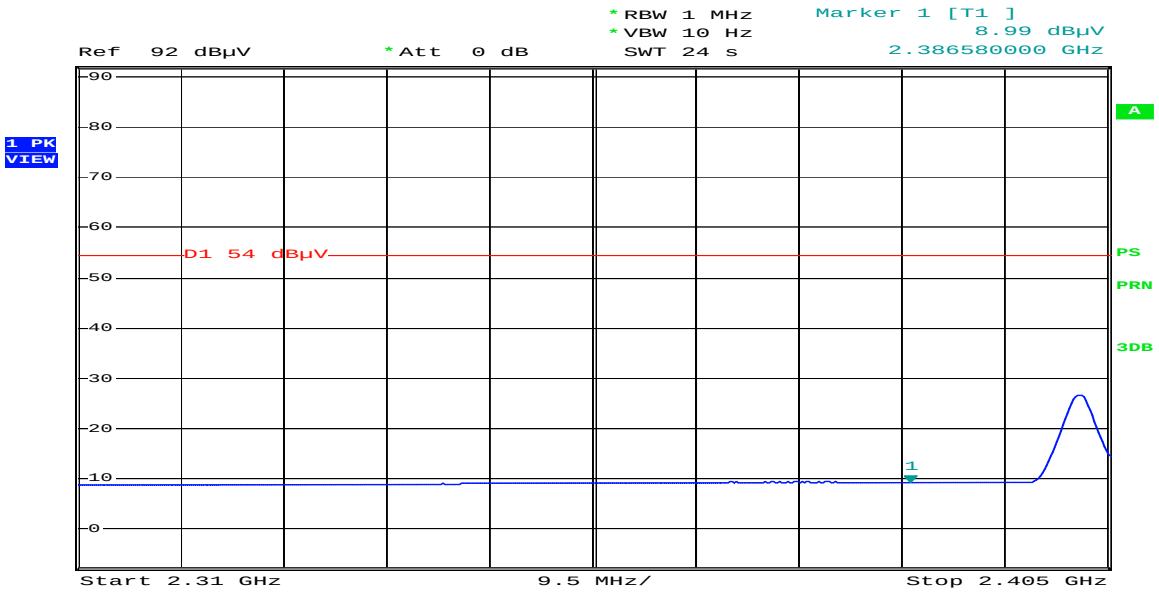
Band Edges(CH Low)

Detector mode:Peak Polarity:Horizontal



Comment: CHD FiVE BLUETOOTH CH0 PK HOR

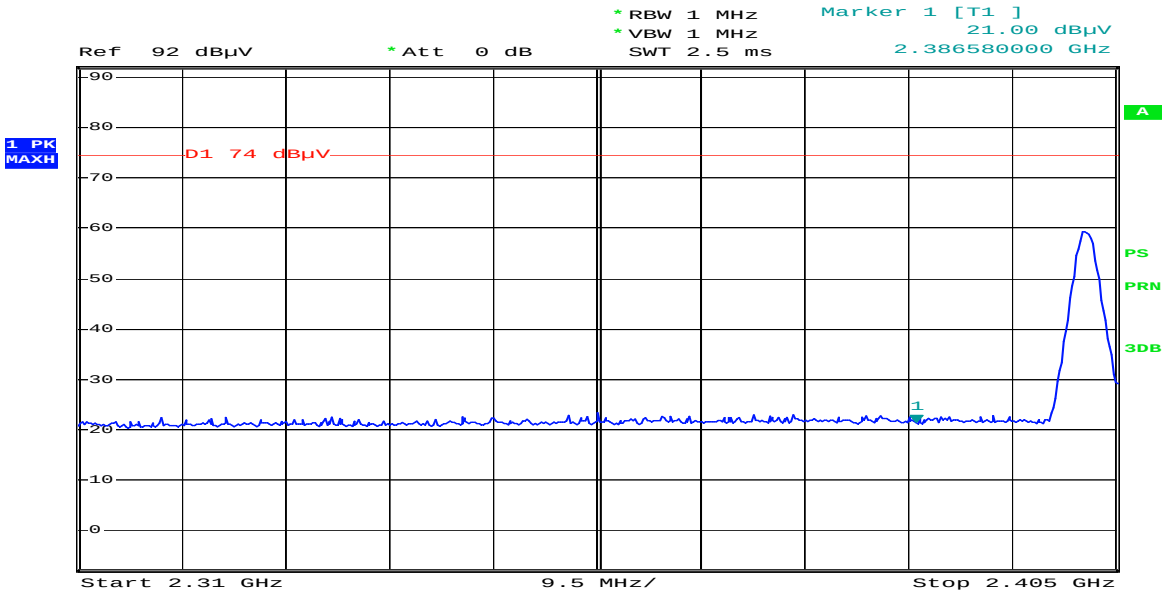
Detector mode:Average Polarity:Horizontal



Comment: CHD FiVE BLUETOOTH CH0 AV HOR

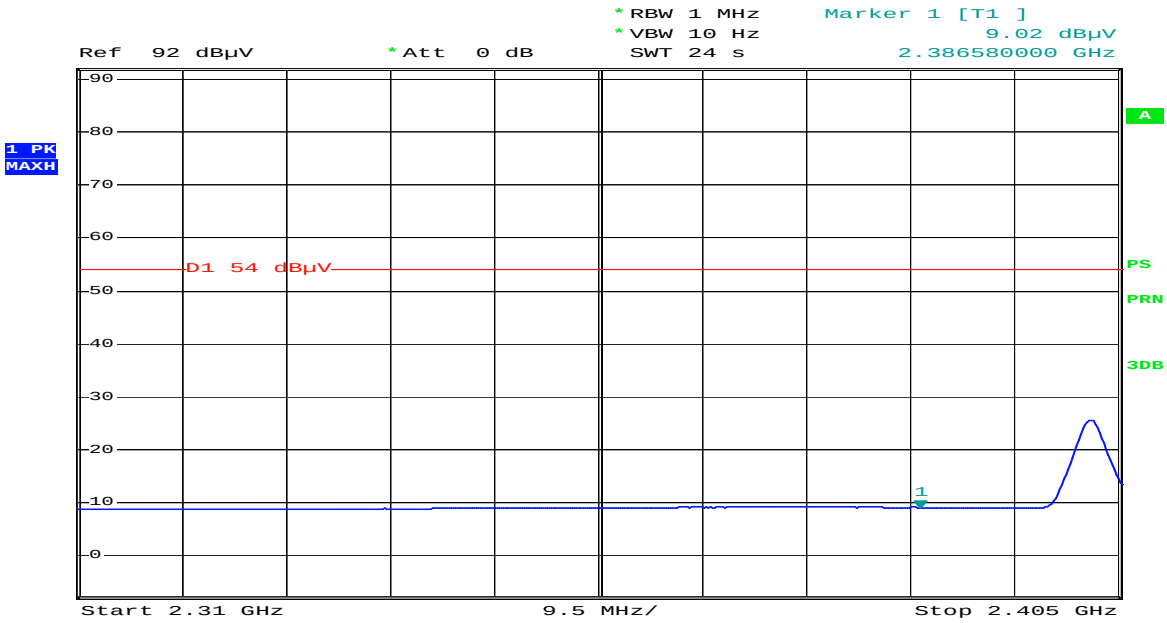
Band Edges(CH Low)

Detector mode:Peak Polarity:Vertical



Comment: CHD FiVE BLUETOOTH CH0 PK VER

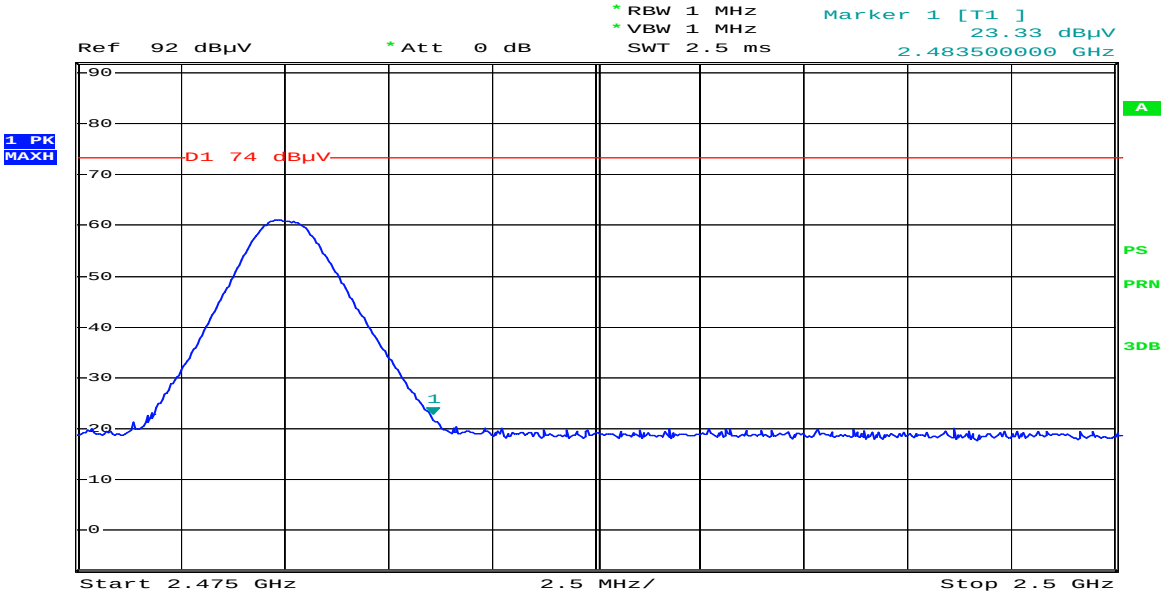
Detector mode:Average Polarity:Vertical



Comment: CHD FiVE BLUETOOTH CH0 AV VER

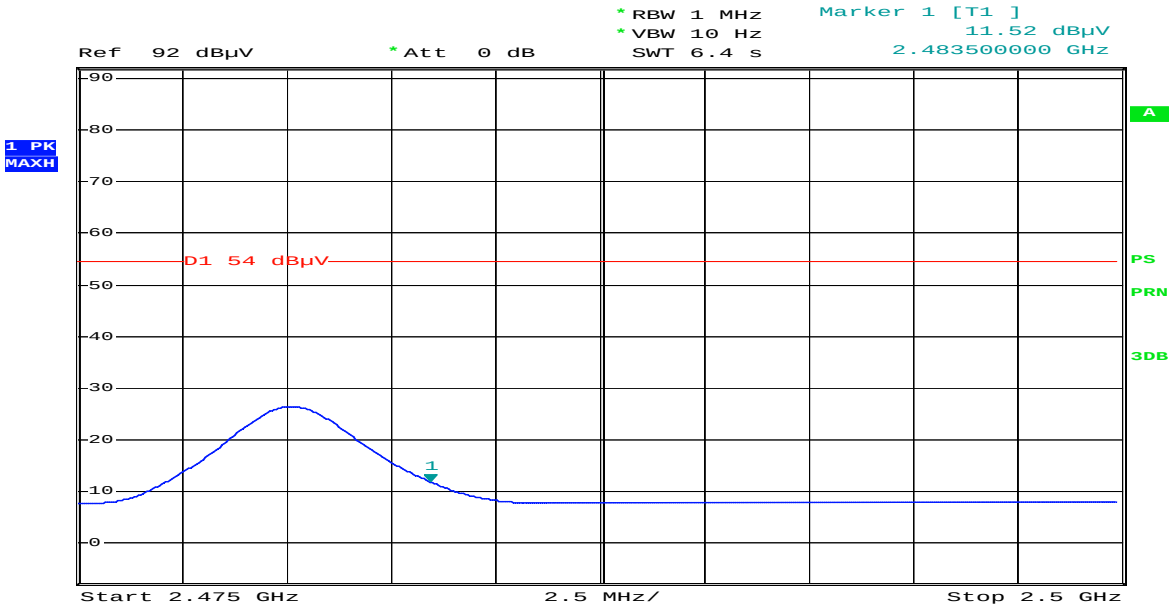
Band Edges(CH High)

Detector mode:Peak Polarity:Horizontal



Comment: CHD FiVE BLUETOOTH CH78 PK HOR

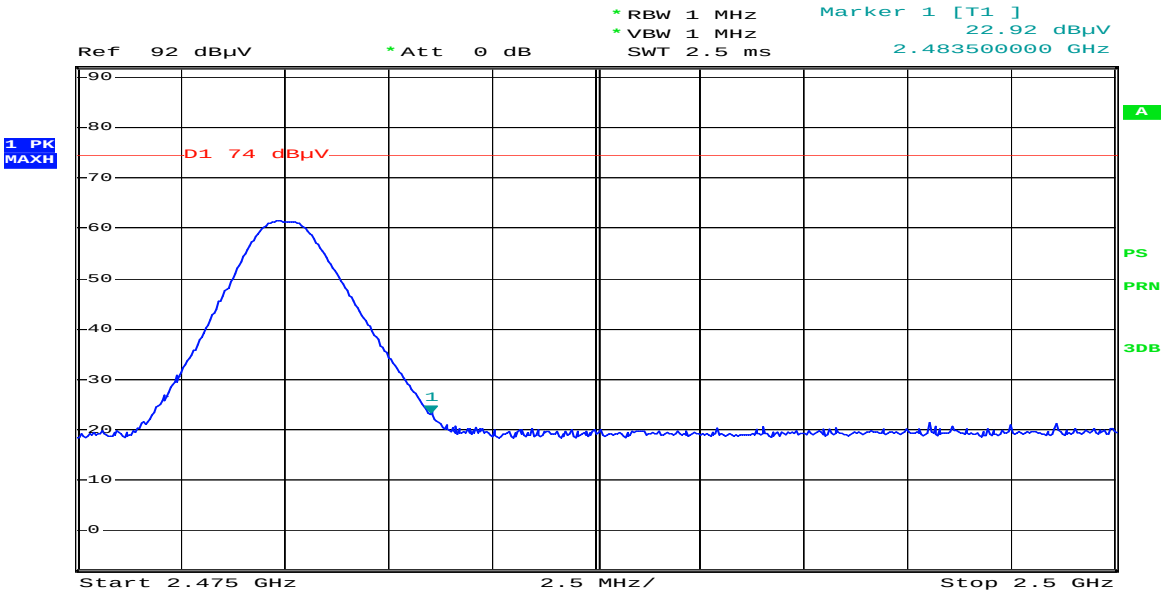
Detector mode:Average Polarity:Horizontal



Comment: CHD FiVE BLUETOOTH CH78 AV HOR

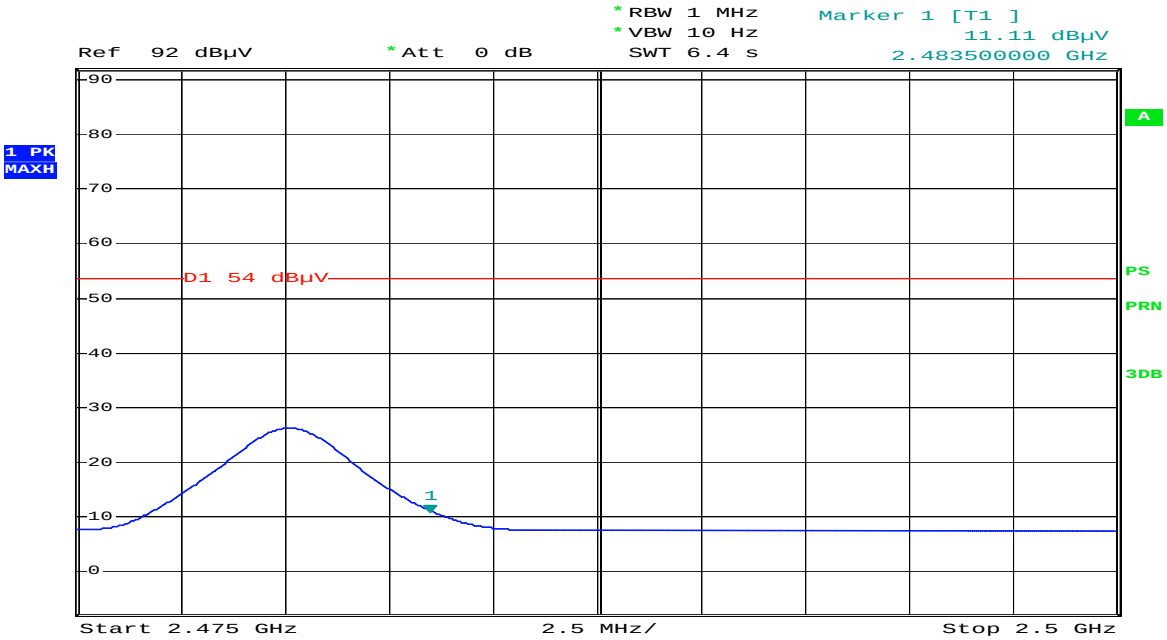
Band Edges(CH High)

Detector mode:Peak Polarity:Vertical



Comment: CHD FiVE BLUETOOTH CH78 PK VER

Detector mode:Average Polarity:Vertical



Comment: CHD FiVE BLUETOOTH CH78 AV VER

11. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to FCC Part 15 (2006) & ANSI C 63.4 (2003) The test setup was made according to FCC Part 15 (2006) & ANSI C 63.4 (2003) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. 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 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

11.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESG3-Z5	Schwarzbeck	838979/010	28-Feb-08
TEST Receive	ESPI7	Rohde & Schwarz	100185	27-Aug-08
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	-

11.2 Environmental Condition

Test Place : Shield Room

Temperature (°C) : 22 ℃

Humidity (%) : 46 %

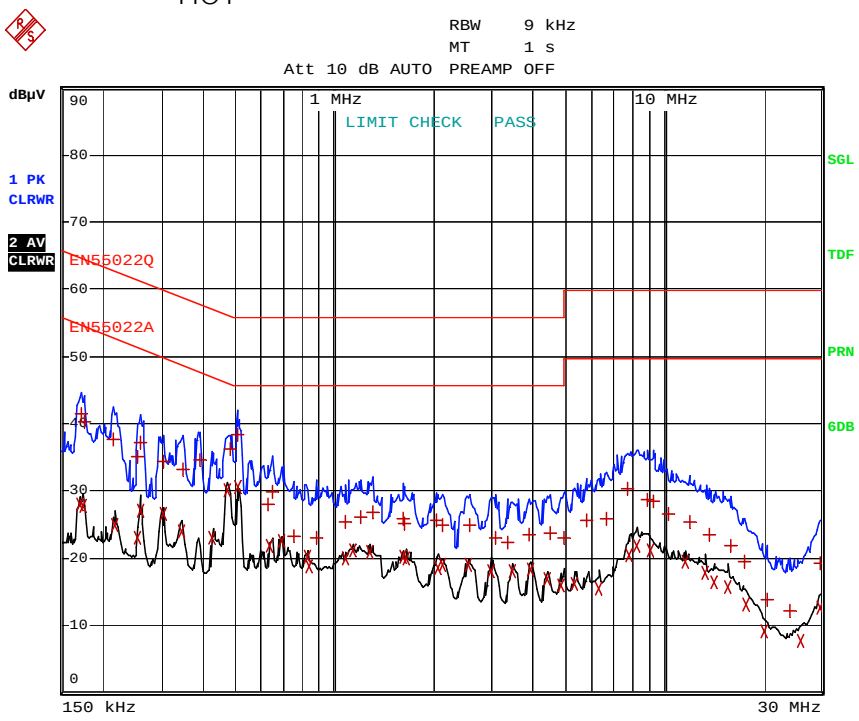
11.0 Test Data for Bluetooth

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	0.16	0.0	H	64.91	41.62	41.83	54.91	28.30	28.51
0.18	0.16	0.0	N	64.67	38.93	39.14	54.67	27.84	28.05
0.21	0.15	0.1	H	63.05	37.89	38.10	53.05	25.07	25.28
0.22	0.15	0.1	N	62.67	37.43	37.64	52.67	22.17	22.38
0.26	0.13	0.1	N	61.50	37.89	38.10	51.50	25.57	25.78
0.30	0.12	0.1	N	60.35	33.14	33.35	50.35	24.64	24.85
0.51	0.15	0.1	H	56.00	38.56	38.80	46.00	30.78	31.02
0.53	0.15	0.1	N	56.00	30.60	30.84	46.00	25.89	26.13
0.57	0.15	0.1	N	56.00	25.30	25.54	46.00	19.28	19.52
0.64	0.15	0.1	H	56.00	28.22	28.47	46.00	22.17	22.42
0.65	0.16	0.1	H	56.00	30.10	30.35	46.00	22.82	23.07
1.21	0.26	0.2	H	56.00	26.22	26.67	46.00	21.06	21.51
5.88	0.42	0.5	H	60.00	25.74	26.69	50.00	16.38	17.33
6.70	0.45	0.6	H	60.00	26.06	27.09	50.00	15.71	16.74
7.79	0.51	0.6	H	60.00	30.55	31.67	50.00	20.65	21.77
7.83	0.51	0.6	N	60.00	24.50	25.63	50.00	18.30	19.43
9.01	0.59	0.7	H	60.00	28.94	30.19	50.00	21.48	22.73
10.43	0.67	0.8	H	60.00	26.79	28.22	50.00	19.63	21.06
Remark	H : Hot Line, N : Neutral Line TEST MODE : Bluetooth-CH39(2441MHz)								

Appendix 1. Spectral diagram for Bluetooth

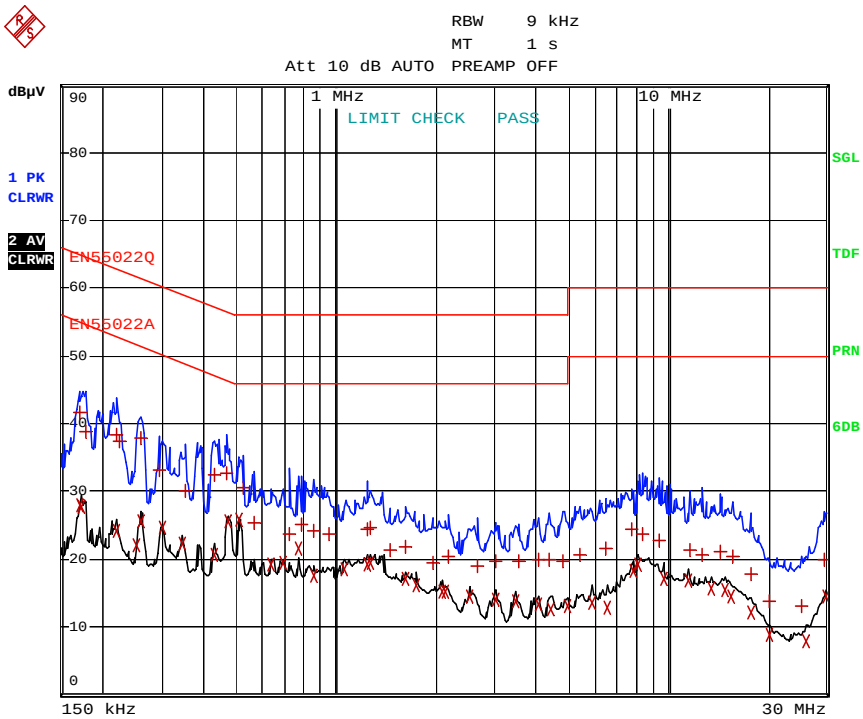
Bluetooth – CH 39

*HOT



Comment: CHD FiVE BLURTOOTH HOT
Date: 15.NOV.2007 10:50:46

*NEUTRAL



Comment: CHD FiVE BLURTOOTH NEUTRAL
Date: 15.NOV.2007 10:59:05

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 1.35dBi.