Test Report for FCC

FCC ID :W2K-WMT20

Report Number		ESTF150901-002		
Applicant	Company name	TMKorea		
	Address	Woolimlions B-504,425 cheongcheon-dong,bupyeong-gu,Incheon-shi		
	Telephone	82-32-623-7470		
Product	Product name	wireless mike		
	Model No.	WMT20	Manufacturer	TMKorea
	Serial No.	NONE	Country of origin	KOREA
Test date	2008-12-18 ~ 2008-12-26		Date of issue	9-Jan-09
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	Senior Engineer J.H.Kim (Signature)			
Reviewed by	Engineering Manager J.M.Yang (Signature)			
Abbreviation	OK, Pass = Passed, 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

Contents

Appendix 1. Spectral diagram

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, Kor
(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)

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

Product Name	: wireless mike
Model Number	: WMT20
Modulation Type	: FHSS
Transfer Rate	: 4Mbps
Number of Channel	: 32 ch
Serial Number	: NONE
Manufacturer	: TMKorea
Country of origin	: KOREA
Rating	: Battery :3.7Vdc
	: Adapter : Input: AC 100V~240V 50 / 60Hz, 0.2A OUTPUT : 5V---0.5A
Receipt Date	: 2008-11-04
Internal clock(s)	: 16MHz

2.2 General descriptions of EUT

- 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)(iii)	Number of Hopping Frequency	Pass	Meet the requirement	>15
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(c)	Band Edge Measurement	Pass	Meet the requirement	

4. Measurement Condition

4.1 EUT Operation.

a. Channel

HOPPING FREQUENCY 32CH MHz

26	48	70	16	38	60
6	28	50	72	18	40
62	08	30	52	74	20
42	64	10	32	54	76
22	44	66	12	34	56
78	24				

b. Measurement Channel : Low(2406MHz), Middle(2442MHz),High(2478MHz)

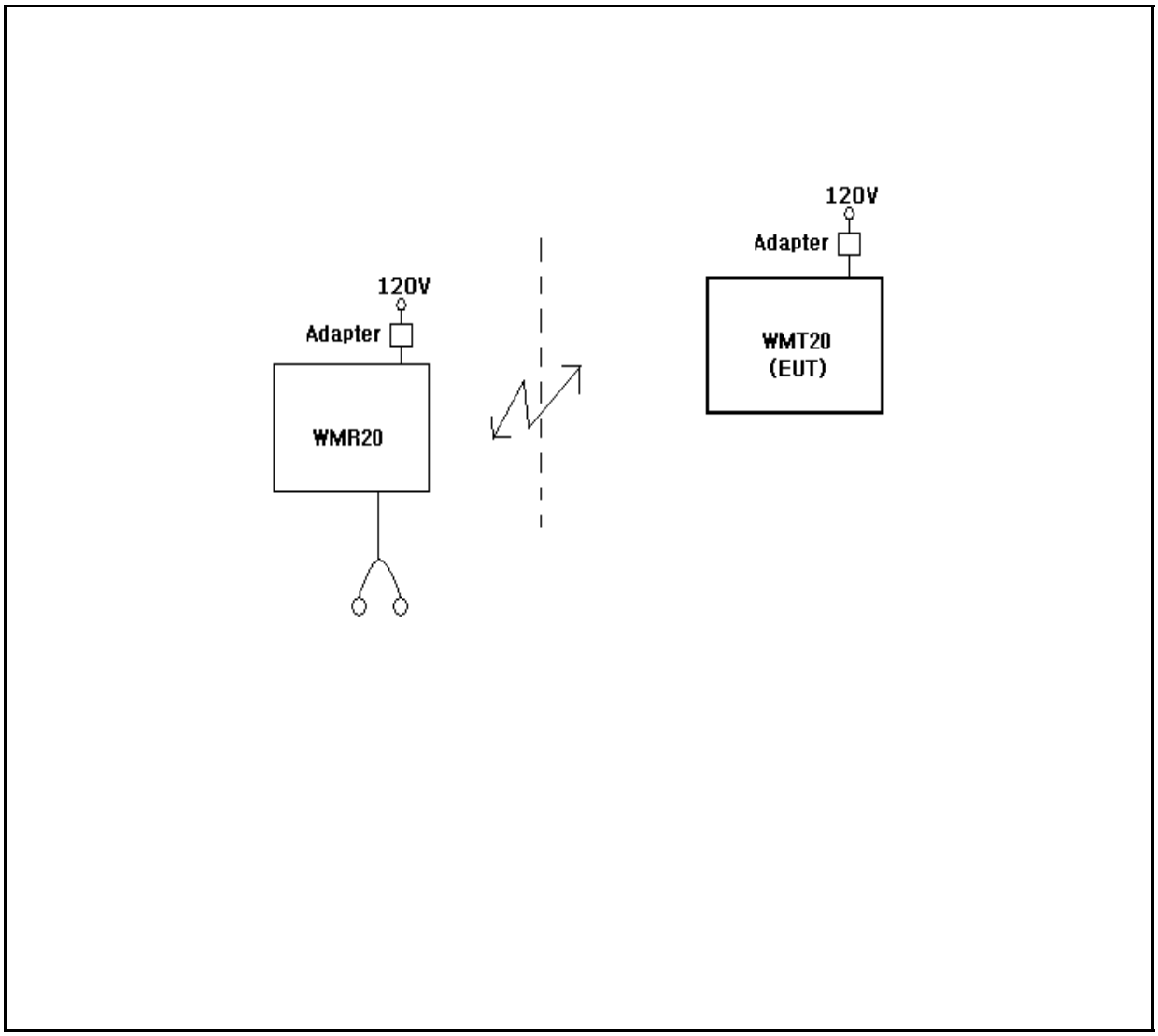
c. Test Mode : FHSS, GFSK

d. Test rate : 4Mbps

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
* After setting the EUT by the provided Test Program, tested under transmission 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)
wireless mike	WMT20	NONE	TMKorea	EUT
Adapter	AK02G-0500050V	NONE	Shenzhen All-key Technology Co.,Ltd.	-

4.5 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
wireless mike	power	Adapter	-	1.5	N	
wireless mike	wireless	wireless (Receiver)	wireless	wireless	-	

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= 10MHz

. Sweep= suitable duration based on the EUT specification.

6dB Bandwidth Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2009-02-28
Dual Directional Coupler	778D	16502	2009-02-28
-Spectrum Analyzer <=> EUT	Loss: 0.5dB	-	

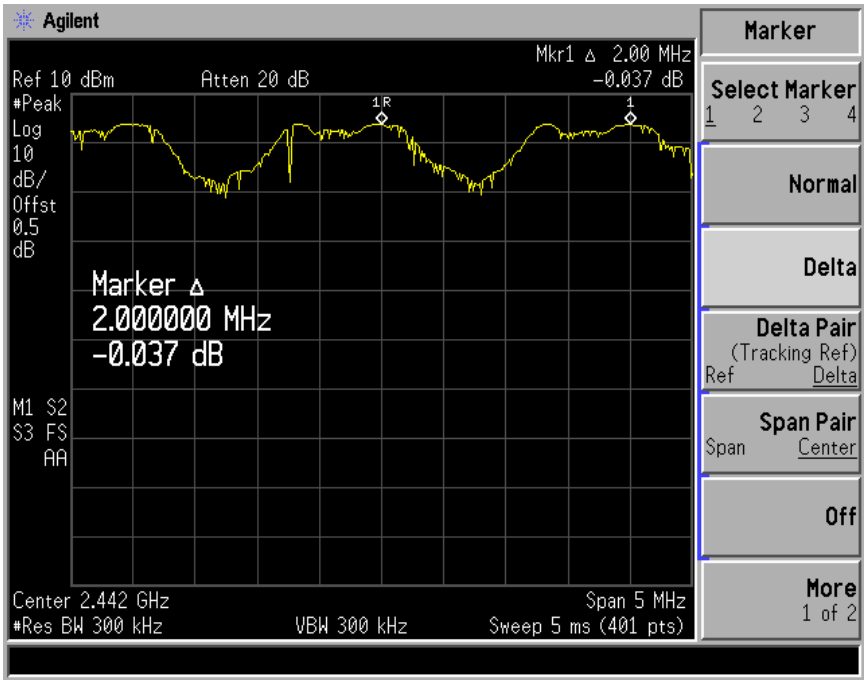
5.3 Measurement results

EUT	Wireless mike	MODEL	WMT20
MODE	FHSS	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

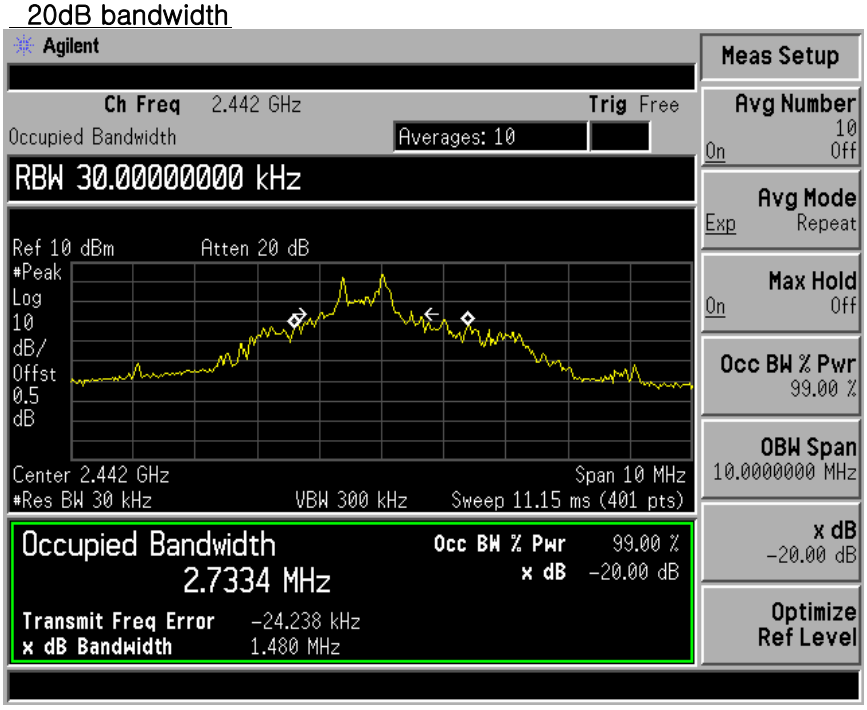
CHANNEL	Channel Frequency (MHz)	Bandwidth at 20dB below(MHz)	Channel Separation (MHz)	Limit (kHz)	PASS/FAIL
Middle	2442	1.48	2.0	>25	PASS

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

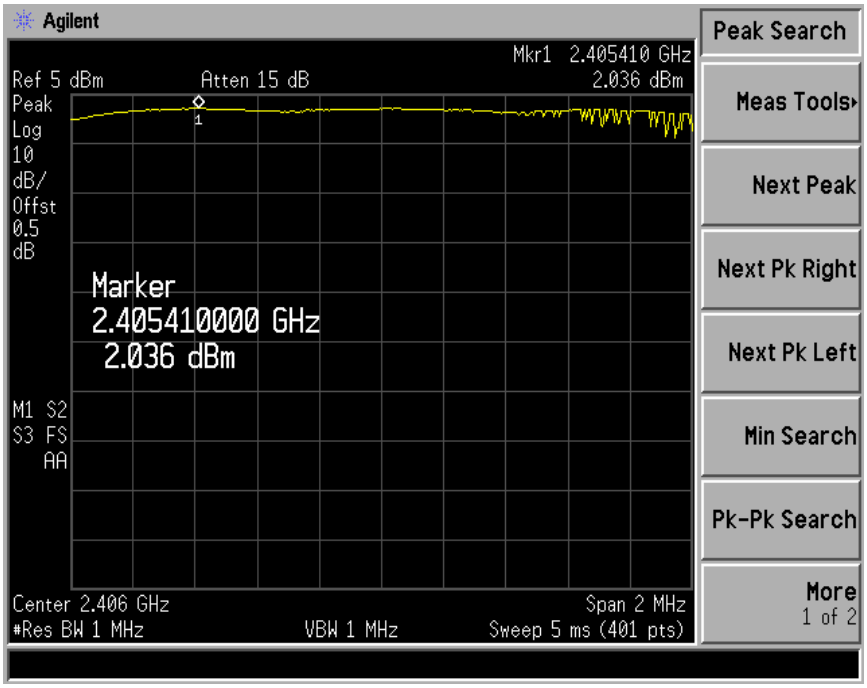
Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2009-02-28
Dual Directional Coupler	778D	16502	2009-02-28
-Spectrum Analyzer <=> EUT	Loss: 0.5dB	-	

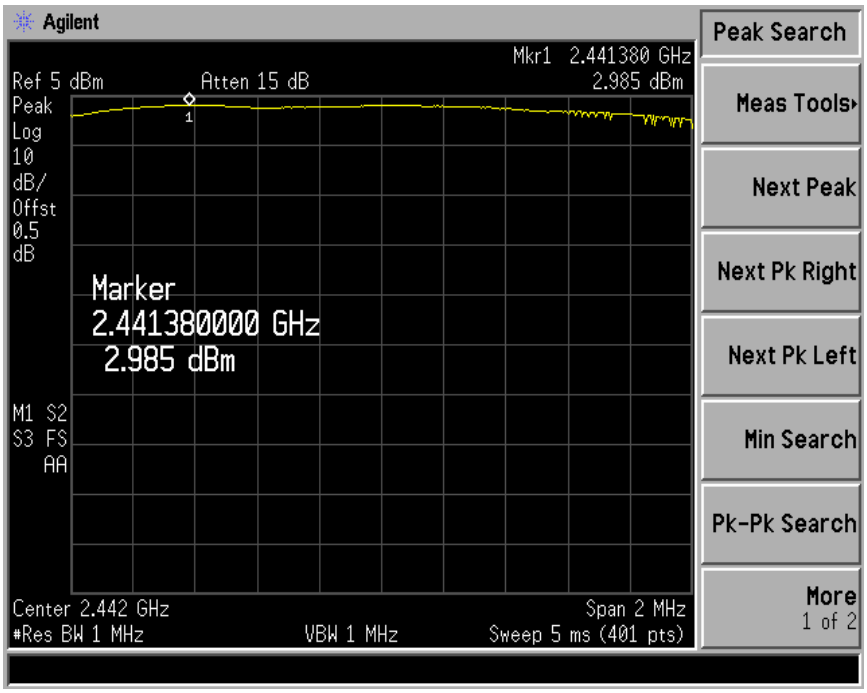
6.2 Measurement results

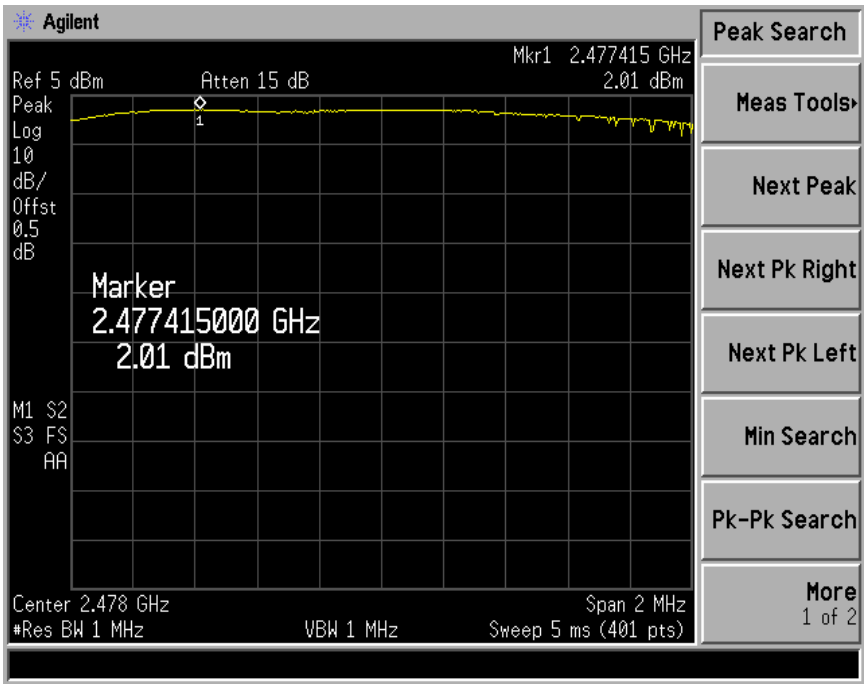
EUT	Wireless mike	MODEL	WMT20
MODE	GFSK	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

CHANNEL	Channel Frequency (MHz)	Peak Power Output(dBm)		Limit[1W] (dBm)	PASS/ FAIL
		(dBm)	(W)		
Low	2406	2.04	0.0016	30.0	PASS
Middle	2442	2.99	0.0020	30.0	PASS
High	2478	2.01	0.0016	30.0	PASS

6.2 Trace data






Agilent
Mkr1 2.477415 GHz
Ref 5 dBm
Atten 15 dB
2.01 dBm
Peak
Log
10
dB/
Offst
0.5
dB
Marker
2.477415000 GHz
2.01 dBm
M1 S2
S3 FS
AA
Center 2.478 GHz
#Res BW 1 MHz
VBW 1 MHz
Span 2 MHz
Sweep 5 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

7. Number of Hopping Frequency

7.1 Test procedure

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5MHz bands shall use at least 15 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

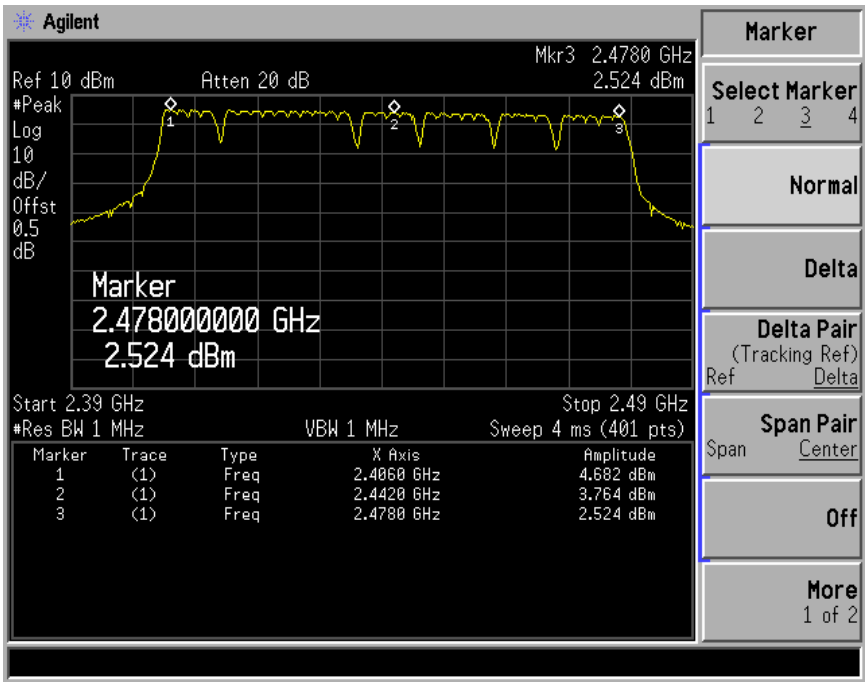
Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4407B	US42041281	2009-02-28
Dual Directional Coupler	778D	16502	2009-02-28
-Spectrum Analyzer <=> EUT	Loss: 0.5dB		

7.3 Measurement results

EUT	Wireless mike	MODEL	WMT20
MODE	FHSS	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

Number of CH	Limit (Number of CH)	PASS/FAIL
32	>15	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	2009-02-28
Dual Directional Coupler	778D	16502	2009-02-28
-Spectrum Analyzer <=> EUT	Loss: 0.5dB	-	

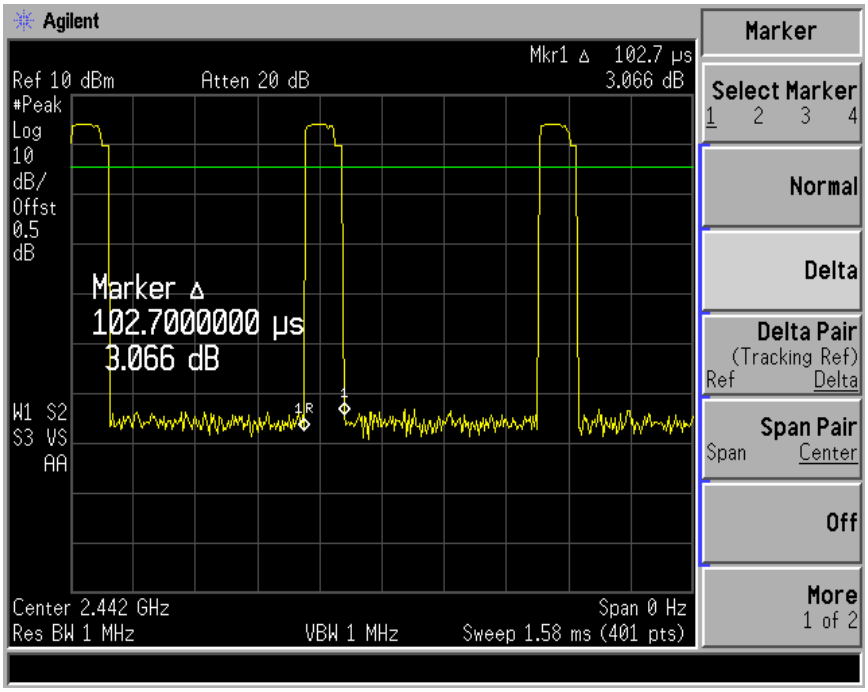
8.3 Measurement results

EUT	Wireless mike	MODEL	WMT20
MODE	FHSS	ENVIRONMENTAL CONDITION	24℃, 43%RH
INPUT POWER	120Vac, 60Hz		

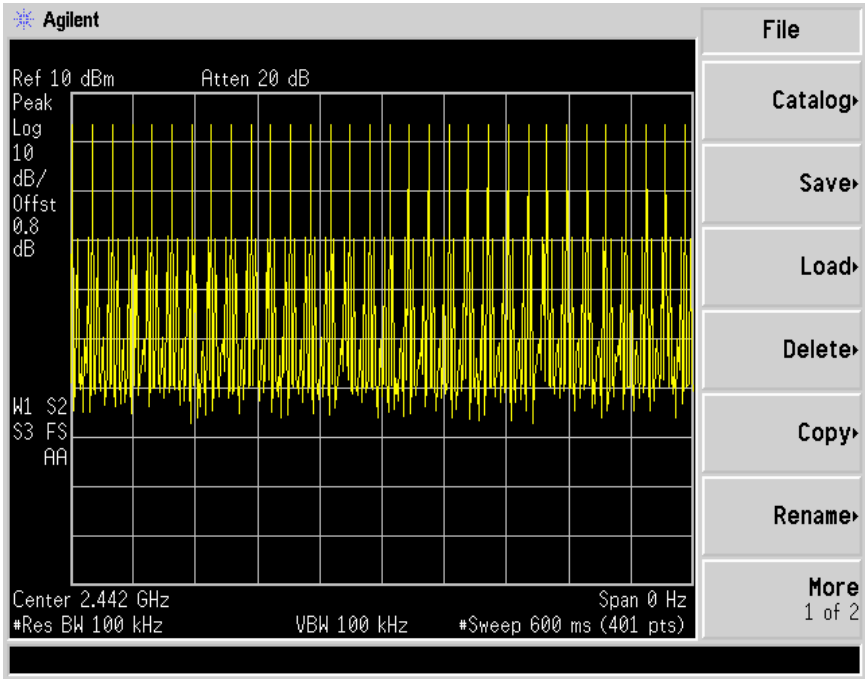
8.3 Measurement Data

8.4 Trace data

Dwell time = 102.7μs



The number of hops for 600ms



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	2009-02-28
Dual Directional Coupler	778D	16502	2009-02-28
-Spectrum Analyzer <=> EUT	Loss: 0.5dB		

9.3 Measurement results of band-edge & out of emission

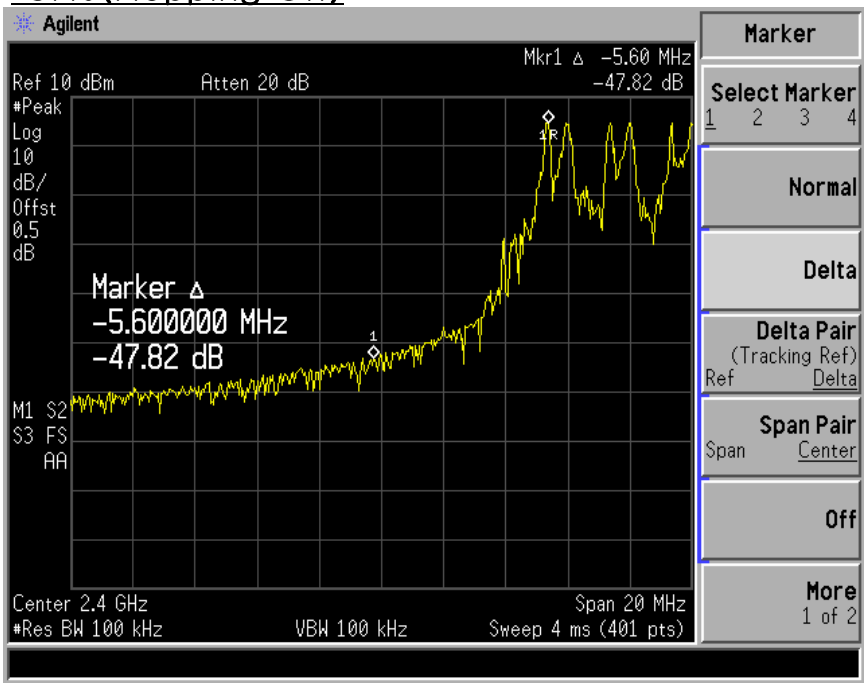
EUT	wireless mike	MODEL	WMT20
MODE	GFSK	ENVIRONMENTAL CONDITION	25℃, 43%RH
INPUT POWER	120Vac, 60Hz		

* Refer to attach spectrum analyzer data chart.

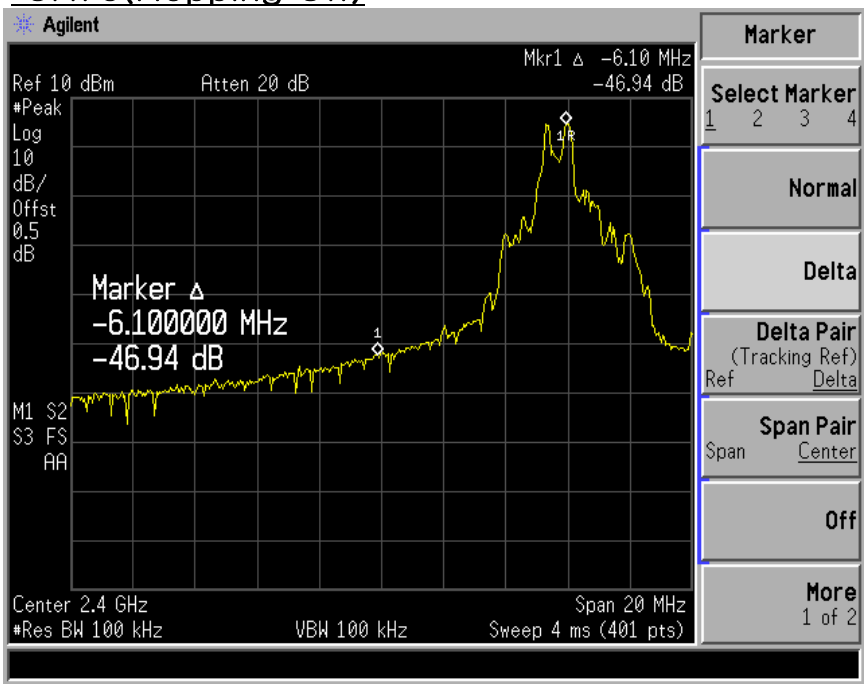
9.4 Trace data of band-edge & Out of Emission

band-edge

CH0(Hopping Off)

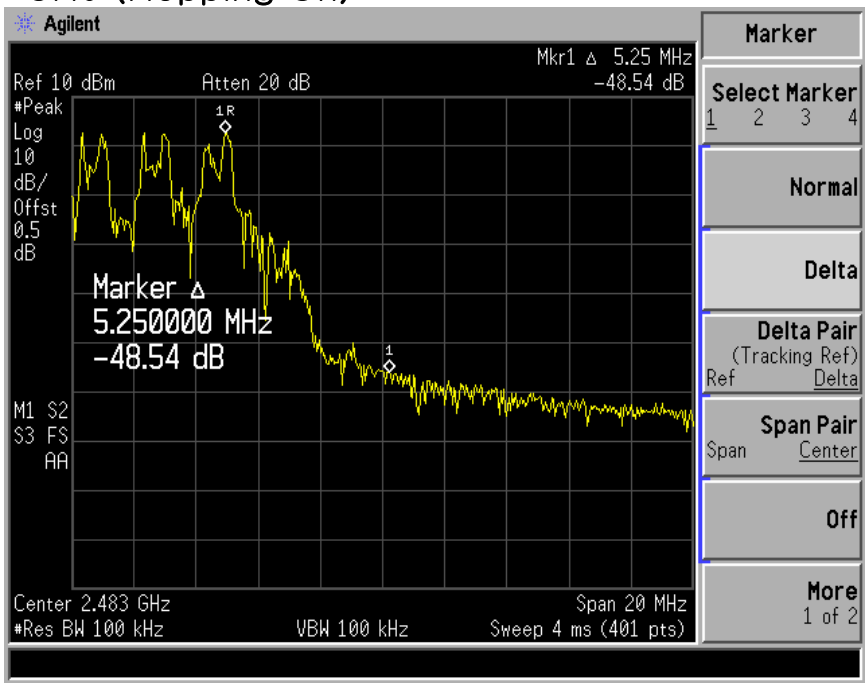


CH78(Hopping Off)

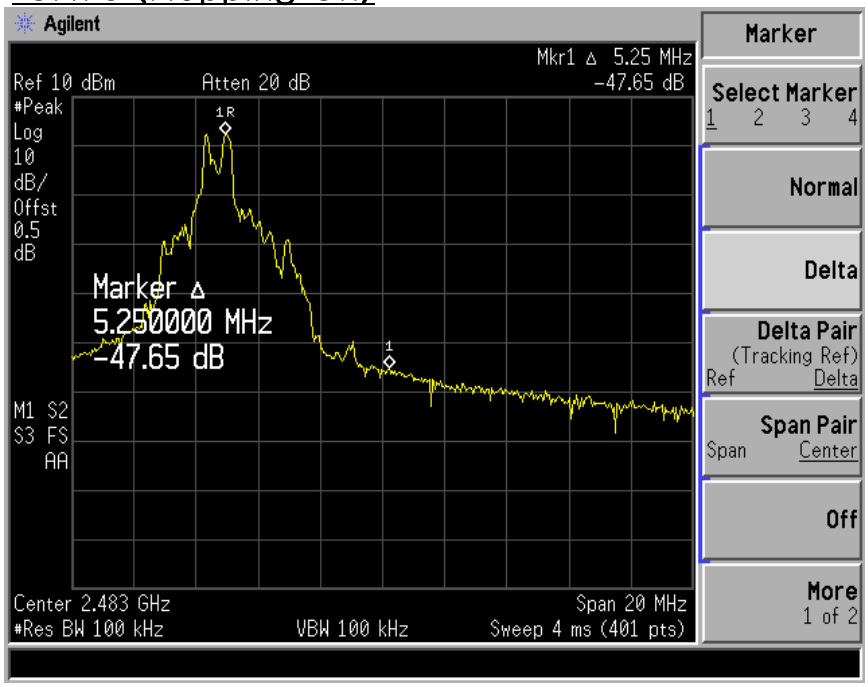


band-edge

CH0 (Hopping On)

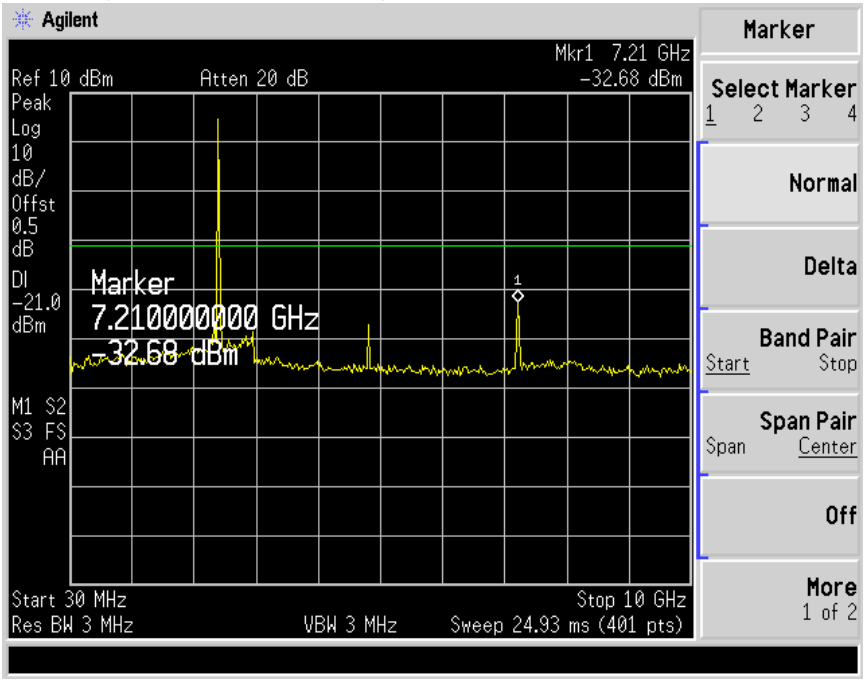


CH78 (Hopping On)

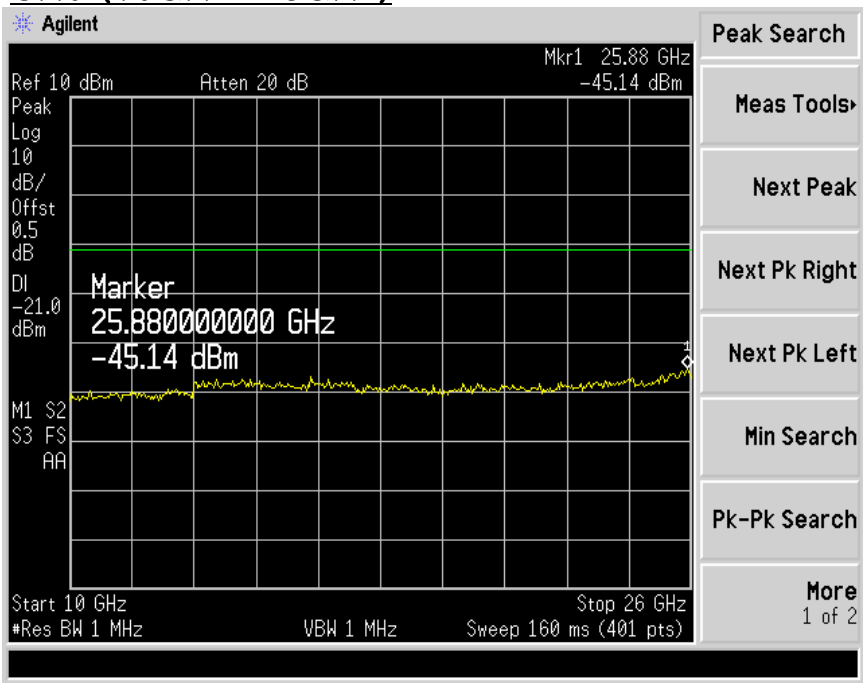


Out of Band Emissions

CH0 (30MHz~10GHz)

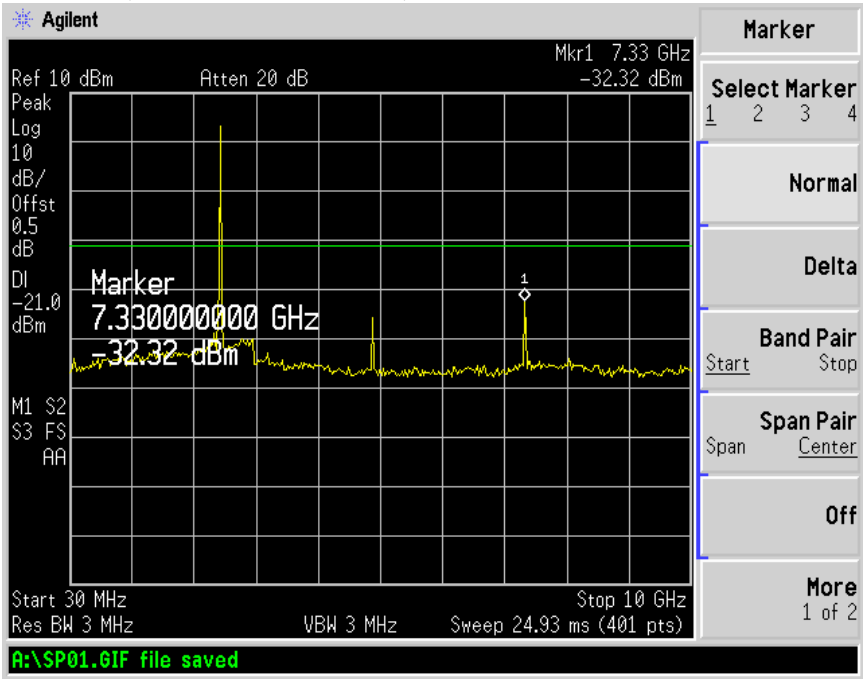


CH0 (10GHz~25GHz)

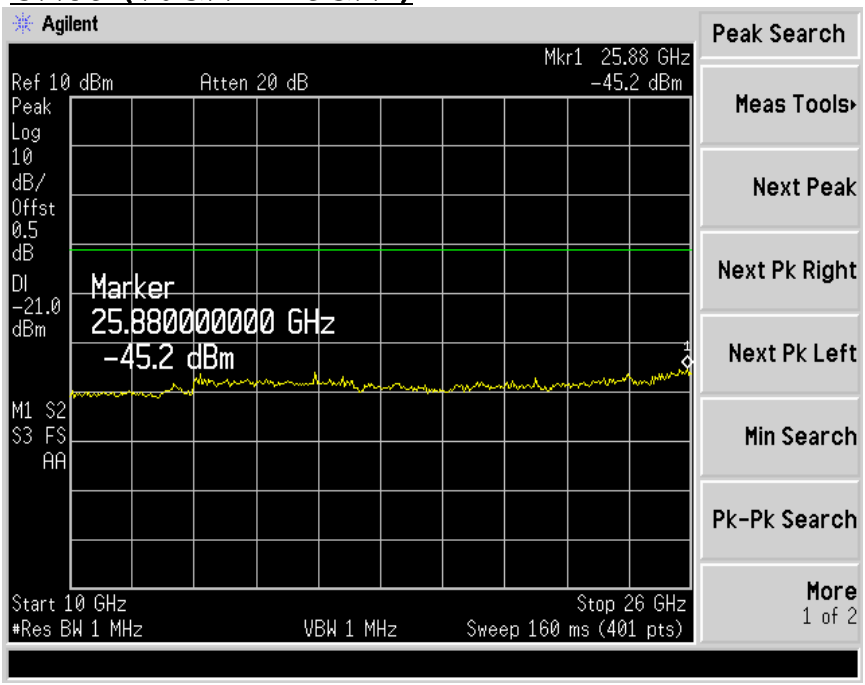


Out of Band Emissions

CH39 (30MHz~10GHz)

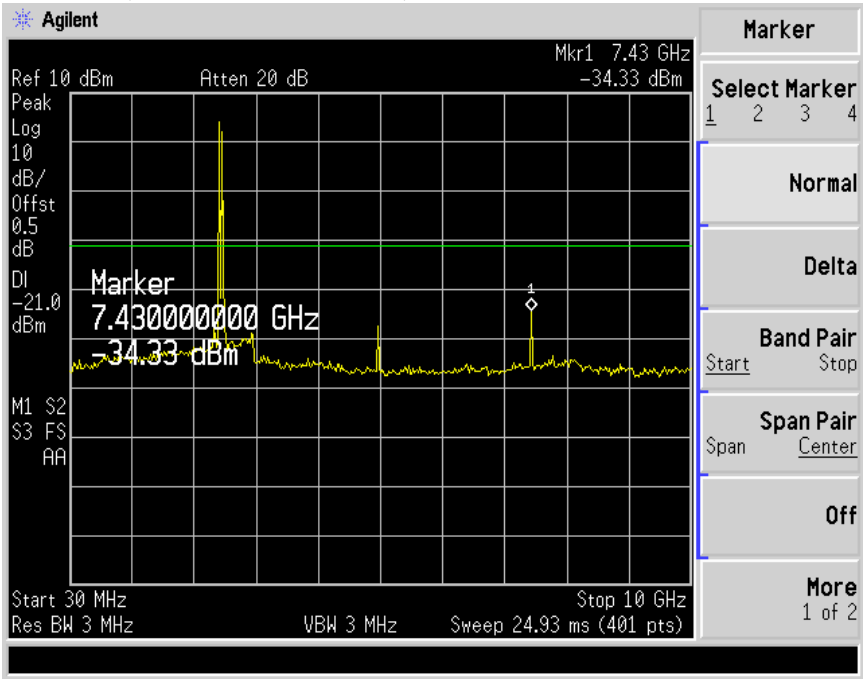


CH39 (10GHz~25GHz)

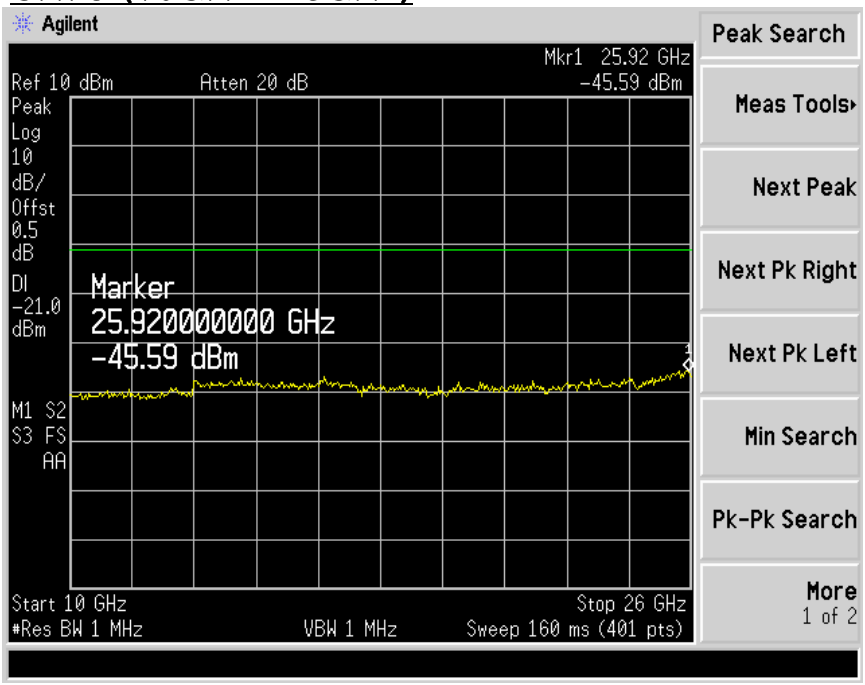


Out of Band Emissions

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	2009. 1. 23
LogBicon Antenna	VULB 9160	SCHWARZBECK	3142	2009. 5. 15
Amplifier	8447F	HP	2805A02972	2009. 6. 26
Spectrum Analyzer	R3273	ADVANTEST	121200664	2009. 11. 24
Horn Antenna	BBHA 9120 D	S/B	352	2009. 6. 13
PREAMPLIFIER	8449B	HP	3008A00581	2009. 3. 06
TEST Receiver	ESPI	Rohde & Schwarz	100005	2009. 1. 15
Pre Amplifier	310N	SONOMAINST	185723	2009. 9. 19
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) : 3 ℃
Humidity (%) : 33 %

10.3 Test data

Test Date : 26-Dec-08 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)
35.15	10.10	V	1.0	11.06	0.3	40.0	21.46	-18.54
43.20	7.40	V	1.0	11.66	0.3	40.0	19.35	-20.65
110.25	10.70	V	1.0	10.26	1.3	43.5	22.26	-21.24
117.39	11.50	V	1.0	10.27	1.3	43.5	23.06	-20.44
150.50	6.20	V	1.0	12.81	1.7	43.5	20.71	-22.79
162.03	5.70	H	1.8	12.89	1.7	43.5	20.29	-23.21
172.11	4.60	H	1.7	12.08	1.8	43.5	18.48	-25.02
212.93	4.20	H	1.3	10.00	2.2	43.5	16.40	-27.10
282.56	5.40	H	1.2	12.48	2.8	46.0	20.68	-25.32
348.00	5.30	H	1.0	14.02	3.3	46.0	22.61	-23.39

Remark	H : Horizontal, V : Vertical *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(LOW)

Test Date : 24-Dec-08 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 / VBW-1MHz)								
2406.00	64.84	H	1.3	26.67	4.5	*OB	96.01	-
2406.00	58.33	V	1.5	26.37	4.5	*OB	89.20	-
4812.00	61.17	H	1.1	29.95	-27.9	74.0	63.22	-10.78
4812.00	53.46	V	1.1	29.95	-27.9	74.0	55.51	-18.49
7218.00	55.17	H	1.2	35.72	-25.5	74.0	65.39	-8.61
7218.00	48.90	V	1.4	35.72	-25.5	74.0	59.12	-14.88
9624.00	48.75	H	1.3	37.89	-22.6	74.0	64.04	-9.96
9624.00	44.30	V	1.1	37.89	-22.6	74.0	59.59	-14.41
AV(RBW 1MHz / VBW 10Hz)								
2406.00	21.44	H	1.3	26.67	4.5	*OB	52.61	-
2406.00	20.39	V	1.5	26.37	4.5	*OB	51.26	-
4812.00	34.17	H	1.1	29.95	-27.9	54.0	36.22	-17.78
4812.00	33.57	V	1.1	29.95	-27.9	54.0	35.62	-18.38
7218.00	32.50	H	1.2	35.72	-25.5	54.0	42.72	-11.28
7218.00	32.00	V	1.4	35.72	-25.5	54.0	42.22	-11.78
9624.00	33.05	H	1.3	37.89	-22.6	54.0	48.34	-5.66
9624.00	31.07	V	1.1	37.89	-22.6	54.0	46.36	-7.64
Remark	H : Horizontal, V : Vertical TEST MODE : 2406MHz *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 above1000Mhz) *CL = Cable Loss(In case of below1000Mhz)							

10.3-3 Test data(MIDDLE)

Test Date : 24-Dec-08 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 / VBW-1MHz)								
2442.00	65.51	H	1.3	26.44	4.5	*OB	96.45	-
2442.00	58.50	V	1.2	26.44	4.5	*OB	89.44	-
4884.00	61.70	H	1.4	30.08	-28.6	74.0	63.18	-10.82
4884.00	53.26	V	1.2	30.08	-28.6	74.0	54.74	-19.26
7326.00	54.17	H	1.4	35.93	-26.0	74.0	64.10	-9.90
7326.00	48.70	V	1.3	35.93	-26.0	74.0	58.63	-15.37
9768.00	49.84	H	1.2	38.13	-23.1	74.0	64.87	-9.13
9768.00	42.78	V	1.1	38.13	-23.1	74.0	57.81	-16.19
AV(RBW 1MHz / VBW 10Hz)								
2442.00	21.51	H	1.3	26.44	4.5	*OB	52.45	-
2442.00	20.10	V	1.2	26.44	4.5	*OB	51.04	-
4884.00	35.36	H	1.4	30.08	-28.6	54.0	36.84	-17.16
4884.00	33.91	V	1.2	30.08	-28.6	54.0	35.39	-18.61
7326.00	33.51	H	1.4	35.93	-26.0	54.0	43.44	-10.56
7326.00	31.97	V	1.3	35.93	-26.0	54.0	41.90	-12.10
9768.00	32.07	H	1.2	38.13	-23.1	54.0	47.10	-6.90
9768.00	30.17	V	1.1	38.13	-23.1	54.0	45.20	-8.80
Remark	H : Horizontal, V : Vertical TEST MODE : 2442MHz *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 above1000Mhz) *CL = Cable Loss(In case of below1000Mhz)							

10.3-4 Test data(HIGH)

Test Date : 24-Dec-08 Measurement Distance : 3 m

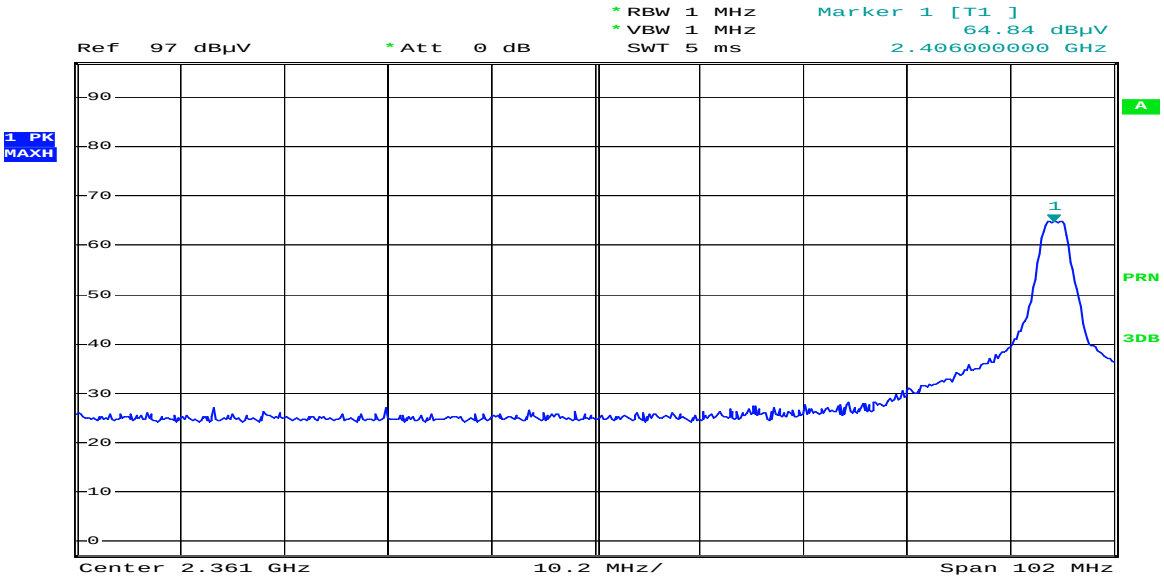
Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW / VBW-1MHz)								
2478.00	69.10	H	1.2	26.52	4.5	*OB	100.12	-
2478.00	57.92	V	1.2	26.52	4.5	*OB	88.94	-
4956.00	64.40	H	1.5	31.22	-28.2	74.0	67.42	-6.58
4956.00	53.17	V	1.3	31.22	-28.2	74.0	56.19	-17.81
7436.00	52.02	H	1.4	35.95	-25.5	74.0	62.47	-11.53
7436.00	48.32	V	1.2	35.95	-25.5	74.0	58.77	-15.23
9912.00	49.22	H	1.1	38.43	-23.9	74.0	63.75	-10.25
9912.00	44.32	V	1.2	38.43	-23.9	74.0	58.85	-15.15
AV(RBW 1MHz / VBW 10Hz)								
2478.00	21.88	H	1.2	26.52	4.5	*OB	52.90	-
2478.00	19.89	V	1.2	26.52	4.5	*OB	50.91	-
4956.00	35.38	H	1.5	31.22	-28.2	54.0	38.40	-15.60
4956.00	33.87	V	1.3	31.22	-28.2	54.0	36.89	-17.11
7436.00	32.87	H	1.4	35.95	-25.5	54.0	43.32	-10.68
7436.00	31.17	V	1.2	35.95	-25.5	54.0	41.62	-12.38
9912.00	32.22	H	1.1	38.43	-23.9	54.0	46.75	-7.25
9912.00	30.17	V	1.2	38.43	-23.9	54.0	44.70	-9.30

Remark	H : Horizontal, V : Vertical TEST MODE : 2478MHz *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 above1000Mhz) *CL = Cable Loss(In case of below1000Mhz)

10.3-5 Restricted Band Edges

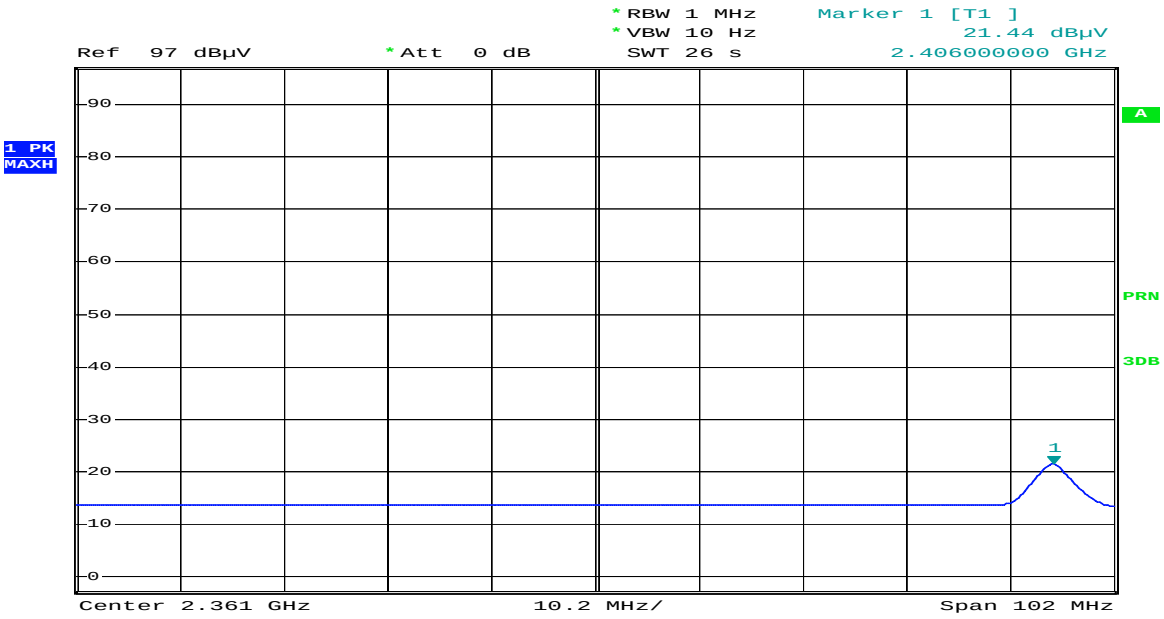
Band Edges(CH Low)

Detector mode:Peak Polarity:Horizontal



Comment: WMT BT LOW PK HOR
Date: 18.DEC.2008 22:34:24

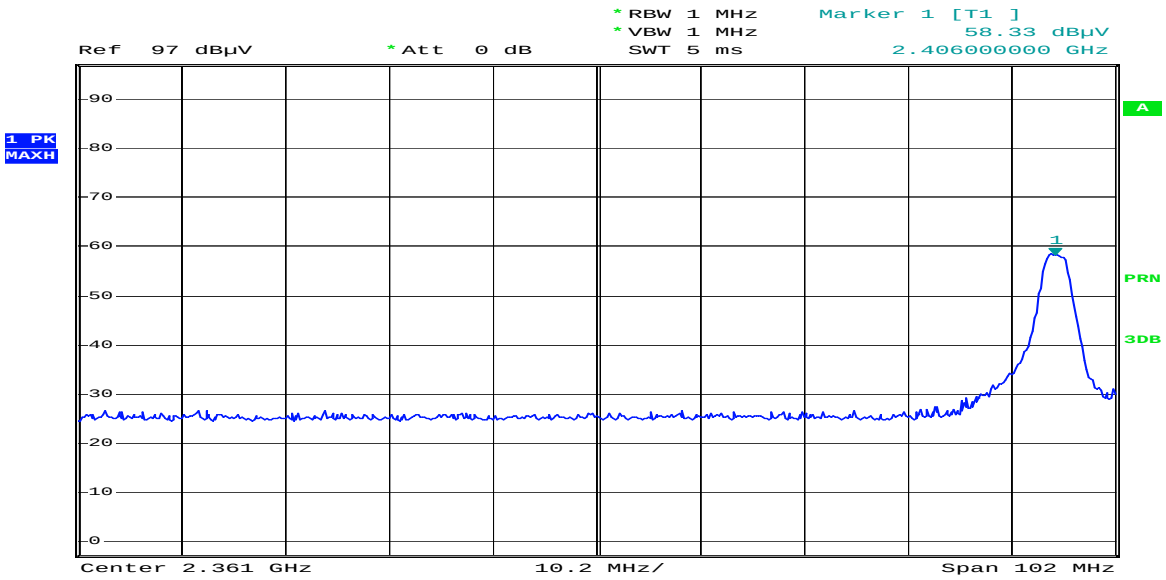
Detector mode:Average Polarity:Horizontal



Comment: WMT BT LOW AV HOR
Date: 18.DEC.2008 22:33:23

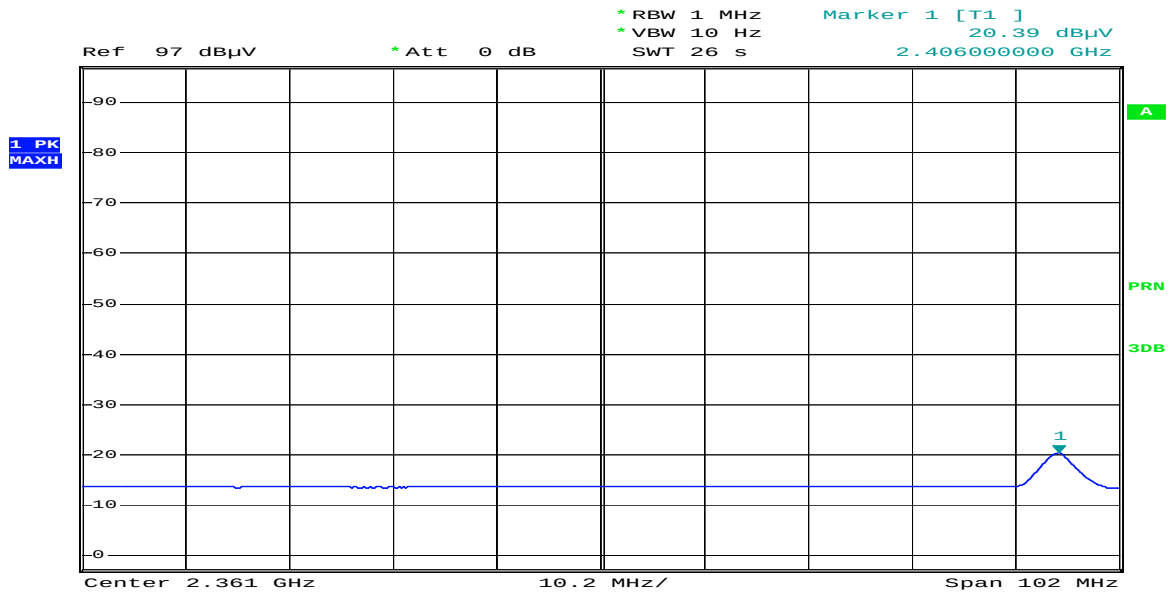
Band Edges(CH Low)

Detector mode:Peak Polarity:Vertical



Comment: WMT BT LOW PK VER
Date: 18.DEC.2008 22:36:18

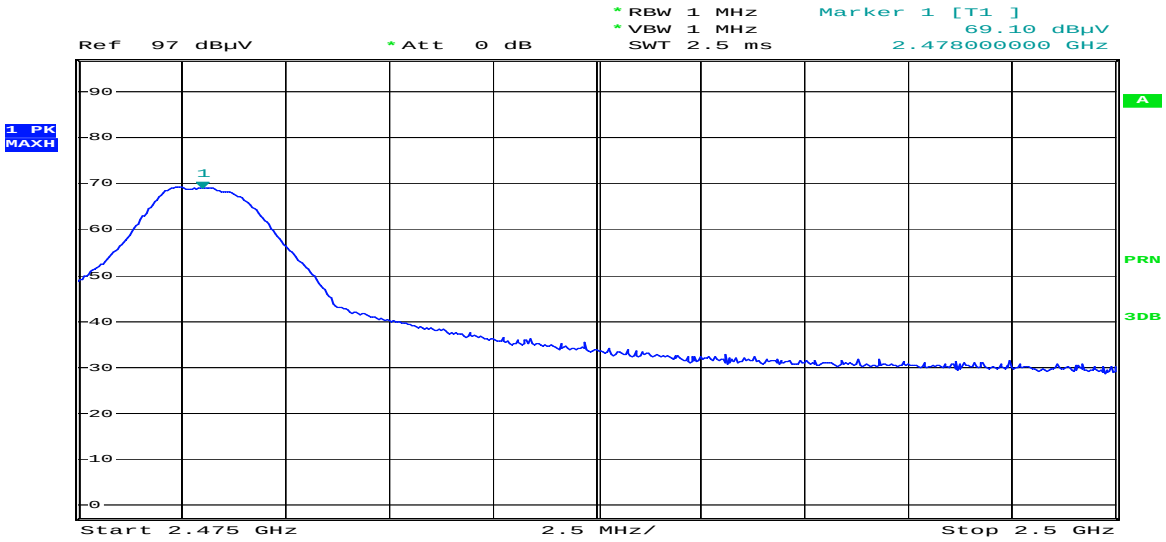
Detector mode:Average Polarity:Vertical



Comment: WMT BT LOW AV VER
Date: 18.DEC.2008 22:41:55

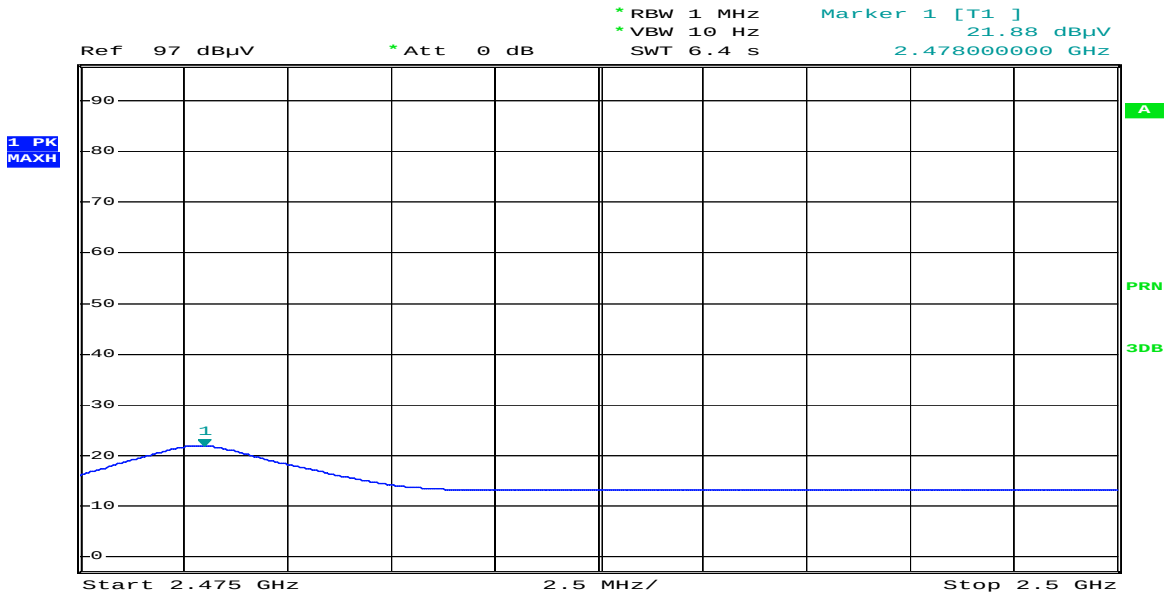
Band Edges(CH High)

Detector mode:Peak Polarity:Horizontal



Comment: WMT BT HIGH PK HOR
Date: 18.DEC.2008 23:04:51

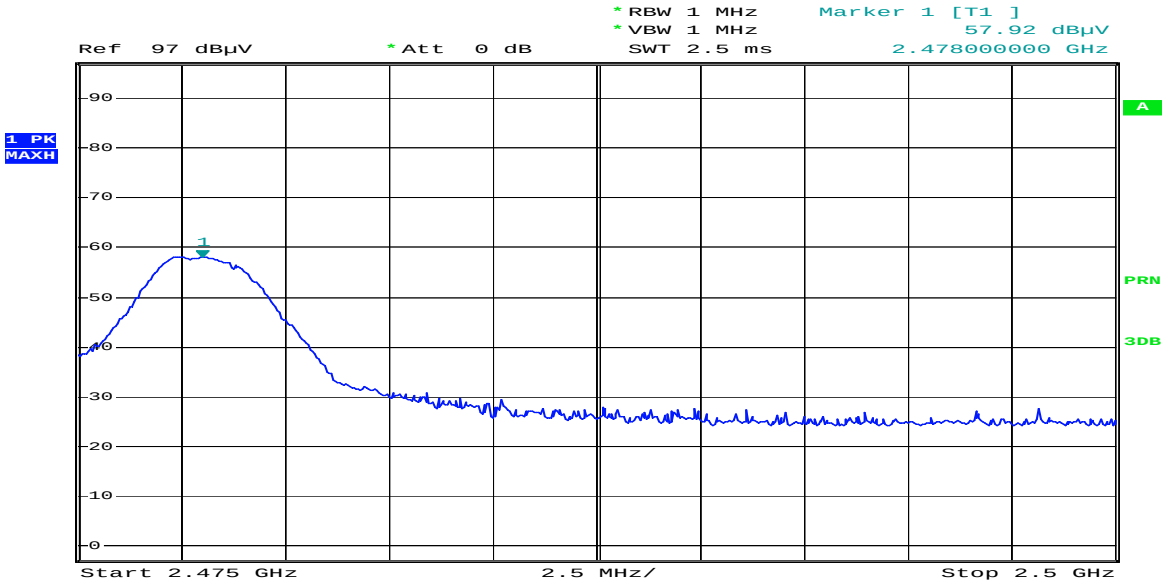
Detector mode:Average Polarity:Horizontal



Comment: WMT BT HIGH AV HOR
Date: 18.DEC.2008 22:56:40

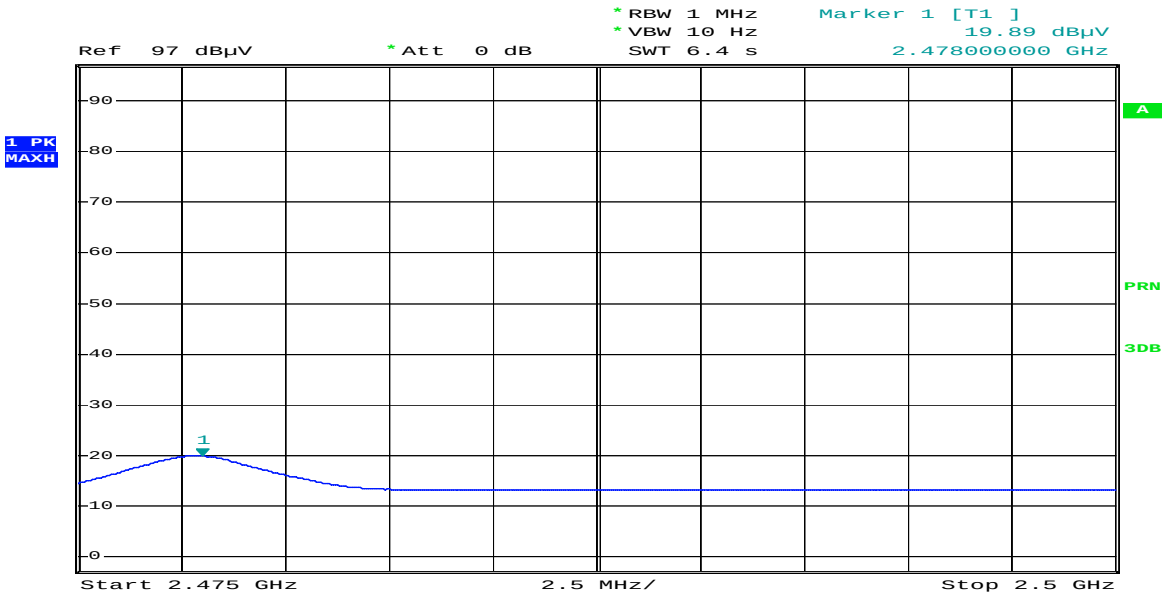
Band Edges(CH High)

Detector mode:Peak Polarity:Vertical



Comment: WMT BT HIGH PK VER
Date: 18.DEC.2008 22:46:58

Detector mode:Average Polarity:Vertical



Comment: WMT BT HIGH AV VER
Date: 18.DEC.2008 22:51:18

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 (2007) & ANSI C 63.4 (2003) The test setup was made according to FCC Part 15 (2007) & 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	ESH3-Z5	Schwarzbeck	838979/010	2009. 2. 28
LISN	NNLA8120A	Schwarzbeck	8120161	2009. 2. 28
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2009. 8. 27
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2009. 9. 10

11.2 Environmental Condition

Test Place : Shield Room
Temperature (°C) : 19 ℃
Humidity (%) : 36 %

11.3 Test data

Test Date : 26-Dec-08

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)
0.15	0.15	0.2	H	65.84	51.67	52.05	55.84	34.96	35.34
0.16	0.16	0.2	N	65.26	48.37	48.74	55.26	30.53	30.90
0.19	0.17	0.2	H	63.91	48.01	48.36	53.91	27.82	28.17
0.20	0.17	0.2	H	63.57	46.78	47.13	53.57	26.90	27.25
0.23	0.18	0.2	H	62.52	44.36	44.69	52.52	26.17	26.50
0.27	0.20	0.1	H	61.15	40.97	41.28	51.15	23.64	23.95
0.50	0.20	0.4	H	56.00	32.08	32.64	46.00	19.44	20.00
0.58	0.20	0.3	H	56.00	30.60	31.13	46.00	17.85	18.38
0.62	0.20	0.3	N	56.00	29.76	30.28	46.00	18.25	18.77
0.65	0.20	0.3	N	56.00	29.65	30.15	46.00	17.97	18.47
0.91	0.19	0.4	N	56.00	28.59	29.16	46.00	19.30	19.87
1.33	0.20	0.4	H	56.00	28.44	29.07	46.00	19.19	19.82
Remark	H : Hot Line, N : Neutral Line TEST MODE : Middle (2442 MHz)								

12. Antenna Requirement

12.1 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.

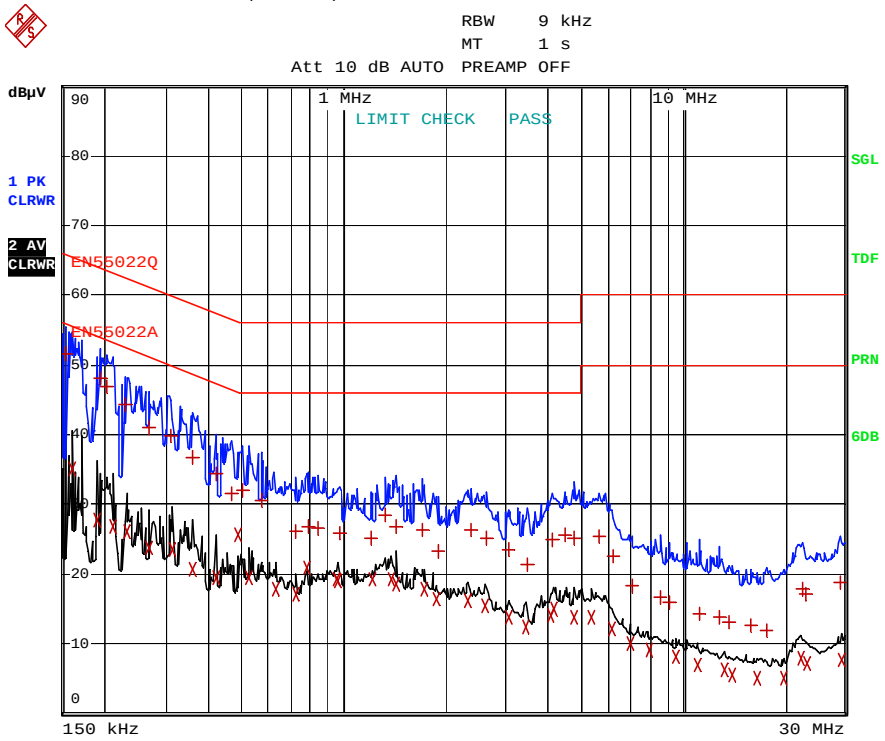
And according to FCC 47 CFR Section 15.24

12.2 Antenna Connected Construction

The antenna types used in this product are internal Antenna. The maximum Gain of this antenna is 0dBi.

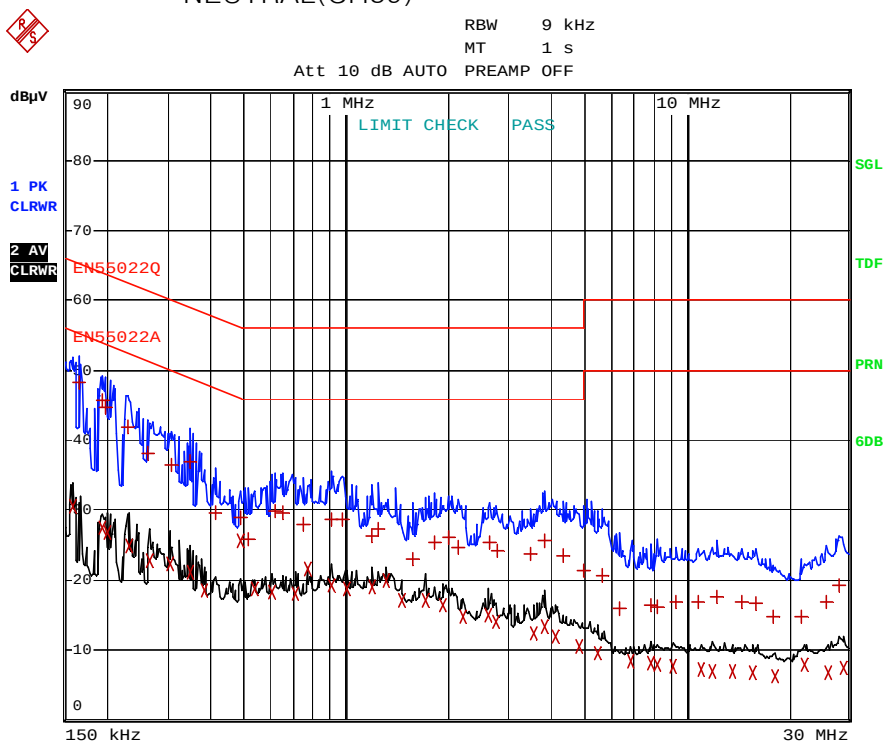
Appendix 1. Spectral diagram

*HOT(CH39)



Comment: WMT20 HOT
Date: 26.DEC.2008 18:45:46

*NEUTRAL(CH39)



Comment: WMT20 NEUTRAL
Date: 26.DEC.2008 18:52:24