

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C AND CANADA RSS-210 REQUIREMENT

OF

Product Name: 2.4GHz Wireless mouse

Brand Name: N/A

Model No.: B250 / 23420 / 23423

Model Difference: Color difference

FCC ID: P5A-CB0013
IC: 9468A-00B250

Report No.: ER/2012/80013

Issue Date: Aug. 24, 2012

FCC Rule Part: §15.249

IC Rule Part: RSS-210 issue 8: 2010, Annex 2.9
ARESON Technology Corp.

Prepared for: 11F, No. 646, Sec. 5, Chongxin Rd., Sanchung
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SGS Taiwan Ltd.
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VERIFICATION OF COMPLIANCE

Applicant: ARESON Technology Corp.
11F, No. 646, Sec. 5, Chongxin Rd., Sanchung Dist., New Taipei City
241, Taiwan (R.O.C.)

Product Description: 2.4GHz Wireless mouse

FCC ID: P5A-CB0013
IC: 9468A-00B250

Brand Name: N/A

Model No.: B250 / 23420 / 23423

Model Difference: Color difference

File Number: ER/2011/70003

Date of test: Aug. 09, 2012 ~ Aug. 22, 2012

Date of EUT Received: Aug. 09, 2012

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd., Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249 and RSS-210 issue 8: 2010 Annex 2.9.

The test results of this report relate only to the tested sample identified in this report.

Test By:

Marcus Tseng

Date:

Aug. 24, 2012

Marcus Tseng / Engineer

Prepared By:

Tiffany Kao

Date:

Aug. 24, 2012

Tiffany Kao / Clerk

Approved By:

Jim Chang

Date:

Aug. 24, 2012

Jim Chang / Supervisor

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Version

Version No.	Date	Description
00	Aug. 24, 2012	Initial creation of document

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1. GENERAL INFORMATION

1.1. Product Description

Product Name:	2.4GHz Wireless mouse
Brand Name:	N/A
Model No.:	B250 / 23420 / 23423
Model Difference:	Color difference
Hardware Version	01
Software Version	MA431D
Operation Frequency:	2408~2474MHz
Channel number:	34 channels
Channel Spacing:	2MHz
Modulation Type:	GFSK
Power Supply	DC 3V form AA Batteries*2
Antenna Designation:	Printed Antenna

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1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: P5A-CB0013** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules and **IC: 9468A-00B250** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 2.9.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and RSS-Gen: 2007. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 & 10 meters) and FCC Registration Number: 94644.

1.5. Special Accessories

Not available for this EUT intended for grant.

1.6. Equipment Modifications

Not available for this EUT intended for grant.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The Transmitter was operated in the engineering operating mode. the Tx frequency was fixed at 5736, 5762 and 5814 MHz which were for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003 and RSS-Gen: 2007. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003 and RSS-Gen:2007.

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2.4. Limitation

(1) Conducted Emission

According to section 15.207(a) and RSS-Gen §7.2.2 Conducted Emission Limits is as following.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 - 56	56 - 46
0.5 – 5	56	46
5 - 30	60	50

(2) Radiated Emission 15.249(a) and RSS-210 issue 8, §A2.9(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3

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(3) Radiated Emission 15.249 (d) and RSS-210 issue 8, §A2.9(b)

Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 and RSS-210 issue 8, §A2.9(a) as below, whichever is the lesser attenuation.

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance (m)	Field strength at 3m $\text{dB}\mu\text{V/m}$
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

(4) Radiated Emission 15.249(e) and RSS-210 issue 8

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

- Remark:
1. Emission level in $\text{dB}\mu\text{V/m} = 20 \log(\mu\text{V/m})$
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205
 4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of §15.205, then the general radiated emission limits in § 15.209 apply.

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2.5. Configuration of Tested System

Fig. 2-1 Configuration

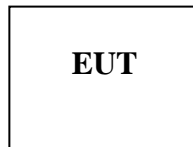


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	N/A					

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

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3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207/ RSS-Gen §7.2.2	Conducted Emission	N/A
§15.249(a)(d)(e) RSS-210 issue 8, §A2.9(a)(b)	Field Strength Measurement (TX and RX)	Compliant
§15.215(c)	20dB band width Measurement	Compliant
RSS-Gen §4.6.1	99% Power Bandwidth	Compliant

4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting and receive mode is programmed.

Channel low (2408MHz)、mid (2440MHz) and high (2474MHz) with highest data rate are chosen for full testing.

5. MEASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SPURIOUS RADIATION

Measurement uncertainty (Polarization : Vertical)	30MHz - 180MHz: 3.37dB
	180MHz -417MHz: 3.19dB
	0.417GHz-1GHz: 3.19dB
	1GHz - 18GHz: 4.04dB
	18GHz - 40GHz: 4.04dB

Measurement uncertainty (Polarization : Horizontal)	30MHz - 167MHz: 4.22dB
	167MHz -500MHz: 3.44dB
	0.5GHz-1GHz: 3.39dB
	1GHz - 18GHz: 4.08dB
	18GHz - 40GHz: 4.08dB

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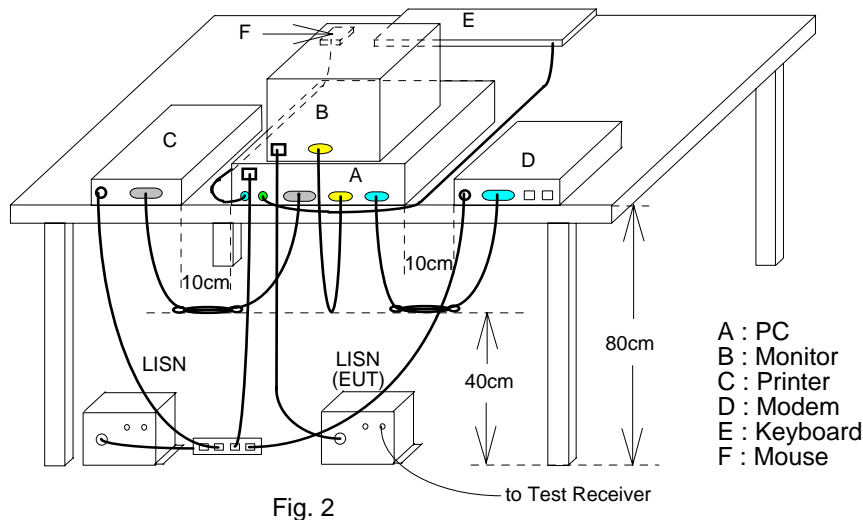
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6. CONDUCTED EMISSIONS TEST

6.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)



6.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013
EMI Receiver	R&S	ESCS 30	828985/004	09/23/2011	09/22/2012
LISN	Rolf-Heine	NNB-2/16Z	99012	03/23/2012	03/22/2013
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/23/2012	03/22/2013
Coaxial Cables	N/A	WK CE Cable	N/A	01/05/2012	01/04/2013

6.4 Measurement Result:

N/A

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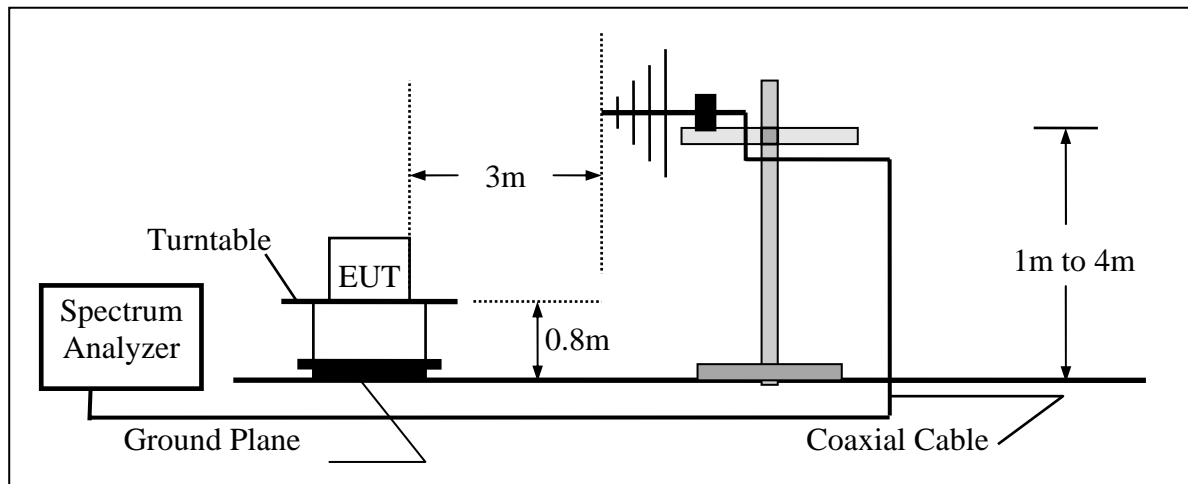
7. RADIATED EMISSION TEST

7.1 Measurement Procedure

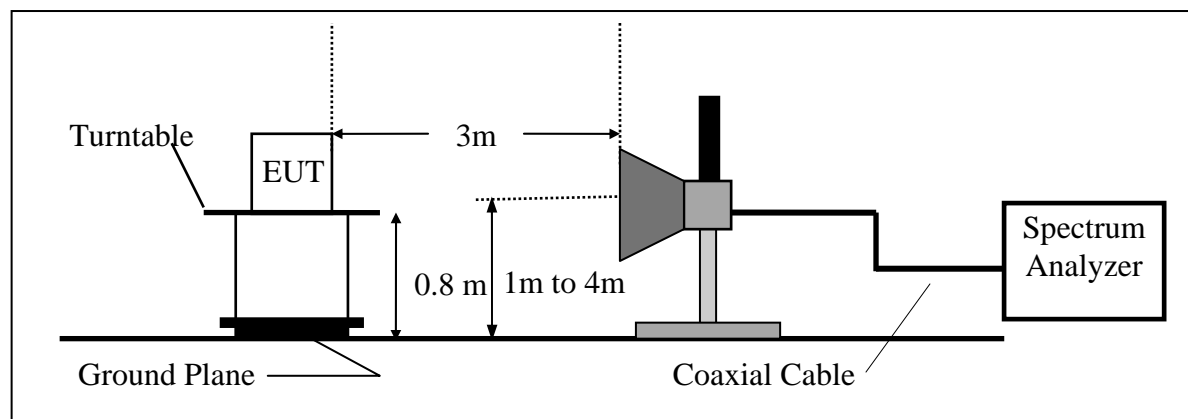
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

7.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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7.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/15/2011	02/14/2013
Spectrum Analyzer	R&S	FSV-30	101398	10/18/2011	10/17/2013
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/10/2012	01/09/2014
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2011	05/18/2013
Horn Antenna	Schwarzbeck	BBHA9170	185	07/11/2011	07/10/2013
Pre-Amplifier	Agilent	8447D	2944A07676	01/04/2012	01/03/2013
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/04/2012	01/03/2013
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	02/28/2012	02/28/2013
Attenuator	Mini-Circuit	BW-S10W2+	004	02/28/2012	02/27/2013
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_Rx	9	01/04/2012	01/03/2013
3m Site NSA	SGS	966 chamber	N/A	07/15/2012	07/14/2013

7.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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7.5 Measurement Result

Radiated Spurious Emission Measurement Result

Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2408 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX LOW MAIN	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2407.57	F	Average	85.24	4.67	89.91	94.00	-4.09
2407.57	F	Peak	88.43	4.67	93.10	114.00	-20.90

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2408 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX LOW MAIN	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2407.61	F	Average	85.66	5.36	91.02	94.00	-2.98
2407.61	F	Peak	90.34	5.36	95.70	114.00	-18.30

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2440 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX MID MAIN	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2439.54	F	Average	85.11	4.85	89.96	94.00	-4.04
2439.54	F	Peak	88.23	4.85	93.08	114.00	-20.92

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2440 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX MID MAIN	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2439.66	F	Average	85.66	5.69	91.35	94.00	-2.65
2439.66	F	Peak	89.28	5.69	94.97	114.00	-19.03

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2474 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX HIGH MAIN	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2473.58	F	Average	82.47	5.20	87.67	94.00	-6.33
2473.58	F	Peak	85.60	5.20	90.80	114.00	-23.20

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2474 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX HIGH MAIN	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2474.60	F	Average	85.42	6.19	91.61	94.00	-2.39
2474.60	F	Peak	88.73	6.19	94.92	114.00	-19.08

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2408 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

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“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
31.94	S	Peak	34.40	-14.30	20.10	40.00	-19.90
61.04	S	Peak	33.95	-14.78	19.17	40.00	-20.83
103.72	S	Peak	33.73	-16.41	17.32	43.50	-26.18
468.44	S	Peak	30.26	-9.90	20.36	46.00	-25.64
792.42	S	Peak	27.78	-4.29	23.49	46.00	-22.51
939.86	S	Peak	27.58	-2.19	25.39	46.00	-20.61
4816.00	H	Average	40.22	9.58	49.80	54.00	-4.20
4816.00	H	Peak	48.74	9.58	58.32	74.00	-15.68
7224.00	H	---					
9632.00	H	---					
12040.00	H	---					
14448.00	H	---					
16856.00	H	---					
19264.00	H	---					
21672.00	H	---					
24080.00	H	---					

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Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
152.22	S	Peak	27.24	-12.32	14.92	43.50	-28.58
286.08	S	Peak	27.76	-12.89	14.87	46.00	-31.13
356.89	S	Peak	26.98	-11.58	15.40	46.00	-30.60
546.04	S	Peak	29.10	-8.65	20.45	46.00	-25.55
756.53	S	Peak	28.81	-4.86	23.95	46.00	-22.05
960.23	S	Peak	27.74	-2.06	25.68	54.00	-28.32
4816.00	H	Average	40.00	9.60	49.60	54.00	-4.40
4816.00	H	Peak	47.59	9.60	57.19	74.00	-16.81
7224.00	H	---					
9632.00	H	---					
12040.00	H	---					
14448.00	H	---					
16856.00	H	---					
19264.00	H	---					
21672.00	H	---					
24080.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2440 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
31.94	S	Peak	33.95	-14.30	19.65	40.00	-20.35
103.72	S	Peak	34.48	-16.41	18.07	43.50	-25.43
393.75	S	Peak	29.00	-11.13	17.87	46.00	-28.13
468.44	S	Peak	31.01	-9.90	21.11	46.00	-24.89
713.85	S	Peak	27.69	-5.53	22.16	46.00	-23.84
985.45	S	Peak	27.34	-1.91	25.43	54.00	-28.57
4880.00	H	Average	42.66	10.16	52.82	54.00	-1.18
4880.00	H	Peak	52.13	10.16	62.29	74.00	-11.71
7320.00	H	---					
9760.00	H	---					
12200.00	H	---					
14640.00	H	---					
17080.00	H	---					
19520.00	H	---					
21960.00	H	---					
24400.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2440 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
191.99	S	Peak	30.44	-15.76	14.68	43.50	-28.82
395.69	S	Peak	29.34	-11.13	18.21	46.00	-27.79
444.19	S	Peak	29.33	-10.12	19.21	46.00	-26.79
617.82	S	Peak	28.66	-7.18	21.48	46.00	-24.52
827.34	S	Peak	28.64	-3.90	24.74	46.00	-21.26
924.34	S	Peak	28.90	-2.33	26.57	46.00	-19.43
4880.00	H	Average	39.85	10.11	49.96	54.00	-4.04
4880.00	H	Peak	45.59	10.11	55.70	74.00	-18.30
7320.00	H	---					
9760.00	H	---					
12200.00	H	---					
14640.00	H	---					
17080.00	H	---					
19520.00	H	---					
21960.00	H	---					
24400.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2474 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
31.94	S	Peak	33.95	-14.30	19.65	40.00	-20.35
103.72	S	Peak	34.18	-16.41	17.77	43.50	-25.73
145.43	S	Peak	27.79	-12.68	15.11	43.50	-28.39
455.83	S	Peak	30.66	-9.99	20.67	46.00	-25.33
705.12	S	Peak	29.01	-5.66	23.35	46.00	-22.65
958.29	S	Peak	27.33	-2.07	25.26	46.00	-20.74
4948.00	H	Average	42.44	9.96	52.40	54.00	-1.60
4948.00	H	Peak	50.15	9.96	60.11	74.00	-13.89
7422.00	H	---					
9896.00	H	---					
12370.00	H	---					
14844.00	H	---					
17318.00	H	---					
19792.00	H	---					
22266.00	H	---					
24740.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-08-18
Fundamental Frequency	:2474 MHz	Temp./Humi.	:25 deg_C / 60 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
153.19	S	Peak	27.25	-12.32	14.93	43.50	-28.57
286.08	S	Peak	28.47	-12.89	15.58	46.00	-30.42
395.69	S	Peak	29.15	-11.13	18.02	46.00	-27.98
624.61	S	Peak	28.41	-7.03	21.38	46.00	-24.62
828.31	S	Peak	29.29	-3.90	25.39	46.00	-20.61
875.84	S	Peak	30.07	-3.29	26.78	46.00	-19.22
4948.00	H	Average	38.98	9.82	48.80	54.00	-5.20
4948.00	H	Peak	44.83	9.82	54.65	74.00	-19.35
7422.00	H	---					
9896.00	H	---					
12370.00	H	---					
14844.00	H	---					
17318.00	H	---					
19792.00	H	---					
22266.00	H	---					
24740.00	H	---					

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8. 20 dB BAND WIDTH MEASUREMENT

8.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency, RBW = 100kHz, VBW = 300kHz, Span = 5MHz.
4. Set SPA Max hold. Mark peak, -20dB.

8.2 Test SET-UP (Block Diagram of Configuration)

Same as 7.2 Radiated Emission Measurement.

8.3 Measurement Equipment Used:

Same as 7.3 Radiated Emission Measurement.

8.4 Measurement Results:

2408 Channel = 2.373MHz
2440 Channel = 2.352MHz
2474 Channel = 2.365MHz

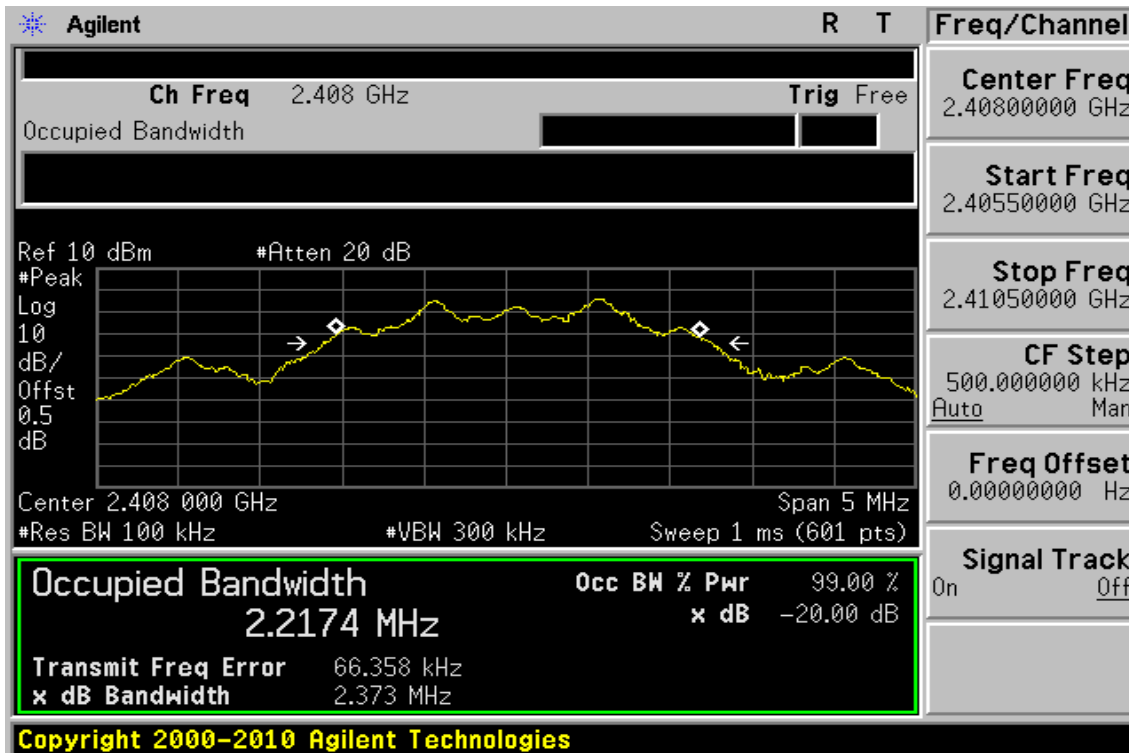
Refer to attached data chart.

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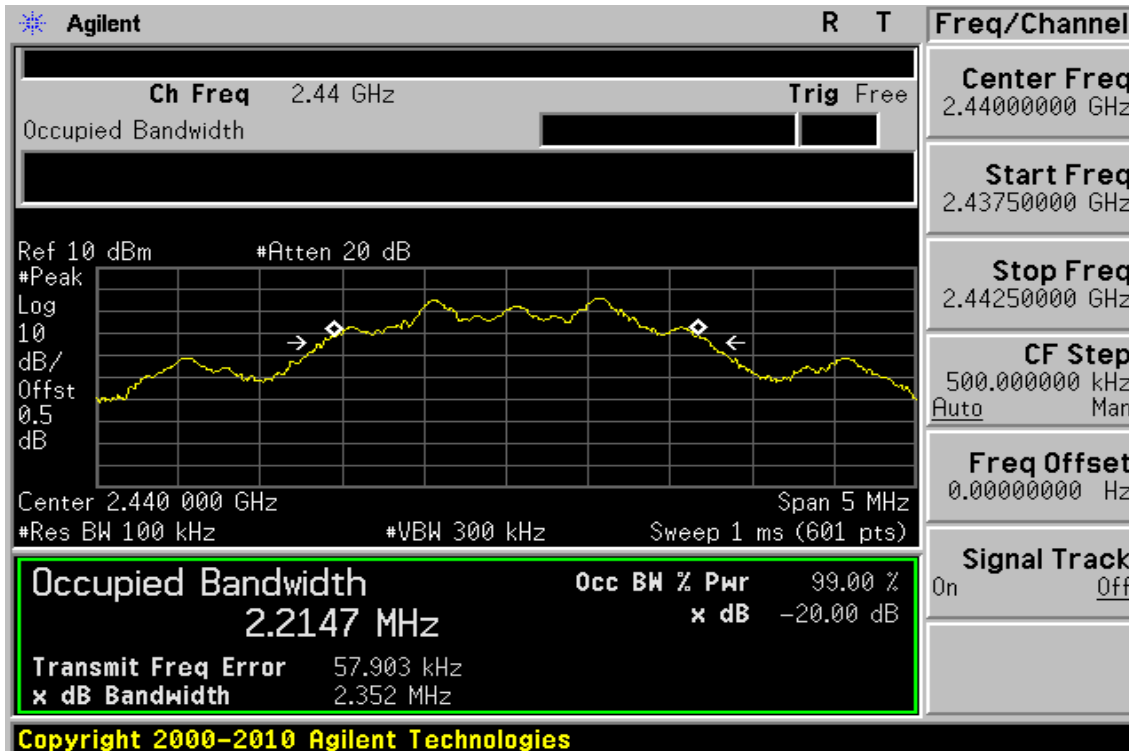
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20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid

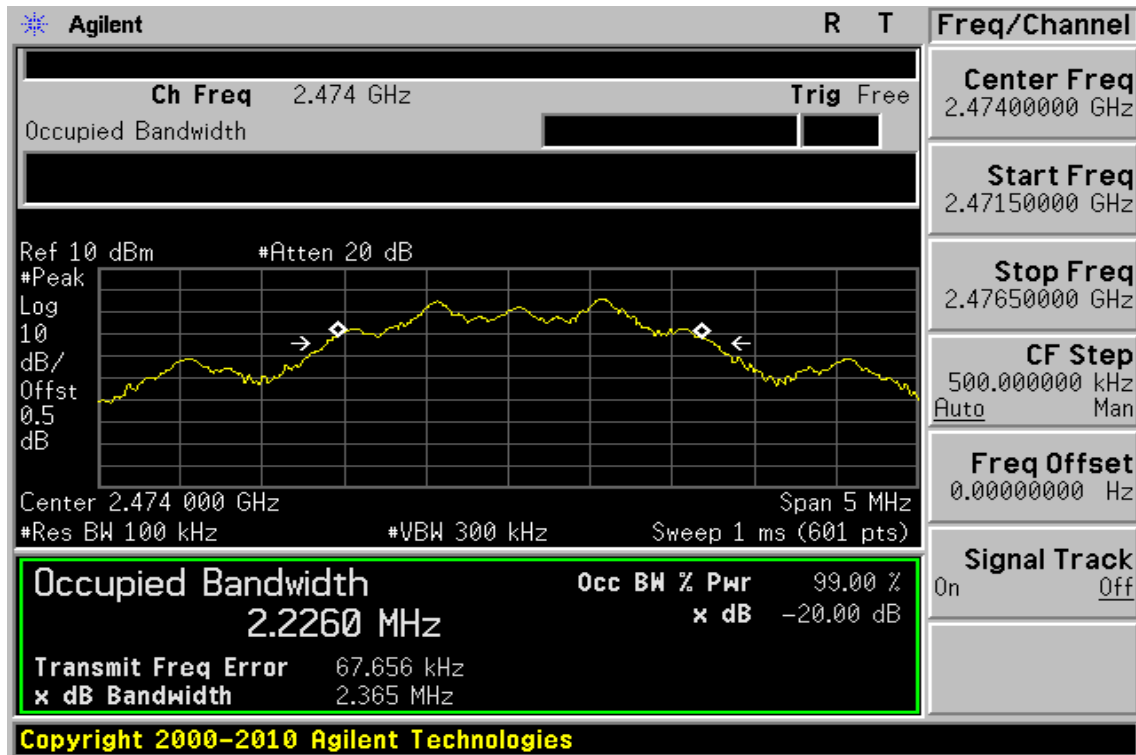


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20dB Bandwidth Test Data CH-High



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9. 99% BAND WIDTH MEASUREMENT

9.1 Measurement Procedure

- 1 Place the EUT on the table and set it in transmitting mode.
- 2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3 Set the spectrum analyzer as RBW=1% of the approximate emission bandwidth, VBW = 3 times RBW, Span= approximately 20dB below the peak level. Sweep=auto
- 4 Turn on the 99% bandwidth function, max reading..
- 5 Repeat above procedures until all frequency measured were complete.

9.2 Test SET-UP (Block Diagram of Configuration)

Same as 7.2 Radiated Emission Measurement.

9.3 Measurement Equipment Used:

Same as 7.3 Radiated Emission Measurement.

9.4 Measurement Results:

2408 Channel = 2.174MHz

2440 Channel = 2.147MHz

2474 Channel = 2.260MHz

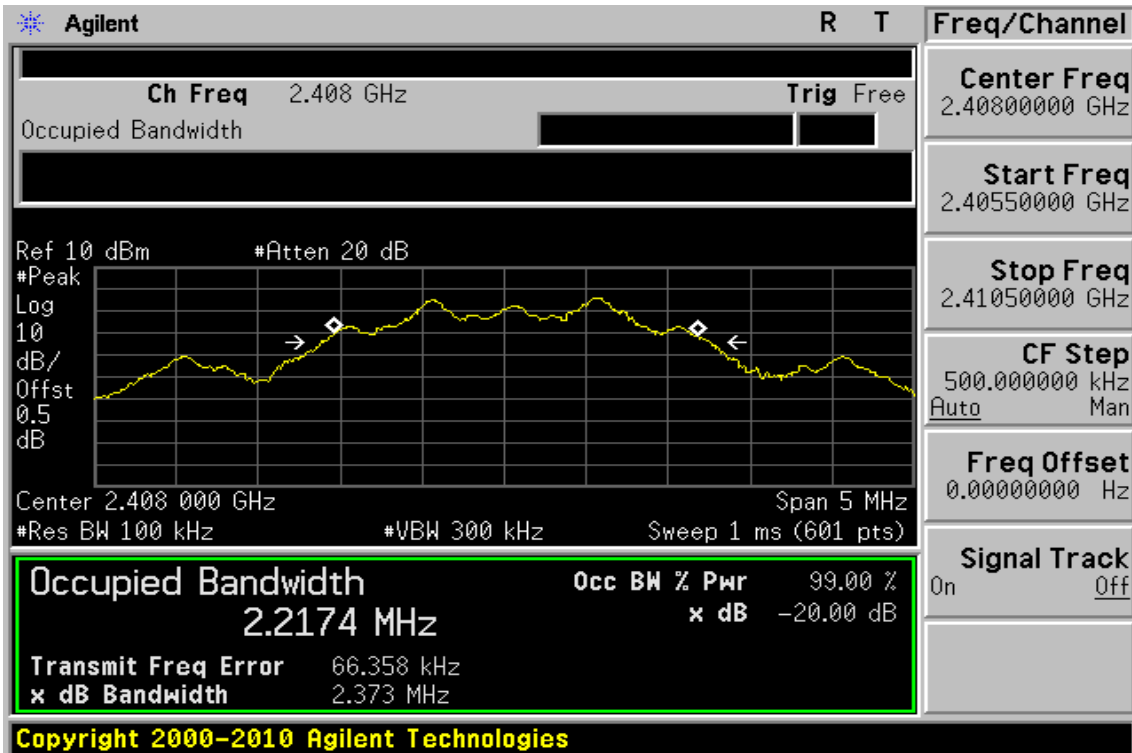
Refer to attached data chart.

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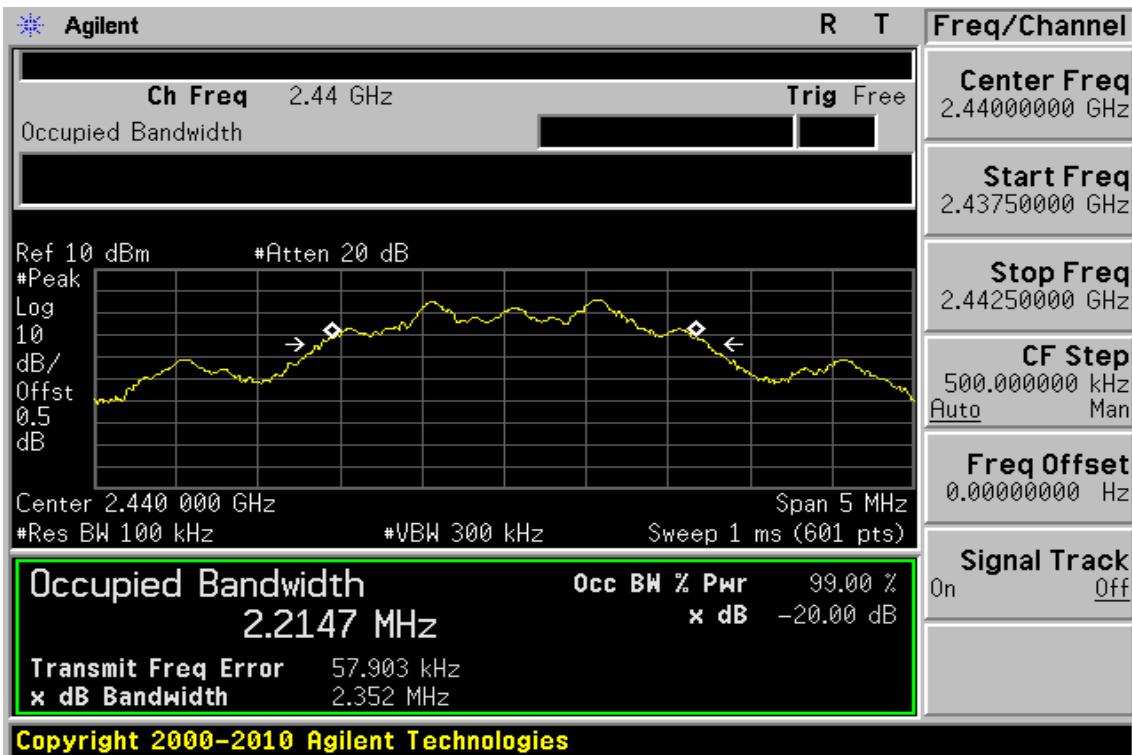
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99% Bandwidth Test Data CH-Low



99% Bandwidth Test Data CH-Mid

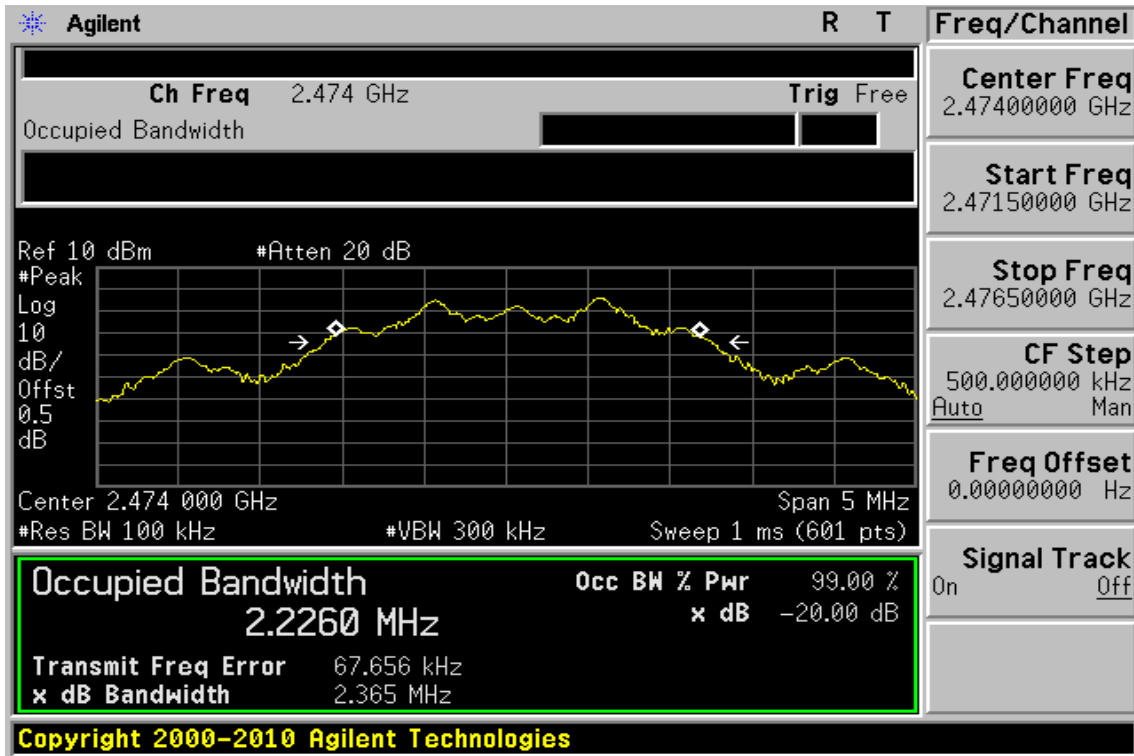


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99% Bandwidth Test Data CH-High



~ End of Report ~

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