ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	**RM-687**
Brand Name:	**Nokia**
Model Name:	**RM-687**
Model Difference:	**N/A**
FCC ID:	**QMNRM-687**
Report No.:	**EH/2010/30042**
Issue Date:	**Apr. 06, 2010**
Rule Part:	**§15.247, DSS**
Prepared for:	**Nokia Inc.** **12278 Scripps Summit Dr. San Diego, CA 92131, USA**
Prepared by:	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory** **No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

Testing Laboratory
0513

CERTIFICATION OF COMPLIANCE

Applicant:	Nokia Inc. 12278 Scripps Summit Dr., San Diego, CA 92131, USA
Manufacturer:	Compal Communications(Nanjing)Co.Ltd. Nanjing Jiangning Export Processing Zone (South Area) No.68-2 Su-yuan Street
Product Name:	RM-687
Brand Name:	Nokia
FCC ID:	QMNRM-687
Model No.:	RM-687
Model Difference:	N/A
File Number:	EH/2010/30042
Date of test:	Mar. 17, 2010 ~ Mar. 21, 2010
Date of EUT Received:	Mar. 17, 2010

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003). 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 15.247.
The test results of this report relate only to the tested sample identified in this report.

Test By:	Brian Chang	***Date:***	Apr. 06, 2010
	Brian Chang / Engineer		
Prepared By:	Gigi yeh	***Date:***	Apr. 06, 2010
	Gig Yeh / Clerk		
Approved By:	Vincent Su	***Date:***	Apr. 06, 2010
	Vincent Su / Manager		

Version

Version No.	Date	Description
00	Mar. 25, 2010	Initial creation of document
01	Apr. 06, 2010	Add DA 00-705 in section 2.3.2.

Table of Contents

1. GENERAL INFORMATION

1.1. Product Description

General:

Type Name:	RM-687	
Brand Name:	Nokia	
Model Name:	RM-687	
Model Difference:	N/A	
Power Supply:	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter	
	Battery Model:	BL-4C, Supplier: Samsung SDI Co., Ltd
	Adaptor Model:	AC-6U , Supplier: AstecC Aqencies LTD. Taiwan Branch (HK)

CDMA:

Cellular Phone Standards Frequency Range and Power:	CDMA2000 Cellular	824.70 ~ 848.31MHz	24.28 dBm
	EVDO Cellular	824.70 ~ 848.31MHz	24.11 dBm
Type of Emission:	1M27F9W		
MEID:	A0000001B35E55		
Software Version:	SK_2250B_TLC		
Hardware Version:	2000		

Bluetooth:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V2.1 + EDR (GFSK + π/4DQPSK + 8DPSK)
Channel number:	79 channels
Transmit Power:	3.84 dBm (Peak)
Modulation type:	Frequency Hopping Spread Spectrum
Antenna Designation:	PIFA Antenna, -2.5dBi.

The report applies for Bluetooth function.

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

This submittal(s) (test report) is intended for **FCC ID: QMNRM-687** filing to comply with Section 15.247 of the FCC Part 15C, Subpart C Rules.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and DA00-705. 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. 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-1.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. 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.

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 Nokia CDMA2000 Phone was tested with a test program to fix the Tx frequency that was for the purpose of the measurements. For more information please see test data and APPENDIX 1 for set-up photographs.

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, 13 of ANSI C63.4-2003.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 and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 8 and 13 of ANSI C63.4-2003 and DA 00-705.

2.4. Configuration of Tested System

Fig. 2-1 Radiated Emission

Fig. 2-2 AC power Line Conducted Emission

Fig. 2-3 Remote side

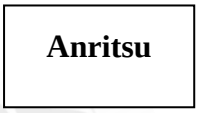


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.
1.	Bluetooth Test Set	Anritsu	MT8852B	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power line Conducted Emission	Compliant
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(d)	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(c)	TX Spurious Emission	Compliant
§15.247(a)(1)	Frequency Separation	Compliant
§15.247(a)(1)(iii)	Number of hopping frequency	Compliant
§15.247(a)(1)(iii)	Time of Occupancy	Compliant
§15.247	Peak Power Density	Compliant
§15.247(a)(1)	20dB Bandwidth	No Limit
§15.203, §15.247(c)	Antenna Requirement	Compliant

4. DESCRIPTION OF TEST MODES

The EUT has been tested under engineering test condition. Test program was used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low (2402MHz)、mid (2441MHz) and high (2480MHz) with BDR/EDR modes are chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) The worst-case of E1 position were reported.

5. AC POWER LINE CONDUCTED EMISSION TEST

5.1. Standard Applicable:

According to §15.207, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

1.The lower limit shall apply at the transition frequencies

2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

3.The measurement uncertainty is ±2.586dB.

5.2. Measurement Equipment Used:

AC Power Line Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCS30	828985/004	09/15/2009	09/14/2010
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	02/02/2010	02/01/2011
Coaxial Cables	N/A	WK CE Cable	N/A	11/28/2009	11/27/2010

5.3. EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4:2003.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

5.4. 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.

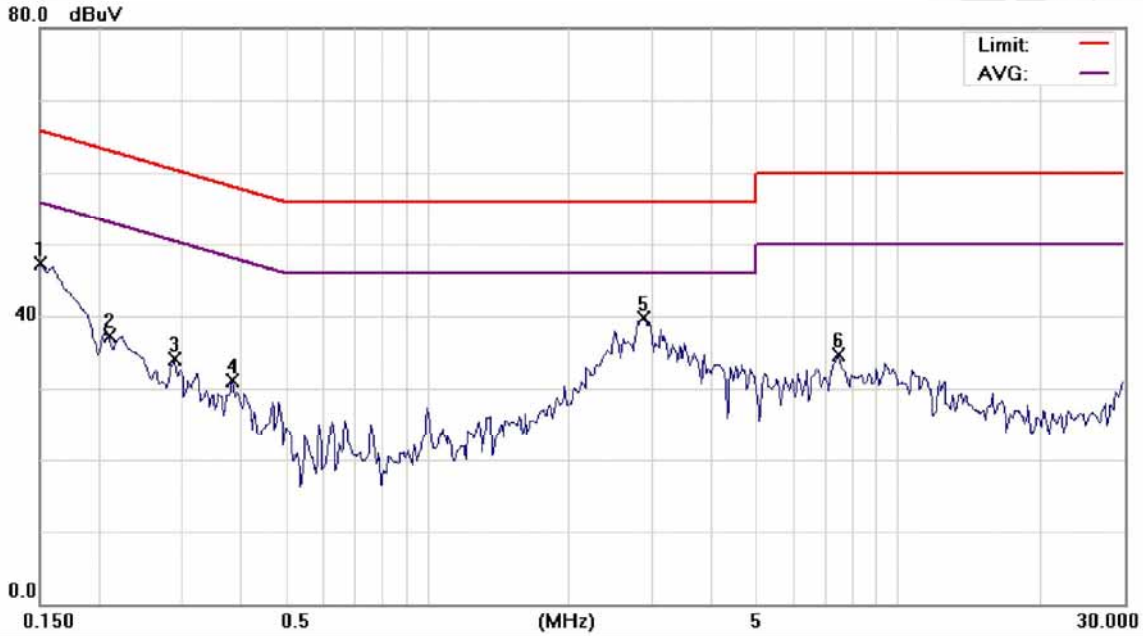
5.5. Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.

AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	BT Link			Test Date:	Mar. 18, 2010
Temperature:	24 ℃	Humidity:	61%	Test By:	Brian

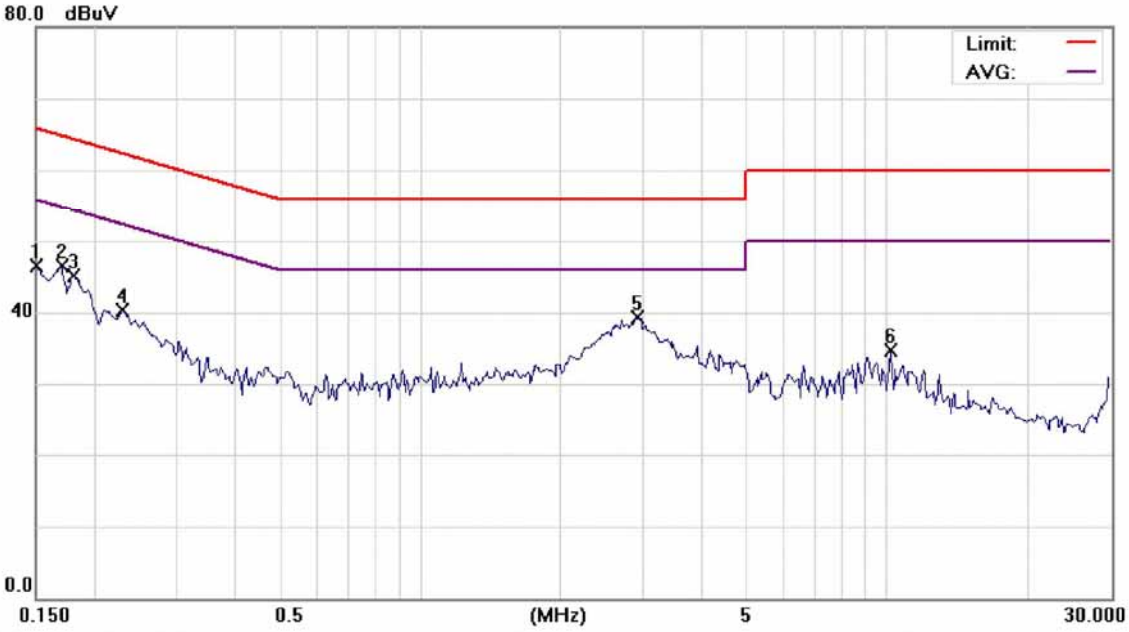


Site SGS CONDUCTED #1
Limit: FCC Class B Conduction(QP)
EUT: Mobile phone
M/N: RM-687
Note: BT mode

Phase: L1
Power: AC 120V/60Hz
Distance:

Temperature: 24 ℃
Humidity: 61 %
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	47.06	0.18	47.24	66.00	-18.76	peak	
2		0.2100	37.19	0.12	37.31	63.21	-25.90	peak	
3		0.2900	34.03	0.10	34.13	60.52	-26.39	peak	
4		0.3850	31.03	0.08	31.11	58.17	-27.06	peak	
5	*	2.8800	39.60	0.14	39.74	56.00	-16.26	peak	
6		7.4800	34.44	0.27	34.71	60.00	-25.29	peak	



Site SGS CONDUCTED #1
Limit: FCC Class B Conduction(QP)
EUT: Mobile phone
M/N: RM-687
Note: BT mode

Phase: N
Power: AC 120V/60Hz
Distance:

Temperature: 24 ℃
Humidity: 61 %
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	46.31	0.20	46.51	66.00	-19.49	peak	
2		0.1700	46.32	0.17	46.49	64.96	-18.47	peak	
3		0.1800	44.97	0.16	45.13	64.49	-19.36	peak	
4		0.2300	40.22	0.14	40.36	62.45	-22.09	peak	
5	*	2.9100	39.08	0.16	39.24	56.00	-16.76	peak	
6		10.2200	34.16	0.45	34.61	60.00	-25.39	peak	

6. PEAK OUTPUT POWER MEASUREMENT

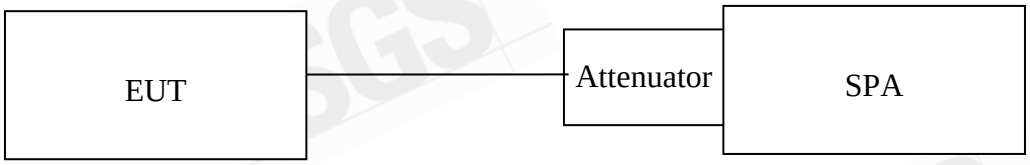
6.1. Standard Applicable:

According to §15.247(b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels. For all frequency hopping systems in the 2400 – 2483.5MHz band: 0.125 Watts.

6.2. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2010	01/24/2011
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2010	01/04/2011
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010

6.3. Test Set-up:



6.4. 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 power meter or spectrum. (Max Peak function, RBW, VBW = 20dB bandwidth)
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

6.5. Measurement Result:

BDR mode:

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	2.22	0.00	2.22	0.00167	1
2441.00	2.15	0.00	2.15	0.00164	1
2480.00	1.39	0.00	1.39	0.00138	1

**Note: offset 6.5dB*

EDR mode:

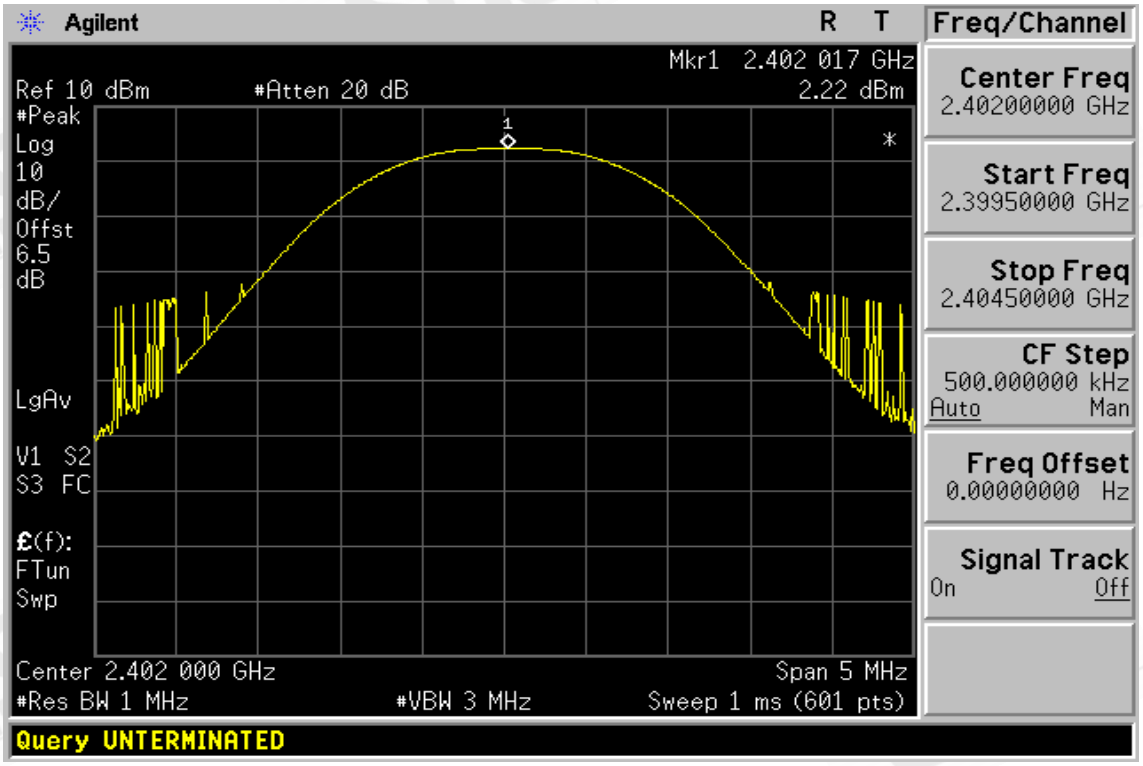
Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	3.75	0.00	3.75	0.00237	1
2441.00	3.84	0.00	3.84	0.00242	1
2480.00	2.95	0.00	2.95	0.00197	1

**Note: offset 6.5dB*

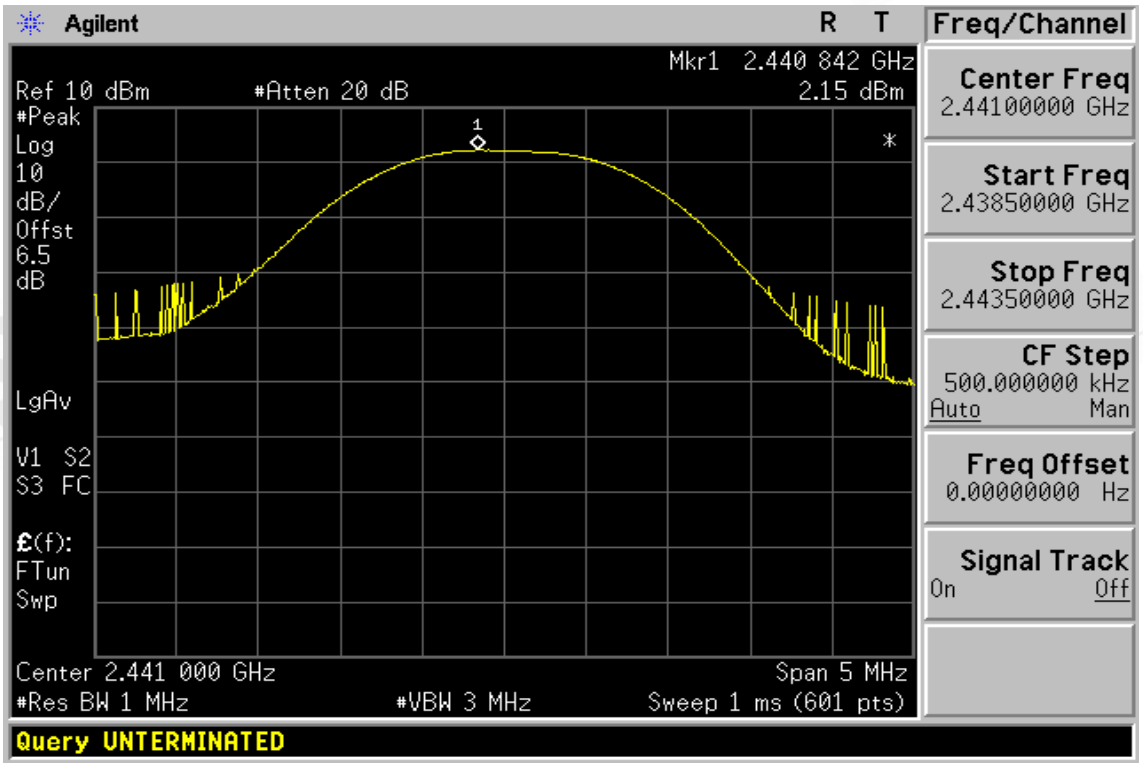
Note: Refer to next page for plots.

BDR Mode

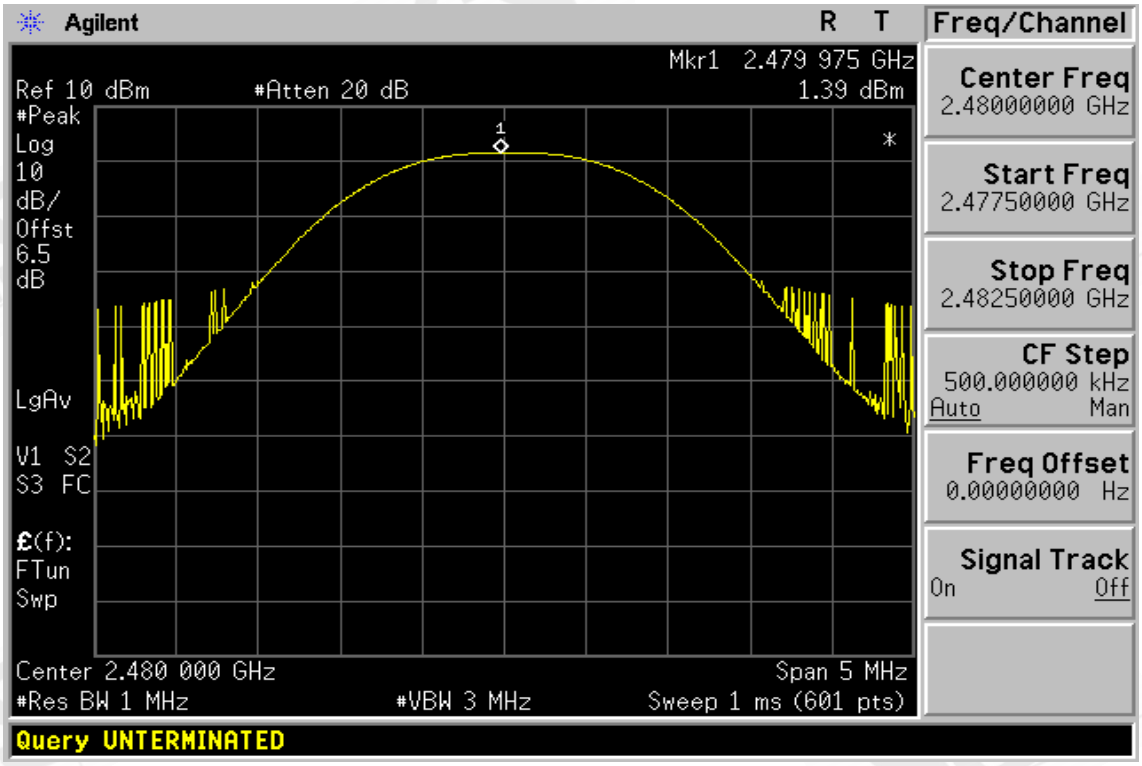
Peak Power Output Data Plot (CH Low)



Peak Power Output Data Plot (CH Mid)

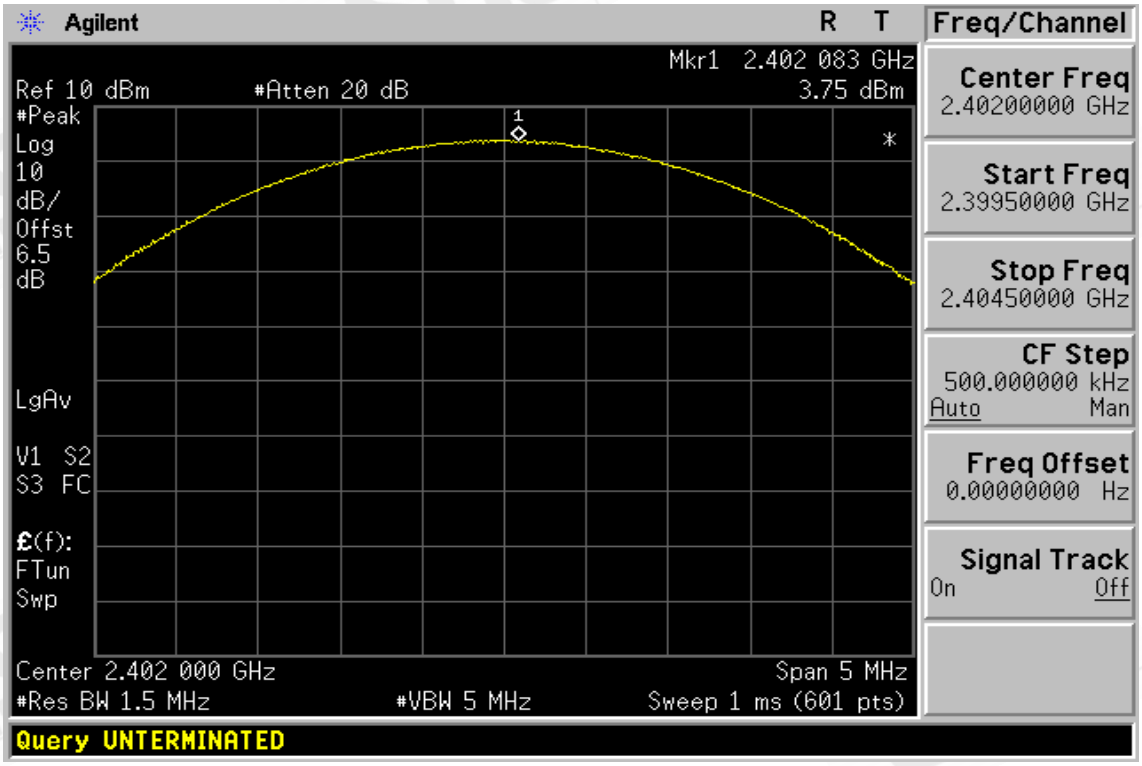


Peak Power Output Data Plot (CH High)

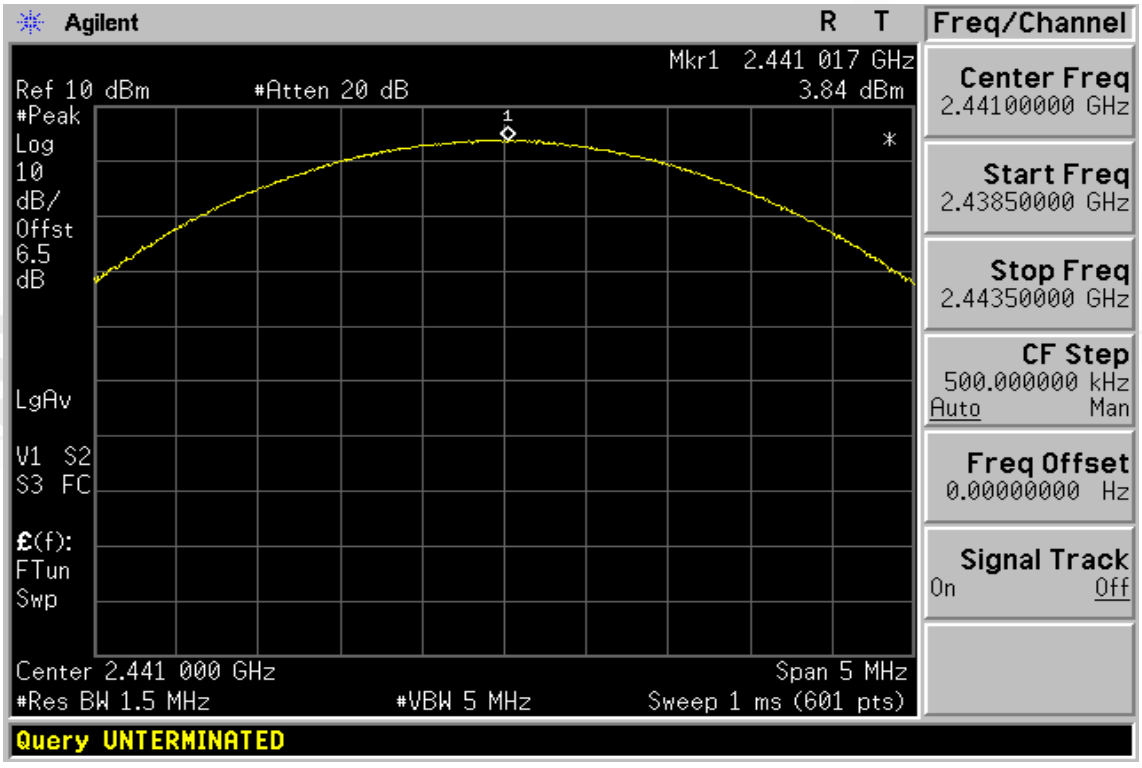


EDR Mode

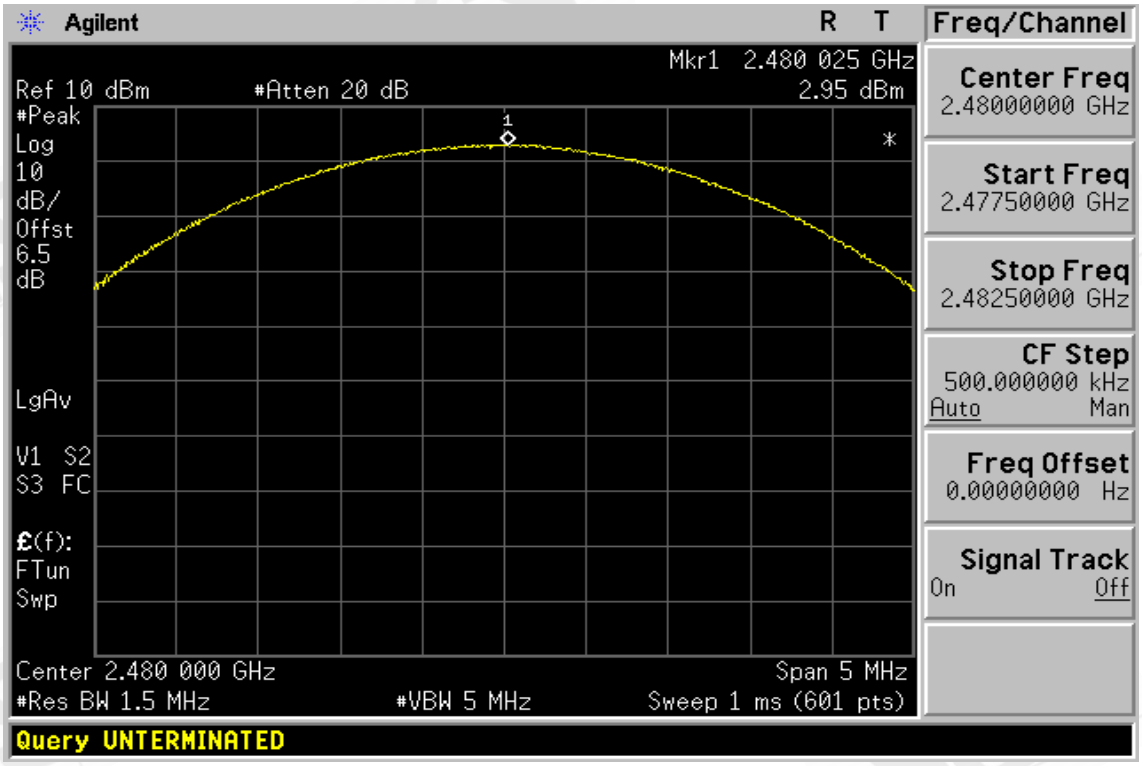
Peak Power Output Data Plot (CH Low)



Peak Power Output Data Plot (CH Mid)



Peak Power Output Data Plot (CH High)



7. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

7.1. Standard Applicable:

According to §15.247(d), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

7.2. Measurement Equipment Used:

7.2.1. Conducted Emission at antenna port:

Refer to section 5.2 for details.

7.2.2. Radiated emission:

966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2010	01/24/2011
Loop antenna	MESSTEC	FLA30	03/10086	07/08/2009	07/07/2011
Bilog Antenna	SCHWAZBECK	VULB9160	3136	09/15/2009	09/14/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/27/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011
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	SUCOFLEX 104PEA-10M	10m	01/05/2010	01/04/2011
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010

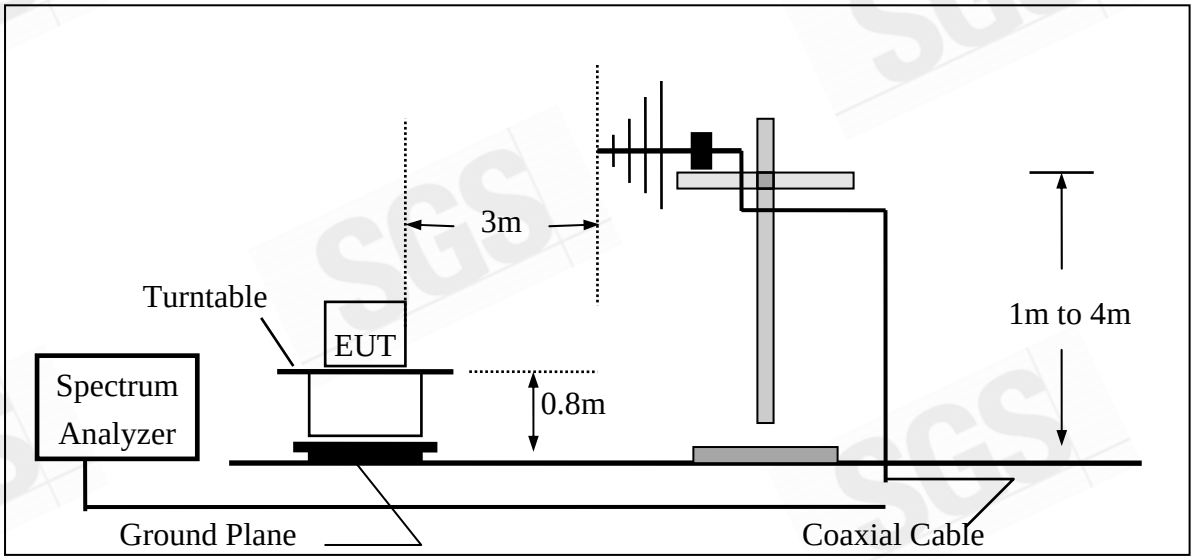
7.3. Test SET-UP:

7.3.1. Conducted Emission at antenna port:

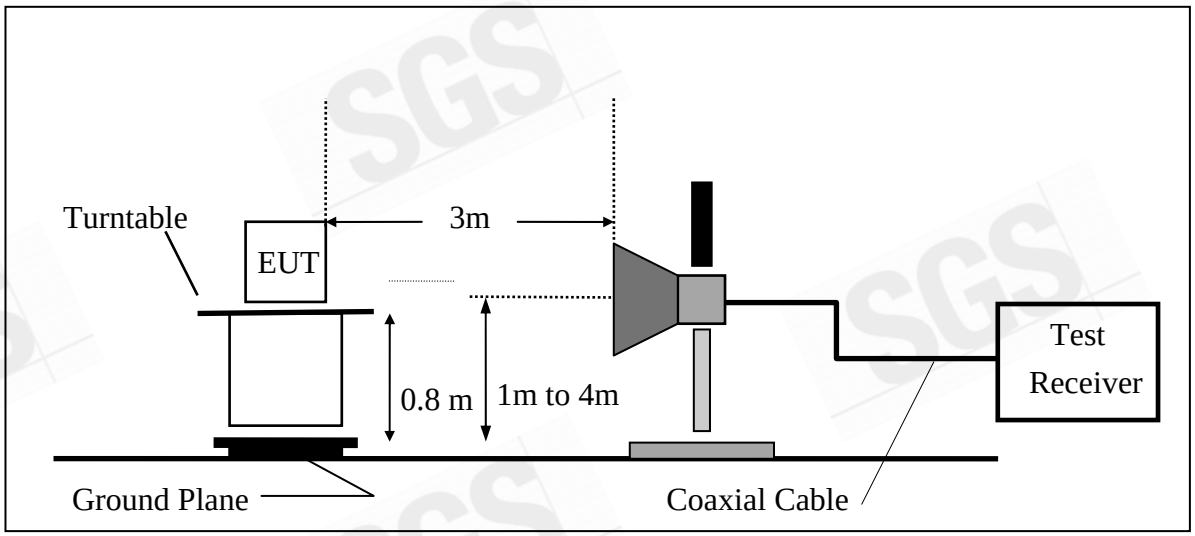
Refer to section 6.3 for details.

7.3.2. Radiated emission:

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



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



7.4. 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 center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RB𝕎≧1% of span, VBW ≧RBW, Span=25MHz, Sweep = auto
5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
6. Repeat above procedures until all frequency measured were complete.

7.5. 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:

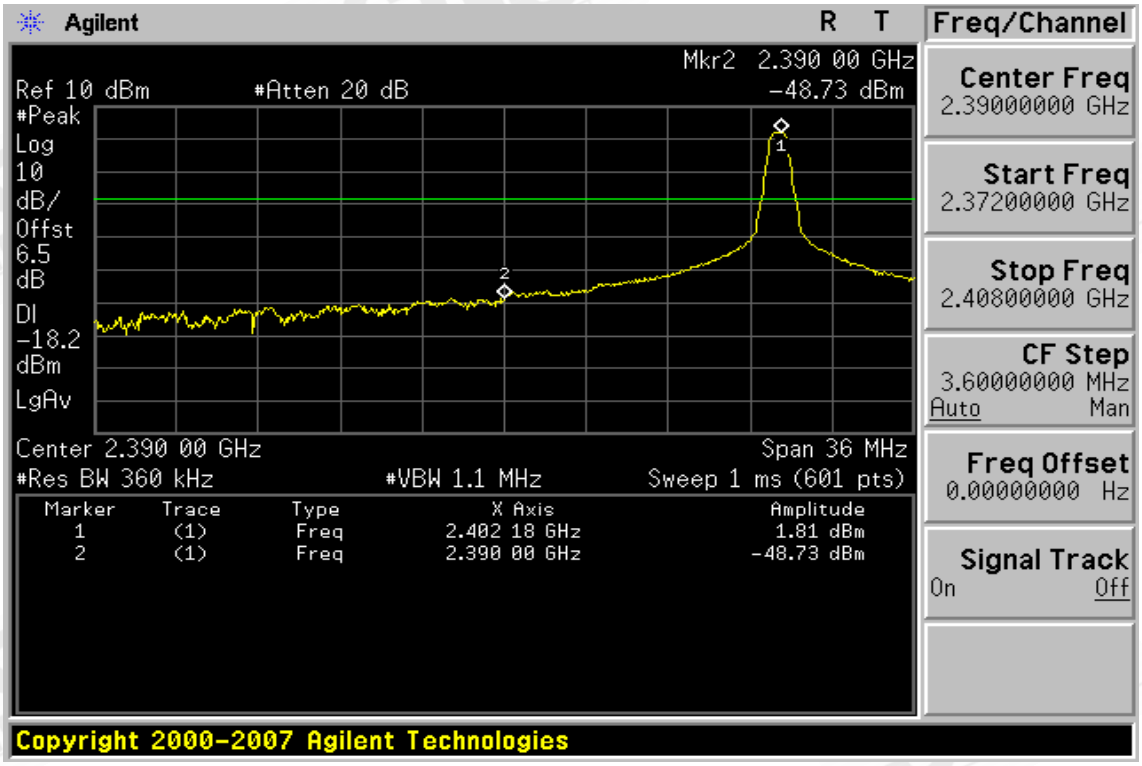
FS = RA + AF + CL - AG

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

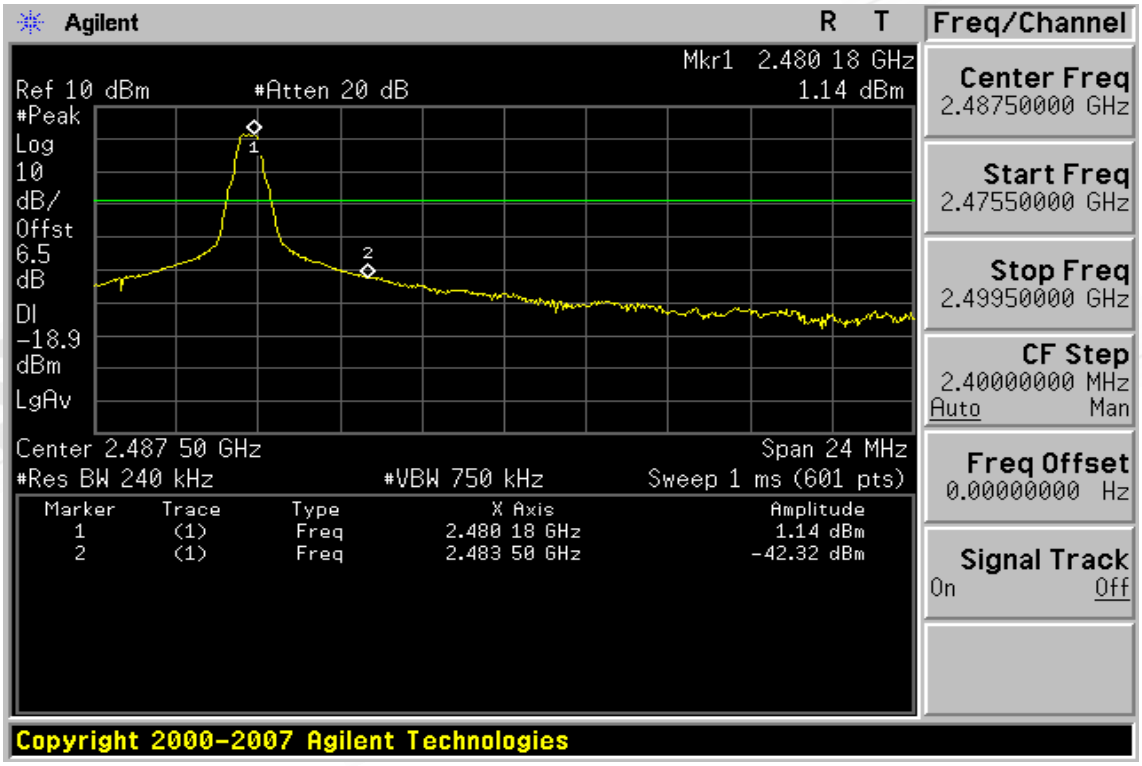
7.6. Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

BDR Mode
Band Edges Test Data CH-Low



Band Edges Test Data CH-High



Radiated Emission:

Operation Mode	TX CH Low	Test Date	Mar. 19, 2010
Fundamental Frequency	2402 MHz	Test By	Brian
Temperature	23 ℃	Pol	Ver.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2390.00	44.00	---	-1.39	42.61	---	74.00	54.00	-11.39	Peak

Operation Mode	TX CH Low	Test Date	Mar. 19, 2010
Fundamental Frequency	2402 MHz	Test By	Brian
Temperature	23 ℃	Pol	Hor.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2390.00	43.94	---	-1.39	42.55	---	74.00	54.00	-11.45	Peak

Remark：

(1) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Emission:

Operation Mode	TX CH High	Test Date	Mar. 19, 2010
Fundamental Frequency	2480 MHz	Test By	Brian
Temperature	23 ℃	Pol	Ver.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	48.59	---	-0.92	47.67	---	74.00	54.00	-6.33	Peak

Operation Mode	TX CH High	Test Date	Mar. 19, 2010
Fundamental Frequency	2480 MHz	Test By	Brian
Temperature	23 ℃	Pol	Hor.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	46.15	---	-0.92	45.23	---	74.00	54.00	-8.77	Peak

Remark：

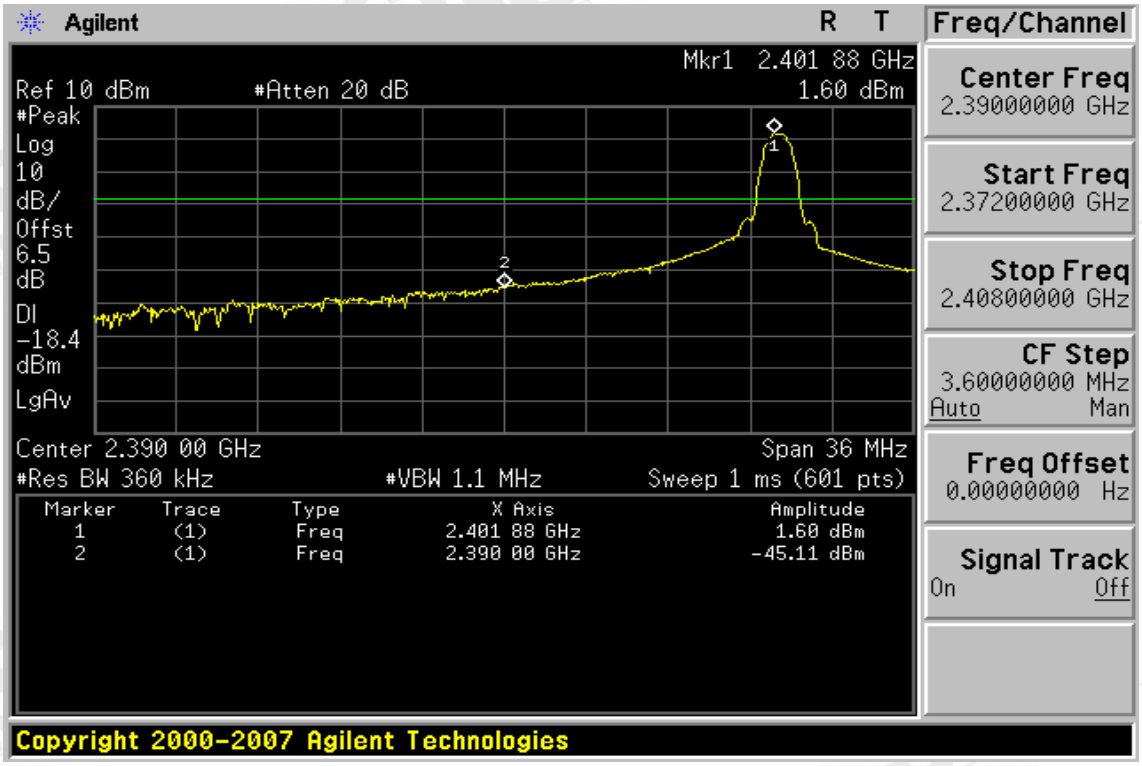
(1) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

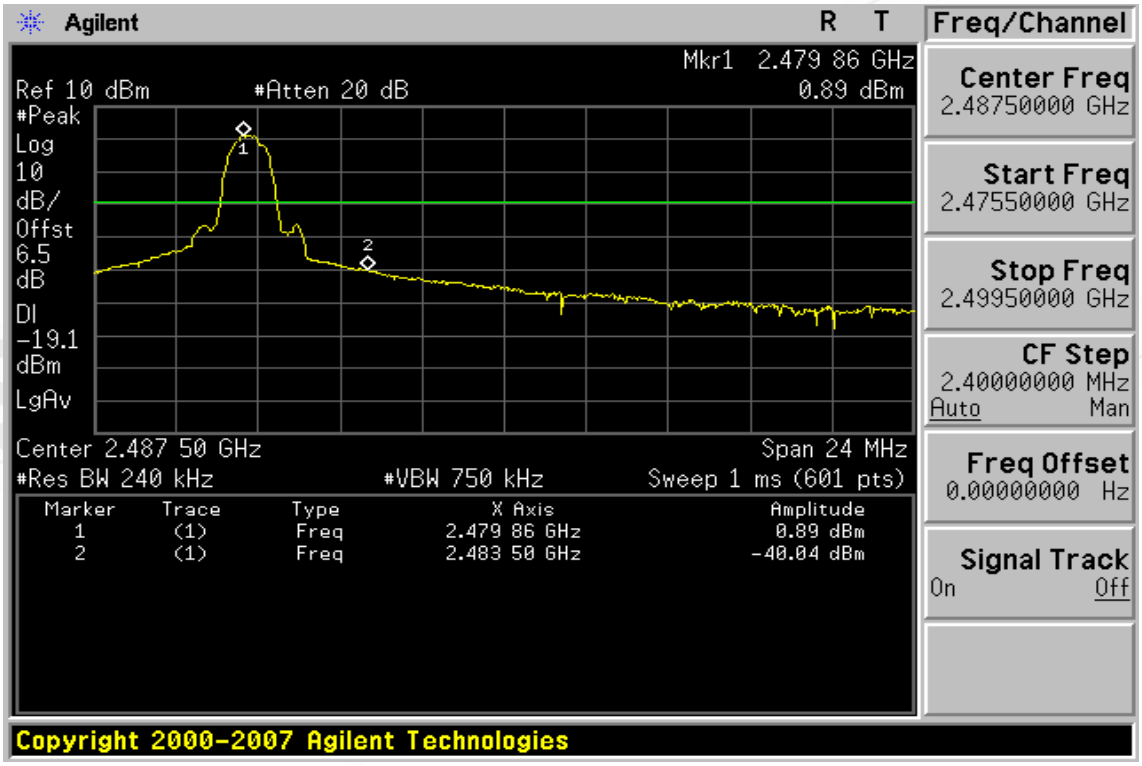
(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

EDR Mode
Band Edges Test Data CH-Low



Band Edges Test Data CH-High



Radiated Emission:

Operation Mode	TX CH Low	Test Date	Mar. 19, 2010
Fundamental Frequency	2402 MHz	Test By	Brian
Temperature	23 ℃	Pol	Ver.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2390.00	43.87	---	-1.39	42.48	---	74.00	54.00	-11.52	Peak

Operation Mode	TX CH Low	Test Date	Mar. 19, 2010
Fundamental Frequency	2402 MHz	Test By	Brian
Temperature	23 ℃	Pol	Hor.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2390.00	44.13	---	-1.39	42.74	---	74.00	54.00	-11.26	Peak

Remark：

(1) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Emission:

Operation Mode	TX CH High	Test Date	Mar. 19, 2010
Fundamental Frequency	2480 MHz	Test By	Brian
Temperature	23 ℃	Pol	Ver.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	47.25	---	-0.92	46.33	---	74.00	54.00	-7.67	Peak

Operation Mode	TX CH High	Test Date	Mar. 19, 2010
Fundamental Frequency	2480 MHz	Test By	Brian
Temperature	23 ℃	Pol	Hor.
Humidity	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
2483.50	47.52	---	-0.92	46.60	---	74.00	54.00	-7.40	Peak

Remark：

(1) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。

(3) Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

(4) Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

8. SPURIOUS EMISSION TEST

8.1. Standard Applicable:

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

8.2. Measurement Equipment Used:

8.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

8.2.2. Radiated emission:

Refer to section 7.2 for details.

8.3. Test SET-UP:

8.3.1. Conducted Emission at antenna port:

Refer to section 6.3 for details.

8.3.2. Radiated emission:

Refer to section 7.3 for details.

8.4. Measurement Procedure:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all frequency measured were complete.

8.5. 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:

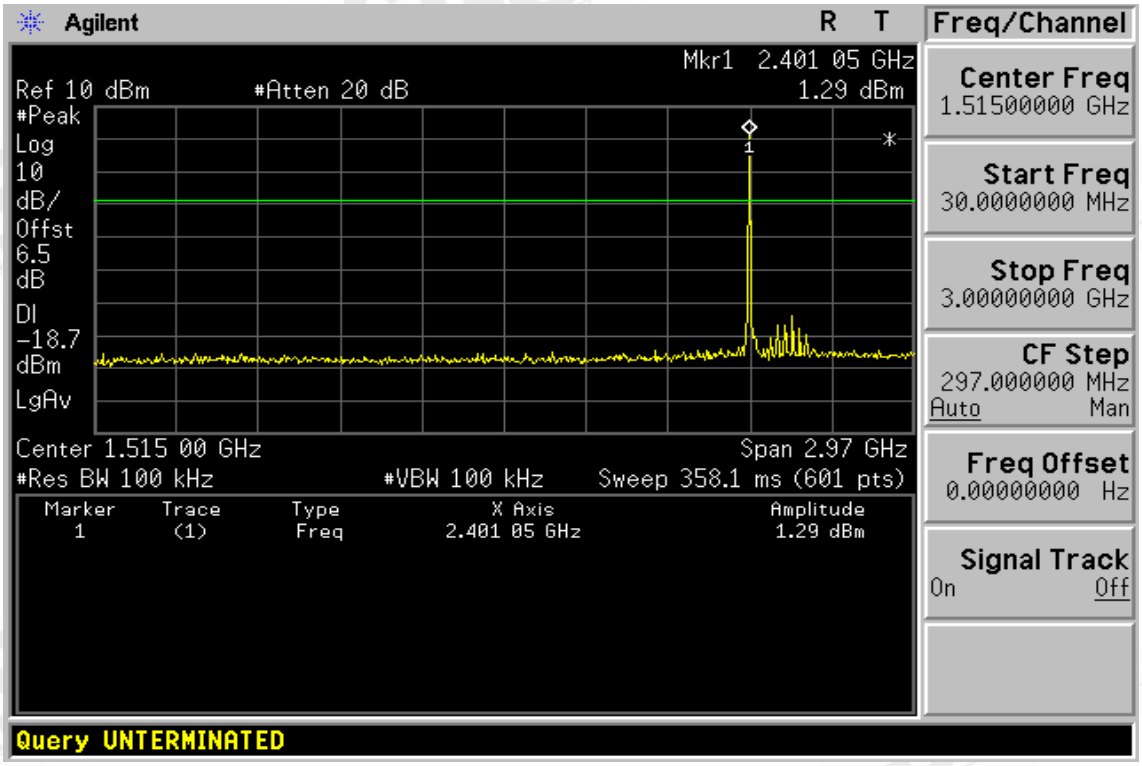
FS = RA + AF + CL - AG

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

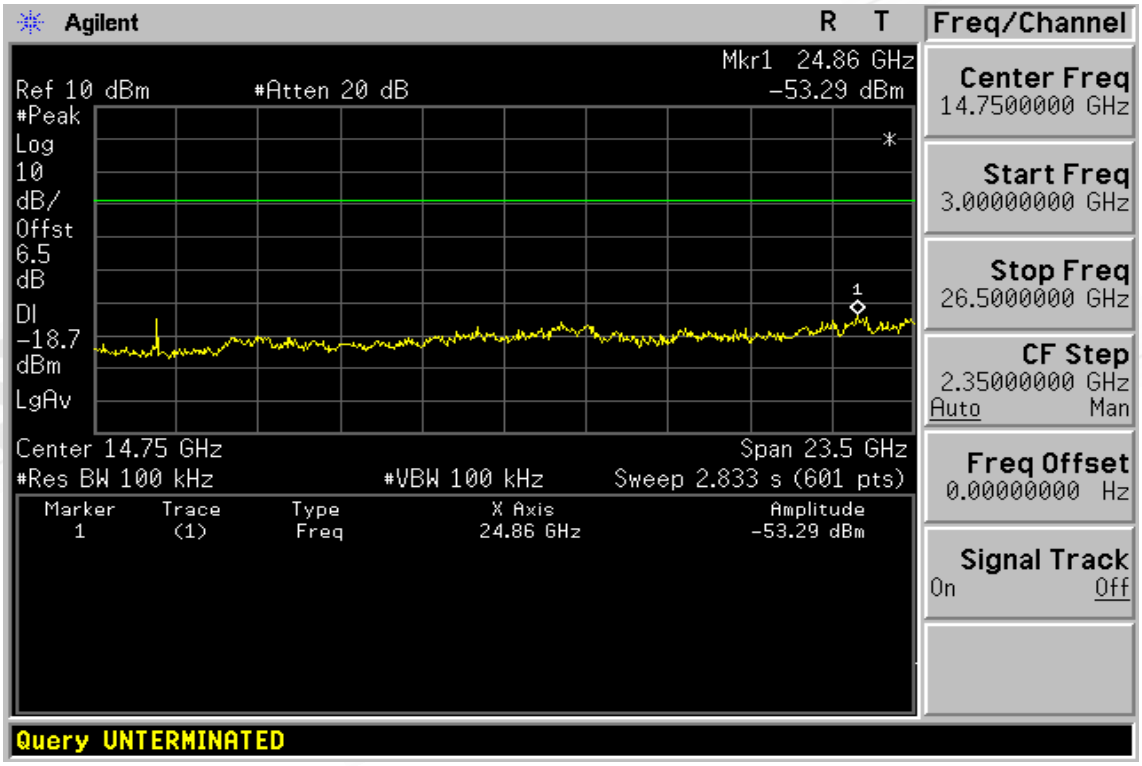
8.6. Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

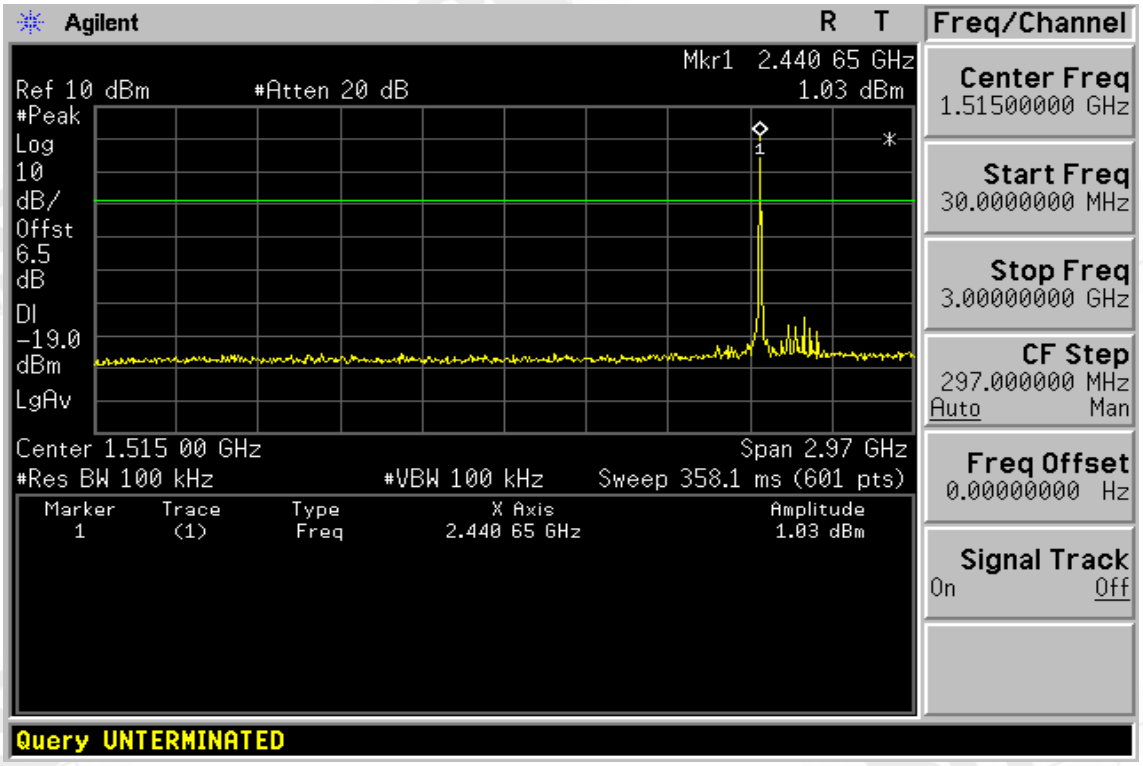
BDR Mode Conducted Spurious Emission Measurement Result
Ch Low 30MHz – 3GHz



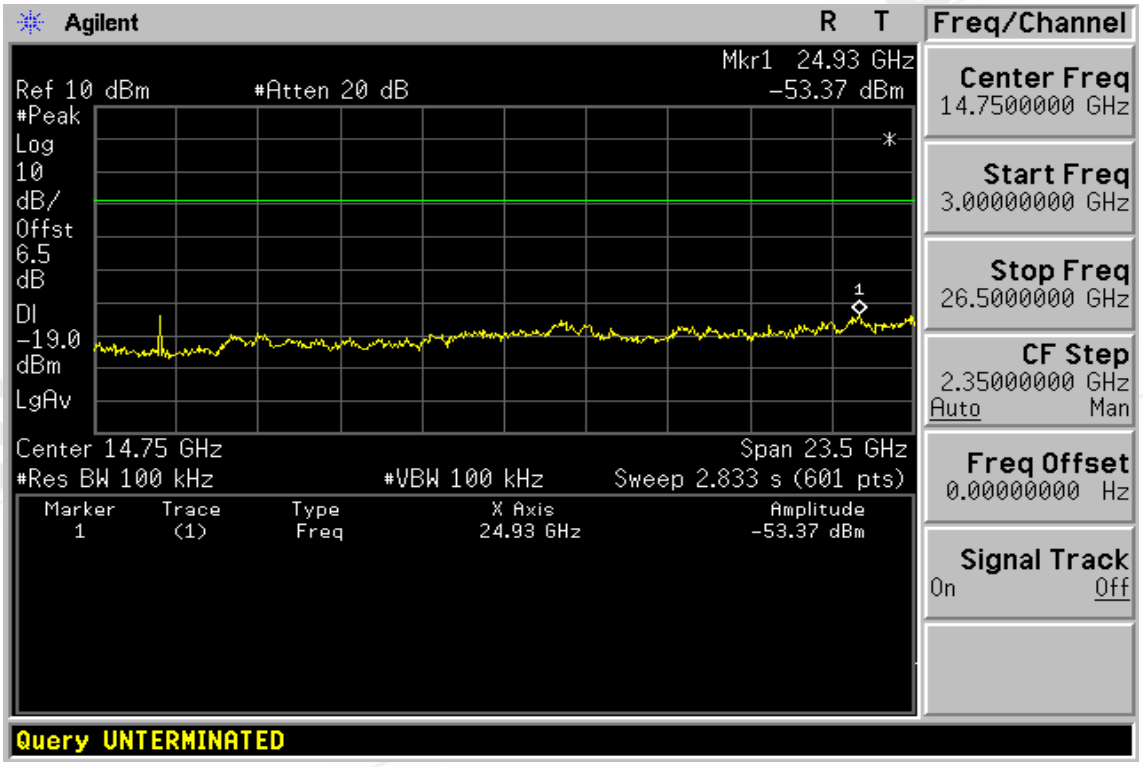
Ch Low 3GHz – 26.5GHz



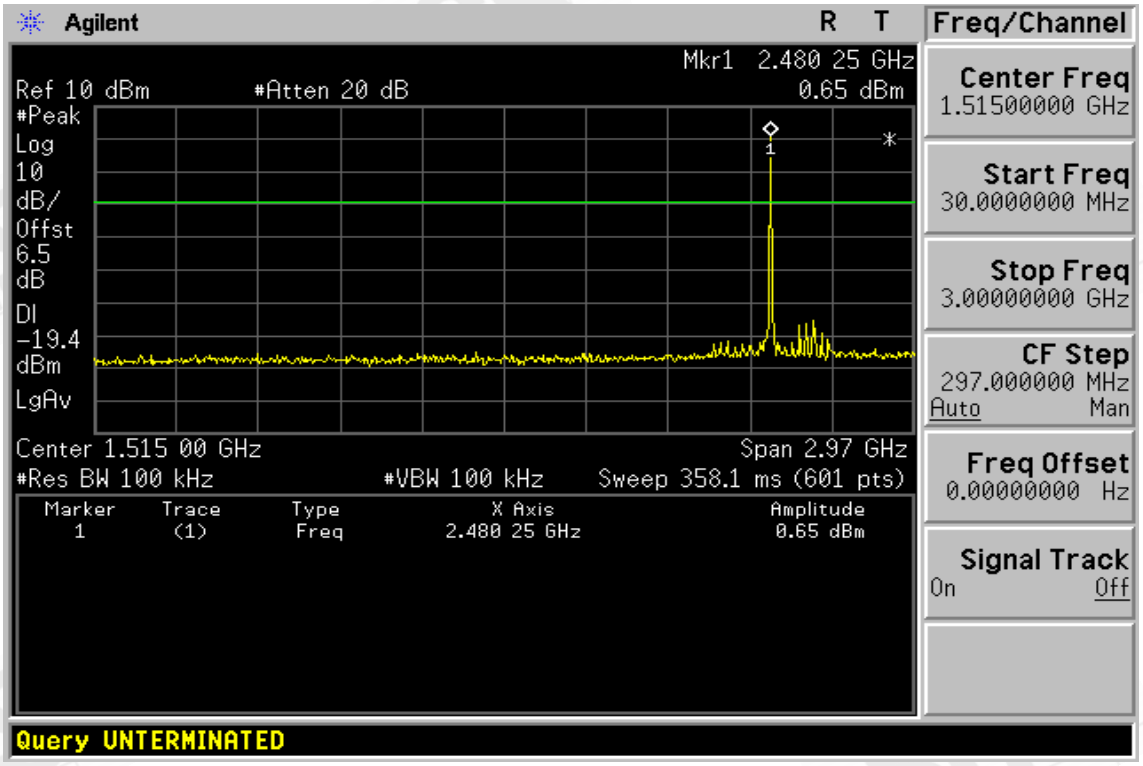
Ch Mid 30MHz – 3GHz



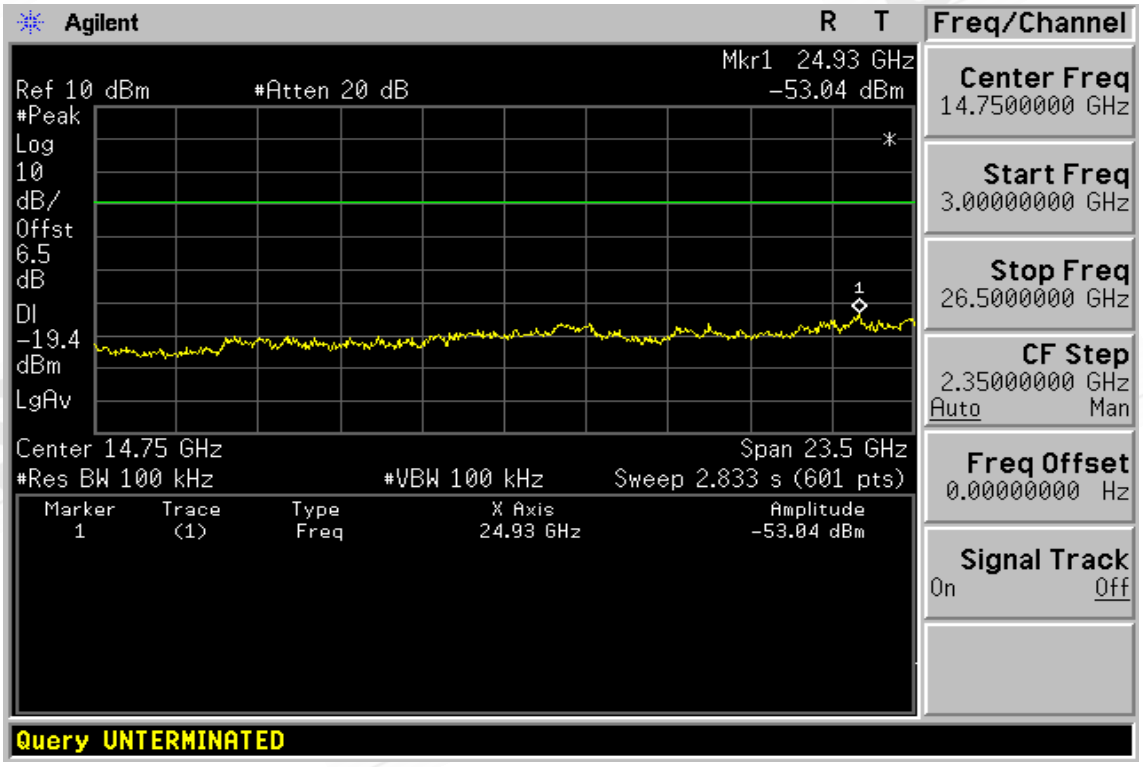
Ch Mid 3GHz – 26.5GHz



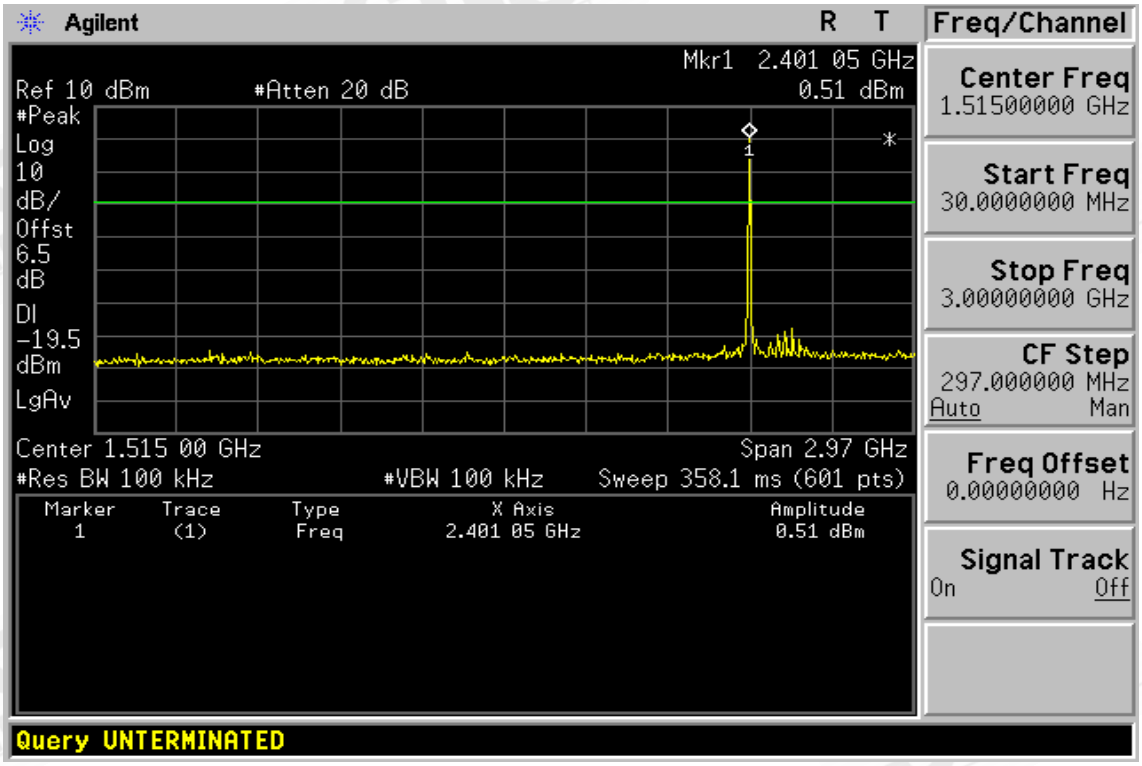
Ch High 30MHz – 3GHz



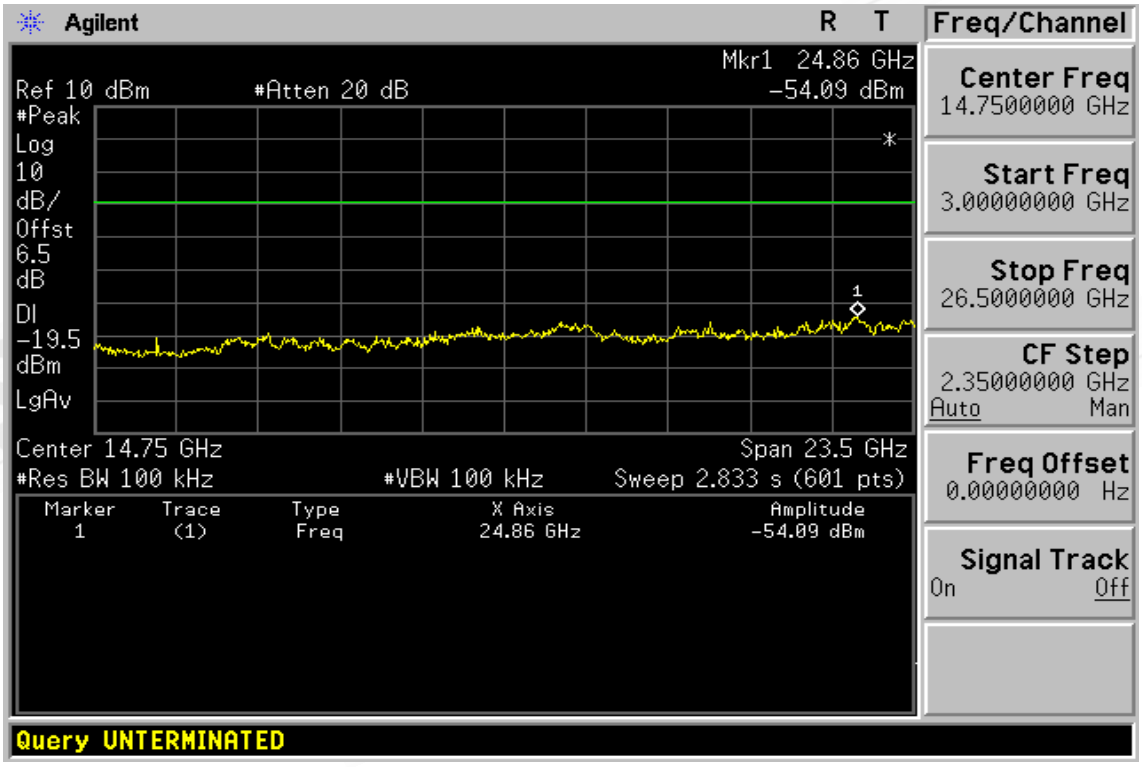
Ch High 3GHz – 26.5GHz



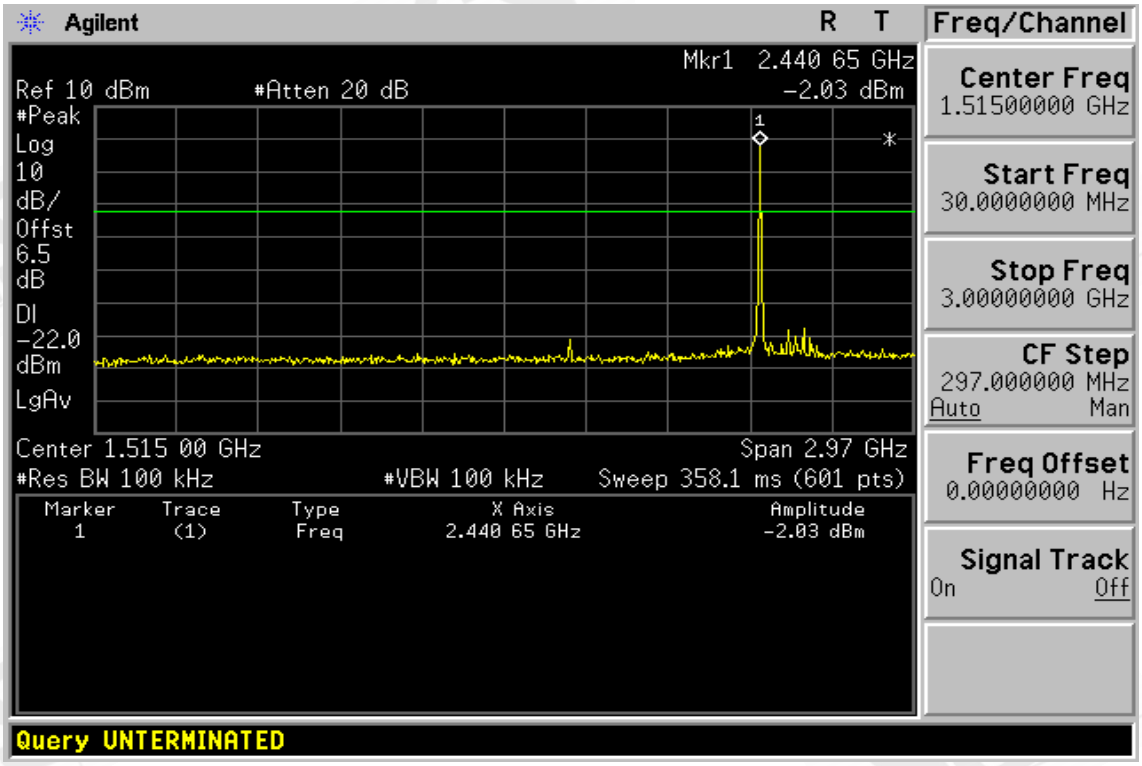
EDR Mode Conducted Spurious Emission Measurement Result
Ch Low 30MHz – 3GHz



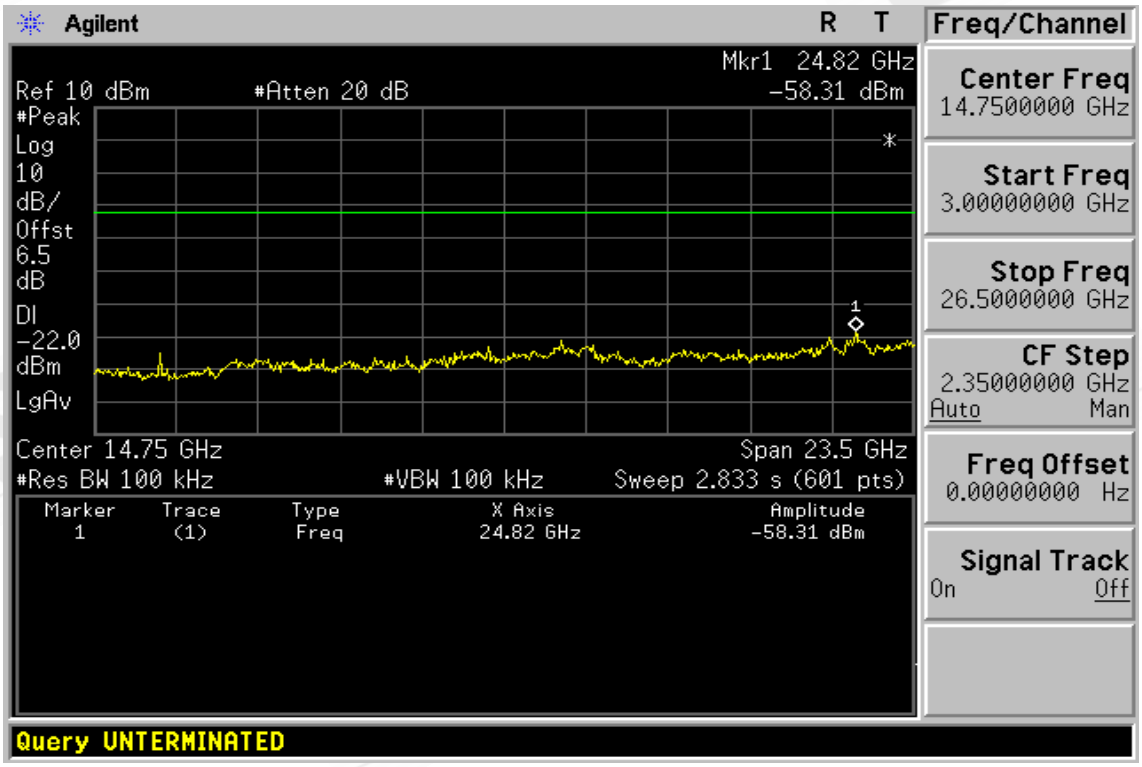
Ch Low 3GHz – 26.5GHz



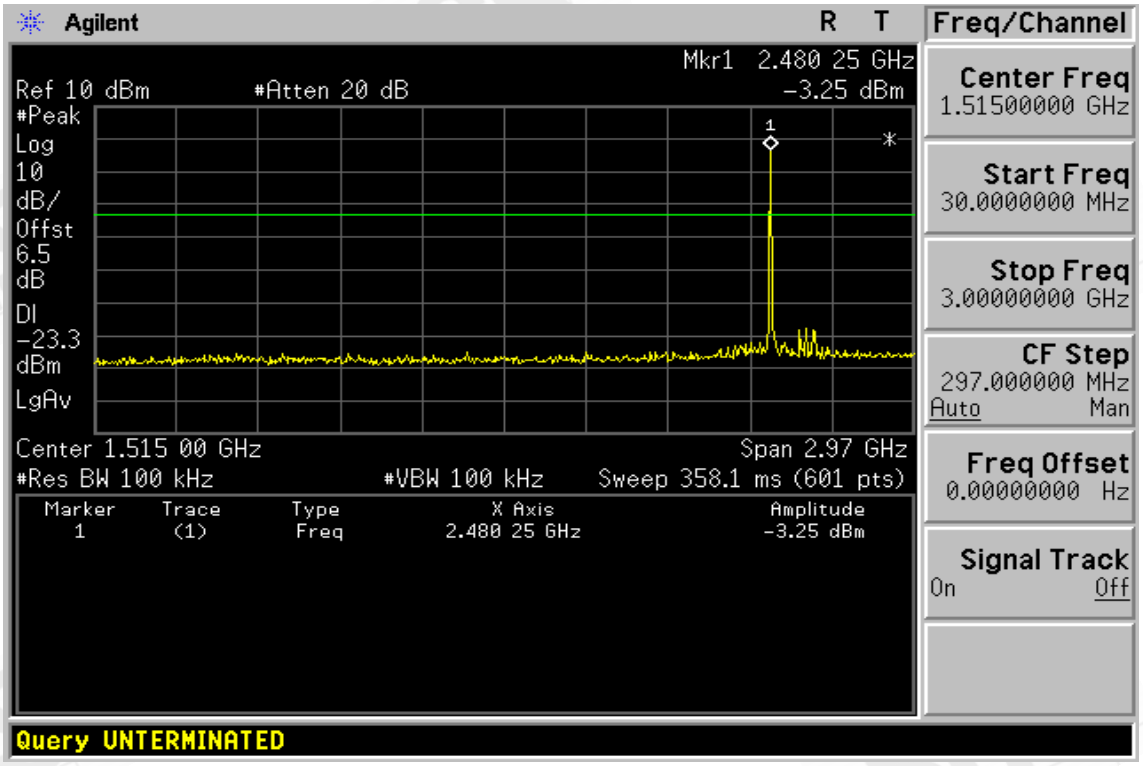
Ch Mid 30MHz – 3GHz



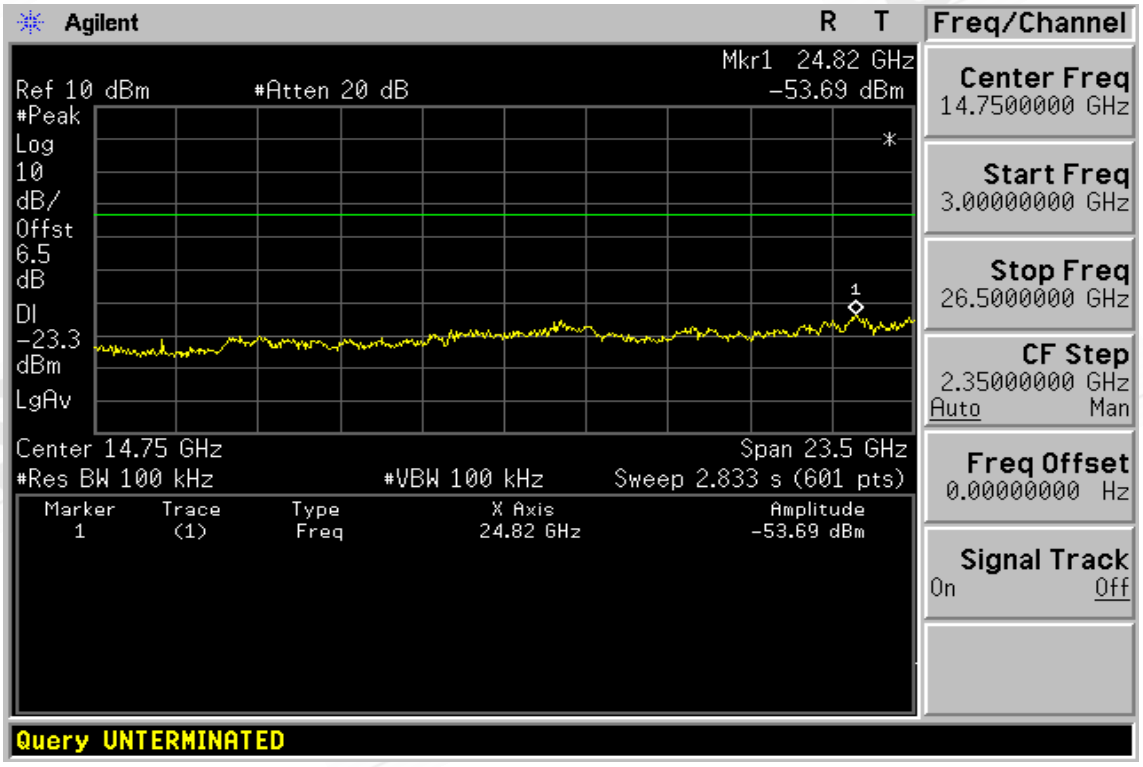
Ch Mid 3GHz – 26.5GHz



Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	EDR TX CH Low	Test Date	Mar. 19, 2010
Fundamental Frequency	2402MHz	Test By	Brian
Temperature	23 ℃	Pol	Ver./Hor.
Humidity	57 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
53.28	V	Peak	40.81	-14.40	26.41	40.00	-13.59
65.89	V	Peak	45.08	-15.09	29.99	40.00	-10.01
75.59	V	Peak	47.54	-17.13	30.41	40.00	-9.59
730.34	V	Peak	33.15	-4.54	28.61	46.00	-17.39
916.58	V	Peak	32.88	-1.05	31.83	46.00	-14.17
54.25	H	Peak	40.87	-14.51	26.36	40.00	-13.64
70.74	H	Peak	40.96	-16.27	24.69	40.00	-15.31
104.69	H	Peak	40.16	-16.63	23.53	43.50	-19.97
701.24	H	Peak	33.15	-4.97	28.18	46.00	-17.82
780.78	H	Peak	32.97	-3.47	29.50	46.00	-16.50
933.07	H	Peak	32.64	-1.04	31.60	46.00	-14.40

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode:	EDR TX CH Mid	Test Date:	Mar. 19, 2010
Fundamental Frequency:	2441MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Ver./Hor.
Humidity :	57 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
53.28	V	Peak	41.71	-14.40	27.31	40.00	-12.69
65.89	V	Peak	45.45	-15.09	30.36	40.00	-9.64
70.74	V	Peak	47.06	-16.27	30.79	40.00	-9.21
77.53	V	Peak	47.24	-17.46	29.78	40.00	-10.22
798.24	V	Peak	32.85	-3.08	29.77	46.00	-16.23
885.54	V	Peak	32.96	-1.27	31.69	46.00	-14.31
53.28	H	Peak	41.11	-14.40	26.71	40.00	-13.29
70.74	H	Peak	41.42	-16.27	25.15	40.00	-14.85
75.59	H	Peak	41.20	-17.13	24.07	40.00	-15.93
104.69	H	Peak	38.66	-16.63	22.03	43.50	-21.47
790.48	H	Peak	32.76	-3.26	29.50	46.00	-16.50
853.53	H	Peak	32.37	-1.93	30.44	46.00	-15.56

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode:	EDR TX CH High	Test Date :	Mar. 19, 2010
Fundamental Frequency:	2480MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Ver./Hor.
Humidity :	57 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
53.28	V	Peak	40.41	-14.40	26.01	40.00	-13.99
65.89	V	Peak	46.01	-15.09	30.92	40.00	-9.08
70.74	V	Peak	47.99	-16.27	31.72	40.00	-8.28
104.69	V	Peak	41.54	-16.63	24.91	43.50	-18.59
722.58	V	Peak	33.02	-4.71	28.31	46.00	-17.69
848.68	V	Peak	33.38	-2.01	31.37	46.00	-14.63
53.28	H	Peak	42.15	-14.40	27.75	40.00	-12.25
70.74	H	Peak	40.99	-16.27	24.72	40.00	-15.28
75.59	H	Peak	40.76	-17.13	23.63	40.00	-16.37
101.78	H	Peak	39.55	-16.87	22.68	43.50	-20.82
872.93	H	Peak	32.81	-1.56	31.25	46.00	-14.75
921.43	H	Peak	32.26	-1.05	31.21	46.00	-14.79

Remark：

1 Measuring frequencies from 30 MHz to the 1GHz。

2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.

3 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	EDR TX CH Low	Test Date :	Mar. 19, 2010
Fundamental Frequency:	2402 MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Ver.
Humidity :	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
3815.5	44.12	---	6.36	50.48	---	74.00	54.00	-3.52	Peak
4804.0	33.77	---	8.02	41.79	---	74.00	54.00	-12.21	Peak
7206.0	----					74.00	54.00		
9608.0	----					74.00	54.00		
12010.0	----					74.00	54.00		
14412.0	----					74.00	54.00		
16814.0	----					74.00	54.00		
19216.0	----					74.00	54.00		
21618.0	----					74.00	54.00		
24020.0	----					74.00	54.00		

Remark:

1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.

2 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	EDR TX CH Low	Test Date :	Mar. 19, 2010
Fundamental Frequency:	2402 MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Hor.
Humidity :	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
3815.5	43.81	---	6.61	50.42	---	74.00	54.00	-3.58	Peak
4804.0	33.61	---	8.02	41.63	---	74.00	54.00	-12.37	Peak
7206.0	----					74.00	54.00		
9608.0	----					74.00	54.00		
12010.0	----					74.00	54.00		
14412.0	----					74.00	54.00		
16814.0	----					74.00	54.00		
19216.0	----					74.00	54.00		
21618.0	----					74.00	54.00		
24020.0	----					74.00	54.00		

Remark:

1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.

2 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	EDR TX CH Mid	Test Date :	Mar. 19, 2010
Fundamental Frequency:	2441 MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Ver.
Humidity :	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
3815.5	44.75	---	6.61	51.36	---	74.00	54.00	-2.64	Peak
4882.0	33.82	---	8.10	41.92	---	74.00	54.00	-12.08	Peak
7323.0	----					74.00	54.00		
9764.0	----					74.00	54.00		
12205.0	----					74.00	54.00		
14646.0	----					74.00	54.00		
17087.0	----					74.00	54.00		
19528.0	----					74.00	54.00		
21969.0	----					74.00	54.00		
24410.0	----					74.00	54.00		

Remark:

1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.

2 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	EDR TX CH Mid	Test Date :	Mar. 19, 2010
Fundamental Frequency:	2441 MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Hor.
Humidity :	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
3515.5	44.11	---	6.61	50.72	---	74.00	54.00	-3.28	Peak
4882.0	33.95	---	8.10	42.05	---	74.00	54.00	-11.95	Peak
7323.0	----					74.00	54.00		
9764.0	----					74.00	54.00		
12205.0	----					74.00	54.00		
14646.0	----					74.00	54.00		
17087.0	----					74.00	54.00		
19528.0	----					74.00	54.00		
21969.0	----					74.00	54.00		
24410.0	----					74.00	54.00		

Remark:

1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.

2 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	EDR TX CH High	Test Date:	Mar. 19, 2010
Fundamental Frequency:	2480 MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Ver.
Humidity :	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
3515.5	44.59	---	6.61	51.20	---	74.00	54.00	-2.80	Peak
4960.0	33.57	---	8.15	41.72	---	74.00	54.00	-12.28	Peak
7440.0	----					74.00	54.00		
9920.0	----					74.00	54.00		
12400.0	----					74.00	54.00		
14880.0	----					74.00	54.00		
17360.0	----					74.00	54.00		
19840.0	----					74.00	54.00		
22320.0	----					74.00	54.00		
24800.0	----					74.00	54.00		

Remark:

1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.

2 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode:	EDR TX CH High	Test Date :	Mar. 19, 2010
Fundamental Frequency:	2480 MHz	Test By:	Brian
Temperature :	23 ℃	Pol:	Hor.
Humidity :	57 %		

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL CF(dB)	Actual FS Peak (dBuV/m)	Actual FS AV (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
3515.5	43.67	---	6.61	50.28	---	74.00	54.00	-3.72	Peak
4960.0	33.96	---	8.15	42.11	---	74.00	54.00	-11.89	Peak
7440.0	----					74.00	54.00		
9920.0	----					74.00	54.00		
12400.0	----					74.00	54.00		
14880.0	----					74.00	54.00		
17360.0	----					74.00	54.00		
19840.0	----					74.00	54.00		
22320.0	----					74.00	54.00		
24800.0	----					74.00	54.00		

Remark:

1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.

2 Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.

4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.

5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

9. FREQUENCY SEPARATION

9.1. Standard Applicable:

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.

9.2. Measurement Equipment Used:

Refer to section 6.2 for details.

9.3. Test Set-up:

Refer to section 6.3 for details.

9.4. Measurement Procedure:

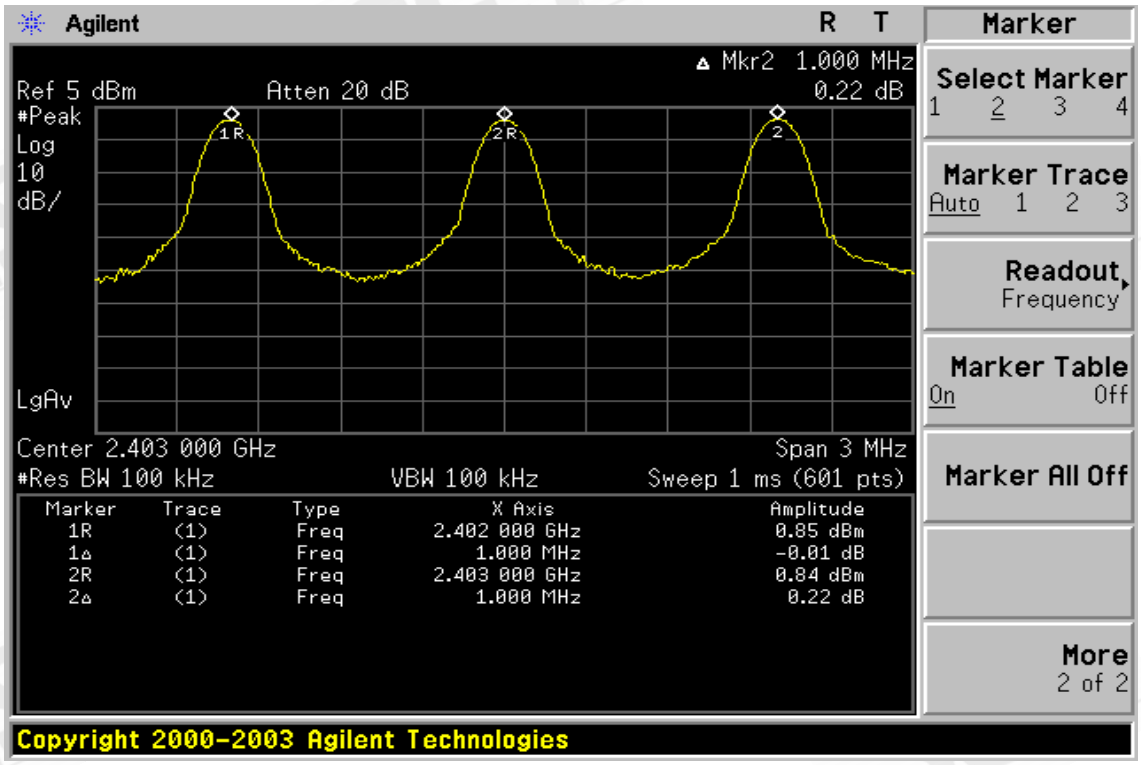
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = middle of hopping channel .
4. Set the spectrum analyzer as RBW,VBW=100KHz, Adjust Span to 3.0 MHz, Sweep = auto.
5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

9.5. Measurement Result:

Channel separation (MHz)	Limit	Result
1	>=25KHz or 2/3 times 20dB bandwidth	PASS

Note: Refer to next page for plots.

Frequency Separation Test Data



10. NUMBER OF HOPPING FREQUENCY

10.1. Standard Applicable:

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

10.2. Measurement Equipment Used:

Refer to section 6.2 for details.

10.3. Test Set-up:

Refer to section 6.3 for details.

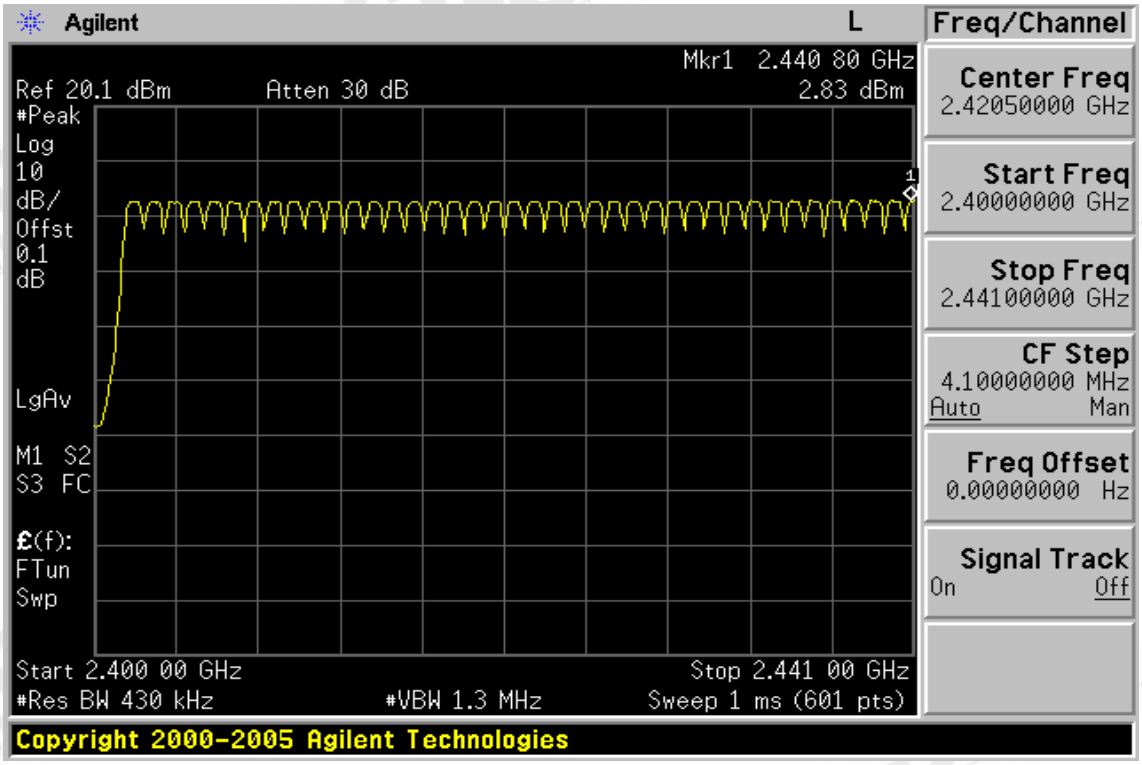
10.4. Measurement Procedure:

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 spectrum analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
4. Set the spectrum analyzer as RBW≧430KHz, VBW=1.3MHz,
5. Max hold, view and count how many channel in the band.

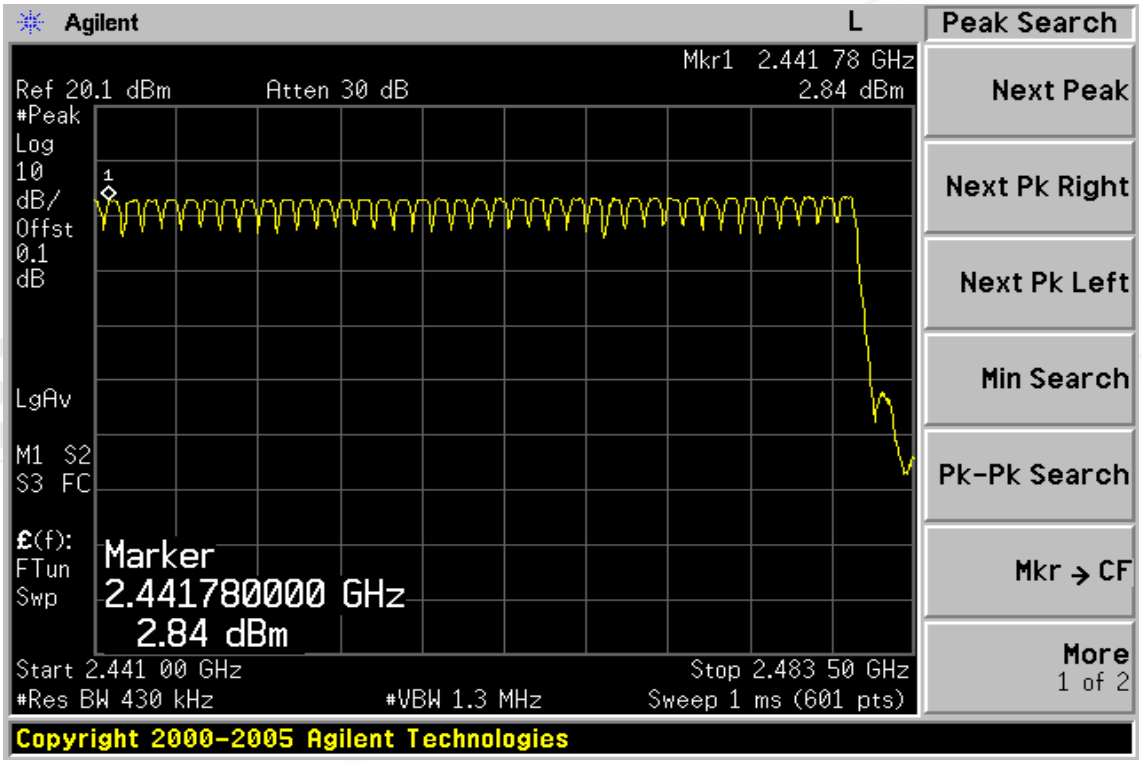
10.5. Measurement Result:

Note: Refer to next page for plots.

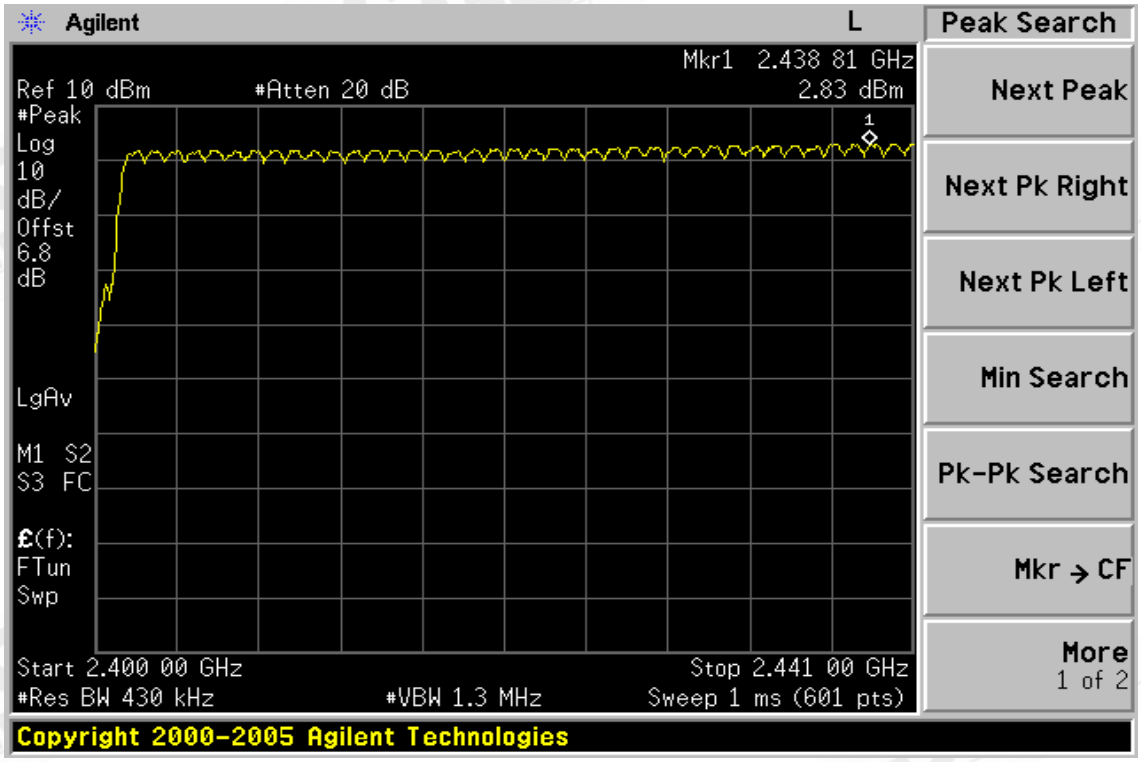
BDR Channel Number
2.4 GHz – 2.441GHz



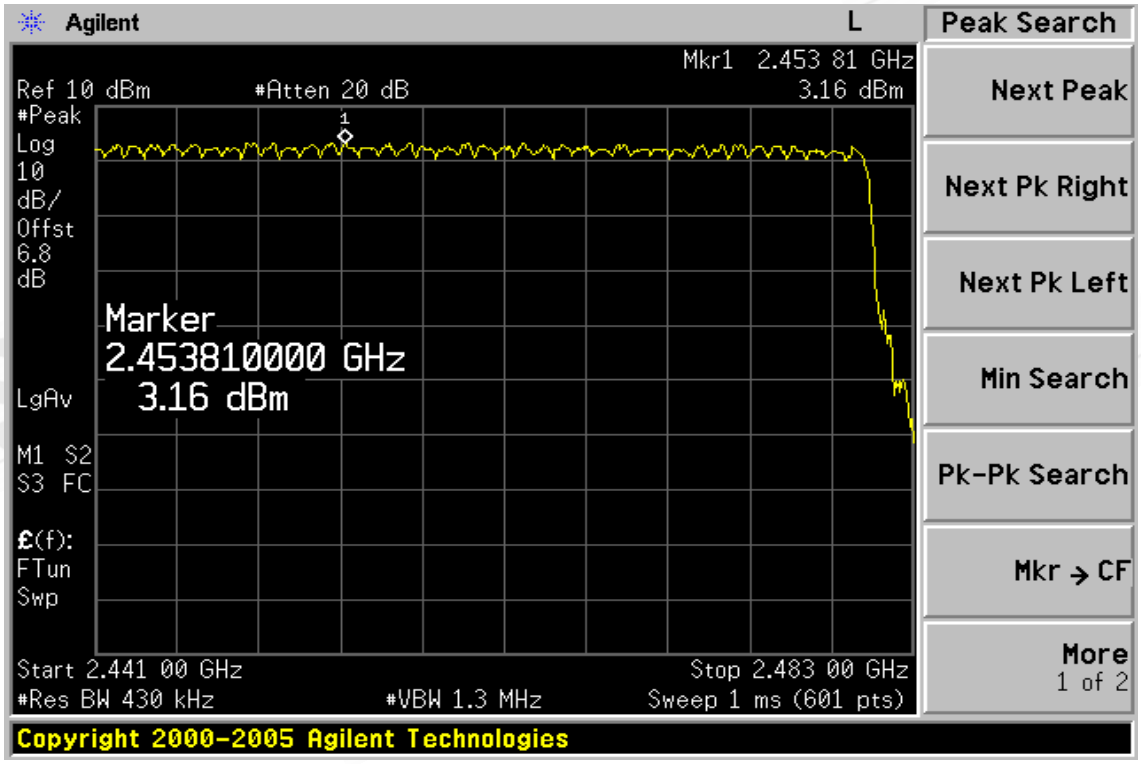
2.441 GHz – 2.4835GHz



EDR Channel Number
2.4 GHz – 2.441GHz



2.441 GHz – 2.4835GHz



11. TIME OF OCCUPANCY (DWELL TIME)

11.1. Standard Applicable:

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

11.2. Measurement Equipment Used:

Refer to section 6.2 for details.

11.3. Test Set-up:

Refer to section 6.3 for details.

11.4. 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 center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW=1MHz,VBW=3MHz, Span = 0Hz.
5. Repeat above procedures until all frequency measured were complete.

11.5. Measurement Result:

BDR Mode

A period time = 0.4 (ms) * 79 = 31.6 (s)

CH Low: DH1 time slot = 0.417 (ms) * (1600/(2*79)) * 31.6 = 133.44 (ms)

DH3 time slot = 1.667 (ms) * (1600/(4*79)) * 31.6 = 266.72 (ms)

DH5 time slot = 2.925 (ms) * (1600/(6*79)) * 31.6 = 312.00 (ms)

CH Mid: DH1 time slot = 0.417 (ms) * (1600/(2*79)) * 31.6 = 133.44 (ms)

DH3 time slot = 1.667 (ms) * (1600/(4*79)) * 31.6 = 266.72 (ms)

DH5 time slot = 2.925 (ms) * (1600/(6*79)) * 31.6 = 312.00 (ms)

CH High: DH1 time slot = 0.417 (ms) * (1600/(2*79)) * 31.6 = 133.44 (ms)

DH3 time slot = 1.667 (ms) * (1600/(4*79)) * 31.6 = 266.72 (ms)

DH5 time slot = 2.925 (ms) * (1600/(6*79)) * 31.6 = 312.00 (ms)

EDR Mode

A period time = 0.4 (ms) * 79 = 31.6 (s)

CH Low: DH1 time slot = 0.397 (ms) * (1600/(2*79)) * 31.6 = 127.04 (ms)

DH3 time slot = 1.650 (ms) * (1600/(4*79)) * 31.6 = 264.00 (ms)

DH5 time slot = 2.883 (ms) * (1600/(6*79)) * 31.6 = 307.52 (ms)

CH Mid: DH1 time slot = 0.397 (ms) * (1600/(2*79)) * 31.6 = 127.04 (ms)

DH3 time slot = 1.650 (ms) * (1600/(4*79)) * 31.6 = 264.00 (ms)

DH5 time slot = 2.883 (ms) * (1600/(6*79)) * 31.6 = 307.52 (ms)

CH High: DH1 time slot = 0.397 (ms) * (1600/(2*79)) * 31.6 = 127.04 (ms)

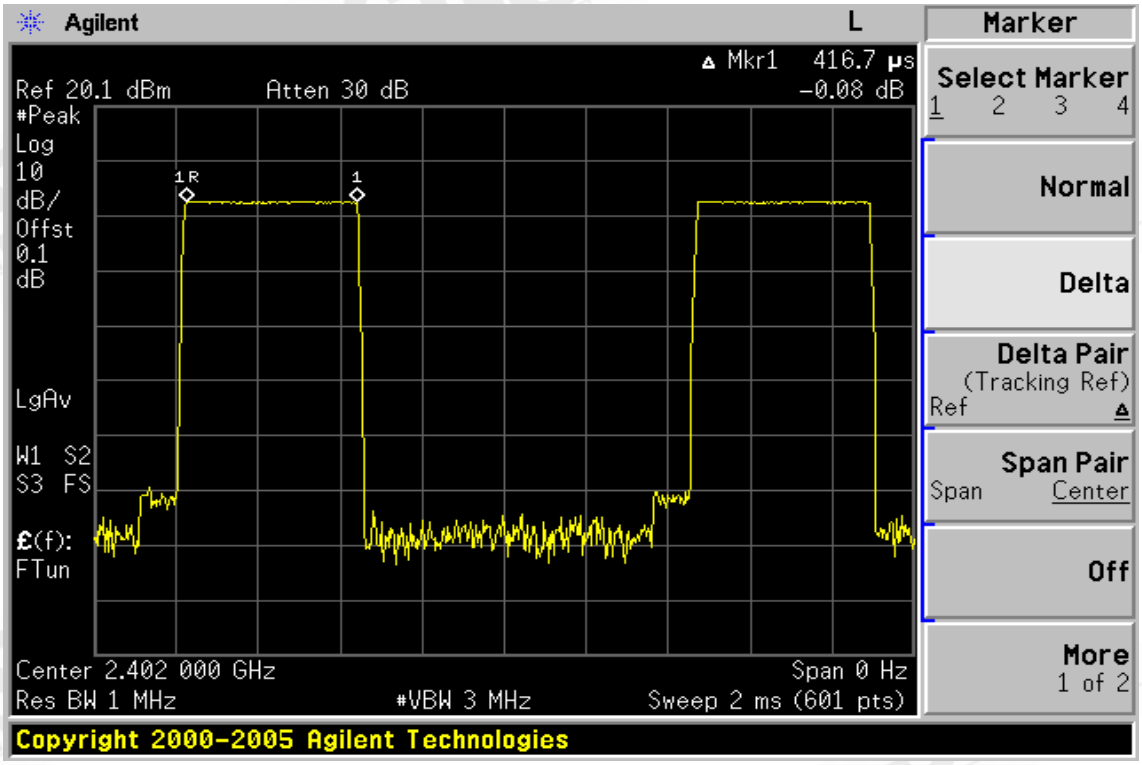
DH3 time slot = 1.650 (ms) * (1600/(4*79)) * 31.6 = 264.00 (ms)

DH5 time slot = 2.883 (ms) * (1600/(6*79)) * 31.6 = 307.52 (ms)

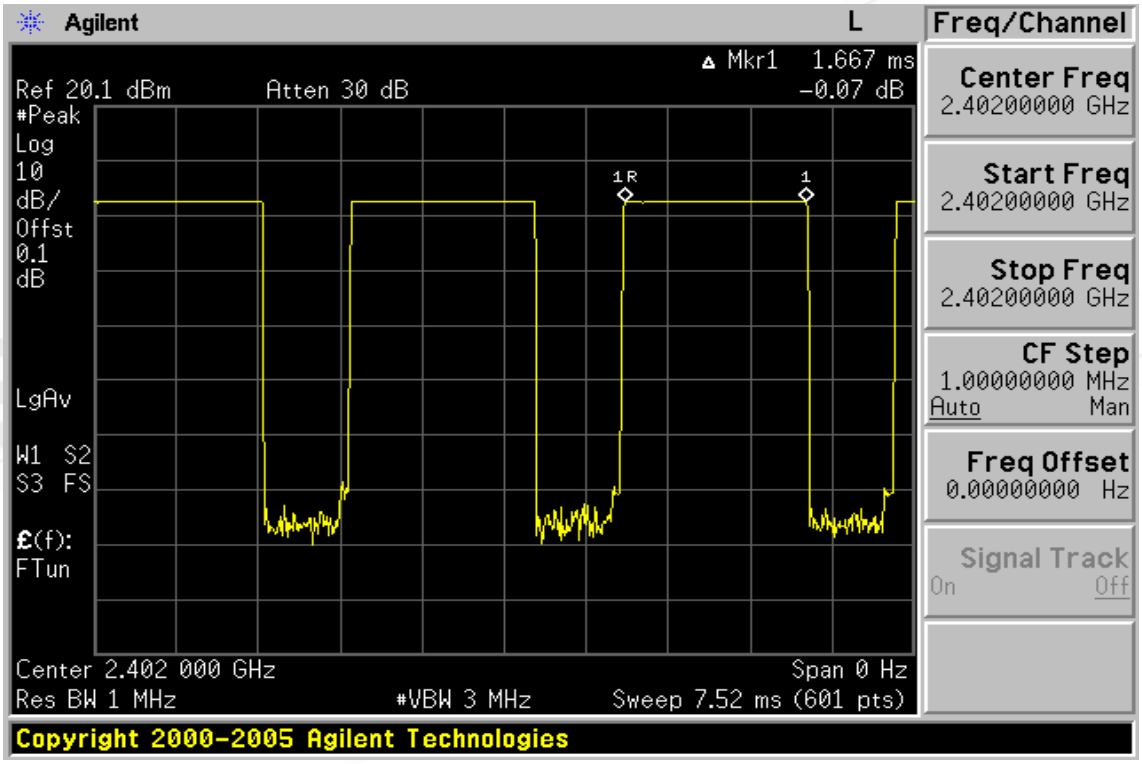
Note: Refer to next page for plots.

BDR CH-Low

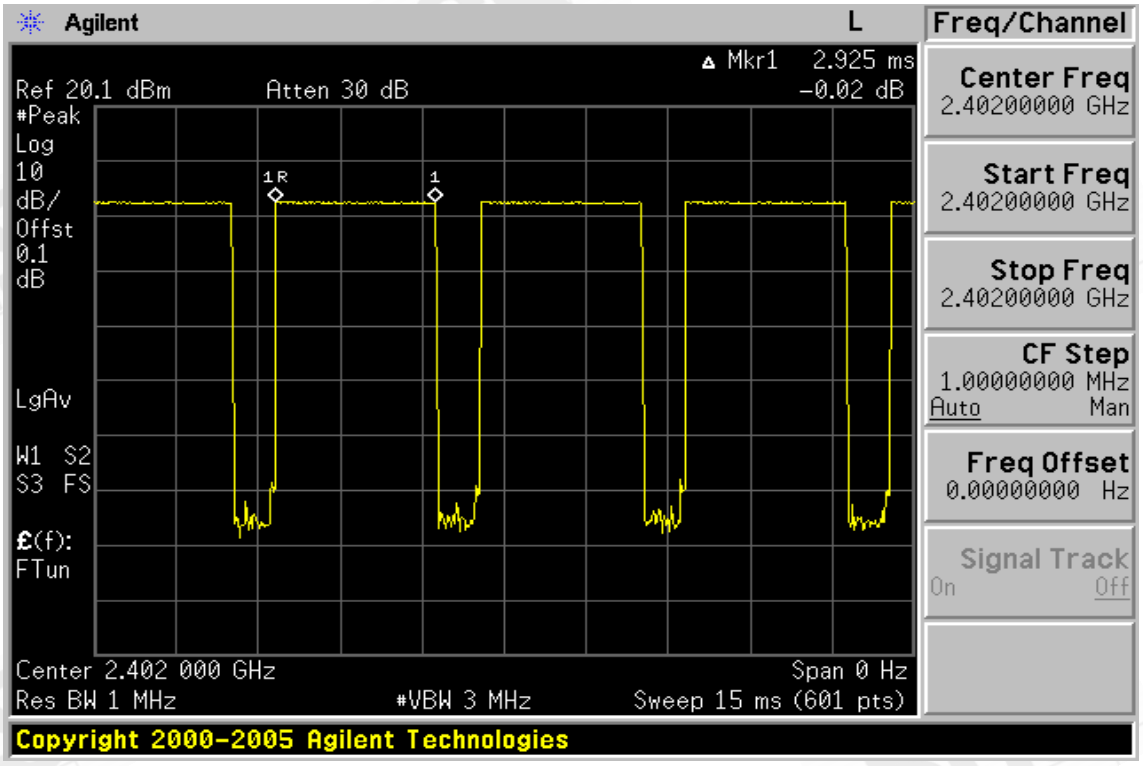
DH1



DH3

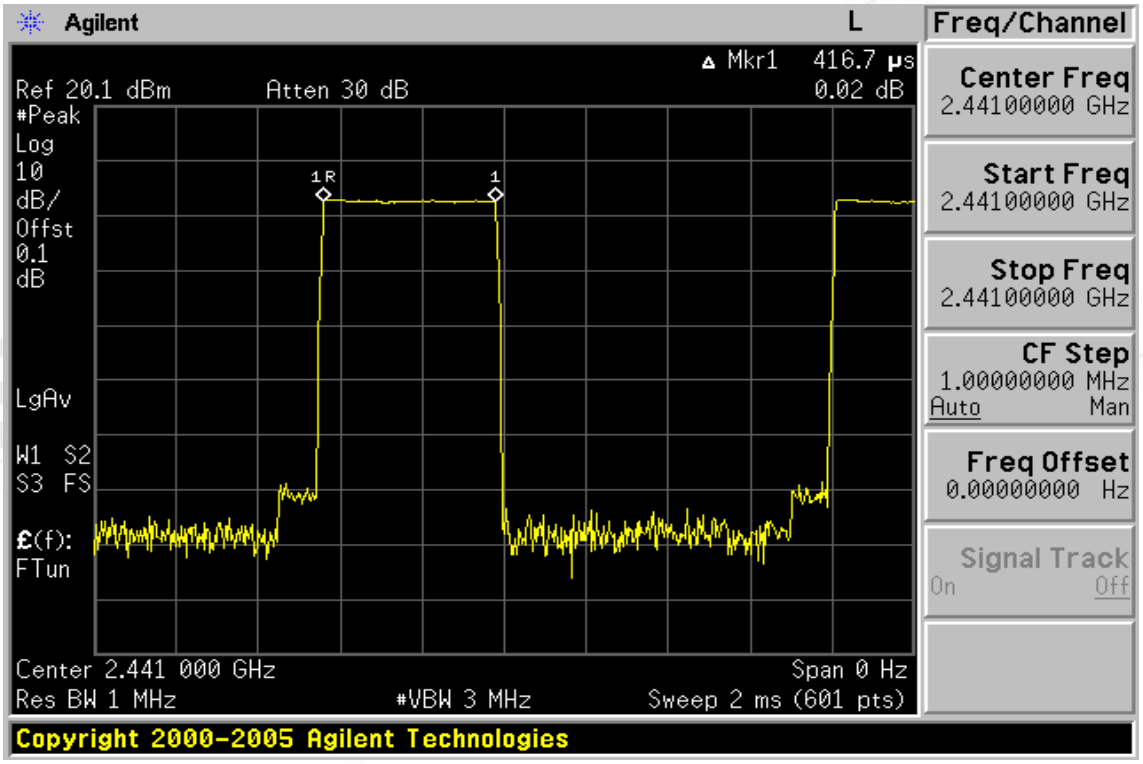


DH5

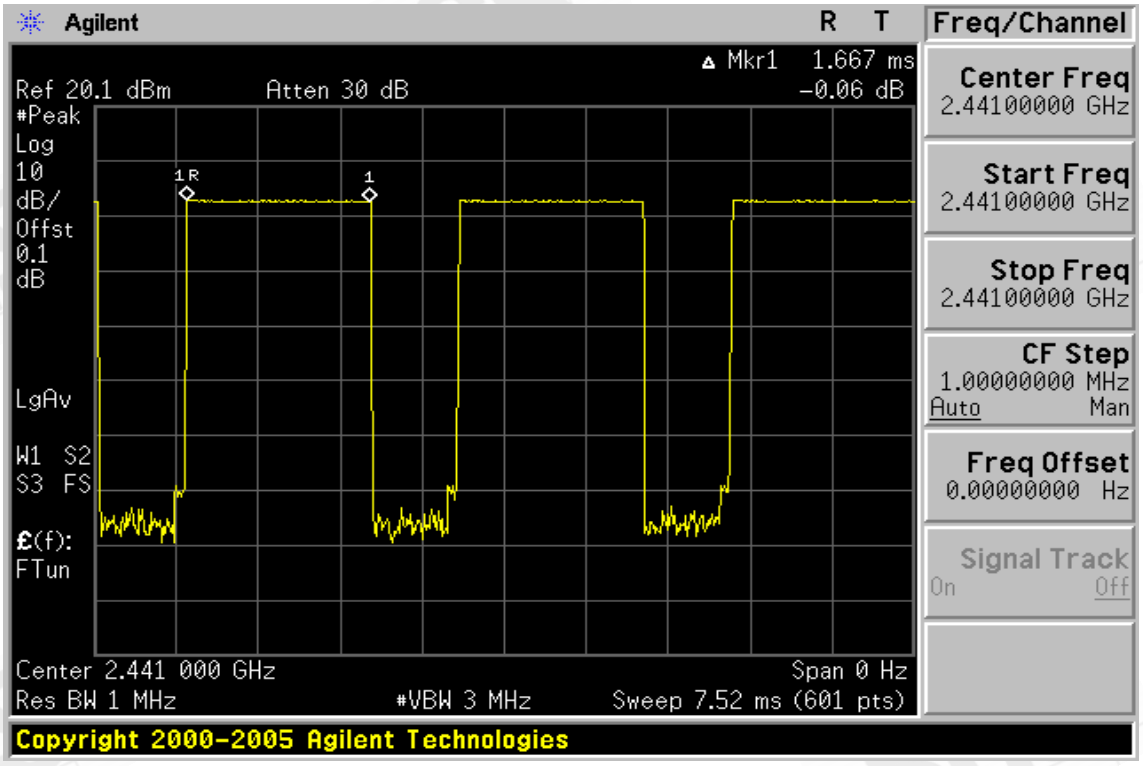


BDR CH-Mid

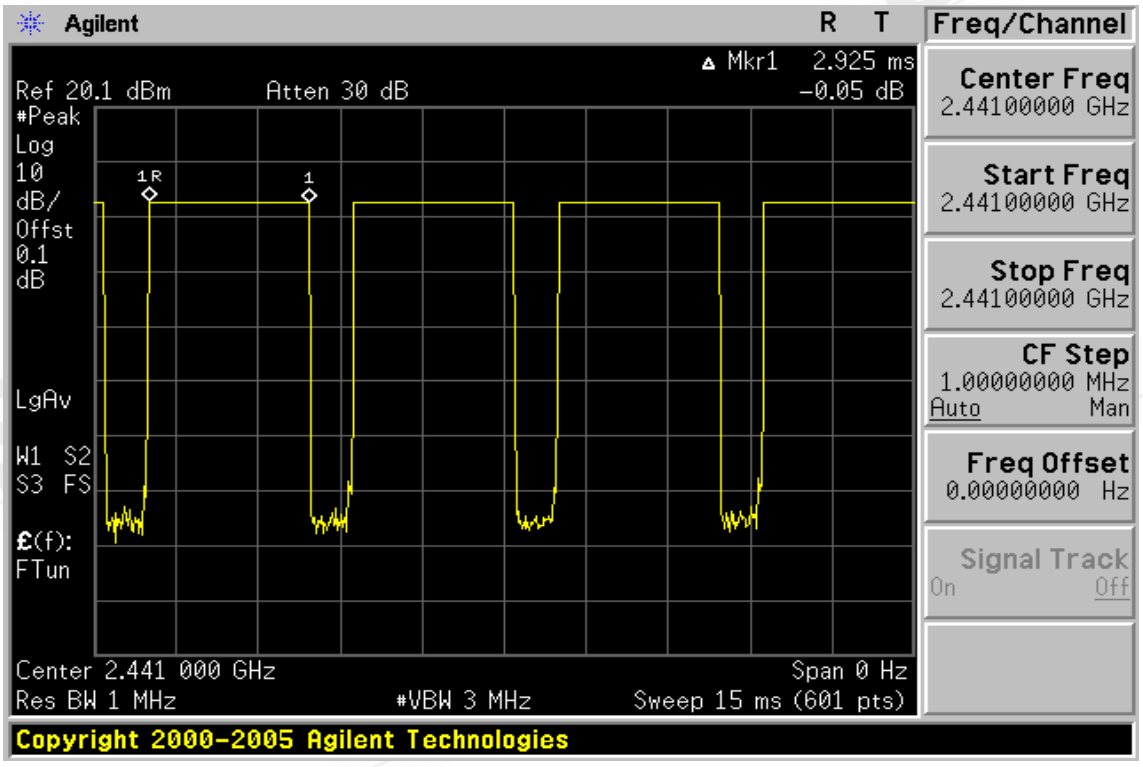
DH1



DH3

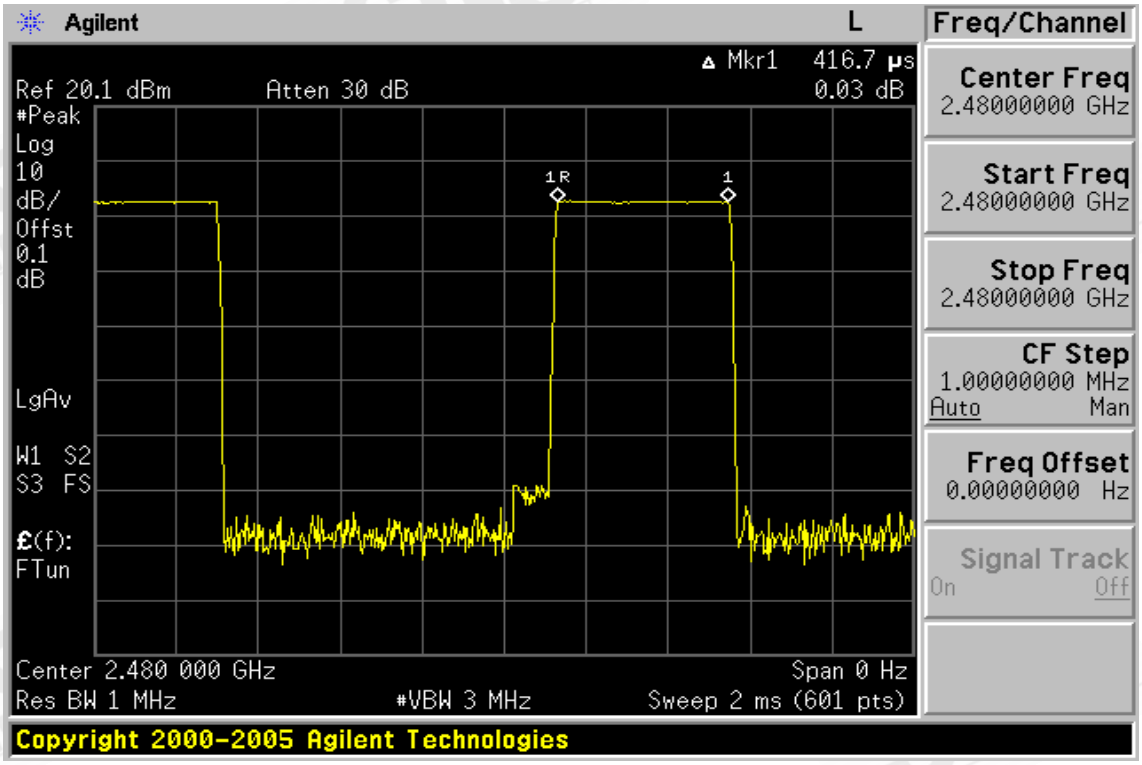


DH5

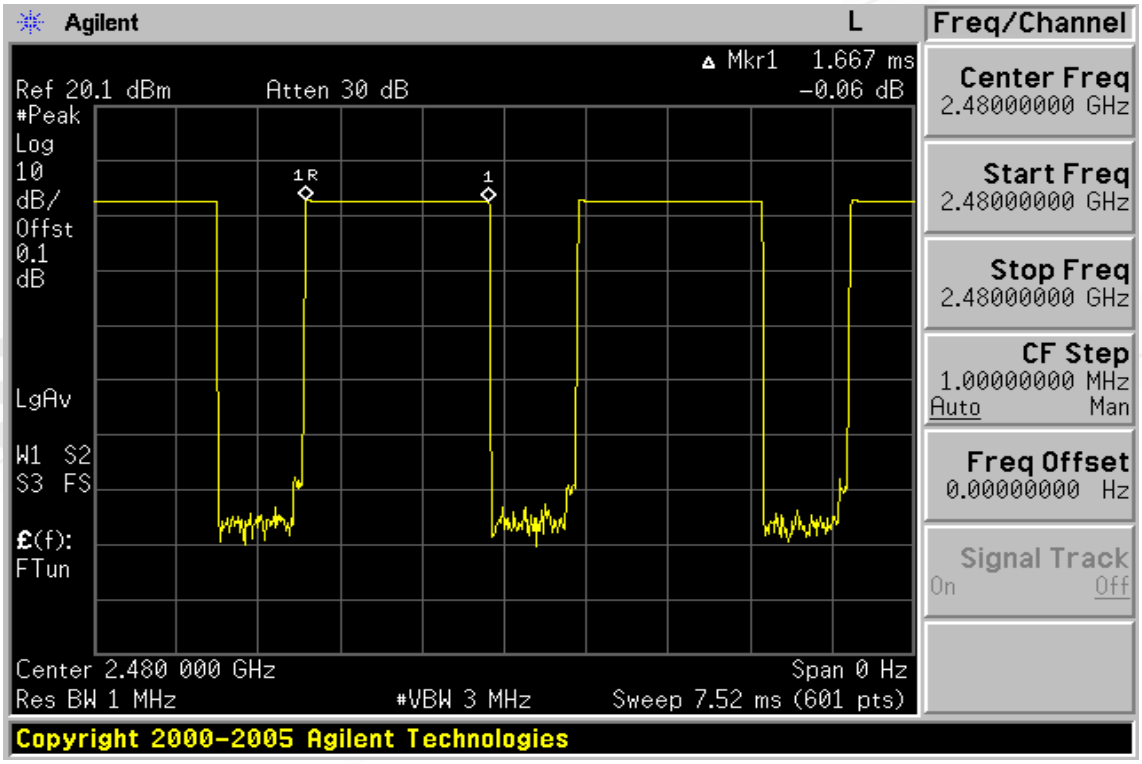


BDR CH-High

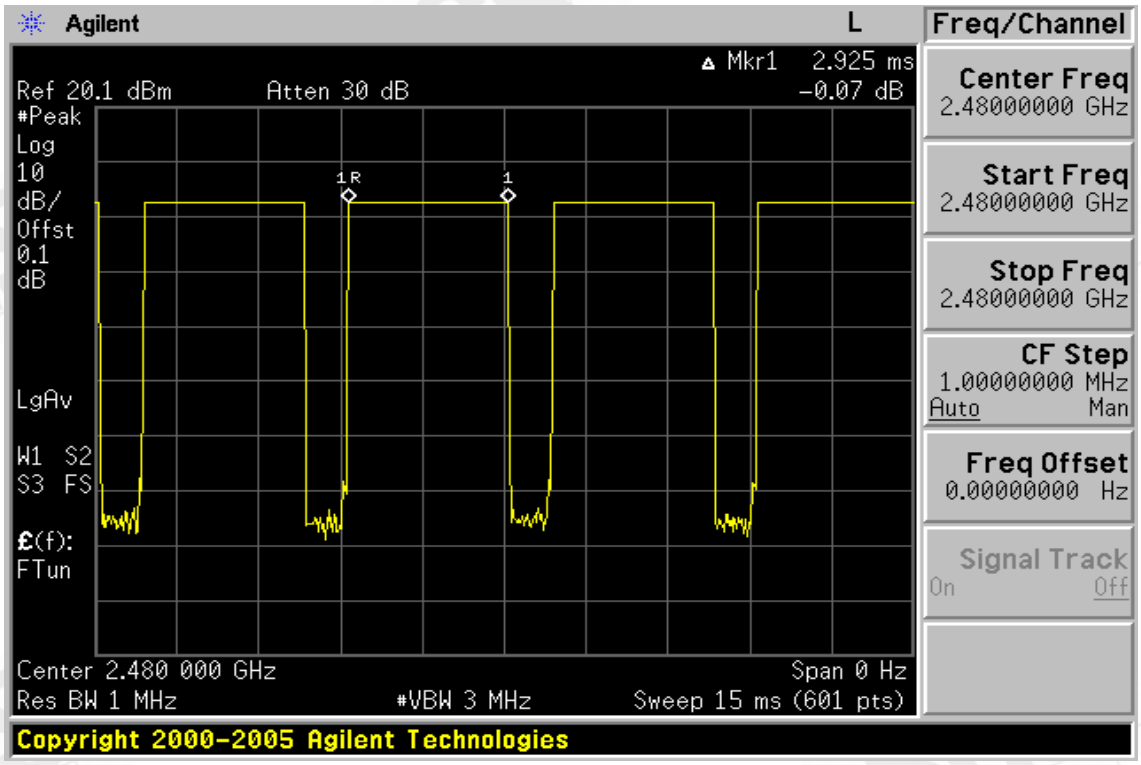
DH1



DH3

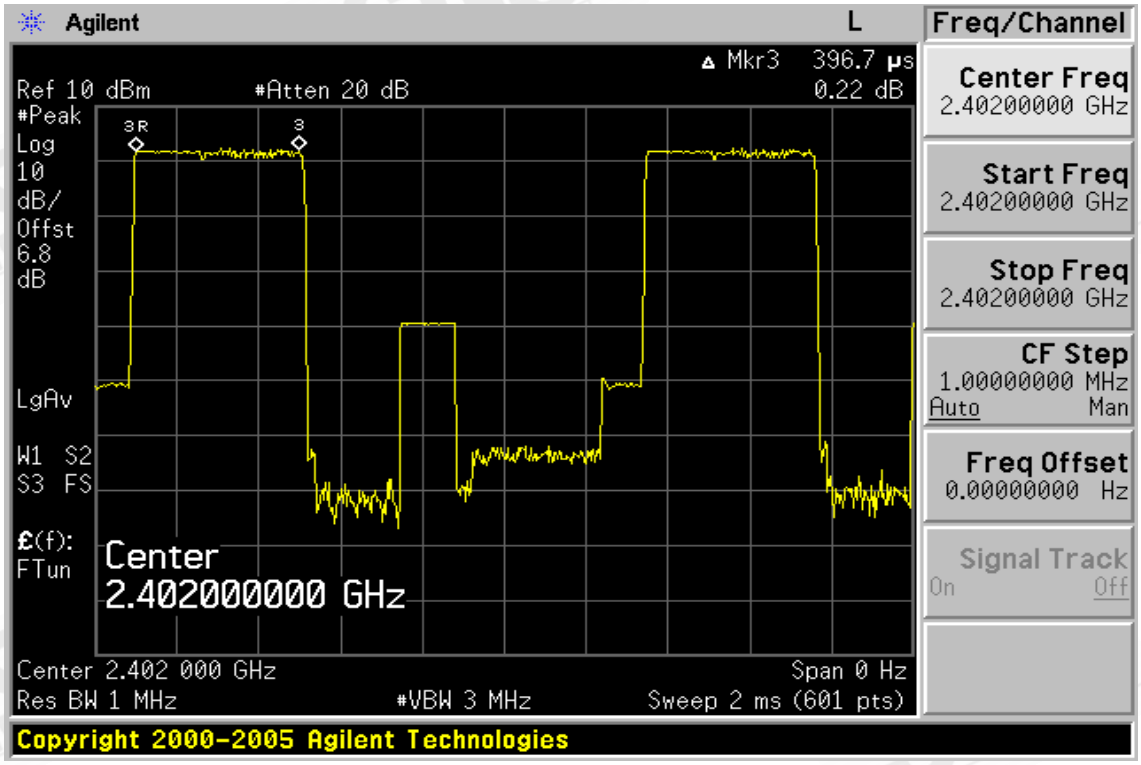


DH5

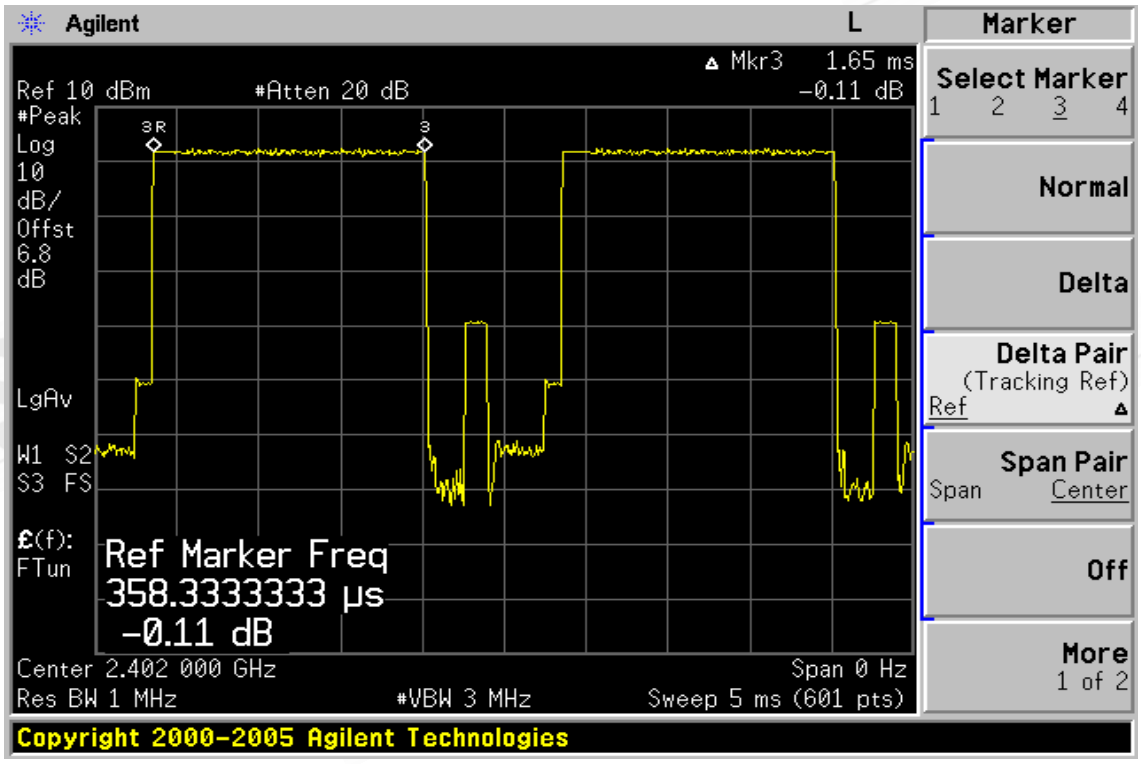


EDR CH-Low

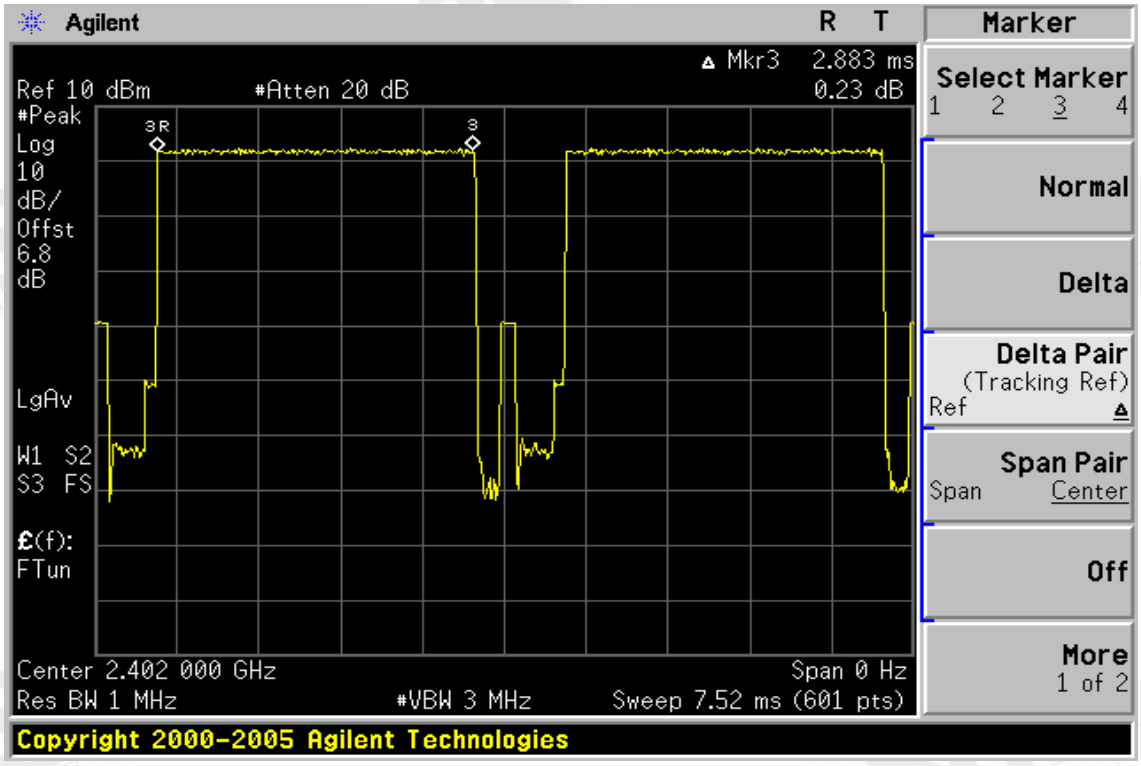
DH1



DH3

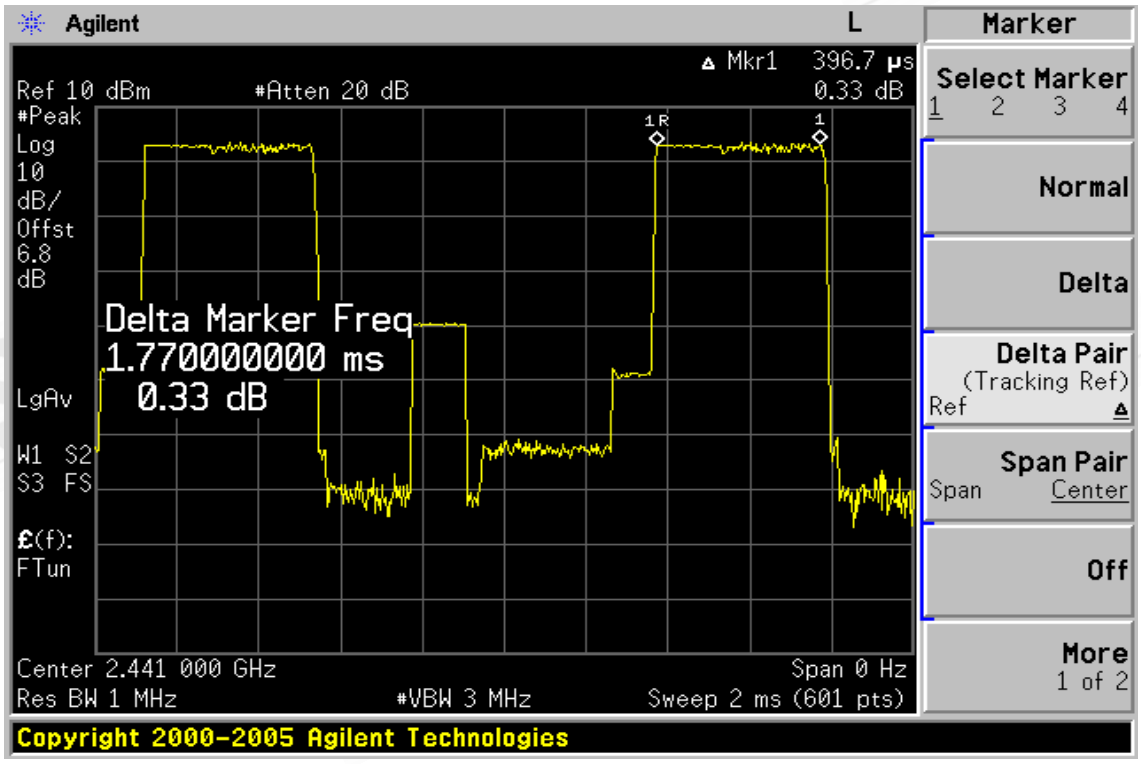


DH5

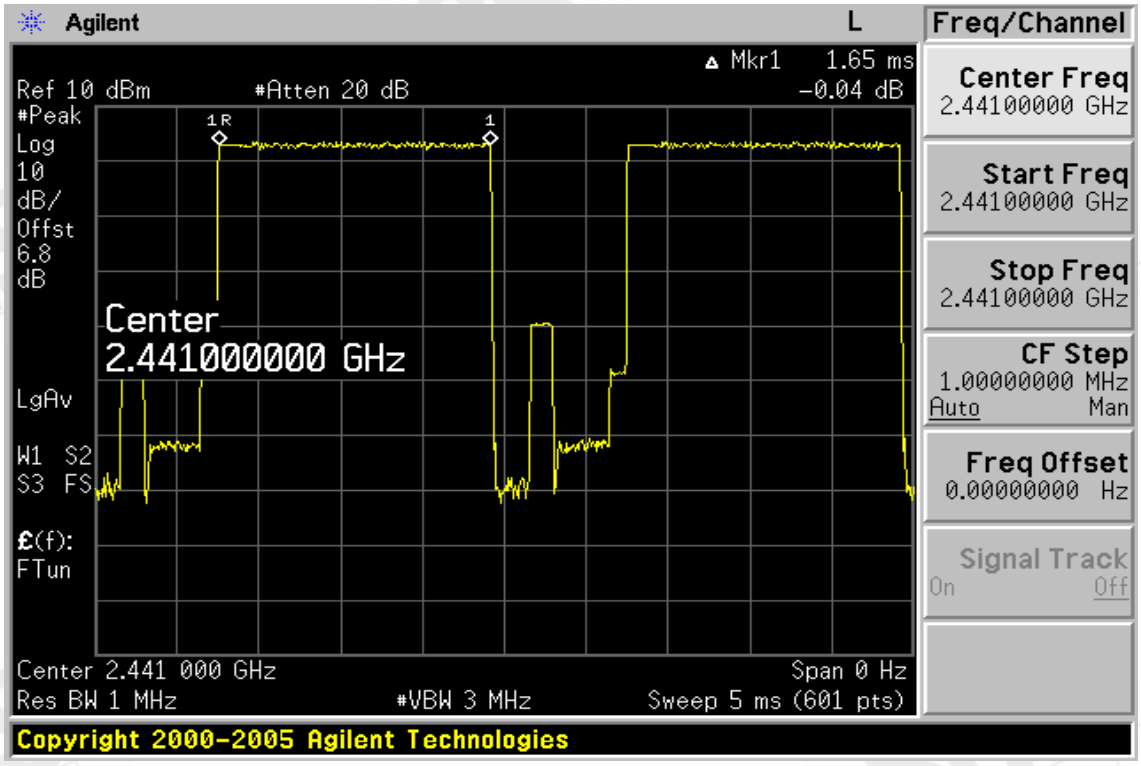


EDR CH-Mid

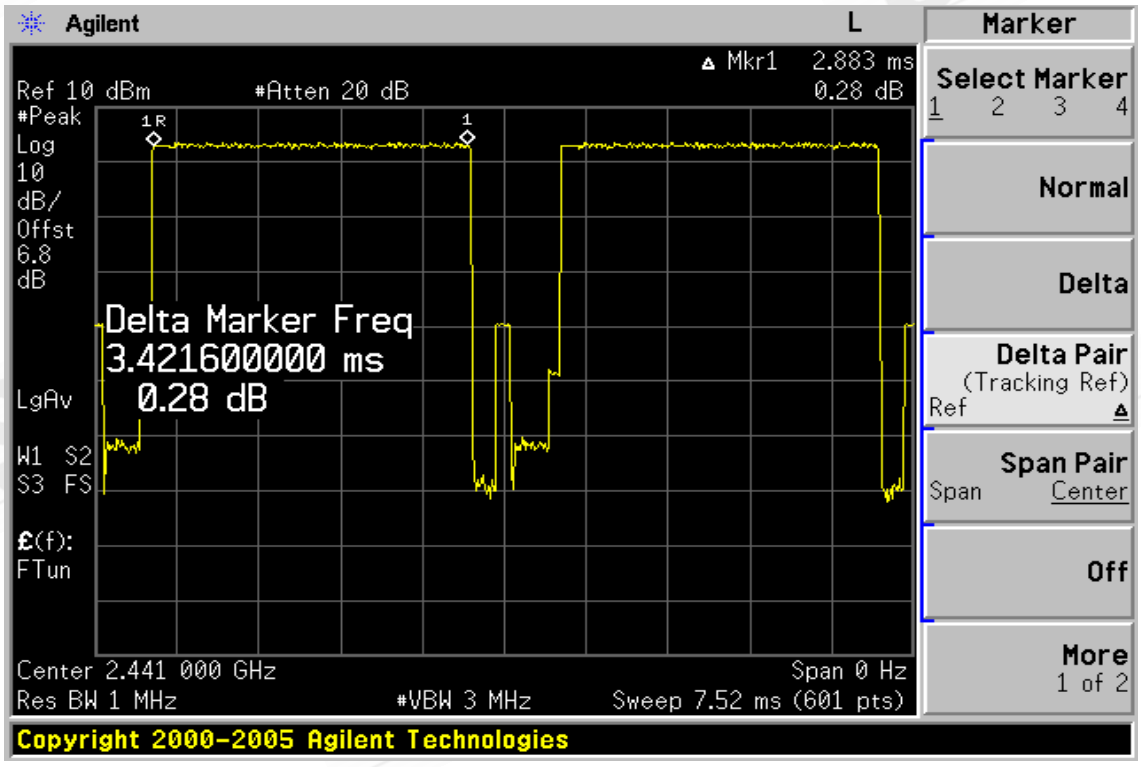
DH1



DH3

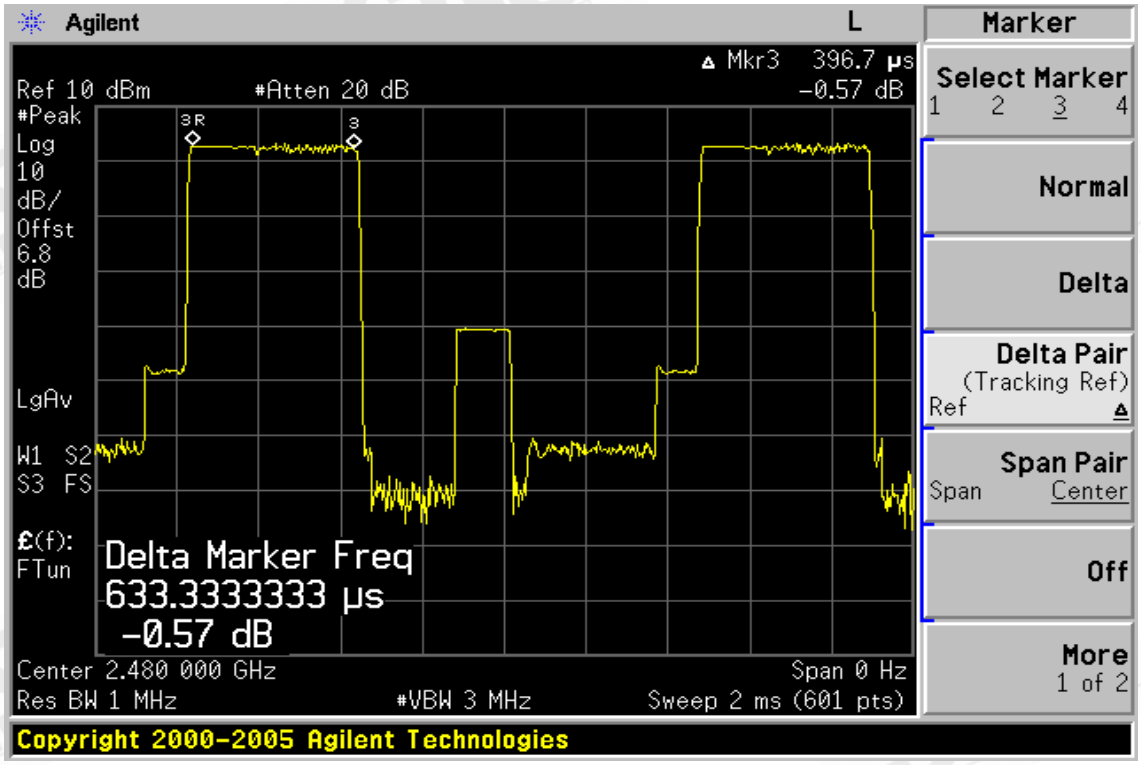


DH5

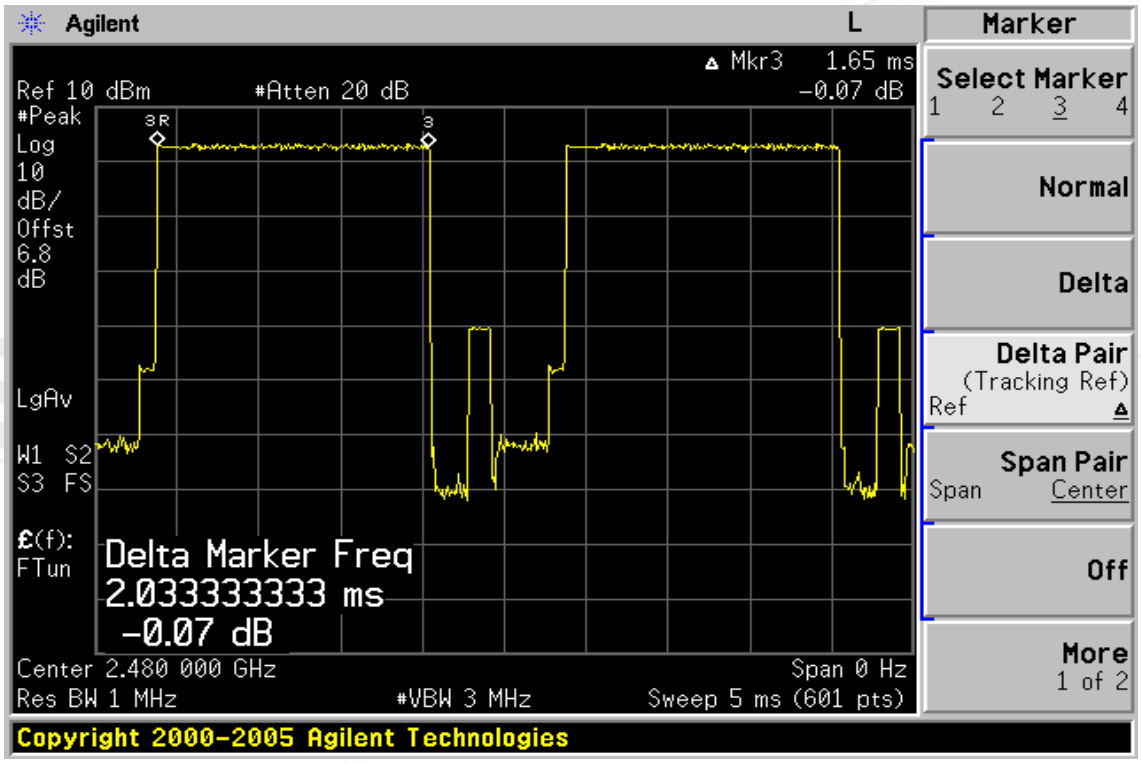


EDR CH-High

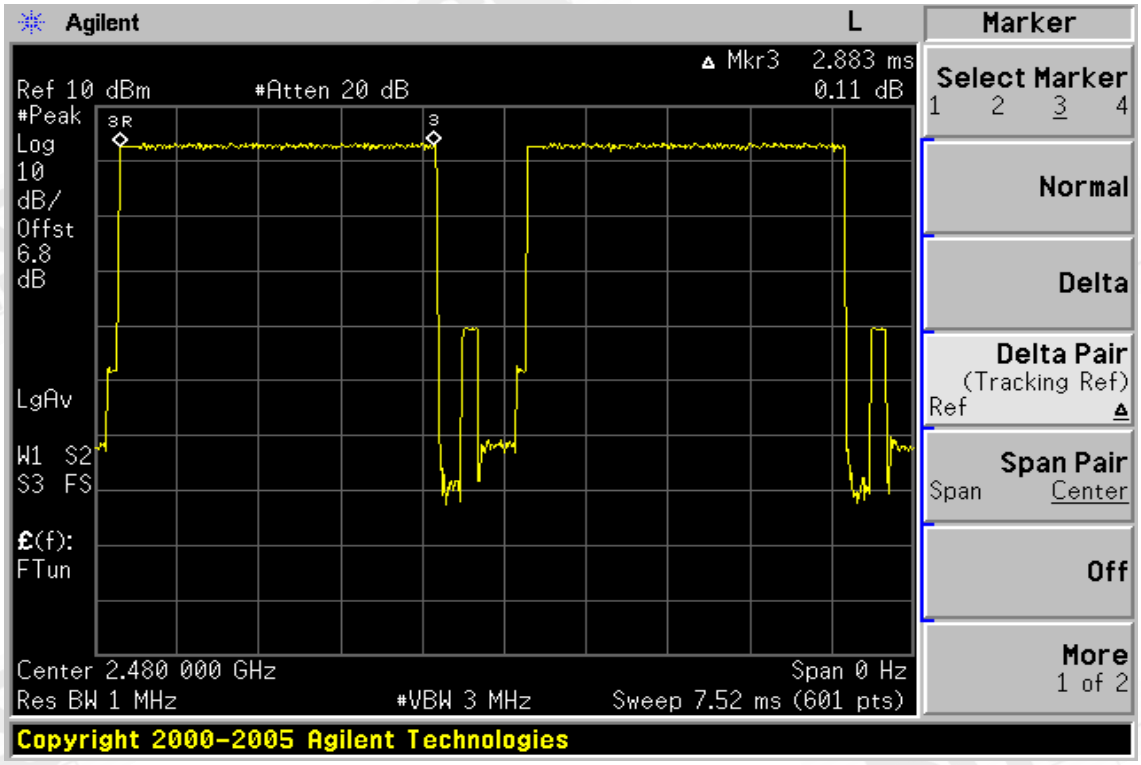
DH1



DH3



DH5



12. 20dB Bandwidth

12.1. Standard Applicable:

According to §15.247(a)(1), for frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

12.2. Measurement Equipment Used:

Refer to section 6.2 for details.

12.3. Test Set-up:

Refer to section 6.3 for details.

12.4. 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=10KHz, Span= 3MHz, Sweep=28.68ms (BDR)
4. Set the spectrum analyzer as RBW=15KHz, Span= 3MHz, Sweep=12.648ms (EDR)
5. Mark the peak frequency and –20dB (upper and lower) frequency.
6. Repeat above procedures until all frequency measured were complete.

12.5. Measurement Result:

BDR mode:

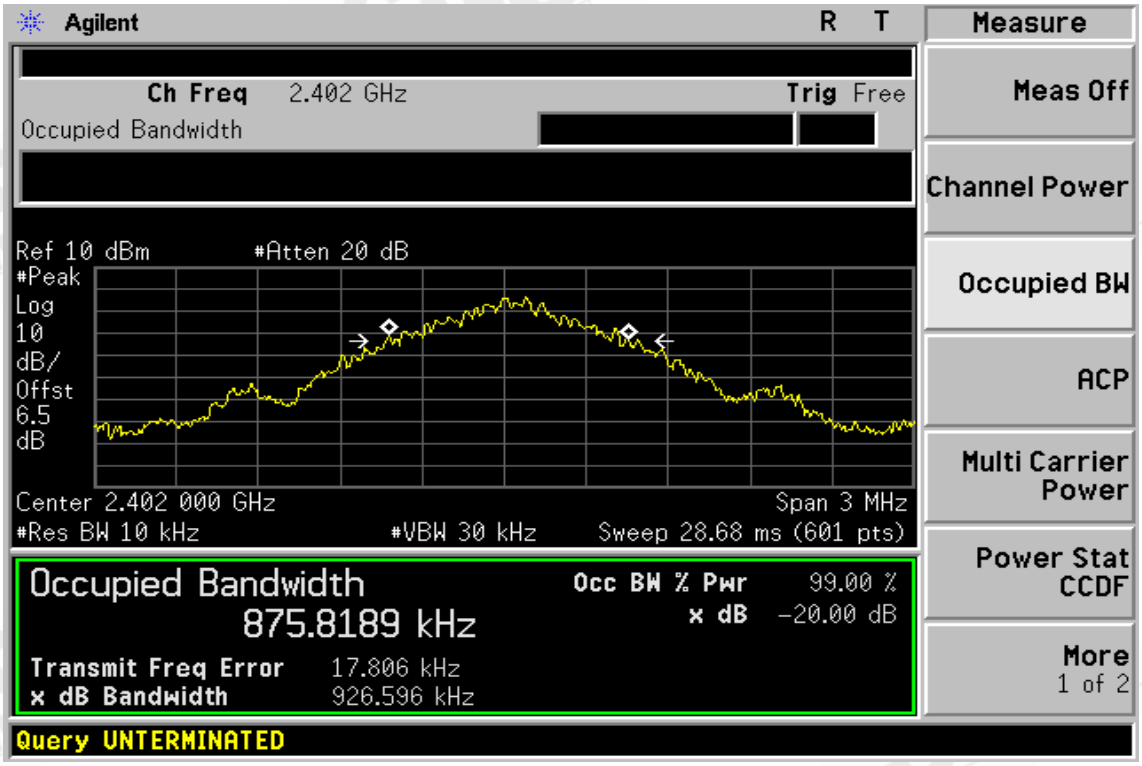
CH	Bandwidth (kHz)
Lower	926.596
Mid	918.952
Higher	926.634

EDR mode:

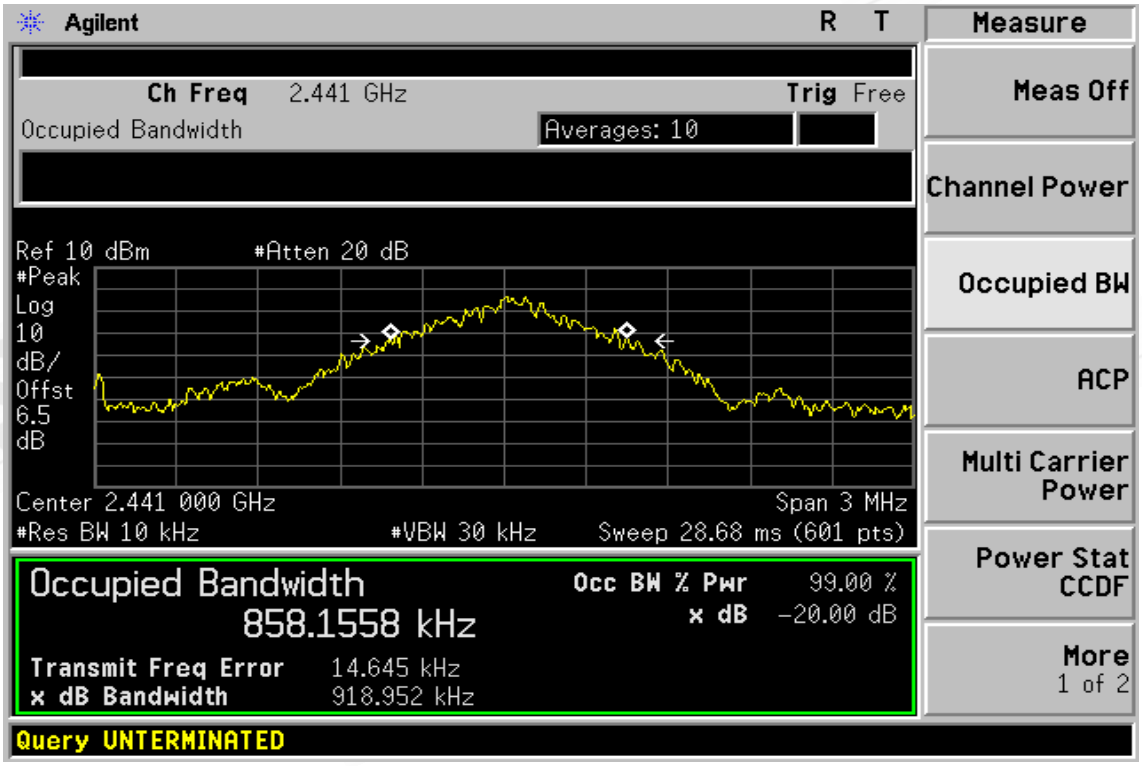
CH	Bandwidth (MHz)	2/3 Bandwidth (MHz)
Lower	1.241	0.827
Mid	1.239	0.826
Higher	1.243	0.829

BDR Mode

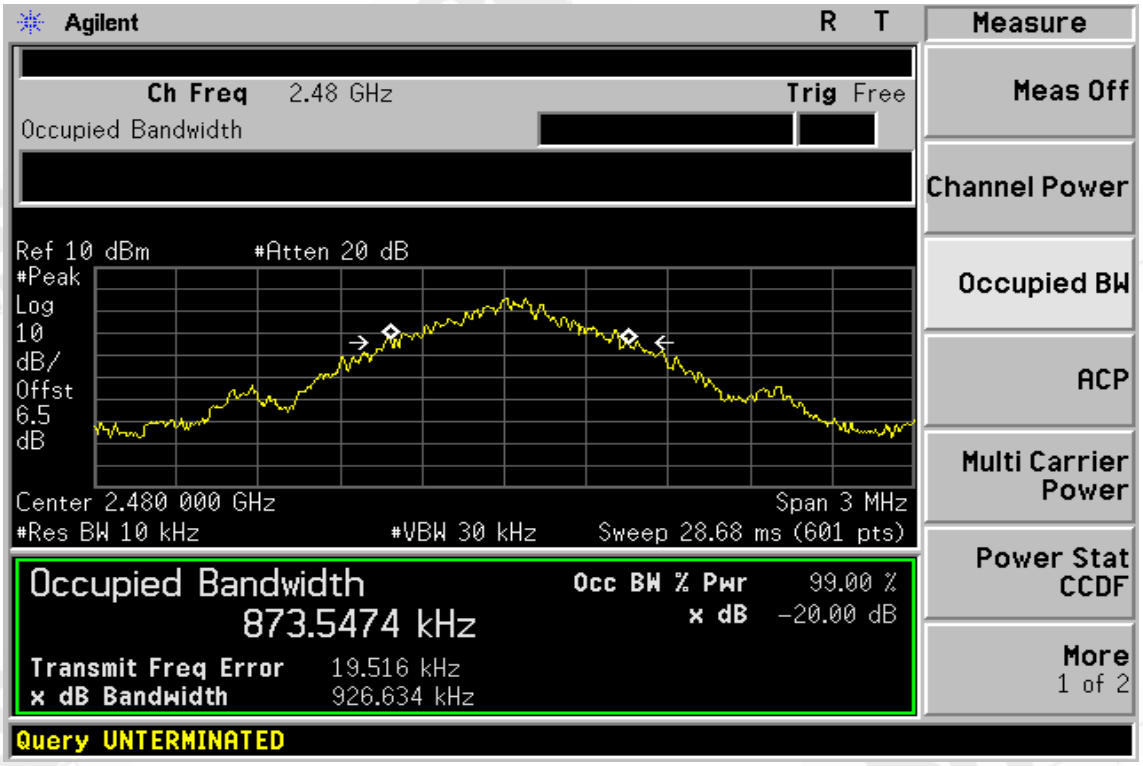
20dB Bandwidth Test Data CH-Low



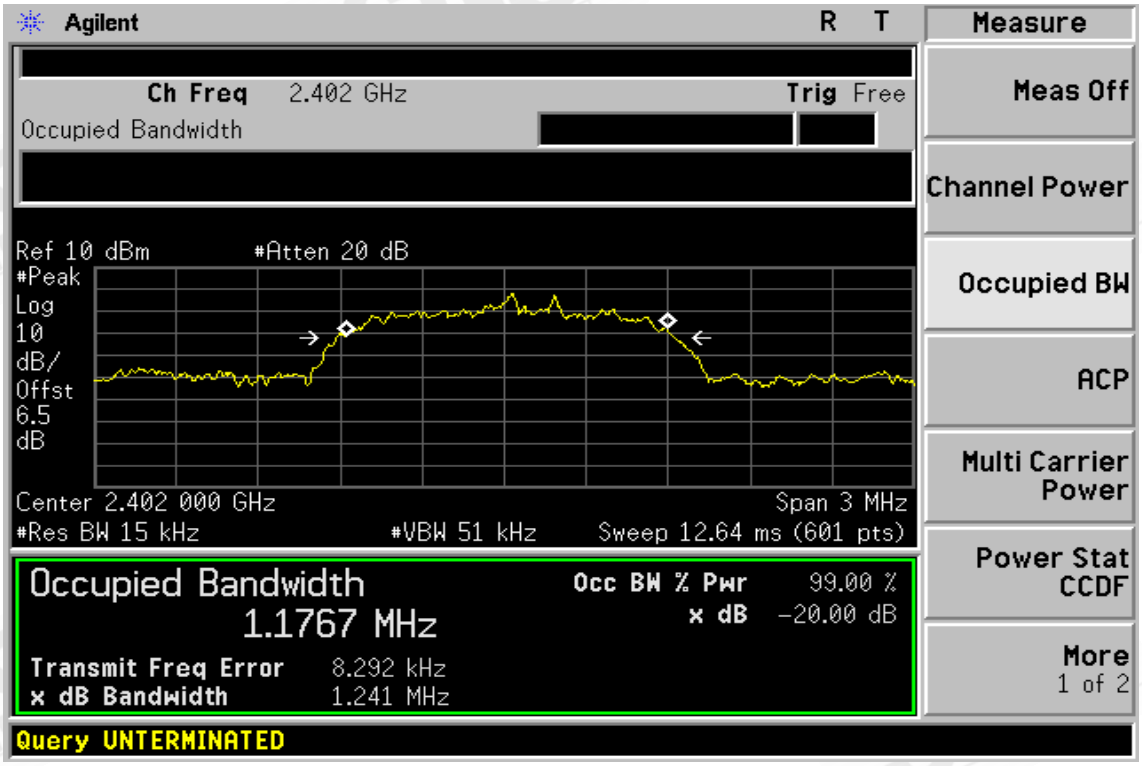
20dB Bandwidth Test Data CH-Mid



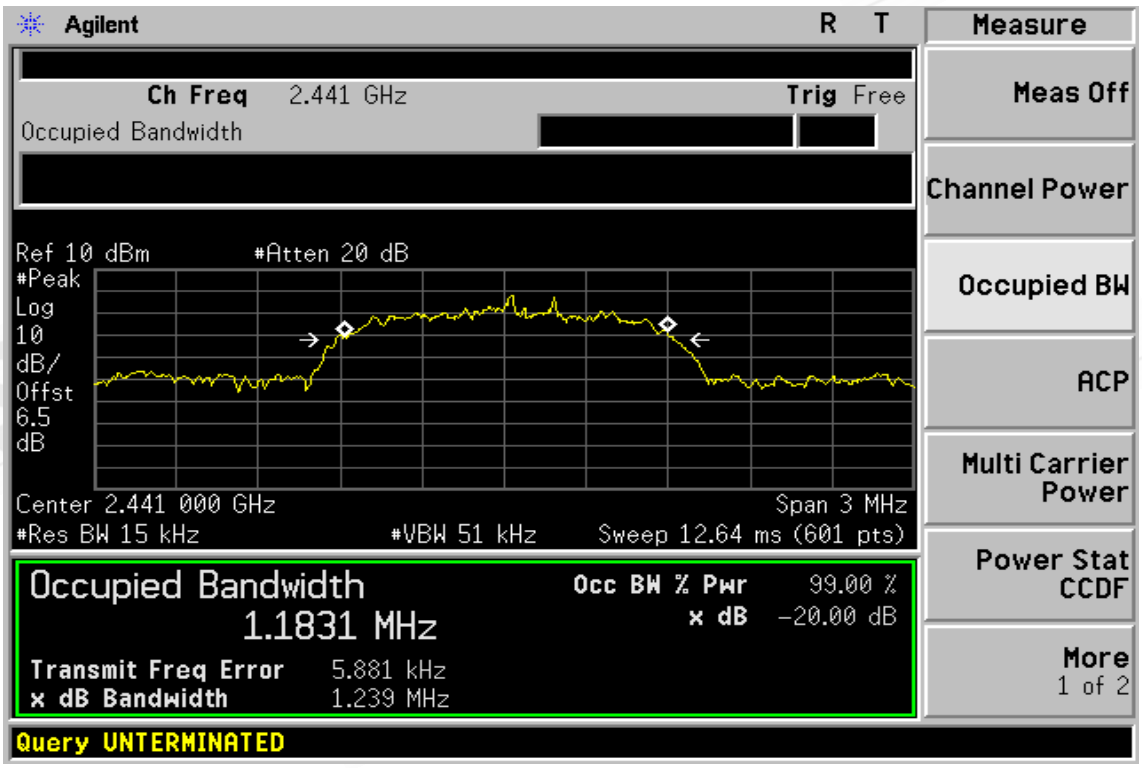
20dB Bandwidth Test Data CH-High



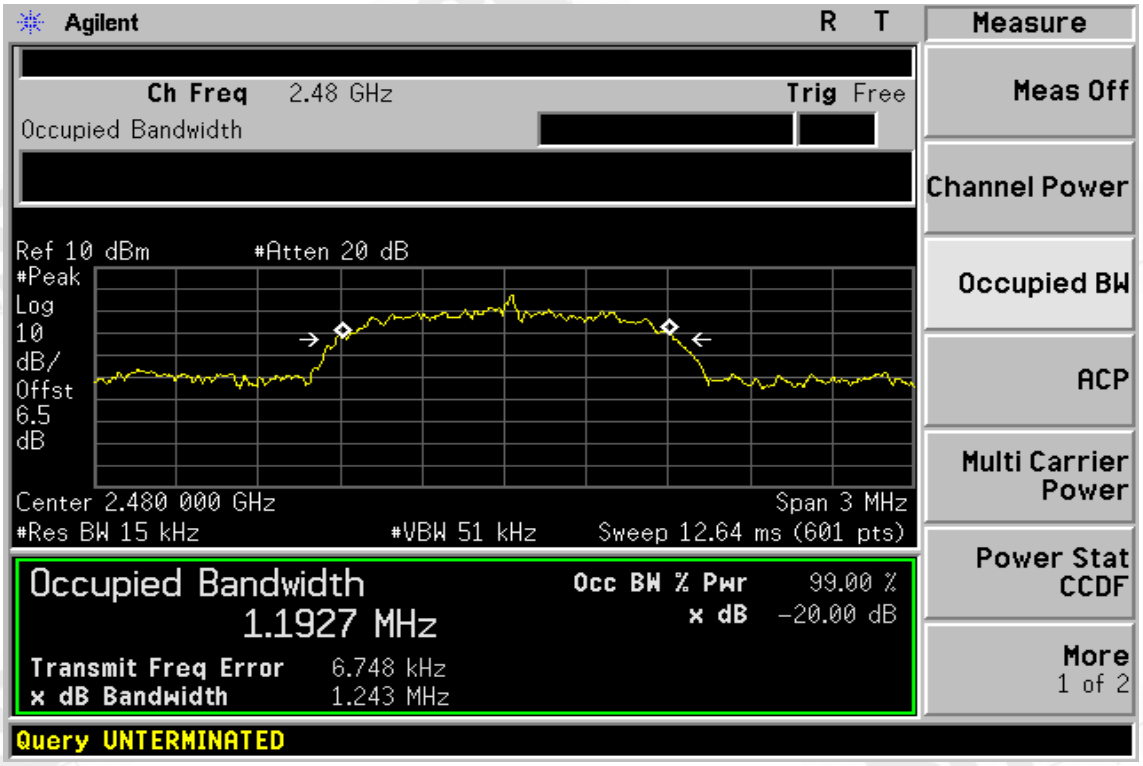
EDR Mode
20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid



20dB Bandwidth Test Data CH-High



13. ANTENNA REQUIREMENT

13.1. Standard Applicable:

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

And according to §15.246(1), if transmitting antennas of directional gain greater than 6dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

13.2. Antenna Connected Construction:

The directional gains of antenna used for transmitting is -2.5dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

14. MEASUREMENT UNCERTAINTY

AC Conduction Uncertainty is ±2.586dB.

Radiated Emission Uncertainty is ±4.22dB.

Output Power is ±1.3dB.

Frequency Tolerance is ±290Hz.