

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name: Bluetooth Remote Handset

Brand Name: HTC

Model No.: BL R100

Model Difference: N/A

FCC ID: NM8BLR100

Report No.: EF/2012/90008

Issue Date: Sep. 25, 2012

FCC Rule Part: §15.247, Cat: DSS

Prepared for: HTC Corporation.
No.23,Xinghua Rd., Taoyuan City, Taoyuan
County 330,Taiwan

Prepared by: SGS Taiwan Ltd.
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24803



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VERIFICATION OF COMPLIANCE

Applicant: HTC Corporation.
No.23,Xinghua Rd., Taoyuan City, Taoyuan County 330,Taiwan

Product Name: Bluetooth Remote Handset

Brand Name: HTC

FCC ID: NM8BLR100

Model No.: BL R100

Model Difference: N/A

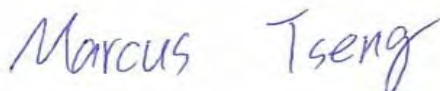
File Number: EF/2012/90008

Date of test: Sep. 11, 2012 ~ Sep. 25, 2012

Date of EUT Received: Sep. 11, 2012

We hereby certify that:

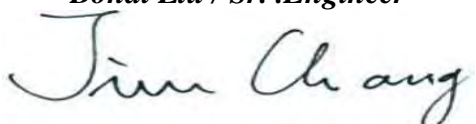
The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247. The test results of this report relate only to the tested sample identified in this report.

Test By:  **Date:** Sep. 25, 2012

Marcus Tseng / Engineer

Prepared By:  **Date:** Sep. 25, 2012

Bondi Liu / Sr. .Engineer

Approved By:  **Date:** Sep. 25, 2012

Jim Chang / Supervisor

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Version

Version No.	Date	Description
00	Sep. 25, 2012	Initial creation of document

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1. GENERAL INFORMATION

General:

Product Name:	Bluetooth Remote Handset	
Brand Name:	HTC	
Model No.:	BL R100	
Model Difference:	N/A	
Data Cable	Model No.: DC M600, Supplier: Foxlink	
Power Supply:	3.7Vdc form Li-Ion battery or 5Vdc form adapter.	
	Battery:	Model No.: BN02100, Supplier: ATL
	Adapter :	Model No.: TC U250, Supplier: Phihong / Delta

Bluetooth:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V2.1 + EDR
Channel number:	79 channels
Modulation type:	GFSK+ π /4DQPSK+8DPSK
Transmit Power:	7.95dBm (Peak)
Dwell Time:	<= 0.4s
Operating Mode:	Point-to-Point
Antenna Designation:	Monopole antenna, 0.8dBi

This test report applies for Bluetooth function.

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

This submittal(s) (test report) is intended for **FCC ID: NM8BLR100** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a Doc procedure.

1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2009. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC Public Notice DA 00-705

1.3. 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: 2009. 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.

1.4. Special Accessories

Not available for this EUT intended for grant.

1.5. 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 EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was 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: 2009. 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 and Subclause 8.3.1.2 of ANSI C63.4: 2009.

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2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

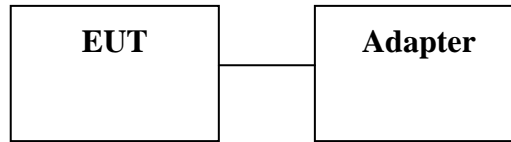


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	BT Software	BlueSuite 1.22	CSR	Version1.22	N/A	N/A
2.	Adapter	Phihong / Delta	TC U250	N/A	Shielded	Un-shielded

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3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	Conducted Emission	Compliant
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(a)	20dB Bandwidth	Compliant
§15.247I	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.209(a) (f)	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
§15.203, §15.247(b)(4)(i)	Antenna Requirement	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 receiving mode is programmed.

Channel low (2402MHz) 、mid (2441MHz) and high (2480MHz) with worst case BDR mode is chosen for full testing.

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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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6. CONDUCTED EMISSION TEST

6.1. Standard Applicable

According to §15.207. frequency 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.

6.2. EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4: 2009.
2. The EUT was plug-in the AC/DC Power adapter. The host system was placed on the center of the back edge on the test table. The peripherals was placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The spacing between the peripherals was 10 centimeters.
4. External I/O cables were draped along the edge of the test table and bundle when necessary.
5. The host system was connected with 120Vac/60Hz power source.

6.3. 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.

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6.4. 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

6.5. 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.

Test Result: Refer to next page for measurement data and plots.

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode			Test Date:	Sep. 21, 2012
Temperature:	26 °C	Humidity:	59 %	Test By:	Marcus
Adapter :	Model No.: TC U250, Supplier: Phihong				



Site	ConductionRoom	Phase:	L1	Temperature:	26 °C
Limit:	FCC Class B Conduction(QP)	Power:	AC 120V/60Hz	Humidity:	60%
EUT:	BLR100	Distance:			
M/N:	BLR100				
Mode:	Operationmode				
Note:	Adaptor model : TCU 250 、 AdaptorP /N : 79H00108 -00M				

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1656	44.33	0.23	44.56	65.18	-20.62	QP	
2		0.2047	40.59	0.21	40.80	63.42	-22.62	QP	
3		0.4824	41.40	0.22	41.62	56.30	-14.68	QP	
4	*	0.4824	34.50	0.22	34.72	46.30	-11.58	AVG	
5		0.6056	38.18	0.22	38.40	56.00	-17.60	QP	
6		0.8636	37.97	0.22	38.19	56.00	-17.81	QP	
7		1.2351	33.18	0.22	33.40	56.00	-22.60	QP	

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Site ConductionRoom Phase: **N** Temperature: 26 °C
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60%
 EUT: BLR100 Distance:
 M/N: BLR100
 Mode: Operationmode
 Note: Adaptor model : TCU 250 \ AdaptorP /N : 79H00108 -00 M

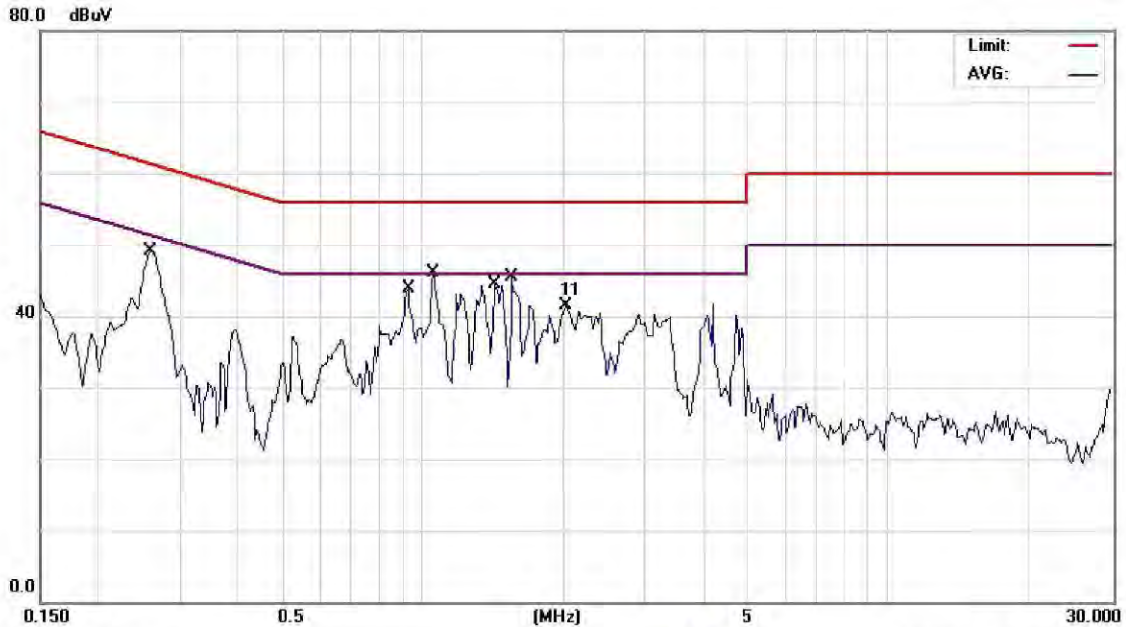
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1578	41.82	0.34	42.16	65.58	-23.42	QP	
2		0.1735	42.58	0.33	42.91	64.79	-21.88	QP	
3		0.2174	38.17	0.31	38.48	62.92	-24.44	QP	
4	*	0.4941	41.60	0.34	41.94	56.10	-14.16	QP	
5		0.4941	23.10	0.34	23.44	46.10	-22.66	AVG	
6		0.5704	37.48	0.33	37.81	56.00	-18.19	QP	
7		0.7541	37.70	0.32	38.02	56.00	-17.98	QP	

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Operation Mode:	Operation Mode			Test Date:	Sep. 21, 2012
Temperature:	26 °C	Humidity:	59 %	Test By:	Marcus
Adapter :	Model No.: TC U250, Supplier: Delta				



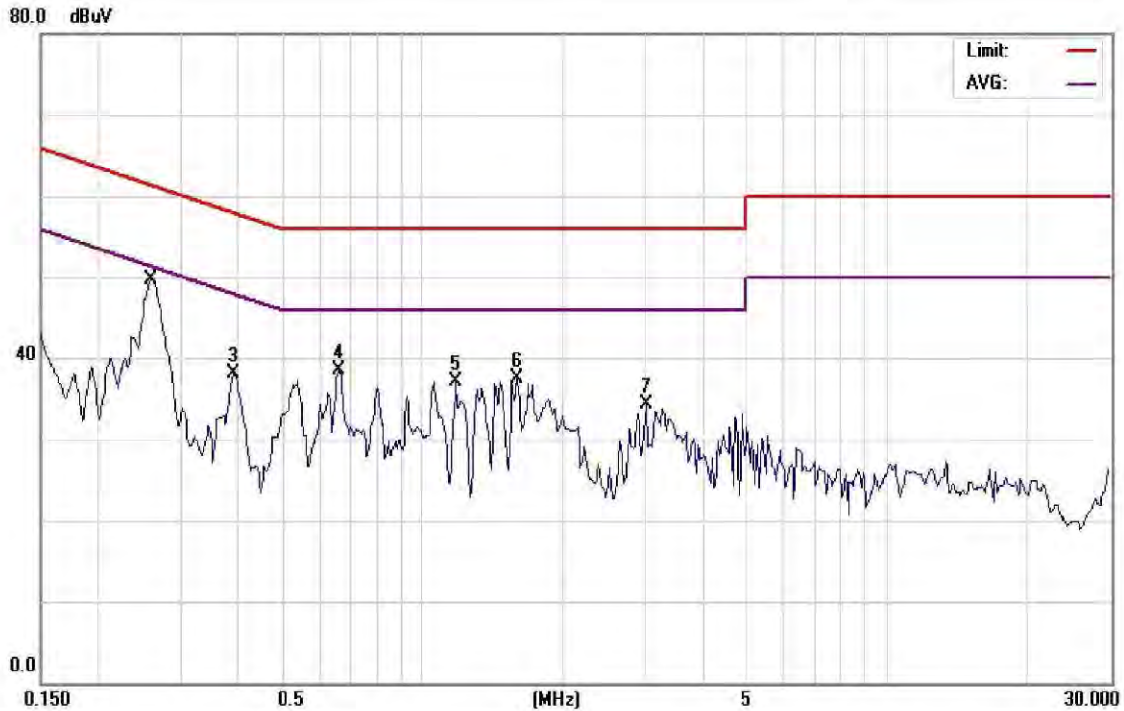
Site ConductionRoom Phase: **L1** Temperature: 26 °C
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60%
 EUT: BLR100 Distance:
 M/N: BLR100
 Mode: Operationmode
 Note: Adaptor model : TCU 250 、 AdaptorP /N : 79 H00098 -01 M

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2588	45.84	0.21	46.05	61.47	-15.42	QP	
2		0.2588	33.57	0.21	33.78	51.47	-17.69	AVG	
3		0.9274	34.80	0.22	35.02	56.00	-20.98	QP	
4		0.9274	27.09	0.22	27.31	46.00	-18.69	AVG	
5		1.0483	34.13	0.22	34.35	56.00	-21.65	QP	
6		1.0483	28.65	0.22	28.87	46.00	-17.13	AVG	
7		1.4266	32.79	0.23	33.02	56.00	-22.98	QP	
8		1.4266	24.82	0.23	25.05	46.00	-20.95	AVG	
9		1.5514	31.33	0.24	31.57	56.00	-24.43	QP	
10		1.5514	24.45	0.24	24.69	46.00	-21.31	AVG	
11	*	2.0288	41.18	0.25	41.43	56.00	-14.57	peak	

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Site: ConductionRoom Phase: **N** Temperature: 26 °C
 Limit: FCC Class B Conduction(QP) Power: AC 120V/60Hz Humidity: 60%
 EUT: BLR100 Distance:
 M/N: BLR100
 Mode: Operationmode
 Note: Adaptor model : TCU 250 、 AdaptorP /N : 79 H00098 -01 M

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.2588	45.56	0.32	45.88	61.47	-15.59	QP	
2		0.2588	29.41	0.32	29.73	51.47	-21.74	AVG	
3		0.3924	37.83	0.34	38.17	58.01	-19.84	peak	
4		0.6603	38.08	0.33	38.41	56.00	-17.59	peak	
5		1.1803	36.89	0.31	37.20	56.00	-18.80	peak	
6		1.5987	37.26	0.33	37.59	56.00	-18.41	peak	
7		3.0298	33.91	0.34	34.25	56.00	-21.75	peak	

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7. PEAK OUTPUT POWER MEASUREMENT

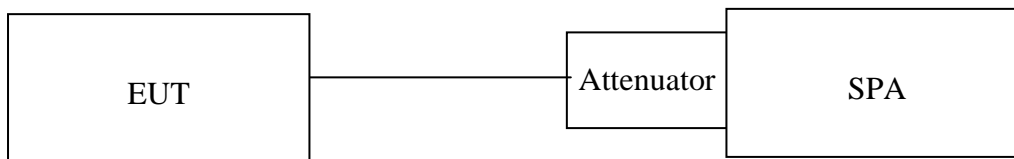
7.1. Standard Applicable

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1Watt. For all other frequency hopping systems in the 2400 – 2483.5MHz band: 0.125 Watts.

7.2. Measurement Equipment Used

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Sensor	Anritsu	ML2495A	1005007	02/08/2012	02/07/2014
Power Meter	Anritsu	MA2411B	917032	02/08/2012	02/07/2014
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/17/2012	03/16/2014
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2012	02/27/2013
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2012	01/04/2013
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2012	02/27/2013
Splitter	Agilent	11636B	N/A	02/28/2012	02/27/2013

7.3. Test Set-up:



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

7.5. Measurement Result

BDR mode:

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	7.86	7.86	0.00611	0.125
2441.00	7.95	7.95	0.00624	0.125
2480.00	7.88	7.88	0.00614	0.125

EDR mode:

Frequency (MHz)	Reading Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	7.38	7.38	0.00547	0.125
2441.00	7.28	7.28	0.00535	0.125
2480.00	7.52	7.52	0.00565	0.125

**Note: offset 11.0dB*

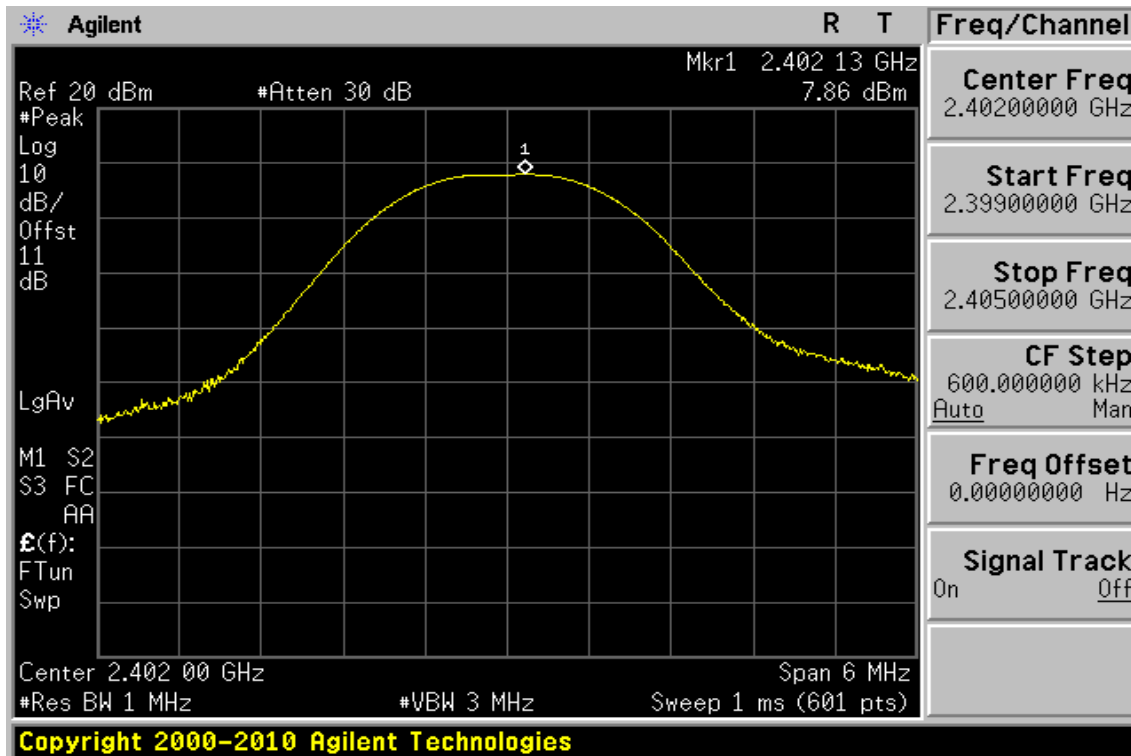
Note: Refer to next page for plots.

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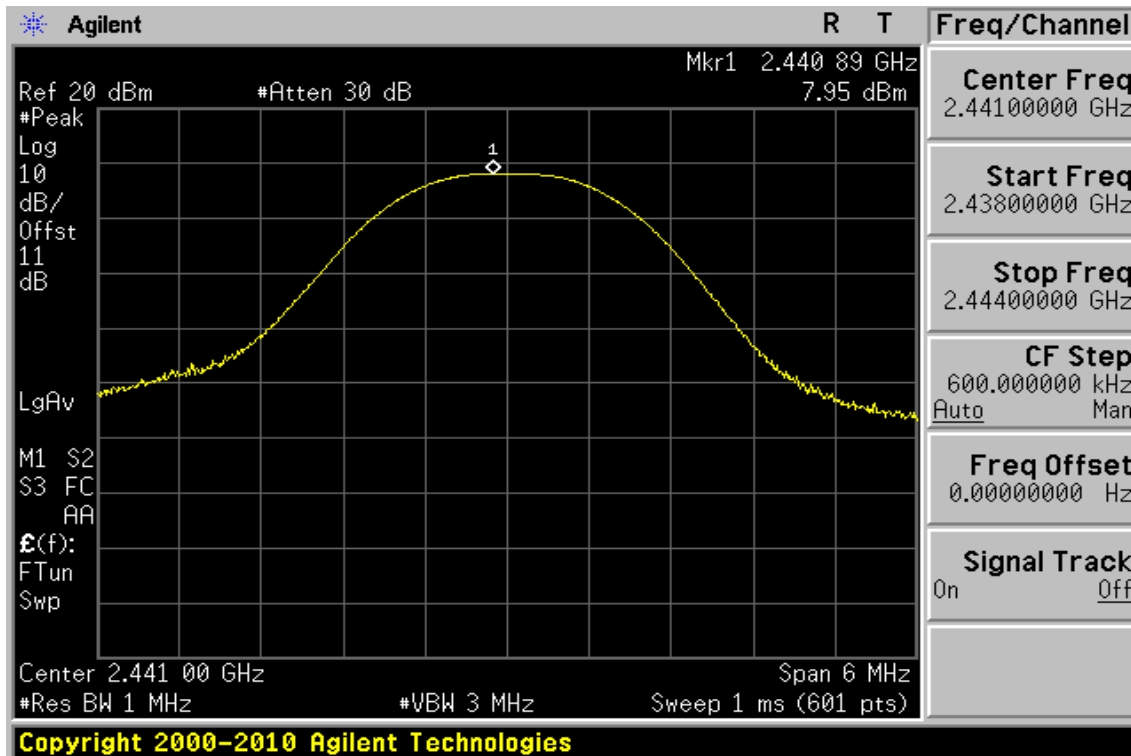
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Peak Power Output Data Plot (CH Low) (BDR mode)



Peak Power Output Data Plot (CH Mid) (BDR mode)



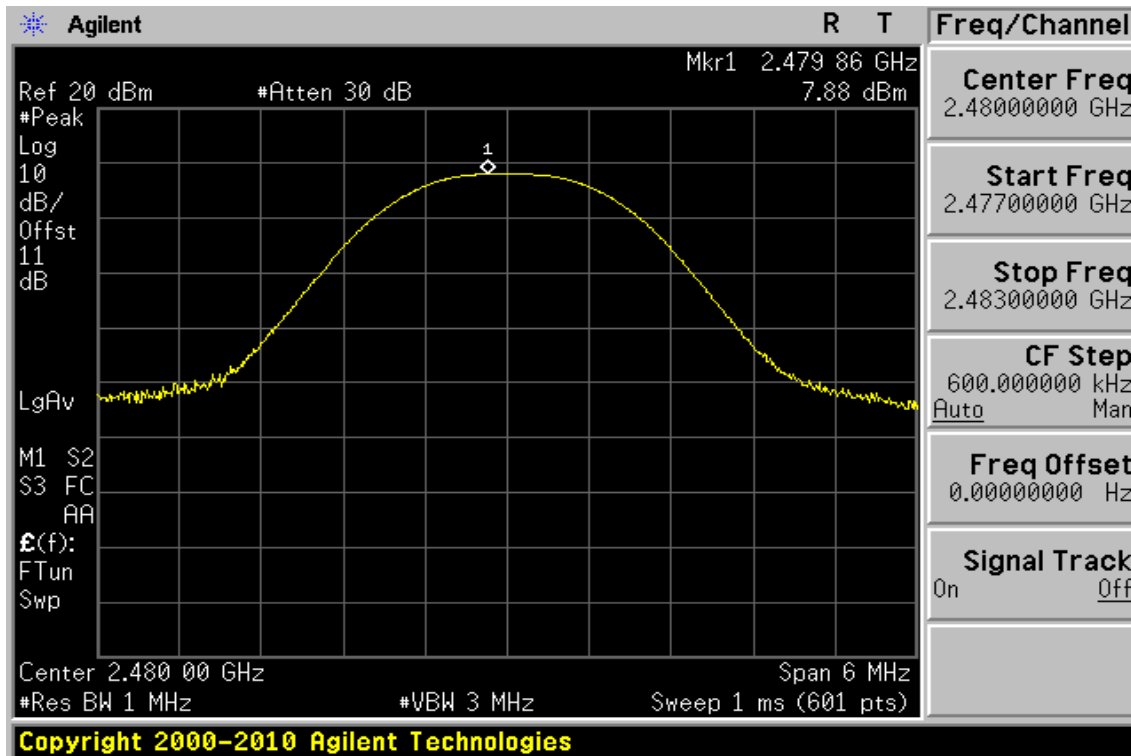
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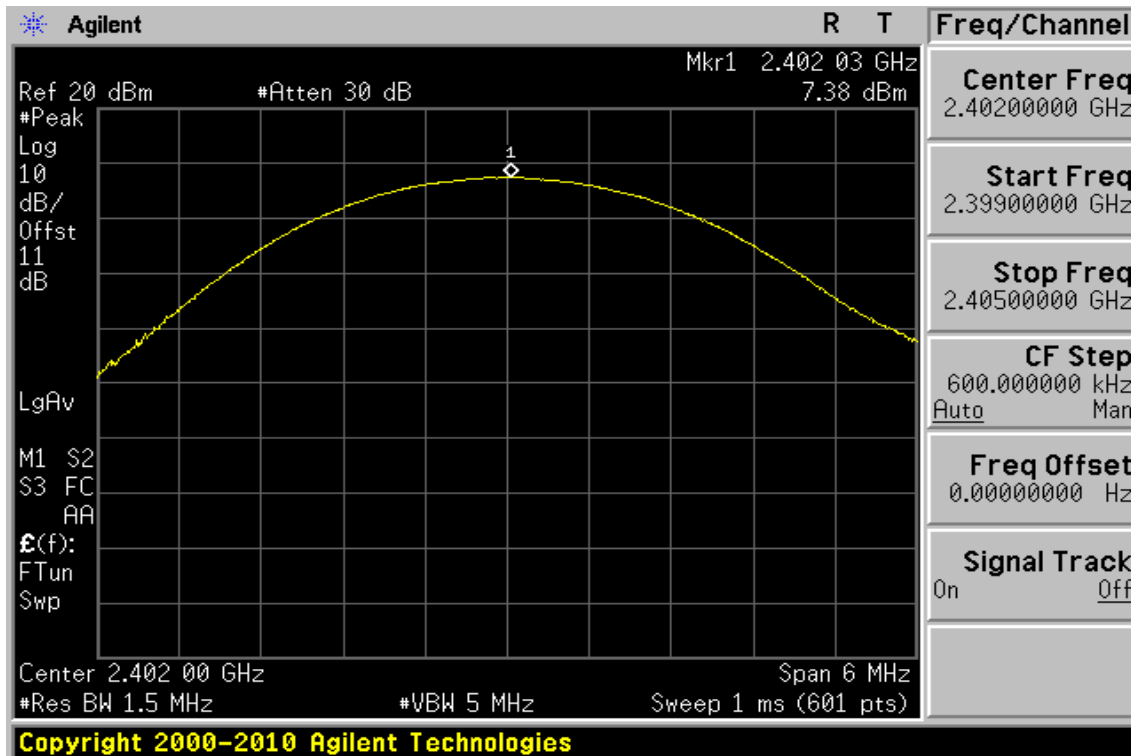
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Peak Power Output Data Plot (CH High) (BDR mode)



Peak Power Output Data Plot (CH Low) (EDR mode)



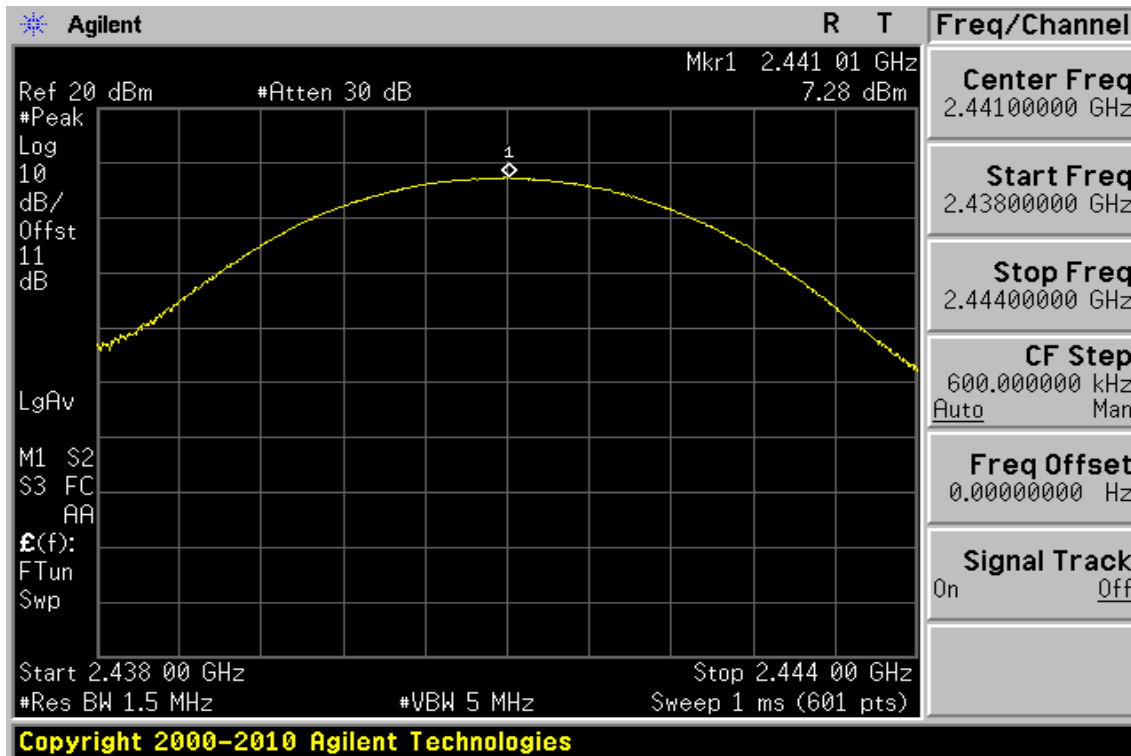
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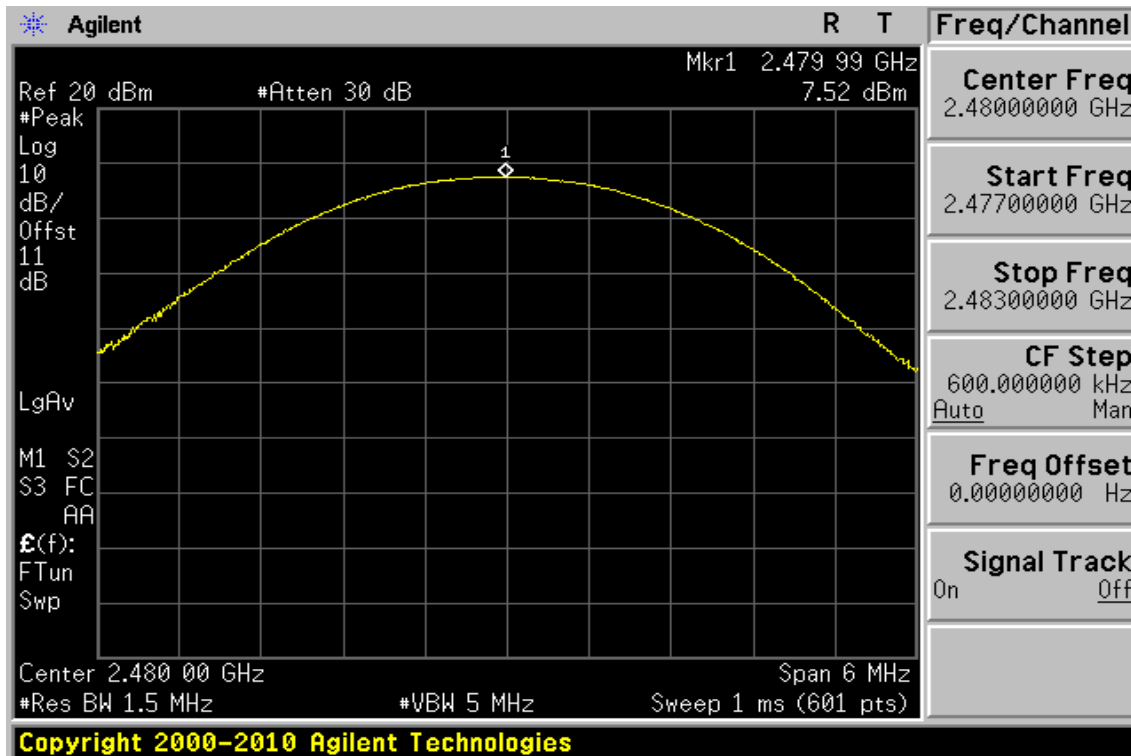
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Peak Power Output Data Plot (CH Mid) (EDR mode)



Peak Power Output Data Plot (CH High) (EDR mode)



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8. 20dB BAND WIDTH

8.1. Standard Applicable

For frequency hopping systems operating in the 2400MHz-2483.5 MHz no limit for 20dB bandwidth.

8.2. Measurement Equipment Used

Refer to section 7.2 for details.

8.3. Test Set-up

Refer to section 7.3 for details.

8.4. 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 (1 % of Bandwidth.), Span= 3MHz, Sweep=auto
4. Mark the peak frequency and -20dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

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8.5. Measurement Result:

BDR mode

CH	Bandwidth (kHz)
Lower	928.432
Mid	926.831
Higher	925.960

EDR mode

CH	Bandwidth (MHz)	2/3 Bandwidth (MHz)
Lower	1.263	0.842
Mid	1.333	0.889
Higher	1.251	0.834

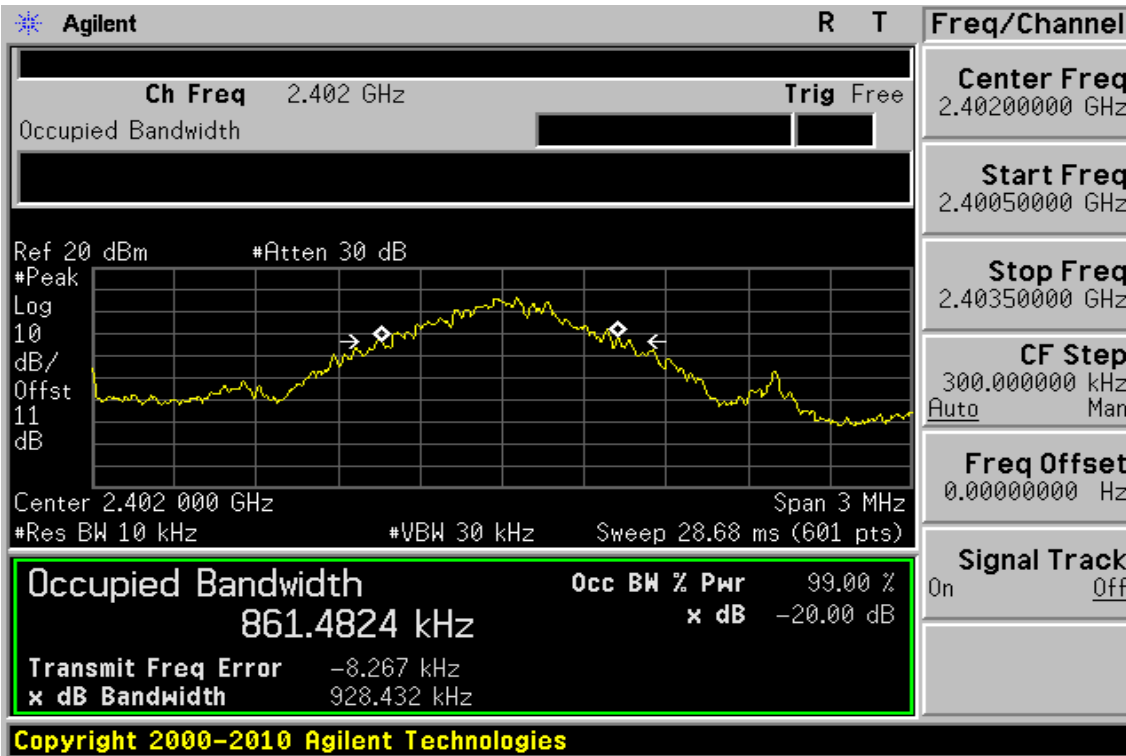
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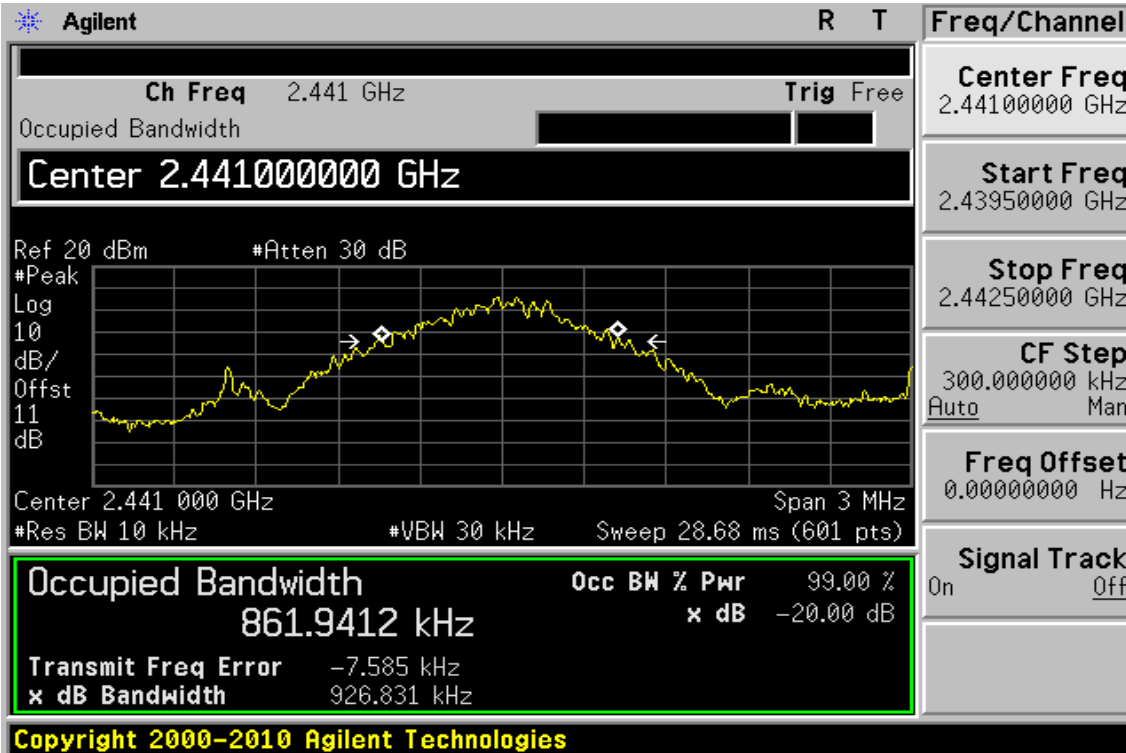
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BDR Mode

20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid



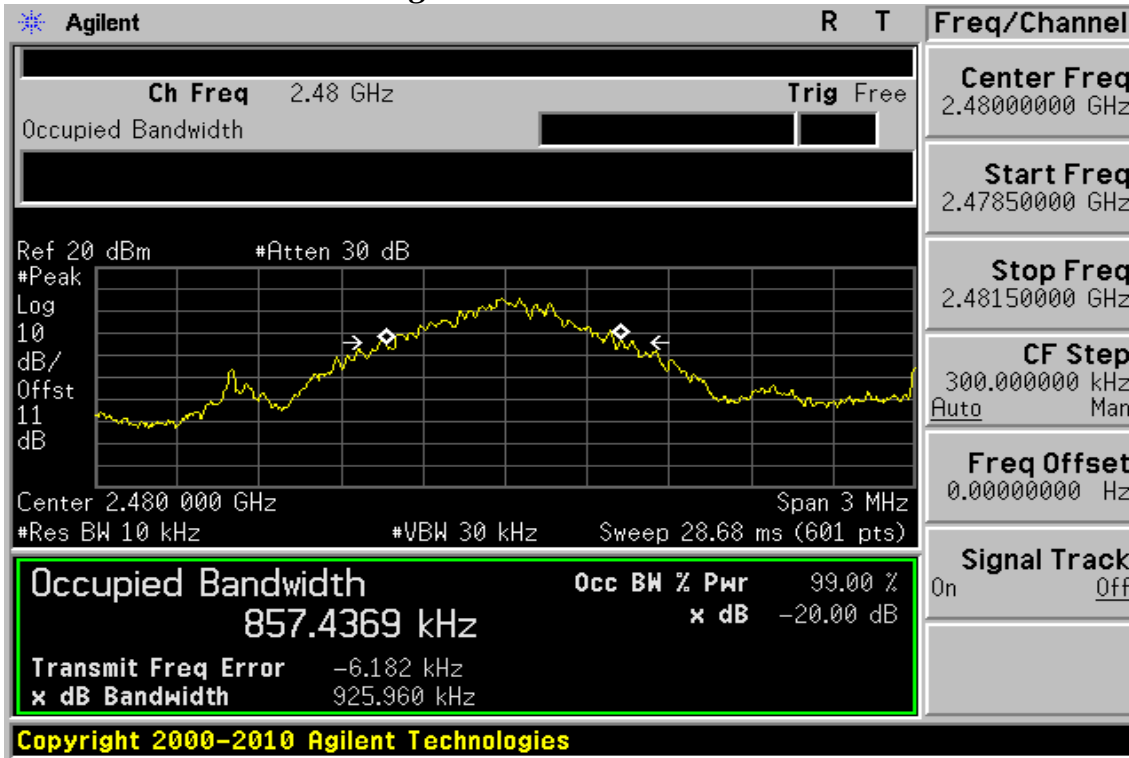
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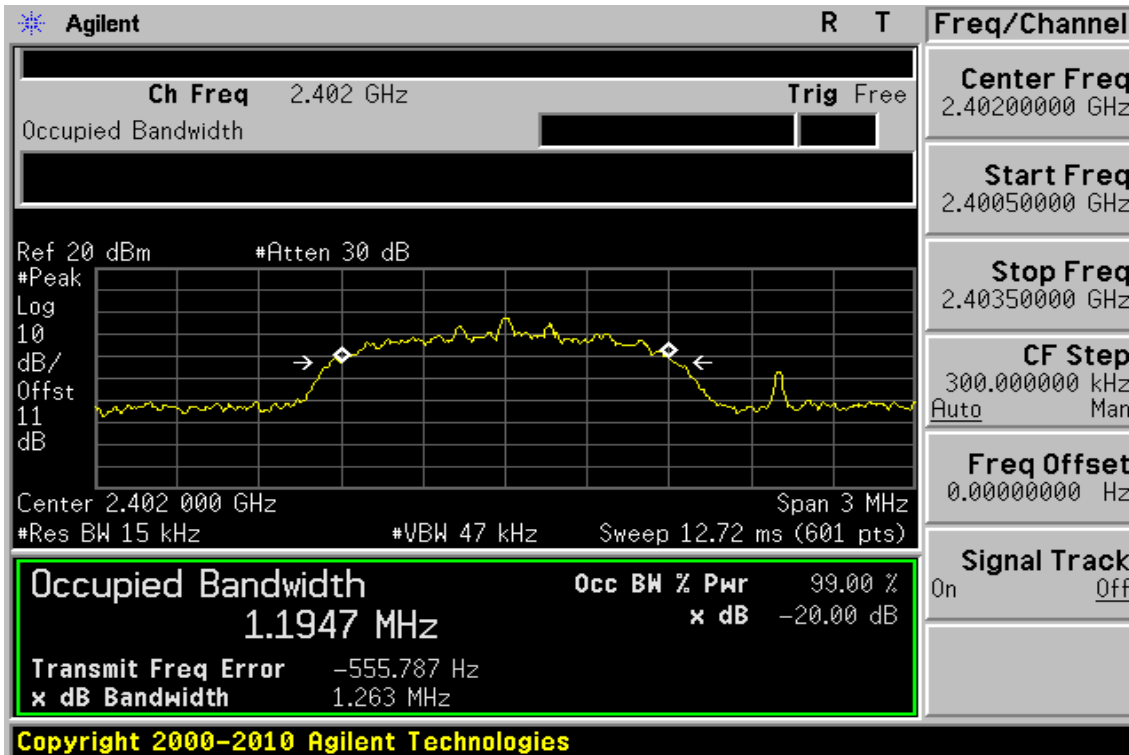
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20dB Bandwidth Test Data CH-High



EDR Mode

20dB Bandwidth Test Data CH-Low



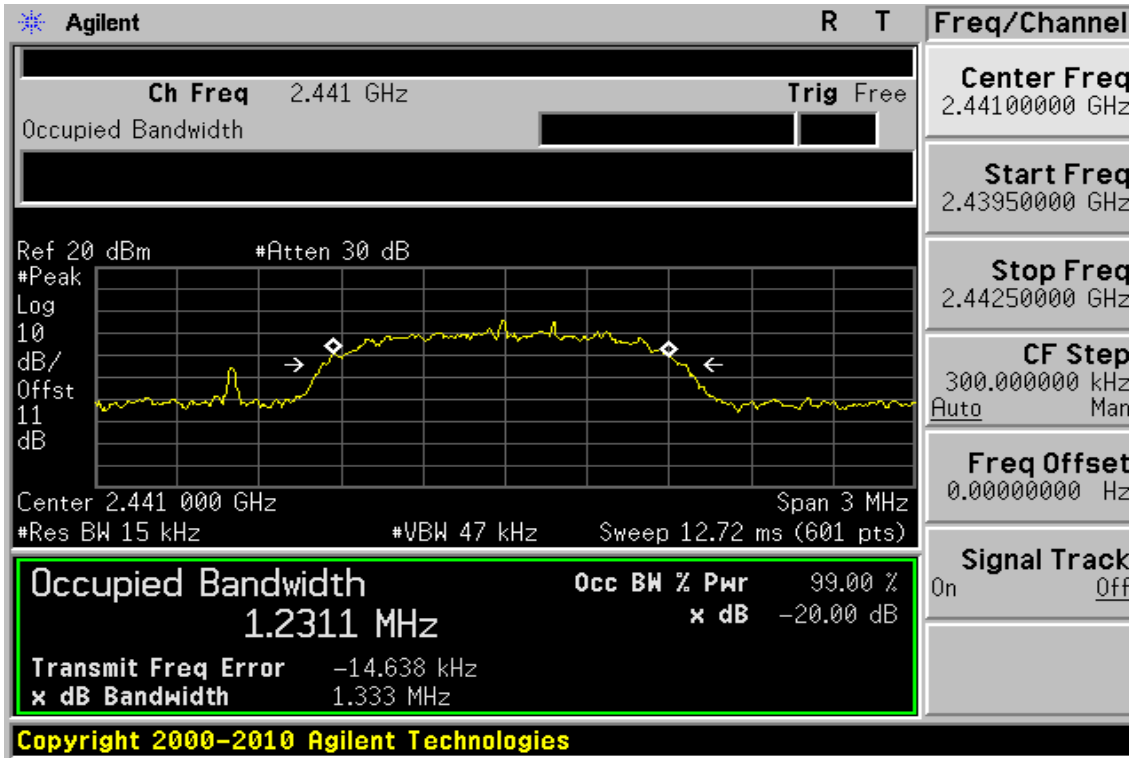
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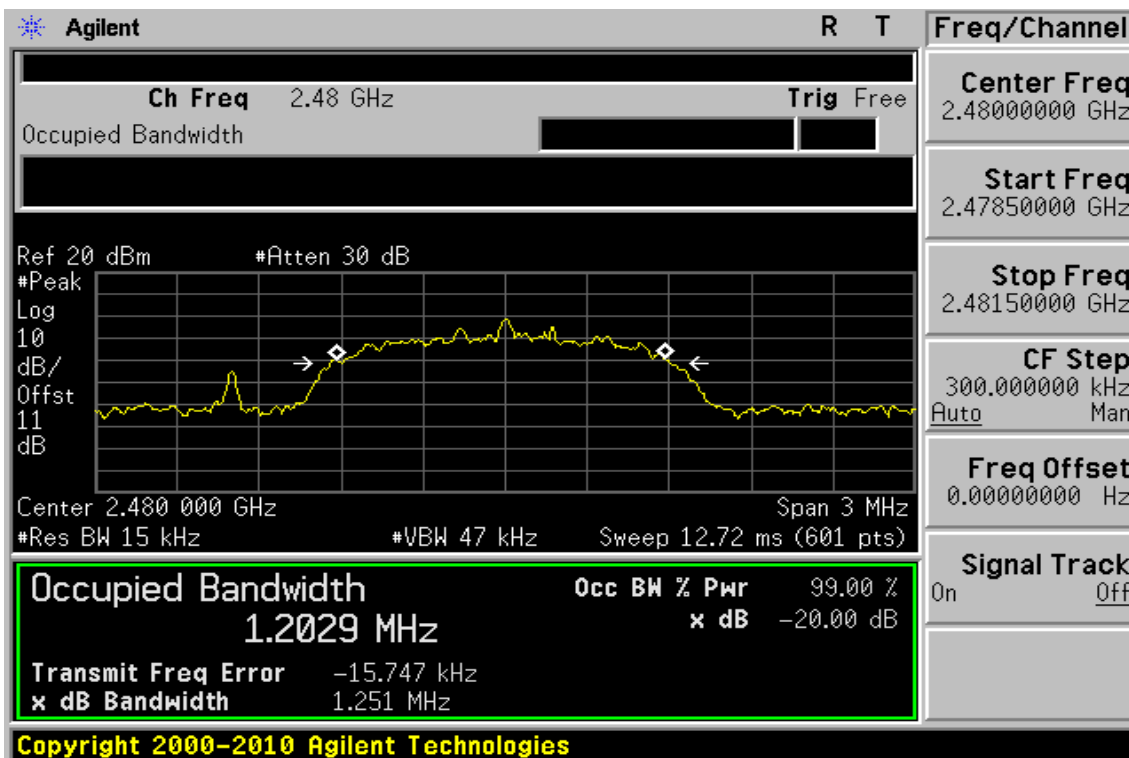
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20dB Bandwidth Test Data CH-Mid



20dB Bandwidth Test Data CH-High



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9. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

9.1. Standard Applicable

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is 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 in 15.209(a).

9.2. Measurement Equipment Used

9.2.1. Conducted Emission at antenna port:

Refer to section 7.2 for details.

9.2.2. Radiated emission:

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

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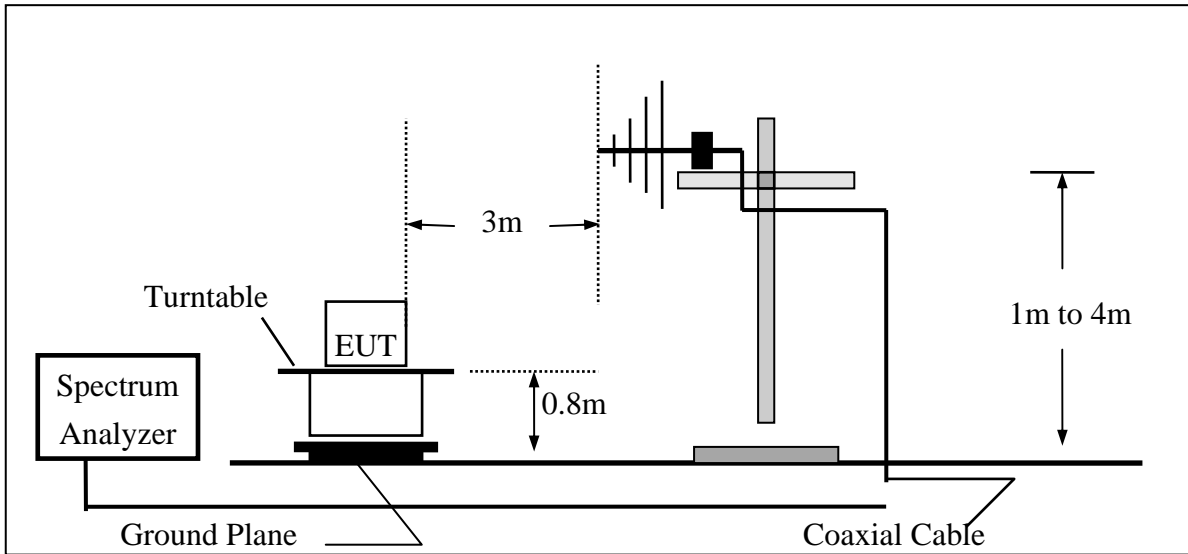
9.3. Test SET-UP:

9.3.1. Conducted Emission at antenna port:

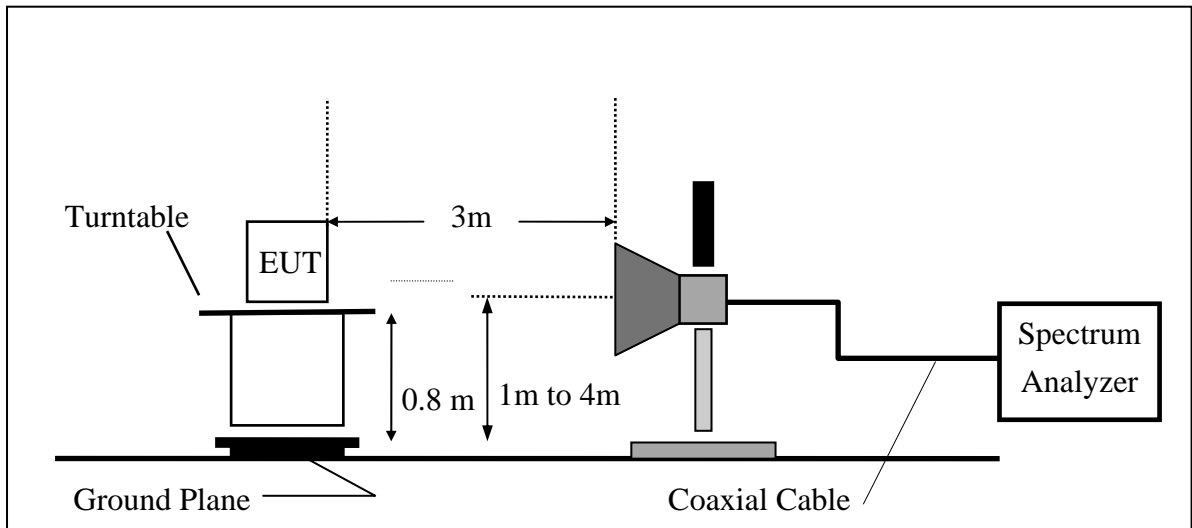
Refer to section 7.3 for details.

9.3.2. Radiated emission:

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



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



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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 = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100KHz, 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. Radiated Emission refer to section 9.

9.5. 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	

9.6. Measurement Result

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

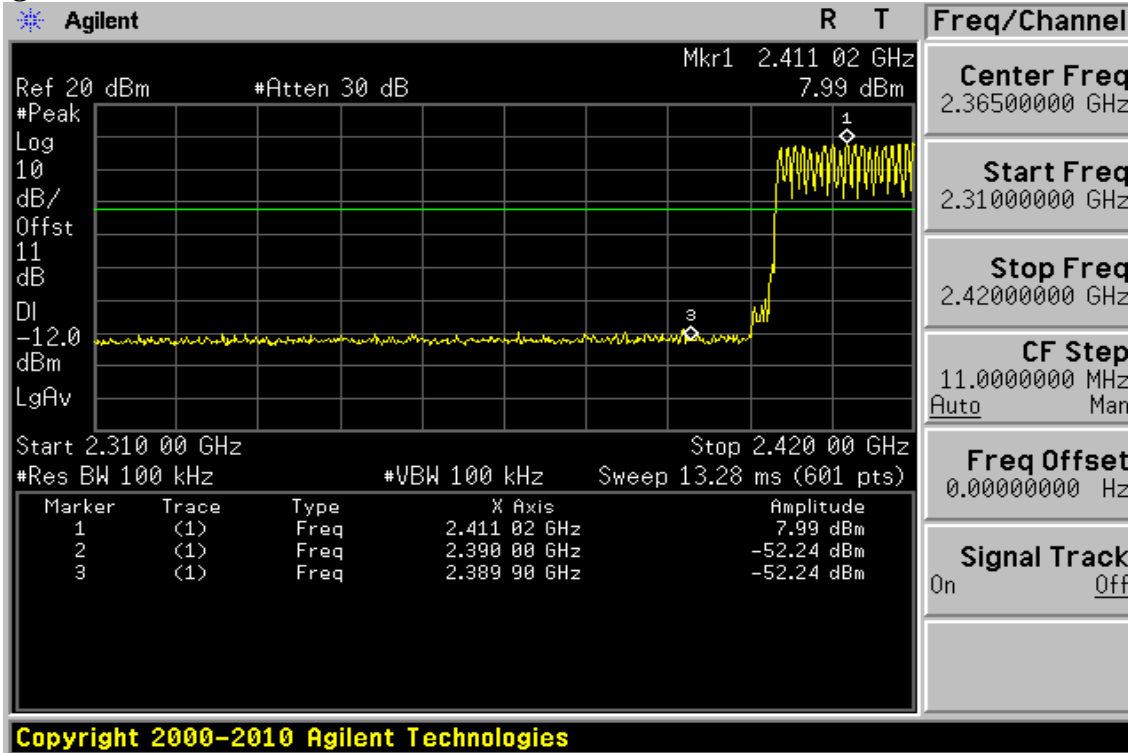
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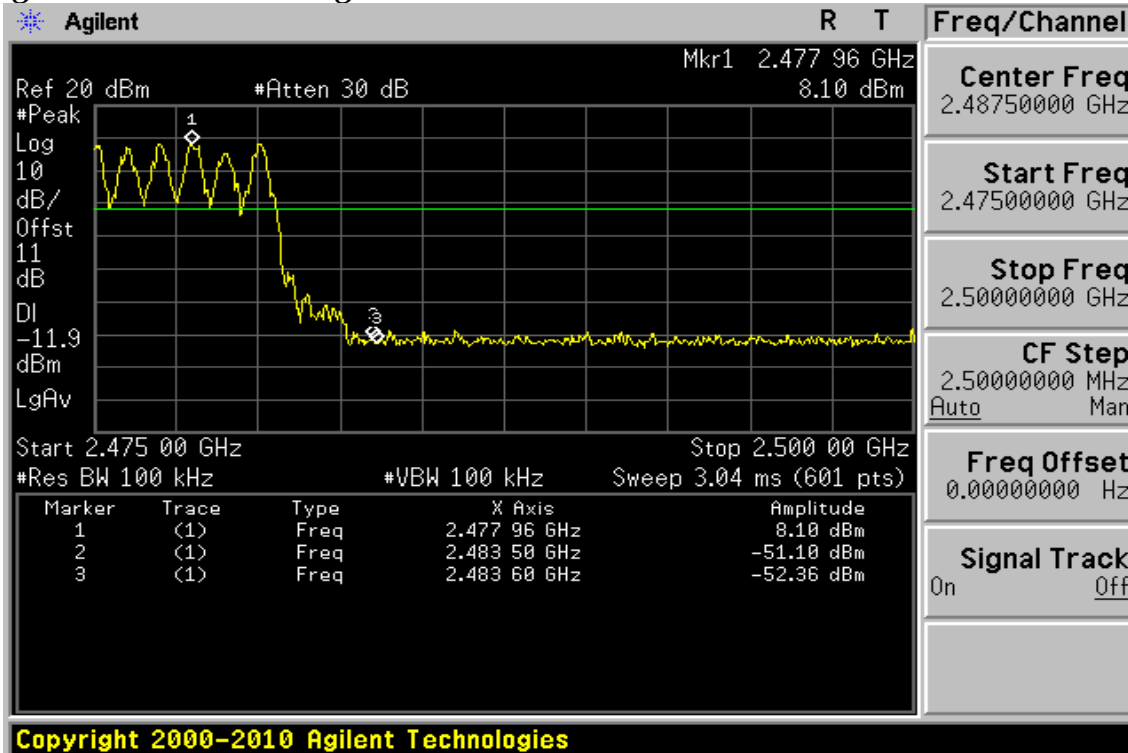
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BDR Mode

Band Edges Test Data CH-Low



Band Edges Test Data CH-High



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Radiated Emission: (BDR mode)

Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2402 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX LOW Bandedge DH5	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Average	31.32	4.68	36.00	54.00	-18.00
2390.00	E	Peak	44.34	4.68	49.02	74.00	-24.98

Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2402 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX LOW Bandedge DH5	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Average	30.26	5.30	35.56	54.00	-18.44
2390.00	E	Peak	39.96	5.30	45.26	74.00	-28.74

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Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2480 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX HIGH Bandedge DH5	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
2483.50	E	Average	31.99	5.26	37.25	54.00	-16.75
2483.50	E	Peak	49.40	5.26	54.66	74.00	-19.34

Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2480 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX HIGH Bandedge DH5	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
2483.50	E	Average	30.61	6.29	36.90	54.00	-17.10
2483.50	E	Peak	43.96	6.29	50.25	74.00	-23.75

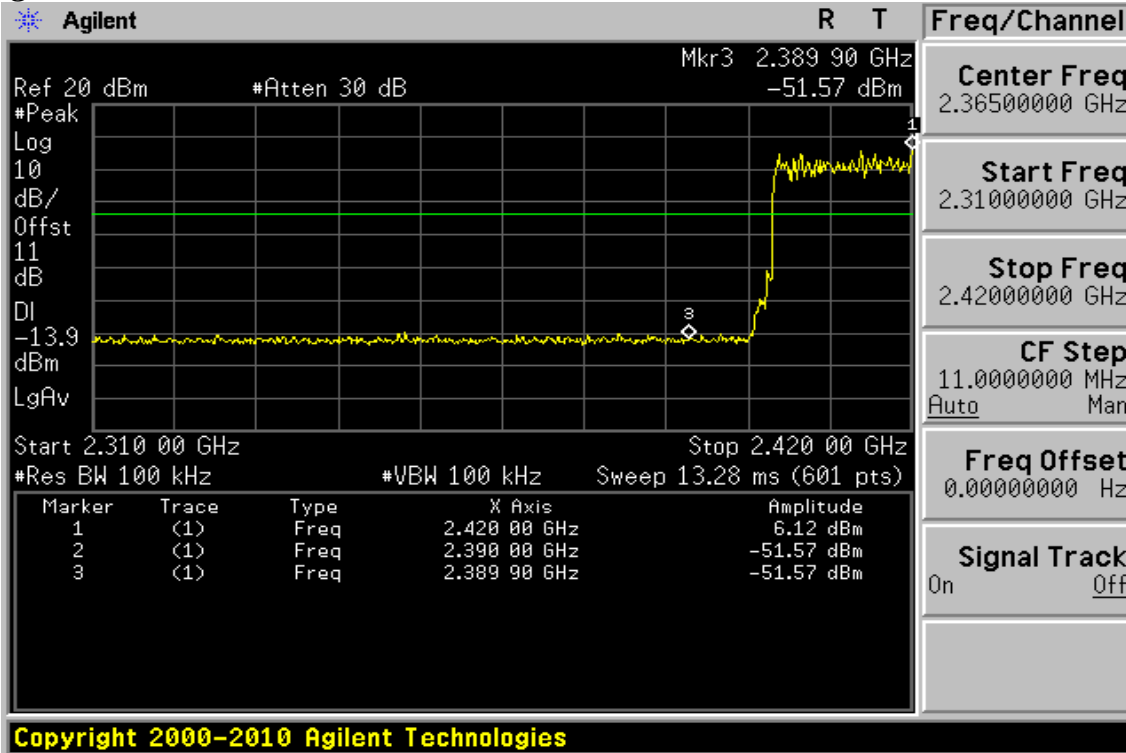
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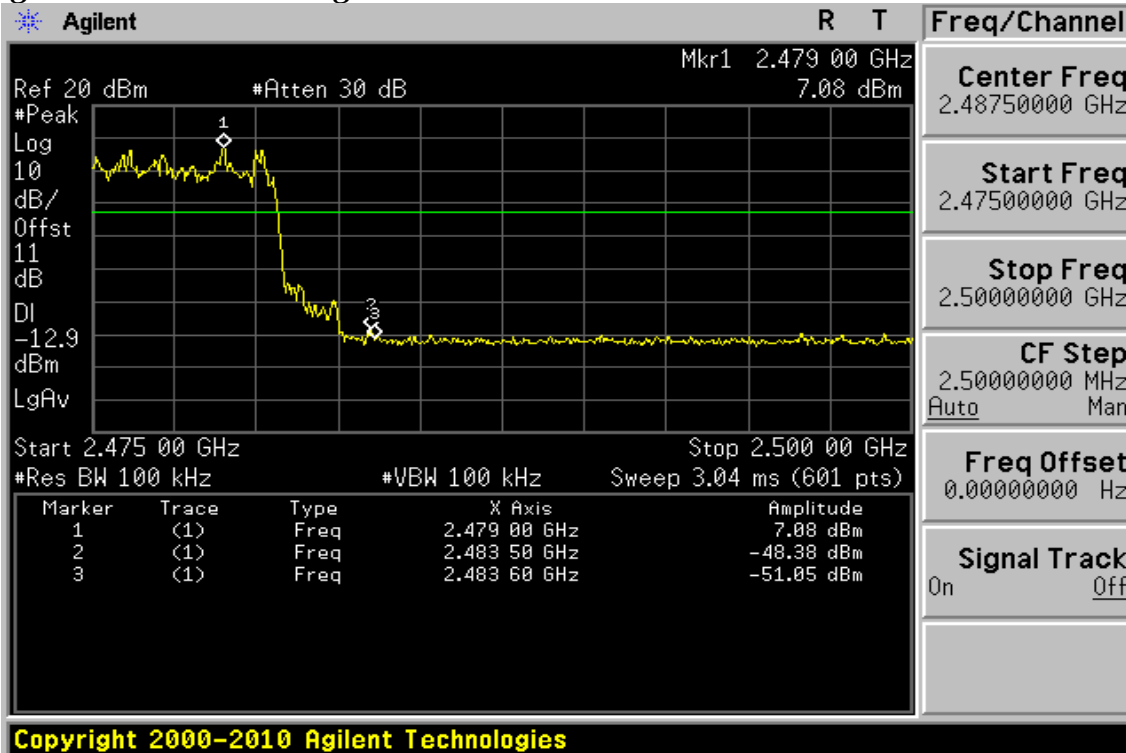
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EDR Mode

Band Edges Test Data CH-Low



Band Edges Test Data CH-High



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Radiated Emission: (EDR mode)

Operation Band	:EDR	Test Date	:2012-09-13
Fundamental Frequency	:2402 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX LOW Bandedge	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Average	37.19	4.68	41.87	54.00	-12.13
2390.00	E	Peak	43.07	4.68	47.75	74.00	-26.25

Operation Band	:EDR	Test Date	:2012-09-13
Fundamental Frequency	:2402 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX LOW Bandedge	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
2390.00	E	Average	32.09	5.30	37.39	54.00	-16.61
2390.00	E	Peak	40.29	5.30	45.59	74.00	-28.41

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Operation Band	:EDR	Test Date	:2012-09-13
Fundamental Frequency	:2480 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX HIGH Bandedge	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
2483.50	E	Average	33.94	5.26	39.20	54.00	-14.80
2483.50	E	Peak	59.61	5.26	64.87	74.00	-9.13

Operation Band	:EDR	Test Date	:2012-09-13
Fundamental Frequency	:2480 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX HIGH Bandedge	Engineer	:Marcus
EUT Pol.	:H Plan	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.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
2483.50	E	Average	31.19	6.29	37.48	54.00	-16.52
2483.50	E	Peak	50.64	6.29	56.93	74.00	-17.07
2484.16	S	Average	30.93	6.31	37.24	54.00	-16.76
2484.16	S	Peak	51.46	6.31	57.77	74.00	-16.23

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10. SPURIOUS RADIATED EMISSION TEST

10.1. 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.

10.2. Measurement Equipment Used:

10.2.1. Conducted Emission at antenna port:

Refer to section 7.2 for details.

10.2.2. Radiated emission:

Refer to section 9.2.2 for details.

10.3. Test SET-UP:

10.3.1. Conducted Emission at antenna port:

Refer to section 7.3 for details.

10.3.2. Radiated emission:

Refer to section 9.3.2 for details.

10.4. 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.

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Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 100K & VBW = 100K on Spectrum.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 3G, 3G to 8G, 8G to 13G, 13G to 18G and 18G to 26.5GHz
4. Via Software, combine 5 spans of frequency range into one plot

10.5. 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	

10.6. Measurement Result:

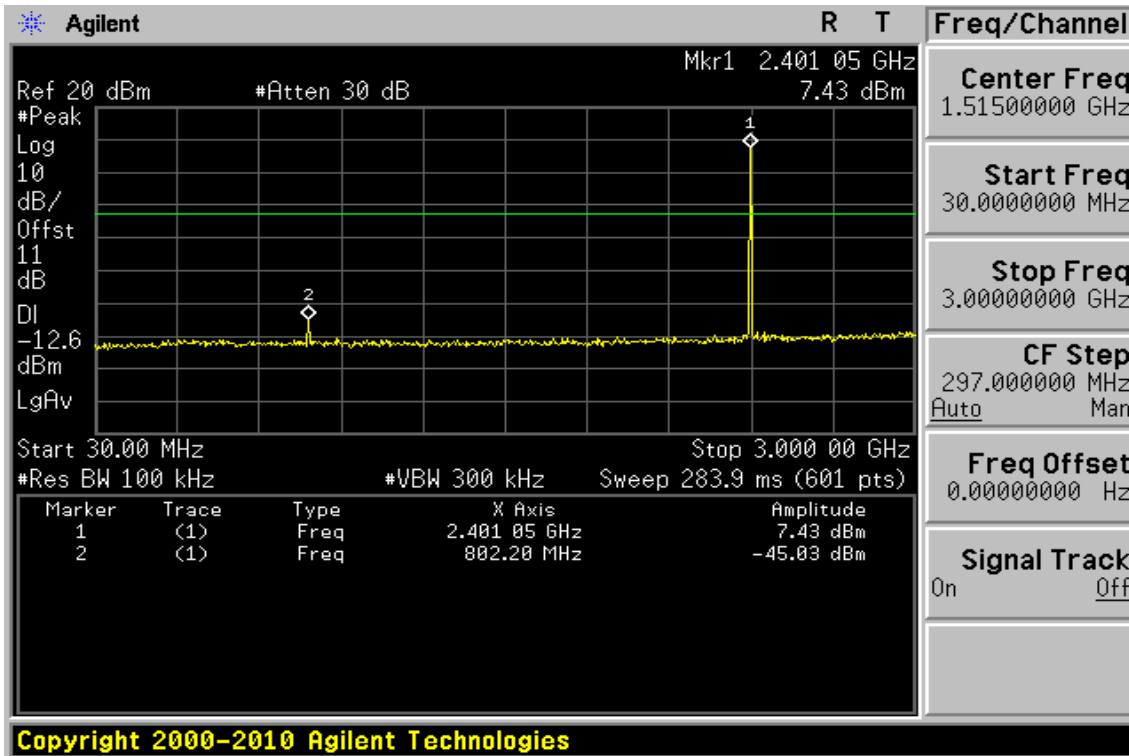
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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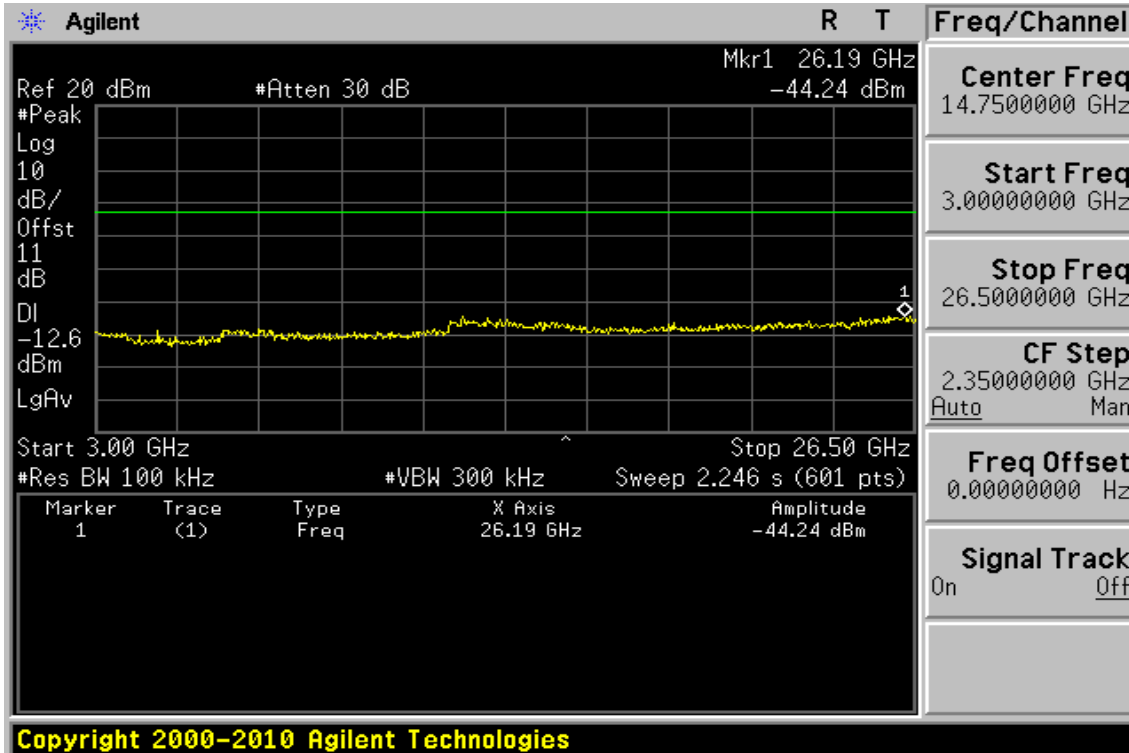
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**Conducted Spurious Emission Measurement Result(Worst BDR Mode)
Ch Low 30MHz – 3GHz**



Ch Low 3GHz –26.5GHz



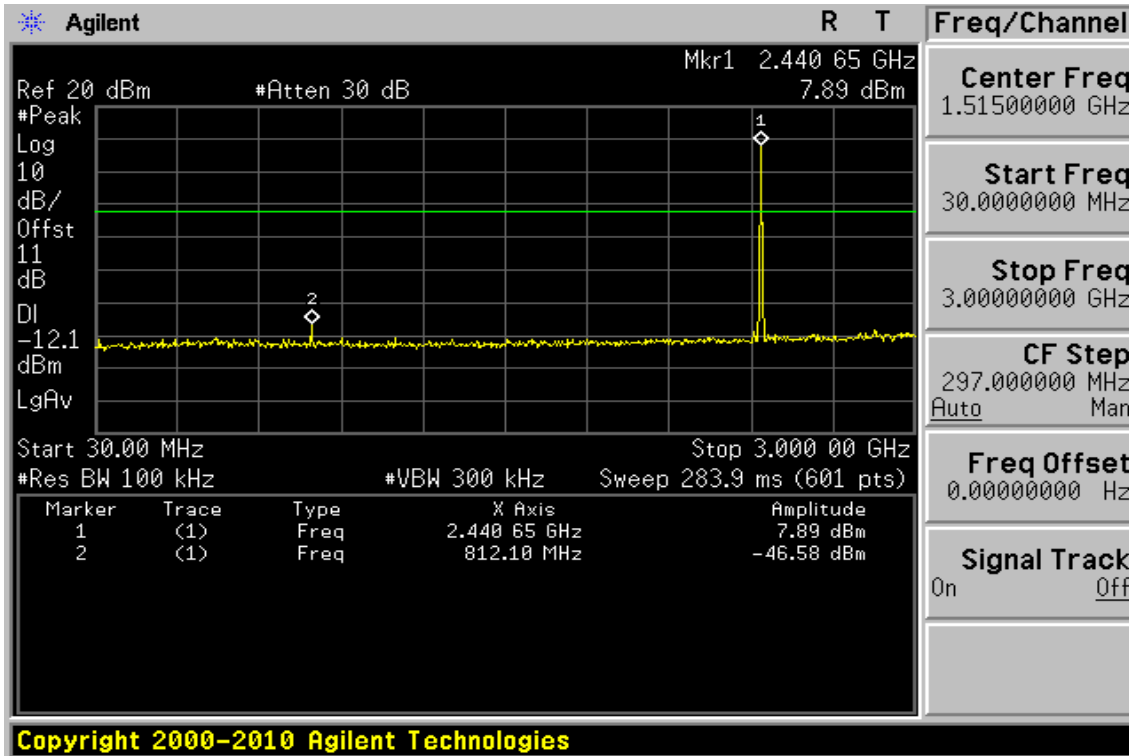
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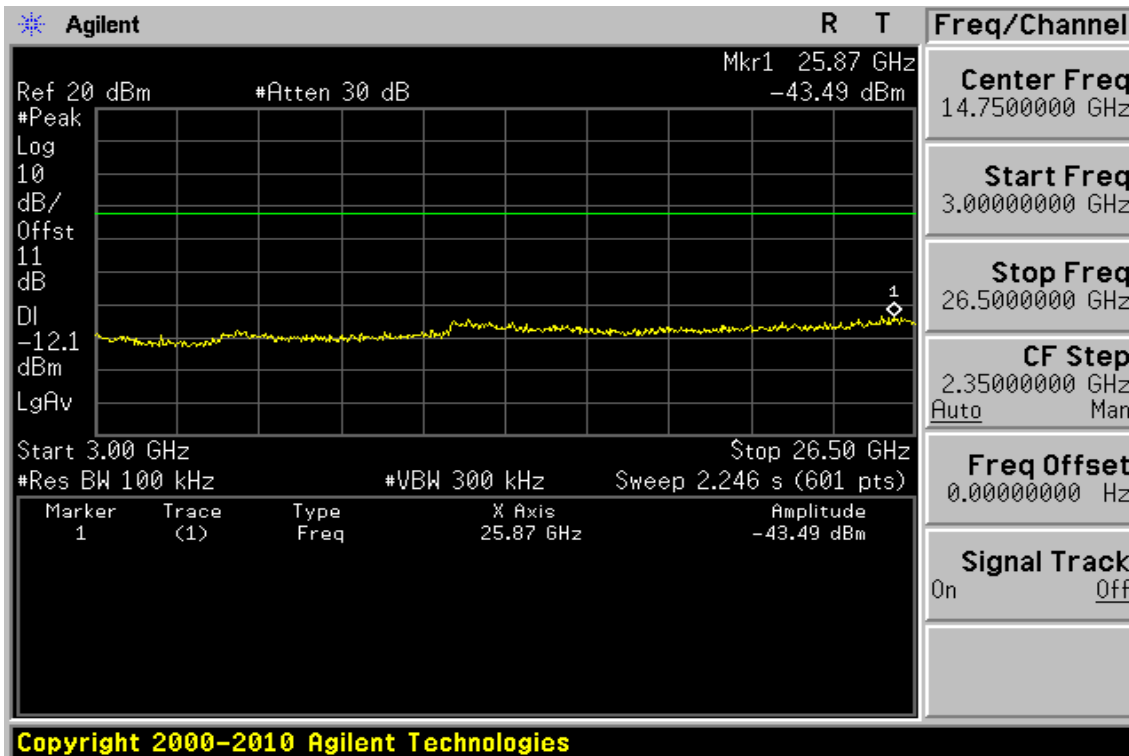
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Ch Mid 30MHz – 3GHz



Ch Mid 3GHz – 26.5GHz

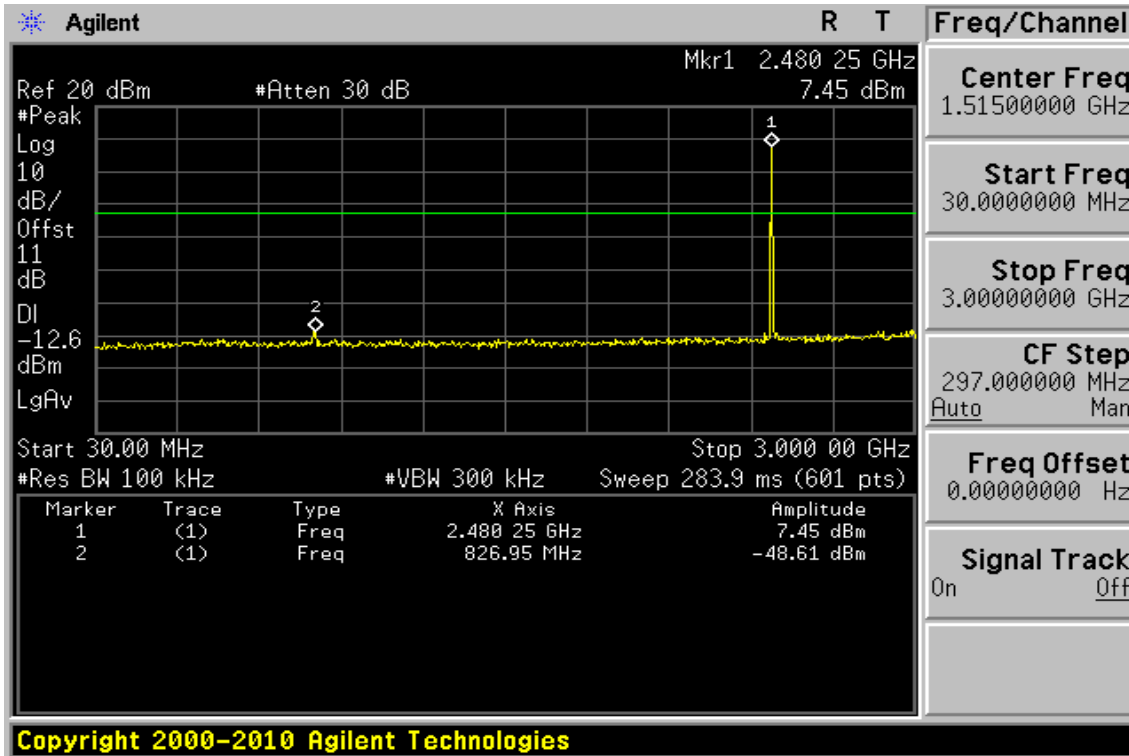


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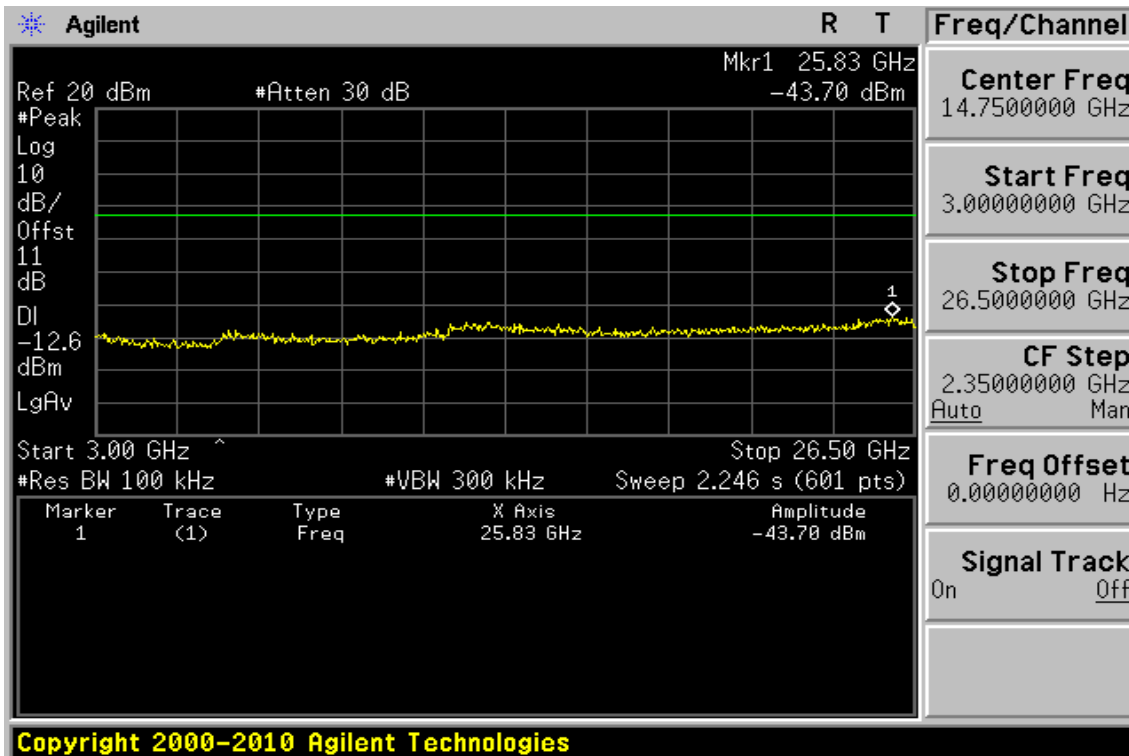
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Ch High 30MHz – 3GHz



Ch High 3GHz – 26.5GHz



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Radiated Spurious Emission Measurement Result (Worst BDR mode)

Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2402 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
71.71	S	Peak	32.70	0.00	32.70	40.00	-7.30
200.72	S	Peak	19.51	0.00	19.51	43.50	-23.99
300.63	S	Peak	20.62	0.00	20.62	46.00	-25.38
500.45	S	Peak	27.36	0.00	27.36	46.00	-18.64
640.13	S	Peak	32.31	0.00	32.31	46.00	-13.69
801.15	S	Peak	27.74	0.00	27.74	46.00	-18.26
4804.00	H	Average	28.18	9.65	37.83	54.00	-16.17
4804.00	H	Peak	36.41	9.65	46.06	74.00	-27.94
7206.00	H	---					
9608.00	H	---					
12010.00	H	---					
14412.00	H	---					
16814.00	H	---					
19216.00	H	---					
21618.00	H	---					

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Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2402 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX LOW	Engineer	:Marcus
EUT Pol.	:H Plan	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
71.71	S	Peak	29.83	0.00	29.83	40.00	-10.17
101.78	S	Peak	27.12	0.00	27.12	43.50	-16.38
200.72	S	Peak	26.42	0.00	26.42	43.50	-17.08
400.54	S	Peak	33.14	0.00	33.14	46.00	-12.86
701.24	S	Peak	36.26	0.00	36.26	46.00	-9.74
864.20	S	Peak	23.77	0.00	23.77	46.00	-22.23
4804.00	H	Average	26.83	9.69	36.52	54.00	-17.48
4804.00	H	Peak	34.80	9.69	44.49	74.00	-29.51
7206.00	H	---					
9608.00	H	---					
12010.00	H	---					
14412.00	H	---					
16814.00	H	---					
19216.00	H	---					
21618.00	H	---					

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Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2441 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
71.71	S	Peak	32.49	0.00	32.49	40.00	-7.51
200.72	S	Peak	19.79	0.00	19.79	43.50	-23.71
300.63	S	Peak	20.20	0.00	20.20	46.00	-25.80
500.45	S	Peak	26.90	0.00	26.90	46.00	-19.10
666.32	S	Peak	34.27	0.00	34.27	46.00	-11.73
901.06	S	Peak	23.20	0.00	23.20	46.00	-22.80
4882.00	H	Average	27.79	10.17	37.96	54.00	-16.04
4882.00	H	Peak	36.35	10.17	46.52	74.00	-27.48
7323.00	H	---					
9764.00	H	---					
12205.00	H	---					
14646.00	H	---					
17087.00	H	---					
19528.00	H	---					
21969.00	H	---					

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Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2441 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX MID	Engineer	:Marcus
EUT Pol.	:H Plan	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
71.71	S	Peak	30.12	0.00	30.12	40.00	-9.88
103.72	S	Peak	27.51	0.00	27.51	43.50	-15.99
200.72	S	Peak	26.23	0.00	26.23	43.50	-17.27
367.56	S	Peak	33.75	0.00	33.75	46.00	-12.25
666.32	S	Peak	39.90	0.00	39.90	46.00	-6.10
864.20	S	Peak	23.66	0.00	23.66	46.00	-22.34
4882.00	H	Average	28.06	10.11	38.17	54.00	-15.83
4882.00	H	Peak	35.40	10.11	45.51	74.00	-28.49
7323.00	H	---					
9764.00	H	---					
12205.00	H	---					
14646.00	H	---					
17087.00	H	---					
19528.00	H	---					
21969.00	H	---					

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Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2480 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
71.71	S	Peak	32.34	0.00	32.34	40.00	-7.66
200.72	S	Peak	19.91	0.00	19.91	43.50	-23.59
400.54	S	Peak	24.14	0.00	24.14	46.00	-21.86
640.13	S	Peak	32.20	0.00	32.20	46.00	-13.80
701.24	S	Peak	31.43	0.00	31.43	46.00	-14.57
833.16	S	Peak	22.96	0.00	22.96	46.00	-23.04
4960.00	H	Average	26.48	10.04	36.52	54.00	-17.48
4960.00	H	Peak	35.06	10.04	45.10	74.00	-28.90
7440.00	H	---					
9920.00	H	---					
12400.00	H	---					
14880.00	H	---					
17360.00	H	---					
19840.00	H	---					
22320.00	H	---					

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Operation Band	:BDR	Test Date	:2012-09-13
Fundamental Frequency	:2480 MHz	Temp./Humi.	:26.2 deg_C / 62 RH
Operation Mode	:TX HIGH	Engineer	:Marcus
EUT Pol.	:H Plan	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
71.71	S	Peak	29.95	0.00	29.95	40.00	-10.05
100.81	S	Peak	28.77	0.00	28.77	43.50	-14.73
200.72	S	Peak	27.04	0.00	27.04	43.50	-16.46
367.56	S	Peak	40.25	0.00	40.25	46.00	-5.75
666.32	S	Peak	37.64	0.00	37.64	46.00	-8.36
701.24	S	Peak	36.35	0.00	36.35	46.00	-9.65
4960.00	H	Average	26.86	9.89	36.75	54.00	-17.25
4960.00	H	Peak	35.20	9.89	45.09	74.00	-28.91
7440.00	H	---					
9920.00	H	---					
12400.00	H	---					
14880.00	H	---					
17360.00	H	---					
19840.00	H	---					
22320.00	H	---					

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11. FREQUENCY SEPARATION

11.1. Standard Applicable

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the $2/3 * 20\text{dB}$ bandwidth of the hopping channel, whichever is greater.

11.2. Measurement Equipment Used:

Refer to section 7.2 for details.

11.3. Test Set-up:

Refer to section 7.3 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 = 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.

11.5. Measurement Result:

Channel separation (MHz)	Limit	Result
1	$\geq 25\text{KHz}$ or $2/3$ times 20dB bandwidth	PASS

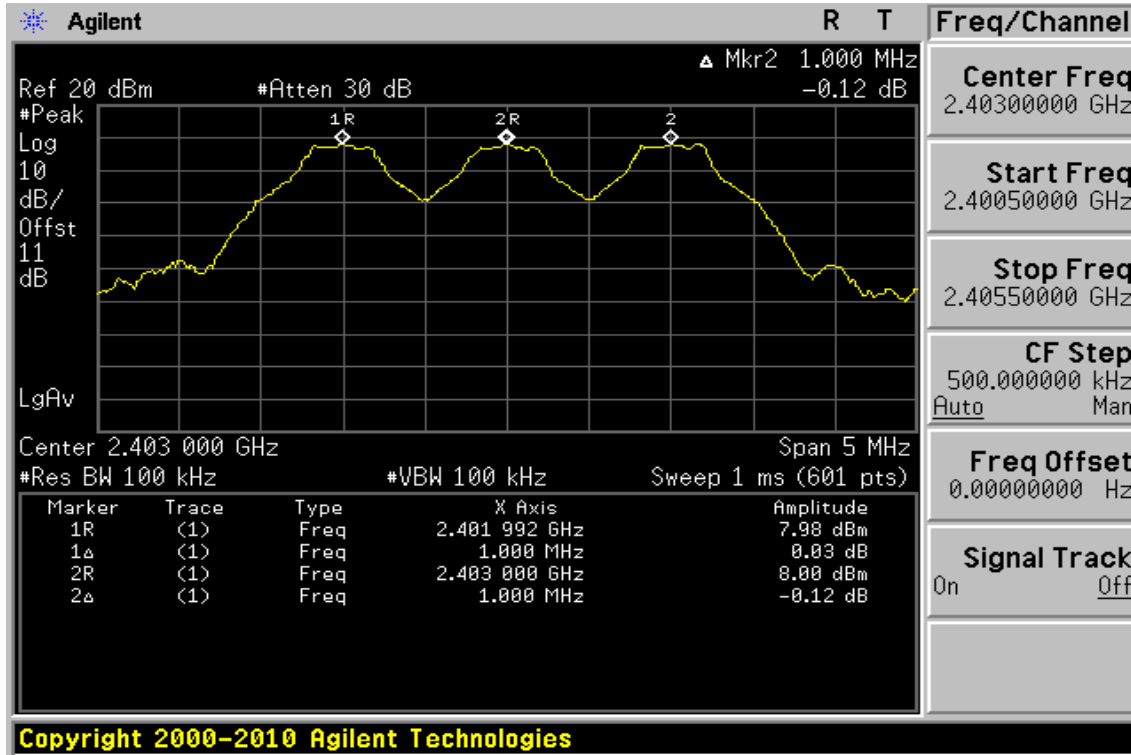
Note: Refer to next page for plots.

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Frequency Separation Test Data



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12. NUMBER OF HOPPING FREQUENCY

12.1. Standard Applicable

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

12.2. Measurement Equipment Used:

Refer to section 7.2 for details.

12.3. Test Set-up:

Refer to section 7.3 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 spectrum analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
4. Set the spectrum analyzer as RBW=430KHz,, VBW=1.5MHz.
5. Max hold, view and count how many channel in the band.

12.5. Measurement Result:

Note: Refer to next page for plots.

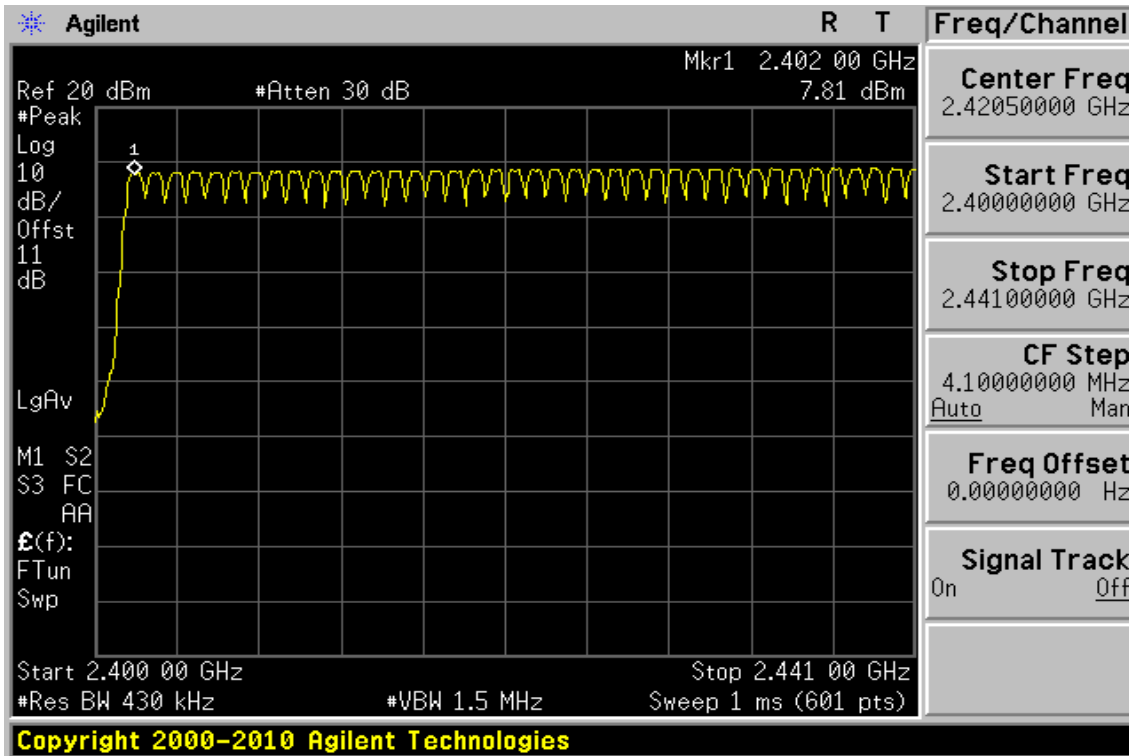
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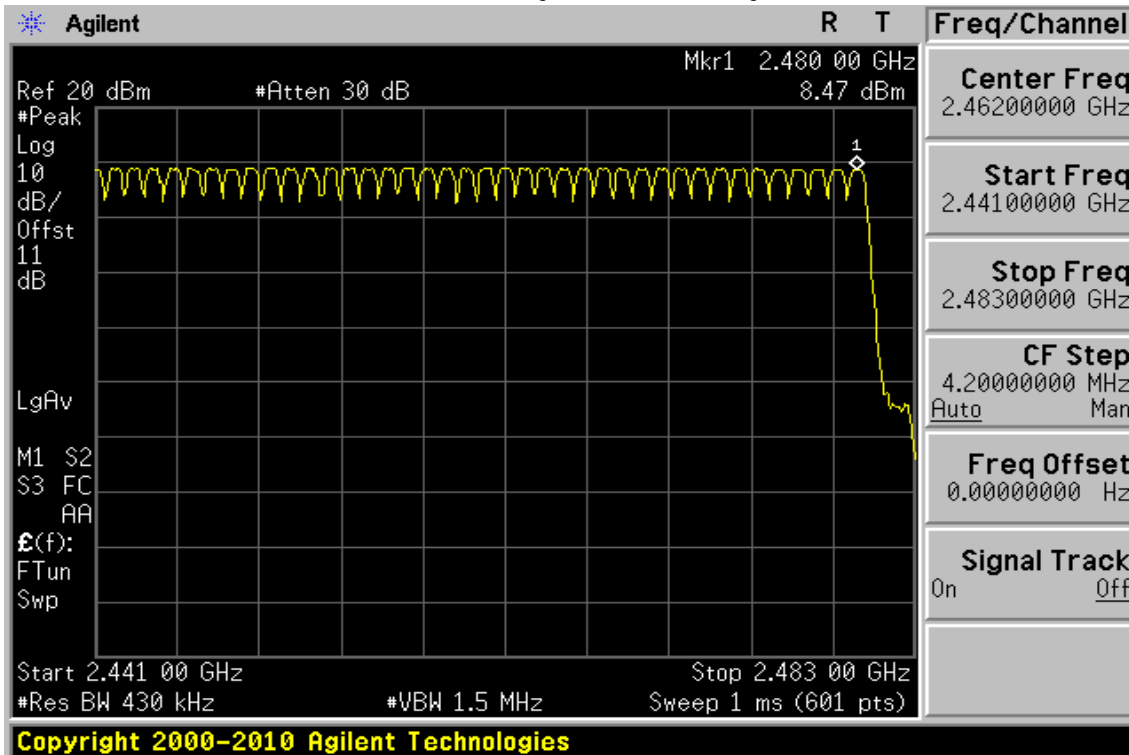
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Channel Number

2.4 GHz – 2.441GHz



2.441 GHz – 2.4835GHz



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13. TIME OF OCCUPANCY (DWELL TIME)

13.1. 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.

13.2. Measurement Equipment Used:

Refer to section 7.2 for details.

13.3. Test Set-up:

Refer to section 7.3 for details.

13.4. 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 , Adjust Sweep = 2~7.52ms.
5. Repeat above procedures until all frequency measured were complete.

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13.5. Measurement Result

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

CH Low: DH1 time slot = 0.4067 (ms) * (1600/(2*79)) * 31.6 = 130.144(ms)

DH3 time slot = 1.658(ms) * (1600/(4*79)) * 31.6 = 265.28 (ms)

DH5 time slot = 2.895 (ms) * (1600/(6*79)) * 31.6 = 308.80(ms)

CH Mid: DH1 time slot = 0.4067 (ms) * (1600/(2*79)) * 31.6 = 130.144(ms)

DH3 time slot = 1.658 (ms) * (1600/(4*79)) * 31.6 = 265.28 (ms)

DH5 time slot = 2.895 (ms) * (1600/(6*79)) * 31.6 = 308.80 (ms)

CH High: DH1 time slot = 0.4067 (ms) * (1600/(2*79)) * 31.6 = 130.144(ms)

DH3 time slot = 1.658 (ms) * (1600/(4*79)) * 31.6 = 265.28(ms)

DH5 time slot = 2.895 (ms) * (1600/(6*79)) * 31.6 = 308.80 (ms)

Note: Refer to next page for plots.

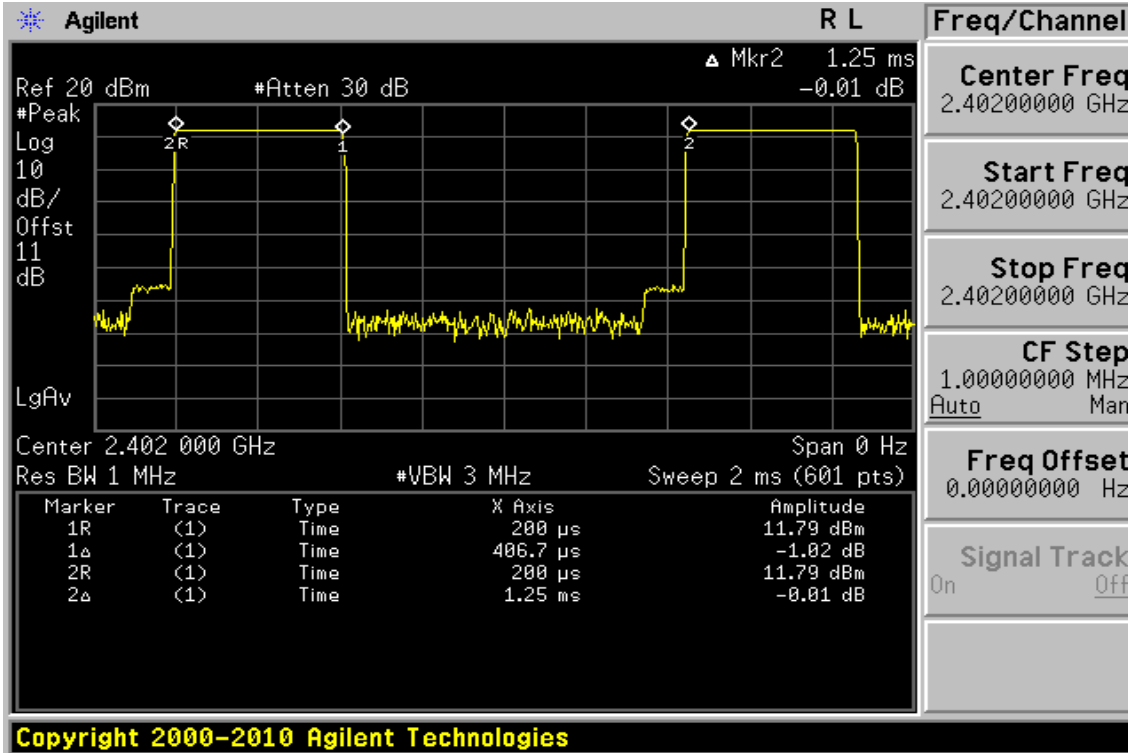
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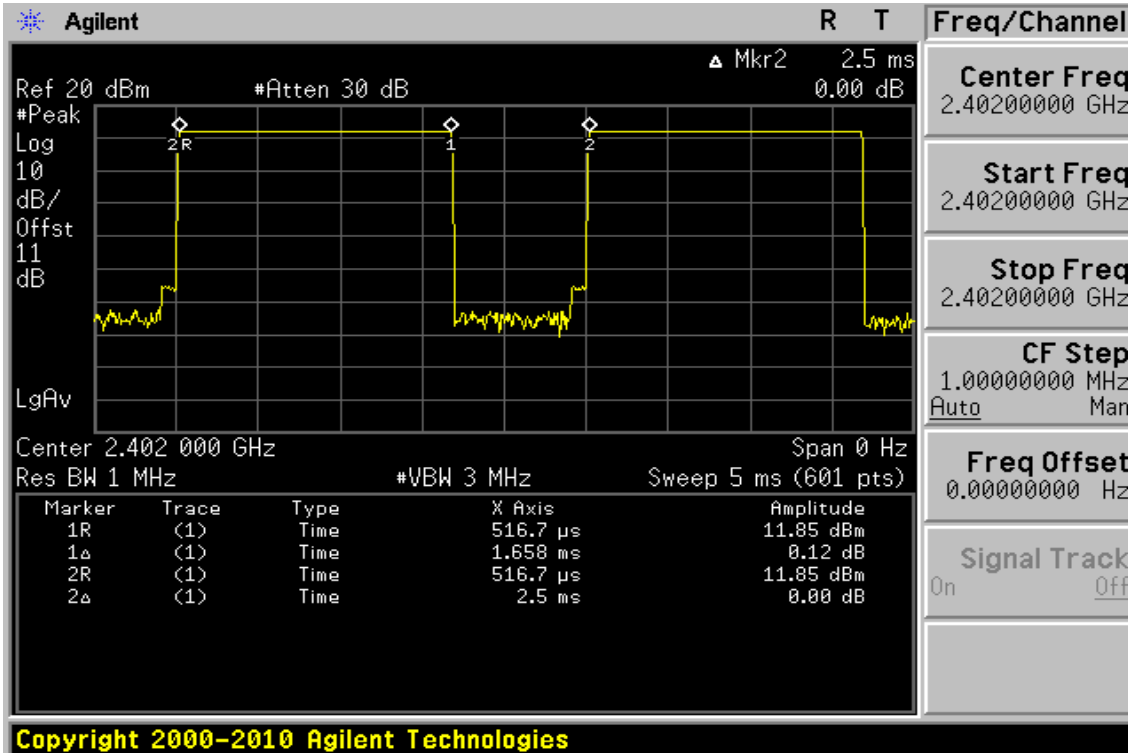
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CH-Low

DH1



DH3



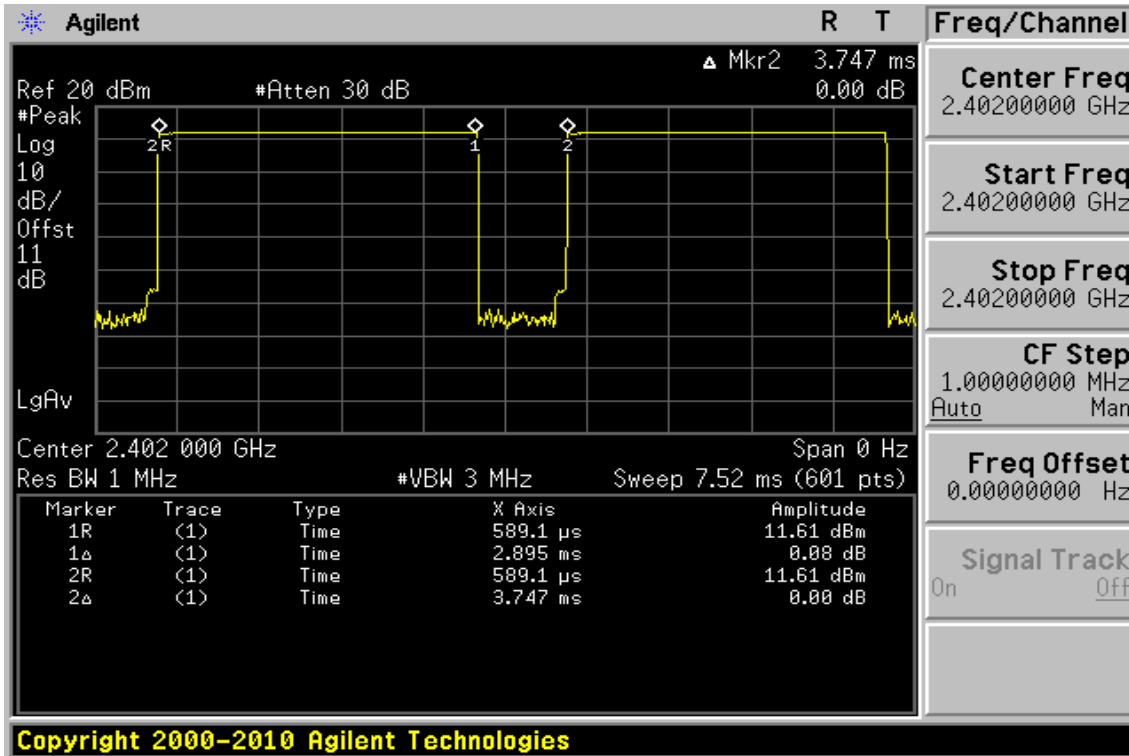
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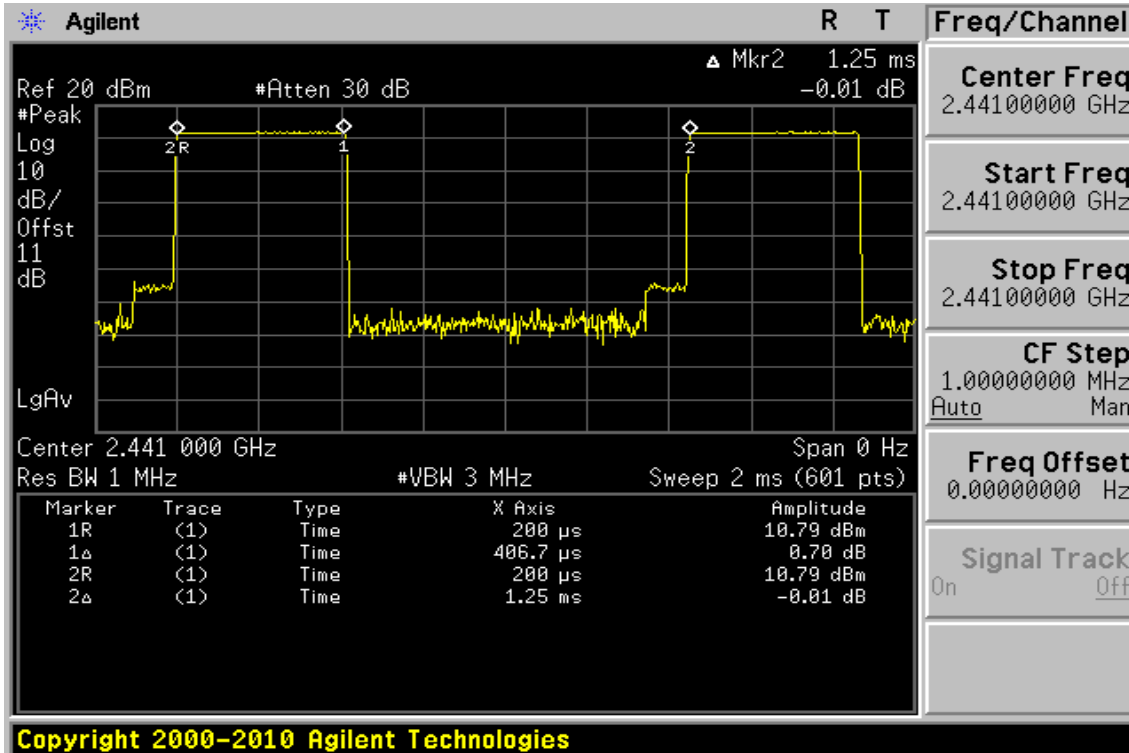
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DH5



CH-Mid

DH1



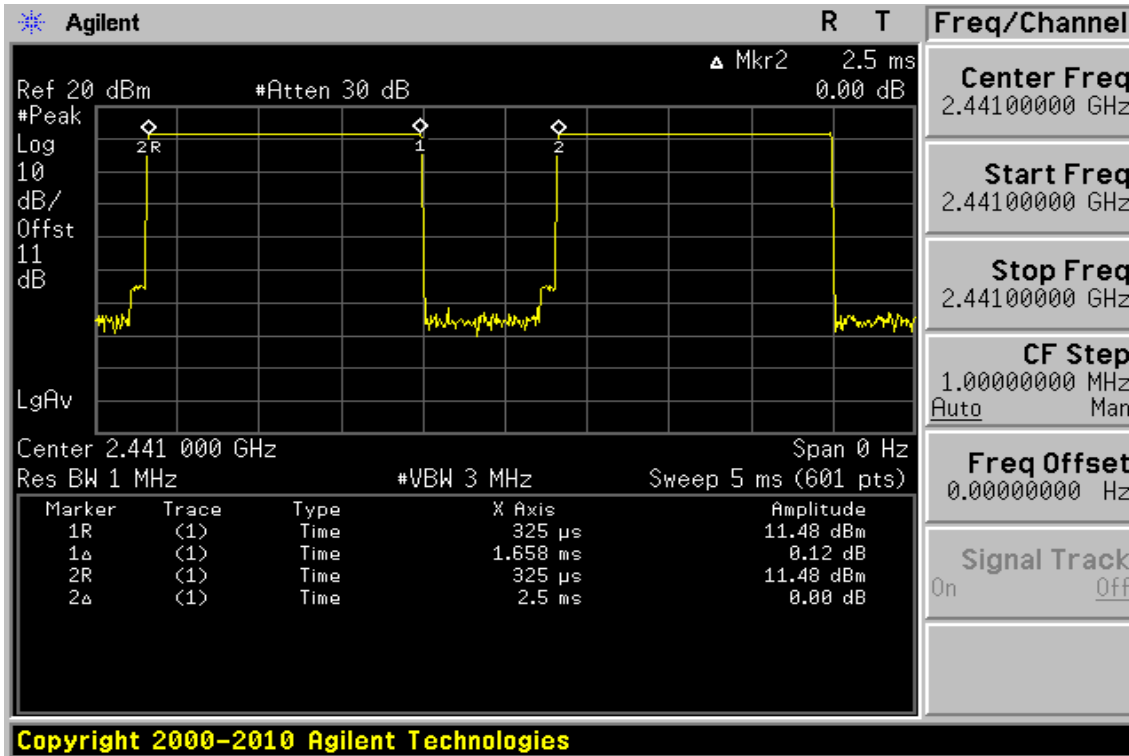
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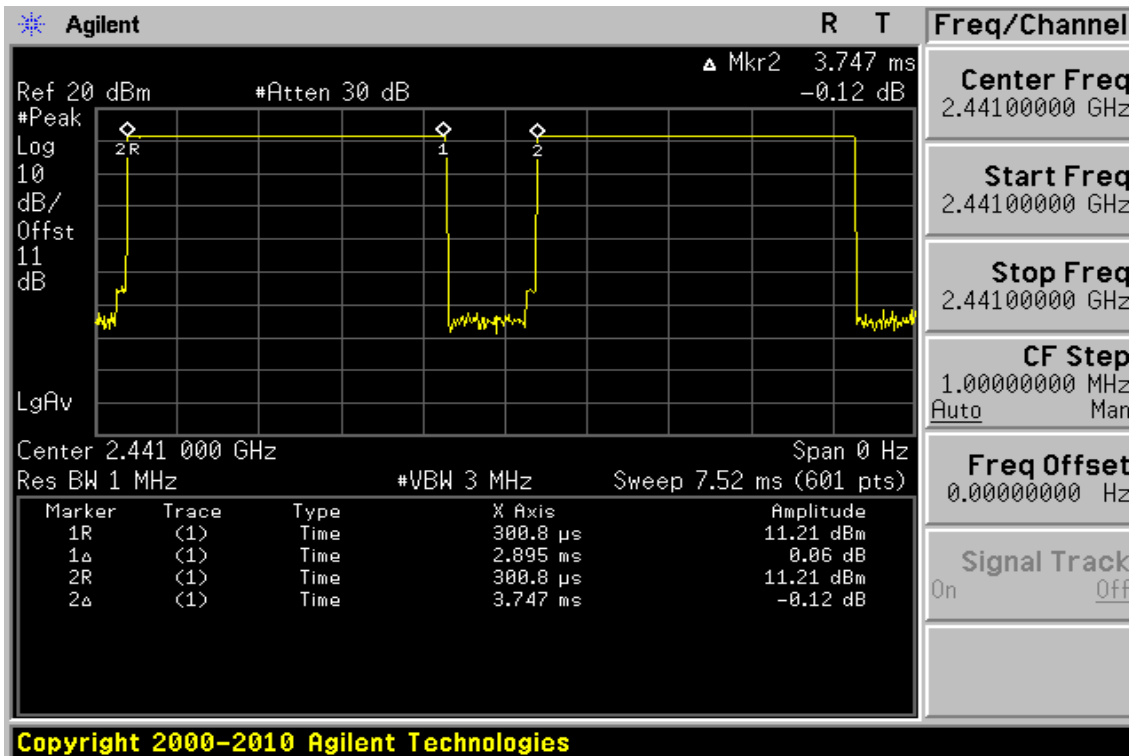
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DH3



DH5



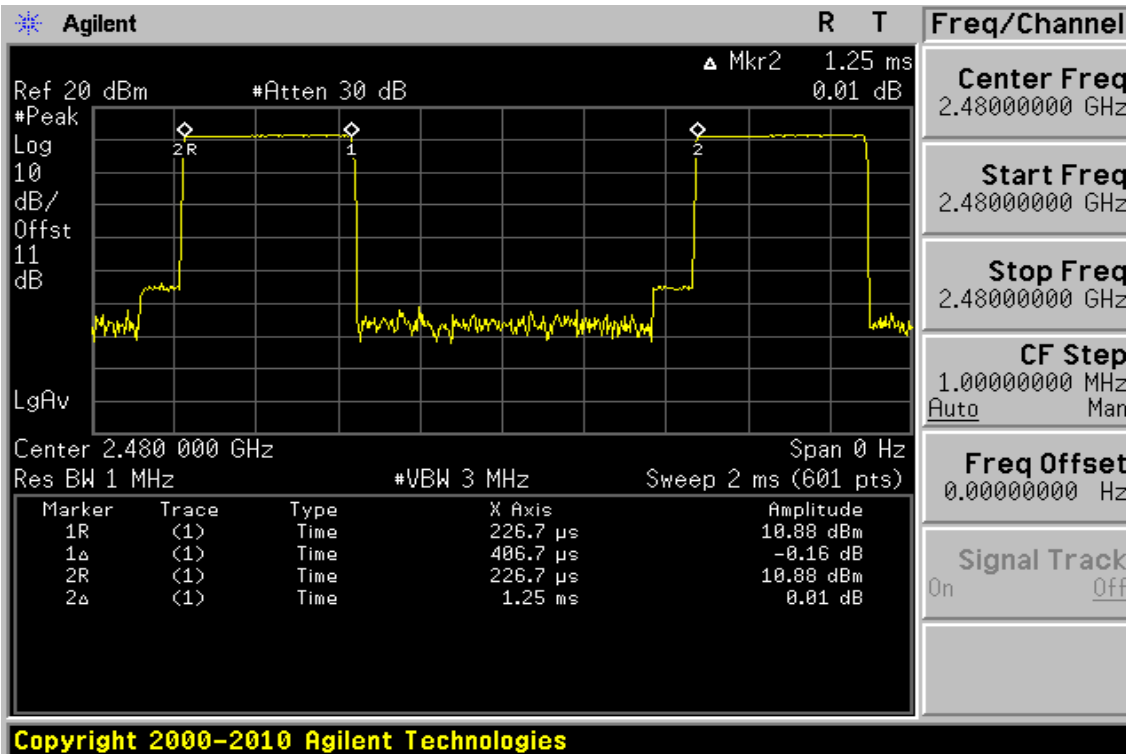
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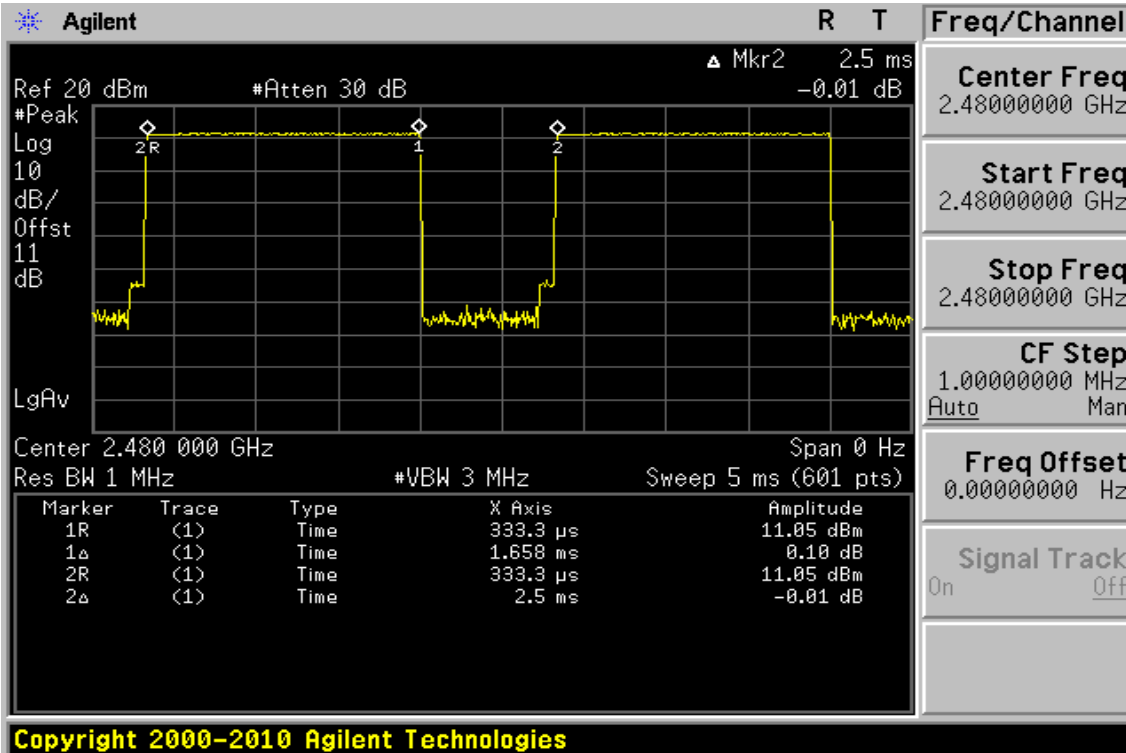
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CH-High DH1



DH3

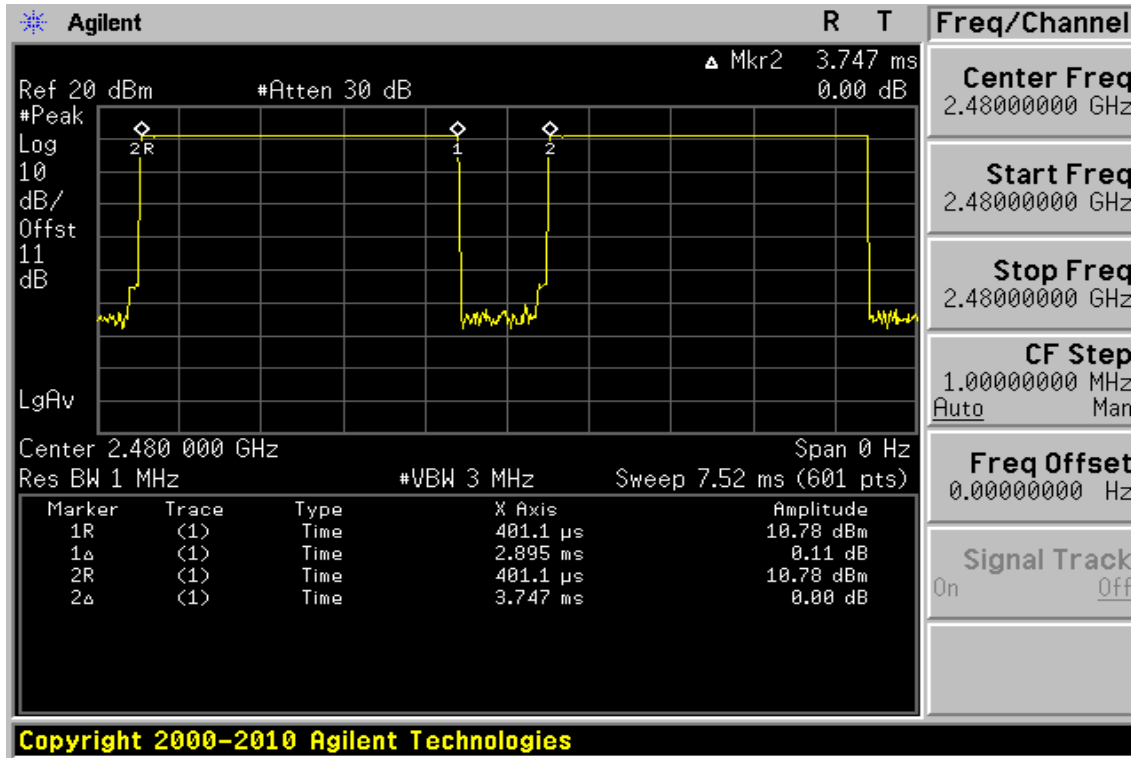


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DH5



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14. ANTENNA REQUIREMENT

14.1. Standard Applicable

For intentional device, 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 §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

14.2. Antenna Connected Construction

The directional gains of antenna used for transmitting is 0.8 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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