

Report No.: ER/2010/A0001 Issue Date: Oct. 13, 2010

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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name: GPS Cradle

Brand Name: MAGELLAN

Model Name: Premium Car Kit AP0300

Model Difference: N/A

FCC ID: P4Q-N269A

Report No.: ER/2010/A0001

Issue Date: Oct. 13, 2010

Rule Part: FCC §15.247

Prepared for: Mitac International Corporation

Building B,No. 209,Sec. 1, Nan Gang Rd.,Nan

Gan, Taipei, Taiwan, R.O.C.

Prepared by: SGS Taiwan Ltd.

Electronics & Communication Laboratory

No. 134, Wu Kung Rd., Wuku Industrial Zone,

Taipei County, Taiwan.





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CERTIFICATION OF COMPLIANCE

Applicant: Mitac International Corporation

Building B,No. 209,Sec. 1, Nan Gang Rd.,Nan Gan,Taipei, Taiwan,

R.O.C.

Product Name: GPS Cradle

Brand Name: MAGELLAN

FCC ID: P4Q-N269A

Premium Car Kit AP0300 Model No.:

Model Difference: N/A

File Number: ER/2010/A0001

Date of test: Oct. 04, 2010 ~ Oct. 11, 2010

Date of EUT Received: Oct. 04, 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 15C:2007, §15.247. The test results of this report relate only to the tested sample identified in this report.

Test By:	Brian Chang	Date:	Oct. 13, 2010
	Brian Chang / Engineer		
Prepared By:	Alex Hsieh	Date:	Oct. 13, 2010
	Alex Hsieh / Sr. Engineer		
Approved By:	Almo Hsieh	Date:	Oct. 13, 2010
	Arno Hsieh / Asst. Supervisor		

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Version No.	Date	Description	
00	Oct. 13, 2010	Initial creation of document	

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1. GENERAL INFORMATION

1.1. Product Description

General:

Product Name:	GPS Cradle				
Brand Name:	MAGELLAN				
Model Name:	Premium Car Kit AP0300				
Model Difference:	N/A				
Downer Cumply	12/24 Vdc DC car charger				
Power Supply	Car Charger: Model: MiTAC CA-052-00U-09, Supplier: MiTA				

Bluetooth:

Bluetooth Version	 V1.1 (GFSK) V1.2 (GFSK) V2.0 (GFSK) V2.0 + EDR (GFSK + π/4DQPSK + 8DPSK) V2.1 + EDR (GFSK + π/4DQPSK + 8DPSK)
Frequency Range	2402 – 2480MHz
Channel number	79 channels max.
Rated Power	3.53 dBm (Peak)
Modulation type	Frequency Hopping Spread Spectrum
Antenna Designation	PIFA Antenna / -3dBi.

The EUT is compliance with Bluetooth 2.1 Standard.

This report applies for Bluetooth

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

This submittal(s) (test report) is intended for FCC ID: P4Q-N269A 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 RSS-Gen: 2007. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4. Test Facility

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

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

1.5. Special Accessories

Not available for this EUT intended for grant.

1.6. Equipment Modifications

Not available for this EUT intended for grant.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

The EUT (Transmitter) was tested with a test program to fix the Tx/RX 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.

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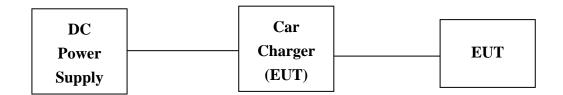


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2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed channel)



Remote Side Equipment

Bluetooth test set

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.
1.	Car Charger	MITAC	MiTAC CA-052-00U-09	N/A
2.	DC Power Supply	Topward	3303A	715856
3.	Bluetooth Test Set	Anritsu	MT8852B	N/A

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3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	§15.207(a) AC Power line Conducted Emission	
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(d)	100 KHz Bandwidth Of	
§15.247(c)	TX/RX Spurious Emission	Compliant
§15.247(a)(1))	Frequency Separation	Compliant
§15.247(a)(1)(iii)	Number of hopping frequency	Compliant
§15.247(a)(1)(ii)	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
MPE	RF EXPOSURE	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 highest data rate are chosen EDR mode worst case for full testing.

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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		mits (uV)
MHz	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.

5.2. Measurement Equipment Used:

AC Power Line Conducted Emission Test Site						
EQUIPMENT MFR MODEL SERIAL LAST CAL DUI						
TYPE		NUMBER	NUMBER	CAL.		
EMI Test Receiver	R&S	ESCS30	828985/004	09/16/2010	09/15/2011	
LISN	Rolf-Heine	NNB-2/16Z	99012	02/02/2010	02/01/2011	
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.

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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:

N/A, the EUT power form DC12/24V Car charger.

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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, 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.

6.2. Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012		
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2010	01/24/2011		
Bluetooth Test Set	Anritsu	MT8852B	N/A	N/A	N/A		
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2010	01/04/2011		
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2010	07/04/2011		
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2010	07/04/2011		
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2010	07/04/2011		
Splitter	Agilent	11636B	N/A	07/05/2010	07/04/2011		

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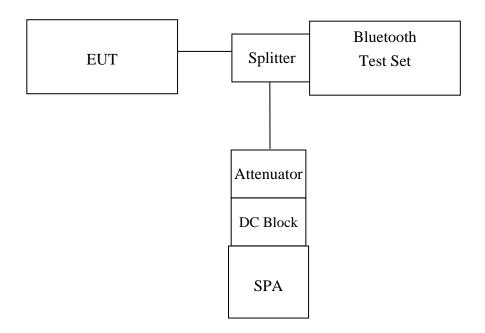
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6.3. .Test Set-up:



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 BDR, RBW=1M, VBW=3M, EDR, RBW=1.5M, VBW=5M, function, RBW, VBW = 1MHz)
- 3. Record the max. reading.
- 4. Repeat above procedures until all frequency measured were complete.

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6.5. Measurement Result:

BDR mode:

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	1.15	0.00	1.15	0.00130	1
2441.00	1.26	0.00	1.26	0.00134	1
2480.00	0.63	0.00	0.63	0.00116	1

*Note: offset 7dB

EDR mode:

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	3.53	0.00	3.53	0.00225	1
2441.00	3.50	0.00	3.50	0.00224	1
2480.00	2.63	0.00	2.63	0.00183	1

*Note: offset 7dB

Note: Refer to next page for plots.

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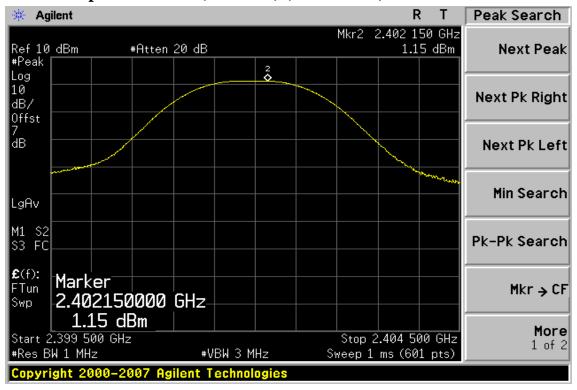
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Peak Power Output Data Plot (CH Low) (BDR mode)



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



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



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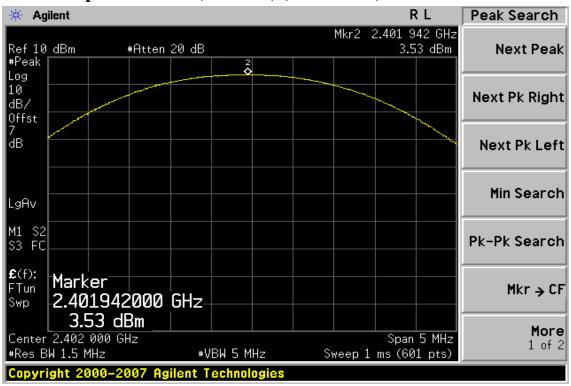
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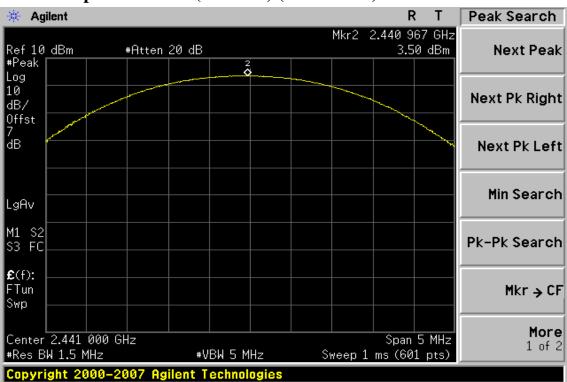
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Peak Power Output Data Plot (CH Low) (EDR mode)



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



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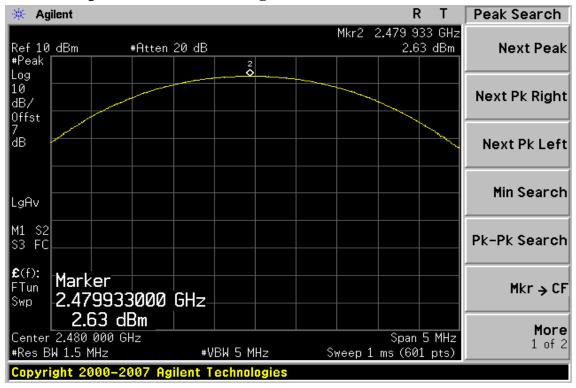
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Peak Power Output Data Plot (CH High) (EDR mode)



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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 in 15.209(a).

7.2. Measurement Equipment Used:

7.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

7.2.2. Radiated emission:

	9	66 Chamber			
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2011
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2009	11/18/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	03/09/2009	03/08/2011
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/28/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011
Radio Communication Analyzer	R & S	CMU200	111787	10/31/2008	10/30/2010
DC Block	Agilent	BLK-18	155452	07/05/2010	07/04/2011
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

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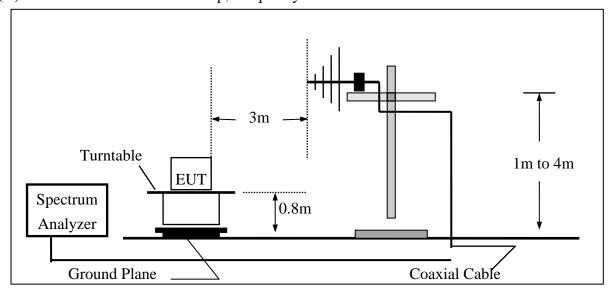
7.3. Test **SET-UP**:

7.3.1. Conducted Emission at antenna port:

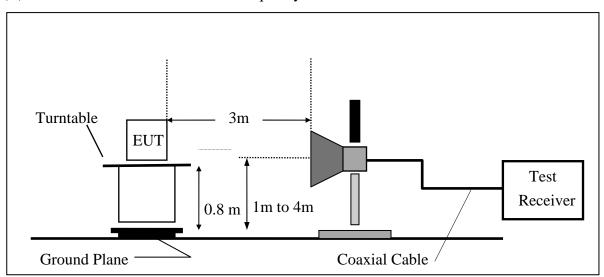
Refer to section 6.3 for details.

7.3.2. Radiated emission:

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



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



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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 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.

7.5. 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.

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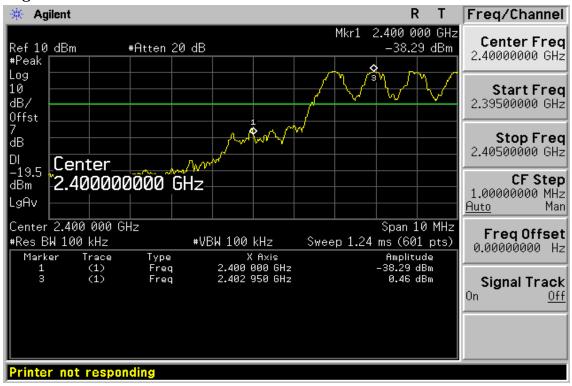
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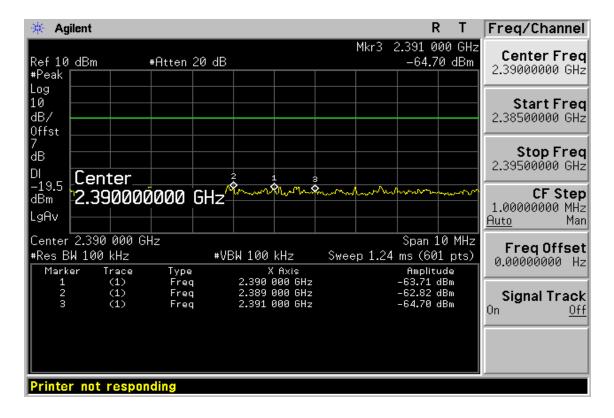


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BDR Mode Band Edges Test Data CH-Low





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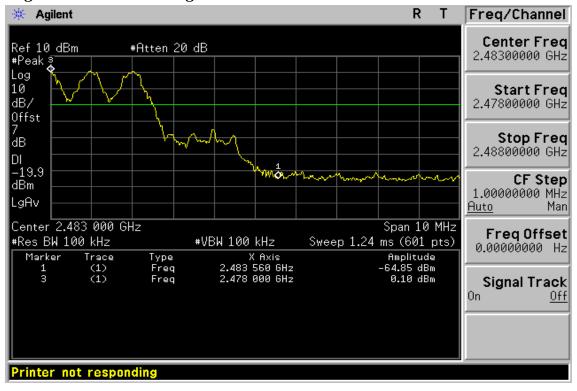
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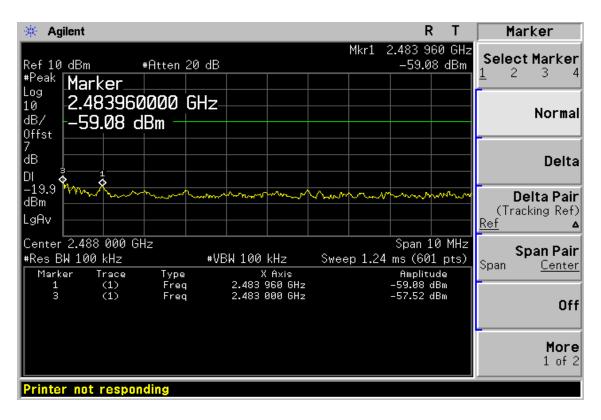


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Band Edges Test Data CH-High





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Radiated Emission: (BDR mode)

Operation Mode **Test Date** Oct. 10, 2010 TX CH Low

Fundamental Frequency 2402 MHz Test By Brian Temperature 25 °C Pol Ver.

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) (dB)	
2389.00	44.93		-10.66	34.27		74.00	54.00	-19.73	Peak
2390.00	42.88		-10.66	32.22		74.00	54.00	-21.78	Peak
2391.00	43.03		-10.66	32.37		74.00	54.00	-21.63	Peak
Operation	Mode	TX C	CH Low			Test	Date	Oct. 10, 20	010
Fundamen	tal Frequei	ncy 2402	MHz			Test	By	Brian	
Temperatu	re	25 ℃				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{A}\mathbf{V}$		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2389.00	43.51		-10.66	32.85		74.00	54.00	-21.15	Peak
2390.00	42.95		-10.66	32.29		74.00	54.00	-21.71	Peak
2391.00	43.40		-10.66	32.74		74.00	54.00	-21.26	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_o
- (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.

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Radiated Emission:

Operation Mode TX CH High Test Date Oct. 10, 2010

Fundamental Frequency 2480 MHz Test By Brian Pol Ver. Temperature 25 ℃

65 % Humidity

	Peak	$\mathbf{A}\mathbf{V}$		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2483.56	46.33		-10.36	35.97		74.00	54.00	-18.03	Peak

Operation Mode TX CH High Test Date Oct. 10, 2010

Fundamental Frequency 2480 MHz Test By Brian Temperature 25 °C Pol Hor.

Humidity 65 %

	Peak	$\mathbf{A}\mathbf{V}$		Actu	ıal FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz) (dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	(dB)	_
2483.3	0 42.18		-10.36	31.82		74.00	54.00	-22.18	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.

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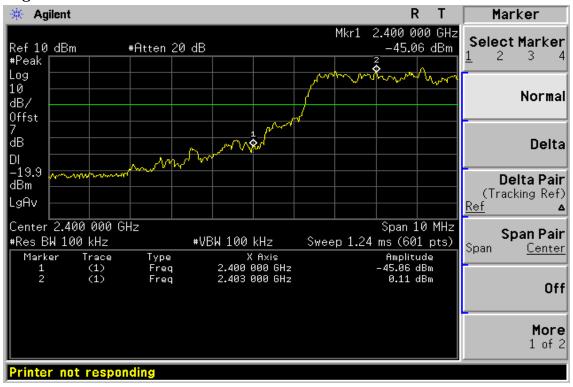
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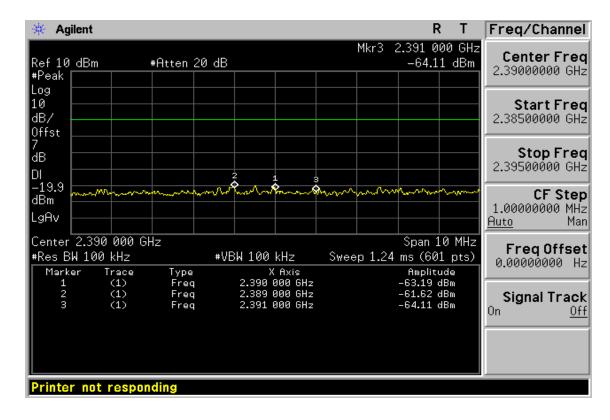


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EDR Mode Band Edges Test Data CH-Low





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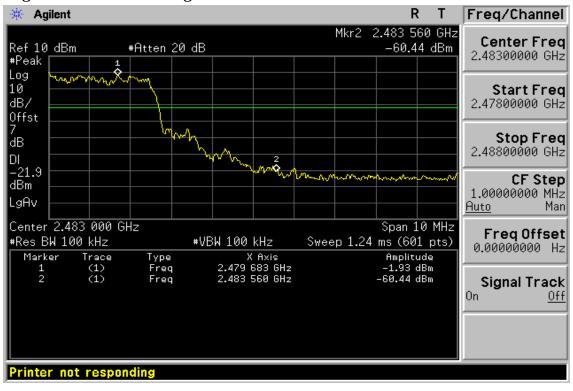
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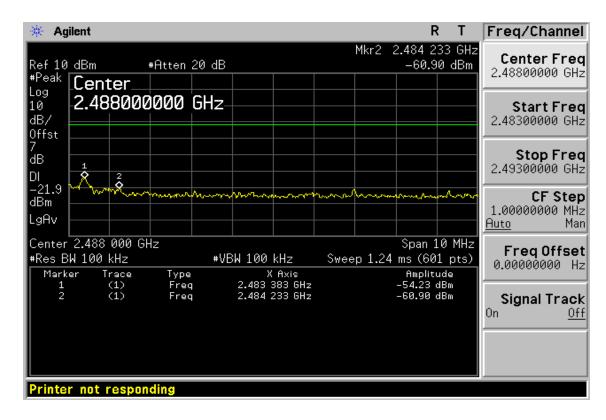


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Band Edges Test Data CH-High





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Radiated Emission:

Operation Mode TX CH Low **Test Date** Oct. 10, 2010

Fundamental Frequency 2402 MHz Test By Brian Temperature 25 °C Pol Ver.

Humidity 65 %

	Peak	\mathbf{AV}		Actu	ıal FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) (dB)	
2389.00	43.34		-10.66	32.68		74.00	54.00	-21.32	Peak
2390.00	43.25		-10.66	32.59		74.00	54.00	-21.41	Peak
2391.00	44.64		-10.66	33.98		74.00	54.00	-20.02	Peak
Operation	Mode	TX C	H Low			Test	Date	Oct. 10, 20)10
Fundamen	tal Frequei	ncy 2402	MHz			Test	Ву	Brian	
Temperatu	re	25 ℃				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{A}\mathbf{V}$		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2389.00	42.93		-10.66	32.27		74.00	54.00	-21.73	Peak
2390.00	43.46		-10.66	32.80		74.00	54.00	-21.20	Peak
2391.00	42.81		-10.66	32.15		74.00	54.00	-21.85	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_o
- (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.

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Radiated Emission:

Operation Mode TX CH High Test Date Oct. 10, 2010

Fundamental Frequency 2480 MHz Test By Brian Pol Ver. Temperature 25 °C

Humidity 65 %

	Peak	\mathbf{AV}		Actu	ıal FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	(dB)	
2483.30	48.01		-10.36	37.65		74.00	54.00	-16.35	Peak
2484.20	46.39		-10.36	36.03		74.00	54.00	-17.97	Peak
Operation	Mode	TX C	H High			Test	Date	Oct. 10, 20	010
Fundamen	tal Freque	ncy 2480	MHz			Test	By	Brian	
Temperatu	ire	25 ℃				Pol		Hor.	
Humidity		65 %							

	Peak	$\mathbf{A}\mathbf{V}$		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2483.30	47.36		-10.36	37.00		74.00	54.00	-17.00	Peak
2484.20	43.91		-10.36	33.55		74.00	54.00	-20.45	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.

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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.

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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.

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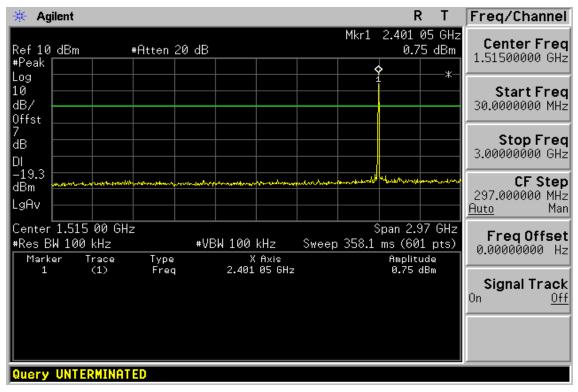
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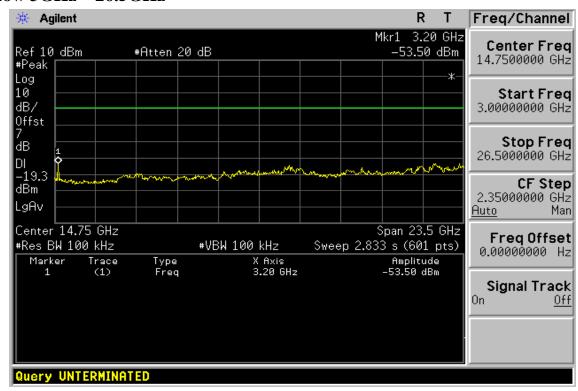
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Conducted Spurious Emission Measurement Result (EDR mode worst case) Ch Low 30MHz - 3GHz



Ch Low 3GHz – 26.5GHz



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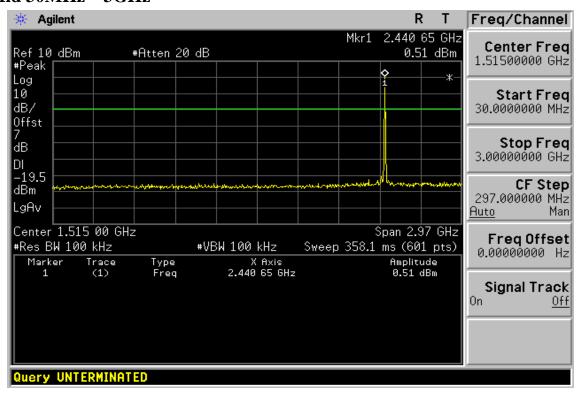
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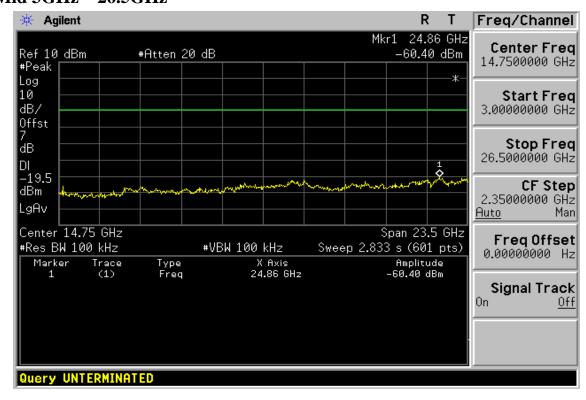
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz – 26.5GHz



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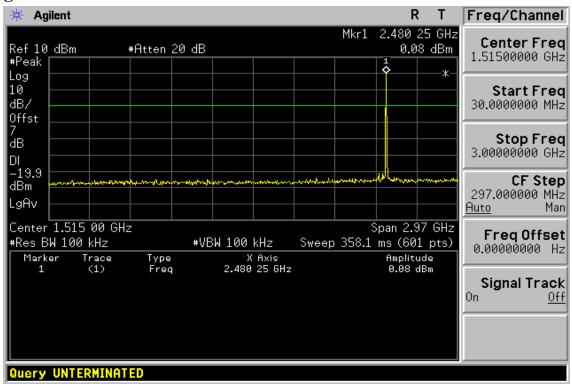
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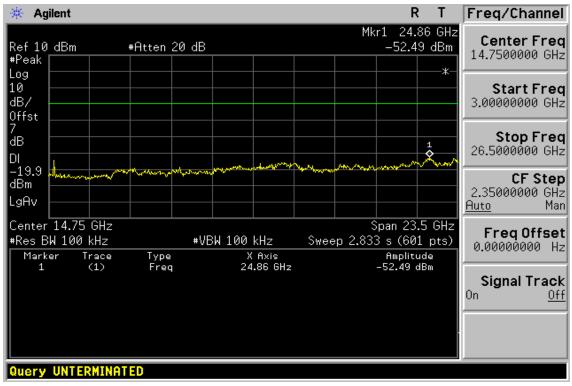
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Ch High 30MHz - 3GHz



Ch High 3GHz – 26.5GHz



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Radiated Spurious Emission Measurement Result (below 1GHz) (EDR mode worst case)

Operation Mode TX CH Low Test Date Oct. 10, 2010

Brian Fundamental Frequency 2402MHz Test By Pol Temperature Ver./Hor. 25 °C

65 % Humidity

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
58.13	V	Peak	56.60	-27.17	29.43	40.00	-10.57
104.69	V	Peak	53.48	-30.73	22.75	43.50	-20.75
153.19	V	Peak	47.74	-28.12	19.62	43.50	-23.88
450.98	V	Peak	44.88	-26.89	17.99	46.00	-28.01
599.39	V	Peak	45.60	-25.11	20.49	46.00	-25.51
732.28	V	Peak	47.01	-23.48	23.53	46.00	-22.47
30.97	Н	Peak	51.68	-26.52	25.16	40.00	-14.84
153.19	Н	Peak	49.83	-28.12	21.71	43.50	-21.79
174.53	Н	Peak	47.04	-29.88	17.16	43.50	-26.34
381.14	Н	Peak	45.83	-28.26	17.57	46.00	-28.43
633.34	Н	Peak	45.63	-24.56	21.07	46.00	-24.93
708.03	Н	Peak	45.75	-23.73	22.02	46.00	-23.98

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.

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Radiated Spurious Emission Measurement Result (below 1GHz) (EDR mode worst case)

Operation Mode TX CH Mid Test Date Oct. 10, 2010

Brian Fundamental Frequency 2441MHz Test By Pol Temperature Ver./Hor. 25 °C

Humidity 65 %

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
58.13	V	Peak	55.57	-27.17	28.40	40.00	-11.60
104.69	V	Peak	55.15	-30.73	24.42	43.50	-19.08
247.28	V	Peak	46.90	-31.18	15.72	46.00	-30.28
386.96	V	Peak	44.17	-28.10	16.07	46.00	-29.93
484.93	V	Peak	45.42	-26.81	18.61	46.00	-27.39
659.53	V	Peak	46.53	-24.24	22.29	46.00	-23.71
43.58	Н	Peak	51.34	-26.26	25.08	40.00	-14.92
150.28	Н	Peak	50.89	-28.12	22.77	43.50	-20.73
313.24	Н	Peak	46.65	-29.67	16.98	46.00	-29.02
473.29	Н	Peak	44.88	-26.96	17.92	46.00	-28.08
628.49	Н	Peak	46.11	-24.64	21.47	46.00	-24.53
798.24	Н	Peak	46.38	-22.86	23.52	46.00	-22.48

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.

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Radiated Spurious Emission Measurement Result (below 1GHz) (EDR mode worst case)

Operation Mode TX CH High Test Date Oct. 10, 2010

Brian Fundamental Frequency 2480MHz Test By Pol Temperature Ver./Hor. 25 °C

65 % Humidity

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
70.74	V	Peak	58.23	-30.38	27.85	40.00	-12.15
104.69	V	Peak	54.21	-30.73	23.48	43.50	-20.02
140.58	V	Peak	47.75	-28.37	19.38	43.50	-24.12
402.48	V	Peak	44.97	-27.82	17.15	46.00	-28.85
589.69	V	Peak	45.92	-25.27	20.65	46.00	-25.35
754.59	V	Peak	46.34	-23.25	23.09	46.00	-22.91
36.79	Н	Peak	51.94	-26.41	25.53	40.00	-14.47
148.34	Н	Peak	49.96	-28.25	21.71	43.50	-21.79
395.69	Н	Peak	44.24	-27.93	16.31	46.00	-29.69
478.14	Н	Peak	44.61	-26.91	17.70	46.00	-28.30
688.63	Н	Peak	46.50	-23.90	22.60	46.00	-23.40
870.99	Н	Peak	45.80	-22.25	23.55	46.00	-22.45

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.

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Radiated Spurious Emission Measurement Result (above 1GHz) (EDR mode worst case)

Operation Mode TX CH Low Test Date Oct. 10, 2010

Fundamental Frequency 2402 MHz Test By Brian Temperature Pol Ver. 25 °C

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4804.0	62.79		31.17	-13.18		74.00	54.00	-67.18	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.

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Radiated Spurious Emission Measurement Result (above 1GHz) (EDR mode worst case)

Operation Mode TX CH Low Test Date Oct. 10, 2010

Fundamental Frequency 2402 MHz Test By Brian Pol Temperature Hor. 25 °C

65 % Humidity

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4804.0	59.59		-13.18	46.41		74.00	54.00	-7.59	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.

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Radiated Spurious Emission Measurement Result (above 1GHz) (EDR mode worst case)

Operation Mode TX CH Mid Test Date Oct. 10, 2010

Fundamental Frequency 2441 MHz Test By Brian Pol Temperature Ver. 25 °C

65 % Humidity

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4882.0	61.44		-13.13	48.31		74.00	54.00	-5.69	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
- 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.

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Radiated Spurious Emission Measurement Result (above 1GHz) (EDR mode worst case)

Operation Mode TX CH Mid Test Date Oct. 10, 2010

Fundamental Frequency 2441 MHz Test By Brian Pol Temperature Hor. 25 °C

65 % Humidity

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4882.0	58.42		-13.13	45.29		74.00	54.00	-8.71	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
- 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.

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Radiated Spurious Emission Measurement Result (above 1GHz) (EDR mode worst case)

Operation Mode TX CH High Test Date Oct. 10, 2010

Fundamental Frequency 2480 MHz Test By Brian Pol Temperature Ver. 25 °C

65 % Humidity

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4960.0	57.11		-13.09	44.02		74.00	54.00	-9.98	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.

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Radiated Spurious Emission Measurement Result (above 1GHz) (EDR mode worst case)

Operation Mode TX CH High Test Date Oct. 10, 2010

Fundamental Frequency 2480 MHz Test By Brian Pol Temperature Hor. 25 °C

65 % Humidity

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}		
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
4960.0	58.27		-13.09	45.18		74.00	54.00	-8.82	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
- 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.

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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 100 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.

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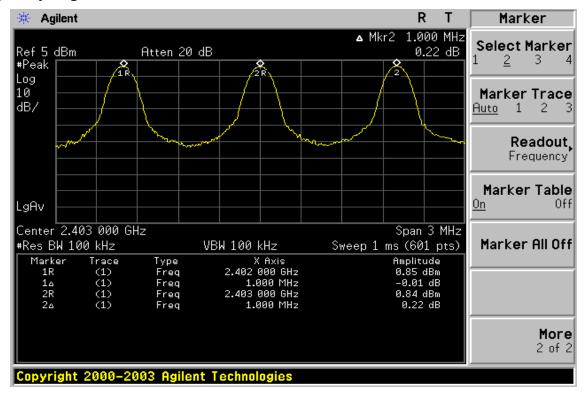
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Frequency Separation Test Data



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10. NUMBER OF HOPPING FREQUENCY

10.1. 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.

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.

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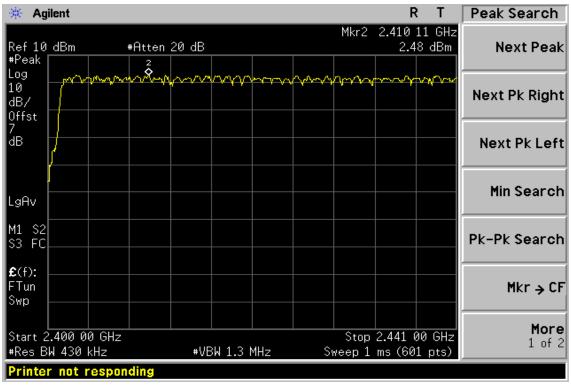
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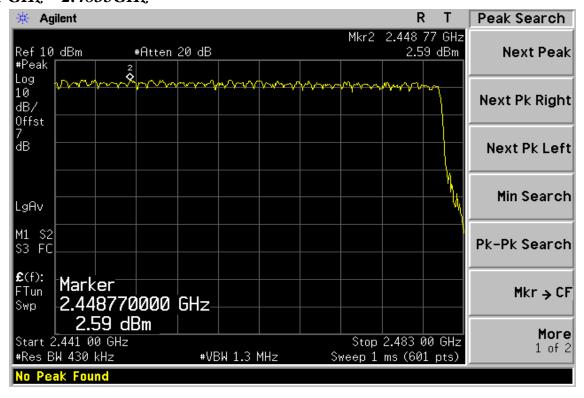
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Channel Number 2.4 GHz - 2.441GHz



2.441 GHz - 2.4835GHz



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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=1M, VBW=3M, Span = 0Hz, Adjust Sweep = 15ms.
- 5. Repeat above procedures until all frequency measured were complete.

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11.5. Measurement Result:

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

CH Low: DH1 time slot = 0.380 (ms) * (1600/(2*79)) * 31.6 = 243.2 (ms)

DH3 time slot = 1.640 (ms) * (1600/(4*79)) * 31.6 = 349.9 (ms)

DH5 time slot = 2.892 (ms) * (1600/(6*79)) * 31.6 = 370.2 (ms)

CH Mid: DH1 time slot = 0.383 (ms) * (1600/(2*79)) * 31.6 = 245.1 (ms)

DH3 time slot = 1.640 (ms) * (1600/(4*79)) * 31.6 = 349.9 (ms)

DH5 time slot = 2.883 (ms) * (1600/(6*79)) * 31.6 = 369.0 (ms)

DH1 time slot = 0.383 (ms) * (1600/(2*79)) * 31.6 = 245.1 (ms) CH High:

DH3 time slot = 1.640 (ms) * (1600/(4*79)) * 31.6 = 349.9 (ms)

DH5 time slot = 2.883 (ms) * (1600/(6*79)) * 31.6 = 369.0 (ms)

Note: Refer to next page for plots.

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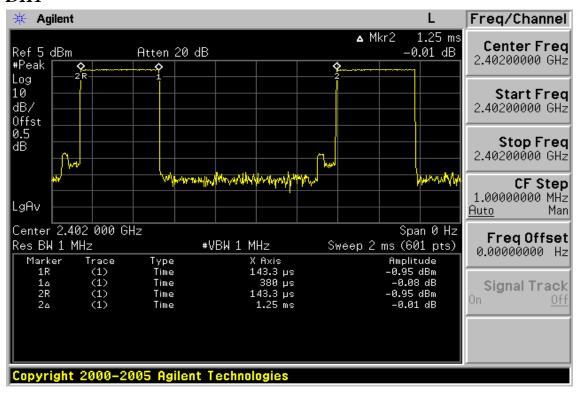


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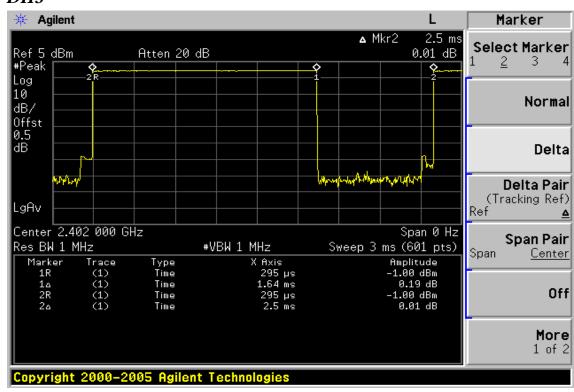
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CH-Low

DH1



DH3



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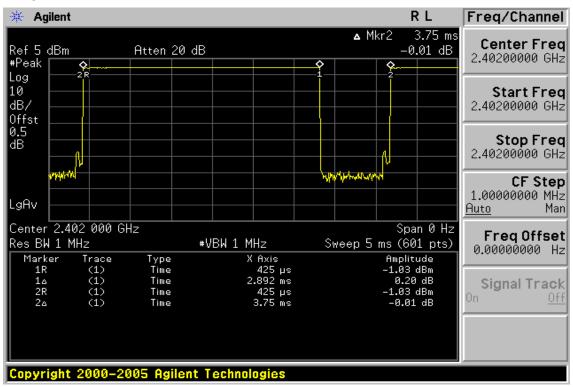
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DH5



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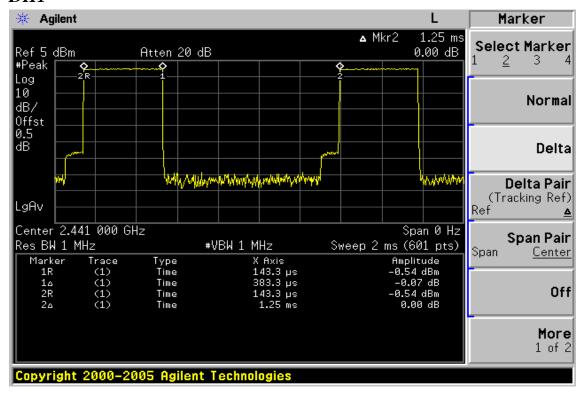
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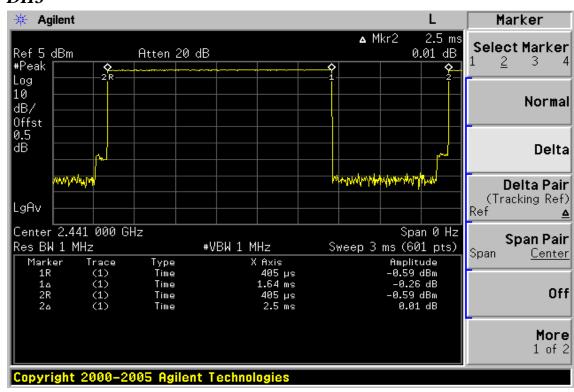
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CH-Mid DH1



DH3



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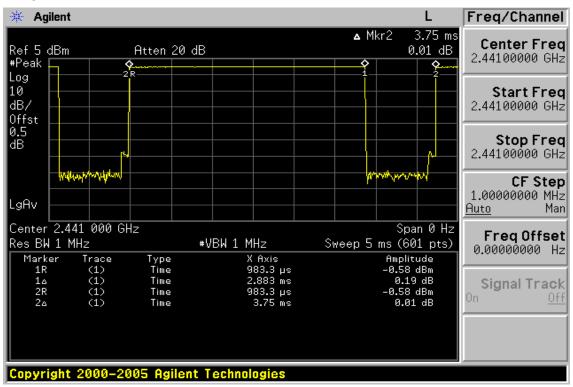
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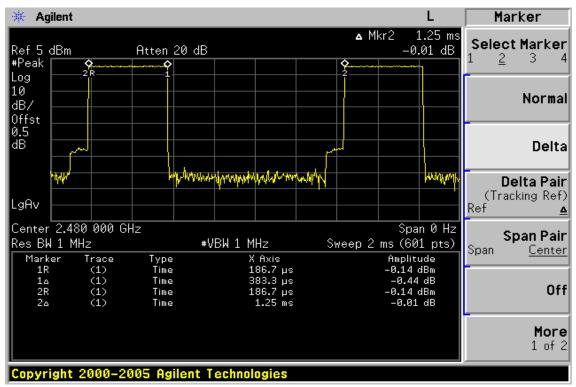
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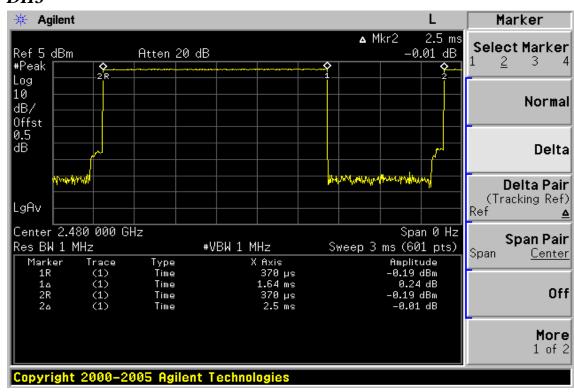
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CH-High DH1



DH3



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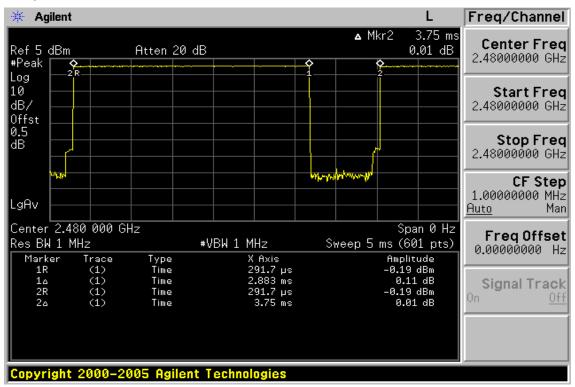
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12. 20dB Bandwidth

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 (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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12.5. Measurement Result:

BDR mode:

СН	Bandwidth
	(kHz)
Lower	927.727
Mid	926.490
Higher	926.953

EDR mode:

СН	Bandwidth	2/3 Bandwidth
	(MHz)	(MHz)
Lower	1.26	0.840
Mid	1.331	0.887
Higher	1.259	0.839

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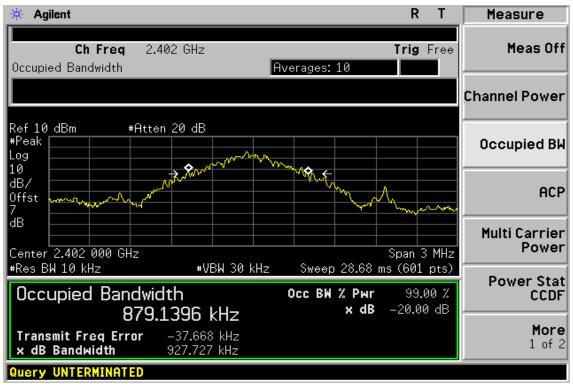
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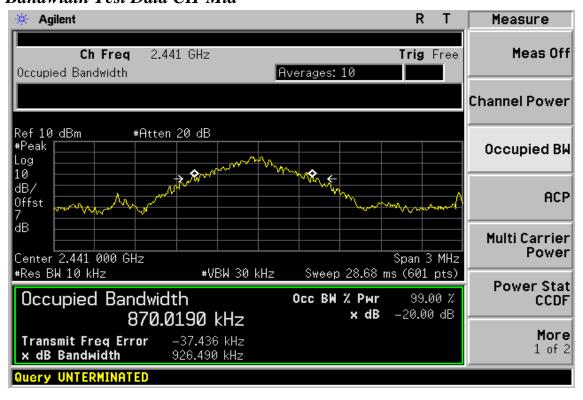
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BDR Mode 20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid



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20dB Bandwidth Test Data CH-High



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EDR Mode 20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid



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20dB Bandwidth Test Data CH-High



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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.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

13.2. Antenna Connected Construction:

The directional gains of antenna used for transmitting is -3dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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14. RF EXPOSURE

14.1. Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device.

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	3.53	0.00	3.53	0.00225	1
2441.00	3.50	0.00	3.50	0.00224	1
2480.00	2.63	0.00	2.63	0.00183	1

MPE Prediction (EDR mode worse case)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

 $S=PG/4 \pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

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Maximum peak output power at antenna input terminal:	3.53	(dBm)
Maximum peak output power at antenna input terminal:	2.254239212	(mW)
Duty cycle:	77	(%)
Maximum Pav :	1.735764193	(mW)
Antenna gain (typical):	-3	(dBi)
Maximum antenna gain:	0.501187234	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2402	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0001732	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.000173 mW/cm2. This is below the uncontrolled exposure limit of 1 mW/cm2 at 2402.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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