

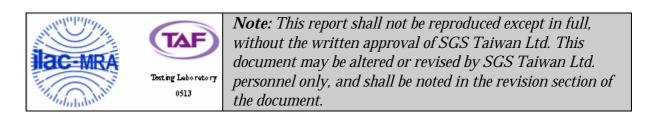
**REPORT NO: EF/2005/90016-04** DATE: Jul. 03, 2007 Page: 1 of 63

# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

# **INTENTIONAL RADIATOR CERTIFICATION TO** FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	Bluetooth stereo headphone			
Brand Name:	IOGEAR			
	GBMH211W6 GBMH211, GBMH211W1, GBMH211W2, GBMH211W3,			
Model Name:	GBMH211W4, GBMH211W5, GBMH211W7, GBMH211W8, GBMH211W9			
Model Differences:	Differences for lookout external			
FCC ID:	QLEGBMH211W6			
Report No.:	EF/2005/90016-04			
Issue Date:	Jul. 03, 2007			
FCC Rule Part:	§15.247			
Prepared for:	Aten Technology, Inc dba IOGEAR, Inc.			
	23 Hubble Drive, Irvine, CA 92618			
Prepared by:	SGS Taiwan Ltd.			
	No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.			



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 台灣檢驗科技股份有限公司
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REPORT NO: ER/2005/90016-04 DATE: Jul. 03, 2007 Page: 2

# **VERIFICATION OF COMPLIANCE**

Applicant:	Aten Technology, Inc dba IOGEAR, Inc.		
	23 Hubble Drive, Irvine, CA 92618		
Equipment Under Test:	Bluetooth stereo headphone		
Brand Name:	IOGEAR		
FCC ID Number:	QLEGBMH211W6		
Model No.:	GBMH211W6 GBMH211, GBMH211W1, GBMH211W2, GBMH211W3, GBMH211W4, GBMH211W5, GBMH211W7, GBMH211W8, GBMH211W9		
Model Difference:	Differences for lookout external		
File Number:	ER/2005/90016-04		
Date of test:	Jun. 29, 2007 ~ Jul. 02, 2007		
Date of EUT Received:	Jun. 28, 2007		

### 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) 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:	Sky Wang	Date	Jul. 03, 2007
_	Sky Wang/Sr. Engineer		
Prepared By:	Alex Hsieh	Date	Jul. 03, 2007
-	Alex Hsieh/ Sr. Engineer		
Approved By:	Timent du	Date	Jul. 03, 2007
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### Version

Version No.	Date
00	Jul. 03, 2007
01	Jul. 25, 2007

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# 1. GENERAL INFORMATION

### **1.1. Product Description**

The Aten Technology, Inc dba IOGEAR, Inc.., Model: GBMH211W6 GBMH211, GBMH211W1, GBMH211W2, GBMH211W3, GBMH211W4, GBMH211W5, GBMH211W7, GBMH211W8, GBMH211W9, is a Bluetooth stereo headset.

The EUT is compliance with Bluetooth Standard.

A major technical descriptions of EUT is described as following:

A). Operation Frequency: 2402 – 2480Hz, 79 channels

B). Rated output power: 2.13 dBm

C). Modulation type: Frequency Hopping Spread Spectrum (FHSS)

D). Antenna Designation: Chip Antenna, 2.5dBi, Non-User Replaceable (Fixed)

E). Power Supply: 3.7V from re-chargeable battery or 5V from AC/DC power adaptor

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

This submittal(s) (test report) is intended for **FCC ID:** <u>**OLEGBMH211W6**</u> filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

#### 1.3. Test Methodology

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

### 1.4. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and CISPR 22/EN 55022 requirements. Site No. 1(3 &10 meters) Registration Number: 94644, Both OATS and Anechoic chamber (3 meters) was accredited by TAF (0513).

### **1.5. Special Accessories**

Not available for this EUT intended for grant.

### **1.6. Equipment Modifications**

Not available for this EUT intended for grant.



# 2. SYSTEM TEST CONFIGURATION

### **2.1. EUT Configuration**

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

### 2.2. EUT Exercise

The 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 C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

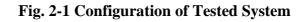
#### 2.3.2 Radiated Emissions

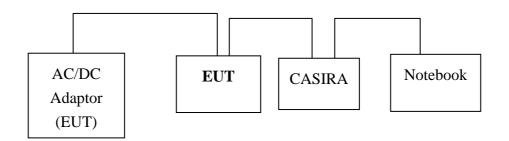
The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to 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 according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

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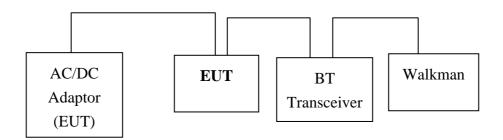


# 2.4. Configuration of Tested System





### Fig. 2-2 Configuration of AC Power Line Tested System



### **Table 2-1 Equipment Used in Tested System**

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	CASIRA	CSR	BCES301199/1	8836310305	Un-shielding	Un-shielding
2.	Notebook	Compaq	Presarlo 2100	CNF345Q1R	N/A	Un-shielding
3.	DC power Supply	Topward	3303D	981327	N/A	Un-shielding
4.	BT development kit	CSR/CASIRA	BCES301199	DOC	7383-07-04-03	30cm, un-shielded
5.	BT Transceiver	EPL	T900S	DOC	N/A	Un-shield
6.	Walkman	BSD	R-909T	3893A367	N/A	Shielding 1.8m

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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	
§15.247(c)	100 KHz Bandwidth Of Fre-	Compliant	
	quency Band Edges		
§15.209(a) (f)	Spurious Emission	Compliant	
§15.247(a)(1)	Frequency Separation	Compliant	
§15.247(a)(1)(iii)	5.247(a)(1)(iii) Number of hopping frequency		
§15.247(a)(1)(iii)	Time of Occupancy	Compliant	
§15.247	Peak Power Density	Compliant	
§15.203,	Antenna Requirement	Compliant	
§15.247(b)(4)(i)			

# 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)  $\cdot$  mid (2441MHz) and high (2480MHz) with highest data rate are chosen for full testing.

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# 5. CONDUCTED EMISSION TEST

# 5.1. Standard Applicable

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

Frequency range	Lir dB(	nits 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. 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 EUT was plug-in the host PC. 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 110Vac/60Hz power source.

### 5.3. 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.



Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
EMC Analyzer	HP	8594EM	3624A00203	09/02/2006	09/03/2007
EMI Test Receiver	R&S	ESCS30	828985/004	06/10/2007	06/09/2008
Transient Limiter	HP	11947A	3107A02062	09/02/2006	09/03/2007
LISN	Rolf-Heine	NNB-2/16Z	99012	12/31/2006	12/30/2007
LISN	Rolf-Heine	NNB-2/16Z	99013	12/24/2006	12/23/2007
Coaxial Cables	N/A	No. 3, 4	N/A	12/01/2006	12/01/2007

# **5.4.** Measurement Equipment Used:

### 5.5. Measurement Result

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

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2.1050

39.70

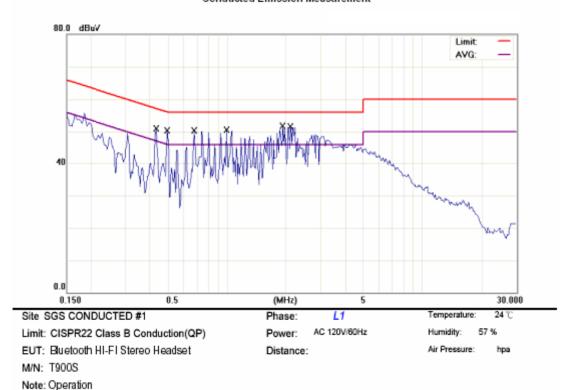
0.65

FCC ID: QLEGBMH211W6

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# AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Normal Operatin	g + Charge Mode	Test Date:	Apr. 03, 2007			
Temperature:	25	Humidity:	62 %	Test By:	Sky		
RBW:	9kHz	VBW:	9kHz				
Conducted Emission Measurement							



No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.4350	49.80	0.61	50.41	57.16	-6.75	QP	
2	0.4350	42.00	0.61	42.61	47.16	-4.55	AVG	
3	0.4950	48.90	0.61	49.51	56.08	-6.57	QP	
4	0.4950	40.70	0.61	41.31	46.08	-4.77	AVG	
5	0.6800	48.60	0.61	49.21	56.00	-6.79	QP	
6 *	0.6800	41.30	0.61	41.91	46.00	-4.09	AVG	
7	0.9900	48.50	0.62	49.12	56.00	-6.88	QP	
8	0.9900	40.20	0.62	40.82	46.00	-5.18	AVG	
9	1.9200	49.90	0.65	50.55	56.00	-5.45	QP	
10	1.9200	38.80	0.65	39.45	46.00	-6.55	AVG	
11	2.1050	48.80	0.65	49.45	56.00	-6.55	QP	

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46.00

-5.65

AVG

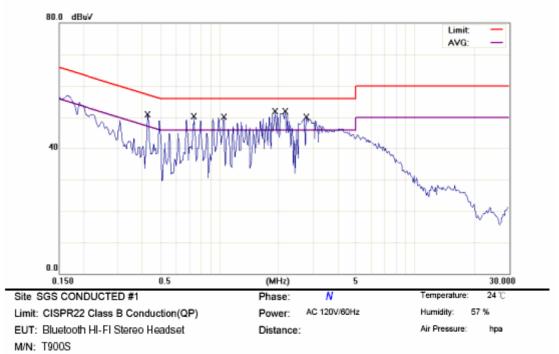
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40.35



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Conducted Emission Measurement



Note: Operation

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4300	49.20	0.61	49.81	57.25	-7.44	QP	
2		0.4300	40.20	0.61	40.81	47.25	-6.44	AVG	
3		0.7400	48.60	0.61	49.21	56.00	-6.79	QP	
4		0.7400	39.40	0.61	40.01	46.00	-5.99	AVG	
5		1.0500	47.60	0.62	48.22	56.00	-7.78	QP	
6		1.0500	36.70	0.62	37.32	46.00	-8.68	AVG	
7	•	1.9150	50.00	0.65	50.65	56.00	-5.35	QP	
8		1.9150	39.60	0.65	40.25	46.00	-5.75	AVG	
9		2.1600	48.60	0.65	49.25	56.00	-6.75	QP	
10		2.1600	36.80	0.65	37.45	46.00	-8.55	AVG	
11		2.7750	47.30	0.67	47.97	56.00	-8.03	QP	
12		2.7750	36.30	0.67	36.97	46.00	-9.03	AVG	

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# 6. PEAK OUTPUT POWER MEASUREMENT

### 6.1. 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.

# 6.2. 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. (Channel power function, RBW, VBW = 1MHz)
- 3. Record the max. reading.
- 4. Repeat above procedures until all frequency measured were complete.

(	СН	Frequency (MHz)	Reading Power dBm	Cable Loss	Output Power dBm	Output Power W	Limit (W)
L	OW	2402.00	2.75	0.10	2.85	0.00193	1
Ν	/ID	2441.00	2.93	0.10	3.03	0.00201	1
Η	IGH	2480.00	3.33	0.10	3.43	0.00220	1

### 6.3. Measurement Result

# 6.4. Measurement Equipment Used:

EQUIPMENT	EQUIPMENT MFR		SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	05/27/2006	05/26/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/27/2007
Spectrum Analyzer	Agilent	E4446A	MY43360126	01/22/2007	01/21/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007

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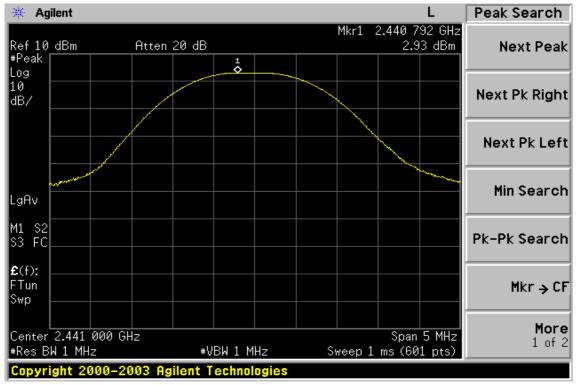


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# Peak Power Output Data Plot (CH Low)



# Peak Power Output Data Plot (CH Mid)



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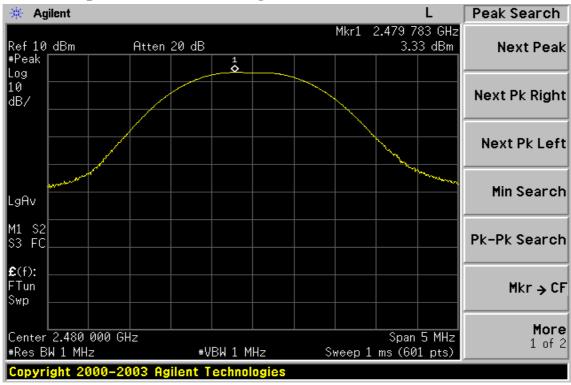
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# Peak Power Output Data Plot (CH High)



\*Note: Peak detector is used when measuring Peak power. LgAV, doesn't mean AV detector, is a default and standard setting from Agilent's Spectrum.

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# 7. 20dB BAND WIDTH

### 7.1. Standard Applicable

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

### 7.2. 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.

### 7.3. Measurement Result

СН	Bandwidth
	(kHz)
Lower	0.826
Mid	0.829
Higher	0.826

### 7.4. Measurement Equipment Used:

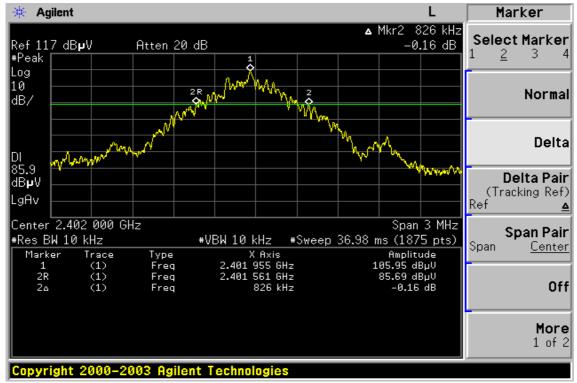
EQUIPMENT MFR		MODEL SERIAL		LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2006	11/10/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/27/2007
Spectrum Analyzer	Agilent	E4446A	MY43360126	01/22/2007	01/21/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007

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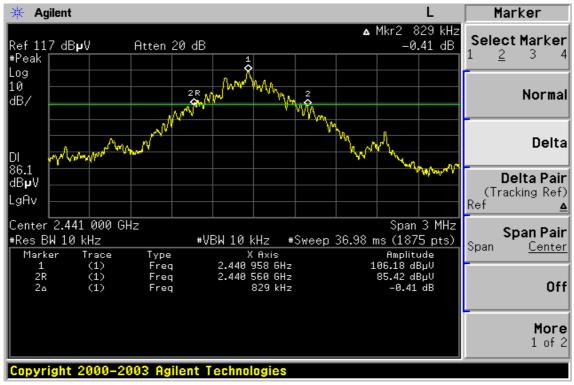


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### 20dB Band Width Test Data CH-Low



### 20dB Band Width Test Data CH-Mid



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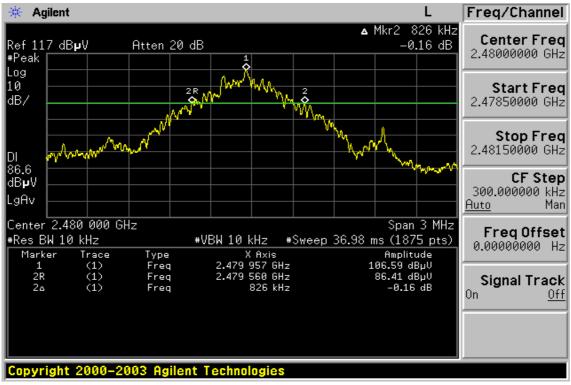
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# 20dB Band Width Test Data CH-High



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# 8. 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

### 8.1. Standard Applicable

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

### 8.2. 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 2.488GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.
- 7. Radiated Emission refer to section 9.

### 8.3. Measurement Result

Refer to attach spectrum analyzer data chart.

EQUIPMENT	MFR	MODEL NUMBER	SERIAL NUMBER	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2006	11/10/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/26/2007
Spectrum Analyzer	Agilent	E4446A	MY43360126	01/22/2007	01/21/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007
Splitter	Mini-Circult	ZFSC-2-10G	N/A	10/07/2006	10/06/2007

### 8.4. Measurement Equipment Used:

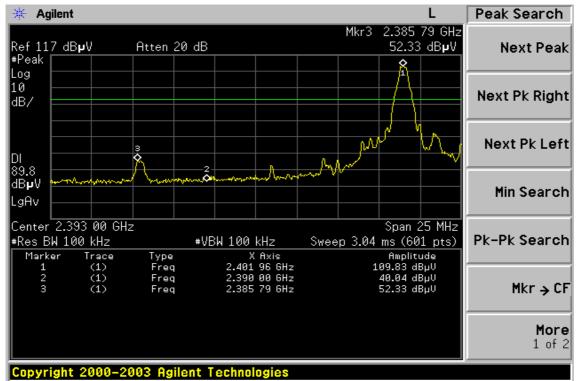
Note: Measurement Equipment for radiated emission refers to section 9.

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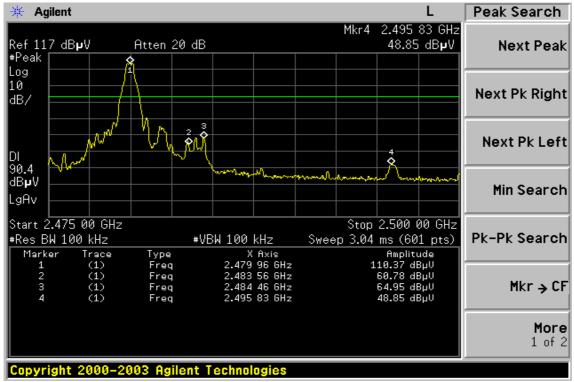


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# **Conducted Emission: Test Data CH-Low**



# **Conducted Emission: Test Data CH-High**



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#### **Radiated Emission:**

Operation Mode	TX CH Low	Test Date	Jun. 30, 2007
Fundamental Frequency	2402 MHz	Test By	Sky
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/n	n) ( <b>dB</b> )	
2386.0	33.94		-3.43	30.51		74.00	54.00	-23.49	Peak
2390.0	34.04		-3.40	30.64		74.00	54.00	-23.36	Peak
Operation Fundamen Temperatu Humidity	ntal Freque ure						st Date st By l	Jun. 30, 2 Sky Hor.	2007

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	( <b>dB</b> )	
2386.0	36.76		-3.43	33.33		74.00	54.00	-20.67	Peak
2390.0	34.33		-3.40	30.93		74.00	54.00	-23.07	Peak

Remark :

- (1) Datas 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<sub>o</sub>
- (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	Jun. 30, 2007
Fundamental Frequency	2480 MHz	Test By	Sky
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m	( <b>dB</b> )	
2483.6	41.18		-3.04	38.14		74.00	54.00	-15.86	Peak
2484.5	46.21		-3.04	43.17		74.00	54.00	-10.83	Peak
2495.8	35.29		-2.95	32.34		74.00	54.00	-21.66	Peak
Operation	Mode	TX	CH High			Te	st Date	Jun. 30, 2	2007
Fundamer	ntal Freque	ency 2480	) MHz			Te	st By	Sky	
Temperat	ure	25 °(	2			Ро	1	Hor.	
Humidity		65 %	б						

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m	)(dBuV/m)	( <b>dB</b> )	
2483.6	45.44		-3.04	42.40		74.00	54.00	-11.60	Peak
2484.5	52.16		-3.04	49.12		74.00	54.00	-4.88	Peak
2495.8	37.40		-2.95	34.45		74.00	54.00	-19.55	Peak

Remark :

- (1) Datas 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<sub>o</sub>
- (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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# 9. SPURIOUS RADIATED EMISSION TEST

### 9.1. 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.

### 9.2. EUT Setup

- 1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-2003.
- 2. The EUT was put in the front of the test table. The peripherals was placed on the side of the host 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 PC system was connected with 110Vac/60Hz power source.

### 9.3. Measurement Procedure

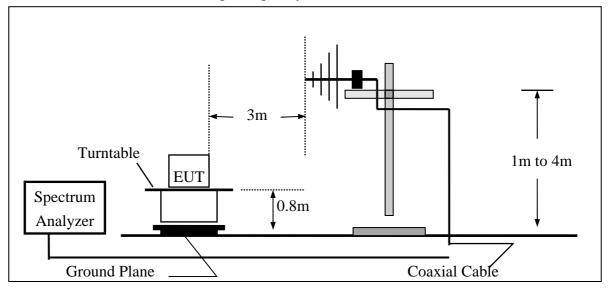
- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until all frequency measured were complete.



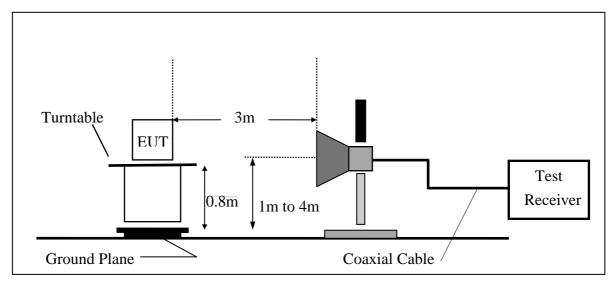
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# 9.4. Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1GHz



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



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# 9.5. Measurement Equipment Used:

966 Chamber									
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2006	11/10/2007				
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/26/2007				
Bilog Antenna	SCHWAZBECK	VULB9160	3224	11/14/2006	13/11/2007				
Horn antenna	Schwarzbeck	BBHA 9120D	309/320	08/16/2006	08/15/2007				
Horn antenna	Schwarzbeck	BBHA 9170	184/185	07/04/2006	07/03/2007				
Pre-Amplifier	HP	8447D	2944A09469	07/19/2006	07/18/2007				
Pre-Amplifier	HP	8494B	3008A00578	02/26/2007	02/25/2008				
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	10/09/2006	10/08/2007				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2006	10/08/2007				
Site NSA	SGS	966 chamber	N/A	11/17/2006	11/16/2007				

### 9.6. 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:

### $\mathbf{FS} = \mathbf{RA} + \mathbf{AF} + \mathbf{CL} - \mathbf{AG}$

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

### 9.7. Measurement Result

Refer to attach tabular data sheets.

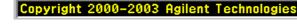
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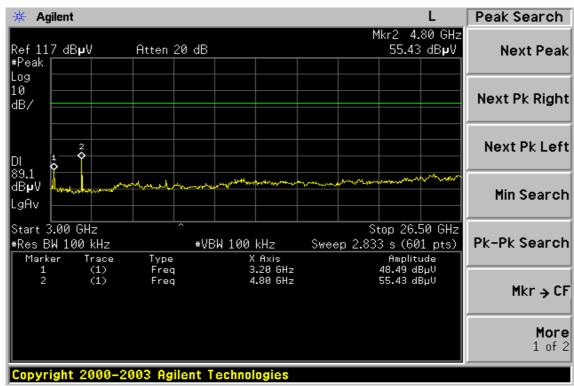


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#### 🔆 Agilent L Peak Search Mkr1 2.401 GHz Ref 117 dB**µ**V Atten 20 dB 109.61 dBµV Next Peak #Peak φ Log 10 Next Pk Right dB/ Next Pk Left DI 89.1 dB**µ**V Min Search LgAv Start 3<mark>0 MH</mark>z Stop 3.000 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 358.1 ms (601 pts) Pk-Pk Search Marker Trace (1) X Axis Amplitude Type Freq 2.401 GHz 109.61 dBµV Mkr → CF More 1 of 2

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





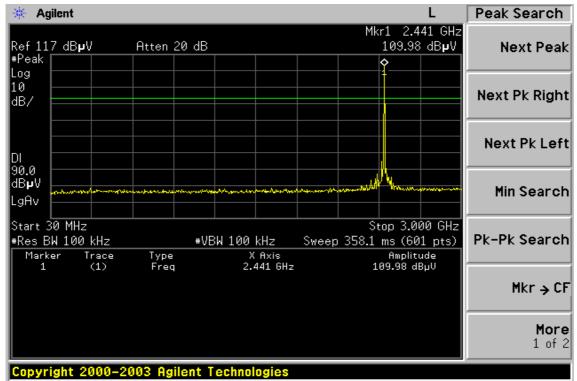
# Ch Low 3GHz - 26.5GHz

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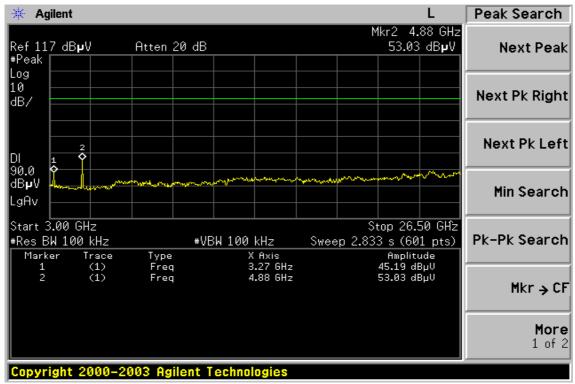


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# Ch Mid 30MHz – 3GHz







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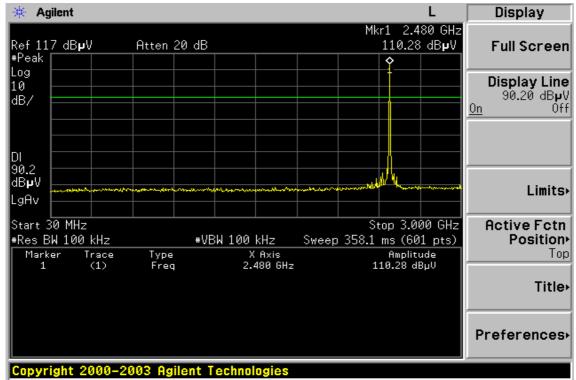
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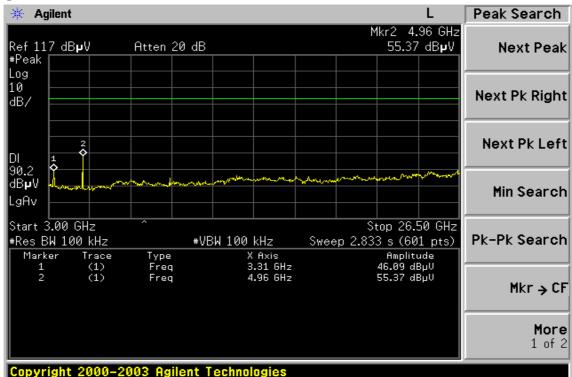


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# Ch High 30MHz – 3GHz



### Ch High 3GHz – 26.5GHz



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#### **Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode	TX CH Low	Test Date	Jun. 30, 2007
Fundamental Frequency	2402MHz	Test By	Sky
Temperature	25 °C	Pol	Ver./Hor.
Humidity	65 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
48.83	V	Peak	46.18	-14.70	31.48	40.00	-8.52
128.94	V	Peak	44.19	-14.79	29.40	43.50	-14.10
130.88	Н	Peak	43.94	-14.63	29.31	43.50	-14.19
300.63	Н	Peak	42.90	-13.37	29.53	46.00	-16.47

Remark :

- 1 Measuring frequencies from 30 MHz to the 1GHz  $\circ$
- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Datas 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)**

Operation Mode	TX CH Mid	Test Date	Jun. 30, 2007
Fundamental Frequency	2441MHz	Test By	Sky
Temperature	25 °C	Pol	Ver./Hor.
Humidity	65 %		

Freq.	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
 (MHz)	H/V	(PK/QP)	(dBuV)	( <b>dB</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
 126.03	V	Peak	44.81	-15.03	29.78	43.50	-13.72
533.43	V	Peak	40.81	-8.75	32.06	46.00	-13.94
135.73	Н	Peak	44.80	-14.23	30.57	43.50	-12.93
198.78	Н	Peak	48.79	-16.60	32.19	43.50	-11.31
623.64	Н	Peak	36.27	-7.10	29.17	46.00	-16.83

#### Remark :

1 Measuring frequencies from 30 MHz to the 1GHz  $\circ$ 

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

Operation Mode	TX CH High	Test Date	Jun. 30, 2007
Fundamental Frequency	2480MHz	Test By	Sky
Temperature	25 °C	Pol	Ver./Hor.
Humidity	65 %		

FS Limit3m Safe Margin
/m) (dBuV/m) (dB)
43.50 -13.80
5 43.50 -17.15
43.50 -13.29
3 46.00 -16.37
5

#### 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 Datas 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)**

Operation Mode	TX CH Low	Test Date	Jun. 30, 2007
Fundamental Frequency	2402 MHz	Test By	Sky
Temperature	25 °C	Pol	Ver.
Humidity	65 %		

	Peak	AV		Act	ual FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/n	n](dBuV/m]	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	Remarl
1598.0	51.47		-6.81	44.66		74.00	54.00	-9.34	Peak
4796.0	46.20		2.95	49.15		74.00	54.00	-4.85	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<sub>o</sub>
- (2) Datas 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<sub>o</sub>
- (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)**

Operation Mode	TX CH Low	Test Date	Jun. 30, 2007
Fundamental Frequency	2402 MHz	Test By	Sky
Temperature	25 °C	Pol	Hor.
Humidity	65 %		

	Peak	AV		Actual FS		Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	) (dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	Remark
1045.5	44.57		-9.25	35.32		74.00	54.00	-18.68	Peak
1598.0	51.47		-6.81	44.66		74.00	54.00	-9.34	Peak
4796.0	46.20		2.95	49.15		74.00	54.00	-4.85	Peak
9608.0									
12010.0									
14412.0									
16814.0									
19216.0									
21618.0									
24020.0									

#### Remark :

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency<sub>o</sub>
  - (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<sub>o</sub>
  - (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)**

Operation Mode	TX CH Mid	Test Date	Jun. 30, 2007
Fundamental Frequency	2441 MHz	Test By	Sky
Temperature	<b>25</b> ℃	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	Actual FS		AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	Remark
1630.5	51.91		-6.64	45.27		74.00	54.00	-8.73	Peak
4880.5	50.41	46.30	3.18	53.59	49.48	75.00	54.00	-4.52	AV
7323.0									
9764.0									
12205.0									
14646.0									
17087.0									
19528.0									
21969.0									
24410.0									

#### 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<sub>o</sub>
- (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)**

Operation Mode	TX CH Mid	Test Date	Jun. 30, 2007
Fundamental Frequency	2441 MHz	Test By	Sky
Temperature	25 °C	Pol	Hor.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	Remark
1045.5	45.14		-9.25	35.89		74.00	54.00	-18.11	Peak
1630.5	55.06		-6.64	48.42		75.00	54.00	-5.58	Peak
4880.5	45.84		3.18	49.02		76.00	54.00	-4.98	Peak
9764.0									
12205.0									
14646.0									
17087.0									
19528.0									
21969.0									
24410.0									

#### Remark :

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency<sub>o</sub>
  - (2) Datas 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<sub>o</sub>
  - (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)**

Operation Mode	TX CH High	Test Date	Jun. 30, 2007
Fundamental Frequency	2480 MHz	Test By	Sky
Temperature	<b>25</b> ℃	Pol	Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	Remark
1643.5	54.34		-6.60	47.74		74.00	54.00	-6.26	Peak
3301.0	38.63		-1.46	37.17		74.00	54.00	-16.83	Peak
4958.5	41.16		3.40	44.56		74.00	54.00	-9.44	Peak
7440.0									
9920.0									
12400.0									
14880.0									
17360.0									
19840.0									
22320.0									
24800.0									

#### Remark :

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency<sub>o</sub>
- (2) Datas 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<sub>o</sub>
- (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)**

Operation Mode	TX CH High	Test Date	Jun. 30, 2007
Fundamental Frequency	2480 MHz	Test By	Sky
Temperature	<b>25</b> ℃	Pol	Hor.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	Remar
1045.5	44.90		-9.25	35.65		74.00	54.00	-18.35	Peak
1643.5	56.47		-6.60	49.87		74.00	54.00	-4.13	Peak
3301.0	38.71		-1.46	37.25		74.00	54.00	-16.75	Peak
4958.5	39.98		3.40	43.38		74.00	54.00	-10.62	Peak
7440.0									
9920.0									
12400.0									
14880.0									
17360.0									
19840.0									
22320.0									
24800.0									

#### Remark :

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency<sub>o</sub>
  - (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<sub>o</sub>
  - (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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## **10. FREQUENCY SEPARATION**

### 10.1. 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\*20dB bandwidth of the hopping channel, whichever is greater.

### **10.2. 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 5 MHz, Sweep = auto.
- 5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

### **10.3. Measurement Result**

Channel separation	Limit	Result
MHz	kHz	
1	>=25KHz or 2/3* 20 dB bandwidth	PASS

### 10.4. Measurement Equipment Used:

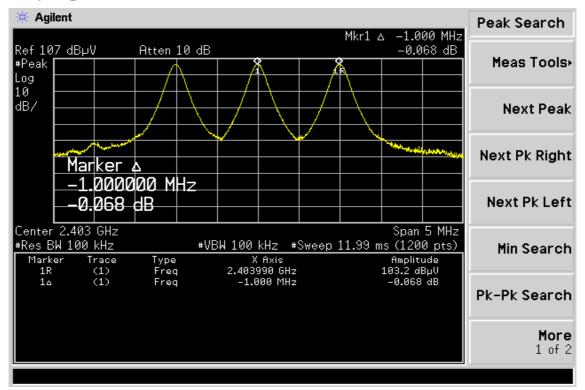
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2006	11/10/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/26/2007
Spectrum Analyzer	Agilent	E4446A	MY43360126	01/22/2007	01/21/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007

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## **Frequency Separation Test Data**



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## **11. NUMBER OF HOPPING FREQUENCY**

### 11.1. 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.

## **11.2. 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, VBW=100KHz,
- 5. Max hold, view and count how many channel in the band.

### **11.3. Measurement Result**

Total No of hopping channel	Limit (CH)	Measurement result (CH)	Result
	15	79	Pass

### 11.4. Measurement Equipment Used:

EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2006	11/10/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/26/2007
Spectrum Analyzer	Agilent	E4446A	MY43360126	01/22/2007	01/21/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007

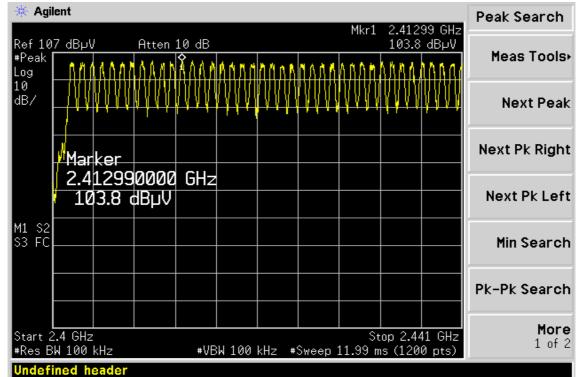
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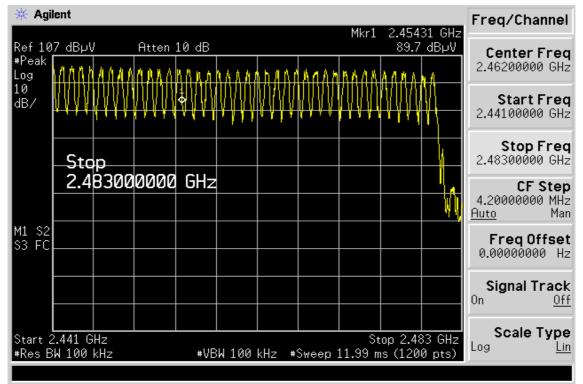
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## **Channel Number**

2.4 GHz – 2.441GHz



### 2.441 GHz - 2.4835GHz



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## 12. TIME OF OCCUPANCY (DWELL TIME)

### 12.1. 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.

### **12.2. 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 = 0Hz, Adjust Sweep = 30s.
- 5. Repeat above procedures until all frequency measured were complete.

#### 12.3. Measurement Result

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

CH Low: DH1 time slot = 
$$0.405 \text{ (ms)} * (1600/(1*79)) * 31.6 = 259.1 \text{ (ms)}$$
  
DH3 time slot =  $1.675 \text{ (ms)} * (1600/(3*79)) * 31.6 = 357.2 \text{ (ms)}$   
DH5 time slot =  $2.925 \text{ (ms)} * (1600/(5*79)) * 31.6 = 374.3 \text{ (ms)}$ 

CH Mid:	DH1 time slot = $0.405 \text{ (ms)} * (1600/(1*79)) * 31.6 = 259.1 \text{ (ms)}$
	DH3 time slot = $1.675 \text{ (ms)} * (1600/(3*79)) * 31.6 = 357.2 \text{ (ms)}$
	DH5 time slot = 2.906 (ms) * (1600/(5*79)) * 31.6 = 371.9 (ms)

CH High: DH1 time slot = 0.416 (ms) \* (1600/(1\*79)) \* 31.6 = 266.1 (ms)DH3 time slot = 1.662 (ms) \* (1600/(3\*79)) \* 31.6 = 354.5 (ms)DH5 time slot = 2.906 (ms) \* (1600/(5\*79)) \* 31.6 = 371.9 (ms)

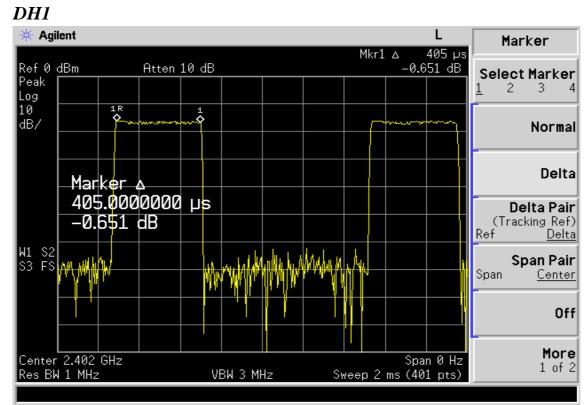
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## 12.4. Measurement Equipment Used:

EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2006	11/10/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/27/2007
Spectrum Analyzer	Agilent	E4446A	MY43360126	03/29/2007	03/28/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007

# Dwell Time Test Data CH-Low



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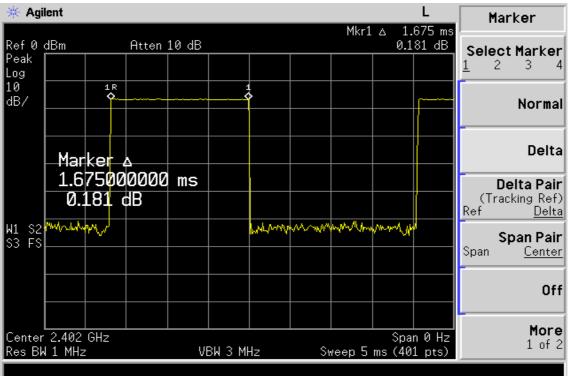
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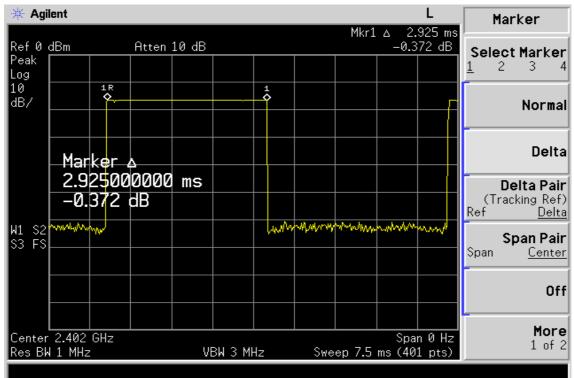


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#### DH5



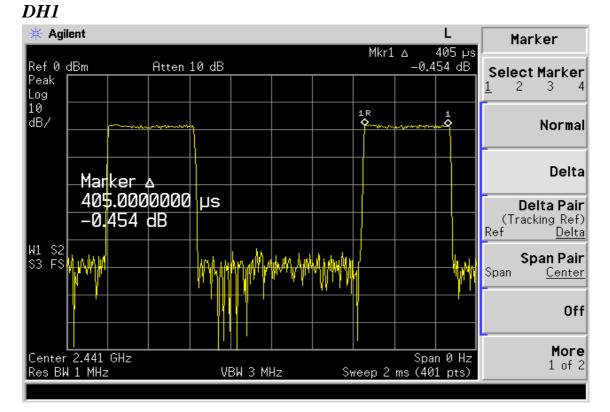
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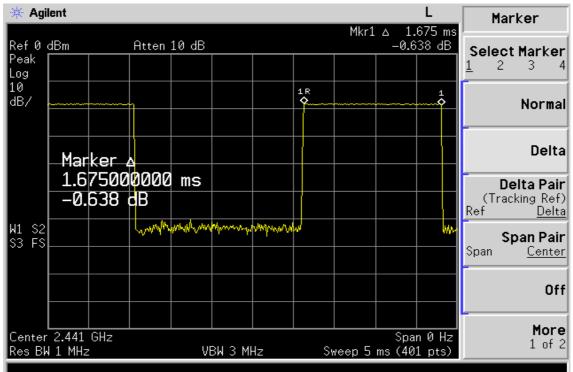


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## CH-Mid



### DH3



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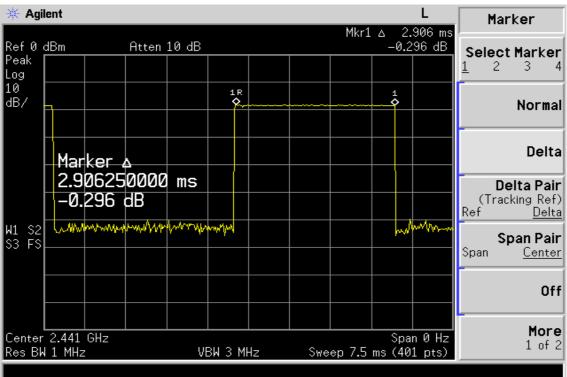
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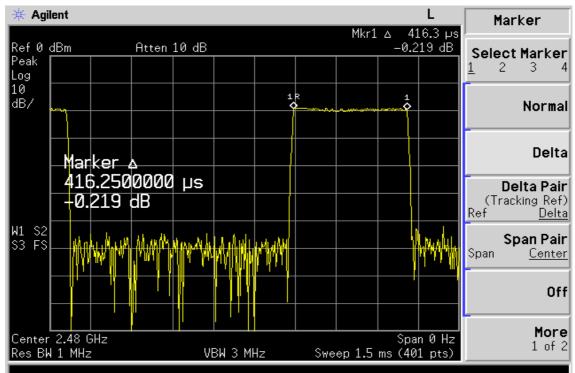
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## CH-High

DH1



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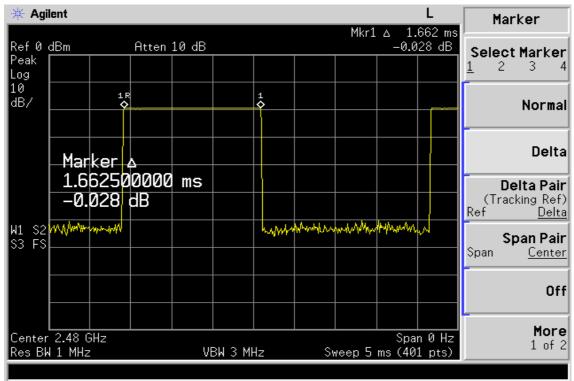
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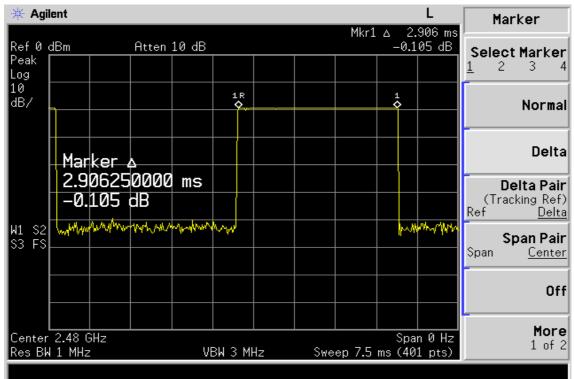


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DH3



#### DH5



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## 13. Peak Power Spectral Density

### 13.1. Standard Applicable

According to §15.247(d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3kHz band during any time interval of continuous transmission.

### **13.2. 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 = 3KHz, VBW = 10KHz, Span = 1.5MHz, Sweep=100s
- 4. Record the max. reading.
- 5. Repeat above procedures until all frequency measured were complete.

### 13.3. Measurement Result

СН	<b>RF</b> Power Density	Cable loss	<b>RF</b> Power Density	Maximum Limit
	Reading (dBm)	(dB)	Level (dBm)	(dBm)
Low	-10.28	0.20	-10.08	8
Mid	-10.52	0.20	-10.32	8
High	-12.89	0.20	-12.69	8

#### **13.4. Measurement Equipment Used:**

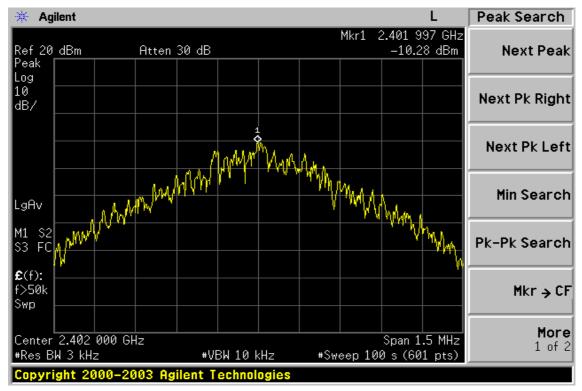
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2006	11/10/2007
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2006	08/26/2007
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circult	BW-S6W5	N/A	10/07/2006	10/06/2007

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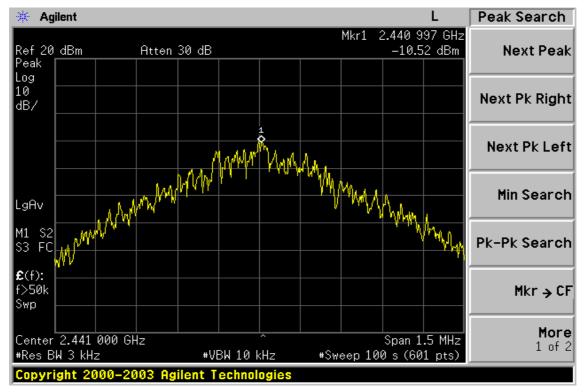


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## Power Spectral Density Test Plot (CH-Low)



## Power Spectral Density Test Plot (CH-Mid)



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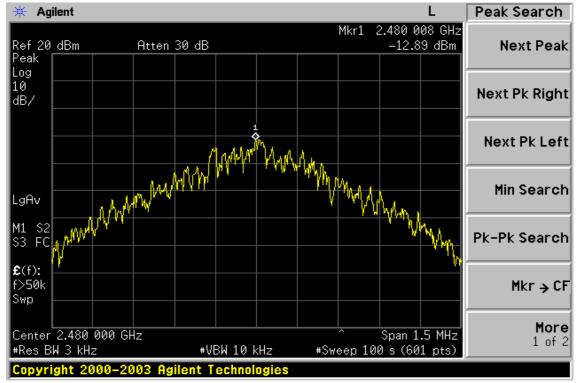
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## Power Spectral Density Test Plot (CH-High)



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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 2.5dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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