

Report No.: ER/2008/40051 **Issue Date: May. 12, 2008**

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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name: Bluetooth Car Kit

HUEY CHIAO, Bluesonic Brand Name:

HCC03,HCCxx(xx=0~9,A~Z)**Model Name:**

FCC ID: RL9-HCC03

Report No.: ER/2008/40051

Issue Date: May. 12, 2008

FCC Rule Part: §15.247

HUEY CHIAO INTERNATIONAL CO., Prepared for:

LTD.

5F, NO. 649-1, CHUNG-CHENG ROAD, HSIN-CHUANG CITY, TAIPEI HSIEN,

TAIWAN R.O.C.

SGS Taiwan Ltd. Prepared by:

Electronics & Communication Laboratory

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VERIFICATION OF COMPLIANCE

Applicant: HUEY CHIAO INTERNATIONAL CO., LTD.

5F, NO. 649-1, CHUNG-CHENG ROAD, HSIN-CHUANG CITY,

TAIPEI HSIEN, TAIWAN R.O.C.

Bluetooth Car Kit **Equipment Under Test:**

Brand Name: HUEY CHIAO, Bluesonic

RL9-HCC03 **FCC ID Number:**

Model No.: $HCC03,HCCxx(xx=0\sim9,A\sim Z)$

N/A **Model Difference:**

File Number: ER/2008/40051

Apr. 19, 2008 ~ May. 07, 2008 Date of test:

Apr. 18, 2008 **Date of EUT Received:**

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

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

Test By:	Jazz	Huang	Date	May. 12, 2008	
_	Jazz Huai	ng / Engineer			
Prepared By:	Alex	Hsieh	Date	May. 12, 2008	
Approved By:		/Sr. Engineer	Date	May. 12, 2008	
	Vincent S	Su / Manager			

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Version

Version No.	Date
00	May. 12, 2008
01	May. 22, 2008
02	May. 29, 2008

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1. GENERAL INFORMATION

1.1. Product Description

General:

Product Name:	Bluetooth Car Kit			
Brand Name:	HUEY CHIAO, Bluesonic			
Model Name:	HCC03,HCCxx(xx=0~9,A~Z)			
Model Difference:	N/A			
	3.7 Vdc re-chargeable battery or 5.1Vdc from AC/DC power Adaptor			
Power Supply:	Adapter:	er: Model: HCR-D05-003		

Bluetooth:

Diuctootii.	,
Frequency Range:	2402 – 2480MHz
Channel number:	79 channels
Transmit Power:	2.83 dBm.(Peak)
Modulation type:	Frequency Hopping Spread Spectrum (GFSK) (FHSS)(8DPSK) (π/ 4-DQPSK)
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Operating Mode:	Point-to-Point
Antenna Designation:	PIFA Antenna, -2 dBi

The EUT is compliance with Bluetooth 2.0 with EDR.

This test 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: <u>RL9-HCC03</u> filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a Doc procedure.

1.3. 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 measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

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

1.5. Special Accessories

台灣檢驗科技股份有限公司

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 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 and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna, according to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.4-2003.

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2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

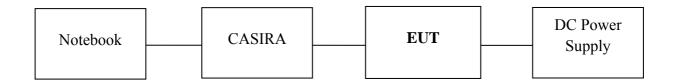


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Notebook	Compaq	Presarlo 2100	CNF345Q1R	Un-shield	Un-shield
2	Test software	BlueSuite 1.22	CSR	Verson1.22	N/A	N/A
3	CASIRA	CSR	BCES301199/1	7383070403	Un-shield	Un-shield
4	DC Power Supply	Topward	3303A	715856	N/A	Un-shield

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3. SUMMARY OF TEST RESULTS

FCC Rules	CC Rules Description Of Test	
§15.207(a)	Conducted Emission	Compliant
§15.247(b)(1)	Peak Output Power	Compliant
§15.247(a)	20dB Bandwidth	No Limit
§15.247I	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)	Number of hopping frequency	Compliant
§15.247(a)(1)(iii)	Time of Occupancy	Compliant
§15.247	Peak Power Density	Compliant
§15.203,	§15.203, Antenna Requirement	
§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) · mid (2441MHz) and high (2480MHz) with highest data rate are chosen for full testing.

The Radiated Spurious Emission was performed at X. Y. and Z. axle. The worst case Y axle was reported.



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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	Lin 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

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 AC/DC Power adapter. The host system was placed on the center of the back edge on the test table. The peripherals was placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The spacing between the peripherals was 10 centimeters.
- 4. External I/O cables were draped along the edge of the test table and bundle when necessary.
- 5. The host system was connected with 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.

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^{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.



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5.4. Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
EMC Analyzer	НР	8594EM	3624A00203	09/02/2007	09/03/2008		
EMI Test Receiver	R&S	ESCS30	828985/004	06/09/2007	06/10/2008		
Transient Limiter	HP	11947A	3107A02062	09/02/2007	09/03/2008		
LISN	Rolf-Heine	NNB-2/16Z	99012	12/31/2007	12/30/2008		
LISN	Rolf-Heine	NNB-2/16Z	99013	01/10/2008	01/09/2009		
Coaxial Cables	FCC	FCC-LISN-50/250-25-2-01	04034	01/11/2008	01/10/2009		

5.5. **Measurement Result**

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



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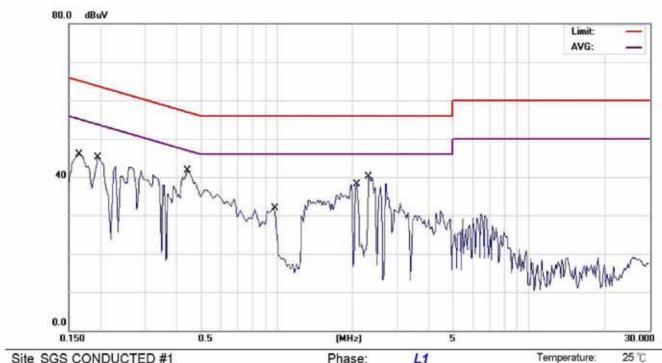
Humidity:

60 %

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Normal Operatio	n Mode	Test Date:	Apr. 27, 2008
Temperature:	25 ℃	Humidity:	Test By:	Jazz
Adaptor:	Model: HCR-D0	5-003		



Site SGS CONDUCTED #1

Limit: CISPR22/11 Class B Conduction(QP)

EUT: Bluetooth CARKIT

M/N: HCC03 Note: Charge Mode

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1650	45.62	0.34	45.96	65.21	-19.25	QP	
2		0.1950	44.88	0.19	45.07	63.82	-18.75	QP	
3	*	0.4400	41.71	0.08	41.79	57.06	-15.27	QP	
4		0.9800	31.86	0.04	31.90	56.00	-24.10	QP	
5		2.0800	38.08	0.04	38.12	56.00	-17.88	QP	
6		2.3200	39.98	0.04	40.02	56.00	-15.98	QP	

Power:

AC 120V/60Hz

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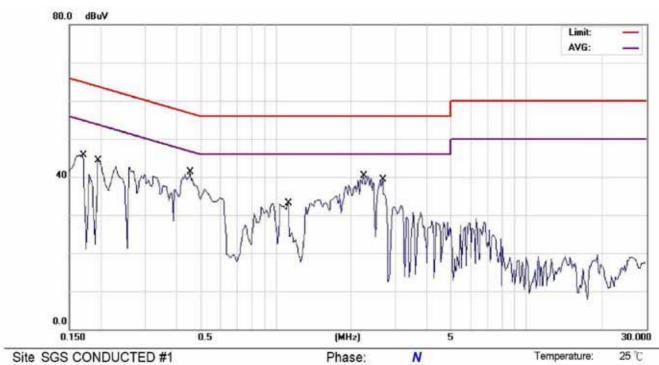
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Humidity:

Member of SGS Group

60 %

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Site SGS CONDUCTED #1

Limit: CISPR22/11 Class B Conduction(QP)

EUT: Bluetooth CARKIT

M/N: HCC03 Note: Charge Mode

No.	Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1700	45.40	0.29	45.69	64.96	-19.27	QP	3 TO 1410-41 SEC.
2		0.1950	44.05	0.17	44.22	63.82	-19.60	QP	
3	*	0.4550	41.16	0.06	41.22	56.78	-15.56	QP	
4		1.1200	33.15	0.03	33.18	56.00	-22.82	QP	
5		2.2400	40.25	0.03	40.28	56.00	-15.72	QP	
6		2.6800	39.19	0.03	39.22	56.00	-16.78	QP	

Power:

AC 120V/60Hz

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PEAK OUTPUT POWER MEASUREMENT 6.

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.

6.3. Measurement Result

(Normal Mode)

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	2.17	0.10	2.27	0.00169	1
2441.00	2.73	0.10	2.83	0.00192	1
2480.00	2.56	0.10	2.66	0.00185	1

(EDR Mode)

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	1.83	0.10	1.93	0.00156	1
2441.00	1.39	0.10	1.49	0.00141	1
2480.00	1.25	0.10	1.35	0.00136	1

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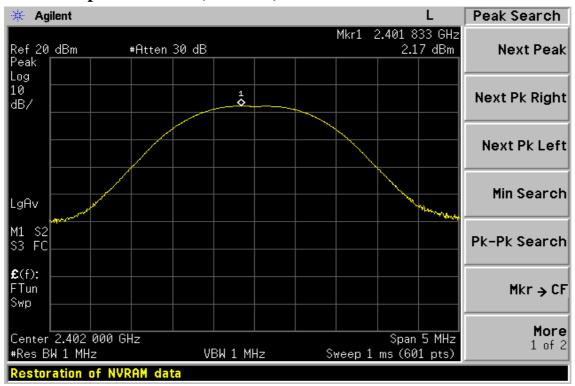
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6.4. Measurement Equipment Used:

Conducted Emission Test Site										
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.					
ТҮРЕ		NUMBER	NUMBER	CAL.						
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009					
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008					
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2007	11/10/2008					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A					
Attenuator	Attenuator Mini-Circuit		N/A	01/05/2008	01/04/2009					

(Normal Mode)

Peak Power Output Data Plot (CH Low)



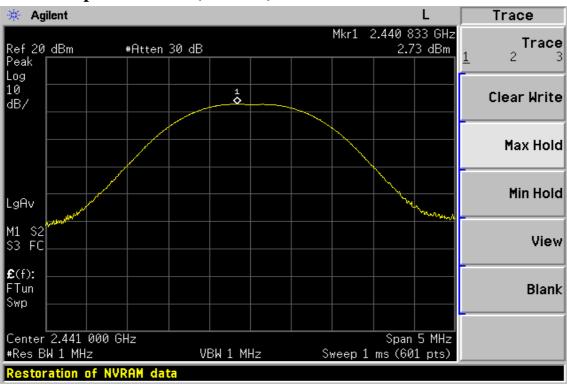
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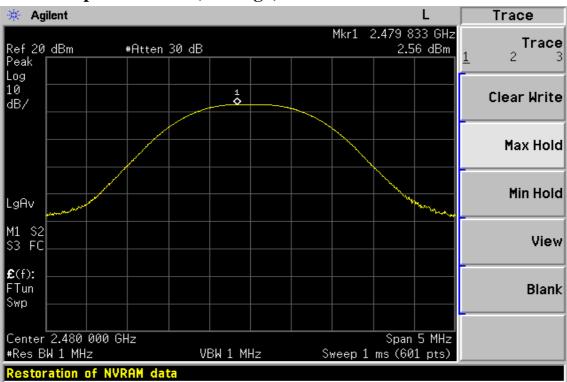
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Peak Power Output Data Plot (CH Mid)



Peak Power Output Data Plot (CH High)



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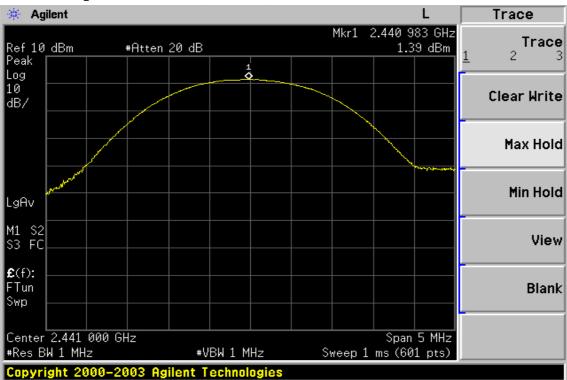
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(EDR Mode)

Peak Power Output Data Plot (CH Low)



Peak Power Output Data Plot (CH Mid)



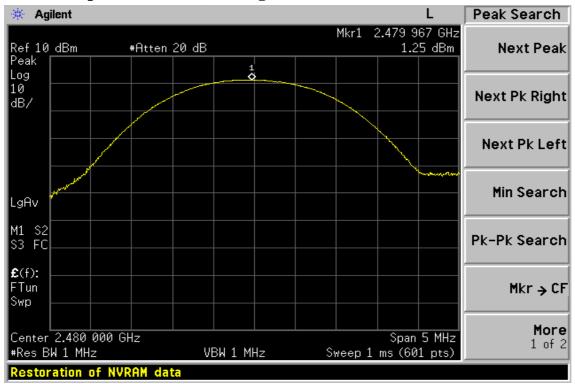
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Peak Power Output Data Plot (CH High)



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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

(Normal Mode)

СН	Bandwidth				
	(MHz)				
Lower	0.939				
Mid	0.917				
Higher	0.923				

(EDR Mode)

СН	Bandwidth	2/3 Bandwidth		
	(MHz)	(MHz)		
Lower	1.253	0.835		
Mid	1.344	0.896		
Higher	1.301	0.867		

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7.4. Measurement Equipment Used:

Conducted Emission Test Site										
EQUIPMENT	MFR	MODEL SERIAL		LAST	CAL DUE.					
TYPE		NUMBER	NUMBER	CAL.						
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009					
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008					
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2007	11/10/2008					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A					
Attenuator Mini-Circuit		BW-S6W5	N/A	01/05/2008	01/04/2009					

(Normal Mode)

20dB Band Width Test Data CH-Low



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20dB Bandwidth Test Data CH-Mid



20dB Bandwidth Test Data CH-High



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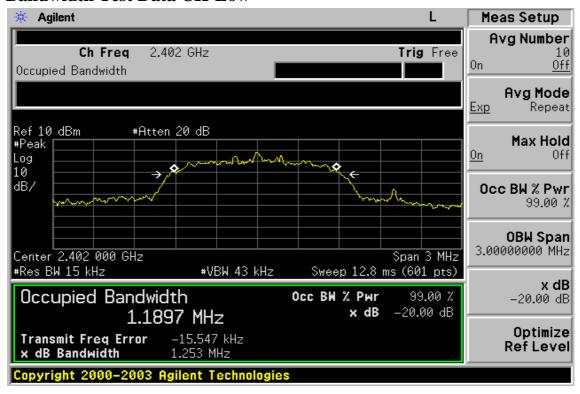


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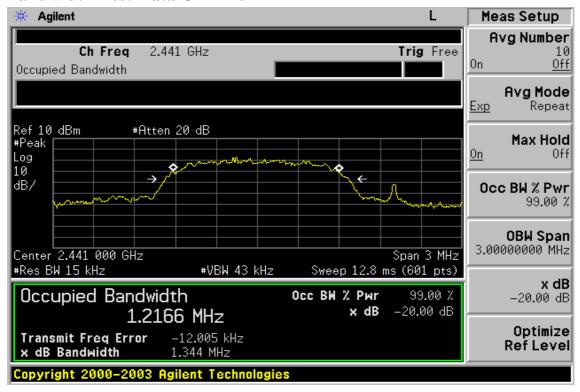
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(EDR Mode)

20dB Bandwidth Test Data CH-Low



20dB Bandwidth Test Data CH-Mid



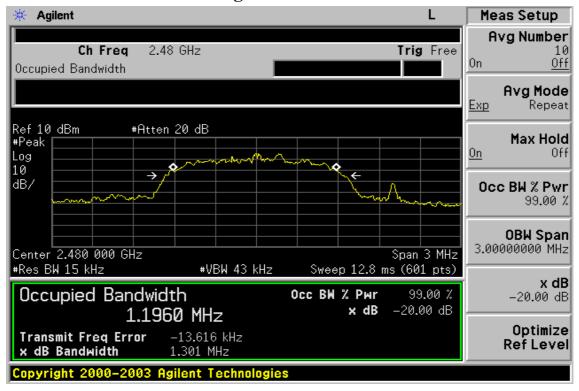
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20dB Bandwidth Test Data CH-High



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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 in 15.209(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 2.4835GHz 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.

8.4. Measurement Equipment Used:

Conducted Emission Test Site										
EQUIPMENT	EQUIPMENT MFR		SERIAL	LAST	CAL DUE.					
TYPE		NUMBER	NUMBER	CAL.						
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009					
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008					
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2007	11/10/2008					
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A					
Attenuator Mini-Circuit		BW-S6W5	N/A	01/05/2008	01/04/2009					

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

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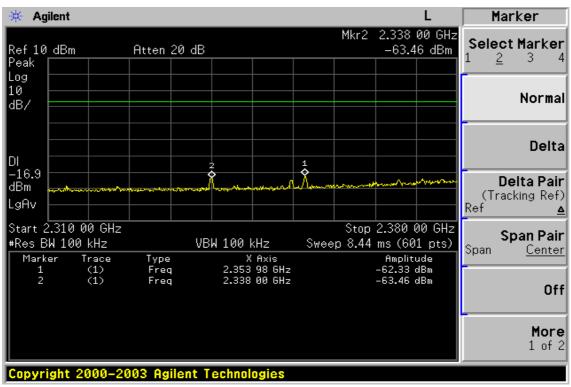


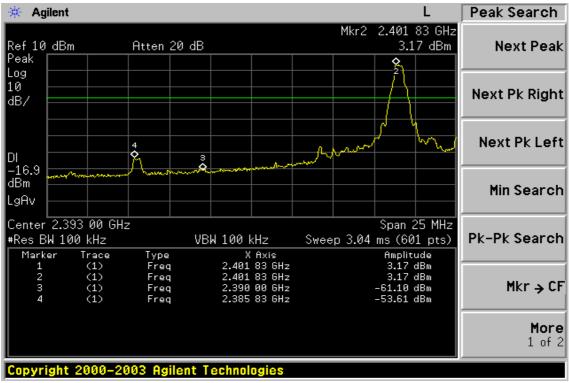
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(Normal Mode)

Conducted Emission: Test Data CH-Low





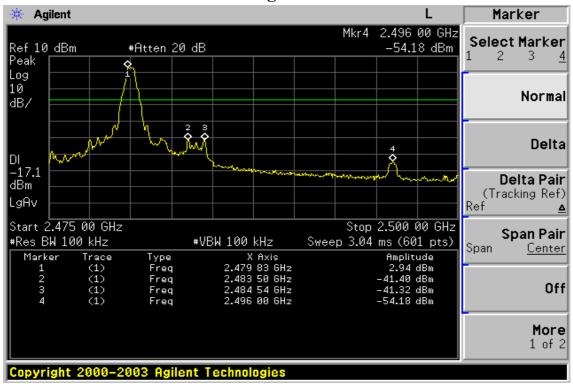
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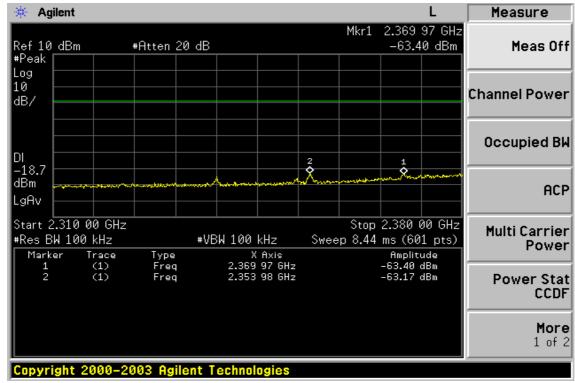
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Conducted Emission: Test Data CH-High



(EDR Mode)

Conducted Emission: Test Data CH-Low



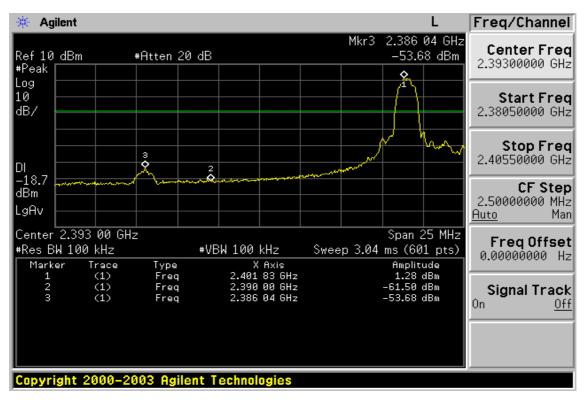
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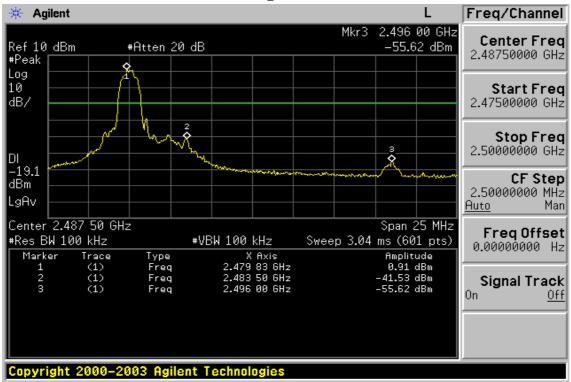


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Conducted Emission: Test Data CH-High



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(Normal Mode)

Radiated Emission:

Operation Mode TX CH Low Test Date Apr. 27, 2008 Fundamental Frequency 2402 MHz Test By Jazz 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/m	(dB)	
2386.00	34.29		-1.40	32.89		74.00	54.00	-21.11	Peak
2390.00	32.98		-1.39	31.59		74.00	54.00	-22.41	Peak
Operation	Mode	TX C	CH Low			Test	Date	Apr. 27, 20	800
Fundamen	tal Freque	ncy 2402	MHz			Test	By	Jazz	
Temperatu	ıre	25 ℃				Pol		Hor.	
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)	
•	2386.00	34.38		-1.40	32.98		74.00	54.00	-21.02	Peak
	2390.00	33.95		-1.39	32.56		74.00	54.00	-21.44	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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Radiated Emission:

Operation Mode TX CH High Test Date Apr. 27, 2008 Fundamental Frequency 2480 MHz Test By Jazz Temperature 25 $^{\circ}$ 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)	
2483.50	44.21		-0.92	43.29		74.00	54.00	-10.71	Peak
2496.00	35.21		-0.92	34.29		74.00	54.00	-19.71	Peak
Operation	Mode	TX C	CH High			Test	t Date	Apr. 27, 20	800
Fundamen	tal Freque	ncy 2480	MHz			Test	t By	Jazz	
Temperatu	ıre	25 ℃	•			Pol		Hor.	
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)	
2483.50	43.92		-0.92	43.00		74.00	54.00	-11.00	Peak
2496.00	34.50		-0.92	33.58		74.00	54.00	-20.42	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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(EDR Mode)

Radiated Emission:

Operation Mode TX CH Low Test Date Apr. 27, 2008 Fundamental Frequency 2402 MHz Test By Jazz Temperature 25 $^{\circ}$ 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	(dB)	
2386.00	33.90		-1.40	32.50		74.00	54.00	-21.50	Peak
2390.00	33.95		-1.39	32.56		74.00	54.00	-21.44	Peak
Operation	Mode	TX C	H Low			Test	Date	Apr. 27, 20	800
Fundamen	tal Freque	ncy 2402	MHz			Test	By	Jazz	
Temperatu	ire	25 ℃				Pol		Hor.	
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)	
2386.00	34.49	-1.40	33.09		74.00	54.00	-20.91	Peak
2390.00	32.98	-1.39	31.59		74.00	54.00	-22.41	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 Apr. 27, 2008 Fundamental Frequency 2480 MHz Test By Jazz Temperature 25 $^{\circ}$ 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	(dB)	
2483.50	44.21		-0.92	43.29		74.00	54.00	-10.71	Peak
2496.00	35.26		-0.92	34.34		74.00	54.00	-19.66	Peak
Operation	Mode	TX C	CH High			Test	t Date	Apr. 27, 20	800
Fundamen	tal Freque	ncy 2480	MHz			Test	t By	Jazz	
Temperatu	ire	25 ℃				Pol		Hor.	
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)	
2483.50	43.92		-0.92	43.00		74.00	54.00	-11.00	Peak
2496.00	35.44		-0.92	34.52		74.00	54.00	-19.48	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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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. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. Repeat above procedures until all frequency measured were complete.

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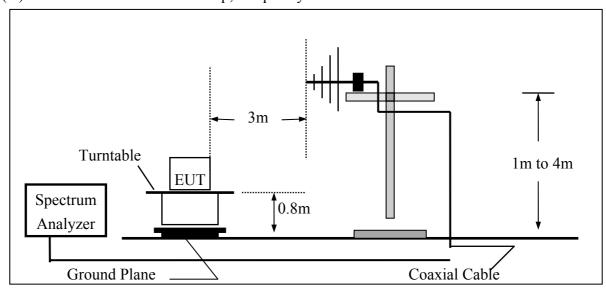
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Report No.: ER/2008/40051 Issue Date: May. 12, 2008

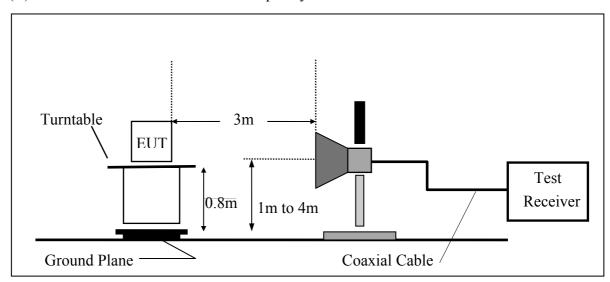
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9.4. Test SET-UP (Block Diagram of Configuration)

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



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



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Measurement Equipment Used:

966 Chamber							
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.		
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009		
Spectrum Analyzer	R&S	FSP 40	100034	05/27/2007	05/26/2008		
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008		
Bi-log Antenna	SCHWAZBECK	VULB9160	3224	11/14/2007	11/13/2008		
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	12/14/2007	12/13/2008		
Horn antenna	SCHWAZBECK	BBHA 9170	184/185	12/13/2007	12/12/2008		
Pre-Amplifier	HP	8447D	2944A09469	07/19/2007	07/18/2008		
Pre-Amplifier	HP	8494B	3008A00578	02/26/2008	02/25/2009		
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	10/09/2007	10/08/2008		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2007	10/08/2008		
Site NSA	SGS	966 chamber	N/A	11/17/2007	11/16/2008		

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:

FS = RA + AF + CL - AG

Who	ere	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.

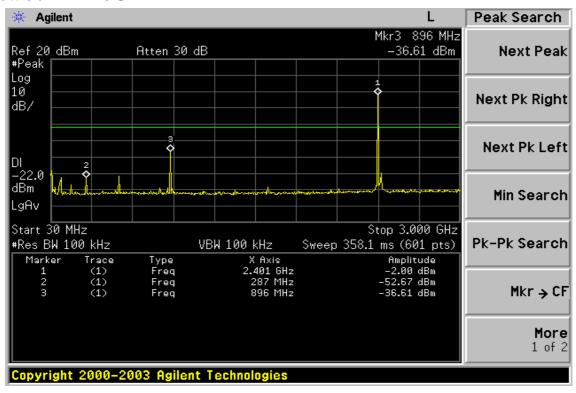
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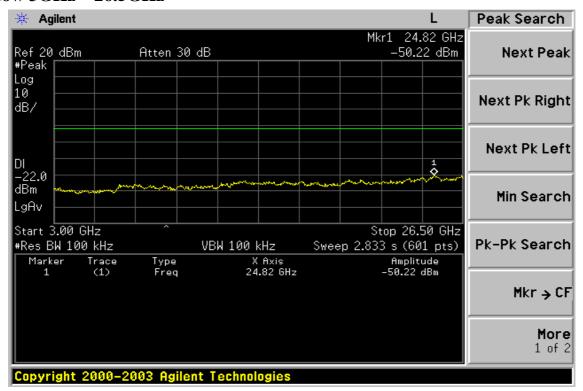
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Conducted Spurious Emission Measurement Result Ch Low 30MHz - 3GHz



Ch Low 3GHz – 26.5GHz



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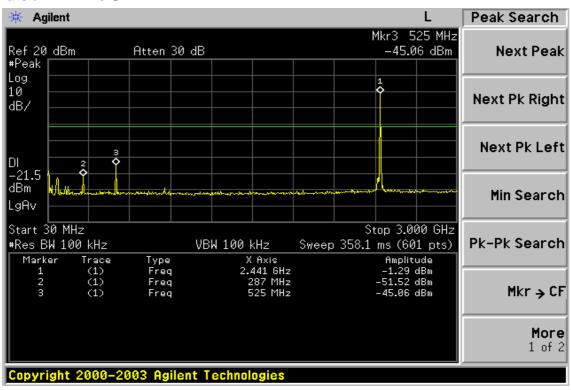
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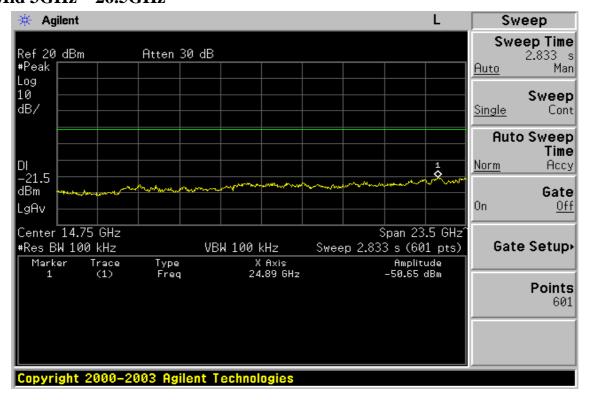
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Ch Mid 30MHz - 3GHz



Ch Mid 3GHz – 26.5GHz



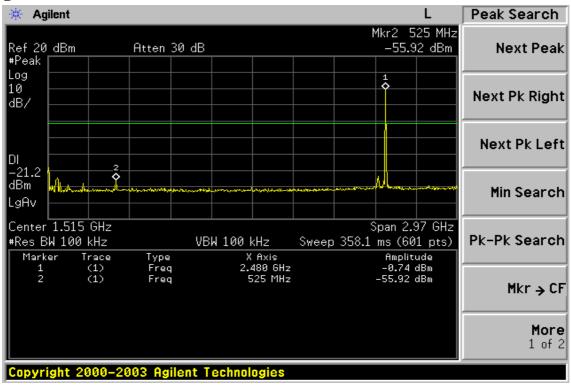
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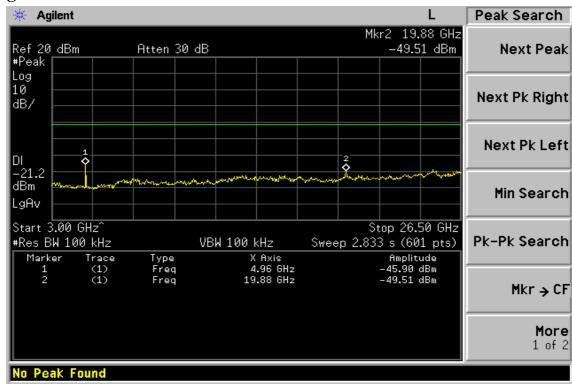
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Ch High 30MHz - 3GHz



Ch High 3GHz – 26.5GHz



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Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode TX CH Low Test Date Apr. 27, 2008

Fundamental Frequency 2402MHz Test By Jazz 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)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
51.34	V	Peak	51.31	-14.19	37.12	40.00	-2.88
145.43	V	Peak	39.90	-13.14	26.76	43.50	-16.74
51.34	Н	Peak	43.96	-14.19	29.77	40.00	-10.23
64.92	Н	Peak	42.01	-14.83	27.18	40.00	-12.82

- 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)

Operation Mode TX CH Mid Test Date Apr. 27, 2008 Fundamental Frequency 2441MHz Test By Jazz Pol Temperature 25 °C Ver./Hor.

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)
36.79	V	Peak	47.45	-14.36	33.09	40.00	-6.91
51.34	V	Peak	45.82	-14.19	31.63	40.00	-8.37
51.34	Н	Peak	43.12	-14.19	28.93	40.00	-11.07
126.03	H	Peak	38.78	-14.78	24.00	43.50	-19.50

- 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)

Operation Mode TX CH High Test Date Apr. 27, 2008

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

Humidity 65 %

Fr	eq. A	Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
(M	Hz)	H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
36	.79	V	Peak	48.17	-14.36	33.81	40.00	-6.19
51.	.34	V	Peak	43.77	-14.19	29.58	40.00	-10.42
51.	.34	Н	Peak	45.00	-14.19	30.81	40.00	-9.19
62.	.98	Н	Peak	42.16	-14.85	27.31	40.00	-12.69

- 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)

Operation Mode TX CH Low Test Date Apr. 27, 2008

Fundamental Frequency 2402 MHz Test By Temperature 25 $^{\circ}$ 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
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
1598.0	46.13		-5.48	40.65		74.00	54.00	-13.35
4804.0	40.76		5.99	46.75		74.00	54.00	-7.25
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	

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency_o
- (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_o
- (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 Apr. 27, 2008 Fundamental Frequency 2402 MHz Test By Jazz Temperature 25 $^{\circ}$ C Pol Hor.

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}	
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
1598.0	55.52		-5.48	50.04		74.00	54.00	-3.96
4804.0	42.75		8.00	50.75		74.00	54.00	-3.25
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_o
- (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_o
- (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 Apr. 27, 2008

Fundamental Frequency 2441 MHz Test By Jazz 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
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
1630.5	53.39		-5.26	48.13		74.00	54.00	-5.87
4882.0	46.48		6.17	52.65		74.00	54.00	-1.35
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	

- (1) Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency_o
- (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_o
- (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 Apr. 27, 2008 Fundamental Frequency 2441 MHz Test By Jazz Temperature 25 °C Pol Hor.

Humidity 65 %

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}	
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
1630.5	53.42		-5.26	48.16		74.00	54.00	-5.84
4882.0	45.78		6.17	51.95		74.00	54.00	-2.05
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	

- (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_o
- (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 Apr. 27, 2008

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

65 % Humidity

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}	
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
1643.5	46.05		-5.22	40.83		74.00	54.00	-13.17
4960.0	43.91		6.36	50.27		74.00	54.00	-3.73
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	

- (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
- (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 Apr. 27, 2008

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

65 % Humidity

	Peak	\mathbf{AV}		Actu	al FS	Peak	\mathbf{AV}	
Freq.	Reading	Reading	Ant./CL	Peak	\mathbf{AV}	Limit	Limit	Margin
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
1643.5	53.35		-5.22	48.13		74.00	54.00	-5.87
4960.0	42.12		6.36	48.48		74.00	54.00	-5.52
4960.0						74.00	54.00	
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
- (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:

10.11.11.10.11.11.11.11.11.11.11.11.11.1	10.4. Measurement Equipment Osca.								
Conducted Emission Test Site									
EQUIPMENT MFR MODEL SERIAL LAST CAL									
TYPE		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009				
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008				
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2008	11/10/2009				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A				
Attenuator	Mini-Circuit	BW-S6W5	N/A	01/05/2008	01/04/2009				

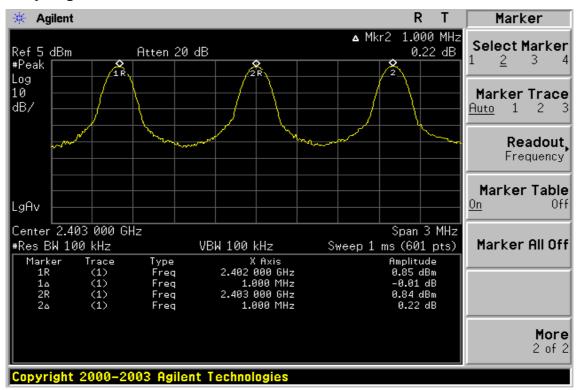
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Frequency Separation Test Data



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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	Limit (CH)	Measurement result (CH)	Result
hopping channel	15	79	Pass

11.4. Measurement Equipment Used:

Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009	
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2008	11/10/2009	
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A	
Attenuator	Mini-Circuit	BW-S6W5	N/A	01/05/2008	01/04/2009	

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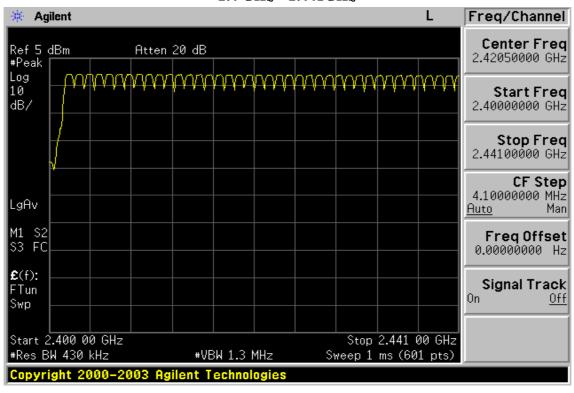


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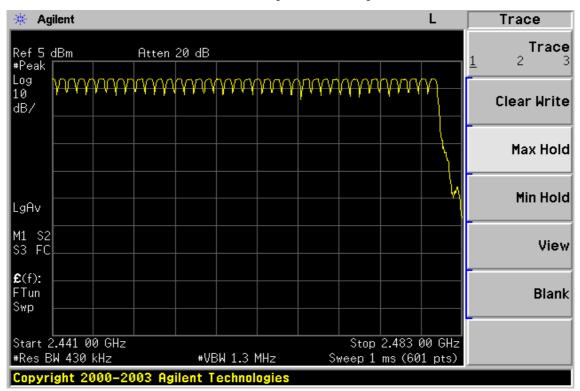
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Channel Number

2.4 GHz - 2.441GHz



2.441 GHz - 2.4835GHz



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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)

DH1 time slot = 0.405 (ms) * (1600/(1*79)) * 31.6 = 259.2 (ms) CH Low:

DH3 time slot = 1.675 (ms) * (1600/(3*79)) * 31.6 = 357.3 (ms)

DH5 time slot = 2.925 (ms) * (1600/(5*79)) * 31.6 = 374.4 (ms)

CH Mid: DH1 time slot = 0.405 (ms) * (1600/(1*79)) * 31.6 = 259.2 (ms)

DH3 time slot = 1.675 (ms) * (1600/(3*79)) * 31.6 = 357.3 (ms)

DH5 time slot = 2.906 (ms) * (1600/(5*79)) * 31.6 = 371.9 (ms)

CH High: DH1 time slot = 0.405 (ms) * (1600/(1*79)) * 31.6 = 259.2 (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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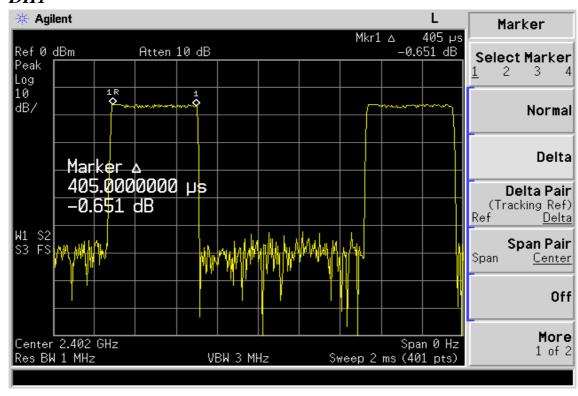
12.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2008	11/10/2009
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A
Attenuator	Mini-Circuit	BW-S6W5	N/A	01/05/2008	01/04/2009

Dwell Time Test Data

CH-Low

DH1



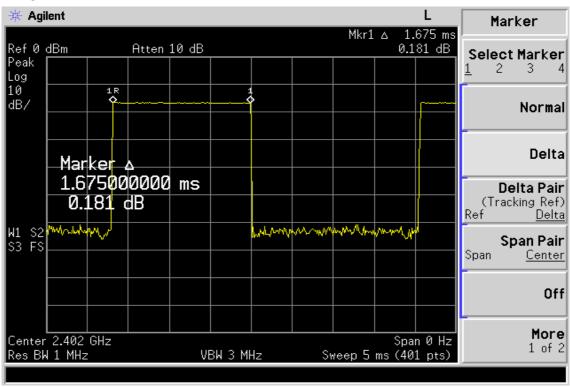
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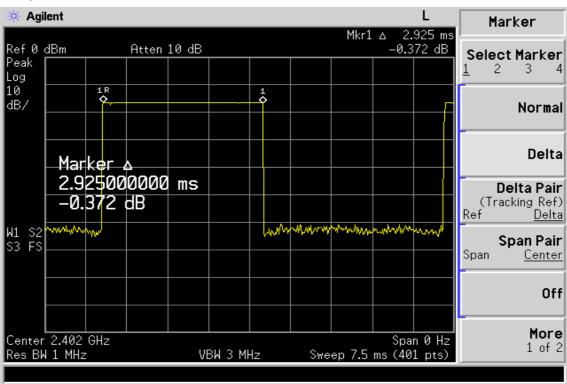
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DH3



DH5



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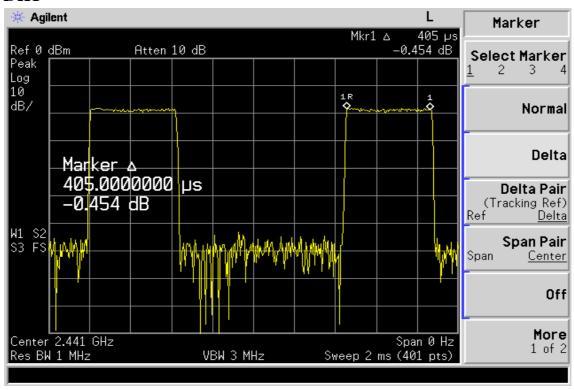


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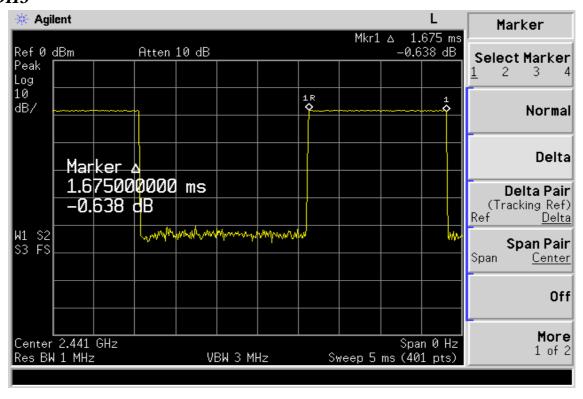
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CH-Mid

DH1



DH3



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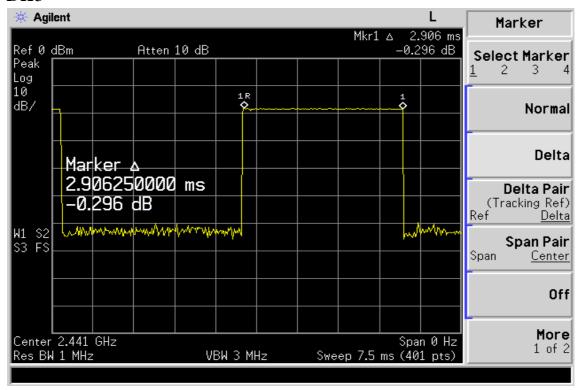
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DH5



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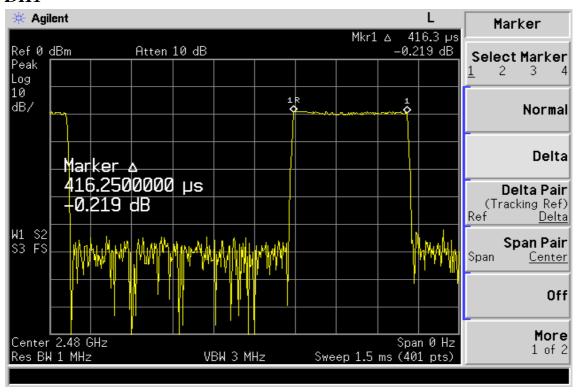


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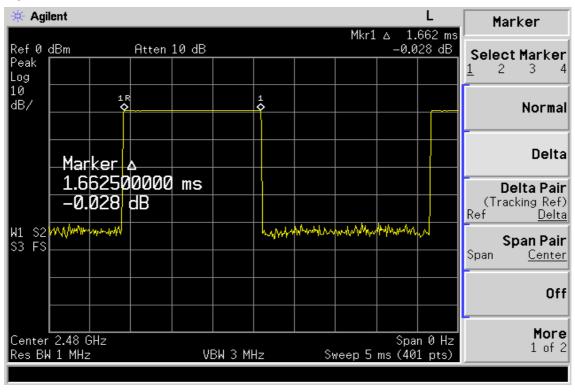
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CH-High

DH1



DH3



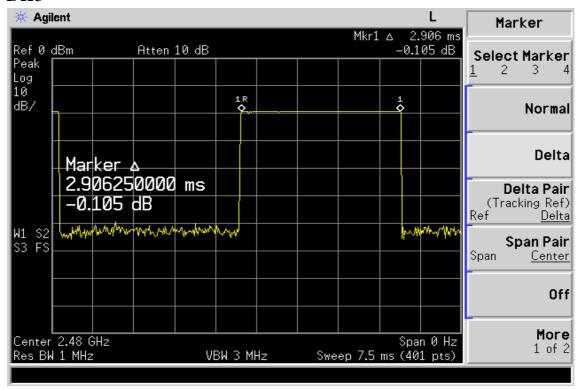
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DH5



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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 = 300KHz, Sweep=100s
- 4. Record the max. reading.
- 5. Repeat above procedures until all frequency measured were complete.

13.3. Measurement Result

СН	RF Power Density	Cable loss	RF Power Density	Maximum Limit
	Reading (dBm)	(dB)	Level (dBm)	(dBm)
Low	-10.47	0.10	-10.37	8
Mid	-10.89	0.10	-10.79	8
High	-11.11	0.10	-11.01	8

13.4. Measurement Equipment Used:

Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2009	
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008	
Spectrum Analyzer	R&S	FSP 40	100034	11/09/2008	11/10/2009	
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	N/A	N/A	
Attenuator	Mini-Circuit	BW-S6W5	N/A	01/05/2008	01/04/2009	

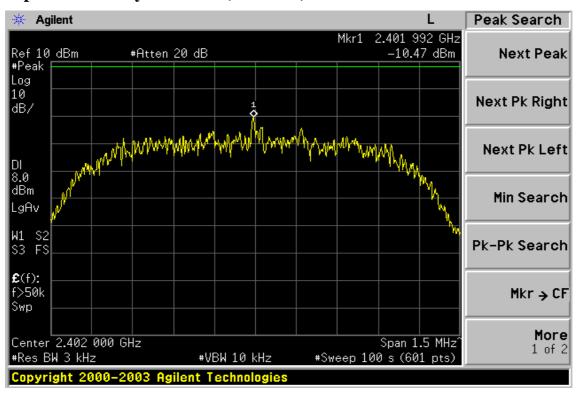
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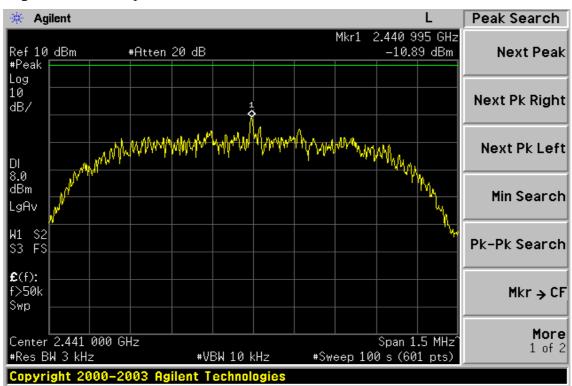
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Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



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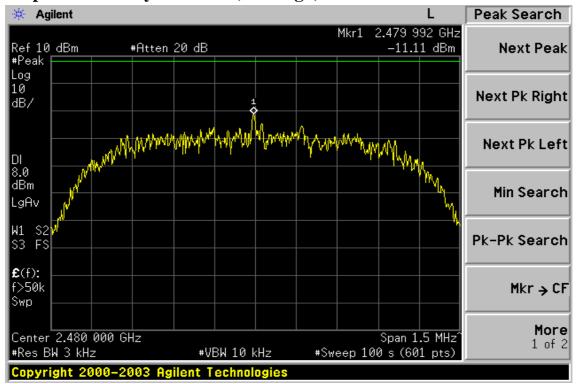
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Power Spectral Density Test Plot (CH-High)



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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 -2.0 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.