

FCC ID: PU5-N7SP510

Report No.: EH/2009/20029 Issue Date: Mar. 10, 2009 Page: 1 of 67

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	SP510
Brand Name:	Wistron
Model Name:	SP510
Model Difference:	N/A
FCC ID:	PU5-N7SP510
Report No.:	EH/2009/20029
Issue Date:	Mar. 10, 2009
FCC Rule Part:	§15.247, Cat: DSS
Prepared for:	Wistron Corporation
	21F, 88, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.
Prepared by:	SGS Taiwan Ltd.
	Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan



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FCC ID: PU5-N7SP510

Report No.: EH/2009/20029 Issue Date: Mar. 10, 2009 Page: 2 of 67

VERIFICATION OF COMPLIANCE

Applicant:	Wistron Corporation
	21F, 88, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan,
	R.O.C.
Equipment Under Test:	SP510
Brand Name:	Wistron
Model No.:	SP510
Model Difference:	N/A
FCC ID:	PU5-N7SP510
File Number:	EH/2009/20029
Date of test:	Feb. 23, 2009 ~ Mar. 10, 2009
Date of EUT Received:	Feb. 23, 2009

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 Wong	Date:	Mar. 10, 2009
Prepared By:	Sky Wang / Asst. Supervisor Wallow	Date:	Mar. 10, 2009
- Approved By:	Eva Kao / Asst. Supervisor Timent In	Date:	Mar. 10, 2009
_	Vincent Su / Manager		ed for 00 days only. This tost most const be seen if

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Version

Version No. Date		Description		
00 Mar. 10, 2009		Initial creation of document		

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1. GENERAL INFORMATION

General:

Product Name	SP510			
Brand Name	Wistron			
Model Name	SP510			
Model Difference	N/A	N/A		
Data Cable (USB)	Model No.: SM033-8005R2, Supplier: AEC IMEX INC			
Simple Hands-free (SHF)	Model No.: DY-EM187-WG001S, Supplier: HEDTek			
	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter			
Power Supply	Battery: Model: BTY-WHSP510A01, Supplier: SMF			
	Adapter:	Model No.: P005WA051001202LF, Supplier: PI		

GSM and WCDMA:

	Operating Frequency		Rated Power		
	GSM/GPRS/EDGE 850 Class 12	824.2 MHz- 848.8 MHz	33 dBm		
	GSM/GPRS/EDGE 900 Class 12	880.2MHz – 914.8MHz	33 dBm		
	GSM/GPRS/EDGE 1800 Class 12	1710.2MHz – 1784.8MHz	30 dBm		
Callular Dhana Stan danda	GSM/GPRS/EDGE 1900 Class 12	1850.2MHz – 1909.8MHz	30 dBm		
Cellular Phone Standards Frequency Range and Power	WCDMA /HSDPA Band I	1920.4MHz – 1979.6MHz	24 dBm		
	WCDMA /HSDPA Band II	1852.4MHz – 1907.6MHz	24 dBm		
	WCDMA /HSDPA Band V	826.4 MHz– 846.6MHz	24 dBm		
	HSDPA data rate: uplink up to 384kbps data rate: downlink up to 3.6Mbps, Release 5				
	GSM 850: 245KGXW, GSM 1900 :246KGXW				
Type of Emission	EDGE 850: 246KG7W, EDGE 1900:244KG7W WCDMA B2: 4M17F9W, WCDMA B5: 4M18F9W				
IMEI	3577800				

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Bluetooth:			
Bluetooth Version	V1.1 (GFSK)V1.2 (GFSK)V2.0 (GFSK)V2.0 + EDR (GFSK + $\pi/4DQPSK + 8DPSK)$ V2.1 + EDR (GFSK + $\pi/4DQPSK + 8DPSK)$		
Frequency Range	2402 – 2480MHz		
Channel number	79 channels max.		
Rated Power	0.97 dBm (Peak)		
Modulation type	Frequency Hopping Spread Spectrum		
Antenna Designation	PIFA Antenna / 2.59dBi.		
Type of Emission	1M17FXD		

The EUT is compliance with Bluetooth 2.0 Standard.

This report applies for Bluetooth

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

This submittal(s) (test report) is intended for FCC ID: <u>PU5-N7SP510</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.

1.2. 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.

1.3. Test Facility

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

1.4. Special Accessories

Not available for this EUT intended for grant.

1.5. Equipment Modifications

Not available for this EUT intended for grant.



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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4: 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

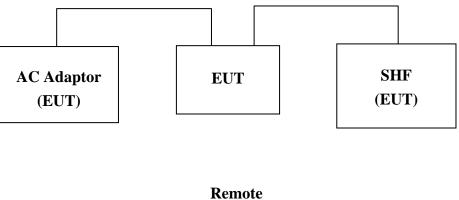
The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to 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 AC Power line and Radiated Emission Configuration





It	tem	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
	1	Bluetooth Test Set	Anritsu	MT8852B	6K00006107	Un-shielding	Shielding

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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	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,	Antenna Requirement Complia	
§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, Mid and High with highest rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for Bluetooth Transmitter for channel Low, Mid and High the worst case H position was reported.



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.

	Limits					
Frequency range	dB	(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 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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5.4. Measurement Equipment Used:

Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
EMI Test Receiver	R&S	ESCS30	828985/004	09/16/2008	09/15/2009	
LISN	Rolf-Heine	NNB-2/16Z	99012	04/28/2008	04/27/2009	
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	04/28/2008	04/27/2009	
Coaxial Cables	N/A	WK CE Cable	N/A	10/30/2008	10/29/2009	

5.5. Measurement Result

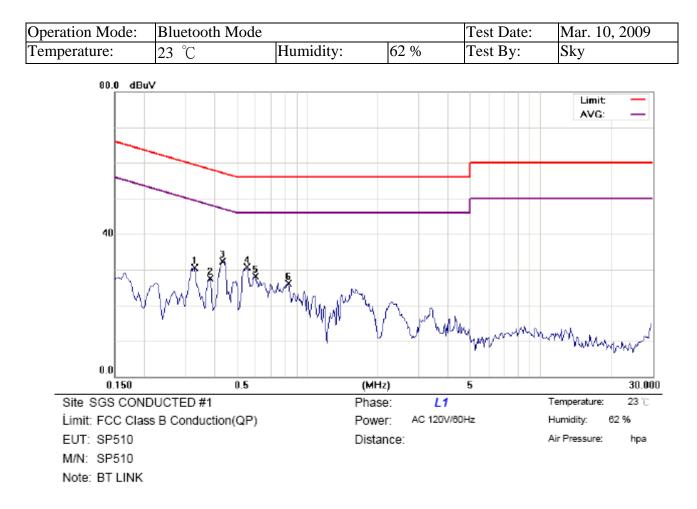
The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

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AC POWER LINE CONDUCTED EMISSION TEST DATA



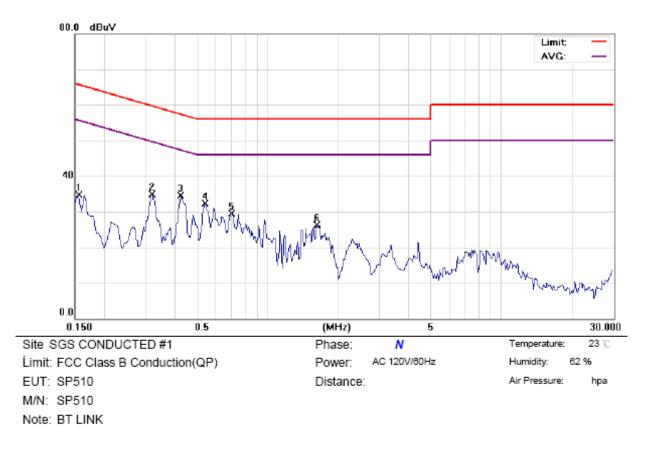
No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	0.3300	30.34	0.09	30.43	59.45	-29.02	peak		
2	0.3850	27.43	0.08	27.51	58.17	-30.66	peak		
3 *	0.4350	32.22	0.08	32.30	57.16	-24.86	peak		
4	0.5500	30.55	0.07	30.62	56.00	-25.38	peak		
5	0.6000	27.99	0.07	28.06	56.00	-27.94	peak		
6	0.8300	26.00	0.08	26.08	56.00	-29.92	peak		

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No. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	0.1550	34.61	0.19	34.80	65.73	-30.93	peak		
2	0.3200	34.71	0.12	34.83	59.71	-24.88	peak		
3 *	0.4250	34.43	0.11	34.54	57.35	-22.81	peak		
4	0.5400	32.28	0.10	32.38	56.00	-23.62	peak		
5	0.7000	29.36	0.11	29.47	56.00	-26.53	peak		
6	1.6200	26.24	0.14	26.38	56.00	-29.62	peak		

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6. PEAK OUTPUT POWER MEASUREMENT

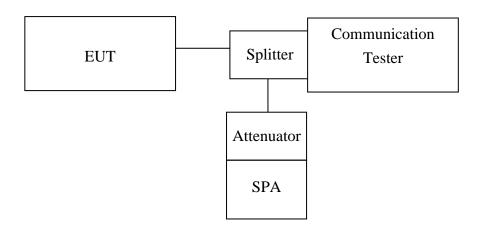
6.1. Standard Applicable

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.

	Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010		
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/23/2008	01/22/2010		
DC Block	Agilent	BLK-18	155452	07/05/2008	07/04/2009		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010		
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2008	07/04/2009		
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2008	07/04/2009		
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2008	07/04/2009		
Splitter	Agilent	11636B	N/A	07/05/2008	07/04/2009		

6.2. Measurement Equipment Used

6.3. Test Set-up:





6.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Channel power function, RBW, VBW = 1MHz)
- 3. Record the max. reading.
- 4. Repeat above procedures until all frequency measured were complete.

6.5. Measurement Result

BDR mode:

Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	0.41	0.00	0.41	0.00110	1
2441.00	0.97	0.00	0.97	0.00125	1
2480.00	-0.36	0.00	-0.36	0.00092	1

EDR mode:

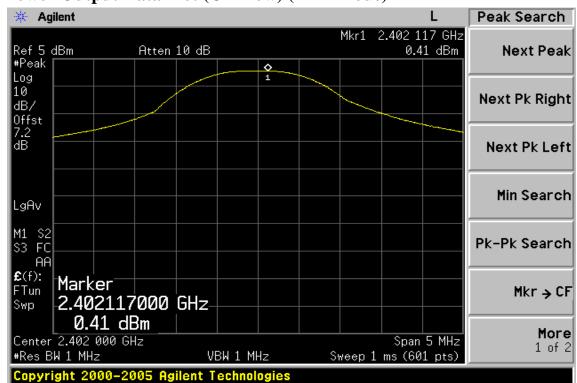
Frequency (MHz)	Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
2402.00	-3.90	0.00	-3.90	0.00041	1
2441.00	-3.05	0.00	-3.05	0.00050	1
2480.00	-4.25	0.00	-4.25	0.00038	1

NOTE: offset: 7.2dB

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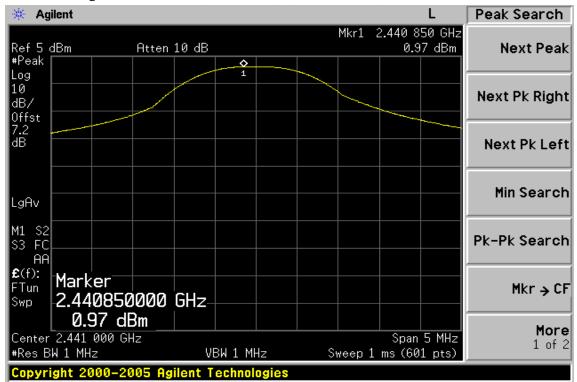


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Peak Power Output Data Plot (CH Low) (BDR mode)

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



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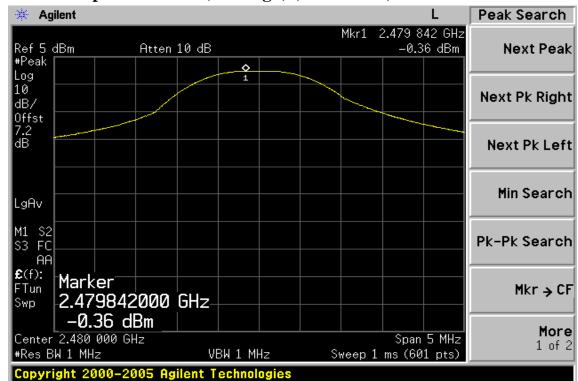
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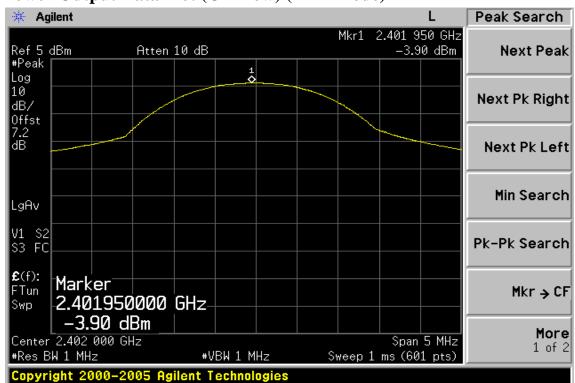


Peak Power Output Data Plot (CH High) (BDR mode)

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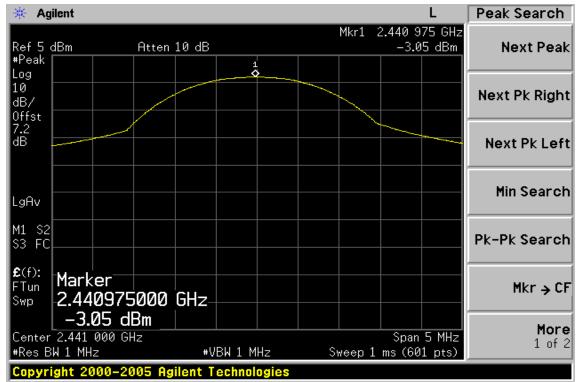


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Peak Power Output Data Plot (CH Low) (EDR mode)

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



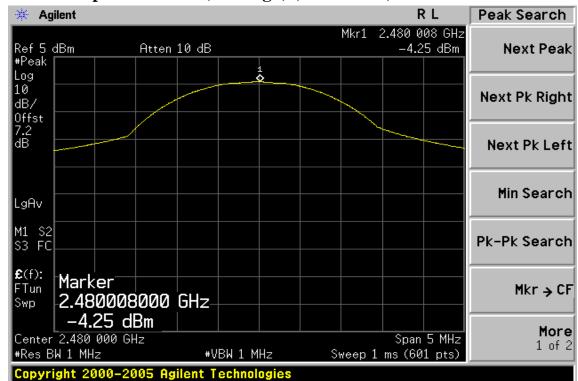
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Peak Power Output Data Plot (CH High) (EDR mode)

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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 band-width.

7.2. Measurement Equipment Used

Refer to section 6.2 for details.

7.3. Test Set-up

Refer to section 6.3 for details.

7.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer as RBW=10KHz (1 % of Bandwidth.), Span= 3MHz, Sweep=auto
- 4. Mark the peak frequency and –20dB (upper and lower) frequency.
- 5. Repeat above procedures until all frequency measured were complete.



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7.5. Measurement Result:

BDR mode:

СН	Bandwidth
	(kHz)
Lower	930.614
Mid	930.374
Higher	929.949

EDR mode:

СН	Bandwidth	2/3 Bandwidth
	(MHz)	(MHz)
Lower	1.267	0.845
Mid	1.267	0.845
Higher	1.266	0.844

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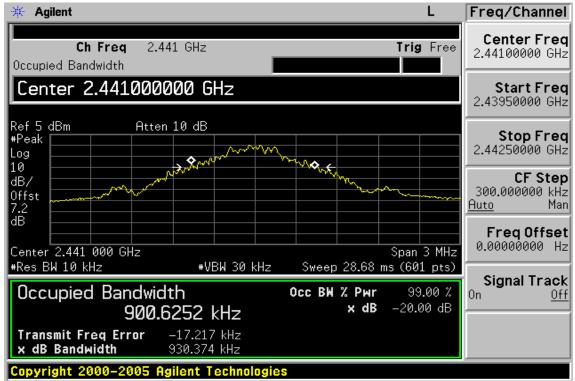


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20dB Band Width Test Data CH-Low (BDR mode)



20dB Band Width Test Data CH-Mid (BDR mode)

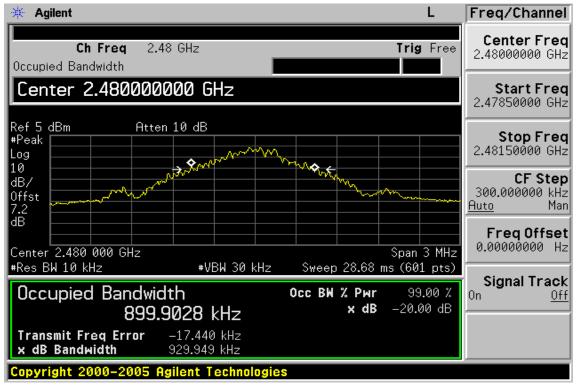


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20dB Band Width Test Data CH-High (BDR mode)

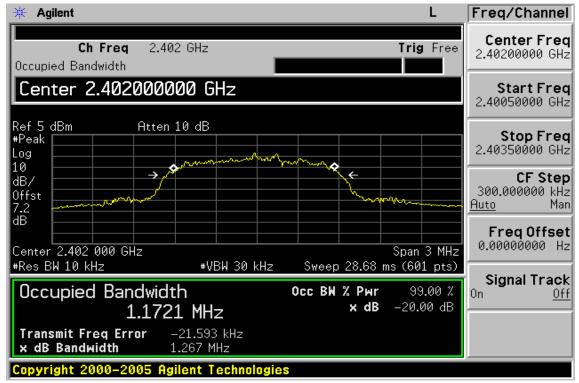


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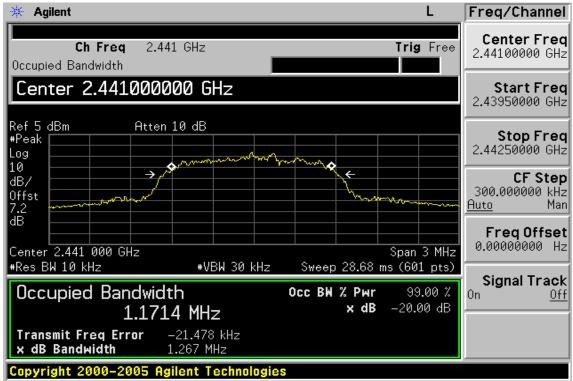


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20dB Band Width Test Data CH-Low (EDR mode)



20dB Band Width Test Data CH-Mid (EDR mode)

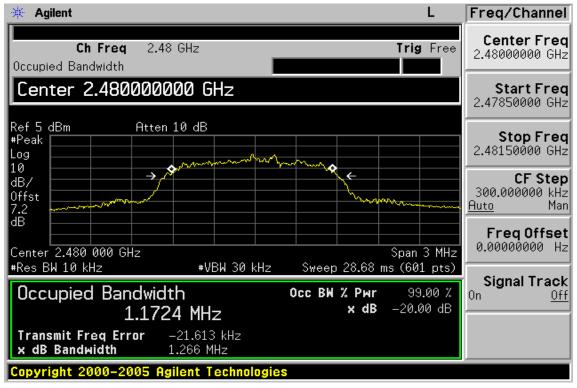


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20dB Band Width Test Data CH-High (EDR mode)



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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 Equipment Used

8.2.1. Conducted Emission at antenna port:

Refer to section 6.2 for details.

8.2.2. Radiated emission:

	966 Chamber						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010		
Loop antenna	MESSTEC	FLA30	03/10086	06/06/2007	06/05/2009		
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009		
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-320	03/14/2008	03/13/2009		
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009		
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010		
Turn Table	HD	DT420	N/A	N.C.R	N.C.R		
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R		
Controller	HD	HD100	N/A	N.C.R	N.C.R		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010		

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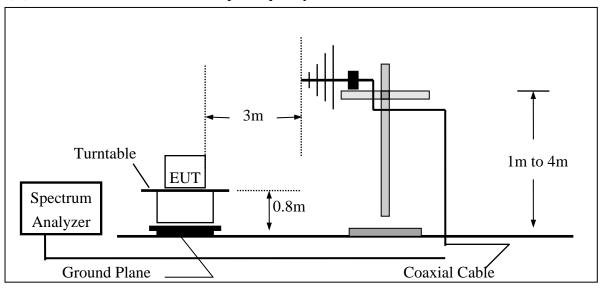
8.3. Test SET-UP:

8.3.1. Conducted Emission at antenna port:

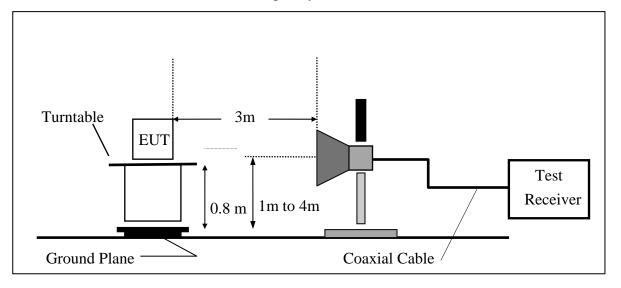
Refer to section 6.3 for details.

8.3.2. Radiated emission:

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



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



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8.4. Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set 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.

8.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

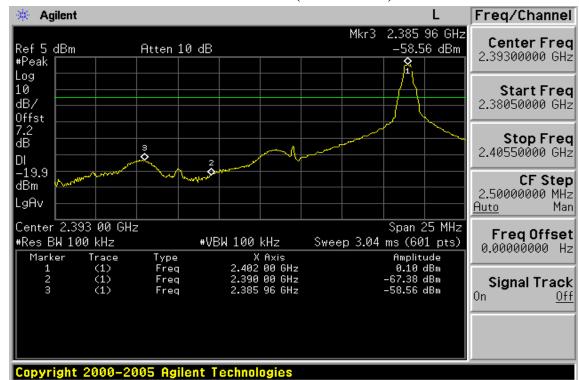
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

8.6. Measurement Result

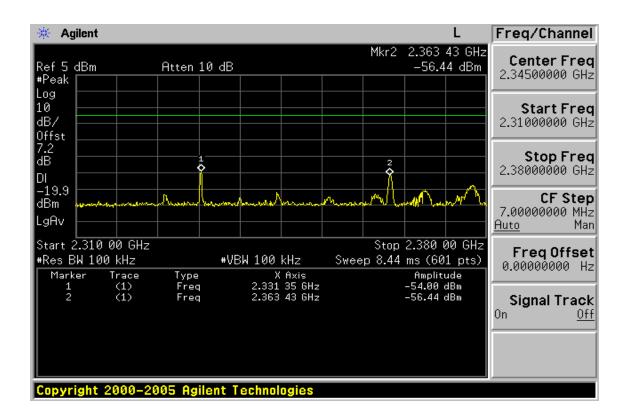
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.



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Conducted Emission: Test Data CH-Low (BDR mode)



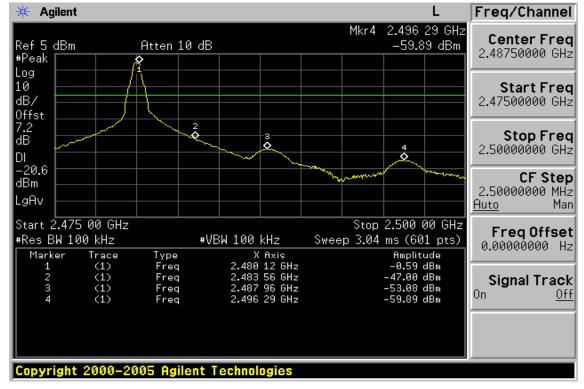
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Conducted Emission: Test Data CH-High

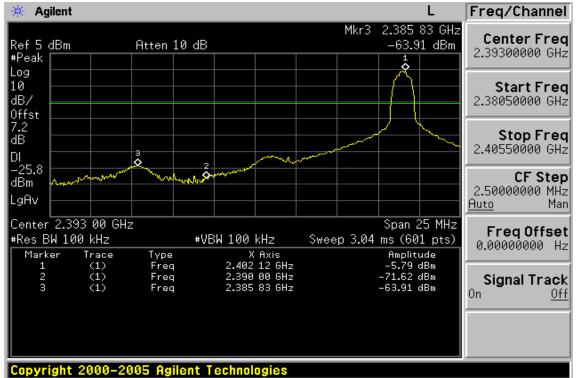


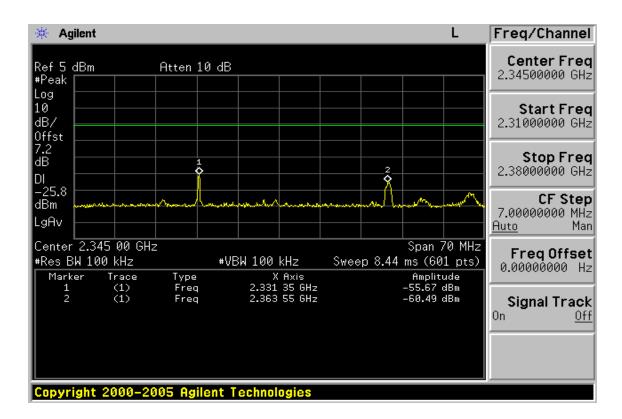
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Conducted Emission: Test Data CH-Low (EDR mode)



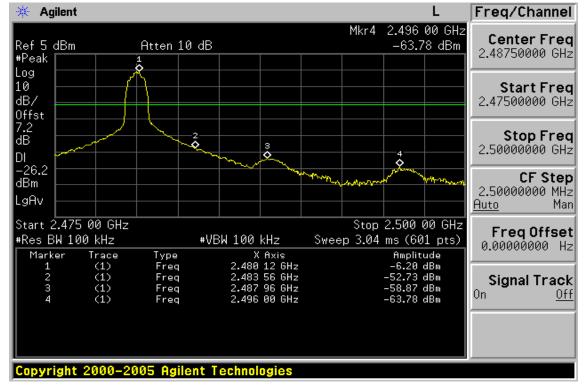


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Conducted Emission: Test Data CH-High



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Radiated Emission: (BDR mode)

TX CH Low	Test Date	Mar. 09, 2009
2402 MHz	Test By	Sky
25 °C	Pol	Ver.
65 %		
	-	2402 MHz Test By 25 ℃ Pol

	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) (dB)	
2331.35	35.54		-1.73	33.81		74.00	54.00	-20.19	Peak
2363.45	35.59		-1.57	34.02		74.00	54.00	-19.98	Peak
2385.96	31.15		-1.40	29.75		74.00	54.00	-24.25	Peak
2390.00	33.31		-1.39	31.92		74.00	54.00	-22.08	Peak
Operation Fundamen Temperatu Humidity	tal Frequei		CH Low MHz			Test Test Pol	By	Mar. 09, 20 Sky Hor.	009

	Peak	AV		Actual FS		Peak	AV		
F req.	Reading	Reading	Ant./CL	Peak	AV	Limit	Limit	Margin	Remark
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
2331.35	38.79		-1.73	37.06		74.00	54.00	-16.94	Peak
2363.45	39.73		-1.57	38.16		74.00	54.00	-15.84	Peak
2385.96	38.82		-1.40	37.42		74.00	54.00	-16.58	Peak
2390.00	32.96		-1.39	31.57		74.00	54.00	-22.43	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: (BDR mode)

1	TX CH High	Test Date	Mar. 09, 2009
Fundamental Frequency Temperature	2480 MHZ 25 °C	Test By Pol	Sky Ver.
Humidity	65 %		

	Peak	AV		Actu	al FS	Peak	AV		
Freq. (MHz)	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/n	0	Remark
2483.56	34.51		-0.92	33.59		74.00	54.00	-20.41	Peak
2487.96	34.15		-0.86	33.29		74.00	54.00	-20.71	Peak
2496.29	33.74		-0.84	32.90		74.00	54.00	-21.10	Peak
Operation Mode TX CH High Fundamental Frequency 2480 MHz					Test Test		Mar. 09, 2 Sky	009	
Temperatu	ire	25 °C				Pol	•	Hor.	
Humidity		65 %							
	Peak AV Actual FS Peak AV								
Freq. (MHz)	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/n	U	Remark
2 402 56	40.12		0.00	20.01		74.00	54.00	14.70	D 1

2483.56	40.13	 -0.92	39.21	 74.00	54.00	-14.79	Peak
2487.96	34.87	 -0.86	34.01	 74.00	54.00	-19.99	Peak
2496.29	33.78	 -0.84	32.94	 74.00	54.00	-21.06	Peak

- (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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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. Measurement Equipment Used:

9.2.1. Conducted Emission at antenna port: Refer to section 6.2 for details.

9.2.2. Radiated emission:

Refer to section 7.2 for details.

9.3. Test SET-UP:

9.3.1. Conducted Emission at antenna port: Refer to section 6.3 for details.

9.3.2. Radiated emission:

Refer to section 7.3 for details.

9.4. Measurement Procedure:

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

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9.5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

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

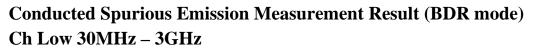
9.6. Measurement Result:

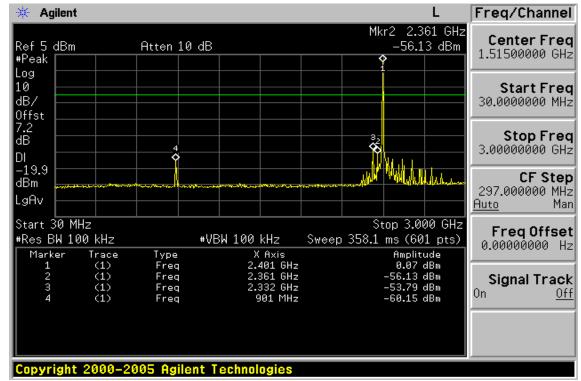
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

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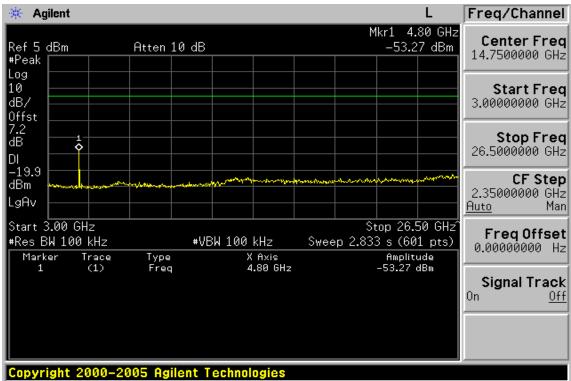


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Ch Low 3GHz – 26.5GHz

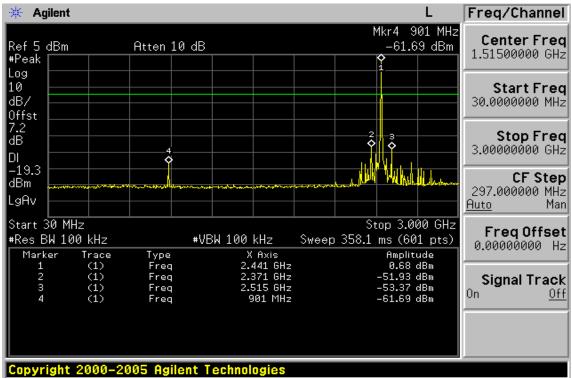


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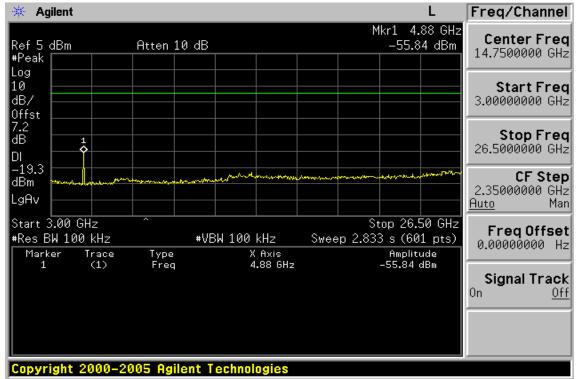


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Ch Mid 30MHz – 3GHz







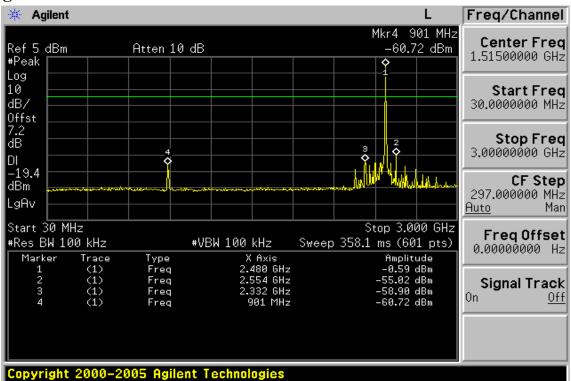
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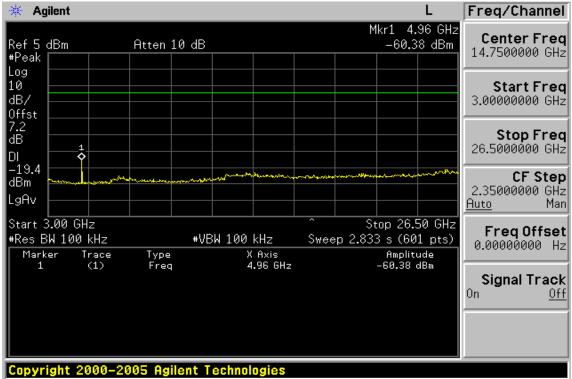


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Ch High 30MHz – 3GHz







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Radiated Spurious Emission Measurement Result (below 1GHz) (BDR mode)

Operation Mode	TX CH Low	Test Date	Mar. 09, 2009
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)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
	31.94	V	Peak	40.15	-14.82	25.33	40.00	-14.67
	56.19	V	Peak	40.57	-14.63	25.94	40.00	-14.06
	72.68	V	Peak	43.08	-16.62	26.46	40.00	-13.54
	90.14	V	Peak	50.54	-17.62	32.92	43.50	-10.58
	41.64	Н	Peak	41.12	-13.76	27.36	40.00	-12.64
	90.14	Н	Peak	43.98	-17.62	26.36	43.50	-17.14

Remark :

1 Measuring frequencies from 30 MHz to the 1GHz •

- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.



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Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Mid	Test Date	Mar. 09, 2009
Fundamental Frequency	2441MHz	Test By	Sky
Temperature	25 ℃	Pol	Ver./Hor.
Humidity	65 %		

Ant.Pol.	Detector Mode	Reading	Factor	Actual FS	Limit3m	Safe Margin
H/V	(PK/QP)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
V	Peak	40.31	-14.82	25.49	40.00	-14.51
V	Peak	43.89	-17.13	26.76	40.00	-13.24
V	Peak	50.30	-17.62	32.68	43.50	-10.82
Н	Peak	40.81	-13.76	27.05	40.00	-12.95
Н	Peak	42.69	-17.13	25.56	40.00	-14.44
Н	Peak	43.93	-17.62	26.31	43.50	-17.19
	H/V V V V H H	Ant.Pol.Mode ModeH/V(PK/QP)VPeakVPeakVPeakHPeakHPeak	Ant.Pol.Mode ModeReadingH/V(PK/QP)(dBuV)VPeak40.31VPeak43.89VPeak50.30HPeak40.81HPeak42.69	Ant.Pol. Mode Mode Reading Factor H/V (PK/QP) (dBuV) (dB) V Peak 40.31 -14.82 V Peak 43.89 -17.13 V Peak 50.30 -17.62 H Peak 40.81 -13.76 H Peak 42.69 -17.13	Ant.Pol. Mode Mode Reading Factor Actual FS H/V (PK/QP) (dBuV) (dB) (dBuV/m) V Peak 40.31 -14.82 25.49 V Peak 43.89 -17.13 26.76 V Peak 50.30 -17.62 32.68 H Peak 40.81 -13.76 27.05 H Peak 42.69 -17.13 25.56	Ant.Pol. Mode Mode Reading Factor Actual FS Limit3m H/V (PK/QP) (dBuV) (dB) (dBuV/m) (dBuV/m) V Peak 40.31 -14.82 25.49 40.00 V Peak 43.89 -17.13 26.76 40.00 V Peak 50.30 -17.62 32.68 43.50 H Peak 40.81 -13.76 27.05 40.00 H Peak 42.69 -17.13 25.56 40.00

Remark :

1 Measuring frequencies from 30 MHz to the 1GHz •

- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.



Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH High	Test Date	Mar. 09, 2009
Fundamental Frequency	2480MHz	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)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
31.94	V	Peak	39.73	-14.82	24.91	40.00	-15.09
72.68	V	Peak	43.48	-16.62	26.86	40.00	-13.14
90.14	V	Peak	49.34	-17.62	31.72	43.50	-11.78
41.64	Н	Peak	41.36	-13.76	27.60	40.00	-12.40
75.59	Н	Peak	42.68	-17.13	25.55	40.00	-14.45
90.14	Н	Peak	44.47	-17.62	26.85	43.50	-16.65

Remark :

1 Measuring frequencies from 30 MHz to the 1GHz •

- 2 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
- 3 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.



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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low	Test Date	Mar. 09, 2009
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	
 (MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
 1013.0	47.54		-7.68	39.86		74.00	54.00	-14.14	Peak
1435.5	43.76		-6.22	37.54		74.00	54.00	-16.46	Peak
4804.0	39.78		6.00	45.78		74.00	54.00	-8.22	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		

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Low	Test Date	Mar. 09, 2009
Fundamental Frequency	2402 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)	(dB)	
	1013.0	42.77		-7.68	35.09		74.00	54.00	-18.91	Peak
	1338.0	41.17		-6.62	34.55		74.00	54.00	-19.45	Peak
	4804.0	34.68		6.00	40.68		75.00	54.00	-13.32	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		

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid	Test Date	Mar. 09, 2009
Fundamental Frequency	2441 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	
 (MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1013.0	46.69		-7.68	39.01		74.00	54.00	-14.99	Peak
1435.5	42.29		-6.22	36.07		74.00	54.00	-17.93	Peak
4882.0	43.80		6.15	49.95		74.00	54.00	-4.05	Peak
7323.0						74.00	54.00		
9764.0						74.00	54.00		
12205.0						74.00	54.00		
14646.0						74.00	54.00		
17087.0						74.00	54.00		
19528.0						74.00	54.00		
21969.0						74.00	54.00		
24410.0						74.00	54.00		

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid	Test Date	Mar. 09, 2009
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)	(dB)	
 1013.0	42.63		-7.68	34.95		74.00	54.00	-19.05	Peak
1338.0	38.93		-6.62	32.31		74.00	54.00	-21.69	Peak
4882.0	43.14		6.15	49.29		74.00	54.00	-4.71	Peak
7323.0						74.00	54.00		
9764.0						74.00	54.00		
12205.0						74.00	54.00		
14646.0						74.00	54.00		
17087.0						74.00	54.00		
19528.0						74.00	54.00		
21969.0						74.00	54.00		
24410.0						74.00	54.00		

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High	Test Date	Mar. 09, 2009
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	
(MHz)	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1013.0	46.59		-7.68	38.91		74.00	54.00	-15.09	Peak
1435.5	43.21		-6.22	36.99		74.00	54.00	-17.01	Peak
4960.0	45.17		6.32	51.49		74.00	54.00	-2.51	Peak
7440.0						74.00	54.00		
9920.0						74.00	54.00		
12400.0						74.00	54.00		
14880.0						74.00	54.00		
17360.0						74.00	54.00		
19840.0						74.00	54.00		
22320.0						74.00	54.00		
24800.0						74.00	54.00		

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



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Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High	Test Date	Mar. 09, 2009
Fundamental Frequency	2480 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)	(dB)	
 1013.0	41.77		-7.68	34.09		74.00	54.00	-19.91	Peak
1338.0	39.85		-6.62	33.23		74.00	54.00	-20.77	Peak
4960.0	44.24		6.32	50.56		74.00	54.00	-3.44	Peak
7440.0						74.00	54.00		
9920.0						74.00	54.00		
12400.0						74.00	54.00		
14880.0						74.00	54.00		
17360.0						74.00	54.00		
19840.0						74.00	54.00		
22320.0						74.00	54.00		
24800.0						74.00	54.00		

- 1 Measuring frequencies from 1GHz to the 10th harmonic of highest fundamental frequency.
- 2 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 3 Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4 Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.
- 5 Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



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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 Equipment Used:

Refer to section 6.2 for details.

10.3. Test Set-up:

Refer to section 6.3 for details.

10.4. Measurement Procedure:

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

10.5. Measurement Result:

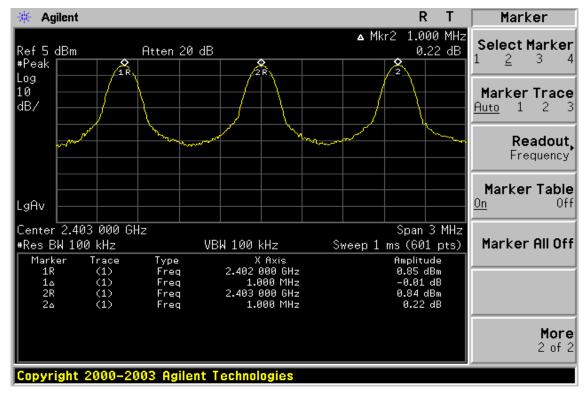
Channel separation (MHz)	Limit	Result
1	>=25KHz or 2/3 times 20dB bandwidth	PASS

Note: Refer to next page for plots.



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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 Equipment Used:

Refer to section 6.2 for details.

11.3. Test Set-up:

Refer to section 6.3 for details.

11.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set 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.

11.5. Measurement Result:

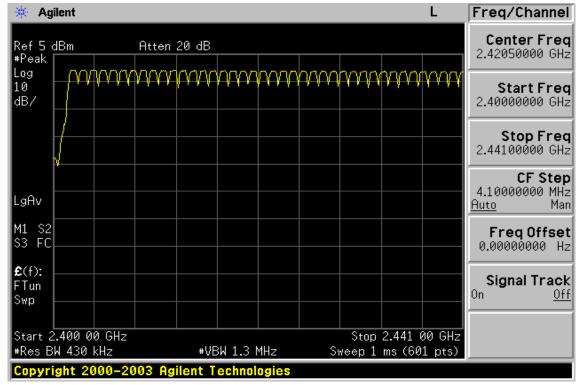
Note: Refer to next page for plots.



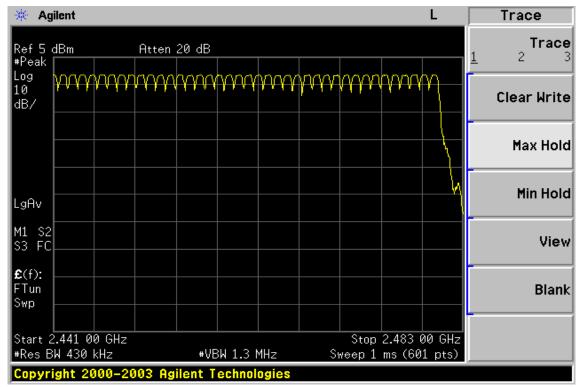
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Channel Number

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 Equipment Used:

Refer to section 6.2 for details.

12.3. Test Set-up:

Refer to section 6.3 for details.

12.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set 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.

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12.5. Measurement Result

A period time = $0.4 \text{ (ms)} * 79 = 31.6 \text{ (s)}$								
CH Low	DH1 time slot =	0.405 (ms) * (1600/2/79)	* 31.6 =	129.60 (ms)				
	DH3 time slot =	1.675 (ms) * (1600/4/79)	* 31.6 =	268.00 (ms)				
	DH5 time slot =	2.925 (ms) * (1600/6/79)	* 31.6 =	312.00 (ms)				
CH Mid	DH1 time slot =	0.405 (ms) * (1600/2/79)	* 31.6 =	129.60 (ms)				
	DH3 time slot =	1.675 (ms) * (1600/4/79)	* 31.6 =	268.00 (ms)				
	DH5 time slot =	2.906 (ms) * (1600/6/79)	* 31.6 =	309.97 (ms)				
CH High	DH1 time slot =	0.416 (ms) * (1600/2/79)	* 31.6 =	133.12 (ms)				
	DH3 time slot =	1.662 (ms) * (1600/4/79)	* 31.6 =	265.92 (ms)				
	DH5 time slot =	2.906 (ms) * (1600/6/79)	* 31.6 =	309.97 (ms)				

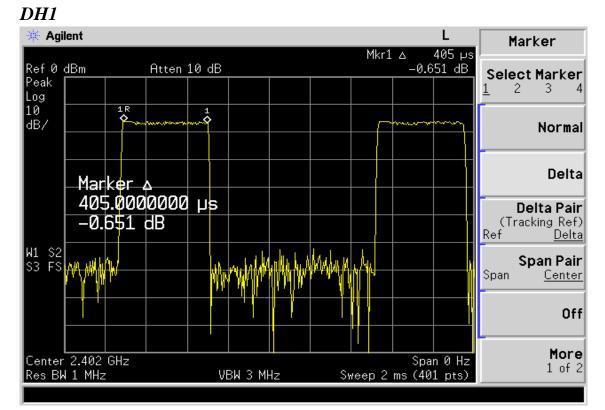
Note: Refer to next page for plots.

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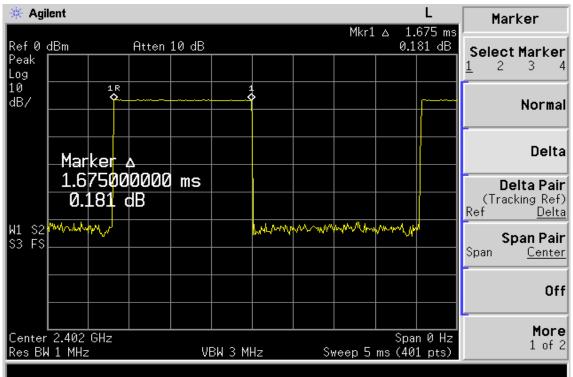


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CH-Low



DH3



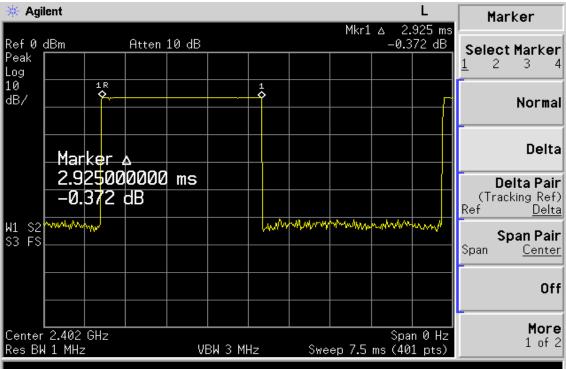
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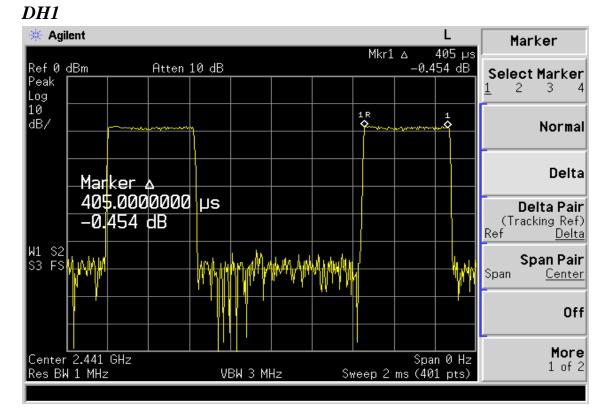


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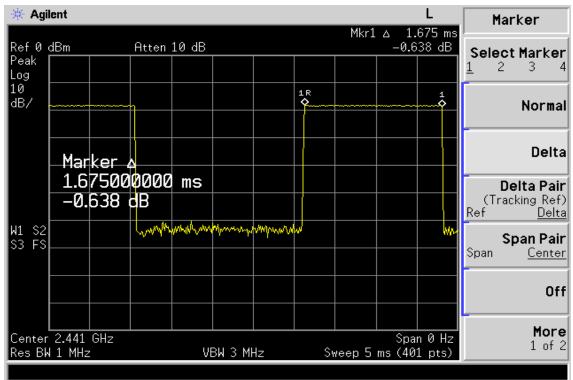


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CH-Mid



DH3



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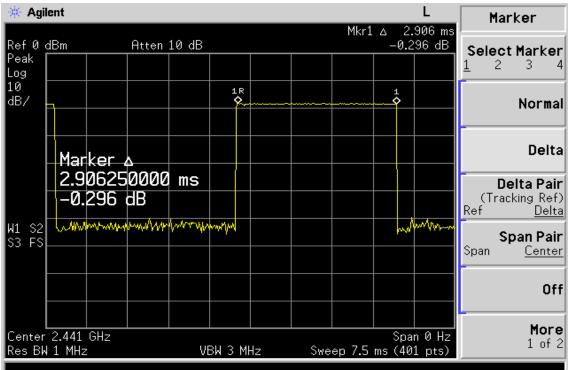
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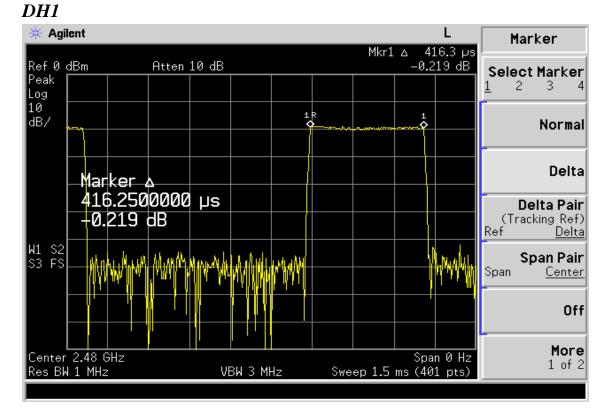
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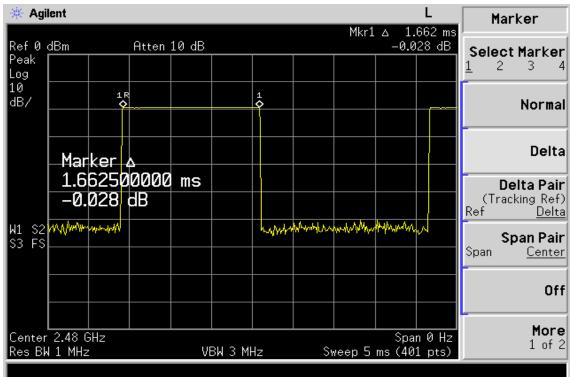


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CH-High



DH3



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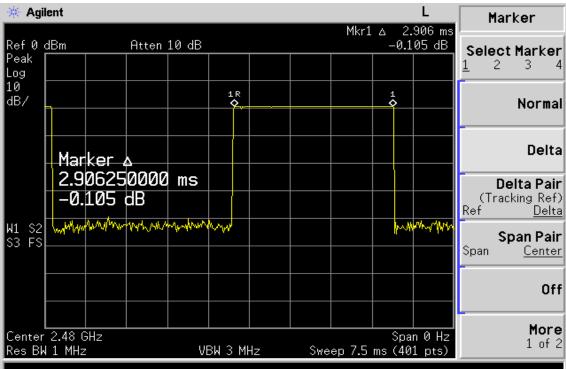
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13. Peak Power Spectral Density

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 Equipment Used:

Refer to section 6.2 for details.

13.3. Test Set-up:

Refer to section 6.3 for details.

13.4. Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set 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.

СН	RF Power Density	Cable loss	RF Power Density	Maximum Limit
	Reading (dBm)	(dB)	Level (dBm)	(dBm)
Low	-1.95	0.00	-1.95	8
Mid	-10.33	0.00	-10.33	8
High	-11.66	0.00	-11.66	8

13.5. Measurement Result

NOTE: offset: 7.2dB

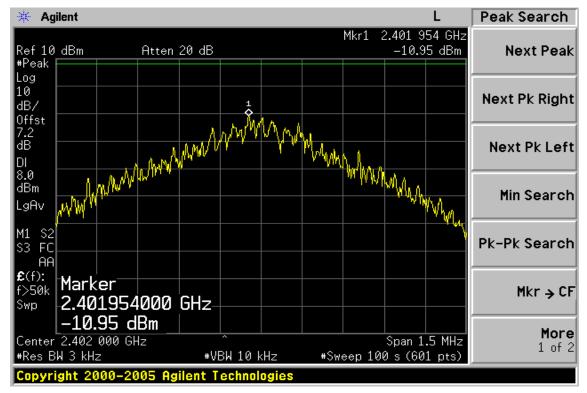
Note: Refer to next page for plots.

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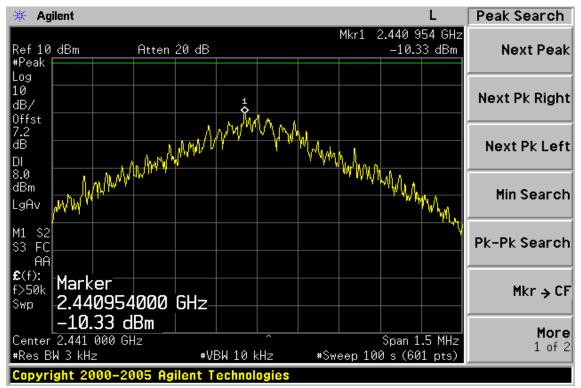


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Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



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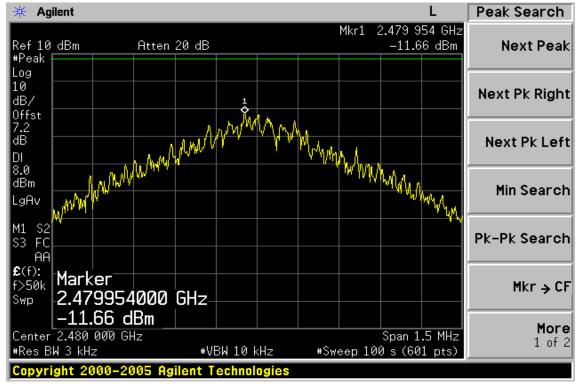
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Power Spectral Density Test Plot (CH-High)



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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 2.59Bi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

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