

## ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

**Product Name:** MCM200-2.4G WIRELESSOPTICAL  
MOUSE

**Brand Name:** ARCHER

**Model Name:** MCM200-2.4G

**FCC ID:** RSQ-20024G

**Report No.:** EF/2004/80001

**Issue Date:** Oct. 04, 2004

**FCC Rule Part:** §15.249

**Prepared for** Archer Wireless Co., Ltd.  
8F, No. 442, Sec. 2, Chung Shun Road,  
Chung Ho City, Taipei Hsien, Taiwan

**Prepared by** SGS Taiwan Ltd.  
No. 134, Wu Kung Rd., Wuku Industrial  
Zone, Taipei County, Taiwan.

**Note:** This report shall not be reproduced except in full, without the written approval of SGS Taiwan Ltd. This document may be altered or revised by SGS Taiwan Ltd. personnel only, and shall be noted in the revision section of the document.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

**VERIFICATION OF COMPLIANCE**

**Applicant:** Archer Wireless Co., Ltd.  
8F, No. 442, Sec. 2, Chung Shun Road, Chung Ho City,  
Taipei Hsien, Taiwan

**Product Description:** MCM200-2.4G WIRELESSOPTICAL MOUSE

**Brand Name:** ARCHER

**FCC ID Number:** RSQ-20024G

**Model No.:** MCM200-2.4G

**Model Difference:** N/A

**File Number:** EF/2004/80001

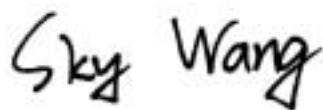
**Date of test:** Sep. 15, ~ Sep. 22, 2004

**Date of EUT Received:** Sep. 13, 2004

**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 (2001) 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 15.249.

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

**Test By:****Date**

Oct. 04, 2004

**Approved By****Date**

Oct. 04, 2004



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## Version

Version No.	Date
00	Oct. 04, 2004

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## Table of Contents

<b>1. GENERAL INFORMATION .....</b>	<b>5</b>
1.1 PRODUCT DESCRIPTION .....	5
1.2 RELATED SUBMITTAL(S) / GRANT (S) .....	5
1.3 TEST METHODOLOGY.....	5
1.4 TEST FACILITY .....	5
1.5 SPECIAL ACCESSORIES.....	5
1.6 EQUIPMENT MODIFICATIONS .....	5
<b>2. SYSTEM TEST CONFIGURATION .....</b>	<b>6</b>
2.1 EUT CONFIGURATION.....	6
2.2 EUT EXERCISE.....	6
2.3 TEST PROCEDURE.....	6
2.4 LIMITATION .....	7
2.5 CONFIGURATION OF TESTED SYSTEM.....	9
<b>3. SUMMARY OF TEST RESULTS .....</b>	<b>10</b>
<b>4. CONDUCTED EMISSIONS TEST (NOT APPLICABLE IN THIS REPORT).....</b>	<b>11</b>
4.1 MEASUREMENT PROCEDURE: .....	11
4.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	11
4.3 MEASUREMENT EQUIPMENT USED: .....	11
4.4 MEASUREMENT RESULT: .....	11
<b>5. RADIATED EMISSION TEST .....</b>	<b>12</b>
5.1 MEASUREMENT PROCEDURE.....	12
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	12
5.3 MEASUREMENT EQUIPMENT USED: .....	13
5.4 FIELD STRENGTH CALCULATION .....	13
5.5 MEASUREMENT RESULT .....	14
<b>6. 26 DB BAND WIDTH MEASUREMENT.....</b>	<b>23</b>
6.1 MEASUREMENT PROCEDURE.....	23
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	23
6.3 MEASUREMENT EQUIPMENT USED: .....	23
6.4 MEASUREMENT RESULTS:.....	23

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 1. GENERAL INFORMATION

### 1.1 Product Description

The Archer Wireless Co., Ltd., Model: MCM200-2.4G (referred to as the EUT in this report)  
The EUT is a WIRELESSOPTICAL MOUSE.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2402 ~ 2480MHz, 17 channel.
- B). Modulation: Pi/4 DQPSK with DSSS
- C). Antenna Designation: Metal Antenna, non user removeable
- D). Power Supply: 3Vdc from two AAA battery

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

This submittal(s) (test report) is intended for FCC ID: **RSQ-20024G** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules. The composite system (receiver) 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 (2001). Radiated testing was performed at an antenna to EUT distance 3 meters.

### 1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2001 and CISPR 22/EN 55022 requirements. Site No. 1(3 &10 meters) Registration Number: 94644, Anechoic chamber (3 meters) Registration Number: 573967

### 1.5 Special Accessories

Not available for this EUT intended for grant.

### 1.6 Equipment Modifications

Not available for this EUT intended for grant.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 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 Transmitter was operated in the engineering operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2001. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

#### 2.3.2 Radiated Emissions

The EUT is a placed on a 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, according to the requirements in Section 13.1.4.1 of ANSI C63.4-2001.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 2.4 Limitation

### (1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 - 56	56 - 46
0.5 – 5	56	46
5 - 30	60	50

### (2) Radiated Emission 15.249(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
24.0 – 24.25 GHz	250 mV/m (107.95dBuV/m)	2500 uV/m (67.95dBuV/m)	3

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

**(3) Radiated Emission 15.249 (d)**

Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 as below, whichever is the lesser attenuation.

Frequency (MHz)	Field strength μV/m	Distance (m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

**(4) Radiated Emission 15.249(e)**

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

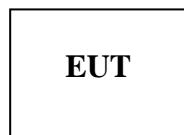
Remark:

1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of §15.205, then the general radiated emission limits in § 15.209 apply.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Test Setup**



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

Item	Equipment	Mfr/Brand	Model/ Type No.	FCC ID	Series No.	Data Cable	Power Cord
1	N/A						

**Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

**Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

### 3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§15.207	Conducted Emission	N/A
§15.249(a)(e)	Radiated Emission	Compliant
§15.249(d)	26dB band width Measurement	Compliant

#### Description of test modes

The EUT has been tested under continuous operating with 1kHz Audio Signal. The Frequency 2402MHz (low), 2450MHz(Mid) and 2480MHz(High) are chosen for full testing.

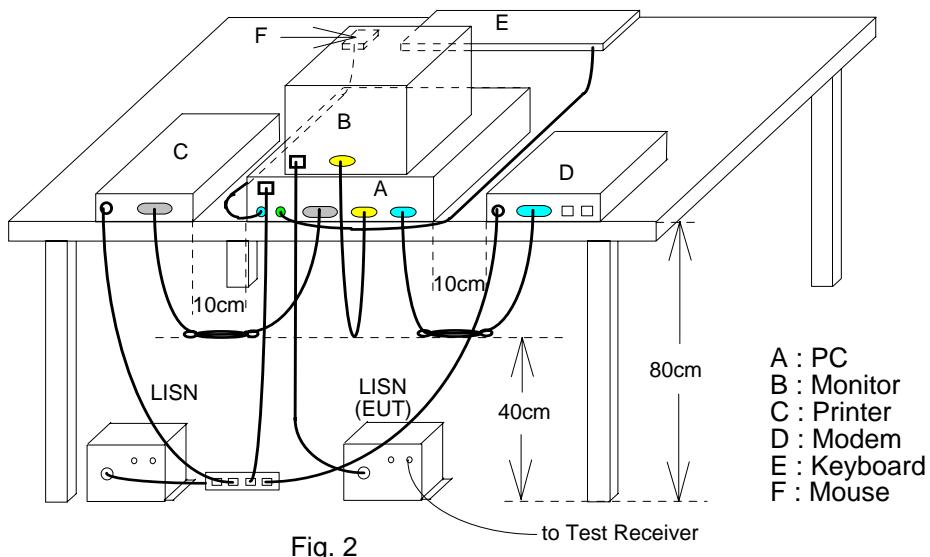
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

#### 4. Conducted Emissions Test (Not applicable in this report)

## 4.1 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.

## 4.2 Test SET-UP (Block Diagram of Configuration)



#### 4.3 Measurement Equipment Used:

Conducted Emission Test Site					
<b>EQUIPMENT TYPE</b>	<b>MFR</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>LAST CAL.</b>	<b>CAL DUE.</b>
EMC Analyzer	HP	8594EM	3624A00203	12/31/2003	12/30/2004
EMI Test Receiver	R&S	ESCS30	828985/004	01/15/2004	01/14/2005
LISN	Rolf-Heine	NNB-2/16Z	99012	12/30/2003	12/29/2004
LISN	Rolf-Heine	NNB-2/16Z	99013	11/06/2003	11/05/2004

#### 4.4 Measurement Result:

N/A

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

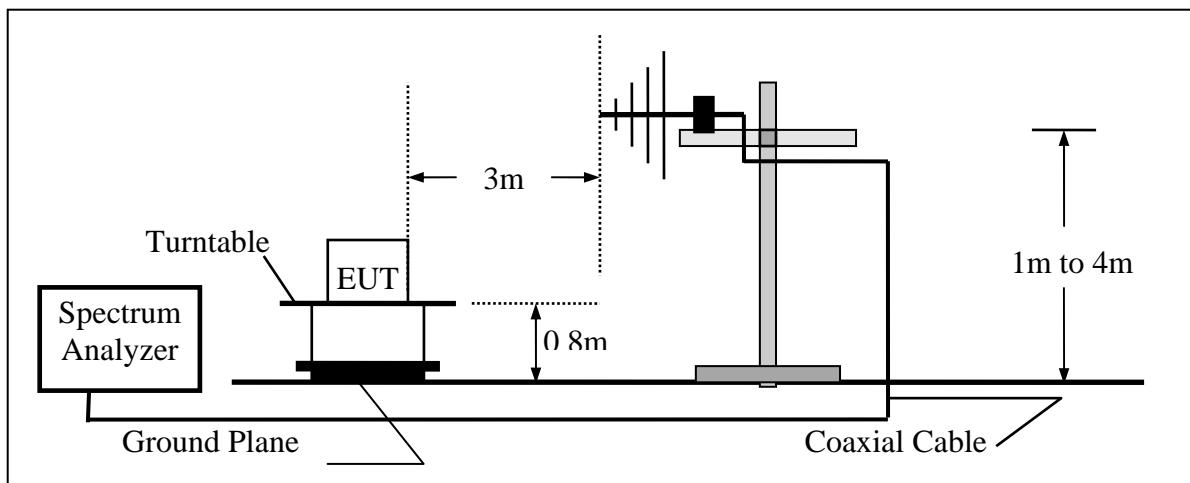
## 5. Radiated Emission Test

### 5.1 Measurement Procedure

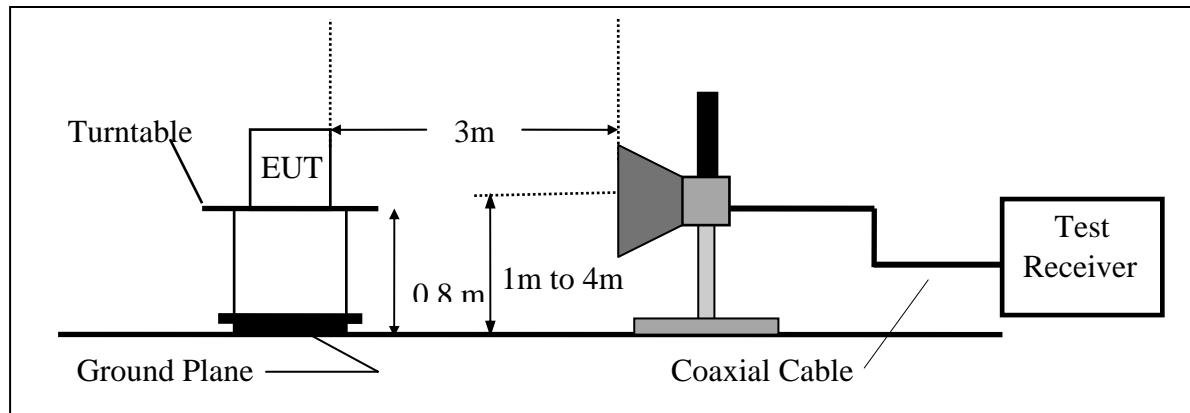
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)

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



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



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

### 5.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	05/27/2004	05/26/2005
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2004	08/26/2005
Bilog Antenna	SCHWAZBECK	VULB9163	152	06/03/2004	06/02/2005
Horn antenna	Schwarzbeck	BBHA 9120D	309/320	08/16/2004	08/15/2005
Horn antenna	Schwarzbeck	BBHA 9170	184/185	07/04/2004	07/03/2005
Pre-Amplifier	HP	8447D	2944A09469	07/19/2004	07/18/2005
Pre-Amplifier	HP	8494B	3008A00578	02/26/2004	02/25/2005
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	10/09/2003	10/08/2004
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2003	10/08/2004
Site NSA	SGS	966 chamber	N/A	11/17/2003	11/16/2004

### 5.4 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		

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 5.5 Measurement Result

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

Operation Mode	TX CH Low	Test Date	Sep. 17, 2004
Fundamental Frequency	2402MHz	Test By	Sky
Temperature	25	Pol	Ver./Hor
Humidity	68 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
33.88	V	Peak	41.86	-15.13	26.73	40.00	-13.27
90.14	V	Peak	36.31	-17.89	18.42	43.50	-25.08
104.69	V	Peak	35.09	-16.82	18.27	43.50	-25.23
153.19	V	Peak	32.91	-13.67	19.24	43.50	-24.26
182.29	V	Peak	37.64	-15.35	22.29	43.50	-21.21
41.64	H	Peak	40.15	-14.67	25.48	40.00	-14.52
62.98	H	Peak	32.80	-14.95	17.85	40.00	-22.15
104.69	H	Peak	34.39	-16.82	17.57	43.50	-25.93
155.13	H	Peak	30.79	-13.85	16.94	43.50	-26.56
182.29	H	Peak	31.88	-15.35	16.53	43.50	-26.97

#### Remark :

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

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

Operation Mode	TX CH Mid	Test Date	Sep. 17, 2004
Fundamental Frequency	2450MHz	Test By	Sky
Temperature	25	Pol	Ver./Hor
Humidity	68 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
33.88	V	Peak	42.19	-15.13	27.06	40.00	-12.94
90.14	V	Peak	35.63	-17.89	17.74	43.50	-25.76
104.69	V	Peak	35.50	-16.82	18.68	43.50	-24.82
153.19	V	Peak	33.92	-13.67	20.25	43.50	-23.25
182.29	V	Peak	36.99	-15.35	21.64	43.50	-21.86
41.64	H	Peak	40.10	-14.67	25.43	40.00	-14.57
90.14	H	Peak	33.69	-17.89	15.80	43.50	-27.70
104.69	H	Peak	35.19	-16.82	18.37	43.50	-25.13
182.29	H	Peak	32.53	-15.35	17.18	43.50	-26.32

## Remark :

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

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

Operation Mode	TX CH High	Test Date	Sep. 17, 2004
Fundamental Frequency	2480MHz	Test By	Sky
Temperature	25	Pol	Ver./Hor
Humidity	68 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
33.88	V	Peak	41.00	-15.13	25.87	40.00	-14.13
90.14	V	Peak	36.24	-17.89	18.35	43.50	-25.15
104.69	V	Peak	34.38	-16.82	17.56	43.50	-25.94
153.19	V	Peak	32.71	-13.67	19.04	43.50	-24.46
182.29	V	Peak	37.05	-15.35	21.70	43.50	-21.80
41.64	H	Peak	39.70	-14.67	25.03	40.00	-14.97
61.04	H	Peak	32.58	-14.81	17.77	40.00	-22.23
90.14	H	Peak	34.35	-17.89	16.46	43.50	-27.04
104.69	H	Peak	34.52	-16.82	17.70	43.50	-25.80
182.29	H	Peak	32.66	-15.35	17.31	43.50	-26.19

## Remark :

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

### Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode: TX Mode  
 Fundamental Frequency: 2402MHz  
 Temperature : 25  
 Humidity : 68 %

Test Date : Sep. 17, 2004  
 Test By: Sky  
 Pol: Vertical

Freq. (MHz)	Ant.Pol.	Peak	AV	Factor (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)
		Reading (dBuV)	Reading (dBuV)		(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
24105.0	V	83.00	--	-3.35	79.65	--	114.00	94.00	-14.35
4815.5	V	58.65	32.16	3.01	61.66	35.17	74.00	54.00	-18.83
7220.5	V	38.66	--	9.30	47.96	--	74.00	54.00	-6.04
7231.5	V	--	--		--	--	74.00	54.00	
9642.0	V	--	--		--	--	74.00	54.00	
12052.5	V	--	--		--	--	74.00	54.00	
14463.0	V	--	--		--	--	74.00	54.00	
16873.5	V	--	--		--	--	74.00	54.00	
19284.0	V	--	--		--	--	74.00	54.00	
21694.5	V	--	--		--	--	74.00	54.00	
24105.0	V	--	--		--	--	74.00	54.00	

#### Remark :

- (1) Measuring frequencies from 30MHz to the 10th of fundamental frequency.
- (2) Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB
- (3) "F" denotes fundamental frequency; "H" denotes harmonics frequency. "S" denotes spurious frequency.
- (4) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The RBW,VBW of SPA for frequency

Below 1GHz was RBW=VBW=100KHz, above 1GHz was 1MHz for Peak Mode

The RBW= 1MHz, ,VBW= 10Hz of SPA for frequency above 1GHz for Average Mode.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode: TX Mode Test Date : Sep. 17, 2004  
 Fundamental Frequency: 2402MHz Test By: Sky  
 Temperature : 25 Pol: Horizontal  
 Humidity : 68 %

Freq. (MHz)	Ant.	Pol.	Peak	AV	Factor	Actual	Actual	Peak Limit	AV Limit	Margin	
			H/V	(dBuV)		Reading	(dBuV)	(dB)	Peak FS	AV FS	
24105.0	H		87.41	--	-3.35	84.06	--	114.00	94.00	-9.94	F
4815.5	H		63.79	32.46	3.01	66.80	35.47	74.00	54.00	-18.53	H
7220.5	H		36.96	--	9.30	46.26	--	74.00	54.00	-7.74	H
4821.0	H		--	--			--	74.00	54.00		H
7231.5	H		--	--			--	74.00	54.00		H
9642.0	H		--	--			--	74.00	54.00		H
12052.5	H		--	--			--	74.00	54.00		H
14463.0	H		--	--			--	74.00	54.00		H
16873.5	H		--	--			--	74.00	54.00		H
19284.0	H		--	--			--	74.00	54.00		H
21694.5	H		--	--			--	74.00	54.00		H
24105.0	H		--	--			--	74.00	54.00		H

### Remark :

- (1) Measuring frequencies from 30MHz to the 10th of fundamental frequency.
- (2) Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB
- (3) "F" denotes fundamental frequency; "H" denotes harmonics frequency. "S" denotes spurious frequency.
- (4) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The RBW,VBW of SPA for frequency

Below 1GHz was RBW=VBW=100KHz, above 1GHz was 1MHz for Peak Mode

The RBW= 1MHz, ,VBW= 10Hz of SPA for frequency above 1GHz for Average Mode.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode: TX Mode  
 Fundamental Frequency: 2450MHz  
 Temperature : 25  
 Humidity : 68 %

Test Date : Sep. 17, 2004  
 Test By: Sky  
 Pol: Vertical

Freq. (MHz)	Ant.Pol.	Peak		AV		Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	
		H/V	Reading (dBuV)	Reading (dBuV)	Factor (dB)						
2443.0	V	87.46	--	-3.18	84.28	--	114.00	94.00	-9.72	F	
4893.5	V	46.50	--	3.23	49.73	--	74.00	54.00	-4.27	H	
7350.5	V	52.89	30.28	9.52	62.41	39.80	74.00	54.00	-11.59	H	
7360.0	V	--	--			--	74.00	54.00		H	
9772.0	V	--	--			--	74.00	54.00		H	
12215.0	V	--	--			--	74.00	54.00		H	
14658.0	V	--	--			--	74.00	54.00		H	
17101.0	V	--	--			--	74.00	54.00		H	
19544.0	V	--	--			--	74.00	54.00		H	
21987.0	V	--	--			--	74.00	54.00		H	
24430.0	V	--	--			--	74.00	54.00		H	

### Remark :

- (1) Measuring frequencies from 30MHz to the 10th of fundamental frequency.
- (2) Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB
- (3) "F" denotes fundamental frequency; "H" denotes harmonics frequency. "S" denotes spurious frequency.
- (4) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The RBW,VBW of SPA for frequency  
 Below 1GHz was RBW=VBW=100KHz, above 1GHz was 1MHz for Peak Mode  
 The RBW= 1MHz, ,VBW= 10Hz of SPA for frequency above 1GHz for Average Mode.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode: TX Mode Test Date : Sep. 17, 2004  
 Fundamental Frequency: 2450MHz Test By: Sky  
 Temperature : 25 Pol: Horizontal  
 Humidity : 68 %

Freq. (MHz)	Ant.	Pol.	Peak	AV	Factor	Actual	Actual	Peak Limit	AV Limit	Margin
			Reading	Reading		Peak FS (dBuV/m)	AV FS (dBuV/m)	at 3m (dBuV/m)	at 3m (dBuV/m)	
H/V	(dBuV)	(dBuV)	(dB)							
2443.0	H		90.05	--	-3.18	86.87	--	114.00	94.00	-7.13
4893.5	H		51.08	30.16	-8.06	43.02	30.16	74.00	54.00	-23.84
7350.5	H		52.03	30.69	3.23	55.26	30.69	74.00	54.00	-23.31
7329.0	H		--	--			--	74.00	54.00	
9772.0	H		--	--			--	74.00	54.00	
12215.0	H		--	--			--	74.00	54.00	
14658.0	H		--	--			--	74.00	54.00	
17101.0	H		--	--			--	74.00	54.00	
19544.0	H		--	--			--	74.00	54.00	
21987.0	H		--	--			--	74.00	54.00	
24430.0	H		--	--			--	74.00	54.00	

### Remark :

- (1) Measuring frequencies from 30MHz to the 10th of fundamental frequency.
- (2) Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB
- (3) "F" denotes fundamental frequency; "H" denotes harmonics frequency. "S" denotes spurious frequency.
- (4) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The RBW,VBW of SPA for frequency  
 Below 1GHz was RBW=VBW=100KHz, above 1GHz was 1MHz for Peak Mode  
 The RBW= 1MHz, ,VBW= 10Hz of SPA for frequency above 1GHz for Average Mode.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode: TX Mode  
 Fundamental Frequency: 2480MHz  
 Temperature : 25  
 Humidity : 68 %

Test Date : Sep. 17, 2004  
 Test By: Sky  
 Pol: Vertical

Freq. (MHz)	Ant.Pol.	Peak		AV Factor	Actual		Peak Limit	AV Limit	Margin
		H/V	Reading (dBuV)		Reading (dBuV)	Peak FS (dBuV/m)	AV FS (dBuV/m)	at 3m (dBuV/m)	
2475.5	V	84.78	--	-3.04	81.74	--	114.00	94.00	-12.26 F
4945.5	V	46.38	--	3.37	49.75	--	74.00	54.00	-4.25 H
7428.5	V	42.27	--	9.63	51.90	--	74.00	54.00	-2.10 H
7424.0	V	--	--			--	74.00	54.00	H
9902.0	V	--	--			--	74.00	54.00	H
12377.5	V	--	--			--	74.00	54.00	H
14853.0	V	--	--			--	74.00	54.00	H
17328.5	V	--	--			--	74.00	54.00	H
19804.0	V	--	--			--	74.00	54.00	H
22279.5	V	--	--			--	74.00	54.00	H
24755.0	V	--	--			--	74.00	54.00	H
						--			
						--			

### Remark :

- (1) Measuring frequencies from 30MHz to the 10th of fundamental frequency.
- (2) Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB
- (3) "F" denotes fundamental frequency; "H" denotes harmonics frequency. "S" denotes spurious frequency.
- (4) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The RBW,VBW of SPA for frequency  
 Below 1GHz was RBW=VBW=100KHz, above 1GHz was 1MHz for Peak Mode  
 The RBW= 1MHz, ,VBW= 10Hz of SPA for frequency above 1GHz for Average Mode.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode: TX Mode Test Date : Sep. 17, 2004  
 Fundamental Frequency: 2480MHz Test By: Sky  
 Temperature : 25 Pol: Horizontal  
 Humidity : 68 %

Freq. (MHz)	Ant.	Pol.	Peak	AV	Factor	Actual	Actual	Peak Limit	AV Limit	Margin
			Reading	Reading		Peak FS (dBuV/m)	AV FS (dBuV/m)	at 3m (dBuV/m)	at 3m (dBuV/m)	
H/V	(dBuV)	(dBuV)	(dB)							
2475.5	H		87.74	--	-3.04	84.70	--	114.00	94.00	-9.30
4945.5	H		54.49	32.69	3.37	57.86	32.69	74.00	54.00	-16.14
7428.5	H		52.77	30.62	9.63	62.40	30.62	74.00	54.00	-11.60
7426.5	H		--	--			--	74.00	54.00	
9902.0	H		--	--			--	74.00	54.00	
12377.5	H		--	--			--	74.00	54.00	
14853.0	H		--	--			--	74.00	54.00	
17328.5	H		--	--			--	74.00	54.00	
19804.0	H		--	--			--	74.00	54.00	
22279.5	H		--	--			--	74.00	54.00	
24755.0	H		--	--			--	74.00	54.00	

### Remark :

- (1) Measuring frequencies from 30MHz to the 10th of fundamental frequency.
- (2) Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB
- (3) "F" denotes fundamental frequency; "H" denotes harmonics frequency. "S" denotes spurious frequency.
- (4) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The RBW,VBW of SPA for frequency  
 Below 1GHz was RBW=VBW=100KHz, above 1GHz was 1MHz for Peak Mode  
 The RBW= 1MHz, ,VBW= 10Hz of SPA for frequency above 1GHz for Average Mode.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 6. 26 dB Band Width Measurement

### 6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW = 100KHz, Span =3MHz.
4. Set SPA Max hold. Mark peak, -26dB.

### 6.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

### 6.3 Measurement Equipment Used:

Same as 4.2 Radiated Emission Measurement.

### 6.4 Measurement Results:

CH Low: 26dB Bandwidth = 75 MHz

CH Mid: 26dB Bandwidth = 130 MHz

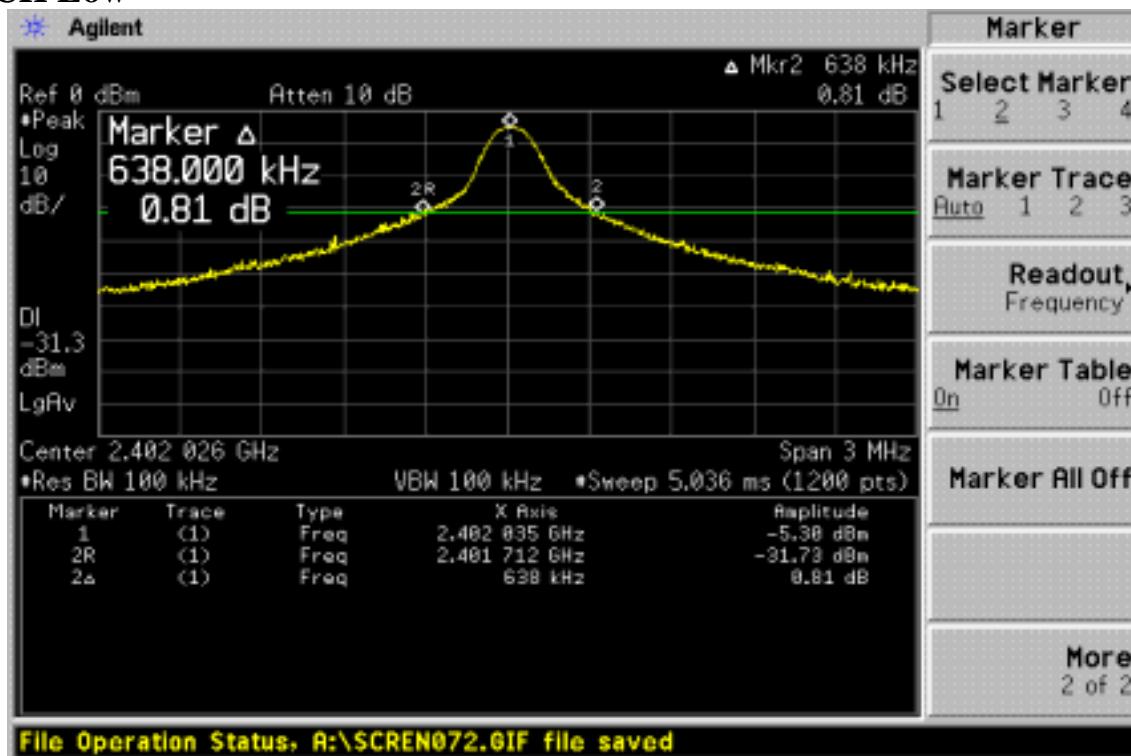
CH High: 26dB Bandwidth = 49 MHz

Refer to attached data chart.

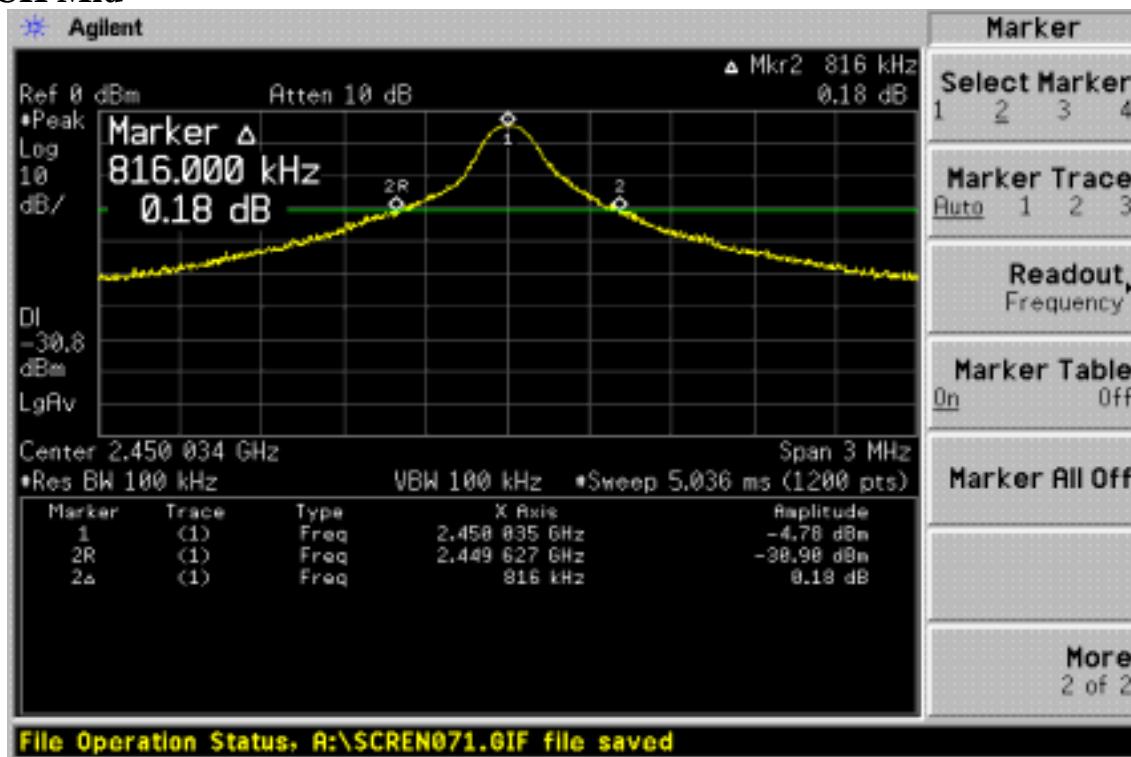
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 26 dB Band Width test Plot

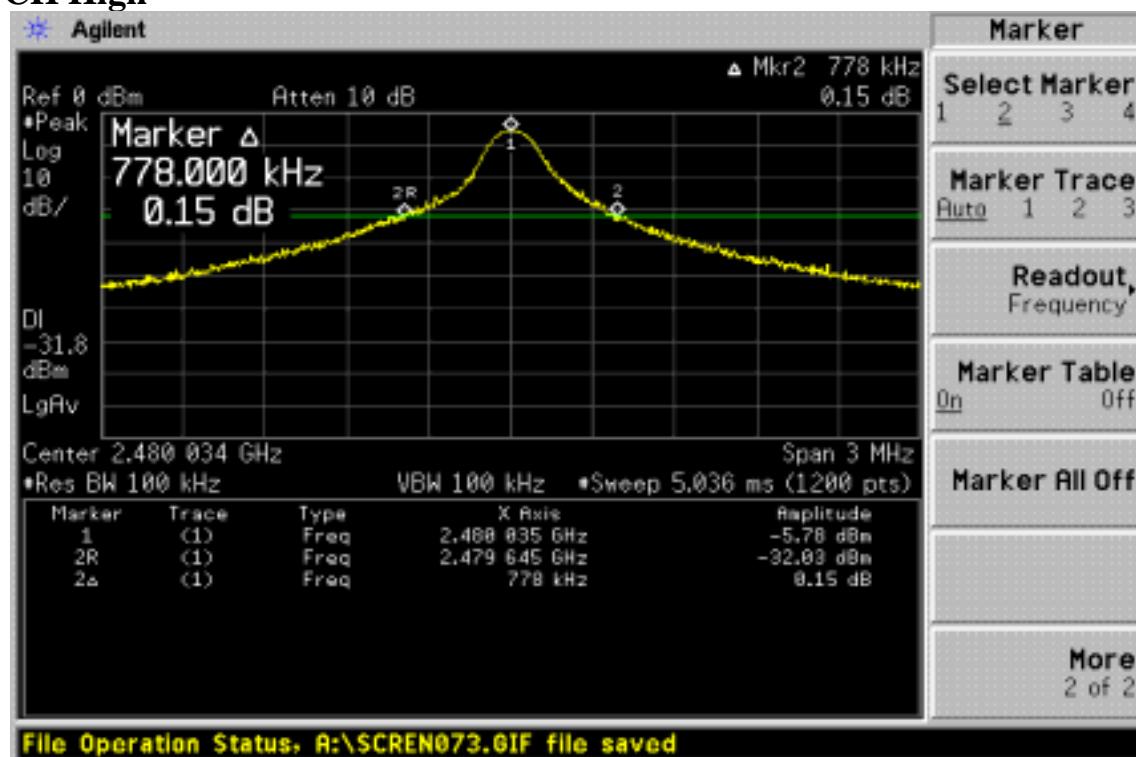
### CH Low



### CH Mid



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

**CH High**

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.