



# FCC TEST REPORT

**REPORT NO.:** RF910617R01

**MODEL NO.:** RFMO-0201

**RECEIVED:** June 17, 2002

**TESTED:** August 13 ~ August 15, 2002

**APPLICANT:** AMELEKS CORP.

**ADDRESS:** 6F, 48, KEELUNG ROAD, SEC.2, TAIPEI,  
TAIWAN, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** 47 14th Lin, Chia Pau Tsuen, Linkou Hsiang,  
Taipei, Taiwan, R.O.C.

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Lab Code: 200102-0

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## 1 CERTIFICATION

**PRODUCT :** RF Module  
**BRAND NAME :** Ameleks  
**MODEL NO :** RFMO-0201  
**APPLICANT :** AMELEKS CORP.  
**STANDARDS :** 47 CFR Part 15, Subpart C(15.231)  
ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from August 13 ~ August 15, 2002. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

**CHECKED BY:** Rennie Wang, **DATE:** August 20, 2002  
Rennie Wang

**APPROVED BY:** Alan Lane, **DATE:** August 20, 2002  
Dr. Alan Lane  
Manager

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
STANDARD PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	N/A	Power supply is 3VDC from batteries
15.231	Radiated Emission Test	PASS	Minimum passing margin is -11.10dBuV at 1301.00MHz
15.231(c)	Occupied Bandwidth Test	PASS	NA

**NOTE:** The receiver part to communicate with the EUT has been verified to comply with FCC Part 15, Subpart B, Class B (DoC).

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	RF Module
<b>MODEL NO.</b>	RFMO-0201
<b>POWER SUPPLY</b>	3VDC from battery
<b>MODULATION TYPE</b>	FSK
<b>CARRIER FREQUENCY OF EACH CHANNEL</b>	433.92MHz
<b>BANDWIDTH OF EACH CHANNEL</b>	+/-125kHz
<b>NUMBER OF CHANNEL</b>	1
<b>ANTENNA TYPE</b>	Integral antenna
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	RS-232
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

1. Devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.
2. For more detailed features description of the EUT, please refer to the manufacturer's specifications or the User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

One channel was provided to this EUT.

Channel	Frequency
1	433.92MHz

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is the transmitter part of a RF Module. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC CFR 47 Part 15, Subpart C (15.231)**

**ANSI C63.4-1992**

All tests have been performed and recorded as per the above standards.

### 3.4 DESCRIPTION OF SUPPORT UNITS

NA

## 4 TEST PROCEDURE AND RESULT

### 4.1 CONDUCTED EMISSION MEASUREMENT

NA

### 4.2 RADIATED EMISSION MEASUREMENT

#### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.231 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field Strength of spurious emission (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500 <sup>1</sup>	50 to 150 <sup>1</sup>
174-260	1,500	150
260-470	1,500 to 5,000 <sup>1</sup>	150 to 500 <sup>1</sup>
Above 470	5,000	500

<sup>1</sup> Linear interpolations.

The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

#### 4.2.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Oct. 30, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jul. 3, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 9, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 25, 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 12, 2003
Open Field Test Site	Site 5	ADT-R05	Jul. 19, 2003
VCCI Site Registration No.	Site 5	R-1039	NA

**NOTE:**

1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
3. “\*” = These equipment are used for the final measurement.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The test was performed in ADT Open Site No. 5.

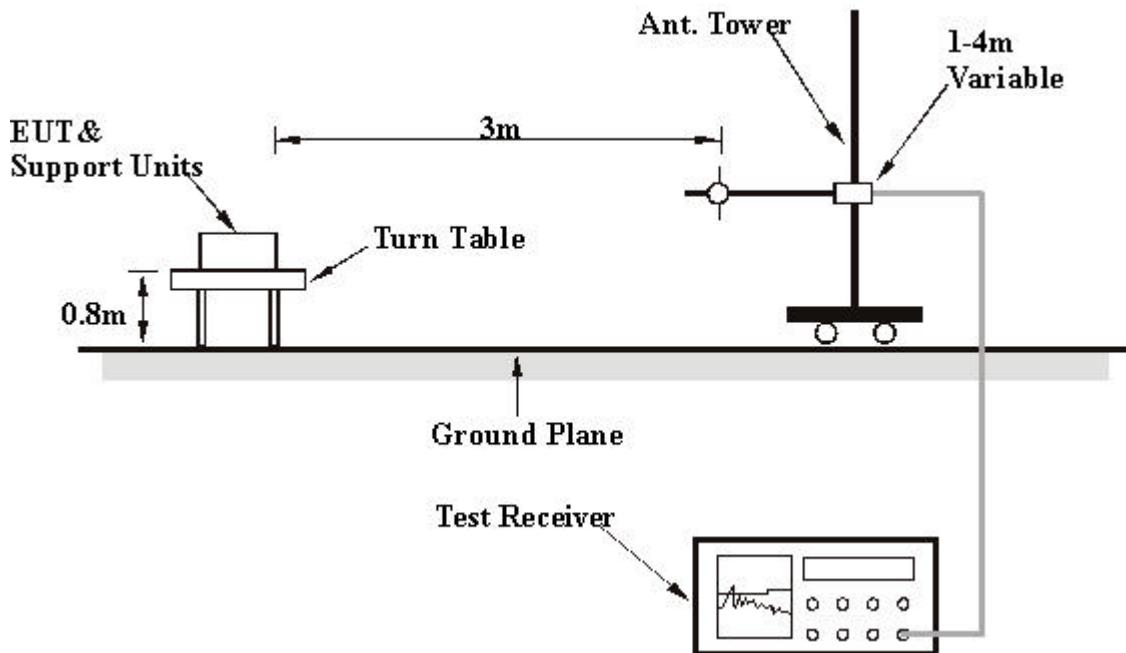
#### 4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 TEST SETUP



For the actual test configuration, please refer to the related item in this test report - Photographs of the Test Configuration.

#### 4.2.5 EUT OPERATING CONDITION

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

#### 4.2.6 TEST RESULT

<b>EUT</b>		RF Module			<b>MODEL</b>		RFMO-0201		
<b>INPUT POWER</b>		3VDC			<b>DETECTOR FUNCTION</b>		Peak / Quasi-Peak		
<b>ENVIRONMENTAL CONDITIONS</b>		35 deg. C, 50 % RH, 1050 hPa			<b>TESTED BY:</b> Bunny Yao				

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*433.78	63.4 PK	92.87	-29.47	1.00H	227	40.31	16.29	6.80	0.00	-23.08
2	*433.78	60.8 QP	72.87	-12.07	1.00H	227	37.70	16.29	6.80	0.00	-23.08
3	867.53	34.0 QP	46.00	-12.00	1.00H	39	2.25	20.59	11.16	0.00	-31.75
4	1301.00	32.9 AV	54.00	-21.10	1.04H	106	4.00	25.39	3.49	0.00	-28.89
5	1301.00	42.9 PK	54.00	-11.10	1.04H	106	14.00	25.39	3.49	0.00	-28.89

**NOTE:**

1. Emission level = Raw Value – Correction Factor
2. Correction Factor = Pre-Amplifier Factor - Antenna Factor - Cable Factor  
(Pre-Amplifier Factor = 0, when a Pre-Amplifier is not used for the test.)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”= Fundamental frequency.

<b>EUT</b>	RF Module	<b>MODEL</b>	RFMO-0201
<b>INPUT POWER</b>	3VDC	<b>DETECTOR FUNCTION</b>	Peak / Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	35 deg. C, 50 % RH, 1050 hPa	<b>TESTED BY:</b> Bunny Yao	

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*433.77	49.5 QP	72.87	-23.37	2.52V	258	26.40	16.29	6.80	0.00	-23.08
2	*433.77	53.1 PK	92.87	-39.77	2.52V	258	30.05	16.29	6.80	0.00	-23.08
3	867.55	31.6 QP	46.00	-14.40	1.23V	111	-0.17	20.59	11.16	0.00	-31.75
4	1301.00	31.2 AV	54.00	-22.80	1.11V	101	2.31	25.39	3.49	0.00	-28.89
5	1301.00	42.0 PK	54.00	-12.00	1.11V	101	13.11	25.39	3.49	0.00	-28.89

**NOTE:**

1. Emission level = Raw Value – Correction Factor
2. Correction Factor = Pre-Amplifier Factor - Antenna Factor - Cable Factor  
(Pre-Amplifier Factor = 0, when a Pre-Amplifier is not used for the test.)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. "\*"= Fundamental frequency.

### 4.3 OCCUPIED BANDWIDTH

#### 4.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

#### 4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

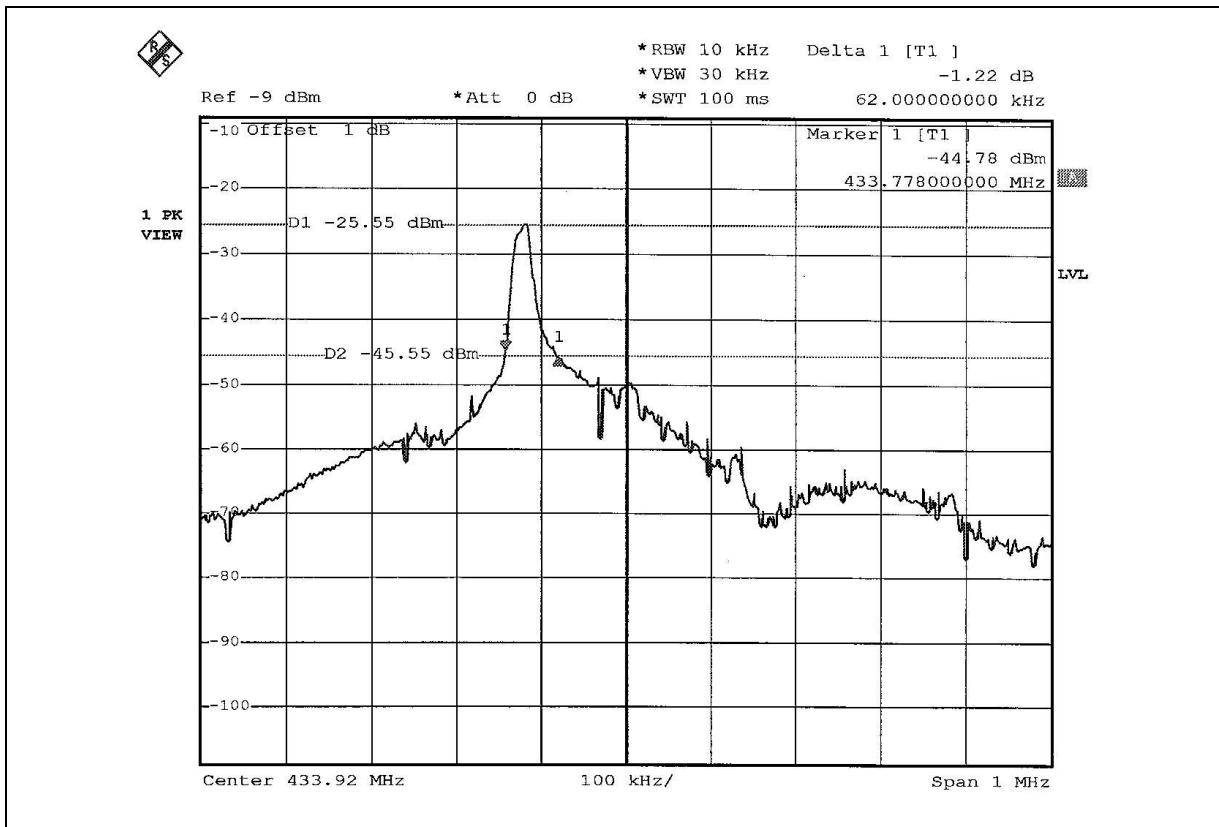
#### 4.3.3 TEST PROCEDURE

The transmitter output was coupled to the spectrum analyzer via an antenna. Set the RBW=10kHz and VBW=30kHz of spectrum analyzer. The occupied bandwidth was measured and recorded.

#### 4.3.4 EUT OPERATING CONDITION

Same as Item 4.3.5

#### 4.3.5 TEST RESULTS



## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

### RADIATED EMISSION TEST



## 6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

<b>USA</b>	FCC, NVLAP
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>New Zealand</b>	MoC
<b>Norway</b>	NEMKO
<b>R.O.C.</b>	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml). If you have any comments, please feel free to contact us at the following:

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**Lin Kou RF&Telecom Lab:**  
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The address and road map of all our labs can be found in our web site also.