



EMC

TEST REPORT

REPORT NO. : F88081005

MODEL NO. : ADS-380

DATE OF TEST : Aug. 13, 1999

PREPARED FOR: ROYAL INFORMATION ELECTRONICS CO., LTD.

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**1. CERTIFICATION**

Issue Date: Aug. 18, 1999

Product : USB SPEAKER
Trade Name : RIC
Model No. : ADS-380
Applicant : ROYAL INFORMATION ELECTRONICS CO., LTD.
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22: 1993+A1: 1995+A2: 1996, Class B

We hereby certify that one sample of the designation has been tested in our facility on Aug. 13, 1999. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

TESTED BY : Kenny Meng , DATE: 8/18/99
(Kenny Meng)

CHECKED BY : Yemmy , DATE: 8/18/99
(Yemmy Soong)

APPROVED BY : Mike Su , DATE: 8/18/99.
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION**NVLAP[®]**

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product : USB SPEAKER
Model No. : ADS-380
Power Supply Type: Linear
Power Cord : Nonshielded (1.8m)
Data Cable : Nonshielded (1.5m) (from woofer to PC)
Nonshielded (2.8m) (from right & left speakers to woofer)

Note: The EUT are speakers with amplifier to be used in a multimedia computer system.

The EUT set consists of right and left speakers and a woofer which has one port for earphone.

The EUT was pre-tested with four modes:

- ◆ EUT connected to USB port of PC (With headphone)
- ◆ EUT connected to USB port of PC (Without headphone)
- ◆ EUT connected to line-in port of PC (With headphone)
- ◆ EUT connected to line-in port of PC (Without headphone)

The worst emission level was found when the EUT was connected to line-in port of PC (without headphone). Therefore, the test data of this mode is recorded in this report.

For more detailed features description, please refer to Manufacturer's Specification or User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No.	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	NTI	PII-450T	FCC DoC Approved	Nonshielded Power (1.8m)
2	MONITOR	HP	D2846	FCC DoC Approved	Shielded Signal (1.5m) Nonshielded Power (1.8m)
3	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded signal (1.4m)
4	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.2m)
5	MODEM	ACEEX	1414	IFAXDM1414	Shielded signal (1.2m) Nonshielded Power (1.2m)
6	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded signal (1.5m)
7	VGA CARD	CARDEX	CD-GX2A44T	ICUVGA-GW710	NA
8	SOUND CARD	YA HSIN	AUDIO 1869	NA	NA

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:1992. Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site.

Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828765/002	Aug. 2, 2000
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 21, 2000
EMCO-L.I.S.N.	3825/2	90031627	July 21, 2000
Shielded Room	Site 5	ADT-C05	NA

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per 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.

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01176	April 22, 2000
HP Preamplifier	8447D	2944A08485	April 21, 2000
HP Preamplifier	8347A	3307A01088	Sept. 9, 1999
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 27, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 25, 1999
CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2000
EMCO Turn Table	1060	1115	NA
SHOSHIN Tower	AP-4701	A6Y005	NA
Open Field Test Site	Site 5	ADT-R05	July 30, 2000

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per 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.



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m) *	Class B (at 10m) *
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

* Detector Function: Quasi-Peak

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	80.0	60.0	74.0	54.0

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	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 to 0.50 MHz
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 1000 MHz (Radiated Emission)
Input Voltage : 120 Vac, 60 Hz
Temperature : 28 degree C
Humidity : 52 %
Atmospheric Pressure : 993 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -17.9 dB at 3.652 MHz Minimum passing margin of radiated emission: -2.3 dB at 480.01 MHz

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipment.
2. PC runs a test program to enable all function.
3. Adjust speakers output to 1/8 load.
4. PC sends 1 kHz audio sine wave to right & left speakers (EUT).
5. PC sends 100 Hz audio sine wave to woofer (EUT).
6. PC sends "H" messages to monitor and monitor display "H" patterns on screen.
7. PC sends "H" messages to modem.
8. PC sends "H" messages to printer, and the printer prints them on paper.
9. Repeat steps 4-9.



4.3 TEST DATA OF CONDUCTED EMISSION

EUT: USB SPEAKERMODEL: ADS-3806 dB Bandwidth: 10 kHzPHASE: LINE (L)

Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.276	0.2	15.6	-	15.8	-	60.9	50.9	-45.1	-
0.345	0.2	15.8	-	16.0	-	59.1	49.1	-43.1	-
1.385	0.3	28.2	-	28.5	-	56.0	46.0	-27.5	-
3.652	0.5	37.3	-	37.8	-	56.0	46.0	-18.2	-
7.542	0.8	27.2	-	28.0	-	60.0	50.0	-32.0	-
20.564	1.3	36.3	-	37.6	-	60.0	50.0	-22.4	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



TEST DATA OF CONDUCTED EMISSION

EUT: **USB SPEAKER**MODEL: **ADS-380**6 dB Bandwidth: 10 kHzPHASE: LINE (L)

Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.276	0.2	25.6	-	25.8	-	60.9	50.9	-35.1	-
0.345	0.2	27.9	-	28.1	-	59.1	49.1	-31.0	-
1.385	0.3	33.4	-	33.7	-	56.0	46.0	-22.3	-
3.652	0.4	37.7	-	38.1	-	56.0	46.0	-17.9	-
7.542	0.7	30.9	-	31.6	-	60.0	50.0	-28.4	-
20.564	1.1	38.3	-	39.4	-	60.0	50.0	-20.6	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.



4.4 TEST DATA OF RADIATED EMISSION

EUT: **USB SPEAKER**MODEL: **ADS-380**ANT. POLARITY: HorizontalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
179.77	11.1	15.5	26.6	30.0	-3.4	100	27
384.02	17.9	11.4	29.3	37.0	-7.7	218	311
480.01	20.3	14.4	34.7	37.0	-2.3	166	167
576.01	23.0	11.6	34.6	37.0	-2.4	156	346
623.99	23.0	11.5	34.5	37.0	-2.5	158	357
672.01	23.7	10.2	33.9	37.0	-3.1	164	34
768.00	26.1	7.6	33.7	37.0	-3.3	129	236
815.99	26.4	4.8	31.2	37.0	-5.8	100	246
863.98	27.0	5.3	32.3	37.0	-4.7	123	301

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION

EUT: **USB SPEAKER**

MODEL: **ADS-380**

ANT. POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
179.78	11.1	13.5	24.6	30.0	-5.4	100	352
384.02	17.9	12.1	30.0	37.0	-7.0	103	5
480.00	20.3	11.4	31.7	37.0	-5.3	319	162
576.02	23.0	7.4	30.4	37.0	-6.6	276	356
624.00	23.0	8.6	31.6	37.0	-5.4	250	1
672.01	23.7	8.1	31.8	37.0	-5.2	229	275
720.00	24.8	7.3	32.1	37.0	-4.9	215	280
768.00	26.1	5.9	32.0	37.0	-5.0	180	0
815.99	26.4	5.5	31.9	37.0	-5.1	165	192
864.00	27.0	4.3	31.3	37.0	-5.7	169	319

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB)
+ Reading value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value

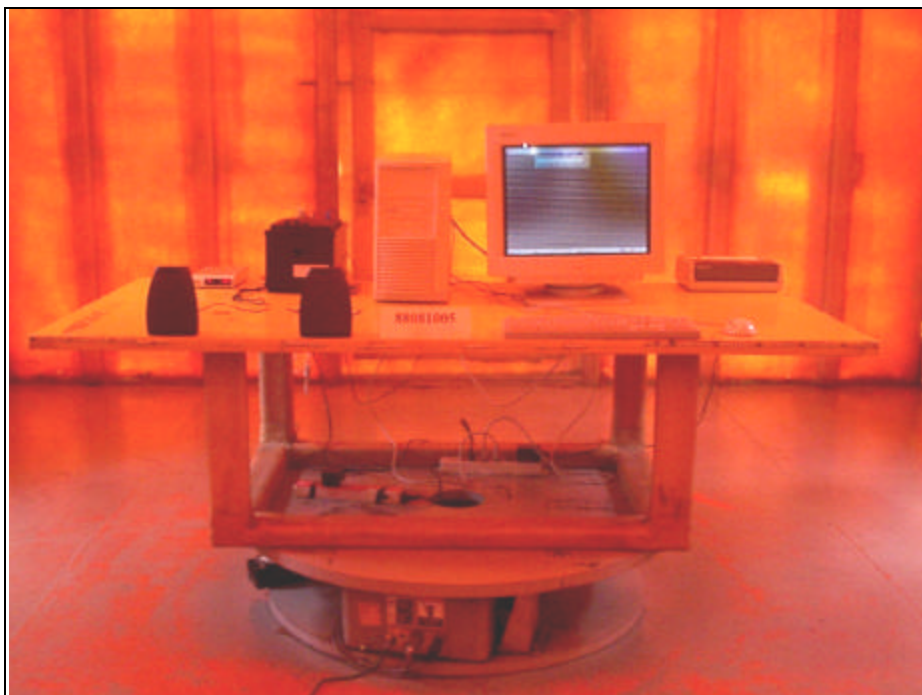


5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST





6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

Information of the testing laboratory

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

- | | |
|---------------|--------------------------------------|
| ● USA | FCC, UL, NVLAP |
| ● Germany | TUV Rheinland
TUV Product Service |
| ● Japan | VCCI |
| ● New Zealand | RFS |
| ● Norway | NEMKO, DNV |
| ● U.K. | INCHCAPE |
| ● R.O.C. | BSMI |

Enclosed please find some certificates of our laboratory obtained from approval agencies. If you have any comments, please feel free to contact us with the following:

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