



World Standardization Certification & Testing CO.,LTD
World Standardization Safety and EMC Testing Centre

FCC Certification TEST REPORT

for

Wireless Optical Mouse-Receiver

Brand: N/A

**Model: RF-02, TXD03, TXD04, TXD06, TXD21,
TXD42, TXD48, TXD49, TXD53, TXD66**

Test Report Number: WSCT09030052E-RE

Issued Date: March 23, 2009

Issued for

Shenzhen Wude Electronics Co.,Ltd.
4F,F1 Building,Huafneg Industrial Park,Gushu,Xixiang
Bao'an District, ShenZhen

Issued by:

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World Standardization Certification & Testing CO.,LTD
World Standardization Safety and EMC Testing Centre

Revision History

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TEST RESULT CERTIFICATION

Product: Wireless Optical Mouse-Receiver

Model: RF-02, TXD03, TXD04, TXD06, TXD21, TXD42, TXD48, TXD49, TXD53, TXD66

Brand: N/A

Applicant: Shenzhen Wude Electronics Co.,Ltd.

4F,F1 Building,Huafneg Industrial Park,Gushu,Xixiang, Bao'an District, Shenzhen

Manufacturer: Shenzhen Wude Electronics Co.,Ltd.

4F,F1 Building,Huafneg Industrial Park,Gushu,Xixiang, Bao'an District, Shenzhen

Tested Date: March12 ~23, 2009

Test Voltage: AC120V/60Hz

EMISSION			
Standard	Item	Result	Remarks
FCC 47 CFR Part 15 Subpart B, Part 15.107,15.109 ANSI C63.4-2003	Conducted (Main Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

Note: 1. The test result judgment is decided by the limit of measurement standard
2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard
None

The above equipment has been tested by World Standardization Certification & Testing Co., Ltd and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

Cheney Chen

(Cheney Chen)

Date: 2009-03-23

Check By:

Joe Lin

(Joe Lin)

Date: 2009-03-23

Approved By:

Sula Huang

(Sula Huang)

Date: 2009-03-23



EUT DESCRIPTION

Product	Wireless Optical Mouse-Receiver
Brand Name	N/A
Model	RF-02, TXD03, TXD04, TXD06, TXD21, TXD42, TXD48, TXD49, TXXDD53, TXD66
Applicant	Shenzhen Wude Electronics Co., Ltd.
Housing material	Plastic
EUT Type	<input type="checkbox"/> Engineering Sample. <input checked="" type="checkbox"/> Product Sample, <input type="checkbox"/> Mass Product Sample.
Serial Number	N/A
EUT Power Rating	Powered by the notebook

Model Differences

No.	Model Number	Tested With
1	RF-02	<input checked="" type="checkbox"/>
2	TXD03	<input type="checkbox"/>
3	TXD04	<input type="checkbox"/>
4	TXD05	<input type="checkbox"/>
5	TXD06	<input type="checkbox"/>
6	TXD21	<input type="checkbox"/>
7	TXD42	<input type="checkbox"/>
8	TXD48	<input type="checkbox"/>
9	TXD49	<input type="checkbox"/>
10	TXD53	<input type="checkbox"/>
11	TXD66	<input type="checkbox"/>

Note: All models are identical to each other except for model name for marketing purpose.

I/O PORT

I/O PORT TYPES	Model Number	TESTED WITH
1) USB port	1	1

1 TEST METHODOLOGY

1.1. DECISION OF FINAL TEST MODE

The EUT was tested together with the above additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.

The following test mode(s) were scanned during the preliminary test:

Pre-Test Mode		
Mode	Conducted Emission	Mode 1:NORMAL
Emission	Radiated Emission	Mode 1:NORMAL

After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Mode	Conducted Emission	Mode 1:NORMAL
Emission	Radiated Emission	Mode 1:NORMAL

Then, the EUT configuration and cable configuration of the above highest emission mode was chosen for all final test items.

1.2. EUT SYSTEM OPERATION

1. Set up EUT with the relative support equipments.
2. Make sure the EUT worked normally during the test.



2 SETUP OF EQUIPMENT UNDER TEST

2.1. DESCRIPTION OF SUPPORT UNITS

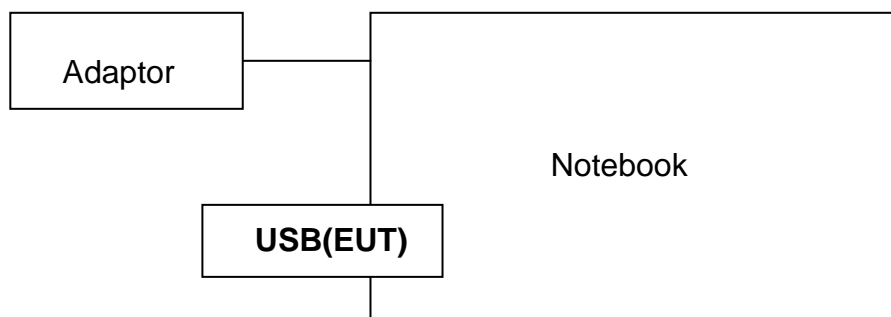
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	Notebook	Satellite L200	N/A	N/A	TOSHIBA	N/A	Unshielded 1.8m

Note:

- 1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

2.2. CONFIGURATION OF SYSTEM UNDER TEST





3 FACILITIES AND ACCREDITATIONS

3.1. FACILITIES

All measurement facilities used to collect the measurement data are located at 1-2/F, DaChong Science&Technology Building, No.28 of Tonggu Road, Nanshan District, ShenZhen.PRC

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

3.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC
Germany	TUV Rheinland
Japan	VCCI
Canada	INDUSTRY CANADA
China	CNAS

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.wsct.org.cn>

3.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency		Uncertainty
Conducted emissions	9kHz~30MHz		+/- 3.59dB
Radiated emissions	Horizontal	30MHz ~ 200MHz	+/- 4.77dB
		200MHz ~1000MHz	+/- 4.93dB
	Vertical	30MHz ~ 200MHz	+/- 5.04dB
		200MHz ~1000MHz	+/- 4.93dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



4 CONDUCTED EMISSION MEASUREMENT

4.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

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 in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
- (3) All emanations 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.

4.2. TEST INSTRUMENTS

Conducted Emission Test Site Shielding Room(743)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100005	06/23/2009
LISN	AFJ	LS16	16010222119	04/02/2009
LISN	Meestec	AN3016	04/10040	04/02/2009

- NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).
2. N.C.R = No Calibration Request.



4.3. TEST PROCEDURES

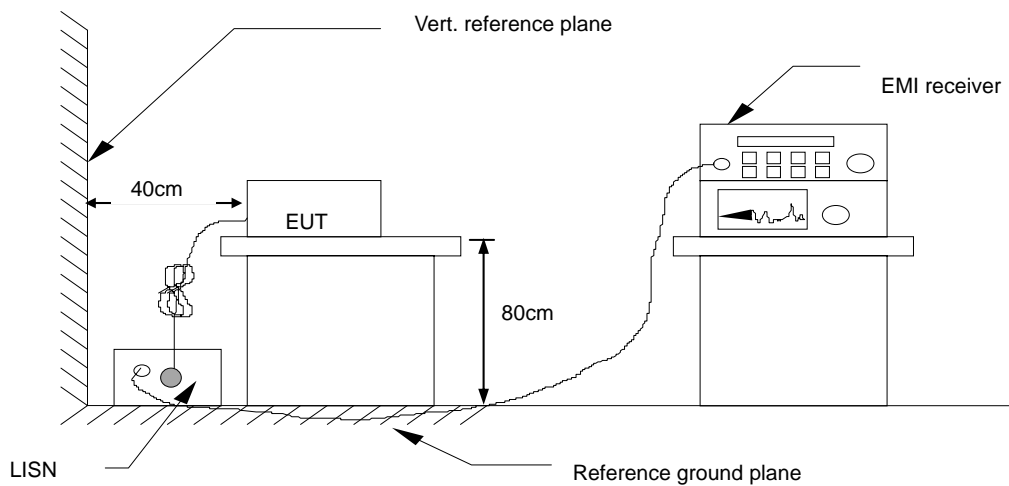
Procedure of Preliminary Test

- The EUT and Support equipment, if needed, was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The EUT received DC5V power from notebook, and adaptor received AC120V/60Hz through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment power received from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

4.4. TEST SETUP



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



4.5. Data Sample:

Freq. (KHz)	Peak Amptd (dBuV)	QP Amptd (dBuV)	Avg Amptd (dBuV)	Q.P. Limit (dBuV)	Average Limit (dBuV)	Margin (dB)	Factor (dB)
x.xx	38.84	32.88	33.26	56.00	46.00	-12.74	10.69

Remark:

1. The measuring frequencies range between 0.15 MHz and 30 MHz.
2. The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.
3. “---” denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.
4. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.

Freq. = Emission frequency in KHz

Factor (dB) = cable loss + Insertion loss of LISN+ Insertion loss of TRANSIENT LIMITER
(The TRANSIENT LIMITER included 10 dB ATTENUATION)

Amptd dBuV= Uncorrected Analyzer/Receiver reading + cable loss + Insertion loss of LISN+ Insertion loss of TRANSIENT LIMITER,
if it > 0.5 dB

Limit dBuV = Limit stated in standard

Margin dB = Reading in reference to limit

Q.P.: =Quasi-Peak

Calculation Formula

Margin (dB) = Amptd (dBuV) – Limit (dBuV)



4.6. TEST RESULTS

Model No.	RF-02	Test Mode	Mode 1
Environmental Conditions	25°C, 56% RH	6dB Bandwidth	10 KHz
Test Result	Pass		

(The chart below shows the highest readings taken from the final data.)

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.484	43.50	40.69	33.59	56.45	46.45	-15.76	-12.86	L1
0.711	42.99	32.47	17.97	56.00	46.00	-23.53	-28.03	L1
1.321	47.40	42.29	30.22	56.00	46.00	-13.71	-15.78	L1
1.871	53.58	47.39	33.50	56.00	46.00	-8.61	-12.50	L1
1.954	51.11	47.62	33.55	56.00	46.00	-8.38	-12.45	L1
3.460	47.06	41.59	26.80	56.00	46.00	-14.41	-19.20	L1
0.444	44.38	36.00	15.78	57.58	47.58	-21.58	-31.80	L2
0.826	44.43	41.24	25.55	56.00	46.00	-14.76	-20.45	L2
1.483	48.89	44.52	31.82	56.00	46.00	-11.48	-14.18	L2
1.882	57.28	42.84	28.99	56.00	46.00	-13.16	-17.01	L2
3.277	47.29	40.53	26.18	56.00	46.00	-15.47	-19.82	L2
13.433	47.91	40.20	31.46	60.00	50.00	-19.80	-18.54	L2

NOTE: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

2. The emission level was or more than 2dB below the Average limit, so no re-check anymore.

5 RADIATED EMISSION MEASUREMENT

5.1. LIMITS OF RADIATED EMISSION MEASUREMENT

Maximum permissible level of Radiated Emission measured at 3 meter

FREQUENCY (MHz)	dBuV/m (At 3m)
	Class B
30~88	40.00
88~216	43.50
216~960	46.00
960~1000	54.00

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

5.2. TEST INSTRUMENTS

966 Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100005	06/23/2009
Pre Amplifier	H.P.	HP8447E	2945A02715	06/15/2009
Bilog Antenna	SUNOL Sciences	JB3	A021907	06/10/2009
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/09/2008
System-Controller	CCS	N/A	N/A	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to International system of unit (SI).

2. N.C.R = No Calibration Request.

5.3. TEST PROCEDURES

Procedure of Preliminary Test

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received DC5V power from notebook, and adaptor received AC120V/60Hz through the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.
- The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The EUT and worse cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

When measuring emissions above 1GHz, the frequencies of maximum emission shall be determined by manually positioning the antenna close to the EUT and by moving the antenna over all sides of the EUT while observing a spectral display. It will be advantageous to have prior knowledge of the frequencies of emissions above 1GHz. If the EUT is a device with dimensions approximately equal to that of the measurement antenna beam width, the measurement antenna shall be aligned with the EUT.



Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.

For the measurement above 1GHz, use the cable, EUT arrangement, and mode of operation determined in the exploratory testing to produce the emission that has the highest amplitude relative to the limit.

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, 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.

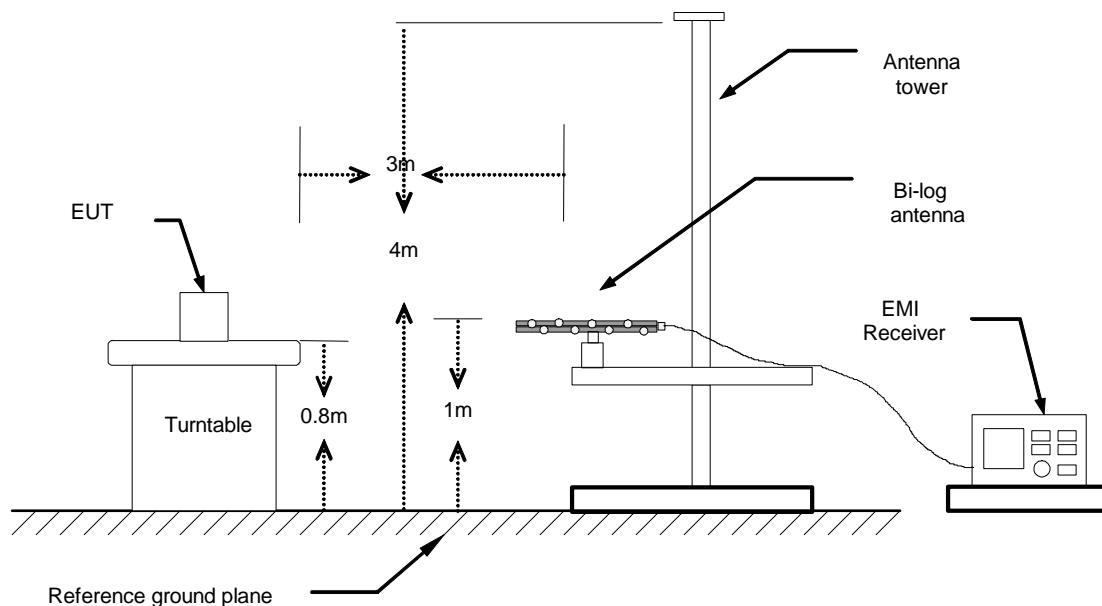
The antenna may have to be higher or lower than the EUT, depending on the EUT's size and mounting height, but the antenna should be restricted to a range of height of from 1m to 4m above the ground or reference ground plane.

If the transmission line for the measurement antenna restricts its range of height and polarization, the steps needed to ensure the correct measurement of the maximum emissions, shall be described in detail in the report of the measurements.

- 1) using the procedures above to measure with peak detector function, if the result comply with the average limit specified by the appropriate regulation, record the EUT arrangement, mode of operation, and cable positions used for final radiated emission measurement , this can be done with either diagrams or photographs.
- 2) Set the detector function of the measuring instrument to average mode, using the procedures above and remeasure only those emissions that complied with the peak limits but exceeded the average limits.

Recorded at least the six highest emissions.

5.4. TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

5.5. Data Sample

Freq. (MHz)	Pk (dBuV/m)	Q.P. (dBuV/m)	Pk Margin (dB)	Q.P. Margin (dB)	Limit (dBuV/m)	Read (dBuV)	C.F (dB)	Height	Deg	Remark
XX.XX	37.03	---	-8.97	---	46.00	40.63	-3.60	100	0	

Freq.	= Emission frequency in MHz
Read	=Uncorrected Analyzer / Receiver Reading
Corr. Factor (dB/m)	= Antenna factor + Cable loss – Amplifier gain
Emiss. Level (dBuV/m)	= Raw reading converted to dBuV/m and C.F added
Limit (dBuV/m)	= Limit stated in standard
Margin (dB)	= Reading in reference to limit
Pk	= Peak Reading
Q.P.	= Quasi-peak Reading

Calculation Formula

Margin (dB) = Emiss. Level (dBuV/m) – Limits (dBuV/m)

Emission Level (dBuV/m) = Raw Data (dBuV) + Corr. Factor (dB)

5.6. TEST RESULTS

Model No.	RF-02	Test Mode	Mode 1
Environmental Conditions	25°C, 56% RH	6dB Bandwidth	120 KHz
Antenna Pole	Vertical / Horizontal	Antenna Distance	3m
Detector Function	Peak / Quasi-peak	Test Result	Pass

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated (30 MHz TO 1000 MHz)							
Freq. (MHz)	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Ant. H/V	Mark
247.681	39.06	-5.80	33.26	46.00	-12.74	V	P
279.043	39.15	-2.89	36.26	46.00	-9.74	V	P
349.250	35.34	-1.85	33.49	46.00	-12.51	V	P
419.108	35.92	0.60	36.52	46.00	-9.48	V	P
495.934	40.93	0.10	41.03	46.00	-4.97	V	P
798.979	34.53	5.71	40.24	46.00	-5.76	V	P
141.929	37.33	-6.23	31.10	43.50	-12.40	H	P
210.048	41.91	-7.25	34.66	43.50	-8.84	H	P
282.985	43.39	-2.90	40.49	46.00	-5.51	H	P
352.943	36.43	-2.80	33.63	46.00	-12.37	H	P
531.963	32.64	1.83	34.47	46.00	-11.53	H	P
798.979	36.23	4.60	40.83	46.00	-5.17	H	P

REMARKS: 1. P= Peak Reading; Q= Quasi-peak Reading A= Average Reading.
 2. The other emission levels were very low against the limit.