

FCC TEST REPORT

REPORT NO.: RF930812L27

MODEL NO.: IRC-TP SY-IRC7

RECEIVED: Aug. 17, 2004

TESTED: Aug. 18 ~ Aug. 23, 2004

APPLICANT: Interlink K K

ADDRESS: 10-7, Higashi-Kanda 2-Chome, Chiyoda-ku,
Tokyo, Japan

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: No. 19, Hwa Ya 2nd Rd., Kueishan, Taoyuan,
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0528
ILAC MRA



No. 2177-01



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1 CERTIFICATION

PRODUCT : Interactive Remote Controller
BRAND NAME : SANYO
MODEL NO : IRC-TP SY-IRC7
APPLICANT : Interlink K K
TESTED: Aug. 18 ~ Aug. 23, 2004
TEST ITEM: Engineering Sample
STANDARDS : FCC Part 15, Subpart C(15.249)
ANSI C63.4-2001

The above equipment have been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Windy Chou , **DATE:** Aug. 26, 2004
(Windy Chou)

TECHNICAL
ACCEPTANCE : Gary Chang , **DATE:** Aug. 26, 2004
Responsible for RF
(Gary Chang)

APPROVED BY : Cody Chang , **DATE:** Aug. 26, 2004
(Cody Chang,
Deputy Manager)



2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	N/A	Power supply is 3Vdc from batteries
15.209 15.249	Radiated Emission Test	PASS	Minimum passing margin is -11.17dB at 4806.00MHz
15.249	Band edge Test	PASS	Meet the requirement of limit

2.1. MEASUREMENT UNCERTAINTY

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

Measurement	Frequency	Uncertainty
Conducted emissions	9k~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.55 dB
	200MHz ~1000MHz	3.58 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB

3 GENERAL INFORMATION

3.1. GENERAL DESCRIPTION OF EUT

PRODUCT	Interactive Remote Controller
MODEL NO.	IRC-TP SY-IRC7
POWER SUPPLY	3Vdc from batteries
MODULATION TYPE	GFSK
CARRIER FREQUENCY OF EACH CHANNEL	2403MHz, 2421MHz, 2446MHz & 2472MHz
NUMBER OF CHANNEL	4
ANTENNA TYPE	1/4 λ monopole antenna with 2.14 dBi antenna gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



3.2. DESCRIPTION OF TEST MODES

Four channels were provided to this EUT.

Channel	Frequency	Channel	Frequency
1	2403MHz	2	2421MHz
3	2446MHz	4	2472MHz

Note: For Radiated Emission Measurement, the channel 1, 3 and 4 were tested individually on the positioned of each 3 axis (X, Y, Z - plane).

3.3. GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.249)

ANSI C63.4-2001

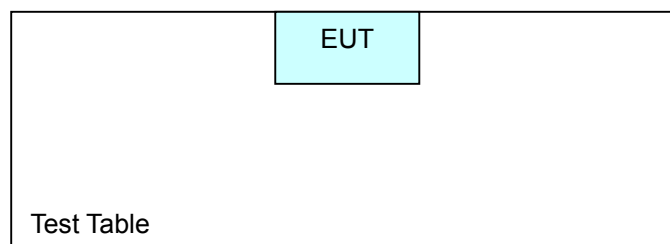
All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4. DESCRIPTION OF SUPPORT UNITS

NA

3.5. CONFIGURATION OF SYSTEM UNDER TEST





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 15.249 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 (dBuV/m)	
	Peak	Average
2400 – 2483.5	114	94

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Other Frequencies (MHz)	Field Strength of Fundamental	
	uV/meter	dBuV/meter
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, 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.



4.2.2 TEST INSTRUMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	100033	Jun, 08, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Dec. 15, 2004
BILOG Antenna SCHWARZBECK	VULB9168	9168-153	Feb. 03, 2005
HORN Antenna SCHWARZBECK	9120D	9120D-408	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170243	Feb. 23, 2005
Preamplifier Agilent	8447D	2944A10633	Jan. 15, 2005
Preamplifier Agilent	8449B	3008A01964	Jan. 27, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218183/4	Mar. 05, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218195/4	Mar. 05, 2005
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 2.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC4924-3.

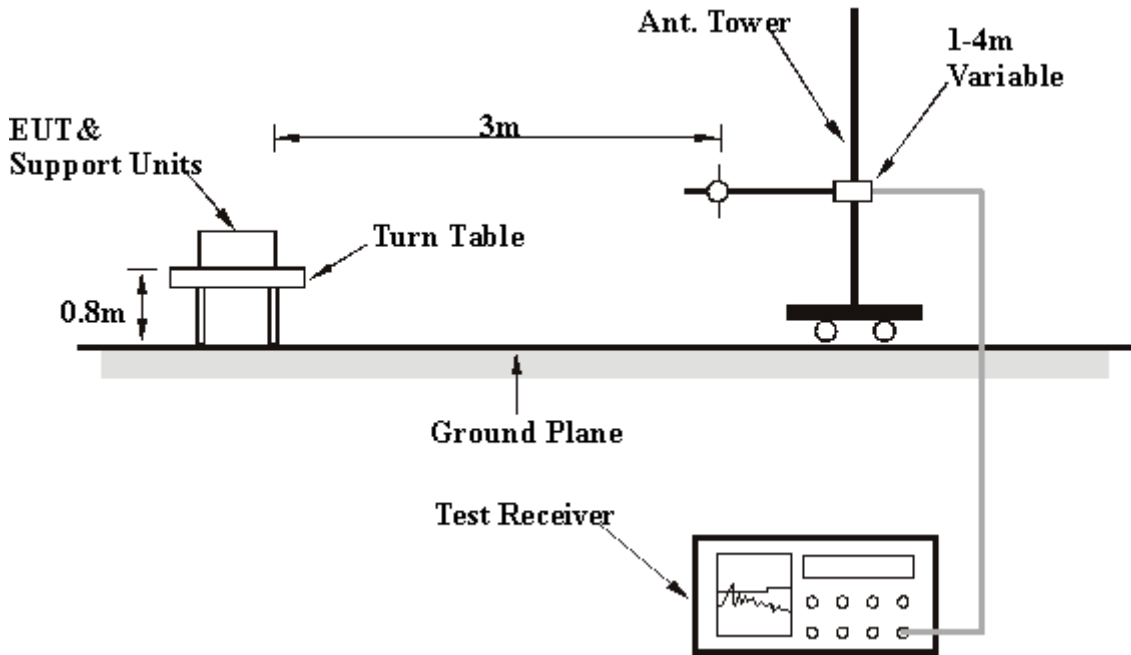
4.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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.

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

EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
FREQUENCY RANGE	30MHz ~ 1GHz	AXIS	X
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	TESTED BY	Long Chen

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)	Correction Factor (dB/m)
1	535.41	20.89 QP	46.00	-25.11	3.00 H	169	1.40	19.49
2	605.39	22.08 QP	46.00	-23.92	2.00 H	145	0.75	21.32
3	679.26	23.66 QP	46.00	-22.34	3.00 H	118	1.39	22.27
4	757.01	24.31 QP	46.00	-21.69	1.00 H	13	0.61	23.69
5	795.89	24.97 QP	46.00	-21.03	2.00 H	295	1.20	23.76
6	842.55	24.98 QP	46.00	-21.02	4.00 H	148	0.80	24.18
7	875.59	26.07 QP	46.00	-19.93	2.00 H	202	1.31	24.76

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) = Antenna Factor (dB) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
FREQUENCY RANGE	30MHz ~ 1GHz	AXIS	X
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	TESTED BY	Long Chen

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	578.18	21.21 QP	46.00	-24.79	1.00 V	184	0.59	20.62
2	619.00	23.74 QP	46.00	-22.26	1.00 V	117	2.22	21.51
3	679.26	23.57 QP	46.00	-22.43	1.00 V	301	1.30	22.27
4	714.25	23.35 QP	46.00	-22.65	1.00 V	34	0.51	22.84
5	755.07	24.14 QP	46.00	-21.86	1.00 V	355	0.45	23.69
6	805.61	24.33 QP	46.00	-21.67	2.00 V	109	0.51	23.82
7	840.60	25.23 QP	46.00	-20.77	1.00 V	322	1.07	24.16

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) = Antenna Factor (dB) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
FREQUENCY RANGE	30MHz ~ 1GHz	AXIS	Y
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	TESTED BY	Long Chen

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)	Correction Factor (dB/m)
1	535.41	20.61 QP	46.00	-25.39	1.00 H	79	1.12	19.49
2	609.28	23.39 QP	46.00	-22.61	3.00 H	79	2.02	21.38
3	663.71	22.48 QP	46.00	-23.52	1.00 H	211	0.38	22.10
4	727.86	24.15 QP	46.00	-21.85	1.00 H	202	0.99	23.16
5	758.96	23.98 QP	46.00	-22.02	2.00 H	172	0.28	23.70
6	821.16	24.88 QP	46.00	-21.12	2.00 H	337	0.90	23.97
7	861.98	25.22 QP	46.00	-20.78	2.00 H	232	0.73	24.49

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) = Antenna Factor (dB) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
FREQUENCY RANGE	30MHz ~ 1GHz	AXIS	Y
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	TESTED BY	Long Chen

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	584.01	22.43 QP	46.00	-23.57	1.00 V	163	1.64	20.79
2	653.99	21.66 QP	46.00	-24.34	2.00 V	73	-0.33	21.99
3	760.90	23.94 QP	46.00	-22.06	1.00 V	160	0.24	23.70
4	811.44	24.44 QP	46.00	-21.56	1.00 V	142	0.56	23.88
5	856.15	24.88 QP	46.00	-21.12	1.00 V	268	0.51	24.37
6	896.97	25.38 QP	46.00	-20.62	1.00 V	286	0.20	25.18

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) = Antenna Factor (dB) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
FREQUENCY RANGE	30MHz ~ 1GHz	AXIS	Z
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	TESTED BY	Long Chen

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)	Correction Factor (dB/m)
1	716.19	24.11 QP	46.00	-21.89	1.00 H	277	1.22	22.89
2	782.28	24.16 QP	46.00	-21.84	1.00 H	328	0.42	23.74
3	828.94	25.02 QP	46.00	-20.98	1.00 H	169	0.97	24.05
4	861.98	24.43 QP	46.00	-21.57	1.00 H	103	-0.06	24.49
5	896.97	25.35 QP	46.00	-20.65	1.00 H	232	0.17	25.18
6	945.57	26.33 QP	46.00	-19.67	1.00 H	79	0.56	25.77

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) = Antenna Factor (dB) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
FREQUENCY RANGE	30MHz ~ 1GHz	AXIS	Z
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	TESTED BY	Long Chen

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	506.25	20.66 QP	46.00	-25.34	2.00 V	76	1.81	18.85
2	576.23	22.95 QP	46.00	-23.05	1.00 V	106	2.39	20.57
3	611.22	24.11 QP	46.00	-21.89	2.00 V	340	2.71	21.40
4	753.13	24.74 QP	46.00	-21.26	2.00 V	283	1.06	23.69
5	784.23	24.29 QP	46.00	-21.71	2.00 V	250	0.55	23.74
6	819.22	25.26 QP	46.00	-20.74	2.00 V	214	1.31	23.95

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) = Antenna Factor (dB) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	1	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	X
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	2382.60	59.27 PK	74.00	-14.73	1.00 H	248	27.68	31.59
1	2382.60	42.27 AV	54.00	-11.73	1.00 H	248	10.65	31.59
2	*2403.00	88.38 PK	114.00	-25.62	1.09 H	156	56.73	31.65
2	*2403.00	64.95 AV	94.00	-29.05	1.09 H	156	33.30	31.65
3	4806.00	62.07 PK	74.00	-11.93	1.45 H	108	24.52	37.55
3	4806.00	38.64 AV	54.00	-15.36	1.45 H	108	1.09	37.55
4	7209.00	56.09 PK	74.00	-17.91	1.22 H	38	12.02	44.07
4	7209.00	32.66 AV	54.00	-21.34	1.22 H	38	-11.41	44.07

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2382.60	51.24 PK	74.00	-22.76	1.48 V	184	19.65	31.59
1	2382.60	32.24 AV	54.00	-19.76	1.48 V	184	0.65	31.59
2	*2403.00	81.53 PK	114.00	-32.47	2.04 V	196	49.88	31.65
2	*2403.00	58.10 AV	94.00	-35.90	2.04 V	196	26.45	31.65
3	4806.00	59.00 PK	74.00	-15.00	1.24 V	20	21.45	37.55
3	4806.00	35.57 AV	54.00	-18.43	1.24 V	20	-1.98	37.55
4	7209.00	51.58 PK	74.00	-22.42	1.24 V	192	7.51	44.07
4	7209.00	28.15 AV	54.00	-25.85	1.24 V	192	-15.92	44.07

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * ” : Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	1	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	Y
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	2382.60	54.23 PK	74.00	-19.77	1.12 H	95	22.64	31.59
1	2382.60	37.23 AV	54.00	-16.77	1.12 H	95	-0.79	31.59
2	*2403.00	84.55 PK	114.00	-29.45	1.08 H	148	52.90	31.65
2	*2403.00	61.12 AV	94.00	-32.88	1.08 H	148	29.47	31.65
3	4806.00	60.24 PK	74.00	-13.76	1.00 H	292	22.69	37.55
3	4806.00	36.81 AV	54.00	-17.19	1.00 H	292	-0.94	37.55
4	7209.00	57.32 PK	74.00	-16.68	1.22 H	20	13.25	44.07
4	7209.00	33.89 AV	54.00	-20.11	1.22 H	20	-10.18	44.07

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2382.60	47.48 PK	74.00	-26.52	1.22 V	25	15.89	31.59
2	*2403.00	81.23 PK	114.00	-32.77	1.19 V	192	49.58	31.65
2	*2403.00	57.80 AV	94.00	-36.20	1.19 V	192	26.15	31.65
3	4806.00	61.81 PK	74.00	-12.19	1.21 V	231	24.26	37.55
3	4806.00	38.38 AV	54.00	-15.62	1.21 V	231	0.83	37.55
4	7209.00	58.39 PK	74.00	-15.61	1.02 V	0	14.32	44.07
4	7209.00	34.96 AV	54.00	-19.04	1.02 V	0	-9.11	44.07

REMARKS:

- Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
- Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level – Limit value.
- * * : Fundamental frequency
- The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	1	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	Z
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	2382.60	45.17 PK	74.00	-28.83	1.42 H	235	13.58	31.59
2	*2403.00	75.93 PK	114.00	-32.71	1.14 H	284	44.28	31.65
2	*2403.00	57.86 AV	94.00	-36.14	1.14 H	284	26.21	31.65
3	4806.00	60.05 PK	74.00	-13.95	1.08 H	270	22.50	37.55
3	4806.00	36.62 AV	54.00	-17.38	1.08 H	270	-0.93	37.55
4	7209.00	56.88 PK	74.00	-17.12	1.53 H	56	12.81	44.07
4	7209.00	33.45 AV	54.00	-20.55	1.53 H	56	-10.62	44.07

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2382.60	51.14 PK	74.00	-22.86	1.22 V	18	19.55	31.59
1	2382.60	34.17 AV	54.00	-19.83	1.22 V	18	2.58	31.59
2	*2403.00	81.29 PK	114.00	-38.07	1.27 V	19	49.64	31.65
2	*2403.00	52.50 AV	94.00	-41.50	1.27 V	19	20.85	31.65
3	4806.00	62.83 PK	74.00	-11.17	1.07 V	0	25.28	37.55
3	4806.00	39.40 AV	54.00	-14.60	1.07 V	0	1.85	37.55
4	7209.00	55.32 PK	74.00	-18.68	1.00 V	15	11.25	44.07
4	7209.00	31.89 AV	54.00	-22.11	1.00 V	15	-12.18	44.07

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	3	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	X
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	*2446.00	88.30 PK	114.00	-35.70	1.04 H	156	56.39	31.91
1	*2446.00	64.87 AV	94.00	-29.13	1.04 H	156	32.96	31.91
2	4892.00	61.41 PK	74.00	-12.59	1.00 H	184	23.72	37.69
2	4892.00	37.98 AV	54.00	-16.02	1.00 H	184	0.29	37.69
3	7338.00	56.37 PK	74.00	-17.63	1.00 H	340	11.95	44.42
3	7338.00	32.94 AV	54.00	-21.06	1.00 H	340	-11.48	44.42

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2446.00	80.77 PK	114.00	-33.23	2.01 V	188	48.86	31.91
1	*2446.00	57.34 AV	94.00	-36.66	2.01 V	188	25.43	31.91
2	4892.00	59.10 PK	74.00	-14.90	1.18 V	37	21.42	37.69
2	4892.00	35.67 AV	54.00	-18.33	1.18 V	37	-2.02	37.69
3	7338.00	54.50 PK	74.00	-19.50	1.24 V	174	10.08	44.42
3	7338.00	31.07 AV	54.00	-22.93	1.24 V	174	-13.35	44.42

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	3	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	Y
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	*2446.00	83.36 PK	114.00	-30.64	1.36 H	136	51.45	31.91
1	*2446.00	59.93 AV	94.00	-34.07	1.36 H	136	28.02	31.91
2	4892.00	58.49 PK	74.00	-15.51	1.22 H	15	20.80	37.69
2	4892.00	35.06 AV	54.00	-18.94	1.22 H	15	-2.63	37.69
3	7338.00	55.32 PK	74.00	-18.68	1.00 H	219	10.90	44.42
3	7338.00	31.89 AV	54.00	-22.11	1.00 H	219	-12.53	44.42

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2446.00	80.12 PK	114.00	-33.88	1.18 V	193	48.21	31.91
1	*2446.00	56.69 AV	94.00	-37.31	1.18 V	193	24.78	31.91
2	4892.00	60.92 PK	74.00	-13.08	1.15 V	241	23.23	37.69
2	4892.00	37.49 AV	54.00	-16.51	1.15 V	241	-0.20	37.69
3	7338.00	57.92 PK	74.00	-16.08	1.00 V	358	13.50	44.42
3	7338.00	34.49 AV	54.00	-19.51	1.00 V	358	-9.93	44.42

REMARKS:

- Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
- Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level – Limit value.
- * * : Fundamental frequency
- The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	3	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	Z
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	*2446.00	75.84 PK	114.00	-38.46	1.11 H	280	43.93	31.91
1	*2446.00	52.41 AV	94.00	-41.57	1.11 H	280	20.49	31.91
2	4892.00	59.47 PK	74.00	-14.53	1.02 H	264	21.78	37.69
2	4892.00	36.04 AV	54.00	-17.96	1.02 H	264	-1.65	37.69
3	7338.00	56.28 PK	74.00	-17.72	1.45 H	59	11.86	44.42
3	7338.00	32.85 AV	54.00	-21.15	1.45 H	59	-11.57	44.42

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2446.00	80.23 PK	114.00	-32.77	1.20 V	309	48.32	31.91
1	*2446.00	56.80 AV	94.00	-37.20	1.20 V	309	24.89	31.91
2	4892.00	61.26 PK	74.00	-12.74	1.05 V	0	23.57	37.69
2	4892.00	37.83 AV	54.00	-16.17	1.05 V	0	0.14	37.69
3	7338.00	57.39 PK	74.00	-16.61	1.12 V	20	12.97	44.42
3	7338.00	33.96 AV	54.00	-20.04	1.12 V	20	-10.46	44.42

REMARKS:

- Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
- Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
- The other emission levels were very low against the limit.
- Margin value = Emission level – Limit value.
- * * : Fundamental frequency
- The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	4	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	X
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	*2472.00	87.92 PK	114.00	-26.08	1.12 H	159	55.86	32.06
1	*2472.00	64.49 AV	94.00	-29.51	1.12 H	159	32.43	32.06
2	2498.70	59.14 PK	74.00	-14.86	1.32 H	169	26.92	32.22
2	2498.70	42.14 AV	54.00	-11.86	1.32 H	169	3.49	32.22
3	4944.00	60.19 PK	74.00	-13.81	1.00 H	186	22.41	37.78
3	4944.00	36.76 AV	54.00	-17.24	1.00 H	186	-1.02	37.78
4	7416.00	57.27 PK	74.00	-16.73	1.34 H	0	12.64	44.62
4	7416.00	33.84 AV	54.00	-20.16	1.34 H	0	-10.78	44.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	81.60 PK	114.00	-32.94	1.96 V	186	49.54	32.06
1	*2472.00	58.17 AV	94.00	-35.83	1.96 V	186	26.11	32.06
2	2498.70	51.24 PK	74.00	-22.76	1.00 V	234	19.02	32.22
2	2498.70	32.24 AV	54.00	-19.76	1.00 V	234	0.02	32.22
3	4944.00	58.29 PK	74.00	-15.71	1.00 V	34	20.51	37.78
3	4944.00	34.86 AV	54.00	-19.14	1.00 V	34	-2.92	37.78
4	7416.00	54.35 PK	74.00	-19.65	1.08 V	228	9.73	44.62
4	7416.00	30.92 AV	54.00	-23.08	1.08 V	228	-13.70	44.62

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	4	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	Y
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	*2472.00	83.81 PK	114.00	-30.17	1.36 H	142	51.75	32.06
1	*2472.00	60.58 AV	94.00	-33.62	1.36 H	142	28.52	32.06
2	2498.70	54.14 PK	74.00	-19.86	1.18 H	249	21.92	32.22
2	2498.70	37.14 AV	54.00	-20.14	1.18 H	249	4.92	32.22
3	4944.00	59.18 PK	74.00	-14.82	1.00 H	22	21.40	37.78
3	4944.00	35.75 AV	54.00	-18.25	1.00 H	22	-2.03	37.78
4	7416.00	56.44 PK	74.00	-17.56	1.00 H	262	11.81	44.62
4	7416.00	33.01 AV	54.00	-20.99	1.00 H	262	-11.61	44.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	80.83 PK	114.00	-33.17	1.11 V	175	48.77	32.06
1	*2472.00	57.40 AV	94.00	-36.60	1.11 V	175	25.34	32.06
2	2498.70	47.23 PK	74.00	-26.77	1.40 V	17	15.01	32.22
3	4944.00	61.19 PK	74.00	-12.81	1.11 V	175	23.41	37.78
3	4944.00	37.76 AV	54.00	-16.24	1.11 V	175	-0.02	37.78
4	7416.00	58.70 PK	74.00	-15.30	1.00 V	0	14.07	44.62
4	7416.00	35.27 AV	54.00	-18.73	1.00 V	0	-9.35	44.62

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty



EUT	Interactive Remote Controller	MODEL	IRC-TP SY-IRC7
CHANNEL	4	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER	3Vdc	FREQUENCY RANGE	1~25 GHz
ENVIRONMENTAL CONDITIONS	24 deg. C, 64% RH, 991 hPa	AXIS	Z
TESTED BY	Steven Lu		

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)	Correction Factor (dB/m)
1	*2472.00	76.23 PK	114.00	-37.77	1.14 H	281	44.17	32.06
1	*2472.00	52.80 AV	94.00	-41.20	1.14 H	281	20.74	32.06
3	4944.00	60.04 PK	74.00	-13.96	1.14 H	264	22.26	37.78
3	4944.00	36.61 AV	54.00	-17.39	1.14 H	264	-1.17	37.78
4	7416.00	57.25 PK	74.00	-16.75	1.00 H	0	12.62	44.62
4	7416.00	33.82 AV	54.00	-20.18	1.00 H	0	-10.80	44.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

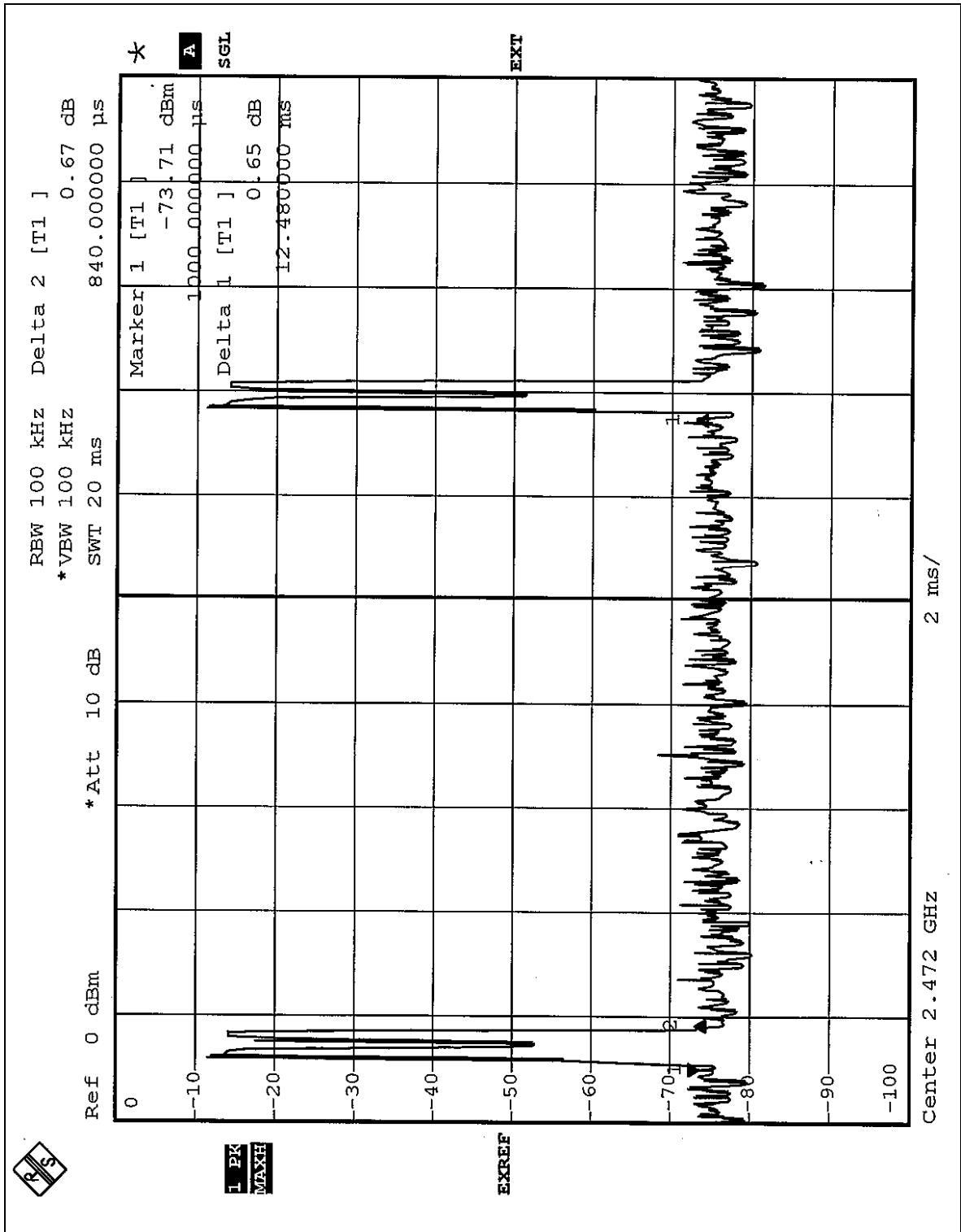
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	80.64 PK	114.00	-33.64	1.00 V	342	48.58	32.06
1	*2472.00	57.21 AV	94.00	-36.77	1.00 V	342	25.15	32.06
2	2498.70	50.42 PK	74.00	-23.58	1.12 V	28	18.20	32.22
2	2498.70	33.42 AV	54.00	-20.58	1.12 V	28	1.20	32.22
3	4944.00	61.75 PK	74.00	-12.25	1.14 V	3	23.97	37.78
3	4944.00	38.32 AV	54.00	-15.68	1.14 V	3	0.54	37.78
4	7416.00	55.91 PK	74.00	-18.09	1.24 V	336	11.28	44.62
4	7416.00	32.48 AV	54.00	-21.52	1.24 V	336	-12.14	44.62

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle)
Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log \frac{0.84\text{ms}}{12.48\text{ms}} = -23.43\text{dB}$$

please see page 26 for plotted duty





4.3 BAND EDGES MEASUREMENT

4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Emissions 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 15.209, whichever is the lesser attenuation.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTE: 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 connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

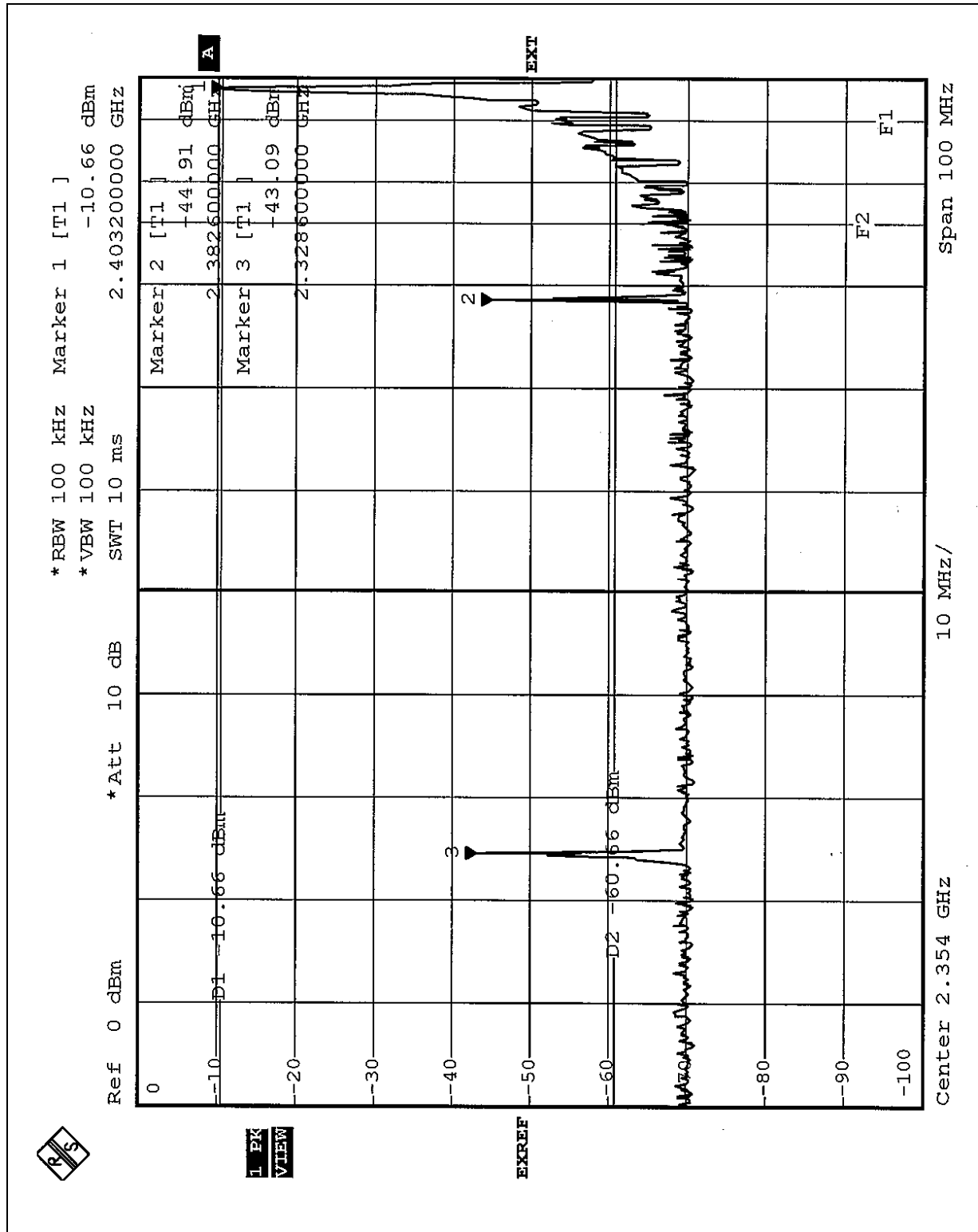
4.3.4 EUT OPERATING CONDITION

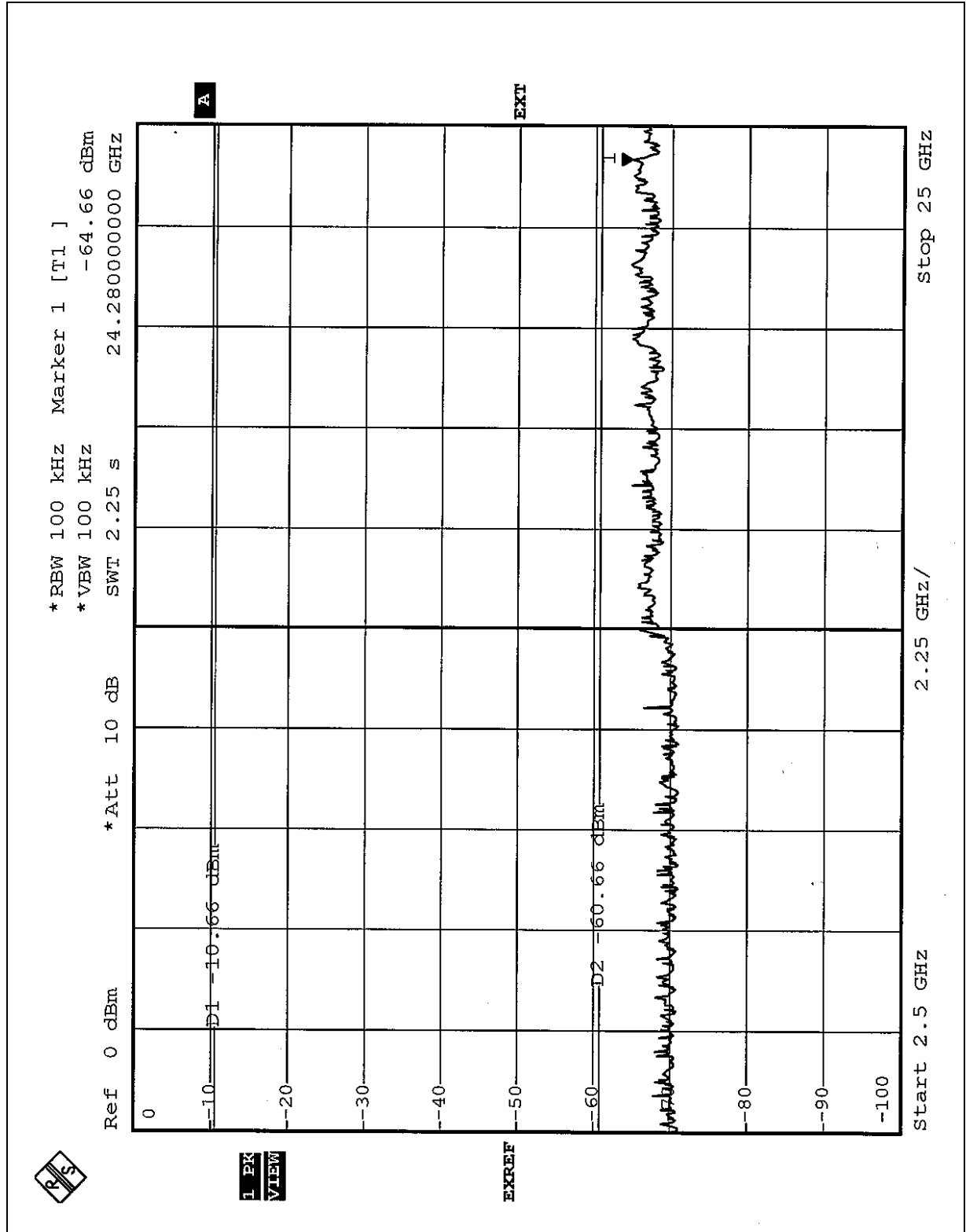
Same as Item 4.1.6

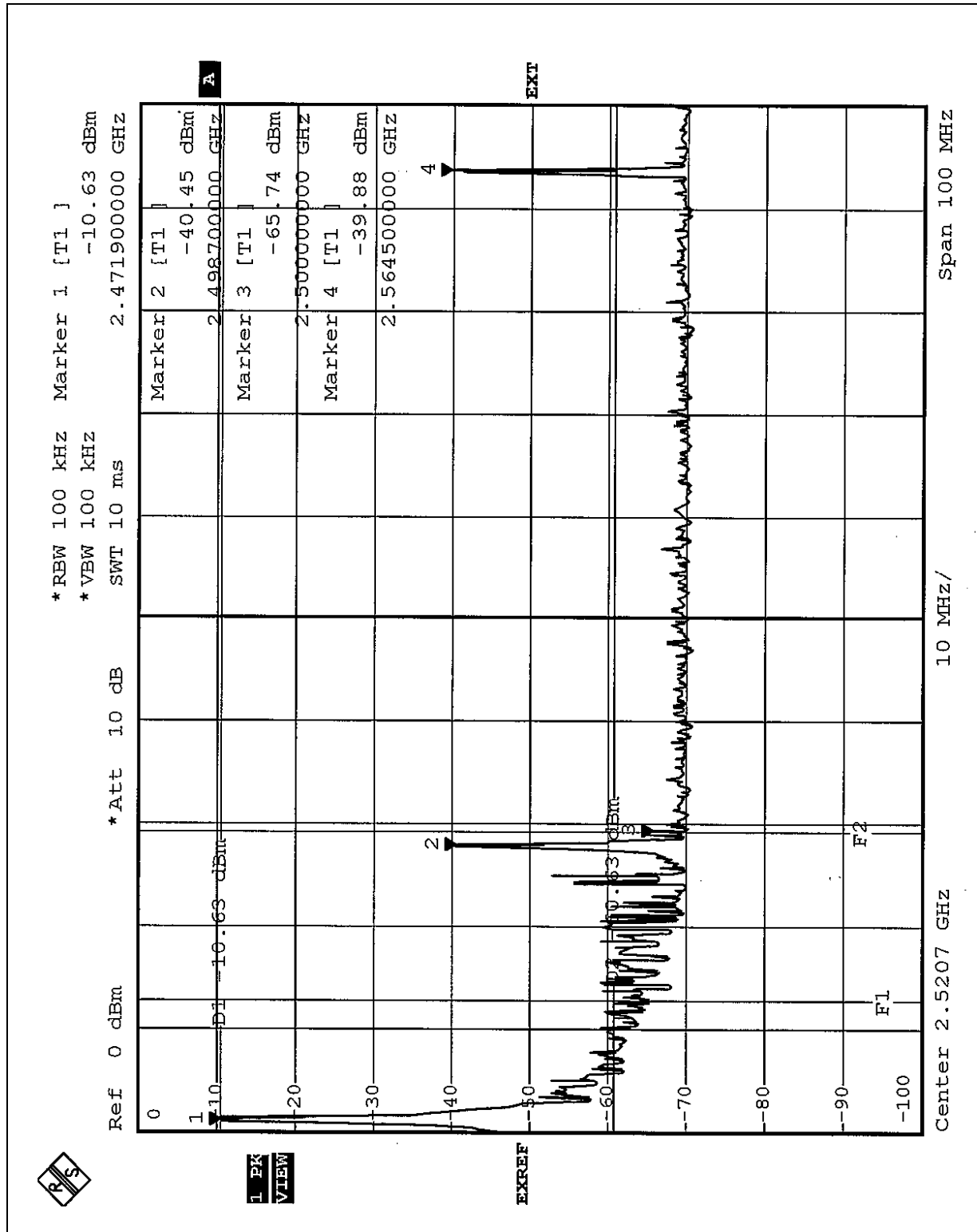
4.3.5 TEST RESULTS

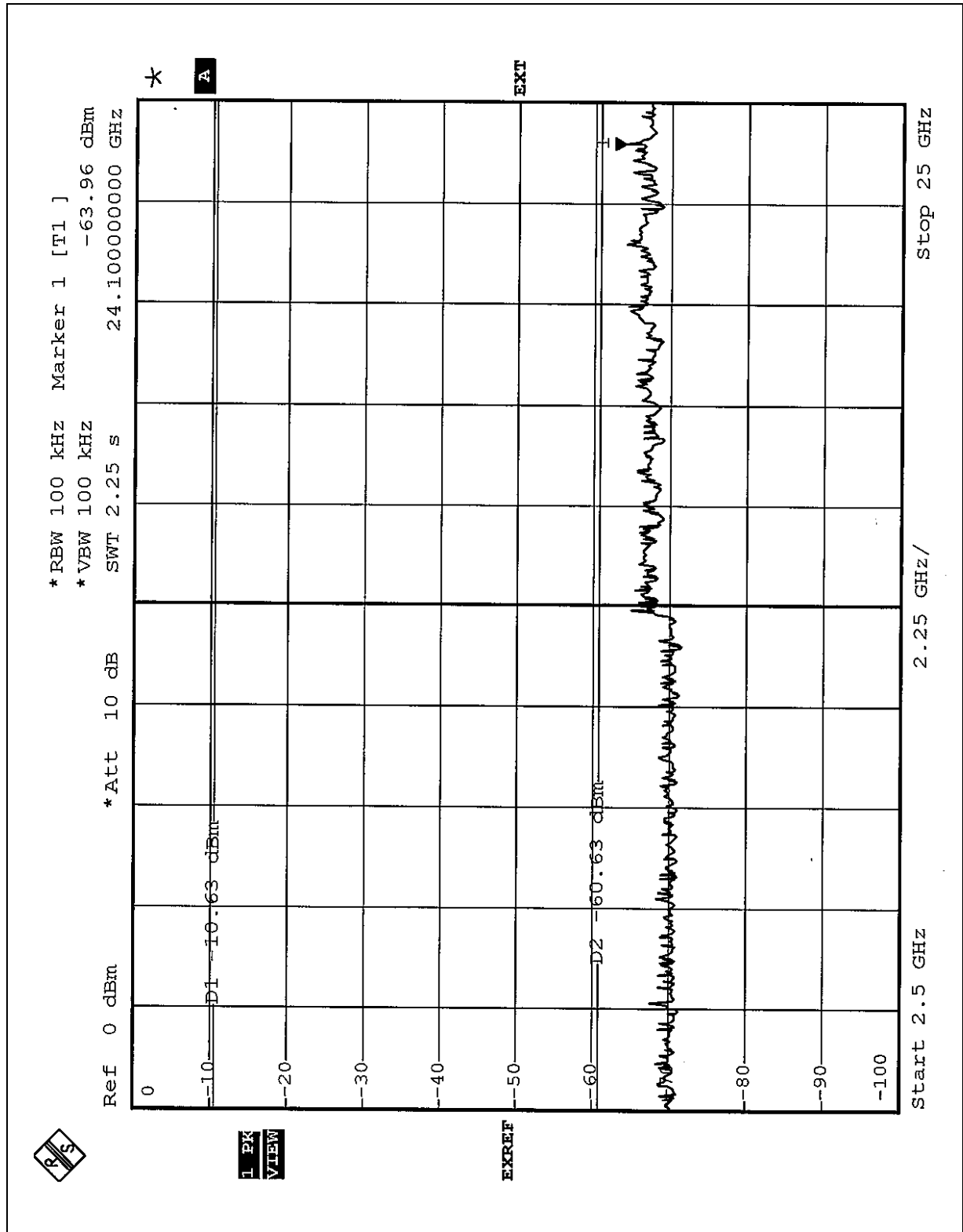
The band edge emission plot on the following 1 ~ 2 pages show 32.43dB delta between carrier maximum power and local maximum emission in restrict band (2.3286GHz). The emission of carrier strength list in the test result of channel 1 is 64.95dBuV/m, so the maximum field strength in restrict band is $64.95 - 32.43 = 32.52$ dBuV/m which is under 54dBuV/m limit.

The band edge emission plot on the following 3 ~ 4 pages show 29.82dB delta between carrier maximum power and local maximum emission in restrict band (2.4987GHz). The emission of carrier strength list in the test result of channel 4 is 64.49dBuV/m, so the maximum field strength in restrict band is $64.49 - 29.82 = 34.67$ dBuV/m which is under 54dBuV/m limit.



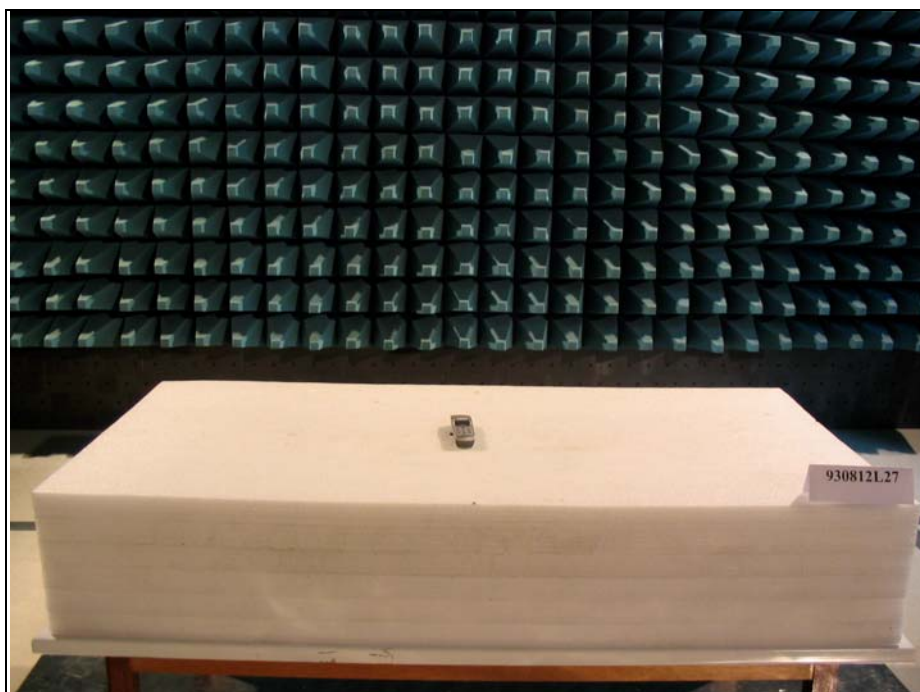
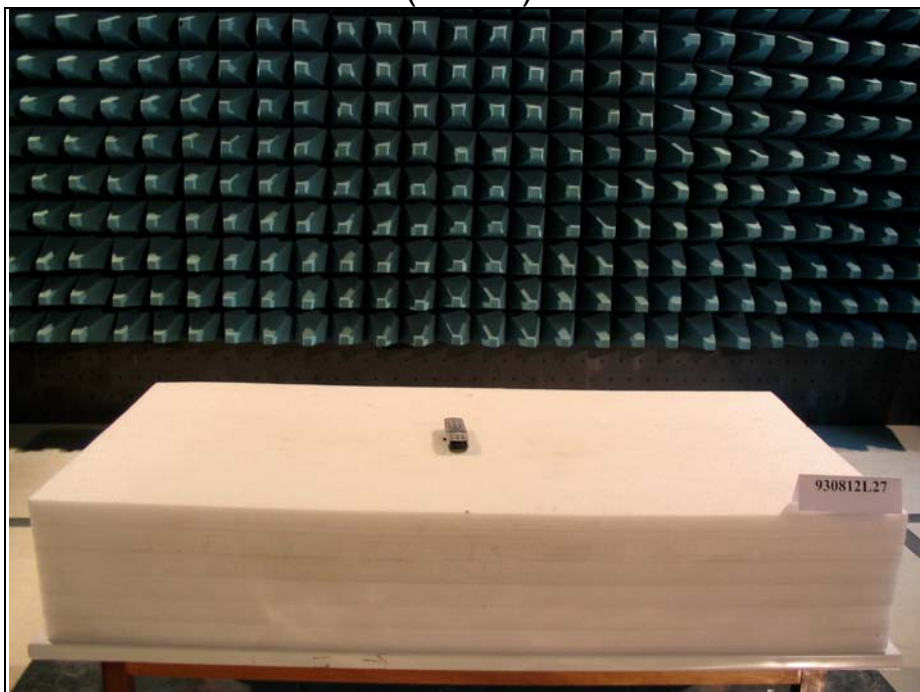




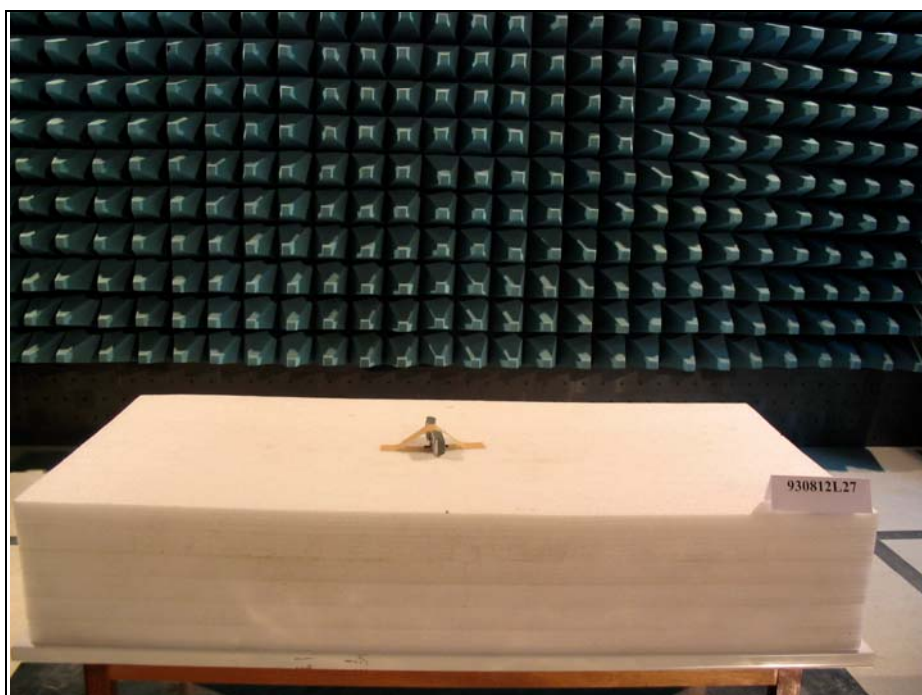
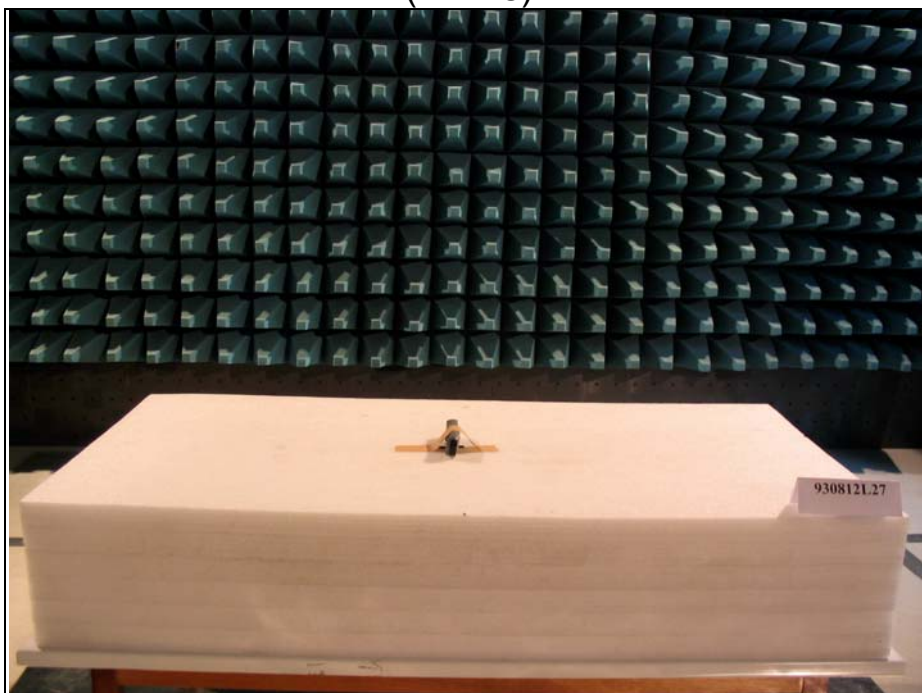


5 PHOTOGRAPHS OF THE TEST CONFIGURATION

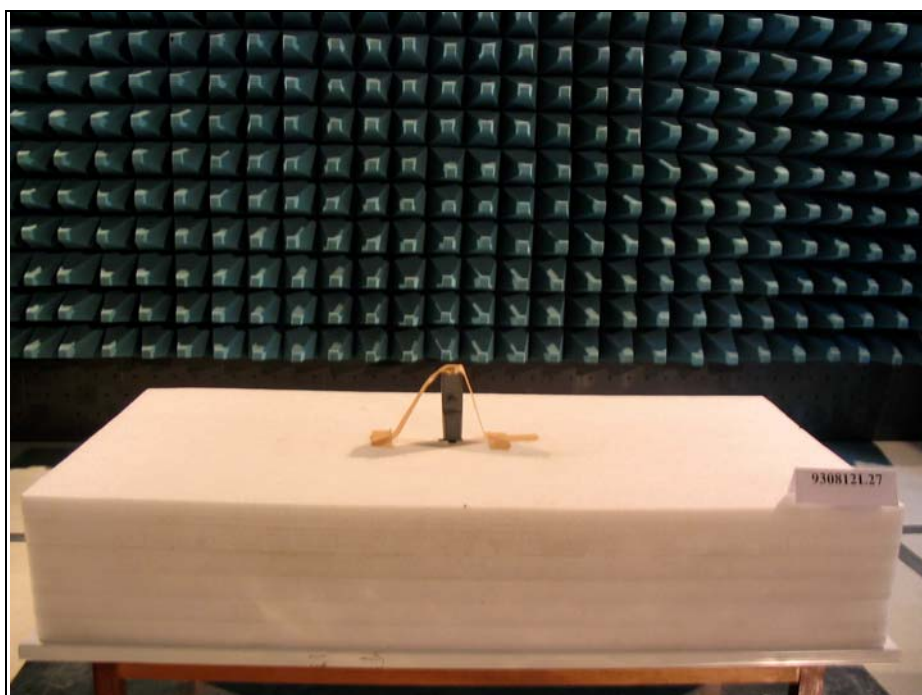
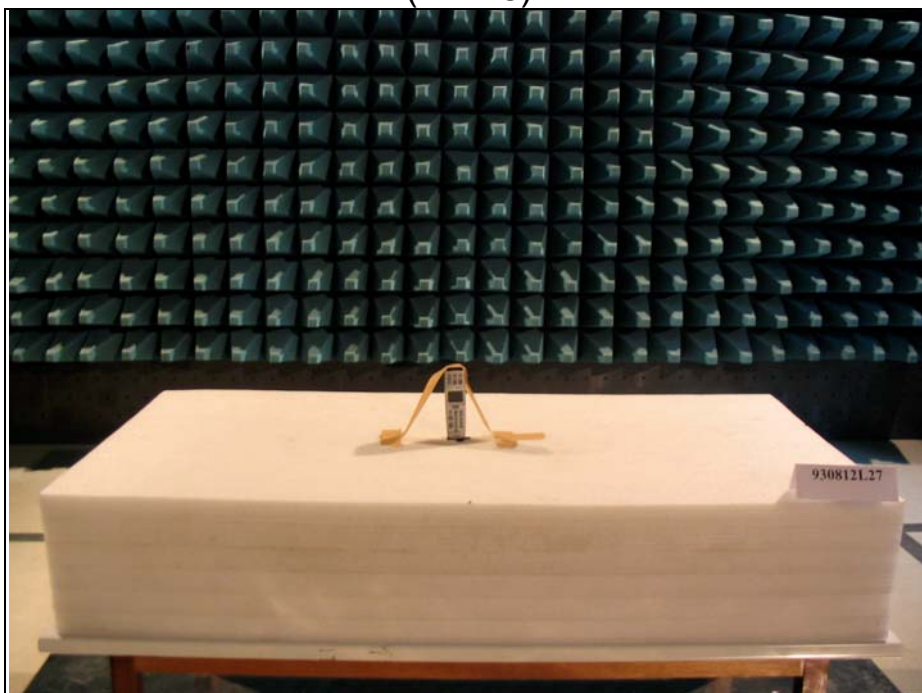
RADIATED EMISSION TEST (X Axis)



(Y Axis)



(Z Axis)





6 INFORMATION ON THE TESTING LABORATORIES

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

USA	FCC, NVLAP, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

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.
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The address and road map of all our labs can be found in our web site also.