



## **5.6 Conducted Emission Measurement**

### **5.6.1 Measuring Instruments**

As described in chapter 6 of this test Report.

### **5.6.2 Test Procedures**

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of the line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

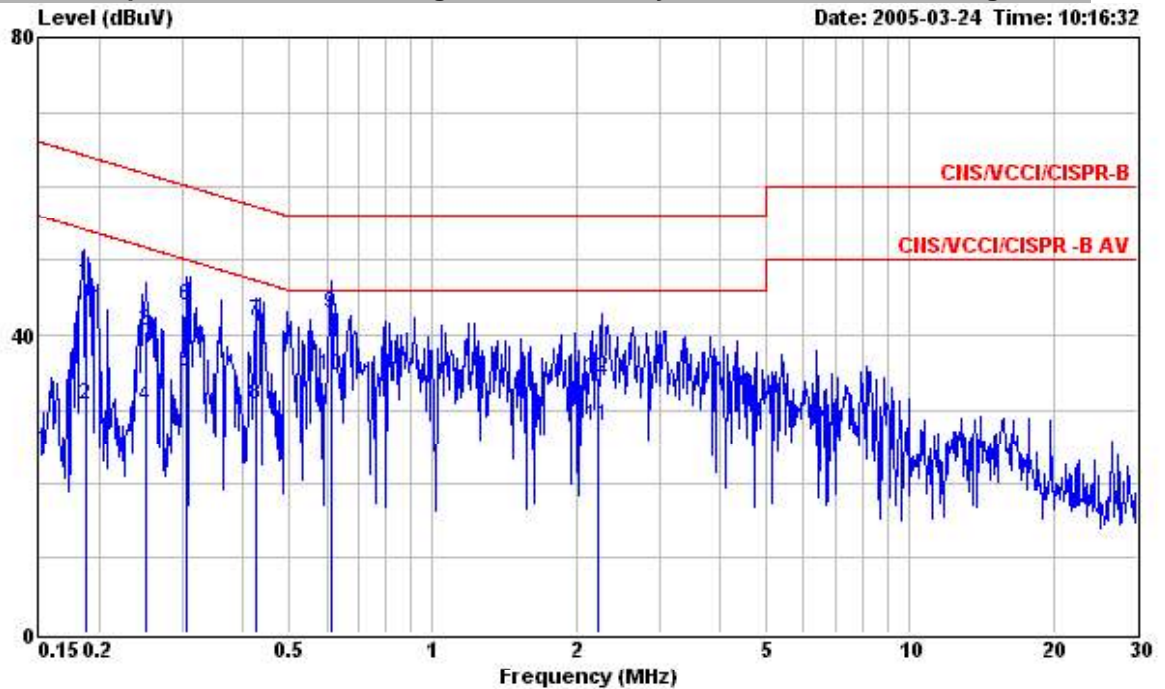


## 5.6.3 Test Data

## 5.4.1 Frequency Range of Test : 150kHz to 30 MHz

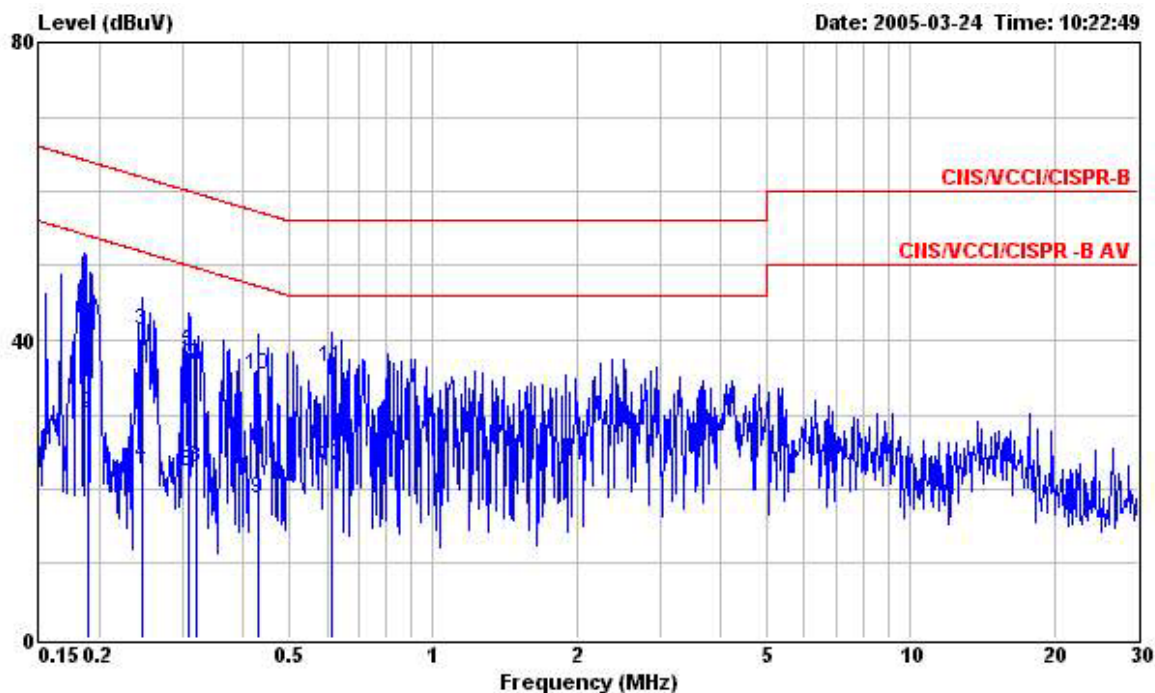
- Test Mode : Mode 1
- Temperature : 26°C
- Relative Humidity : 53%

The test that passed at minimum margin was marked by the frame in the following table.




Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE  
 EUT : WLAN bg AP  
 Power : 120Vac/50Hz  
 Model : FD 532118  
 Memo : LINK MODE  
 Adapter : DVE

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.188	47.07	-17.07	64.14	46.93	0.10	0.04	QP
2	0.188	30.63	-23.51	54.14	30.49	0.10	0.04	Average
3	0.250	40.60	-21.15	61.75	40.47	0.10	0.03	QP
4	0.250	30.47	-21.28	51.75	30.34	0.10	0.03	Average
5	0.306	35.14	-14.95	50.09	35.01	0.10	0.03	Average
6	0.306	43.92	-16.17	60.09	43.79	0.10	0.03	QP
7	0.428	41.91	-15.38	57.29	41.79	0.10	0.02	QP
8	0.428	30.52	-16.77	47.29	30.40	0.10	0.02	Average
9	0.611	42.85	-13.15	56.00	42.73	0.10	0.02	QP
10	0.611	34.64	-11.36	46.00	34.52	0.10	0.02	Average
11	2.230	27.66	-18.34	46.00	27.48	0.10	0.08	Average
12	2.230	34.35	-21.65	56.00	34.17	0.10	0.08	QP



Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL  
 EUT : WLAN bg AP  
 Power : 120Vac/50Hz  
 Model : FD 532118  
 Memo : LINK MODE  
 Adapter : DVE

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.190	45.17	-18.88	64.05	45.03	0.10	0.04	QP
2	0.190	30.23	-23.82	54.05	30.09	0.10	0.04	Average
3	0.247	41.33	-20.53	61.86	41.20	0.10	0.03	QP
4	0.247	23.48	-28.38	51.86	23.35	0.10	0.03	Average
5	0.308	38.56	-21.46	60.02	38.43	0.10	0.03	QP
6	0.308	22.39	-27.63	50.02	22.26	0.10	0.03	Average
7	0.319	36.68	-23.06	59.74	36.55	0.10	0.03	QP
8	0.319	22.98	-26.76	49.74	22.85	0.10	0.03	Average
9	0.431	18.83	-28.40	47.23	18.71	0.10	0.02	Average
10	0.431	35.29	-21.94	57.23	35.17	0.10	0.02	QP
11	0.611	36.34	-19.66	56.00	36.22	0.10	0.02	QP
12	0.611	23.07	-22.93	46.00	22.95	0.10	0.02	Average

Test Engineer : 

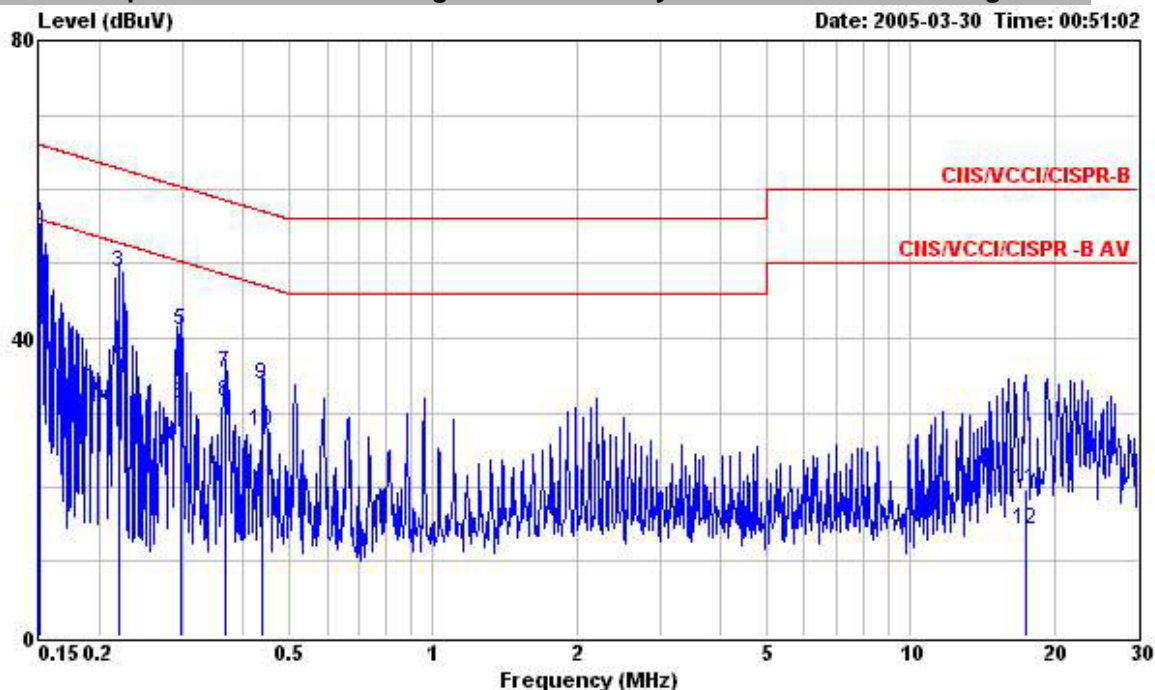
Jay



## 5.4.2 Frequency Range of Test : 150kHz to 30 MHz

- Test Mode : Mode 2
- Temperature : 26°C
- Relative Humidity : 53%

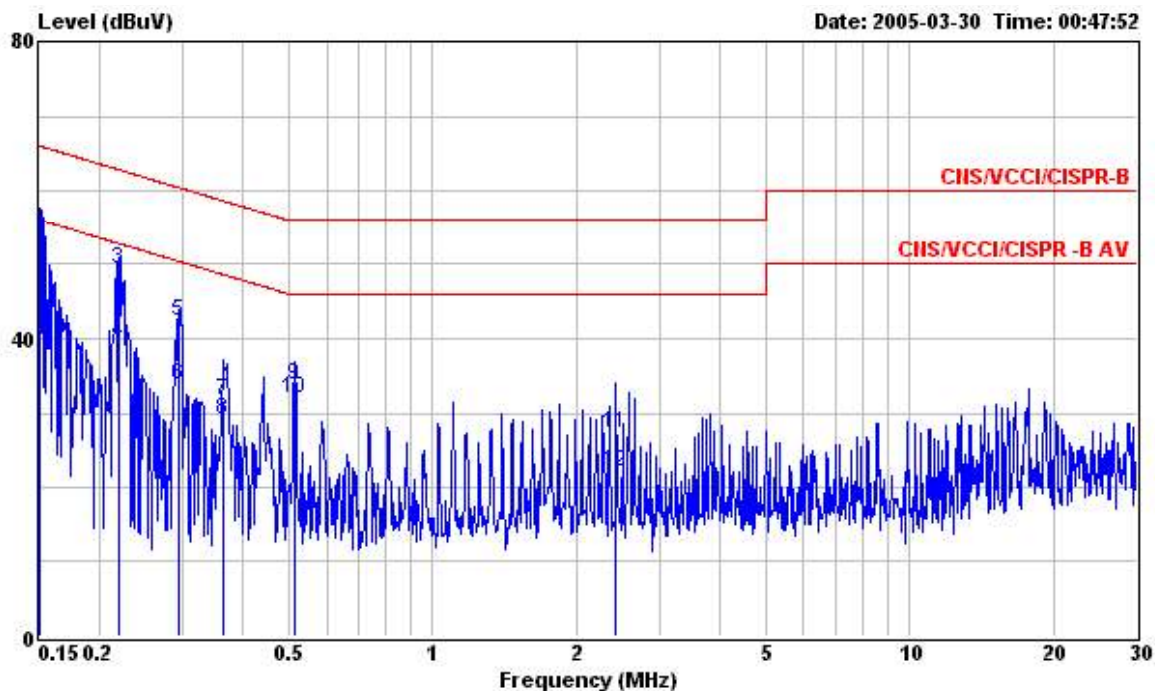
The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE  
 EUT : WLAN bg AP  
 Power : 120Vac/60Hz  
 Model : FD 532118  
 Memo : LINK MODE  
 Adapter : LEADER

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	55.52	-10.48	66.00	55.39	0.10	0.03	QP
2	0.150	43.66	-12.34	56.00	43.53	0.10	0.03	Average
3	0.220	48.83	-13.99	62.82	48.69	0.10	0.04	QP
4	0.220	37.26	-15.56	52.82	37.12	0.10	0.04	Average
5	0.296	41.13	-19.22	60.35	41.00	0.10	0.03	QP
6	0.296	31.28	-19.07	50.35	31.15	0.10	0.03	Average
7	0.367	35.24	-23.33	58.57	35.12	0.10	0.02	QP
8	0.367	31.54	-17.03	48.57	31.42	0.10	0.02	Average
9	0.440	33.67	-23.39	57.06	33.55	0.10	0.02	QP
10	0.440	27.50	-19.56	47.06	27.38	0.10	0.02	Average
11	17.470	19.73	-40.27	60.00	19.24	0.25	0.24	QP
12	17.470	14.17	-35.83	50.00	13.68	0.25	0.24	Average





Site : CO01-HY  
 Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL  
 EUT : WLAN bg AP  
 Power : 120Vac/50Hz  
 Model : FD 532118  
 Memo : LINK MODE  
 Adapter : LEADER

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	56.13	-9.87	66.00	56.00	0.10	0.03	QP
2	0.150	45.86	-10.14	56.00	45.73	0.10	0.03	Average
3	0.220	49.34	-13.48	62.82	49.20	0.10	0.04	QP
4	0.220	39.36	-13.46	52.82	39.22	0.10	0.04	Average
5	0.294	42.42	-17.99	60.41	42.29	0.10	0.03	QP
6	0.294	33.83	-16.58	50.41	33.70	0.10	0.03	Average
7	0.363	31.70	-26.96	58.66	31.58	0.10	0.02	QP
8	0.363	29.01	-19.65	48.66	28.89	0.10	0.02	Average
9	0.516	33.86	-22.14	56.00	33.74	0.10	0.02	QP
10	0.516	31.95	-14.05	46.00	31.83	0.10	0.02	Average
11	2.420	27.19	-28.81	56.00	26.97	0.13	0.09	QP
12	2.420	22.11	-23.89	46.00	21.89	0.13	0.09	Average

Test Engineer : Jay

Jay

## 5.7 Radiated Emission Measurement

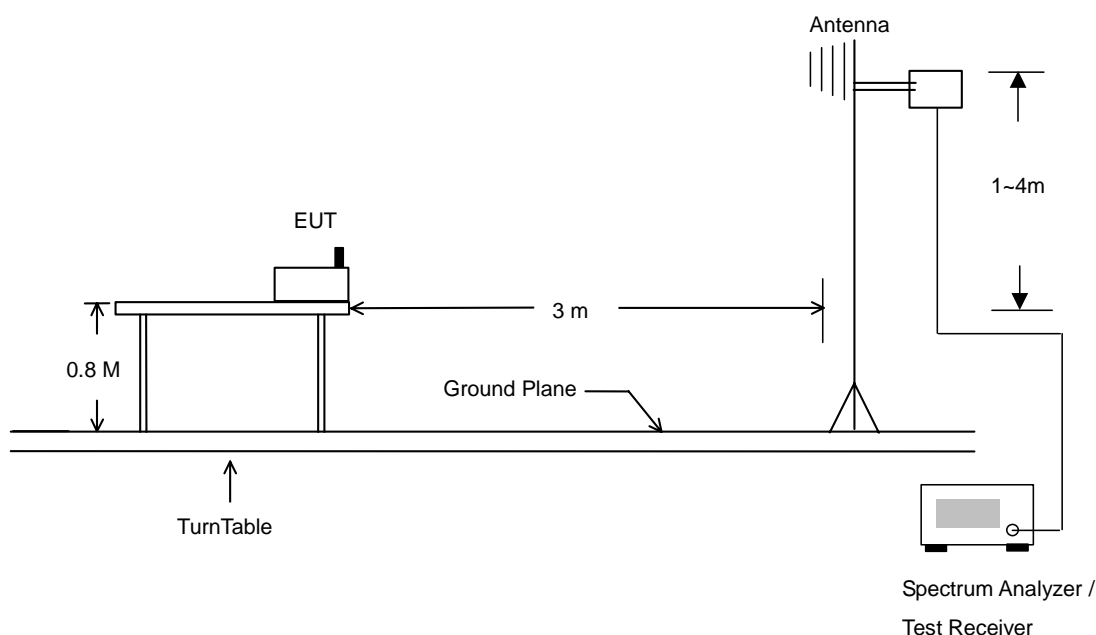
### 5.7.1 Measuring Instruments

As described in chapter 6 of this Report.

### 5.7.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. For testing below 1GHz, If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 5.7.3 Typical Test Setup Layout of Radiated Emission





## 5.7.4 Test Data

- Temperature : 25°C
- Relating Humidity : 60%
- Test Enginner :     Jay
- Test Mode : Mode 1
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1038.00	52.65	-21.35	74.00	61.37	24.54	36.07	2.80	Peak	---	---
2 @	2390.00	49.35	-4.65	54.00	49.58	30.48	35.14	4.43	Average	100	189
3 @	2390.00	70.14	-3.86	74.00	70.37	30.48	35.14	4.43	Peak	---	---
4 @	2414.00	113.35			113.59	30.47	35.14	4.43	Peak	---	---
5 @	2414.00	104.66			104.90	30.47	35.14	4.43	Average	100	189
6 @	2488.00	55.44	-18.56	74.00	55.71	30.40	35.19	4.52	Peak	---	---
7 @	2488.00	43.74	-10.26	54.00	44.01	30.40	35.19	4.52	Average	100	189

Remark: #4 and #5 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	9648.00	60.64	-13.36	74.00	49.23	38.70	36.26	8.96	Peak	---	---
2 @	9648.00	46.10	-7.90	54.00	34.70	38.70	36.26	8.96	Average	100	10

- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2390.00	70.02	-3.98	74.00	70.25	30.48	35.14	4.43	Peak	---	---
2 @	2390.00	49.03	-4.97	54.00	49.26	30.48	35.14	4.43	Average	100	104
3 @	2414.00	110.94			111.18	30.47	35.14	4.43	Peak	---	---
4 @	2414.00	103.76			104.00	30.47	35.14	4.43	Average	100	104
5 @	2494.00	54.76	-19.24	74.00	55.01	30.40	35.20	4.55	Peak	---	---
6 @	2494.00	43.54	-10.46	54.00	43.79	30.40	35.20	4.55	Average	100	104

Remark: # 3 and #4 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	9648.00	60.97	-13.03	74.00	49.57	38.70	36.26	8.96	Peak	---	---
2 @	9648.00	48.55	-5.45	54.00	37.15	38.70	36.26	8.96	Average	100	126



- Test Mode : Mode 2
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	183.63	34.84	-8.66	43.50	55.79	9.22	31.88	1.70	Peak	---	---
2 @	276.24	38.39	-7.61	46.00	55.21	12.92	31.97	2.24	Peak	---	---
3 @	280.29	32.18	-13.82	46.00	49.01	12.92	31.99	2.24	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	498.80	39.65	-6.35	46.00	50.80	17.10	31.41	3.16	Peak	---	---
2 @	749.40	38.36	-7.64	46.00	45.01	20.46	31.45	4.34	Peak	---	---
3 @	1000.00	39.21	-14.79	54.00	42.30	22.97	31.07	5.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2344.00	55.19	-18.81	74.00	55.41	30.52	35.12	4.37	Peak	---	---
2 @	2344.00	43.88	-10.12	54.00	44.10	30.52	35.12	4.37	Average	100	228
3 @	2438.00	111.83			112.08	30.44	35.16	4.46	Peak	---	---
4 @	2438.00	104.44			104.70	30.44	35.16	4.46	Average	100	228
5 @	2488.00	55.09	-18.91	74.00	55.35	30.40	35.19	4.52	Peak	---	---
6 @	2488.00	43.53	-10.47	54.00	43.80	30.40	35.19	4.52	Average	100	228

Remark: #3 and #4 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	3248.00	48.24	-25.76	74.00	47.61	30.20	35.13	5.56	Peak	---	---
2 @	4874.00	49.73	-24.27	74.00	44.86	33.39	35.09	6.57	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	9748.00	60.16	-13.84	74.00	48.61	38.70	36.22	9.07	Peak	---	---
2 @	9748.00	46.36	-7.64	54.00	34.81	38.70	36.22	9.07	Average	100	333





- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	48.09	34.89	-5.11	40.00	55.80	10.66	32.42	0.86	OP	100	349
2 @	91.83	42.37	-1.13	43.50	64.10	9.32	32.24	1.18	OP	100	32
3 @	183.63	37.64	-5.86	43.50	58.59	9.22	31.88	1.70	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	624.80	33.67	-12.33	46.00	43.38	18.21	31.51	3.59	Peak	---	---
2 @	749.40	35.62	-10.38	46.00	42.28	20.46	31.45	4.34	Peak	---	---
3 @	1000.00	36.56	-17.44	54.00	39.66	22.97	31.07	5.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2388.00	55.27	-18.73	74.00	55.51	30.48	35.13	4.40	Peak	---	---
2 @	2388.00	43.30	-10.70	54.00	43.54	30.48	35.13	4.40	Average	100	102
3 @	2438.00	111.53			111.79	30.44	35.16	4.46	Peak	---	---
4 @	2438.00	103.34			103.60	30.44	35.16	4.46	Average	100	102
5 @	2488.00	43.40	-10.60	54.00	43.67	30.40	35.19	4.52	Average	100	102
6 @	2488.00	54.99	-19.01	74.00	55.26	30.40	35.19	4.52	Peak	---	---

Remark: #3 and #4 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	9748.00	60.46	-13.54	74.00	48.91	38.70	36.22	9.07	Peak	---	---
2 @	9748.00	48.00	-6.00	54.00	36.45	38.70	36.22	9.07	Average	100	102



- Test Mode : Mode 3
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	141.24	34.48	-9.02	43.50	54.60	10.62	32.28	1.54	Peak	---	---
2	183.63	34.38	-9.12	43.50	55.32	9.22	31.88	1.70	Peak	---	---
3	276.24	36.05	-9.95	46.00	52.87	12.92	31.97	2.24	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	300.00	45.05	-0.95	46.00	61.60	12.94	31.91	2.42	QP	127	228
2	400.80	36.88	-9.12	46.00	49.62	15.90	31.51	2.86	Peak	---	---
3	666.80	36.31	-9.69	46.00	45.29	18.67	31.57	3.92	Peak	---	---

- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	43.23	30.14	-9.86	40.00	49.00	12.65	32.28	0.77	QP	100	251
2	52.14	35.20	-4.80	40.00	57.50	9.24	32.44	0.90	QP	100	247
3	81.03	33.91	-6.09	40.00	57.80	7.27	32.25	1.10	QP	100	36
4	85.89	37.56	-2.44	40.00	60.40	8.25	32.23	1.13	QP	100	251
5	91.83	39.47	-4.03	43.50	61.20	9.32	32.24	1.18	QP	100	251
6	153.93	38.62	-4.88	43.50	59.77	9.49	32.20	1.56	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	300.00	35.23	-10.77	46.00	51.78	12.94	31.91	2.42	Peak	---	---
2	498.80	34.49	-11.51	46.00	45.64	17.10	31.41	3.16	Peak	---	---
3	666.80	38.40	-7.60	46.00	47.38	18.67	31.57	3.92	Peak	---	---



- Test Mode : Mode 4
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2338.00	55.13	-18.87	74.00	55.37	30.52	35.10	4.34	Peak	---	---
2 @	2338.00	43.91	-10.09	54.00	44.14	30.52	35.10	4.34	Average	100	188
3 @	2460.00	104.75			105.00	30.43	35.17	4.49	Average	100	188
4 @	2460.00	113.15			113.40	30.43	35.17	4.49	Peak	---	---
5 @	2483.50	61.92	-12.08	74.00	62.18	30.41	35.19	4.52	Peak	---	---
6 @	2483.50	51.62	-2.38	54.00	51.87	30.41	35.19	4.52	Average	100	188

Remark: #3 and #4 Fundamental Signal.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	9848.00	61.58	-12.42	74.00	49.89	38.70	36.18	9.17	Peak	---	---
2 @	9848.00	49.93	-4.07	54.00	38.24	38.70	36.18	9.17	Average	100	10

- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1238.00	54.62	-19.38	74.00	61.84	25.41	35.67	3.03	Peak	---	---
2 @	2328.00	43.55	-10.45	54.00	43.77	30.54	35.10	4.34	Average	100	317
3 @	2328.00	55.54	-18.46	74.00	55.76	30.54	35.10	4.34	Peak	---	---
4 @	2460.00	103.85			104.10	30.43	35.17	4.49	Average	100	317
5 @	2460.00	107.92			108.17	30.43	35.17	4.49	Peak	---	---
6 @	2483.50	52.42	-1.58	54.00	52.67	30.41	35.19	4.52	Average	100	317
7 @	2483.50	62.15	-11.85	74.00	62.40	30.41	35.19	4.52	Peak	---	---

Remark: #4 and #5 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	9848.00	61.80	-12.20	74.00	50.11	38.70	36.18	9.17	Peak	---	---
2 @	9848.00	51.48	-2.52	54.00	39.79	38.70	36.18	9.17	Average	100	347



- Test Mode : Mode 5
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	2390.00	52.47	-1.53	54.00	52.70	30.48	35.14	4.43 Average	100	66
2 @	2390.00	71.87	-2.13	74.00	72.10	30.48	35.14	4.43 Peak	---	---
3 @	2414.00	110.10			110.33	30.47	35.16	4.46 Peak	---	---
4 @	2414.00	100.97			101.20	30.47	35.16	4.46 Average	100	66
5 @	2488.00	43.47	-10.53	54.00	43.74	30.40	35.19	4.52 Average	100	66
6 @	2488.00	55.56	-18.44	74.00	55.82	30.40	35.19	4.52 Peak	---	---

Remark: #3 and #4 Fundamental Signal.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	3214.00	48.94	-25.06	74.00	48.34	30.22	35.12	5.51 Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	9644.00	59.16	-14.84	74.00	47.76	38.70	36.26	8.96 Peak	---	---
2 @	9644.00	45.46	-8.54	54.00	34.06	38.70	36.26	8.96 Average	100	54

- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	2390.00	53.54	-0.46	54.00	53.77	30.48	35.14	4.43 Average	100	305
2 @	2390.00	72.48	-1.52	74.00	72.71	30.48	35.14	4.43 Peak	---	---
3 @	2414.00	105.91			106.14	30.47	35.16	4.46 Peak	---	---
4 @	2414.00	98.39			98.62	30.47	35.16	4.46 Average	100	305
5 @	2488.00	43.16	-10.84	54.00	43.43	30.40	35.19	4.52 Average	100	305
6 @	2488.00	54.64	-19.36	74.00	54.91	30.40	35.19	4.52 Peak	---	---

Remark: #3 and #4 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	3214.00	49.51	-24.49	74.00	48.91	30.22	35.12	5.51 Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	9644.00	60.06	-13.94	74.00	48.65	38.70	36.26	8.96 Peak	---	---
2 @	9644.00	45.40	-8.60	54.00	34.00	38.70	36.26	8.96 Average	100	127





- Test Mode : Mode 6
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	183.63	36.20	-7.30	43.50	57.14	9.22	31.88	1.70	Peak	---	---
2	207.93	33.77	-9.73	43.50	54.12	9.77	31.96	1.84	Peak	---	---
3	276.24	41.05	-4.95	46.00	57.87	12.92	31.97	2.24	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	460.30	35.92	-10.08	46.00	47.57	16.59	31.44	3.20	Peak	---	---
2	498.80	36.88	-9.12	46.00	48.03	17.10	31.41	3.16	Peak	---	---
3	749.40	40.65	-5.35	46.00	47.31	20.46	31.45	4.34	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	2388.00	55.46	-18.54	74.00	55.70	30.48	35.13	4.40	Peak	---	---
2	2388.00	43.43	-10.57	54.00	43.67	30.48	35.13	4.40	Average	100	189
3	2436.00	109.96			110.20	30.46	35.16	4.46	Peak	---	---
4	2436.00	100.76			101.00	30.46	35.16	4.46	Average	100	189
5	2488.00	55.12	-18.88	74.00	55.38	30.40	35.19	4.52	Peak	---	---
6	2488.00	43.47	-10.53	54.00	43.74	30.40	35.19	4.52	Average	100	189

Remark: #3 and #4 Fundamental Signal.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	9754.00	58.74	-15.26	74.00	47.20	38.70	36.22	9.07	Peak	---	---
2	9754.00	46.53	-7.47	54.00	34.98	38.70	36.22	9.07	Average	171	143



- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	62.94	36.85	-3.15	40.00	61.78	6.48	32.41	1.01	Peak	---	---
2	135.03	38.36	-5.14	43.50	57.74	11.32	32.24	1.54	Peak	---	---
3	183.63	38.39	-5.11	43.50	59.33	9.22	31.88	1.70	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	498.80	35.84	-10.16	46.00	47.00	17.10	31.41	3.16	Peak	---	---
2	749.40	42.24	-3.76	46.00	48.90	20.46	31.45	4.34	Peak	---	---
3	1000.00	37.62	-16.38	54.00	40.72	22.97	31.07	5.00	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	2338.00	55.43	-18.57	74.00	55.67	30.52	35.10	4.34	Peak	---	---
2	2338.00	43.25	-10.75	54.00	43.48	30.52	35.10	4.34	Average	122	311
3	2436.00	107.13			107.37	30.46	35.16	4.46	Peak	---	---
4	2436.00	99.65			99.89	30.46	35.16	4.46	Average	122	311
5	2484.00	55.02	-18.98	74.00	55.27	30.41	35.19	4.52	Peak	---	---
6	2484.00	43.59	-10.41	54.00	43.84	30.41	35.19	4.52	Average	122	311

Remark: #3 and #4 Fundamental Signal.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	3248.00	48.18	-25.82	74.00	47.55	30.20	35.13	5.56	Peak	---	---
2	4874.00	51.01	-22.99	74.00	46.14	33.39	35.09	6.57	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	9754.00	59.77	-14.23	74.00	48.23	38.70	36.22	9.07	Peak	---	---
2	9754.00	45.97	-8.04	54.00	34.42	38.70	36.22	9.07	Average	100	117



- Test Mode : Mode 7
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1	183.63	34.69	-8.81	43.50	55.64	9.22	31.88	1.70 Peak	---	---
2	251.94	34.84	-11.16	46.00	52.68	11.96	31.84	2.04 Peak	---	---
3	276.24	36.09	-9.91	46.00	52.90	12.92	31.97	2.24 Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1	300.00	45.05	-0.95	46.00	61.60	12.94	31.91	2.42 QP	127	251
2	400.80	38.97	-7.03	46.00	51.71	15.90	31.51	2.86 Peak	---	---
3	666.80	37.06	-8.94	46.00	46.04	18.67	31.57	3.92 Peak	---	---

- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1	38.64	38.08	-1.92	40.00	54.28	15.28	32.16	0.68 Peak	---	---
2	43.23	30.14	-9.86	40.00	49.00	12.65	32.28	0.77 QP	100	251
3	49.98	35.89	-4.11	40.00	57.50	9.94	32.43	0.88 QP	100	247
4	81.84	33.21	-6.79	40.00	57.08	7.27	32.25	1.11 QP	100	247
5	87.24	37.77	-2.23	40.00	60.40	8.45	32.22	1.15 QP	100	251
6	91.83	39.47	-4.03	43.50	61.20	9.32	32.24	1.18 QP	100	251
7	154.74	40.04	-3.46	43.50	61.04	9.64	32.19	1.56 Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1	300.00	36.46	-9.54	46.00	53.01	12.94	31.91	2.42 Peak	---	---
2	498.80	38.34	-7.66	46.00	49.49	17.10	31.41	3.16 Peak	---	---
3	666.80	36.41	-9.59	46.00	45.39	18.67	31.57	3.92 Peak	---	---



- Test Mode : Mode 8
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	2390.00	64.78	-9.22	74.00	65.00	30.48	35.14	4.43 Peak	---	---
2 @	2390.00	48.61	-5.39	54.00	48.84	30.48	35.14	4.43 Average	100	189
3 @	2434.00	105.99			106.23	30.46	35.16	4.46 Peak	---	---
4 @	2434.00	97.76			98.00	30.46	35.16	4.46 Average	100	189
5 @	2494.00	60.75	-13.25	74.00	61.00	30.40	35.20	4.55 Peak	---	---
6 @	2494.00	45.68	-8.32	54.00	45.93	30.40	35.20	4.55 Average	100	189

Remark: #3 and #4 Fundamental Signal.

- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	2390.00	63.66	-10.34	74.00	63.89	30.48	35.14	4.43 Peak	---	---
2 @	2390.00	47.25	-6.75	54.00	47.48	30.48	35.14	4.43 Average	100	306
3 @	2436.00	103.78			104.03	30.46	35.16	4.46 Peak	---	---
4 @	2436.00	95.33			95.57	30.46	35.16	4.46 Average	100	306
5 @	2483.50	60.25	-13.75	74.00	60.50	30.41	35.19	4.52 Peak	---	---
6 @	2483.50	46.37	-7.63	54.00	46.62	30.41	35.19	4.52 Average	100	306

Remark: #3 and #4 Fundamental Signal.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	3248.00	49.39	-24.61	74.00	48.76	30.20	35.13	5.56 Peak	---	---





- Test Mode : Mode 9
- Polarization : Horizontal

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	2328.00	55.29	-18.71	74.00	55.51	30.54	35.10	4.34 Peak	---	---
2 @	2328.00	43.05	-10.95	54.00	43.27	30.54	35.10	4.34 Average	100	69
3 @	2458.00	107.79			108.04	30.43	35.17	4.49 Peak	---	---
4 @	2458.00	99.75			100.00	30.43	35.17	4.49 Average	100	69
5 @	2483.50	71.04	-2.96	74.00	71.30	30.41	35.19	4.52 Peak	---	---
6 @	2483.50	53.94	-0.06	54.00	54.19	30.41	35.19	4.52 Average	100	69

Remark: #3 and #4 Fundamental Signal.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	9844.00	60.58	-13.42	74.00	48.89	38.70	36.18	9.17 Peak	---	---
2 @	9844.00	48.66	-5.34	54.00	36.97	38.70	36.18	9.17 Average	171	146

- Polarization : Vertical

The test that passed at minimum margin was marked by the frame in the following table.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	2338.00	43.26	-10.74	54.00	43.49	30.52	35.10	4.34 Average	207	238
2 @	2338.00	55.46	-18.54	74.00	55.69	30.52	35.10	4.34 Peak	---	---
3 @	2460.00	106.99			107.24	30.43	35.17	4.49 Peak	---	---
4 @	2460.00	98.41			98.66	30.43	35.17	4.49 Average	207	238
5 @	2483.50	72.18	-1.82	74.00	72.44	30.41	35.19	4.52 Peak	---	---
6 @	2483.50	52.74	-1.26	54.00	52.99	30.41	35.19	4.52 Average	207	238

Remark: #3 and #4 Fundamental Signal.

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	3284.00	49.17	-24.83	74.00	48.48	30.19	35.15	5.65 Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	9844.00	62.31	-11.69	74.00	50.63	38.70	36.18	9.17 Peak	---	---
2 @	9844.00	49.00	-5.00	54.00	37.31	38.70	36.18	9.17 Average	103	12



## **5.8 Antenna Requirements**

### **5.8.1 Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no other antenna except assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

### **5.8.2 Antenna Connected Construction**

The antennas used in this product are fixed dipole with reverse SMA and PCB antenna without connector and it is considered to meet antenna requirement of FCC.

### **5.8.3 Antenna Gain**

The antenna gain of EUT is less than 6dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

**6. List of Measuring Equipments Used**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9 KHz – 2.75 GHz	Jun. 23, 2004	Jun. 23, 2005	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/008	9 KHz – 30 MHz	May 03, 2004	May 03, 2005	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9 KHz – 30 MHz	Apr. 19, 2004	Apr. 19, 2005	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Dec. 23, 2004	Dec. 23, 2005	Conduction (CO01-HY)
Spectrum analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Jul. 27, 2004	Jul. 26, 2005	Radiation (03CH06-HY)
Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul,09,2004	Jul, 10,2005	Radiation (03CH06-HY)
Controller	CT	SC100	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 22, 2004	Nov. 21, 2005	Radiation (03CH06-HY)
Horn Antenna	Com-Power	AH118	071025	1G-18G	Feb. 22, 2005	Feb. 22, 2006	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Jun. 22, 2004	Jun. 22, 2005	Radiation (03CH06-HY)
PreAmplifier	Com-Power	PA-103	161055	1MHz - 1000MHz	Apr. 26, 2004	Apr. 26, 2005	Radiation (03CH06-HY)
HF Amplifier	MITEQ	AFS44	973248	0.1G - 26.5G	May 20, 2004	May 20, 2005	Radiation (03CH06-HY)
Amplifier	MITEQ	AMF-6F	997165	26G - 40G	Jun. 24, 2004	Jun. 24, 2005	Radiation (03CH06-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)
Base Station Emulator	Agilent	E5515C	GB43460754	Qual-band	Jan. 12, 2004	Jan. 12, 2006	Base Station



## 7. Uncertainty Evaluation

### Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of $x_i$		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
<b>combined standard uncertainty Uc(y)</b>	<b>1.13</b>		
<b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b>	<b>2.26</b>		

### Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of $x_i$		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
<b>combined standard uncertainty Uc(y)</b>	<b>1.27</b>		
<b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b>	<b>2.54</b>		



**Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)**

Contribution	Uncertainty of $x_i$		$u(x_i)$	$C_i$	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 * \Gamma_2 * \Gamma_3)$	+0.34/-0.35	U-shaped	0.244	1	0.244
<b>Combined standard uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring uncertainty for a level of confidence of 95% <math>U = 2U_c(y)</math></b>	<b>4.72</b>				