

# FCC TEST REPORT

for

## 47 CFR Part 15 Subpart C

**Equipment** : 2-line digital cordless phone with expandable wireless extension  
**Trade Name** : Accent Communication  
**Model No.** : OD-2LP-200DAM / OD-2LP-400DAM / OD-2LP-500DAM / OD-2LP-300EH  
**FCC ID** : KA2-OD-2LP-CL  
**Filing Type** : Certification  
**Applicant** : D-Link Corporation, U.S.A.  
17595 Mt. Herrmann Street Fountain Valley, CA 92708

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- The data shown in this test report were carried out on Feb. 14, 2005 at Sporton International Inc. LAB.



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**History of this test report**

Original Report Issue Date: Feb. 15, 2005

No additional attachment.

Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



## 1. General Description of Equipment under Test

### 1.1. Applicant

**D-Link Corporation, U.S.A.**

17595 Mt. Herrmann Street Fountain Valley, CA 92708

### 1.2 Manufacturer

**Blossom Communication Corp. Ltd.**

5F, No. 20, Lane 50, Sec. 3, Nan Kang Rd., Taipei, Taiwan

### 1.3 Basic Description of Equipment under Test

Equipment	: 2-line digital cordless phone with expandable wireless extension
Trade Name	: Accent Communication
Model No.	: OD-2LP-200DAM / OD-2LP-400DAM / OD-2LP-500DAM / OD-2LP-300EH
FCC ID	: KA2-OD-2LP-CL
Power Supply Type	: Linear
AC Power Cord	: AC 120V, Non-Shielded, Wall-mount, 1.5meter, 2 pin
Accessory	: Charger, OD-2LP-300-ACC-B30 Battery, OD-2LP-300-ACC-B20, OD-2LP-300-ACC-B40 (Battery Cover)



#### 1.4 Feature of Equipment under Test

Product Feature & Specification	
1. DUT Type :	2-line digital cordless phone with expandable wireless extension
2. Trade Name :	Accent Communication
3. Model Name :	OD-2LP-200DAM / OD-2LP-400DAM / OD-2LP-500DAM / OD-2LP-300EH
4. FCC ID :	KA2-OD-2LP-CL
5. Type of Modulation :	DSSS
6. Tx / Rx Frequency :	2400-2483.5 MHz
7. Channel Frequency :	2401920 + 1728 × n kHz; n= 5~29
8. Maximum Output Power to Antenna :	≤20dBm
9. Type of Antenna Connector :	N/A
10. Antenna Type :	WHIP
11. Antenna Gain :	0 dBi
12. HW Version :	N/A
13. SW Version :	N/A
14. Power Rating (DC/AC, Voltage) :	DC 9V / 500mA
15. DUT Stage :	Identical Prototype



## 2 Test Configuration of Equipment under Test

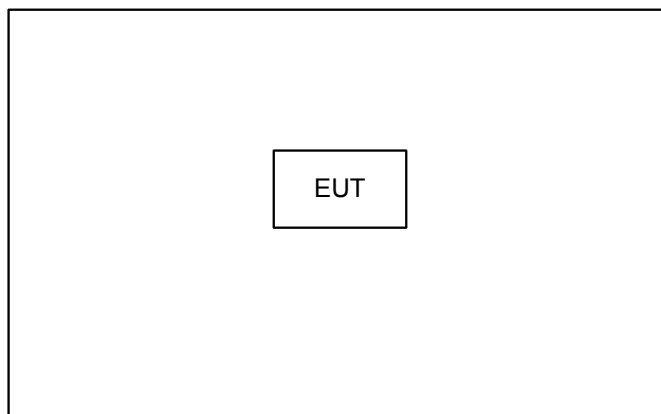
### 2.1 Test Manner

- a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
- b. For spurious emission below 1GHz, only one channel of each application was tested because it is not related to channel selection.
- c. The EUT is programmed to transmit signal continuously for all testings.
- d. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000MHz.

### 2.2 Test Mode

Application	Wireless Handset
Data Rate	11 Mbps
Radiated Emission	Mode 1: Tx CH05 (2410560 KHz)
	Mode 2: Tx CH17 (2431296 KHz)
	Mode 3: Tx CH29 (2452032 KHz)
Conducted Emission	Mode 1: Charging Mode

### 2.3 Connection Diagram of Test System





### **3. Test Software**

RF utility will set the EUT in Tx mode.



## **4. General Information of Test**

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,  
Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.  
TEL : 886-3-327-3456  
FAX : 886-3-318-0055

Test Site No : CO01-HY, 03CH06-HY

### **4.1 Test Voltage**

110V/ 60Hz

### **4.2 Standard for Methods of Measurement**

ANSI C63.4-2003

### **4.3 Test in Compliance with**

47 CFR Part 15 Subpart C

### **4.4 Frequency Range Investigated**

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation: from 30 MHz to 25000 MHz

### **4.5 Test Distance**

The test distance of radiated emission from antenna to EUT is 3 m.





## 5. Test Data and Test Result

### 5.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result	Section
15.207	Conducted Emission	Pass	5.6
15.247(a)(2)	6dB Bandwidth	Pass	5.2
15.247(b)	Maximum Peak Output Power	Pass	5.5
15.209(a)	Radiated Emission	Pass	5.7
15.247 (c)	100kHz Bandwidth of Frequency Band Edges	Pass	5.4
15.247(d)	Power Spectral Density	Pass	5.3
15.203 15.247(b)(4)	Antenna Requirement	Pass	5.8

## 5.2 6dB Bandwidth Measurement

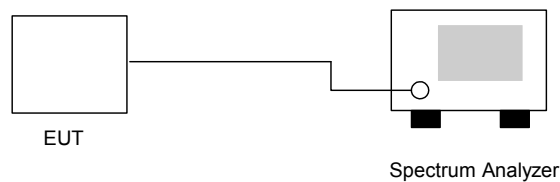
### 5.2.1 Measuring Instruments :

As described in chapter 6 of this test report.

### 5.2.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The 6 dB bandwidth is defined as the frequency range where the power is higher than the peak power minus 6dB.

### 5.2.3 Test Setup Layout :



### 5.2.4 Test Result :

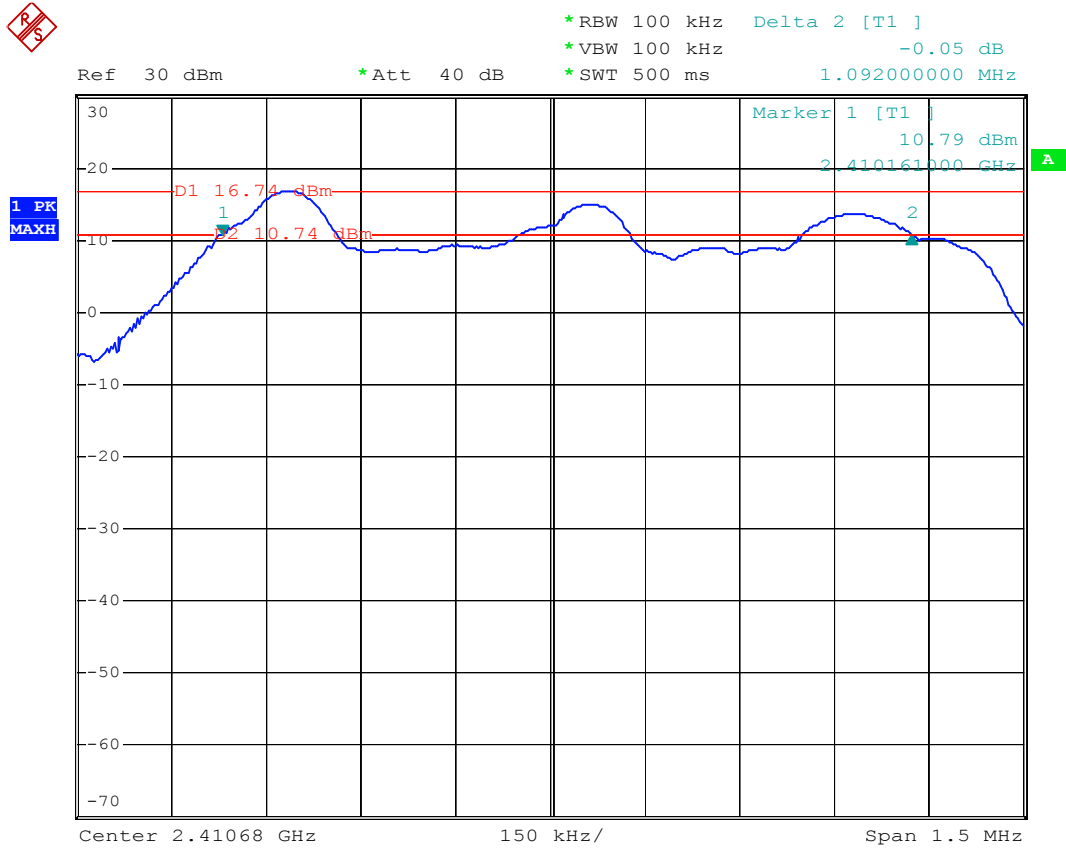
- Application Type : Wireless Handset
- Temperature : 21°C
- Relative Humidity : 55%
- Test Enginner :     Jay

Channel	Frequency ( kHz )	6dB Emission bandwidth ( MHz )	Limits ( MHz )	Plot Ref. No.
05	2410560	1.09	0.5	Mode 1
17	2431296	1.12	0.5	Mode 2
29	2452032	1.16	0.5	Mode 3



5.2.5 6dB Bandwidth

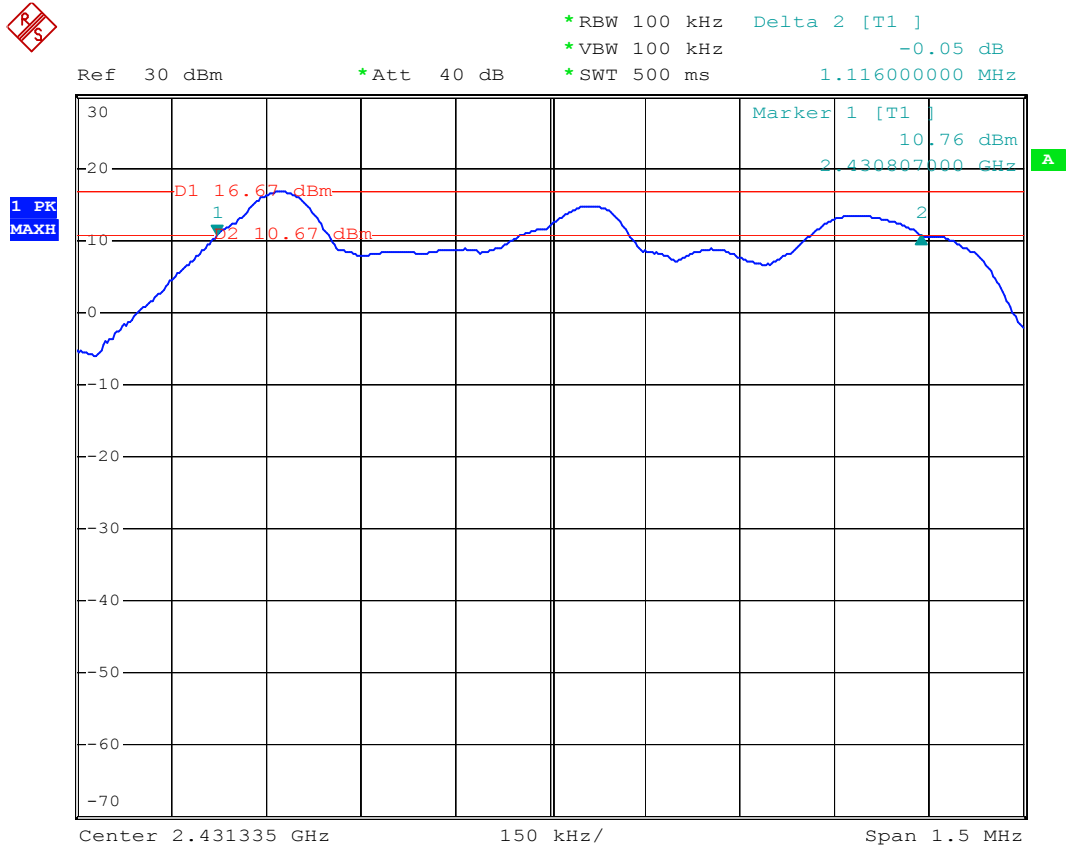
Mode 1 : Tx CH05 (2419200 kHz)



Date: 14.FEB.2005 16:16:19



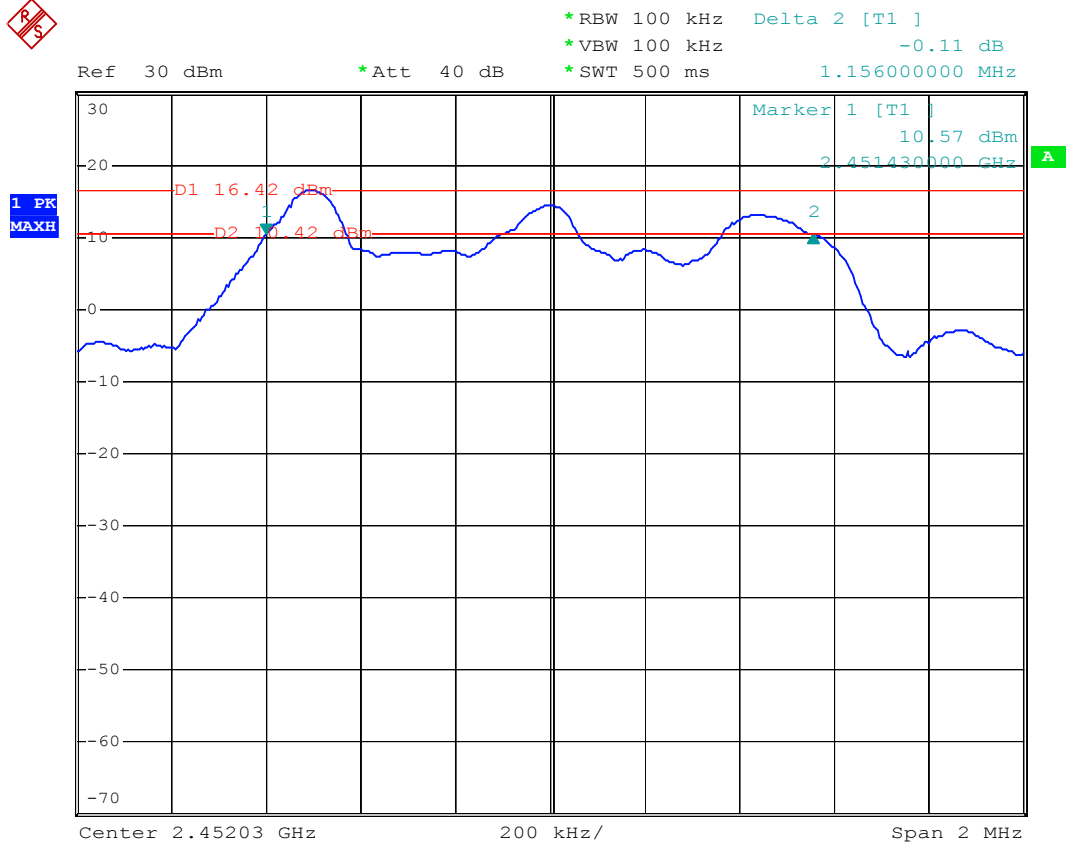
Mode 2 : Tx CH17 (2439936 kHz)



Date: 14.FEB.2005 16:17:41



Mode 3 : Tx CH29 (2452032 kHz)



Date: 14.FEB.2005 16:12:43

### 5.3 Power Spectral Density Measurement

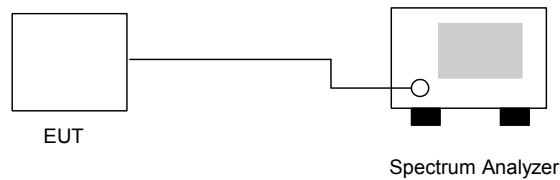
#### 5.3.1 Measuring Instruments :

As described in chapter 6 of this test report.

#### 5.3.2 Test Procedure :

1. The transmitter output was connected to spectrum analyzer directly.
2. The spectrum analyzer's resolution bandwidth was set at 3kHz RBW and 30kHz VBW as that of the fundamental frequency. Set the sweep time=span/3kHz.
3. The power spectral density was measured and recorded.
4. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

#### 5.3.3 Test Setup Layout :



#### 5.3.4 Test Result :

- Application Type : Wireless Handset
- Temperature : 21°C
- Relative Humidity : 55%
- Test Enginner :     Jay

Channel	Frequency (kHz)	Power Spectral Density (dBm)	Limits (dBm )	Plot Ref. No.
05	2410560	1.74	8	Mode 1
17	2431296	1.61	8	Mode 2
29	2452032	1.46	8	Mode 3



5.3.5 Power Spectral Density

Mode 1 : Tx CH05 (2419200 kHz)





Mode 2 : Tx CH17 (2439936 kHz)







Mode 3 : Tx CH29 (2452032 kHz)





### 5.4 Band Edges Measurement

#### 5.4.1 Measuring Instruments :

As described in chapter 6 of this test report.

#### 5.4.2 Test Procedure :

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

#### 5.4.3 Test Result :

- Application Type : Wireless Handset
- Temperature : 21°C
- Relative Humidity : 55%
- Test Enginner : Jay
  
- Test Result in lower band (Channel 05) : PASS
- Test Result in higher band (Channel 29) : PASS

#### 5.4.4 Note on Band Edge Emission

##### CH05 (Horizontal)

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Preamp Factor ( dB )	Cable Loss ( dB )	Detect Mode
2390.00	58.77	-15.23	74.00	62.29	28.40	35.25	3.32	Peak
2390.00	43.95	-10.05	54.00	47.48	28.40	35.25	3.32	Average

##### CH05 (Vertical)

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Preamp Factor ( dB )	Cable Loss ( dB )	Detect Mode
2327.80	63.00	-11.00	74.00	66.64	28.33	35.24	3.27	Peak
2327.80	41.99	-12.01	54.00	45.63	28.33	35.24	3.27	Average



CH29 (Horizontal)

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Preamp Factor ( dB )	Cable Loss ( dB )	Detect Mode
2494.00	59.43	-14.57	74.00	62.79	28.50	35.26	3.39	Peak
2494.00	45.09	-8.91	54.00	48.46	28.50	35.26	3.39	Average

CH29 (Vertical)

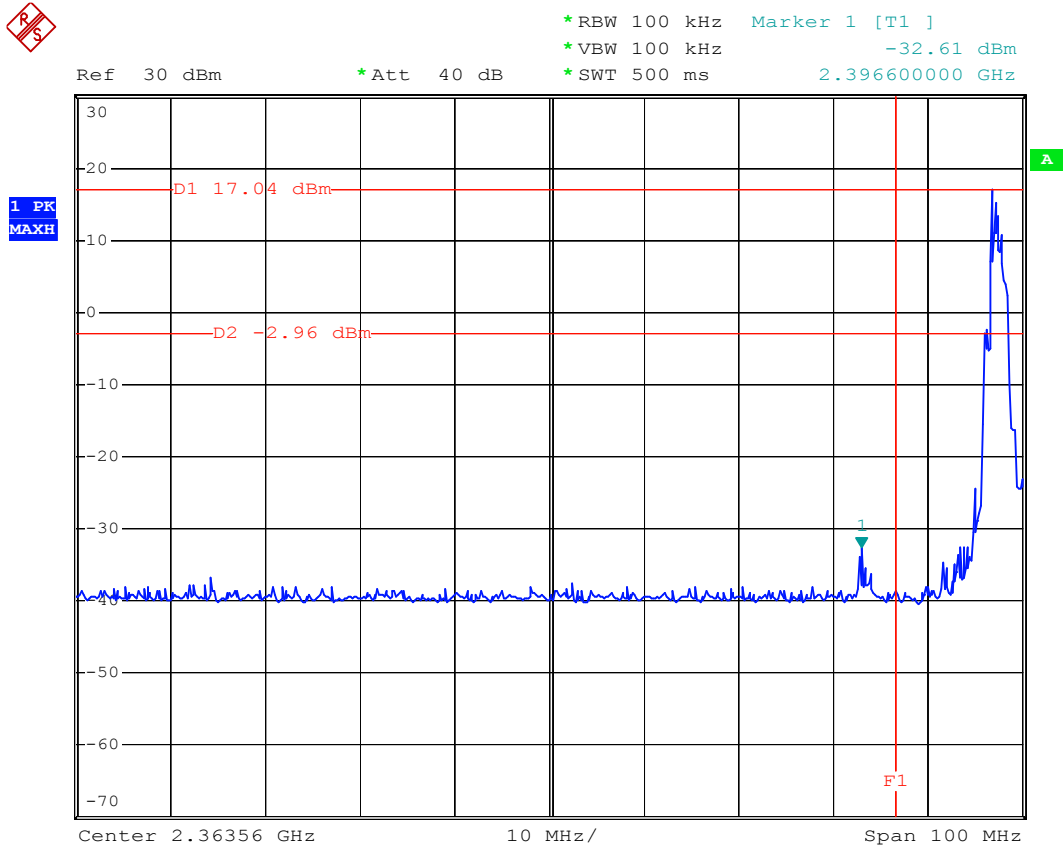
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Preamp Factor ( dB )	Cable Loss ( dB )	Detect Mode
2483.50	28.99	-15.01	74.00	62.38	28.48	35.26	3.38	Peak
2483.50	44.08	-9.92	54.00	47.48	28.48	35.26	3.38	Average

\* Remark: The data above can refer to radiated emission in section 5.7.



5.4.7 20dB Band Edge

Mode1 : Tx CH05 (2419200 kHz)



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Mode 3 : Tx CH29 (2452032 kHz)

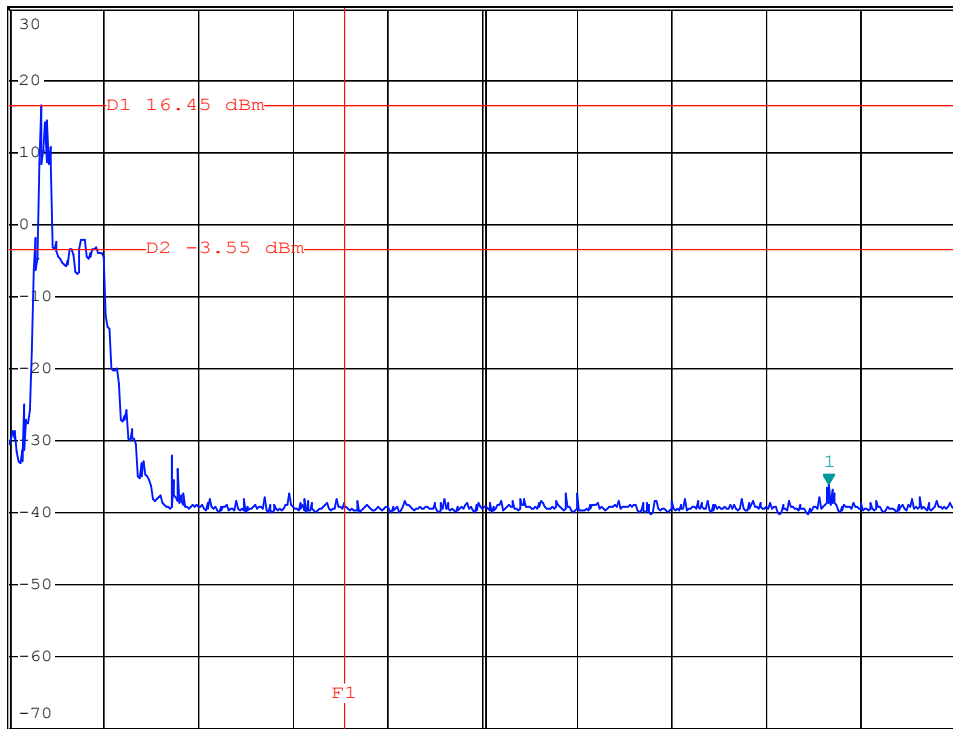


\*RBW 100 kHz    Marker 1 [T1 ]  
\*VBW 100 kHz                    -36.06 dBm  
\*SWT 500 ms                      2.534630000 GHz

Ref 30 dBm

\*Att 40 dB

1 PK  
MAXH



Center 2.49803 GHz                    10 MHz/                    Span 100 MHz

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## 5.5 Peak Output Power Measurement

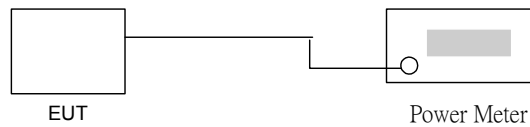
### 5.5.1 Measuring Instruments :

As described in chapter 6 of this test report.

### 5.5.2 Test Procedure :

The antenna port ( RF output ) of the EUT was connected to the input ( RF input ) of a power meter.  
The power is equal to the reading level on power meter plus cable loss at the EUT antenna terminal.

### 5.5.3 Test Setup Layout :



### 5.5.4 Test Result :

- Application Type : Wireless Handset
- Temperature : 21°C
- Relative Humidity : 55%
- Test Enginner :     Jay

Channel	Frequency (kHz)	Measured Output Power (dBm)	Limits (Watt/dBm )
05	2410560	17.13	1W/30 dBm
17	2431296	17.13	1W/30 dBm
29	2452032	17.06	1W/30 dBm



## **5.6 Conducted Emission Measurement**

### **5.6.1 Measuring Instruments**

As described in chapter 6 of this test Report.

### **5.6.2 Test Procedures**

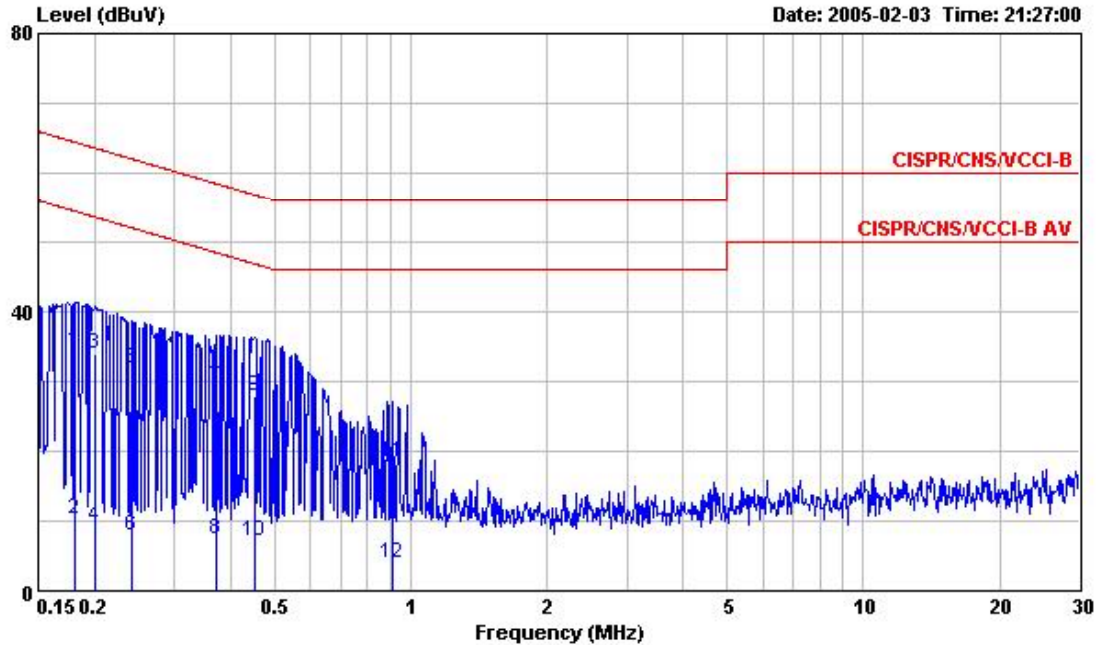
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of the line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.
- 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

- Application Type : Wireless Handset
- Temperature : 21 °C
- Relating Humidity : 55 %
- Test Enginner : Jay
- Test Mode : Mode 1

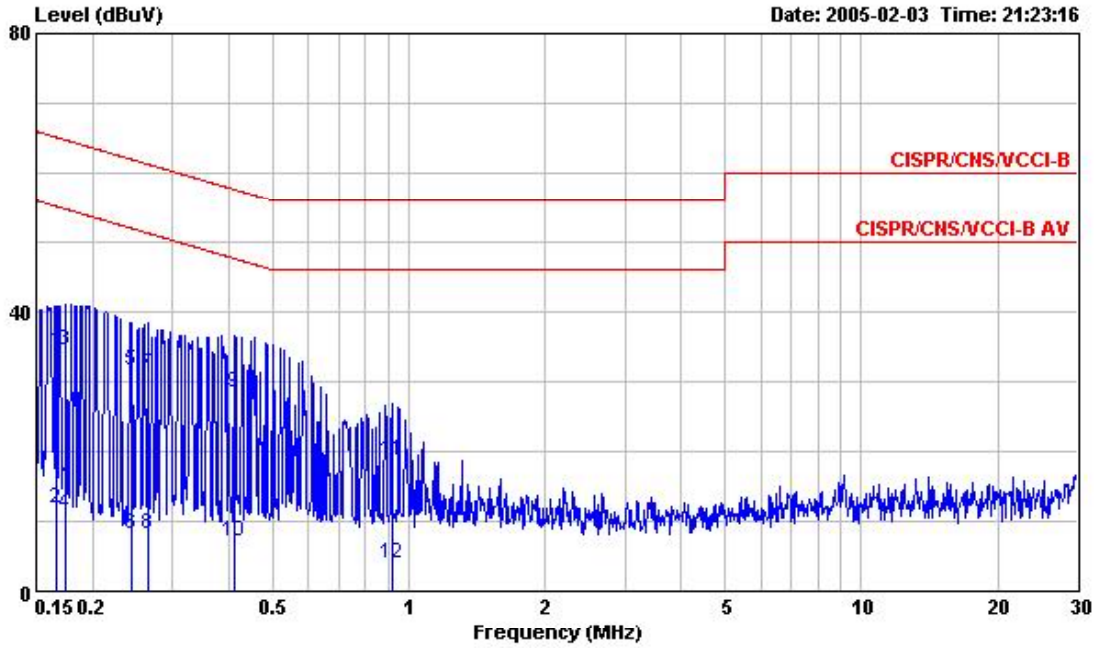
The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY  
 Condition : CISPR/CNS/VCCI-B 2004/004 LINE  
 EUT :  
 POWER: 120Vac/60Hz  
 MODEL : FD401901  
 MEMO : Charging Mode

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.1815220	34.44	-29.98	64.42	34.23	0.10	0.11	QP
2	0.1815220	10.24	-44.18	54.42	10.03	0.10	0.11	Average
3	0.1996860	34.00	-29.62	63.62	33.90	0.10	0.00	QP
4	0.1996860	9.16	-44.46	53.62	9.06	0.10	0.00	Average
5	0.2416480	31.89	-30.15	62.04	31.73	0.10	0.06	QP
6	0.2416480	7.85	-44.19	52.04	7.69	0.10	0.06	Average
7	0.3711650	29.22	-29.25	58.47	29.03	0.10	0.09	QP
8	0.3711650	7.37	-41.10	48.47	7.18	0.10	0.09	Average
9	0.4515500	27.88	-28.97	56.85	27.74	0.10	0.04	QP
10	0.4515500	7.17	-39.68	46.85	7.03	0.10	0.04	Average
11	0.9135710	18.33	-37.67	56.00	17.76	0.10	0.47	QP
12	0.9135710	3.86	-42.14	46.00	3.29	0.10	0.47	Average





Site : CO01-HY  
 Condition : CISPR/CNS/VCCI-B 2004/004 NEUTRAL  
 EUT :  
 POWER: 120Vac/60Hz  
 MODEL : FD401901  
 MEMO : Charging Mode

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1667680	34.18	-30.94	65.12	33.87	0.10	0.21	QP
2	0.1667680	11.92	-43.20	55.12	11.61	0.10	0.21	Average
3	0.1749130	34.36	-30.36	64.72	34.10	0.10	0.16	QP
4	0.1749130	10.95	-43.77	54.72	10.69	0.10	0.16	Average
5	0.2442230	31.69	-30.26	61.95	31.53	0.10	0.06	QP
6	0.2442230	8.13	-43.82	51.95	7.97	0.10	0.06	Average
7	0.2644240	30.95	-30.34	61.29	30.77	0.10	0.08	QP
8	0.2644240	8.17	-43.12	51.29	7.99	0.10	0.08	Average
9	0.4126560	28.55	-29.04	57.59	28.38	0.10	0.07	QP
10	0.4126560	7.11	-40.48	47.59	6.94	0.10	0.07	Average
11	0.9184250	18.66	-37.34	56.00	18.10	0.10	0.46	QP
12	0.9184250	3.85	-42.15	46.00	3.29	0.10	0.46	Average

## 5.7 Radiated Emission Measurement

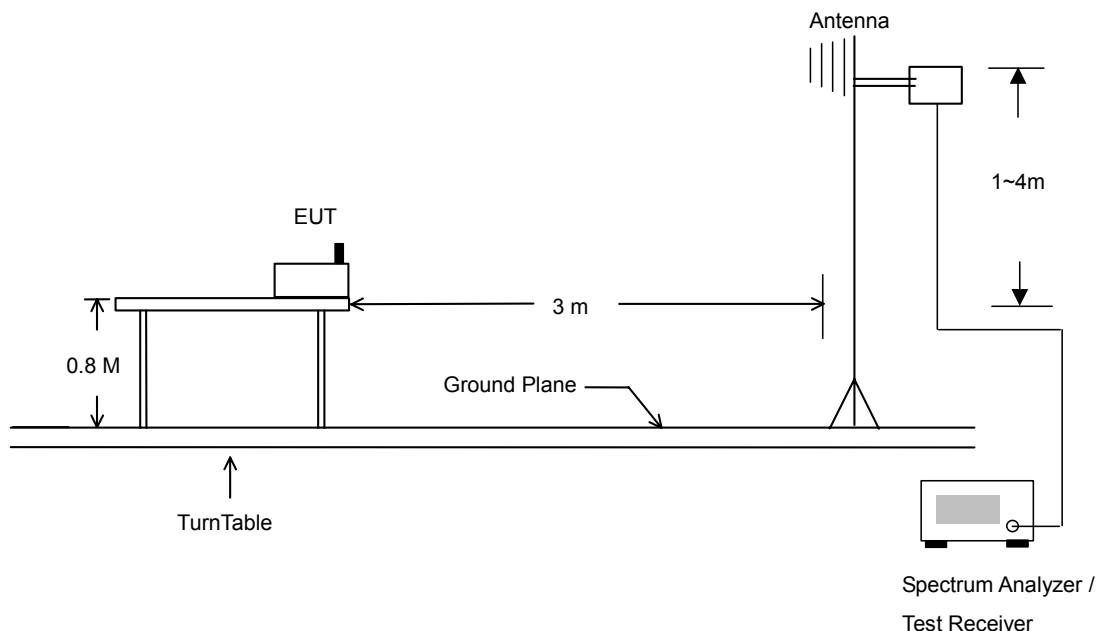
### 5.7.1 Measuring Instruments

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

- Application Type : Wireless Handset
- Temperature : 21 °C
- Relating Humidity : 56 %
- 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 @	2390.00	43.95	-10.05	54.00	47.48	28.40	35.25	3.32	Average	---	---
2 @	2390.00	58.77	-15.23	74.00	62.29	28.40	35.25	3.32	Peak	---	---
3 @	2410.50	109.99			113.50	28.41	35.25	3.32	Peak	---	---
4 @	2410.50	59.70			63.21	28.41	35.25	3.32	Average	---	---
5 @	2483.50	58.09	-15.91	74.00	61.48	28.48	35.26	3.38	Peak	---	---
6 @	2483.50	41.05	-12.95	54.00	44.45	28.48	35.26	3.38	Average	---	---

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 @	4818.00	56.42	-17.58	74.00	54.56	32.36	35.27	4.77	Peak	---	---
2 @	4818.00	39.31	-14.69	54.00	37.45	32.36	35.27	4.77	Average	---	---

	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 @	7228.00	60.36	-13.64	74.00	54.33	35.28	35.49	6.24	Peak	---	---
2 @	7228.00	43.82	-10.18	54.00	37.78	35.28	35.49	6.24	Average	---	---



- Test Mode : Mode 1
- 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 I	2108.00	68.48	-5.52	74.00	72.47	28.10	35.21	3.11 Peak	---	---
2	2108.00	45.45	-8.55	54.00	49.45	28.10	35.21	3.11 Average	---	---
3 I	2258.00	68.91	-5.09	74.00	72.66	28.26	35.23	3.22 Peak	---	---
4	2258.00	45.69	-8.31	54.00	49.44	28.26	35.23	3.22 Average	---	---
5	2327.80	41.99	-12.01	54.00	45.63	28.33	35.24	3.27 Average	---	---
6	2327.80	63.00	-11.00	74.00	66.64	28.33	35.24	3.27 Peak	---	---
7 X	2410.30	77.62			81.03	28.41	35.14	3.32 Average	---	---
8 @	2410.30	114.99			118.40	28.41	35.14	3.32 Peak	---	---
9	2494.00	42.11	-11.89	54.00	45.48	28.50	35.26	3.39 Average	---	---
10	2494.00	60.75	-13.25	74.00	64.11	28.50	35.26	3.39 Peak	---	---
11	2558.00	46.04	-7.96	54.00	49.25	28.70	35.30	3.40 Average	---	---
12	2558.00	67.04	-6.96	74.00	70.25	28.70	35.30	3.40 Peak	---	---
13	2714.00	45.59	-8.41	54.00	48.48	29.15	35.44	3.40 Average	---	---
14	2714.00	66.98	-7.02	74.00	69.87	29.15	35.44	3.40 Peak	---	---
15	2808.00	47.06	-6.94	54.00	49.78	29.40	35.53	3.41 Average	---	---
16 I	2808.00	71.60	-2.40	74.00	74.32	29.40	35.53	3.41 Peak	---	---

Remark: #7 and 8 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 @	4818.00	62.42	-11.58	74.00	60.57	32.36	35.27	4.77 Peak	---	---
2 @	4818.00	47.31	-6.69	54.00	45.45	32.36	35.27	4.77 Average	---	---

	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 @	7234.00	64.36	-9.64	74.00	58.27	35.33	35.49	6.24 Peak	---	---
2 @	7234.00	48.53	-5.47	54.00	42.45	35.33	35.49	6.24 Average	100	345



- 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 @	49.44	25.60	-14.40	40.00	46.86	10.30	32.43	0.87	Peak	---	---
2 @	189.84	27.60	-15.90	43.50	48.28	9.52	31.95	1.75	Peak	---	---
3 @	293.79	37.87	-8.13	46.00	54.61	12.93	31.94	2.26	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	36.21	-9.79	46.00	52.76	12.94	31.91	2.42	Peak	---	---
2 @	437.90	36.70	-9.30	46.00	49.40	16.40	31.96	2.86	Peak	---	---
3 @	880.30	35.93	-10.07	46.00	42.38	20.32	31.05	4.28	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 @	1674.00	58.74	-15.26	74.00	64.99	26.42	35.43	2.76	Peak	---	---
2 @	1674.00	41.23	-12.77	54.00	47.48	26.42	35.43	2.76	Average	---	---
3 @	2058.00	45.40	-8.60	54.00	49.48	28.05	35.21	3.08	Average	---	---
4 @	2058.00	63.59	-10.41	74.00	67.66	28.05	35.21	3.08	Peak	---	---
5 @	2128.00	45.87	-8.13	54.00	49.83	28.12	35.21	3.13	Average	---	---
6 @	2128.00	64.03	-9.97	74.00	68.00	28.12	35.21	3.13	Peak	---	---
7 @	2284.00	44.07	-9.93	54.00	47.77	28.29	35.23	3.24	Average	---	---
8 @	2284.00	60.87	-13.13	74.00	64.58	28.29	35.23	3.24	Peak	---	---
9 @	2354.00	59.31	-14.69	74.00	62.90	28.36	35.24	3.29	Peak	---	---
10 @	2354.00	42.86	-11.14	54.00	46.45	28.36	35.24	3.29	Average	---	---
11 @	2434.00	63.97			67.45	28.43	35.25	3.34	Average	---	---
12 @	2434.00	108.21			111.69	28.43	35.25	3.34	Peak	---	---
13 @	2483.50	59.37	-14.63	74.00	62.76	28.48	35.26	3.38	Peak	---	---
14 @	2483.50	43.05	-10.95	54.00	46.45	28.48	35.26	3.38	Average	---	---
15 @	2584.00	44.27	-9.73	54.00	47.45	28.75	35.33	3.40	Average	---	---
16 @	2584.00	62.93	-11.07	74.00	66.11	28.75	35.33	3.40	Peak	---	---

Remark: #11 and 12 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 @	4858.00	57.46	-16.54	74.00	55.34	32.59	35.26	4.79	Peak	---	---
2 @	4858.00	42.27	-11.73	54.00	40.15	32.59	35.26	4.79	Average	---	---

	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 @	7298.00	59.21	-14.79	74.00	53.03	35.46	35.50	6.22	Peak	---	---
2 @	7298.00	43.63	-10.37	54.00	37.45	35.46	35.50	6.22	Average	---	---



- Test Mode : Mode 2
- 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 @	48.09	25.49	-14.51	40.00	46.40	10.66	32.42	0.86	QP	100	331
2 @	186.33	34.72	-8.78	43.50	55.55	9.35	31.90	1.73	Peak	---	---
3 @	297.03	34.40	-11.60	46.00	51.03	12.94	31.93	2.35	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 @	428.80	39.84	-6.16	46.00	52.70	16.42	32.15	2.87	Peak	---	---
2 @	567.40	38.10	-7.90	46.00	47.43	18.43	31.39	3.63	Peak	---	---
3 @	911.80	39.77	-6.23	46.00	45.72	20.29	30.99	4.76	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 @	2128.00	72.72	-1.28	74.00	76.69	28.12	35.21	3.13	Peak	---	---
2 @	2128.00	50.49	-3.51	54.00	54.45	28.12	35.21	3.13	Average	---	---
3 @	2284.00	68.22	-5.78	74.00	71.92	28.29	35.23	3.24	Peak	---	---
4 @	2284.00	45.08	-8.92	54.00	48.78	28.29	35.23	3.24	Average	---	---
5 @	2318.00	65.97	-8.03	74.00	69.61	28.33	35.24	3.27	Peak	---	---
6 @	2318.00	44.81	-9.19	54.00	48.45	28.33	35.24	3.27	Average	---	---
7 @	2434.00	113.25			116.72	28.43	35.25	3.34	Peak	---	---
8 @	2434.00	64.60			68.08	28.43	35.25	3.34	Average	---	---
9 @	2488.00	60.86	-13.14	74.00	64.24	28.50	35.26	3.38	Peak	---	---
10 @	2488.00	45.40	-8.60	54.00	48.78	28.50	35.26	3.38	Average	---	---
11 @	2738.00	67.87	-6.13	74.00	70.73	29.20	35.46	3.40	Peak	---	---
12 @	2738.00	45.02	-8.98	54.00	47.88	29.20	35.46	3.40	Average	---	---
13 @	2804.00	69.23	-4.77	74.00	71.96	29.40	35.53	3.41	Peak	---	---
14 @	2804.00	46.06	-7.94	54.00	48.78	29.40	35.53	3.41	Average	---	---
15 @	2834.00	69.13	-4.87	74.00	71.77	29.50	35.55	3.41	Peak	---	---
16 @	2834.00	44.84	-9.16	54.00	47.48	29.50	35.55	3.41	Average	---	---

Remark: #7 and 8 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 @	4858.00	64.55	-9.45	74.00	62.44	32.59	35.26	4.79	Peak	---	---
2 @	4858.00	47.57	-6.43	54.00	45.45	32.59	35.26	4.79	Average	---	---

	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 @	7294.00	66.34	-7.66	74.00	60.17	35.46	35.50	6.22	Peak	---	---
2 @	7294.00	50.63	-3.37	54.00	44.45	35.46	35.50	6.22	Average	100	315



- 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 @	2084.00	61.73	-12.27	74.00	65.75	28.09	35.21	3.11	Peak	---	---
2 @	2084.00	41.44	-12.56	54.00	45.45	28.09	35.21	3.11	Average	---	---
3 @	2144.00	65.51	-8.49	74.00	69.44	28.14	35.22	3.15	Peak	---	---
4 @	2144.00	44.52	-9.48	54.00	48.45	28.14	35.22	3.15	Average	---	---
5 @	2354.00	44.53	-9.47	54.00	48.12	28.36	35.24	3.29	Average	---	---
6 @	2354.00	58.91	-15.09	74.00	62.51	28.36	35.24	3.29	Peak	---	---
7 @	2454.00	72.02			75.45	28.47	35.25	3.36	Average	---	---
8 @	2454.00	102.52			105.94	28.47	35.25	3.36	Peak	---	---
9 @	2494.00	45.09	-8.91	54.00	48.46	28.50	35.26	3.39	Average	---	---
10 @	2494.00	59.43	-14.57	74.00	62.79	28.50	35.26	3.39	Peak	---	---
11 @	2758.00	61.80	-12.20	74.00	64.63	29.25	35.48	3.40	Peak	---	---
12 @	2758.00	46.62	-7.38	54.00	49.45	29.25	35.48	3.40	Average	---	---

Remark: #7 and #8 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 @	4904.00	58.00	-16.00	74.00	55.48	32.93	35.24	4.83	Peak	---	---
2 @	4904.00	41.30	-12.70	54.00	38.78	32.93	35.24	4.83	Average	---	---

	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 @	7364.00	62.30	-11.70	74.00	55.98	35.64	35.52	6.20	Peak	---	---
2 @	7364.00	47.77	-6.23	54.00	41.45	35.64	35.52	6.20	Average	---	---



- Test Mode : Mode 3
- 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 @	2078.00	69.56	-4.44	74.00	73.60	28.07	35.21	3.09	Peak	---	---
2 @	2078.00	45.11	-8.89	54.00	49.15	28.07	35.21	3.09	Average	---	---
3 @	2144.00	48.22	-5.78	54.00	52.15	28.14	35.22	3.15	Average	---	---
4 @	2144.00	72.55	-1.45	74.00	76.48	28.14	35.22	3.15	Peak	---	---
5 @	2310.00	45.78	-8.22	54.00	49.45	28.31	35.23	3.25	Average	---	---
6 @	2310.00	65.89	-8.11	74.00	69.56	28.31	35.23	3.25	Peak	---	---
7 @	2454.00	113.20			116.62	28.47	35.25	3.36	Peak	---	---
8 @	2454.00	76.69			80.12	28.47	35.25	3.36	Average	---	---
9 @	2483.50	44.08	-9.92	54.00	47.48	28.48	35.26	3.38	Average	---	---
10 @	2483.50	58.99	-15.01	74.00	62.38	28.48	35.26	3.38	Peak	---	---
11 @	2758.00	69.84	-4.16	74.00	72.67	29.25	35.48	3.40	Peak	---	---
12 @	2758.00	46.62	-7.38	54.00	49.45	29.25	35.48	3.40	Average	---	---
13 @	2854.00	69.80	-4.20	74.00	72.41	29.55	35.57	3.41	Peak	---	---
14 @	2854.00	46.17	-7.83	54.00	48.78	29.55	35.57	3.41	Average	---	---

Remark: # 7 and 8 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 @	4904.00	58.52	-15.48	74.00	56.00	32.93	35.24	4.83	Peak	---	---
2 @	4904.00	41.97	-12.03	54.00	39.45	32.93	35.24	4.83	Average	---	---

	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 @	7358.00	68.07	-5.93	74.00	61.74	35.64	35.52	6.21	Peak	---	---
2 @	7358.00	51.11	-2.89	54.00	44.78	35.64	35.52	6.21	Average	100	334





## **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 antenna used in this product is a Whip Antenna without connector and it is considered to meet antenna requirement of FCC.



### 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. 11, 2005	Feb. 11, 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)



## 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>				