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# TEST REPORT

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**REPORT NUMBER** : **ANKK-101123**  
**APPLICANT** : **Sony Corporation**  
**MODEL NUMBER** : **SPP-A2780/S2730/A2770/S2720**  
**FCC ID** : **AK8SPPA2780**  
**REGURATION** : **FCC Part15**



NVLAP accreditation is valid for  
FCC Part15 (Digital Devices),  
CISPR22 and AS/NZS 3548.  
NVLAP accreditation does not cover  
ICES-003.

**Akzo Nobel K. K.**  
**EMC Division**  
**Kashima Site**

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**ABBREVIATIONS**

LISN = Line Impedance Stabilization Network

AMN = Artificial Mains Network

ANT = Antenna

BBA = Broad-band Antenna

DIP = Dipole Antenna

AMP = Amplifier

ATT = Attenuator

EUT = Equipment Under Test

Q-P = Quasi-peak

AVG = Average

TDD = Time division duplex

ch = Channel

**SECTION 1. TEST CERTIFICATION****APPLICANT INFORMATION**

Company	: Sony Corporation
Address	: 6-7-35, Kitashinagawa, Shinagawa-ku, Tokyo, 141-0001 Japan
Telephone number	: +81 3 5769 5640
Fax number	: +81 3 5769 5962

**DESCRIPTION OF TEST ITEM**

Kind of equipment	: Cordless Telephone
Condition of equipment	: Prototype
Type	: Table-Top
Trademark	: SONY
FCC ID	: AK8SPPA2780
Model number	: SPP-A2780
Serial number	: None

**TEST PERFORMED**

Location	: Kashima No. 1 Test Site (FCC File No. : 31040/SIT)
EUT received	: March 5, 2001
Test started	: March 5, 2001
Test completed	: March 23, 2001
Regulation	: FCC Part15 Subpart C Section 15.247 Intentional Radiators
Test setup	: ANSI C63.4-1992

Report number : ANKK-101123

Report issue date : April 9, 2001

Test engineer : Kazuhiro Ando

Report approved by : Junichi Okada  
[Site Manager]



**On the basis of the measurements made, the equipment tested is capable of operation in compliance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.**

**SECTION 2. SUMMARY OF RESULTS**

<b>Test</b>	<b>Reference</b>	<b>Result</b>
Minimum 6dB Bandwidth	15.247(a)(2)	Pass
Maximum Peak Output Power	15.247(b)	Pass
Spurious Emissions - RF Antenna Conducted Test	15.247(c)	Pass
Spurious Emissions - Radiated Emission Test	15.247(c) 15.205 15.209	Pass
Radiated Emission Test from Digital Part	15.109	Pass
Power Spectral Density	15.247(d)	Pass
Antenna Requirement	15.203	Pass
Restricted Bands of Operation	15.247(c) 15.205 15.209	Pass
AC Conducted Emission	15.207 15.107	Pass
Variation of Input Power	15.31(e)	Pass

Note : As for the data of the processing gain[15.247(e) ], refer to the processing gain file.

**SECTION 3. EQUIPMENT UNDER TEST**

The equipment under test (EUT) consisted of the following equipment.  
Indication in the following left side column corresponds to Section 6.

Symbol	Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer	Remarks
A)	Base phone	SPP-A2780	None	AK8SPPA2780	Sony Corp.	
B)	Cordless handset	SPP-A2780	None	AK8SPPA2780	Sony Corp.	
C)	AC power adaptor	AC-T46	None	N.A.	Sony Corp.	
D)	Charger/AC power adaptor	AC-T127	None	N.A.	Sony Corp.	
E)	Rechargeable battery pack	BP-T38	None	N.A.	Sony Corp.	

Power ratings of EUT : (Base phone) AC 120V, 60 Hz  
AC power adaptor : (Input) AC 120V, 60 Hz  
(Output) DC 9V  
(Cordless handset) DC 3.6V  
Charger/AC power adaptor : (Input) AC 120V, 60 Hz  
(Output) DC 9V

DoC : Device for Declaration of Conformity

**3.1 Overview of EUT**

Access Method	FDMA-TDD
Frequency Band	2.4075 - 2.4720 GHz
Number of Channel	40
Channel Spacing	1.5 MHz
Modulation Method	FSK
Spread Method	Direct Sequence Spread Spectrum
Chip Rate	15 chips/bit
Data Transfer Rate	100 kbps
Rated RF Output	0.06207 W (Base phone)
	0.09613 W (Cordless handset)
Antenna Gain	+1.5 dBi (Main Antenna of Base phone)
	+0.5 dBi (Sub Antenna of Base phone)
	+1.0 dBi (Cordless handset)
Antenna Requirement	The EUT uses a permanently connected antenna.

## 3.2 Variation of model(s)

Model	A2780	S2730	A2770	S2720	H273
Feature					
Digital SS High Power 2.4 GHz	O	O	O	O	O
2 Phones in Corded and Cordless Phone Set with Free	O	O	×	×	-
Multi Handset (up to 4 Handset) capability	O	O	O	O	-
Center Roller Jog	B/H	B/H	H	H	O
Switchable LCD Language (Eng./Span)	B/H	B/H	H	H	O
Caller-ID with Call Waiting Type 2.5	O	O	O	O	O
Walky Talky Function	O	O	O	O	O
Integrated Beltclip	O	O	O	O	O
Headset jack	O	O	O	O	O
EZ Access Button	B/H	B/H	H	H	O
8/15/20 Min. digital recording w/ selectable recording quality	O	×	O	×	-
Eng. voice prompts	O	×	O	×	O
Handset Remote Control	O	×	O	×	O
Handset Call Screening	O	×	O	×	O
Remarks	Tested model				

B/H: usable for both Base phone and Cordless handset  
H: usable for only Cordless handset

Note : Model H273 is used in case of sales for Cordless handset only.

## 3.3 Operating channels and frequencies

<b>Ch</b>	<b>Base phone (MHz)</b>	<b>Cordless handset (MHz)</b>	<b>Ch</b>	<b>Base phone (MHz)</b>	<b>Cordless handset (MHz)</b>
<b>1</b>	<b>2409.00</b>	<b>2409.00</b>	<b>21</b>	<b>2440.50</b>	<b>2440.50</b>
<b>2</b>	<b>2410.50</b>	<b>2410.50</b>	<b>22</b>	<b>2442.00</b>	<b>2442.00</b>
<b>3</b>	<b>2412.00</b>	<b>2412.00</b>	<b>23</b>	<b>2443.50</b>	<b>2443.50</b>
<b>4</b>	<b>2413.50</b>	<b>2413.50</b>	<b>24</b>	<b>2445.00</b>	<b>2445.00</b>
<b>5</b>	<b>2415.00</b>	<b>2415.00</b>	<b>25</b>	<b>2446.50</b>	<b>2446.50</b>
<b>6</b>	<b>2416.50</b>	<b>2416.50</b>	<b>26</b>	<b>2449.50</b>	<b>2449.50</b>
<b>7</b>	<b>2418.00</b>	<b>2418.00</b>	<b>27</b>	<b>2451.00</b>	<b>2451.00</b>
<b>8</b>	<b>2419.50</b>	<b>2419.50</b>	<b>28</b>	<b>2452.50</b>	<b>2452.50</b>
<b>9</b>	<b>2421.00</b>	<b>2421.00</b>	<b>29</b>	<b>2454.00</b>	<b>2454.00</b>
<b>10</b>	<b>2422.50</b>	<b>2422.50</b>	<b>30</b>	<b>2455.50</b>	<b>2455.50</b>
<b>11</b>	<b>2425.50</b>	<b>2425.50</b>	<b>31</b>	<b>2457.00</b>	<b>2457.00</b>
<b>12</b>	<b>2427.00</b>	<b>2427.00</b>	<b>32</b>	<b>2458.50</b>	<b>2458.50</b>
<b>13</b>	<b>2428.50</b>	<b>2428.50</b>	<b>33</b>	<b>2460.00</b>	<b>2460.00</b>
<b>14</b>	<b>2430.00</b>	<b>2430.00</b>	<b>34</b>	<b>2461.50</b>	<b>2461.50</b>
<b>15</b>	<b>2431.50</b>	<b>2431.50</b>	<b>35</b>	<b>2463.00</b>	<b>2463.00</b>
<b>16</b>	<b>2433.00</b>	<b>2433.00</b>	<b>36</b>	<b>2464.50</b>	<b>2464.50</b>
<b>17</b>	<b>2434.50</b>	<b>2434.50</b>	<b>37</b>	<b>2466.00</b>	<b>2466.00</b>
<b>18</b>	<b>2436.00</b>	<b>2436.00</b>	<b>38</b>	<b>2467.50</b>	<b>2467.50</b>
<b>19</b>	<b>2437.50</b>	<b>2437.50</b>	<b>39</b>	<b>2469.00</b>	<b>2469.00</b>
<b>20</b>	<b>2439.00</b>	<b>2439.00</b>	<b>40</b>	<b>2470.50</b>	<b>2470.50</b>

Note:

1. This is for sure that all frequencies are in 2409.00 MHz to 2470.50 MHz.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz. (The locations of these frequencies one near the low, one near the middle and one near the high.)
3. After test, the EUT operating frequencies are in 2409.00 MHz to 2470.50 MHz. So all the items as followed in testing report are need to test these three frequencies: low: ch 1, middle: ch 21, high: ch 40.

## 3.4 Oscillator(s)/Crystal(s) :

<b>Oscillator</b>	<b>Operating frequency</b>	<b>Board name</b>	<b>Remarks</b>
24.0 MHz	24.0 MHz	RF Unit	Highest frequency
10.368 MHz	10.368 MHz	HAND PWB	Cordless handset only
6.0 MHz	6.0 MHz	BASE PWB, HAND PWB	
4.096 MHz	4.096 MHz	BASE PWB	Base phone only

**SECTION 4. SUPPORT EQUIPMENT USED**

The EUT was supported by the following equipment during the test.  
Indication in the following left side column corresponds to Section 6.

Symbol	Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer	Remarks
F)	Bell Ringer Generator	TG-297B	91525	N.A.	Sanwa Radio Measurement Works	
G)	Headset	TL-HD1	None	N.A.	Sony Corp.	

DoC : Device was tested and authorized under a Declaration of Conformity to the applicable FCC rules.

**SECTION 5. CABLE (S) USED**

The following cable(s) was used for the test.

Indication number in the following left side column corresponds to Section 6.

Number	Name	Length	Shield	Connector	Core
1)	Telephone Line cable	2.10 m	None	Plastic	
2)	Handset cable (Curl Cord)	0.50 m	None	Plastic	
3)	Headset cable	1.50 m	None	Metal	
4)	Power cable for AC power adaptor	1.90 m	None		
5)	Power cable for Charger/AC power adaptor	1.80 m	None		

Note :

- a. No ferrite core is attached to the outer cables.

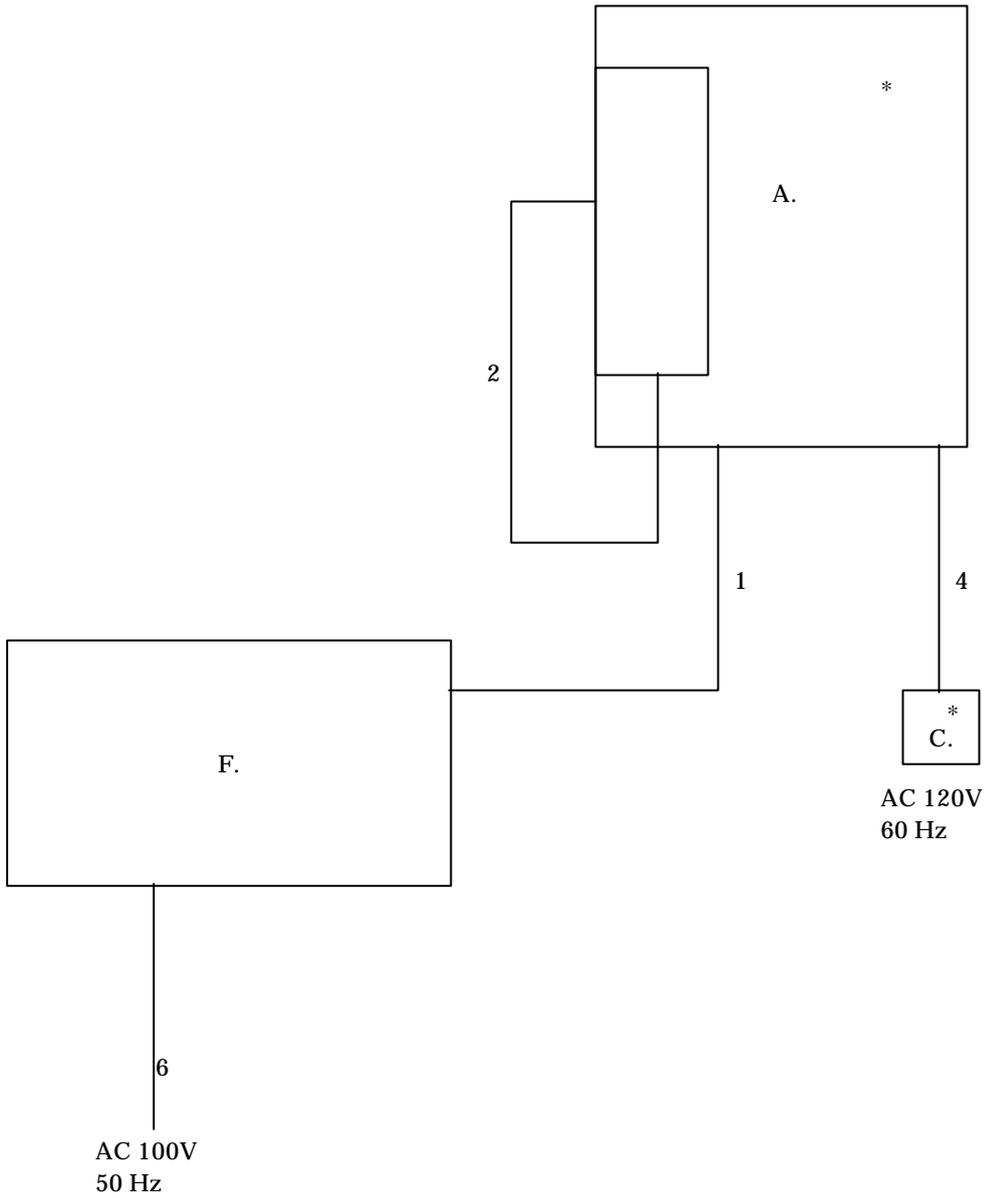
**SECTION 6. CONSTRUCTION OF EQUIPMENT**

The construction of EUT during the test was as follows.

6.1 Base phone

System configuration

\* : EUT

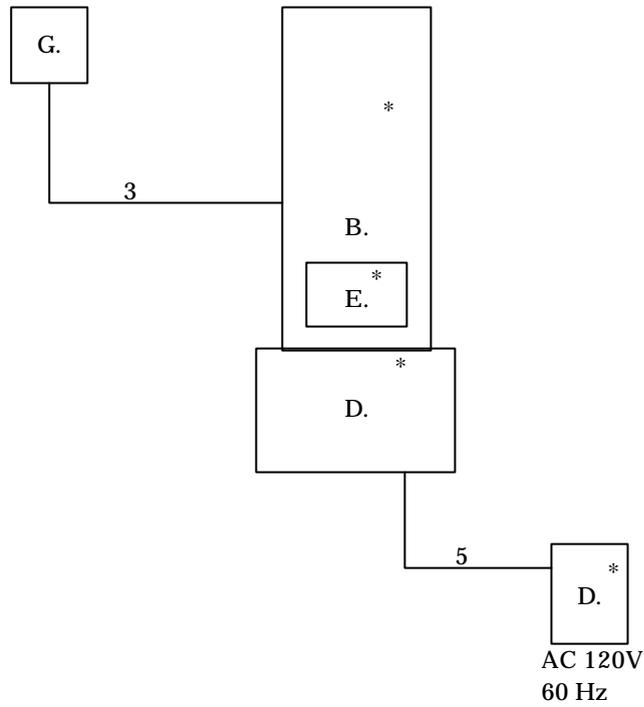


Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

### 6.2 Cordless handset with Charger

#### System configuration

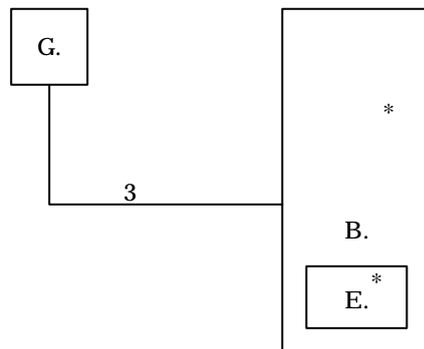
\* : EUT



### 6.3 Cordless handset

#### System configuration

\* : EUT



Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

## SECTION 7. GENERAL TEST CONDITIONS

The EUT was operated under the following conditions during the test.

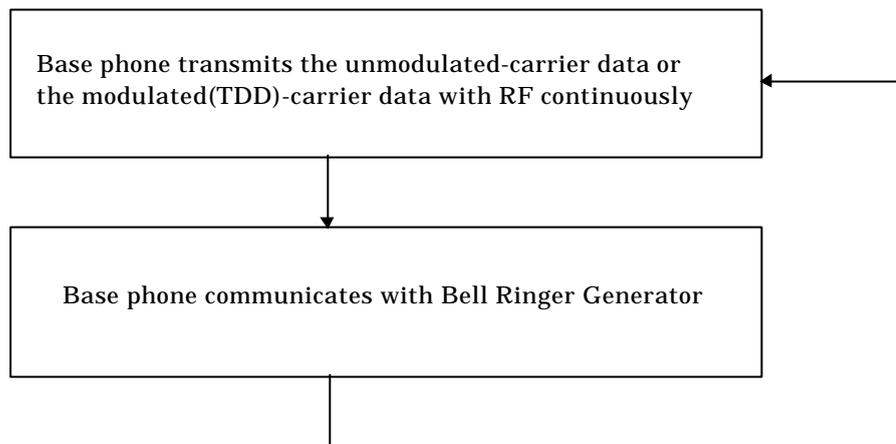
### 7.1 Operating condition

The test was carried out with the transmitter set at maximum power in Test mode. EUT was examined in the operating conditions that had maximum emissions.

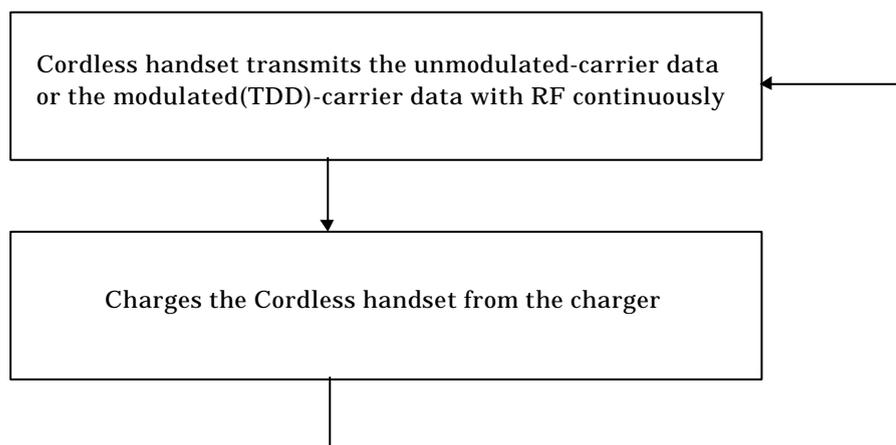
### 7.2 Operating flow

#### 7.2.1 Base phone

Following operations were performed continuously.



#### 7.2.2 Cordless handset



## SECTION 8. TEST PROCEDURE(S)

Test was carried out under the following conditions .

Test was carried out with no deviations from standards and test methods.

### 8.1 Conducted Emission Test [15.207, 15.107]

#### 8.1.1 Equipment Setup

System configuration and Equipment setup are shown on Section 6 and Section 10.

##### 8.1.1.1 Table-Top Equipment

EUT is placed on the wooden table raised 0.8meter above the metal ground plane.

##### 8.1.1.2 Interconnecting Cables

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.

##### 8.1.1.3 AC Power Cable

AC power cable for EUT is connected to one LISN which is placed on the ground plane. The LISN is placed in 80 cm from the nearest part of EUT chassis. The excess power cable is bundled in the center, or shortened to appropriate length. AC cables except from the EUT are connected second LISN.

#### 8.1.2 Measuring Instruments

Brief description of Measuring Instruments are as follows;

##### 8.1.2.1 Spectrum Analyzer

The Spectrum analyzer is used for preliminary measurement.

##### 8.1.2.2 EMI Test Receiver

The Quasi-peak detector (IF bandwidth : 10 kHz) and average detector (IF bandwidth : 10 kHz) built in test receiver is used for final measurement. The test receiver is complied with the specification of the CISPR publication 16.

##### 8.1.2.3 LISN

Two 50 $\mu$ H//50 $\Omega$  LISN are used. The chassis of the LISN is bonded to the ground plane by the copper blade. One LISN is connected to the EUT. Other LISN (2nd LISN) is connected to the support equipment. The signal output of the 2nd LISN is terminated with a 50 $\Omega$  termination.

### 8.1.3 Test Procedure

#### 8.1.3.1 Preliminary Measurement

EUT is tested on all operating conditions.

The spectrum analyzer is controlled by the computer program to sweep regulation frequency, then spectrum chart are plotted out to detect the worst conditions in operating mode and/or configuration for the final test.

All leads other than safety ground are tested.

#### 8.1.3.2 Final Measurement

The EUT is operated in the worst condition where maximum emission is detected by the preliminary test. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

The each spectrum to be tested are measured in quasi-peak using the test receiver. When the value in the quasi-peak mode is higher than the limit in the standard, the measurement in the average mode is done to compare to the value in the quasi-peak mode. If the value in the quasi-peak mode exceeds the value in the average mode by more than 6 dB, the value reducing 13 dB from the value in the quasi-peak mode is used to compare to the limit.

## 8.2 Radiated Emission Test [15.247(b), 15.247(c), 15.205, 15.209, 15.109]

### 8.2.1 Equipment Setup

System configuration and Equipment setup are shown on Section 6 and Section 10.

#### 8.2.1.1 Table-Top Equipment

EUT is placed on the wooden table raised 0.8meter above the metal ground plane (turntable).

#### 8.2.1.2 Interconnecting Cables

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.

### 8.2.2 Measuring Instruments

Brief description of Measuring Instruments are as follows;

#### 8.2.2.1 Antennas

The broadband Tri-log antenna is used for measurement on the frequency range 30 – 1000 MHz.

The Double ridged guide antenna and the Standard gain horn antennas are used for frequency higher than 1000 MHz.

If uncertain result was obtained, the broadband antenna is replaced by the half wave length dipole, then measurement is carried out over again.

#### 8.2.2.2 Pre-amplifier

The broadband pre-amplifier is used for radiated emission measurement.

The signal to noise ratio is improved by using pre-amplifier.

#### 8.2.2.3 Spectrum Analyzer

The spectrum analyzer is used for preliminary measurement of frequency range 30 – 1000 MHz, and also used for final measurement of higher than 1000 MHz

#### 8.2.2.4 EMI Test Receiver

The Quasi-peak detector (IF bandwidth : 120 kHz) built in test receiver is used for final measurement of the frequency 30– 1000 MHz.

The test receiver is complied with the specification of the CISPR publication 16.

#### 8.2.2.5 Turntable

The turntable is capable for EUT weight and rotatable 0 to 360 degree horizontally by remote control in the test room.

#### 8.2.2.6 Antenna Mast

The antenna mast is attachable to all antennas described on clause 8.2.2.1 and antenna height is adjustable 1 to 4 meters continuously by remote control at the test room, and antenna polarization is also changed by the remote control.

### 8.2.3 Test Procedure

#### 8.2.3.1 Preliminary Measurement

EUT is tested on all operating conditions.

The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to detect the worst conditions in configuration, operating mode, or ambient noise notation.

#### 8.2.3.2 Final Measurement

The EUT operated in the condition where maximum emission is detected in the preliminary test.

The turntable azimuth (EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

When the uncertain result was obtained, the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

**SECTION 9. TEST DATA****9.1 Power Spectral Density [15.247(d)]**

## MEASUREMENT PROCEDURE:

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 1 (low), ch 21 (mid), and ch 40 (high).
3. The Spectrum Analyzer was connected directly to the transmitter output.
4. The Spectrum Analyzer was setup using RBW = 3kHz, VBW = 10kHz, span = 300kHz and sweep = 100sec.(span/3kHz).
5. The next page shows the chart of the observed RF profiles.
6. Following data is the worst case.

Test date : March 13, 2001  
 Temperature : 17 °C  
 Humidity : 45 %

**[Base phone] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	Reading (dBm)	Factor (dB)	Emission Level (dBm)	15.247(d) Limit (dBm)	Chart
1	2409.0	0.00	0.17	0.17	8	Page 20
21	2440.5	0.50	0.17	0.67	8	Page 20
40	2470.5	0.67	0.17	0.84	8	Page 21

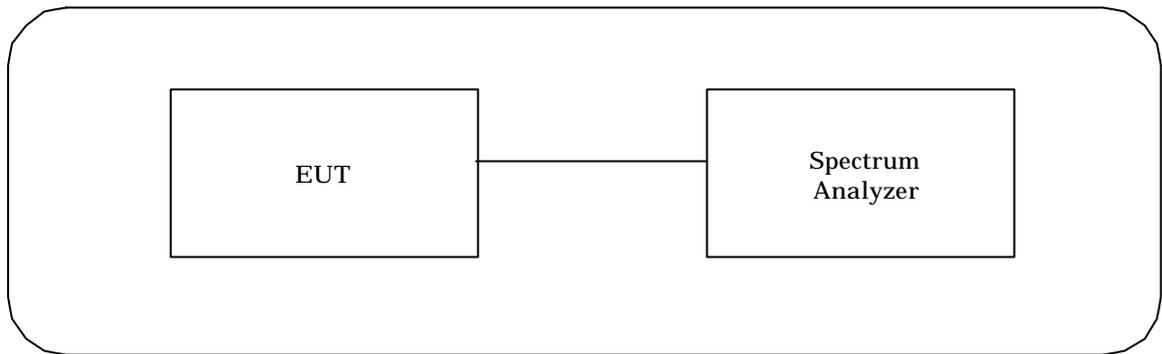
**[Cordless handset] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	Reading (dBm)	Factor (dB)	Emission Level (dBm)	15.247(d) Limit (dBm)	Chart
1	2409.0	2.00	0.17	2.17	8	Page 21
21	2440.5	3.25	0.17	3.42	8	Page 22
40	2470.5	3.58	0.17	3.75	8	Page 22

Note:

1. Emission Level = Reading + Fact or (Cable)

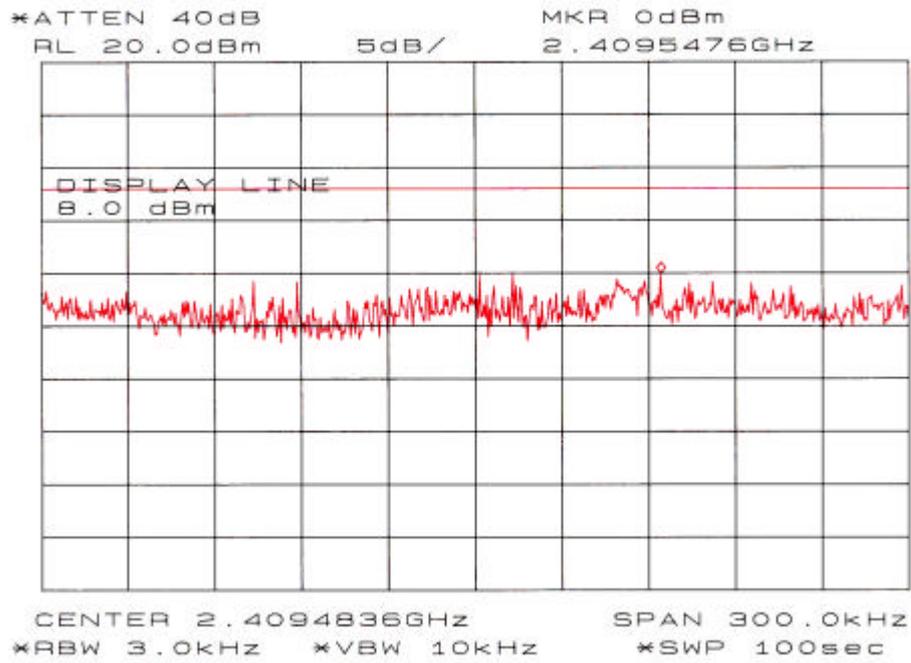
## TEST INSTRUMENTS CONFIGURATION



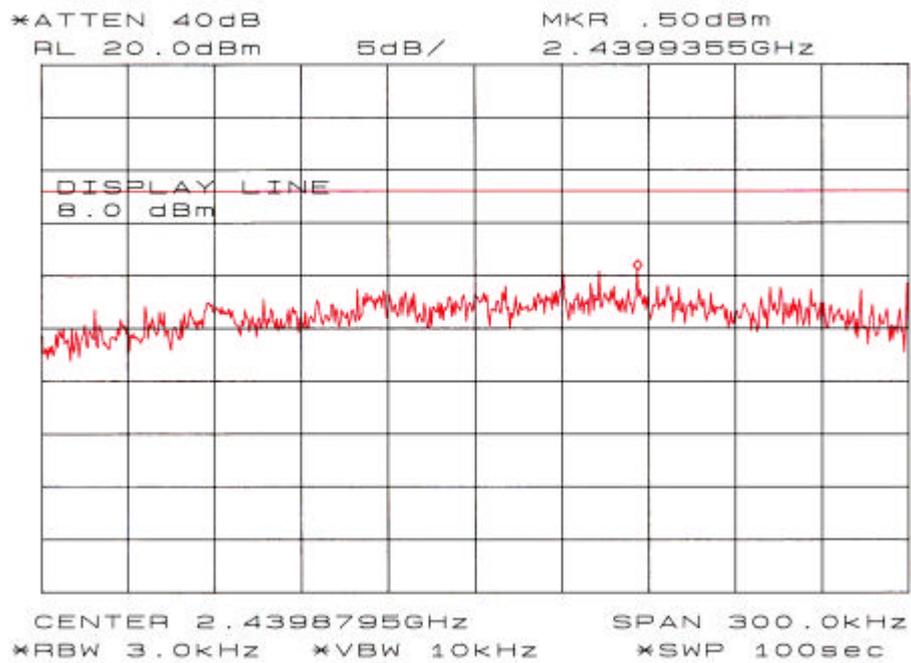
## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8563E	3337A01513	HEWLETT PACKARD	April 4, 00	1 Year

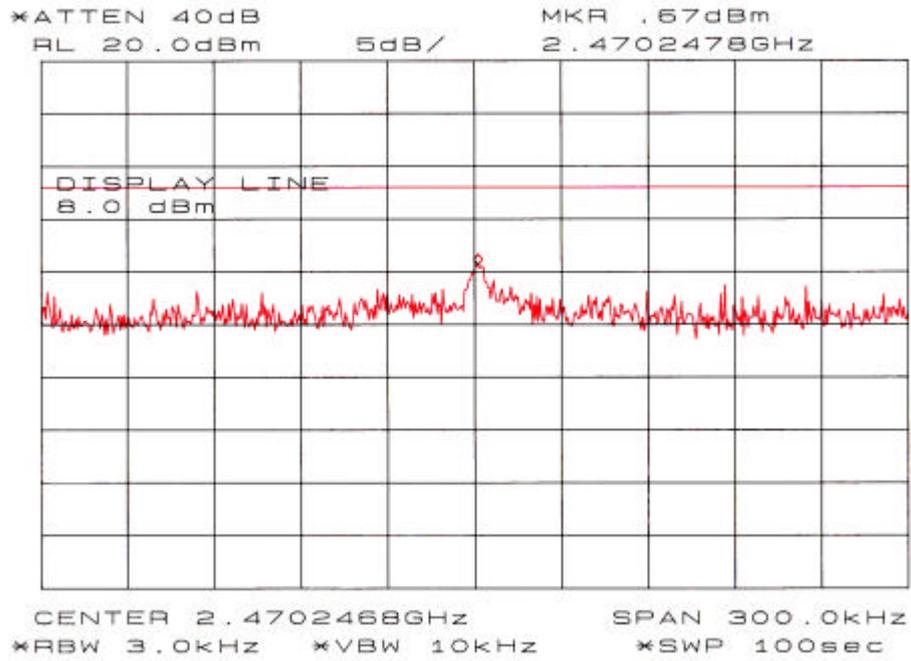
**Chart of Power Spectral Density in ch 1 (Base phone)**



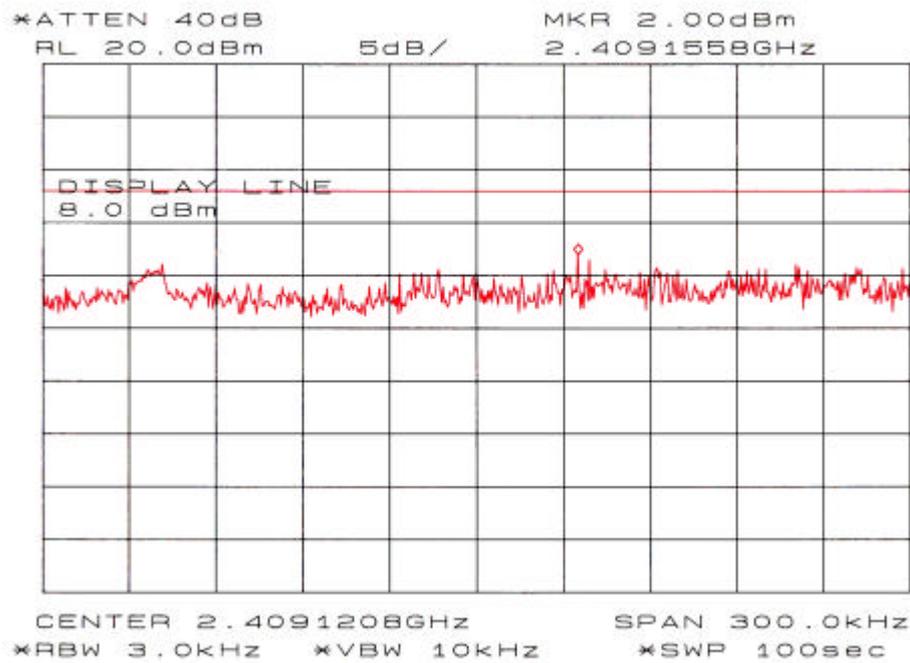
**Chart of Power Spectral Density in ch 21 (Base phone)**



**Chart of Power Spectral Density in ch 40 (Base phone)**



**Chart of Power Spectral Density in ch 1 (Cordless handset)**





**9.2 Minimum 6dB Bandwidth [15.247(a)(2)]**

## MEASUREMENT PROCEDURE:

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 1 (low), ch 21 (mid), and ch 40 (high).
3. The Spectrum Analyzer was connected directly to the transmitter output.
4. The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 100kHz, and span = 50MHz (span>>RBW).
5. The next page shows the chart of the observed RF profiles.
6. Following data is the worst case.

Test date : March 13, 2001  
 Temperature : 17 °C  
 Humidity : 45 %

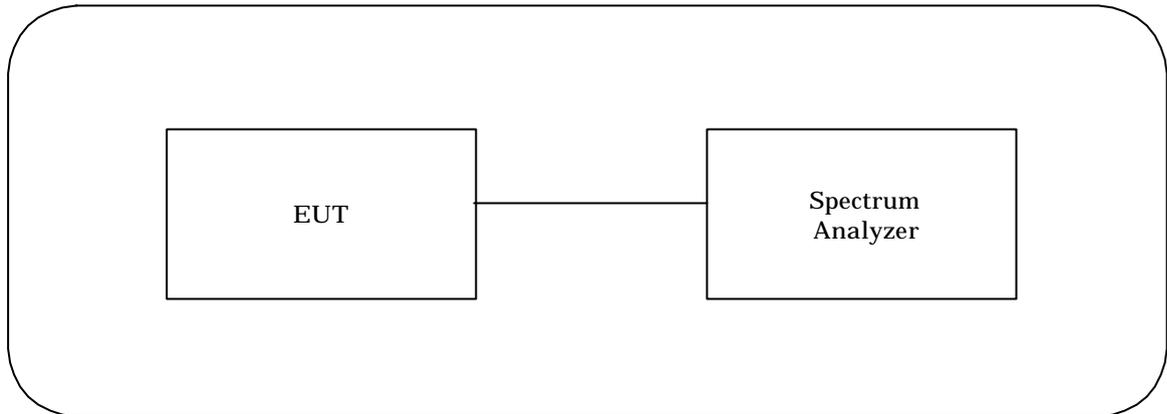
**[Base phone] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	6dB Bandwidth (MHz)	15.247(a)(2) Minimum (kHz)	Chart
1	2409.0	1.758	500	Page 25
21	2440.5	1.808	500	Page 25
40	2470.5	1.908	500	Page 26

**[Cordless handset] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	6dB Bandwidth (MHz)	15.247(a)(2) Minimum (kHz)	Chart
1	2409.0	1.867	500	Page 26
21	2440.5	1.925	500	Page 27
40	2470.5	2.058	500	Page 27

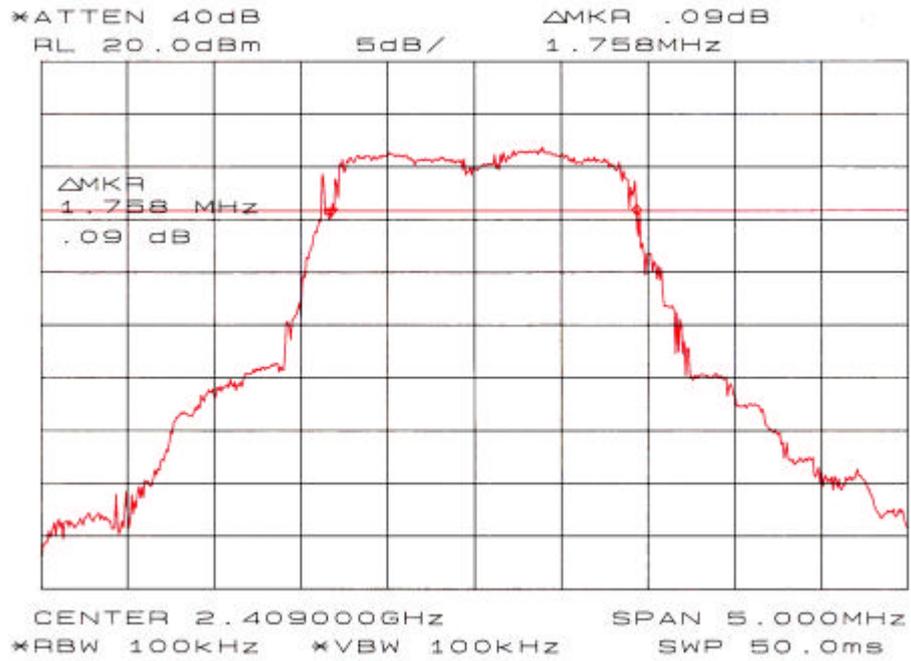
## TEST INSTRUMENTS CONFIGURATION



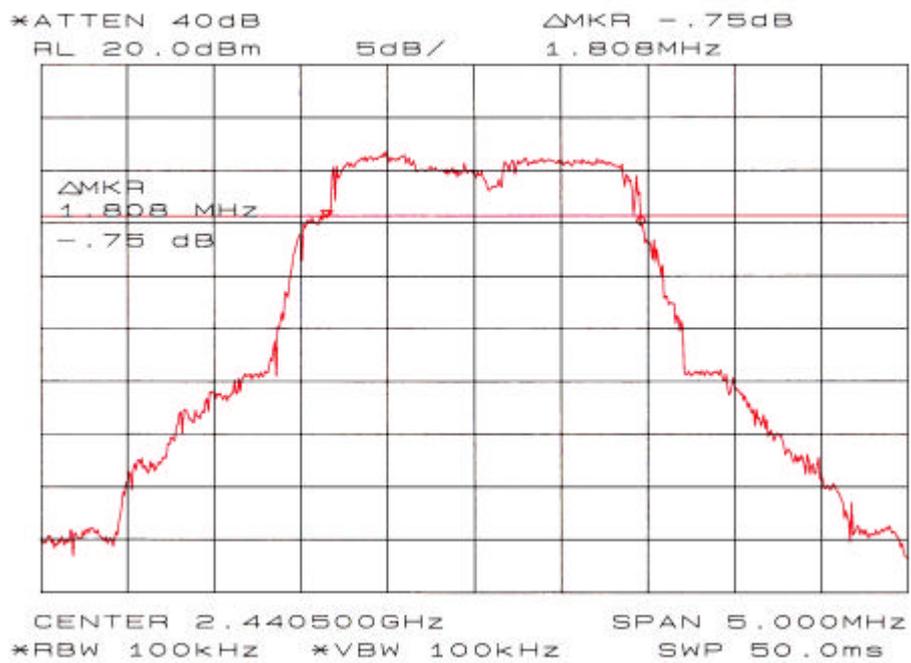
## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8563E	3337A01513	HEWLETT PACKARD	April 4, 00	1 Year

**Chart of Minimum 6dB Bandwidth in ch 1 (Base phone)**



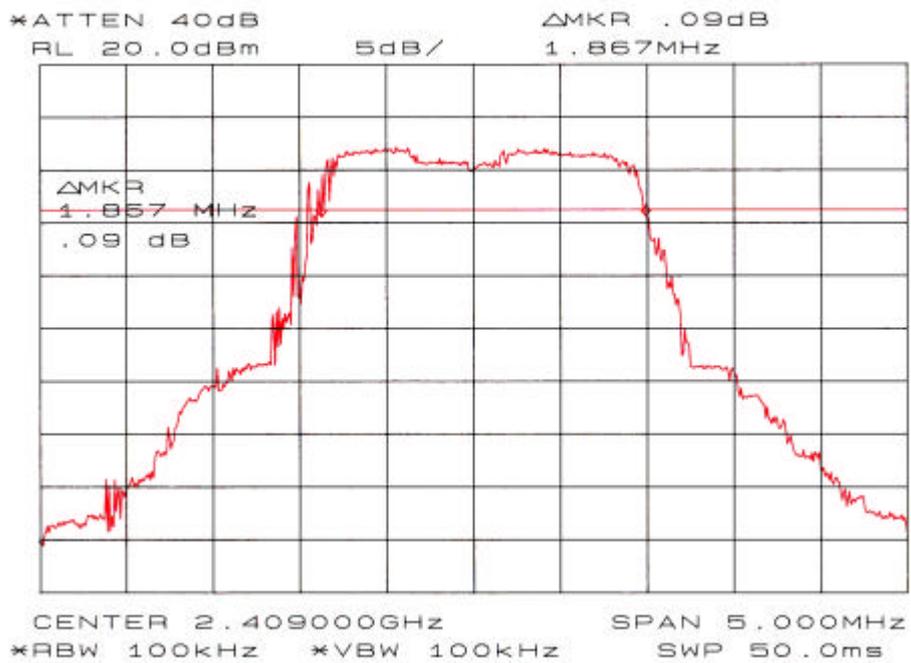
**Chart of Minimum 6dB Bandwidth in ch 21 (Base phone)**



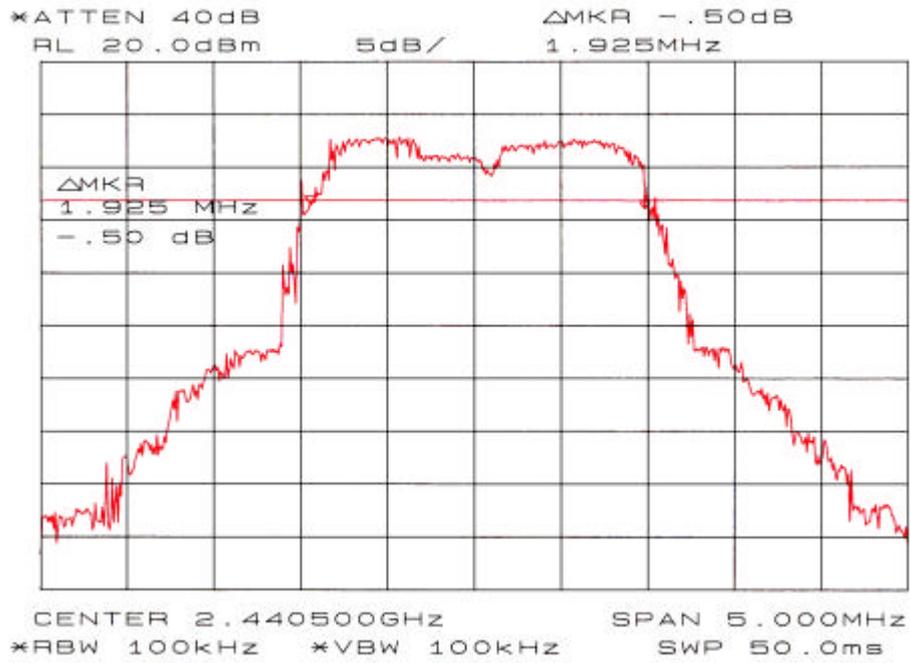
**Chart of Minimum 6dB Bandwidth in ch 40 (Base phone)**



**Chart of Minimum 6dB Bandwidth in ch 1 (Cordless handset)**



**Chart of Minimum 6dB Bandwidth in ch 21 (Cordless handset)**



**Chart of Minimum 6dB Bandwidth in ch 40 (Cordless handset)**



### 9.3 Maximum Peak Output Power [15.247(b)]

#### MEASUREMENT PROCEDURE:

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 1 (low), ch 21 (mid), and ch 40 (high).
3. Base phone is desktop type and also available to mount on the wall.  
It has two types of antenna (Main antenna and Sub antenna).  
Therefore, the measurements were carried out with all conditions.

#### Measurement of Radiated Emissions.

4. The EUT was set upon the wooden turntable 80cm above the ground plane at a distance of 1 meters from the receiving antenna.
5. The transmitted emission level was maximized by rotating the turntable and raising and lowering the search antenna.
6. The Spectrum Analyzer was setup using RBW = 2MHz, VBW = 3MHz.
7. As for the chart of the observed RF profiles, refer to Annex D.
8. Following data is the worst case.

Test date : March 7, 2001  
 Temperature : 22 °C  
 Humidity : 45 %

#### [Base Phone on the wall (used Main Antenna)] - Unmodulated-carrier data

ch	Frequency (MHz)	Reading (dBuV/m)	Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)	Peak Output Power (mW)	15.247(b) Limit (mW)	Chart
1	2409.0	83.6	H	38.7	122.3	56.61	1000	Annex D page 2
21	2440.5	83.5	H	38.8	122.3	56.61	1000	Annex D page 3
40	2470.5	83.3	H	38.9	122.2	55.32	1000	Annex D page 4

#### [Base Phone on the wall (used Main Antenna)] - Modulated(TDD)-carrier data

ch	Frequency (MHz)	Reading (dBuV/m)	Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)	Peak Output Power (mW)	15.247(b) Limit (mW)	Chart
1	2409.0	84.0	H	38.7	122.7	62.07	1000	Annex D page 2
21	2440.5	83.9	H	38.8	122.7	62.07	1000	Annex D page 3
40	2470.5	83.5	H	38.9	122.4	57.93	1000	Annex D page 4

#### Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable)
2. Peak Output Power :  $P = (E \cdot d)^2 / 30G$   
 where P is the power, in Watts  
 E is the measured peak field strength, in Volts/meter  
 d is the distance at which the measurement was made, in meters  
 G is the numeric gain of the radiating element

Example: the Max Radiated Emission of ch 1 with Modulated(TDD)-carrier = 122.7 dBuV/m

$$E = 10^{(122.7/20)} \times 10^{-6} = 1.3646 \text{ V}$$

$$P = (1.3646 \times 1)^2 / 30 \times 1 = 0.06207 \text{ W} = 62.07 \text{ mW}$$

**[Cordless handset] - Unmodulated-carrier data**

ch	Frequency (MHz)	Reading (dBuV/m)	Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)	Peak Output Power (mW)	15.247(b) Limit (mW)	Chart
1	2409.0	83.9	H	38.7	122.6	60.66	1000	Annex D page 5
21	2440.5	85.7	H	38.8	124.5	93.95	1000	Annex D page 6
40	2470.5	85.7	H	38.9	124.6	96.13	1000	Annex D page 7

**[Cordless handset] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	Reading (dBuV/m)	Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)	Peak Output Power (mW)	15.247(b) Limit (mW)	Chart
1	2409.0	84.5	H	38.7	123.2	69.65	1000	Annex D page 5
21	2440.5	85.6	H	38.8	124.4	91.81	1000	Annex D page 6
40	2470.5	85.4	H	38.9	124.3	89.72	1000	Annex D page 7

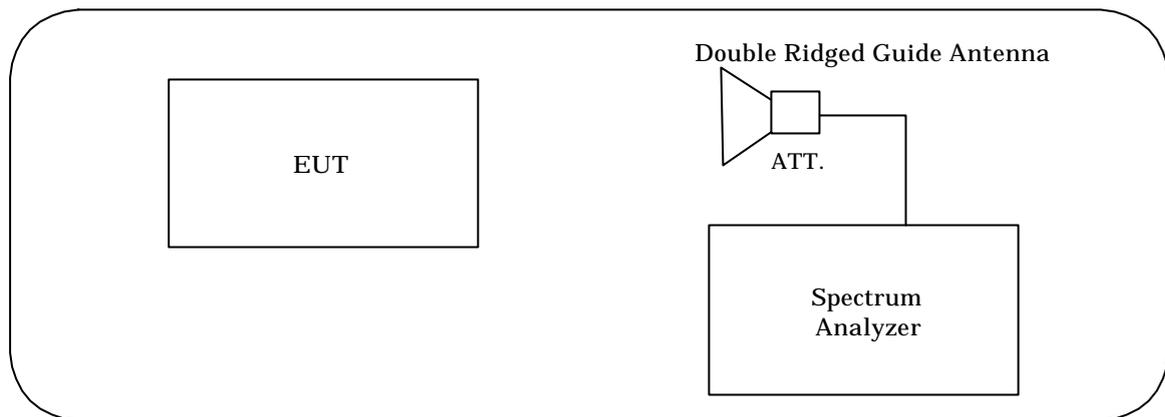
**Note:**

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable)
2. Peak Output Power :  $P = (E * d)^2 / 30G$

where P is the power, in Watts  
E is the measured peak field strength, in Volts/meter  
d is the distance at which the measurement was made, in meters  
G is the numeric gain of the radiating element

Example: the Max Radiated Emission of ch 40 with Unmodulated-carrier = 124.6 dBuV/m  
 $E = 10^{(124.6/20)} \times 10^{-6} = 1.6983 \text{ V}$   
 $P = (1.6983 \times 1)^2 / 30 \times 1 = 0.09613 \text{ W} = 96.13 \text{ mW}$

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year
6dB Attenuator	6806.17B	None	SUHNER	Jan. 5, 01	1 Year
Double Ridged Guide Antenna	3115	5044	EMCO	Jun. 14, 00	1 Year

**9.4 Spurious Emissions - RF Antenna Conducted Test [15.247(c)]****MEASUREMENT PROCEDURE:**

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 1 (low), ch 21 (mid), and ch 40 (high).
3. The Spectrum Analyzer was connected directly to the transmitter output.
4. The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 100kHz.
5. As for the chart of the observed RF profiles, refer to Annex A and B.

Test date : March 13, 2001  
 Temperature : 17 °C  
 Humidity : 45 %

**[Base phone] - Modulated(TDD)-carrier data**

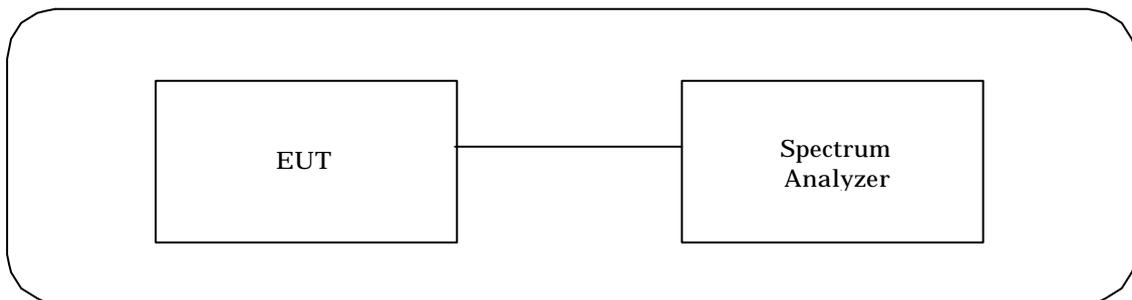
ch	Frequency (MHz)	Chart
1	2409.0	Annex A page 2-4
21	2440.5	Annex A page 5-7
40	2470.5	Annex A page 8-10

**[Cordless handset] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	Chart
1	2409.0	Annex B page 2-4
21	2440.5	Annex B page 5-7
40	2470.5	Annex B page 8-10

**Note:**

1. All out-of-band conducted emissions were more than 20 dB below a carrier.

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8563E	3337A01513	HEWLETT PACKARD	April 4, 00	1 Year

**9.5 Spurious Emissions - Radiated Emission Test [15.247(c), 15.205, 15.209]****MEASUREMENT PROCEDURE:**

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 1 (low), ch 21 (mid), and ch 40 (high).
3. Base phone is desktop type and also available to mount on the wall.  
It has two types of antenna (Main antenna and Sub antenna).  
Therefore, the measurements were carried out with all conditions.

**Measurement of Radiated Emissions.**

4. The EUT was set upon the wooden turntable 80cm above the ground plane at a distance of 1 meter from the receiving antenna.
5. The transmitted emission level was maximized by rotating the turntable and raising and lowering the search antenna.
6. The Spectrum Analyzer was setup using  
Peak mode: RBW = 1MHz, VBW = 1MHz  
Average mode: RBW = 1MHz, VBW = 10Hz
7. Following data is the worst case.

Test date : March 9, 2001  
 Temperature : 18 °C  
 Humidity : 38 %

**[Base phone on the table (used Main Antenna)] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)	
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.
1	4818.0	57.4	37.8	H	3.1	60.5	40.9	74	54	13.5	13.1
	4818.0	61.7	40.1	V	3.1	64.8	43.2	74	54	9.2	10.8
	7227.0	46.0	31.8	H	10.5	56.5	42.3	74	54	17.5	11.7
	7227.0	44.2	31.5	V	10.5	54.7	42.0	74	54	19.3	12.0
	9636.0	42.0	30.0	H	17.3	59.3	47.3	74	54	14.7	6.7
	9636.0	41.1	29.7	V	17.3	58.4	47.0	74	54	15.6	7.0
	12045.0 *	41.2	29.1	H	18.8	60.0	47.9	74	54	14.0	6.1
	12045.0 *	41.0	29.4	V	18.8	59.8	48.2	74	54	14.2	5.8
21	4881.0	58.5	38.2	H	3.3	61.8	41.5	74	54	12.2	12.5
	4881.0	63.0	40.6	V	3.3	66.3	43.9	74	54	7.7	10.1
	7321.5	44.5	31.1	H	10.7	55.2	41.8	74	54	18.8	12.2
	7321.5	46.1	32.5	V	10.7	56.8	43.2	74	54	17.2	10.8
	9762.0	41.9	29.9	H	17.4	59.3	47.3	74	54	14.7	6.7
	9762.0	41.0	29.1	V	17.4	58.4	46.5	74	54	15.6	7.5
	12202.5 *	41.8	30.1	H	18.9	60.7	49.0	74	54	13.3	5.0
	12202.5 *	42.0	30.1	V	18.9	60.9	49.0	74	54	13.1	5.0
40	4941.0	59.1	38.2	H	3.4	62.5	41.6	74	54	11.5	12.4
	4941.0	64.5	41.3	V	3.4	67.9	44.7	74	54	6.1	9.3
	7411.5	42.0	31.0	H	10.9	52.9	41.9	74	54	21.1	12.1
	7411.5	45.2	31.2	V	10.9	56.1	42.1	74	54	17.9	11.9
	9882.0	42.5	29.6	H	17.5	60.0	47.1	74	54	14.0	6.9
	9882.0	40.5	28.8	V	17.5	58.0	46.3	74	54	16.0	7.7
	12352.5 *	42.8	31.0	H	18.9	61.7	49.9	74	54	12.3	4.1
	12352.5 *	42.6	31.0	V	18.9	61.5	49.9	74	54	12.5	4.1

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp., Distance)
2. Other frequencies : Below the 15.247(c) limit
3. \* : This signal is at the system floor noise level.
4. All 100kHz bandwidth out-of-band radiated emissions were more than 20 dB below a carrier.

Test date : March 9, 2001  
 Temperature : 18 °C  
 Humidity : 38 %

**[Base Phone on the table (used Sub Antenna)] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)	
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.
1	4818.0	60.0	40.0	H	3.1	63.1	43.1	74	54	10.9	10.9
	4818.0	61.5	40.2	V	3.1	64.6	43.3	74	54	9.4	10.7
	7227.0	45.8	32.3	H	10.5	56.3	42.8	74	54	17.7	11.2
	7227.0	45.0	32.0	V	10.5	55.5	42.5	74	54	18.5	11.5
	9636.0	41.0	30.0	H	17.3	58.3	47.3	74	54	15.7	6.7
	9636.0	41.6	29.6	V	17.3	58.9	46.9	74	54	15.1	7.1
	12045.0 *	41.2	29.1	H	18.8	60.0	47.9	74	54	14.0	6.1
	12045.0 *	41.0	29.4	V	18.8	59.8	48.2	74	54	14.2	5.8
21	4881.0	58.6	38.0	H	3.3	61.9	41.3	74	54	12.1	12.7
	4881.0	61.4	39.1	V	3.3	64.7	42.4	74	54	9.3	11.6
	7321.5	44.5	31.4	H	10.7	55.2	42.1	74	54	18.8	11.9
	7321.5	45.2	32.2	V	10.7	55.9	42.9	74	54	18.1	11.1
	9762.0	40.1	29.5	H	17.4	57.5	46.9	74	54	16.5	7.1
	9762.0	40.7	28.9	V	17.4	58.1	46.3	74	54	15.9	7.7
	12202.5 *	41.8	30.1	H	18.9	60.7	49.0	74	54	13.3	5.0
	12202.5 *	42.0	30.1	V	18.9	60.9	49.0	74	54	13.1	5.0
40	4941.0	58.9	36.6	H	3.4	62.3	40.0	74	54	11.7	14.0
	4941.0	59.9	38.0	V	3.4	63.3	41.4	74	54	10.7	12.6
	7411.5	46.4	32.2	H	10.9	57.3	43.1	74	54	16.7	10.9
	7411.5	44.0	31.1	V	10.9	54.9	42.0	74	54	19.1	12.0
	9882.0	40.1	28.5	H	17.5	57.6	46.0	74	54	16.4	8.0
	9882.0	39.8	28.5	V	17.5	57.3	46.0	74	54	16.7	8.0
	12352.5 *	42.8	31.0	H	18.9	61.7	49.9	74	54	12.3	4.1
	12352.5 *	42.6	31.0	V	18.9	61.5	49.9	74	54	12.5	4.1

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp., Distance)
2. Other frequencies : Below the 15.247(c) limit
3. \* : This signal is at the system floor noise level.
4. All 100kHz bandwidth out-of-band radiated emissions were more than 20 dB below a carrier.

Test date : March 9, 2001  
 Temperature : 18 °C  
 Humidity : 38 %

**[Base Phone on the wall (used Main Antenna)] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)	
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.
1	4818.0	58.6	38.7	H	3.1	61.7	41.8	74	54	12.3	12.2
	4818.0	59.0	38.7	V	3.1	62.1	41.8	74	54	11.9	12.2
	7227.0	49.5	34.0	H	10.5	60.0	44.5	74	54	14.0	9.5
	7227.0	47.0	32.2	V	10.5	57.5	42.7	74	54	16.5	11.3
	9636.0	44.7	31.0	H	17.3	62.0	48.3	74	54	12.0	5.7
	9636.0	42.0	30.5	V	17.3	59.3	47.8	74	54	14.7	6.2
	12045.0 *	41.2	29.1	H	18.8	60.0	47.9	74	54	14.0	6.1
	12045.0 *	41.0	29.4	V	18.8	59.8	48.2	74	54	14.2	5.8
21	4881.0	58.7	38.5	H	3.3	62.0	41.8	74	54	12.0	12.2
	4881.0	60.3	39.0	V	3.3	63.6	42.3	74	54	10.4	11.7
	7321.5	50.5	34.4	H	10.7	61.2	45.1	74	54	12.8	8.9
	7321.5	48.0	33.2	V	10.7	58.7	43.9	74	54	15.3	10.1
	9762.0	42.8	30.0	H	17.4	60.2	47.4	74	54	13.8	6.6
	9762.0	42.7	30.1	V	17.4	60.1	47.5	74	54	13.9	6.5
	12202.5 *	41.8	30.1	H	18.9	60.7	49.0	74	54	13.3	5.0
	12202.5 *	42.0	30.1	V	18.9	60.9	49.0	74	54	13.1	5.0
40	4941.0	59.5	38.4	H	3.4	62.9	41.8	74	54	11.1	12.2
	4941.0	60.7	39.1	V	3.4	64.1	42.5	74	54	9.9	11.5
	7411.5	49.6	34.0	H	10.9	60.5	44.9	74	54	13.5	9.1
	7411.5	48.9	33.3	V	10.9	59.8	44.2	74	54	14.2	9.8
	9882.0	41.6	29.6	H	17.5	59.1	47.1	74	54	14.9	6.9
	9882.0	43.0	29.9	V	17.5	60.5	47.4	74	54	13.5	6.6
	12352.5 *	42.8	31.0	H	18.9	61.7	49.9	74	54	12.3	4.1
	12352.5 *	42.6	31.0	V	18.9	61.5	49.9	74	54	12.5	4.1

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp., Distance)
2. Other frequencies : Below the 15.247(c) limit
3. \* : This signal is at the system floor noise level.
4. All 100kHz bandwidth out-of-band radiated emissions were more than 20 dB below a carrier.

Test date : March 9, 2001  
 Temperature : 18 °C  
 Humidity : 38 %

**[Base Phone on the wall (used Sub Antenna)] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)	
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.
1	4818.0	57.5	37.5	H	3.1	60.6	40.6	74	54	13.4	13.4
	4818.0	61.0	40.1	V	3.1	64.1	43.2	74	54	9.9	10.8
	7227.0	47.3	32.9	H	10.5	57.8	43.4	74	54	16.2	10.6
	7227.0	46.8	32.7	V	10.5	57.3	43.2	74	54	16.7	10.8
	9636.0	44.4	31.0	H	17.3	61.7	48.3	74	54	12.3	5.7
	9636.0	41.9	30.0	V	17.3	59.2	47.3	74	54	14.8	6.7
	12045.0 *	41.2	29.1	H	18.8	60.0	47.9	74	54	14.0	6.1
	12045.0 *	41.0	29.4	V	18.8	59.8	48.2	74	54	14.2	5.8
21	4881.0	60.0	38.9	H	3.3	63.3	42.2	74	54	10.7	11.8
	4881.0	61.0	39.2	V	3.3	64.3	42.5	74	54	9.7	11.5
	7321.5	46.6	31.9	H	10.7	57.3	42.6	74	54	16.7	11.4
	7321.5	47.2	32.7	V	10.7	57.9	43.4	74	54	16.1	10.6
	9762.0	42.7	29.6	H	17.4	60.1	47.0	74	54	13.9	7.0
	9762.0	42.4	29.7	V	17.4	59.8	47.1	74	54	14.2	6.9
	12202.5 *	41.8	30.1	H	18.9	60.7	49.0	74	54	13.3	5.0
	12202.5 *	42.0	30.1	V	18.9	60.9	49.0	74	54	13.1	5.0
40	4941.0	59.1	38.5	H	3.4	62.5	41.9	74	54	11.5	12.1
	4941.0	60.1	37.9	V	3.4	63.5	41.3	74	54	10.5	12.7
	7411.5	48.0	32.8	H	10.9	58.9	43.7	74	54	15.1	10.3
	7411.5	49.2	33.3	V	10.9	60.1	44.2	74	54	13.9	9.8
	9882.0	40.0	28.7	H	17.5	57.5	46.2	74	54	16.5	7.8
	9882.0	42.4	29.4	V	17.5	59.9	46.9	74	54	14.1	7.1
	12352.5 *	42.8	31.0	H	18.9	61.7	49.9	74	54	12.3	4.1
	12352.5 *	42.6	31.0	V	18.9	61.5	49.9	74	54	12.5	4.1

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp., Distance)
2. Other frequencies : Below the 15.247(c) limit
3. \* : This signal is at the system floor noise level.
4. All 100kHz bandwidth out-of-band radiated emissions were more than 20 dB below a carrier.

Test date : March 9, 2001  
 Temperature : 18 °C  
 Humidity : 38 %

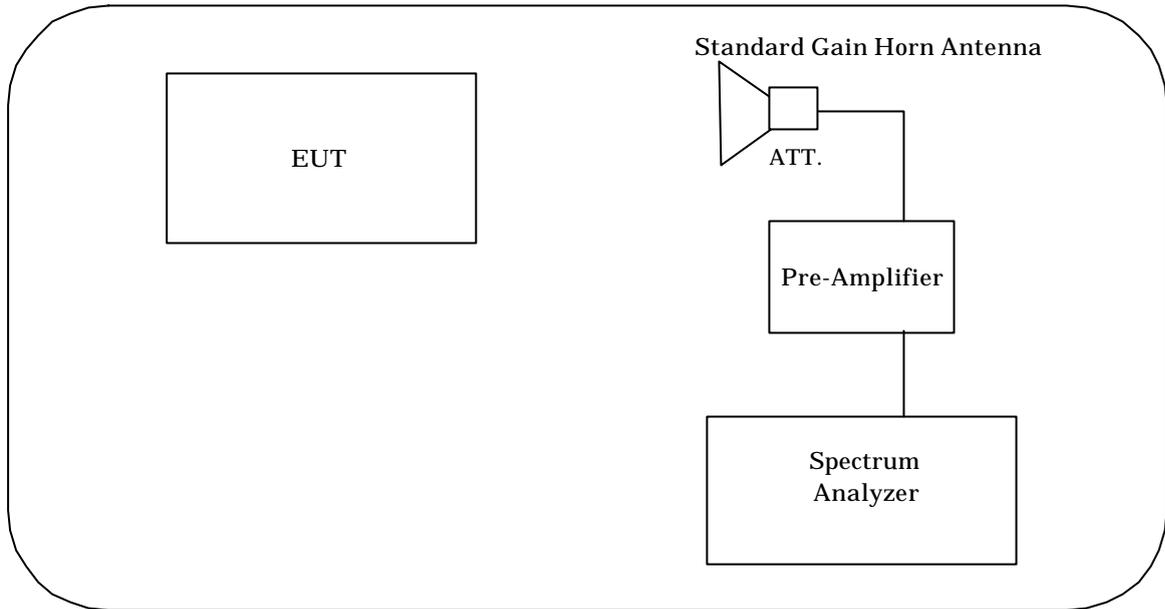
**[Cordless handset] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)	
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.
1	4818.0	64.3	41.8	H	3.1	67.4	44.9	74	54	6.6	9.1
	4818.0	62.0	40.5	V	3.1	65.1	43.6	74	54	8.9	10.4
	7227.0	50.6	34.4	H	10.5	61.1	44.9	74	54	12.9	9.1
	7227.0	49.9	33.9	V	10.5	60.4	44.4	74	54	13.6	9.6
	9636.0	41.3	29.8	H	17.3	58.6	47.1	74	54	15.4	6.9
	9636.0	44.7	31.8	V	17.3	62.0	49.1	74	54	12.0	4.9
	12045.0 *	41.0	29.1	H	18.8	59.8	47.9	74	54	14.2	6.1
	12045.0 *	41.4	29.2	V	18.8	60.2	48.0	74	54	13.8	6.0
21	4881.0	63.9	40.9	H	3.3	67.2	44.2	74	54	6.8	9.8
	4881.0	61.9	39.7	V	3.3	65.2	43.0	74	54	8.8	11.0
	7321.5	49.0	33.5	H	10.7	59.7	44.2	74	54	14.3	9.8
	7321.5	48.6	33.4	V	10.7	59.3	44.1	74	54	14.7	9.9
	9762.0	41.7	29.3	H	17.4	59.1	46.7	74	54	14.9	7.3
	9762.0	43.8	30.8	V	17.4	61.2	48.2	74	54	12.8	5.8
	12202.5 *	41.4	30.0	H	18.9	60.3	48.9	74	54	13.7	5.1
	12202.5 *	43.0	30.3	V	18.9	61.9	49.2	74	54	12.1	4.8
40	4941.0	62.4	37.8	H	3.4	65.8	41.2	74	54	8.2	12.8
	4941.0	60.2	37.2	V	3.4	63.6	40.6	74	54	10.4	13.4
	7411.5	50.5	34.4	H	10.9	61.4	45.3	74	54	12.6	8.7
	7411.5	49.4	33.7	V	10.9	60.3	44.6	74	54	13.7	9.4
	9882.0	41.5	29.0	H	17.5	59.0	46.5	74	54	15.0	7.5
	9882.0	43.0	30.3	V	17.5	60.5	47.8	74	54	13.5	6.2
	12352.5 *	42.3	31.2	H	18.9	61.2	50.1	74	54	12.8	3.9
	12352.5 *	42.8	31.0	V	18.9	61.7	49.9	74	54	12.3	4.1

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp., Distance)
2. Other frequencies : Below the 15.247(c) limit
3. \* : This signal is at the system floor noise level.
4. All 100kHz bandwidth out-of-band radiated emissions were more than 20 dB below a carrier.

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year
Pre-Amplifier	83051A	3332A00329	HEWLETT PACKARD	Jan. 5, 01	1 Year
6dB Attenuator	6806.17B	None	SUHNER	Jan. 5, 01	1 Year
Standard Gain Horn Antenna	3160-05	9701-1038	EMCO	Feb. 24, 99	3 Year
	3160-06	9612-1030	EMCO	Feb. 24, 99	3 Year
	3160-07	9703-1069	EMCO	Feb. 24, 99	3 Year
	3160-08	9703-1057	EMCO	Feb. 24, 99	3 Year
	3160-09	9703-1074	EMCO	Feb. 24, 99	3 Year

**9.6 Restricted Bands of Operation [15.247(c), 15.205, 15.209]****MEASUREMENT PROCEDURE:**

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 1 (low) and ch 40 (high).

**Measurement of Radiated Emissions.**

3. The EUT was set upon the wooden turntable 80cm above the ground plane at a distance of 1 meter from the receiving antenna.
4. The transmitted emission level was maximized by rotating the turntable and raising and lowering the search antenna.
5. The Spectrum Analyzer was setup using  
Peak mode: RBW = 1MHz, VBW = 1MHz  
Average mode: RBW = 1MHz, VBW = 10Hz
6. As for the chart of the observed RF profiles, refer to Annex C .
7. Following data is the worst case.

Test date : March 12, 2001  
 Temperature : 18 °C  
 Humidity : 55 %

**[Base Phone on the wall (used Main Antenna)] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)		Chart
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.	
1	2390.0	38.9	18.7	H	29.2	68.1	47.9	74.0	54.0	5.9	6.1	Annex C page 2
	2390.0	40.9	18.7	V	29.2	70.1	47.9	74.0	54.0	3.9	6.1	Annex C page 2
40	2483.5	40.0	19.5	H	29.4	69.4	48.9	74.0	54.0	4.6	5.1	Annex C page 3
	2483.5	39.4	19.2	V	29.4	68.8	48.6	74.0	54.0	5.2	5.4	Annex C page 3

**Note:**

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Distance)

**[Base Phone on the wall (used Sub Antenna)] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)		Chart
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.	
1	2390.0	39.0	18.7	H	29.2	68.2	47.9	74.0	54.0	5.8	6.1	Annex C page 4
	2390.0	38.9	18.7	V	29.2	68.1	47.9	74.0	54.0	5.9	6.1	Annex C page 4
40	2483.5	38.9	19.0	H	29.4	68.3	48.4	74.0	54.0	5.7	5.6	Annex C page 5
	2483.5	39.4	19.0	V	29.4	68.8	48.4	74.0	54.0	5.2	5.6	Annex C page 5

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Distance)

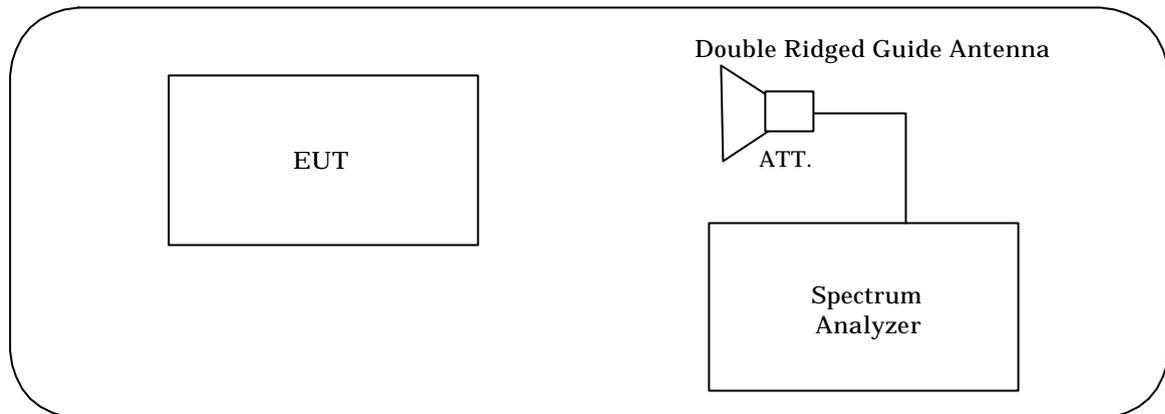
**[Cordless handset] - Modulated(TDD)-carrier data**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)		Chart
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.	
1	2390.0	39.2	18.7	H	29.2	68.4	47.9	74.0	54.0	5.6	6.1	Annex C page 6
	2390.0	38.0	18.5	V	29.2	67.2	47.7	74.0	54.0	6.8	6.3	Annex C page 6
40	2483.5	39.0	19.2	H	29.4	68.4	48.6	74.0	54.0	5.6	5.4	Annex C page 7
	2483.5	38.4	19.0	V	29.4	67.8	48.4	74.0	54.0	6.2	5.6	Annex C page 7

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Distance)

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year
6dB Attenuator	6806.17B	None	SUHNER	Jan. 5, 01	1 Year
Double Ridged Guide Antenna	3115	5044	EMCO	Jun. 14, 00	1 Year

**9.7 AC Conducted Emissions [15.207,15.107]****MEASUREMENT PROCEDURE:**

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 40 (high).

**Measurement of AC Conduct ed Emissions.**

3. The AC conducted emission measurements were performed in shielded room.  
The EUT was placed on a wooden table, which is 80 centimeters high,  
was placed 40 centimeters from the back-wall and at least 1 meter from the side-wall.
4. The Test Receiver is complied with the specification of the CISPR publication 16.
5. Following data is the worst case.

Test date : March 12, 2001  
 Temperature : 18 °C  
 Humidity : 55 %

**[Base phone] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	Reading (dBuV/m)		Factor (dB)	Emission Level (dBuV/m)		15.207 Limit (dBuV/m)	Margin (dB)	
		Line 1	Line 2		Line 1	Line 2		Line 1	Line 2
40	0.4500	-5.2	-4.7	6.3	1.1	1.6	48	46.9	46.4
	6.0608	18.5	19.3	6.5	25.0	25.8	48	23.0	22.2
	12.1230	-11.2	-10.9	6.7	-4.5	-4.2	48	52.5	52.2
	18.1845	2.7	1.8	6.9	9.6	8.7	48	38.4	39.3
	24.2460	-9.1	-9.0	7.1	-2.0	-1.9	48	50.0	49.9
	30.0000	-10.7	-9.1	6.9	-3.8	-2.2	48	51.8	50.2

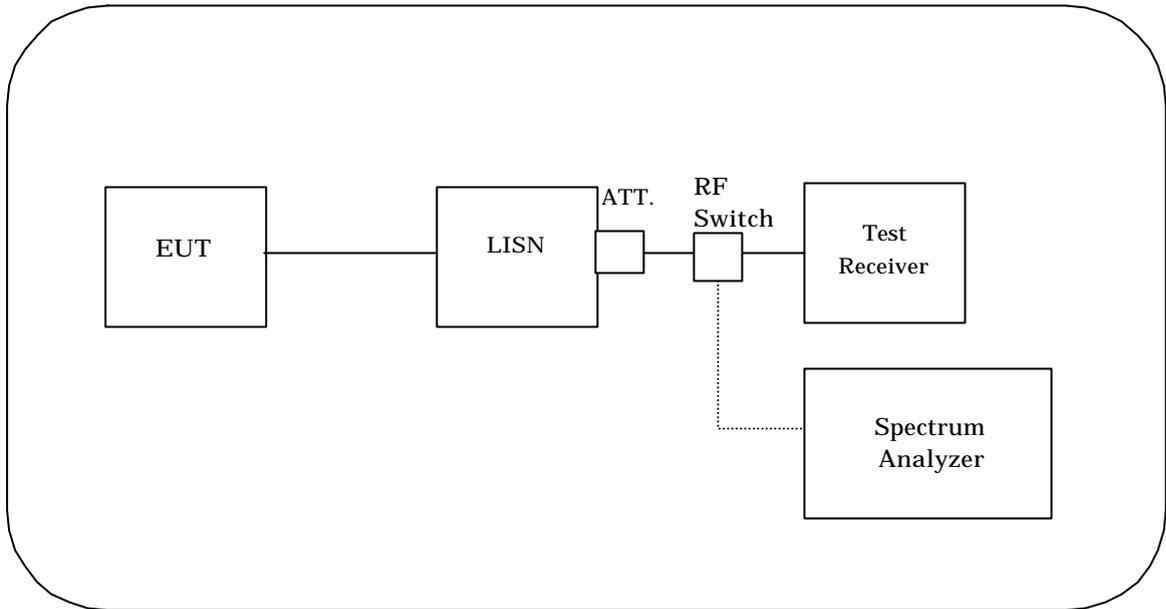
**[Cordless handset] - Modulated(TDD)-carrier data**

ch	Frequency (MHz)	Reading (dBuV/m)		Factor (dB)	Emission Level (dBuV/m)		15.207 Limit (dBuV/m)	Margin (dB)	
		Line 1	Line 2		Line 1	Line 2		Line 1	Line 2
40	10.3693	11.3	13.9	6.7	18.0	20.6	48	30.0	27.4
	18.0017	-5.2	-4.2	6.9	1.7	2.7	48	46.3	45.3
	20.7375	14.8	14.9	7.0	21.8	21.9	48	26.2	26.1
	24.1916	-1.6	-2.7	7.1	5.5	4.4	48	42.5	43.6
	27.6500	11.4	9.5	6.9	18.3	16.4	48	29.7	31.6
	30.0000	2.6	0.2	6.9	9.5	7.1	48	38.5	40.9

**Note:**

1. Emission Level = Reading + Factor (LISN, Pad, Cable)
2. Other frequencies: Below the 15.207 limit

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Test receiver	ESS	847151/012	ROHDE & SCHWARZ	Feb. 06, 01	1 Year
LISN (EUT)	ESH2-Z5	881492/014	ROHDE & SCHWARZ	Oct. 17, 00	1 Year
6dB Attenuator	CFA-01	None	TME	Oct. 12, 00	1 Year
LISN (Peripheral)	KNW-242	8-851-21	KYORITSU	Feb. 20, 01	1 Year
50Ω Termination	CT-01	A010CON50	TME	Feb. 20, 01	1 Year
RF Switch	ACX-150	None	AKZO NOBEL	Oct. 12, 00	1 Year

**9.8 Radiated Emission Test [15.109]****MEASUREMENT PROCEDURE:**

1. The EUT was setup to operate with Test mode.
2. Base phone communicated with Bell Ringer Generator.  
Cordless handset was on standby.

**Measurement of Radiated Emissions.**

3. The EUT was set upon the wooden turntable 80cm above the ground plane at a distance of 3 meter from the receiving antenna.
4. The transmitted emission level was maximized by rotating the turntable and raising and lowering the search antenna.
5. The test receiver which complied with the specification of the CISPR publication 16 was used.
6. Following data is the worst case.

Test date : March 23, 2001  
 Temperature : 20 °C  
 Humidity : 41 %

**[Base phone on the table]**

Frequency (MHz)	Antenna	Reading (dBuV/m)		Factor (dB/m)		Emission Level (dBuV/m)		15.109 Limit (dBuV/m)	Margin (dB)	
		H	V	H	V	H	V		H	V
40.96	DIP	-	54.7	-17.7	-17.7	-	37.0	40.0	-	3.0
45.48	BBA	-	43.5	-7.3	-7.3	-	36.2	40.0	-	3.8
81.93	DIP	51.8	52.0	-13.0	-13.0	38.8	39.0	40.0	1.2	1.0
122.88	BBA	40.6	-	-6.9	-6.9	33.7	-	43.5	9.8	-
163.84	BBA	47.1	40.5	-5.8	-5.8	41.3	34.7	43.5	2.2	8.8
245.77	BBA	48.3	-	-6.8	-6.8	41.5	-	46.0	4.5	-
286.73	BBA	44.0	-	-4.9	-4.9	39.1	-	46.0	6.9	-
327.69	BBA	42.0	-	-3.7	-3.7	38.3	-	46.0	7.7	-
368.65	BBA	41.5	-	-2.5	-2.5	39.0	-	46.0	7.0	-
409.61	BBA	46.2	41.2	-1.3	-1.3	44.9	39.9	46.0	1.1	6.1
491.53	BBA	39.0	36.0	0.9	0.9	39.9	36.9	46.0	6.1	9.1
655.38	BBA	36.7	-	5.0	5.0	41.7	-	46.0	4.3	-
737.30	BBA	32.4	-	6.3	6.3	38.7	-	46.0	7.3	-
901.13	BBA	29.0	-	9.4	9.4	38.4	-	46.0	7.6	-

**Note:**

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp.)
2. Other frequencies : Below the 15.109 limit
3. Ant. : Used antenna (BBA = Broadband antenna, DIP = Dipole antenna)

**[Base phone on the wall]**

Frequency (MHz)	Antenna	Reading (dBuV/m)		Factor (dB/m)		Emission Level (dBuV/m)		15.109 Limit (dBuV/m)	Margin (dB)	
		H	V	H	V	H	V		H	V
40.96	DIP	-	56.5	-17.7	-17.7	-	38.8	40.0	-	1.2
47.51	BBA	-	43.0	-7.2	-7.2	-	35.8	40.0	-	4.2
68.28	BBA	-	45.2	-8.1	-8.1	-	37.1	40.0	-	2.9
81.93	DIP	50.8	52.5	-13.0	-13.0	37.8	39.5	40.0	2.2	0.5
122.88	BBA	47.2	46.4	-6.9	-6.9	40.3	39.5	43.5	3.2	4.0
163.84	BBA	-	40.5	-5.8	-5.8	-	34.7	43.5	-	8.8
245.77	BBA	43.0	-	-6.8	-6.8	36.2	-	46.0	9.8	-
286.73	BBA	43.3	-	-4.9	-4.9	38.4	-	46.0	7.6	-
327.69	BBA	44.0	-	-3.7	-3.7	40.3	-	46.0	5.7	-
368.65	BBA	38.6	-	-2.5	-2.5	36.1	-	46.0	9.9	-
409.61	BBA	46.6	44.5	-1.3	-1.3	45.3	43.2	46.0	0.7	2.8
491.53	BBA	-	36.0	0.9	0.9	-	36.9	46.0	-	9.1
573.45	BBA	-	34.0	3.0	3.0	-	37.0	46.0	-	9.0
655.38	BBA	-	34.2	5.0	5.0	-	39.2	46.0	-	6.8
737.30	BBA	32.0	-	6.3	6.3	38.3	-	46.0	7.7	-
901.13	BBA	28.5	-	9.4	9.4	37.9	-	46.0	8.1	-

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp.)
2. Other frequencies : Below the 15.109 limit
3. Ant. : Used antenna (BBA = Broadband antenna, DIP = Dipole antenna)

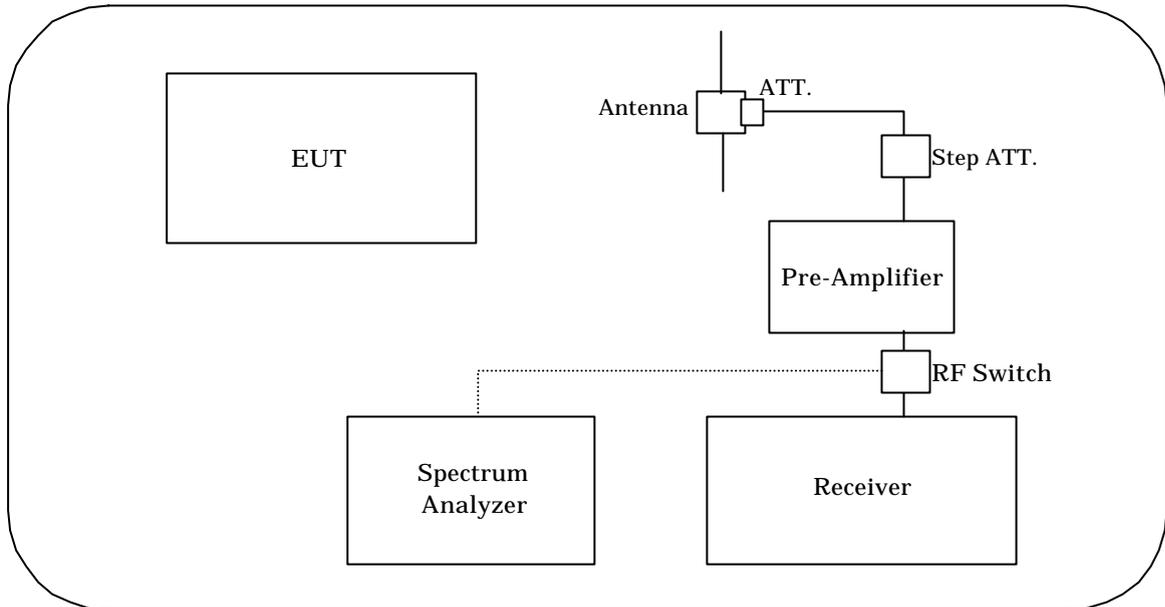
**[Cordless handset with Charger]**

Frequency (MHz)	Antenna	Reading (dBuV/m)		Factor (dB/m)		Emission Level (dBuV/m)		15.109 Limit (dBuV/m)	Margin (dB)	
		H	V	H	V	H	V		H	V
31.10	DIP	49.5	57.0	-21.4	-21.4	28.1	35.6	40.0	11.9	4.4
41.48	BBA	-	38.8	-7.7	-7.7	-	31.1	40.0	-	8.9
51.84	BBA	31.7	42.3	-7.0	-7.0	24.7	35.3	40.0	15.3	4.7
62.21	BBA	-	36.0	-7.2	-7.2	-	28.8	40.0	-	11.2
72.57	BBA	40.0	46.8	-8.9	-8.9	31.1	37.9	40.0	8.9	2.1
82.94	BBA	43.3	42.0	-11.2	-11.2	32.1	30.8	40.0	7.9	9.2
93.32	BBA	38.0	-	-11.2	-11.2	26.8	-	43.5	16.7	-
103.39	BBA	34.5	-	-9.7	-9.7	24.8	-	43.5	18.7	-

Note:

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Pre-Amp.)
2. Other frequencies : Below the 15.109 limit
3. Ant. : Used antenna (BBA = Broadband antenna, DIP = Dipole antenna)

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Tri-Log Antenna	VULB9168	106	SCHWARZBECK	Aug. 04, 00	1 Year
Dipole Antenna	VHA9103	A07082007	A07082007	Nov. 22, 00	1 Year
6dB Attenuator	MP721B	M57593	ANRITSU	Oct. 12, 00	1 Year
Step Attenuator	8494B	2726A14513	HEWLETT PACKARD	Oct. 12, 00	1 Year
Pre-Amplifier	8447D	1937A03130	HEWLETT PACKARD	Oct. 12, 00	1 Year
Test Receiver	ESS	847151/012	ROHDE & SCHWARZ	Feb. 6, 01	1 Year
RF Switch	ACX-150	None	AKZO NOBEL	Oct. 12, 00	1 Year

**9.9 Variation of Input Power [15.31(e)]****MEASUREMENT PROCEDURE:**

1. The EUT was setup to operate with Test mode.
2. The EUT was measured while transmitting continuously at ch 1 (low), ch 21 (mid), and ch 40 (high).
3. The measurements were carried out with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.
4. The Spectrum Analyzer was connected directly to the transmitter output.
5. The Spectrum Analyzer was setup using RBW = 2MHz, VBW = 3MHz.
6. Following data is the worst case.

Test date : May 14, 2001  
 Temperature : 19 °C  
 Humidity : 50 %

**[Base phone] - Unmodulated-carrier data**

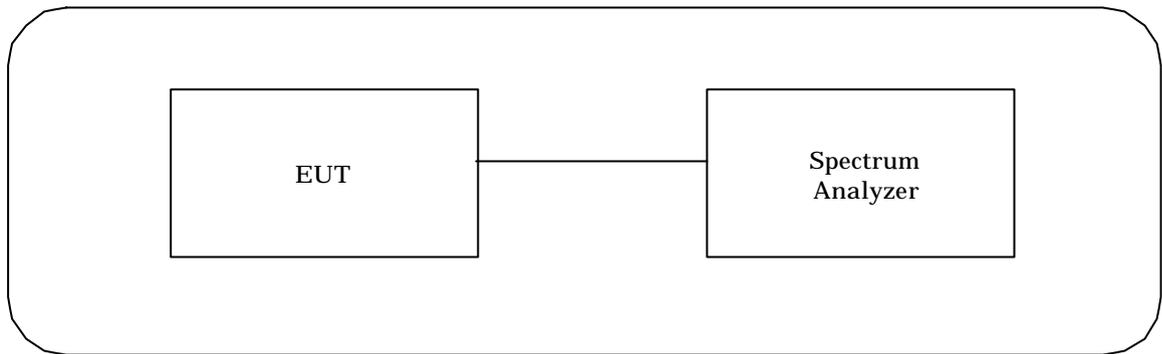
ch	Percentage of Rated Supply	AC Voltage (Vac 60Hz)	Peak Level (dBm)	Deviation (dBm)	Deviation Limit (dBm)
1	85%	102	13.83	0	± 0.5dB
	100%	120	13.83	-	± 0.5dB
	115%	138	13.83	0	± 0.5dB
21	85%	102	13.83	0	± 0.5dB
	100%	120	13.83	-	± 0.5dB
	115%	138	13.83	0	± 0.5dB
40	85%	102	14.67	0	± 0.5dB
	100%	120	14.67	-	± 0.5dB
	115%	138	14.67	0	± 0.5dB

**[Cordless handset] - Unmodulated-carrier data**

ch	Percentage of Rated Supply	AC Voltage (Vac 60Hz)	Peak Level (dBm)	Deviation (dBm)	Deviation Limit (dBm)
1	85%	102	16.00	0	± 0.5dB
	100%	120	16.00	-	± 0.5dB
	115%	138	16.00	0	± 0.5dB
21	85%	102	16.67	0	± 0.5dB
	100%	120	16.67	-	± 0.5dB
	115%	138	16.67	0	± 0.5dB
40	85%	102	17.33	0	± 0.5dB
	100%	120	17.33	-	± 0.5dB
	115%	138	17.33	0	± 0.5dB

Note : Deviation Limit is Manufacturer's specification

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year

**SECTION 10. PHOTOGRAPHS OF MAXIMUM EMISSION SET-UP**

## 10.1 Conducted Emission Test [15.207, 15.107]

## 10.1.1 Base phone

Test setup in accordance with ANSI C63.4-1992



Front view



Side view

## 10.1.2 Cordless handset with Charger

Test setup in accordance with ANSI C63.4-1992



Front view



Side view

## 10.2 RF Conducted Emission Test [15.247(a)(2), 15.247(c), 15.247(d), 15.31(e)]

### 10.2.1 Base phone

Test setup in accordance with ANSI C63.4-1992



Front view

### 10.2.2 Cordless handset with Charger

Test setup in accordance with ANSI C63.4-1992



Front view

### 10.2.3 Cordless handset

Test setup in accordance with ANSI C63.4-1992



Front view

### 10.3 Radiated Emission Test [15.247(b), 15.247(c), 15.205, 15.209, 15.109]

#### 10.3.1 Base phone on the table

Test setup in accordance with ANSI C63.4-1992



Front view



Rear view

#### 10.3.2 Base phone on the wall

Test setup in accordance with ANSI C63.4-1992



Front view



Rear view

### 10.3.3 Cordless handset with Charger

Test setup in accordance with ANSI C63.4-1992



Front view



Rear view

### 10.3.4 Cordless handset

Test setup in accordance with ANSI C63.4-1992



Front view



Rear view

**SECTION 11. MEASUREMENT UNCERTAINTY**

The uncertainty of the measurements performed for this report lies:

Minimum 6dB Bandwidth	[15.247(a)(2)]	
Above 1 GHz .....		+/- 46.7kHz
Maximum Peak Output Power	[15.247(b)]	
Above 1 GHz .....		+/- 3.9 dB
Spurious Emissions		
- RF Antenna Conducted Test	[15.247(c)]	
Above 1 GHz .....		+/- 2.9 dB
Spurious Emissions		
- Radiated Emission Test	[15.247(c), 15.205, 15.209]	
Above 1 GHz .....		+/- 3.9 dB
Power Spectral Density	[15.247(d)]	
Above 1 GHz .....		+/- 2.9 dB
AC Conducted Emission	[15.207,15.107]	
9 kHz – 30 MHz .....		+/- 1.8 dB
Radiated Emission from Digital Part	[15.109]	
30 – 1000 MHz .....		+/- 3.6 dB
Variation of Input Power	[15.31(e)]	
Above 1 GHz .....		+/- 2.9 dB

**Note on Radiated Emission measurement uncertainty**

The following items are not included in the calculations in spite of their own uncertainty components because it is impracticable to find the value. It is our problem awaiting solution in future.

**(1) Repeatability of measurement**

It is not possible to calculate repeatability since the measurement was carried out only one time.

**(2) Antenna factor variation**

The definition of measured (radiated electric field strength) is not completed on the referred standard(s).

**(3) Loss of EUT radiation propagation**

It is certainly one of the uncertainty components, however is not able to calculate.

Please note that these uncertainties are not reflected to the compliance judgement of the test results in this report.

**SECTION 12. VALIDITY OF TEST REPORT**

- 13.1 The test result of this report is effective for equipment under test itself and under the test configuration described on the report.
- 13.2 This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.
- 13.3 This test report shall not be reproduced except in full, without issuer's permission.

## SECTION 13. DESCRIPTION OF TEST LABORATORY

### 13.1 Outline of Akzo Nobel K.K. (formerly Akzo Kashima Limited), EMC Division

Akzo Nobel K.K., the country organization in Japan for Akzo Nobel NV, was established in 1968. The shares are owned by Akzo Nobel NV (100%). Akzo Nobel NV, headquartered in the Netherlands, is one of the world's leading companies in selected areas of chemicals, coatings, healthcare products and fibers with work force of approximately 70,000 people in over 50 countries.

In 1984, in order to respond to the growing testing demand, in particular, for FCC filing, Akzo Nobel K.K. started EMI testing business, installing the first open air test site in Kashima, Ibaraki prefecture. Further the business has been expanded by installing additional testing facilities not only in Ibaraki but also in other areas such as Shizuoka, Nagano, Kanagawa and Tochigi. As results, Akzo Nobel K.K. has now 16 open air test sites and 4 anechoic chambers for EMI/EMC testing. As the largest EMC testing laboratory in number of testing facilities and staffs, EMC Division has been organized separately in the company and independently operated in conformity with the requirements of ISO Guide 25 (EN 45000) for its competency as a testing laboratory.

Akzo Nobel K.K. EMC Division is the first foreign private laboratory accredited by NVLAP, National Voluntary Laboratory Accreditation Program-NIST, USA. The division has been certified, authorized and/or filed as a competent testing laboratory by various testing organizations/authorities as described below.

### 13.2 Filing, certification, authorization and accreditation list

<u>EMI/EMC testing</u>		<u>Telecommunications terminal testing</u>	
FCC	(USA)	FCC	(USA)
NVLAP	(USA)	NVLAP	(USA)
NEMKO	(Norway)	NATA	(Australia)
VCCI	(Japan)	IC	(Canada)
NMi	(The Netherlands)		
TÜV PRODUCT SERVICE	(Germany)		

Note 1 : The above lists, Filing, certification, authorization and accreditation, are under preparing for the change of the company name to Akzo Nobel K.K. from Akzo Kashima Limited.

Note 2 : NVLAP accreditation does not constitute any product endorsement by NVLAP or any agent of the U.S. Government.

# **Appendix**

## **Duty cycle [15.35(c)]**

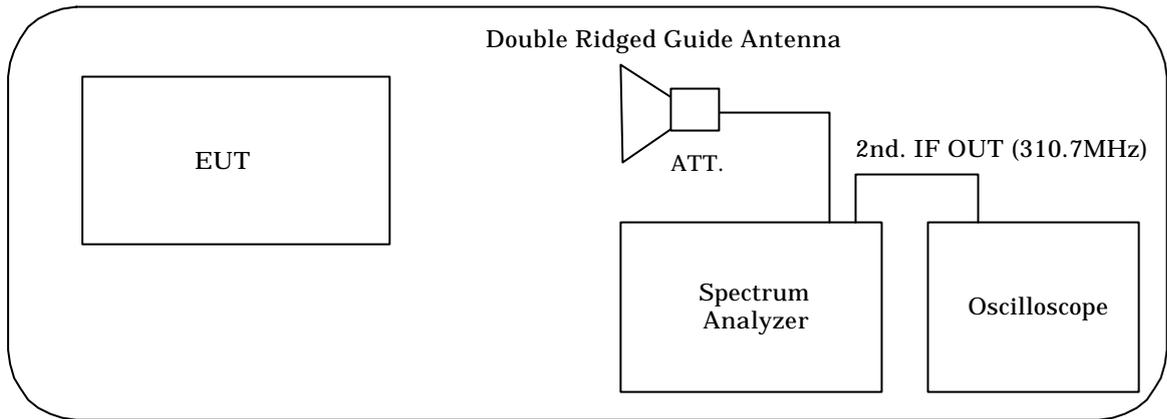
Duty Cycle Factor was used in accordance with 15.35 (C).

The Spectrum Analyzer was setup using RBW = 1MHz, VBW = 1MHz, SPAN = 0MHz.

[Base phone] - Modulated(TDD)-carrier data  
Transmission period = 970usec./2000usec. = 0.485

[Cordless handset] - Modulated(TDD)-carrier data  
Transmission period = 970usec./2000usec. = 0.485

#### TEST INSTRUMENTS CONFIGURATION



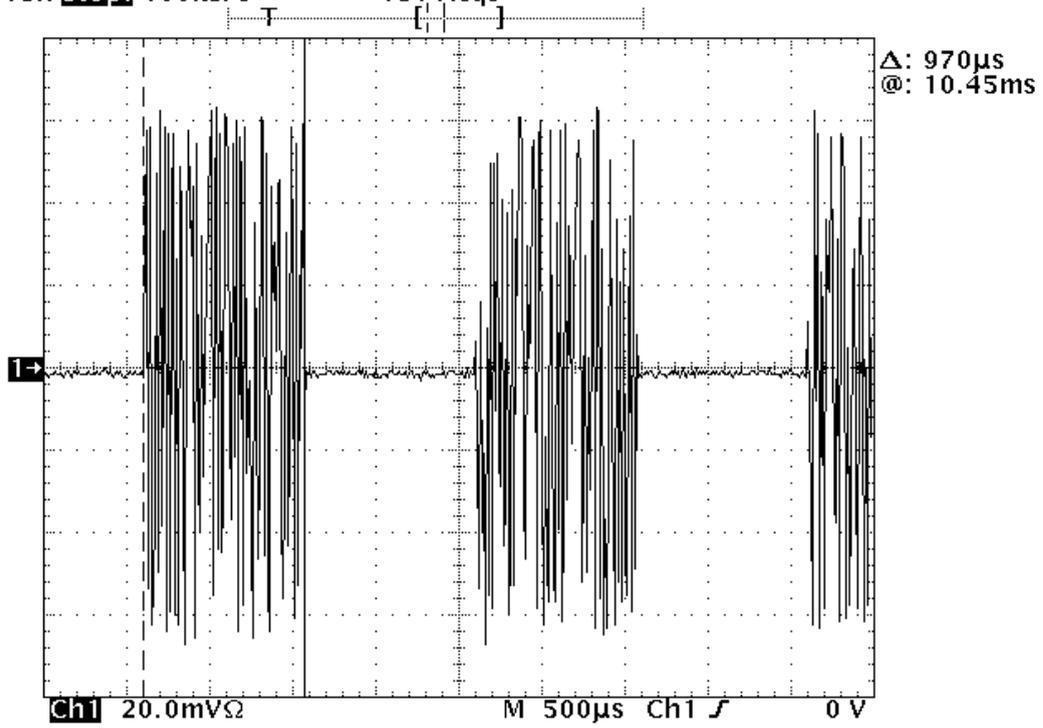
#### TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year
6dB Attenuator	6806.17B	None	SUHNER	Jan. 5, 01	1 Year
Double Ridged Guide Antenna	3115	5044	EMCO	Jun. 14, 00	1 Year
Oscilloscope	TDS 680B	B010205	Tektronix	Apr. 20, 00	1 Year

Note: The Duty cycle correction is not applicable to this Test Report(Report No. ANKK-101123).

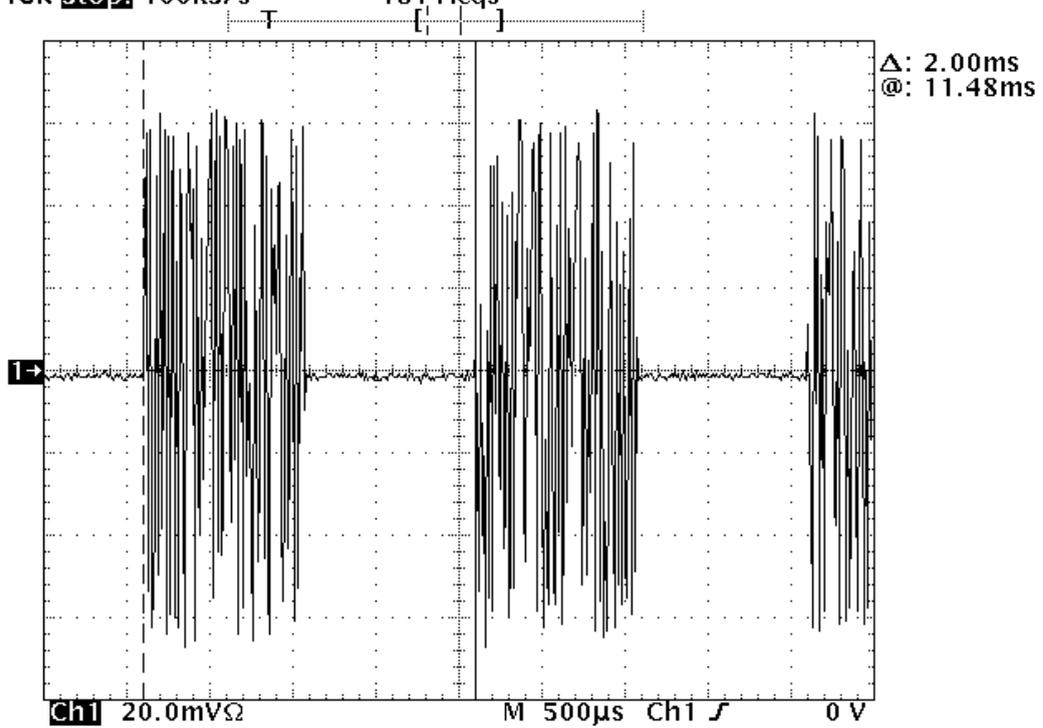
### Chart of Time of duty [Base phone]

Tek **Stop:** 100kS/s 181 Acqs



### Chart of Time of cycle [Base phone]

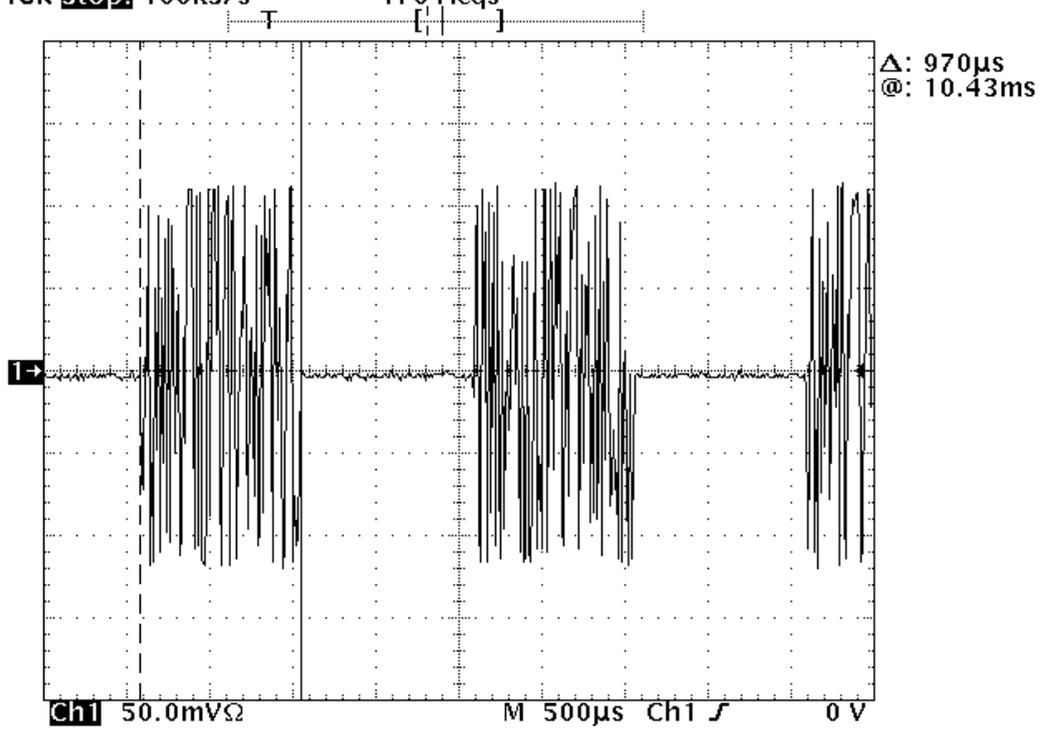
Tek **Stop:** 100kS/s 181 Acqs



### Chart of Time of duty [Cordless handset]

Tek **Stop:** 100kS/s

176 Acqs



### Chart of Time of cycle [Cordless handset]

Tek **Stop:** 100kS/s

176 Acqs

