

**FCC CFR47 PART 15 CERTIFICATION**



**TEST REPORT**

***FOR***

**2.4GHz SPREAD SPECTRUM CORDLESS TELEPHONE**

**MODEL: D271**

**FCC ID: HOLD271**

**REPORT NUMBER: 01U0950-1**

**ISSUE DATE: OCTOBER 15, 2001**

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**NVLAP<sup>®</sup>**  
**LAB CODE:200065-0**

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**ATTACHMENTS**

- EUT PHOTOGRAPHS
- PROPOSED FCC ID LABEL
- THEORY OF OPERATION
- BLOCK DIAGRAM & SCHEMATIC DIAGRAM
- USER'S MANUAL
- PROCESSING GAIN
- CODE LETTER

## 1. TEST RESULT CERTIFICATION

**COMPANY NAME:** CIDCO COMMUNICATIONS, LLC.  
105 COCHRANE CIRCLE  
MORGAN HILL, CA 95035  
USA

**CONTACT PERSON:** SA FOO / ENGINEER

**TELEPHONE NO:** 408-782-8200

**EUT DESCRIPTION:** 2.4GHZ SPREAD SPECTRUM CORDLESS TELEPHONE

**MODEM NAME:** D271

**DATE TESTED:** OCTOBER 02, 2001

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	2.4GHz TRANSCEIVER
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 15.247

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 15.247. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

**Note:** This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

Tested By:

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STEVE CHENG  
EMC ENGINEERING MANAGER  
COMPLIANCE CERTIFICATION SERVICES

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HUE LY VANG  
ASSOCIATE EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. EUT DESCRIPTION

The D271 is a 2.4GHz cordless phone that incorporates your telephone company's calling features, such as calling ID, Voice Mail, and call Waiting ID, to provide a powerful full function caller ID cordless telephone. Listed below are some key features;

- Handset Jack
- Call timer
- Single key redialing
- English and Spanish
- Speakerphone
- New message Indicator
- Stores up to 50 caller ID recordings
- 50 directory records

Crystal

Broad Name	Crystal (MHz)
Main Unit	9.6MHz , 32.768MHz
Handset Unit	9.6MHz , 32.768MHz

## 3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.








## 4. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

### 5.1. Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP*	FCC Part 15, CISPR 22, AS/NZS 3548, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, CNS 13438	 200065-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 1300
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	 R-1014, R-619, C-640
Norway	NEMKO	EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1	 ELA 117
Norway	NEMKO	EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC	 ELA-171
Taiwan	BSMI	CNS 13438	 SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	 IC2324 A,B,C, and F

\*No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government

## 6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

TEST EQUIPMENTS LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Spectrum Analyzer	HP100Hz - 22GHz	8566B	2140A01296	5/4/02
Spectrum Display	HP	85662A	2152A03066	4/10/02
Quasi-Peak Detector	HP9K - 1GHz	85650A	2811A01155	5/4/02
Pre-Amplifier, 25 dB	HP 0.1 - 1300MHz	8447D (P_1M)	2944A06833	11/21/01
Antenna, BiLog	Chase 30 - 2000MHz	CBL6112	2049	12/11/01
LISN	Fisher Cus. Comm.	LISN-50/250-25-2	2023	8/5/02
EMI Test Receiver	Rohde & Schwarz	ESHS 20	827129/006	2/28/02
EMC Receiver (9K-26.5GHz)	HP	8593EM	3710A00205	6/20/02
Horn Antenna(1 - 18GHz)	EMCO	3115	2238	6/20/02
Horn Antenna,(18 - 26GHz)	Antenna Research Associate	MWH 1826/B	1013	7/26/02
Power Meter	HP	436A	2709A29209	2/8/02
High pass filter	ESM Microwave	HM 4570-9SS	3	N.C.R.

### 6.1. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission	
30MHz – 200 MHz	+/- 3.3dB
200MHz – 1000MHz	+4.5/-2.9dB
1000MHz – 2000MHz	+4.6/-2.2dB
Power Line Conducted Emission	
150kHz – 30MHz	+/-2.9

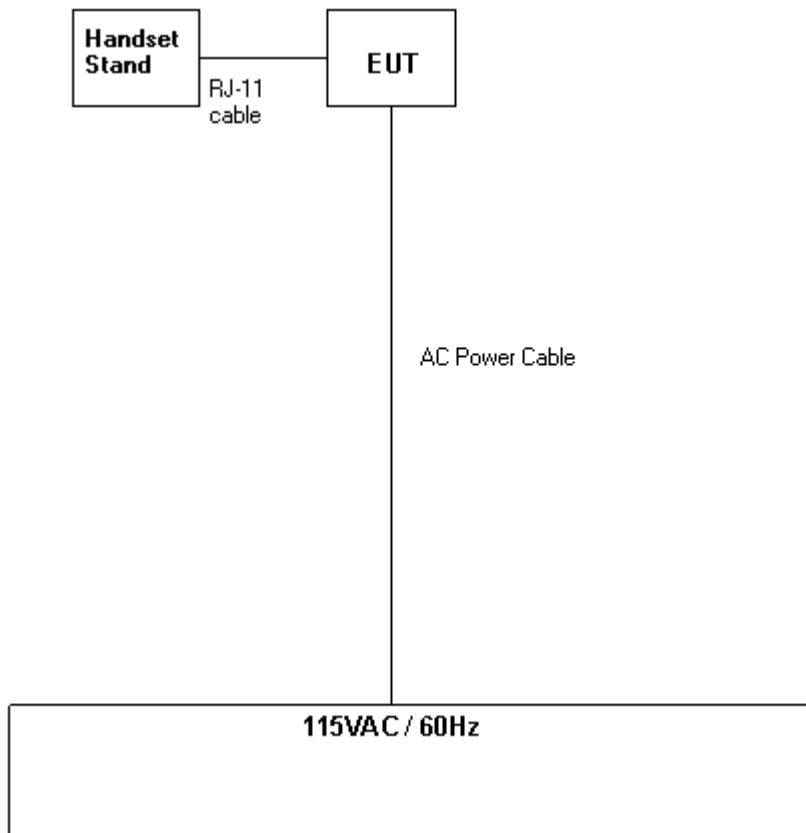
Any results falling within the above values are deemed to be marginal.

## 7. SUPPORT EQUIPMENT / TEST DIAGRAM

### Support Equipment

During Radiated Emission testing, no support equipment was used.

### Test Diagram



## 8. APPLICABLE RULES AND BRIEF TEST RESULT

### §15.247- POWER LIMIT

(b) The maximum peak output power of the intentional radiator shall not exceed the following:

(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, all frequency hopping systems in the 5725-5850 MHz band, and all direct sequence systems: 1 watt.

*Spec limit: As specified above, 1W maximum.*

*Test result: No non-compliance noted.*

#### Base unit

Channel	Frequency (MHz)	Output Power(watts)
4	2408	89.33mW (19.51 dBm)
10	2427	84.92mW (19.29 dBm)
15	2444	81.1mW (19.09 dBm)

#### Handset unit

Channel	Frequency (MHz)	Output Power(watts)
4	2408	57.30mW (17.58 dBm)
10	2452	49.54mW (16.95 dBm)
15	2469	62.23mW (17.94 dBm)

### §14.407- BANDWIDTH LIMITATION

(2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

*Spec limit: > 500 kHz.*

*Test result: No non-compliance noted.*

#### Main unit

Channel	Frequency (MHz)	Bandwidth(MHz)
4	2408	1.6
10	2427	1.613
15	2444	1.613

#### Handset unit

Channel	Frequency (MHz)	Bandwidth(MHz)
4	2408	1.638
10	2452	1.575
15	2469	1.65

**§15.247- PEAK POWER SPECTRAL DENSITY**

(d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

*Spec limit: < 8dBm.*

*Test result: No non-compliance noted.*

**Main unit**

<i>Channel</i>	<i>Frequency (MHz)</i>	<i>Results (dBm)</i>
<b>4</b>	<b>2408</b>	<b>1.01</b>
<b>10</b>	<b>2427</b>	<b>.19</b>
<b>15</b>	<b>2462</b>	<b>.74</b>

**Handset unit**

<i>Channel</i>	<i>Frequency (MHz)</i>	<i>Results (dBm)</i>
<b>4</b>	<b>2408</b>	<b>-1.19</b>
<b>10</b>	<b>2452</b>	<b>-3.66</b>
<b>15</b>	<b>2469</b>	<b>-3.29</b>

**§15.247- PROCESS GAIN**

(e) The processing gain of a direct sequence system shall be at least 10 dB. The processing gain represents the improvement to the received signal-to-noise ratio, after filtering to the information bandwidth, from the spreading/despreading function.

*Spec limit: >10dBm.*

*Test result: No non-compliance noted.*

**§15.205- RESTRICTED BANDS OF OPERATIONS**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

***Spec limit: As specified above.***

***Test result: No non-compliance noted. See section 9.7 Radiated Emission.***

**§90.209- RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS**

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

**FCC PART 15 CLASS A**

MEASURING DISTANCE OF 10 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	90	39.1
88-216	150	43.5
216-960	210	46.4
Above 960	300	49.5

**FCC PART 15 CLASS B**

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

***Spec limit: As specified above.***

***Test result: No non-compliance noted.***

**§15.207- CONDUCTED LIMITS**

(a) For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 450 kHz to 30 MHz shall not exceed 250 microvolts. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

**FCC CLASS A**

FREQUENCY RANGE	FIELD STRENGTH (Microvolts)	FIELD STRENGTH (dBuV)/QP
450kHz-1.705MHz	1000	60
1.705MHz - 30MHz	3000	69.54

**FCC CLASS B**

FREQUENCY RANGE	FIELD STRENGTH (Microvolts)	FIELD STRENGTH (dBuV)/QP
450kHz-30MHz	250	48

***Spec limit: As specified above.***

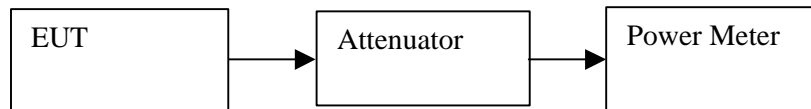
***Test result: No non-compliance noted. No radiated emissions were detected other than the fundamental frequency and harmonics. Line conducted emissions comply.***

## 9. TEST SETUP, PROCEDURE AND RESULT

### 9.1. CONDUCTED POWER

#### 9.1.1. Power Meter Measurement

#### TEST SETUP



#### TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting / receiving mode.

#### RESULT

*No non-compliance noted.*

##### Base unit

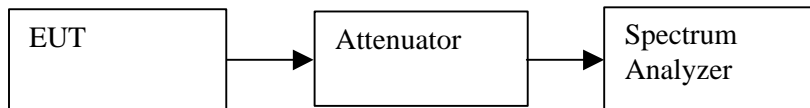
<i>Channel</i>	<i>Frequency (MHz)</i>	<i>Output Power(watts)</i>
<b>4</b>	<b>2408</b>	<b>44.77mW (16.51 dBm)</b>
<b>10</b>	<b>2427</b>	<b>42.56mW (16.29 dBm)</b>
<b>15</b>	<b>2444</b>	<b>41.59mW (16.09 dBm)</b>

##### Handset unit

<i>Channel</i>	<i>Frequency (MHz)</i>	<i>Output Power(watts)</i>
<b>4</b>	<b>2408</b>	<b>41.5mW (16.19 dBm)</b>
<b>10</b>	<b>2452</b>	<b>39.36mW (15.95 dBm)</b>
<b>15</b>	<b>2469</b>	<b>39.26mW (15.94 dBm)</b>

### 9.1.2. Spectrum Analyzer Measurement

#### **TEST SETUP**



Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 3 MHz	<input checked="" type="checkbox"/> 3 MHz

#### **TEST PROCEDURE**

The EUT is configured on a test bench as shown above in a continuously transmitting / receiving mode.

While the transceiver started, the analyzer MAX HOLD function is used to capture the emissions.

Then that number is added to the 6 dB correction factor.

Formula = reading + 10 log (6dB bandwidth / resolution bandwidth)

##### **Base Unit**

Channel	Frequency (MHz)	EUT reading (dBm)	6 dB Bandwidth (MHz)	RES BW (MHz)	True Power After BW Corrections (dBm)
4	2408	16.76	1.6	3	14.03
10	2427	16.44	1.613	3	13.79
15	2444	16.17	1.613	3	13.52

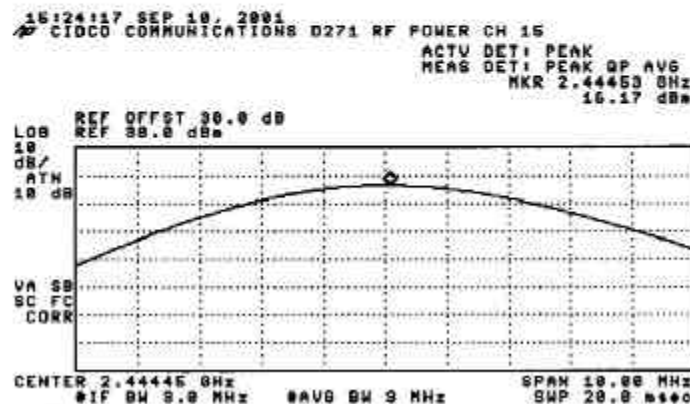
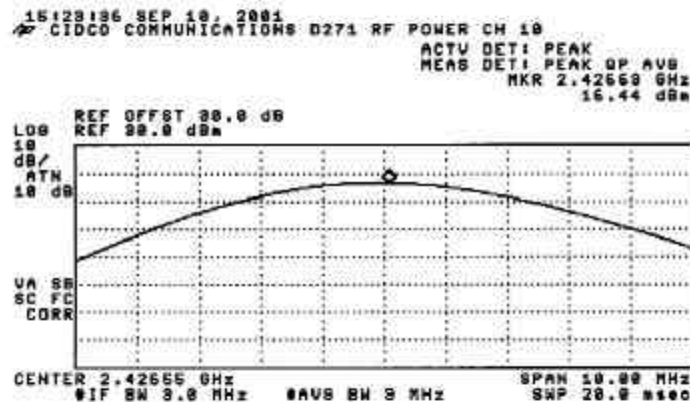
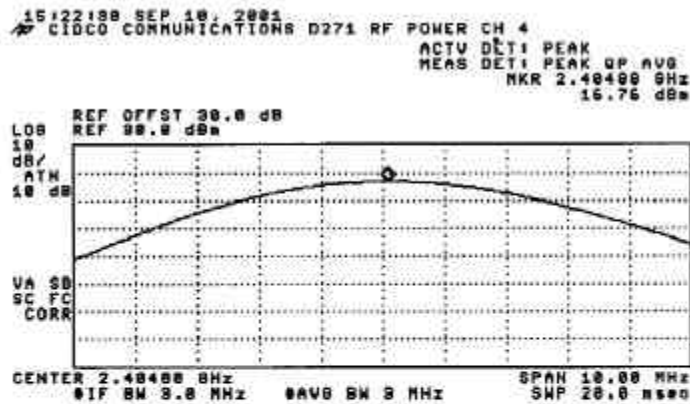
##### **Handset Unit**

Channel	Frequency (MHz)	EUT reading (dBm)	6 dB Bandwidth (MHz)	RES BW (MHz)	True Power After BW Corrections (dBm)
4	2408	14.14	1.638	3	11.5
10	2452	13.78	1.575	3	10.98
15	2469	14.47	1.65	3	11.87

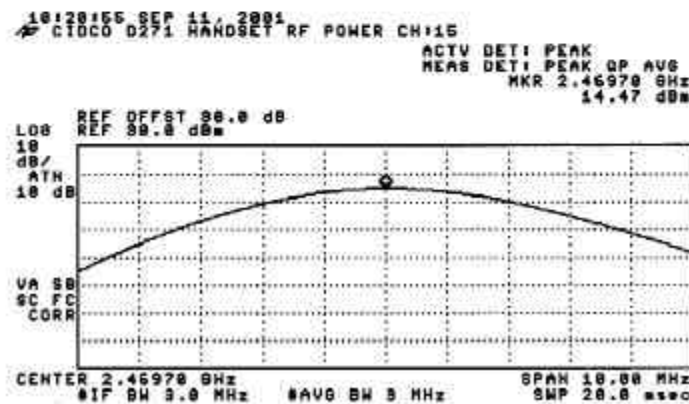
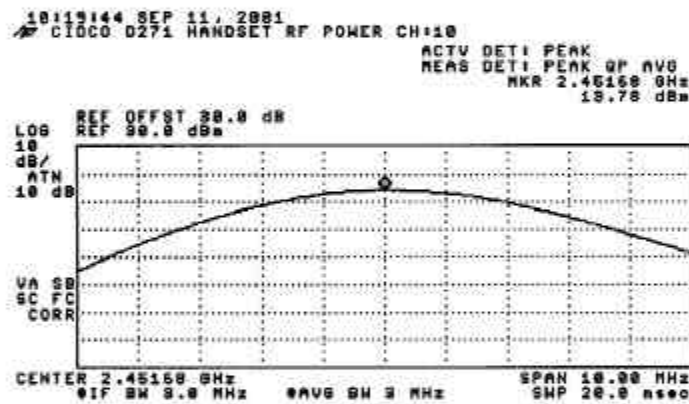
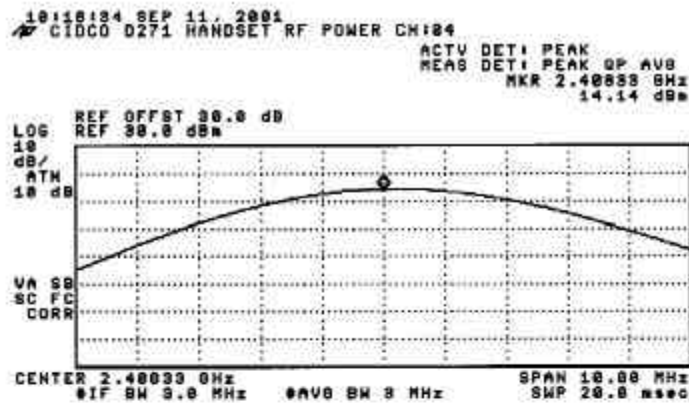
See plots:

6 dB plots is in the 6 dB bandwidth measurement sections

## RF Power for Base Unit



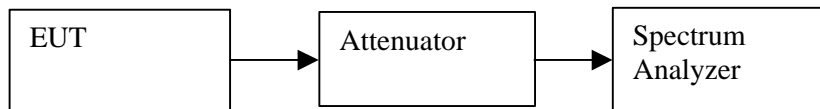
## RF Power for Handset Unit



**9.2. 6 dB BANDWIDTH MEASUREMENT**

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> Average	<input checked="" type="checkbox"/> 100 kHz <input type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 100 kHz <input type="checkbox"/> 1 MHz

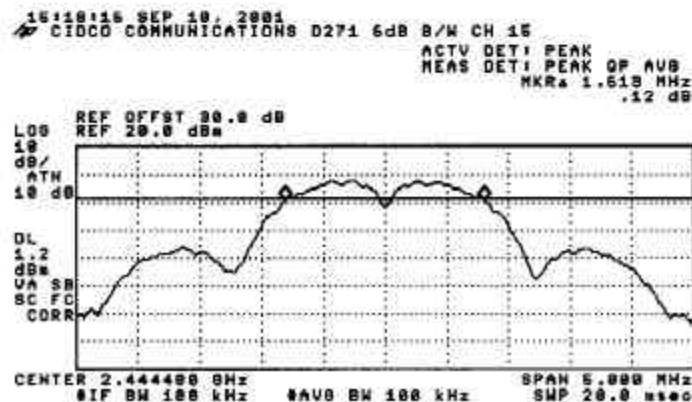
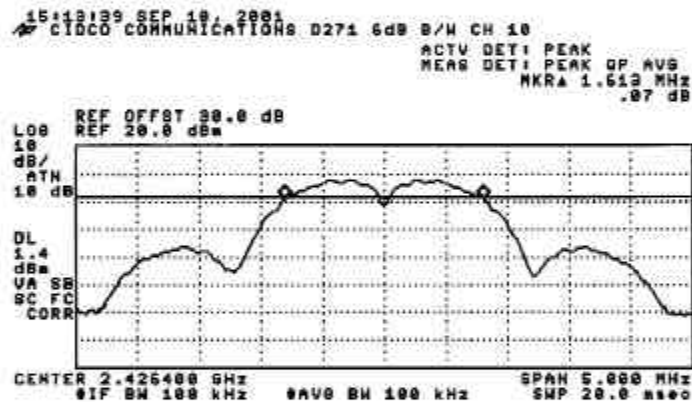
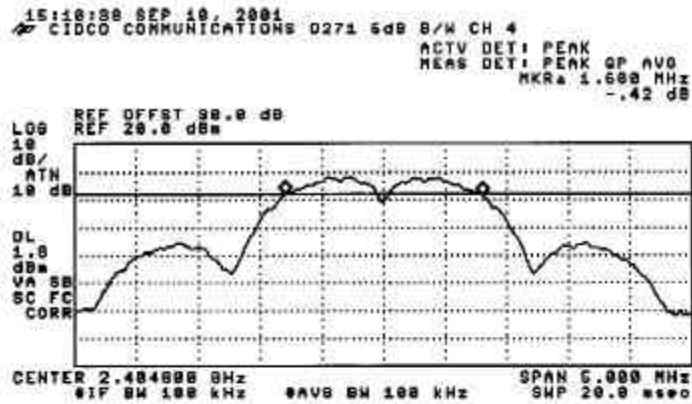
**TEST SETUP****TEST PROCEDURE**

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the poweroff which is higher than peak power minus 6 dB.

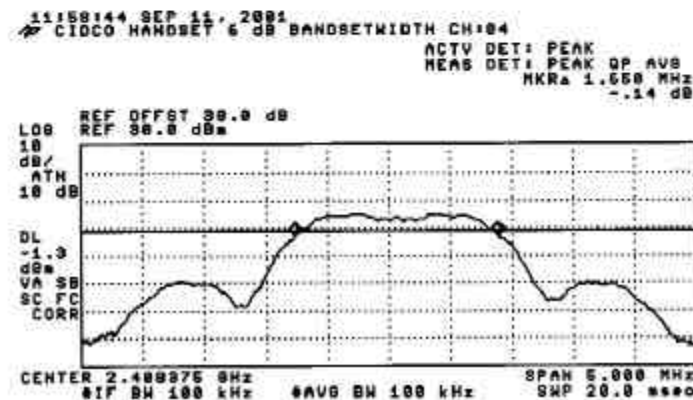
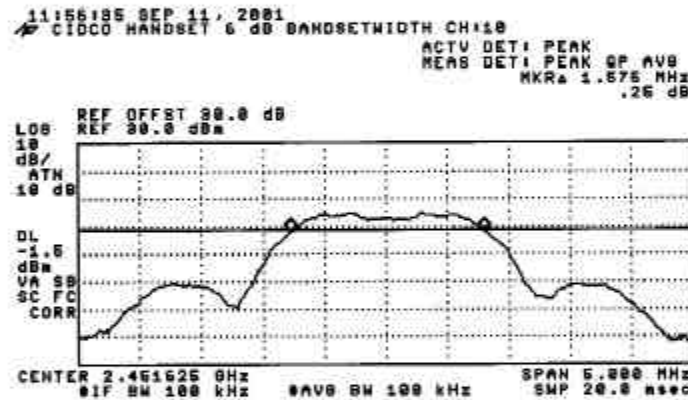
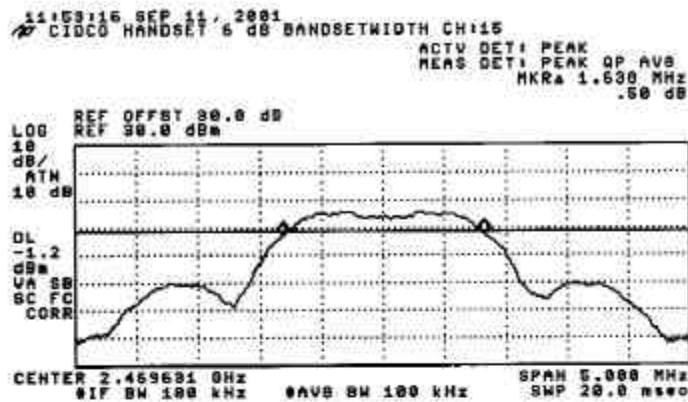
**RESULT**

*No non-compliance noted.*

## 6 dB Bandwidth for Base Unit



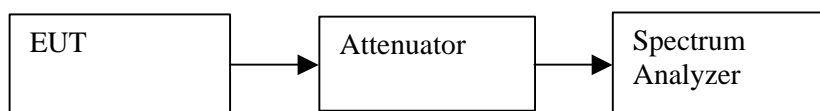
## 6 dB Bandwidth for Handset Unit



**9.3. CONDUCTED SPURIOUS EMISSION**

## Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Below 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 100 kHz	<input checked="" type="checkbox"/> 100 kHz
	<input type="checkbox"/> Average	<input type="checkbox"/> 1 MHz	<input type="checkbox"/> 10 Hz
Above 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 100 kHz	<input checked="" type="checkbox"/> 100 kHz
	<input type="checkbox"/> Average	<input type="checkbox"/> 1 MHz	<input type="checkbox"/> 10 Hz

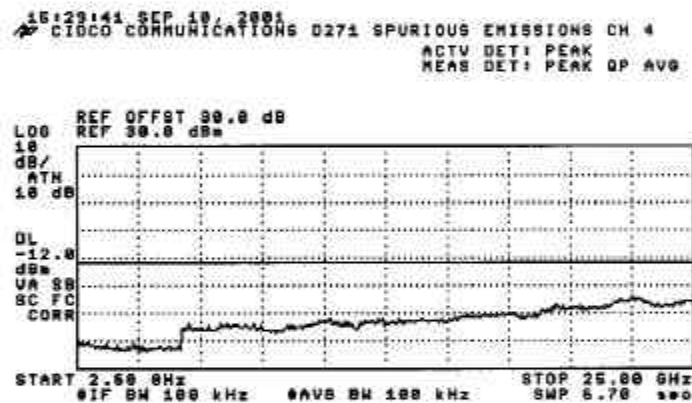
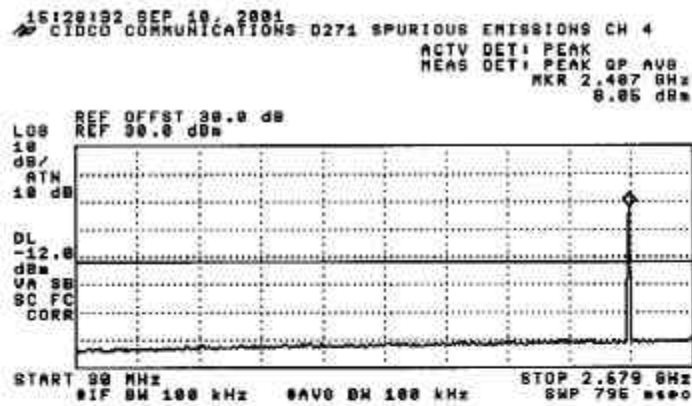
**TEST SETUP****TEST PROCEDURE**

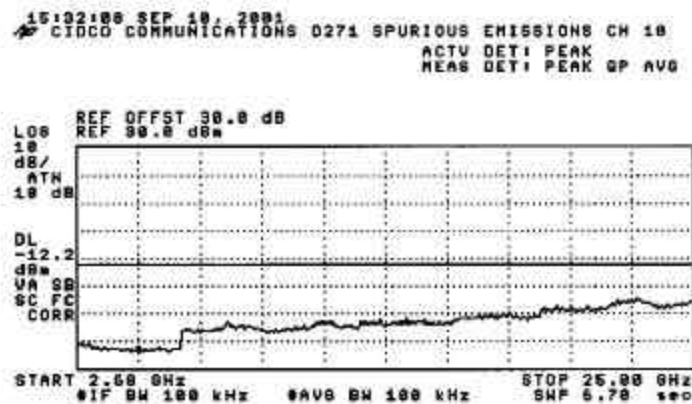
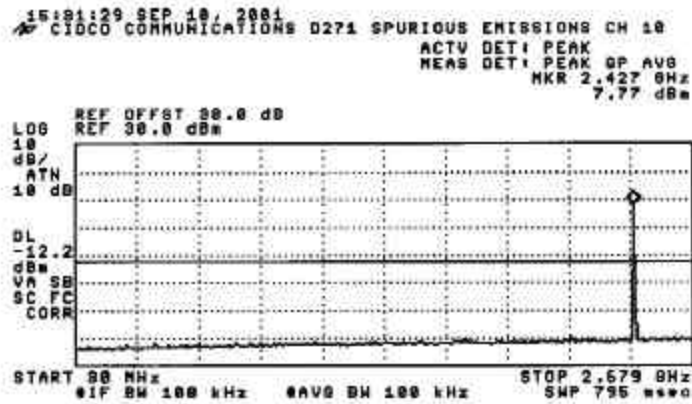
Connect the Eut's antenna port to the Spectrum Analyzer's input.

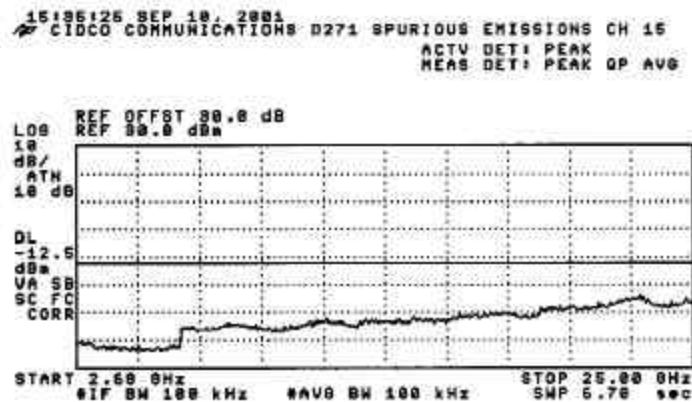
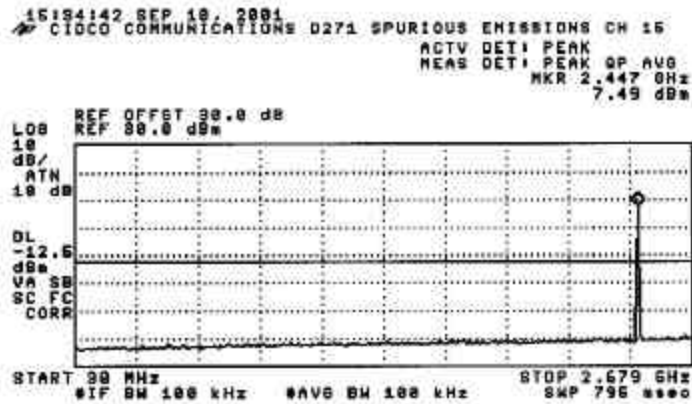
Investigate the entire frequency of the carrier frequency, up to the tenth harmonic.

**RESULT**

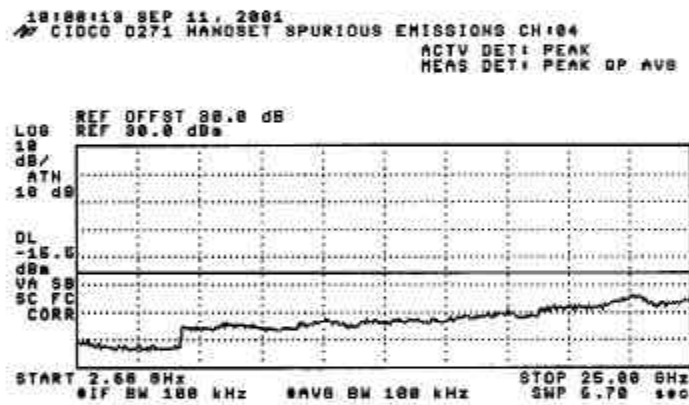
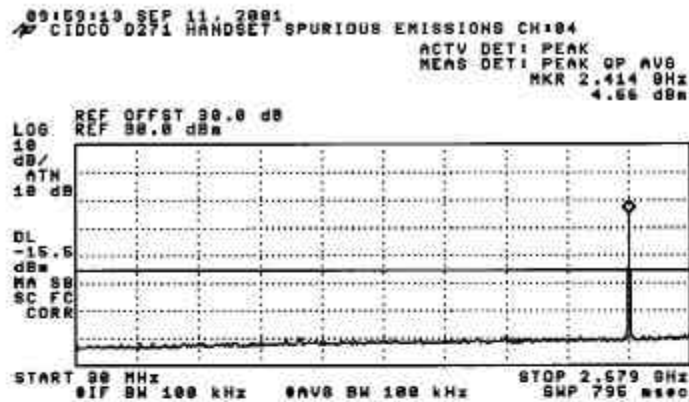
*No non-compliance noted.*

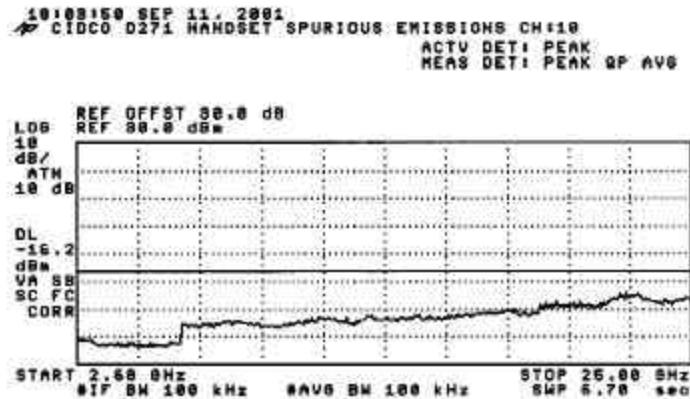
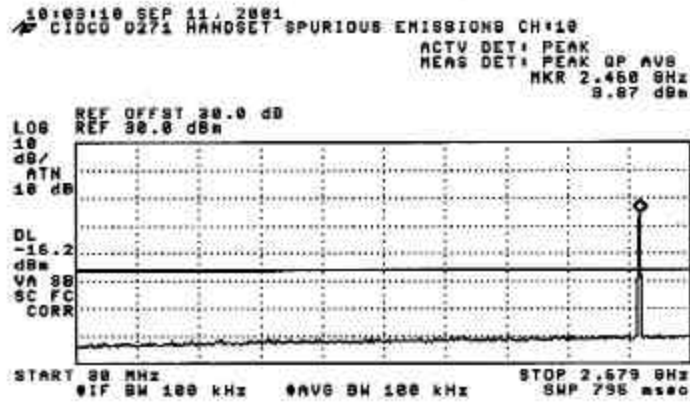
**Conducted Spurious Emission for Base Unit**

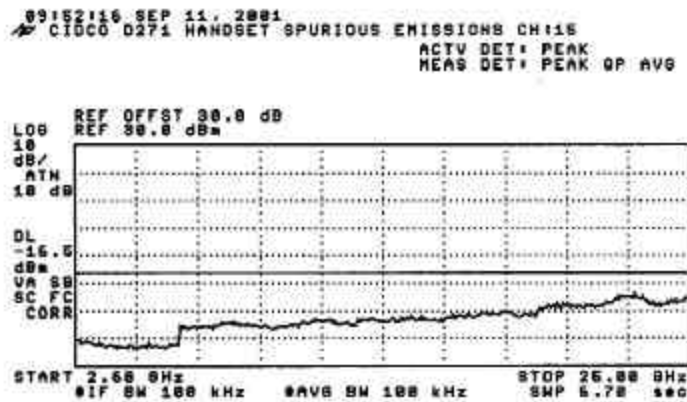
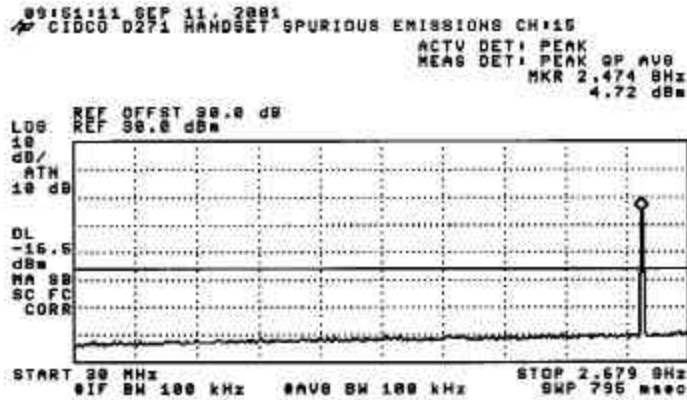




## Conducted Spurious Emission for Handset Unit



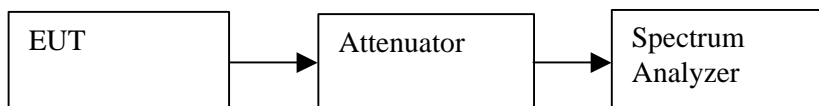




**9.4. PEAK POWER SPECTRAL DENSITY**

## Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> Average	<input checked="" type="checkbox"/> 3 kHz <input type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 3 kHz <input type="checkbox"/> 10 Hz

**TEST SETUP****TEST PROCEDURE**

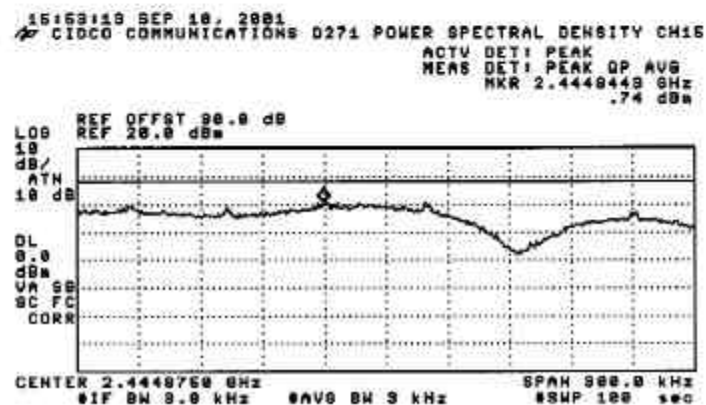
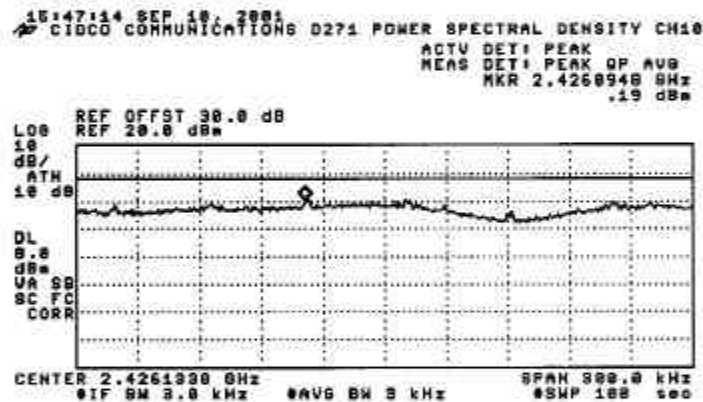
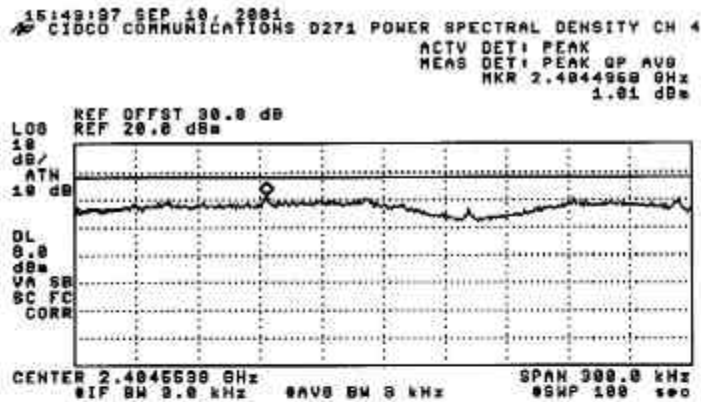
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

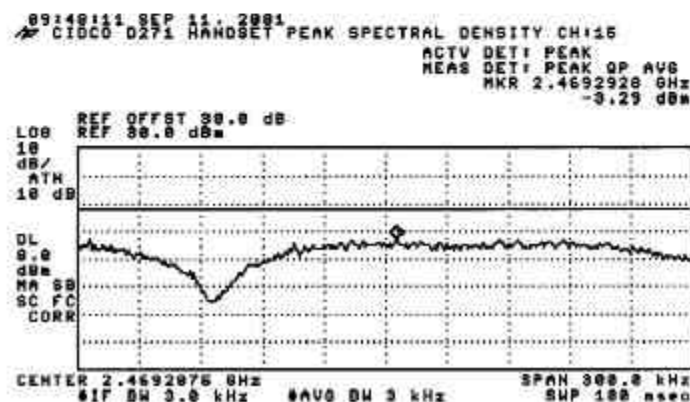
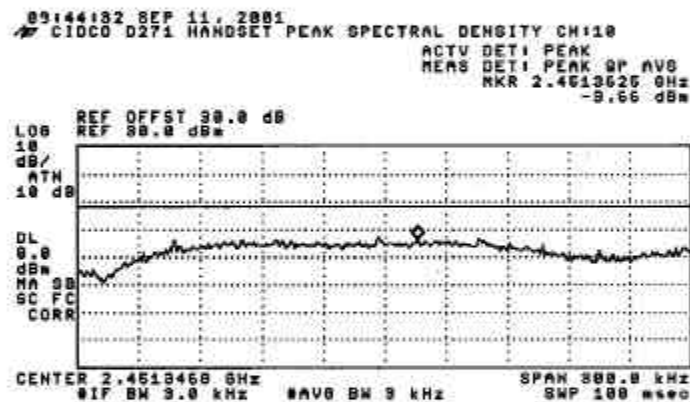
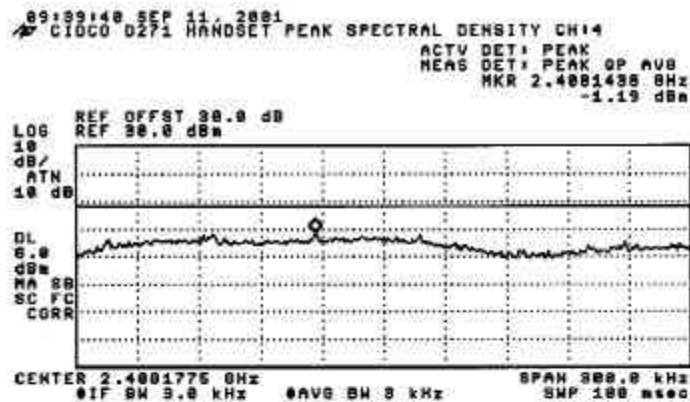
**Result:**

*No non-compliance noted. See plots:*

## Peak Power Spectral Density for Base Unit



## Peak Power Spectral Density for Handset Unit



## 9.5. PROCESSING GAIN

CUSTOMER PROVIDED PROCESSING GAIN.

### Appendix B An Overview of the Processing Gain

The processing gain of a system is the measure of its ability to withstand external interference (jamming). The processing gain is defined as ratio of spread data rate to the unspread data rate. Theoretical processing gain limit for the 12-bit spreading BPSK system is 10.8 dB.

$$\begin{aligned}\text{Processing Gain} &= 10 \text{ Log (spread data rate/unspread data rate)} \\ &= \text{Log } \{ (12 \text{ chip/bit} \times 100 \text{ kbps}) / 100 \text{ kbps} \} \\ &= 10 \text{ Log } \{12\} \\ &= 10.8 \text{ dB}\end{aligned}$$

#### Processing Gain Measurement Method

The following method is specified by the FCC to measure processing gain. The details are in FCC document 15.247 (e)(1). This involves transmitting a Continuous Wave (CW) jammer in the RF passband of the system and measuring the Jammer to Signal Ratio (JSR) required to achieve a certain BER (normally  $10^{-3}$ ). The choice of the actual value of the BER is left up to the tester. The jammer is stepped in 50 kHz increments across the entire passband and in each case the JSR to achieve the desired BER is measured. The Jammer to Signal Ratio (JSR) is measured at the RF input of the system under test. The lowest 20 percent of the JSR data (in dB) is discarded. The processing gain can then be calculated as follows:

$$G_p = \left( \frac{S}{N} \right)_{\text{theory}} + \left( \frac{J}{S} \right)_{\text{measured}} + L_{\text{system}}$$

where  $G_p$  is the processing gain (dB),  $S$  is signal power (dBm),  $N$  is signal noise (dBm),  $J$  is jammer power (dBm), and  $L_{\text{system}}$  is the system implementation losses (dB). Note that the FCC does not allow values for  $L_{\text{system}}$  greater than 2 dB.

#### Processing Gain Measurement Test Setup

The test set up is shown in Figure B-1. The base station and handset are configured to measure the BER using the utility program *Merlin\_V1.exe*. The BER test results are displayed on the monitor. The strength of the received signal entering at the receiving antenna port of the UUT is derived from the signal strength of the transmitting unit.

##### General Procedure

1. Measure the output power of the base station and handset units in LOW, MEDIUM, and HIGH power modes. Determine attenuation and signal losses in the path to calculate the received signal strength arriving at the base station antenna port.
2. Connect the serial interface of the base station and handset to the serial ports of a PC.
3. Connect the base station and handset through the attenuator, signal combiner, and other components using 50  $\Omega$  SMA connectors and cables as shown in Figure B-1. In this way, the BER test set up establishes a link through wired connections.
4. Using the Test Utility software, select the channel frequency, power mode, and corresponding LNA attenuation for the base station and handset units.
5. On the BER Test window, click on the "Start S7 HS Master" button. The link is established and the BER results are displayed on the monitor.
6. Turn on the very low power jamming signal from the signal generator.

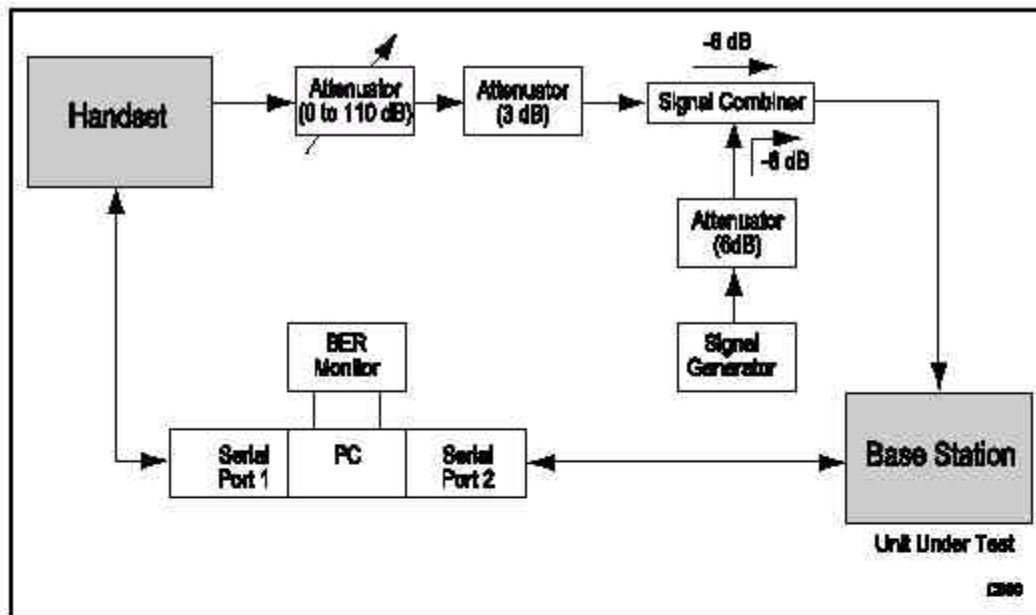


Figure B-1. BER Test Setup

7. Increase jamming signal power until the BER increases to  $\leq 10^{-3}$ . This signal power is recorded for computing received jammer power level  $J$ .
8. Increment the jamming signal frequency in steps of 20 kHz and repeat step 7. Determine the minimum jammer signal power required to achieve a BER of  $\leq 10^{-3}$ . Calculate the processing gain.

Table B-1 provides the parameters used for the test setup. Table B-2 presents test measurement results taken at the base station. The desired BER was set to  $10^{-3}$ .

For Differential Binary Phase-Shift Keying (DBPSK) systems at  $10^{-3}$  BER, the required SNR is 8.0 dB. Using the results above and the data in Table B-3, the processing gain is calculated to be 11.3 dB. The measured result for a processing gain of 11.3 dB is close to the actual processing gain due to a 12-chip spreading code of  $10 \times \log_{10}(12) = 10.8$  dB

Table B-1. Test Setup Parameters

Parameter	Signal Level	Notes
Handset Tx power	-1.9 dBm	Measured @ 50 $\Omega$ SMA-antenna port
Base station LNA gain	0 dB	
Test system losses (signal)	-61.75 dB	-50 dB (channel attenuation), -5.75 dB (attenuator and cables), and -6 dB (signal combiner)
Received signal strength at combiner output	-63.65 dBm	Measured @ combiner output
Test system losses (jammer) up to the combiner output	-12.85 dB	-6 dB (attenuator), -6 dB (signal combiner), -0.85 dB (cable)

## Processing gain for the handset

Table B-2. Test Results

Jammer Frequency (MHz)	BER (Base Station)	Received Jammer Power (dBm)	Received Signal Power (dBm)	Jammer/Signal Ratio (dB)
913.80	$9.4 \times 10^{-4}$	-59.55	-63.65	4.1
913.85	$9.6 \times 10^{-4}$	-57.55	-63.65	5.7
913.90	$9.6 \times 10^{-4}$	-60.15	-63.65	3.5
913.95	$9.6 \times 10^{-4}$	-64.25	-63.65	-0.6
914.00	$1.1 \times 10^{-3}$	-61.55	-63.65	2.1
914.05	$9.8 \times 10^{-4}$	-61.55	-63.65	2.1
914.10	$1.1 \times 10^{-3}$	-61.55	-63.65	1.7
914.15	$9.2 \times 10^{-4}$	-62.85	-63.65	0.8
914.20	$1.0 \times 10^{-3}$	-59.85	-63.65	3.8
914.25	$1.0 \times 10^{-3}$	-61.15	-63.65	2.5
914.30	$1.1 \times 10^{-3}$	-62.05	-63.65	1.6
914.35	$1.0 \times 10^{-3}$	-57.65	-63.65	6.0
914.40	$1.1 \times 10^{-3}$	-55.65	-63.65	8.0
914.45	$1.0 \times 10^{-3}$	-49.35	-63.65	14.3
914.50	$1.1 \times 10^{-3}$	-59.25	-63.65	4.4
914.55	$1.0 \times 10^{-3}$	-62.35	-63.65	1.3
914.60	$9.7 \times 10^{-4}$	-59.05	-63.65	4.6
914.65	$1.0 \times 10^{-3}$	-61.05	-63.65	2.6
914.70	$1.1 \times 10^{-3}$	-62.55	-63.65	1.1
914.75	$9.0 \times 10^{-4}$	-61.95	-63.65	1.7
914.80	$1.0 \times 10^{-3}$	-61.05	-63.65	2.6
914.85	$9.9 \times 10^{-4}$	-62.35	-63.65	1.3
914.90	$1.1 \times 10^{-3}$	-64.05	-63.65	-0.4
914.95	$9.2 \times 10^{-4}$	-56.25	-63.65	7.4
915.00	$1.0 \times 10^{-3}$	-59.85	-63.65	3.8
915.05	$1.1 \times 10^{-3}$	-57.25	-63.65	6.4
915.10	$9.9 \times 10^{-4}$	-58.15	-63.65	5.5

Table B-3: Processing Gain Calculation Data

Parameter	Relative Power Difference (dB)
Required SNR	8.0
System losses	2.0
J/S ratio at 80% point (see shaded row in Table B-2)	1.30
FCC Processing gain	11.3

**Processing Gain for the main unit.**

Freq. Start:	2443	(MHz)	SNRo:	8	(dB)	
	2445.8	(MHz)	Lsys:	2	(dB)	
			Signal Level:	-47	(dB)	
Frequency (MHz)	Jammer Level from Sweeper(dB)	Corrected Jammer Level (dBm)	SNRo (dB)	Lsys (dB)	Signal Level (dBm)	Gp (dB)
2443	-7.5	-24.8	8	2	-47	32.2
2443.05	-8	-25.3	8	2	-47	31.7
2443.1	-8.5	-25.8	8	2	-47	31.2
2443.15	-9	-26.3	8	2	-47	30.7
2443.2	-10.5	-27.8	8	2	-47	29.2
2443.25	-14.5	-31.8	8	2	-47	25.2
2443.3	-12.5	-29.8	8	2	-47	27.2
2443.35	-14	-31.3	8	2	-47	25.7
2443.4	-15.5	-32.8	8	2	-47	24.2
2443.45	-16.5	-33.8	8	2	-47	23.2
2443.5	-19	-36.3	8	2	-47	20.7
2443.55	-20	-37.3	8	2	-47	19.7
2443.6	-21.5	-38.8	8	2	-47	18.2
2443.65	-22	-39.3	8	2	-47	17.7
2443.7	-26	-43.3	8	2	-47	13.7
2443.75	-23.5	-40.8	8	2	-47	16.2
2443.8	-21.5	-38.8	8	2	-47	18.2
2443.85	-25	-42.3	8	2	-47	14.7
2443.9	-21	-38.3	8	2	-47	18.7
2443.95	-29	-46.3	8	2	-47	10.7
2444	-27.5	-44.8	8	2	-47	12.2

Frequency (MHz)	Jammer Level from Sweeper(dB)	Corrected Jammer Level (dBm)	SNRo (dB)	Lsys (dB)	Signal Level (dBm)	Gp (dB)
2444.05	-26	-43.3	8	2	-47	13.7
2444.1	-27	-44.3	8	2	-47	12.7
2444.15	-28	-45.3	8	2	-47	11.7
2444.2	-26	-43.3	8	2	-47	13.7
2444.25	-23.5	-40.8	8	2	-47	16.2
2444.3	-27.5	-44.8	8	2	-47	12.2
2444.35	-24.5	-41.8	8	2	-47	15.2
2444.4	-18	-35.3	8	2	-47	21.7
2444.45	-15	-32.3	8	2	-47	24.7
2444.5	-21	-38.3	8	2	-47	18.7
2444.55	-27.5	-44.8	8	2	-47	12.2
2444.6	-25	-42.3	8	2	-47	14.7
2444.65	-24	-41.3	8	2	-47	15.7
2444.7	-28	-45.3	8	2	-47	11.7
2444.75	-27	-44.3	8	2	-47	12.7
2444.8	-27	-44.3	8	2	-47	12.7
2444.85	-26.5	-43.8	8	2	-47	13.2
2444.9	-29.5	-46.8	8	2	-47	10.2
2444.95	-25	-42.3	8	2	-47	14.7
2445	-23	-40.3	8	2	-47	16.7
2445.05	-25	-42.3	8	2	-47	14.7
2445.1	-20	-37.3	8	2	-47	19.7
2445.15	-27	-44.3	8	2	-47	12.7
2445.2	-24.5	-41.8	8	2	-47	15.2
2445.25	-21.5	-38.8	8	2	-47	18.2
2445.3	-21	-38.3	8	2	-47	18.7
2445.35	-20	-37.3	8	2	-47	19.7
2445.4	-18.5	-35.8	8	2	-47	21.2
2445.45	-17	-34.3	8	2	-47	22.7
2445.5	-15.5	-32.8	8	2	-47	24.2
2445.55	-13.5	-30.8	8	2	-47	26.2
2445.6	-13	-30.3	8	2	-47	26.7
2445.65	-15	-32.3	8	2	-47	24.7
2445.7	-11.5	-28.8	8	2	-47	28.2
2445.75	-10.5	-27.8	8	2	-47	29.2
2445.8	-10	-27.3	8	2	-47	29.7

**9.6. RESTRICTED BAND EDGE MEASUREMENT**

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> Average	<input checked="" type="checkbox"/> 1 MHz <input type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 1 MHz <input type="checkbox"/> 10 Hz

**TEST SETUP****TEST PROCEDURE**

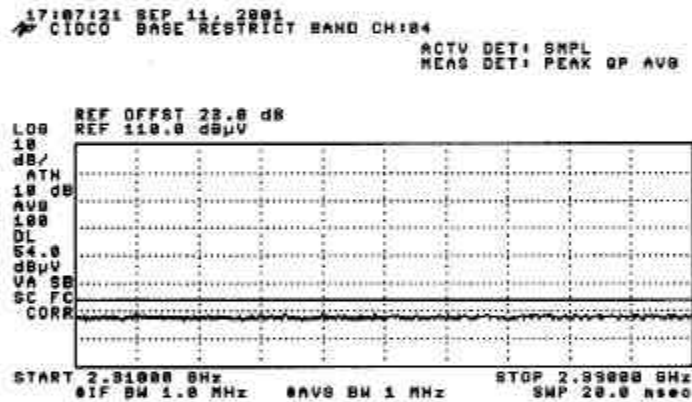
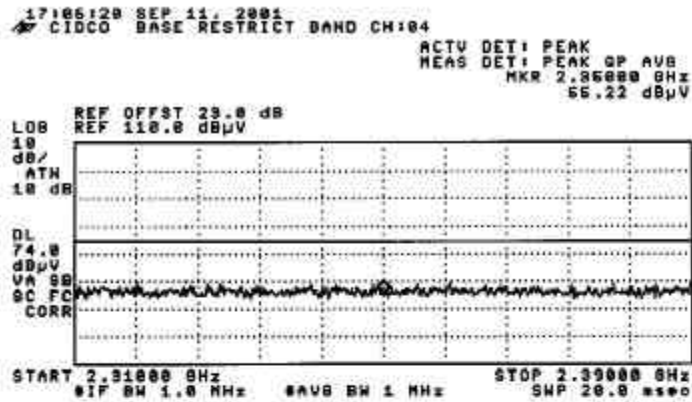
The transmitter output was connected to the spectrum analyzer through an attenuator; the lower and upper band edge of the EUT is investigated.

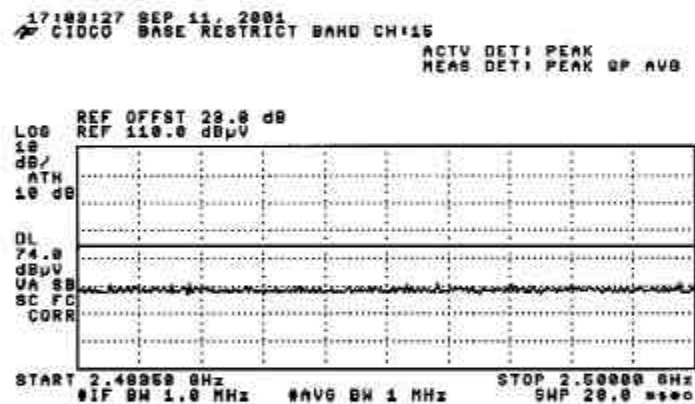
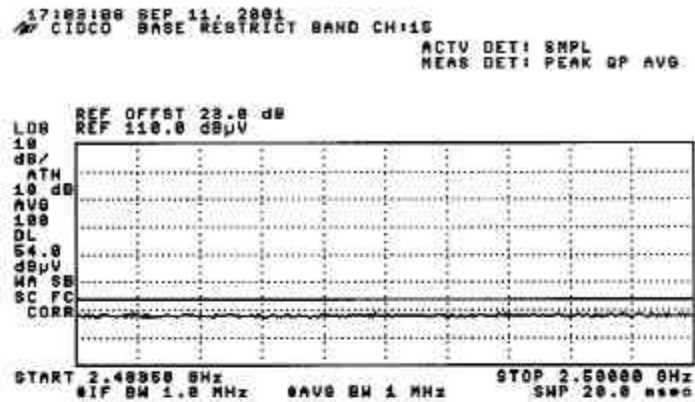
The resolutions and video bandwidth were set to 100kHz.

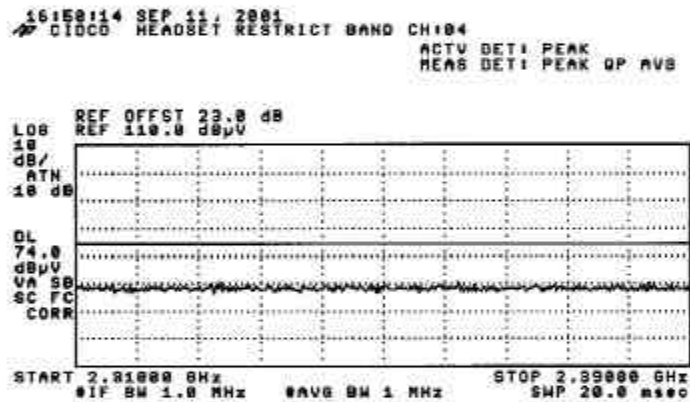
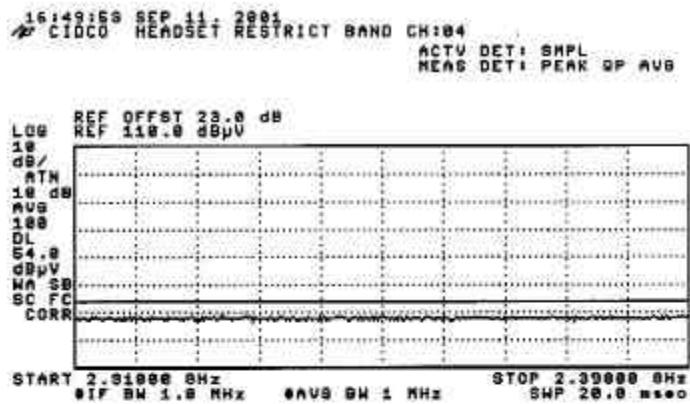
**RESULT**

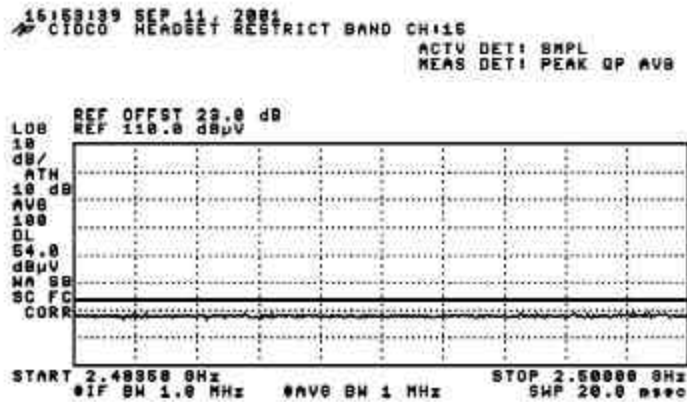
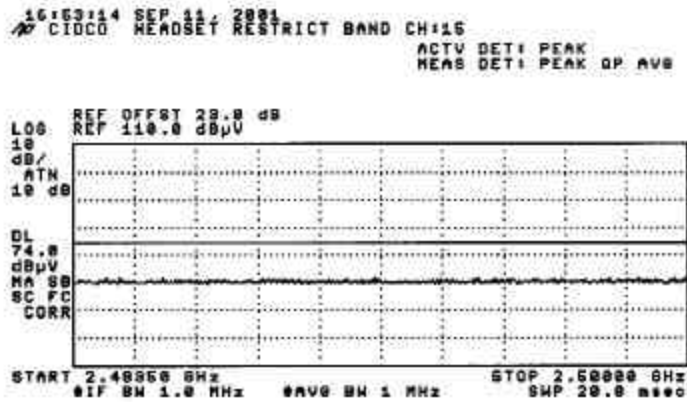
*No non-compliance noted. See plots:*

## Restricted Band Edge Measurement for Base Unit





**Restricted Band Edge Measurement for Handset Unit**



## 9.7. RADIATED EMISSION

### Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 100 KHz	<input checked="" type="checkbox"/> 100 KHz
	<input type="checkbox"/> Quasi Peak	<input type="checkbox"/> 120 KHz	<input type="checkbox"/> 120 KHz
Above 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 1 MHz
	<input type="checkbox"/> Average	<input type="checkbox"/> 1 MHz	<input type="checkbox"/> 10 Hz

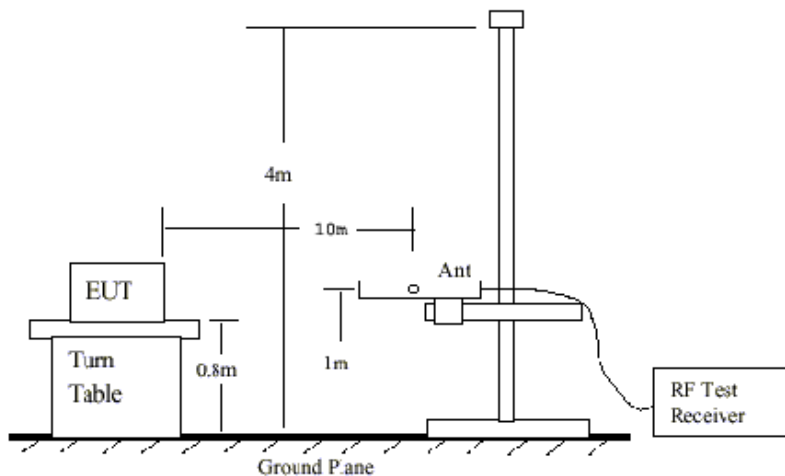


Fig 1: Radiated Emission Measurement 30 to 1000 MHz

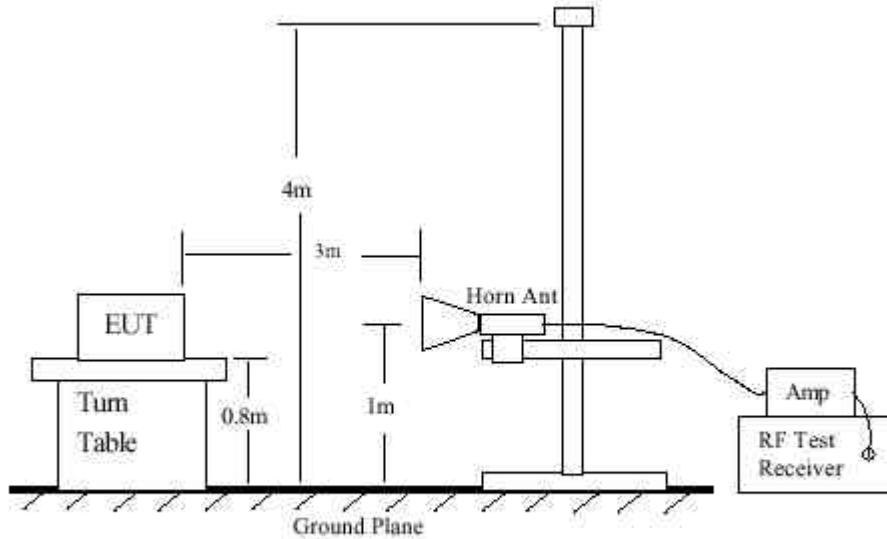


Fig 2: Radiated Emission Above 1000 MHz

### **TEST SETUP & PROCEDURE**

1. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
8. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.

9. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

**RESULT**

*No non-compliance noted, as shown below.*



FCC, VCCI, CISPR, CE, AUSTEL, NZ  
UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001  
PHONE: (408) 463-0885 FAX: (408) 463-0888

<b>Project #:</b>	01U0950-1
<b>Report #:</b>	010904b
<b>Date &amp; Time:</b>	09/04/01 8:58 AM
<b>Test Engr:</b>	Hue Ly Vang

<b>Company:</b>	Cidco Communications, LLC
<b>EUT Description:</b>	2.4GHz Spread Spectream Cordless Telephone
<b>Test Configuration :</b>	EUT only
<b>Type of Test:</b>	FCC Class B
<b>Mode of Operation:</b>	Dialing/Charging Battery

[<< Main Sheet](#)

Freq.	Reading	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
86.00	56.40	9.70	1.23	27.81	39.52	40.00	-0.48	3mH	180.00	1.00	QP
172.80	57.20	11.28	1.73	27.54	42.67	43.50	-0.83	3mV	180.00	1.00	QP
230.40	57.00	13.21	2.02	27.32	44.91	46.00	-1.09	3mH	180.00	2.00	QP
192.00	56.80	10.84	1.84	27.48	42.01	43.50	-1.49	3mH	180.00	2.00	P
182.40	57.00	10.41	1.78	27.51	41.67	43.50	-1.83	3mV	180.00	1.00	P
48.00	52.00	13.06	0.91	27.83	38.14	40.00	-1.86	3mV	180.00	1.00	P
6 Worst Data											

COMPLIANCE ENGINEERING SERVICES, INC.														
Harmonic Emissions														
Cidco Communications LLC.										9/27/01				
Base Unit										Hue Vang				
Channel 4 : 2.408GHz										A site (1.0 Meter)				
F(MHz)	READING		AF	CL	AMP	DIST	HPF	TOTAL		LIMIT	MARGIN		POL	
	(dBuV)		(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)		(dBuV/m)	(dB)		(H/V)	
	Pk	Avg						Pk	Avg	Pk	Avg	Pk	Avg	
4819	58.4	50.5	32.5	5.1	42.5	9.5	1	45	37.1	68.9	68.9	-23.9	-31.8	H
7225	50.2	36.1	37.2	5.44	42.5	9.5	1	41.84	27.74	74	54	-32.2	-26.3	H
9633	45.9	37.5	38	7.48	39.4	9.5	1	43.48	35.08	74	54	-30.5	-18.9	H
12042	48.6	36.5	39.3	8.5	39.5	9.5	1	48.4	36.3	74	54	-25.6	-17.7	H
14450	50.2	36.8	41.3	9.69	42.5	9.5	1	50.19	36.79	74	54	-23.8	-17.2	H
16858	50.1	36.7	40.1	10.2	44.5	9.5	1	47.4	34	74	54	-26.6	-20	H
19266	50.6	36.9	32.1	12.75	44.29	9.5	1	42.66	28.96	74	54	-31.3	-25	H
21674	50.4	37.1	32.7	13.09	42.51	9.5	1	45.18	31.88	74	54	-28.8	-22.1	H
24082	51.1	37.5	32.9	14.28	43.95	9.5	1	45.83	32.23	74	54	-28.2	-21.8	H
4819	49.9	51.9	32.5	5.1	42.5	9.5	1	36.5	38.5	68.9	68.9	-32.4	-30.4	V
7225	50.1	37.1	37.2	5.44	42.5	9.5	1	41.74	28.74	74	54	-32.3	-25.3	V
9633	48.9	36.9	38	7.48	39.4	9.5	1	46.48	34.48	74	54	-27.5	-19.5	V
12042	48.9	36.5	39.3	8.5	39.5	9.5	1	48.7	36.3	74	54	-25.3	-17.7	V
14450	50.2	37.2	41.3	9.69	42.5	9.5	1	50.19	37.19	74	54	-23.8	-16.8	V
16858	50.3	38.1	40.1	10.2	44.5	9.5	1	47.6	35.4	74	54	-26.4	-18.6	V
19266	51.1	36.4	32.1	12.75	44.29	9.5	1	43.16	28.46	74	54	-30.8	-25.5	V
21674	51.2	37.3	32.7	13.09	42.51	9.5	1	45.98	32.08	74	54	-28	-21.9	V
24082	51.6	38.2	32.9	14.28	43.95	9.5	1	46.33	32.93	74	54	-27.7	-21.1	V
NOTE: ALL READINGS MEASURED AT 1 METER.														
DIST: Correction to extrapolate reading to 3m specification distance														
										ANALYZER SETTINGS				
AF: Antenna Factor										PEAK(Pk):	Res bw	Avg. bw		
AMP: Pre-amp gain											1MHz	1MHz		
CL: Cable loss										AVG(Pk):	Res bw	Avg. bw		
HPF: High pass filter insertion loss											1MHz	10Hz		

COMPLIANCE ENGINEERING SERVICES, INC.														
Harmonic Emissions														
Cidco Communications LLC.										6/27/01				
Base Unit										Hue Vang				
Channel 10 : 2.426 GHz										A site (1.0 Meter)				
F(MHz)	READING		AF	CL	AMP	DIST	HPF	TOTAL		LIMIT	MARGIN		POL	
	(dBuV)		(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)		(dBuV/m)	(dB)		(H/V)	
	Pk	Avg						Pk	Avg	Pk	Avg	Pk	Avg	
4852	56.2	43.5	32.5	5.1	42.5	9.5	1	42.8	30.1	74	54	-31.2	-23.9	H
7278	48	44.6	37.2	5.44	42.5	9.5	1	39.64	36.24	74	54	-34.4	-17.8	H
9704	48.5	36.5	38	7.48	39.4	9.5	1	46.08	34.08	74	54	-27.9	-19.9	H
12130	48.2	36.7	39.3	8.5	39.5	9.5	1	48	36.5	74	54	-26	-17.5	H
14556	49.5	36.2	41.3	9.69	42.5	9.5	1	49.49	36.19	74	54	-24.5	-17.8	H
16982	49.8	37.1	40.1	10.2	44.5	9.5	1	47.1	34.4	74	54	-26.9	-19.6	H
19408	49.6	37.5	32.1	12.75	44.29	9.5	1	41.66	29.56	74	54	-32.3	-24.4	H
21834	50.8	37.2	32.7	13.09	42.51	9.5	1	45.58	31.98	74	54	-28.4	-22	H
24260	51	37.8	32.9	14.28	43.95	9.5	1	45.73	32.53	74	54	-28.3	-21.5	H
4852	46	45.6	32.5	5.1	42.5	9.5	1	32.6	32.2	74	54	-41.4	-21.8	V
7278	48.4	46.1	37.2	5.44	42.5	9.5	1	40.04	37.74	74	54	-34	-16.3	V
9704	46.5	36.8	38	7.48	39.4	9.5	1	44.08	34.38	74	54	-29.9	-19.6	V
12130	47.3	35.9	39.3	8.5	39.5	9.5	1	47.1	35.7	74	54	-26.9	-18.3	V
14556	48.9	36.5	41.3	9.69	42.5	9.5	1	48.89	36.49	74	54	-25.1	-17.5	V
16982	49.4	36.4	40.1	10.2	44.5	9.5	1	46.7	33.7	74	54	-27.3	-20.3	V
19408	50.6	36	32.1	12.75	44.29	9.5	1	42.66	28.06	74	54	-31.3	-25.9	V
21834	51	37	32.7	13.09	42.51	9.5	1	45.78	31.78	74	54	-28.2	-22.2	V
24260	51.2	37.2	32.9	14.28	43.95	9.5	1	45.93	31.93	74	54	-28.1	-22.1	V
NOTE: ALL READINGS MEASURED AT 1 METER.														
DIST: Correction to extrapolate reading to 3m specification distance														
										ANALYZER SETTINGS				
AF: Antenna Factor										PEAK(PK):	Res bw	Avg. bw		
AMP: Pre-amp gain											1MHz	1MHz		
CL: Cable loss										AVG(PK):	Res bw	Avg. bw		
HPF: High pass filter insertion loss											1MHz	10Hz		

COMPLIANCE ENGINEERING SERVICES, INC.														
Harmonic Emissions														
Cidco Communications LLC.										6/27/01				
Base Unit										Hue Vang				
Channel 15 : 2.444 GHz										A site (1.0 Meter)				
F(MHz)	READING		AF	CL	AMP	DIST	HPF	TOTAL		LIMIT		MARGIN		POL
	(dBuV)		(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)		(dBuV/m)		(dB)		(H/V)
	Pk	Avg						Pk	Avg	Pk	Avg	Pk	Avg	
4888	53.38	43.5	32.5	5.1	42.5	9.5	1	39.98	30.1	74	54	-34	-23.9	H
7332	50.2	44.6	37.2	5.44	42.5	9.5	1	41.84	36.24	74	54	-32.2	-17.8	H
9776	48.9	36.5	38	7.48	39.4	9.5	1	46.48	34.08	74	54	-27.5	-19.9	H
12220	48	36.7	39.3	8.5	39.5	9.5	1	47.8	36.5	74	54	-26.2	-17.5	H
14664	50	36.2	41.3	9.69	42.5	9.5	1	49.99	36.19	74	54	-24	-17.8	H
17108	50	37.1	40.1	10.2	44.5	9.5	1	47.3	34.4	74	54	-26.7	-19.6	H
19552	50	37.5	32.1	12.75	44.29	9.5	1	42.06	29.56	74	54	-31.9	-24.4	H
21996	50.5	37.2	32.7	13.09	42.51	9.5	1	45.28	31.98	74	54	-28.7	-22	H
24440	51	37.8	32.9	14.28	43.95	9.5	1	45.73	32.53	74	54	-28.3	-21.5	H
4888	60.29	45.6	32.5	5.1	42.5	9.5	1	46.89	32.2	74	54	-27.1	-21.8	V
7332	61.1	46.1	37.2	5.44	42.5	9.5	1	52.74	37.74	74	54	-21.3	-16.3	V
9776	46.5	36.8	38	7.48	39.4	9.5	1	44.08	34.38	74	54	-29.9	-19.6	V
12220	47.8	35.9	39.3	8.5	39.5	9.5	1	47.6	35.7	74	54	-26.4	-18.3	V
14664	49.5	36.5	41.3	9.69	42.5	9.5	1	49.49	36.49	74	54	-24.5	-17.5	V
17108	50.2	36.4	40.1	10.2	44.5	9.5	1	49.3	33.7	74	54	425.3	-20.3	V
19552	50.6	36	32.1	12.75	44.29	9.5	1	42.66	28.06	74	54	-31.3	-25.9	V
21996	50.8	37	32.7	13.09	42.51	9.5	1	45.58	31.78	74	54	-28.4	-22.2	V
24440	50.9	37.2	32.9	14.28	43.95	9.5	1	45.63	31.93	74	54	-28.4	-22.1	V
NOTE: ALL READINGS MEASURED AT 1 METER.														
DIST: Correction to extrapolate reading to 3m specification distance														
										ANALYZER SETTINGS				
AF: Antenna Factor										PEAK(Pk):		Res bw	Avg. bw	
AMP: Pre-amp gain												1MHz	1MHz	
CL: Cable loss										AVG(Pk):		Res bw	Avg. bw	
HPF: High pass filter insertion loss												1MHz	10Hz	

COMPLIANCE ENGINEERING SERVICES, INC.														
Harmonic Emissions														
Cidco Communications LLC.										9/27/01				
Handset Unit										Hue Vang				
Channel 5: 2.408GHz										A site (1.0 Meter)				
F(MHz)	READING		AF	CL	AMP	DIST	HPF	TOTAL		LIMIT		MARGIN		POL
	(dBuV)		(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)		(dBuV/m)		(dB)		(H/V)
	Pk	Avg						Pk	Avg	Pk	Avg	Pk	Avg	
4816	54.4	45.8	32.5	5.1	42.5	9.5	1	41	32.4	74	54	-33	-21.6	H
7224	50.2	36.1	37.2	5.44	42.5	9.5	1	41.84	27.74	74	54	-32.2	-26.3	H
9632	45.9	37.5	38	7.48	39.4	9.5	1	43.48	35.08	74	54	-30.5	-18.9	H
12040	48.1	36.5	39.3	8.5	39.5	9.5	1	47.9	36.3	74	54	-26.1	-17.7	H
14448	49.5	36.8	41.3	9.69	42.5	9.5	1	49.49	36.79	74	54	-24.5	-17.2	H
19264	49.8	36.7	40.1	10.2	44.5	9.5	1	47.1	34	74	54	-26.9	-20	H
16856	49.6	36.9	32.1	12.75	44.29	9.5	1	41.66	28.96	74	54	-32.3	-25	H
19264	50.4	37.1	32.7	13.09	42.51	9.5	1	45.18	31.88	74	54	-28.8	-22.1	H
21672	51.1	37.5	32.9	14.28	43.95	9.5	1	45.83	32.23	74	54	-28.2	-21.8	H
4816	62.5	49.8	32.5	5.1	42.5	9.5	1	49.1	36.4	74	54	-24.9	-17.6	V
7224	50.2	36.1	37.2	5.44	42.5	9.5	1	41.84	27.74	74	54	-32.2	-26.3	V
9632	46.2	36.6	38	7.48	39.4	9.5	1	43.78	34.18	74	54	-30.2	-19.8	V
12040	47.8	36.2	39.3	8.5	39.5	9.5	1	47.6	36	74	54	-26.4	-18	V
14448	50.3	36.6	41.3	9.69	42.5	9.5	1	50.29	36.59	74	54	-23.7	-17.4	V
19264	50.2	36.8	40.1	10.2	44.5	9.5	1	47.5	34.1	74	54	-26.5	-19.9	V
16856	50.5	36.7	32.1	12.75	44.29	9.5	1	42.56	28.76	74	54	-31.4	-25.2	V
19264	51	37.2	32.7	13.09	42.51	9.5	1	45.78	31.98	74	54	-28.2	-22	V
21672	50.2	37.5	32.9	14.28	43.95	9.5	1	44.93	32.23	74	54	-29.1	-21.8	V
NOTE: ALL READINGS MEASURED AT 1 METER.														
DIST: Correction to extrapolate reading to 3m specification distance														
										ANALYZER SETTINGS				
AF: Antenna Factor										PEAK(PK):		Res bw	Avg. bw	
AMP: Pre-amp gain												1MHz	1MHz	
CL: Cable loss										AVG(PK):		Res bw	Avg. bw	
HPF: High pass filter insertion loss												1MHz	10Hz	

COMPLIANCE ENGINEERING SERVICES, INC.														
Harmonic Emissions														
Cidco Communications LLC										6/27/01				
Handset Unit										Hue Vang				
Channel 10: 2.452GHz										A site (1.0 Meter)				
F(MHz)	READING		AF	CL	AMP	DIST	HPF	TOTAL		LIMIT	MARGIN		POL	
	(dBuV)		(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)		(dBuV/m)	(dB)		(H/V)	
	Pk	Avg						Pk	Avg	Pk	Avg	Pk	Avg	
4904	53.5	49.2	32.5	5.1	42.5	9.5	1	40.1	35.8	74	54	-33.9	-18.2	H
7356	47	41.3	37.2	5.44	42.5	9.5	1	38.64	32.94	74	54	-35.4	-21.1	H
9808	48.6	37.6	38	7.48	39.4	9.5	1	46.18	35.18	74	54	-27.8	-18.8	H
12262	48.9	36.8	39.3	8.5	39.5	9.5	1	48.7	36.6	74	54	-25.3	-17.4	H
14714	50.1	37.2	41.3	9.69	42.5	9.5	1	50.09	37.19	74	54	-23.9	-16.8	H
17166	50.6	36.8	40.1	10.2	44.5	9.5	1	47.9	34.1	74	54	-26.1	-19.9	H
19618	50.5	37.4	32.1	12.75	44.29	9.5	1	42.56	29.46	74	54	-31.4	-24.5	H
22070	51.2	36.6	32.7	13.09	42.51	9.5	1	45.98	31.38	74	54	-28	-22.6	H
24522	51.3	36.8	32.9	14.28	43.95	9.5	1	46.03	31.53	74	54	-28	-22.5	H
4904	62.2	37.8	32.5	5.1	42.5	9.5	1	48.8	24.4	74	54	-25.2	-29.6	V
7356	61.3	37.3	37.2	5.44	42.5	9.5	1	52.94	28.94	74	54	-21.1	-25.1	V
9808	48.6	37.5	38	7.48	39.4	9.5	1	46.18	35.08	74	54	-27.8	-18.9	V
12262	48.7	37.6	39.3	8.5	39.5	9.5	1	48.5	37.4	74	54	-25.5	-16.6	V
14714	50.2	37.7	41.3	9.69	42.5	9.5	1	50.19	37.69	74	54	-23.8	-16.3	V
17166	50.4	36.8	40.1	10.2	44.5	9.5	1	47.7	34.1	74	54	-26.3	-19.9	V
19618	50.6	36.8	32.1	12.75	44.29	9.5	1	42.66	28.86	74	54	-31.3	-25.1	V
22070	50.3	37.4	32.7	13.09	42.51	9.5	1	45.08	32.18	74	54	-28.9	-21.8	V
24522	51	37.7	32.9	14.28	43.95	9.5	1	45.73	32.43	74	54	-28.3	-21.6	V
NOTE: ALL READINGS MEASURED AT 1 METER.														
DIST: Correction to extrapolate reading to 3m specification distance														
										ANALYZER SETTINGS				
AF: Antenna Factor										PEAK(Pk):	Res bw	Avg. bw		
AMP: Pre-amp gain											1MHz	1MHz		
CL: Cable loss										AVG(Pk):	Res bw	Avg. bw		
HPF: High pass filter insertion loss											1MHz	10Hz		

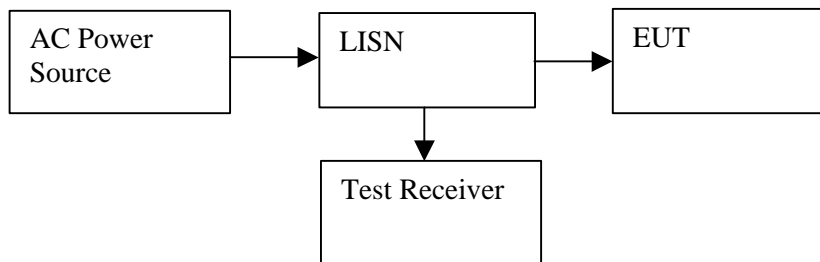
COMPLIANCE ENGINEERING SERVICES, INC.														
Harmonic Emissions														
Cidco Communications LLC.										6/27/01				
Handset										Hue Vang				
Channel 15: 2.469GHz										A site (1.0 Meter)				
F(MHz)	READING		AF	CL	AMP	DIST	HPF	TOTAL		LIMIT		MARGIN		POL
	(dBuV)		(dB)	(dB)	(dB)	(dB)	(dB)	(dBuV/m)		(dBuV/m)		(dB)		(H/V)
	Pk	Avg						Pk	Avg	Pk	Avg	Pk	Avg	
4938	51	48	32.5	5.1	42.5	9.5	1	37.6	34.6	74	54	-36.4	-19.4	H
7407	50	48.1	37.2	5.44	42.5	9.5	1	41.64	39.74	74	54	-32.4	-14.3	H
9876	49.3	36.5	38	7.48	39.4	9.5	1	46.88	34.08	74	54	-27.1	-19.9	H
12345	47	36.8	39.3	8.5	39.5	9.5	1	46.8	36.6	74	54	-27.2	-17.4	H
14814	47.6	37.1	41.3	9.69	42.5	9.5	1	47.59	37.09	74	54	-26.4	-16.9	H
17283	48.6	37.8	40.1	10.2	44.5	9.5	1	45.9	35.1	74	54	-28.1	-18.9	H
19752	59.8	37	32.1	12.75	44.29	9.5	1	51.86	29.06	74	54	-22.1	-24.9	H
22221	49.7	37.6	32.7	13.09	42.51	9.5	1	44.48	32.38	74	54	-29.5	-21.6	H
24690	50	37.4	32.9	14.28	43.95	9.5	1	44.73	32.13	74	54	-29.3	-21.9	H
4938	58	48.8	32.5	5.1	42.5	9.5	1	44.6	35.4	74	54	-29.4	-18.6	V
7407	56	48.1	37.2	5.44	42.5	9.5	1	47.64	39.74	74	54	-26.4	-14.3	V
9876	48.3	37	38	7.48	39.4	9.5	1	45.88	34.58	74	54	-28.1	-19.4	V
12345	48.9	37.2	39.3	8.5	39.5	9.5	1	48.7	37	74	54	-25.3	-17	V
14814	48.8	37.4	41.3	9.69	42.5	9.5	1	48.79	37.39	74	54	-25.2	-16.6	V
17283	47.6	37.7	40.1	10.2	44.5	9.5	1	44.9	35	74	54	-29.1	-19	V
19752	46.9	37.5	32.1	12.75	44.29	9.5	1	38.96	29.56	74	54	-35	-24.4	V
22221	47.9	38	32.7	13.09	42.51	9.5	1	42.68	32.78	74	54	-31.3	-21.2	V
24690	48	38.9	32.9	14.28	43.95	9.5	1	42.73	33.63	74	54	-31.3	-20.4	V
NOTE: ALL READINGS MEASURED AT 1 METER.														
DIST: Correction to extrapolate reading to 3m specification distance														
										ANALYZER SETTINGS				
AF: Antenna Factor										PEAK(Pk):		Res bw	Avg. bw	
AMP: Pre-amp gain												1MHz	1MHz	
CL: Cable loss										AVG(Pk):		Res bw	Avg. bw	
HPF: High pass filter insertion loss												1MHz	10Hz	

## 9.8. POWER LINE CONDUCTED EMISSION

### Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
450 KHz to 30 MHz	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> CISPR Quasi Peak	<input checked="" type="checkbox"/> 9 KHz	<input checked="" type="checkbox"/> 9 KHz

## TEST SETUP



## TEST PROCEDURE

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

## RESULT

No non-compliance noted. See plot Line Conduction.

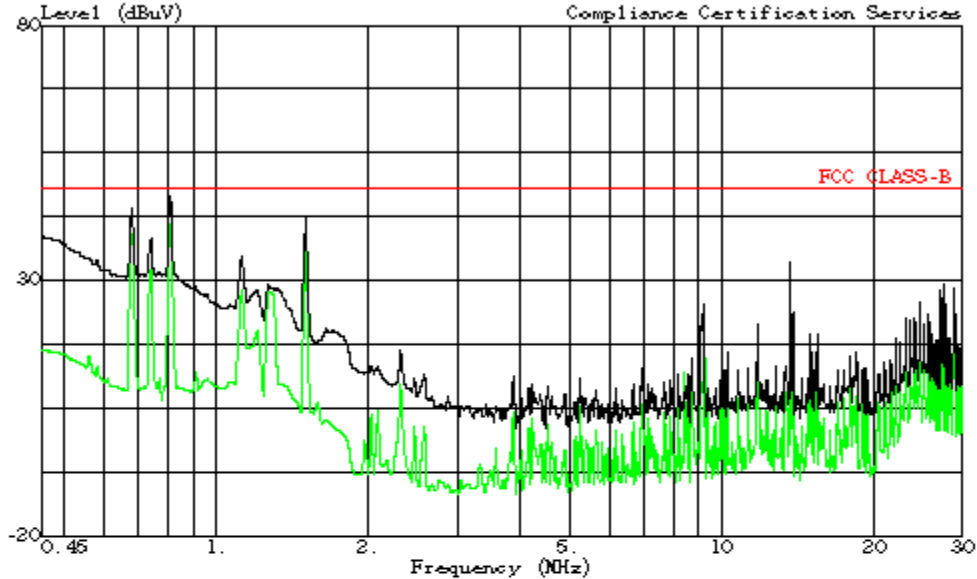
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Cross	Limit		Margin		Remark
(MHz)	PK (dBuV)	OP (dBuV)	AV (dBuV)	(dB)	OP	AV	OP (dB)	AV (dB)	L1 / L2
0.52	42.98	--	--	0.00	48.00	--	-5.02	--	L1
1.79	42.09	--	--	0.00	48.00	--	-5.91	--	L1
27.35	36.99	--	--	0.00	48.00	--	-11.01	--	L1
0.62	45.05	--	--	0.00	48.00	--	-2.95	--	L2
5.57	45.20	--	--	0.00	48.00	--	-2.80	--	L2
12.26	38.32	--	--	0.00	48.00	--	-9.68	--	L2
6 Worst Data									



561 F Monterey Road, Route 2  
Morgan Hill, CA 95037-9001 USA  
Tel: (408) 463-0885  
Fax: (408) 463-0888

Data#: 7 File#: 01U0950.EMI

Date: 09-04-2001 Time: 16:24:02



Trace: 5

Project No. : 01U0950-1

Report No. : 0109041c

Test Engr : Hue Ly Vang

Company : Cideo Communications, LLC

EUT Description : 2.4 GHz S.S. Cordless telephone

Model : D271

EUT Config. : EUT Only

Type of Test : FCC Class B

Mode of Operation:

: QPEAK: L1(Green), PEAK: L1(Black)

: 115Vac, @0Hz

Ref Trace:



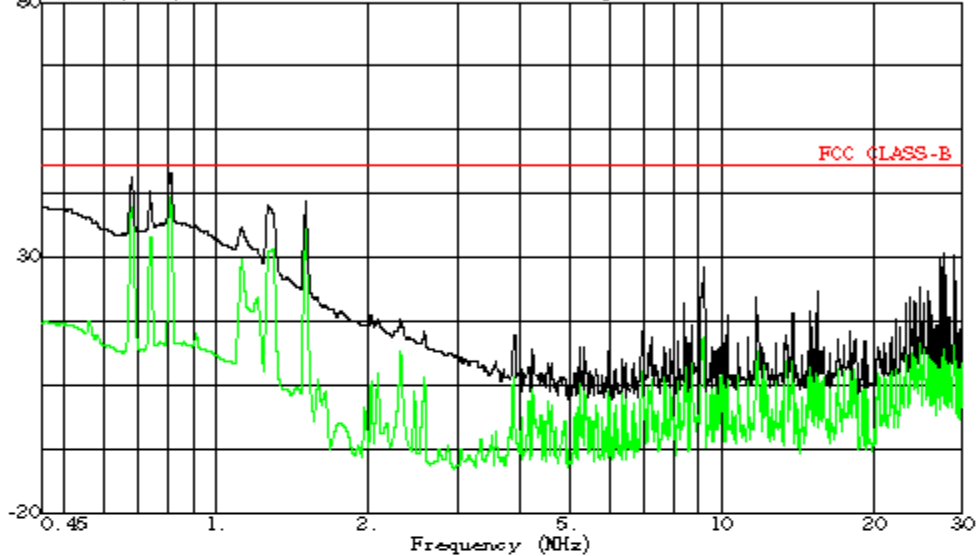
561 F Monterey Road, Route 2  
Morgan Hill, CA 95037-9001 USA  
Tel: (408) 463-0885  
Fax: (408) 463-0888

Data#: 14 File#: 01U0950.EMI

Date: 09-04-2001 Time: 16:58:17

Level (dBuV)

Compliance Certification Services



Trace: 12

Ref Trace:

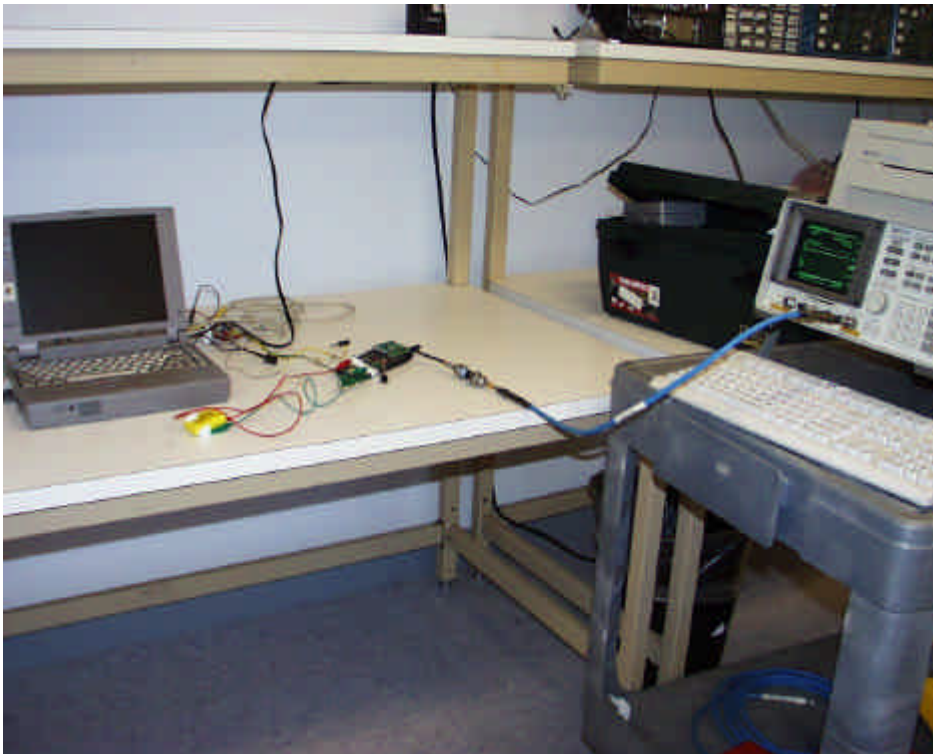
Project No. : 01U0950-1  
Report No. : 010904-12  
Test Engr : Hue Ly Vang  
Company : Cideo Communications, LLC  
EUT Description : 2.4 GHz S.S. Cordless telephone  
Model : D271  
EUT Config. : EUT Only  
Type of Test : FCC Class B  
Mode of Operation:  
: QPEAK: L2 (Green), Peak L2 (Black)  
: 115Vac, @0Hz

## 9.9. SETUP PHOTOS

### Radiated Emission photos



**Conducted Emission Photos**

**FCC testing to antenna port**

**FCC testing above 1GIGHz**