FCC CFR47 PART 15 CERTIFICATION

TEST REPORT

FOR

900MHz DIGITAL SPREAD SPECTRUM CORDLESS PHONE

MODEL: D936 & D937

FCC ID: HOLD93X

REPORT NUMBER: 02U1531-1

ISSUE DATE: SEPTEMBER 18, 2002

Prepared for
CIDCO COMMUNICATIONS, LLC.
105 COCHRANE CIRCLE
MORGAN HILL, CA 95035
USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

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1. TEST RESULT CERTIFICATION

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

EUT DESCRIPTION: **900 MHZ DIGITAL SPREAD SPECTRUM CORDLESS PHONE**

MODEL NAME: **D936 & D937**

DATE TESTED: **SEPT11 – SEPT 13, 2002**

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	900MHz TRANSCEIVER
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 15 SUBPART C

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, Part 15, Subpart C. 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:

MIKE HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH VAN NGUYEN
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

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2. EUT DESCRIPTION

The Models D936 AND D937 are a 900 MHz cordless phone. The phone base antenna gain is 0 dBi. The handset antenna gain is 0 dBi.

Crystal

Board Name	**Crystal (MHz)**
Phone Base Unit	19.2MHz on the base PCB
Handset Unit	19.2MHz on the Handset PCB

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))

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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

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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.

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.

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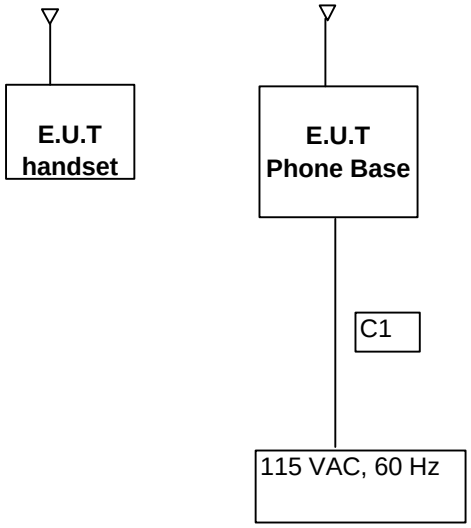
7. SUPPORT EQUIPMENT / TEST DIAGRAM

Support Equipment

During Radiated Emission testing, no support equipment was used.

Test Diagram



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8. APPLICABLE RULES

§15.247- POWER LIMIT

(b) The maximum peak output power of the intentional radiator operating in the 902-928 MHz band not exceed 1 watt.

Spec limit: As specified above, 1W maximum.
Test result: No non-compliance noted.

§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.

§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.

§15.247- PROCESSING 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.

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§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
[1]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	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] 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.

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§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 15.209

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.

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§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 PART 15.207

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

Spec limit: As specified above.
Test result: No non-compliance noted.

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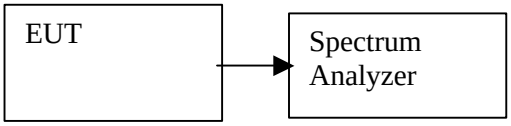
9. TEST SETUP, PROCEDURE AND RESULT

9.1. CONDUCTED POWER

TEST SETUP



TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting mode. The transmitter output was connected to the spectrum analyzer. The output power of the fundamental frequency was measured by spectrum analyzer with 3 MHz RBW and 3 MHz VBW. The spectrum analyzer RBW is greater than the EUT bandwidth.

RESULT

No non-compliance noted.

Phone Base unit

Channel	***Frequency (MHz)***	***Output Power(watts)***
1	***904.2***	***45.0mW (16.53 dBm)***
10	***914.4***	***42.27mW (16.26 dBm)***
20	***926***	***38.11mW (15.81 dBm)***

Handset unit

Channel	***Frequency (MHz)***	***Output Power(watts)***
1	***904.2***	***16.44mW (12.16 dBm)***
10	***914.4***	***14.83mW (11.71 dBm)***
20	***926***	***14.28mW (11.55 dBm)***

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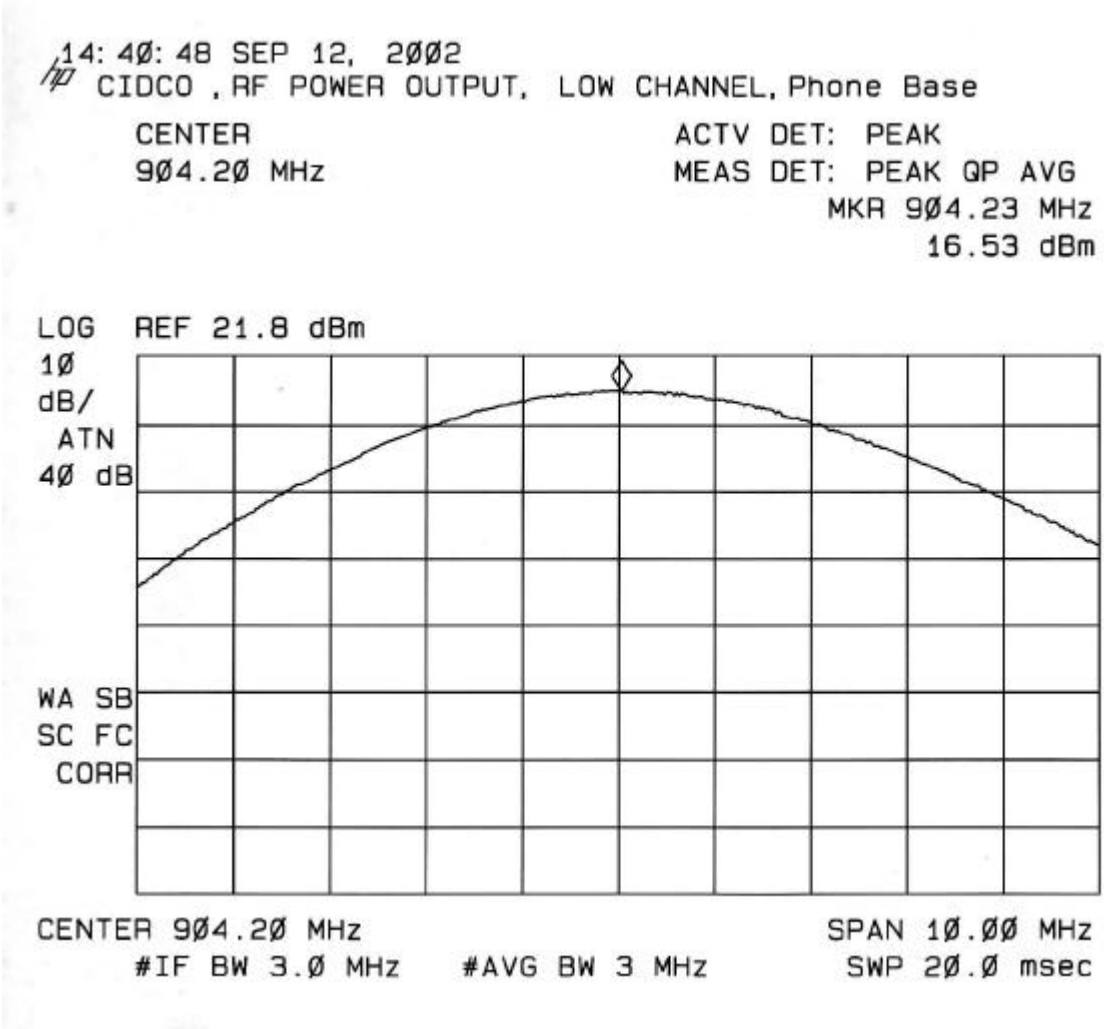
RF Power for Base Unit
Channel 1



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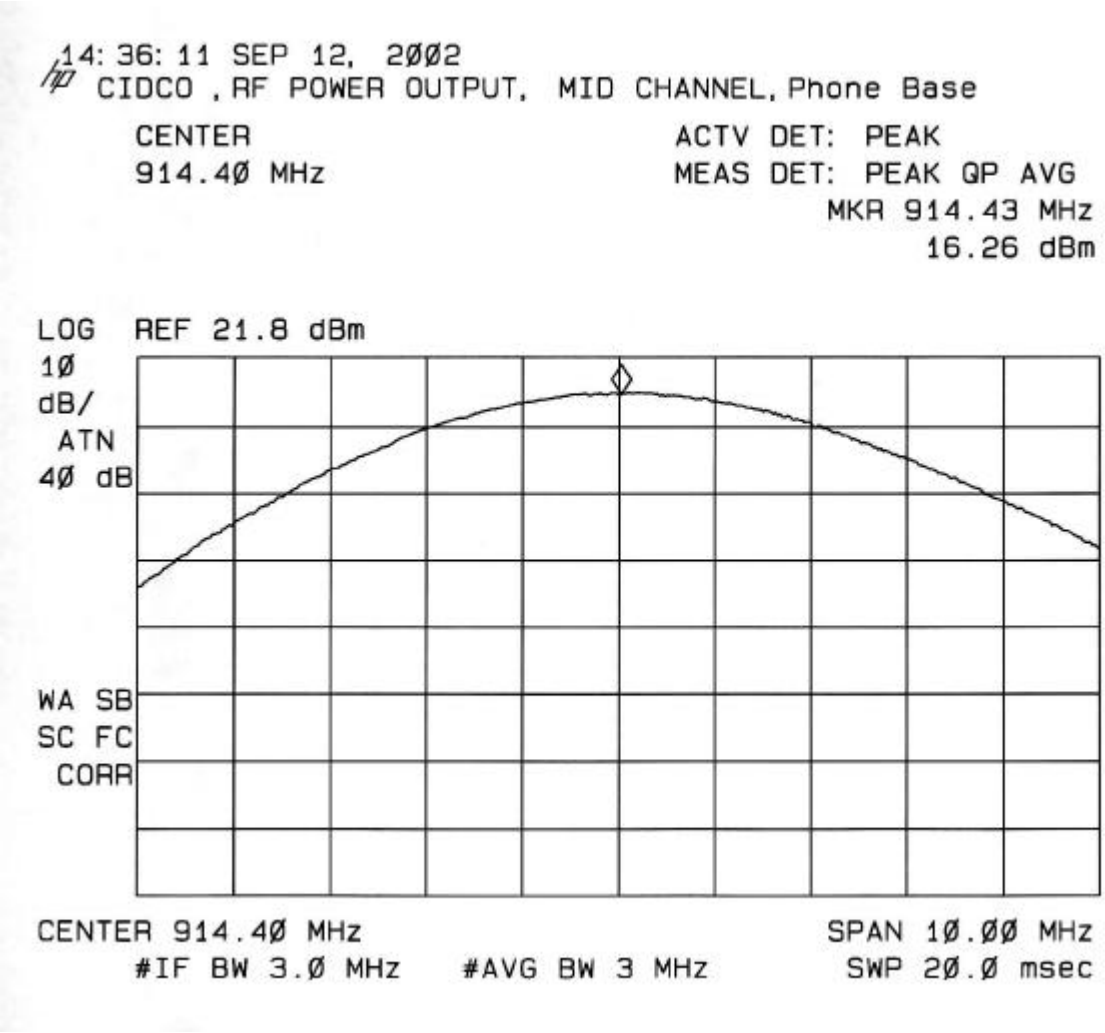
RF Power for Base Unit
Channel 10



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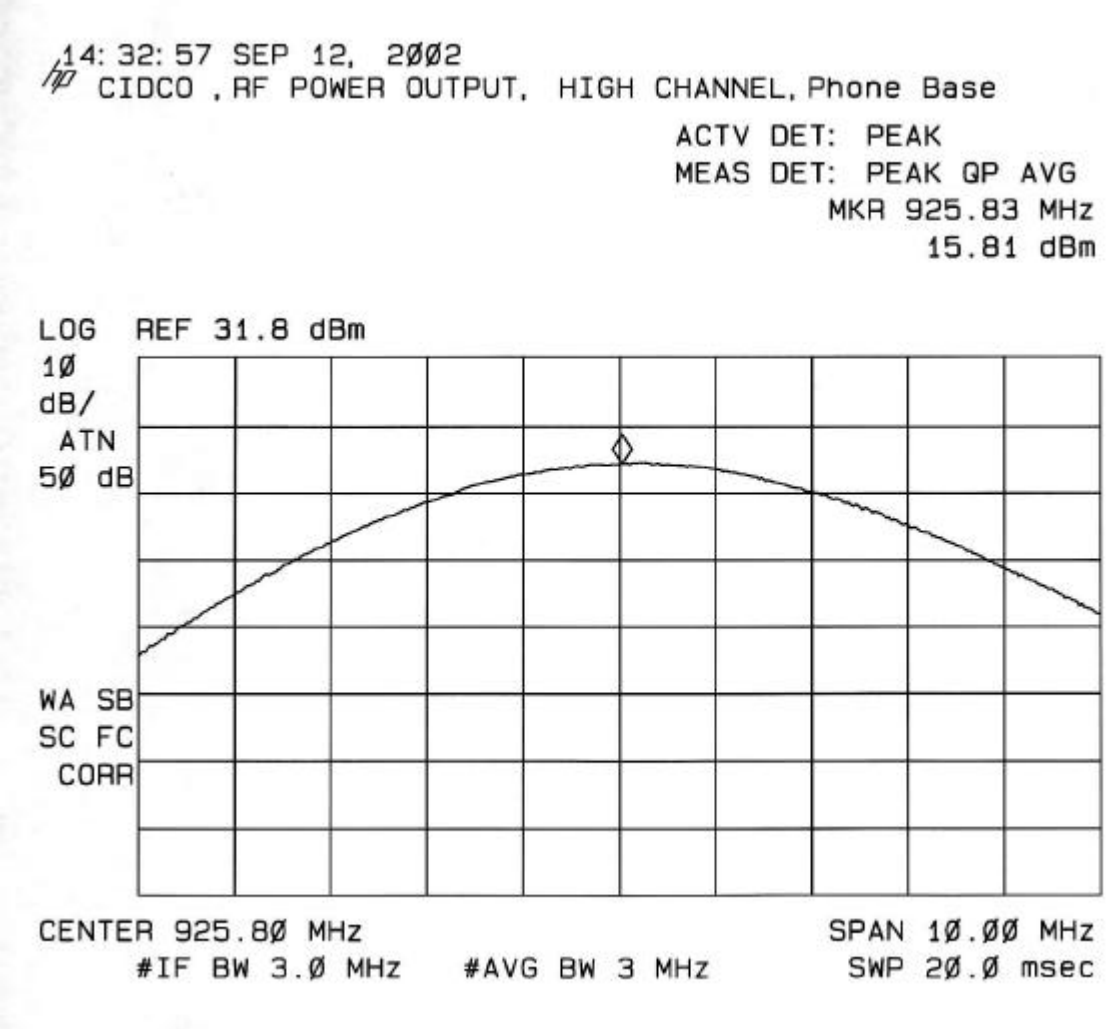
RF Power for Base Unit
Channel 20



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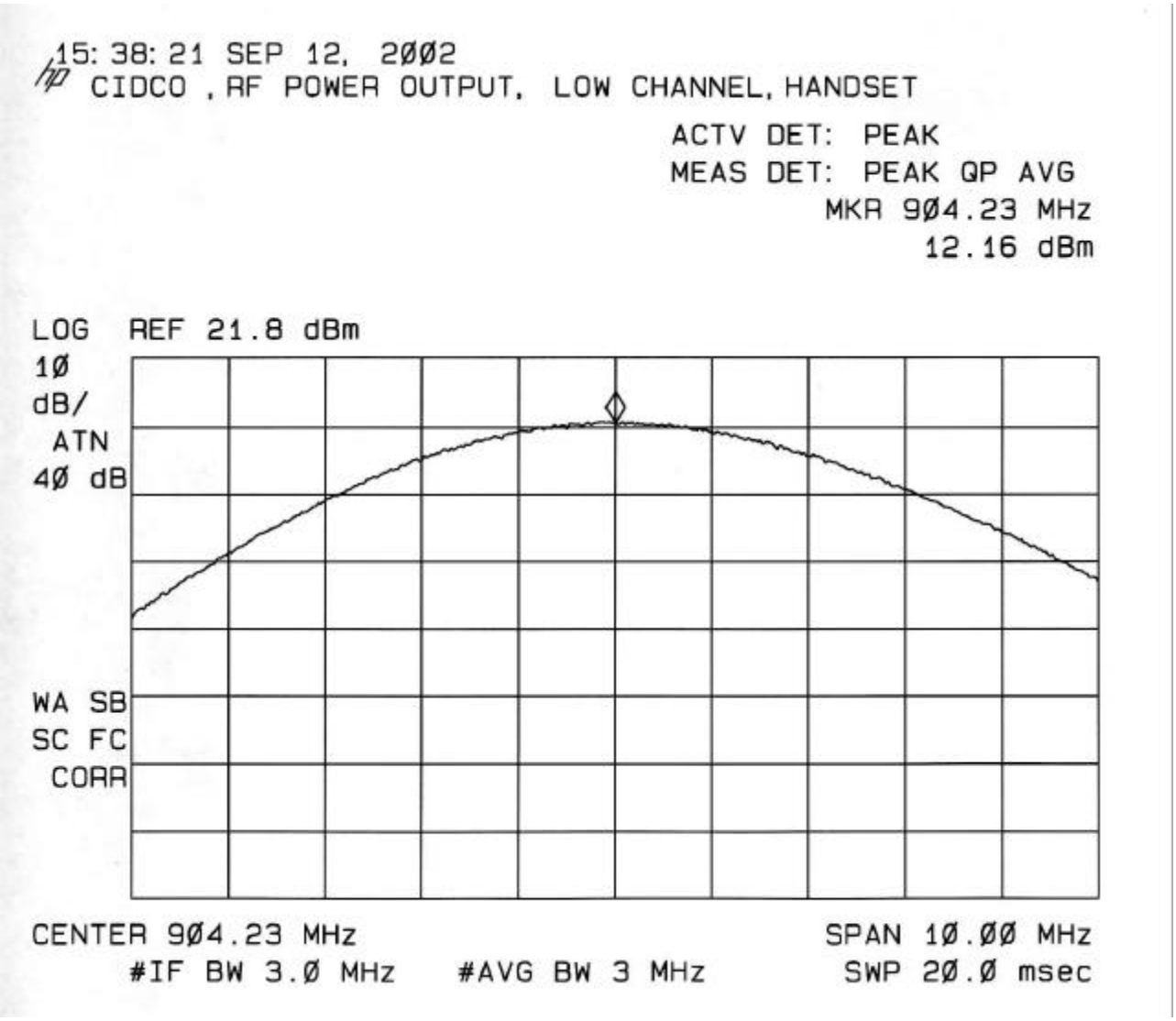
RF Power for Handset Unit
Channel 1



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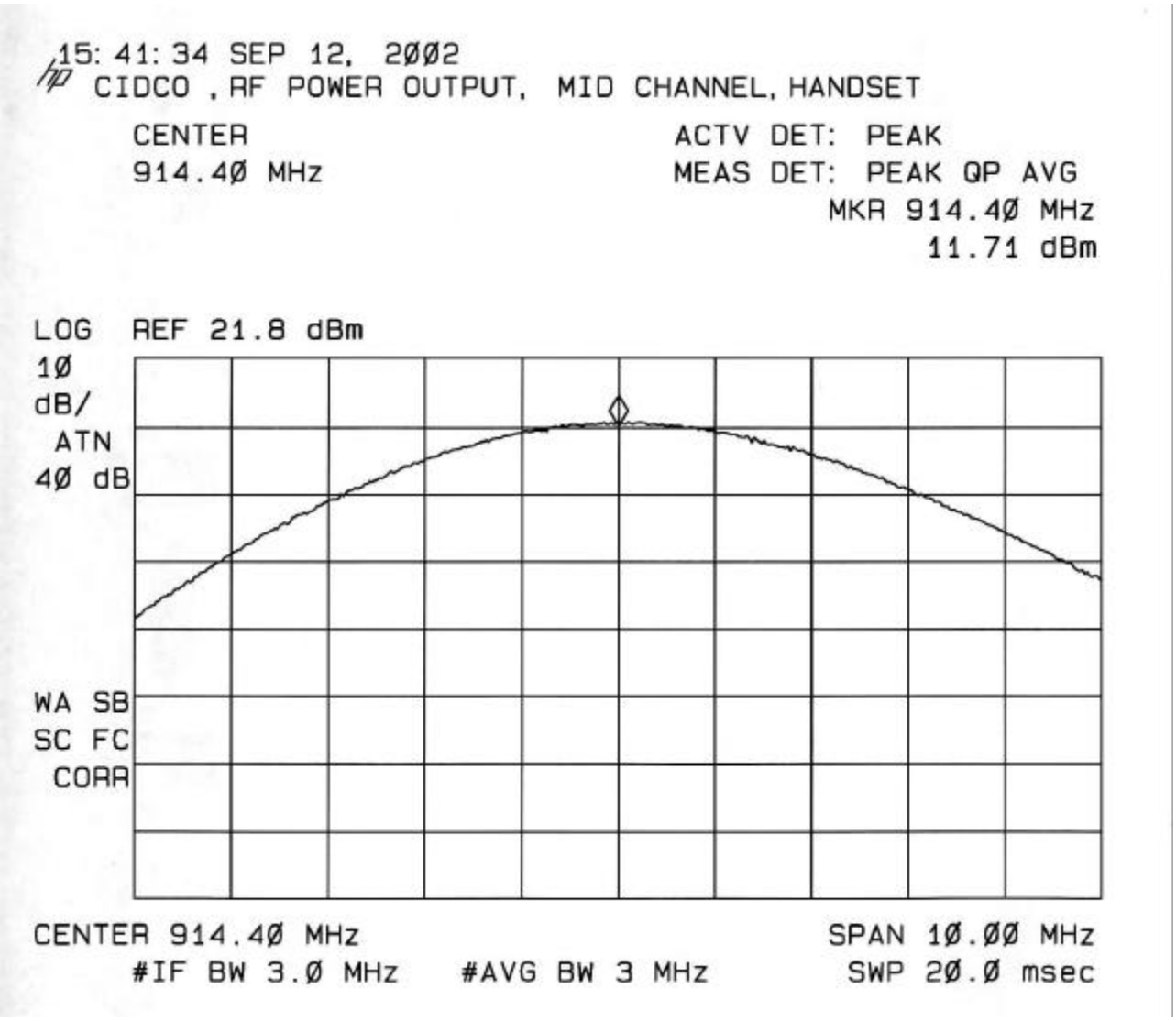
RF Power for Handset Unit
Channel 10



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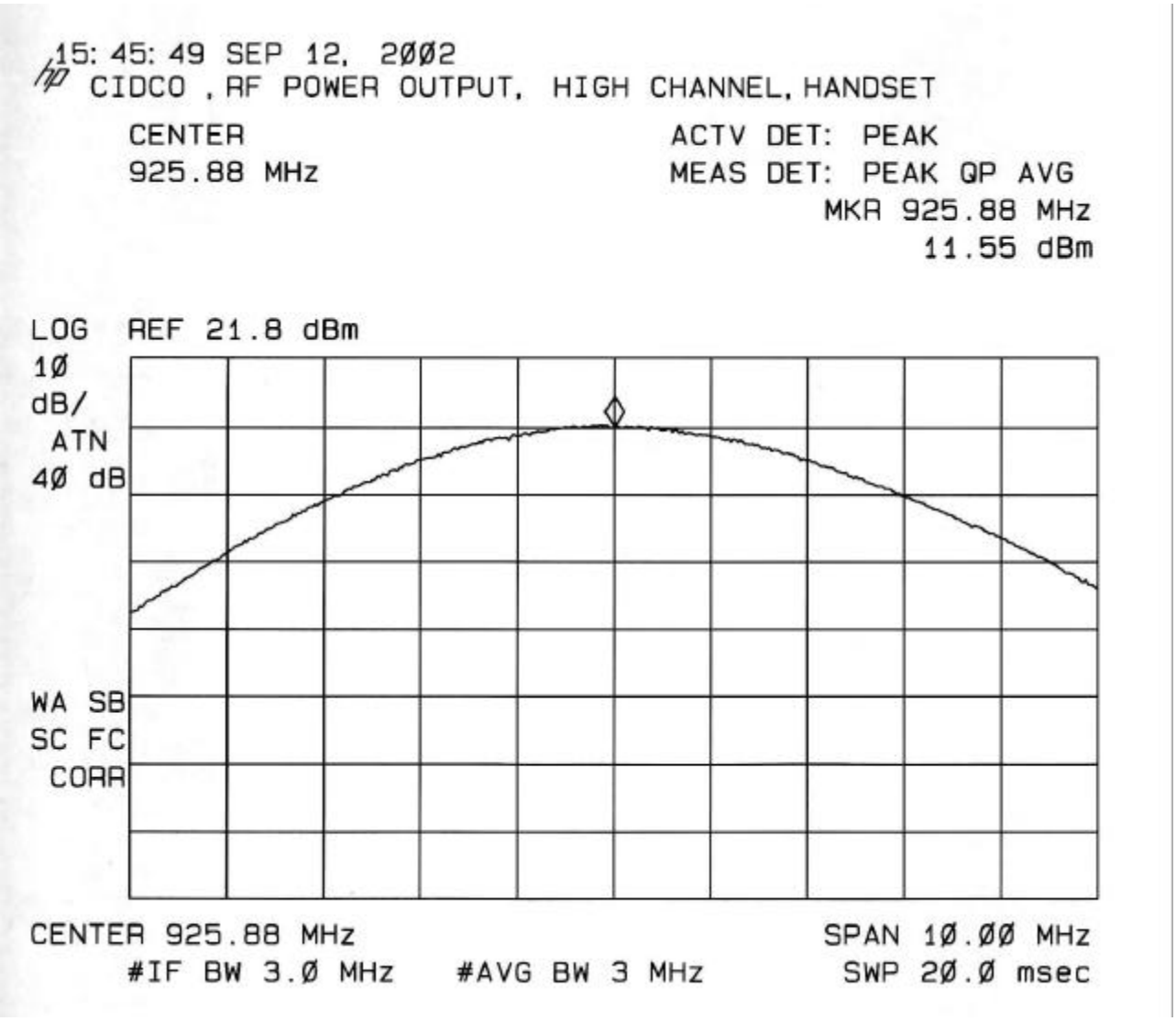
RF Power for Handset Unit
Channel 20



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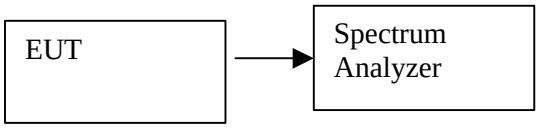
9.2. 6 dB BANDWIDTH MEASUREMENT

TEST SETUP



TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting mode. The transmitter output was connected to the spectrum analyzer. 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 which is higher than peak power minus 6 dB.

RESULT

No non-compliance noted.

Phone Base unit

Channel	*Frequency (MHz)*	*Bandwidth(MHz)*
1	*904.2*	*1.438*
10	*914.4*	*1.563*
20	*926*	*1.438*

Handset unit

Channel	*Frequency (MHz)*	*Bandwidth(MHz)*
1	*904.2*	*1.450*
10	*914.4*	*1.455*
20	*926*	*1.475*

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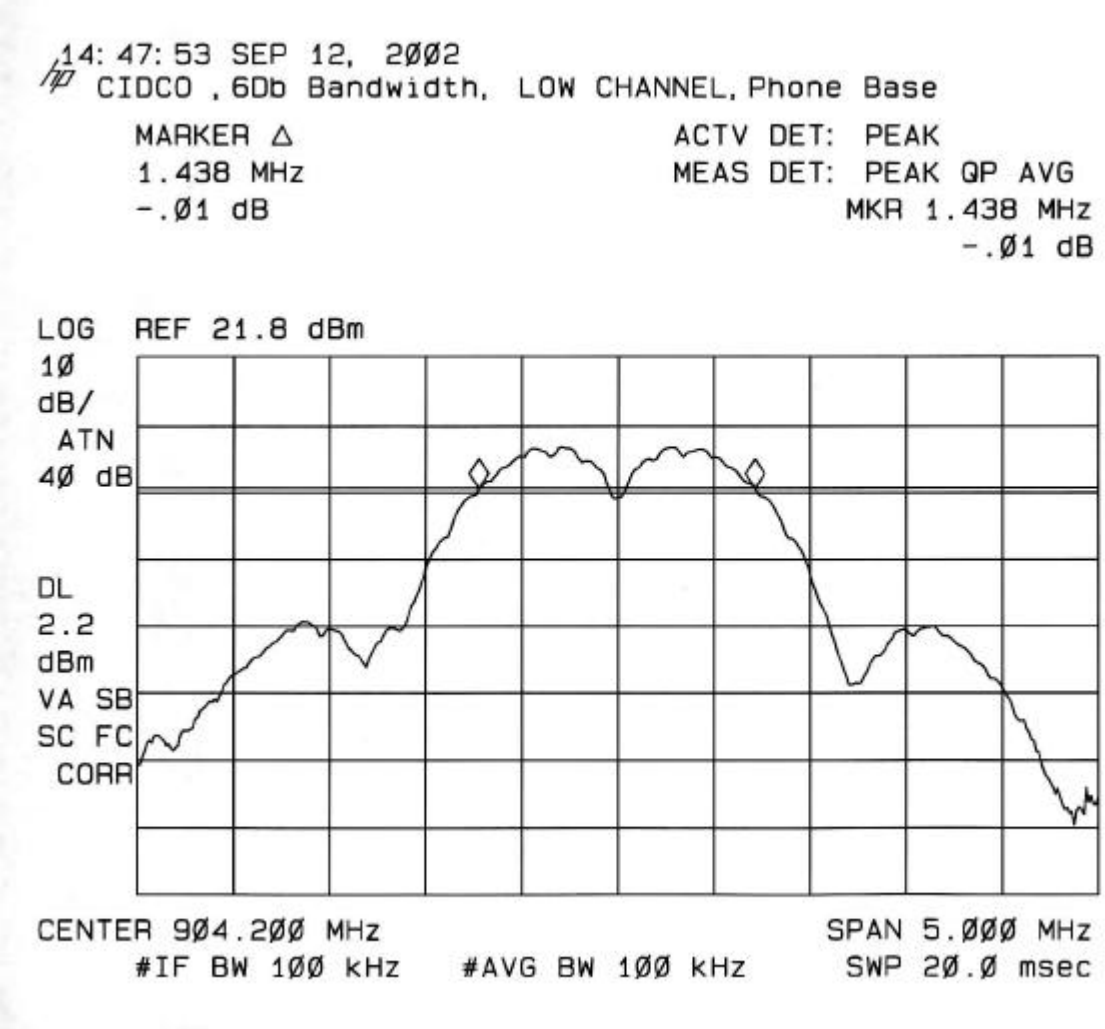
6 dB Bandwidth for Base Unit
Channel 1



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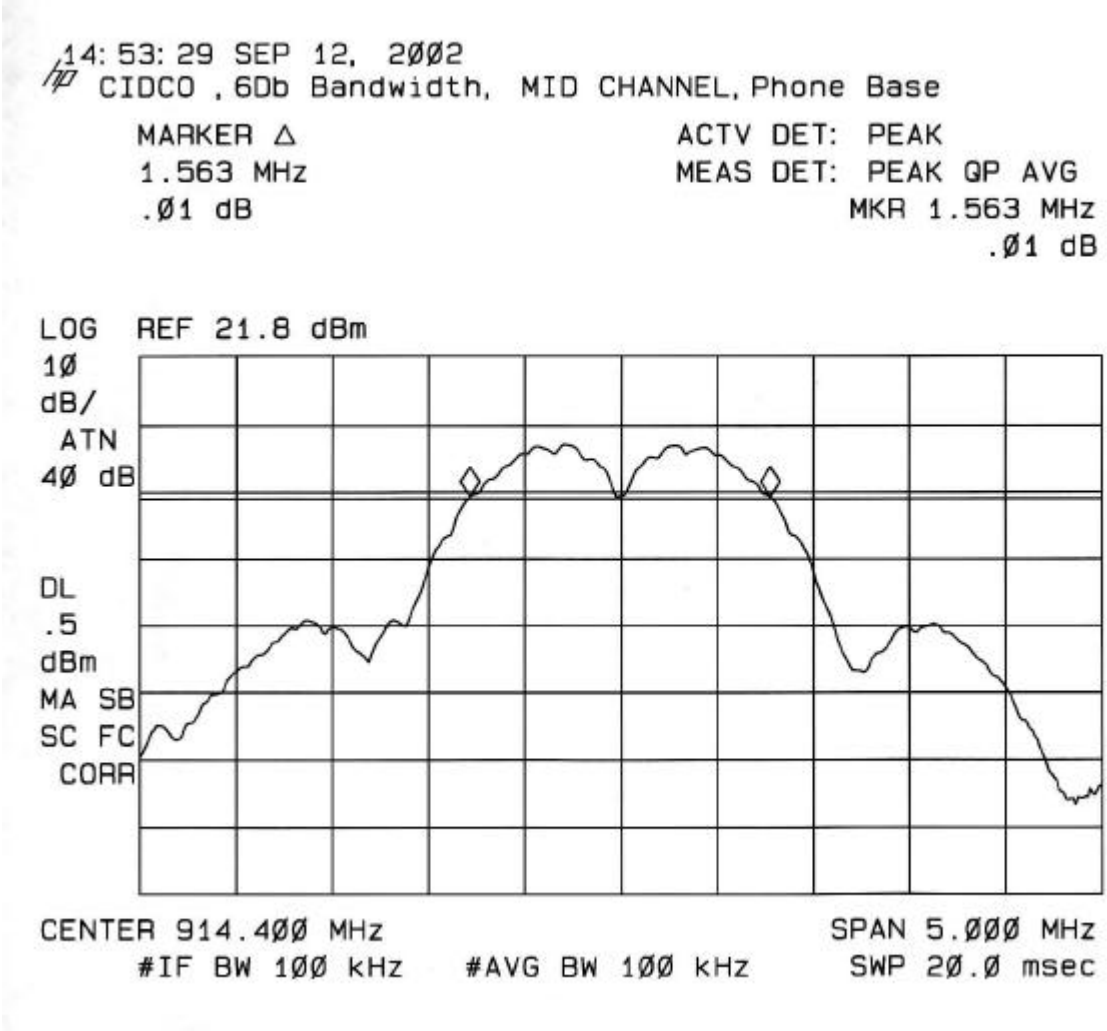
6 dB Bandwidth for Base Unit
Channel 10



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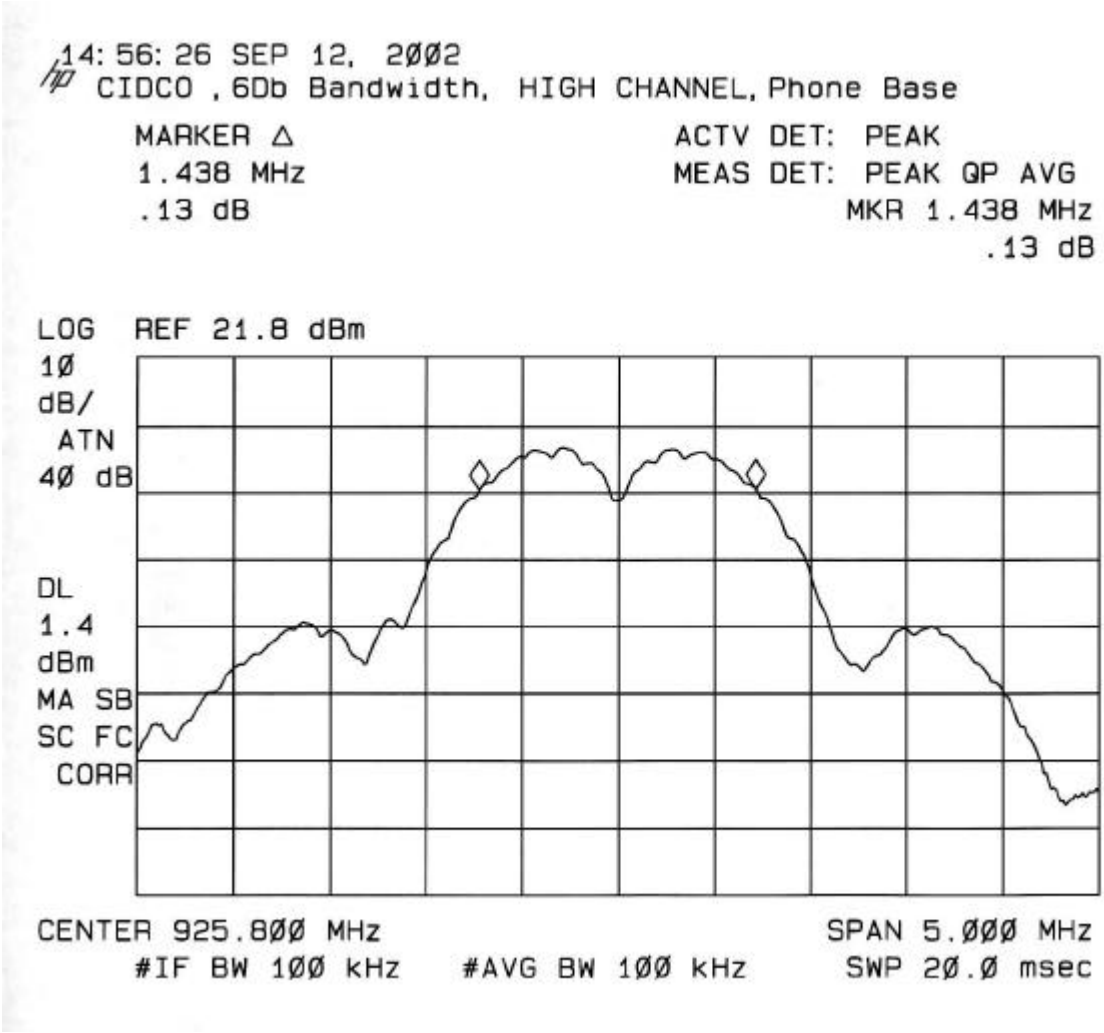
6 dB Bandwidth for Base Unit
Channel 20



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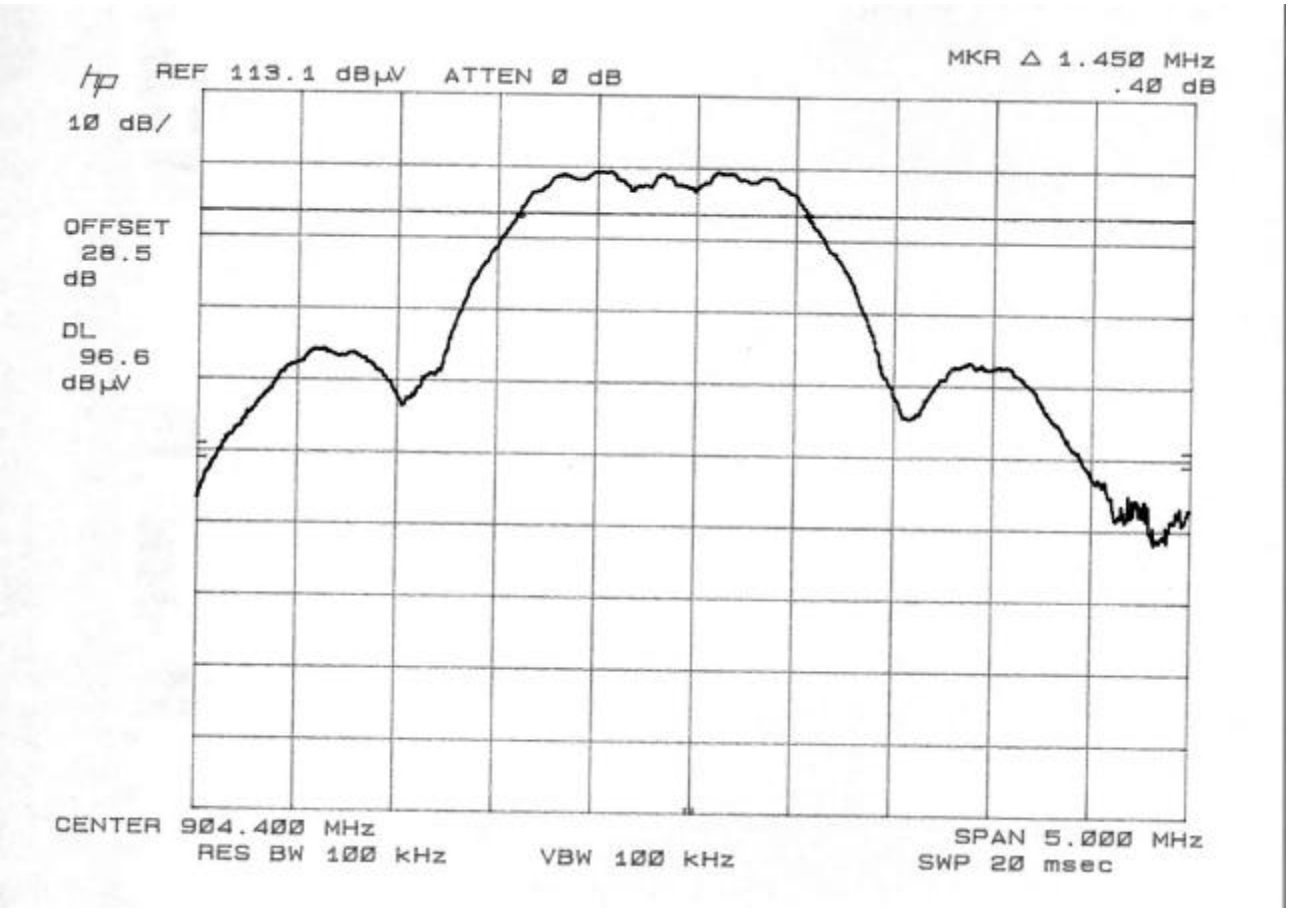
6 dB Bandwidth for Handset Unit
Channel 1



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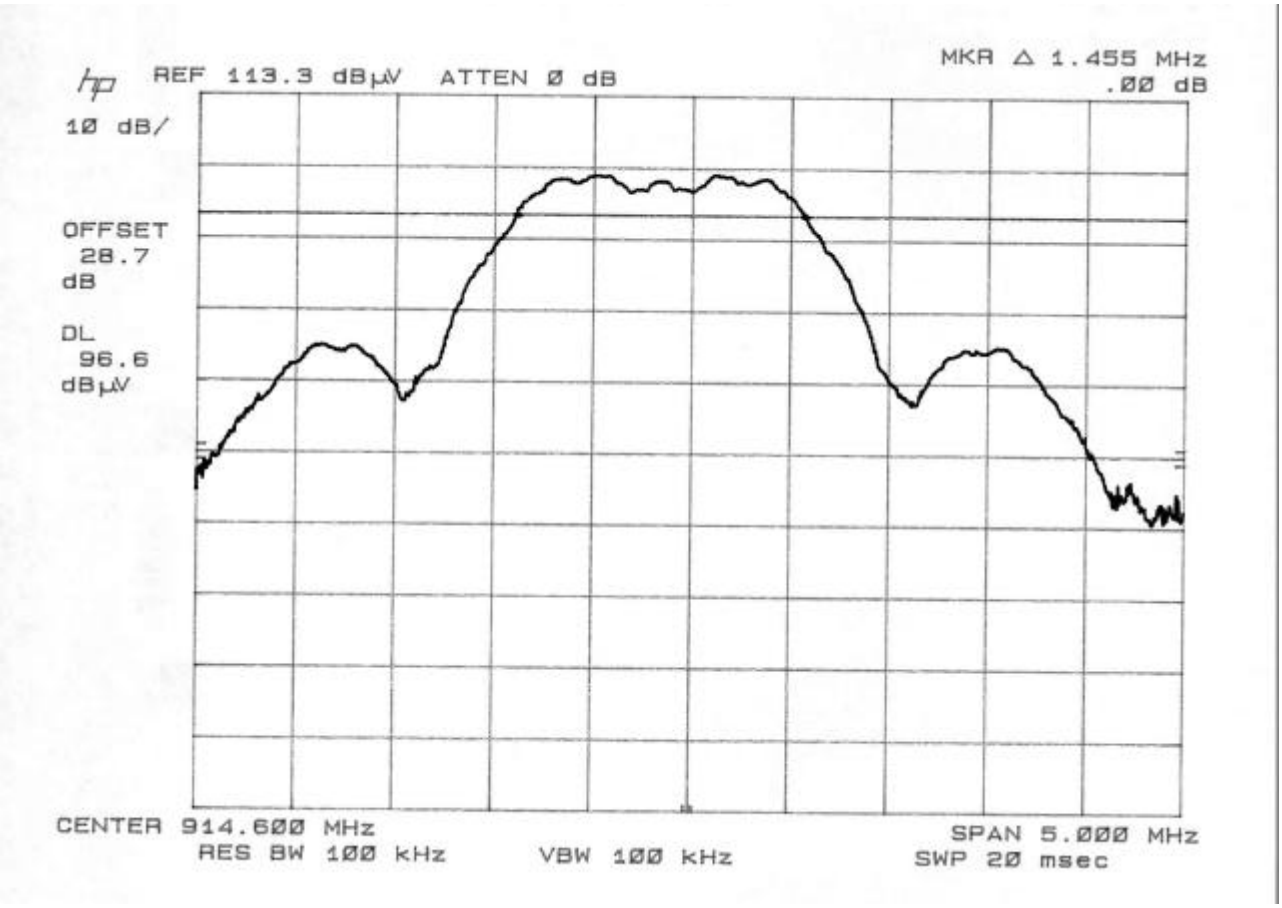
6 dB Bandwidth for Handset Unit
Channel 10



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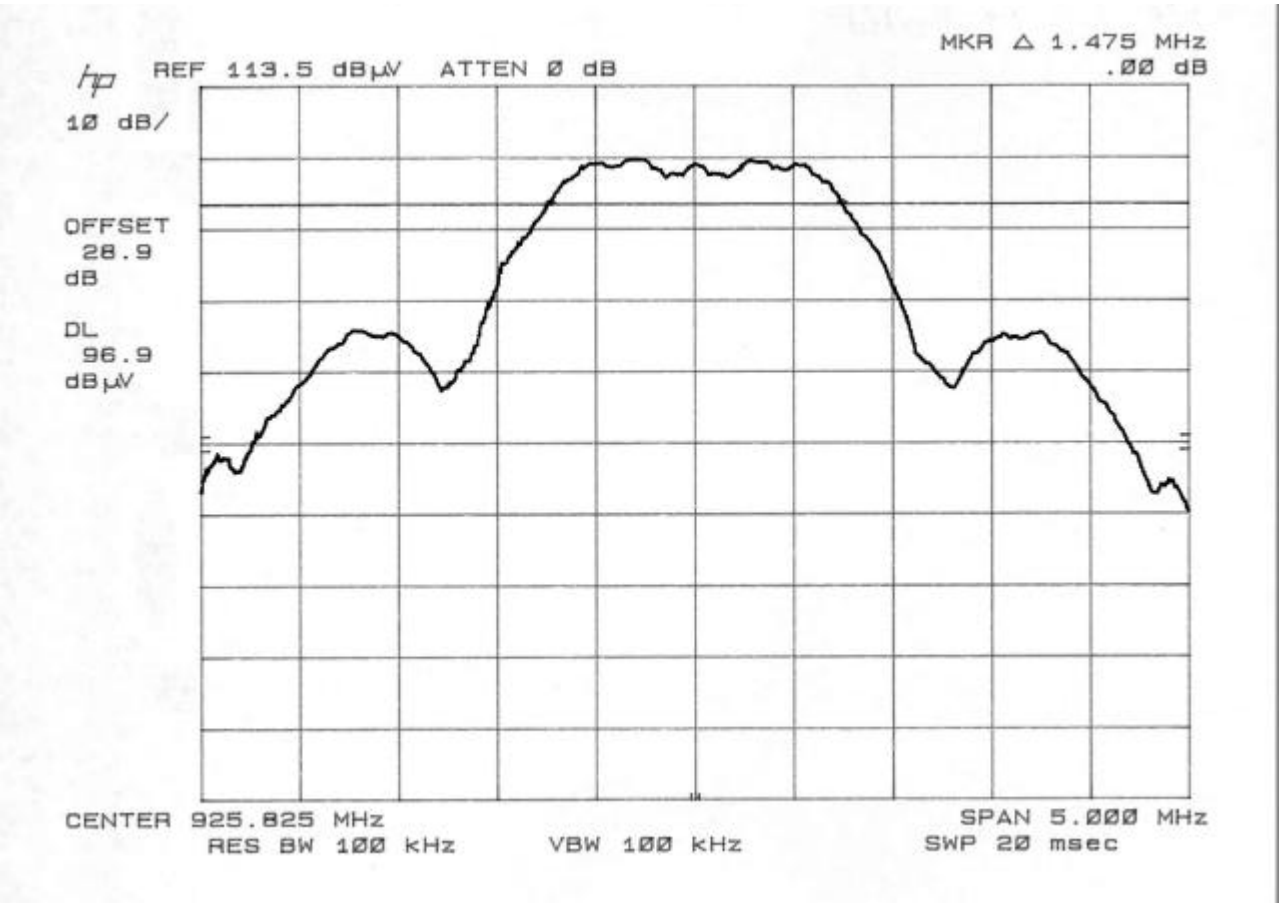
6 dB Bandwidth for Handset Unit
Channel 20



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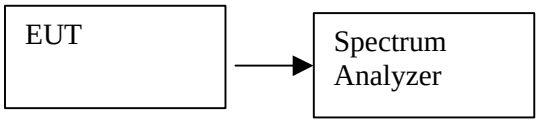
9.3. CONDUCTED SPURIOUS EMISSION

TEST SETUP



TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting mode. The transmitter output was connected to the spectrum analyzer. The spectrum analyzer is set to 100 kHz RBW and 100 kHz VBW. The display line is set to –20 dBc.

The frequency range is investigated from 30 MHz to 10 GHz, in two bands: 30 MHz to 2.5 GHz and 2.5 to 10 GHz.

RESULT

No non-compliance noted.

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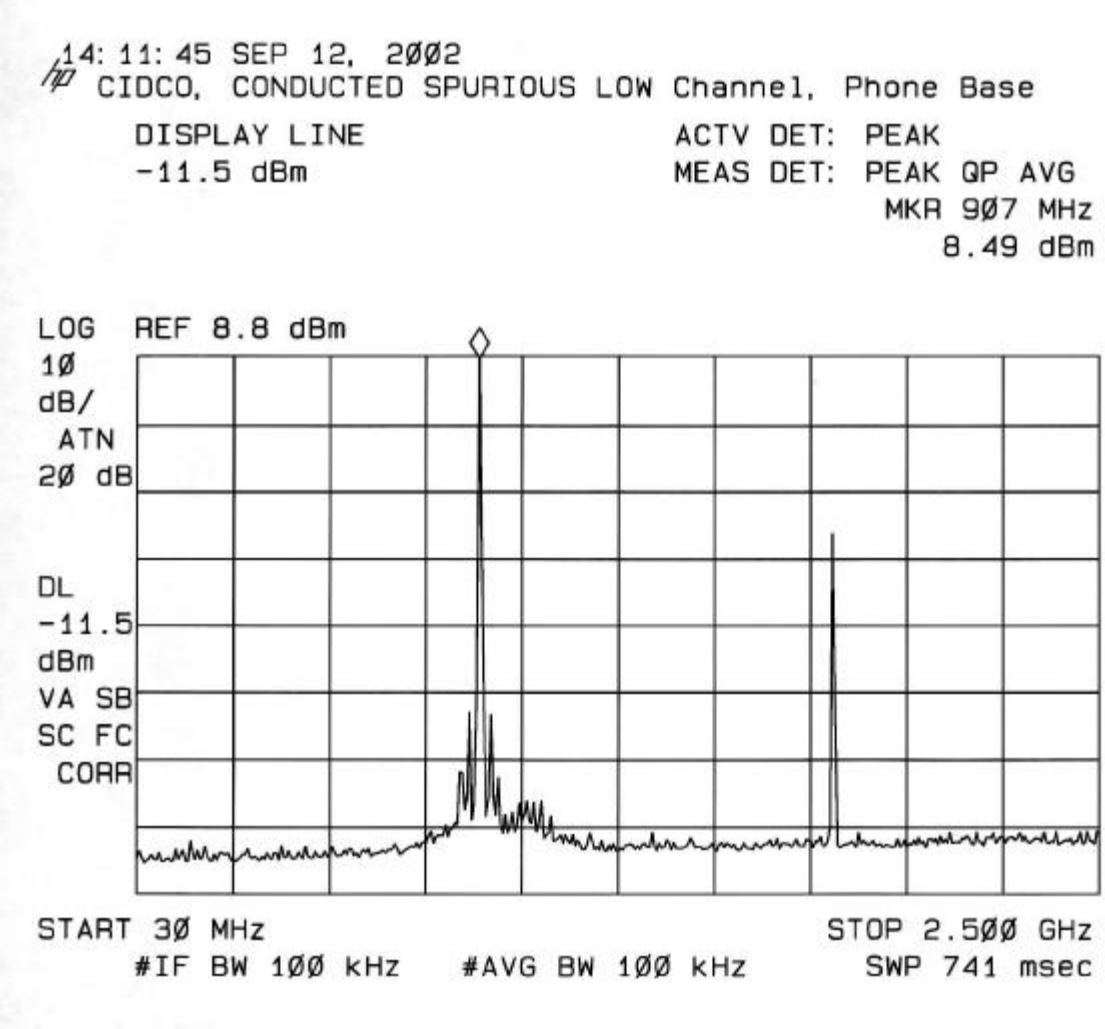
Conducted Spurious Emission for Phone Base Unit
Channel 1



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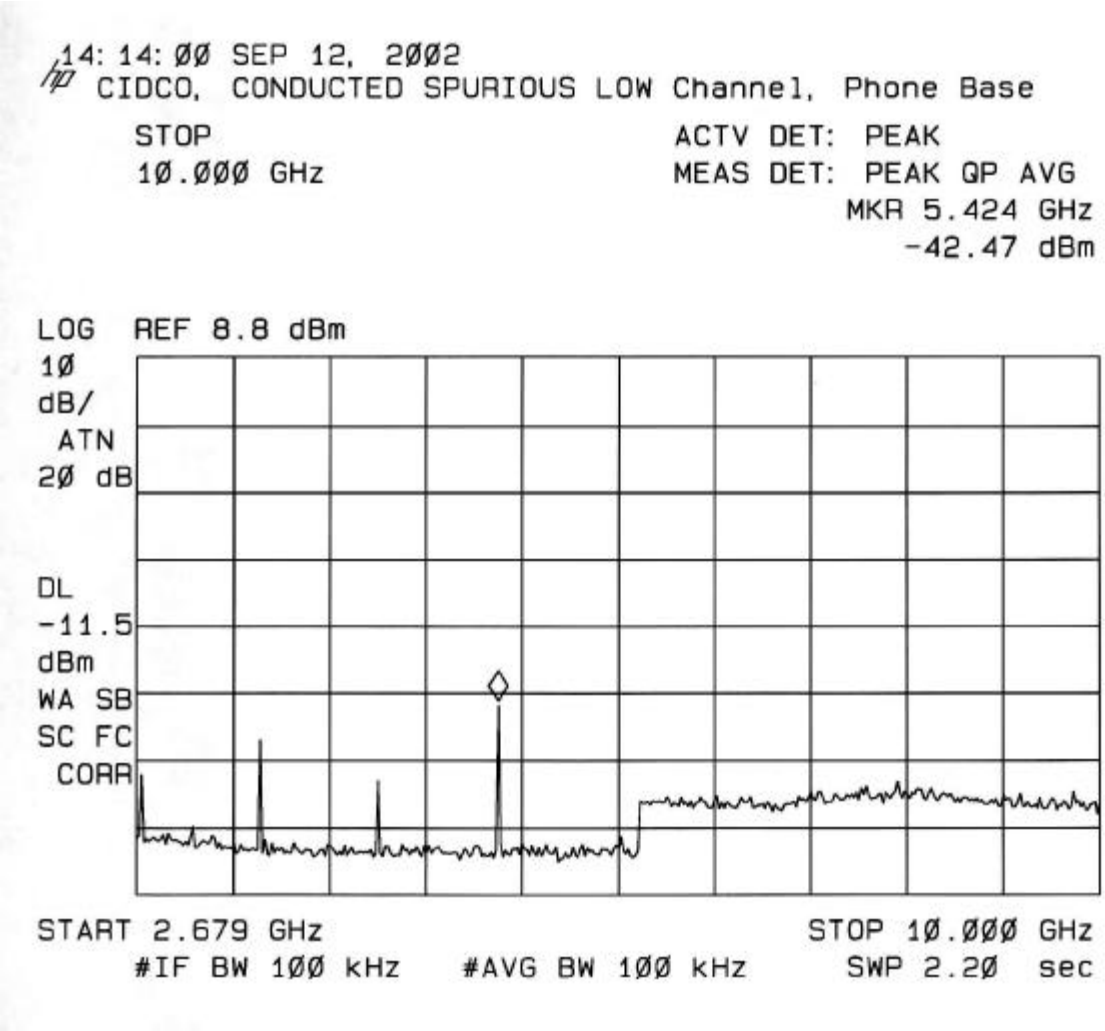

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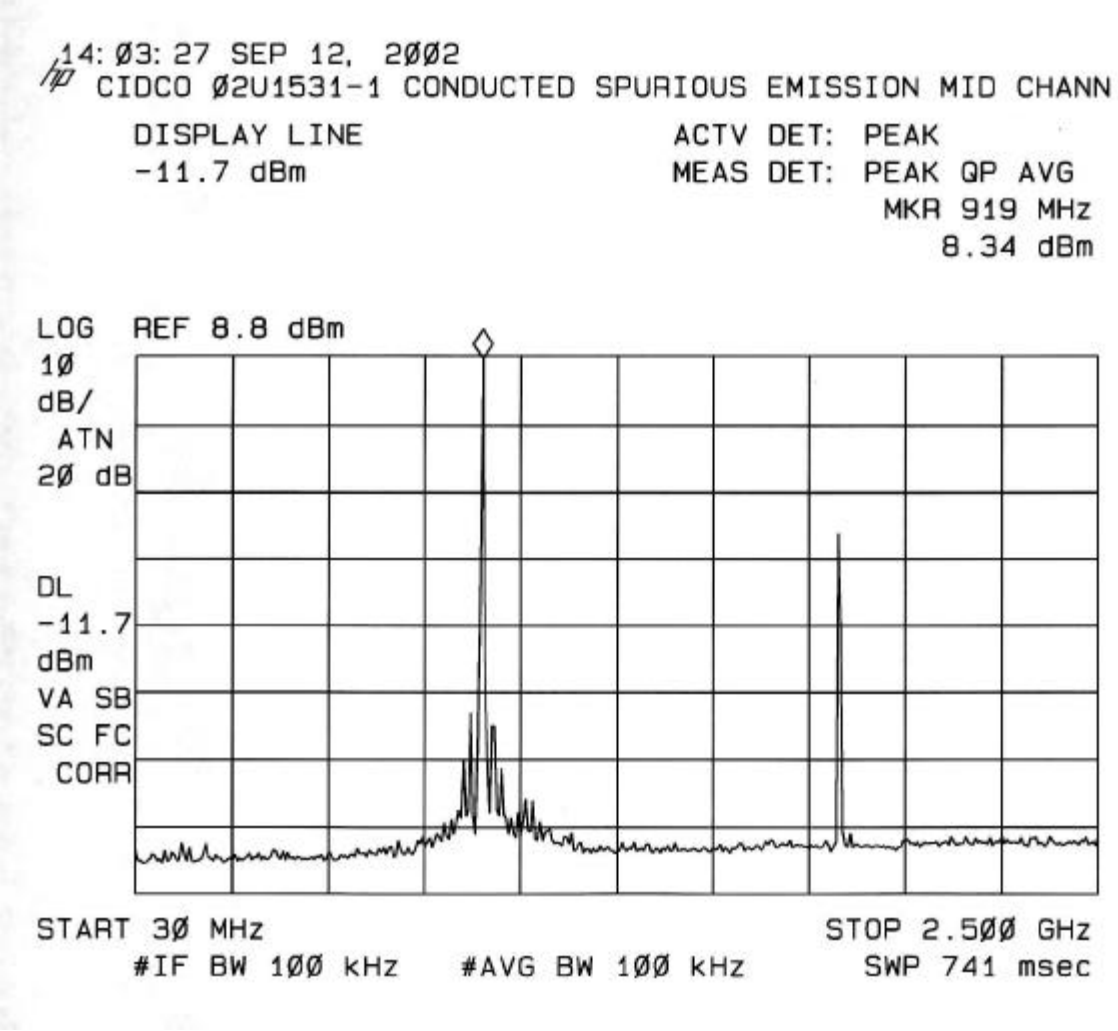
Conducted Spurious Emission for Phone Base Unit
Channel 10



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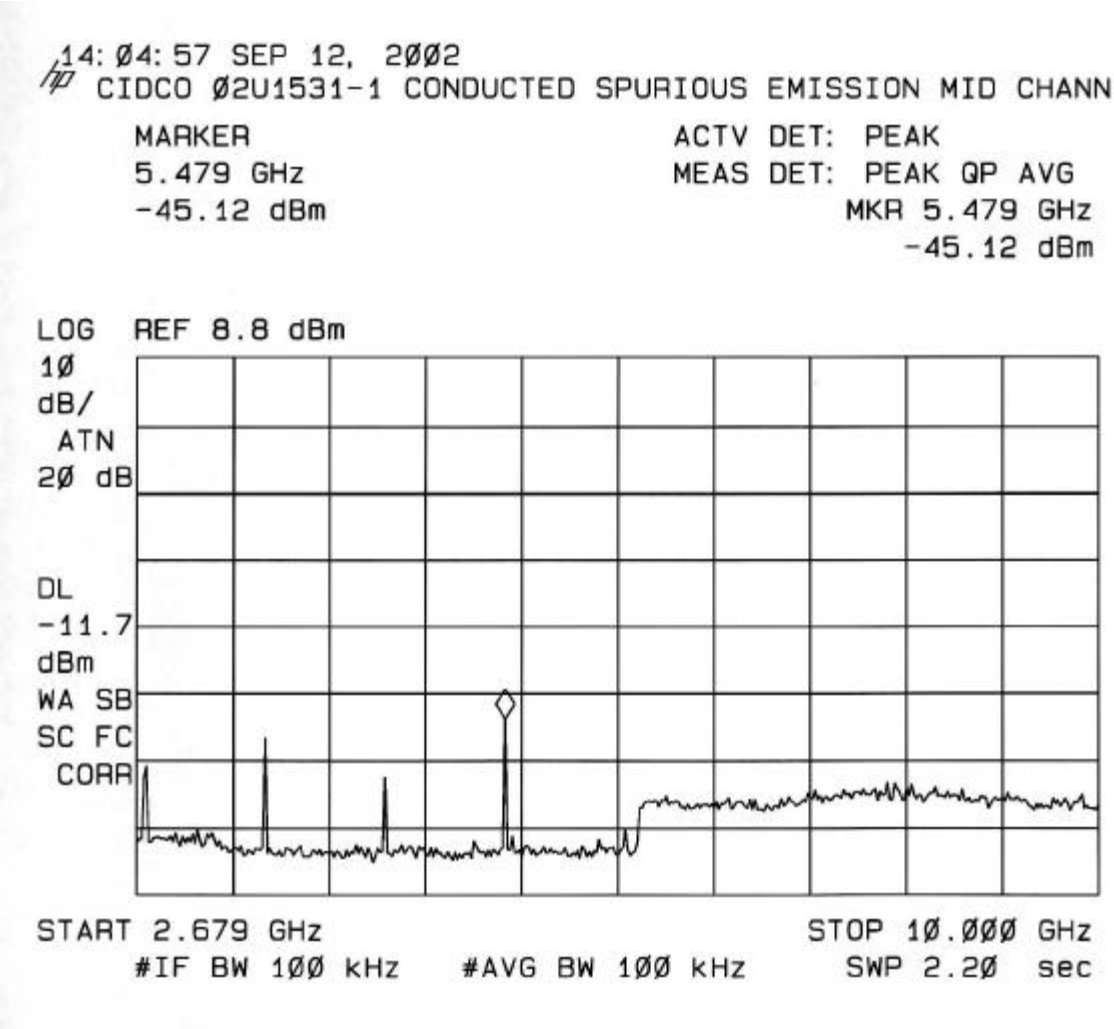

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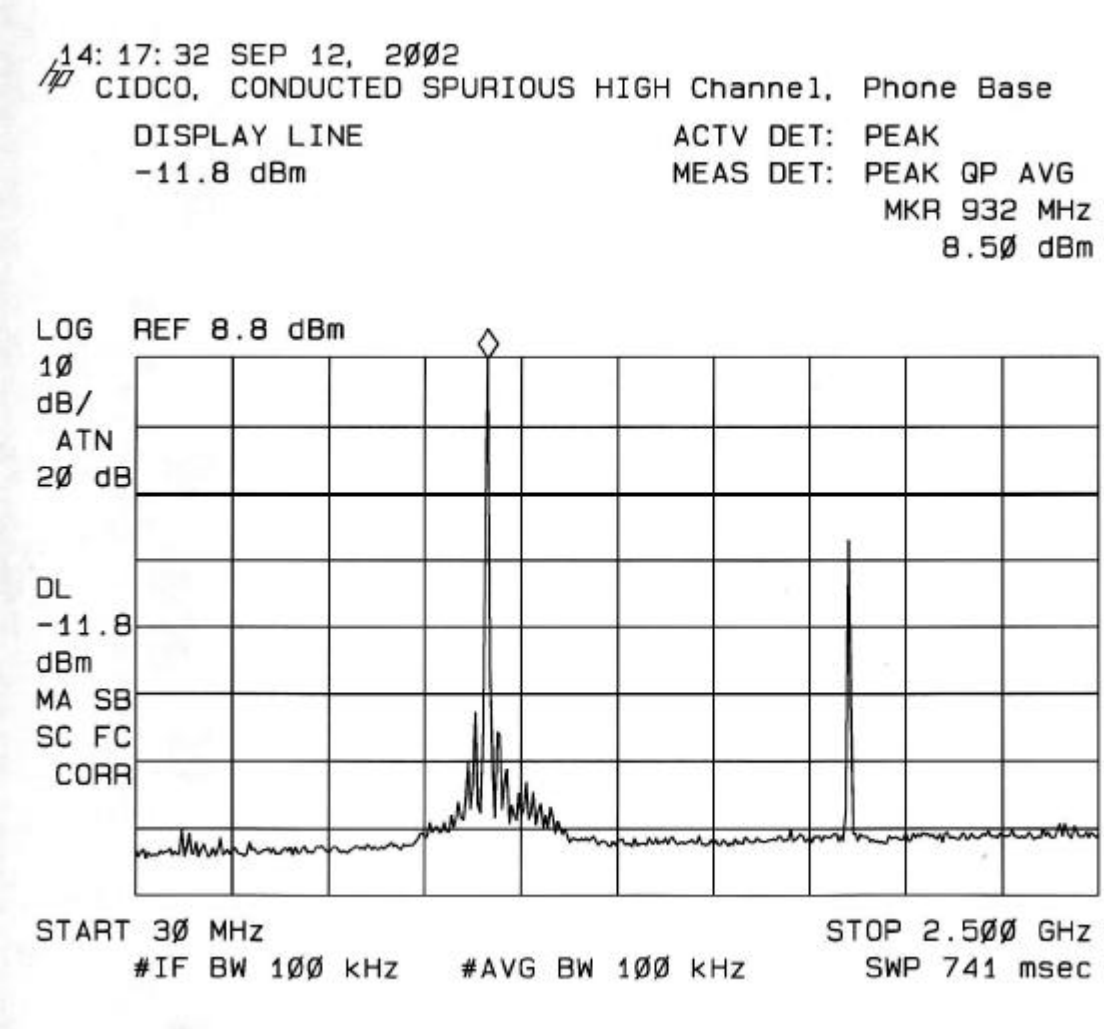
Conducted Spurious Emission for Phone Base Unit
Channel 20



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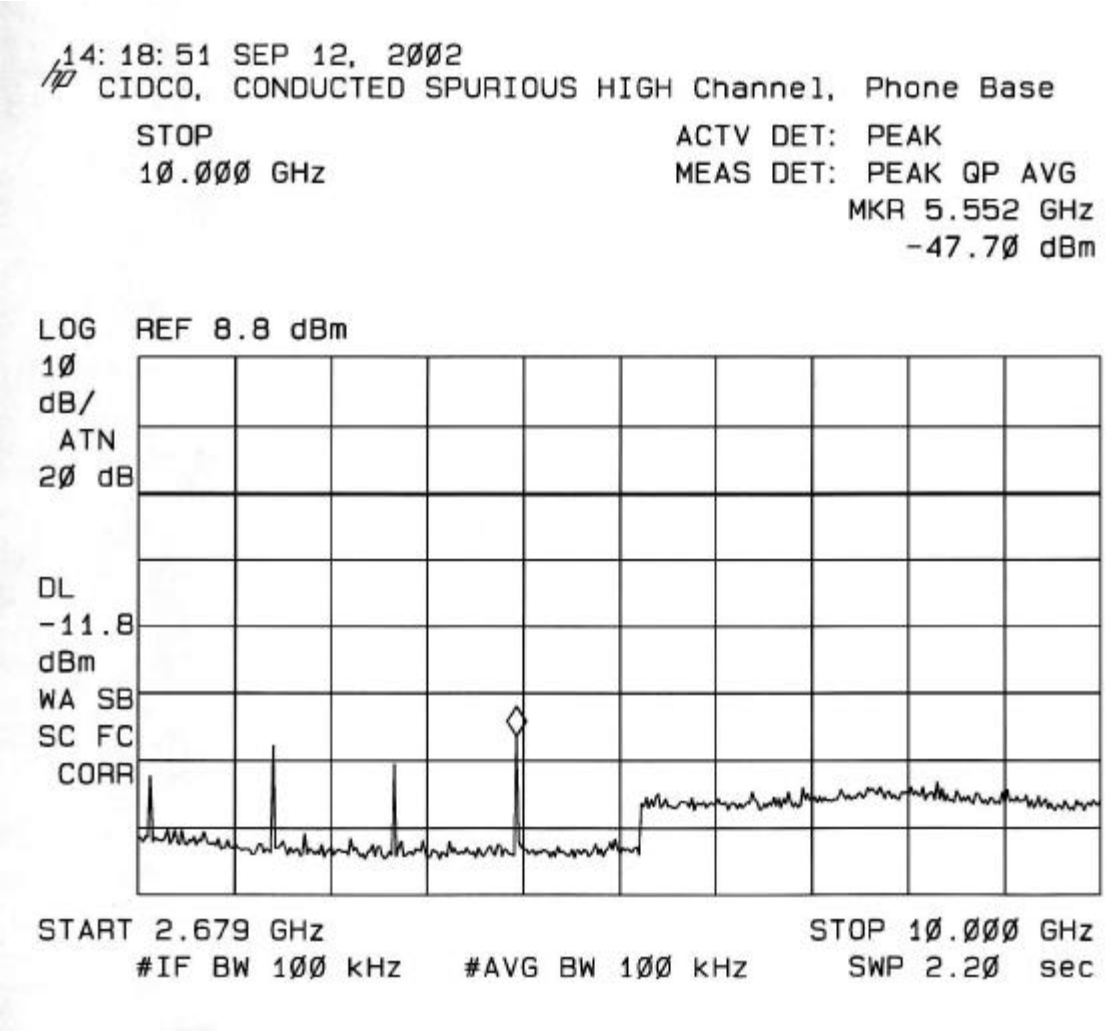

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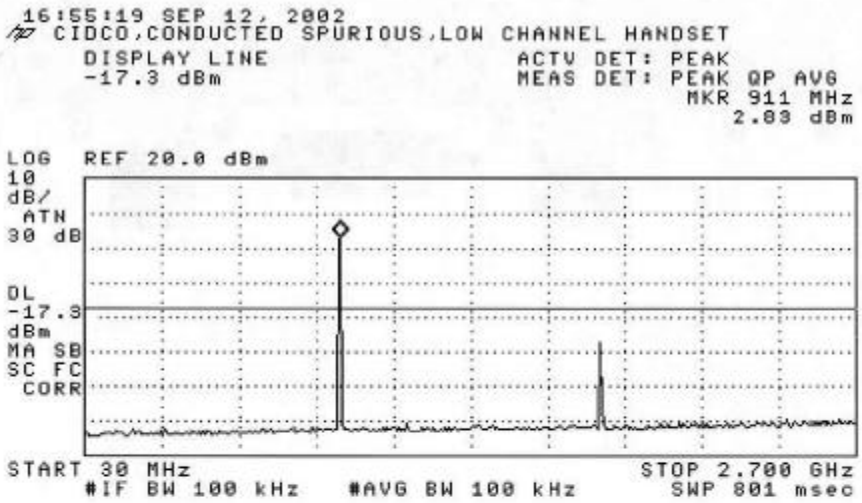
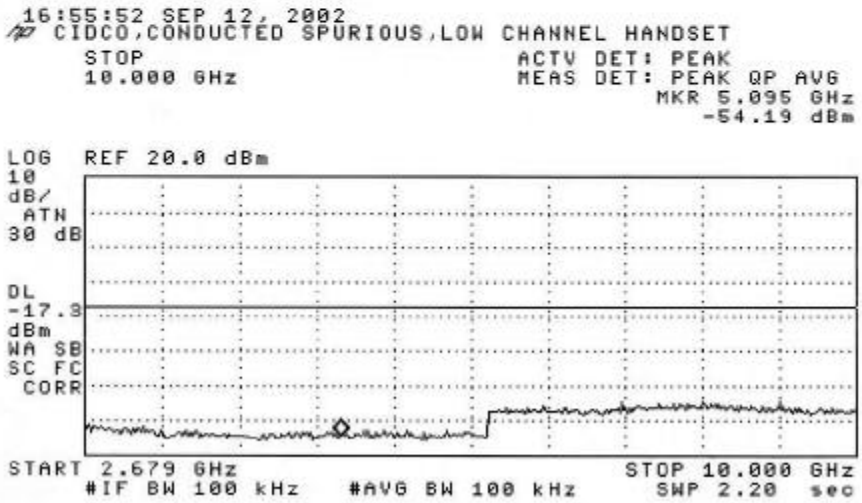
Conducted Spurious Emission for Handset Unit
Channel 1





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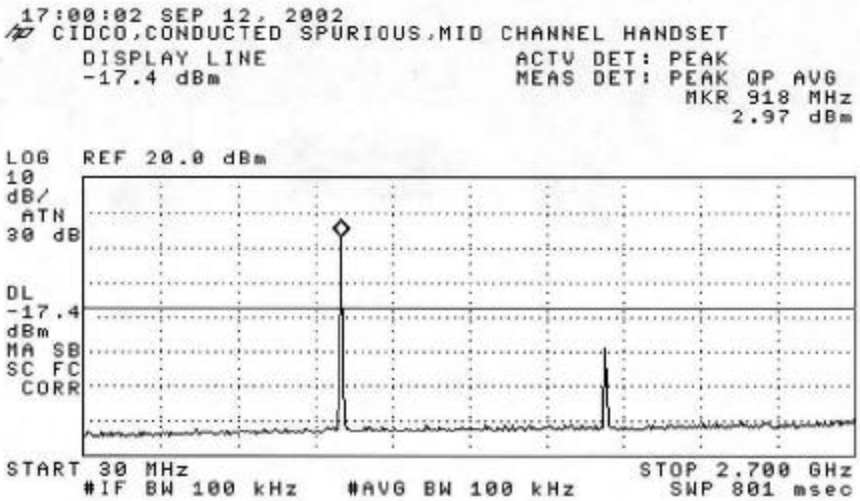
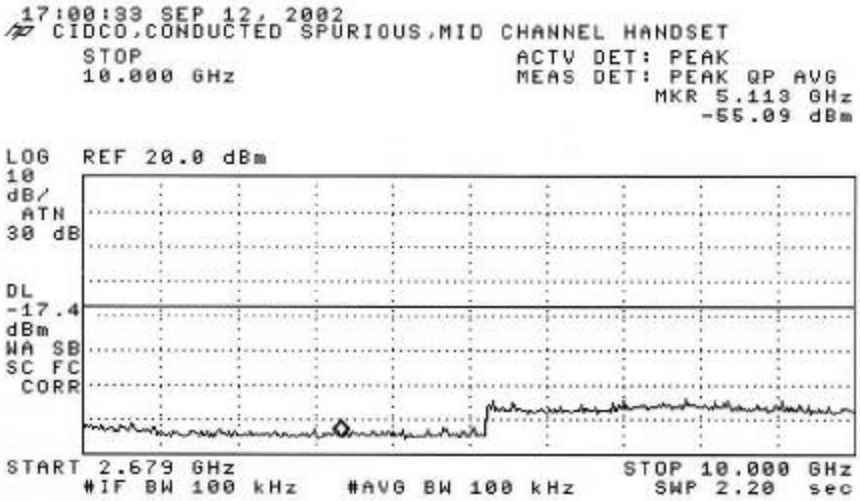
Conducted Spurious Emission for Handset Unit
Channel 10





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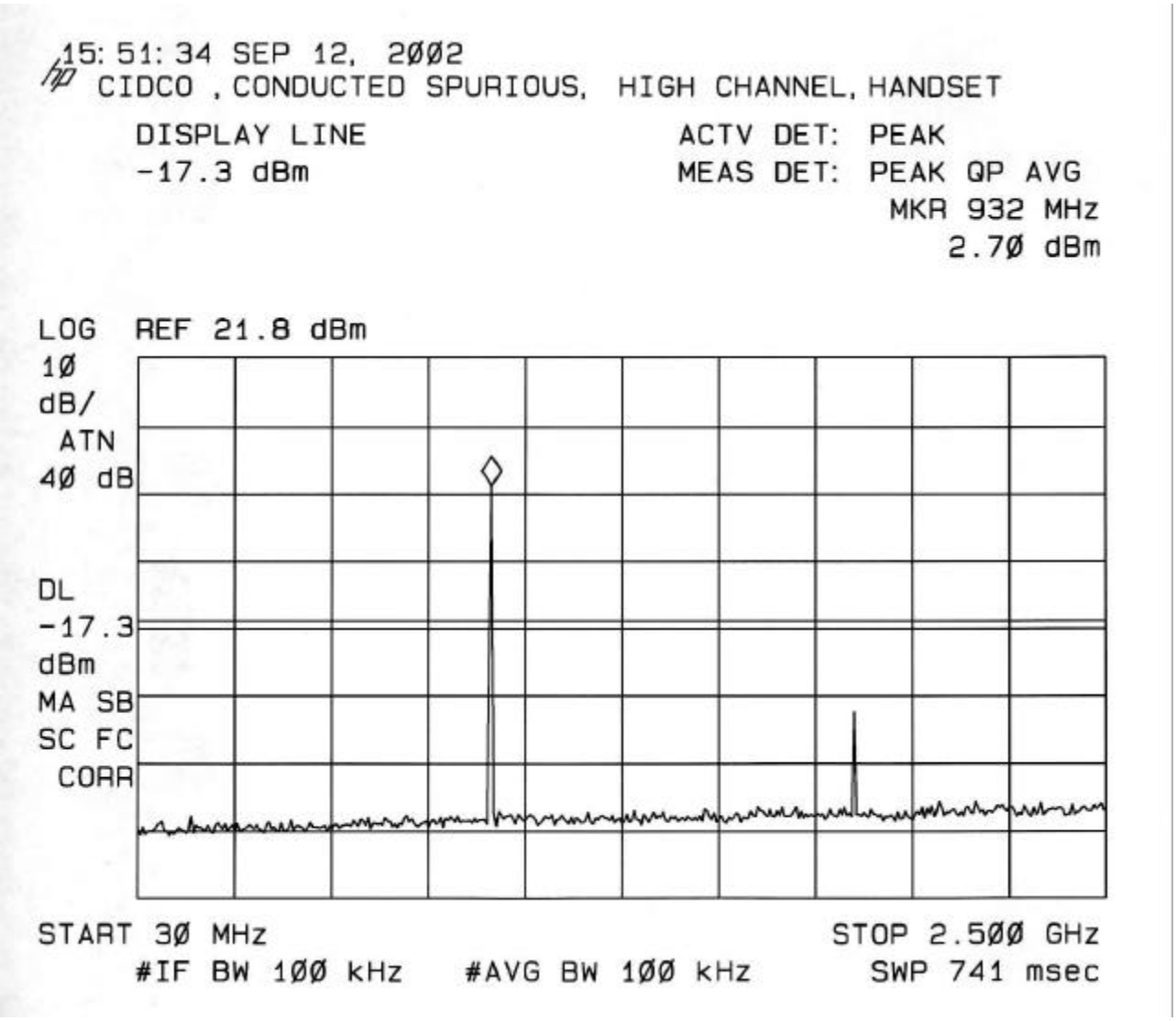
Conducted Spurious Emission for Handset Unit
Channel 20



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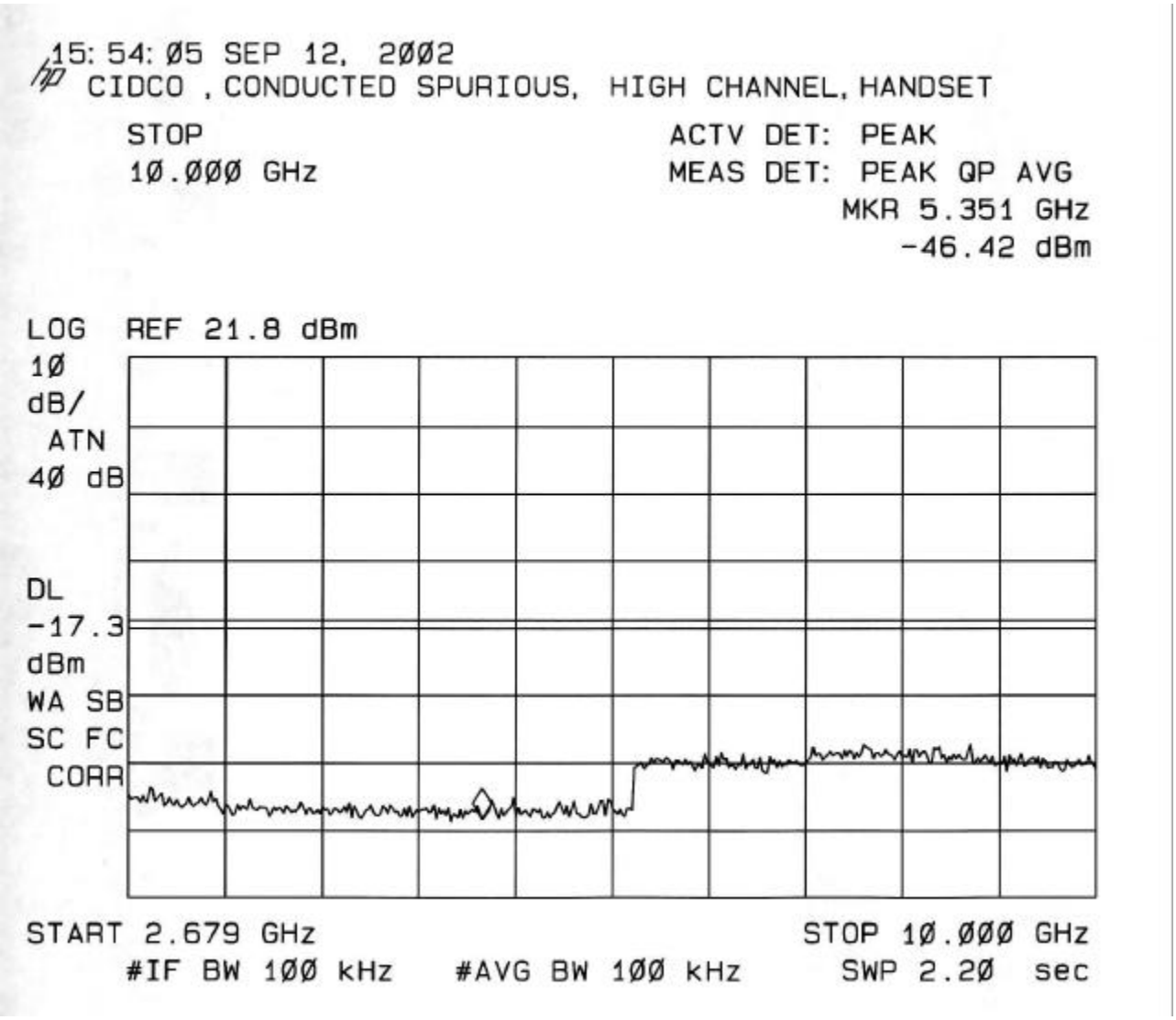

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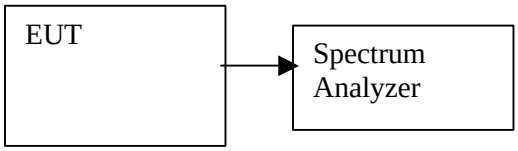
9.4. PEAK POWER SPECTRAL DENSITY

TEST SETUP



TEST PROCEDURE

The EUT is configured on a test bench as shown above in a continuously transmitting mode. The transmitter output was connected to the spectrum analyzer. The spectrum analyzer is set to 3 kHz RBW and 3 kHz VBW, sweep time greater than or equal to span/3kHz.

Result:
No non-compliance noted. See plots:

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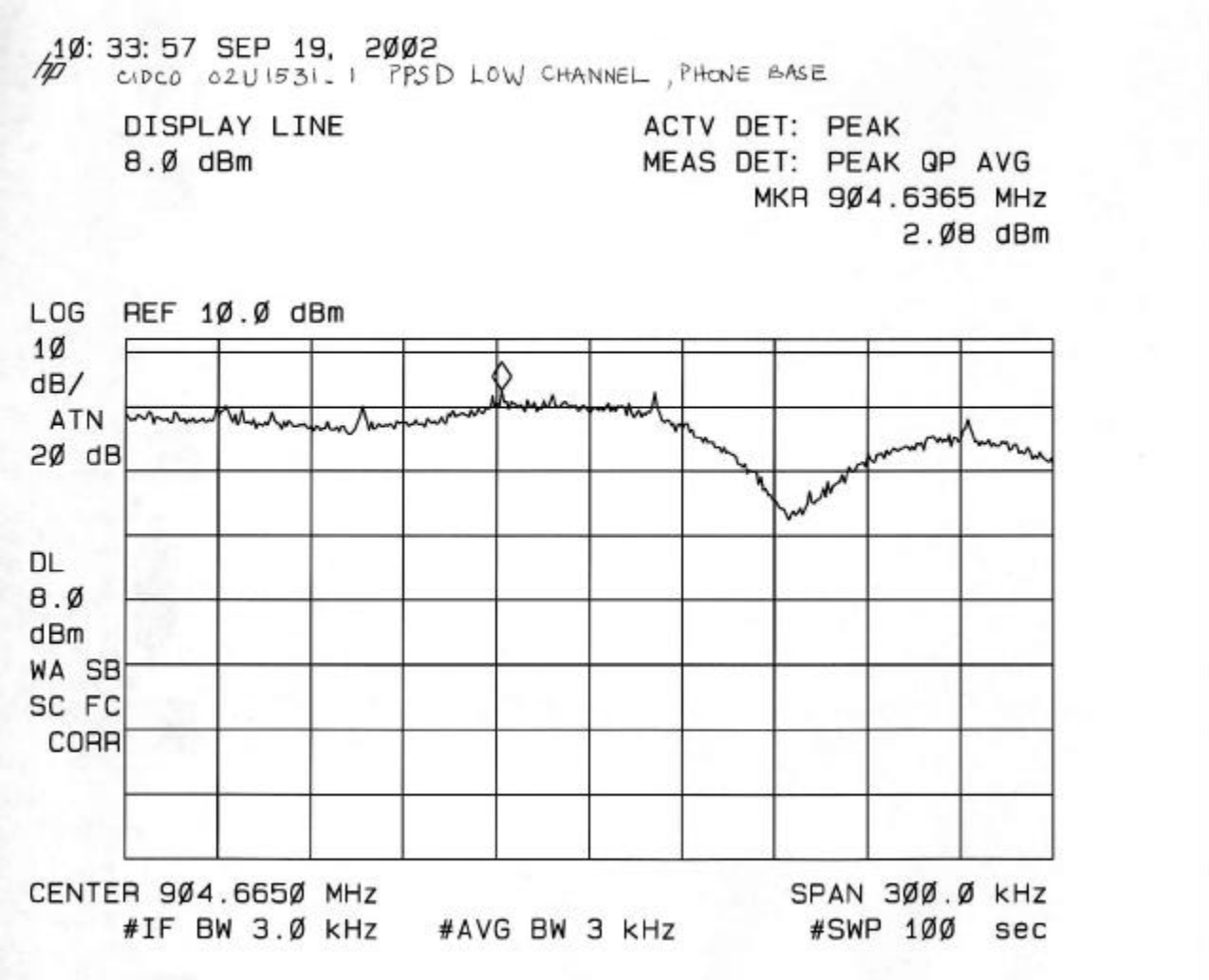
Peak Power Spectral Density for Base Unit
Channel 1



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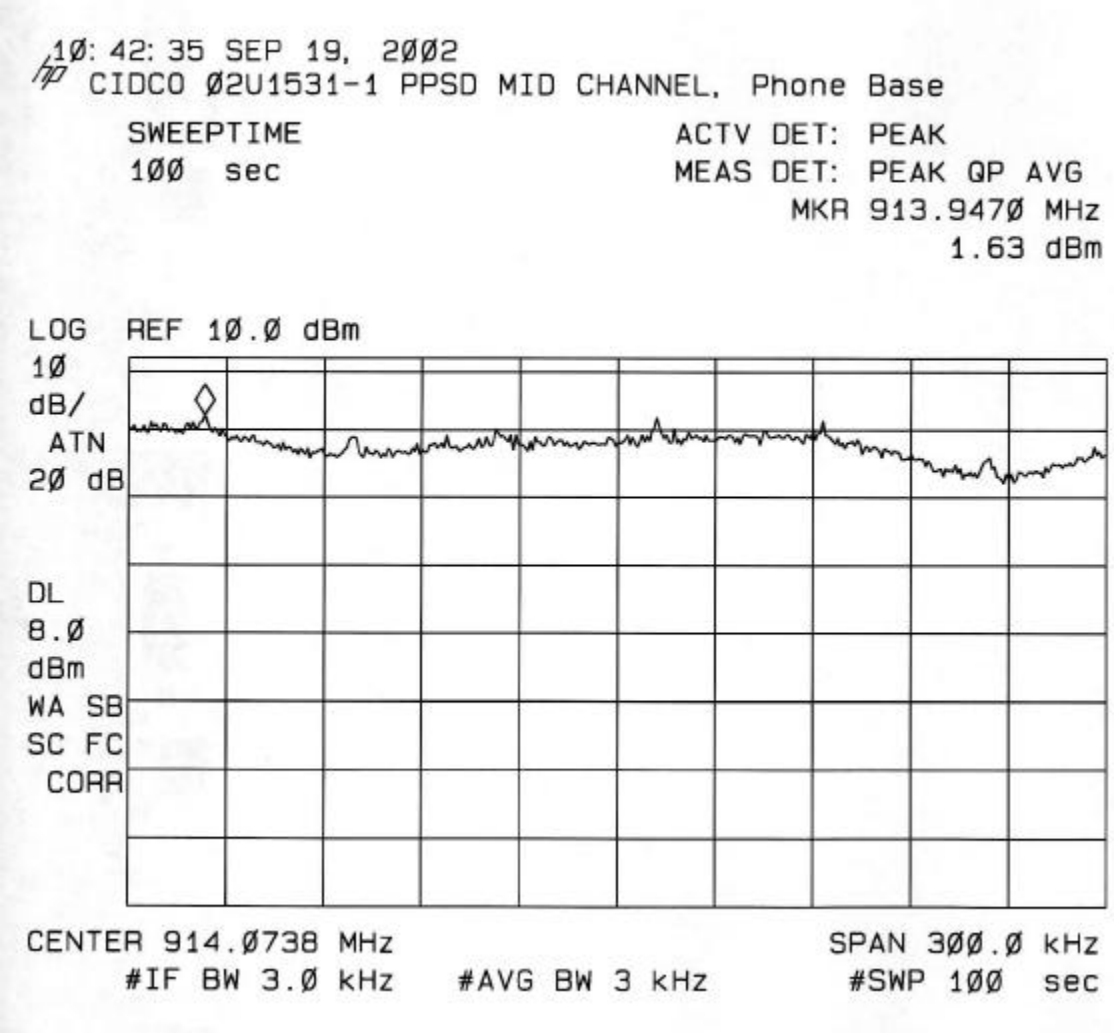
Peak Power Spectral Density for Base Unit
Channel 10



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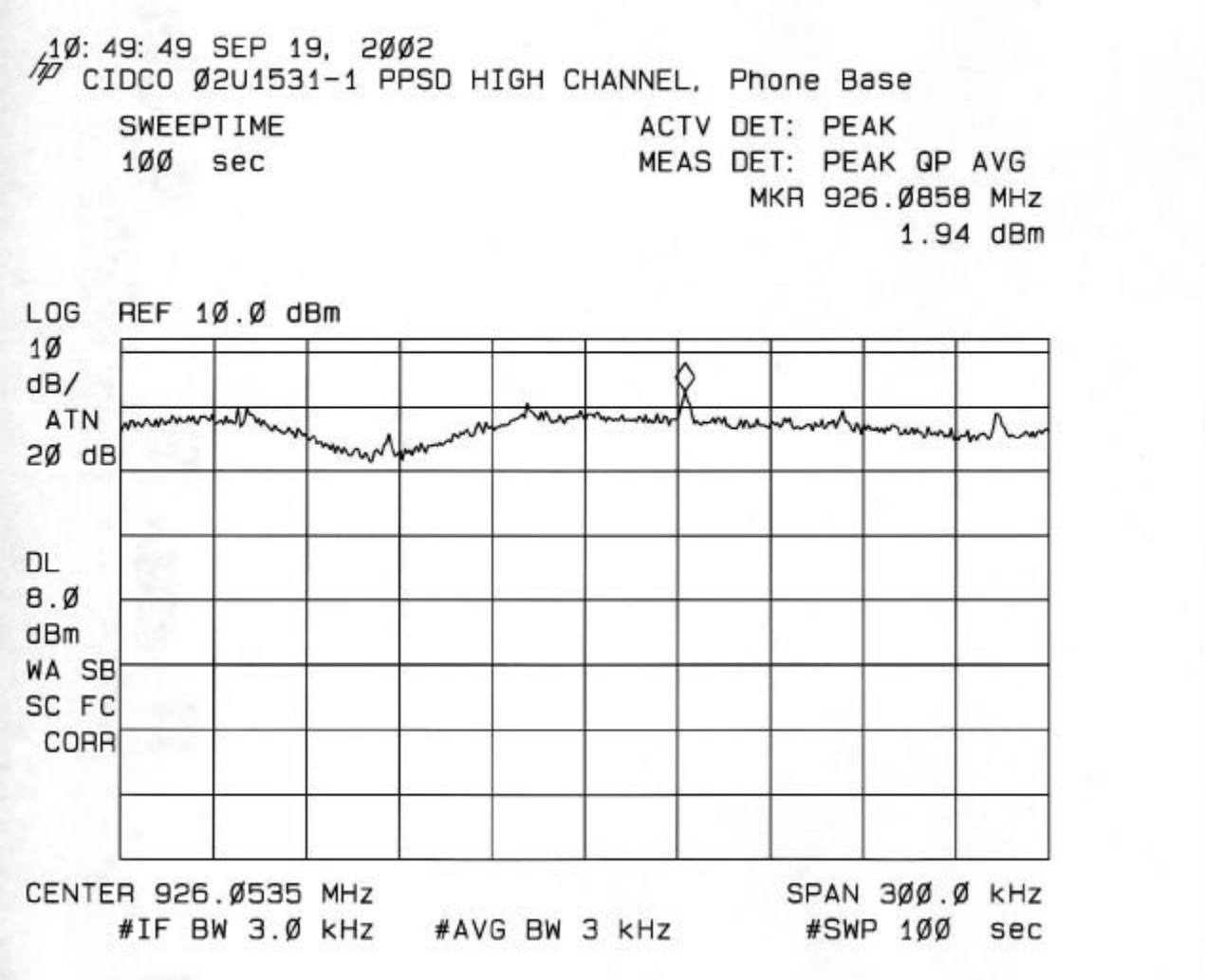
Peak Power Spectral Density for Base Unit
Channel 20



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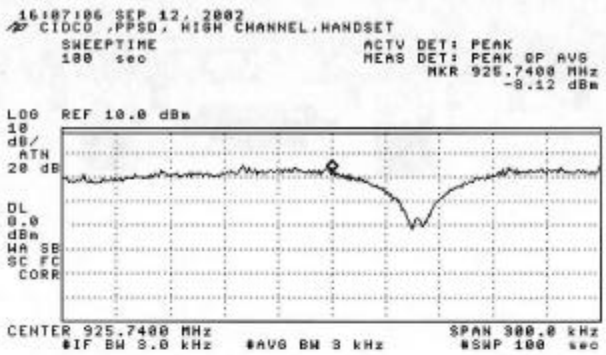
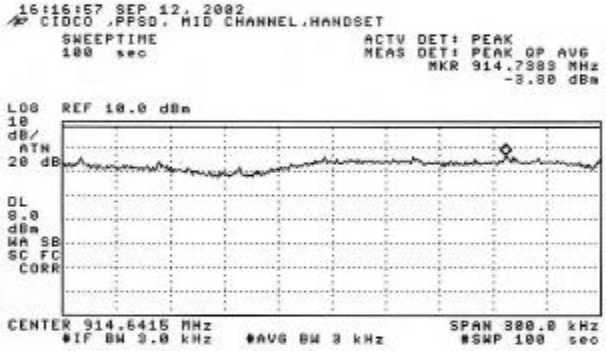
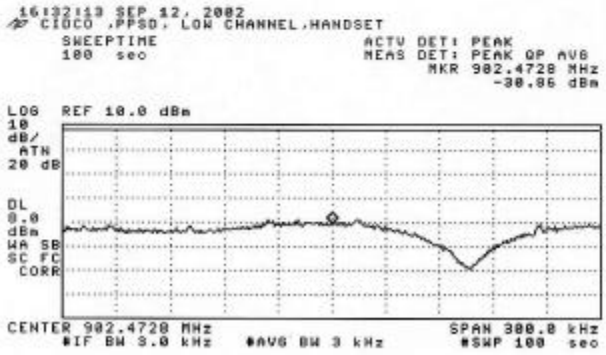
Peak Power Spectral Density for Handset Unit
3 Channels 20, 10, 1







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9.5. BANDEDGE MEASUREMENT

TEST SETUP

See radiated emissions test procedure, section 9.7.

TEST PROCEDURE

See radiated emissions test procedure, section 9.7.

RESULT
No non-compliance noted.

COMPLIANCE CERTIFICATION SERVICES DOCUMENT NO: CCSUP4031A
561F MONTEREY ROAD, MORGAN HILL, CA 95037 USA TEL: (408) 463-0885 FAX: (408) 463-0888
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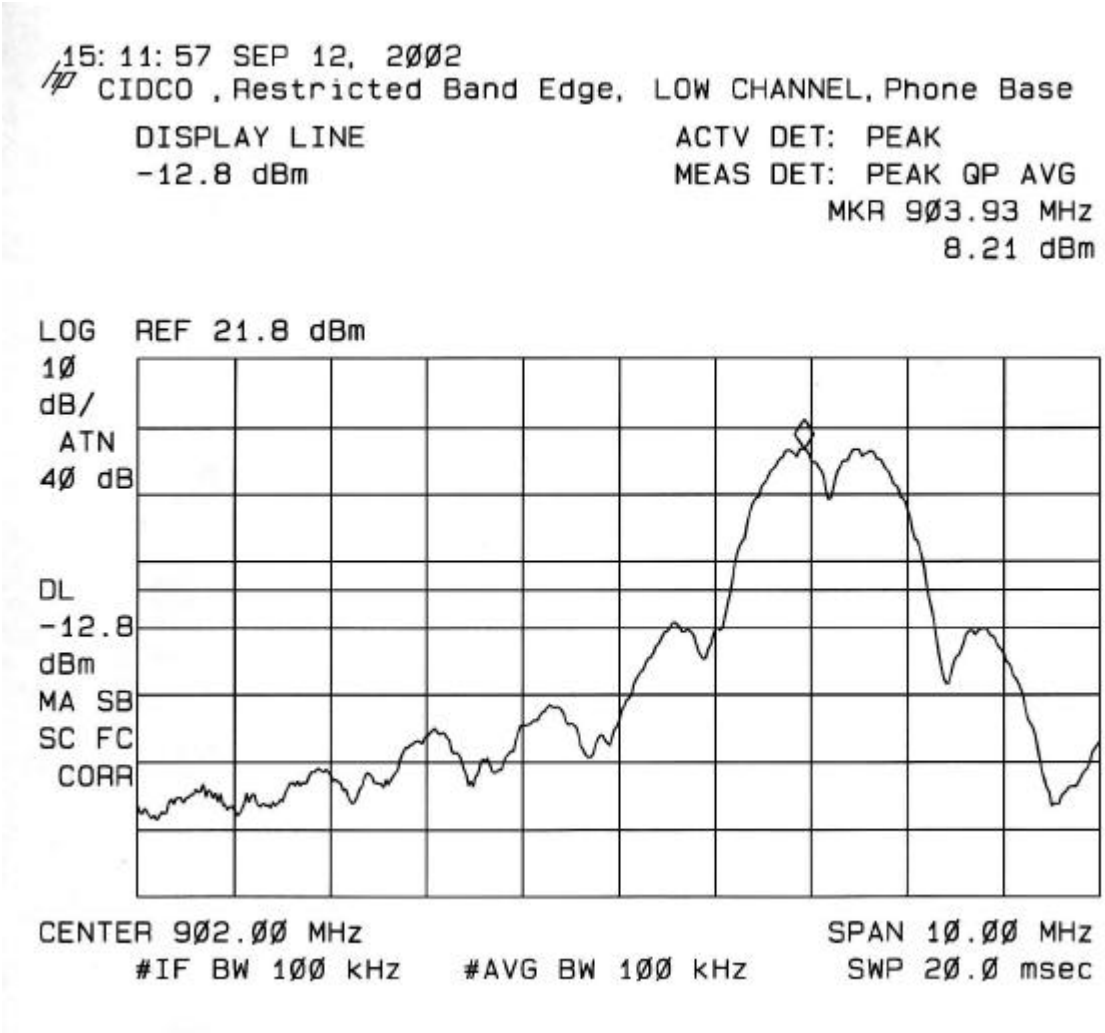
Restricted Band Edge Measurement for Base Unit
Channel 1



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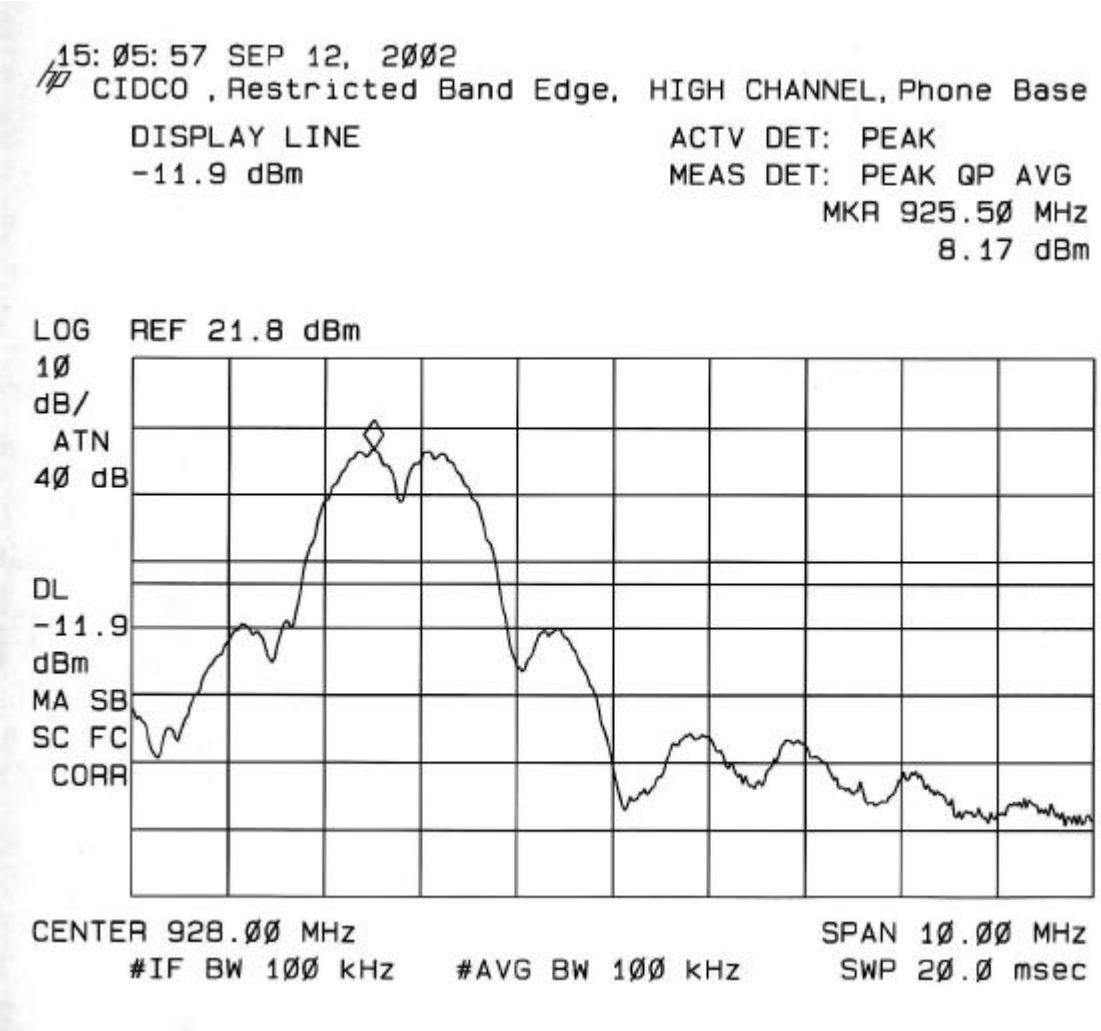
Restricted Band Edge Measurement for Base Unit
Channel 20



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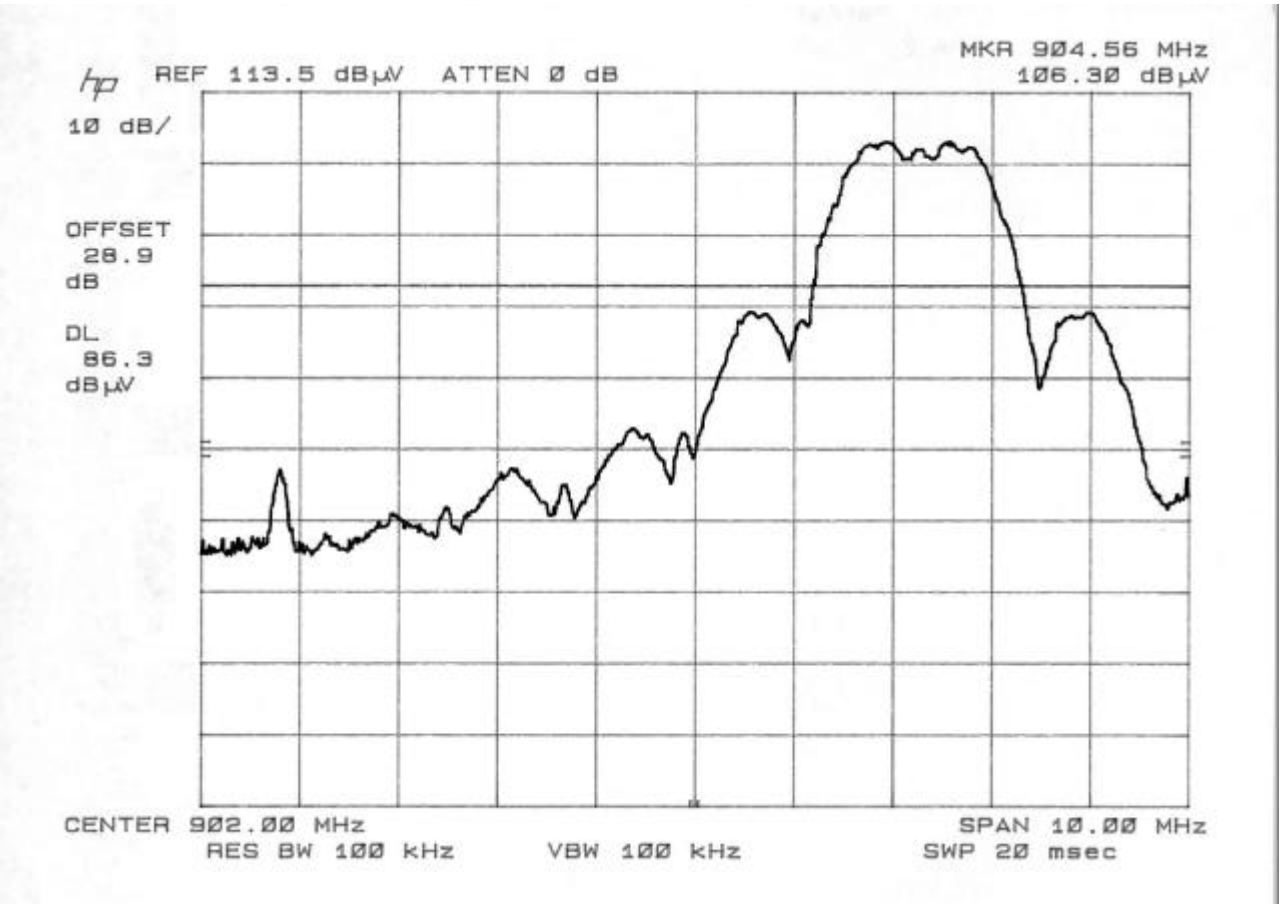
Restricted Band Edge Measurement for Handset Unit
Channel 1



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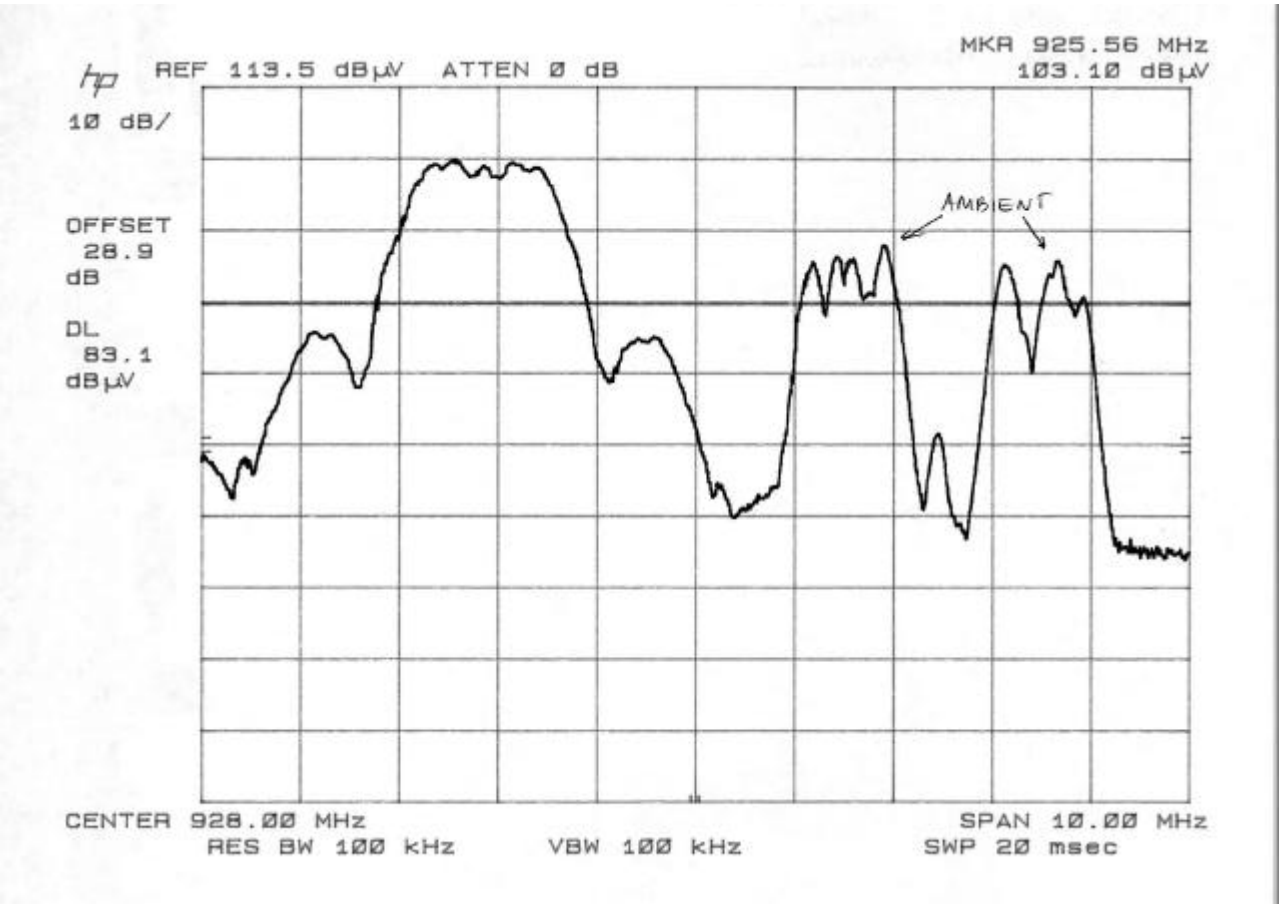
Restricted Band Edge Measurement for Handset Unit
Channel 20



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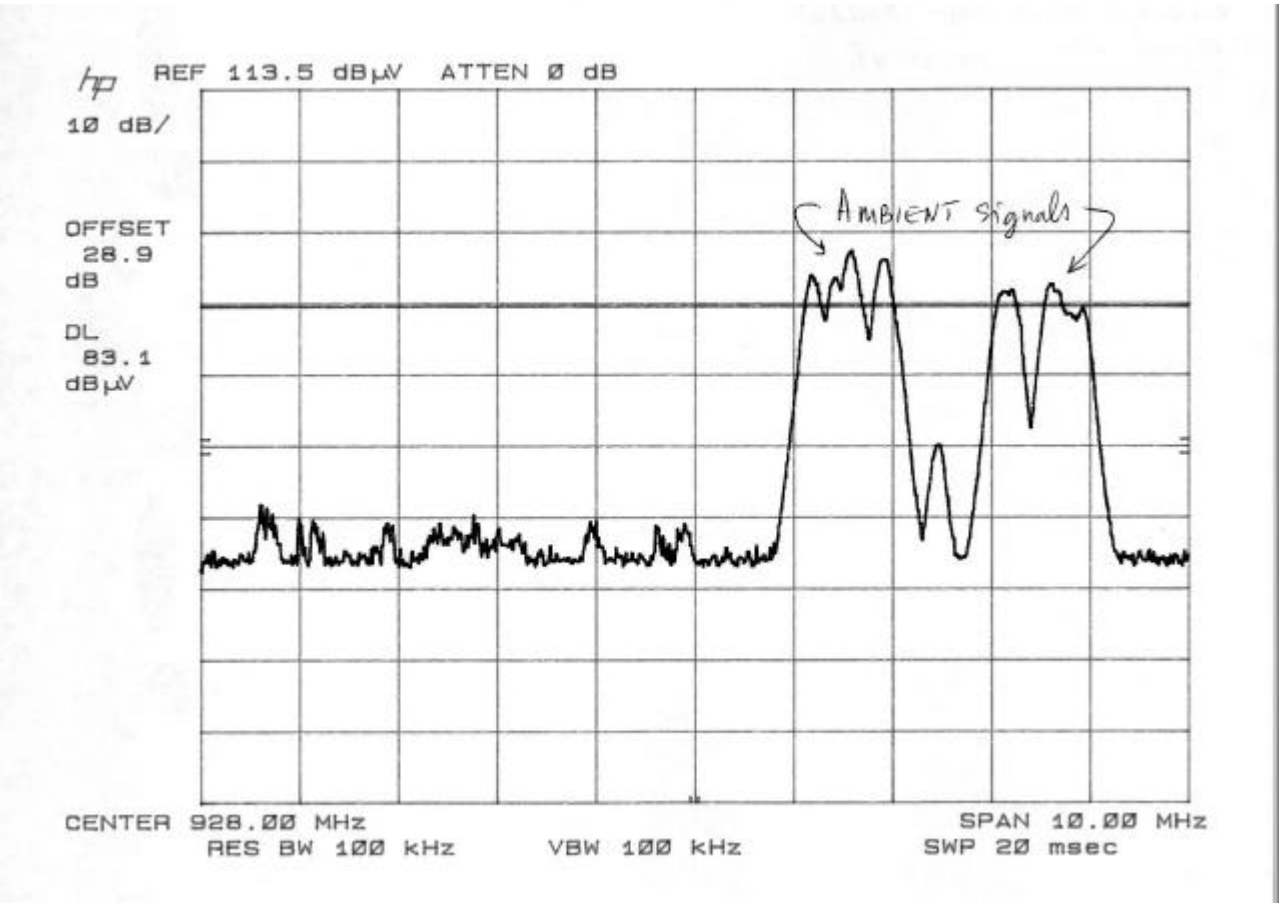

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9.6. RADIATED EMISSION

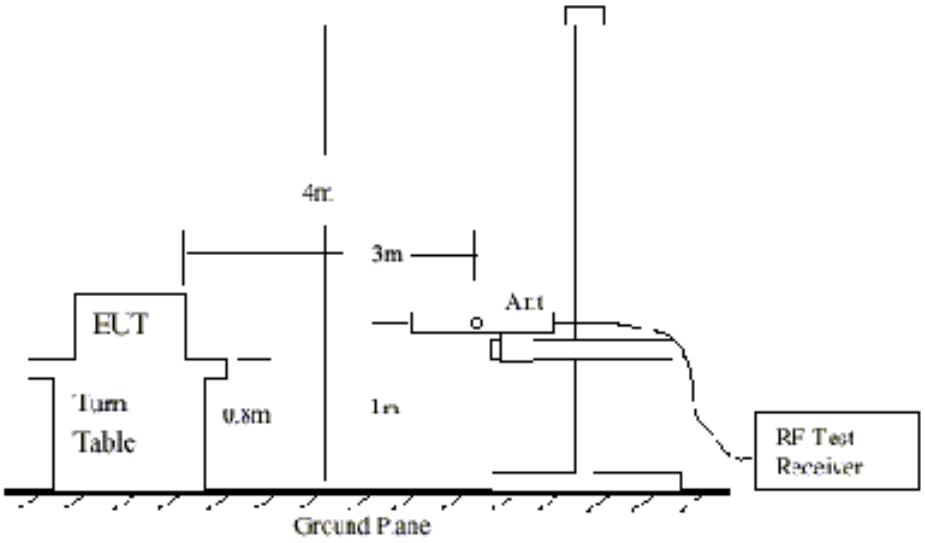

Fig 1: Radiated Emission Measurement 30 to 1000 MHz

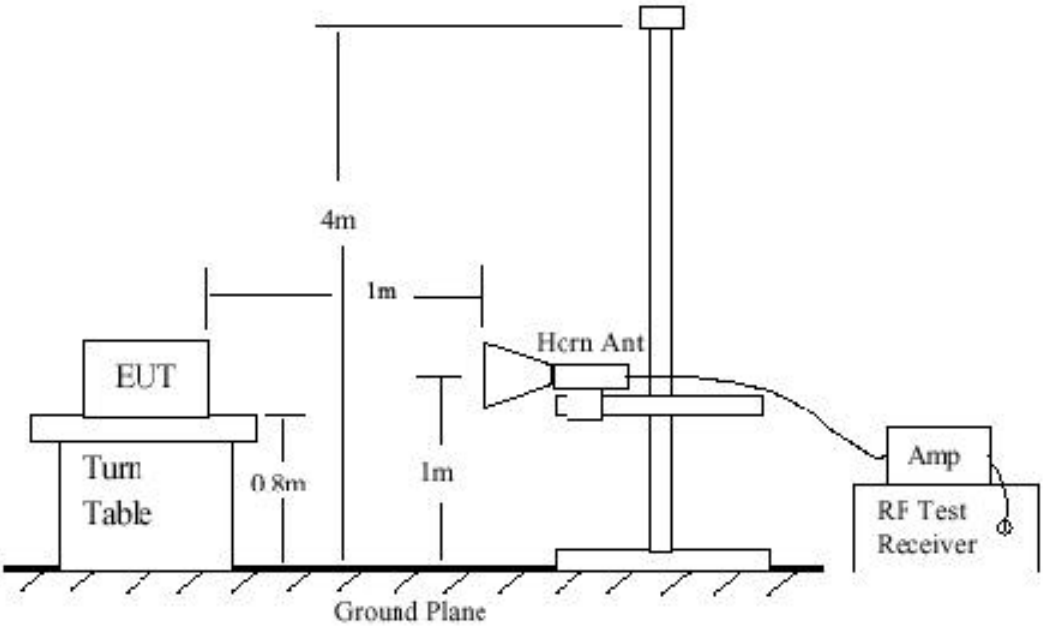

Fig 2: Radiated Emission Above 1000 MHz

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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.

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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.

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COMPLIANCE Certification Services

FCC, VCCI, CISPR, CE, AUSTEL,
UL, CSA, TUV, BSMI, DHHS, NVLAI

561F MONTEREY ROAD, SAN JOSE, CA 95037-90
PHONE: (408) 463-088 FAX: (408) 463-0888

Project #: 021531-1
Report #: 020913A1
Date& Time: 09/13/02 9:48 AM
Test Engr: Thanh Nguyen

Company: CIDCO Communnication Corporation
EUT Description: 900 MHz Digital Spread Spectrum Cordless Telephone
Test Configuration : Phone Base only
Type of Test: FCC Part 15.247
Mode of Operation: Normal TX/RCV

<< Main Sheet

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
653.90	42.60	20.31	4.23	28.13	39.02	46.00	-6.98	3mV	180.00	1.00	P
845.90	40.10	21.87	4.87	27.95	38.90	46.00	-7.10	3mV	180.00	1.00	P
749.90	37.50	21.37	4.56	28.10	35.33	46.00	-10.67	3mV	180.00	1.00	P
461.90	41.20	17.07	3.52	27.54	34.25	46.00	-11.75	3mV	180.00	1.00	P
538.69	39.40	18.38	3.83	27.81	33.80	46.00	-12.20	3mV	180.00	1.00	P
999.50	39.70	23.84	5.41	27.70	41.25	54.00	-12.75	3mV	180.00	1.00	P
6 Worst Data											

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COMPLIANCE Certification Services

FCC, VCCI, CISPR, CE, AUSTEL,
UL, CSA, TUV, BSMI, DHHS, NVLAI

561F MONTEREY ROAD, SAN JOSE, CA 95037-90
PHONE: (408) 463-088! FAX: (408) 463-0888

Project #:	02U1531-1
Report #:	020911C1
Date& Time:	09/11/02 9:40 AM
Test Engr:	Thanh Nguyen

Company:	CIDCO COMMUNICATION CORPORATION
EUT Description:	900MHz Digital Spread Spectrum Cordless Telephone
Test Configuration :	Handset only
Type of Test:	FCC Part 15.247
Mode of Operation:	TX only

<< Main Sheet

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
902.39	36.50	22.79	5.75	27.33	37.70	46.00	-8.30	3mV	180.00	1.00	P
844.79	36.40	21.88	5.51	27.39	36.40	46.00	-9.60	3mV	180.00	1.00	P
710.40	36.40	21.44	5.00	27.88	34.96	46.00	-11.04	3mV	180.00	1.00	P
614.40	37.10	19.19	4.62	27.81	33.10	46.00	-12.90	3mV	180.00	1.00	P
518.40	36.30	18.18	4.14	27.60	31.02	46.00	-14.98	3mV	180.00	1.00	P
403.20	38.90	15.56	3.58	27.13	30.90	46.00	-15.10	3mV	180.00	1.00	P
6 Worst Data											

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Hi Frequency for Phone Base Unit

12-Sep-02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Equipment for 1-22 GHz
HP8593EM Analyzer S/N 3710A00205
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna S/N 6739
Cabl 16.0 feet

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

Peak Measurements:
1MHz Resolution Bandwidth
1MHz Video Bandwidth

EUT: **PHONE BASE** CH1, F0 = 904.2 MHz

f GHz	Dist feet	Read Peak dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Peak Lim dBuV/m	Avg Lim dBuV/m	Peak Mar dB	Avg Mar dB	Notes
2.713	3.3	67.4	57.3	28.9	4.3	-42.3	-9.5	1.0	49.8	39.7	74.0	54.0	-24.2	-14.3	V (Restriced Band)
3.617	3.3	60.1	44.0	31.8	5.1	-42.0	-9.5	1.0	46.5	30.4	74.0	54.0	-27.5	-23.6	V (Restriced Band)
4.521	3.3	59.3	43.3	32.0	5.9	-41.9	-9.5	1.0	46.8	30.8	74.0	54.0	-27.2	-23.2	V (Restriced Band)
5.425	3.3	53.0	46.9	34.0	6.6	-41.7	-9.5	1.0	43.4	37.3	74.0	54.0	-30.6	-16.7	V (Restriced Band)
6.330	3.3	44.7	40.2	34.1	7.2	-41.5	-9.5	1.0	36.1	31.5	74.0	54.0	-37.9	-22.5	V (Restriced Band)
7.230	3.3	48.1	40.2	36.6	7.7	-41.2	-9.5	1.0	42.7	34.8	74.0	54.0	-31.3	-19.2	V (Restriced Band)
8.138	3.3	48.9	42.8	37.0	8.2	-40.3	-9.5	1.0	45.3	39.3	74.0	54.0	-28.7	-14.7	V (Restriced Band)
9.042	3.3	47.2	36.5	37.9	8.7	-39.4	-9.5	1.0	46.0	35.3	74.0	54.0	-28.0	-18.7	V (Restriced Band)
2.713	3.3	67.3	57.1	28.9	4.3	-42.3	-9.5	1.0	49.7	39.5	74.0	54.0	-24.3	-14.5	H (Restricted Band)
3.617	3.3	62.9	47.4	24.2	5.1	-42.0	-9.5	1.0	41.6	26.1	74.0	54.0	-32.4	-27.9	H (Restricted Band)
4.521	3.3	62.6	40.2	24.2	5.9	-41.9	-9.5	1.0	42.3	19.9	74.0	54.0	-31.7	-34.1	H (Restricted Band)
5.425	3.3	56.7	47.8	34.0	6.6	-41.7	-9.5	1.0	47.1	38.2	74.0	54.0	-26.9	-15.8	H (Restricted Band)
6.330	3.3	43.8	40.2	34.1	7.2	-41.5	-9.5	1.0	35.1	31.5	74.0	54.0	-38.9	-22.5	H (Restricted Band)
7.230	3.3	48.6	40.2	36.6	7.7	-41.2	-9.5	1.0	43.2	34.8	74.0	54.0	-30.8	-19.2	H (Restricted Band)
8.138	3.3	48.7	36.7	37.0	8.2	-40.3	-9.5	1.0	45.1	33.1	74.0	54.0	-28.9	-20.9	H (Restricted Band)
9.042	3.3	47.6	36.4	37.9	8.7	-39.4	-9.5	1.0	46.4	35.2	74.0	54.0	-27.6	-18.8	H (Restricted Band)

The frequencies higher than 5.43 GHZ are the noise floor at test site

f Measurement Frequency
Dist Distance to Antenna
Read Analyzer Reading
AF Antenna Factor
CL Cable Loss
Amp Preamp Gain
D Corr Distance Correct to 3 meters
Avg Average Field Strength @ 3 m
Peak Calculated Peak Field Strength
HPF High Pass Filter
Avg Lim Average Field Strength Limit
Pk Lim Peak Field Strength Limit
Avg Mar Margin vs. Average Limit
Pk Mar Margin vs. Peak Limit

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12-Sep-02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Equipment for 1-22 GHz

HP8593EM Analyzer S/N 3710A00205

Miteq NSP2600-44 Preamp

EMCO 3115 Antenna S/N 6739

Cabl 16.0 feet

Average Measurements: Peak Measurements:

1 MHz Resolution Bandwidth 1MHz Resolution Bandwidth

10Hz Video Bandwidth 1MHz Video Bandwidth

EUT: **PHONE BASE** CH10, F0 = 914.4 MHz

f	Dist	Read Peak	Read Avg.	AF	CL	Amp	D Corr	HPF	Peak	Avg	Peak Lim	Avg Lim	Peak Mar	Avg Mar	Notes
GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	
0.914															
2.743	3.3	68.4	53.6	29.0	4.3	-42.2	-9.5	1.0	51.0	36.2	74.0	54.0	-23.0	-17.8	V (Restriced Band)
3.658	3.3	58.7	43.0	31.9	5.1	-42.0	-9.5	1.0	45.2	29.5	74.0	54.0	-28.8	-24.5	V (Restriced Band)
4.572	3.3	55.7	53.8	32.1	5.9	-41.8	-9.5	1.0	43.3	41.4	74.0	54.0	-30.7	-12.6	V (Restriced Band)
5.486	3.3	56.6	51.2	34.2	6.6	-41.7	-9.5	1.0	47.2	41.8	74.0	54.0	-26.8	-12.2	V (Restriced Band)
6.400	3.3	46.7	39.1	34.0	7.3	-41.5	-9.5	1.0	38.0	30.3	74.0	54.0	-36.0	-23.7	V (Restriced Band)
7.315	3.3	49.7	36.5	36.7	7.8	-41.1	-9.5	1.0	44.6	31.4	74.0	54.0	-29.4	-22.6	V (Restriced Band)
8.230	3.3	49.2	36.7	37.1	8.3	-40.2	-9.5	1.0	45.9	33.4	74.0	54.0	-28.1	-20.6	V (Restriced Band)
9.144	3.3	45.5	36.4	37.7	8.8	-39.4	-9.5	1.0	44.2	35.0	74.0	54.0	-29.8	-19.0	V (Restriced Band)
2.743	3.3	67.3	51.7	32.5	4.3	-42.2	-9.5	1.0	53.4	37.8	74.0	54.0	-20.6	-16.2	H (Restricted Band)
3.658	3.3	57.8	33.9	24.2	5.1	-42.0	-9.5	1.0	36.5	12.7	74.0	54.0	-37.5	-41.3	H (Restricted Band)
4.572	3.3	56.1	51.0	24.2	5.9	-41.8	-9.5	1.0	35.9	30.8	74.0	54.0	-38.1	-23.2	H (Restricted Band)
5.486	3.3	53.4	46.0	34.2	6.6	-41.7	-9.5	1.0	44.0	36.6	74.0	54.0	-30.0	-17.4	H (Restricted Band)
6.400	3.3	44.8	42.1	34.0	7.3	-41.5	-9.5	1.0	36.0	33.4	74.0	54.0	-38.0	-20.6	H (Restricted Band)
7.315	3.3	48.5	36.7	36.7	7.8	-41.1	-9.5	1.0	43.4	31.6	74.0	54.0	-30.6	-22.4	H (Restricted Band)
8.230	3.3	48.2	36.7	37.1	8.3	-40.2	-9.5	1.0	44.9	33.4	74.0	54.0	-29.1	-20.6	H (Restricted Band)
9.144	3.3	47.6	36.1	37.7	8.8	-39.4	-9.5	1.0	46.2	34.8	74.0	54.0	-27.8	-19.2	H (Restricted Band)

The frequencies higher than 5.425 GHZ are the noise floor at test site

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

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12-Sep-02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Equipment for 1-22 GHz
HP8593EM Analyzer S/N 3710A00205
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna S/N 6739
Cabl 16.0 feet

Average Measurements: 1 MHz Resolution Bandwidth, 10Hz Video Bandwidth
Peak Measurements: 1MHz Resolution Bandwidth, 1MHz Video Bandwidth

EUT: **PHONE BASE** CH20, F0 = 926 MHz

f	Dist	Read Peak	Read Avg.	AF	CL	Amp	D Corr	HPF	Peak	Avg	Peak Lim	Avg Lim	Peak Mar	Avg Mar	Notes
GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	
2.778	3.3	67.4	52.5	29.2	4.3	-42.2	-9.5	1.0	50.2	35.3	74.0	54.0	-23.8	-18.7	V (Restriced Band)
3.704	3.3	62.5	49.2	32.0	5.2	-42.0	-9.5	1.0	49.2	35.8	74.0	54.0	-24.8	-18.2	V (Restriced Band)
4.630	3.3	58.9	49.5	32.2	5.9	-41.8	-9.5	1.0	46.7	37.3	74.0	54.0	-27.3	-16.7	V (Restriced Band)
5.550	3.3	57.8	51.0	34.2	6.7	-41.7	-9.5	1.0	48.5	41.8	74.0	54.0	-25.5	-12.2	V (Restriced Band)
6.480	3.3	46.4	35.1	33.9	7.3	-41.5	-9.5	1.0	37.6	26.3	74.0	54.0	-36.4	-27.7	V (Restriced Band)
7.408	3.3	52.7	36.9	36.9	7.8	-41.0	-9.5	1.0	48.0	32.1	74.0	54.0	-26.0	-21.9	V (Restriced Band)
8.334	3.3	48.3	36.7	37.2	8.3	-40.1	-9.5	1.0	45.2	33.7	74.0	54.0	-28.8	-20.3	V (Restriced Band)
9.260	3.3	47.1	36.0	37.5	8.9	-39.4	-9.5	1.0	45.6	34.5	74.0	54.0	-28.4	-19.5	V (Restriced Band)
2.778	3.3	67.2	54.1	32.5	4.3	-42.2	-9.5	1.0	53.3	40.3	74.0	54.0	-20.7	-13.7	H (Restricted Band)
3.704	3.3	59.8	46.5	24.2	5.2	-42.0	-9.5	1.0	38.7	25.4	74.0	54.0	-35.3	-28.6	H (Restricted Band)
4.630	3.3	59.2	49.5	24.2	5.9	-41.8	-9.5	1.0	39.0	29.4	74.0	54.0	-35.0	-24.6	H (Restricted Band)
5.550	3.3	53.1	55.2	24.2	6.7	-41.7	-9.5	1.0	33.9	35.9	74.0	54.0	-40.1	-18.1	H (Restricted Band)
6.480	3.3	46.4	33.4	24.2	7.3	-41.5	-9.5	1.0	27.9	14.9	74.0	54.0	-46.1	-39.1	H (Restricted Band)
7.408	3.3	47.8	36.8	36.9	7.8	-41.0	-9.5	1.0	43.0	32.1	74.0	54.0	-31.0	-21.9	H (Restricted Band)
8.334	3.3	45.9	36.9	37.2	8.3	-40.1	-9.5	1.0	42.9	33.8	74.0	54.0	-31.1	-20.2	H (Restricted Band)
9.260	3.3	45.8	36.5	37.5	8.9	-39.4	-9.5	1.0	44.4	35.0	74.0	54.0	-29.6	-19.0	H (Restricted Band)

The frequencies higher than 6.48 GHZ are the noise floor at test site

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Li
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

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Hi Frequency for Handset Unit

11-Sep-02 **FCC Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Equipment for 1-22 GHz
HP8593EM Analyzer S/N 3710A00205
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna S/N 6739
Cabl 16.0 feet

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

Peak Measurements:
1MHz Resolution Bandwidth
1MHz Video Bandwidth

EUT: **Handset** CH1, F0 = 904.2 MHz

f GHz	Dist feet	Read Peak dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Peak Lim dBuV/m	Avg Lim dBuV/m	Peak Mar dB	Avg Mar dB	Notes
2.713	3.3	64.5	57.3	28.9	4.3	-42.3	-9.5	1.0	46.9	39.7	74.0	54.0	-27.1	-14.3	V (Restriced Band)
3.617	3.3	52.3	44.0	31.8	5.1	-42.0	-9.5	1.0	38.7	30.4	74.0	54.0	-35.3	-23.6	V (Restriced Band)
4.521	3.3	54.4	43.3	32.0	5.9	-41.9	-9.5	1.0	42.0	30.8	74.0	54.0	-32.0	-23.2	V (Restriced Band)
5.425	3.3	53.5	46.9	34.0	6.6	-41.7	-9.5	1.0	43.9	37.3	74.0	54.0	-30.1	-16.7	V (Restriced Band)
6.330	3.3	47.9	40.2	34.1	7.2	-41.5	-9.5	1.0	39.2	31.5	74.0	54.0	-34.8	-22.5	V (Restriced Band)
8.138	3.3	46.5	42.8	37.0	8.2	-40.3	-9.5	1.0	43.0	39.3	74.0	54.0	-31.0	-14.7	V (Restriced Band)
9.042	3.3	47.3	36.5	37.9	8.7	-39.4	-9.5	1.0	46.1	35.3	74.0	54.0	-27.9	-18.7	V (Restriced Band)
2.713	3.3	63.1	57.1	28.9	4.3	-42.3	-9.5	1.0	45.6	39.5	74.0	54.0	-28.4	-14.5	H (Restricted Band)
3.617	3.3	48.7	47.4	24.2	5.1	-42.0	-9.5	1.0	27.5	26.1	74.0	54.0	-46.5	-27.9	H (Restricted Band)
4.521	3.3	45.3	40.2	24.2	5.9	-41.9	-9.5	1.0	25.0	19.9	74.0	54.0	-49.0	-34.1	H (Restricted Band)
5.425	3.3	53.5	47.8	34.0	6.6	-41.7	-9.5	1.0	43.9	38.2	74.0	54.0	-30.1	-15.8	H (Restricted Band)
6.330	3.3	47.9	40.2	34.1	7.2	-41.5	-9.5	1.0	39.2	31.5	74.0	54.0	-34.8	-22.5	H (Restricted Band)
8.138	3.3	45.4	36.7	37.0	8.2	-40.3	-9.5	1.0	41.9	33.1	74.0	54.0	-32.1	-20.9	H (Restricted Band)
9.042	3.3	47.3	36.4	37.9	8.7	-39.4	-9.5	1.0	46.1	35.2	74.0	54.0	-27.9	-18.8	H (Restricted Band)

The frequencies higher than 6.33 GHZ are the noise floor at test site

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

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11-Sep-02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Equipment for 1-22 GHz

HP8593EM Analyzer S/N 3710A00205

Miteq NSP2600-44 Preamp

EMCO 3115 Antenna S/N 6739

Cabl 16.0 feet

Average Measurements: Peak Measurements:

1 MHz Resolution Bandwidth 1MHz Resolution Bandwidth

10Hz Video Bandwidth 1MHz Video Bandwidth

EUT: **Handset** CH10, F0 = 914.4 MHz

f	Dist	Read Peak	Read Avg.	AF	CL	Amp	D Corr	HPF	Peak	Avg	Peak Lim	Avg Lim	Peak Mar	Avg Mar	Notes
GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	
0.914															
2.743	3.3	60.2	53.6	29.0	4.3	-42.2	-9.5	1.0	42.8	36.2	74.0	54.0	-31.2	-17.8	V (Restriced Band)
3.658	3.3	48.9	43.0	31.9	5.1	-42.0	-9.5	1.0	35.4	29.5	74.0	54.0	-38.6	-24.5	V (Restriced Band)
4.572	3.3	55.4	53.8	32.1	5.9	-41.8	-9.5	1.0	43.1	41.4	74.0	54.0	-30.9	-12.6	V (Restriced Band)
5.486	3.3	56.9	51.2	34.2	6.6	-41.7	-9.5	1.0	47.6	41.8	74.0	54.0	-26.4	-12.2	V (Restriced Band)
6.400	3.3	41.8	39.1	34.0	7.3	-41.5	-9.5	1.0	33.1	30.3	74.0	54.0	-40.9	-23.7	V (Restriced Band)
7.315	3.3	46.9	36.5	36.7	7.8	-41.1	-9.5	1.0	41.8	31.4	74.0	54.0	-32.2	-22.6	V (Restriced Band)
8.230	3.3	47.4	36.7	37.1	8.3	-40.2	-9.5	1.0	44.0	33.4	74.0	54.0	-30.0	-20.6	V (Restriced Band)
9.144	3.3	46.2	36.4	37.7	8.8	-39.4	-9.5	1.0	44.9	35.0	74.0	54.0	-29.1	-19.0	V (Restriced Band)
2.743	3.3	58.5	51.7	32.5	4.3	-42.2	-9.5	1.0	44.6	37.8	74.0	54.0	-29.4	-16.2	H (Restricted Band)
3.658	3.3	46.9	33.9	24.2	5.1	-42.0	-9.5	1.0	25.7	12.7	74.0	54.0	-48.3	-41.3	H (Restricted Band)
4.572	3.3	52.8	51.0	24.2	5.9	-41.8	-9.5	1.0	32.6	30.8	74.0	54.0	-41.4	-23.2	H (Restricted Band)
5.486	3.3	51.2	46.0	34.2	6.6	-41.7	-9.5	1.0	41.8	36.6	74.0	54.0	-32.2	-17.4	H (Restricted Band)
6.400	3.3	43.2	42.1	34.0	7.3	-41.5	-9.5	1.0	34.5	33.4	74.0	54.0	-39.5	-20.6	H (Restricted Band)
7.315	3.3	48.9	36.7	36.7	7.8	-41.1	-9.5	1.0	43.8	31.6	74.0	54.0	-30.2	-22.4	H (Restricted Band)
8.230	3.3	46.1	36.7	37.1	8.3	-40.2	-9.5	1.0	42.8	33.4	74.0	54.0	-31.2	-20.6	H (Restricted Band)
9.144	3.3	47.3	36.1	37.7	8.8	-39.4	-9.5	1.0	46.0	34.8	74.0	54.0	-28.0	-19.2	H (Restricted Band)

The frequencies higher than 5.425 GHZ are the noise floor at test site

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

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11-Sep-02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Equipment for 1-22 GHz

HP8593EM Analyzer S/N 3710A00205

Miteq NSP2600-44 Preamp

EMCO 3115 Antenna S/N 6739

Cabl 16.0 feet

Average Measurements: Peak Measurements:

1 MHz Resolution Bandwidth 1MHz Resolution Bandwidth

10Hz Video Bandwidth 1MHz Video Bandwidth

EUT: **Handset** CH20, F0 = 926 MHz

f	Dist	Read Peak	Read Avg.	AF	CL	Amp	D Corr	HPF	Peak	Avg	Peak Lim	Avg Lim	Peak Mar	Avg Mar	Notes
GHz	feet	dBuV	dBuV	dB/m	dB	dB	dB		dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	
2.778	3.3	60.0	52.5	29.2	4.3	-42.2	-9.5	1.0	42.8	35.3	74.0	54.0	-31.2	-18.7	V (Restriced Band)
3.704	3.3	51.3	49.2	32.0	5.2	-42.0	-9.5	1.0	38.0	35.8	74.0	54.0	-36.0	-18.2	V (Restriced Band)
4.630	3.3	56.6	49.5	32.2	5.9	-41.8	-9.5	1.0	44.4	37.3	74.0	54.0	-29.6	-16.7	V (Restriced Band)
5.550	3.3	56.0	51.0	34.2	6.7	-41.7	-9.5	1.0	46.7	41.8	74.0	54.0	-27.3	-12.2	V (Restriced Band)
6.480	3.3	45.2	35.1	33.9	7.3	-41.5	-9.5	1.0	36.4	26.3	74.0	54.0	-37.6	-27.7	V (Restriced Band)
7.408	3.3	47.0	36.9	36.9	7.8	-41.0	-9.5	1.0	42.3	32.1	74.0	54.0	-31.7	-21.9	V (Restriced Band)
8.334	3.3	46.9	36.7	37.2	8.3	-40.1	-9.5	1.0	43.8	33.7	74.0	54.0	-30.2	-20.3	V (Restriced Band)
9.260	3.3	46.4	36.0	37.5	8.9	-39.4	-9.5	1.0	44.9	34.5	74.0	54.0	-29.1	-19.5	V (Restriced Band)
2.778	3.3	61.1	54.1	32.5	4.3	-42.2	-9.5	1.0	47.2	40.3	74.0	54.0	-26.8	-13.7	H (Restricted Band)
3.704	3.3	52.3	46.5	24.2	5.2	-42.0	-9.5	1.0	31.1	25.4	74.0	54.0	-42.9	-28.6	H (Restricted Band)
4.630	3.3	56.3	49.5	24.2	5.9	-41.8	-9.5	1.0	36.2	29.4	74.0	54.0	-37.8	-24.6	H (Restricted Band)
5.550	3.3	59.2	55.2	24.2	6.7	-41.7	-9.5	1.0	39.9	35.9	74.0	54.0	-34.1	-18.1	H (Restricted Band)
6.480	3.3	43.4	33.4	24.2	7.3	-41.5	-9.5	1.0	24.9	14.9	74.0	54.0	-49.1	-39.1	H (Restricted Band)
7.408	3.3	46.6	36.8	36.9	7.8	-41.0	-9.5	1.0	41.8	32.1	74.0	54.0	-32.2	-21.9	H (Restricted Band)
8.334	3.3	47.1	36.9	37.2	8.3	-40.1	-9.5	1.0	44.1	33.8	74.0	54.0	-29.9	-20.2	H (Restricted Band)
9.260	3.3	45.7	36.5	37.5	8.9	-39.4	-9.5	1.0	44.2	35.0	74.0	54.0	-29.8	-19.0	H (Restricted Band)

The frequencies higher than 6.48 GHZ are the noise floor at test site

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Li
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

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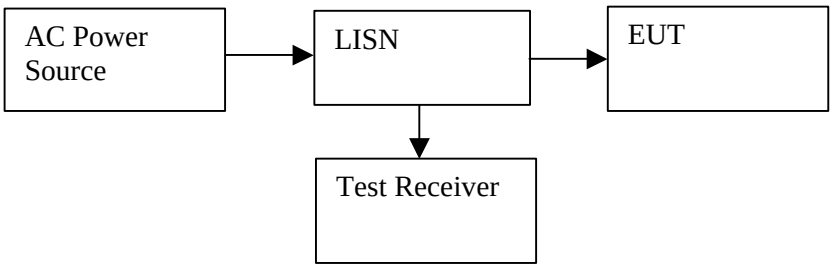
9.7. LINE CONDUCTED EMISSION

TEST SETUP



TEST PROCEDURE

1. EMI Receiver was set to 9 kHz bandwidth.
2. 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.

3. 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			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.45	39.45	--	--	0.00	48.00	--	-8.55	--	L1
0.78	34.86	--	--	0.00	48.00	--	-13.14	--	L1
9.61	15.26	--	--	0.00	48.00	--	-32.74	--	L1
0.45	41.26	--	--	0.00	48.00	--	-6.74	--	L2
0.78	34.12	--	--	0.00	48.00	--	-13.88	--	L2
9.61	16.70	--	--	0.00	48.00	--	-31.30	--	L2
6 Worst Data									

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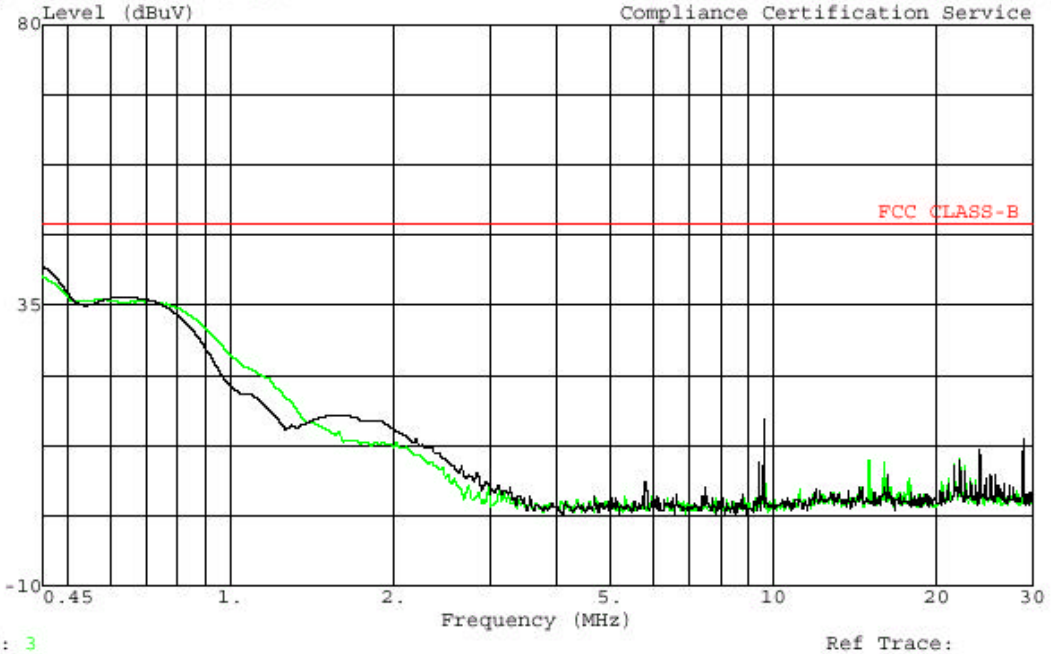
COMPLIANCE Engineering Services, Inc.
561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 7 File#: 02U1531.EMI Date: 09-12-2002 Time: 19:33:15



Trace: 3 Ref Trace:

Project # : 02U1531-1
Test Engineer : Thanh Nguyen
Company : CIDCO Communication Corporation
EUT : 900 MHz Digital Spread Spectrum Cordless
: Telephone.Model DS936&D937
: PHONE BASE
Test Config. : EUT
Test of Target: FCC 15.247
Mode of Op. : Normal Operation
: 115 VAC, 60 Hz
: PEAK ,Line 1 (GREEN), LINE 2 (BLACK)

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9.8. SETUP PHOTOS

RADIATED EMISSION PHOTOS

Handset Unit-Z Position

Handset Unit-X Position

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Handset Unit-Y Position

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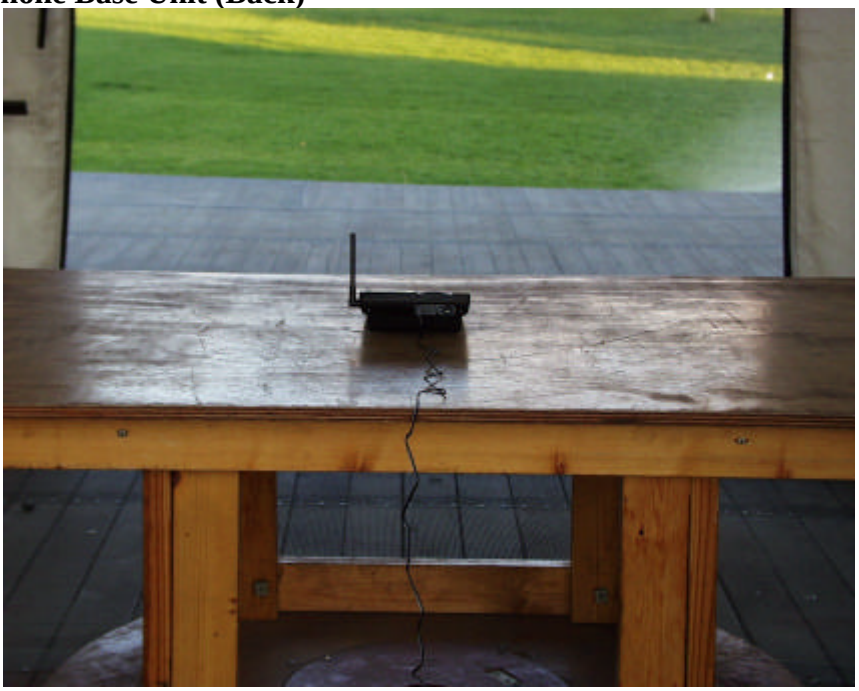
Phone Base Unit (Front)

Phone Base Unit (Back)



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CONDUCTED EMISSION PHOTOS

Phone Base Unit (Front)

Phone Base Unit (Back)

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FCC TESTING TO ANTENNA PORT

Handset Unit

Phone Base Unit

END OF REPORT

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