Report No.	N1315266
Specifications Test Method	FCC Part 15.109(g), Class B ANSI C63.4 1992
Applicant address	2F, NO. 28, INDUSTRY EAST 9TH RD., SCIENCE PARK, HSIN-CHU, TAIWAN
Applicant Items tested Model No.	NATIONAL DATACOMM CORPORATION 5 PORT SOHOWARE 10/100 FAST HUB NDH305, DH305 (Sample # N13266)
Results Sample received data	**Compliance** (As detailed within this report) 04/26/1999 (month / day / year)
Prepared by	project engineer
Authorized by	Vice General Manager (Jacob Lin)
Issue date	June 2, 1999 (month / day / year)
Modifications	**None**
Tested by Office and Open site at	Training Research Co., Ltd. No. 15, Lane 530, Pa-Lian RD., Sec. 1, Hsi-Chih Town, Taipei Hsien, Taiwan, R.O.C.

Conditions of issue:

(1) ***This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.***

(2) ***This report must not be used by the client to claim product endorsement by NVLAP or any agency of U.S. Government.***

★ ***FCC ID: IOUNDH305S01***

Contents

Chapter 1 Introduction

Description of EUT:

HUB is a data transmission / receiver facility. It was connected to Lan card installed in the PC or compatible computer and makes your data equipment available to transmit / receive data via the EUT. During testing the EUT was operated at Tx or Rx mode for each emission measured. This was done in order to insure that maximum emission levels were attained.

Connections of EUT:

(1) The power jack of EUT was connected with the AC power source via a power adapter.
(2) UTP 1 port was connected with a Lan card installed in the nearby PC.
(3) UTP 5 port was connected with another Lan card installed in another PC located remotely.
(4) The other UTP ports were terminated.

Test method:

Pretest was found that the emission of operating mode is worse than standby mode. So, The final test is made at the operating mode.

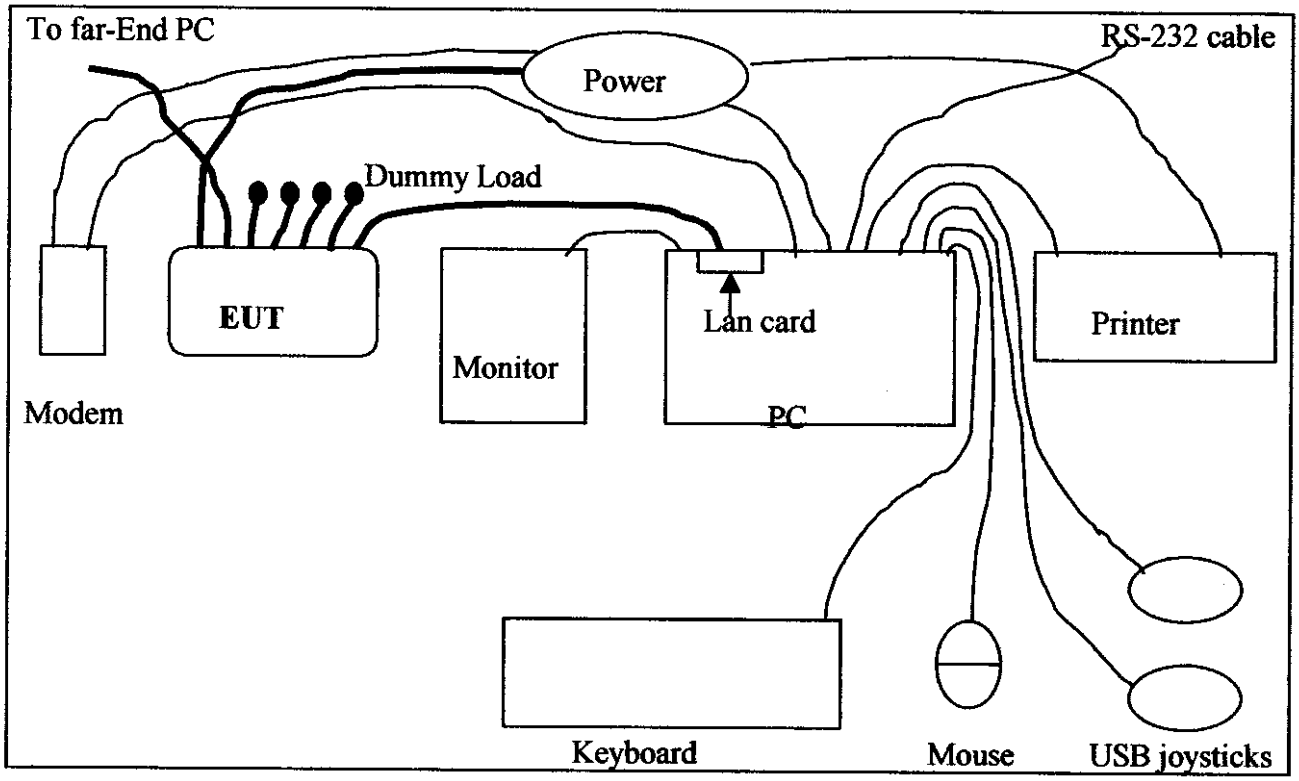
During pretest, there were three modes testing: 10 x 10MHz, 10 x 100MHz, 100 x 100MHz.

During testing, the EUT was operated at "transmitting" and "receiving" mode simultaneously.

The test placement as the photographs showed is the worst case emission placed. (If the emission is close to the ambient, the resolution BW and view resolution will be reduced and the data will be recorded by detection of maximum hold peak mode.)

The testing configuration of test setup is showing in the next page.

Configuration of test setup



Connections:

PC:

*Serial A port --- a external modem with 76 cm shielded RS-232 cable

*Serial B port --- a 76 cm shielded RS232 cable

*Printer port --- a Printer with 1.2m length data cable

*Monitor port --- a monitor with 1m length data cable

*Keyboard port --- a Keyboard with 1m length data cable

*Mouse port --- a Mouse with 0.7m long of data cable

*USB ports --- two USB joysticks with 1.5m long, shielded, no ferrite bead data cable

(Each port on PC is connected with suitable device)

Lan Card

*RJ-45 jack --- via a 3m long, non-shielded, no ferrite bead, RJ-45 cable to EUT.

EUT:

*UTP 1 port --- via a 1m long, non-shielded, no ferrite bead, RJ-45 cable to the RJ-45 jack of the Lan card that installed in PC.

*UTP 2~4 port --- connect with a 1m long, non-shielded, no ferrite bead, RJ-45 cable that terminated with 200ohm.

*UTP 5 port --- via a 30m long, non-shielded, no ferrite bead, RJ-45 cable to another Lan card that installed in another PC located in far-end.

*Power jack --- connect with a power adapter that the power cable is 1.8m long, non -shielded, with ferrite bead.

List of support equipment

Conducted (Radiated) test:

PC	:	**HP**
Model	:	VE6/350 SERIES 8
Serial No.	:	SG91002329
FCC ID	:	DoC Approval
Power type	:	AC 100~127 / 200~240 VAC, Switching
Power cord	:	non-Shielded, 1.7m long, Plastic, no ferrite core
Monitor	:	**HP**
Model No.	:	D2821
Serial No.	:	TW 73512262 (TW 73147163)
FCC ID	:	A3KMO64
Power type	:	AC 110~120 / 220~240 VAC, Switching
Power cord	:	Non-Shielded, 3m long, no ferrite core
Data cable	:	Shielded, 1.8m long, with ferrite core
Keyboard	:	**Digital**
Model No.	:	KB-5923
Serial No.	:	9S74904837 (9S74904665)
FCC ID	:	E8HKB-5923
Power type	:	By PC
Data cable	:	Shielded, 1.8m long, with ferrite core
Printer	:	**HP**
Model No.	:	C2642A
Serial No.	:	SG69A196GV
FCC ID	:	B94C2642X
Power type	:	110 VAC, 60Hz
Power cord	:	Non-shielded, 2m long, no ferrite core
Data cable	:	Shielded, 1.84m long, no ferrite core (1.7m)

Modem	:	**ACEEX**
Model No.	:	XDM-56V14
FCC ID	:	IFAXDM-56V14
Power type	:	110VAC, 60HZ/ 9VAC, 1A
Power cord	:	Non-shielded, 1.9m long, no ferrite cord
Data cable	:	RS232, Shielded, 1.2m long, no ferrite core
		RJ11C x 2, 7' long non-shielded, no ferrite core

Mouse	:	**Hewlett Packard Mouse**
Model No.	:	C3751B
Serial No.	:	LCA52707170
FCC ID	:	DZL210582
Power type	:	Powered by PC
Power Cable	:	Non – Shielded. 5.5' long, Plastic hoods, No ferrite bead

Joystick	:	**Padix**
Model	:	QF-3U, QF-305U, QF-606U, QF-707U (DoC Approval)
Power Type	:	By PC

Lan Card	:	**DELTA**
Model No.	:	AEF380-TX
Serial No.	:	N/A
Power Type	:	Powered by PC
Data Cable	:	UTP, 7', Plastic RJ-45 hoods, No ferrite bead.

Chapter 2 Conducted emission test

Test condition and setup:

All the equipment is placed and setup according to the ANSI C63.4-1992.
The EUT is assembled on a wooden table that is 80 cm high, is placed 40 cm from the back-wall that is a vertical conducting plane. One LISN is for EUT, the other LISN is for support equipment. They are all placed on the conductive ground. The EUT's LISN connect a line switch box for selecting L1 or L2, then connect to a preamplifier and spectrum.

The spectrum scans from 450KHz to 30MHz. Conducted emission levels are detected at max. peak mode. But if the max. peak mode failed, it will be measured by CISPR's quasi-peak detection mode.

While testing, there is the worst-emission plot printed at peak detection mode, and there are more than 6 highest emissions relative to limit recorded. The plot is kept as the original data, not included in test report.

List of test Instrument:

				Calibration Date	
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum analyzer	8594EM	H P	3710A00279	01/07/99	01/07/00
LISN (EUT)	3825/2	EMCO	9411-2284	05/20/99	05/20/00
LISN (Support E.)	AC3-001	TRC	- - - - - - - - -	05/20/99	05/20/00
Preamplifier	AC3-002	TRC	- - - - - - - - -	05/20/99	05/20/00
Line switch box	AC3-003	TRC	- - - - - - - - -	05/20/99	05/20/00

The level of confidence of 95%, the uncertainty of measurement of conducted emission is ± 2.4 dB.

Test Result: Pass (Appendix A)

Chapter 3 Radiated emission test

Test condition and setup:

Pretest: Prior to the final test (OATS test), the EUT is placed in a anechoic chamber and scan from 30MHz to 1GHz. This is done to ensure the radiation exactly emits form the EUT.

Final test: Final radiation measurements are made on a **3 - meter,** open-field test site. The EUT is placed on a nonconductive table that is 0.8m height, the top surface is 1.0 x 1.5 meter. The placement is according to ANSI C63.4-1992.

The spectrum is examined from 30 MHz to 1000 MHz measured by HP spectrum.

The EMCO whole range Antenna is used to measure frequency from 30 MHz to 1GHz. The final test is used the spectrum HP 8594EM.

Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency. The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meters to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization.

Appropriated preamplifier which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading. The spectrum analyzer's 6dB bandwidth is set to 120 KHz, and the EUT is measured at quasi-peak mode.

If the emission is close to the frequency band of ambient, the data will be rechecked by the tester and the corrected data will be written in the test data sheet. If the emission is just within the ambient, the data from anechoic chamber will be taken as the final data.

List of test Instrument:

				Calibration Date	
Instrument Name	Model No.	Brand	Serial No.	Last	Next
Spectrum analyzer	8594EM	H P	3619A00198	11/17/98	11/17/99
RF Pre-selector	AC4-001	TRC	- - - - - - - - -	05/20/99	05/20/00
Antenna (30M-2G Hz)	3141	EMCO	9711-1076	12/17/98	12/17/99
Open test side (Antenna, Amplify, cable calibrated together)				05/20/99	05/20/00

The level of confidence of 95%, the uncertainty of measurement of radiated emission is ± 4.96 dB.

Test Result: Pass (Appendix B)

Appendix A

Conducted Emission Test Result: (10 X 10 MHz)

Testing room: Temperature : 28 ° C Humidity : 45 % RH

Line 1

FREQUENCY (KHz)	READING AMPLITUDE			LIMIT		MARGIN (dB)
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
590	25.03	***.**	***.**	48.00	***.**	-22.97
749	23.80	***.**	***.**	48.00	***.**	-24.20
803	23.51	***.**	***.**	48.00	***.**	-24.49
862	23.04	***.**	***.**	48.00	***.**	-24.96
3750	24.03	***.**	***.**	48.00	***.**	-23.97
13740	22.36	***.**	***.**	48.00	***.**	-25.64
16260	24.53	***.**	***.**	48.00	***.**	-23.47
17570	23.99	***.**	***.**	48.00	***.**	-24.01
23650	26.94	***.**	***.**	48.00	***.**	-21.06
28160	23.73	***.**	***.**	48.00	***.**	-24.27

Line 2

FREQUENCY (KHz)	READING AMPLITUDE			LIMIT		MARGIN (dB)
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
586	26.12	***.**	***.**	48.00	***.**	-21.88
645	29.29	***.**	***.**	48.00	***.**	-18.71
749	28.95	***.**	***.**	48.00	***.**	-19.05
808	31.30	***.**	***.**	48.00	***.**	-16.70
910	26.74	***.**	***.**	48.00	***.**	-21.26
3750	36.34	***.**	***.**	48.00	***.**	-11.66
13740	30.41	***.**	***.**	48.00	***.**	-17.59
15050	25.31	***.**	***.**	48.00	***.**	-22.69
26220	25.94	***.**	***.**	48.00	***.**	-22.06
28160	25.63	***.**	***.**	48.00	***.**	-22.37

Conducted Emission Test Result: (10 X 100 MHz)

Testing room: Temperature : 28 ° C Humidity : 45 % RH

Line 1

FREQUENCY (KHz)	READING AMPLITUDE			LIMIT		MARGIN (dB)
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
862	29.39	***.**	***.**	48.00	***.**	-18.61
3750	34.38	***.**	***.**	48.00	***.**	-13.62
15600	27.94	***.**	***.**	48.00	***.**	-20.06
16260	30.85	***.**	***.**	48.00	***.**	-17.15
17700	28.05	***.**	***.**	48.00	***.**	-19.95
18210	31.62	***.**	***.**	48.00	***.**	-16.38
18850	27.87	***.**	***.**	48.00	***.**	-20.13
19750	30.08	***.**	***.**	48.00	***.**	-17.92
21560	27.89	***.**	***.**	48.00	***.**	-20.11
23050	28.02	***.**	***.**	48.00	***.**	-19.98

Line 2

FREQUENCY (KHz)	READING AMPLITUDE			LIMIT		MARGIN (dB)
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
862	34.58	***.**	***.**	48.00	***.**	-13.42
3750	36.17	***.**	***.**	48.00	***.**	-11.83
6260	33.13	***.**	***.**	48.00	***.**	-14.87
13740	30.20	***.**	***.**	48.00	***.**	-17.80
15600	29.87	***.**	***.**	48.00	***.**	-18.13
16260	33.13	***.**	***.**	48.00	***.**	-14.87
18850	30.23	***.**	***.**	48.00	***.**	-17.77
19750	31.77	***.**	***.**	48.00	***.**	-16.23
20260	30.13	***.**	***.**	48.00	***.**	-17.87
26220	31.60	***.**	***.**	48.00	***.**	-16.40

Conducted Emission Test Result: (100 X 100 MHz)

Testing room: Temperature : 28 ° C Humidity : 45 % RH

Line 1

FREQUENCY (KHz)	READING AMPLITUDE			LIMIT		MARGIN (dB)
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
15600	28.56	***.**	***.**	48.00	***.**	-19.44
16260	36.33	***.**	***.**	48.00	***.**	-11.67
16800	30.36	***.**	***.**	48.00	***.**	-17.64
17700	34.95	***.**	***.**	48.00	***.**	-13.05
18980	32.48	***.**	***.**	48.00	***.**	-15.52
19750	32.97	***.**	***.**	48.00	***.**	-15.03
22310	28.39	***.**	***.**	48.00	***.**	-19.61
23050	33.85	***.**	***.**	48.00	***.**	-14.15
24300	29.34	***.**	***.**	48.00	***.**	-18.66
29180	29.23	***.**	***.**	48.00	***.**	-18.77

Line 2

FREQUENCY (KHz)	READING AMPLITUDE			LIMIT		MARGIN (dB)
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
803	31.46	***.**	***.**	48.00	***.**	-16.54
851	33.07	***.**	***.**	48.00	***.**	-14.93
16480	32.00	***.**	***.**	48.00	***.**	-16.00
16800	32.43	***.**	***.**	48.00	***.**	-15.57
17350	32.50	***.**	***.**	48.00	***.**	-15.50
18340	33.96	***.**	***.**	48.00	***.**	-14.04
19620	32.76	***.**	***.**	48.00	***.**	-15.24
20510	32.47	***.**	***.**	48.00	***.**	-15.53
21560	32.50	***.**	***.**	48.00	***.**	-15.50
24470	32.55	***.**	***.**	48.00	***.**	-15.45

Appendix B

Radiated Emission Test Result: (Horizontal) (10 X 100 MHz)

Test Conditions:

Testing room : Temperature : 25 ° C Humidity : 30 % RH

Testing site : Temperature : 25 ° C Humidity : 42 % RH

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
350.000	61.69	0.99	98	-19.58	42.11	46.00	-3.89
375.000	57.66	0.99	283	-18.73	38.93	46.00	-7.07
400.010	53.67	0.99	131	-17.95	35.72	46.00	-10.28
***							

Note:

1.Margin = Amplitude - limit, if margin is minus means under limit.

2.Corrected Amplitude = Reading Amplitude + Correction Factors

3.Correction factor = Antenna factor + (Cable Loss - Amplitude gain)

(For example: 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)

Radiated Emission Test Result: (Vertical) (10 X 100 MHz)

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
32.020	48.44	0.99	340	-23.40	25.04	40.00	-14.96
43.520	50.26	0.99	233	-22.17	28.09	40.00	-11.91
77.220	61.68	2.50	235	-24.17	37.51	40.00	-2.49
81.200	59.81	0.99	320	-25.96	33.85	40.00	-6.15
125.000	53.23	4.00	345	-21.89	31.34	43.50	-12.16
130.020	53.55	0.99	115	-21.75	31.80	43.50	-11.70
250.000	58.27	0.99	81	-22.68	35.59	46.00	-10.41
350.000	54.28	0.99	74	-19.58	34.70	46.00	-11.30
***							

Final statement:

This test report, measurements made by TRC are traceable to the NIST.

EXHIBIT B

Measurement Report

MEASUREMENT REPORT
of
CORDLESS TELEPHONE

Applicant : GVC CORPORATION

Model No. : MH-9988

EUT : 900 MHz S.S.T. Cordless Phone

FCC ID : DK4MH9988BK

Report No. : G0115637

Test by :

Training Research Co., Ltd.

TEL : 886-2-26935155 FAX : 886-2-26934440

2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan, R.O.C.

CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (1992) as a reference. All test were conducted by ***Training Research Co., Ltd.***, 2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set forth in the FCC Rules Part 15 Subpart C Section 15.233.

Applicant	: GVC CORPORATION
Model No.	: MH-9988
EUT	: 900 MHz S.S.T. Cordless Phone
FCC ID	: DK4MH9988BK
Report No.	: G0115637
Test Date	: Aug. 16, 1999

Prepared by: _____
JACK TSAI

Approved by: _____
FRANK TSAI

Test by :

Training Research Co., Ltd.

TEL: 886-2-26935155 **FAX: 886-2-26934440**

2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan, R.O.C.

Tables of Contents

I . GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of Applicant in support of a Cordless Telephone certification in accordance with Part 2 Subpart J and Part 15 Subpart A and C of the Commission's Rules and Regulations.

1.2 Description of EUT

EUT	: 900MHz S.S.T. Cordless Phone
Model No.	: MH-9988
FCC ID	: DK4MH9988BK
Frequency Range	: Base : 905.023 – 927.133 MHz Handset : 904.520 – 926.128 MHz
Support Channel	: 20 Channel
Modulation Skill	: TDMA / Spread spectrum
Security Code	: 12-bit P/N code, 8-bit scramble, 16-bit 2D
Power Type	: Base Powered by 120Vac 60 Hz / 9Vdc 400mA Handset powered by 3.6V / 600mAh
Power Cord	: Non-shielded
Data Cable	: RJ-11C x 1 => Non-shielded, 7' long, Plastic hoods, No bead
Applicant	: GVC CORPORATION 14F, 76 TUN-HWA S. RD., SEC. 2, TAIPEI, TAIWAN

1.3 Description of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

PSTN Simulator	: King Design Public Switched Telephone Network Simulator
Model No.	: 8705-A
Serial No.	: N/A
Notebook	: CER Notebook
Model No.	: 386SL
Serial No.	: 001855
Power Type	: Linear
Power Core	: Non-shielded, 6' long, Plastic hoods, No ferrite bead
FCC ID	: Q8V486S
Headset & Mic.	: DBTEL
Model No.	: D & B
Serial No.	: N/A
Data Cable	: Non-shielded, 217cm long, Plastic hoods, No bead

1.4 Configuration of System Under Test

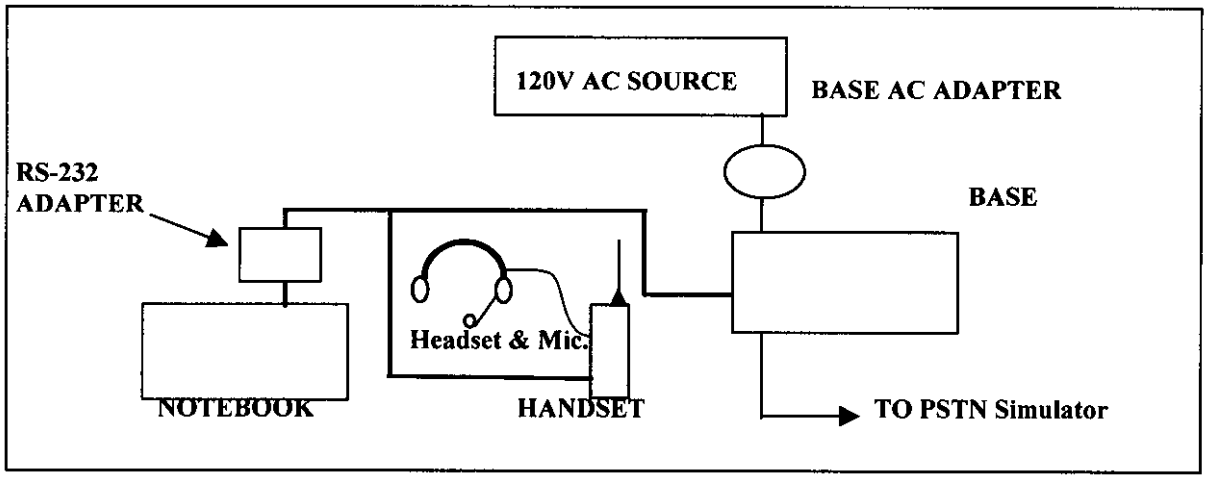


Fig. 1 Configuration of system under test

The tests below are run with the DCT transmitter set at high power in TDD mode .A serial port from a computer to the DCT UUT is needed to force selection of output power level and channel number.

The setting up procedure was recorded in Appendix A.

1.5 Verify the Frequency and Channel

1.5.1 Verify the Frequency Pairs

Channel	Base(MHz)	Handset(MHz)	Channel	Base(MHz)	Handset(MHz)
1	905.023	904.520	11	915.300	915.300
2	904.700	904.700	12	916.500	916.500
3	906.900	906.900	13	918.700	918.700
4	907.100	907.100	14	919.900	919.900
5	908.300	908.300	15	920.100	920.100
6	909.500	909.500	16	921.300	921.300
7	910.700	910.700	17	922.500	922.500
8	912.900	912.900	18	924.700	924.700
9	913.100	913.100	19	925.900	925.900
10	915.575	915.072	20	927.133	926.128

Note:

1.This is for sure that all frequencies are in 902 MHz to 928 MHz.

2.Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz. (The locations of these frequencies one near the top, one near the middle and one near the bottom.)

3.After test, the EUT operating frequencies are in 904.520 MHz to 927.133 MHz. So all the items as followed in testing report are need to test these three frequencies: top: channel 1, middle: channel 10, bottom: channel 20.

1.6 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (1992) and the pre-setup was written on Appendix A, the detail setup was written on each test item.

1.7 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter, Anechoic Chamber (Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F., No. 2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a shielded enclosure also located at Training Research Co., Ltd. B1, No. 2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.8 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests was chosen as that which produced the highest emission levels. However, only those conditions which the EUT was considered likely to encounter in normal use were investigated.

In test, the base and handset are tested separately. They were set in high power and continuously transmitting mode that controlled by computer. The ch01, ch10 and ch20 of base and handset were all tested. The setting up procedure is recorded on Appendix A.

Ⅱ. Section 15.207: Power Line Conducted Emissions for AC Powered Units

2.1 Test Condition & Setup

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the backwall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3825/2 Line Impedance Stabilization Networks (LISNs). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPER quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 450 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 2.4.

There are tree test condition apply in this test item, the test procedure description as the following :

1.Base station transmit only:
Using the RS-232 port of notebook and Rockwell software to control the base, handset. Then making access to the mode of continuous transmission. Three channel is tested, one in the top (CH01), one in the middle (CH10) and the other in bottom (CH20).

2.Idle state (handset park, on hook mode)

The setting up procedure is recorded on Appendix A.

2.2 List of Test Instruments

Manufacturer	Device	Model	Input impedance
Hewlett Packard	100Hz-1.5GHz Spectrum Analyzer	HP8591EM	50.00
EMCO	Line Impedance Stabilization Network	3825/2	50.00
TRC	Shielded Room	TRC-SR!	N/A

2.4 Test Result of Conducted Emissions

2.4.1 Base station transmit only

The following table shows a summary of the highest emissions of power line conducted emissions on the HOT and NATURAL conductors of the EUT power cord.

Model No. : MH-9988

EUT : 900MHz S.S.T. Cordless Phone

Table 1 Power Line Conducted Emissions (Channel 1)

Power	*Connected*	*Emissions*	*FCC Class B*	
Conductor	*Frequency (KHz)*	*Peak Amplitude (dBuV)*	*Limit (dBuV)*	*Margin (dB)*
Line 1	464.00	36.86	48.00	-11.14
	477.00	37.25	48.00	-10.75
	489.00	37.77	48.00	-10.23
	512.00	38.25	48.00	-9.75
	538.00	38.65	48.00	-9.35
	553.00	38.12	48.00	-9.88
	568.00	38.46	48.00	-9.54
	601.00	37.97	48.00	-10.03
	628.00	36.63	48.00	-11.37
	650.00	35.81	48.00	-12.19
LINE 2	455.00	40.86	48.00	-7.14
	489.00	40.06	48.00	-7.94
	508.00	39.82	48.00	-8.18
	538.00	38.86	48.00	-9.14
	553.00	38.83	48.00	-9.17
	593.00	37.72	48.00	-10.28
	637.00	36.43	48.00	-11.57
	692.00	35.45	48.00	-12.55
	719.00	35.07	48.00	-12.93
	1215.00	35.39	48.00	-12.61

NOTE:

1. Margin = Peak Amplitude - Limit
2. A "+" sign in the margin column means the emission is OVER the Class B Limit and "-" sign of means UNDER the Class B limit.

Table 2 Power Line Conducted Emissions (Channel 10)

Power Conductor	*Connected Frequency (KHz)*	*Emissions Peak Amplitude (dBuV)*	*FCC Class B Limit (dBuV)*	*Margin (dB)*
Line 1	461.00	36.61	48.00	-11.39
	470.00	36.44	48.00	-11.56
	486.00	36.83	48.00	-11.17
	515.00	37.88	48.00	-10.12
	538.00	38.01	48.00	-9.99
	549.00	38.10	48.00	-9.90
	571.00	38.39	48.00	-9.61
	590.00	38.09	48.00	-9.91
	628.00	37.16	48.00	-10.84
	650.00	36.78	48.00	-11.22
LINE 2	452.00	40.86	48.00	-7.14
	467.00	40.82	48.00	-7.18
	508.00	39.84	48.00	-8.16
	530.00	39.03	48.00	-8.97
	549.00	38.40	48.00	-9.60
	604.00	36.95	48.00	-11.05
	658.00	34.45	48.00	-13.55
	966.00	32.59	48.00	-15.41
	991.00	32.55	48.00	-15.45
	1021.00	32.56	48.00	-15.44

Table 3 Power Line Conducted Emissions (Channel 20)

Power	*Connected*	*Emissions*	*FCC Class B*	
Conductor	*Frequency (KHz)*	*Peak Amplitude (dBuV)*	*Limit (dBuV)*	*Margin (dB)*
Line 1	461.00	36.54	48.00	-11.46
	470.00	37.02	48.00	-10.98
	489.00	37.06	48.00	-10.94
	508.00	37.67	48.00	-10.33
	524.00	37.79	48.00	-10.21
	545.00	38.15	48.00	-9.85
	571.00	38.25	48.00	-9.75
	597.00	37.84	48.00	-10.16
	641.00	36.64	48.00	-11.36
	654.00	35.95	48.00	-12.05
LINE 2	461.00	40.98	48.00	-7.02
	489.00	40.39	48.00	-7.61
	505.00	39.75	48.00	-8.25
	515.00	39.77	48.00	-8.23
	530.00	39.22	48.00	-8.78
	560.00	38.40	48.00	-9.60
	590.00	37.81	48.00	-10.19
	620.00	36.51	48.00	-11.49
	654.00	35.79	48.00	-12.21
	675.00	34.67	48.00	-13.33

Table 4 Power Line Conducted Emissions (Charging)

Power	*Connected*	*Emissions*	*FCC Class B*	
Conductor	*Frequency (KHz)*	*Peak Amplitude (dBuV)*	*Limit (dBuV)*	*Margin (dB)*
Line 1	464.00	38.86	48.00	-9.14
	499.00	40.88	48.00	-7.12
	515.00	41.12	48.00	-6.88
	530.00	40.91	48.00	-7.09
	560.00	39.72	48.00	-8.28
	597.00	37.63	48.00	-10.37
	628.00	35.73	48.00	-12.27
	773.00	33.87	48.00	-14.13
	813.00	33.89	48.00	-14.11
	868.00	33.80	48.00	-14.20
LINE 2	455.00	39.30	48.00	-8.70
	477.00	39.55	48.00	-8.45
	489.00	39.29	48.00	-8.71
	512.00	38.58	48.00	-9.42
	553.00	36.60	48.00	-11.40
	633.00	34.96	48.00	-13.04
	645.00	34.81	48.00	-13.19
	688.00	35.99	48.00	-12.01
	739.00	34.96	48.00	-13.04
	1021.00	35.04	48.00	-12.96

Table 5 Power Line Conducted Emissions (Linking)

Power	*Connected*	*Emissions*	*FCC Class B*	
Conductor	*Frequency (KHz)*	*Peak Amplitude (dBuV)*	*Limit (dBuV)*	*Margin (dB)*
Line 1	457.00	35.85	48.00	-12.15
	467.00	36.68	48.00	-11.32
	499.00	38.92	48.00	-9.08
	524.00	39.52	48.00	-8.48
	545.00	39.65	48.00	-8.35
	568.00	39.36	48.00	-8.64
	590.00	38.94	48.00	-9.06
	615.00	38.08	48.00	-9.92
	637.00	37.79	48.00	-10.21
	650.00	37.06	48.00	-10.94
LINE 2	461.00	40.56	48.00	-7.44
	486.00	40.04	48.00	-7.96
	524.00	39.12	48.00	-8.88
	542.00	38.36	48.00	-9.64
	571.00	36.99	48.00	-11.01
	593.00	36.04	48.00	-11.96
	604.00	35.45	48.00	-12.55
	1156.00	33.72	48.00	-14.28
	1224.00	35.17	48.00	-12.83
	1274.00	36.65	48.00	-11.35

Ⅲ. Section 15.247(a)(2): Bandwidth for Direct Sequence System.

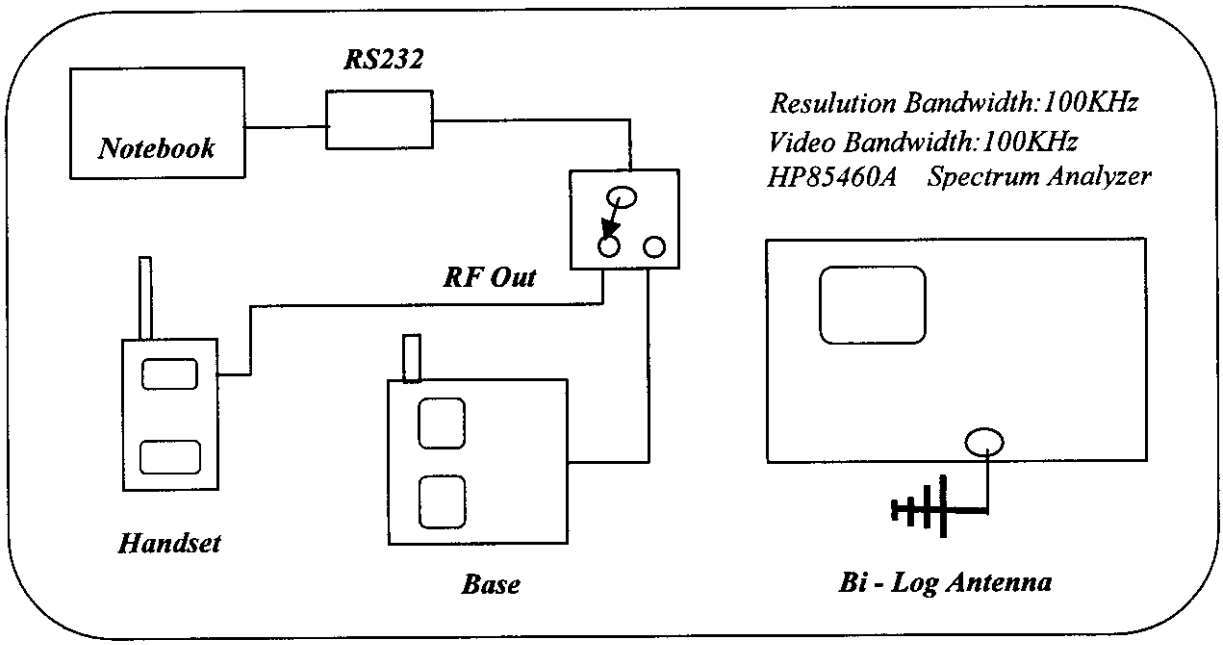
3.1 Test Condition & Setup

The transmitter bandwidth measurements were performed in a shielded enclosure. The EUT was placed on a wooded table which is 0.8 meters height. The EUT was set to transmit continuously. Various channels were also investigated to find the maximum occupied bandwidth. The minimum 6 dB bandwidth shall be at least 500 KHz.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Set the span>> RBW. The detector function was set to peak and hold mode to clearly observe the components.

Setting up procedure is written on Appendix A.

3.2 Test Instruments Configuration



P.S.A serial port from notebook computer to control the EUT at maximal power output and channel Number.

Fig 10. Test Configuration of bandwidth for direct sequence system

3.3 List of Test Instruments

Manufacturer	Device	Model	Input Impedance
Hewlett Packard	.9KHz – 6GHz EMI Receiver	HP85460A	50.00
M.E.	30MHz-1.5GHz Bi-Log Antenna	VULB 9160	50.00

3.4 Test Result of Bandwidth

Bandwidth of Channel 1

Bandwidth of Base : 1.57 MHz
Bandwidth of Handset : 1.57 MHz
The min. 6 dB BW at least : 500 KHz

Bandwidth of Channel 10

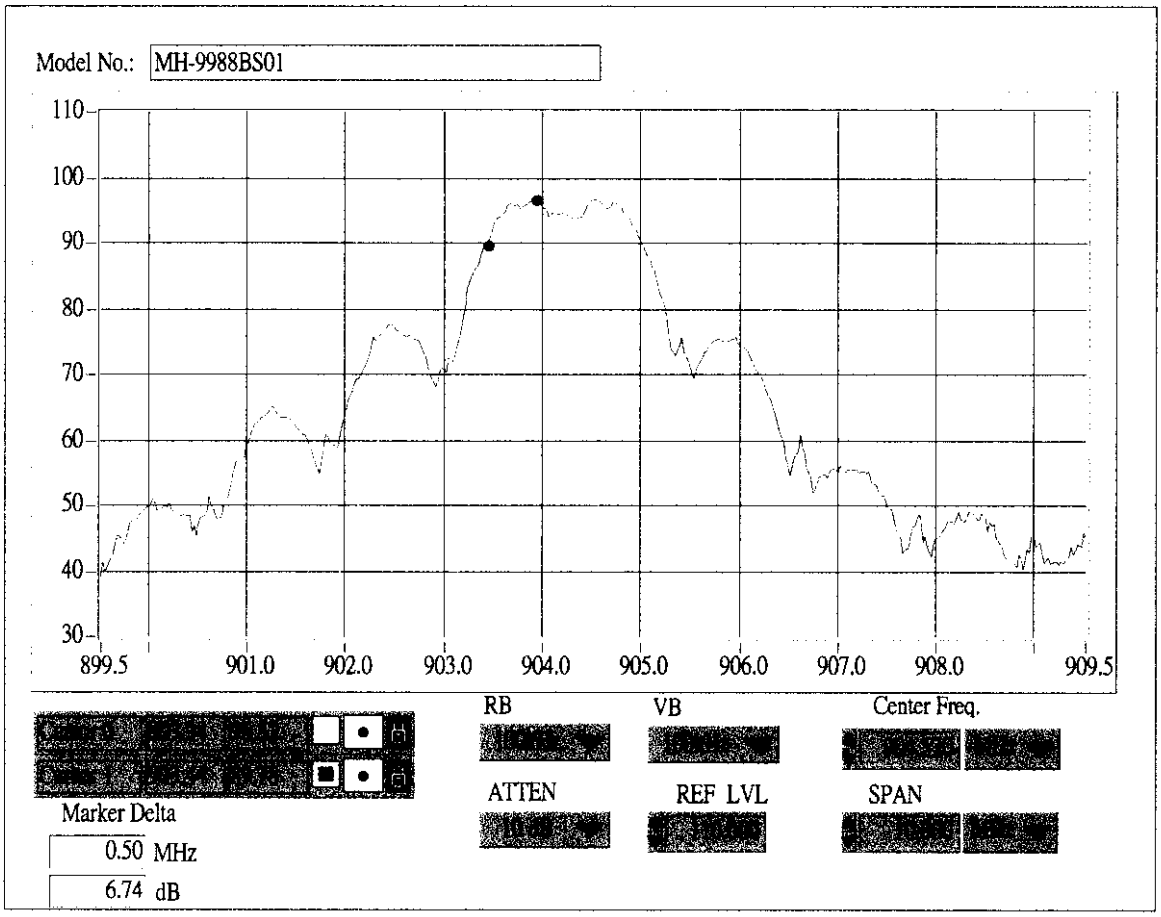
Bandwidth of Base : 1.55 MHz
Bandwidth of Handset : 1.57 MHz
The min. 6 dB BW at least : 500 KHz

Bandwidth of Channel 20

Bandwidth of Base : 1.57 MHz
Bandwidth of Handset : 1.57 MHz
The min. 6 dB BW at least : 500 KHz

Note:

1. The data in the above table are summarize the following attachment spectrum analyzer hard copy.
2. The attachment follow by this page and there is no page number.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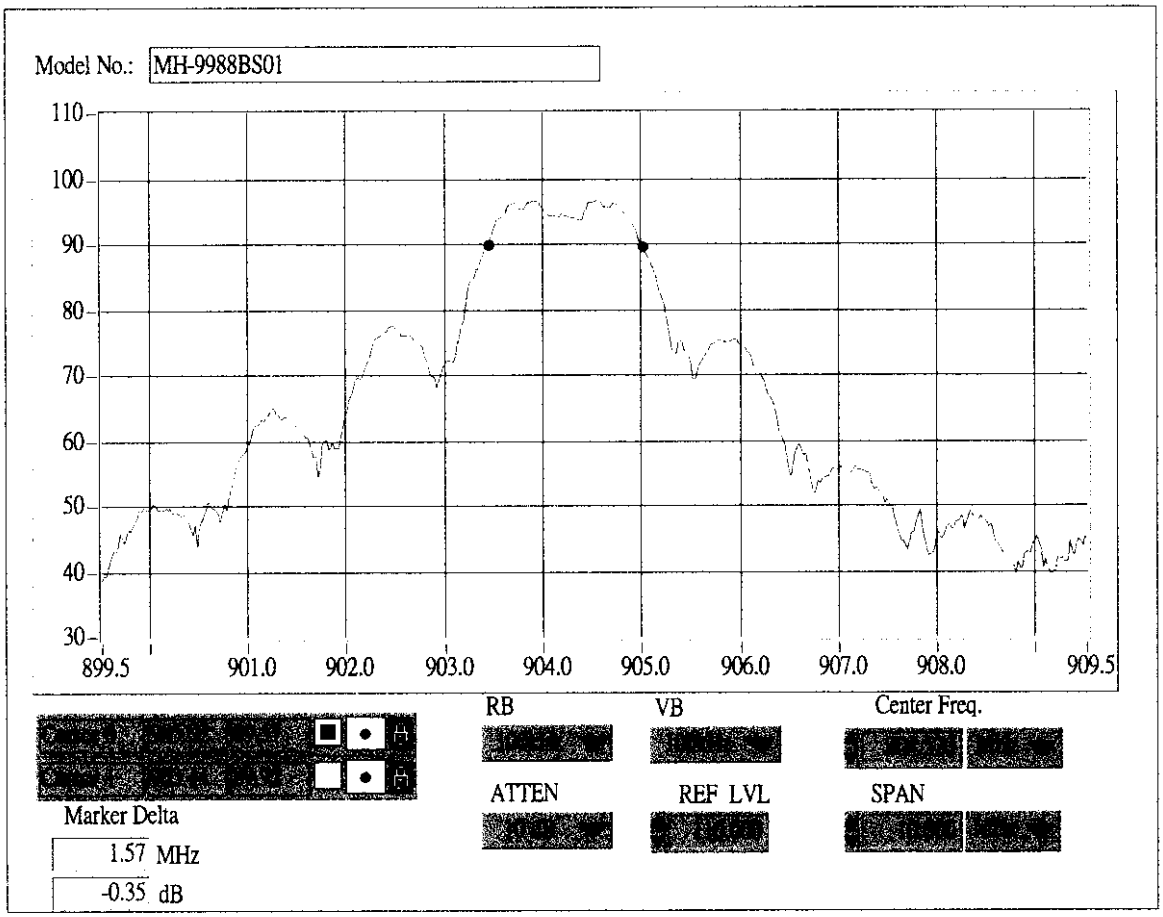
90
80
70
60
50
40
30
899.5
901.0
902.0
903.0
904.0
905.0
906.0
907.0
908.0
909.5
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
0.50 MHz
6.74 dB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30
899.5
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904.0
905.0
906.0
907.0
908.0
909.5
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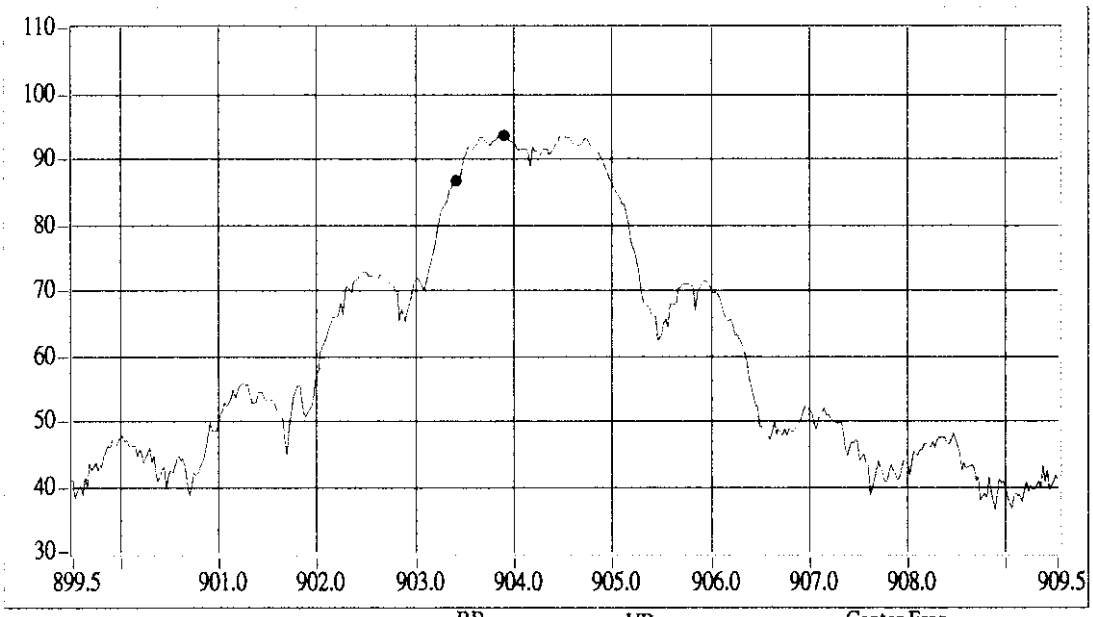
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.57 MHz
-0.35 dB

Model No.: MH-9988HS01



RB VB Center Freq.

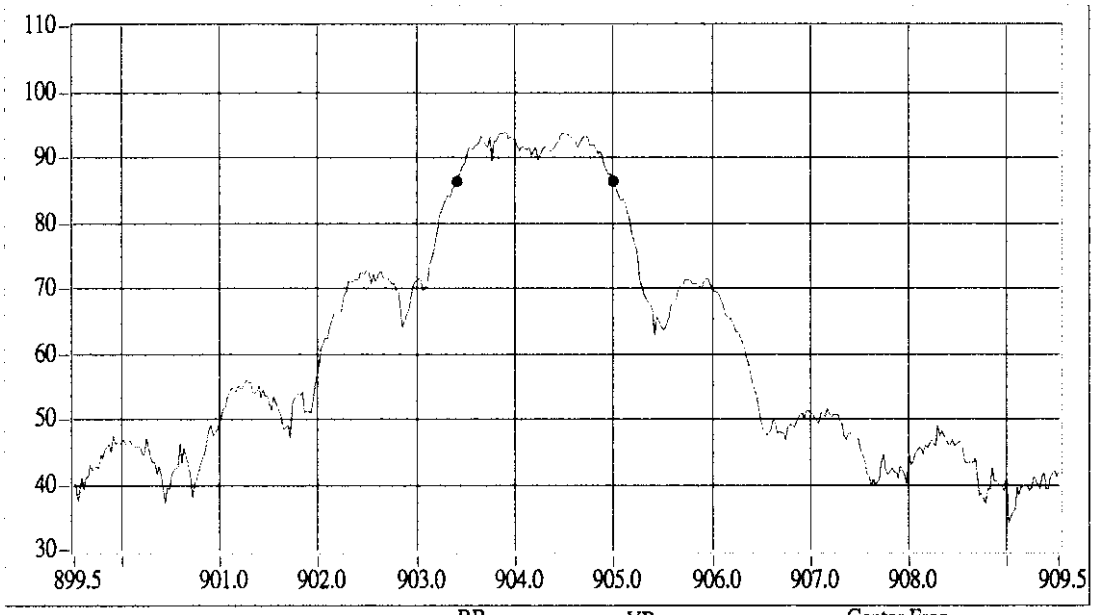
ATTEN REF LVL SPAN

Marker Delta

0.47 MHz

6.96 dB

Model No.: MH-9988HS01



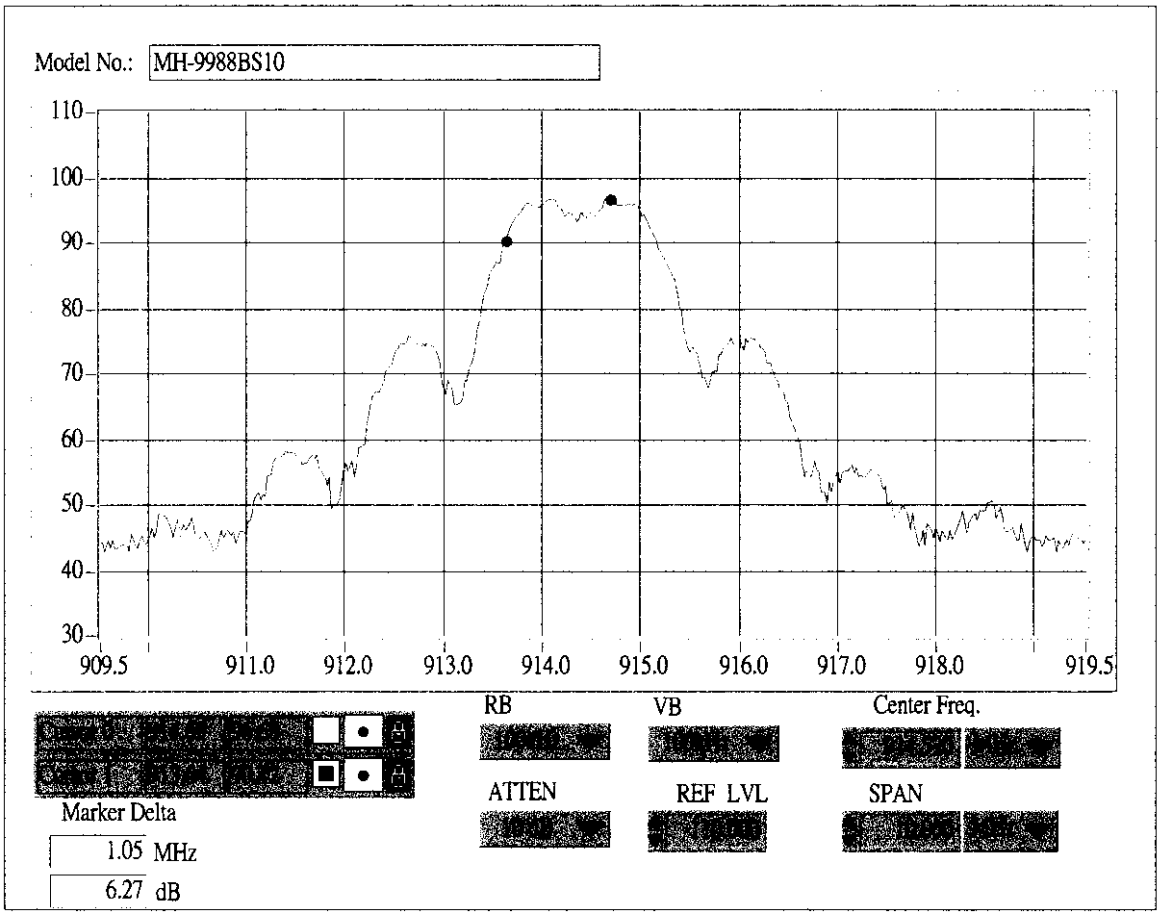
RB VB Center Freq.

ATTEN REF LVL SPAN

Marker Delta

1.57 MHz

-0.25 dB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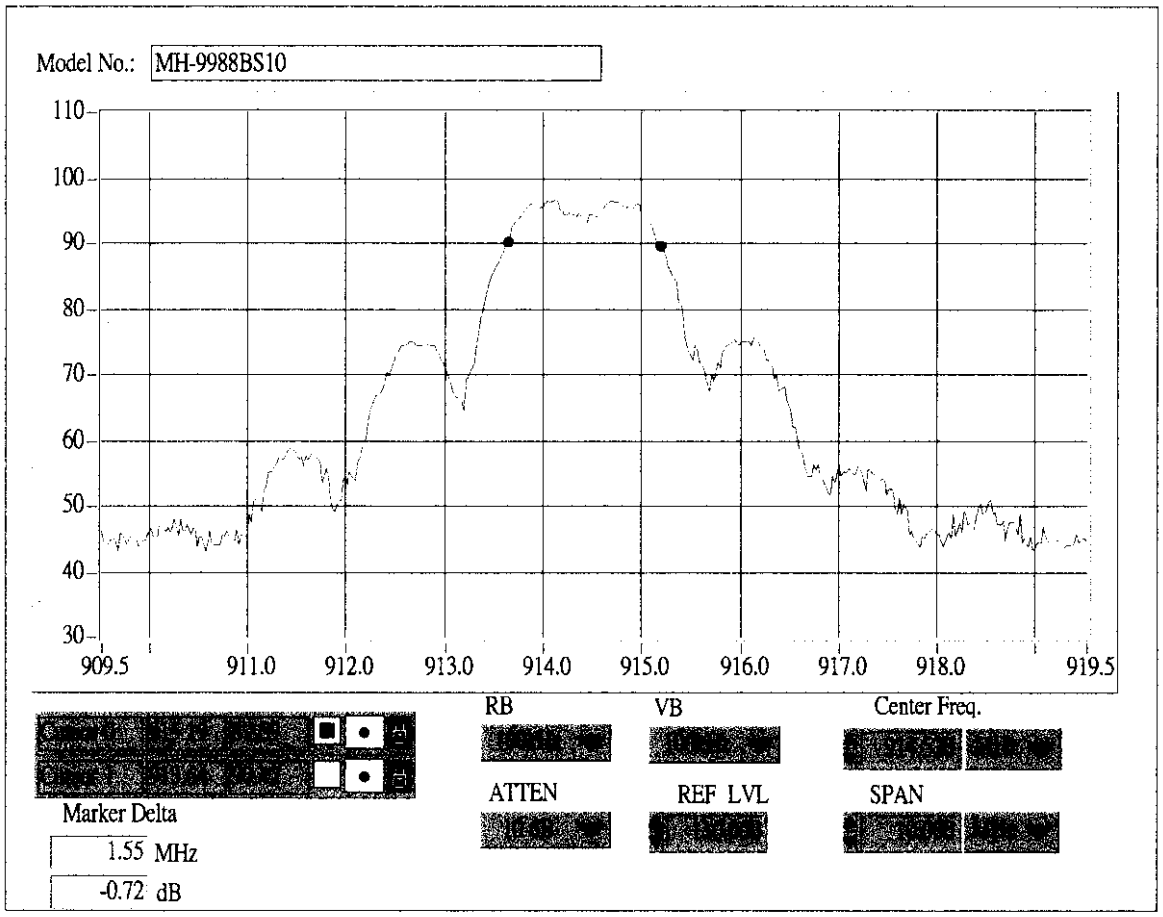
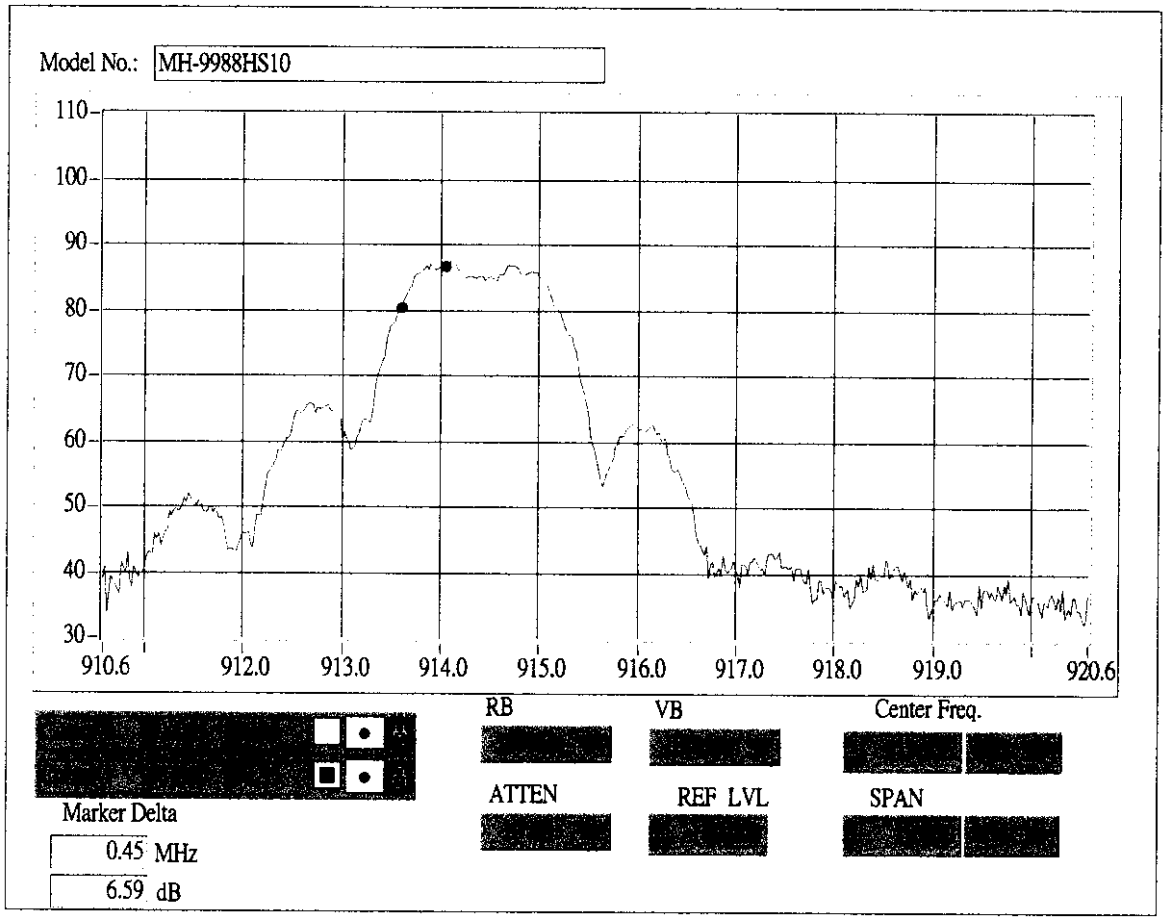
100
90
80
70
60
50
40
30
909.5
911.0
912.0
913.0
914.0
915.0
916.0
917.0
918.0
919.5
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.05 MHz
6.27 dB


Model No.: MH-9988BS10
110
100
90
80
70
60
50
40
30
909.5
911.0
912.0
913.0
914.0
915.0
916.0
917.0
918.0
919.5
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.55 MHz
-0.72 dB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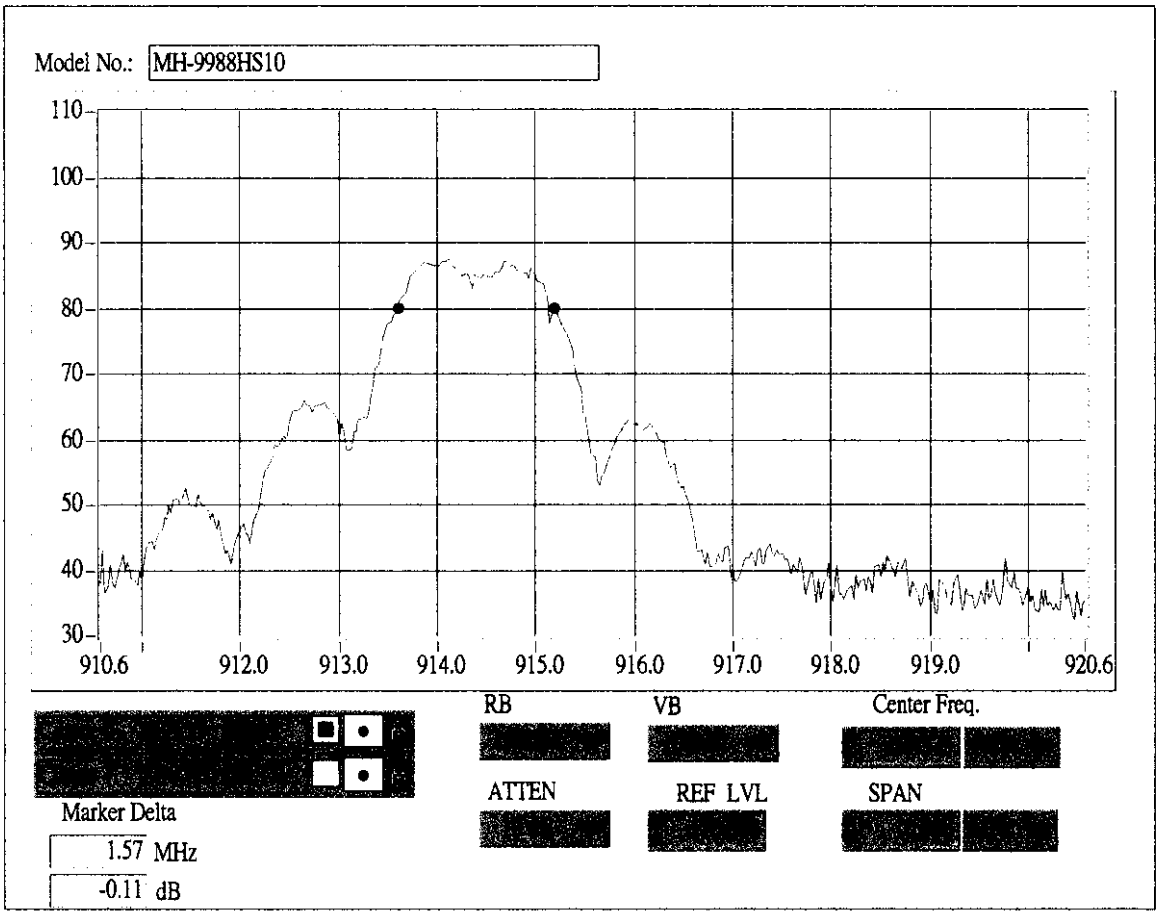
110
100
90
80
70
60
50
40
30
910.6
912.0
913.0
914.0
915.0
916.0
917.0
918.0
919.0
920.6
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
0.45 MHz
6.59 dB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80
70
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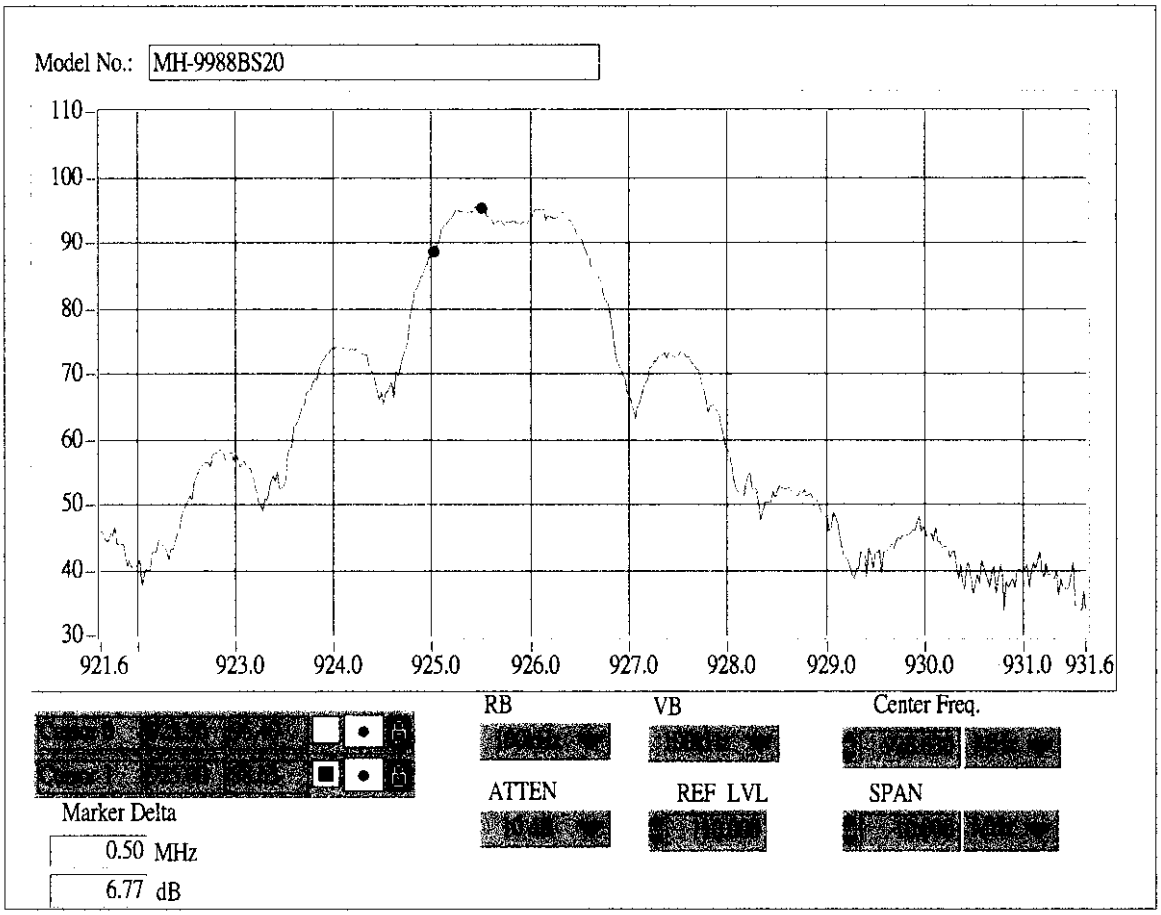
50
40
30
910.6
912.0
913.0
914.0
915.0
916.0
917.0
918.0
919.0
920.6
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.57 MHz
-0.11 dB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60
50
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30
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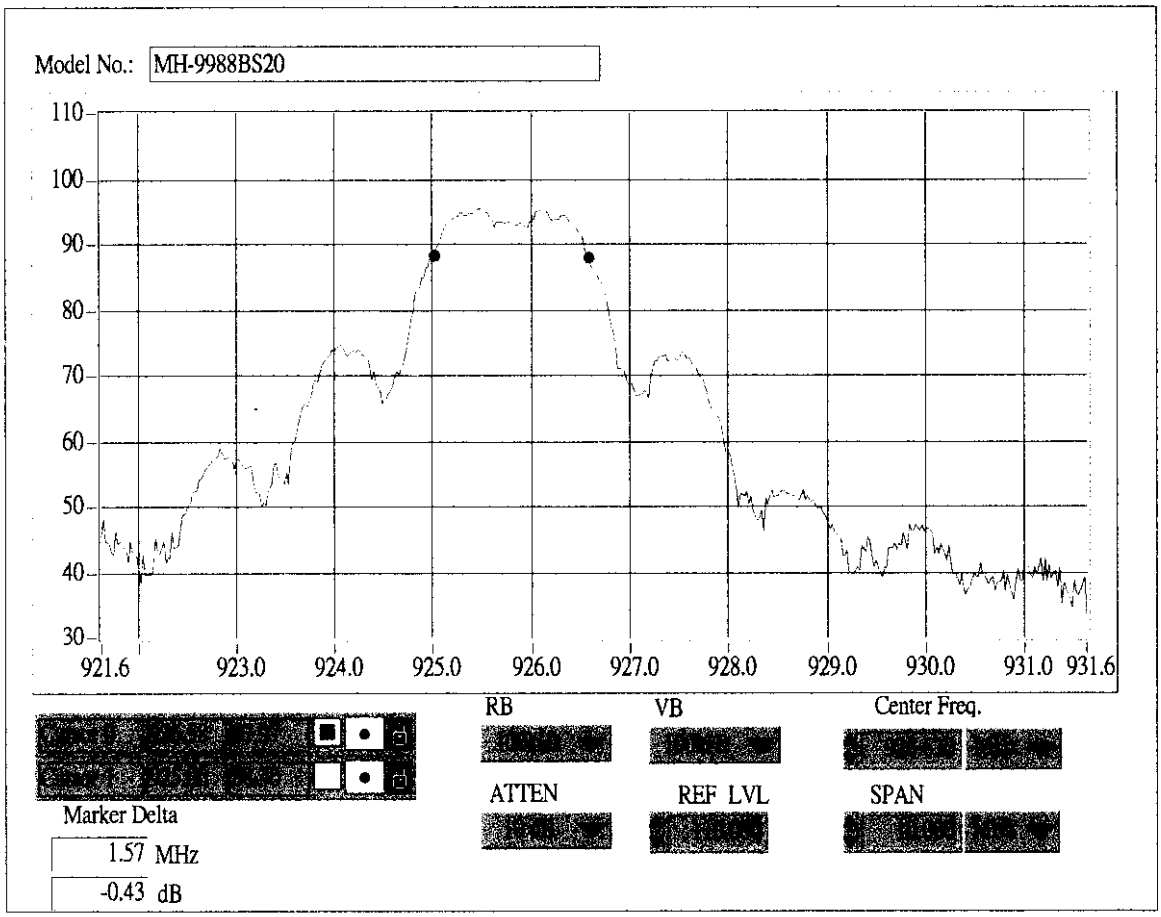
923.0
924.0
925.0
926.0
927.0
928.0
929.0
930.0
931.0
931.6
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
0.50 MHz
6.77 dB


Model No.: MH-9988BS20
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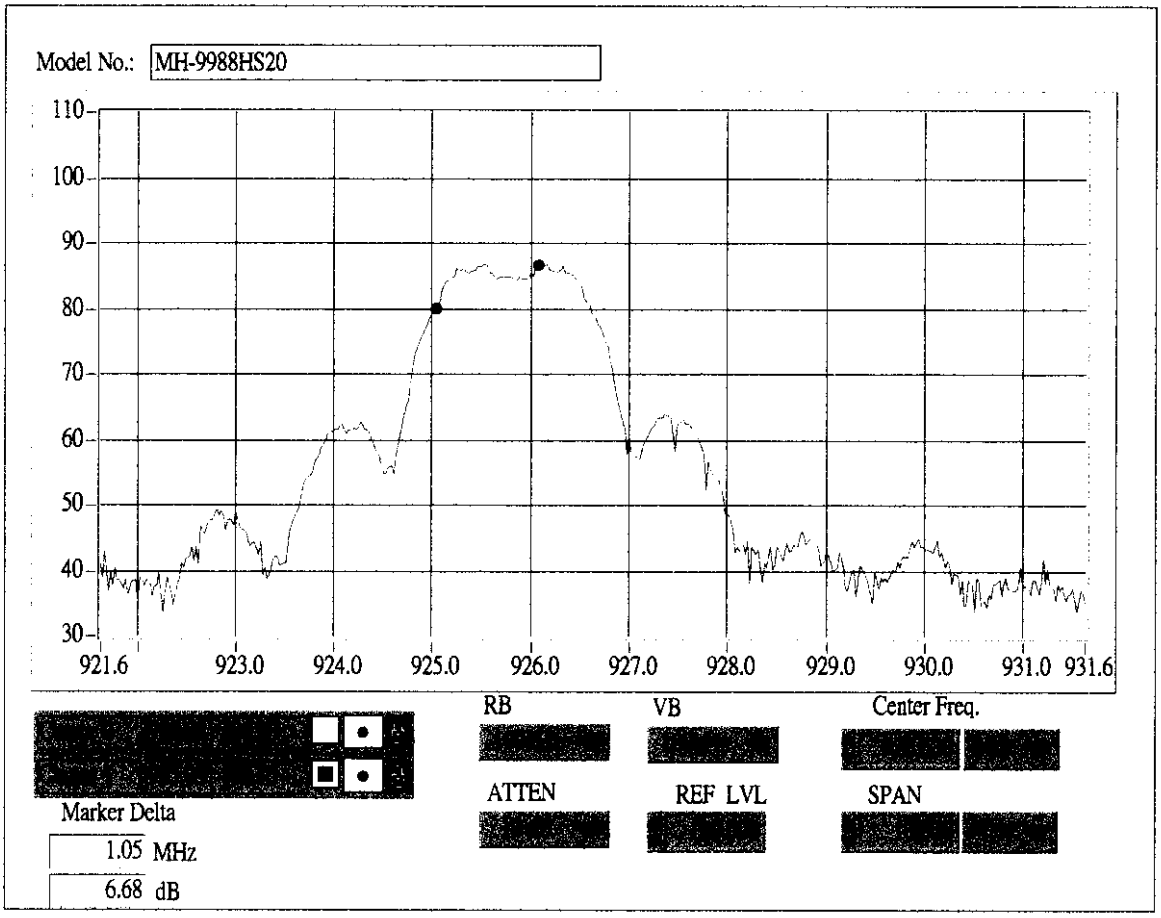
70
60
50
40
30
921.6
923.0
924.0
925.0
926.0
927.0
928.0
929.0
930.0
931.0
931.6
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.57 MHz
-0.43 dB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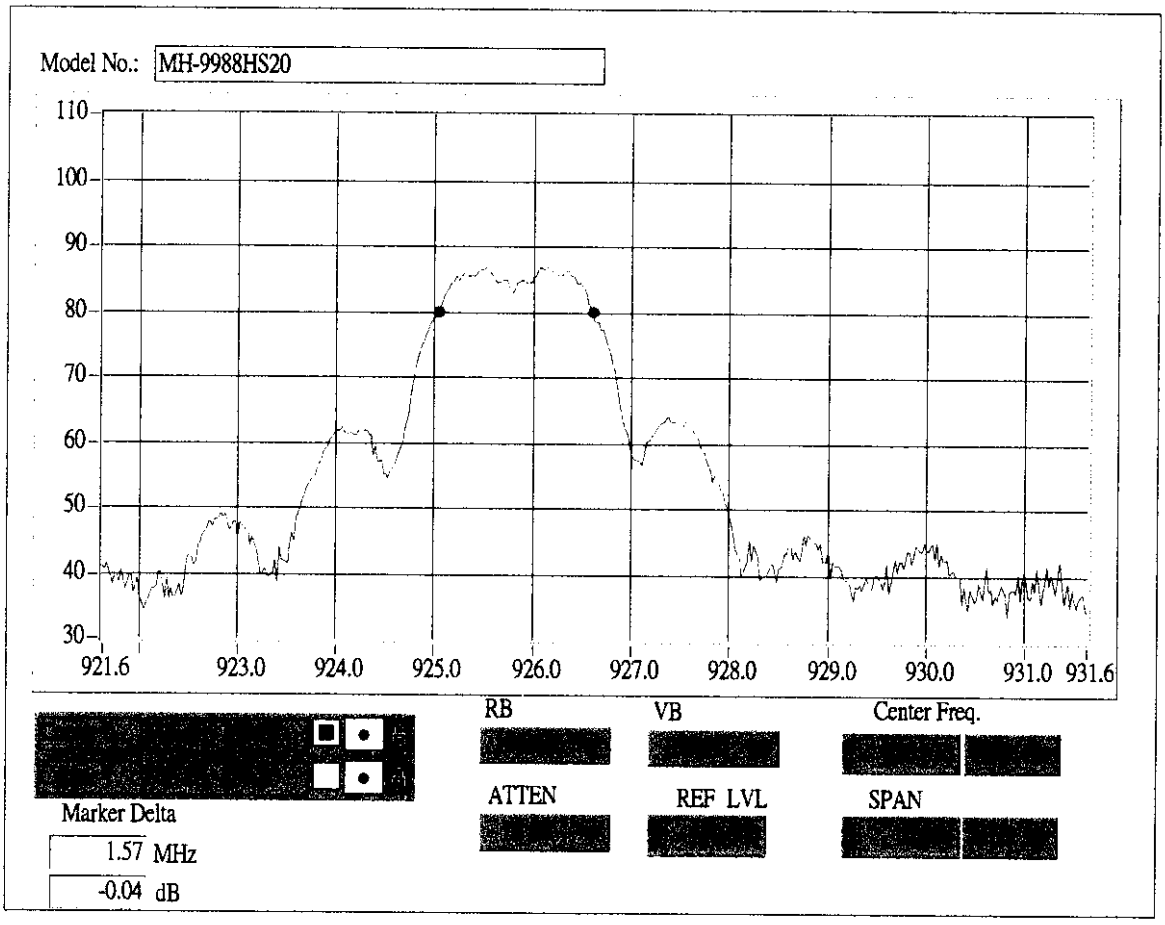
90
80
70
60
50
40
30
921.6
923.0
924.0
925.0
926.0
927.0
928.0
929.0
930.0
931.0
931.6
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.05 MHz
6.68 dB


Model No.: MH-9988HS20
110
100
90
80
70
60
50
40
30
921.6
923.0
924.0
925.0
926.0
927.0
928.0
929.0
930.0
931.0
931.6
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.57 MHz
-0.04 dB

Ⅳ. Section 15.247(B) : Power Output

4.1 Test Condition & Setup

The EUT was placed in a anechoic chamber and scanned at 3 meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration which produced the highest emissions was noted so it could be reproduced later during the final tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT. Final radiation measurements were made on a three-meter, anechoic chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The spectrum was examined from 30 MHz to 1000 MHz using an Hewlett Packard 85460A EMI Receiver, M.E.whole range Bi-Log antenna (Model No.: VULB9160) is used to measure frequency from 30 MHz to 1GHz.The final test is used the spectrum HP 85460A. At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. The spectrum analyzer HP85460A used on this testing for frequency 30MHz to 1000MHz. No post-detector video filters were used in the test. Set the RB= 3 MHz, VB = 3MHz and the span = 5 MHz. The analyzer was operated in the maximum hold mode.

There are two test condition apply in this test item, the test procedure description as the following:

(1) Base and handset station transmit only:

Using the RS-232 port of notebook and Rockwell software to control the base, handset. Then making access to the mode of continuous transmission. Three channel is tested, one in the top (CH01), one in the middle (CH10) and the other in bottom (CH20).

With the transmitter operating from a fully charged battery and using the internal antenna,

Radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to low, mid and high channels in the 902-928 MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency.

4.2 List of Test Instruments

Manufacturer	Device	Model	Input Impedance
Hewlett Packard	.9KHz – 6GHz EMI Receiver	HP85460A	50.00
M.E.	30MHz-1.5GHz Bi-Log Antenna	VULB 9160	50.00

4.3 Test Result of Fundamental Emissions

The peak values of fundamental emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

Model No. : MH-9988

EUT : 900MHz S.S.T. Cordless Phone

Table 6 Open Field Fundamental Emissions

Channel	*Frequency (MHz)*	*A.P. (H/V)*	*A.H. (M)*	*Table (degree)*	*Amplitude (dBuV/m)*	*CF (dB)*	*Corrected Amplitude (dBuV/m)*	*E.R.P.(Peak)*	
								mW	*dBm*
Base 01	904.520	H	1.00	241	127.99	-27.96	100.03	3.021	4.801
	905.023	V	1.00	16	131.73	-27.96	103.77	7.147	8.541
Base 10	915.575	H	1.00	310	127.46	-28.04	99.42	2.625	4.191
	915.575	V	1.00	11	127.97	-28.04	99.93	2.952	4.701
Base 20	926.128	H	1.00	120	127.71	-28.21	99.50	2.674	4.271
	927.133	V	1.00	96	131.20	-28.21	102.99	5.972	7.761
Handset 01	905.023	H	1.00	108	101.76	-27.96	73.80	0.007	-21.429
	904.520	V	1.00	45	128.20	-27.96	100.24	3.170	5.011
Handset 10	915.575	H	1.00	177	122.00	-28.04	93.96	0.747	-1.269
	915.072	V	1.00	280	127.57	-28.04	99.53	2.692	4.301
Handset 20	927.133	H	1.00	118	119.10	-28.22	90.88	0.367	-4.349
	926.128	V	1.00	319	127.39	-28.21	99.18	2.484	3.951

Note:

1. A.P. means antenna polarization, horizontal and vertical.
2. A.H. means antenna height.
3. Table means turntable turning position.
4. Corrected Factor (C. F.) = Cable Loss + Antenna Factor – Amplified Gain
   Corrected Amplitude = Peak Amplitude + Corrected Factor
5. Amplitude means the fundamental emission measured.
6. Effective Radiation Power (E.R.P.) = $(E\ d)^2 / 30G$

E is the measured maximum field strength in V/m utilizing the maximum hold mode RBW (3MHz).
G is the numeric gain of the transmitting antenna over an isotropic radiator (1.00).
d is the distance in meters from which the field strength was measured (3M).

Example: the Max Radiation Emission of base ch01 = 100.03 dBuV/m

$10^{(100.03/20)} \times 10^{-6} = 0.100346$ V

E.R.P. = $(0.100346 \times 3)^2 / 30 = 3.021$ mW = 10 x log (3.021 mW/1mW) = 4.801 dBm

V. Section 15.247 (C)(2): Spurious Emissions (Radiated)

5.1 Test Condition & Setup

The EUT was placed in a anechoic chamber and scanned at 3 meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration which produced the highest emissions was noted so it could be reproduced later during the final tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements were made on a three-meter, anechoic chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The spectrum was examined from 30 MHz to 1000 MHz using an Hewlett Packard 85460A EMI Receiver, M.E.whole range Bi-Log antenna (Model No.: VULB9160) is used to measure frequency from 30 MHz to 1GHz.The final test is used the spectrum HP 85460A and spectrum was examined from 1 GHz to 18GHz using an Hewlett Packard 8592A Spectrum Analyzer, EMCO Horn Antenna (Model 3115) for 1 G - 18 GHz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. There are two spectrum analyzers use on this testing , HP 85460A for frequency 30MHz to 1000MHz, and HP8592A for frequency 1 GHz to 18 GHz. No post-detector video filters were used in the test. The spectrum analyzer's 6 dB bandwidth was set to 120 KHz (spectrum was examined from 30 MHz to 1000 MHz), the spectrum analyzer's 6 dB bandwidth was set to 1 MHz (spectrum was examined from 1 GHz to 18GHz) and the analyzer was operated in the maximum hold mode.

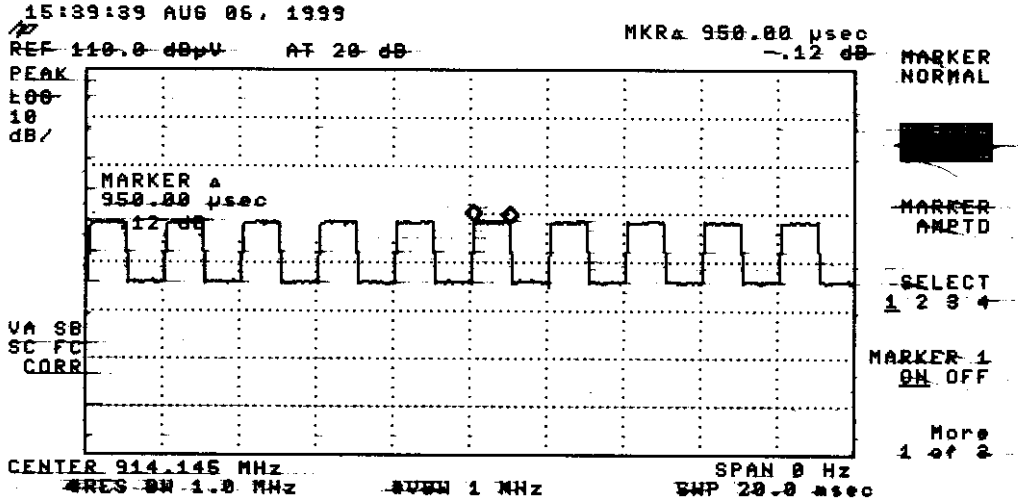
There are two test condition apply in this test item, the test procedure description as the following:

(1) Base and handset station transmit only:

Using the RS-232 port of notebook and Rockwell software to control the base, handset. Then making access to the mode of continuous transmission. Three channels is tested, one in the top (CH01), one in the middle (CH10) and the other in bottom (CH20).

With the transmitter operating from a fully charged battery and using the internal antenna, radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to low, mid and high channels in the 902-928 MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency.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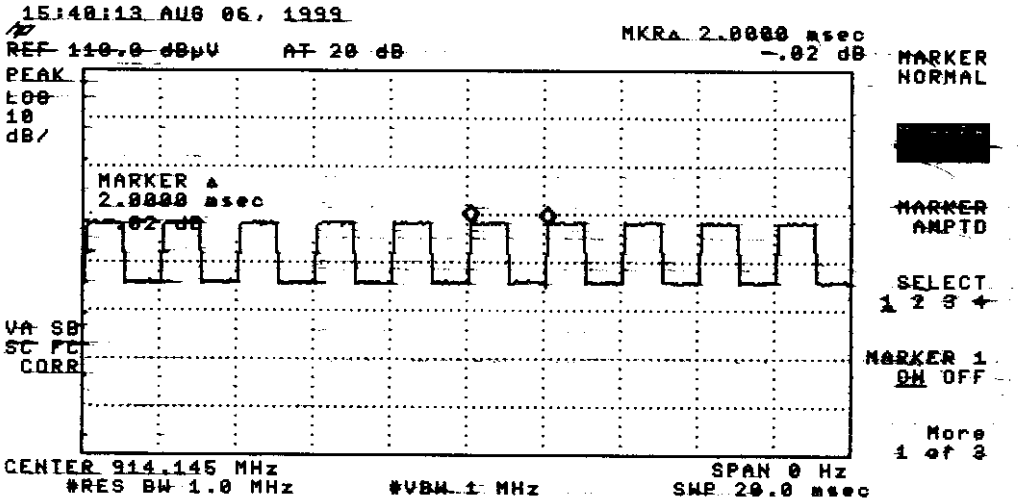
AT 20 dB
MKRΔ 950.00 µsec
-.12 dB
PEAK
LOG
10
dB/
MARKER Δ
950.00 µsec
-.12 dB
VA SB
SC FC
CORR
MARKER
NORMAL
MARKER
AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 2
CENTER 914.145 MHz
#RES BW 1.0 MHz
#VBW 1 MHz
SPAN 0 Hz
SWP 20.0 msec


15:40:13 AUG 06, 1999
REF 110.0 dBµV
AT 20 dB
MKRΔ 2.0000 msec
-.02 dB
PEAK
LOG
10
dB/
MARKER Δ
2.0000 msec
-.02 dB
VA SB
SC FC
CORR
MARKER
NORMAL
MARKER
AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 2
CENTER 914.145 MHz
#RES BW 1.0 MHz
#VBW 1 MHz
SPAN 0 Hz
SWP 20.0 msec

For frequency between 30MHz to 1000MHz

FIa (dBuV/m) = FIr (dBuV) + Correction Factors

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss

For frequency between 1 GHz to 18 GHz

FIa(dBuV/m) = FIr(dBuV) + Correction Factor - Duty Cycle

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Distance Factor (9.54dB)- Amplifier Gain

The setting up procedure is recorded on Appendix A.

5.2 List of Test Instruments

Manufacturer	Device	Model	Input Impedance
Hewlett Packard	.9KHz – 6GHz EMI Receiver	HP85460A	50.00
M.E.	30MHz-1.5GHz Bi-Log Antenna	VULB 9160	50.00
Hewlett Packard	.50KHz – 22GHz Spectrum Analyzer	HP8592A	50.00
EMCO	1G-18GMHz Double Ridge Antenna	3115.00	50.00

5.2.1 Duty Cycle Factor Measurement

The duty cycle factor measurement is performed in a shield enclosure. The test condition and setup is as same as paragraph Ⅲ. Set the RB = 1MHz, VB=1MHz, and span = 0 MHz. Link the base and handset ,then get the Time of duty and cycle as follow page.

The duty cycle factor = 20 log (T_{duty} / T_{cycle}) = 20 log (0.95000/2.00000) = - 6.466

5.4 Test Result of Second Harmonic

Set the spectrum RB= 3 MHz, VB = 3MHz and span = 5MHz. The correction factors of the second harmonic is the second harmonic must lower 20 dB than the fundamental.

Model No. : MH-9988

EUT : 900MHz S.S.T. Cordless Phone

Table 7 Second Harmonic Attendation

Channel	*Fundamental (MHz)*	*Fundamental (dBuV/m)*	*2nd Harmonic (GHz)*	*2nd Har. (dBuV/m)*	*Result (F/H dB)*	*Limit (dB)*	*Margin (dB)*
B/S CH 01	905.023	103.77	1.812	57.45	46.32	20.00	26.32
B/S CH 10	915.575	99.93	1.832	50.47	49.46	20.00	29.46
B/S CH 20	927.133	102.99	1.855	59.68	43.31	20.00	23.31
H/S CH 01	904.520	100.24	1.812	54.29	45.95	20.00	25.95
H/S CH 10	915.072	99.53	1.832	54.01	45.52	20.00	25.52
H/S CH 20	926.128	99.18	1.857	52.55	46.63	20.00	26.63

Note:

1. The data in the above table are summarize the following attachment spectrum analyzer hard copy.
2. Result = Fundamental – 2nd Harmonic must over 20 dB.

5.5 Test Result of Spurious Radiated Emissions

5.5.1 Base and handset station transmit only

The highest peak values of radiated emissions form the EUT at various antenna heights, antenna polarizations, EUT orientation, etc. are recorded on the following.

Model No. : MH-9988

EUT : 900MHz S.S.T. Cordless Phone

Table 8 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 1, Base Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
403.740	60.38	1.00	18	-18.22	42.16	46.00	-3.84
422.850	59.84	1.00	104	-18.70	41.14	46.00	-4.86
489.637	62.74	1.00	307	-20.40	42.34	46.00	-3.66
509.267	62.63	2.00	227	-20.64	41.99	46.00	-4.01
768.840	69.34	1.00	135	-25.66	43.68	46.00	-2.32
787.935	70.02	1.00	256	-26.28	43.74	46.00	-2.26
806.533	71.40	2.00	62	-26.63	44.77	46.00	-1.23
816.080	70.82	1.00	77	-26.54	44.28	46.00	-1.72
825.628	71.24	1.00	238	-26.60	44.64	46.00	-1.36
***							

Note:

1.Margin = Corrected - Limit.

2.Peak Amplitude + Correction Factors = Corrected

Table 9 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 1, Base Horizontal]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.68	49.58	1.00	88	-6.84	-6.46	36.28	54	-17.72
3.48	54.42	1.00	325	-5.64	-6.46	42.32	54	-11.68
3.59	50.59	1.00	120	-5.64	-6.46	38.49	54	-15.51
4.50	45.87	1.00	109	3.91	-6.46	43.32	54	-10.68
5.32	29.90	1.00	338	9.72	-6.46	33.16	54	-20.84
5.41	41.56	1.00	68	9.72	-6.46	44.82	54	-9.18
6.31	40.23	1.00	191	9.72	-6.46	43.49	54	-10.51
***								

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor + Duty Cycle = Corrected

Table 10 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 1, Base Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (MHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
489.637	63.27	1.00	171	-20.40	42.87	46.00	-3.13
509.267	64.68	2.00	107	-20.64	44.04	46.00	-1.96
624.622	64.48	1.00	263	-23.20	41.28	46.00	-4.72
788.437	69.70	1.00	98	-26.30	43.40	46.00	-2.60
***							

Table 11 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 1, Base Vertical]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.68	52.96	1.00	230	-6.84	-6.46	39.66	54	-14.34
3.37	44.59	1.00	121	-5.64	-6.46	32.49	54	-21.51
3.59	53.59	1.00	35	-5.64	-6.46	41.49	54	-12.51
4.50	46.71	1.00	217	3.91	-6.46	44.16	54	-9.84
5.41	37.73	1.00	155	9.72	-6.46	40.99	54	-13.01
6.31	37.06	1.00	200	9.72	-6.46	40.32	54	-13.68
***								

Table 12 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 10, Base Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (MHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
403.740	59.57	1.00	11	-18.22	41.35	46.00	-4.65
470.385	61.51	2.00	189	-20.05	41.46	46.00	-4.54
490.015	61.87	1.00	205	-20.41	41.46	46.00	-4.54
787.935	71.18	1.00	223	-26.28	44.90	46.00	-1.10
806.533	71.26	1.00	15	-26.63	44.63	46.00	-1.37
893.465	69.57	2.00	248	-27.74	41.83	46.00	-4.17
895.977	69.25	1.00	139	-27.80	41.45	46.00	-4.55
***							

Table 13 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 10, Base Horizontal]

Radiated Emission				Correction Factors	Duty Cycle	Corrected Amplitude	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
2.71	48.62	1.00	52	-6.84	-6.46	35.32	54	-18.68
3.65	53.09	1.00	120	-5.64	-6.46	40.99	54	-13.01
4.55	47.04	1.00	335	3.91	-6.46	44.49	54	-9.51
5.46	42.40	1.00	327	9.72	-6.46	45.66	54	-8.34
6.37	37.90	1.00	85	9.72	-6.46	41.16	54	-12.84
7.30	34.06	1.00	320	9.72	-6.46	37.32	54	-16.68
***								

Table 14 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 10, Base Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (MHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
470.385	61.01	1.00	135	-20.05	40.96	46.00	-5.04
489.637	63.27	1.00	85	-20.40	42.87	46.00	-3.13
624.622	64.28	1.00	154	-23.20	41.08	46.00	-4.92
934.168	71.51	2.00	199	-28.35	43.16	46.00	-2.84
***							

Table 15 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 10, Base Vertical]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.71	51.96	1.00	252	-6.84	-6.46	38.66	54	-15.34
3.65	53.92	1.00	72	-5.64	-6.46	41.82	54	-12.18
4.55	45.71	1.00	235	3.91	-6.46	43.16	54	-10.84
5.46	38.06	1.00	127	9.72	-6.46	41.32	54	-12.68
6.37	35.23	1.00	77	9.72	-6.46	38.49	54	-15.51
7.30	32.90	1.00	113	9.72	-6.46	36.16	54	-17.84
***								

Table 16 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 20, Base Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (MHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
403.740	60.00	1.00	33	-18.22	41.78	46.00	-4.22
490.015	63.19	1.00	147	-20.41	42.78	46.00	-3.22
806.533	71.43	1.00	97	-26.63	44.80	46.00	-1.20
826.130	70.89	1.00	166	-26.61	44.28	46.00	-1.72
***							

Table 17 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 20, Base Horizontal]

Radiated Emission				Correction Factors	Duty Cycle	Corrected Amplitude	FCC Class B (3 M)	
Frequency (GHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
2.77	50.12	1.00	82	-6.84	-6.46	36.82	54	-17.18
3.48	46.76	1.00	172	-5.64	-6.46	34.66	54	-19.34
3.67	55.09	1.00	203	-5.64	-6.46	42.99	54	-11.01
4.61	46.21	1.00	188	3.91	-6.46	43.66	54	-10.34
5.54	44.73	1.00	77	9.72	-6.46	47.99	54	-6.01
6.84	38.06	1.00	13	9.72	-6.46	41.32	54	-12.68
7.39	39.06	1.00	333	9.72	-6.46	42.32	54	-11.68
***								

Table 18 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 20, Base Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (MHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
490.015	63.71	1.00	295	-20.41	43.30	46.00	-2.70
586.278	63.87	1.00	25	-22.76	41.11	46.00	-4.89
605.025	64.40	1.00	140	-23.26	41.14	46.00	-4.86
787.935	69.50	1.00	205	-26.28	43.22	46.00	-2.78
826.130	68.86	1.00	89	-26.61	42.25	46.00	-3.75
893.465	71.19	1.00	336	-27.74	43.45	46.00	-2.55
***							

Table 19 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 20, Base Vertical]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.77	52.46	1.00	282	-6.84	-6.46	39.16	54	-14.84
3.67	55.42	1.00	170	-5.64	-6.46	43.32	54	-10.68
4.61	47.87	1.00	320	3.91	-6.46	45.32	54	-8.68
5.54	38.73	1.00	68	9.72	-6.46	41.99	54	-12.01
6.84	37.90	1.00	227	9.72	-6.46	41.16	54	-12.84
7.39	34.90	1.00	101	9.72	-6.46	38.16	54	-15.84
***								

Table 20 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 1, Handset Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (MHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
105.927	52.28	1.00	176	-11.75	40.53	43.50	-2.97
115.608	49.64	1.00	109	-12.81	36.83	43.50	-6.67
153.398	55.01	1.00	250	-14.93	40.08	43.50	-3.42
163.213	52.12	1.00	134	-14.86	37.26	43.50	-6.24
203.785	51.03	1.00	218	-12.69	38.34	46.00	-7.66
***							

Table 21 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 1, Handset Horizontal]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.68	59.62	1.00	223	-6.84	-6.46	46.32	54	-7.68
3.59	50.76	1.00	25	-5.64	-6.46	38.66	54	-15.34
4.50	46.54	1.00	220	3.91	-6.46	43.99	54	-10.01
5.41	38.40	1.00	179	9.72	-6.46	41.66	54	-12.34
6.31	35.90	1.00	318	9.72	-6.46	39.16	54	-14.84
8.13	33.23	1.00	108	9.72	-6.46	36.49	54	-17.51
9.94	32.56	1.00	97	9.72	-6.46	35.82	54	-18.18
***								

Table 22 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 1, Handset Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (MHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
105.927	46.98	1.00	76	-11.75	35.23	43.50	-8.27
153.775	49.02	1.00	169	-14.96	34.06	43.50	-9.44
173.028	49.02	1.00	240	-13.84	35.18	43.50	-8.32
211.532	45.76	1.00	135	-11.57	34.19	43.50	-9.31
432.600	62.72	1.00	21	-19.02	43.70	46.00	-2.30
787.935	71.03	1.00	208	-26.28	44.75	46.00	-1.25
895.475	71.64	1.00	279	-27.79	43.85	46.00	-2.15
***							

Table 23 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 1, Handset Vertical]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.71	60.46	1.00	23	-6.84	-6.46	47.16	54	-6.84
3.59	50.76	1.00	215	-5.64	-6.46	38.66	54	-15.34
4.50	54.87	1.00	331	3.91	-6.46	52.32	54	-1.68
5.41	41.23	1.00	174	9.72	-6.46	44.49	54	-9.51
6.31	40.73	1.00	55	9.72	-6.46	43.99	54	-10.01
7.22	34.06	1.00	78	9.72	-6.46	37.32	54	-16.68
8.13	33.56	1.00	297	9.72	-6.46	36.82	54	-17.18
***								

Table 24 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 10, Handset Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (MHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
105.927	48.34	2.00	311	-11.75	36.59	46.00	-9.41
115.608	48.24	2.00	174	-12.81	35.43	46.00	-10.57
134.665	47.20	2.00	275	-13.69	33.51	46.00	-12.49
153.398	54.81	1.00	69	-14.93	39.88	46.00	-6.12
163.213	56.58	1.00	328	-14.86	41.72	46.00	-4.28
173.028	51.46	1.00	86	-13.84	37.62	46.00	-8.38
230.785	49.93	1.00	207	-12.69	37.24	46.00	-8.76
***							

Table 25 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 10, Handset Horizontal]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.71	59.29	1.00	300	-6.84	-6.46	45.99	54	-8.01
3.65	53.59	1.00	187	-5.64	-6.46	41.49	54	-12.51
4.55	48.04	1.00	253	3.91	-6.46	45.49	54	-8.51
5.46	43.73	1.00	72	9.72	-6.46	46.99	54	-7.01
6.37	38.40	1.00	192	9.72	-6.46	41.66	54	-12.34
8.21	38.40	1.00	26	9.72	-6.46	38.16	54	-12.34
***								

Table 26 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 10, Handset Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (MHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
105.927	48.45	1.00	115	-11.75	36.70	43.50	-6.80
153.398	50.66	1.00	74	-14.93	35.73	43.50	-7.77
432.600	57.11	1.00	258	-19.02	38.09	46.00	-7.91
509.267	61.36	1.00	39	-20.64	40.72	46.00	-5.28
787.935	70.61	1.00	215	-26.28	44.33	46.00	-1.67
797.985	70.80	1.00	147	-26.59	44.21	46.00	-1.79
***							

Table 27 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 10, Handset Vertical]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.71	59.79	1.00	123	-6.84	-6.46	46.49	54	-7.51
3.65	50.09	1.00	166	-5.64	-6.46	37.99	54	-16.01
4.55	52.37	1.00	329	3.91	-6.46	49.82	54	-4.18
5.46	42.06	1.00	8	9.72	-6.46	45.32	54	-8.68
6.37	38.40	1.00	204	9.72	-6.46	41.66	54	-12.34
7.30	33.23	1.00	221	9.72	-6.46	36.49	54	-8.68
8.21	32.56	1.00	107	9.72	-6.46	35.82	54	-12.34
***								

Table 28 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 20, Handset Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (MHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
105.927	50.57	1.00	251	-11.75	38.82	43.50	-4.68
115.608	52.96	2.00	207	-12.81	40.15	43.50	-3.35
153.398	52.98	1.00	156	-14.93	38.05	43.50	-5.45
163.213	54.21	1.00	90	-14.86	39.35	43.50	-4.15
173.028	50.47	1.00	116	-13.84	36.63	43.50	-6.87
211.532	45.85	2.00	308	-11.57	34.28	43.50	-9.22
230.785	55.15	1.00	227	-12.69	42.46	46.00	-3.54
***							

Table 29 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 20, Handset Horizontal]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.77	58.12	1.00	331	-6.84	-6.46	44.82	54	-9.18
3.67	52.42	1.00	109	-5.64	-6.46	40.32	54	-13.68
4.61	46.54	1.00	105	3.91	-6.46	43.99	54	-10.01
5.54	42.56	1.00	224	9.72	-6.46	45.82	54	-8.18
6.48	40.56	1.00	18	9.72	-6.46	43.82	54	-10.18
7.39	38.13	1.00	223	9.72	-6.46	41.39	54	-12.61
8.32	32.23	1.00	94	9.72	-6.46	35.49	54	-18.51
9.26	32.56	1.00	199	9.72	-6.46	35.82	54	-18.18
***								

Table 30 Open Field Radiated Emissions For 30MHz ~ 1GHz [Channel 20, Handset Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 M)	
Frequency (MHz)	Amplitude (dBuV/m)	Ant.H. (m)	Table (°)	(dB)	(dBuV/m)	Limit (dBuV/m)	Margin (dB)
105.927	47.67	1.00	118	-11.75	35.92	43.50	-7.58
115.608	50.56	1.00	208	-12.81	37.75	43.50	-5.75
153.775	53.21	1.00	351	-14.96	38.25	43.50	-5.25
230.785	52.77	1.00	99	-12.69	40.08	46.00	-5.92
470.385	61.49	1.00	107	-20.05	41.44	46.00	-4.56
787.935	70.48	1.00	251	-26.28	44.20	46.00	-1.80
797.482	70.62	1.00	33	-26.59	44.03	46.00	-1.97
896.982	71.16	1.00	148	-27.82	43.34	46.00	-2.66
***							

Table 31 Open Field Radiated Emissions For 1GHz ~ 18GHz [Channel 20, Handset Vertical]

Radiated Emission				*Correction Factors*	*Duty Cycle*	*Corrected Amplitude*	*FCC Class B (3 M)*	
Frequency (GHz)	*Amplitude (dBuV/m)*	*Ant.H. (cm)*	*Table (°)*	*(dB)*	*(dB)*	*(dBuV/m)*	*Limit (dBuV/m)*	*Margin (dB)*
2.77	60.29	1.00	31	-6.84	-6.46	46.99	54	-7.01
3.67	53.92	1.00	307	-5.64	-6.46	41.82	54	-12.18
4.61	51.71	1.00	110	3.91	-6.46	49.16	54	-4.84
5.54	42.56	1.00	44	9.72	-6.46	45.82	54	-8.18
6.48	39.40	1.00	158	9.72	-6.46	42.66	54	-11.34
7.41	35.73	1.00	83	9.72	-6.46	38.99	54	-15.01
***								

VI. Section 15.247(d): Power Spectral Density

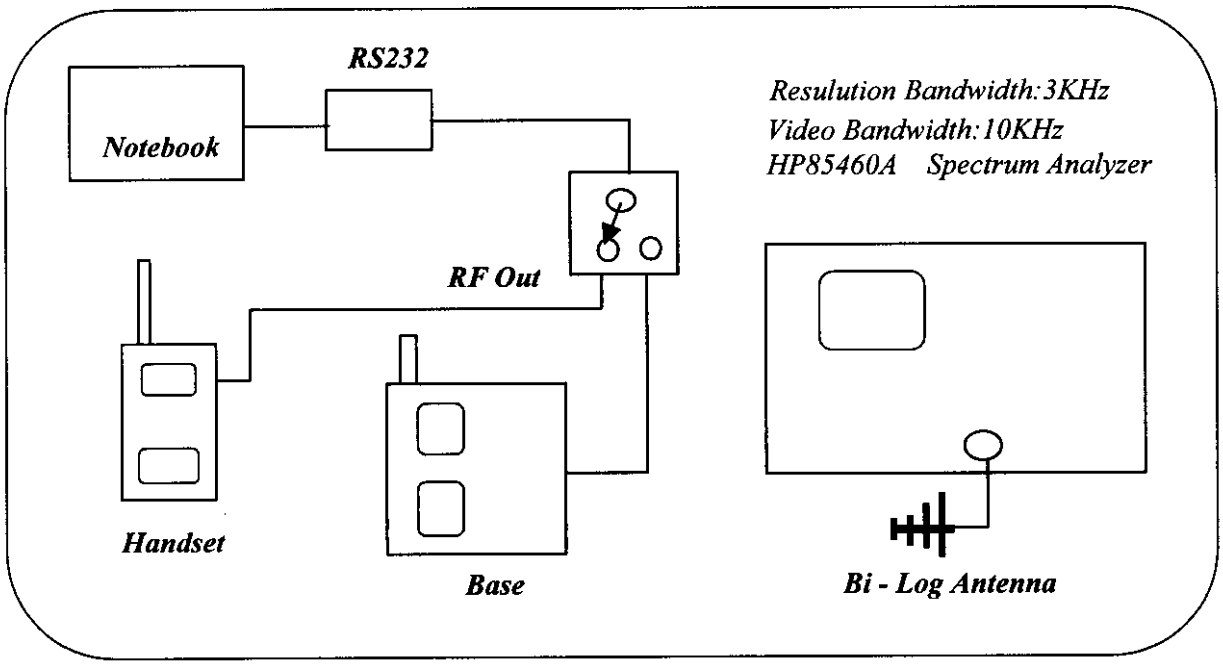
6.1 Test Condition & Setup

The tests below are running with the DCT transmitter set at high power in TDD mode .A serial port from a computer to the DCT UUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. A log antenna was connected with the spectrum analyzer.

The EUT is tested in open field site. Put EUT on the middle of a wooden table. Set spectrum analyzer RBW = 3 KHz, VBW > RBW (e.g. VBW = 10 KHz), Span = 1.5 MHz. Turn around the table to find maximum emission. Then set the Span = 300 KHz and sweep time = 100 sec. Peak the maximum emission again. The peak level measured must be no greater than + 8dBm.

The setting up procedure is recorded on Appendix A.

6.2 Test Instruments Configuration



P.S.A serial port from notebook computer to control the EUT at maximal power output and channel Number.

Fig 12. Test Configuration of power spectral density

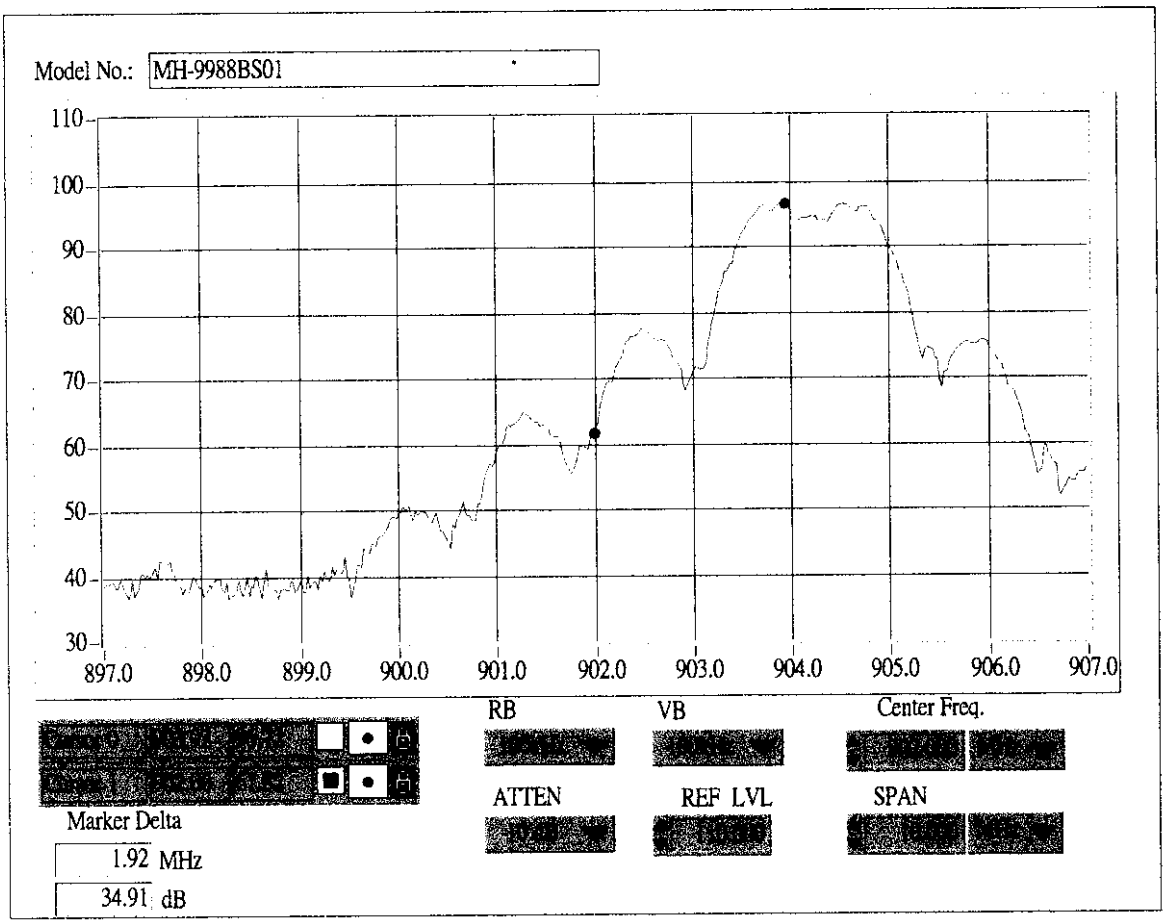
6.3 List of Test Instruments

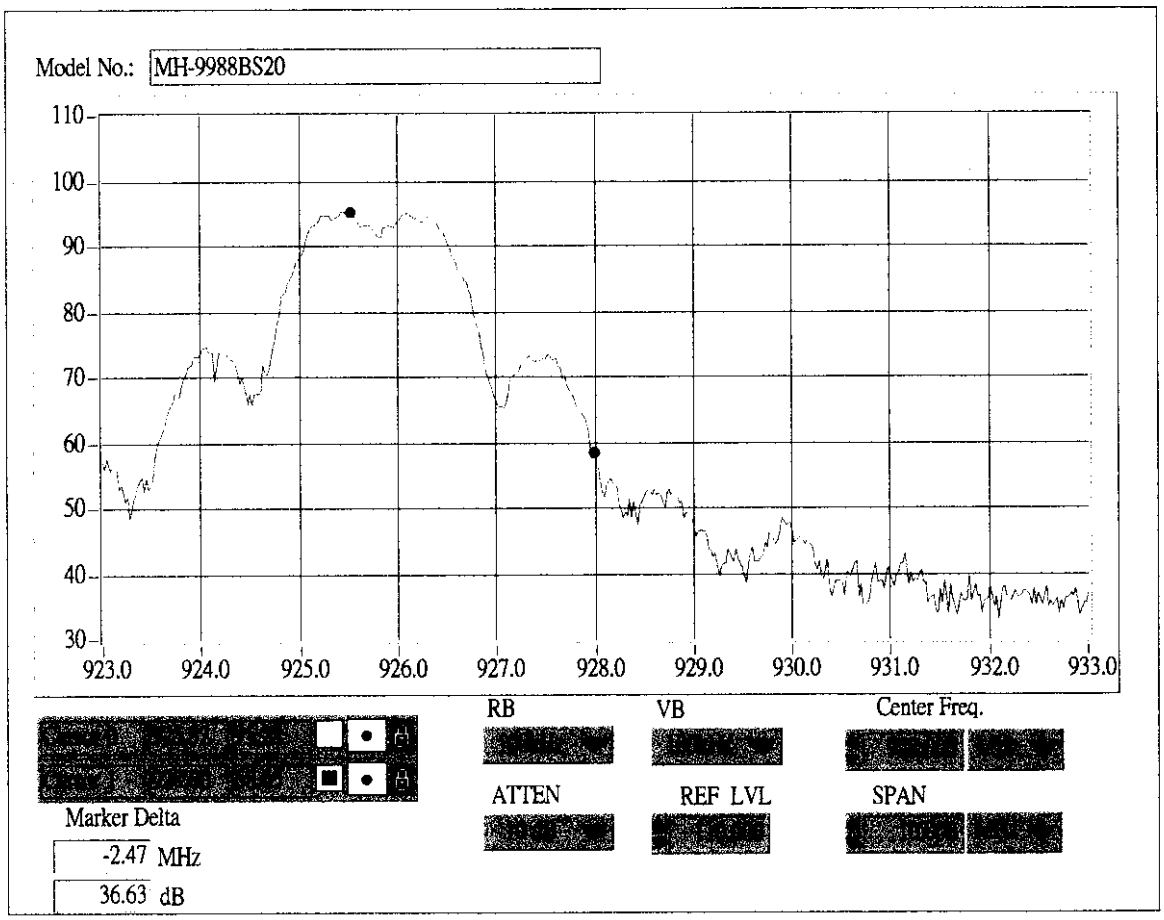
Manufacturer	Device	Model	Input Impedance
Hewlett Packard	.9KHz – 6GHz EMI Receiver	HP85460A	50.00
M.E.	30MHz-1.5GHz Bi-Log Antenna	VULB 9160	50.00

6.4 Required of Carrier frequency

If any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified id § 15.209(a), whichever results in the lesser attenuation.

Test Condition & Setup: same as 3.1


Model No.: MH-9988BS01
110
100
90
80
70
60
50
40
30
897.0
898.0
899.0
900.0
901.0
902.0
903.0
904.0
905.0
906.0
907.0
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.92 MHz
34.91 dB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110
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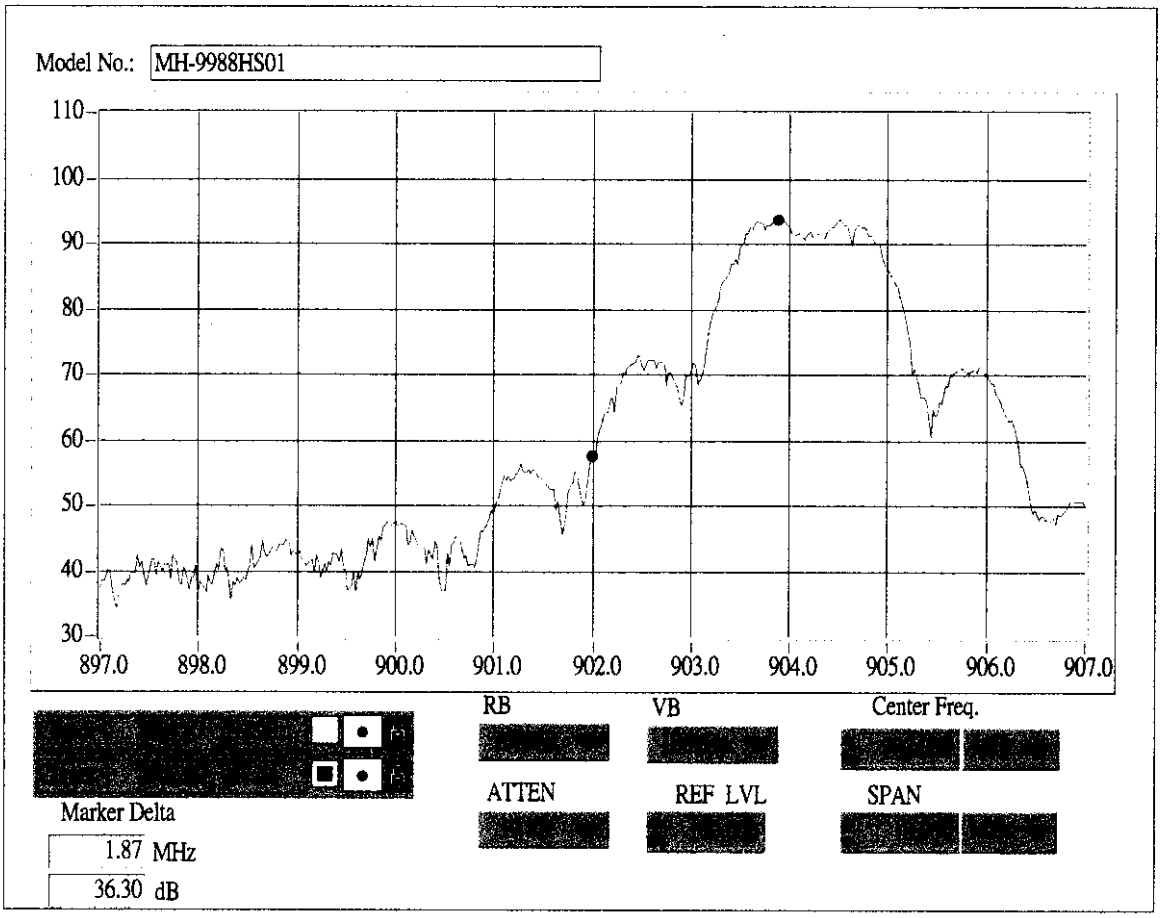
90
80
70
60
50
40
30
923.0
924.0
925.0
926.0
927.0
928.0
929.0
930.0
931.0
932.0
933.0
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
-2.47 MHz
36.63 dB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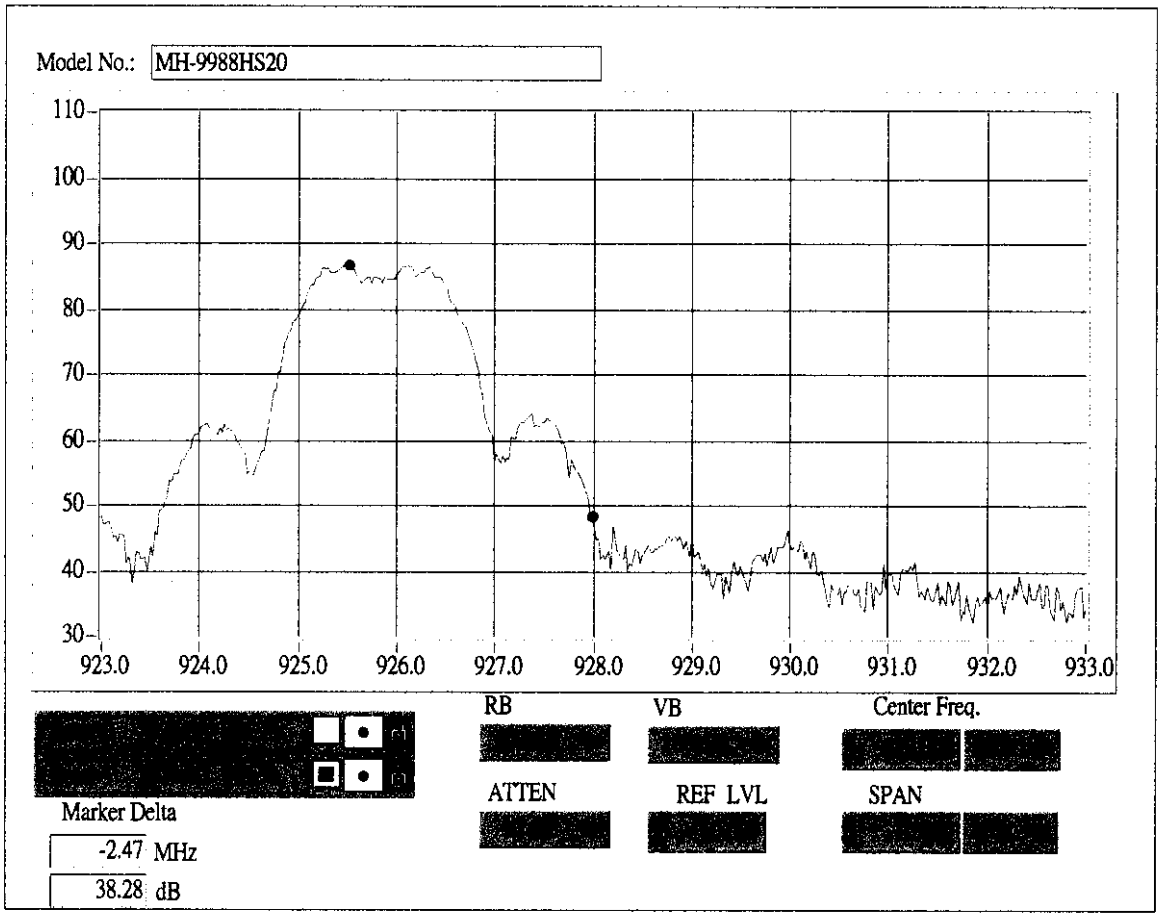
50
40
30
897.0
898.0
899.0
900.0
901.0
902.0
903.0
904.0
905.0
906.0
907.0
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
1.87 MHz
36.30 dB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110
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80
70
60
50
40
30
923.0
924.0
925.0
926.0
927.0
928.0
929.0
930.0
931.0
932.0
933.0
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
-2.47 MHz
38.28 dB

6.5 Test Result of Power spectral density.

The following table shows a summary of the highest power out of UT.

Model No. : MH-9988

EUT : 900MHz S.S.T. Cordless Phone

Table 33. Power Spectral Density

Channel	*Frequency (MHz)*	*Ppr (dBuV)*	*CF (dB)*	*Ppq (dBm)*	*Limit (dB)*	*Margin (dB)*
B/S CH 01	904.52	116.68	-27.96	-6.51	8.00	-14.51
B/S CH 10	915.63	119.01	-28.04	-4.26	8.00	-12.26
B/S CH 20	927.17	124.96	-28.21	1.52	8.00	-6.48
H/S CH 01	904.52	112.55	-27.96	-10.64	8.00	-18.64
H/S CH 10	915.07	123.18	-28.04	-0.09	8.00	-8.09
H/S CH 20	927.13	108.21	-28.21	-15.23	8.00	-23.23

Note:

1.The attachment follow by this page and there is no page number.

2.Ppr: spectrum read power density (using peak search mode), CF: correct factor, Ppq: actual peak power density in the spread spectrum band.

3.Ppq = Ppr + CF

4. Effective Radiation Power (E.R.P.) = $(E\ d)^2 / 30G$

E is the measured maximum field strength in V/m utilizing the maximum hold mode

RBW (3KHz).

G is the numeric gain of the transmitting antenna over an isotropic radiator (1.00).

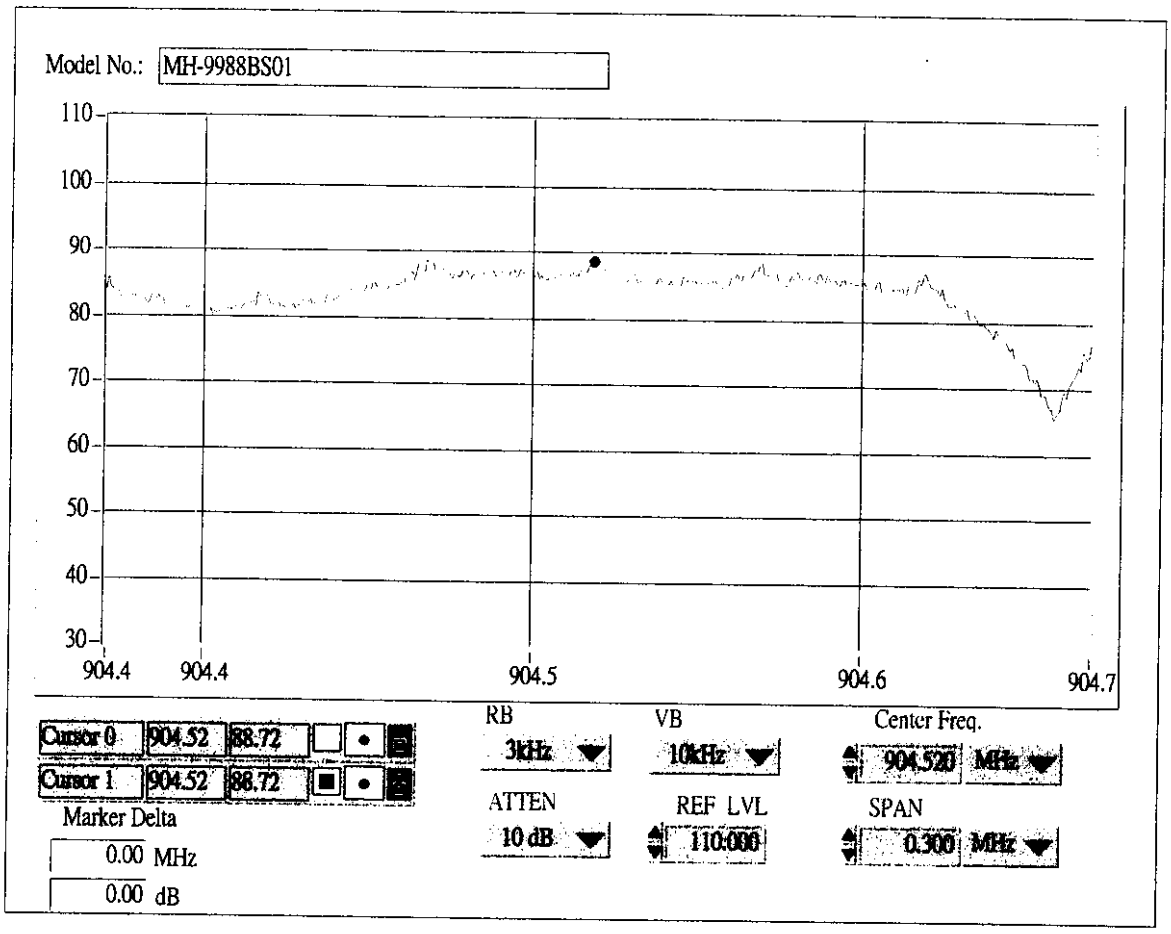
d is the distance in meters from which the field strength was measured (3M).

Example: the Max Radiation Emission of base ch01 = 116.68 + (-27.96) = 88.72 dBuV/m

$10^{(88.72/20)} \times 10^{-6} = 0.027290$ V

E.R.P. = $(0.027290 \times 3)^2 / 30 = 0.223420$ mW = 10 x log (0.223420 mW/1mW)

= -6.51 dBm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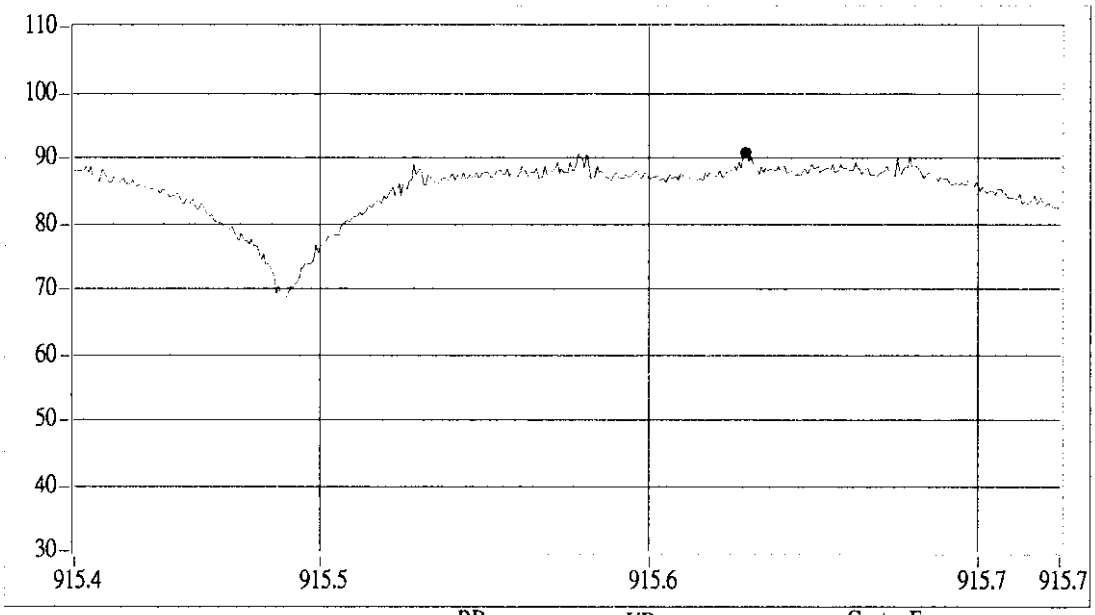
100
90
80
70
60
50
40
30
904.4
904.4
904.5
904.6
904.7
Cursor 0
904.52
88.72
Cursor 1
904.52
88.72
Marker Delta
0.00 MHz
0.00 dB
RB
3kHz
VB
10kHz
Center Freq.
904.520
MHz
ATTEN
10 dB
REF LVL
110.000
SPAN
0.300
MHz

Model No.: MH-9988BS10



RB

VB

Center Freq.

ATTEN

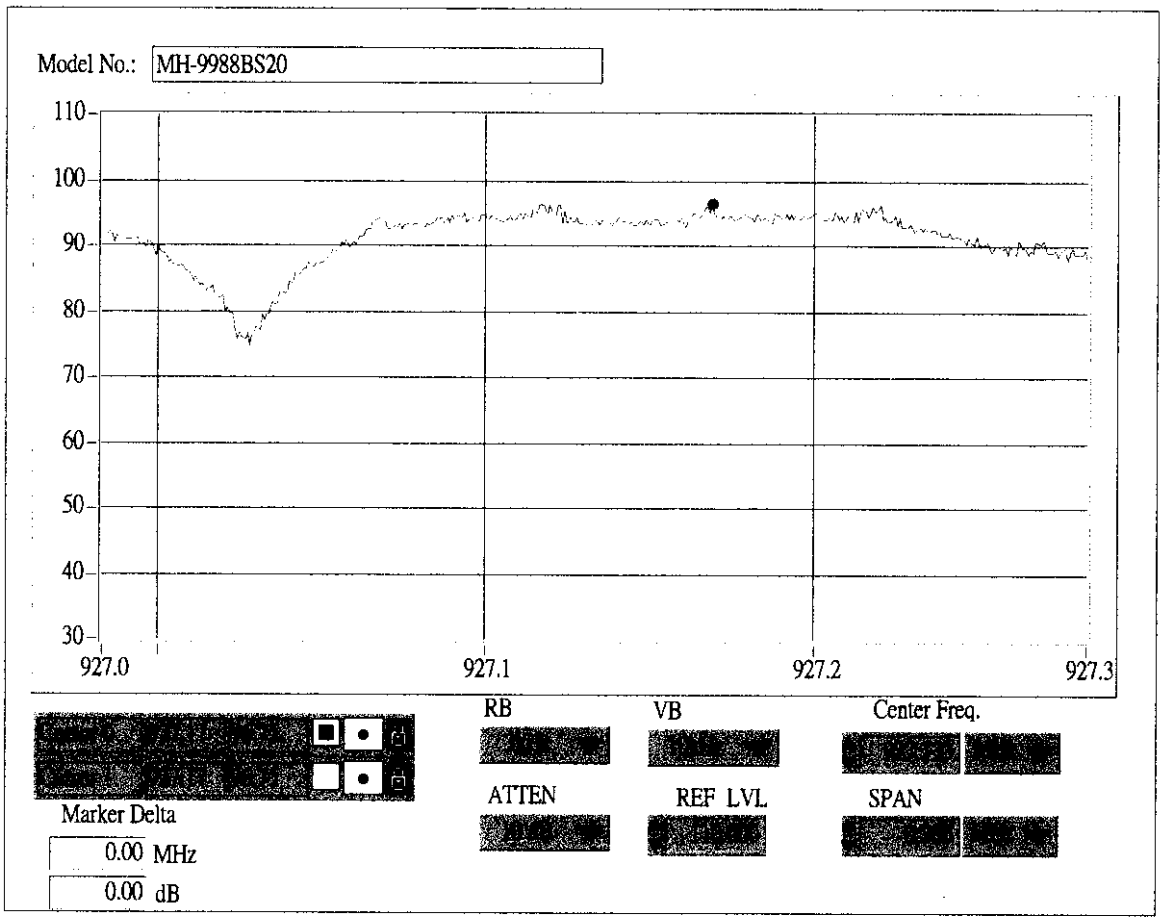
REF LVL

SPAN

Marker Delta

0.00 MHz

0.00 dB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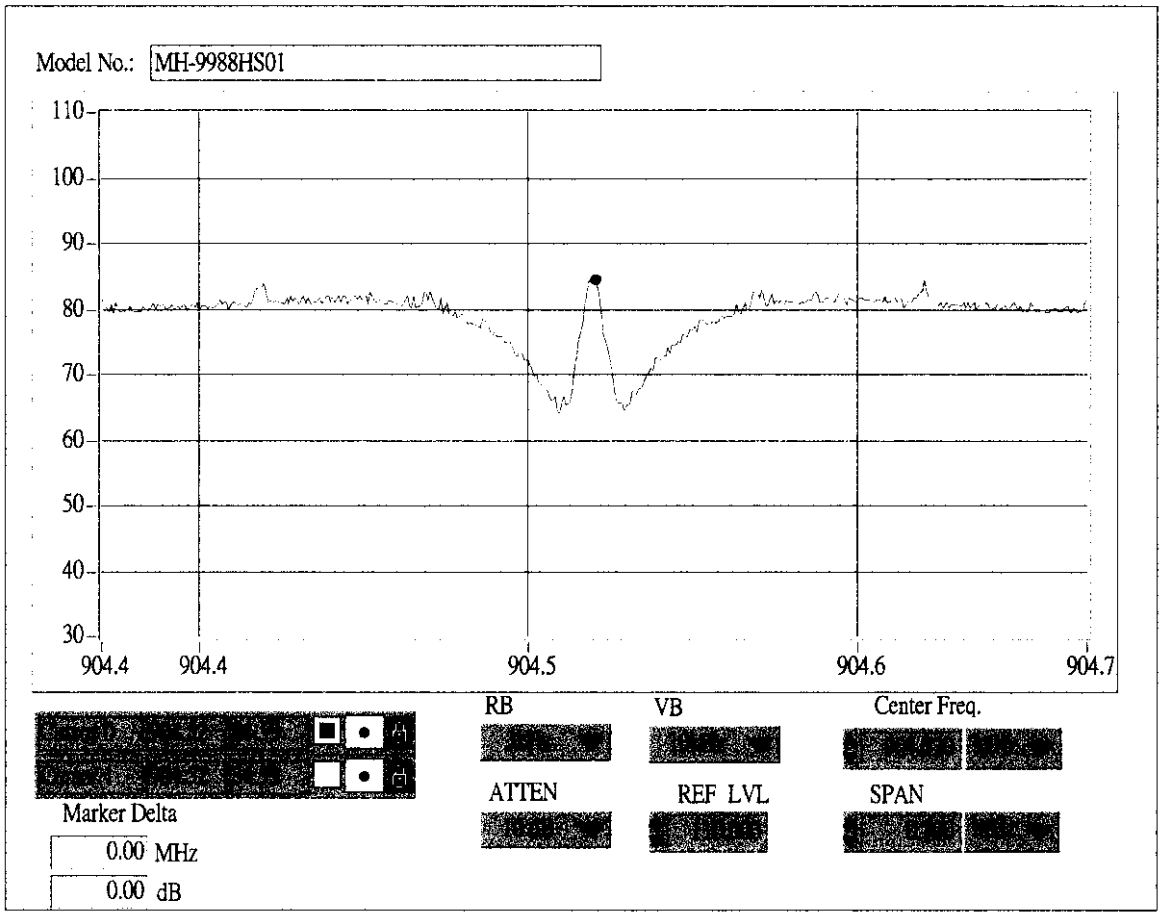
90
80
70
60
50
40
30
927.0
927.1
927.2
927.3
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
0.00 MHz
0.00 dB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100
90
80
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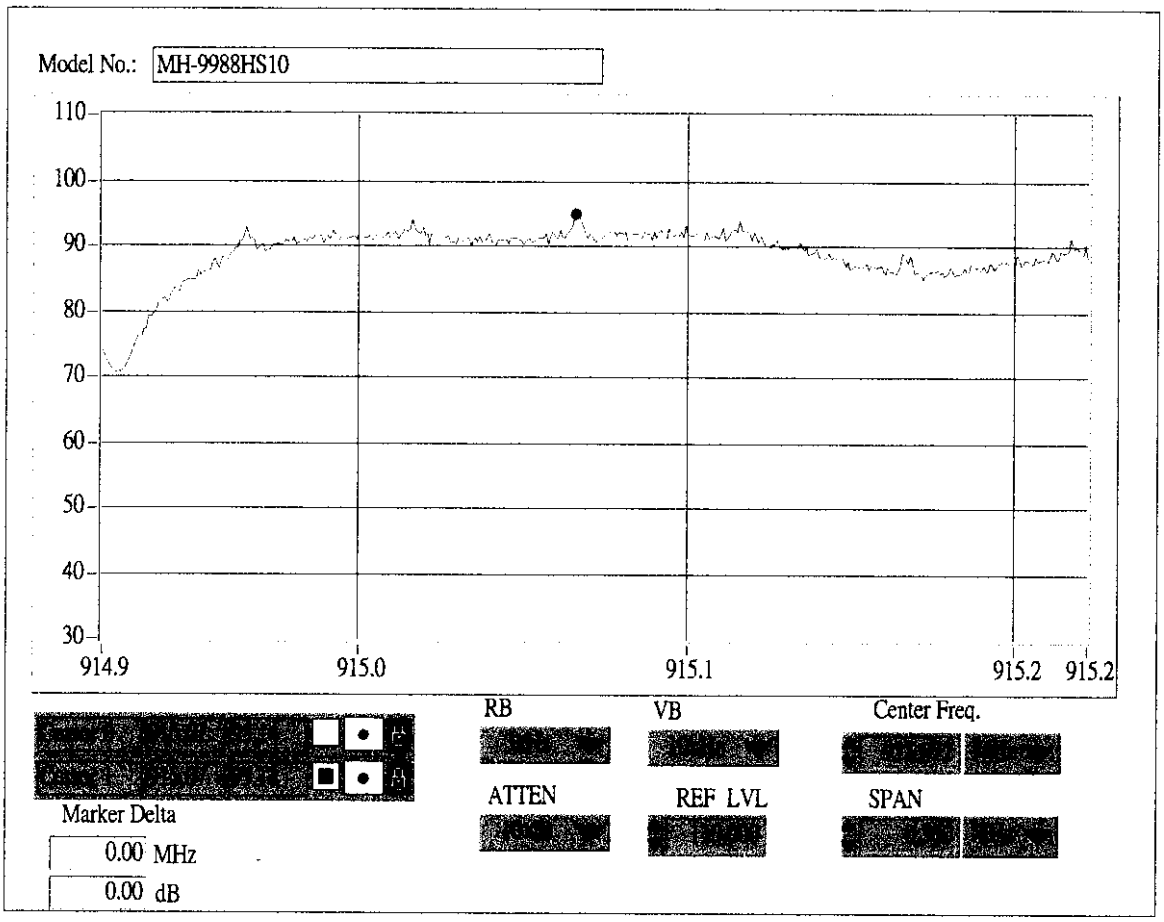
60
50
40
30
904.4
904.4
904.5
904.6
904.7
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
0.00 MHz
0.00 dB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80
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60
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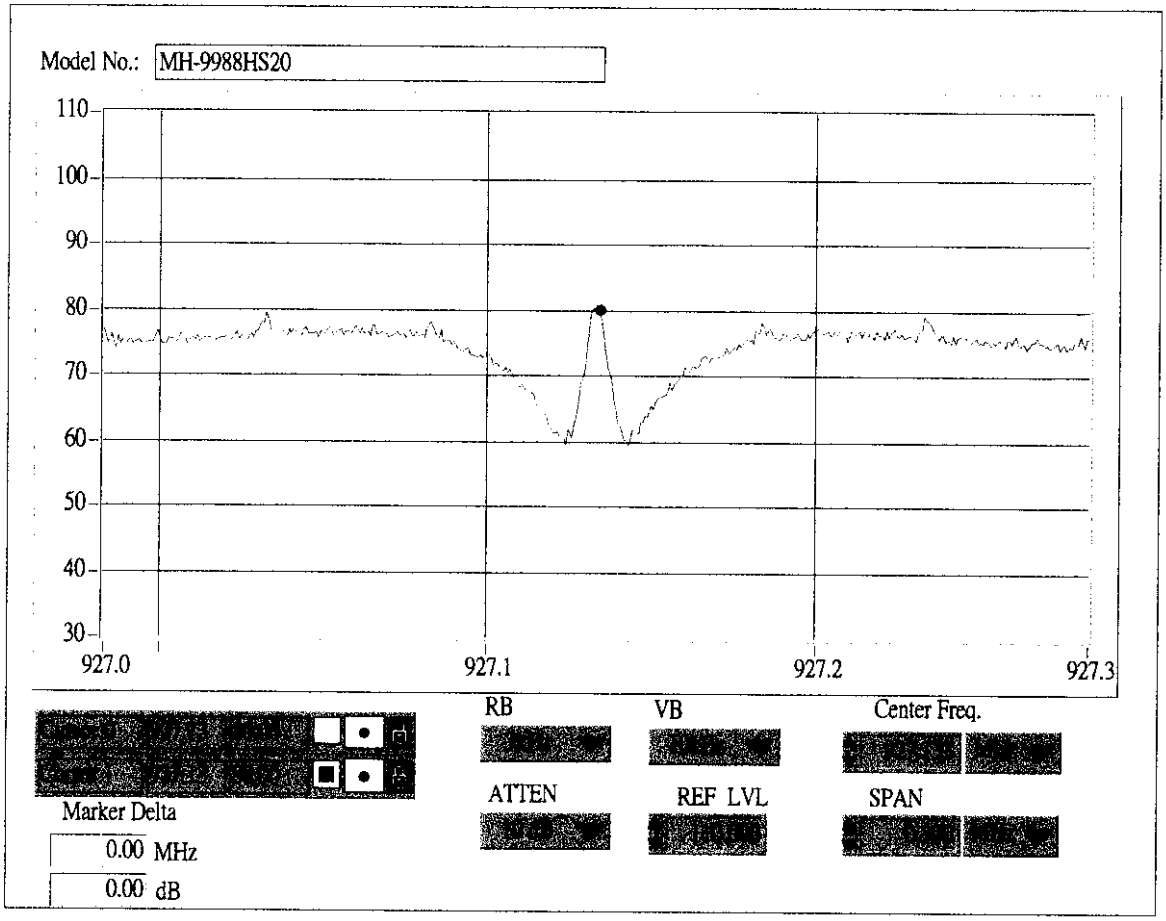
40
30
914.9
915.0
915.1
915.2
915.2
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
0.00 MHz
0.00 dB


Model No.: MH-9988HS20
110
100
90
80
70
60
50
40
30
927.0
927.1
927.2
927.3
RB
VB
Center Freq.
ATTEN
REF LVL
SPAN
Marker Delta
0.00 MHz
0.00 dB

Ⅶ. Section 15.247(e): Processing Gain

7.1 Test Condition & Setup

A. Bit Error Rate (Pe)

The subjective device RF module (base & handset) digital modulation by Differential Phase -Shift Keying (DPSK), the DPSK can use it's previous waveform as the phase reference for demodulation and thus requires no coherent detection, which greatly simplifies the receiver structure but with some Bit Error Rate (BER) degradation because of noisy phase reference. There is tradeoff between system complexity and system performance. In order to driver the DPSK error probability , we observe that DPSK using differential coding , we observable that DPSK using different coding is essentially an orthogonal signal scheme. A binary 1 is transmitted a sequence of two pulse (P,P) or (-P,-P) over 2 To seconds (no transition). Similarly, a binary 0 is transmitted by a sequence of two plus (P,-P) or (-P,P) over 2 TO seconds (transition). Either of the pulse sequences used for binary 1 is orthogonal to either of the pulse sequences used for binary 0. Because no local carrier is generated for demodulation, the detection is noncoherent , with an effective pulse energy equal to 2 Ep (twice the energy of pulse P). The actual energy transmitted per digit only Ep, however, the same as in noncoherent FSK, Consequently, the performance of DPSK is 3 dB superior to that of noncoherent FSK, We can write Pe for DPSK as :

The major component inside the subjective device are supplied by Rock well , Included RF block transmitter (RF101), Receiver (RF 100), and Base band block ASIC (c8502-13), CODEC (10497-14), above 4 IC chips are affected the processing gain as following :

J/S = (W/RD) / (ED/NO) [without CODING]

Where: W= Spread Chip Rate = Required Transmitted Base band Bandwidth.

Rb = Information Data Rate

Eb/No = Require Energy per Bit over noise Spectral Density for a Specific Bit Error Probability.

The subjective Device Information Data Rate are 80k and the Spread Chip Rate are 960k So the processing gain (10 log w/Rb) at least 10.79 dB (without Coding).

The ASIC (c8502-13) and CODEC (10497-14) these two chip included the coding function, So, it is great improve the processing gain and also improve the J/S ratio.

The Engineer work for Rock well System in Taiwan had pass us the information about the probability of error rate (Pe) must be lower than 0.001 that the system performance will satisfy for communication between Handset and Base station.

Why we need the Pe lower than 0.001, the Rockwell Semiconductor System is not explained , Since it relative with ASIC and Codec, it is confidential area that Rockwell is not allow to disdouse to the public.

When Pe = 0.001 and then Signal to Noise Ratio (S/N) = 6.2194 = 7.9dB.

B. Jamming Margin Method

The Rockwell Semiconductor System give us a software operated in the personal computer, and use the computer series port COM1 and COM2 connect Handset and Base than we can measure the Bit Error Rate.

Using this software we can perform Jamming Margin method testing, The test consists of stepping a signal generator in 50 KHz increments across the pass band of the system (up to 960 KHz away in RI's DCT). At each point, the generator level required to produce the recommend Bit Error Rate (BER = 10e - 3) is recorded. This level is the jamming level. The maximum implementation loss a system can claim in calculating processing gain is 2 dB. The equation to calculate the processing gain (Gp) is the following:

Gp = (S/N) + Mj + Lsys

Gp = 8 dB + Mj + 2 dB

FCC regulation section 15.247 (e) rewire the processing gain of a direct sequence system shall be at least 10 dB, when Gp must be greater than 10 dB, then the Jammer must be greater than 0 dB.

The processing gain may be measured using the CW jamming margin method. The Jammer to Signal (J/S) ratio is then calculated. Discard the worst 20% of the J/S data points.

1. For avoid the handset and basestation are situation, so, the UUT were in low power mode.
2. The signal generator was selected in interference band, using this software we can perform Jamming Margin method testing, the test consists of stepping a signal generator is 50 KHz increments across the pass band of the system (up to 960 KHz away in RI's DCT). So, the BER will keep in 0.1%.

The setting up procedure is recorded on Appendix A.

7.2 Test Instruments Configuration

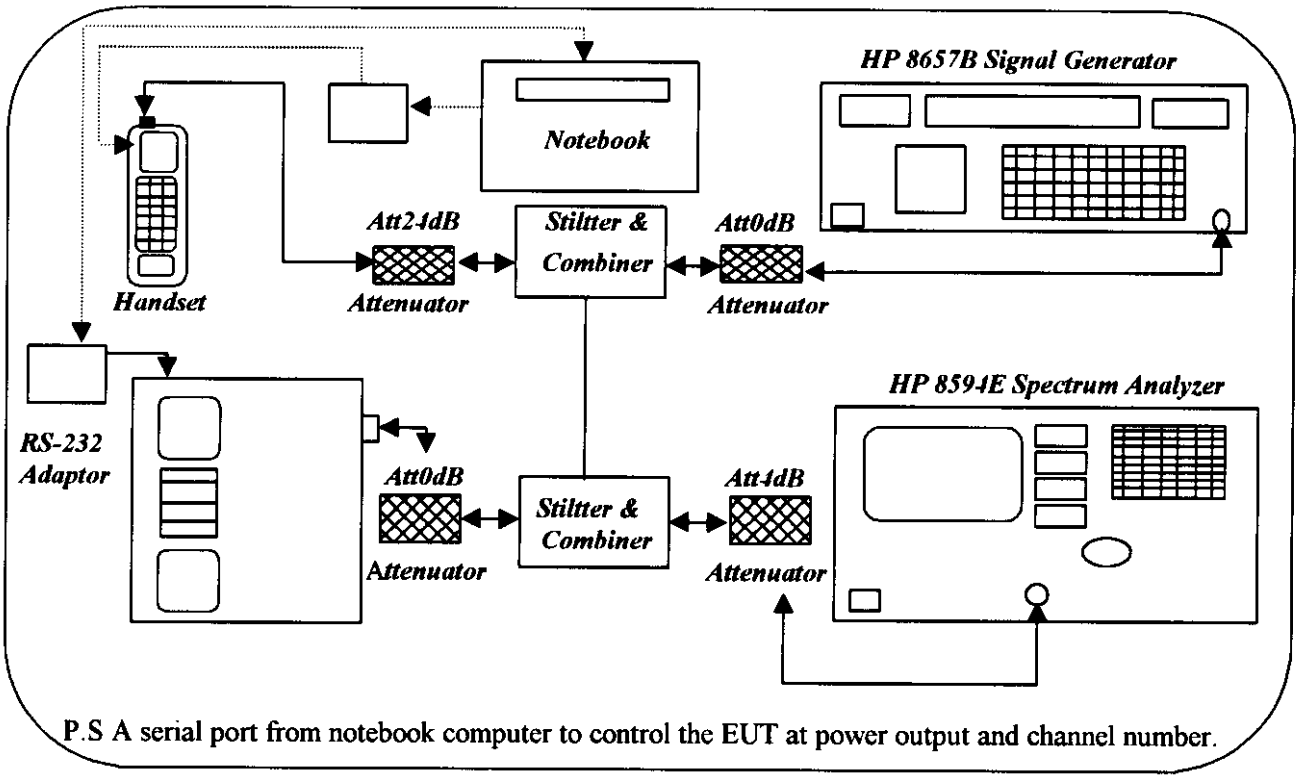


Fig 13. Test Configuration of processing gain for base station

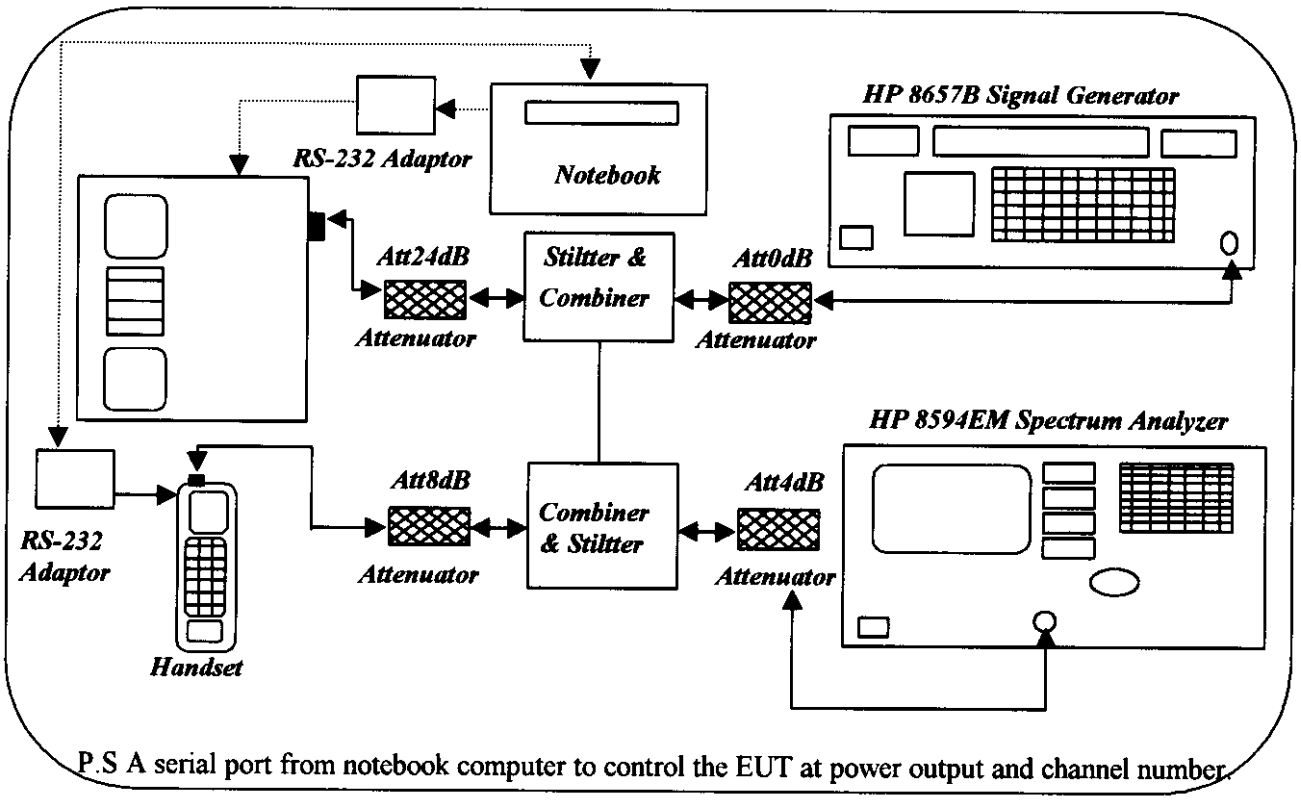


Fig. 14 Test Configuration of processing gain for handset

7.3 List of Test Instruments

Manufacturer	Device	Model	Input Impedance
Hewlett Packard	100Hz-1.8GHz Spectrum Analyzer	HP8592A	50.00
Hewlett Packard	100Hz-2.6GHz Signal Generator	HP8657B	50.00
Mini Circuits	10MHz-2GHz Power Stlitter/Combiner	ZESC-2-11	50.00
Mini Circuits	DC-1.5GHz 3dB Attenuator	CAT-3	50.00
Mini Circuits	DC-1.5GHz 20dB Attenuator	CAT-20	50.00
Mini Circuits	DC-1.5GHz 30dB Attenuator	CAT-30	50.00

7.4 Test Procedure

According to the Fig. 13 of the page 53, combine the stuffs.

Measure the low power output of the channel 10 of the handset while the handset is in "Transmit-Only-Test" and the whole circuit is as same as Fig. 13. What we measure in this step is "S".

Change to the "BER Test " program. Increase the RF output of the signal generator till the BER is close to the 0.1% but under 0.1%.

Stop the program and turn off the base, handset then record the highest point of the spectrum. What we measure in this step is "J".

Star the Program again and test the next point.

7.5 Test Result of Processing Gain.

Model No. : MH-9988

EUT : 900MHz S.S.T. Cordless Phone

Table 34 Processing Gain [Channel 10, Base]

Jammer Frequency (MHz)	S (dBm)	J (dBm)	Mj (J/S)	Process Gain (dB)
914.600	-47.91	-46.50	1.41	11.31
914.650	-47.91	-46.44	1.47	11.37
914.700	-47.91	-45.85	2.06	11.96
914.750	-47.91	-45.88	2.03	11.93
914.800	-47.91	-44.92	2.99	12.89
914.850	-47.91	-44.80	3.11	13.01
914.900	-47.91	-44.85	3.06	12.96
914.950	-47.91	-44.76	3.15	13.05
915.000	-47.91	-44.77	3.14	13.04
915.050	-47.91	-44.60	3.31	13.21
915.100	-47.91	-44.52	3.39	13.29
915.150	-47.91	-44.45	3.46	13.36
915.200	-47.91	-44.50	3.41	13.31
915.250	-47.91	-44.40	3.51	13.41
915.300	-47.91	-44.30	3.61	13.51
915.350	-47.91	-44.22	3.69	13.59
915.400	-47.91	-44.17	3.74	13.64
915.450	-47.91	-44.02	3.89	13.79
915.500	-47.91	-43.88	4.03	13.93
915.550	-47.91	-43.85	4.06	13.96
915.600	-47.91	-43.80	4.11	14.01
915.650	-47.91	-43.61	4.30	14.20
915.700	-47.91	-43.50	4.41	14.31
915.750	-47.91	-43.52	4.39	14.29
915.800	-47.91	-43.40	4.51	14.41
915.850	-47.91	-43.20	4.71	14.61
915.900	-47.91	-43.10	4.81	14.71
915.950	-47.91	-42.95	4.96	14.86
916.000	-47.91	-42.97	4.94	14.84
916.050	-47.91	-42.60	5.31	15.21

Test Result : Processing Gain: 13.01 dB

Note: 1. GP = (S/No) + Mj + Lsys = 7.9dB + Mj + 2dB

2. S = Signal Level

3. J = Signal Generator RF Output

Table 35 Processing Gain [Channel 10, Handset]

Jammer Frequency (MHz)	S (dBm)	J (dBm)	Mj (J/S)	Process Gain (dB)
914.600	-47.91	-46.60	1.31	11.21
914.650	-47.91	-46.55	1.36	11.26
914.700	-47.91	-46.21	1.70	11.60
914.750	-47.91	-45.77	2.14	12.04
914.800	-47.91	-45.75	2.16	12.06
914.850	-47.91	-45.22	2.69	12.59
914.900	-47.91	-44.82	3.09	12.99
914.950	-47.91	-44.81	3.10	13.00
915.000	-47.91	-44.75	3.16	13.06
915.050	-47.91	-44.72	3.19	13.09
915.100	-47.91	-44.70	3.21	13.11
915.150	-47.91	-44.66	3.25	13.15
915.200	-47.91	-44.68	3.23	13.13
915.250	-47.91	-44.52	3.39	13.29
915.300	-47.91	-44.33	3.58	13.48
915.350	-47.91	-44.35	3.56	13.46
915.400	-47.91	-44.26	3.65	13.55
915.450	-47.91	-44.21	3.70	13.60
915.500	-47.91	-43.85	4.06	13.96
915.550	-47.91	-43.88	4.03	13.93
915.600	-47.91	-43.74	4.17	14.07
915.650	-47.91	-43.65	4.26	14.16
915.700	-47.91	-43.52	4.39	14.29
915.750	-47.91	-43.50	4.41	14.31
915.800	-47.91	-43.24	4.67	14.57
915.850	-47.91	-43.15	4.76	14.66
915.900	-47.91	-42.77	5.14	15.04
915.950	-47.91	-42.72	5.19	15.09
916.000	-47.91	-42.75	5.16	15.06
916.050	-47.91	-42.41	5.50	15.40

Test Result : Processing Gain: 12.99 dB

Note: 1. GP = (S/No) + Mj + Lsys = 7.9dB + Mj + 2 dB

2. S = Signal Level

3. J = Signal Generator RF Output

Appendix A

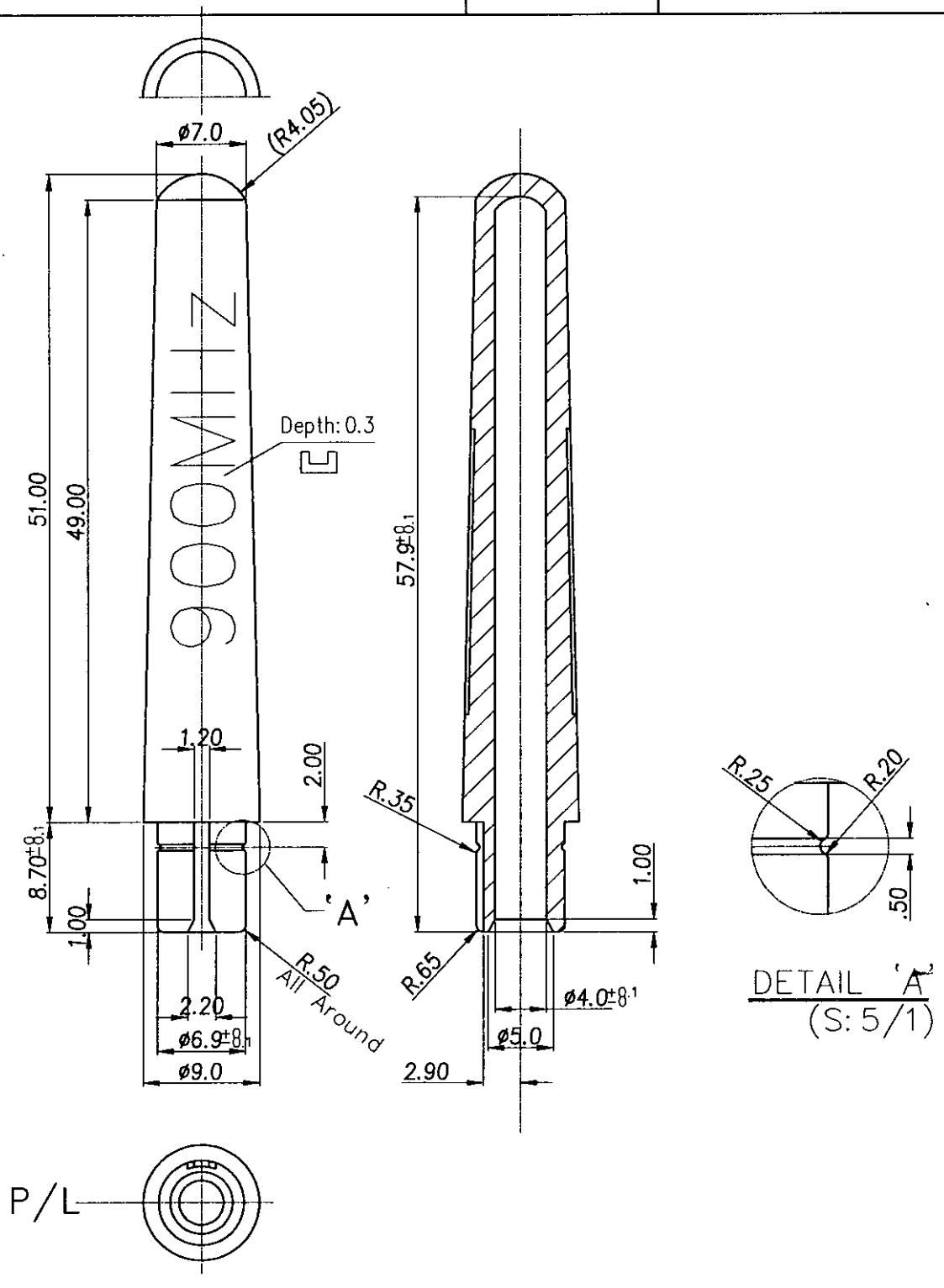
Setting up Procedure

1. Using an RS-232 Adaptor that is given by customer connected with the COM 1 of the computer.
2. The other end of the RS-232 Adaptor is connected with the EUT.
3. Use the software that is given by the customer and operated in the windows to control the EUT's continuous transmission.

Appendix B

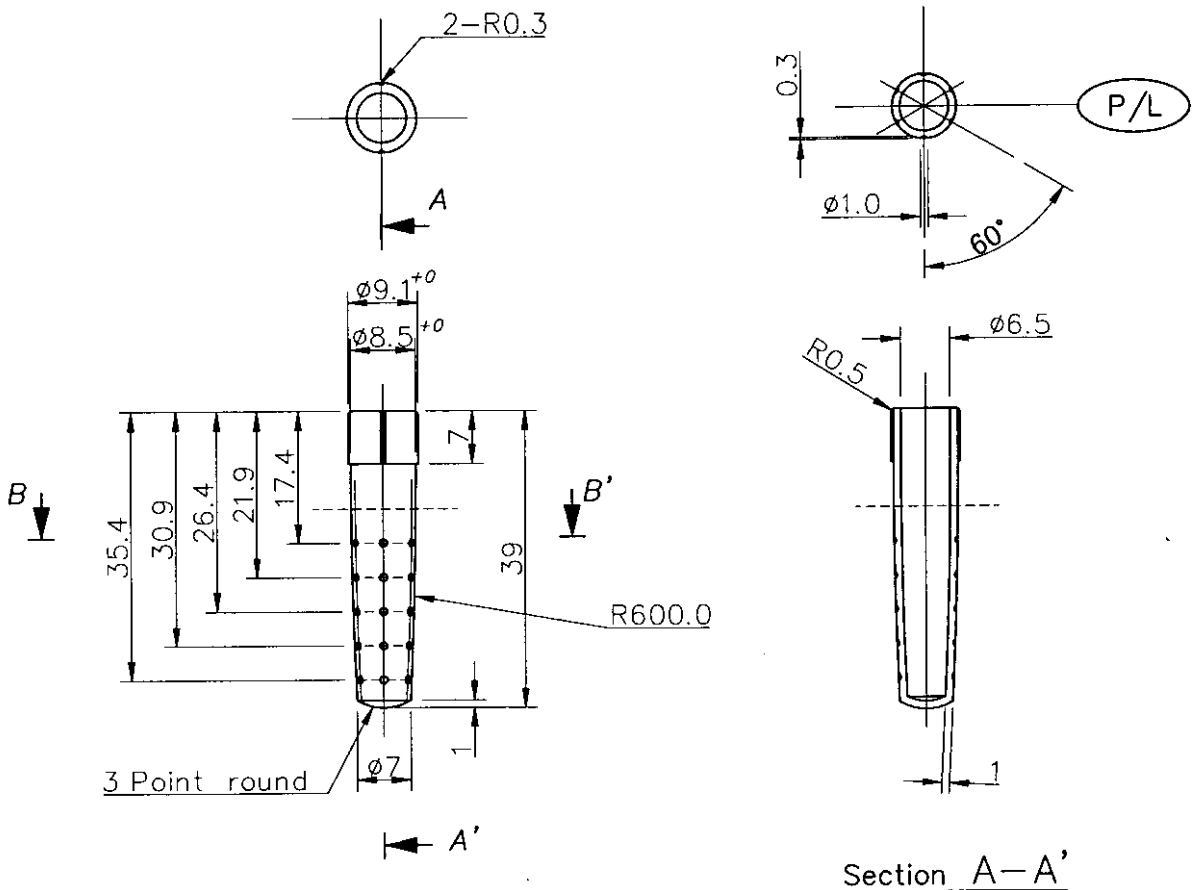
Antenna Sketch

REV	DESCRIPTION	DATE	APPROVED
⚠			



				URETHANE	1				
NO	DESCRIPTION			MATERIAL	Q'ty	SPECIFICATION		TREAT	REMARKS
TOLERANCE (+)		1–4	4–16	16–63	63–250	250–500	ANGLE	SCALE 2/1	1999.01.21	REV 0
	A	0.05	0.07	0.1	0.2	0.3	±			
	B	0.10	0.20	0.3	0.5	0.8		UNIT M/M	CAD NO.	
	C	0.25	0.35	0.5	0.7	1.5				
DRAW & DESIGN			DET.CHE		APPROVAL		NAME	MH–9024(Base)		
								Cap, Antenna		

REV	DESCRIPTION	DATE	APPROVED
⚠			



Section A-A'

NOTES : (UNLESS OTHERWISE SPECIFIED)

1. MOLD CONSTRUCTION TO BE APPROVED BY UNICOM.
2. FINISH; EXTERIOR SURFACES TO BE VERY HIGH GLOSS. VISIBLE SIDES
3. VISIBLE SIDES TO BE FREE FROM SINK, FLOW, EJECTOR PIN MARK, WELD LINE AND OTHER COSMETIC DEFECTS INCLUDING.
4. SMALL ALPHABET IN '' (SINGLE QUOTATION MARKS) ARE FOR SAME DESIGN ONLY.
5. ALL DRAFT TO BE 3°.
6. WALL THICKNESS TO BE 1.0m/m
7. RIB THICKNESS TO BE 0.8/1.0
8. ALL BOSSES', RIBS' DRAFT TO BE 1°
9. INTERIOR(NON-APPEARANCE) RADII TO BE 0.3

TOOL MAT'L

No	DESCRIPTION	Q'TY	MATERIAL	REMARKS
1	CAVITY		NAK-81 SKD-61 KP-4M	(HRc 48~50°)
2	CORE			
3	SLIDE CORE			
4	INSERT CORE			

NO	DESCRIPTION	MATERIAL	Q'ty	SPECIFICATION	TREAT	REMARKS
		URETHANE	1			

TOLERANCE (+)	1-4	4-16	16-63	63-250	250-500	ANGLE
A	0.05	0.07	0.1	0.2	0.3	±
B	0.10	0.20	0.3	0.5	0.8	
C	0.25	0.35	0.5	0.7	1.5	

SCALE	1/1	1999.1.16	REV	0
UNIT	M/M	CAD NO.	9026anca	

DRAW & DESIGN	DET.CHE	APPROVAL	NAME	MH9026
			CAP, H/ANTENNA	

Unicom Co., LTD	DWG NO	216 - 257	SHEET	OF

Appendix C

The antenna of the device is screwed inside the device, the user can not remove it freely without any tools from outside the device. This is comply with the FCC rules part 15.203

Appendix D

Security Code

Description of 900 MHz Direct Spectrum Cordless Phone

The subject device's 20 independent channels, autoscan at link establishment and smart channel hopping combine to find the clearest channels at all times, automaticlly.
Spread spectrum technology ensures the highest level of security available in a cordless phone.

The spread cpectrum technique provides better security than other solutionssince only the receiver has a copy of the pre-assigned spreading code, making iterception virtually impossible. The trainsmitting singal diluted over a large bandwidth with power density at any point being very light, so the singal goes unnoticed by other systems since they are not tuned to receive it. Moreover the scambling code changes every 8 times the phone is parked, and there are millions of codes.

Scambler / Descrambler A16-code randomizes the voice and supervisory data for trainsmission and reception, more than 64K scramble codes are availble from the 16-bit maximal length pesudo-noise sequencu generator.

Sread Spectrum Spreader Each trainsmitted bit is multiplied with a 12-chip spreading code, meeting FCC Part 15.247 requirements.

EXHIBIT C

User Manual