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

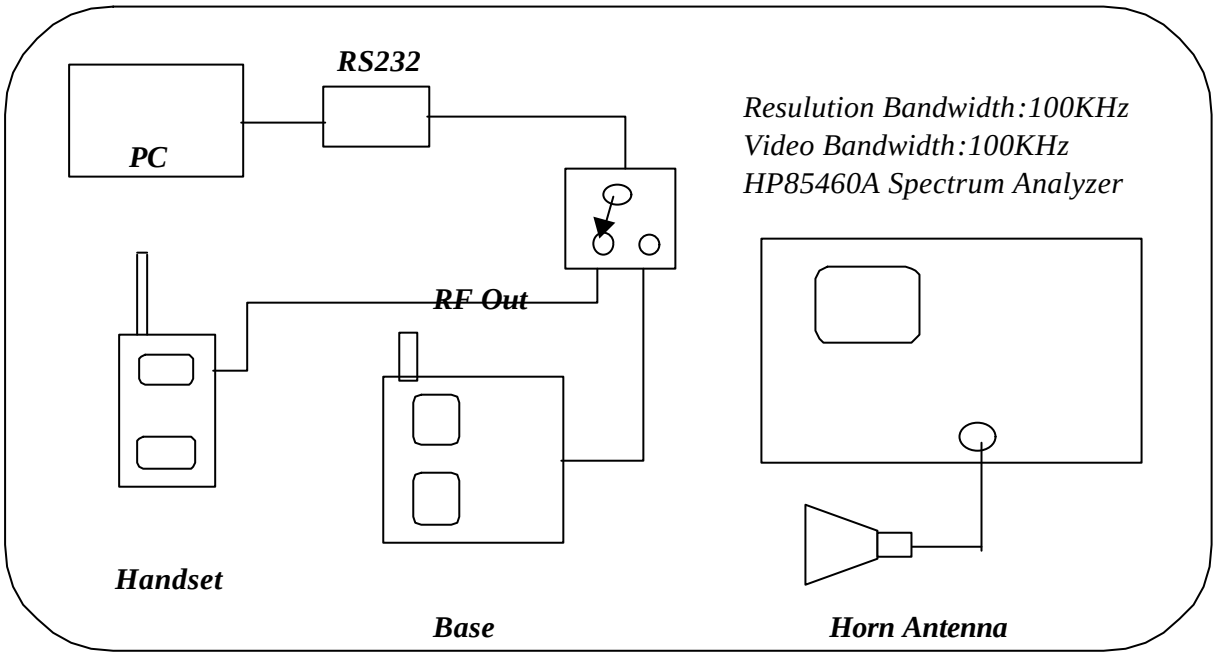
3.1 Test Condition & Setup

The transmitter bandwidth measurements were performed in an anechoic chamber. 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

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	10/18/00	10/18/01
RF Filter Section	85460A	H P	3448A00217	10/18/00	10/18/01
Horn Antenna	3115	EMCO	9704 – 5178	08/15/00	08/15/01

3.4 Test Result of Bandwidth

Bandwidth of Channel 1

Bandwidth of Base : 1.63 MHz
Bandwidth of Handset : 1.60 MHz
The min. 6 dB BW at least : 500 KHz

Bandwidth of Channel 21

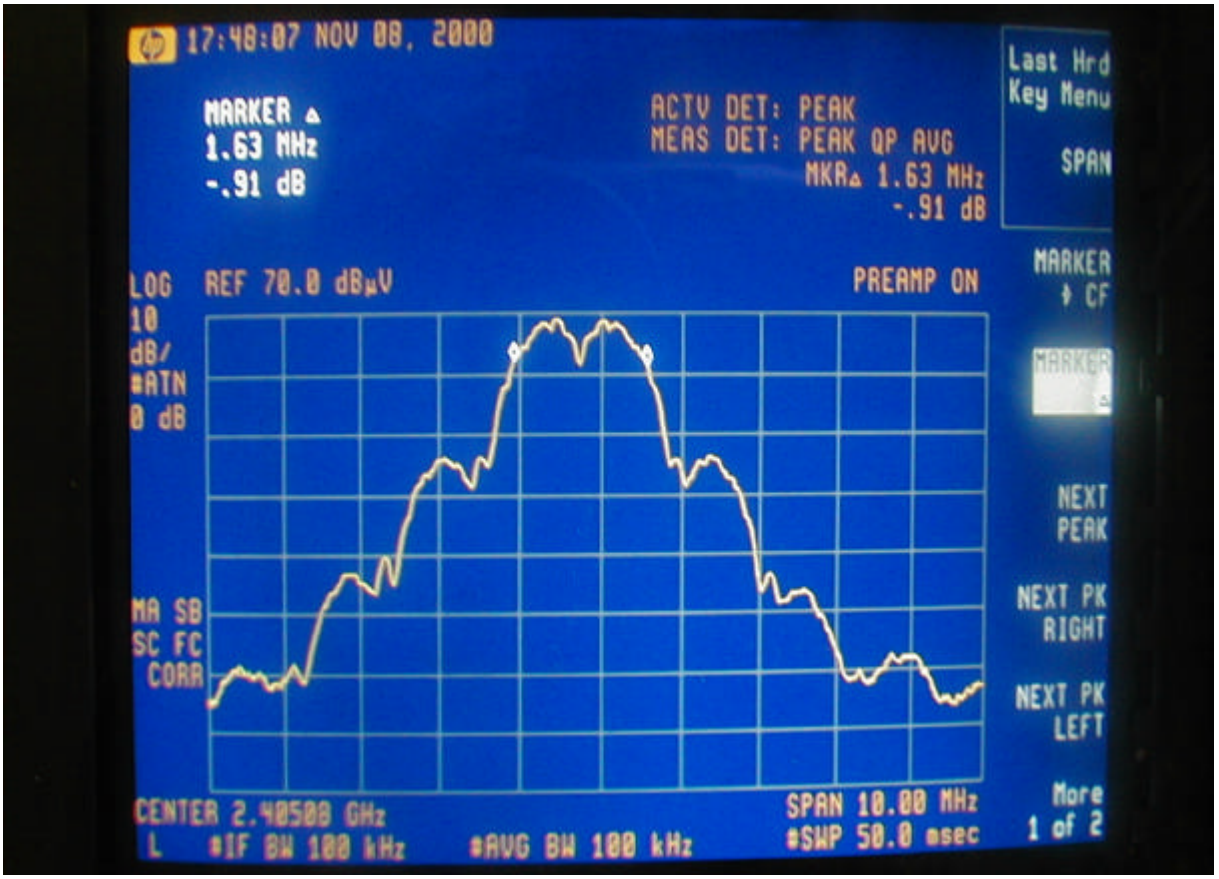
Bandwidth of Base : 1.63 MHz
Bandwidth of Handset : 1.58 MHz
The min. 6 dB BW at least : 500 KHz

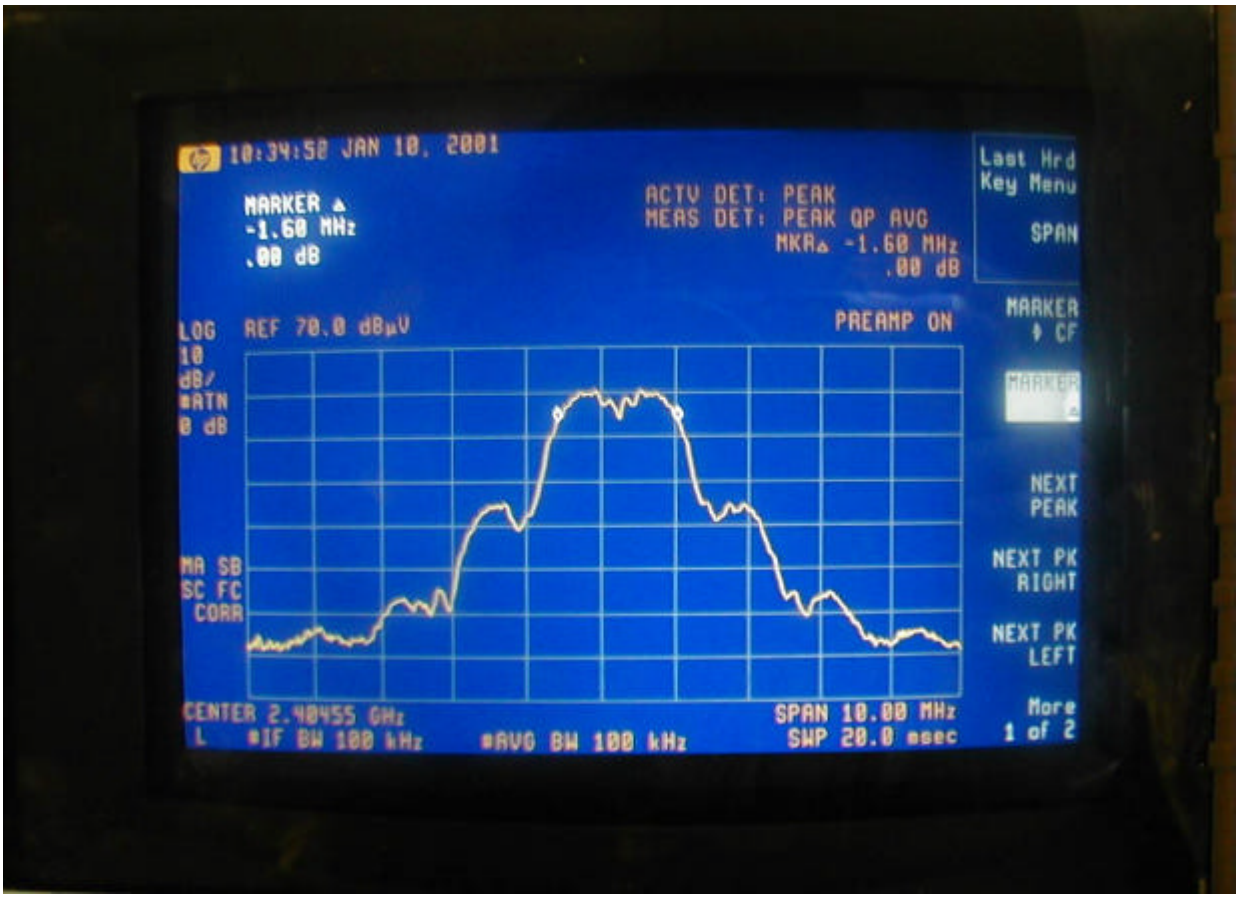
Bandwidth of Channel 40

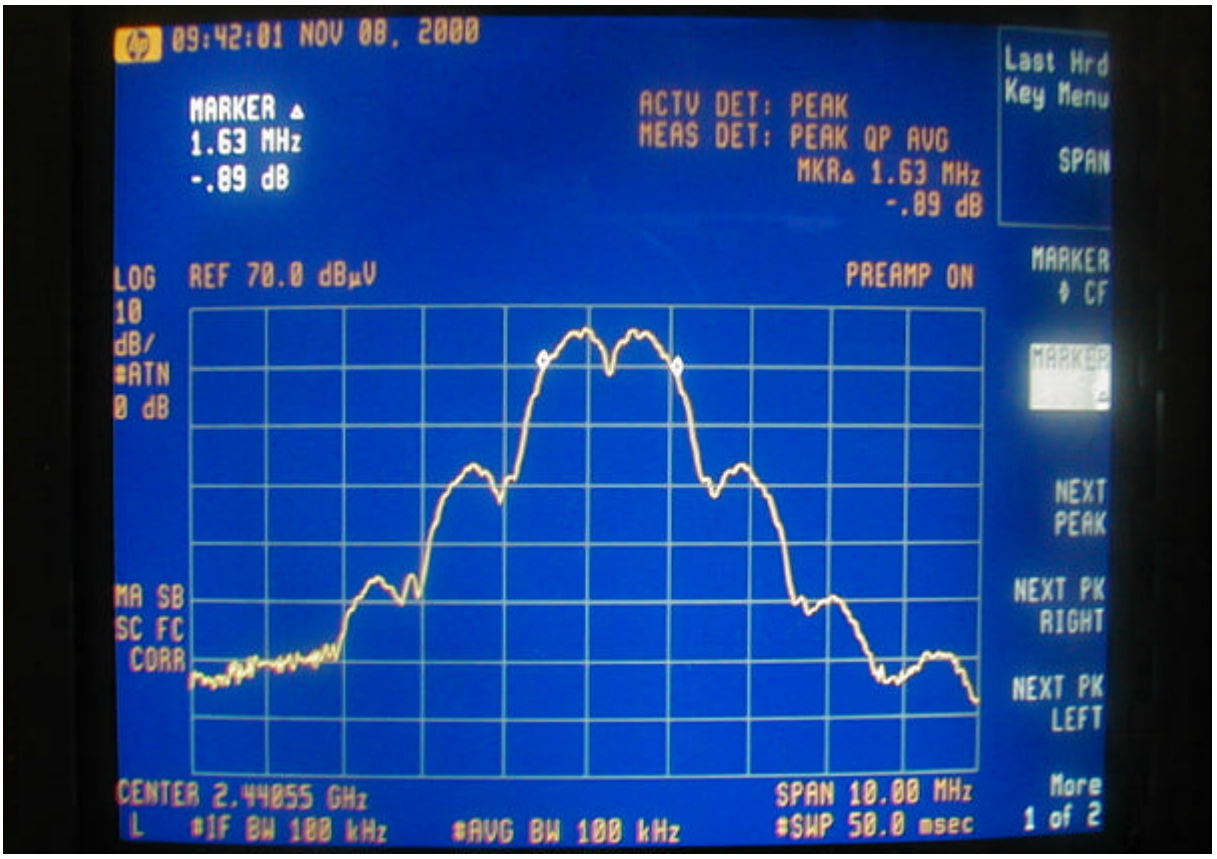
Bandwidth of Base : 1.60 MHz
Bandwidth of Handset : 1.60 MHz
The min. 6 dB BW at least : 500 KHz

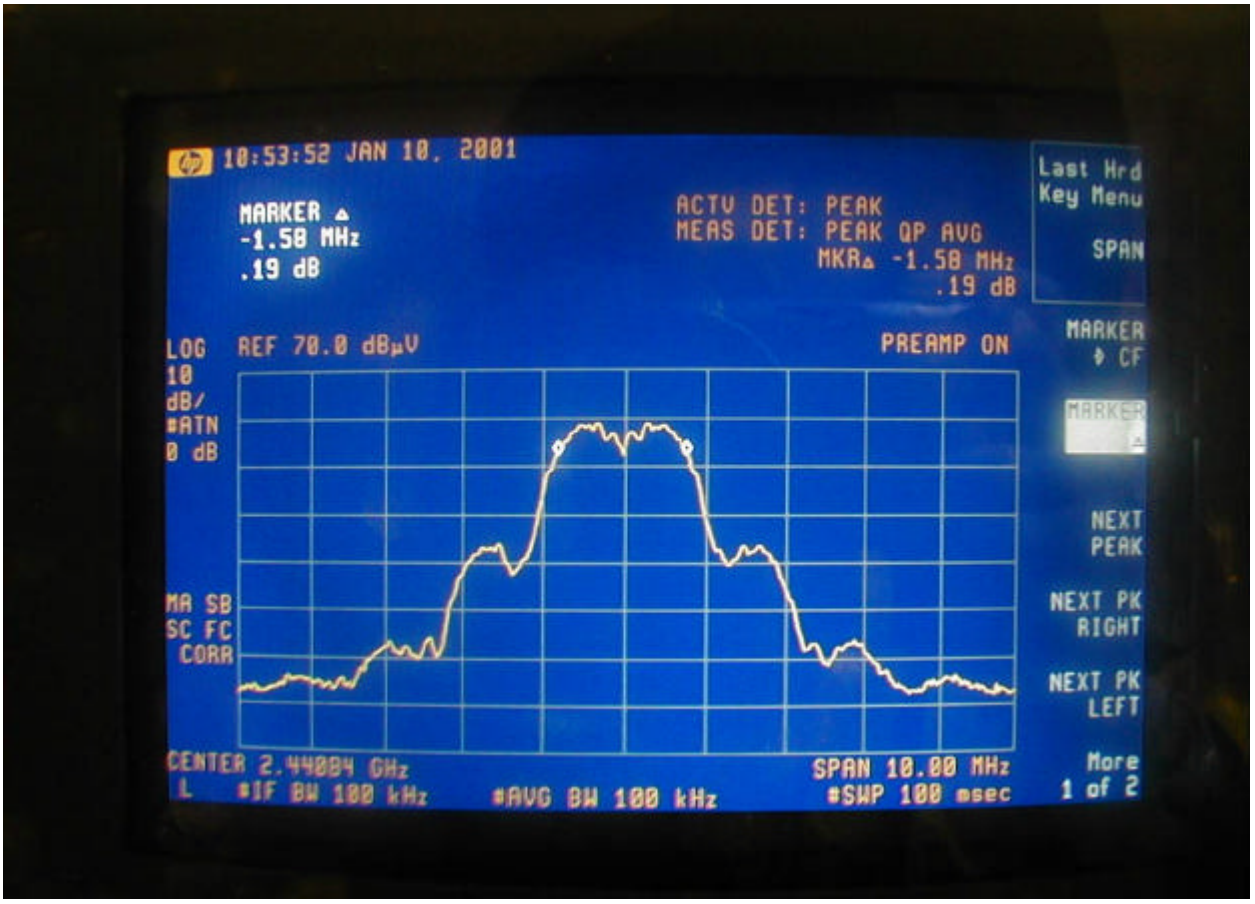
Note:

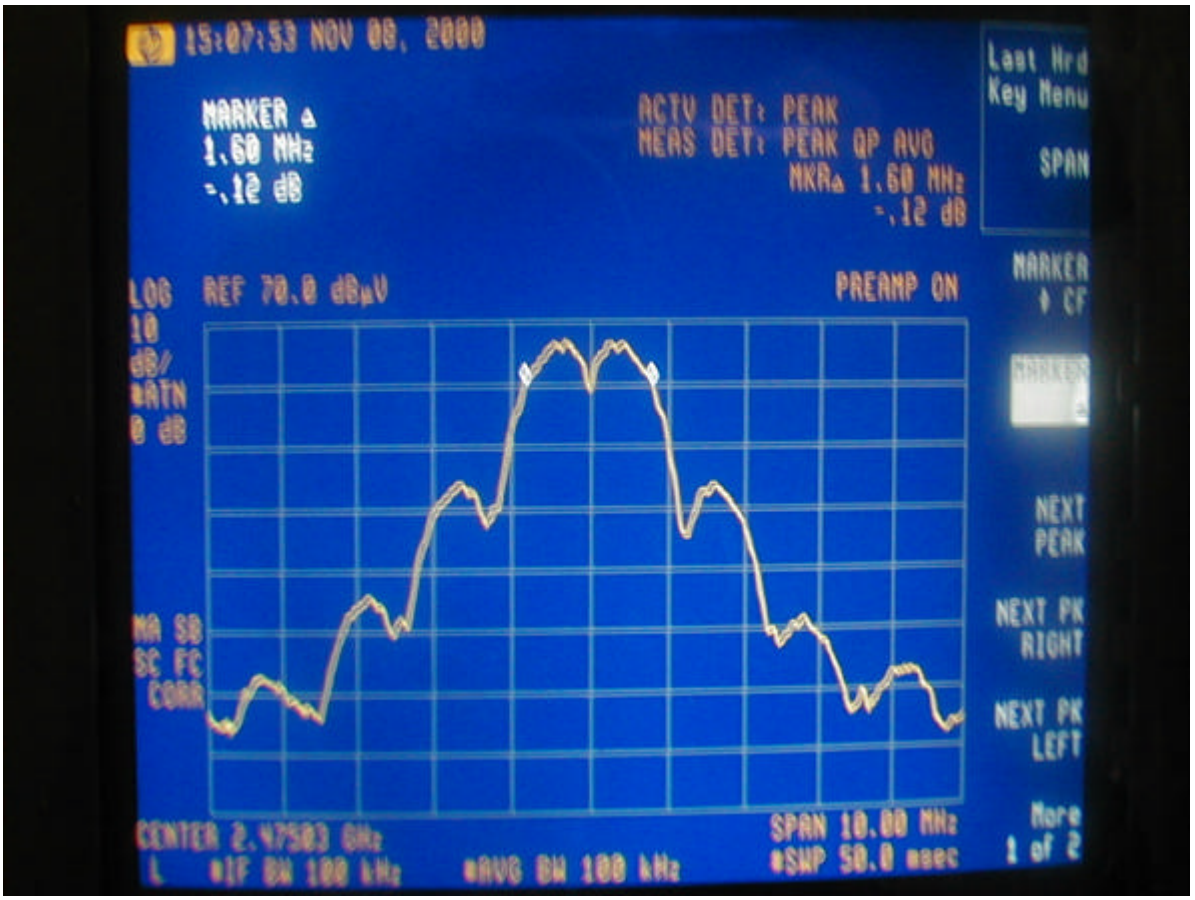
1. The data in the above table are summarizing the following attachment spectrum analyzer hard copy.
2. The attachments follow page.

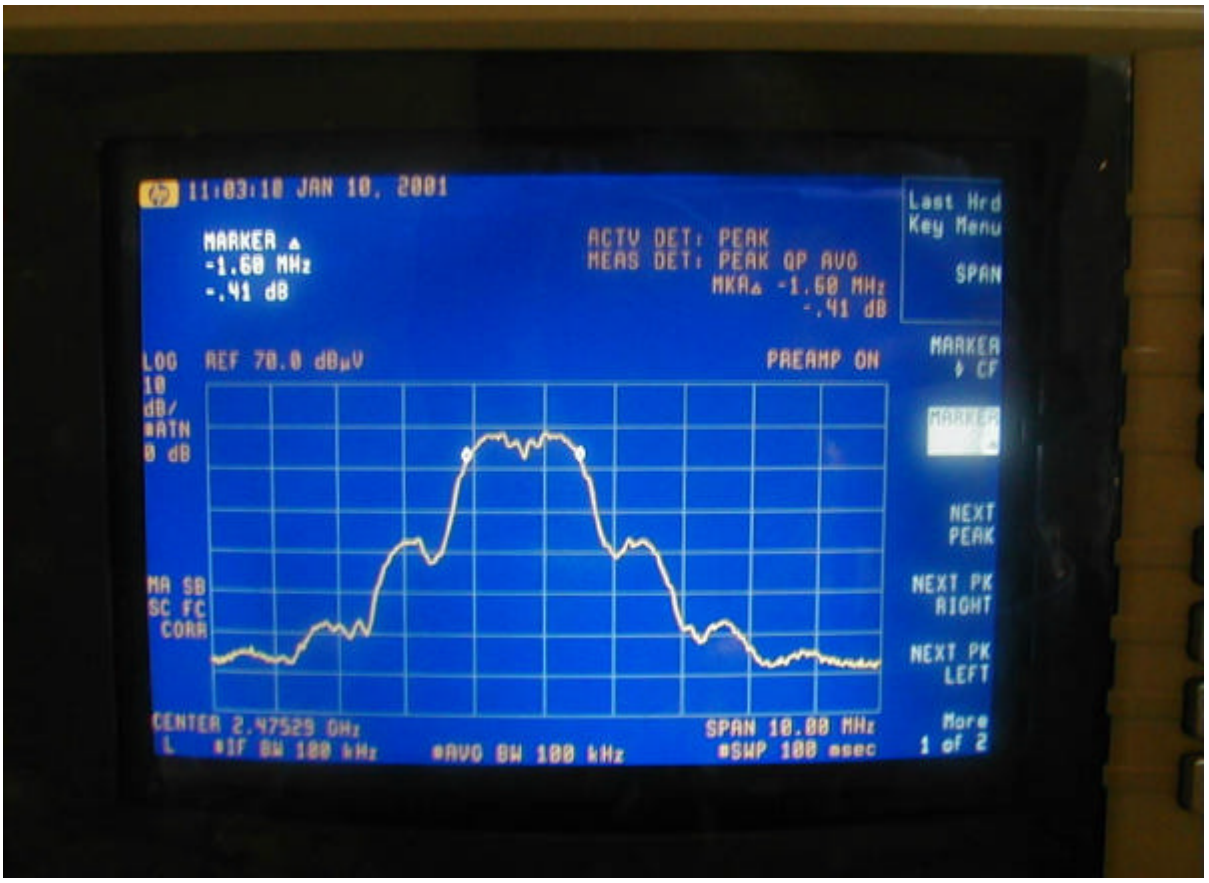

17:48:07 NOV 08, 2000
MARKER Δ
1.63 MHz
-.91 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ 1.63 MHz
-.91 dB
Last Hrd Key Menu
SPAN
LOG
10
dB/
#ATN
0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MARKER
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
MA SB
SC FC
CORR
CENTER 2.40500 GHz
#IF BW 100 kHz
#AVG BW 100 kHz
SPAN 10.00 MHz
#SWP 50.0 msec


10:34:50 JAN 10, 2001
MARKER Δ
-1.60 MHz
.00 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ -1.60 MHz
.00 dB
Last Hrd Key Menu
SPAN
LOG
10
dB/
#ATN
0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MARKER
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
MA SB
SC FC
CORR
CENTER 2.40455 GHz
#IF BW 100 kHz
#AVG BW 100 kHz
SPAN 10.00 MHz
SWP 20.0 msec


09:42:01 NOV 08, 2000
MARKER ▲
1.63 MHz
-.89 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR▲ 1.63 MHz
-.89 dB
Last Hrd Key Menu
SPAN
LOG
10
dB/
#ATN
0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MA SB
SC FC
CORR
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
CENTER 2.44055 GHz
#IF BW 100 kHz
#AVG BW 100 kHz
SPAN 10.00 MHz
#SWP 50.0 msec


10:53:52 JAN 10, 2001
MARKER ▲
-1.58 MHz
.19 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR▲ -1.58 MHz
.19 dB
Last Hrd Key Menu
SPAN
LOG
10
dB/
#ATN
0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MA SB
SC FC
CORR
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
CENTER 2.44084 GHz
#IF BW 100 kHz
#AVG BW 100 kHz
SPAN 10.00 MHz
#SWP 100 msec


15:07:53 NOV 08, 2000
MARKER Δ
1.60 MHz
-.12 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ 1.60 MHz
-.12 dB
Last Hrd Key Menu
SPAN
LOG REF 70.0 dBμV
PREAMP ON
10 dB/
#ATN 0 dB
MARKER → CF
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
MA SB SC FC CORR
CENTER 2.47503 GHz
SPAN 10.00 MHz
#IF BW 100 kHz
#AVG BW 100 kHz
#SWP 50.0 msec


11:03:10 JAN 10, 2001
MARKER Δ
-1.60 MHz
-.41 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ -1.60 MHz
-.41 dB
Last Hrd Key Menu
SPAN
LOG REF 70.0 dBμV
PREAMP ON
10 dB/
#ATN 0 dB
MARKER → CF
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
MA SB SC FC CORR
CENTER 2.47525 GHz
SPAN 10.00 MHz
#IF BW 100 kHz
#AVG BW 100 kHz
#SWP 100 msec

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 that 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 1GHz to 40GHz using a Hewlett Packard Spectrum Analyzer 8564E, EMCO whole range Horn antenna (Model No.: 3115) is used to measure frequency from 1GHz to 18GHz. The final test is used the spectrum HP 8564E. 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 HP8564E used on this testing for frequency 1GHz to 18GHz. 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 PC and Rockwell software to control the base, handset. Then making access to the mode of continuous transmission. Three channels were tested, one in the top (CH01), one in the middle (CH21) and the other in bottom (CH40).

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 2400-2483.5 MHz band.

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

4.2 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
Spectrum Analyzer	8564E	H P	US36433002	08/13/00	08/13/01
Microwave Preamplifier	83051A	H P	3232A00347	08/13/00	08/13/01
Horn Antenna	3115	EMCO	9704 – 5178	08/15/00	08/15/01

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.

FCC ID : AK8SPPA2470

Table 6 Open Field Fundamental Emissions

Channel	*Frequency (GHz)*	*A.P. (H/V)*	*A.H. (M)*	*Table (degree)*	*Amplitude (dBmV/m)*	*CF (dB)*	*Duty Cycle (dB)*	*Corrected Amplitude (dBmV/m) Excluded Duty Cycle*	*Corrected Amplitude (dBmV/m) Included Duty Cycle*	*E.I.R.P. Included Duty Cycle*	
										m W	*dB m*
Base 01	2.4048	H	1.00	33	108.51	-8.67	-6.46	93.38	99.84	2.891	4.661
	2.4048	V	1.00	165	121.47	-8.67	-6.46	106.34	112.80	57.164	17.571
Base 21	2.4408	H	2.43	189	107.90	-8.67	-6.46	92.77	99.23	2.513	4.001
	2.4408	V	1.00	224	119.26	-8.67	-6.46	104.13	110.59	34.365	15.361
Base 40	2.4750	H	1.00	62	106.89	-8.67	-6.46	91.76	98.22	1.991	2.991
	2.4750	V	1.00	179	119.59	-8.67	-6.46	104.46	110.92	37.078	15.961
Handset 01	2.4048	H	2.51	307	106.21	-8.67	-6.46	91.08	97.54	1.702	2.31
	2.4048	V	1.00	338	114.57	-8.67	-6.46	99.44	105.90	11.668	10.67
Handset 21	2.4408	H	3.97	95	106.37	-8.67	-6.46	91.24	97.70	1.766	2.47
	2.4408	V	1.00	112	114.70	-8.67	-6.46	99.57	106.03	12.022	10.80
Handset 40	2.4750	H	2.51	245	109.14	-8.67	-6.46	94.01	100.49	3.342	5.24
	2.4750	V	1.00	219	114.88	-8.67	-6.46	99.75	106.21	12.531	10.98

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 (Included Duty Cycle)= Peak Amplitude + Corrected Factor
   Corrected Amplitude (Excluded Duty Cycle)= Peak Amplitude + Corrected Factor + Duty Cycle
5. Amplitude means the fundamental emission measured.
6. Conducted output power "P", $P= (E d)^2 / 30G$
7. Since G=1. P=EIRP

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 = 112.80 dBμV/m

$10^{(112.80/20)} \times 10^{-6} = 0.4365158$ V

E.I.R.P. = $(0.4365158 \times 3)^2 / 30 = 57.164$ mW = 10 x log (57.164 mW / 1 mW) = 17.571 dBm

So, the Max Radiation Emission of handset ch40 = 106.21 dBμV/m, output power for 12.531mW.

E.I.R.P. = $(0.046665 \times 3)^2 / 30 = 0.653312$ mW = 10 x log (0.653312 mW / 1 mW) = -1.85 dBm

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

5.1 Test Condition & Setup

The EUT was placed in an 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, Schaffner whole range Bi-Log antenna (Model No.: CBL6141A) 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 8564E 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 8564E 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 PC 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 (CH21) and the other in bottom (CH40).

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 2400 ~ 2483.5 MHz band.

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

For frequency between 30MHz to 1000MHz

FIa (dBuV/m) = FIr (dBμV) – Correction Factors

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Amplifier Gain

For frequency between 1 GHz to 18 GHz

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

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Amplifier Gain

The setting up procedure is recorded on Appendix A.

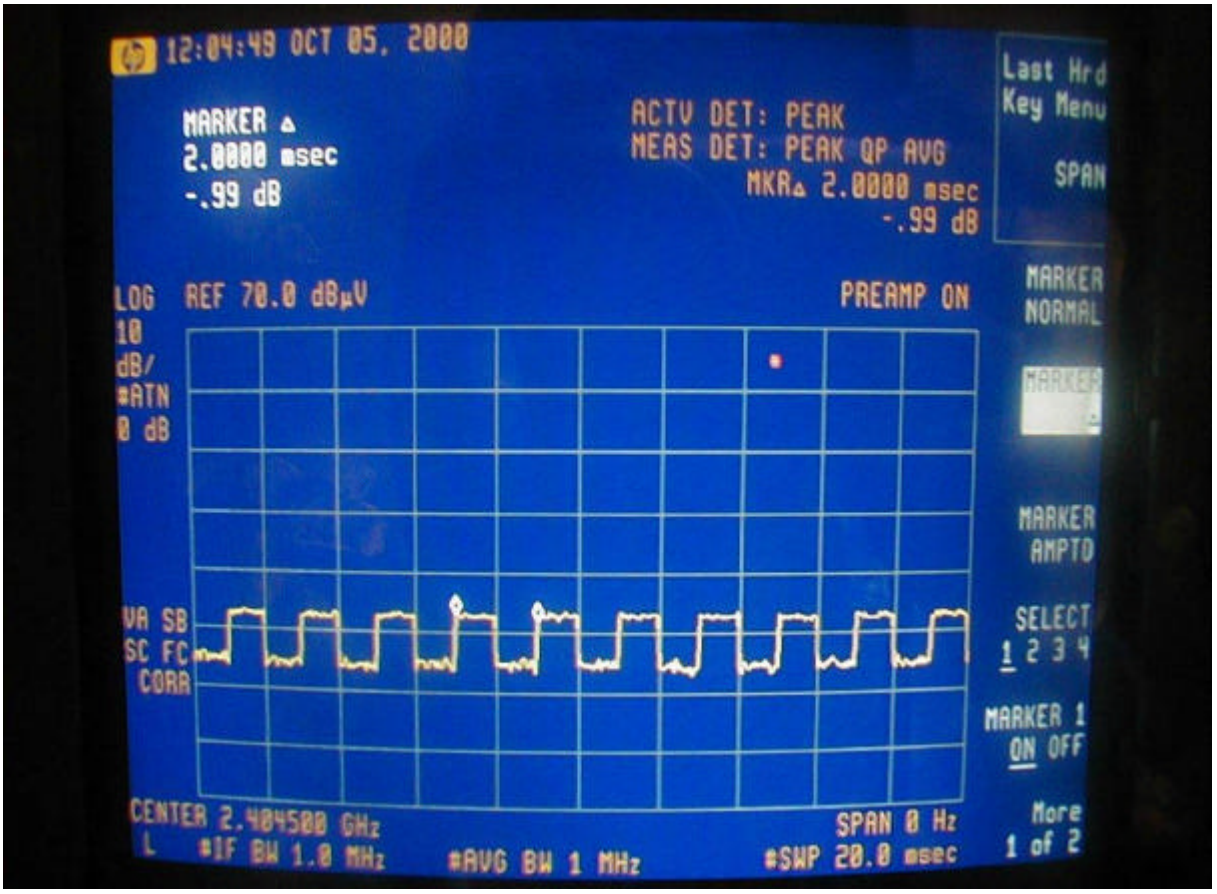
5.2 List of Test Instruments

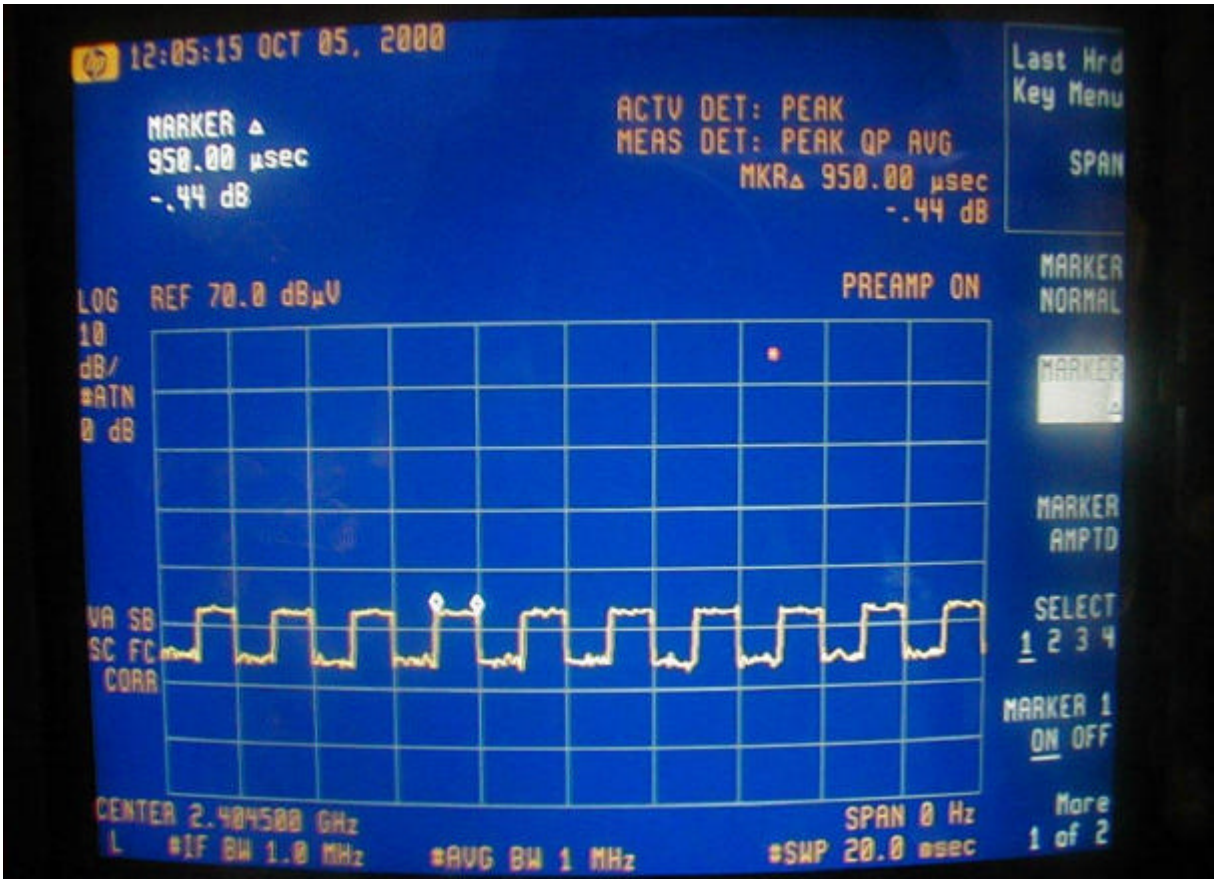
Instrument Name	Model No	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	10/18/00	10/18/01
RF Filter Section	85460A	H P	3448A00217	10/18/00	10/18/01
Switch/Control Unit (> 30MHz)	3488A	H P	N/A	11/22/00	11/22/01
Auto Switch Box (> 30MHz)	ASB-01	TRC	9904-01	11/22/00	11/22/01
Spectrum Analyzer	8564E	H P	US36433002	08/13/00	08/13/01
Microwave Preamplifier	83051A	H P	3232A00347	08/13/00	08/13/01
Horn Antenna	3115	EMCO	9704 – 5178	08/15/00	08/15/01

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 (0.950/2.000) = – 6.466


12:04:49 OCT 05, 2000
MARKER Δ
2.0000 msec
-.99 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ 2.0000 msec
-.99 dB
Last Hrd Key Menu
SPAN
LOG 10 dB/ #ATN 0 dB
REF 70.0 dBµV
PREAMP ON
MARKER NORMAL
MARKER AMPTD
SELECT 1 2 3 4
MARKER 1 ON OFF
More 1 of 2
VA SB SC FC CORR
CENTER 2.404500 GHz
L #IF BW 1.0 MHz
#AVG BW 1 MHz
SPAN 0 Hz
#SWP 20.0 msec


12:05:15 OCT 05, 2000
MARKER Δ
950.00 µsec
-.44 dB
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ 950.00 µsec
-.44 dB
Last Hrd Key Menu
SPAN
LOG 10 dB/ #ATN 0 dB
REF 70.0 dBµV
PREAMP ON
MARKER NORMAL
MARKER AMPTD
SELECT 1 2 3 4
MARKER 1 ON OFF
More 1 of 2
VA SB SC FC CORR
CENTER 2.404500 GHz
L #IF BW 1.0 MHz
#AVG BW 1 MHz
SPAN 0 Hz
#SWP 20.0 msec

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. : SPP-A2470

EUT : Cordless Telephone with Answering System

Table 7 Second Harmonic Attendation

Channel	*Fundamental (MHz)*	*Fundamental (dBmV/m)*	*2nd Harmonic (GHz)*	*2nd Harmonic (dBmV/m)*	*Result (F/H dB)*	*Limit (dB)*	*Margin (dB)*
B/S CH 01	2.4048	112.80	4.807	52.79	60.01	20.00	40.01
B/S CH 10	2.4408	110.59	4.883	52.60	57.99	20.00	37.99
B/S CH 20	2.4750	110.92	4.948	51.33	59.59	20.00	39.59
H/S CH 01	2.4048	105.90	4.807	47.16	58.74	20.00	38.74
H/S CH 10	2.4408	106.03	4.883	47.16	58.87	20.00	38.87
H/S CH 20	2.4750	106.21	4.948	45.66	60.55	20.00	40.55

Note:

1. The 2nd Harmonic is comply with 15.209.
2. Result = Fundamental (Peak)– 2nd Harmonic(Peak) must over 20 dB and comply with 15.209.

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 (dBmV/m)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dBmV/m)*	*Limit (dBmV/m)*	*Margin (dB)*
144.345	10.21	2.99	75	-14.74	24.95	43.50	-18.55
182.843	14.26	2.55	135	-12.65	26.91	43.50	-16.59
202.095	16.13	2.51	95	-13.55	29.68	43.50	-13.82
211.910	16.32	1.00	85	-14.26	30.58	43.50	-12.92
221.725	13.69	1.00	116	-15.55	29.24	46.00	-16.76
***							

Note:

1. Margin = Corrected Amplitude – Limit.
2. Peak Amplitude – Correction Factors = Corrected Amplitude

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 (dBm V/m)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dB)*	*(dBm V/m)*	*Limit (dBm V/m)*	*Margin (dB)*
7.220	36.61	1.00	274	9.72	-6.46	39.87	54.00	-14.13
***								

Note:

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

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 (dBmV/m)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dBmV/m)*	*Limit (dBmV/m)*	*Margin (dB)*
154.153	11.06	2.54	265	-13.48	24.54	43.50	-18.96
163.590	11.67	1.00	118	-13.18	24.85	43.50	-18.65
202.472	12.66	2.51	126	-13.80	26.46	43.50	-17.04
211.910	10.46	1.00	78	-14.39	24.85	43.50	-18.65
***							

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 (dBm V/m)	Ant. H. (m)	Table (°)	(dB)	(dB)	(dBm V/m)	Limit (dBm V/m)	Margin (dB)
7.220	39.27	1.00	324	9.72	-6.46	42.53	54.00	-11.47
***								

Table 24 Open Field Radiated Emissions For 30MHz 1GHz [Channel 21, Handset Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	FCC Class B (3 m)	
Frequency (MHz)	Amplitude (dBmV/m)	Ant. H. (m)	Table (°)	(dB)	(dBmV/m)	Limit (dBmV/m)	Margin (dB)
182.243	13.98	2.54	58	-12.65	26.63	43.50	-16.87
192.657	13.22	2.51	245	-12.92	26.14	43.50	-17.36
202.472	15.35	2.55	95	-13.57	28.92	43.50	-14.58
211.910	15.70	1.00	119	-14.26	29.96	43.50	-13.54
221.725	13.20	2.50	124	-15.55	28.75	46.00	-17.25
365.520	8.73	1.00	137	-18.37	27.10	46.00	-18.90
***							

Table 25 Open Field Radiated Emissions For 1GHz 18GHz [Channel 21, Handset Horizontal]

Radiated Emission				Correction Factors	Duty Cycle	Corrected Amplitude	FCC Class B (3 m)	
Frequency (GHz)	Amplitude (dBm V/m)	Ant. H. (m)	Table (°)	(dB)	(dB)	(dBm V/m)	Limit (dBm V/m)	Margin (dB)
7.325	36.90	1.00	174	9.72	-6.46	40.16	54.00	-13.84
***								

Table 26 Open Field Radiated Emissions For 30MHz 1GHz [Channel 21, Handset Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBmV/m)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dBmV/m)*	*Limit (dBmV/m)*	*Margin (dB)*
144.345	8.10	2.53	74	-14.09	22.19	43.50	-21.31
163.590	9.78	2.54	154	-13.18	22.96	43.50	-20.54
182.843	10.77	1.00	195	-12.16	22.93	43.50	-20.57
202.095	10.25	2.51	235	-13.77	24.02	43.50	-19.48
***							

Table 27 Open Field Radiated Emissions For 1GHz 18GHz [Channel 21, Handset Vertical]

Radiated Emission				Correction Factors	Duty Cycle	Corrected Amplitude	FCC Class B (3 m)	
Frequency (GHz)	Amplitude (dBm V/m)	Ant. H. (m)	Table (°)	(dB)	(dB)	(dBm V/m)	Limit (dBm V/m)	Margin (dB)
7.325	31.27	1.00	257	9.72	-6.46	34.53	54.00	-19.47
***								

Table 28 Open Field Radiated Emissions For 30MHz 1GHz [Channel 40, Handset Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBmV/m)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dBmV/m)*	*Limit (dBmV/m)*	*Margin (dB)*
182.843	12.56	2.51	241	-12.65	25.21	43.50	-18.29
211.910	13.99	2.49	302	-14.26	28.25	43.50	-15.25
221.347	12.17	2.46	97	-15.51	27.68	46.00	-18.32
231.162	10.59	2.51	126	-14.95	25.54	46.00	-20.46
240.997	10.86	1.00	178	-15.14	26.00	46.00	-20.00
326.520	9.17	1.00	199	-17.24	26.41	46.00	-19.59
***							

Table 29 Open Field Radiated Emissions For 1GHz 18GHz [Channel 40, Handset Horizontal]

Radiated Emission				Correction Factors	Duty Cycle	Corrected Amplitude	FCC Class B (3 m)	
Frequency (GHz)	Amplitude (dBm V/m)	Ant. H. (m)	Table (°)	(dB)	(dB)	(dBm V/m)	Limit (dBm V/m)	Margin (dB)
7.432	39.77	1.00	195	9.72	-6.46	43.03	54.00	-10.97
***								

Table 30 Open Field Radiated Emissions For 30MHz 1GHz [Channel 40, Handset Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*FCC Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBmV/m)*	*Ant. H. (m)*	*Table (°)*	*(dB)*	*(dBmV/m)*	*Limit (dBmV/m)*	*Margin (dB)*
125.287	7.75	2.52	125	-13.95	21.70	43.50	-21.80
144.345	8.80	2.54	248	-14.09	22.89	43.50	-20.61
154.153	8.30	1.00	167	-13.48	21.78	43.50	-21.72
163.590	9.11	1.00	25	-13.18	22.29	43.50	-21.21
182.843	9.59	1.00	98	-12.16	21.75	43.50	-21.75
202.095	9.79	2.54	127	-13.77	23.56	43.50	-19.94
***							

Table 31 Open Field Radiated Emissions For 1GHz 18GHz [Channel 40, Handset Vertical]

Radiated Emission				Correction Factors	Duty Cycle	Corrected Amplitude	FCC Class B (3 m)	
Frequency (GHz)	Amplitude (dBm V/m)	Ant. H. (m)	Table (°)	(dB)	(dB)	(dBm V/m)	Limit (dBm V/m)	Margin (dB)
7.432	40.94	1.00	324	9.72	-6.46	44.20	54.00	-9.80
***								

Ⅵ. Section 15.247(d): Power Spectral Density

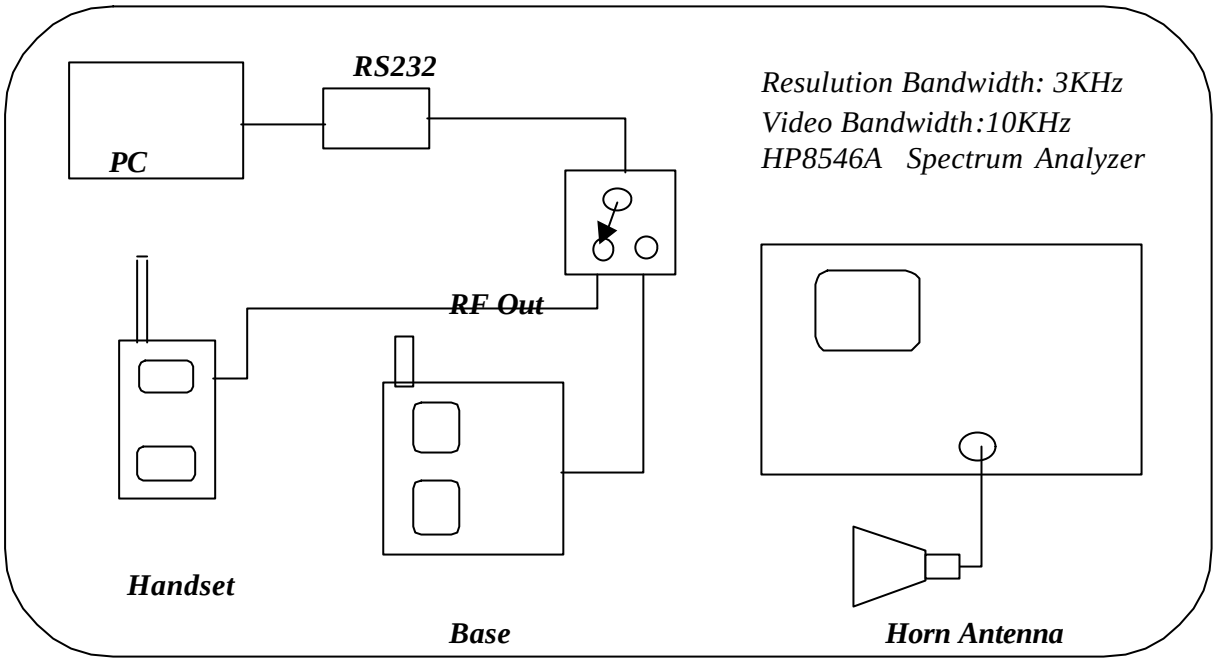
6.1 Test Condition & Setup

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. The EUT 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 = 300kHz. Turn around the table to find maximum emission. Then 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

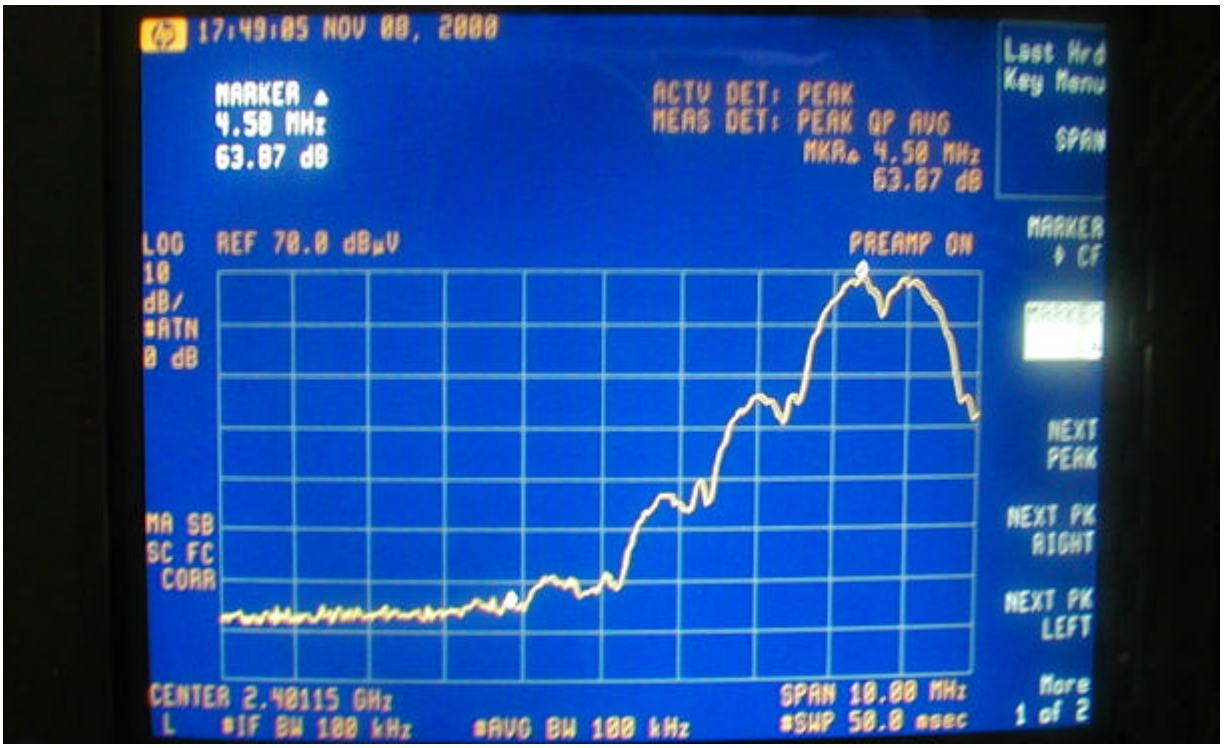
6.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	10/18/00	10/18/01
RF Filter Section	85460A	H P	3448A00217	10/18/00	10/18/01
Horn Antenna	3115	EMCO	9704 – 5178	08/15/00	08/15/01

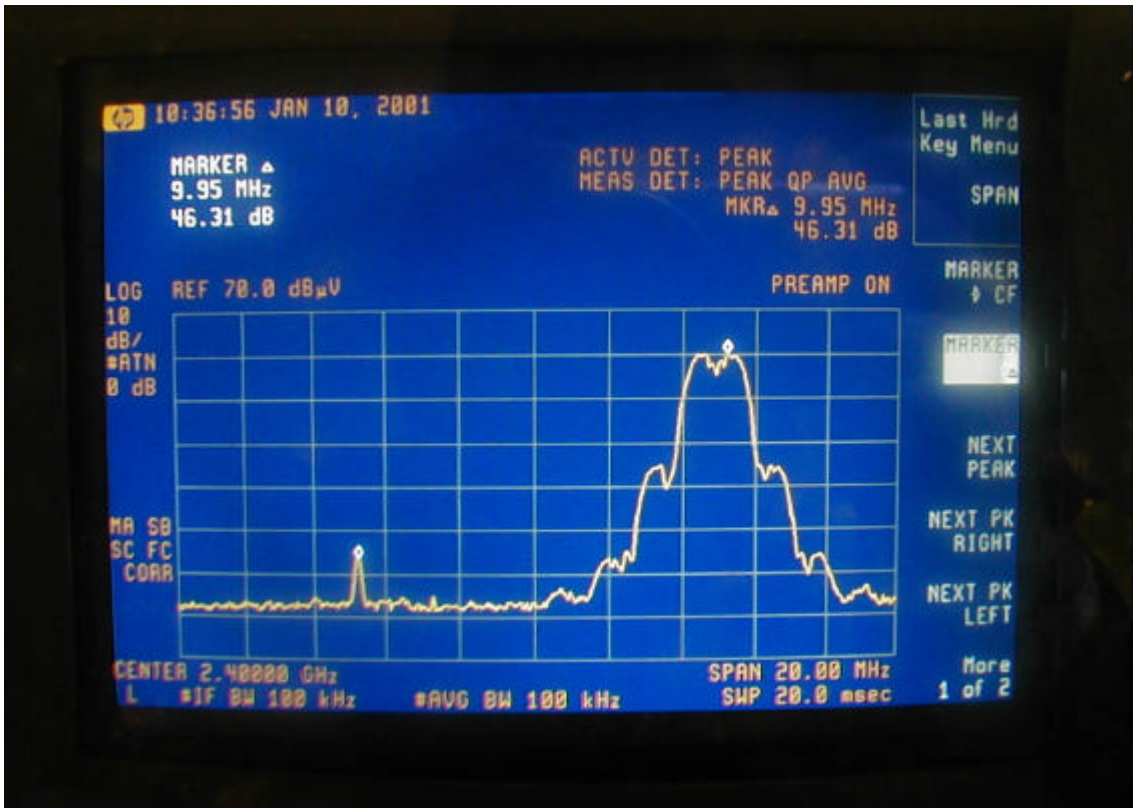
6.4 Required of Carrier frequency

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



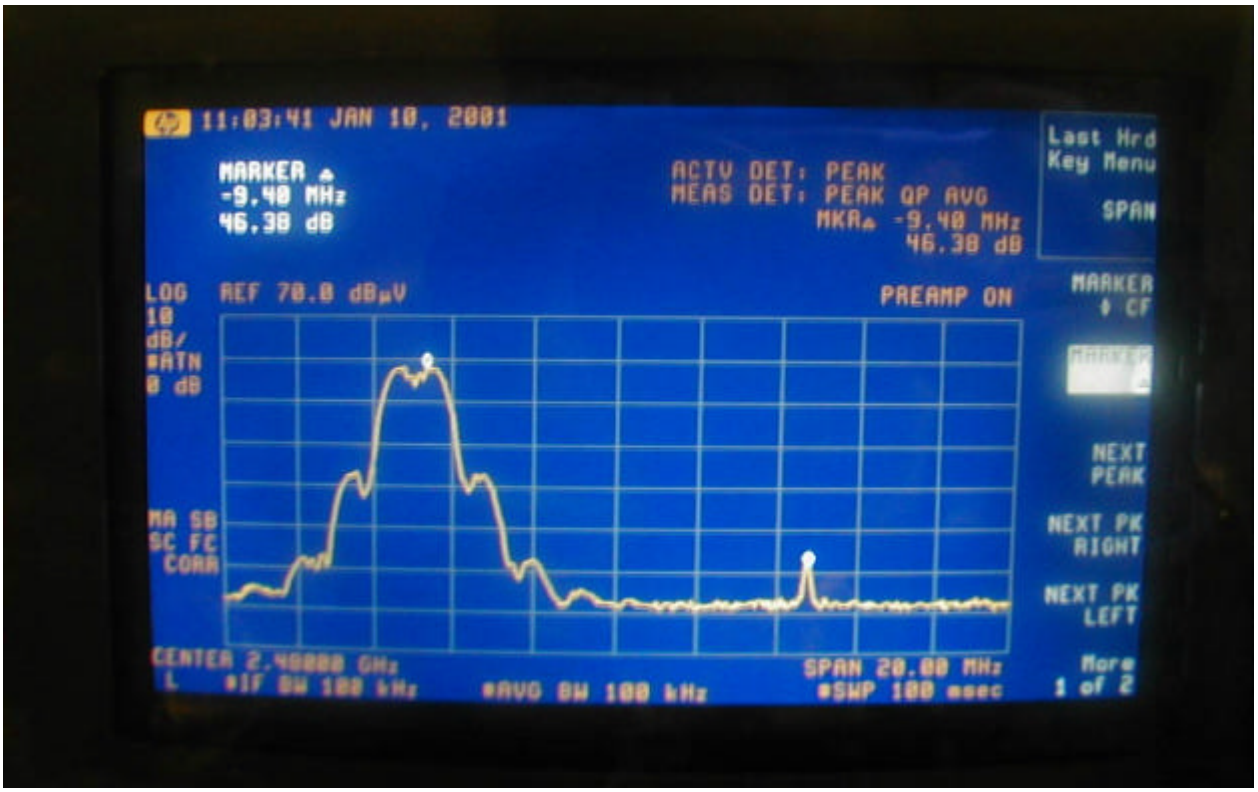
BASE CH01



Handset CH01

Peak 60 dBuV/m + correct factor 35.6 dB = 95.6 dBuV/m

95.6 – 46.31 = 49.25 dBuV/m < 53.9 dBuV/m (Class B Limit)



Handset CH40

12.01 dBuV/m + correct factor 35.6 dB = 47.91 dBuV/m< 53.9 dBuV/m (Class B Limit)

6.5 Test Result of Power spectral density.

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

Model No. : SPP-A2470

EUT : Cordless Telephone with Answering System

Table 33. Power Spectral Density

Channel	*Frequency (MHz)*	*Ppr (dBuV)*	*CF (dB)*	*Ppq (dBm)*	*Limit (dB)*	*Margin (dB)*
B/S CH 01	2.4048	64.69	35.60	5.06	8.00	-2.94
B/S CH 21	2.4408	62.74	35.60	3.11	8.00	-4.89
B/S CH 40	2.4750	59.06	35.60	-0.57	8.00	-8.57
H/S CH 01	2.4048	56.87	35.60	-2.76	8.00	-10.76
H/S CH 21	2.4408	56.10	35.60	-3.53	8.00	-11.53
H/S CH 40	2.4750	56.21	35.60	-3.42	8.00	-11.42

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).

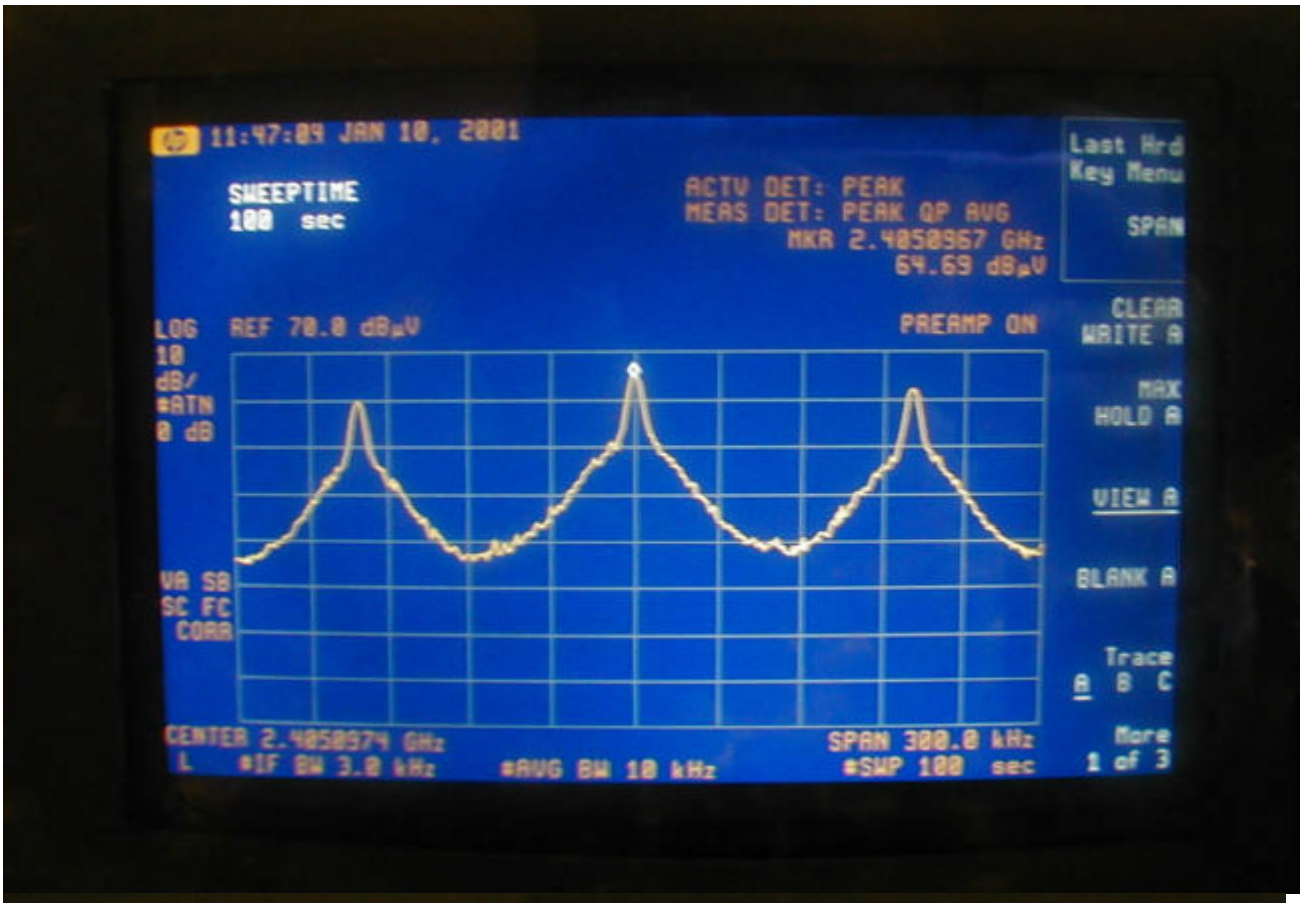
Example: the Max Radiation Emission of base ch01 = 64.69+(35.60) = 100.29 dBμV/m

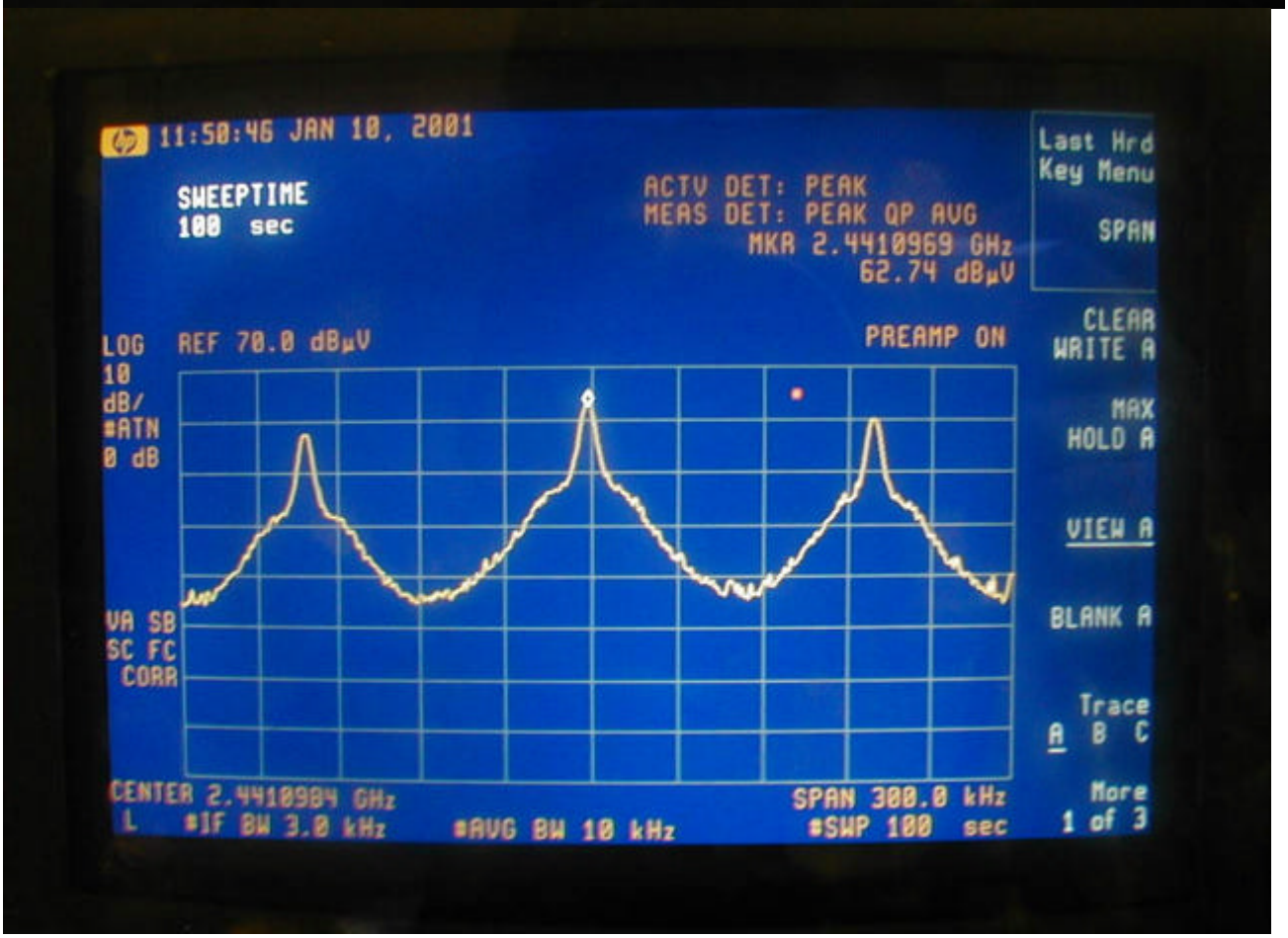
$10^{(100.29/20)} \times 10^{-6} = 0.103395$ V

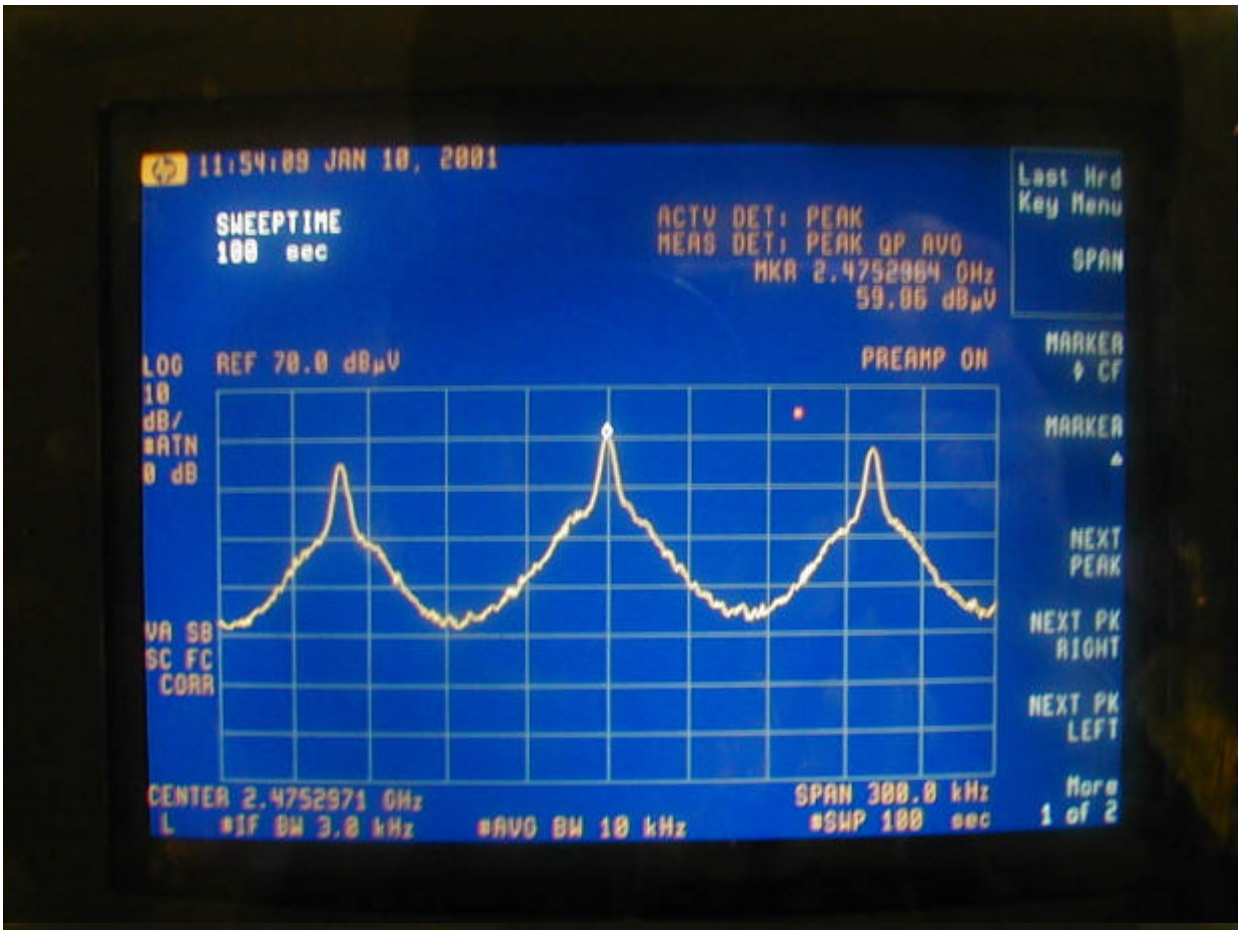
E.R.P. = $(0.103395 \times 3)^2 / 30 = 3.207$ mW

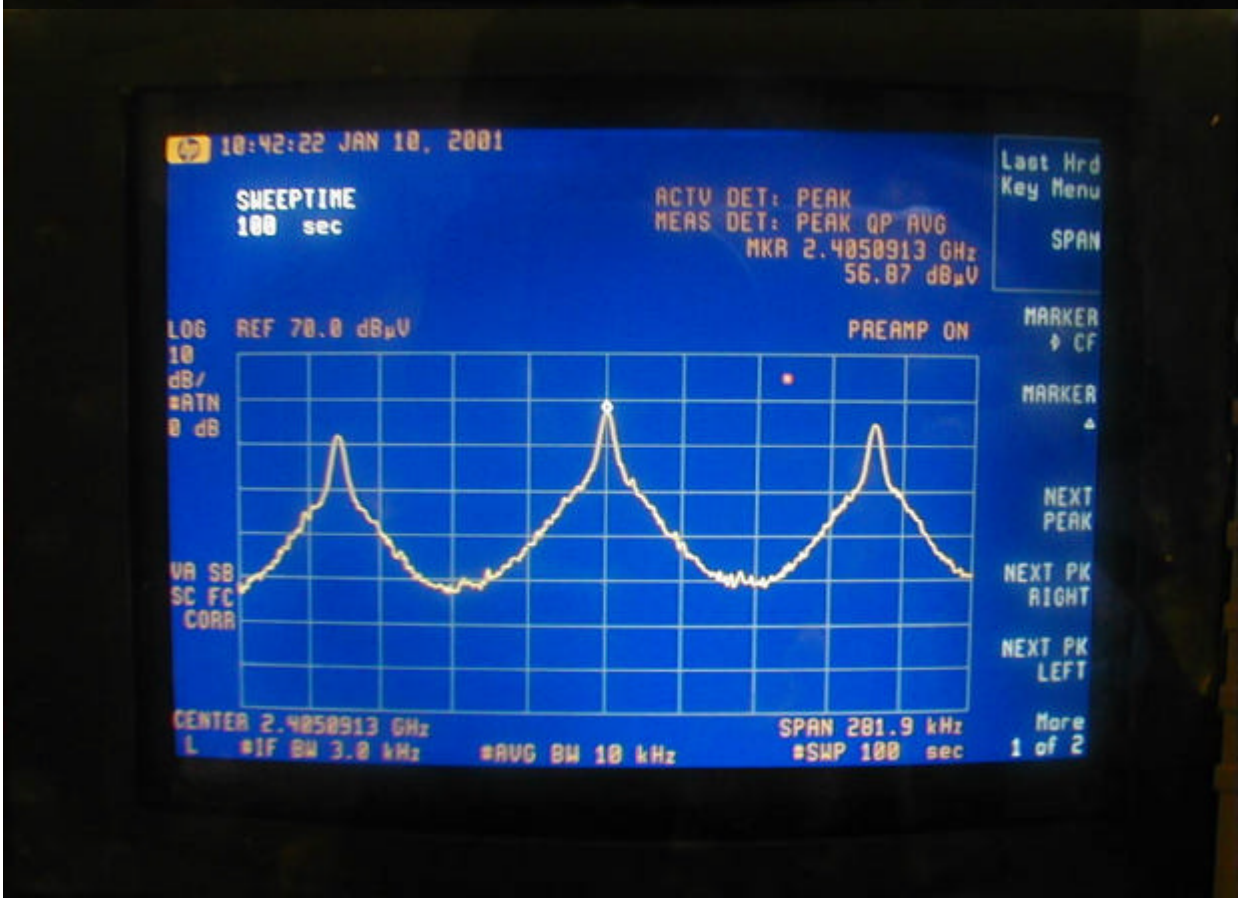
= 10 x log (3.207 mW/1mW)

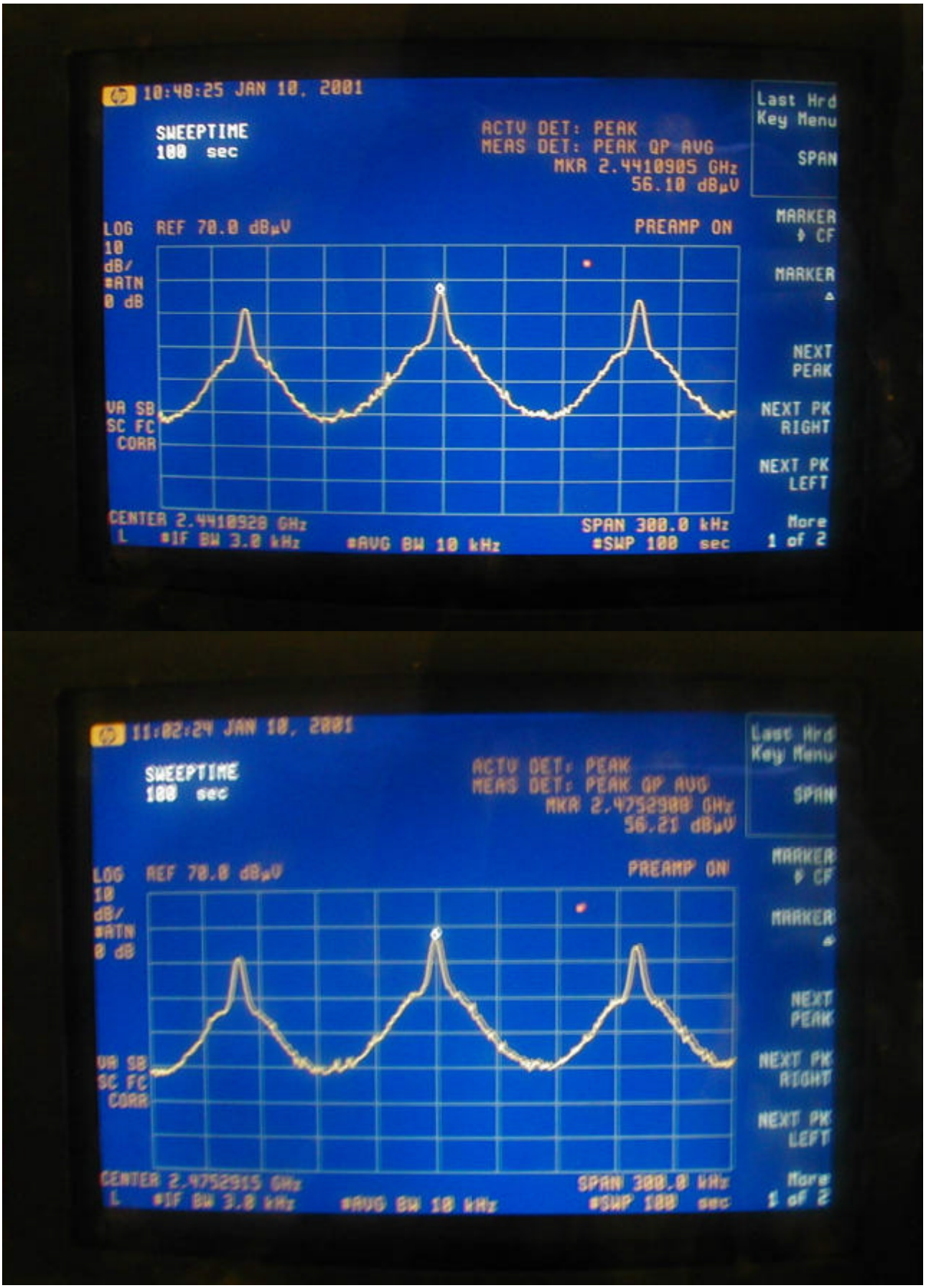
= 5.06 dBm


11:47:09 JAN 10, 2001
SWEEPTIME
100 sec
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4050967 GHz
64.69 dBµV
Last Hrd Key Menu
SPAN
LOG 10 dB/ #ATN 0 dB
REF 70.0 dBµV
PREAMP ON
CLEAR WRITE A
MAX HOLD A
VIEW A
BLANK A
VA SB SC FC CORR
Trace A B C
CENTER 2.4050974 GHz
#IF BW 3.0 kHz
#AVG BW 10 kHz
SPAN 300.0 kHz
#SWP 100 sec
More 1 of 3


11:50:46 JAN 10, 2001
SWEEPTIME
100 sec
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4410969 GHz
62.74 dBµV
Last Hrd Key Menu
SPAN
LOG 10 dB/ #ATN 0 dB
REF 70.0 dBµV
PREAMP ON
CLEAR WRITE A
MAX HOLD A
VIEW A
BLANK A
VA SB SC FC CORR
Trace A B C
CENTER 2.4410984 GHz
#IF BW 3.0 kHz
#AVG BW 10 kHz
SPAN 300.0 kHz
#SWP 100 sec
More 1 of 3


11:54:09 JAN 10, 2001
SWEEPTIME
100 sec
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4752964 GHz
59.06 dBµV
Last Hrd Key Menu
SPAN
LOG
10
dB/
#ATN
0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MARKER
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
VA SB
SC FC
CORR
CENTER 2.4752971 GHz
#IF BW 3.0 kHz
#AVG BW 10 kHz
SPAN 300.0 kHz
#SWP 100 sec


10:42:22 JAN 10, 2001
SWEEPTIME
100 sec
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4050913 GHz
56.87 dBµV
Last Hrd Key Menu
SPAN
LOG
10
dB/
#ATN
0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MARKER
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
VA SB
SC FC
CORR
CENTER 2.4050913 GHz
#IF BW 3.0 kHz
#AVG BW 10 kHz
SPAN 281.9 kHz
#SWP 100 sec


10:48:25 JAN 10, 2001
SWEEPTIME
100 sec
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4410905 GHz
56.10 dBµV
Last Hrd Key Menu
SPAN
LOG 10 dB/ #ATN 0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MARKER Δ
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
VA SB SC FC CORR
CENTER 2.4410928 GHz
#IF BW 3.0 kHz
#AVG BW 10 kHz
SPAN 300.0 kHz
#SWP 100 sec
11:02:24 JAN 10, 2001
SWEEPTIME
100 sec
ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.4752900 GHz
56.21 dBµV
Last Hrd Key Menu
SPAN
LOG 10 dB/ #ATN 0 dB
REF 70.0 dBµV
PREAMP ON
MARKER → CF
MARKER Δ
NEXT PEAK
NEXT PK RIGHT
NEXT PK LEFT
More 1 of 2
VA SB SC FC CORR
CENTER 2.4752915 GHz
#IF BW 3.0 kHz
#AVG BW 10 kHz
SPAN 300.0 kHz
#SWP 100 sec