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RM1105,11FL, ACE TECHNO TOWER
197-22,GURO-DONG GURO-GU, SEOUL KOREA
81221095059F81221095056 email thrukang@kornet.net

Test Report

Product Name: 2.4 GHz Wireless police MIC

FCC ID: SRUKT-24R

Applicant:
KCI Communications,Inc.

1050 Ensell Road, Ste.100,
Lake Zurich, IL 60047

Date Receipt: 12/15/2004

Date Tested: 12/13/2004

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APPLICANT: KCI Communication, Inc.

FCC ID: SRUKT-24R

TEST REPORT CONTAINING:

EXHIBITS CONTAINING:

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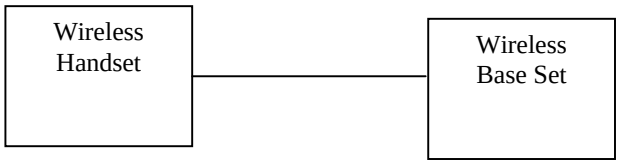
APPLICANT: KCI Communications, Inc.

FCC ID: SRUKT-24T

PRODUCT DESCRIPTION:

This device is a 2.4 GHz DSSS wireless system that can be used by the Police Department to record dialog between the police and a suspect. When a policeman arrests a suspect, he must read the Miranda Rights to suspect. At the scene, a camcorder is recording the scene. This device will transmit the audio signal to scene and sound can be recorded for further use.



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TEST EQUIPMENT LIST

DEVICE	MODEL	MFGR	SERNO	DUE.CAL
EMI Test Receiver	ESVS 10	Rohde & Schwarz	830489/001	2005.04.07.
Spectrum Analyzer	8566B	Hewlett Packard	2311A02394	2005.04.07.
Spectrum Display	85662A	Hewlett Packard	2542A12429	2005.04.07.
Quasi-Peak Adapter	85650A	Hewlett Packard	2521A00887	2005.04.07.
RF Preselector	85685A	Hewlett Packard	2648A00504	2005.04.07.
Pre-Amplifier	8449B	Hewlett Packard	3008A00375	2005.04.07.
Pre-Amplifier	8447F	Hewlett Packard	3113A05367	2005.04.07.
Spectrum Monitor	EZM	Rohde & Schwarz	862304/007	2005.04.07.
Bico-Antenna	94455-1	Eaton	977	2005.03.17.
Log-Periodic Antenna	3146	EMCO	2051	2005.03.17.
Dipole Antenna	TDA25/1/2	Electro Metrics	176/200/200	2005.03.17.
Horn Antenna	SAS-571	A.H Systems	414	2005.03.17.
Spectrum Analyzer	R3261C	Advantest	71720189	2005.04.07.
LISN	KNW-242	Kyoritsu	8-923-2	2004.07.17.
LISN	8012-50-R-24	Solar	8379121	2004.07.17.
Loop Ant	6507	EMCO	1435	2004.10.06.
Signal Generator	SMS	Rohde & Schwarz	872165/100	2005.04.07.
Modulation Analyzer	8901B	Hewlett Packard	3438A05094	2005.04.07.
Frequency Counter	CMC251	Tektronic	CMC-251TW52489	2005.04.07.

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TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written Approval of THRU &ENGINEERING. Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal data transmission on a network.

POWER LINE CONDUCTED INTERPERENCE: The procedure used ANSI STANDARD C63,4-1992 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10 KHz with an appropriate sweep speed. The ambient temperature of the UUT was 23℃ with a humidity of 35%.

BANDWIDTH 6.0dB : The measurement were made with the spectrum analyzer's resolution bandwidth (RBW)=300 KHz and the video bandwidth (VBW) =300 KHz and the span set as shown on plot.

POWER OUTPUT: The RF power output was measured at the antenna feed point by removing the permanent antenna and connecting the UUT to a spectrum analyzer, HP Model No.8866B, RBW=3MHz, VBW>or=RBW, span=5MHz.

ANTENNA CONDUCTED EMISSIONS: The RBW=100KHz, VBW > or = RBW and the spectrum was scanned from 30MHz to the 10^{th} Harmonic of the fundamental.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth (RBW) of the spectrum analyzer was 100KHz up to 1GHz and 1.0MHz above 1 GHz with an appropriate sweep speed. The VBW above 1.0 GHz was = 1.0 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 23℃ with a humidity of 33%.

15.247(d) POWER SPECTRAL DENSITY: The peak within the pass band was located with a RBW set to 30KHz and a span of 5 MHz, slightly greater than the 6dB bandwidth, then the emission was centered on the display and the span and RBW reduced. A 2MHz span, 3KHz RBW, and a sweep time to sweep time set to 670 seconds. Since spectral line spacing could not be resolved, the noise power density method was used. The response was then plotted, a correction factor of measured using the noise power density and adding the correction of 35dB and any attenuation used was added.
15.247(e) : PROCESSING GAIN, This gain is supplied by the manufacturer of the UUT.

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2.1033(b) (4)

ANTENNA AND GROUND SYSTEM : This unit uses a short, inductively loaded, antenna element for the base unit and the handset. The antenna is permanently attached to the unit and no provision is made for connection to an external antenna.

No ground connection is provided. The only ground in use is the ground plane on the printed circuit board.

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APPLICANT : KCI Communication Inc.

FCC ID: SRUKT-24R

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NO.: 15.207

REQUIREMENTS:	QUASI-PEAK	AVERAGE
.15 – 0.5 MHz	66-56 dBuV	56-46 dBuV
0.5 – 5.0	56	46
5.0 – 30.	60	50

TEST PROCEDURE: ANSI STANDARD C63.4-1992. The spectrum was scanned from .15 to 30MHz.

THE HIGHEST EMISSION READ FOR LINE 1 was

THE HIGHEST EMISSION READ FOR LINE 2 was.

THE GRAPHS IN EXHIBITS 9-10 REPRESENT THE EMISSIONS READ FOR POWERLINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS : Both lines were observed with the UUT transmitting. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

PERFORMED BY: K.M CHOI **DATE: 2004/12/13**

"not applied"

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APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: OCCUPIED BANDWIDTH

RULES PART NO.: 15.247

15.247(a) (2)
6dB bandwidth shall be at least 500 kHz as shown in the accompanying plots. The bandwidth was measured at three places in the band and the narrowest is reported below.

Receiver 6dB Bandwidth

Receiver		
CHANNEL	MHZ	LIMIT
1	1.595	**6dB bandwidth shall be at lest 500Khz**
20	1.595	
40	1.605	

PERFORMED BY: K.M CHOI **DATE:2004/12/13**

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APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: OCCUPIED BANDWIDTH (1ch)

RULES PART NO.: 15.247

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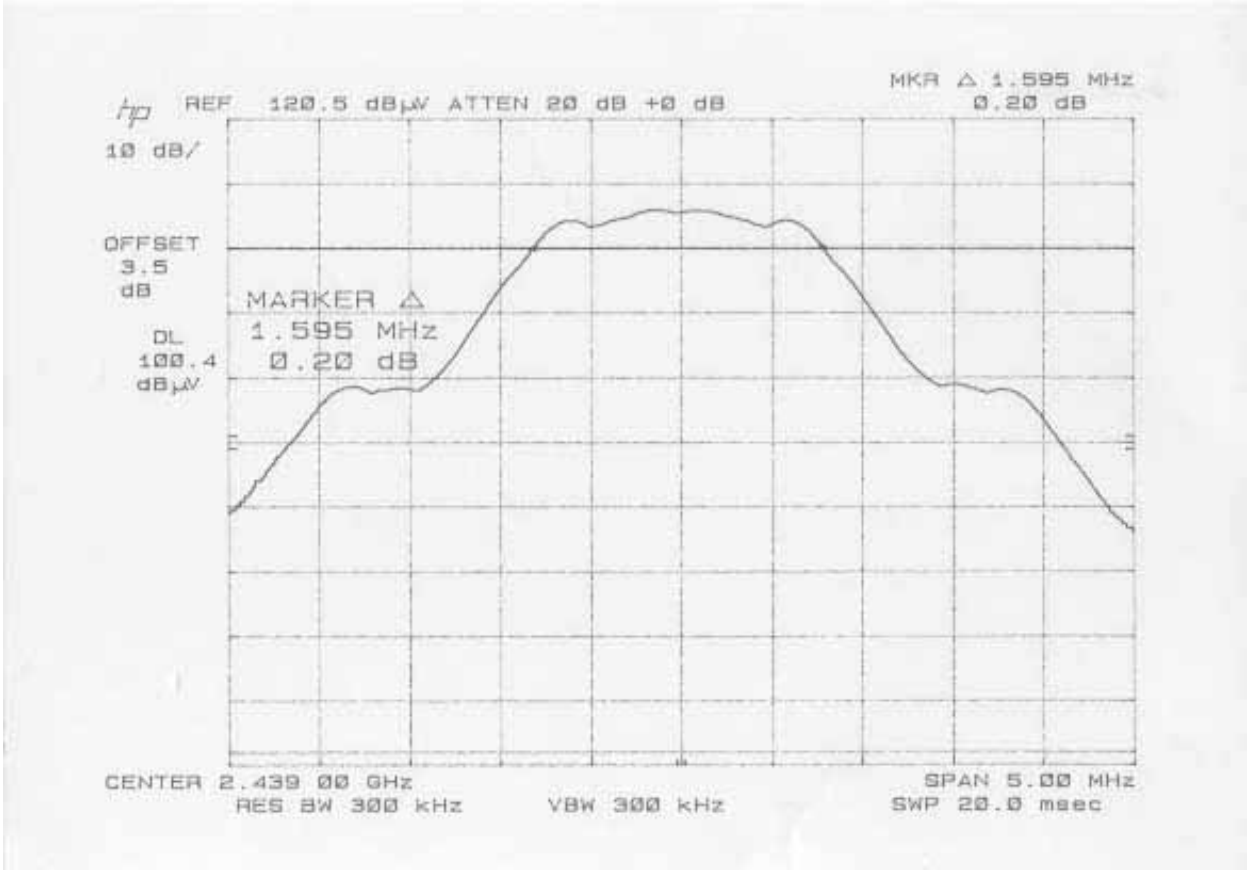
APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: OCCUPIED BANDWIDTH (20ch)

RULES PART NO.: 15.247



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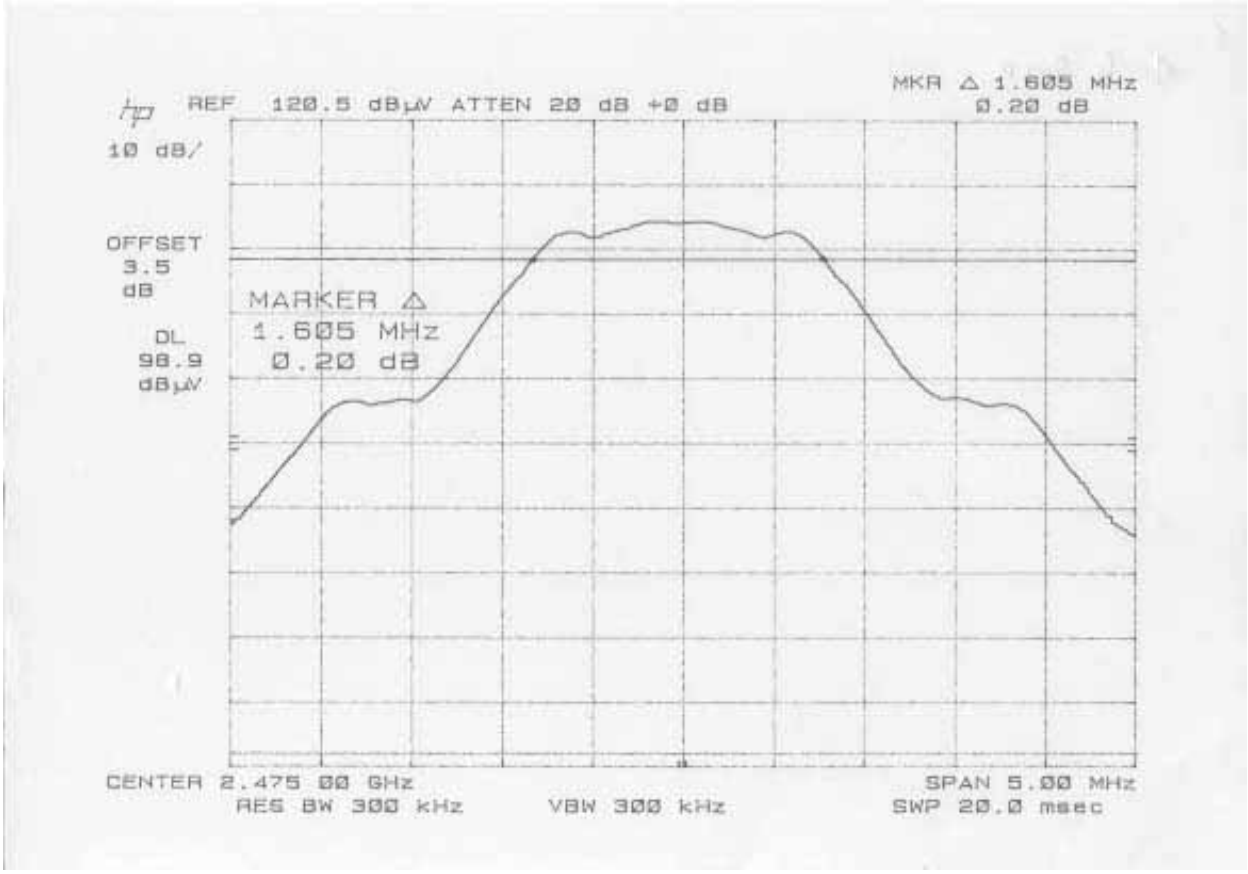
APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: OCCUPIED BANDWIDTH (40ch)

RULES PART NO.: 15.247



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APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: PEAK POWER OUTPUT

RULES PART NO.: 15.247(B)

The maximum peak output power shall net exceed 1 watt (30dBm). If directional transmitting antennas with a gain of more than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Both the base and handset have a maximum power output of less than +30 dBm. Power was measured by disconnecting the antennas and measuring across a 50 ohm load as recommended by the manufacturer using a HP spectrum analyzer Model 8566B. The antennas are non-directional and do not exceed 6dBi gain. The power output was measured at three places in the band highest is reported below.

POWER OUTPUT – LIMIT + 30 dBm

Receiver			
CHANNEL	**dBm**	**mW**	**LIMIT**
1	4.3	2.7	**2400-2483.5**
20	3.7	2.3	**1.0 WATT**
40	2.8	1.9	**or 30dBm**

PERFORMED BY: K.M CHOI **DATE:2004/12/13**

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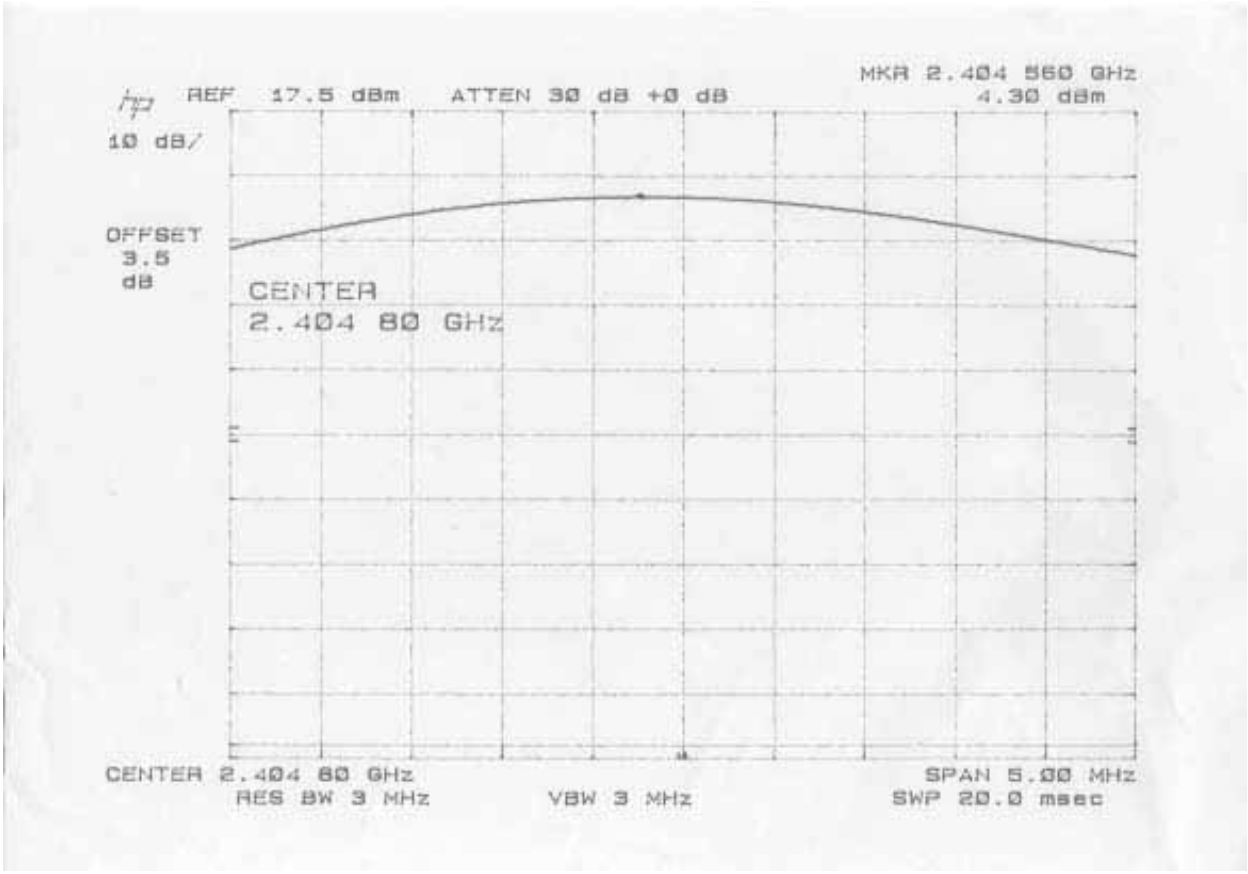
APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: PEAK POWER OUTPUT (1ch)

RULES PART NO.: 15.247(B)



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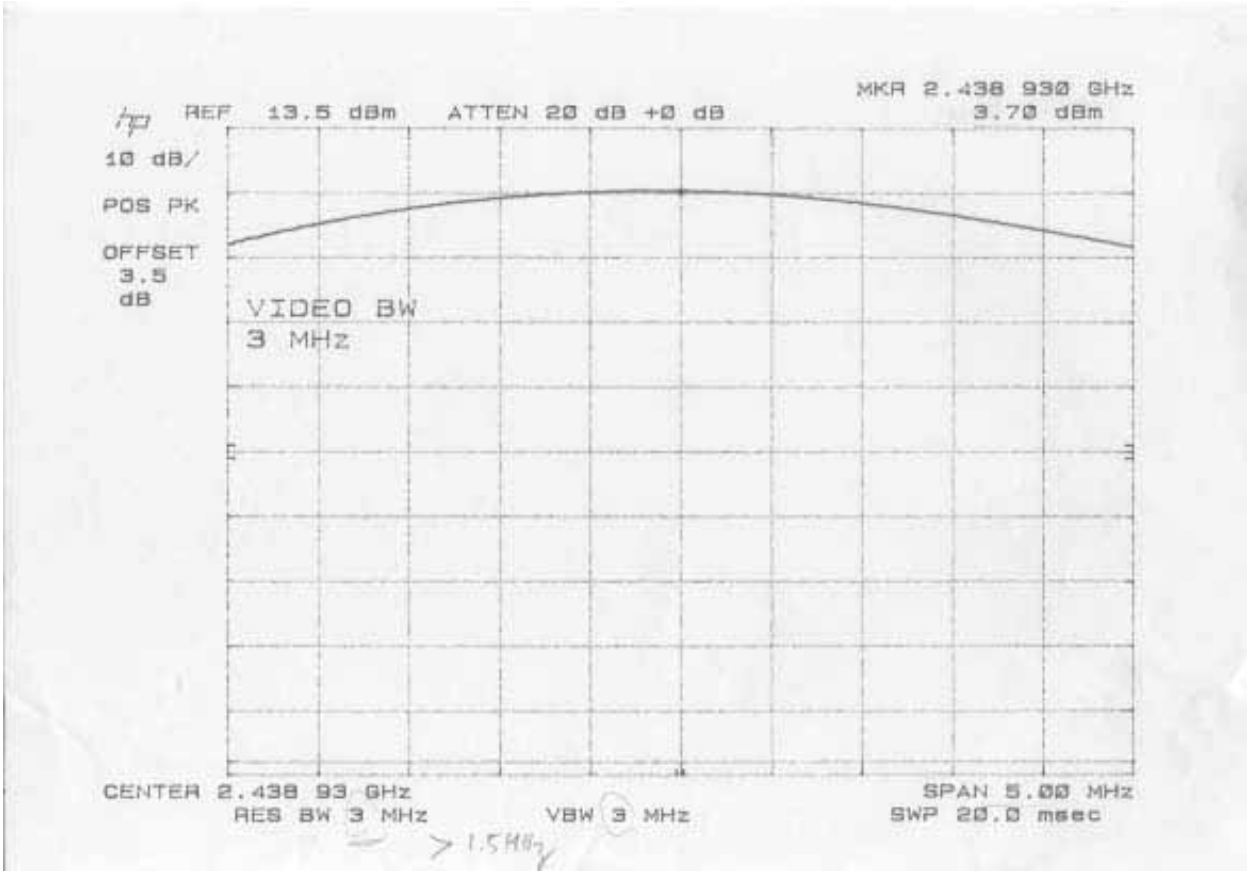
FCC ID: SRUKT-24R

NAME OF TEST: PEAK POWER OUTPUT (20ch)

RULES PART NO.: 15.247(B)



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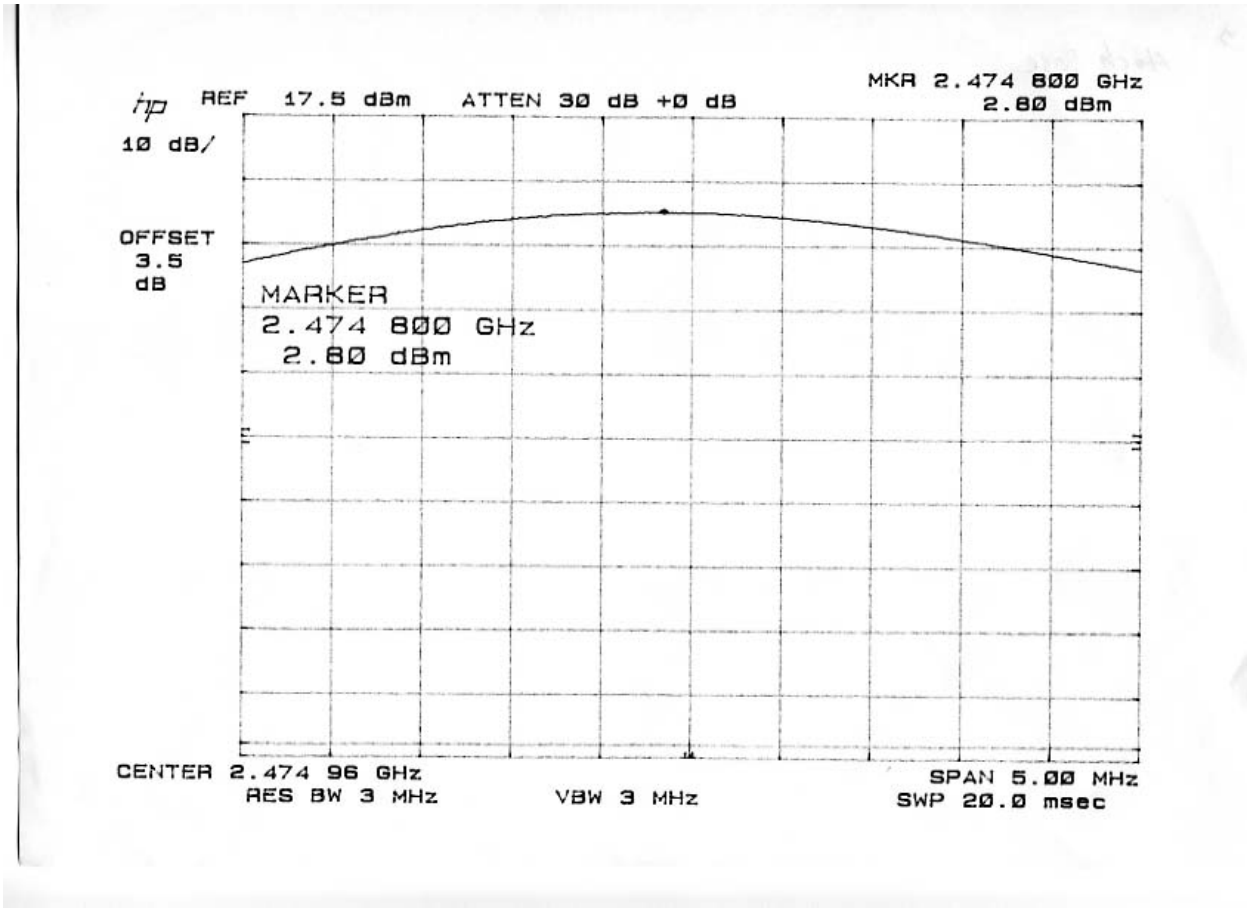
FCC ID: SRUKT-24R

NAME OF TEST: PEAK POWER OUTPUT (40ch)

RULES PART NO.: 15.247(B)



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APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: ANTENNA CONDUCTED SPURIOUS EMISSIONS

RULES PART NO.: 15.247(c) Spurious Emissions must be 20 dBc.

HAMONICS(Receiver)											
Frequency	dBm	dBc	Margin	Frequency	dBm	dBc	Margin	Frequency	dBm	dBc	Margin
2.404 GHz	4.3	-	-	2.438 GHz	3.7	-	-	2.475 GHz	2.8	-	-
4.813 GHz	-62.8	67.1	-47.1	4.878 GHz	-63.9	67.6	-47.6	4.95 GHz	-65.1	67.9	-47.9
7.214 GHz	-70.7	75	-55	7.317 GHz	-70.6	74.3	-54.3	7.475 GHz	-72.4	75.2	-55.2
9.164 GHz	-78.8	83.1	-63.1	9.752 GHz	-78.5	82.2	-62.2	9.9 GHz	-79.6	82.4	-62.4
12.028 GHz	-77.3	81.6	-61.6	12.195 GHz	-77.3	81	-61	12.375 GHz	-79.7	82.5	-62.5

PERFORMED BY: K.M CHOI **DATE:2004/12/13**

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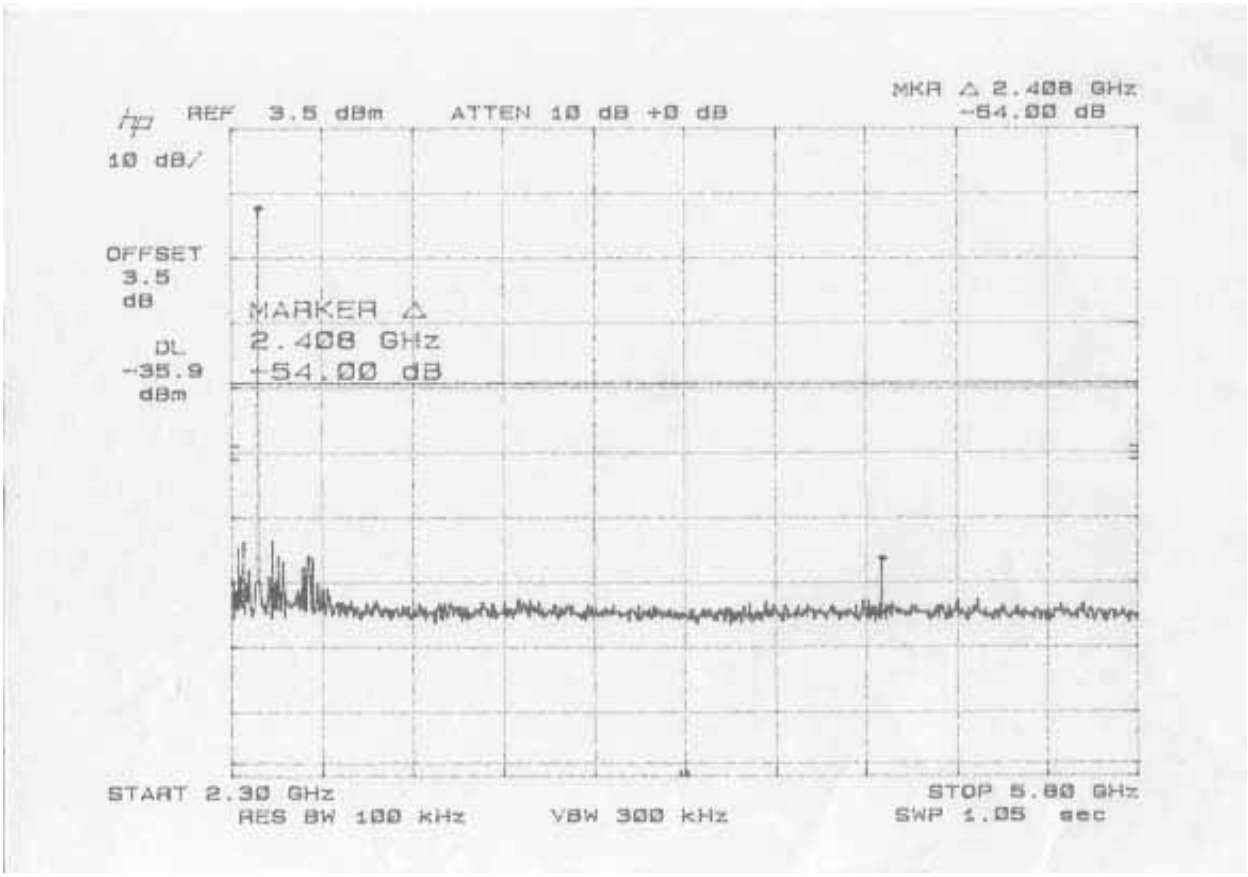

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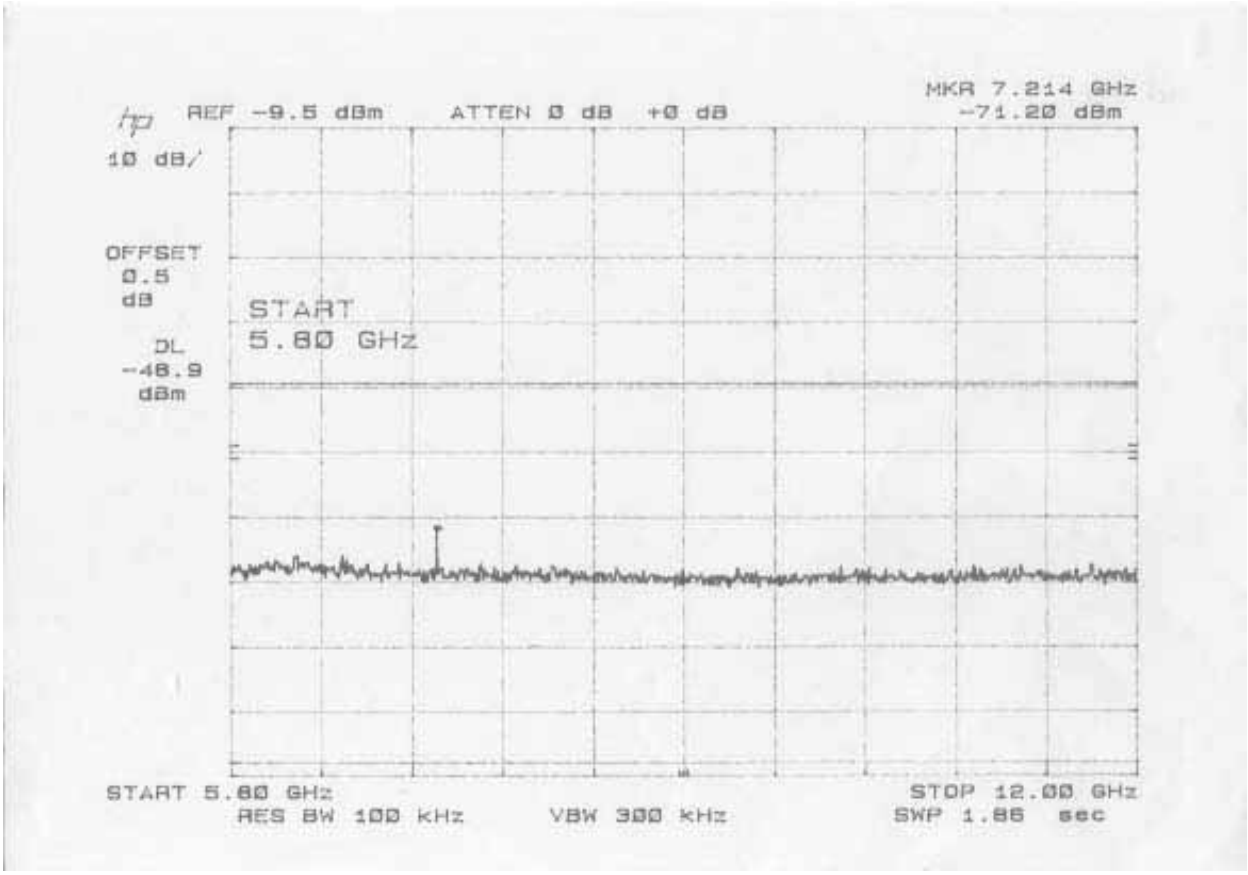

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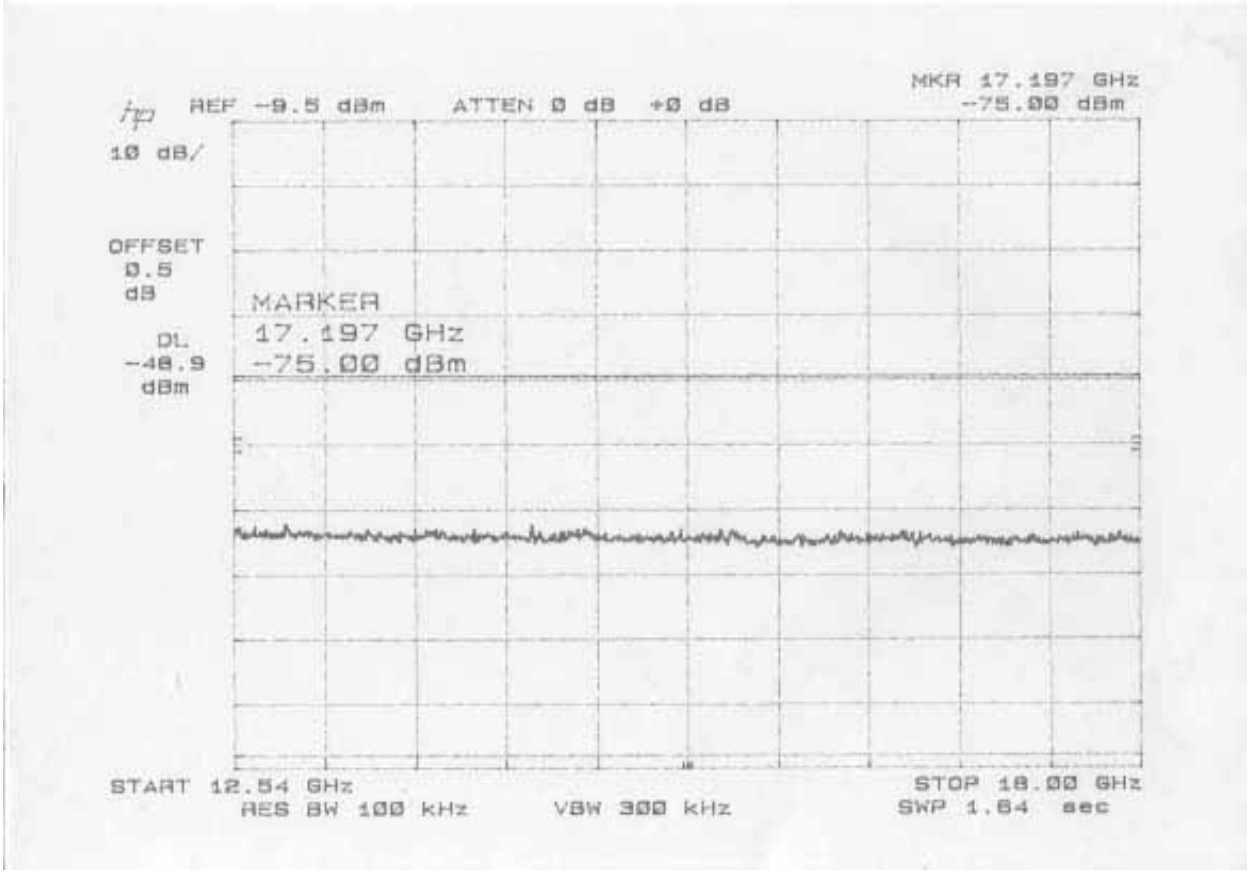

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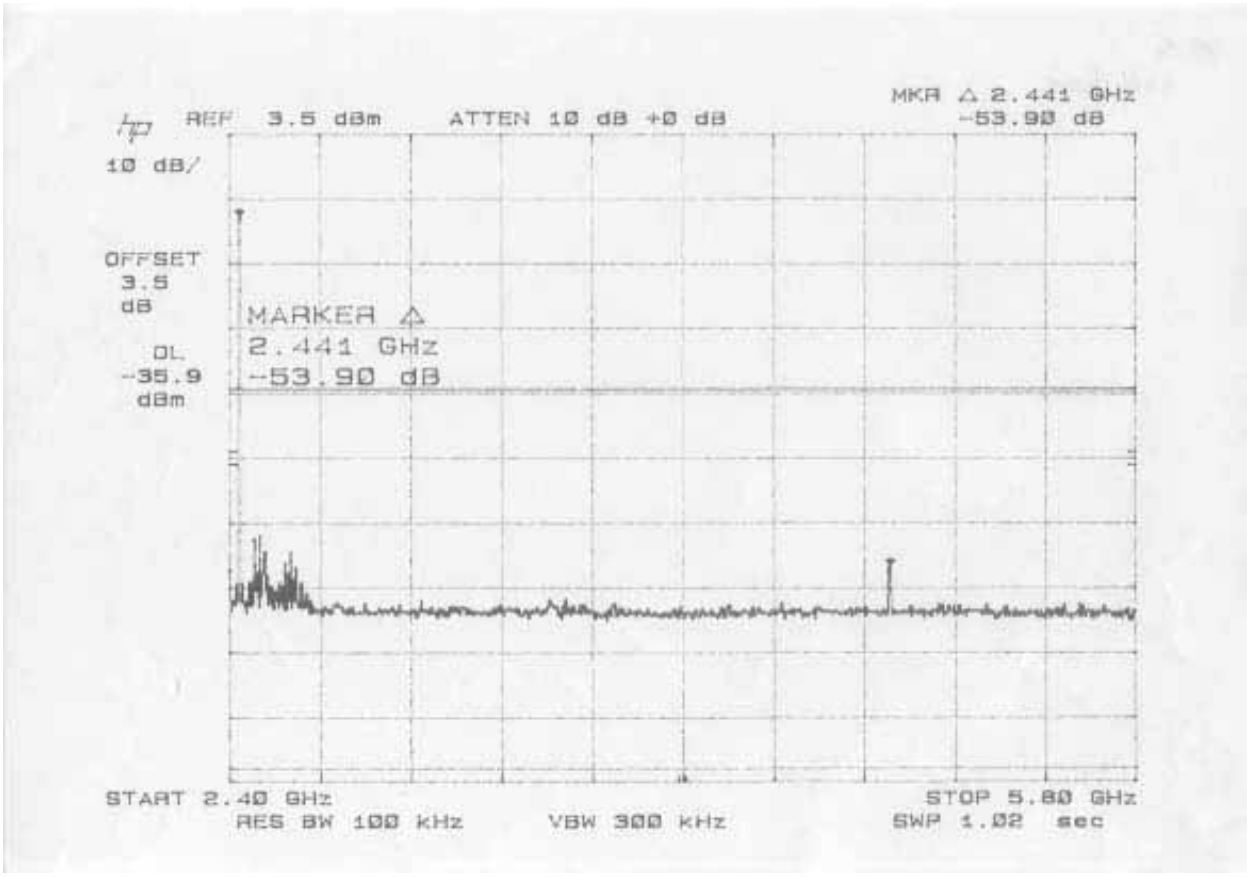

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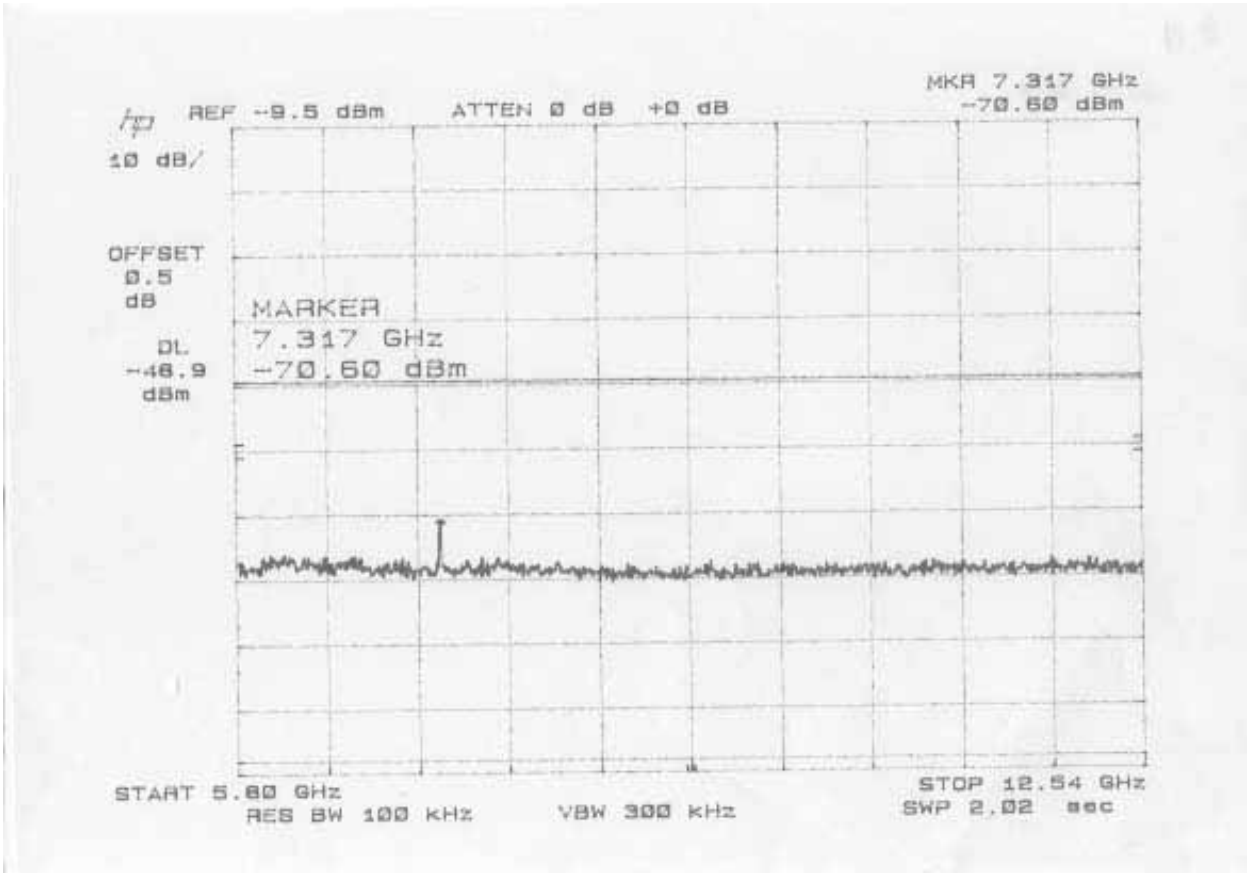

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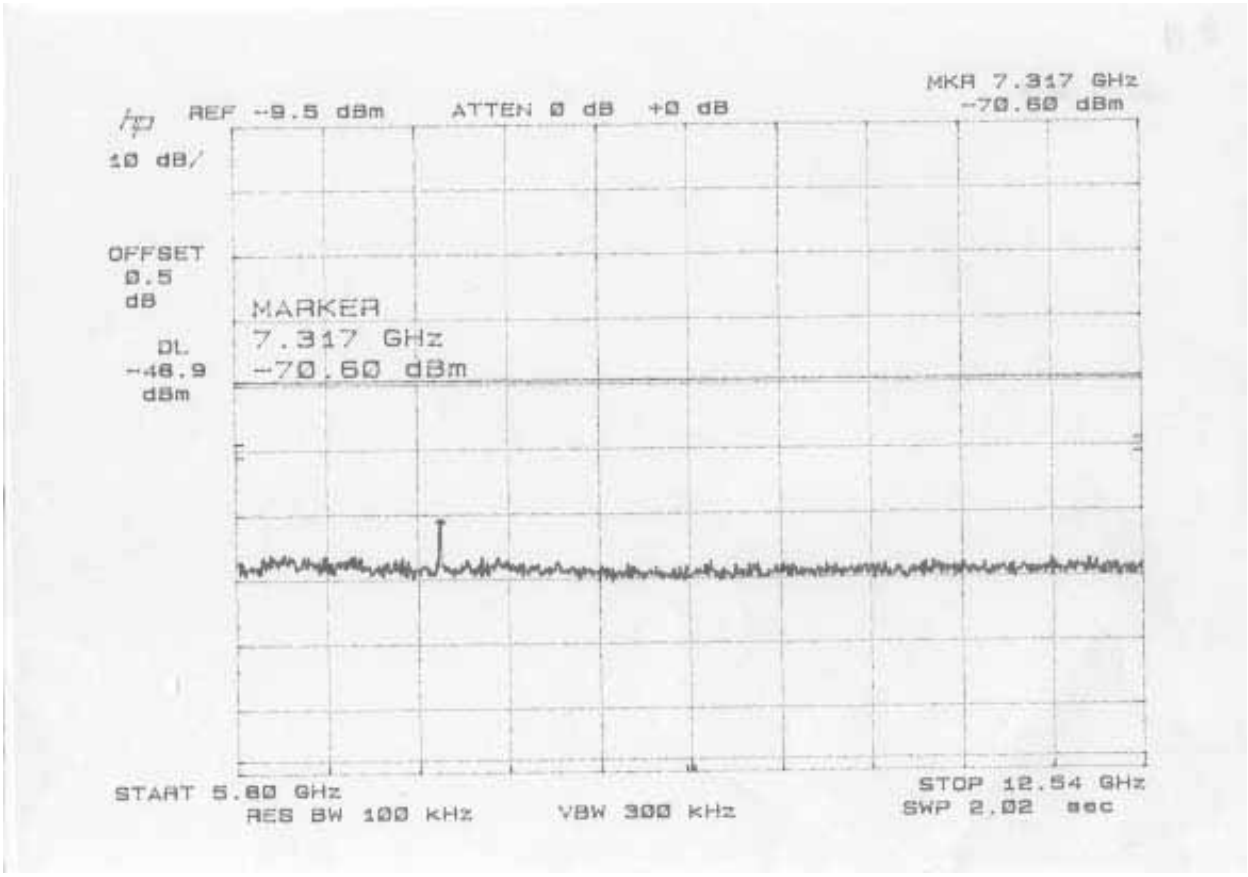

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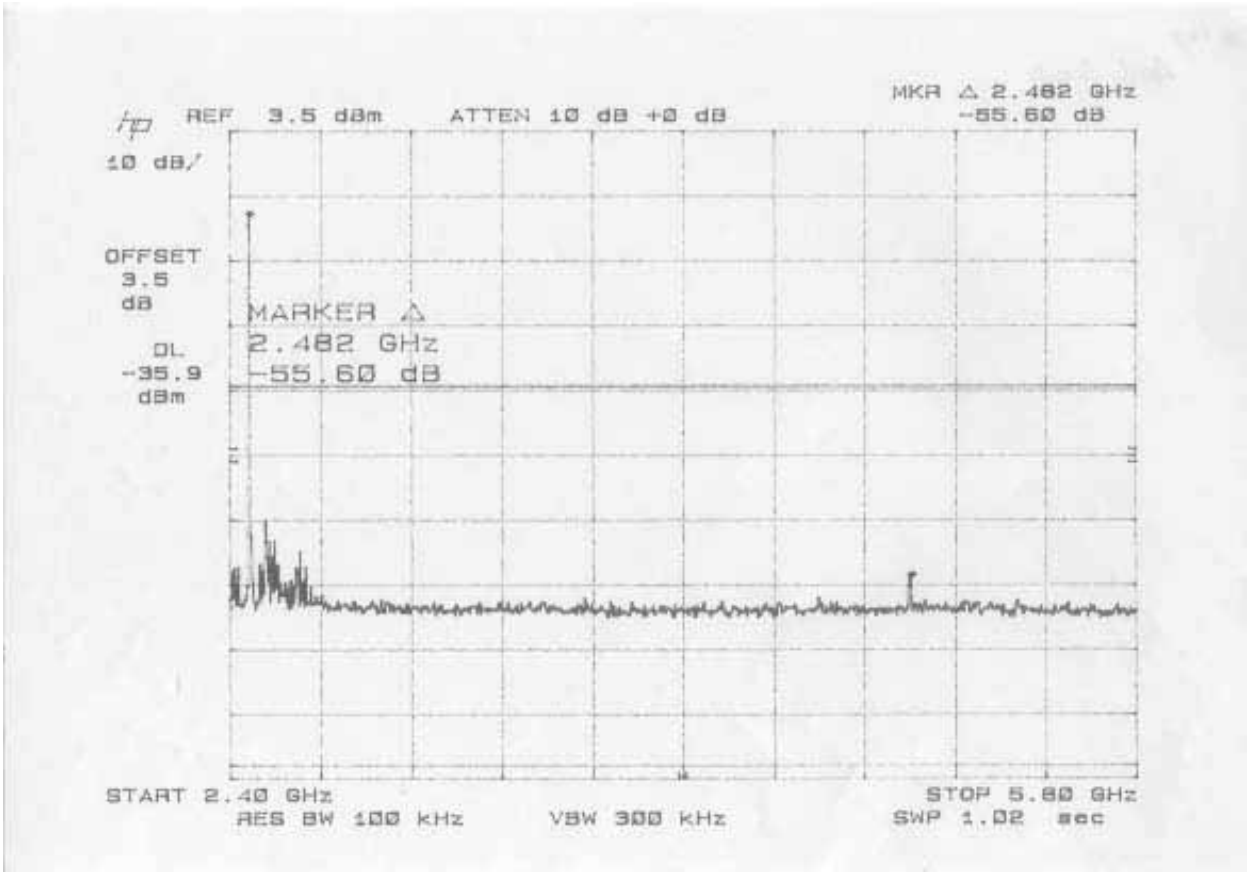

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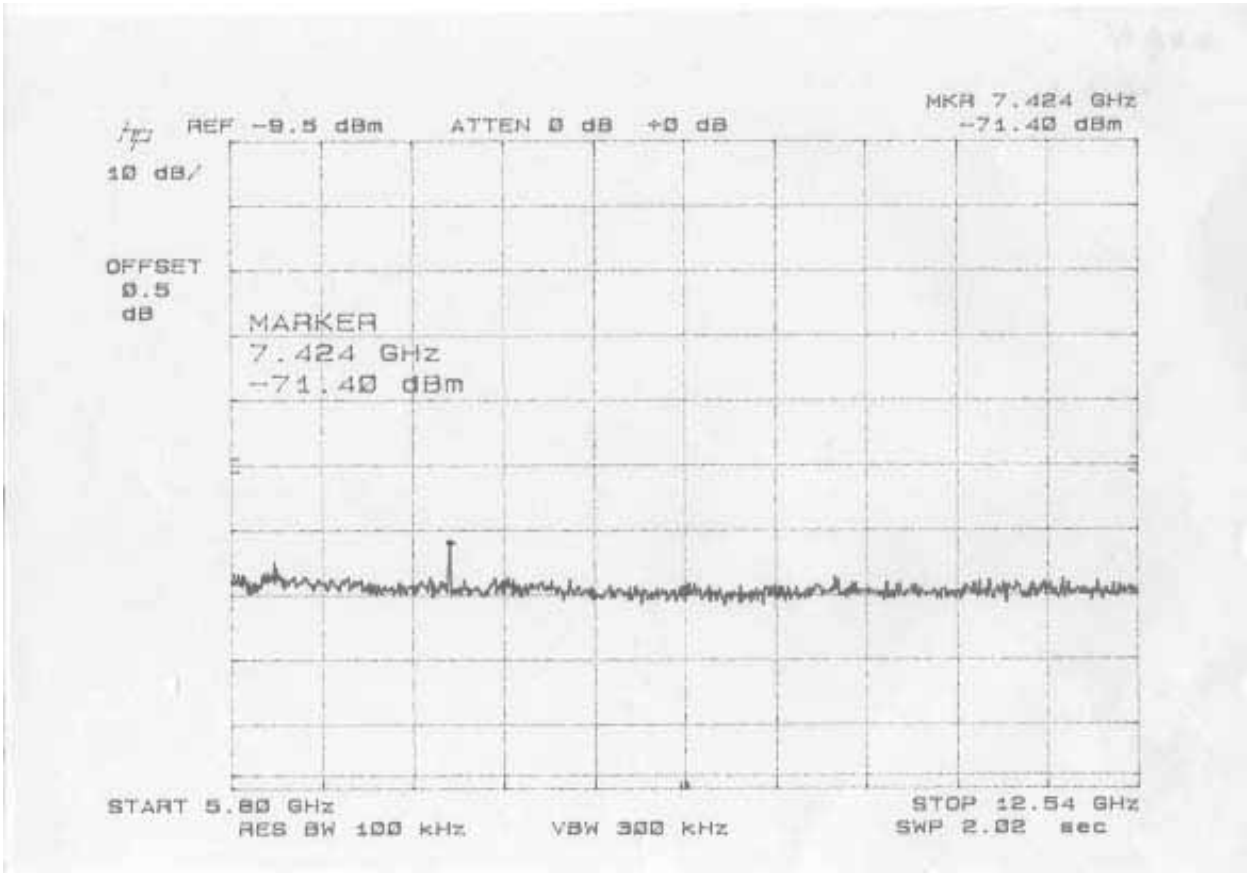

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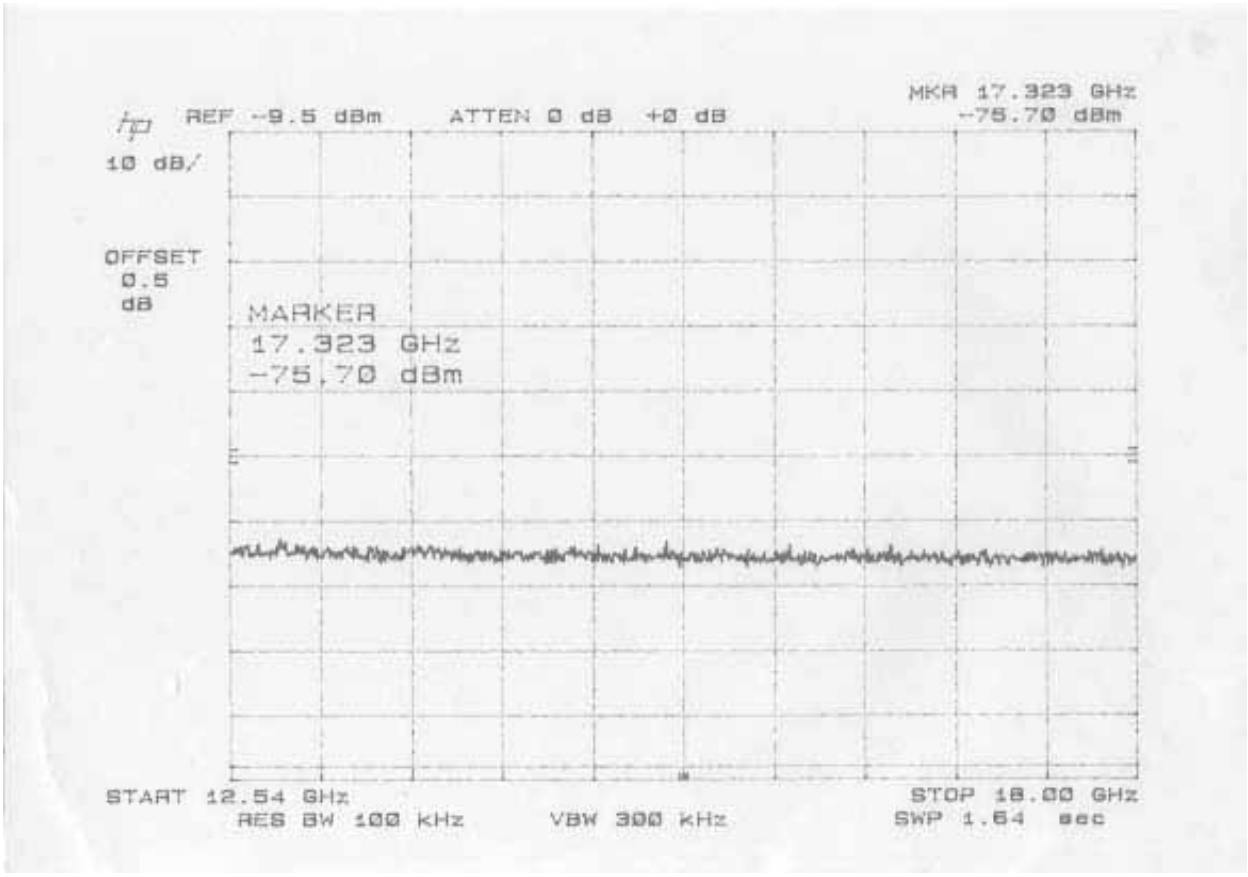

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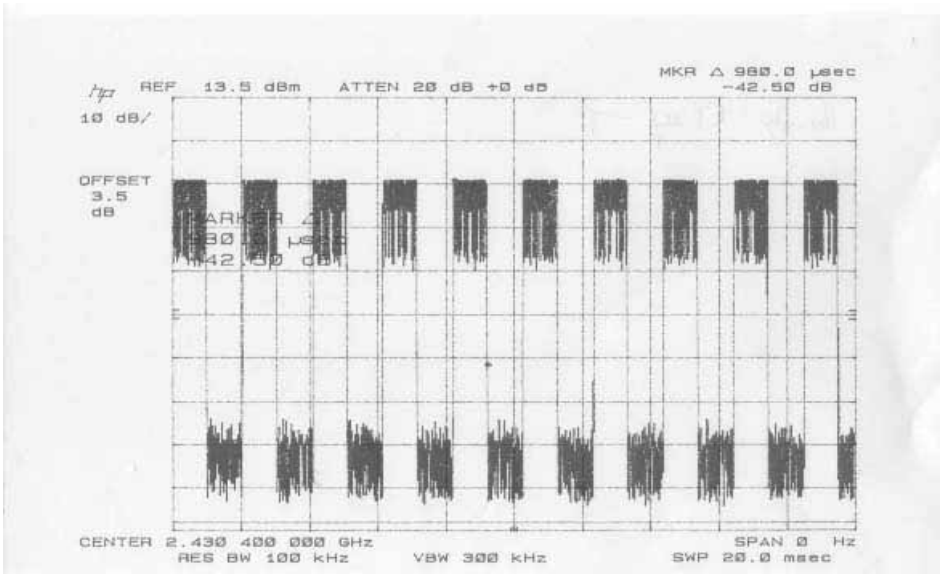
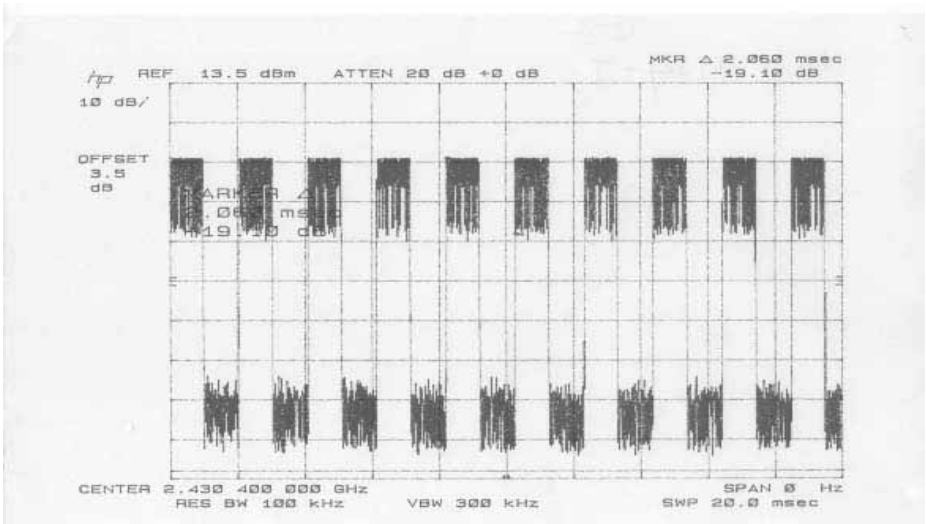
APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND
DUTY CYCLE

RULES PART NO.: 15.209**,** 15.247(c)





Duty cycle value = 20log(Twidth/Tperiod)=20log(980*10-8/2.060*10-3)=-6.45

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APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

RULES PART NO.: 15.209**,** 15.247(c)

REQUIREMENTS:

FIELD STRENGTH	FIELD STRENGTH	s15.209
OF Fundamental :	of Harmonics	30 – 88 MHz 40 dBuV/m@
902-928MHz		88- 216MHz 43.5
2.4-2.4835GHz		216-916MHz 46
127.38dBuV/m @3m	54 dBuV	ABOVE 960MHz 54dBuV/m

Emissions that fall in the restricted bands(15.205) must be less than or equal to 500uV/m (54 dBuV/m). Spurious not in a restricted band must be 20 dBc.

TEST DATA:

Tuned Frequency MHz	Emission Frequency (MHz)	Meter Reading dBuV	Ant. Pola	ANT Factor dB	Cable Loss dB	Duty Cycle dB	Field Strength (dBuv/m)	Margin (dBuv)	Limit (dBuv/m)	Detector mode
2404.8	2404.8	64.0	H	27.8	3.3		95.1	N/A		PK
2404.8	4810.8	12.8	H	33.7	4.6	6.5	44.7	-9.3	54.0	PK
2439.4	2439.6	60.0	H	27.9	3.3		91.2	N/A		PK
2439.4	4878.2	16.7	H	33.9	4.6	6.5	48.8	-5.2	54.0	PK
2475.3	2475.8	61.4	H	27.9	3.3		92.6	N/A		PK
2475.3	4950.6	14.1	H	34.1	4.7	6.5	46.4	-7.6	54.0	PK
2404.8	2404.8	65.7	V	27.8	3.3		96.8	N/A		PK
2404.8	4810.8	16.2	V	33.7	4.6	6.5	48.0	-6.0	54.0	PK
2439.4	2439.6	65.0	V	27.9	3.3		96.2	N/A		PK
2439.4	4878.2	22.6	V	33.9	4.6	6.5	54.6	0.6	54.0	PK(*)
2475.3	2475.8	65.5	V	27.9	3.3		96.7	N/A		PK
2475.3	4950.6	16.6	V	34.1	4.7	6.5	48.9	-5.1	54.0	PK

THRU Lab & Engineering.

RM1105,11FL, ACE TECHNO TOWER
197-22,GURO-DONG GURO-GU , SEOUL KOREA
T81221095059F81221095056 email thrukang@kornet.net

APPLICANT : KCI Communication, Inc.

FCC ID: SRUKT-24R

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

RULES PART NO.: 15.209**,** 15.247(c)

REQUIREMENTS:

FIELD STRENGTH	FIELD STRENGTH	s15.209
OF Fundamental :	of Harmonics	30 – 88 MHz 40 dBuV/m@
902-928MHz		88- 216MHz 43.5
2.4-2.4835GHz		216-916MHz 46
127.38dBuV/m @3m	54 dBuV	ABOVE 960MHz 54dBuV/m

Emissions that fall in the restricted bands(15.205) must be less than or equal to 500uV/m (54 dBuV/m). Spurious not in a restricted band must be 20 dBc.

PK(*) exceed 54dBuv/m and retested AV Mode (RBW=1MHZ,VBW=10Hz)
The Transmitter was modified for continuous opration.

Tuned Frequency MHz	Emission Frequency (MHz)	Meter Reading dBuV	Ant. Pola	ANT Factor dB	Cable Loss dB	Duty Cycle dB	Field Strength (dBuv/m)	Margin (dBuv)	Limit (dBuv/m)	Detector mode
2439.4	4878.2	17.8	V	33.9	4.6	6.5	49.8	-4.2	54.0	AV

SAMPLE CALCULATION: FSdBuV/m = MR(dBuV) + ACFdB + COAX + C.F.

METHOD OF MEASUREMENT : The procedure used was ANSI STANDARD C63.4-1992. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was scanned from 30MHz to 10GHz using a Hewlett Packard Model8566B Spectrum Analyzer, Hewlett Packard Model 85685A Preselector, Hewlett Packard Model 85650A Quasi-peak Adaptor, and an appropriate antenna. Low loss coax was used above 1 GHz. Measurements were made at thru & Engineering. RM302, BOKJO B/D,29-15, Chongpa3-dong yongsan-Gu, Seoul, Korea.

TEST RESULTS : The unit DOES meet the FCC requirements.

PERFORMED BY: K.M CHOI **DATE:2004/12/13**

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NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

RULES PART NO.: 15.209**,** 15.247(c)

TEST PROCEDURE : An in band field strength measurement of the fundamental emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an peak detector. we use Δ -method and a plot made. The calculated field strength in the adjacent restricted band is presented below.

RECEVIER

Channel frequency : 2404 MHz

Frequency : 2385 MHz (PK MODE)

42.8 dBuV from plot (pk)
-6.5 Duty cycle
27.8 antenna factor
3.3 cable loss
-30 preamplifier

37.4 dBuV/m (pk)

Channel frequency: 2475 MHz

Frequency : 2484 MHz (PK MODE)

96.7 dBuV from plot (pk)
-6.5 Duty cycle
27.9 antenna factor
3.3 cable loss
-30 preamplifier
-53.1 Δ method

38.3 dBuV/m (PK)

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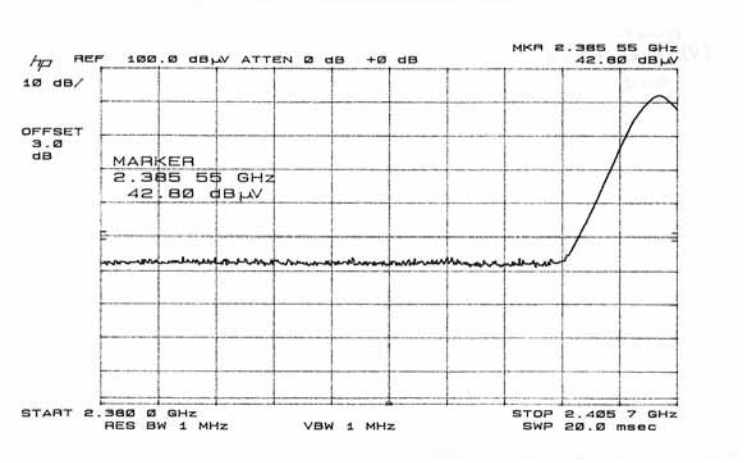
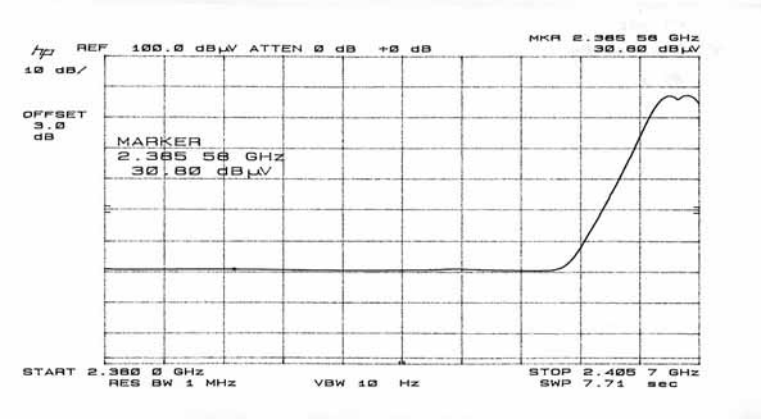
NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND
Δ -METHOD PLOT

RULES PART NO.: 15.209**,** 15.247(c)

TEST PROCEDURE : An in band field strength measurement of the fundamental emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an peak detector. we used Δ -method and a plot made. The calculated field strength in the adjacent restricted band is presented below.





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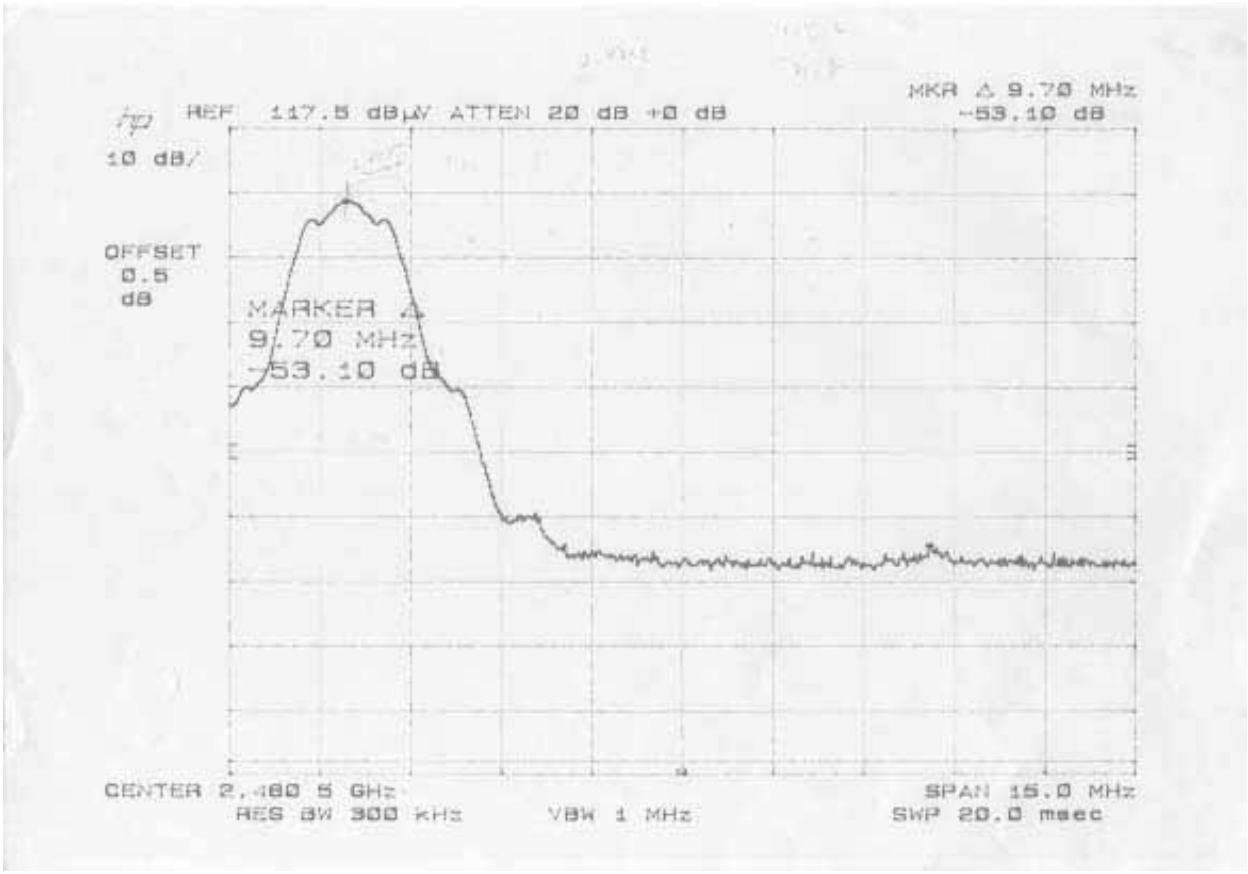

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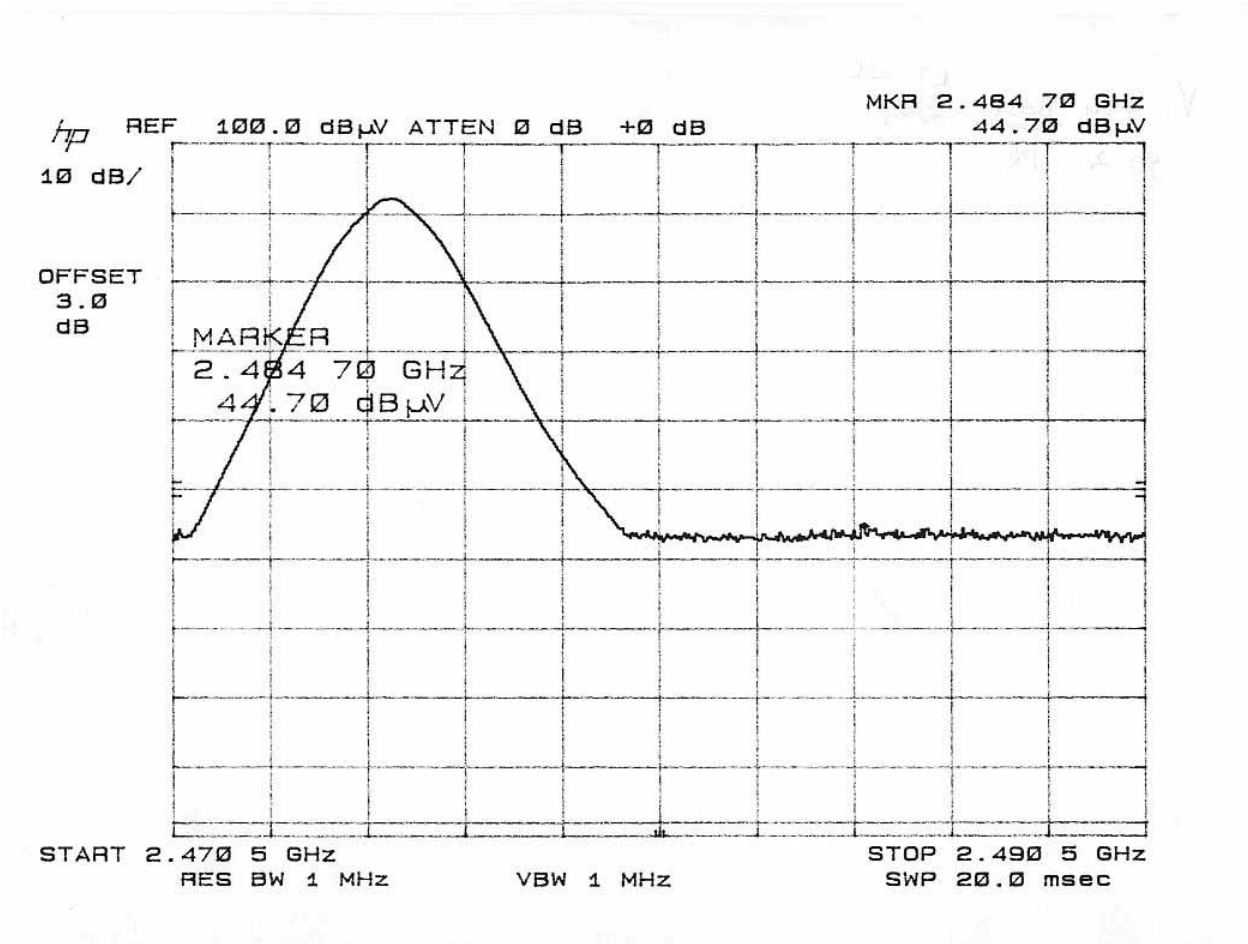

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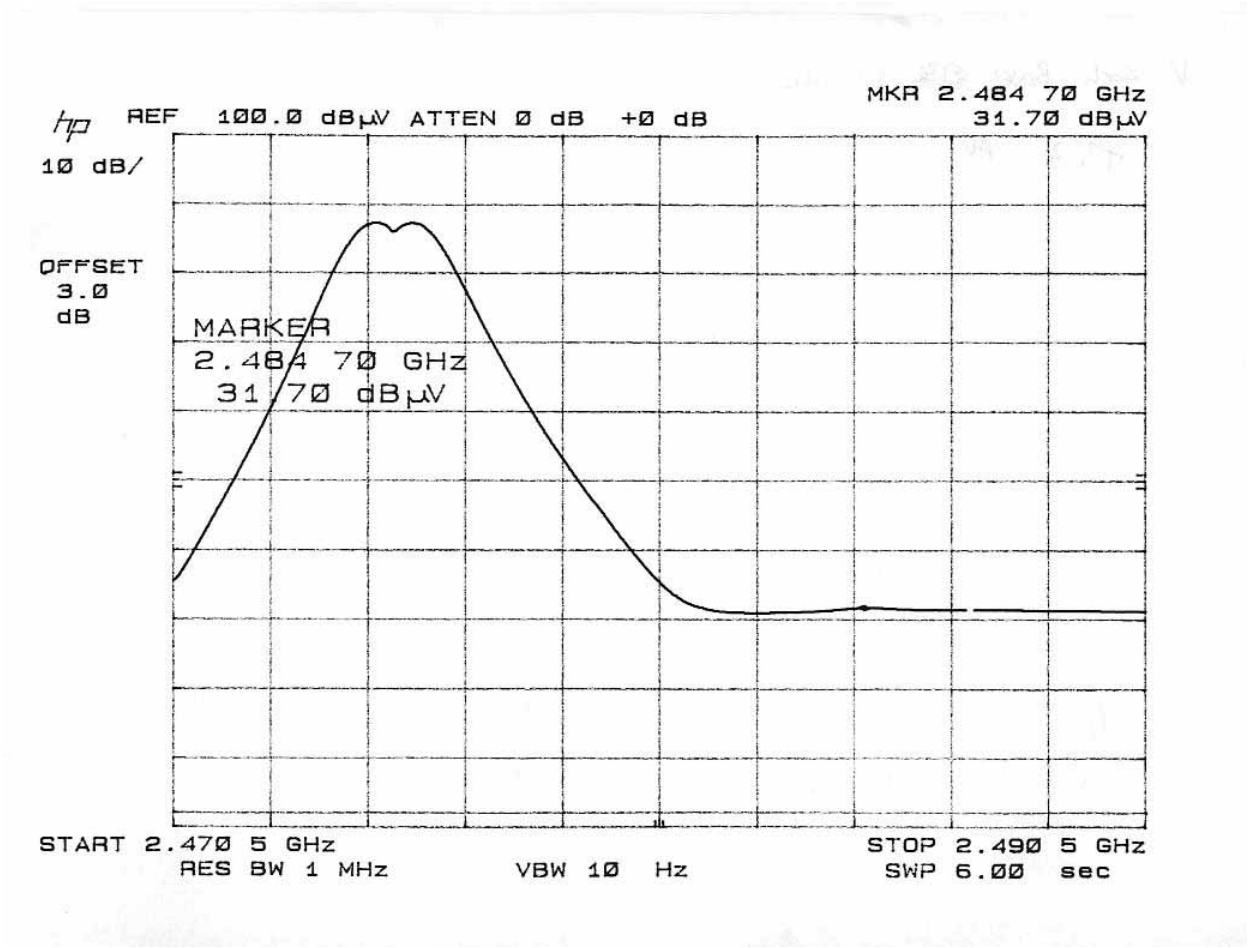

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FCC ID: SRUKT-24R

NAME OF TEST: POWER SPECTRAL DENSITY

RULES PART NO.: 15.247(d)

REQUIREMENTS: The power spectral density averaged over any 1-second interval shall not be greater than 8 dBm in any 3KHz bandwidth within these bands.

TEST DATA :

Receiver		
CHANNEL	dBm	LIMIT
1	-12.1	Less Then
20	-12.7	8
40	-14.1	dBm

Measurement Method;

Starting from the settings that were used for the 6 dB bandwidth the peak signal was located and the span was reduced and the sweep time increased in a manner to maintain calibration and to keep the peak emission in the display, then the sweep time was increased to 670seconds at 1.5MHz span and a RBW changed to 3KHz. The spectrum analyzer was put into the noise power mode and the plots made.

PERFORMED BY: K.M CHOI **DATE:2004/12/13**

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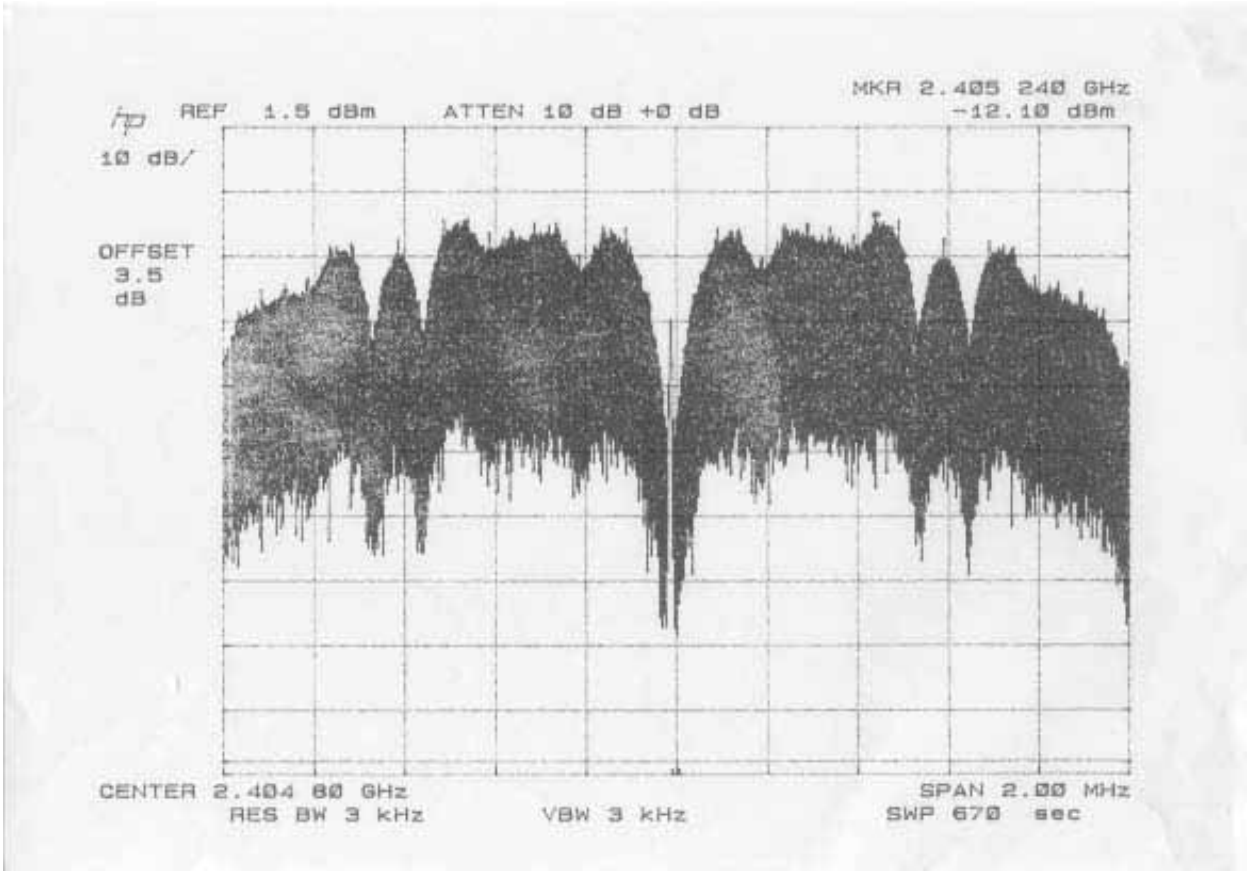

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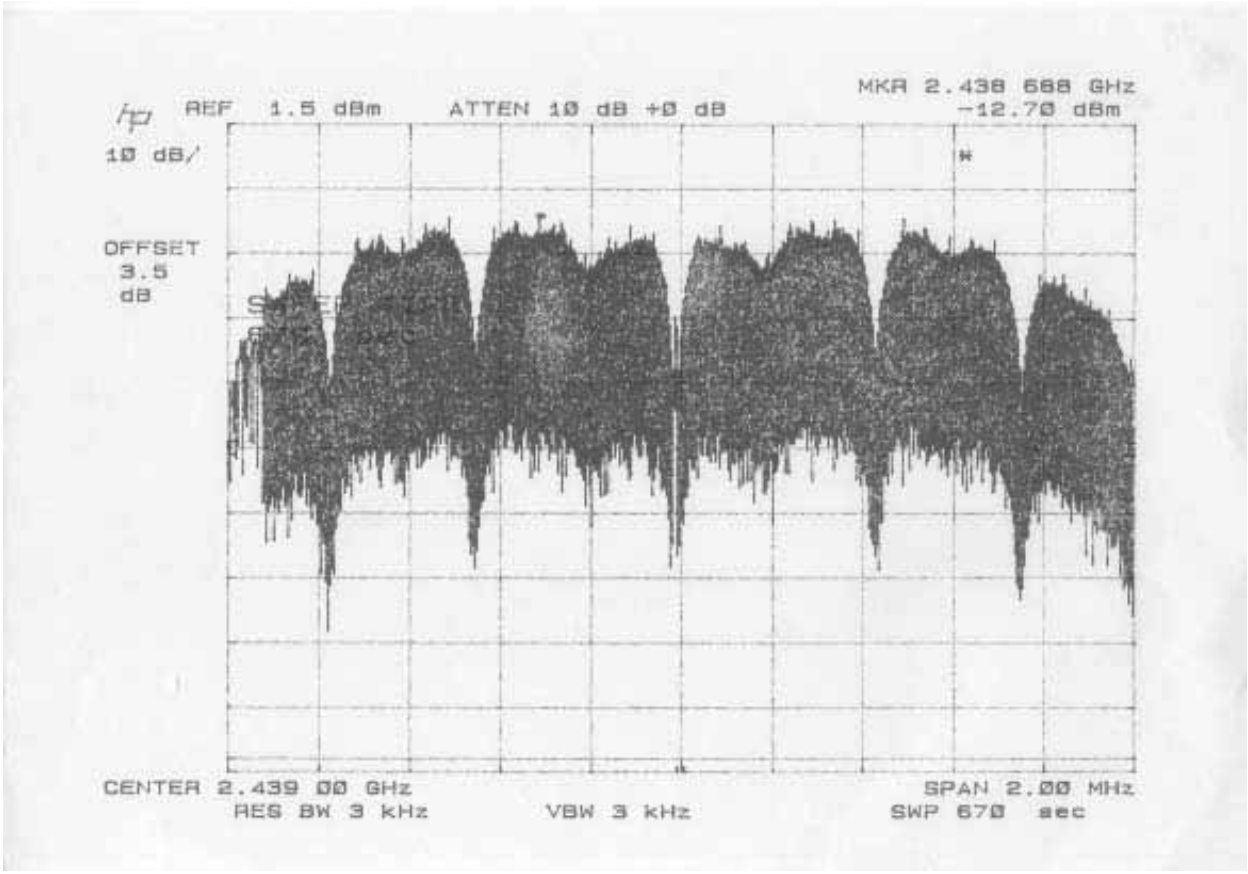

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