FCC CFR47 PART 95H REQUIREMENT

CERTIFICATION TEST REPORT

FOR

TRANSMITTER FOR MEDICAL

MODEL: ZM-931PA

FCC ID: B6BZM-931PA

REPORT NUMBER: 08J12204-1, Revision A

ISSUE DATE: NOVEMBER 24, 2008

Prepared for
NIHON KOHDEN CORPORATION
1-31-4, NISHIOCHIAI SHINJUKU-KU
TOKYO 161-8560, JAPAN

Prepared by
COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	11/11/08	Initial Issue	T. Chan
A	11/24/2008	Clarified methodology and radiated emission results	M. Heckrotte

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: NIHON KOHDEN CORPORATION
1-31-4, NISHIOCHIAI SHINJUKU-KU
TOKYO 161-8560, JAPAN

EUT DESCRIPTION: TRANSMITTER FOR MEDICAL

MODEL: ZM-931PA

SERIAL NUMBER: 90001

DATE TESTED: NOVEMBER 1 – 8, 2008

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 95 SUBPART H	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By: Tested By:

MICHAEL HECKROTTE
DIRECTOR OF ENGINEERING
COMPLIANCE CERTIFICATION SERVICES

DEVIN CHANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-C-2004, FCC CFR 47 Part 2 and FCC CFR 47 Part 95.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

a).	Type of EUT:	WMTS TRANSMITTER
b).	Brand Name:	NIHON KOHDEN
c).	Model No:	ZM-931PA
d).	FCC ID:	B6BZM-931PA
e).	Battery Type:	Two AA (R6)
f).	Channel Number:	1395.0250 MHz (channel number E002) to 1399.9750 MHz (channel number E398), and 1427.0250 MHz (channel number E502) to 1431.9750 MHz (channel number E898)
g).	Frequency Range:	1395.025-1399.975 MHz and 1427.025-1431.975 MHz bands
h).	RF Conducted Output Power:	5mW (factory default setting) or 1mW
i).	Channel Spacing:	50 KHz or 37.5 kHz (12.5 KHz when interleave)
j).	Modulation	Frequency Shift Keying
k).	Type of Modulation:	F1D
l).	Occupied Bandwidth	<20 kHz
m).	Antenna Type:	Internal

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Helical Monopole antenna, with a maximum gain of 0 dBi.

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was Channel Writer, rev. 02-04.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

During emission tests the antenna orientations as X, Y, and Z were investigated to determine the worst-case. The outcome showed that Y-orientation as the worst-case.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	LENOVO	7658	L3-A1589 07/07	DoC
AC Adapter	LENOVO	92P1160	11S92P1160Z1ZBGH74LH2M	N/A
Channel Writer	NIHON KOHDEN	QI-901PK	28	N/A

I/O CABLES

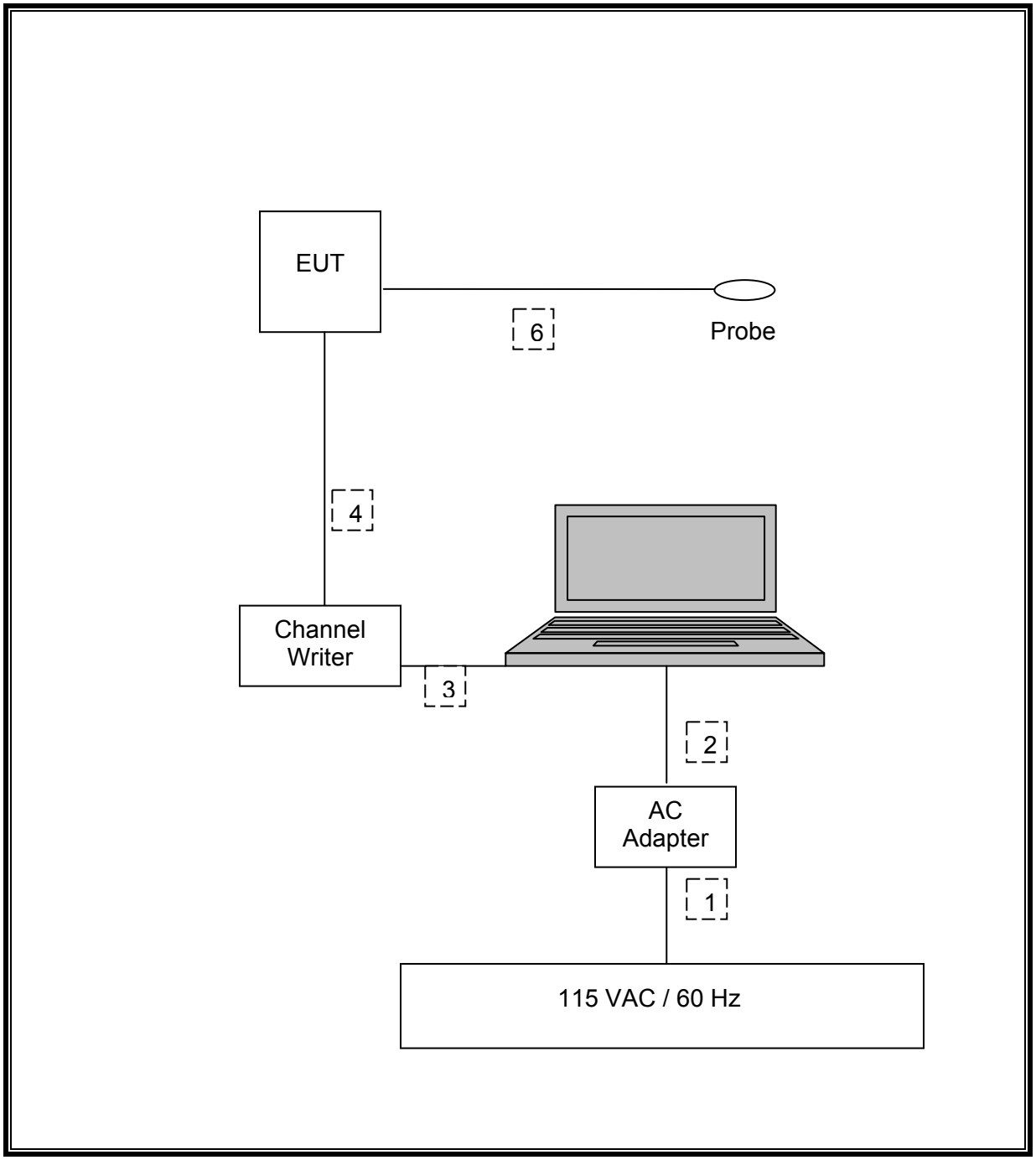
I/O CABLE LIST						
Cable No.	**Port**	**# of Identica Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	US115V	Un-shielded	1m	N/A
2	DC	1	DC	Un-shielded	1.8m	Ferrite on laptop's end
3	USB	1	USB	Shielded	2m	No
4	ECG	1	ECG	Un-shielded	0.3m	No
5	ECG	1	ECG	Un-shielded	0.7 m	N/A
6	Sp02	1	Sp02	Un-shielded	1.6 m	Probe

TEST SETUP

The EUT is standalone unit and just use a host laptop computer to configure the mode during the tests. Test software exercised the radio card.

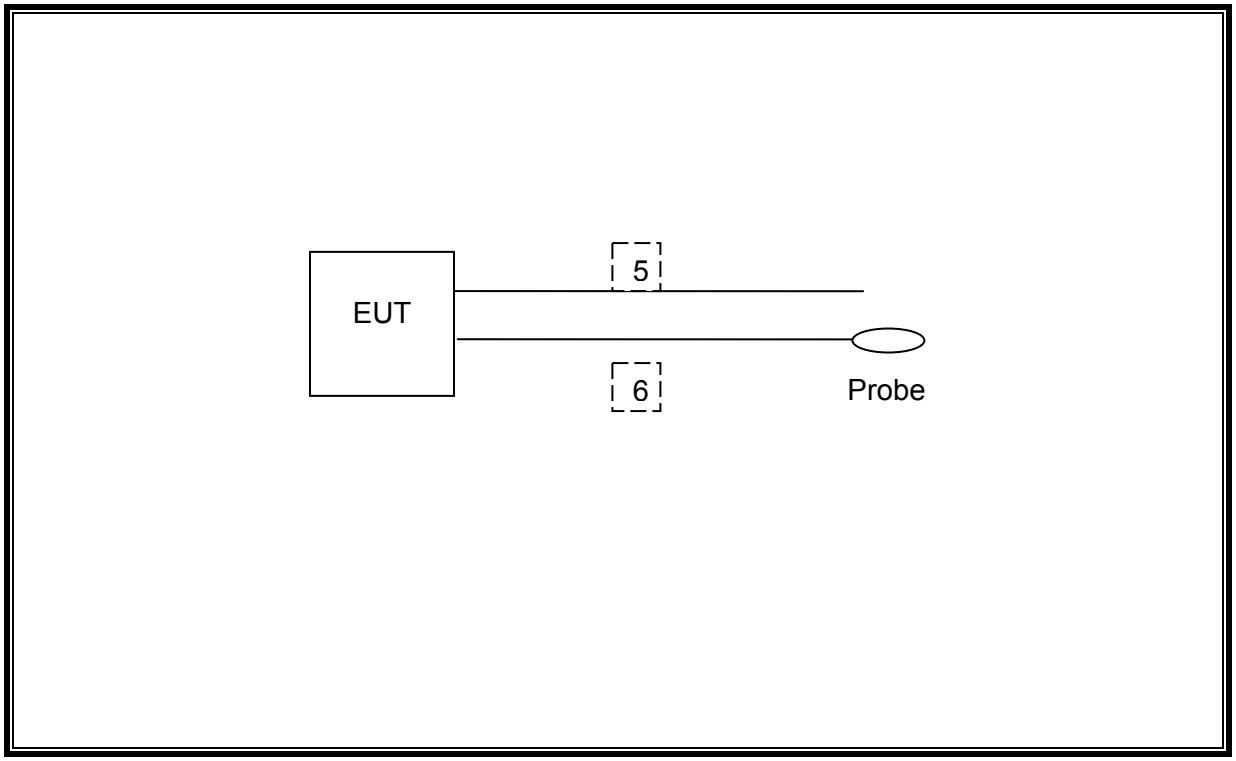
SETUP DIAGRAM FOR TESTS

RF Conducted test



SETUP DIAGRAM FOR TESTS

RF Radiated test



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Horn Antenna	ETS	3117	C01005	04/22/09
Bilog Antenna	Sunol Sciences	JB1	C01016	02/11/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C00749	11/27/08
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	03/31/09
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	09/19/09
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	03/03/09
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/03/10
Temperature / Humidity	Thermotron	SE 600-10-10	C00930	05/13/09
DC power supply, 40 V @ 30 A	Agilent / HP	6268A	N02490	CNR

7. ANTENNA PORT TEST RESULTS

7.1. 26 dB AND 99% BW

LIMITS

§2.1049, for reporting purposes only, also the 26dB bandwidth shall be less than 20 KHz (F1D).

TEST PROCEDURE

ANSI C63.4

The transmitter output is connected to the spectrum analyzer.

26dB Bandwidth: The RBW is set to 1% to 3% of the 26dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 26dB bandwidth function is utilized.

99% Bandwidth: The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

26dB Bandwidth

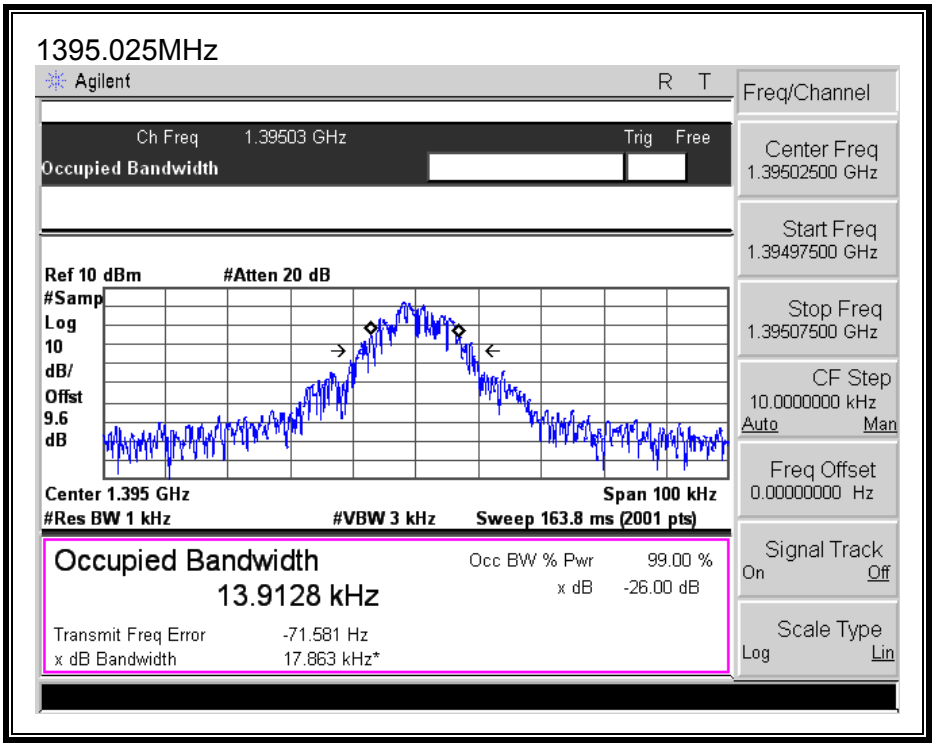
Channel	Frequency (MHz)	26dB Bandwidth (kHz)
E002	1395.025	17.863
E390	1399.975	19.112
E502	1427.025	17.544
E898	1431.975	16.902

99% Bandwidth

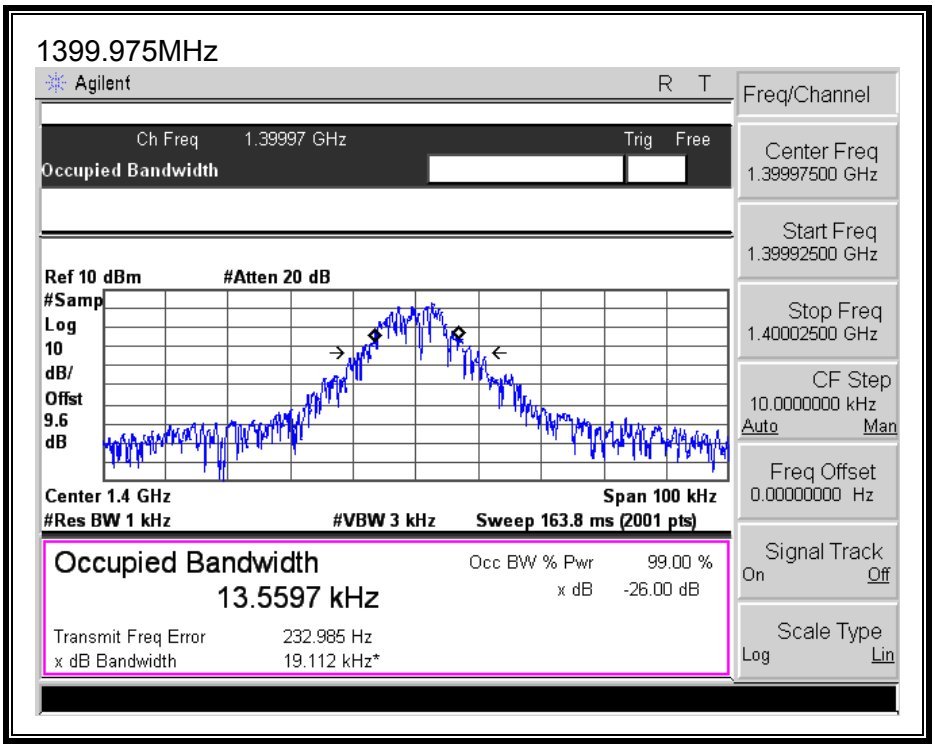
Channel	Frequency (MHz)	99% Bandwidth (kHz)
E002	1395.025	13.9128
E390	1399.975	13.5597
E502	1427.025	13.9777
E898	1431.975	13.128

20dB and 99% BANDWIDTH

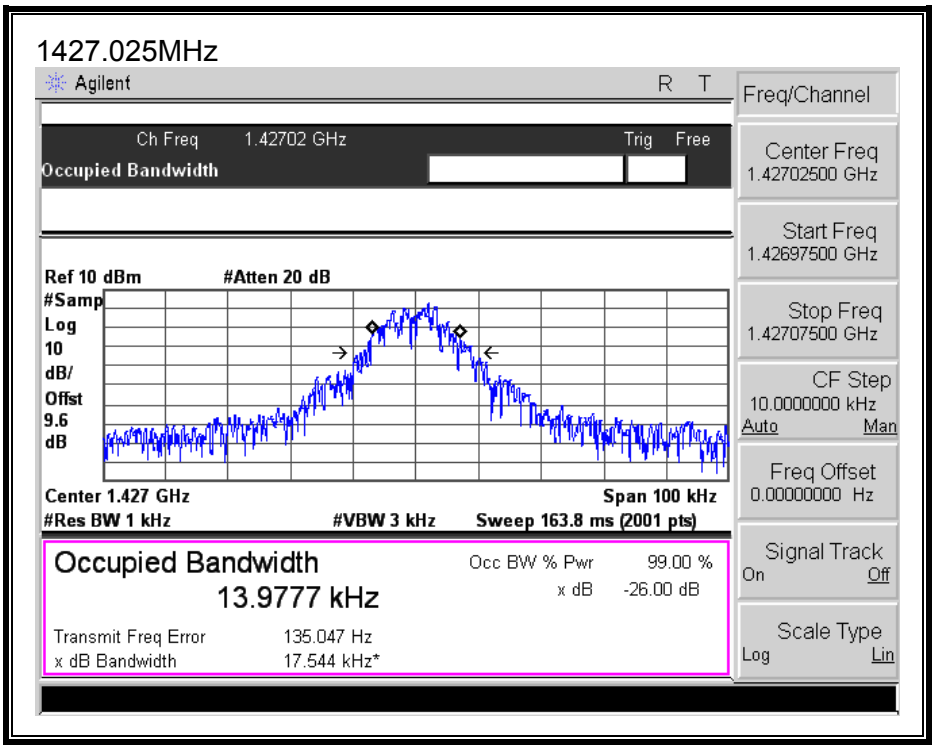
1395.025MHz



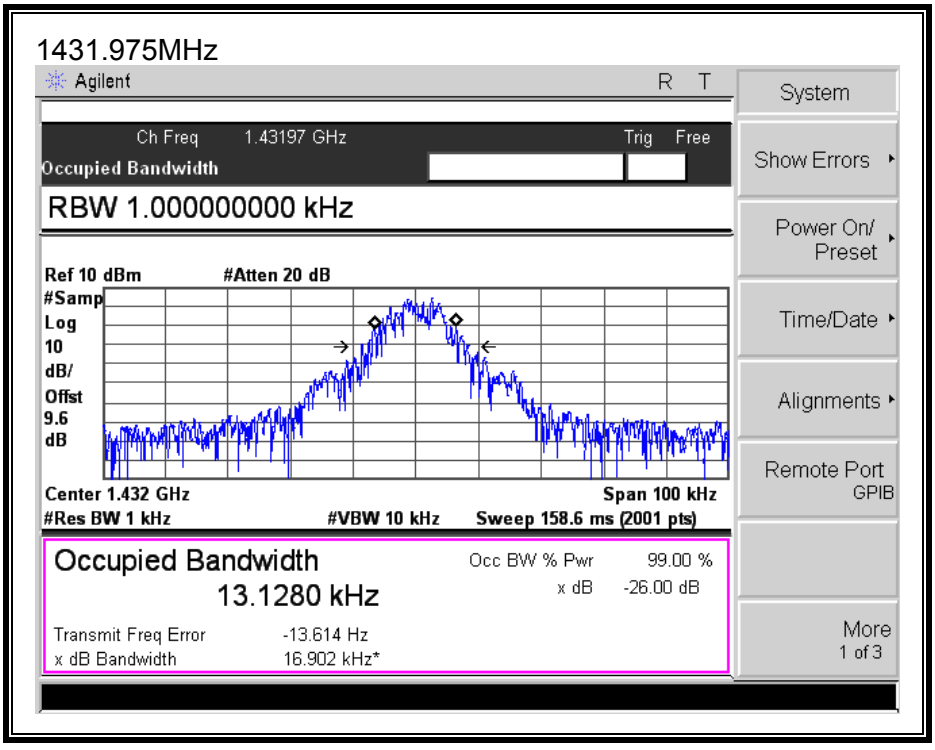
1399.975MHz



1427.025MHz



1431.975MHz



7.2. PEAK OUTPUT POWER

LIMITS

§2.1046, for reporting purposes only.

TEST PROCEDURE

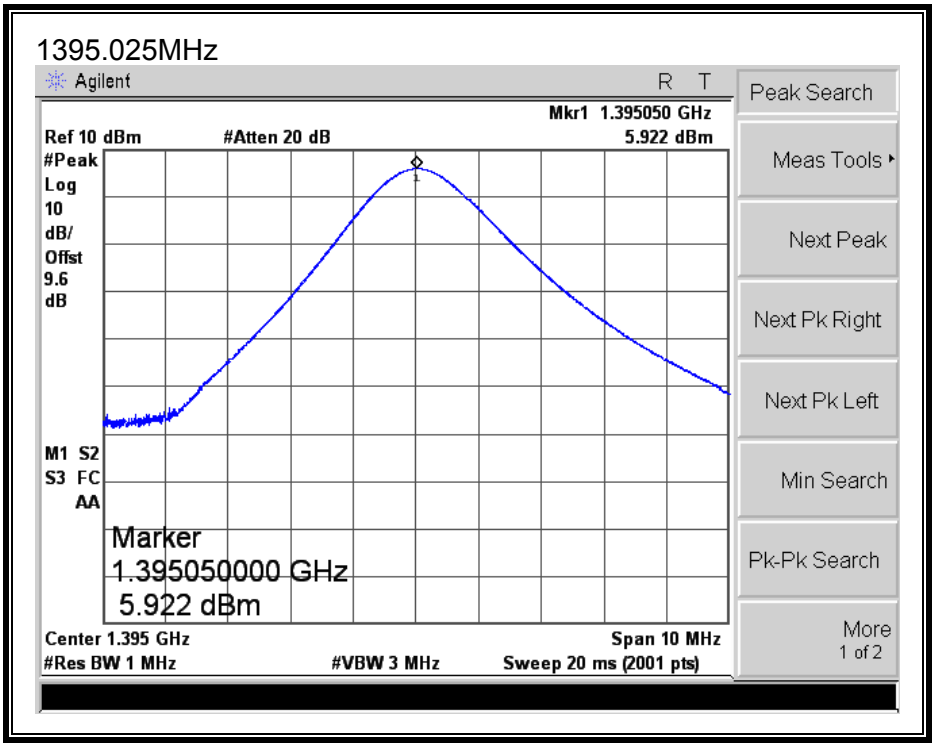
The transmitter output is connected to the spectrum analyzer. The RBW is set greater then the 26dB bandwidth. The VBW is set to 3 times the RBW.

RESULTS

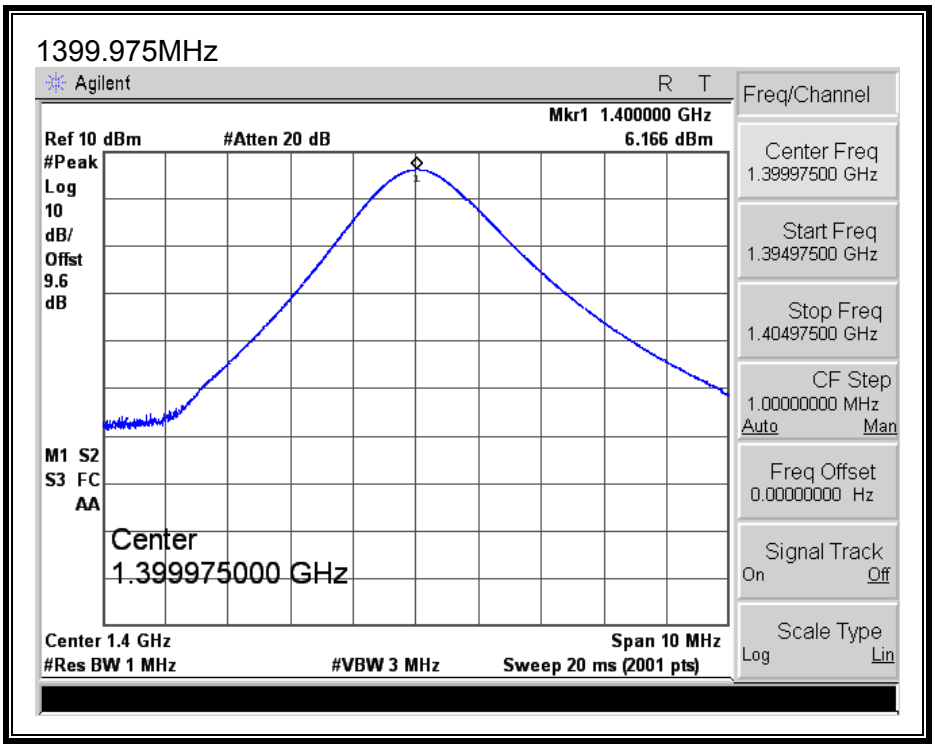
Channel	Frequency (MHz)	Output Power (dBm)
E002	1395.025	5.92
E390	1399.975	6.17
E502	1427.025	7.09
E898	1431.975	7.19

OUTPUT POWER

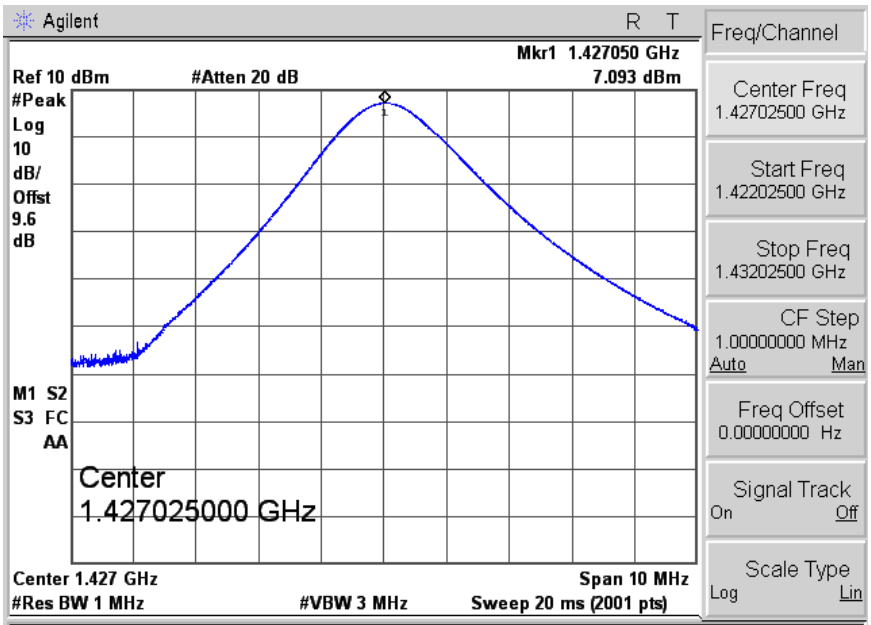
1395.025MHz



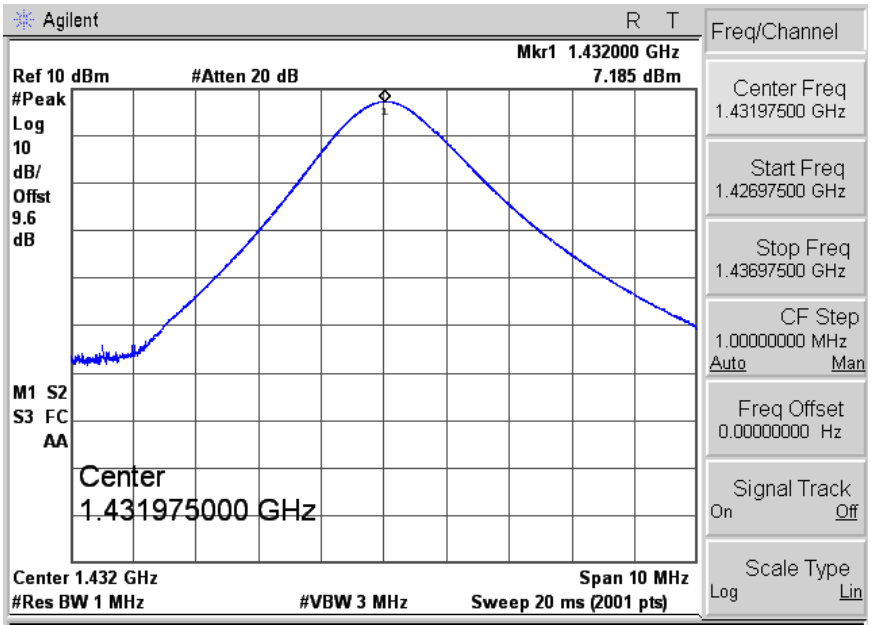
1399.975MHz



1427.025MHz



1431.975MHz



7.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 9.6 dB (including 9.6 dB pad) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Output Power (dBm)
E002	1395.025	5.90
E390	1399.975	6.14
E502	1427.025	7.09
E898	1431.975	7.18

7.4. SPURIOUS EMISSIONS AT ANTENNA TERMINAL

LIMIT

§2.1051All the conducted emission spurious level shall be at least -20dBc below the band that contains the highest level of desired power.

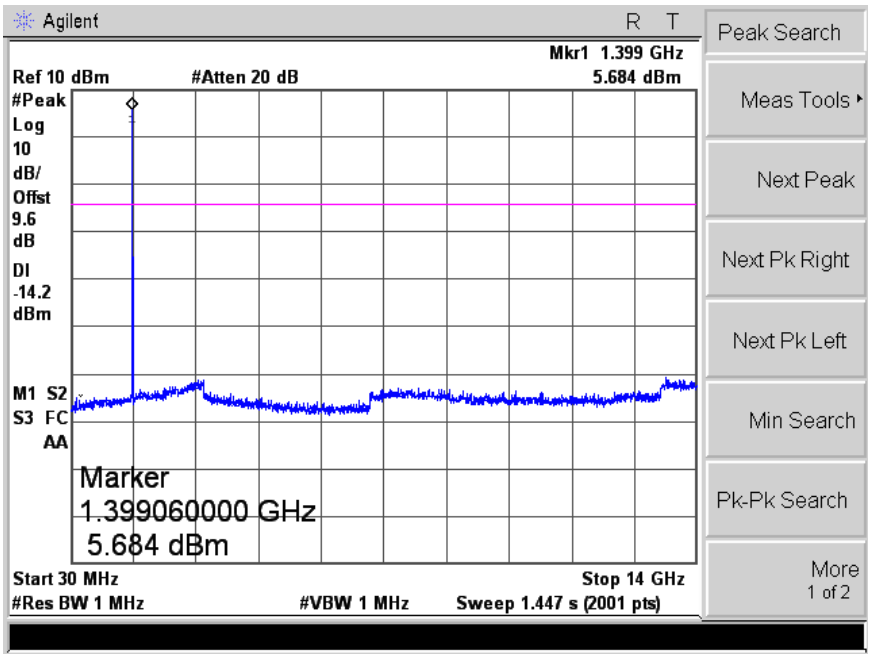
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW=VBW=1MHz.

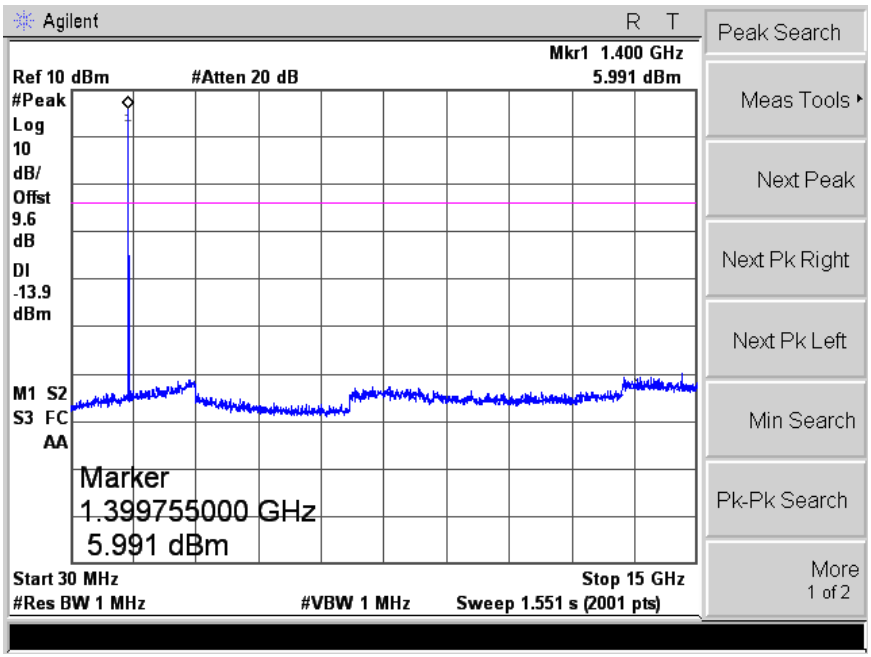
The spectrum from 30 MHz to 10th harmonic is investigated with the transmitter set to the lowest and highest channels.

TEST RESULTS

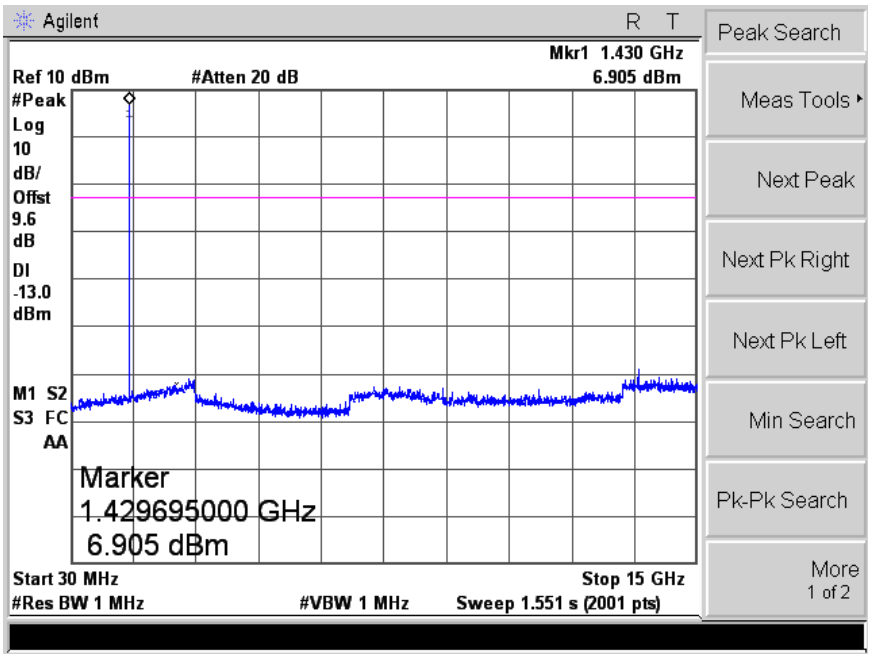
1395.025MHz SPURIOUS



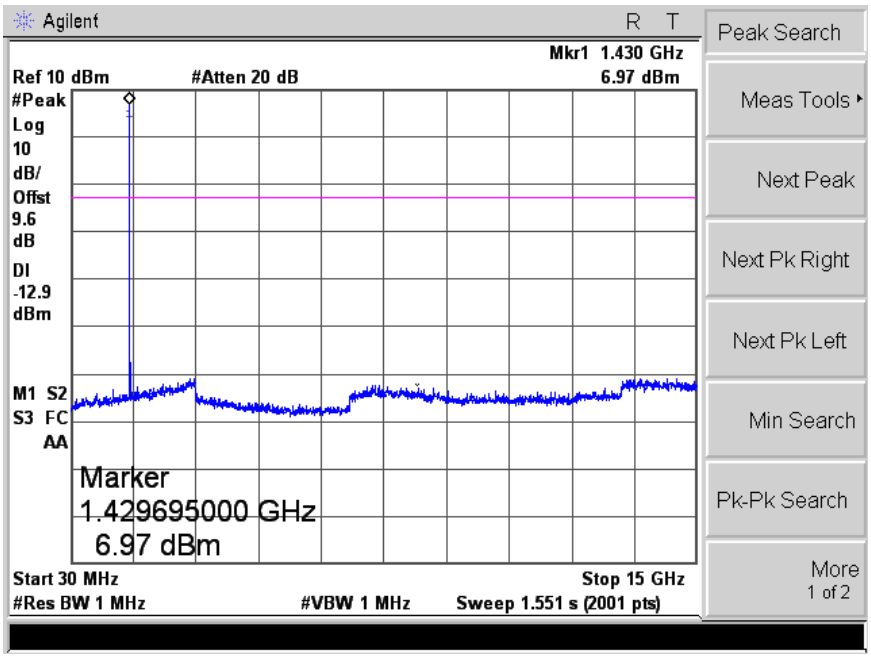
1399.975MHz SPURIOUS



1427.025MHz SPURIOUS



1431.975MHz SPURIOUS



7.5. FREQUENCY STABILITY MEASUREMENT

LIMIT

§95.115 (e) Frequency stability.
Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions.

TEST PROCEDURE

Frequency stability versus environmental temperature

1) Set the temperature of chamber to 25°C @ low/high channel. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.

2) Set SA Resolution Bandwidth to 300 Hz and Video Resolution Bandwidth to 300 Hz and Frequency Span to 20 KHz. Record this frequency as reference frequency.

3) Repeat step 2 with a 10°C decreased per stage until the lowest temperature -30°C is measured, record all measured frequencies on each temperature step.

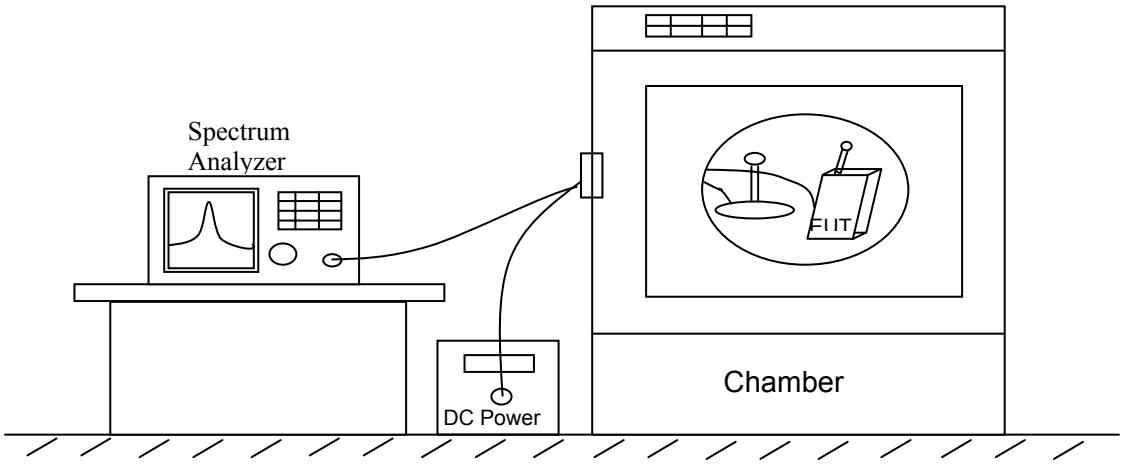
3) Repeat step 2 with a 10°C increased per stage until the highest temperature +50°C is measured; record all measured frequencies on each temperature step.

Frequency stability versus input voltage

1). Setup the configuration as shown below for frequencies measured at temperature if it is 25°C.

2). Set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 300 Hz and Video Resolution Bandwidth to 300 Hz and Frequency Span to 20 KHz. Record this frequency as reference frequency.

3). For battery operated only device, supply the EUT primary voltage at the operating end point which is specified by manufacturer and record the frequency.



Frequency stability measurement configuration

TEST RESULTS

LOW CHANNEL

20℃ Reference Frequency:			1395.025000		MHz
Limit: +/- 15		ppm =	0.020925		MHz
Power Supply		Environment	Frequency	Delta (MHz)	Limit +/- (MHz)
VDC		Temperature (℃)	(MHz)		
3.00	Normal (100%)	50	1395.025443	0.000443	0.020925
		40	1395.025421	0.000421	0.020925
		30	1395.025378	0.000378	0.020925
		20	1395.025331	0.000331	0.020925
		10	1395.025254	0.000254	0.020925
		0	1395.025117	0.000117	0.020925
		-10	1395.024927	-0.000073	0.020925
		-20	1395.024775	-0.000225	0.020925
		-30	1395.024670	-0.000330	0.020925
3.45	High (115%)		1395.025368	0.000368	0.020925
3.00	Normal (100%)		1395.025331	0.000331	0.020925
2.55	Low (85%)		1395.025217	0.000217	0.020925
1.45	End Point				

HIGH CHANNEL

20℃ Reference Frequency:			1431.975000		MHz
Limit: +/- 15 ppm =			0.021480		MHz
Power Supply		Environment	Frequency	Delta (MHz)	Limit +/- (MHz)
VDC		Temperature (℃)	(MHz)		
3.00	Normal (100%)	50	1431.975674	0.000674	0.021480
		40	1431.975558	0.000558	0.021480
		30	1431.975453	0.000453	0.021480
		20	1431.975403	0.000403	0.021480
		10	1431.975224	0.000224	0.021480
		0	1431.974821	-0.000179	0.021480
		-10	1431.974668	-0.000332	0.021480
		-20	1431.974602	-0.000398	0.021480
		-30	1431.974571	-0.000429	0.021480
3.45	High (115%)		1431.975470	0.000470	0.021480
3.00	Normal (100%)		1431.975403	0.000403	0.021480
2.55	Low (85%)		1431.975449	0.000449	0.021480
1.45	End Point				

8. RADIATED EMISSION TEST RESULTS

LIMITS

§95.115
(a) Field strength limits
(2) In the 1395–1400 MHz and 1427–1429.5 MHz bands, the maximum allowable field strength is 740 mV/m as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth.

(b) Undesired emissions.
(1) Out-of-band emissions below 960 MHz are limited to 200 microvolts/meter, as measured at a distance of 3 meters, using measuring instrumentation with a CISPR quasi-peak detector.
(2) Out-of-band emissions above 960 MHz are limited to 500 microvolts/meter as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth.

TEST PROCEDURE

ANSI/TIA-603-C-2004

RESULTS

8.1. FUNDAMENTAL OUTPUT POWER

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Devin Chang
Date: 11/05/08
Project #: 08J12204
Company: Nihon Kohden
EUT Description: EUT only
EUT M/N: ZM-931PA
Test Target: FCC 95.1115 (a) (2)
Mode Oper: Tx mode

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

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
1395.025MHz															
1.395	3.0	57.8	29.2	3.7	0.0	0.0	0.0	90.7	117.4	-26.7	V	A	187.0	227.7	Y-axis
1.395	3.0	63.3	29.2	3.7	0.0	0.0	0.0	96.3	117.4	-21.1	H	A	107.9	160.8	Y-axis
1399.975MHz															
1.400	3.0	58.0	29.2	3.8	0.0	0.0	0.0	90.9	117.4	-26.5	V	A	100.0	227.6	Y-axis
1.400	3.0	63.4	29.2	3.8	0.0	0.0	0.0	96.4	117.4	-21.0	H	A	104.8	157.2	Y-axis
1427.025MHz															
1.427	3.0	58.9	29.3	3.8	0.0	0.0	0.0	92.0	117.4	-25.4	V	A	100.0	229.3	Y-axis
1.427	3.0	62.3	29.3	3.8	0.0	0.0	0.0	95.4	117.4	-22.0	H	A	100.5	146.0	Y-axis
1431.975MHz															
1.432	3.0	60.0	29.4	3.8	0.0	0.0	0.0	93.2	117.4	-24.2	V	A	100.0	226.2	Y-axis
1.432	3.0	62.9	29.4	3.8	0.0	0.0	0.0	96.1	117.4	-21.3	H	A	101.4	169.7	Y-axis

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

8.2. RADIATED EMISSIONS BELOW 960 MHz

Note 1: The measurements in this section show that Peak values are less than the Quasi-Peak limit.

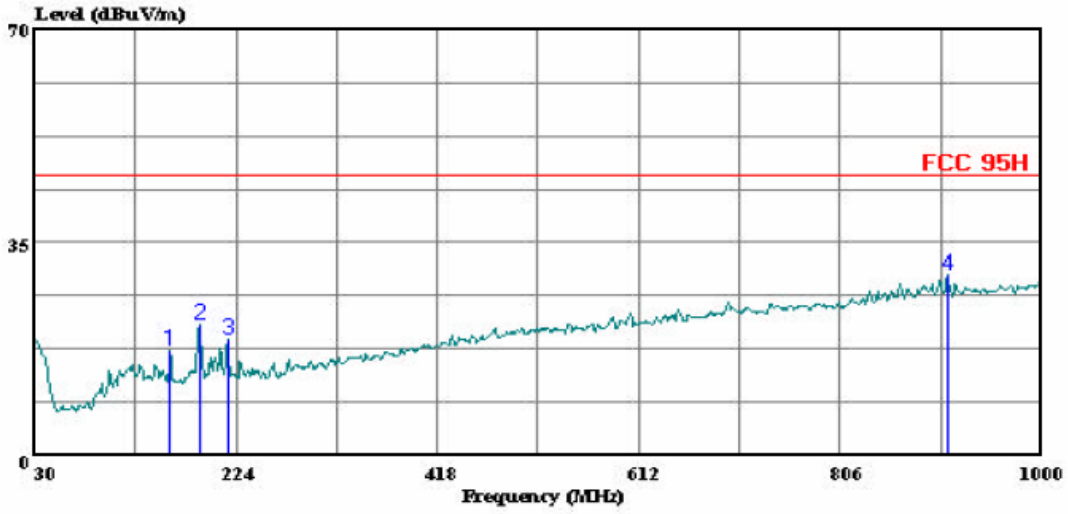
Note 2: Plots in the range of 960 to 100 MHz in this section are shown for reporting purposes only.

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1395.025MHz

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 6 File#: 08J12204.EMI Date: 11-01-2008 Time: 13:23:00



Trace: 5 Ref Trace:

Condition: FCC 95H HORIZONTAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1395.025MHz
Target: : FCC 95H

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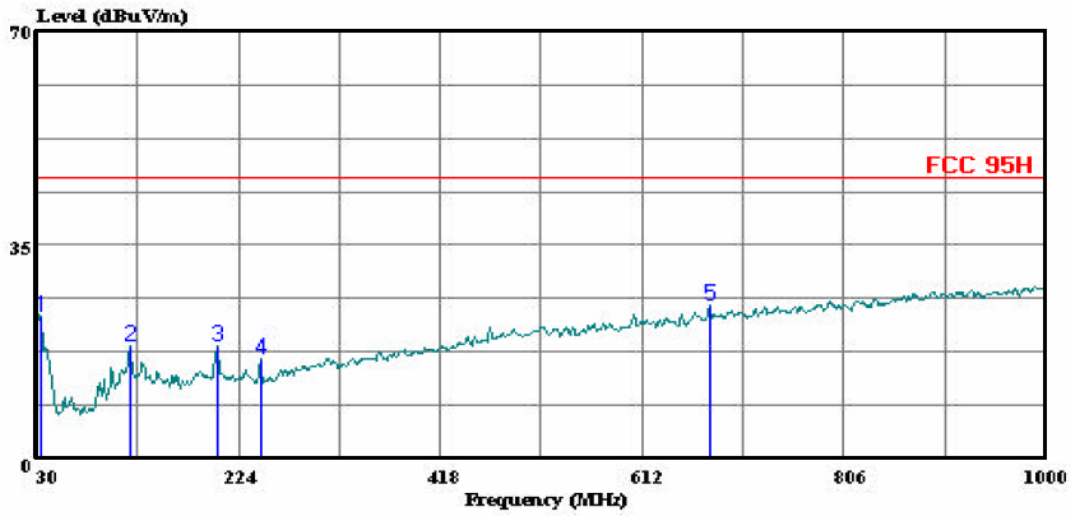
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	159.980	31.81	-14.61	17.20	46.00	-28.80	Peak
2	189.080	35.31	-13.89	21.42	46.00	-24.58	Peak
3	216.240	32.08	-13.09	18.99	46.00	-27.01	Peak
4	909.790	26.78	2.91	29.69	46.00	-16.31	Peak

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 8 File#: 08J12204.EMI Date: 11-01-2008 Time: 13:30:05



Trace: 7 Ref Trace:

Condition: FCC 95H VERTICAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1395.025MHz
Target: : FCC 95H

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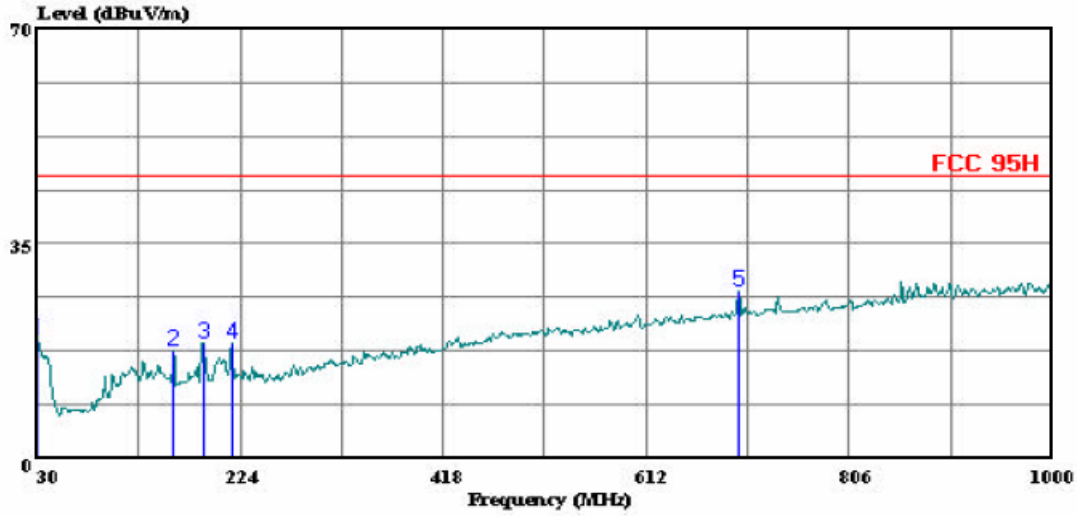
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	32.75	-9.49	23.26	46.00	-22.74	Peak
2	119.240	31.46	-12.91	18.55	46.00	-27.45	Peak
3	203.630	31.46	-13.02	18.44	46.00	-27.56	Peak
4	245.340	29.69	-13.25	16.44	46.00	-29.56	Peak
5	676.990	26.19	-0.98	25.21	46.00	-20.79	Peak

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1399.975MHz

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 12 File#: 08J12204.EMI Date: 11-01-2008 Time: 13:57:21



Trace: 11 Ref Trace:

Condition: FCC 95H HORIZONTAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1399.975MHz
Target: : FCC 95H

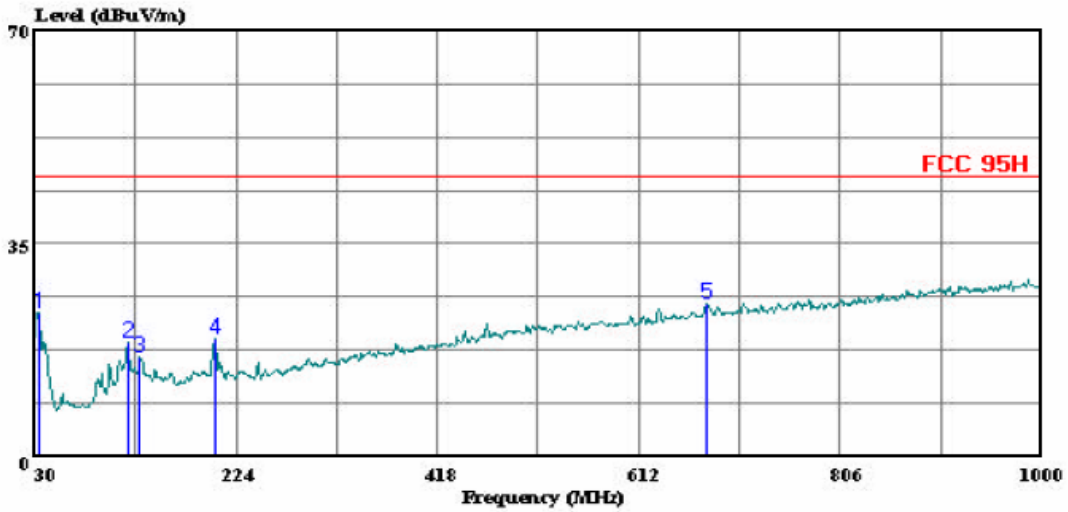
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	30.970	26.37	-7.11	19.26	46.00	-26.74	Peak
2	159.980	32.30	-14.61	17.69	46.00	-28.31	Peak
3	189.080	32.77	-13.89	18.88	46.00	-27.12	Peak
4	216.240	31.80	-13.09	18.71	46.00	-27.29	Peak
5	701.240	27.62	-0.44	27.18	46.00	-18.82	Peak

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 10 File#: 08J12204.EMI Date: 11-01-2008 Time: 13:50:20



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Condition: FCC 95H VERTICAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1399.975MHz
Target: : FCC 95H

Page: 1

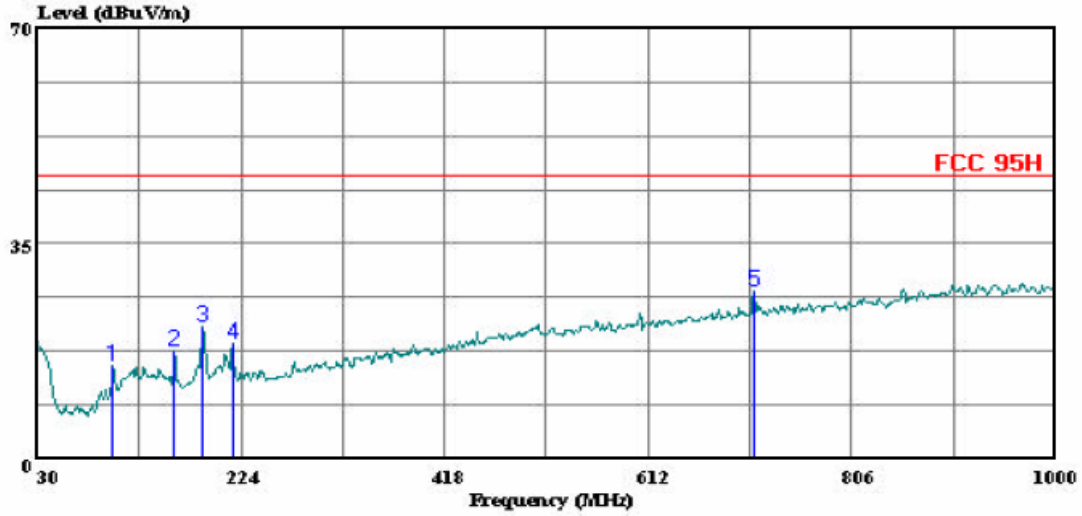
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	33.27	-9.49	23.78	46.00	-22.22	Peak
2	119.240	31.78	-12.91	18.87	46.00	-27.13	Peak
3	130.880	29.63	-13.38	16.25	46.00	-29.75	Peak
4	203.630	32.53	-13.02	19.51	46.00	-26.49	Peak
5	676.990	26.09	-0.98	25.11	46.00	-20.89	Peak

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1427.025MHz

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 4 File#: 08J12204.EMI Date: 11-01-2008 Time: 13:14:09



Trace: 3 Ref Trace:

Condition: FCC 95H HORIZONTAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1427.025MHz
Target: : FCC 95H

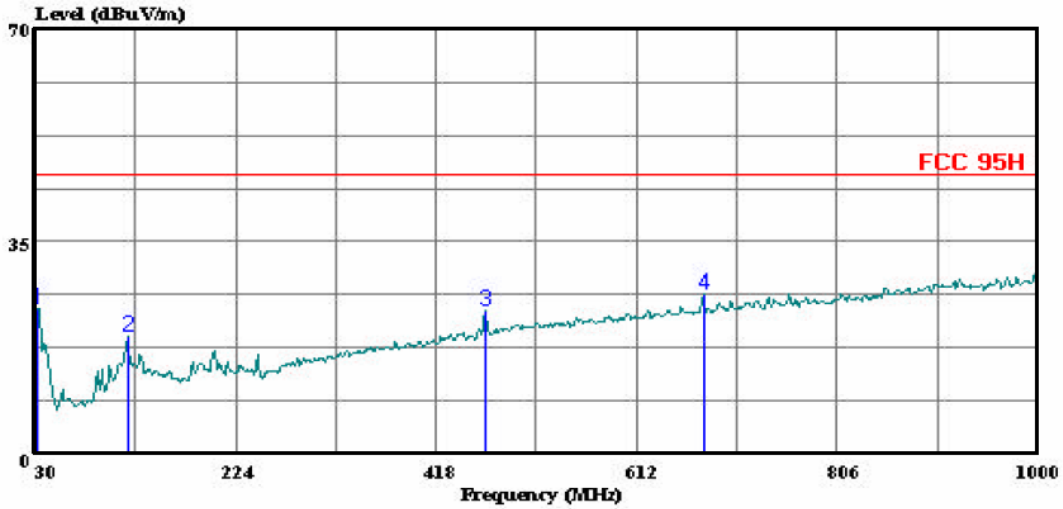
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	101.780	31.55	-16.41	15.14	46.00	-30.86	Peak
2	159.980	32.25	-14.61	17.64	46.00	-28.36	Peak
3	187.140	35.40	-13.94	21.46	46.00	-24.54	Peak
4	216.240	31.76	-13.09	18.67	46.00	-27.33	Peak
5	712.880	27.57	-0.27	27.30	46.00	-18.70	Peak

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 2 File#: 08J12204.EMI Date: 11-01-2008 Time: 13:06:18



Trace: 1 Ref Trace:

Condition: FCC 95H VERTICAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1427.025MHz
Target: : FCC 95H

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	32.910	32.19	-8.30	23.89	46.00	-22.11	Peak
2	119.240	32.17	-12.91	19.26	46.00	-26.74	Peak
3	465.530	29.65	-5.94	23.71	46.00	-22.29	Peak
4	676.990	27.32	-0.98	26.34	46.00	-19.66	Peak

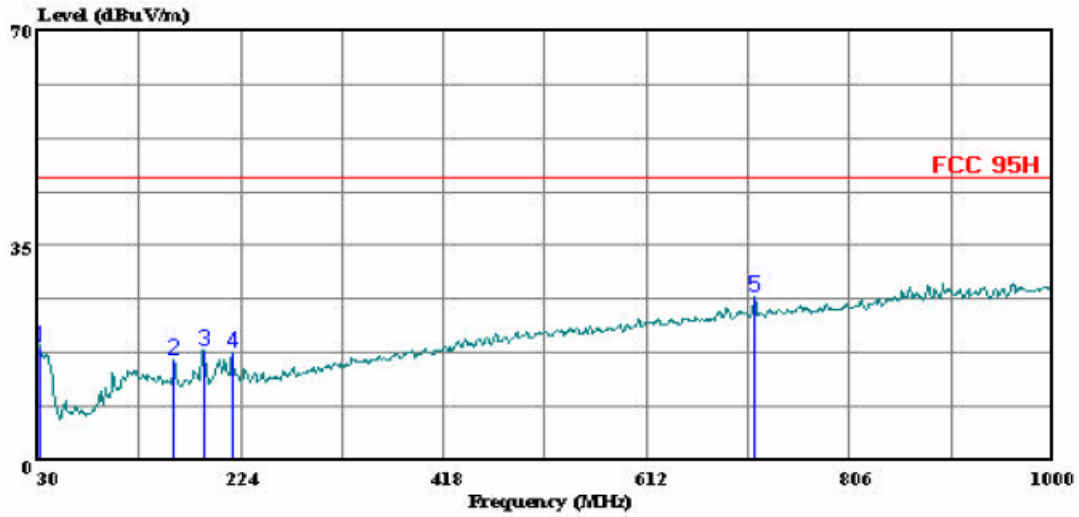
SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1431.975MHz

COMPLIANCE Engineering Service, Inc.
FCC,VCCI,CISPR,CE UL,CSA,TUV

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 14 File#: 08J12204.EMI Date: 11-01-2008 Time: 14:07:25



Trace: 13 Ref Trace:

Condition: FCC 95H HORIZONTAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1431.975MHz
Target: : FCC 95H

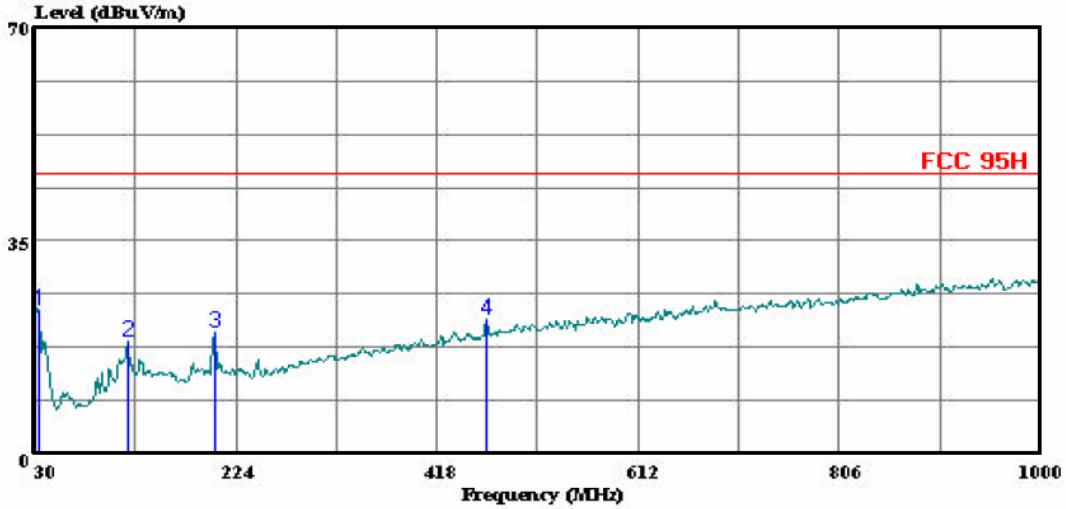
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	26.80	-8.30	18.50	46.00	-27.50	Peak
2	159.980	30.94	-14.61	16.33	46.00	-29.67	Peak
3	189.080	31.92	-13.89	18.03	46.00	-27.97	Peak
4	216.240	30.61	-13.09	17.52	46.00	-28.48	Peak
5	715.790	26.90	-0.22	26.68	46.00	-19.32	Peak

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 16 File#: 08J12204.EMI Date: 11-01-2008 Time: 14:19:14



Trace: 15 Ref Trace:

Condition: FCC 95H VERTICAL
Test Operator: : Devin Chang
Project #: : 08J12204
Company: : Nihon Kohden
Configuration: : EUT only
Mode : : ZM-931PA
EUT Description: Tx-1431.975MHz
Target: : FCC 95H

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	33.08	-9.49	23.59	46.00	-22.41	Peak
2	119.240	31.27	-12.91	18.36	46.00	-27.64	Peak
3	203.630	32.93	-13.02	19.91	46.00	-26.09	Peak
4	465.530	28.07	-5.94	22.13	46.00	-23.87	Peak

8.3. RADIATED EMISSIONS ABOVE 960 MHz

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 960 MHz

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Devin Chang
Date: 11/05/08
Project #: 08J12204
Company: Nihon Kohden
EUT Description: EUT only
EUT M/N: ZM-931PA
Test Target: FCC 95.1115 (b) (2)
Mode Oper: Tx mode

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

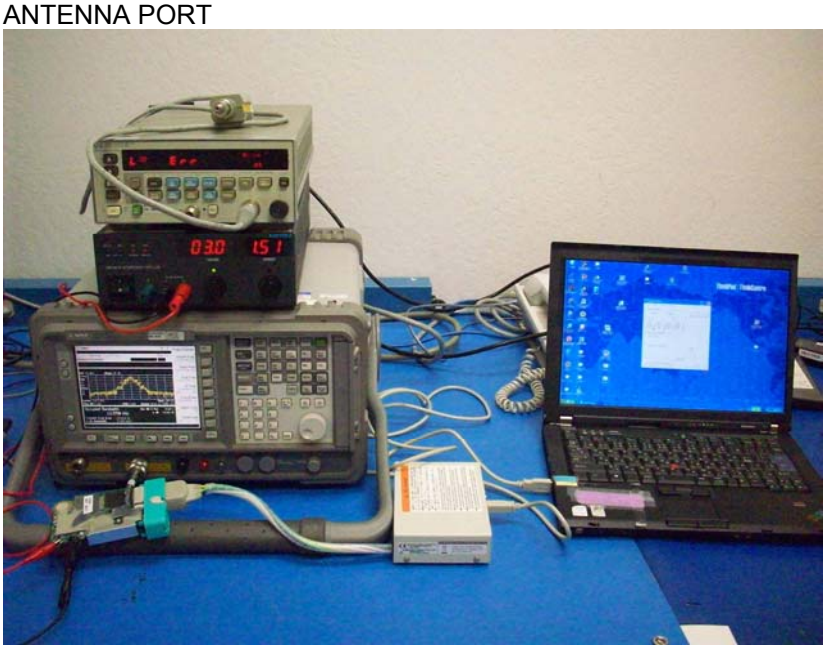
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
1395.025MHz															
2.790	3.0	29.0	32.2	5.4	-35.2	0.0	0.6	32.0	54.0	-22.0	V	A	123.3	165.5	
4.185	3.0	31.6	33.4	6.6	-34.8	0.0	0.6	37.3	54.0	-16.7	V	A	115.5	310.5	
8.370	3.0	24.3	35.4	9.0	-34.6	0.0	0.7	34.8	54.0	-19.2	V	A	200.0	0.5	
2.790	3.0	29.8	32.2	5.4	-35.2	0.0	0.6	32.8	54.0	-21.2	H	A	104.3	162.5	
4.185	3.0	29.9	33.4	6.6	-34.8	0.0	0.6	35.7	54.0	-18.3	H	A	171.1	214.4	
8.370	3.0	24.9	35.4	9.0	-34.6	0.0	0.7	35.4	54.0	-18.6	H	A	142.1	55.6	
1399.975MHz															
2.800	3.0	29.8	32.2	5.4	-35.2	0.0	0.6	32.8	54.0	-21.2	V	A	118.9	164.4	
4.200	3.0	31.6	33.4	6.6	-34.8	0.0	0.6	37.4	54.0	-16.6	V	A	113.6	303.0	
8.400	3.0	24.5	35.4	9.0	-34.7	0.0	0.7	35.0	54.0	-19.0	V	A	158.9	45.3	
2.800	3.0	35.0	32.2	5.4	-35.2	0.0	0.6	38.0	54.0	-16.0	H	A	117.3	69.7	
4.200	3.0	29.6	33.4	6.6	-34.8	0.0	0.6	35.4	54.0	-18.6	H	A	171.2	214.7	
8.400	3.0	24.5	35.4	9.0	-34.7	0.0	0.7	35.0	54.0	-19.0	H	A	160.8	296.5	
1427.025MHz															
2.854	3.0	34.4	32.3	5.4	-35.2	0.0	0.6	37.5	54.0	-16.5	V	A	100.9	340.8	
4.281	3.0	26.6	33.4	6.6	-34.8	0.0	0.6	32.4	54.0	-21.6	V	A	100.2	142.4	
2.854	3.0	38.6	32.3	5.4	-35.2	0.0	0.6	41.7	54.0	-12.3	H	A	106.7	124.0	
4.281	3.0	26.9	33.4	6.6	-34.8	0.0	0.6	32.8	54.0	-21.2	H	A	154.0	281.5	
1431.975MHz															
2.864	3.0	34.6	32.3	5.4	-35.2	0.0	0.6	37.7	54.0	-16.3	V	A	115.7	285.9	
4.296	3.0	28.0	33.4	6.7	-34.8	0.0	0.6	33.9	54.0	-20.1	V	A	109.0	312.9	
2.864	3.0	37.8	32.3	5.4	-35.2	0.0	0.6	40.9	54.0	-13.1	H	A	188.0	206.8	
4.296	3.0	26.8	33.4	6.7	-34.8	0.0	0.6	32.7	54.0	-21.3	H	A	129.7	278.7	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

9. SETUP PHOTOS

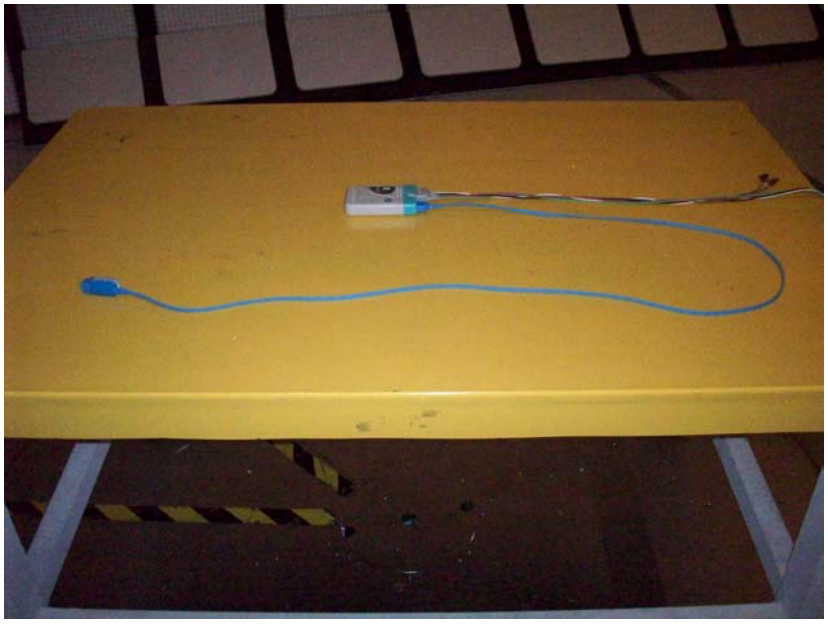
ANTENNA PORT

ANTENNA PORT

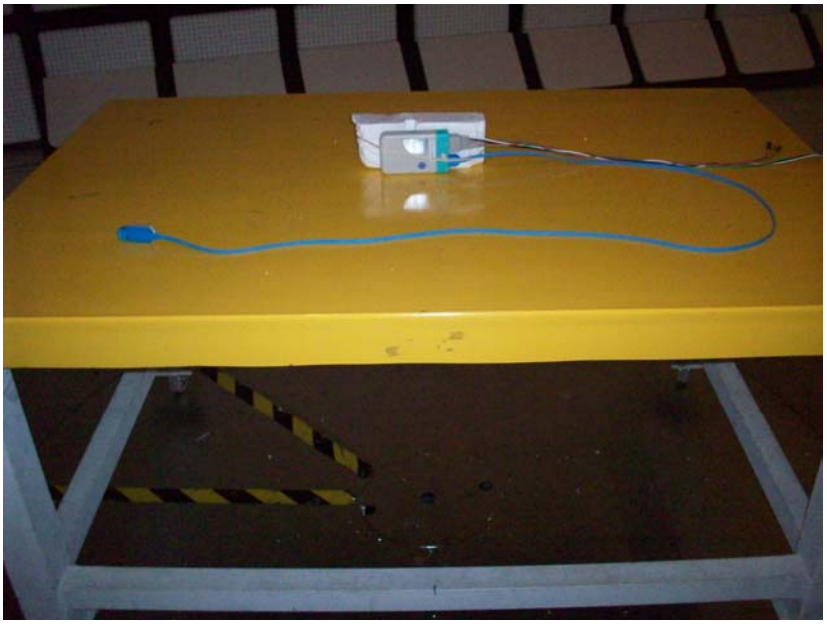


RADIATED EMISSION FOR PORTABLE CONFIGURATION

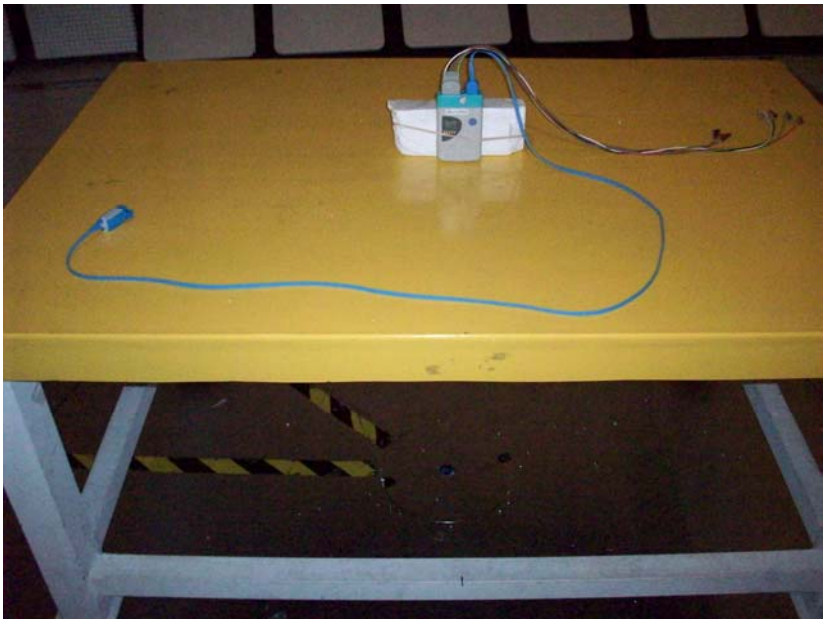
X ORIENTATION



Y ORIENTATION

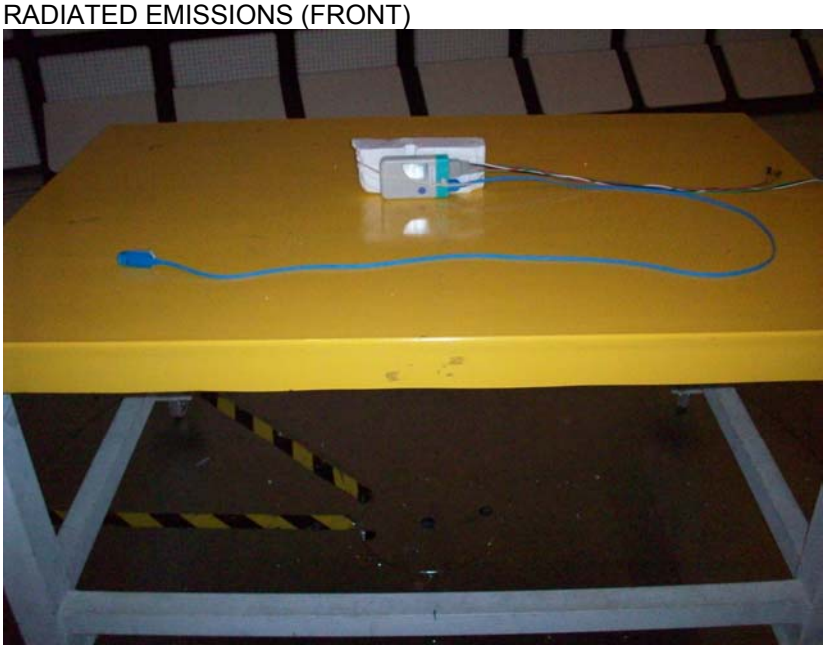


Z ORIENTATION

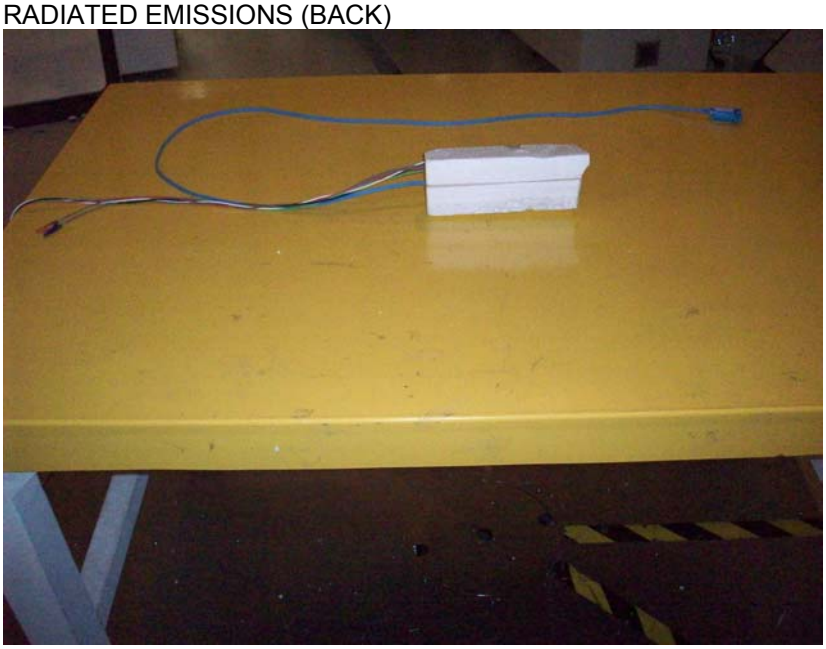


RADIATED EMISSION

RADIATED EMISSIONS (FRONT)



RADIATED EMISSIONS (BACK)



END OF REPORT