



**FCC CFR47 PART 95H REQUIREMENT
CERTIFICATION TEST REPORT
FOR
MEDICAL TELEMETRY TRANSMITTER**

MODEL: ZM-541PA

FCC ID: B6BZM-541PA

REPORT NUMBER: 09J12558-1

ISSUE DATE: JUNE 16, 2009

**Prepared for
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1-31-4, NISHIOCHIAI SHINJUKU-KU
TOKYO 161-8560, JAPAN**

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/16/09	Initial Issue	T. Chan

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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: MEDICAL TELEMETRY TRANSMITTER

MODEL: ZM-541PA

SERIAL NUMBER: 91005

DATE TESTED: JUNE 09 – 11, 2009

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. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:

Tested By:



THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

VIEN TRAN
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. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 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-541PA |
| d). | FCC ID: | B6BZM-541PA |
| e). | Battery Type: | Three 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	Dell	PP18L	6364419229	DoC
AC/DC Adapter	Dell	LA65S0-00	CN-ODF263-71615-66C-2E21	DoC
Channel Writer	Nihon Kohden	QI-901PK	28	N/A

I/O CABLES

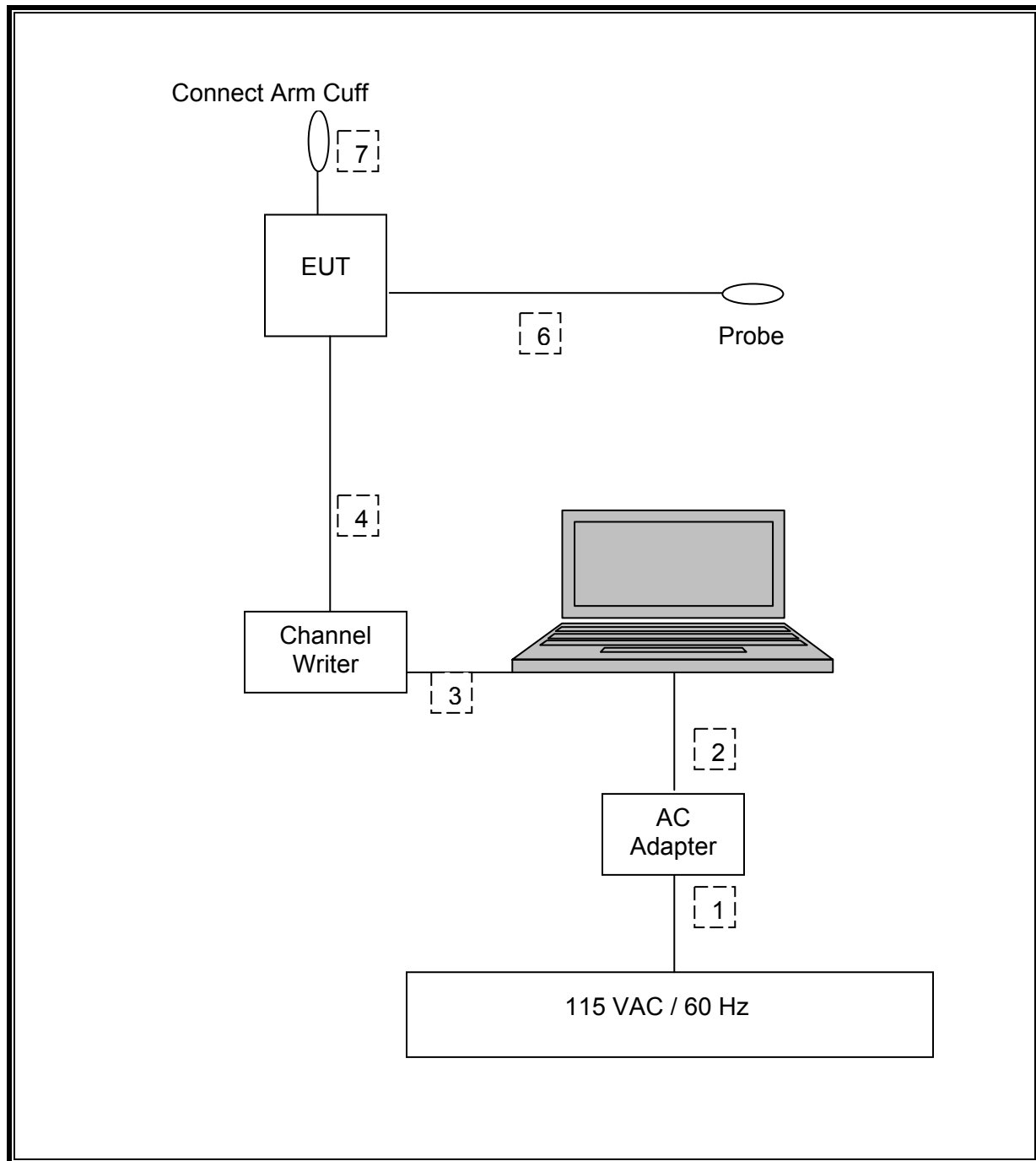
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US115V	Un-shielded	1m	N/A
2	DC	1	DC	Un-shielded	1.8m	Ferrite on laptop's end
3	USB	1	USB	Shielded	2m	No
4	ECG	1	ECG	Un-shielded	0.3m	No
5	ECG	1	ECG	Un-shielded	0.7 m	N/A
6	SpO2	1	SpO2	Un-shielded	1.6 m	Probe
7	NIBP	1	NIBP socket	Rubber	0.3 m	Connect Arm Cuff

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.

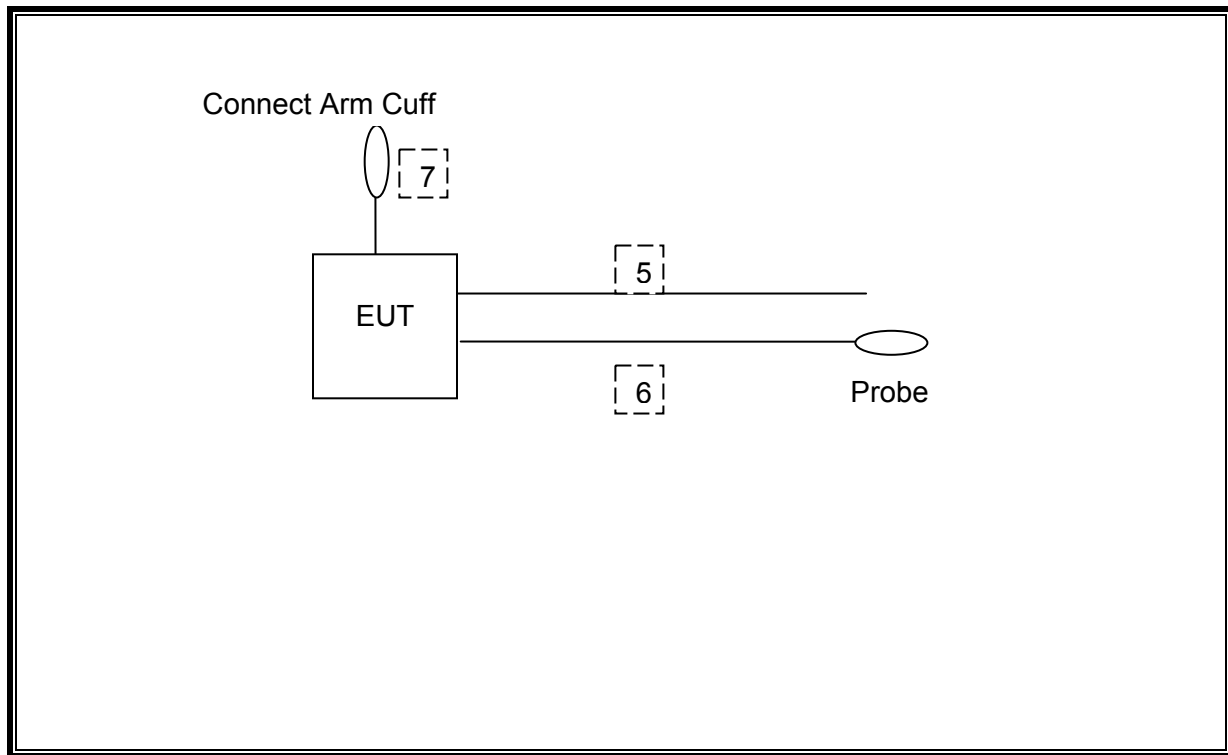
SETUP DIAGRAM FOR TESTS

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
Antenna, Horn, 18 GHz	EMCO	3115	C01005	01/29/10
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01016	02/07/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00749	12/16/09
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C00558	01/14/10
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/03/10
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	05/13/10
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

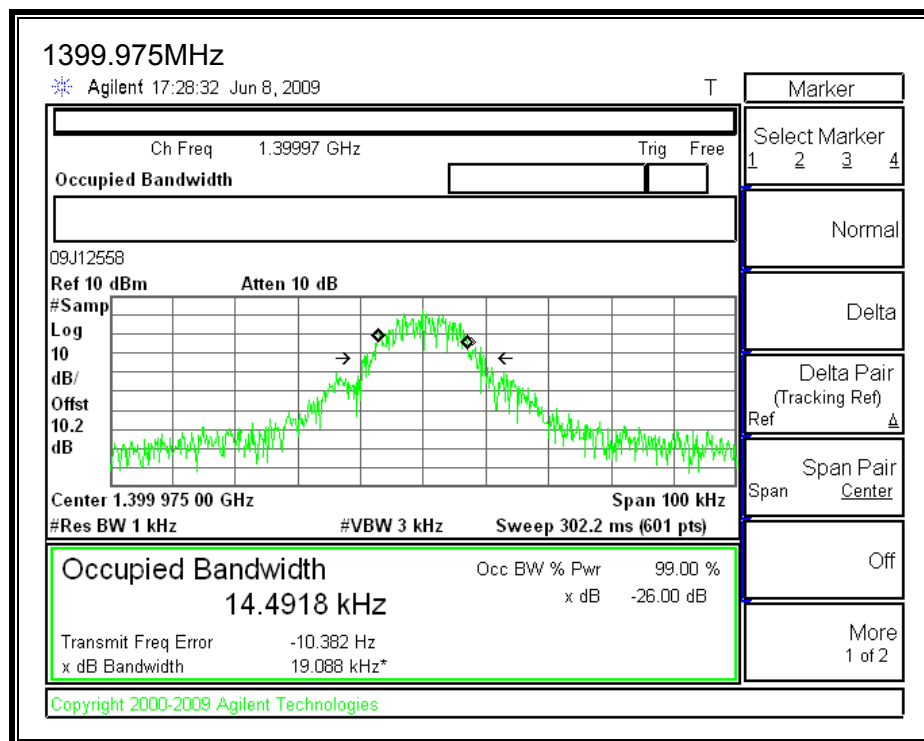
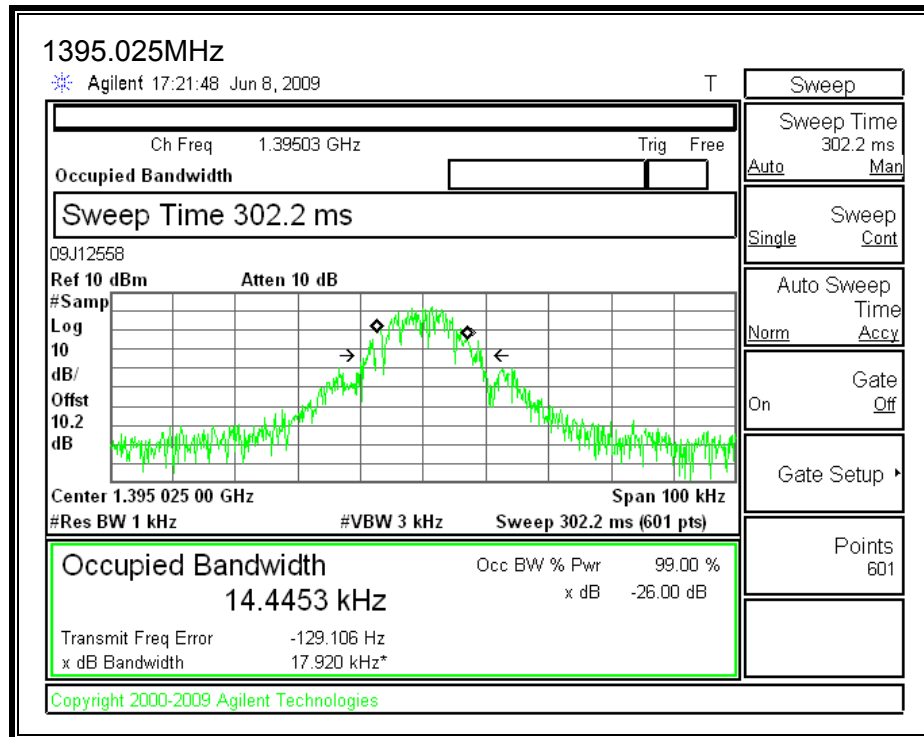
26dB Bandwidth

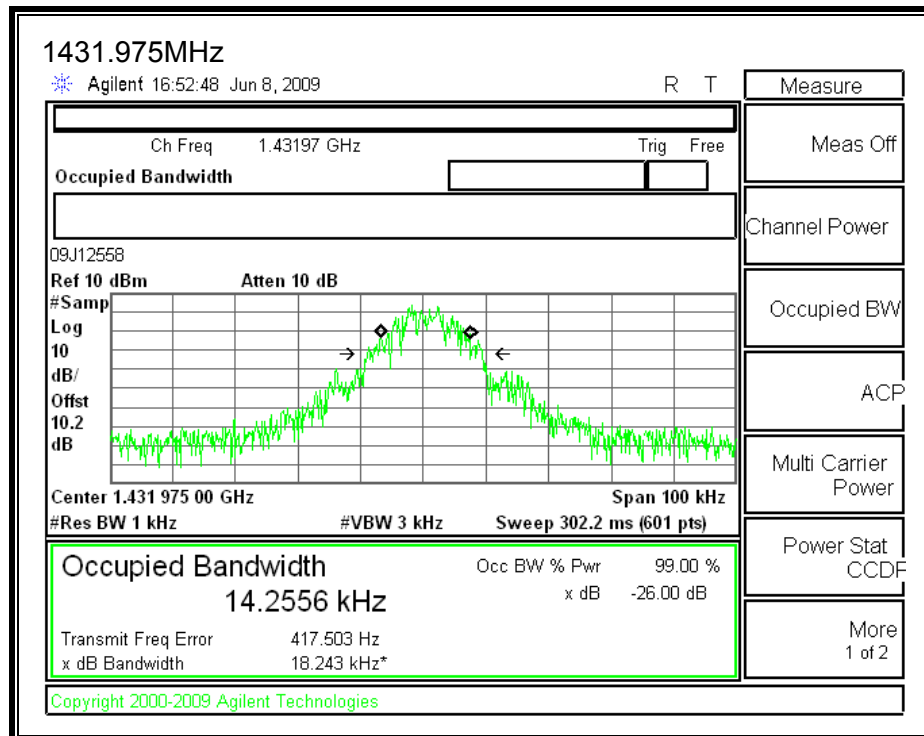
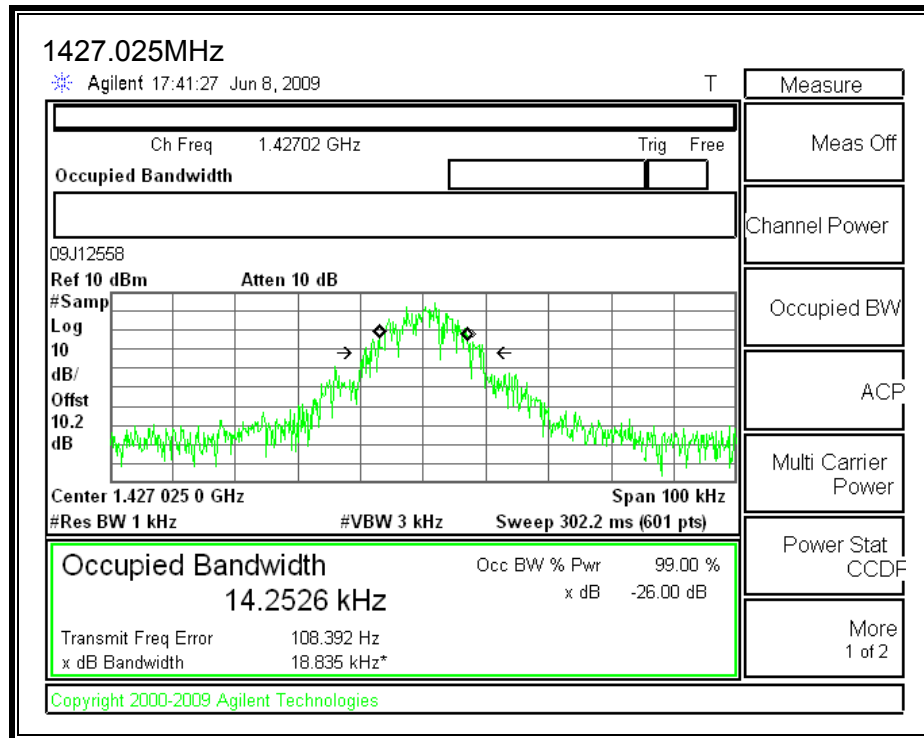
Channel	Frequency (MHz)	26dB Bandwidth (kHz)
E002	1395.025	17.920
E390	1399.975	19.088
E502	1427.025	18.835
E898	1431.975	18.243

99% Bandwidth

Channel	Frequency (MHz)	99% Bandwidth (kHz)
E002	1395.025	14.445
E390	1399.975	14.492
E502	1427.025	14.253
E898	1431.975	14.256

20dB and 99% BANDWIDTH





7.2. PEAK OUTPUT POWER

LIMITS

§2.1046, for reporting purposes only.

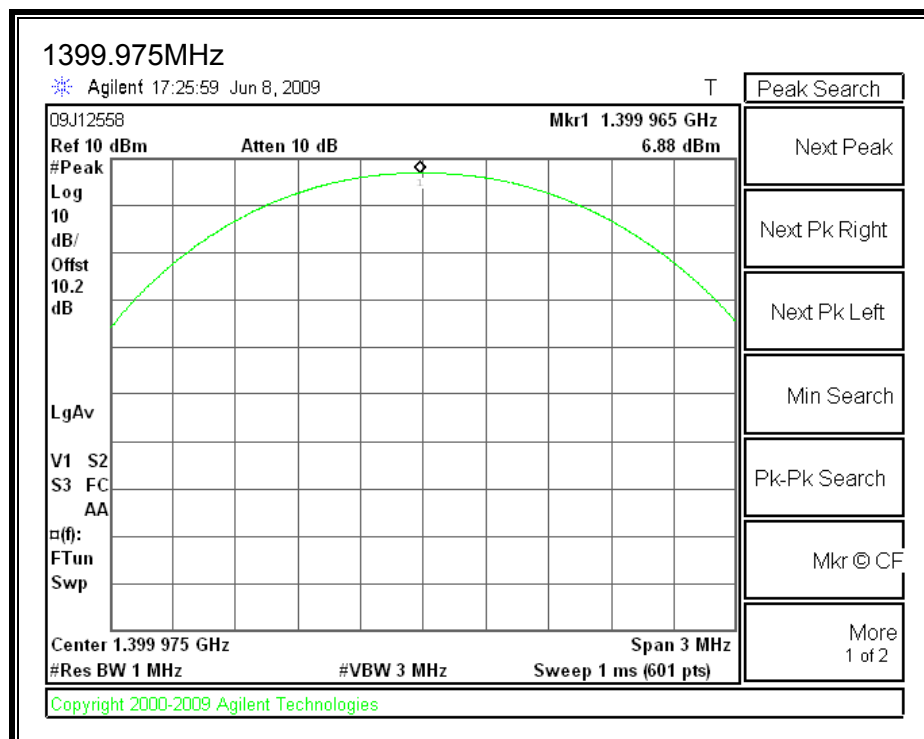
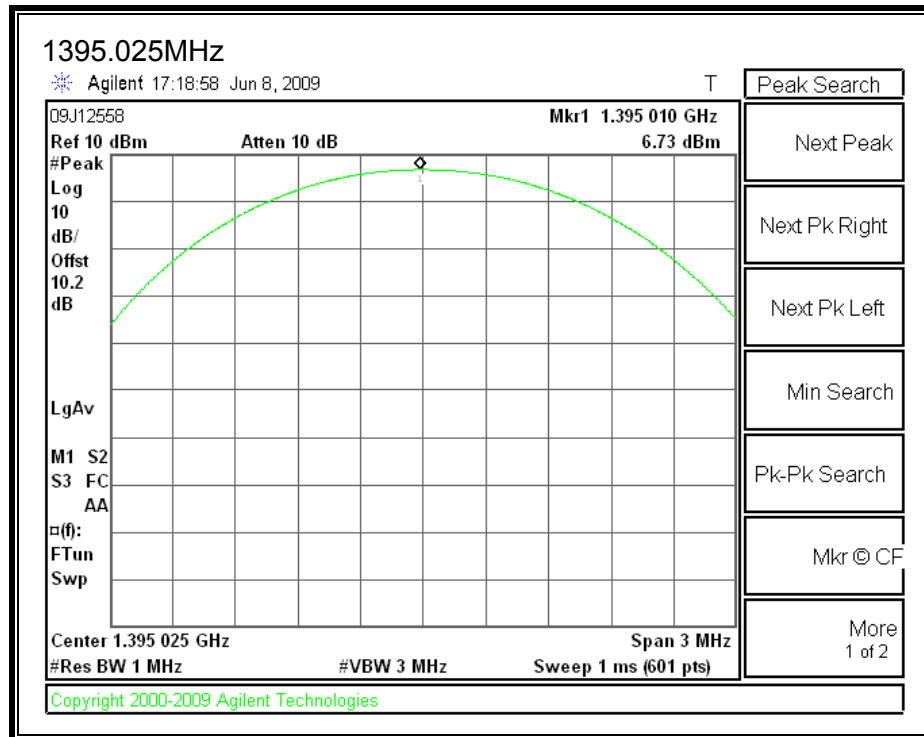
TEST PROCEDURE

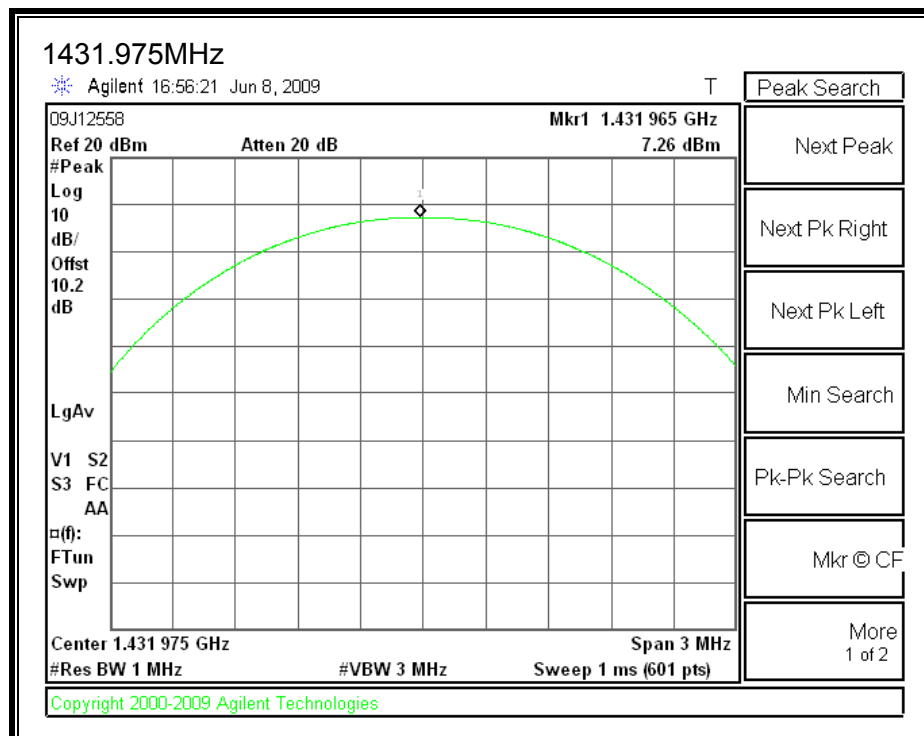
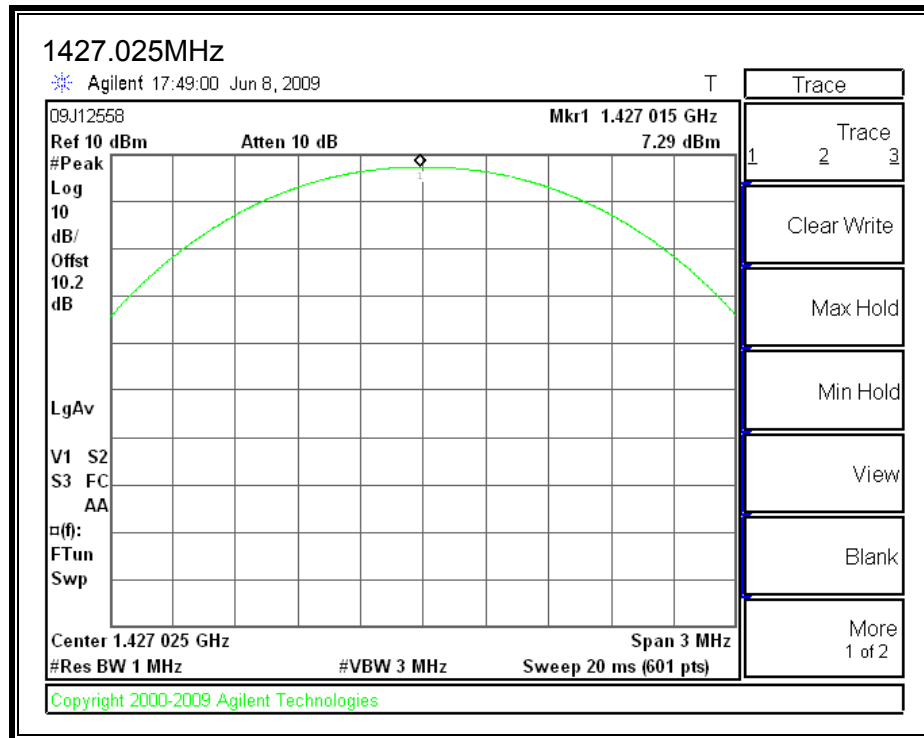
The transmitter output is connected to the spectrum analyzer. The RBW is set greater than the 26dB bandwidth. The VBW is set to 3 times the RBW.

RESULTS

Channel	Frequency (MHz)	Output Power (dBm)
E002	1395.025	6.73
E390	1399.975	6.88
E502	1427.025	7.29
E898	1431.975	7.26

OUTPUT POWER





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 10.2 dB (including 10dB pad & 0.20dB cable loss) 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	6.40
E390	1399.975	6.60
E502	1427.025	7.00
E898	1431.975	7.07

7.4. SPURIOUS EMISSIONS AT ANTENNA TERMINAL

LIMIT

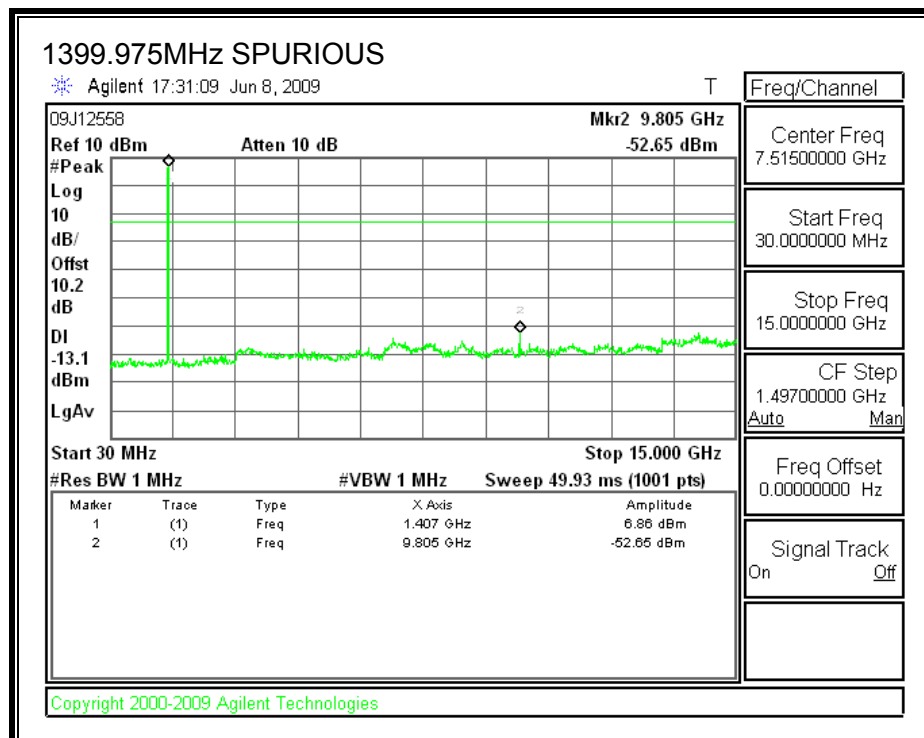
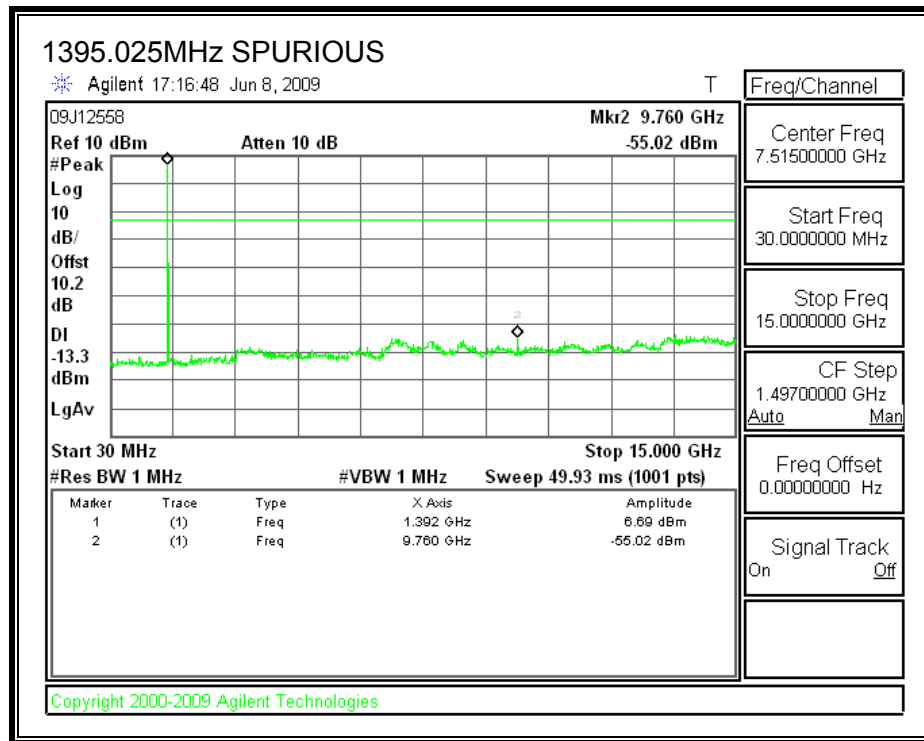
§2.1051 All the conducted emission spurious level shall be at least -20dBc below the band that contains the highest level of desired power.

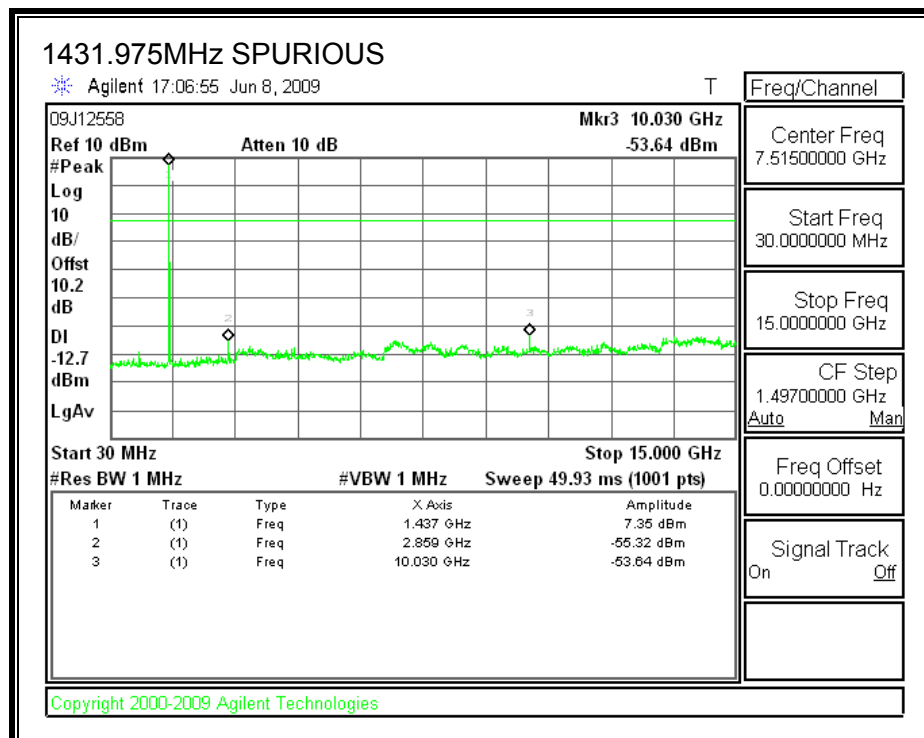
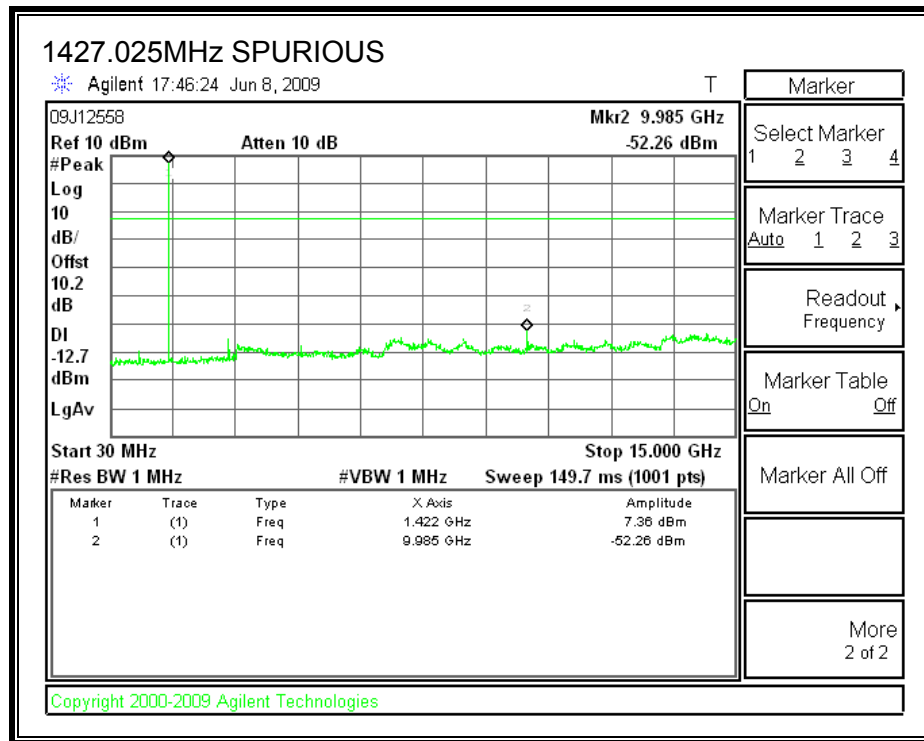
TEST PROCEDURE

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





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.

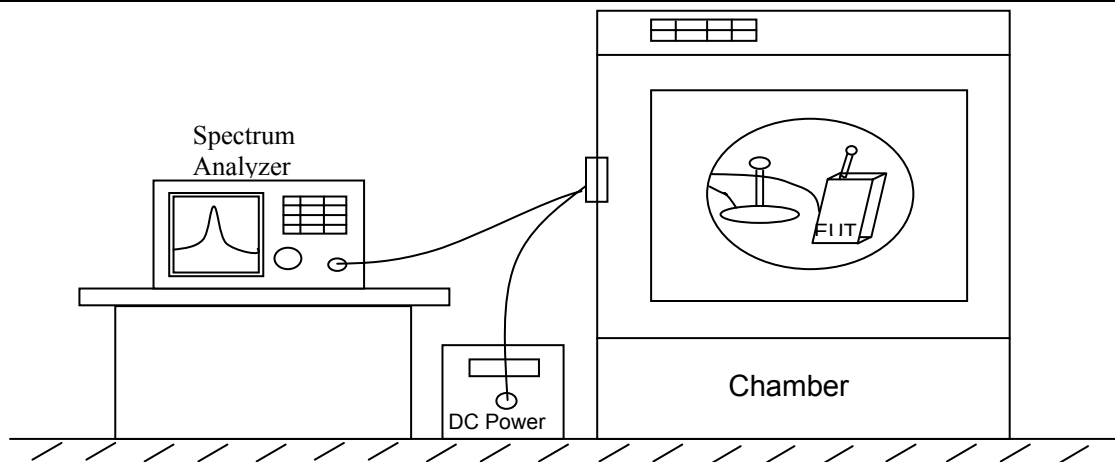
TEST PROCEDURE

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°C Reference Frequency:			1395.025000	MHz
Limit: +/-	2.5	ppm =	0.003488	MHz
Power Supply		Environment	Frequency	Limit +/- (MHz)
VDC		Temperature (°C)	(MHz)	
4.80	Normal (100%)	50	1395.025192	0.000192
		40	1395.025313	0.000313
		30	1395.025339	0.000339
		20	1395.025416	0.000416
		10	1395.025424	0.000424
		0	1395.025454	0.000454
		-10	1395.025147	0.000147
		-20	1395.025256	0.000256
		-30	1395.025026	0.000026
4.80	Normal		1395.025416	0.000416
3.20	Low		1395.025126	0.000126
3.10	End Point			

HIGH CHANNEL

20°C Reference Frequency:		1431.975000		MHz	
Limit:		0.003580		MHz	
+/- 2.5 ppm =					
Power Supply	Environment	Frequency	Delta	Limit	+/- (MHz)
VDC	Temperature (°C)	(MHz)			
4.80	Normal (100%)	50	0.000540		0.003580
		40	0.000522		0.003580
		30	0.000470		0.003580
		20	0.000410		0.003580
		10	0.000307		0.003580
		0	0.000095		0.003580
		-10	0.000008		0.003580
		-20	-0.000014		0.003580
		-30	-0.000026		0.003580
4.80	Normal	1431.975410	0.000410		0.003580
3.20	Low	1431.975780	0.000780		0.003580
3.10	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: Vien Tran
Date: 06/08/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx

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 Peak Calculated Peak Field Strength Margin vs. Peak Limit
CL Cable Loss HPF High Pass Filter

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fitr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Ant.High cm	Table Angle Degree	Notes
1395.025 MHz															
1.395	3.0	66.3	25.4	2.6	0.0	0.0	0.0	94.3	117.4	-23.1	V	A	100.0	249.3	X-Axis
1.395	3.0	67.5	25.4	2.6	0.0	0.0	0.0	95.4	117.4	-22.0	H	A	114.0	17.1	X-Axis
1399.975 MHz															
1.399975	3.0	67.1	25.4	2.6	0.0	0.0	0.0	95.1	117.4	-22.3	V	A	100.0	278.3	X-Axis
1.399975	3.0	67.8	25.4	2.6	0.0	0.0	0.0	95.7	117.4	-21.7	H	A	114.4	115.2	X-Axis
1427.025MHz															
1.427	3.0	66.4	25.5	2.6	0.0	0.0	0.0	94.5	117.4	-22.9	V	A	100.0	352.2	X-Axis
1.427	3.0	68.1	25.5	2.6	0.0	0.0	0.0	96.2	117.4	-21.2	H	A	108.5	20.9	X-Axis
1427.025MHz															
1.432	3.0	67.9	25.5	2.6	0.0	0.0	0.0	96.0	117.4	-21.4	V	A	100.0	106.3	X-Axis
1.432	3.0	66.6	25.5	2.6	0.0	0.0	0.0	94.7	117.4	-22.7	H	A	112.0	23.7	X-Axis

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 1000 MHz in this section are shown for reporting purposes only.

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1395.025MHz

30-1000MHz Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx_1395.025MHz

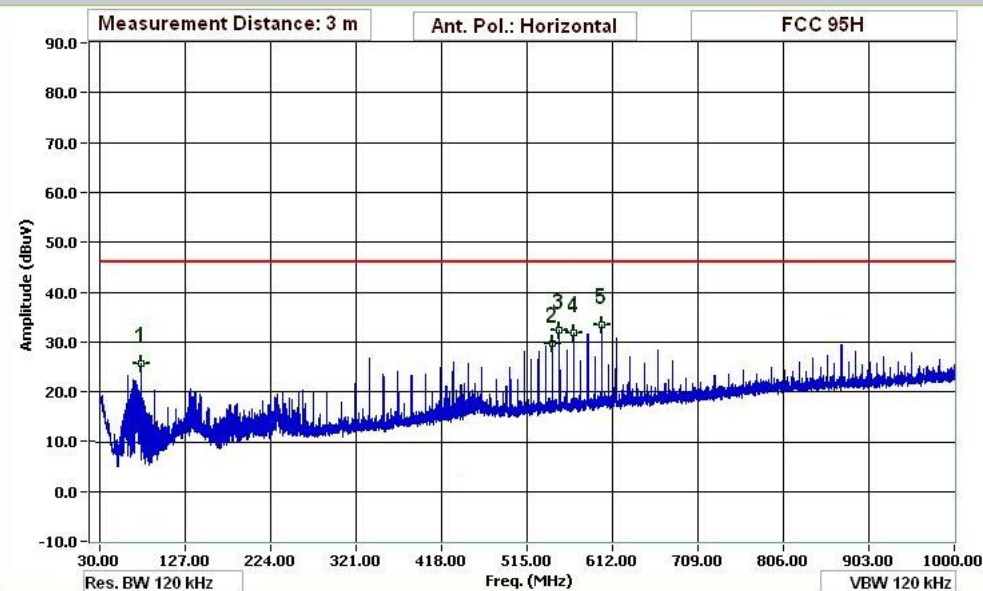
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1395.025MHz Horizontal													
76.802	3.0	47.2	7.8	0.8	29.6	0.0	0.0	26.2	46.0	-19.8	H	EP	
543.981	3.0	40.2	17.4	2.2	29.7	0.0	0.0	30.3	46.0	-15.7	H	EP	
552.022	3.0	42.6	17.6	2.3	29.7	0.0	0.0	32.8	46.0	-13.2	H	EP	
567.982	3.0	41.8	17.8	2.3	29.7	0.0	0.0	32.3	46.0	-13.7	H	EP	
600.024	3.0	42.9	18.3	2.4	29.6	0.0	0.0	33.9	46.0	-12.1	H	EP	

Rev. 1.27.09

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

Measurement Configuration



Project No.: 09J12558

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

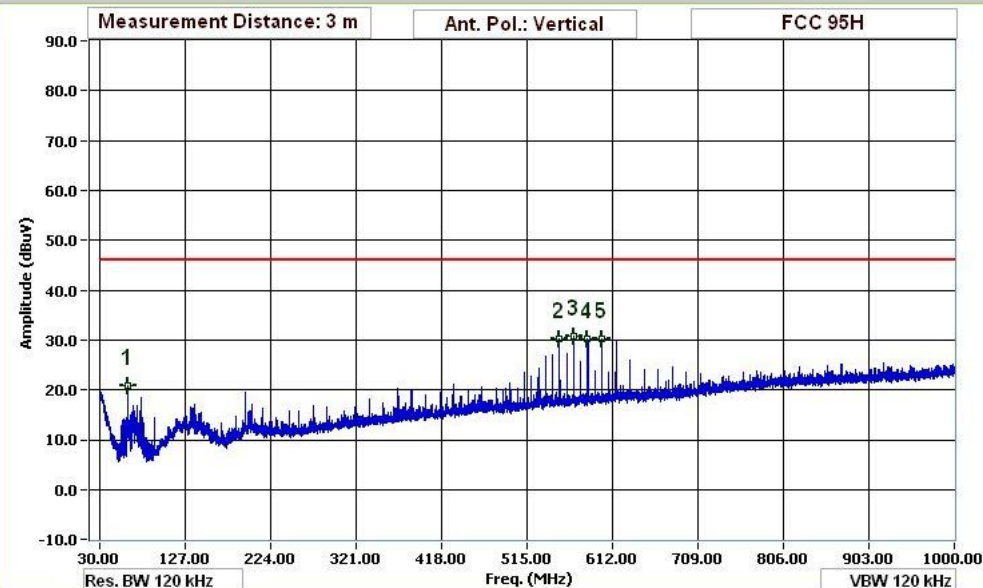
Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx_1395.025MHz

f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1395.025MHz Vertical													
61.441	3.0	42.5	7.9	0.7	29.6	0.0	0.0	21.5	46.0	-24.5	V	EP	
552.022	3.0	40.6	17.6	2.3	29.7	0.0	0.0	30.7	46.0	-15.3	V	EP	
567.982	3.0	40.8	17.8	2.3	29.7	0.0	0.0	31.3	46.0	-14.7	V	EP	
583.943	3.0	40.0	18.0	2.3	29.6	0.0	0.0	30.8	46.0	-15.2	V	EP	
600.024	3.0	39.7	18.3	2.4	29.6	0.0	0.0	30.8	46.0	-15.2	V	EP	

Rev. 1.27.09

Measurement Configuration



Project No.: 09J12558

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1399.975MHz

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx_1399.975MHz

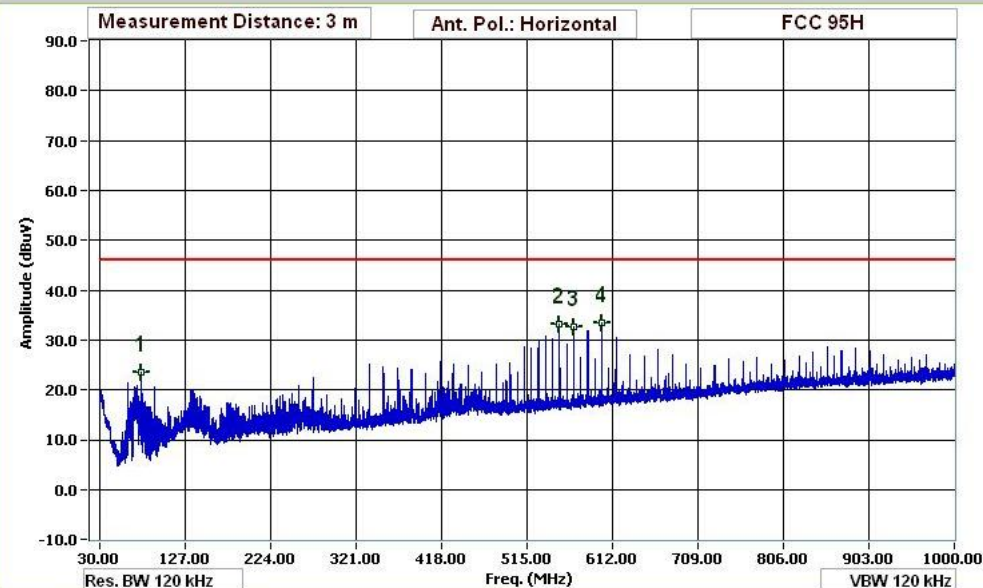
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1399.975MHz Horizontal													
76.802	3.0	45.1	7.8	0.8	29.6	0.0	0.0	24.1	46.0	-21.9	H	EP	
552.022	3.0	43.4	17.6	2.3	29.7	0.0	0.0	33.6	46.0	-12.4	H	EP	
567.982	3.0	42.9	17.8	2.3	29.7	0.0	0.0	33.3	46.0	-12.7	H	EP	
600.024	3.0	42.9	18.3	2.4	29.6	0.0	0.0	33.9	46.0	-12.1	H	EP	

Rev. 1.27.09

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

Measurement Configuration



Project No.: 09J12558

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx_1399.975MHz

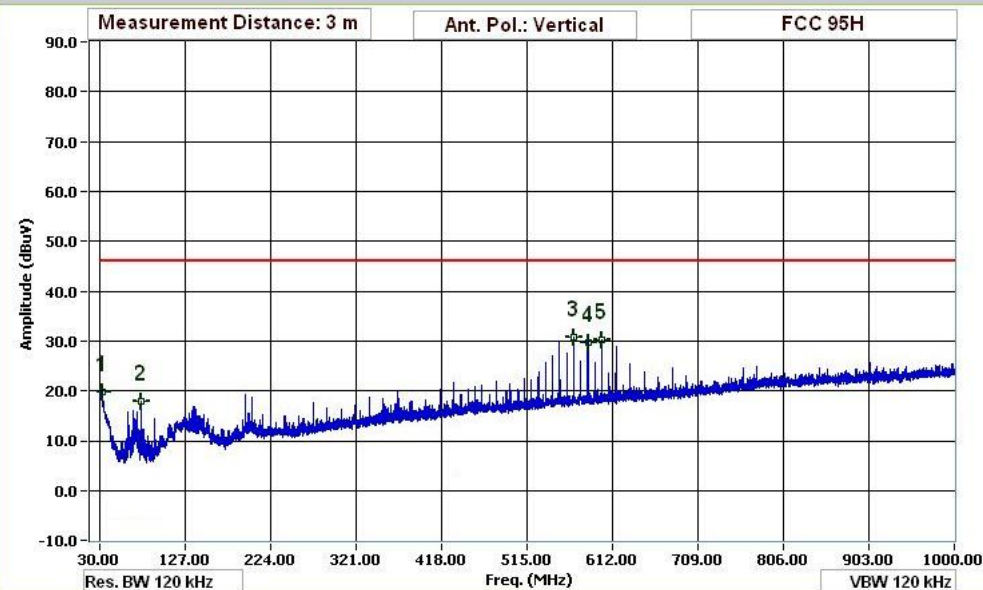
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1399.975MHz Vertical													
32.76	3.0	30.3	19.1	0.5	29.7	0.0	0.0	20.3	46.0	-25.7	V	EP	
76.802	3.0	39.4	7.8	0.8	29.6	0.0	0.0	18.4	46.0	-27.6	V	EP	
567.982	3.0	40.8	17.8	2.3	29.7	0.0	0.0	31.2	46.0	-14.8	V	EP	
584.063	3.0	39.6	18.0	2.3	29.6	0.0	0.0	30.3	46.0	-15.7	V	EP	
600.024	3.0	39.7	18.3	2.4	29.6	0.0	0.0	30.7	46.0	-15.3	V	EP	

Rev. 1.27.09

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

Measurement Configuration



Project No.: 09J12558

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1427.025MHz

30-1000MHz Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx 1427.025MHz

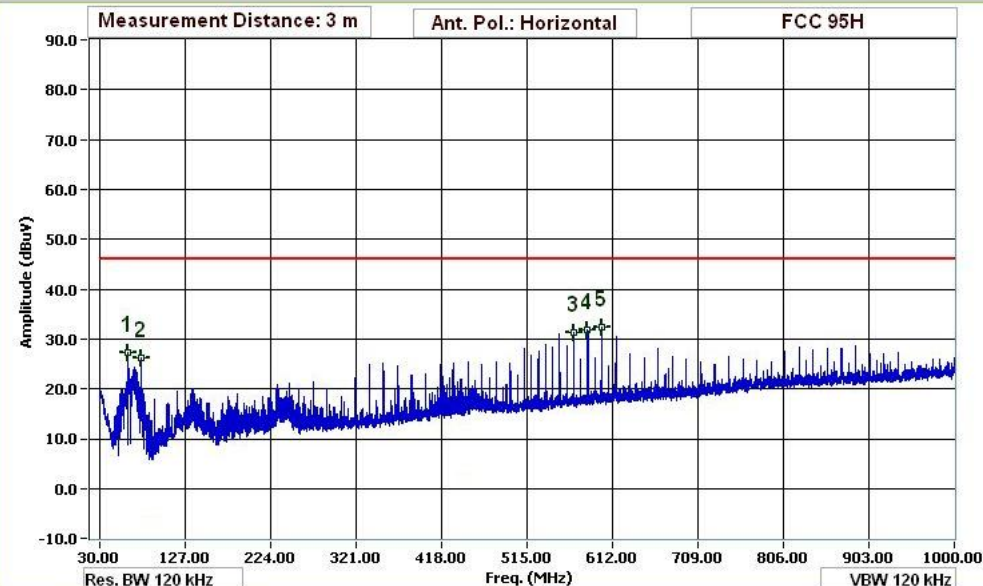
f	Measurement Frequency	Amp	Preamplifier Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1427.025MHz Horizontal													
61.441	3.0	48.9	7.9	0.7	29.6	0.0	0.0	27.9	46.0	-18.1	H	EP	
76.802	3.0	47.7	7.8	0.8	29.6	0.0	0.0	26.6	46.0	-19.4	H	EP	
567.982	3.0	41.3	17.8	2.3	29.7	0.0	0.0	31.7	46.0	-14.3	H	EP	
583.943	3.0	41.6	18.0	2.3	29.6	0.0	0.0	32.3	46.0	-13.7	H	EP	
600.024	3.0	41.9	18.3	2.4	29.6	0.0	0.0	32.9	46.0	-13.1	H	EP	

Rev. 1.27.09

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

Measurement Configuration



Project No.: 09J12558

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx_1427.025MHz

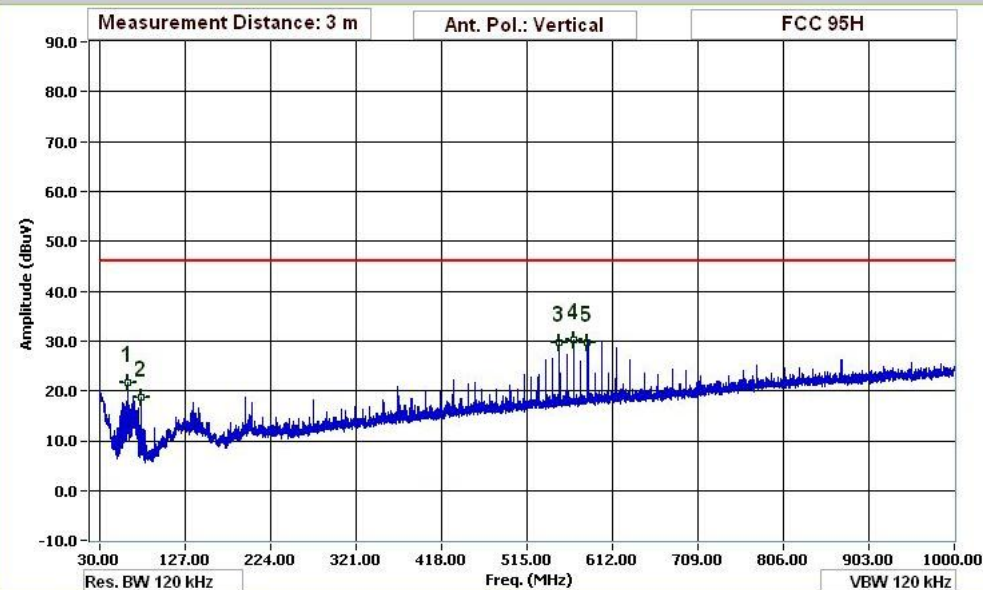
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1427.025MHz Vertical													
61.441	3.0	43.2	7.9	0.7	29.6	0.0	0.0	22.2	46.0	-23.8	V	EP	
76.802	3.0	40.3	7.8	0.8	29.6	0.0	0.0	19.3	46.0	-26.7	V	EP	
552.022	3.0	40.0	17.6	2.3	29.7	0.0	0.0	30.2	46.0	-15.8	V	EP	
567.982	3.0	40.3	17.8	2.3	29.7	0.0	0.0	30.7	46.0	-15.3	V	EP	
583.943	3.0	39.4	18.0	2.3	29.6	0.0	0.0	30.1	46.0	-15.9	V	EP	

Rev. 1.27.09

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

Measurement Configuration



Project No.: 09J12558

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1431.975MHz

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx 1431.974MHz

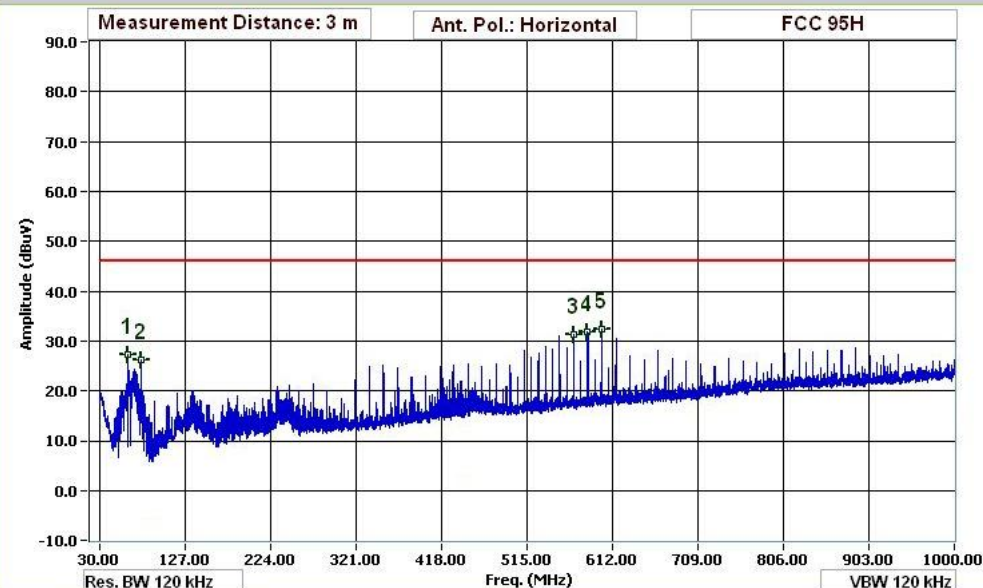
f	Measurement Frequency	Amp	Preamplifier Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1431.975MHz Horizontal													
76.802	3.0	47.1	7.8	0.8	29.6	0.0	0.0	26.1	46.0	-19.9	H	EP	
92.163	3.0	43.4	8.1	0.9	29.6	0.0	0.0	22.8	46.0	-23.2	H	EP	
552.022	3.0	43.4	17.6	2.3	29.7	0.0	0.0	33.5	46.0	-12.5	H	EP	
567.982	3.0	42.4	17.8	2.3	29.7	0.0	0.0	32.9	46.0	-13.1	H	EP	
600.024	3.0	41.7	18.3	2.4	29.6	0.0	0.0	32.7	46.0	-13.3	H	EP	

Rev. 1.27.09

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

Measurement Configuration



Project No.: 09J12558

SPURIOUS EMISSIONS 30 TO 960 MHz (VERTICAL)

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Vien Tran
Date: 06/09/09
Project #: 09J12558
Company: Nihon Kohden
EUT Description: Medical Telemetry Transmitter
EUT M/N: ZM-541PA
Test Target: FCC Part 95H
Mode Oper: Tx_1431.974MHz

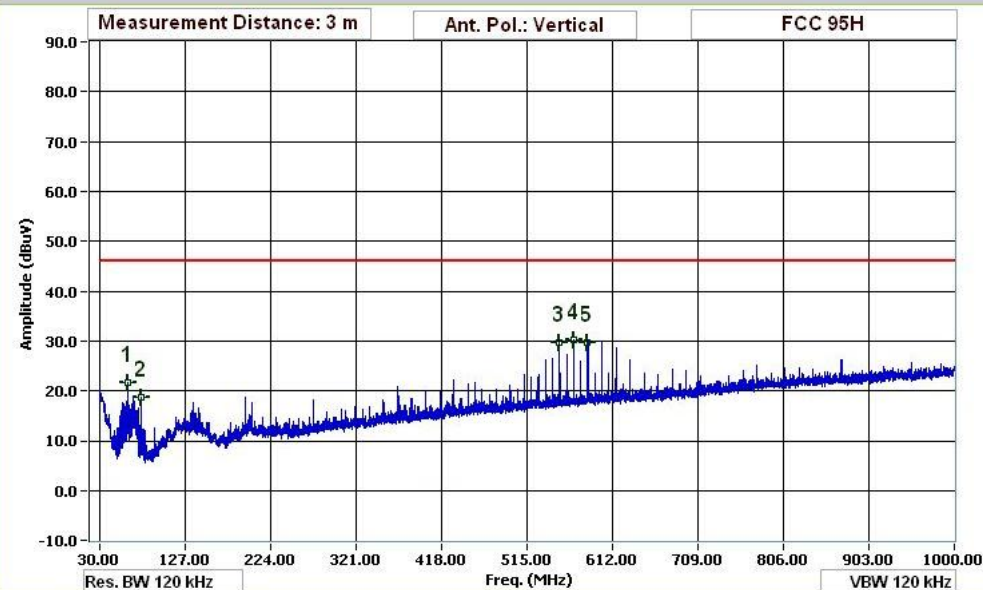
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
1431.975MHz Vertical													
33.12	3.0	30.9	18.9	0.5	29.7	0.0	0.0	20.7	46.0	-25.3	V	EP	
76.802	3.0	40.9	7.8	0.8	29.6	0.0	0.0	19.9	46.0	-26.1	V	EP	
552.022	3.0	40.5	17.6	2.3	29.7	0.0	0.0	30.6	46.0	-15.4	V	EP	
567.982	3.0	40.8	17.8	2.3	29.7	0.0	0.0	31.3	46.0	-14.7	V	EP	
600.024	3.0	40.2	18.3	2.4	29.6	0.0	0.0	31.2	46.0	-14.8	V	EP	

Rev. 1.27.09

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

Measurement Configuration



Project No.: 09J12558

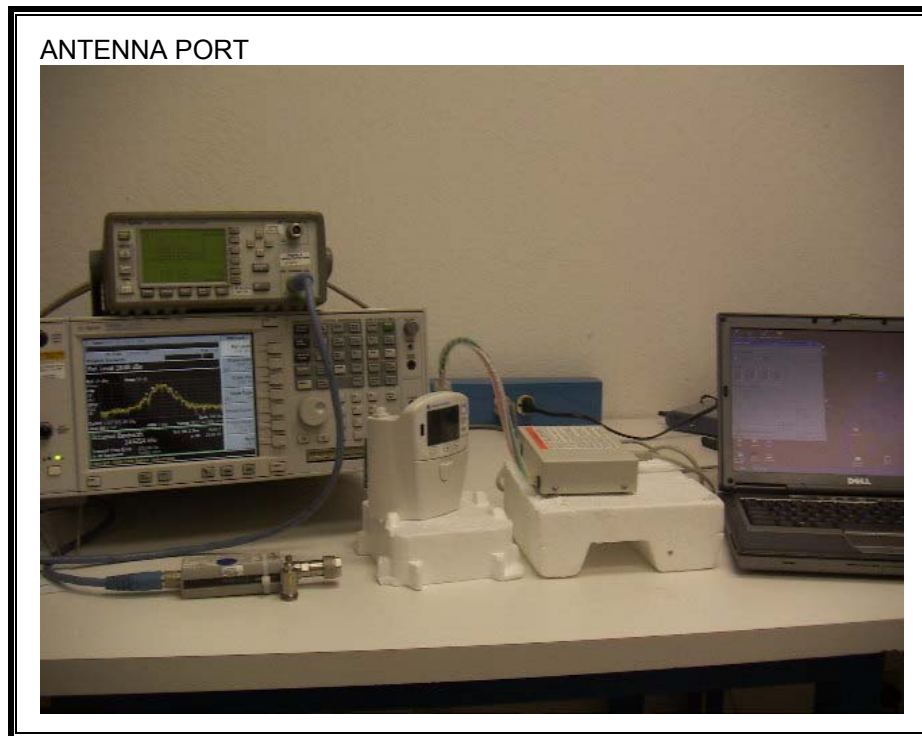
8.3. RADIATED EMISSIONS ABOVE 960 MHz

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 960 MHz

High Frequency Measurement Compliance Certification Services, Fremont 3m Chamber													
Test Engr:		Vien Tran											
Date:		06/10/09											
Project #:		09J12558											
Company:		Nihon Kohden											
EUT Description:		Medical Telemetry Transmitter											
EUT M/N:		ZM-541PA											
Test Target:		FCC Part 95H											
Mode Oper:		Tx											
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	Peak	Calculated Peak Field Strength	Margin vs. Peak Limit									
CL	Cable Loss	HPF	High Pass Filter										
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Ftr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det. P/A/QP	Notes
1395.025MHz													
2.790	3.0	38.6	29.1	4.2	-36.0	0.0	0.1	35.9	54.0	-18.1	V	A	
4.185	3.0	36.9	32.2	5.3	-34.9	0.0	0.4	39.8	54.0	-14.2	V	A	
5.580	3.0	43.8	33.6	6.3	-34.9	0.0	0.5	49.3	54.0	-4.7	V	A	
6.975	3.0	40.1	35.1	7.1	-34.2	0.0	0.5	48.5	54.0	-5.5	V	A	
8.370	3.0	34.6	36.7	7.8	-34.4	0.0	0.6	45.3	54.0	-8.7	V	A	
9.765	3.0	33.1	37.5	8.6	-33.3	0.0	0.7	46.6	54.0	-7.4	V	A	
2.790	3.0	32.5	29.1	4.2	-36.0	0.0	0.1	29.8	54.0	-24.2	H	A	
4.185	3.0	32.6	32.2	5.3	-34.9	0.0	0.4	35.5	54.0	-18.5	H	A	
5.580	3.0	39.1	33.6	6.3	-34.9	0.0	0.5	44.6	54.0	-9.4	H	A	
6.975	3.0	36.1	35.1	7.1	-34.2	0.0	0.5	44.6	54.0	-9.4	H	A	
8.370	3.0	26.3	36.7	7.8	-34.4	0.0	0.6	37.0	54.0	-17.0	H	A	
9.765	3.0	27.1	37.5	8.6	-33.3	0.0	0.7	40.6	54.0	-13.4	H	A	
1399.975MHz													
2.800	3.0	40.7	29.1	4.2	-36.0	0.0	0.1	38.0	54.0	-16.0	V	A	
4.200	3.0	34.7	32.2	5.3	-34.9	0.0	0.4	37.7	54.0	-16.3	V	A	
5.600	3.0	43.5	33.6	6.3	-34.9	0.0	0.5	49.0	54.0	-5.0	V	A	
7.000	3.0	40.2	35.1	7.1	-34.2	0.0	0.5	48.7	54.0	-5.3	V	A	
8.400	3.0	31.4	36.7	7.9	-34.4	0.0	0.6	42.1	54.0	-11.9	V	A	
9.800	3.0	34.4	37.5	8.6	-33.2	0.0	0.7	48.1	54.0	-5.9	V	A	
11.200	3.0	22.3	37.8	9.3	-32.6	0.0	0.8	37.6	54.0	-16.4	V	A	
2.800	3.0	36.0	29.1	4.2	-36.0	0.0	0.1	33.4	54.0	-20.6	H	A	
4.200	3.0	32.1	32.2	5.3	-34.9	0.0	0.4	35.1	54.0	-18.9	H	A	
5.600	3.0	40.4	33.6	6.3	-34.9	0.0	0.5	45.8	54.0	-8.2	H	A	
7.000	3.0	35.2	35.1	7.1	-34.2	0.0	0.5	43.7	54.0	-10.3	H	A	
8.400	3.0	26.4	36.7	7.9	-34.4	0.0	0.6	37.2	54.0	-16.8	H	A	
9.800	3.0	30.0	37.5	8.6	-33.2	0.0	0.7	43.7	54.0	-10.3	H	A	
11.200	3.0	20.2	37.8	9.3	-32.6	0.0	0.8	35.5	54.0	-18.5	H	A	
1427.025MHz													
2.854	3.0	37.0	29.3	4.2	-36.0	0.0	0.1	34.6	54.0	-19.4	V	A	
4.281	3.0	24.8	32.3	5.4	-34.9	0.0	0.4	27.9	54.0	-26.1	V	A	
5.708	3.0	31.5	33.6	6.4	-35.0	0.0	0.4	36.5	54.0	-17.0	V	A	
7.135	3.0	28.8	35.3	7.2	-34.2	0.0	0.5	36.6	54.0	-16.4	V	A	
2.854	3.0	35.5	29.3	4.2	-36.0	0.0	0.1	33.1	54.0	-20.9	H	A	
4.281	3.0	24.4	32.3	5.4	-34.9	0.0	0.4	27.5	54.0	-26.5	H	A	
5.708	3.0	30.8	33.6	6.4	-35.0	0.0	0.4	36.2	54.0	-17.8	H	A	
7.135	3.0	27.6	35.3	7.2	-34.2	0.0	0.5	36.3	54.0	-17.7	H	A	
8.562	3.0	21.9	36.9	8.0	-34.7	0.0	0.6	32.7	54.0	-21.3	H	A	
1431.975MHz													
2.864	3.0	38.2	29.3	4.2	-36.0	0.0	0.1	35.8	54.0	-18.2	V	A	
4.296	3.0	24.7	32.3	5.4	-34.9	0.0	0.4	27.8	54.0	-26.2	V	A	
5.728	3.0	31.1	33.6	6.4	-35.0	0.0	0.4	36.5	54.0	-17.5	V	A	
7.160	3.0	27.8	35.3	7.2	-34.2	0.0	0.5	36.6	54.0	-17.4	V	A	
2.864	3.0	36.6	29.3	4.2	-36.0	0.0	0.1	34.2	54.0	-19.8	H	A	
4.296	3.0	24.5	32.3	5.4	-34.9	0.0	0.4	27.6	54.0	-26.4	H	A	
5.728	3.0	30.1	33.6	6.4	-35.0	0.0	0.4	35.5	54.0	-18.5	H	A	
7.160	3.0	27.6	35.3	7.2	-34.2	0.0	0.5	36.5	54.0	-17.5	H	A	
8.592	3.0	21.7	36.9	8.0	-34.7	0.0	0.6	32.5	54.0	-21.5	H	A	
Note: No other emissions were detected above the system noise floor.													

9. SETUP PHOTOS

ANTENNA PORT



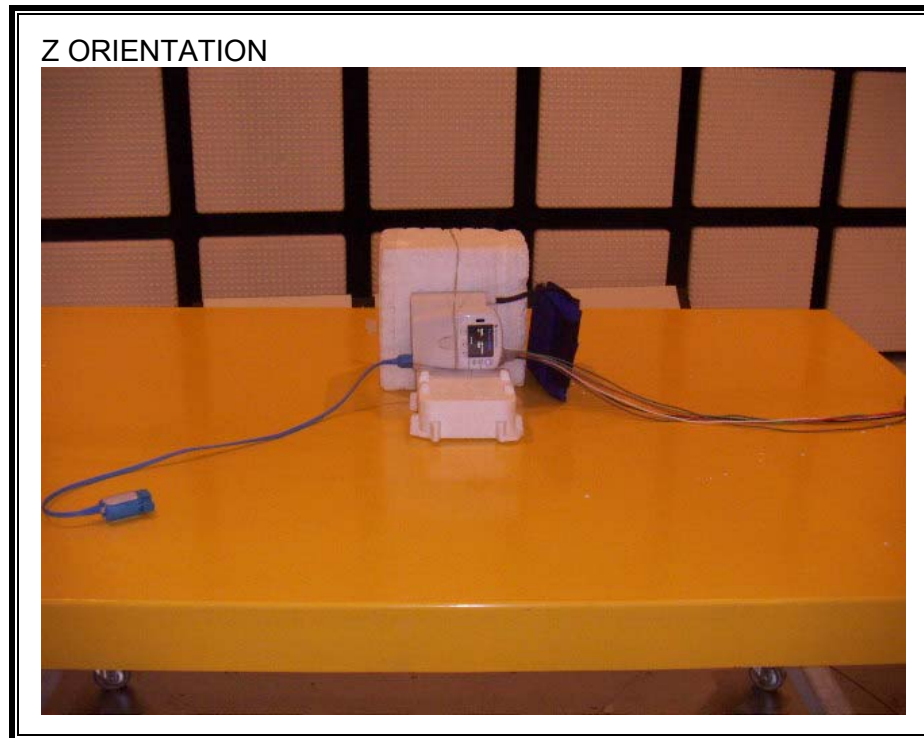
RADIATED EMISSION FOR PORTABLE CONFIGURATION

X ORIENTATION (Worst Position)



Y ORIENTATION





END OF REPORT