

FCC ID : DV8LX5630 Test report No. : 23GE0033-YK Page : 1 of 40 **Issued** date : June 18, 2003

EMI TEST REPORT

Test Report No. : 23GE0033-YK

Applicant:	FUKUDA DENSHI CO., LTD.
Type of Equipment:	ECG, Respiration and SpO2 Transmitter
Model No.:	LX-5630
FCC ID:	DV8LX5630
Test standard:	FCC Part 95 Subpart H, Section 95.1115 (Except FCC 95.1115 (e) Frequency Stability) FCC Part 2 Subpart J, Section 2.1049 and 2.1051
Test Result:	Complied

1. This test report shall not be reproduced except in full or partial, without the written approval of UL Apex Co., Ltd.

2. The results in this report apply only to the sample tested.

Date of test:

EMI: April 25, June 4, 5 and 6, 2003

Tested by: EMI:

Toyokazu Imamura

Approved by:

Osamu Watatani

Site Manager of Yamakita EMC Lab.

UL Apex Co., Ltd. YAMAKITA EMC LAB.

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MF060b(23.04.02)

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1 GENERAL INFORMATION

Company Name	:	FUKUDA DENSHI CO., LTD.
Address	:	2-35-8 Hongo, Bunkyo-ku, Tokyo, 113-8420 JAPAN
Telephone Number	:	+81 3 5684 1337
Facsimile Number	:	+81 3 5684 1321
Contact Person	:	Tamotsu Toya
Type of Equipment	:	ECG, Respiration and SpO2 Transmitter
Model Number	:	LX-5630
Serial Number	:	2003020602
Rating	:	DC 3.0V, battery operation
Condition of EUT	:	Production prototype
Country of Manufacture	:	Japan
Receipt Date of Sample	:	April 10 and June 4, 2003
Regulation(s)	:	FCC Part95 Subpart H ,Section 95.1115 (Except FCC 95.1115(e) Frequency stability) FCC Part2 Subpart J, Section 2.1049 and 2.1051
Test Site	:	UL Apex Yamakita EMC Lab. No.1 Open Test Site and No.4 Shielded Room

1.1 Tested Methodology

The measurement was performed according to the procedures in ANSI C63.4 (2001).

1.2 Test Facility

This site has been fully described in a report submitted to FCC office, and accepted on December 8, 2000. (No.1 Open Test Site Registration No.: 99354) NVLAP Lab. code : 200441-0

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2 PRODUCT DESCRIPTION

FUKUDA DENSHI CO., LTD., Model: LX-5630 (referred to as the EUT in this report) is an ECG, Respiration and SpO2 Transmitter.

Frequency Characteristics	: 608.0125MHz through 613.9875MHz
Reference for Carrier Frequency	: 608-614MHz
Reference For Carrier Frequency Fixed Crystal Oscillator TCXO	: 9.600MHz
No. of Channels and channel Spacing	: 445 channels/ 12.5kHz channel spacing
Modulation	: Digital Frequency Shift Keying
Antenna Type	: Integrated antenna
Antenna Gain	: 2.15dBi
Temperature Range	: 10 to 40 deg. C.
Power supply	: DC 3.0V, battery operation
ITU Emission Code(s)	: 8K50F1DAN
Clock for Gate Array	: 84kHz
Clock For CPU	: 4.000MHz

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3 SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured in typical fashion (as a customer would normally use it) for testing.

Test mode: Transmitting mode The EUT transmits under constant modulation.

3.2 Configuration of Tested System

Front View



Top View



*Cabling was taken into consideration and test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark	FCC ID
Α	ECG, Respiration and SpO2 Transmitter	LX-5630	2003020602	FUKUDA DENSHI CO., LTD.	EUT.	DV8LX5630
В	Simulator PCB board	-	-	FUKUDA DENSHI CO., LTD.	Not EUT.	-

List of cables used

No.	Name	Model number	Length (m)	Shield	Backshell material	Remark
1	ECG cable	CM-85C	0.75	Shielded	Polyvinyl chloride	EUT.
2	SpO ₂ Interconnection cable	CI-128A	1.2	Shielded	Polyvinyl chloride	EUT.
3	SpO ₂ probe	SR-5C	0.26	Shielded	Polyvinyl chloride	EUT.

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4 MEASUREMENT UNCERTAINTY

Radiated emission test

The measurement uncertainty (with 95% confidence level) for this test using Biconical antenna is ± 4.8 dB. The measurement uncertainty (with 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB. The measurement uncertainty (with 95% confidence level) for this test using Horn antenna is ± 6.6 dB.

The data listed in this test report has enough margin, more than site margin.

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5 SUMMARY OF TESTS

5.1 § 95.1115 (a) Filed Strength (Radiated)

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

The Radiated Electric Field Strength intensity has been measured on an open test site with a ground plane and at a distance of 3m.

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

EUT emission levels were compared when the EUT antenna position was vertical polarization and horizontal polarization.

The equipment was also previously checked at each position of three axes X, Y and Z to find that Y axis was worst under the vertical antenna polarization and that Z axis was worst under the horizontal antenna polarization. The position in which the maximum noise occurred was chosen to put into measurement.

See the photographs in page 12.

Maximum Filed Strength (Radiated)

The Radiated Electric Field Strength intensity has been measured on an open test site with a ground plane and at a distance of 3m.

Measurement range: CISPR QP Detector, IF BW 120kHz

Test data	: APPENDIX Page13 to 15
Photographs of test setu	p: Page 11
Test result	: Pass
Test instruments	: KCC-10/11/12/13/18, KLA-01, KAF-01, KAT6-01, KTR-01, KOTS-01

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5.2 § 95.1115 (b) Out of Band Emissions (Radiated)

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

The Radiated Electric Field Strength intensity has been measured on an open test site with a ground plane and at a distance of 3m.

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

EUT emission levels were compared when the EUT antenna position was vertical polarization and horizontal polarization.

The equipment was also previously checked at each position of three axes X, Y and Z.

In below 1GHz, Y axis was worst under the vertical antenna polarization and Z axis was worst under the horizontal antenna polarization. In above 1GHz, X axis was worst under both of the horizontal and vertical antenna polarization. The position in which the maximum noise occurred was chosen to put into measurement. See the photographs in page 12.

Radiated Spurious emissions

The result was also satisfied the general limits specified in Sec.95.1115 (b).

To determine the level of band-edge spurious, we use the following procedure:

Set the resolution bandwidth to 1kHz in the peak detector mode. Measure the maximum level of the in-band channel closest to the band edge and the maximum level of the out-of-band emissions close to the same band edge. Determine the ratio of the in-band signal to the out-of-band emissions. Then, measure the level of the in-band channel in CISPR quasi-peak mode with 120kHz bandwidth. Using the ratio obtained, we calculate the equivalent level of the out-of-band emissions to determine compliance with the limits.

The emission tests, except for the band edge, were performed with the quasi-peak mode of the test receiver. (Bandwidth: 120kHz)

Measurement range: 30MHz to 1000MHz CISPR QP Detector, IF BW 120kHz : 1GHz to 7GHz AV Detector

Test data	APPENDIX Page 16 to 21 (30 –1000MHz)	
	APPENDIX Page 22 to 27 (1 – 7GHz)	
	APPENDIX Page 28 to 31 (Band Edges: 608MHz/614MHz, Restricted band Char	rts)
Photograph	f test setup : Page 11	í
Test result	: Pass	
Test instrun	ts : KCC-10/11/12/13/18, KCC-D11/D12, KBA-03, KLA-01, KHA-01,	
	KAF-01, KAF-02, KAT10-S1, KAT6-01, KFL-01, KTR-01, KOTS-0)1

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5.3 § 2.1049 Bandwidth (Antenna Port Conducted)

Test Procedure

The minimum 26dB bandwidth was measured with a spectrum analyzer connected to the antenna port. The measurement was performed according to the procedures in ANSI C63.4-13.1.7 (2001).

Occupied Bandwidth (99%)

1. 608.0125MHz (Low): 7.5669kHz 2. 611.00MHz (Mid): 7.5482kHz 3. 613.9875MHz (High): 7.5855kHz

26dB Bandwidth

1. 608.0125MHz (Low): 43.5872kHz **2.** 611.00MHz (Mid): 43.5872kHz **3.** 613.9875MHz (High): 43.5872kHz

Test data: APPENDIX Page 32 to 33Test instruments: KTR-01, KCC-A3

5.4 § 2.1051 Out of Band Emissions (Antenna Port Conducted)

Test Procedure

The Out of Band Emissions (Conducted) was measured with a spectrum analyzer connected to the antenna port.

Test data: APPENDIX Page 34 to 39Test result: PassTest instruments: KTR-01, KCC-A3

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APPENDIX 1: Photographs of test setup

1.Page 11	:	Radiated emission
2.Page 12	:	Pre check of worse-case position

APPENDIX 2: Test Data

1.Page 13 - 15:	Filed Strength (Radiated)
2.Page 16 - 31:	Out of Band Emissions (Radiated)
3.Page 32 :	Occupied Bandwidth (Antenna Port Conducted)
4.Page 33 :	26dB Bandwidth (Antenna Port Conducted)
5.Page 34 - 39:	Out Band Emissions (Antenna Port Conducted)

APPENDIX 3: Test instruments

Page 40 : Test instruments

Radiated emission





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Pre check of worse-case position



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UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

ApplicantIKind of EquipmentIModel No.ISerial No.IPowerIModeIRemarksIDateITest DistanceITemperatureIHumidityI					UDA DEN • RESPI 5630 3020602 OV nsmitti /2003 °C %	ISHI C(RATIO ng (608	D., LTD. V & SpC B. 0125N)2 TRAN IHz)	NSMITTER <u>Amamma</u> Engineer : Toyokazu Imamura
Regui	ation		•	FUG	Partys	н 89:	5.1115((a)	
No.	FREQ.	ANT TYPE	READI HOR	NG VFR	ANT	AMP GAIN	CABLE	ATTEN.	I. RESULT LIMITS MARGIN
	[MHz]	III D	[dB μ	V]	[dB/m]	[dB]	[dB]	[dB]	$\begin{bmatrix} dB \ \mu \ V/m \end{bmatrix} \begin{bmatrix} dB \ \mu \ V/m \end{bmatrix} \begin{bmatrix} dB \end{bmatrix}$
1.	608.01	BB	89.5	89.1	19.5	29.5	7.0	6.1	1 92.6 92.2 106.0 13.4 13.8

CALCULATION: READING [dB μ V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB].

■ANTENNA: KBA-03 (VHA9103) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz ■CABLE: KCC-10/11/12/13/18 ■PREAMP: KAF-01 (8447D) ■EMI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

App1 Kind Mode Seri Powe Mode Rema Date Test	icant of Equip No. al No. r rks Distance erature		<pre>FUKUDA DENSH1 CO., LTD. ECG • RESPIRATION & Sp02 TRANSMITTER LX-5630 2003020602 DC3.0V Transmitting(611MHz) 6/5/2003 3 m 26 °C</pre>									
Humidity Regulation				59 FCC	% Part95	iH § 9!	5. 1115 ((a)				
No.	FREQ. AN TY [MHz]	∜T ∕PE	READ HOR [dB µ	ING VER ιV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT HOR VEI [dBµV/m]	LIMITS { [dBµV/m]	MAI HOR	RGIN VER HB]
1.	611.00 E	3B 9	0.2	87.9	19.5	29. 5	7.0	6.1	93.3 91.	0 106.0	12.7	15.0

CALCULATION: READING [dB μ V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB].

■ ANTENNA: KBA-03 (VHA9103) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz ■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ ENI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No.: 23GE0033-YK

Appl Kind Mode Seri Powe Mode Rema	icant of Equipme No. al No. r rks	FUKUDA DENS ECG - RESPIF LX-5630 2003020602 DC3.0V Transmittin	ECG - RESPIRATION & SpO2 TRANSMITTER LX-5630 2003020602 DC3. 0V Transmitting (613. 9875MHz)										
Date Test Temp Humi Regu	Distance erature dity lation	: 6/5/2003 : 3 m : 36 ℃ : 59 % : FCC Part95H	H § 95, 1115 (a)	Engineer : Toyokazu Imamura									
No.	FREQ. ANT TYPE [MHz]	$\begin{array}{llllllllllllllllllllllllllllllllllll$	AMP CABLE ATTEN. GAIN LOSS [dB] [dB] [dB]	RESULT LIMITS HOR VER [dB µ V/m] [dB µ V/m]	MARGIN HOR VER [dB]								
1.	613.99 BB	88.7 89.5 19.5	29.5 7.0 6.1	L 91.8 92.6 106.0	14.2 13.4								

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

■ ANTENNA: KBA-03 (VHA9103) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz ■ CABLE: KCC-10/11/12/13/18 ■ PREAMP: KAF-01 (8447D) ■ EMI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

Applicant: FUKUDA DENSHI CO.,Kind of Equipment: ECG • RESPIRATION &Model No.: LX-5630Serial No.: 2003020602Power: DC3. OVMode: Transmitting (608. CRemarks:Date: 6 (E (2002)).,LTD. V&SpO 3.0125M	2 TRANS IHz)	MITTER	\sim	- 1		
Date Test Distance Temperature Humidity Regulation				6/5 3 m 36 59 FCC	/2003 °C % Part95	iH §9(5. 1115 (Ē (b) (1)	Engineer : Toyokazu Imamura				
No.	FREQ. [MHz]	ANT TYPE	READ HOR [dB µ	ING VER ιV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dBµV	ILT VER 7/m] [c	LIMITS iΒμV/m]	MAH HOR [c	RGIN VER 1B]
1. 2. 3. 4. 5. 6.	$\begin{array}{c} 32.\ 00\\ 40.\ 00\\ 53.\ 05\\ 225.\ 00\\ 320.\ 00\\ 608.\ 00 \end{array}$	BB BB BB BB BB BB	23. 3 24. 4 23. 6 22. 5 22. 8 36. 6	23. 8 27. 7 23. 7 22. 8 22. 6 36. 2	17.8 14.7 10.4 16.8 15.1 19.5	28. 4 28. 5 28. 6 28. 0 27. 9 29. 5	1.4 1.6 1.8 3.9 4.8 7.0	$\begin{array}{c} 6.0\\ 6.0\\ 6.0\\ 6.1\\ 6.1\\ 6.1 \end{array}$	20. 1 18. 2 13. 2 21. 3 20. 9 39. 7	20. 6 21. 5 13. 3 21. 6 20. 7 39. 3	$\begin{array}{c} 46.\ 0\\ 46.\ 0\\ 46.\ 0\\ 46.\ 0\\ 46.\ 0\\ 46.\ 0\end{array}$	25. 9 27. 8 32. 8 24. 7 25. 1 6. 3	25. 424. 532. 724. 425. 3 $6. 7$

CALCULATION: READING [dB μ V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB].

ANTENNA: KBA-03 (VHA9103) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz CABLE: KCC-10/11/12/13/18 PREAMP: KAF-01 (8447D) ENI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No. 1 Open Test Site Report No. : 23GE0033-YK

Applicant	<pre>: FUKUDA DENSHI CO.,LTD.</pre>
Kind of Equipment	: ECG • RESPIRATION & Sp02 TRANSMITTER
Model No.	: LX-5630
Serial No.	: 2003020602
Power	: DC3. 0V
Mode	: Transmitting(608.0125MHz)
Remarks	:
Date	: 6/5/2003
Test Distance	: 3 m
Temperature	: 36 °C
Humidity	: 59 %
Regulation	: FCC Part95H § 95.1115(b)(1)



UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

Appl Kind Mode Seri Powe Mode	icant of Equ I No. al No. r	ipmen	t	: FUK : ECG : LX- : 200 : DC3 : Tra	UDA DEN •RESPI 5630 3020602 .0V nsmitti	ISHI CI RATIOI 2 ng (61	D., LTD. N & SpC 1MHz))2 trans	MITTER				
Date Test	rks Distan	ce		· 6/5, : 3 m	∕2003 ℃			. Anomuna					MA
Humi Regu	dity lation			: 59 : FCC	% Part95	iH § 9!	5. 1115 ((b) (1)	ing mee	•	ΤΟγΟΚά		111U1 0
No.	FREQ. [MHz]	ANT TYPE	REAI HOR [dB]	DING VER µV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dB µ V	JLT VER //m] [d	LIMITS [BµV/m]	MAH HOR [c	RGIN VER HB]
1. 2. 3. 4. 5. 6.	$\begin{array}{c} 32.\ 00\\ 40.\ 00\\ 53.\ 05\\ 96.\ 00\\ 225.\ 03\\ 320.\ 00 \end{array}$	BB BB BB BB BB BB	23. 8 24. 5 23. 7 25. 3 22. 5 22. 5	25. 9 27. 4 24. 0 24. 1 22. 9 22. 6	17.8 14.7 10.4 9.3 16.8 15.1	28. 4 28. 5 28. 6 28. 4 28. 0 27. 9	1.4 1.6 1.8 2.5 3.9 4.8	$\begin{array}{c} 6.0\\ 6.0\\ 6.0\\ 6.0\\ 6.1\\ 6.1\\ 6.1 \end{array}$	20.6 18.3 13.3 14.7 21.3 20.6	22.7 21.2 13.6 13.5 21.7 20.7	46.0 46.0 46.0 46.0 46.0 46.0	25. 4 27. 7 32. 7 31. 3 24. 7 25. 4	23. 3 24. 8 32. 4 32. 5 24. 3 25. 3

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

ANTENNA: KBA-03 (VHA9103) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz CABLE: KCC-10/11/12/13/18 PREAMP: KAF-01 (8447D) ENI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

: FUKUDA DENSHI CO., LTD. : ECG • RESPIRATION & Sp02 TRAI : LX-5630 : 2003020602 : DC3. 0V	NSM I TTER
: Transmitting(611MHz)	
: 6/5/2003	
: 3 m	
: 36 °C	Enginee
: 59 %	Ū.
: FCC Part95H § 95.1115(b)(1)	
	FUKUDA DENSHI CO., LTD. ECG • RESPIRATION & SpO2 TRAN LX-5630 2003020602 DC3.0V Transmitting(611MHz) 6/5/2003 3 m 36 °C 59 % FCC Part95H § 95.1115(b)(1)

Toyokazu Imamura neer

Emission Level [dB μ V/m] □Horizontal ×Vertical 70 60 50 40 30 ¥ 20 X Ŧ 対 10 ł 0 30 500 1000 100 Frequency [MHz]

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

Appli Kind Nodel Seria Power Mode Remar Date Test Tempe Humic Regul	cant of Equ No. I No. ks Distan rature lity ation	ipmen ce	t	ECG • RESPIRATION & Sp02 TRANSMITTER LX-5630 2003020602 DC3.0V Transmitting(613.9875MHz) 6/5/2003 3 m 36 °C Engineer Toyokazu Imamura 59 %									
No.	FREQ. [MHz]	ANT TYPE	READ HOR [dB J	VING VER uV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dB µ V	JLT VER //m] [d]	LIMITS BµV/m]	MAF HOR [c	GIN VER [B]
1. 2. 3. 4. 5. 6. 7.	$\begin{array}{c} 32.\ 00\\ 40.\ 00\\ 53.\ 05\\ 96.\ 00\\ 225.\ 03\\ 320.\ 00\\ 614.\ 00\\ \end{array}$	BB BB BB BB BB BB BB	23. 4 24. 0 23. 8 24. 8 22. 5 22. 4 34. 8	24. 4 27. 6 24. 3 24. 1 22. 7 22. 6 33. 5	17.8 14.7 10.4 9.3 16.8 15.1 19.5	28. 4 28. 5 28. 6 28. 4 28. 0 27. 9 29. 5	$ \begin{array}{c} 1.4\\ 1.6\\ 1.8\\ 2.5\\ 3.9\\ 4.8\\ 7.0 \end{array} $	$\begin{array}{c} 6.\ 0\\ 6.\ 0\\ 6.\ 0\\ 6.\ 1\\ 6.\ 1\\ 6.\ 1\\ 6.\ 1\end{array}$	20. 2 17. 8 13. 4 14. 2 21. 3 20. 5 37. 9	21. 2 21. 4 13. 9 13. 5 21. 5 20. 7 36. 6	46.0 46.0 46.0 46.0 46.0 46.0 46.0 46.0	$\begin{array}{c} 25.8\\ 28.2\\ 32.6\\ 31.8\\ 24.7\\ 25.5\\ 8.1 \end{array}$	24. 8 24. 6 32. 1 32. 5 24. 5 25. 3 9. 4

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

ANTENNA: KBA-03 (VHA9103) 30-299. 99MHz/KLA-01 (USLP9143) 300-1000MHz CABLE: KCC-10/11/12/13/18 PREAMP: KAF-01 (8447D) ENI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK





UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

App Kind Ser Powe Rema Date Test Tem Hum Regu	licant d of Equ el No. ial No. er e arks e t Distan perature idity ulation	ipmen ce	<pre>t FUKUDA DENSHI CO., LTD. t ECG • RESPIRATION & Sp02 TRANSMITTER LX-5630 2003020602 DC3. 0V Transmitting(608. 0125MHz) 6/6/2003 3 m 36 °C 52 % FCC Part95H § 95. 1115 (b) (2)</pre>										
No.	FREQ.	ANT TYPE	REAL HOR [dB]	DING VER µV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dBµV	ILT VER //m] [d]	LIMITS BµV/m]	MAH HOR [‹	RGIN VER [B]
1.	1216.03	BB	36.8	36.0	25.2	38.0	3.4	10.0	37.4	36.6	53.9	16.5	17.3
2.	1824.04	BB	35.3	35.9	29, 1	37.1	4.2	10.0	41.5	42.1	53.9	12.4	11.8
3.	2432.05	BB	32.8	34.3	30.6	36, 9	4.9	10.0	41.4	42.9	53.9	12.5	11.0
4.	3040.06	BB	32.6	33.6	30.9	37.0	5.5	10.0	42.0	43.0	53.9	11.9	10.9
5.	3648.08	BB	37.0	37.0	31, 9	36.7	6.0	0.9	39.1	39.1	53.9	1 4. 8	14.8
6.	4256.09	BB	31.2	31.1	32.9	35.8	6.6	0.7	35.6	35.5	53.9	18.3	18.4
7.	4864.10	BB	30.9	30.9	35.0	35.2	7.0	0.6	38.3	38.3	53.9	15.6	15.6
8.	5472.11	BR	31.4	31.4	35.8	36.3	7.5	0.9	39.3	39.3	53.9	14.6	14.6
9.	6080.13		33.1	33, 1	37.0	36.4	7.9	0.5	42.1	42.1	53.9	11.8	11.8

CALCULATION: READING[dB μ V] + ANT. FACTOR[dB/m] + CABLE LOSS[dB] - AMP. GAIN[dB] + ATTEN[dB].

ANTENNA: KHA-01 (SAS-200 571) 1-18GHz

CABLE: KCC-D11/D12 PREAMP: KAF-02 (8449B) EMI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

Applicant Kind of Equipment Model No. Serial No. Power Mode Remarks	: FUKUDA DENSHI CO.,LTD. : ECG - RESPIRATION & SpO2 TRA : LX-5630 : 2003020602 : DC3.OV : Transmitting(608.0125MHz)	NSMITTER
Date Test Distance Temperature Humidity Regulation	: 6/6/2003 : 3 m : 36 °C : 52 % : FCC Part95H §95.1115(b)(2)	Engineer : Toyokazu Imamura



UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

App Kind Ser Powe Rem Dat Tes Tem Hum Reg	licant d of Equ el No. er e arks e t Distan perature idity ulation	ipmer ce	<pre>FUKUDA DENSHI CO., LTD. t ECG • RESPIRATION & Sp02 TRANSMITTER LX-5630 2003020602 DC3. 0V Transmitting(611MHz) 6/6/2003 3 m 36 °C 52 % FCC Part95H § 95. 1115 (b) (2)</pre>								<i>Mc</i> mura		
No.	FREQ. [MHz]	ANT TYPE	REAL HOR [dB]	VER UER UV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dB µ V	JLT I VER //m][d]	LIMITS BµV/m]	MAH HOR [c	KGIN VER IB]
1.	1222.00	BB	36.5	35.6	25.2	38.0	3.4	10.0	$37.1 \\ 41.8 \\ 41.6$	36.2	53.9	16.8	17.7
2.	1833.00	BB	35.5	36.2	29.2	37.1	4.2	10.0		42.5	53.9	12.1	11.4
3.	2444.00	BB	33.0	33.7	30.6	36.9	4.9	10.0		42.3	53.9	12.3	11.6
4.	3055.00	BB	32. 8	32.9	31. 0	37.0	5.5	10. 0	42.3	42. 4	53. 9	11.6	11.5
5.	3666.00	BB	35. 4	34.2	31. 9	36.7	6.0	0. 9	37.5	36. 3	53. 9	16.4	17.6
6.	4277.00	BB	31. 1	31.4	32. 9	35.7	6.6	0.7	35.6	35.9	53.9	18.3	18.0
7.	4888.00	BB	30. 9	30.9	35. 1	35.2	7.0	0.6	38.4	38.4	53.9	15.5	15.5
8.	5499.00	BB	31. 8	31.8	35. 8	36.3	7.5	0.9	39.7	39.7	53.9	14.2	14.2
9.	6110.00	BB	33. 1	33.0	37. 0	36.4	7.9	0.4	42.0	41.9	53.9	11.9	12.0

CALCULATION: READING [dB μ V] + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB].

■ANTENNA:KHA-01 (SAS-200 571) 1-18GHz ■CABLE:KCC-D11/D12■PREAMP:KAF-02 (8449B) ■ENI RECEIVER:KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

Toyokazu Imamura

Applicant Kind of Equipment Nodel No. Serial No. Power Mode	: FUKUDA DENSHI CO., LTD. : ECG • RESPIRATION & SpO2 TRAN : LX-5630 : 2003020602 : DC3. OV : Transmitting (611MHz)	NSMITTER
Remarks Date Test Distance Temperature Humidity Regulation	<pre>6/6/2003 3 m 36 °C 52 % FCC Part95H § 95. 1115(b) (2)</pre>	<u> </u>



UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No.: 23GE0033-YK

Applicant Kind of Equipment Model No. Serial No. Power Mode Remarks Date Test Distance Temperature Humidity Regulation			FUKI ECG LX- 2003 DC3 Trat 6/6, 3 m 36 52 FCC	<pre>FUKUDA DENSHI CO.,LTD. ECG • RESPIRATION & Sp02 TRANSMITTER LX-5630 2003020602 DC3. 0V Transmitting(613.9875MHz) 6/6/2003 3 m 36 °C 52 % FCC Part95H § 95,1115(b)(2)</pre>									
No.	FREQ. [MHz]	ANT TYPE	REAI HOR [dB]	DING VER µV]	ANT FACTOR [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESU HOR [dB µ V	JLT VER 7/m] [d	LIMITS {BµV/m]	MAI HOR [0	RGIN VER dB]
1.	1227.98	BB	35.4	34.7	25.2	38.0	3.4	10.0	36.0	35.3	53.9	17.9	18.6
2.	1841. 9 6	BB	34.8	36.1	29.3	37.1	4.2	10.0	41.2	42.5	53.9	12.7	11.4
3.	2455.95	BB	32.6	34.0	30.6	36.9	4.9	10.0	41.2	42.6	53.9	12.7	11.3
4.	3069.94	BB	32.6	32.4	31.0	37.0	5.5	10.0	42.1	41.9	53.9	11.8	12.0
5.	3683.93	BB	37.0	36.8	32.0	36.6	6.1	0.9	39.4	39.2	53.9	14.5	14.7
6.	4297.91	BB	31.6	31.6	32.9	35.7	6.6	0.7	36.1	36.1	53.9	17.8	17.8
7.	4911.90	BB	31.1	31.1	35.3	35.2	7.0	0.5	38.7	38.7	53.9	15.2	15.2
8. 9.	5525.89 6139.88	BB	32. 1 33. 1	32. 1 33. 1	35.9 37.0	36, 3 36, 4	7.5 7.9	0.9 0.4	40. 1 42. 0	40. 1 42. 0	53. 9 53. 9	13.8 11.9	13.8 11.9

CALCULATION: READING $[dB \mu V]$ + ANT. FACTOR [dB/m] + CABLE LOSS [dB] - AMP. GAIN [dB] + ATTEN [dB].

■ ANTENNA: KHA-01 (SAS-200 571) 1-18GHz ■ CABLE: KCC-D11/D12 ■ PREAMP: KAF-02 (8449B) ■ ENI RECEIVER: KTR-01 (ESI40)

UL Apex Co., Ltd. Yamakita No.1 Open Test Site Report No. : 23GE0033-YK

Applicant Kind of Equipment Model No. Serial No.	FUKUDA DENSHI CO., LTD. ECG • RESPIRATION & SpO2 TRANSMITTER LX-5630	
Power Mode	2003020002 2 DC3.0V 2 Transmitting(613_9875MHz)	
Remarks Date	6/6/2003	
lest Distance Temperature Humidity	: 3 m : 36 °C : 52 % : 3 m Engineer : Toyokazu Imamura	
Regulation	: FCC Part95H §95.1115(b)(2)	



Restricted band edges: FCC 95.1115(b)

60 1VIEW

MAPMENT

Center 608.0125 MHz

5.JUN.2003 13:37:16

Date:

<u>608.00MHz</u>

1. Horizontal/PK



15 kHz/

FCC ID: DV8LX5630 Job No: 23GE0033-YK

181

1.11.7

.

WWWWAR A

Span 150 kHz



FCC ID: DV8LX5630 Job No: 23GE0033-YK

T. Imamina

2. Vertical/PK



Restricted band edges: FCC 95.1115(b)

- 5

Date:

Center 613.9875 MHz

5.JUN.2003 13:18:10

<u>614.00MHz</u>

1. Horizontal/PK



15 kHz/

Span 150 kHz

T. Amamina

Restricted band edges: FCC 95.1115(b)

2. Vertical/PK



15 kHz/

Span 150 kHz

Center 613.9875 MHz

Date: 5.JUN.2003 13:00:36

FCC ID: DV8LX5630 Job No: 23GE0033-YK

T. Amamina

FCC ID: DV8LX5630 Job No: 23GE0033-YK

7. Imamura

1. ch: 608.0125MHz



2. ch:611.00MHz





3. ch: 613.9875MHz



FCC ID: DV8LX5630 Job No: 23GE0033-YK

T. Amamina

1. ch: 608.0125MHz





3. ch: 613.9875MHz

Date:

2. ch:611.00MHz



Out of Band Emissions (Conducted): FCC 2.1051

Date:

25.APR.2003 11:03:26

Ch 608.0125MHz

1.



30 de

dr.uv

191 192

7. Amamina

2.

3.









FCC ID: DV8LX5630 Job No: 23GE0033-YK

T. Amamina







5.

4.



Ch 611.0000MHz

1.

2.

3.



FCC ID: DV8LX5630 Job No: 23GE0033-YK

T. Amamira





Stop 1 GHz

Date: 25.APR.2003 11:18:17

FCC ID: DV8LX5630 Job No: 23GE0033-YK

T. Amamina







5.

4.





<u>Ch 613.9875MHz</u> 1.







FCC ID: DV8LX5630 Job No: 23GE0033-YK

N. Amamina

2.

3.

FCC ID: DV8LX5630 Job No: 23GE0033-YK

Y. Imamina







5.

4.



Test Report No : 23GE0033-YK

APPENDIX 3

Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Data *
KAF-01	Pre Amplifier				Interval(month)
KAE-02	Dre Amplifier	Hewlett Packard	8447D	RE	2002/08/03 * 12
KAT10-91	Attornation	Hewlett Packard	<u>8449B</u>	RE	2003/05/08 * 12
KATE 01	Allenuator	Agilent	8449D 010	RE	2003/04/18 * 12
	Attenuator	INMET	18N~6dB	RE	2003/05/12 * 12
KBA-U3	Biconical Antenna	Schwarzbeck	BBA9106	RÉ	2003/02/08 * 12
3/18	Coaxial Cable	Fujikura/Suhner	8D-2W/12D-SF A/S04272B/S0 4272B/S04272B	RE	2002/08/17 * 12
KCC-D11/D12	Coaxial cable	Suhner/storm	SCOFLEX103/ 90-388-020	RE	2002/11/25 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	RE	2003/04/18 * 12
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	RF	2002/07/14 + 12
KLA-01	Logperiodic Antenna	Schwarzbeck	USI P9143	RE	2002/07/14 + 12
KOTS-01	Open Test Site	JSE	130m		2003/02/19 + 12
KTR-01	Test Receiver	Rohde & Schwarz			12002/08/18 * 12
KCC-A3	Coaxial Cable	Fujikura	150-214/		2002/07/22 * 12
			100 211	<u>AI</u>	2002/08/1/ * 12
· · · · · · · · · · · · · · · · · · ·	<u> </u>	+	<u> </u>		

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards. Test Item:

RE: Radiated emission test

AT: Antenna terminal conducted test