

Application for Certification
Position sense transmitter

Kap Medical

FCC ID: YTF300358

REPORT # RV08089-001

This report was prepared in accordance with the requirements of the FCC Rules and Regulations Part 2, SubpartJ, 2.1033, Part 15.231 and other applicable sections of the rules as indicated herein.

Prepared By:

DNB Engineering, Inc.
5969 Robinson Avenue
Riverside, CA 92503

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Paragraph numbers in this report follow the application section numbers found in the FCC Rules and Regulations, Part 2, Subpart J for Certification of electronic equipment.

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1.0 ADMINISTRATIVE DATA

1.1 Certifications and Qualifications

I certify that DNB Engineering, Inc conducted the tests performed in order to obtain the technical data presented in this application. Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

1.2 Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.1031 through 2.1057, Part 15. The test results presented in this document are valid only for the equipment identified herein under the test conditions described.

Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include: The made test distance, EUT Height, Measurement Site Characteristics, and the same EUT System Components. The system must have the same interconnecting Cables arranged in identical placement to that in the test setup, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and the environment on the date of the test may result in measurement repeatability difficulties.

All changes made to the EUT during the course of testing as identified in this test report must be incorporated into the EUT or identical models to ensure compliance with the FCC regulations.

Thomas Elders

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2.1033 (b) (1) Application for Certification

Name of Applicant:	Kap Medical
Applicant is:	Manufacturer
Name of Manufacturer:	Kap Medical
Description:	Autofowler Transmitter
Part Number:	K-150
Anticipated Production Quantity:	Multiple Units
15.231 Frequency Bands:	315 MHz
Type of Signal:	ASK

2.1033 (b) (2) FCC Identifier

YTF300358

2.1033 (b) (3) Installation and Operating Instructions

To be filed as a separate attachment

2.1033 (b) (4) Brief Description of Circuit Function

To be filed as a separate attachment.

2.1033 (b) (5) Block Diagram

To be filed as a separate attachment.

2.1033 (b) (6) Report of Measurements

15.207 Conducted Emissions (General Provisions)

Not Applicable. The equipment does not connect directly to the AC mains.

15.205 Radiated Emissions (Restricted Bands)

15.209 Radiated Emissions (General Provisions)

Test Procedure:

The EUT was measured on an open area test site (OATS).

A measuring distance of at least 3m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring distance may be used. The equipment size (excluding the antenna) shall be less than 20% of the measuring distance.

Sufficient precautions shall be taken to ensure that reflections from extraneous objects adjacent to the site do not degrade the measurement results, in particular:


- no extraneous conduction objects having any dimension in excess of a quarter wavelength of the highest frequency tested shall be in the immediate vicinity of the site;
- all cables shall be as short as possible; as much of the cables as possible shall be on the ground plane or preferably below; and the low impedance cables shall be screened.

The EUT shall be placed upon a non-conductive table .8 meters above the ground plane and shall be placed in the “worst case” transmitting mode. The EUT shall be rotated 360 degrees to find the azimuth maxima. The receive antenna shall then be raised and lowered between 1 to 4 meters to find the maximum signal emanating from the EUT. This signal strength is then recorded on the data sheets.

Frequency (MHz)	Field Strength (uV/m)	Field Strength (dBuVm)	Measurement Distance (meters)
.009 – 0.490	2400/F(kHz)	20*(Log10(2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	20*(Log10(24000/F(kHz)	30
1.705 – 30.0	30	29.5	30
30 – 88	100	40	3
88 – 216	150	43.5	3
216 – 960	200	46.0	3
Above 960	500	54.0	3


Test Equipment Log

Asset No	Item	Manufacturer	Model No	Serial No	Calibration Date	Calibration Interval	Calibration Due
31	Antenna (Log Periodic)	Emco	3146	1284	29-Jul-13	730	29 Jul 15
1233	Spectrum Analyzer	HP	8568B	2732A03600	24-Oct-14	365	24 Oct 15
1234	Spec Analyzer Display	HP	85662A	2648A15552	24-Oct-14	365	24 Oct 15
1430	RF Pre-Selector	H/P	85685A	2724A00659	24-Oct-14	365	24 Oct 15
1758	Antenna (Bicon)	AH Systems	SAS-200/540	524	10-Sep-13	730	10 Sep 15
1760	Pre-Amp (called ZFL)	Mini-Circuits	ZFL-2000	8350	17-Feb-15	365	17 Feb 16
1880	Cable	DNB	NMN	11880	12-Aug-14	365	12 Aug 15
1884	Cable 60'	DNB	RG214	11884	28-Jul-14	365	28 Jul 15
1965	Quasi-Peak Adapter	HP	85650A	2043A00277	24-Oct-14	365	24 Oct 15

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Radiated Emissions (spurious)	
DNB Job Number:	08089	Date:	3-3-2015
Customer:	KAP Medical		15.205 15.209
Model Number:	K-150	Specification:	
Description:	Position Sense Transmitter Axis 1		
Fundamental Frequency 315MHz			


Freq. (MHz)	Meter (dBμV)	Ant. (dB)	Cable (dB)	Distance (dB)	Amp. (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Degrees	Polarity
31.211	37.8	13.1	1.2	0	-21.9	30.2	40	-9.8	PK	360	V
34.72	37.2	12.9	1.3	0	-21.9	29.5	40	-10.5	PK	314	V
49.285	29.6	10.4	1.5	0	-21.8	19.7	40	-20.3	PK	169	V
61.796	31.6	9.5	1.6	0	-21.8	20.9	40	-19.1	PK	54	V
71.997	33.9	9.4	1.7	0	-21.8	23.2	40	-16.8	PK	0	V
82.026	31.3	9.1	1.8	0	-21.9	20.3	40	-19.7	PK	0	V
109.526	27	10.2	2.1	0	-21.9	17.4	43.5	-26.1	PK	0	V
123.026	28.4	11.1	2.2	0	-21.9	19.8	43.5	-23.7	PK	0	V
141.136	26.4	11.9	2.4	0	-21.9	18.8	43.5	-24.7	PK	0	V
161.652	29.5	12.9	2.6	0	-21.8	23.2	43.5	-20.3	PK	0	V
183.103	30	14	2.8	0	-21.8	25	43.5	-18.5	PK	0	V
195.261	29.6	14.3	3	0	-21.8	25.1	43.5	-18.4	PK	0	V
30.885	30.4	13.1	1.2	0	-21.9	22.8	40	-17.2	PK	0	H
38.041	32.8	12.2	1.3	0	-21.9	24.4	40	-15.6	PK	0	H
51.028	33.3	10.2	1.5	0	-21.8	23.2	40	-16.8	PK	0	H
63.323	34.4	9.4	1.6	0	-21.8	23.6	40	-16.4	PK	0	H
75.208	28.5	9.3	1.8	0	-21.9	17.7	40	-22.3	PK	0	H
85.698	28.8	9.2	1.9	0	-21.9	18	40	-22	PK	0	H
109.145	34	10.1	2.1	0	-21.9	24.3	43.5	-19.2	PK	0	H
121.645	31.8	11	2.2	0	-21.9	23.1	43.5	-20.4	PK	0	H
144.113	31.6	12.1	2.4	0	-21.9	24.2	43.5	-19.3	PK	0	H
160.134	38	12.8	2.6	0	-21.8	31.6	43.5	-11.9	PK	0	H
180.969	32.8	13.9	2.8	0	-21.8	27.7	43.5	-15.8	PK	0	H
195.908	28.3	14.3	3	0	-21.8	23.8	43.5	-19.7	PK	0	H
208.598	34.1	10.7	3.1	0	-21.8	26.1	43.5	-17.4	PK	0	H
221.598	28.8	10.6	3.2	0	-21.8	20.8	46	-25.2	PK	0	H
241.23	36.3	11.2	3.3	0	-21.7	29.1	46	-16.9	PK	0	H
242.312	37.9	11.2	3.3	0	-21.7	30.7	46	-15.3	PK	130	H
261.779	30	12.1	3.5	0	-21.7	23.9	46	-22.1	PK	241	H
282.001	32.1	13.2	3.6	0	-21.6	27.3	46	-18.7	PK	360	H
301.092	32	13.8	3.7	0	-21.6	27.9	46	-18.1	PK	360	H
314.802	38.8	14.6	3.8	0	-21.6	35.6	46	-10.4	PK	360	H

Freq. (MHz)	Meter (dBμV)	Ant. (dB)	Cable (dB)	Distance (dB)	Amp. (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Degrees	Polarity
401.326	31	15	4.5	0	-21.4	29.1	46	-16.9	PK	360	H
501.444	31.4	17.4	5.2	0	-21.2	32.8	46	-13.2	PK	310	H
609.14	31.4	18.8	5.6	0	-21.2	34.6	46	-11.4	PK	209	H
700.992	31.8	21.1	6	0	-21.2	37.7	46	-8.3	PK	148	H
799.86	31.5	20.2	6.3	0	-21.3	36.7	46	-9.3	PK	108	H
900.848	31.5	21.5	6.7	0	-21.3	38.4	46	-7.6	PK	57	H
999.744	32	23.7	7.1	0	-21.3	41.5	54	-12.5	PK	11	H

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Radiated Emissions (spurious)	
DNB Job Number:	08089	Date:	3-4-2015
Customer:	KAP Medical		15.205 15.209
Model Number:	K-150	Specification:	
Description:	Position Sense Transmitter Axis 2		
Fundamental Frequency 315MHz			

Freq. (MHz)	Meter (dBμV)	Ant. (dB)	Cable (dB)	Distance (dB)	Amp. (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Degrees	Polarity
31	27.6	13.1	1.2	0	-21.9	20	40	-20	PK	0	V
41.232	31.9	11.6	1.4	0	-21.9	23	40	-17	PK	63	V
51.712	29.8	10.1	1.5	0	-21.8	19.6	40	-20.4	PK	129	V
61.623	32	9.5	1.6	0	-21.8	21.3	40	-18.7	PK	190	V
86.832	33	9.2	1.9	0	-21.9	22.2	40	-17.8	PK	360	V
109.832	33	10.2	2.1	0	-21.9	23.4	43.5	-20.1	PK	360	V
121.835	32.4	11	2.2	0	-21.9	23.7	43.5	-19.8	PK	273	V
141.86	27.9	12	2.4	0	-21.9	20.4	43.5	-23.1	PK	212	V
151.381	35.7	12.5	2.5	0	-21.8	28.9	43.5	-14.6	PK	0	V
161.648	32	12.9	2.6	0	-21.8	25.7	43.5	-17.8	PK	0	V
181.148	37.8	13.9	2.8	0	-21.8	32.7	43.5	-10.8	PK	33	V
195.042	36.9	14.3	3	0	-21.8	32.4	43.5	-11.1	PK	93	V
31.569	27.5	13	1.3	0	-21.9	19.9	40	-20.1	PK	254	H
42.078	38	11.4	1.4	0	-21.9	28.9	40	-11.1	PK	340	H
51.106	30.4	10.2	1.5	0	-21.8	20.3	40	-19.7	PK	266	H
61.581	29.6	9.5	1.6	0	-21.8	18.9	40	-21.1	PK	205	H
71.581	29.4	9.4	1.7	0	-21.8	18.7	40	-21.3	PK	0	H
85.212	37.6	9.2	1.9	0	-21.9	26.8	40	-13.2	PK	0	H
109.808	38.2	10.2	2.1	0	-21.9	28.6	43.5	-14.9	PK	0	H
119.844	37.1	10.9	2.2	0	-21.9	28.3	43.5	-15.2	PK	0	H
141.929	35.4	12	2.4	0	-21.9	27.9	43.5	-15.6	PK	102	H
161.68	31.5	12.9	2.6	0	-21.8	25.2	43.5	-18.3	PK	187	H
181.18	37.5	13.9	2.8	0	-21.8	32.4	43.5	-11.1	PK	360	H
195.114	33.1	14.3	3	0	-21.8	28.6	43.5	-14.9	PK	315	H
205.114	27	10.8	3	0	-21.8	19	43.5	-24.5	PK	0	H
220.155	31.5	10.6	3.1	0	-21.8	23.4	46	-22.6	PK	62	H
250.222	31.6	11.7	3.4	0	-21.7	25	46	-21	PK	128	H
299.8	37.3	13.7	3.7	0	-21.6	33.1	46	-12.9	PK	178	H
399.774	36.1	15	4.5	0	-21.4	34.2	46	-11.8	PK	234	H
608.852	32.7	18.8	5.6	0	-21.2	35.9	46	-10.1	PK	262	H
700.252	31.4	21.2	6	0	-21.2	37.4	46	-8.6	PK	192	H
800.702	31.4	20.2	6.3	0	-21.3	36.6	46	-9.4	PK	126	H

Freq. (MHz)	Meter (dBμV)	Ant. (dB)	Cable (dB)	Distance (dB)	Amp. (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Degrees	Polarity
899.596	31.7	21.5	6.7	0	-21.3	38.6	46	-7.4	PK	85	H
998.578	31	23.7	7.1	0	-21.3	40.5	54	-13.5	PK	29	H
204.63	33	10.9	3	0	-21.8	25.1	43.5	-18.4	PK	0	V
220.114	40.2	10.6	3.1	0	-21.8	32.1	46	-13.9	PK	0	V
250.017	33.9	11.7	3.4	0	-21.7	27.3	46	-18.7	PK	0	V
300.278	38.8	13.7	3.7	0	-21.6	34.6	46	-11.4	PK	0	V
401.304	34.5	15	4.5	0	-21.4	32.6	46	-13.4	PK	0	V
501.2	34.7	17.4	5.2	0	-21.2	36.1	46	-9.9	PK	77	V
608.842	30.7	18.8	5.6	0	-21.2	33.9	46	-12.1	PK	203	V
699.626	31.9	21.2	6	0	-21.2	37.9	46	-8.1	PK	259	V
800.026	31.6	20.2	6.3	0	-21.3	36.8	46	-9.2	PK	300	V
899.714	31.9	21.5	6.7	0	-21.3	38.8	46	-7.2	PK	360	V
999.274	31.7	23.7	7.1	0	-21.3	41.2	54	-12.8	PK	360	V

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Radiated Emissions (spurious)	
DNB Job Number:	08089	Date:	3-5-2015
Customer:	KAP Medical		15.205 15.209
Model Number:	K-150	Specification:	
Description:	Position Sense Transmitter Axis 3		
Fundamental Frequency 315MHz			

Freq. (MHz)	Meter (dBμV)	Ant. (dB)	Cable (dB)	Distance (dB)	Amp. (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Degrees	Polarity
30.113	33	13.1	1.2	0	-21.9	25.4	40	-14.6	PK	360	V
40.116	37.5	11.8	1.4	0	-21.9	28.8	40	-11.2	PK	360	V
52.084	27.5	10.1	1.5	0	-21.8	17.3	40	-22.7	PK	343	V
60.098	35.4	9.5	1.6	0	-21.8	24.7	40	-15.3	PK	292	V
70.106	28.7	9.4	1.7	0	-21.8	18	40	-22	PK	237	V
80.11	39	9.1	1.8	0	-21.9	28	40	-12	PK	176	V
109.86	40.1	10.2	2.1	0	-21.9	30.5	43.5	-13	PK	101	V
119.804	36.4	10.9	2.2	0	-21.9	27.6	43.5	-15.9	PK	30	V
139.858	34.5	11.9	2.4	0	-21.9	26.9	43.5	-16.6	PK	0	V
160.712	30	12.8	2.6	0	-21.8	23.6	43.5	-19.9	PK	0	V
180.375	29.5	13.9	2.8	0	-21.8	24.4	43.5	-19.1	PK	0	V
197.972	32.4	14.4	3	0	-21.8	28	43.5	-15.5	PK	91	V
30.937	30	13.1	1.2	0	-21.9	22.4	40	-17.6	PK	360	H
40.422	27.7	11.7	1.4	0	-21.9	18.9	40	-21.1	PK	334	H
51.422	28.7	10.2	1.5	0	-21.8	18.6	40	-21.4	PK	273	H
61.002	28.5	9.5	1.6	0	-21.8	17.8	40	-22.2	PK	182	H
71.052	27.4	9.4	1.7	0	-21.8	16.7	40	-23.3	PK	107	H
80.126	35.4	9.1	1.8	0	-21.9	24.4	40	-15.6	PK	0	H
109.942	37.9	10.2	2.1	0	-21.9	28.3	43.5	-15.2	PK	0	H
140.055	33	11.9	2.4	0	-21.9	25.4	43.5	-18.1	PK	96	H
161.548	33.5	12.9	2.6	0	-21.8	27.2	43.5	-16.3	PK	162	H
181.006	31.1	13.9	2.8	0	-21.8	26	43.5	-17.5	PK	252	H
197.46	28.8	14.4	3	0	-21.8	24.4	43.5	-19.1	PK	360	H
220.106	28.6	10.6	3.1	0	-21.8	20.5	46	-25.5	PK	360	H
250.114	28.1	11.7	3.4	0	-21.7	21.5	46	-24.5	PK	360	H
300.198	35.6	13.7	3.7	0	-21.6	31.4	46	-14.6	PK	360	H
400.062	36.1	15	4.5	0	-21.4	34.2	46	-11.8	PK	293	H
500.141	29.8	17.4	5.2	0	-21.2	31.2	46	-14.8	PK	213	H
608.512	31.1	18.8	5.6	0	-21.2	34.3	46	-11.7	PK	87	H
701.588	31.6	21	6	0	-21.2	37.4	46	-8.6	PK	41	H
800.53	31.3	20.2	6.3	0	-21.3	36.5	46	-9.5	PK	0	H
901.128	31.2	21.5	6.7	0	-21.3	38.1	46	-7.9	PK	0	H

Freq. (MHz)	Meter (dBμV)	Ant. (dB)	Cable (dB)	Distance (dB)	Amp. (dB)	Corrected (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Degrees	Polarity
999.264	32.2	23.7	7.1	0	-21.3	41.7	54	-12.3	PK	0	H
205.301	36.5	10.8	3	0	-21.8	28.5	43.5	-15	PK	65	V
299.658	36.2	13.7	3.7	0	-21.6	32	46	-14	PK	116	V
399.924	35.6	15	4.5	0	-21.4	33.7	46	-12.3	PK	162	V
500.956	32.9	17.4	5.2	0	-21.2	34.3	46	-11.7	PK	248	V
609.108	31.4	18.8	5.6	0	-21.2	34.6	46	-11.4	PK	360	V
700.672	31.5	21.1	6	0	-21.2	37.4	46	-8.6	PK	360	V
799.888	31.4	20.2	6.3	0	-21.3	36.6	46	-9.4	PK	360	V
899.522	31.7	21.5	6.7	0	-21.3	38.6	46	-7.4	PK	360	V
998.804	31.7	23.7	7.1	0	-21.3	41.2	54	-12.8	PK	360	V

15.231(a,2) Transmit time

Test Procedure:
ANSI C63.10 7.4

Use the following spectrum analyzer settings:

RBW	=	1MHz
VBW	=	1MHz
Span	=	0Hz
Sweep	=	5s
Detector	=	peak
Trace	=	single
Trigger	=	video

Set Spectrum analyzer parameters. Activate the transmitter to trigger the sweep. Allow sweep to complete. Record plot.

Requirement: A transmitter operated automatically shall cease transmission within five seconds after activation.


EUT Operating Conditions:

Transmitting in five second intervals when triggered.

Test Setup:

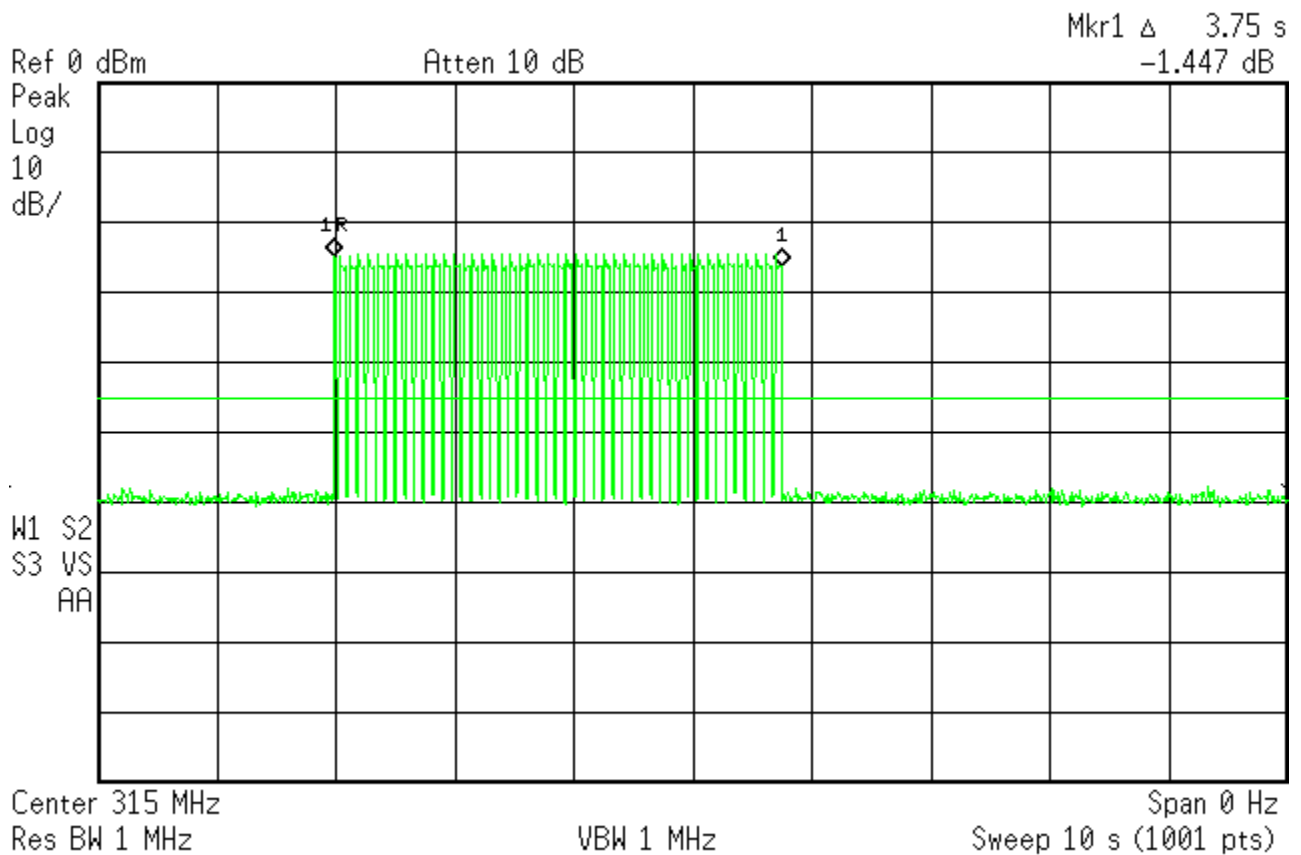
Test Equipment Log

Asset No	Item	Manufacturer	Model No	Serial No	Calibration Date	Calibration Interval	Calibration Due
31	Antenna (Log Periodic)	Emco	3146	1284	29-Jul-13	730	29 Jul 15
1760	Pre-Amp (called ZFL)	Mini-Circuits	ZFL-2000	8350	17-Feb-15	365	17 Feb 16
2079	Cable	Addams Russell	1998-120	2079	28-Jul-14	365	28 Jul 15
2264	Spectrum Analyzer	Agilent	E4407B	MY45103462	07-Aug-14	365	7 Aug 15

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Transmit Time	
DNB Job Number:	08089	Date:	3-12-2015
Customer:	KAP Medical		15.231(a,2)
Model Number:	K-150	Specification:	
Description:	Position Sense Transmitter		
Fundamental Frequency 315MHz			

Frequency	Duration of Transmission	Limit	Verdict
315MHz	3.75 seconds	5 seconds	Pass

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15.231(b) Field Strength

Test Procedure:

ANSI C63.10 6.3

ANSI C63.10 6.6

Use the following spectrum analyzer settings:

RBW	=	1MHz
VBW	=	1MHz
Span	=	1MHz
Sweep	=	auto
Detector	=	peak
Trace	=	continuous
Trigger	=	free run

The EUT was measured on an open area test site (OATS).

A measuring distance of at least 3m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring distance may be used. The equipment size (excluding the antenna) shall be less than 20% of the measuring distance.

Sufficient precautions shall be taken to ensure that reflections from extraneous objects adjacent to the site do not degrade the measurement results, in particular:

- no extraneous conductive objects having any dimension in excess of a quarter wavelength of the highest frequency tested shall be in the immediate vicinity of the site;
- all cables shall be as short as possible; as much of the cables as possible shall be on the ground plane or preferably below; and the low impedance cables shall be screened.


The EUT shall be placed upon a non-conductive table .8 meters above the ground plane and shall be placed in the “worst case” transmitting mode. The EUT shall be rotated 360 degrees to find the azimuth maxima. The receive antenna shall then be raised and lowered between 1 to 4 meters to find the maximum signal emanating from the EUT. This signal strength is then recorded on the data sheets.

The duty cycle correction factor is determined as described in ANSI C63.10 7.5. The average values are calculated using the duty cycle correction factor. The average values are compared to the limits in the table below.

Fundamental frequency	Field strength of fundamental ($\mu\text{V}/\text{meter}$)	Field strength of spurious emissions ($\mu\text{V}/\text{meter}$)
40.66 – 40.7	1,000	100
70 – 130	500	50
130 – 174	500 to 1,500	50 to 150
174 – 260	1,500	150
260 – 470	1,500 to 5,000	150 to 500
Above 470	5000	500

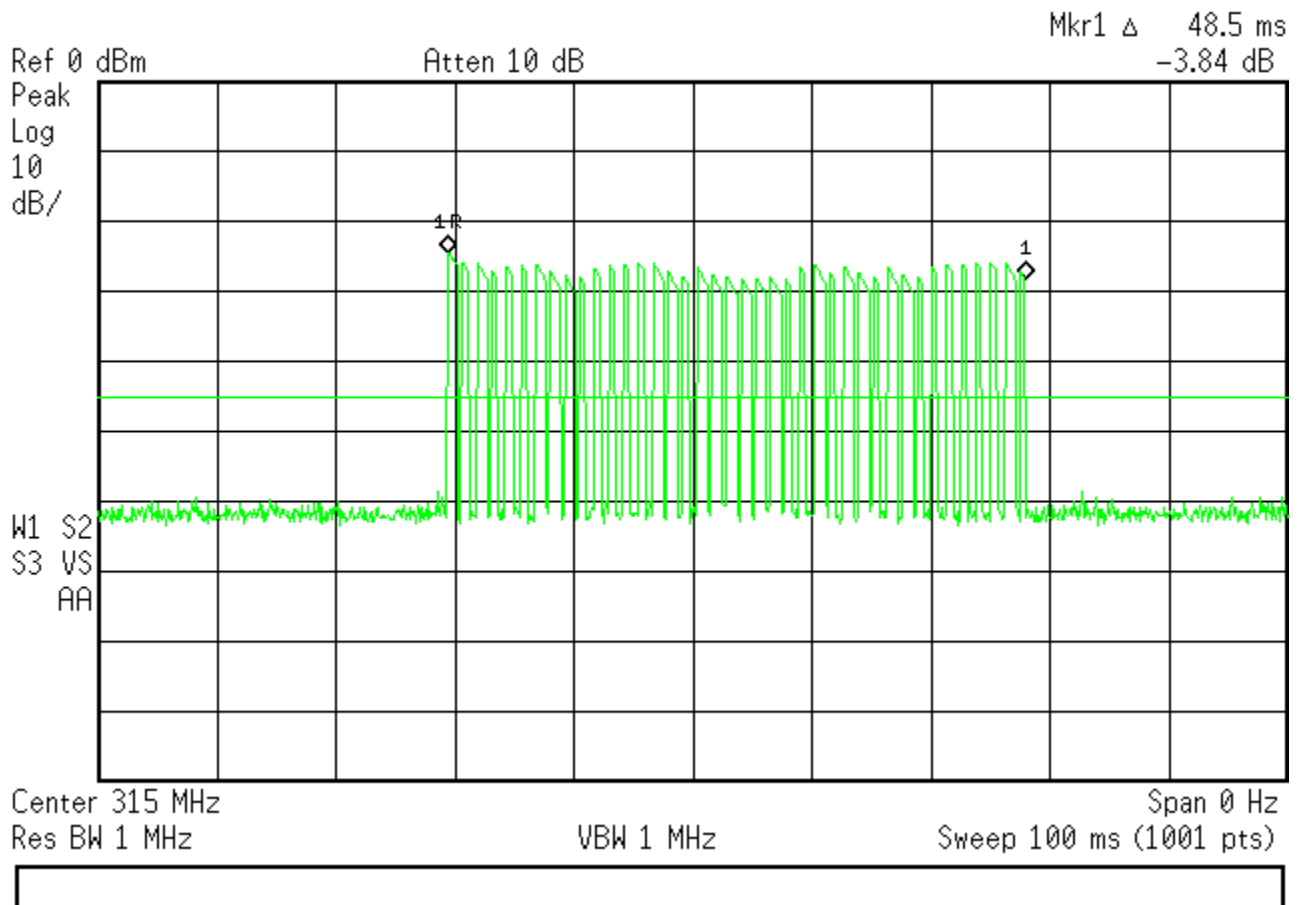
Test Equipment Log


Asset No	Item	Manufacturer	Model No	Serial No	Calibration Date	Calibration Interval	Calibration Due
11	Antenna (Small DRG)	Emco	3115	2281	19-Nov-14	730	19 Nov 16
31	Antenna (Log Periodic)	Emco	3146	1284	29-Jul-13	730	29 Jul 15
1760	Pre-Amp (called ZFL)	Mini-Circuits	ZFL-2000	8350	17-Feb-15	365	17 Feb 16
2079	Cable	Addams Russell	1998-120	2079	28-Jul-14	365	28 Jul 15
2264	Spectrum Analyzer	Agilent	E4407B	MY4510346 2	07-Aug-14	365	7 Aug 15

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Field Strength	
DNB Job Number:	08089	Date:	3-12-2015
Customer:	Kap Medical		15.231(b)
Model Number:	K-150	Specification:	
Description:	Position Sense Transmitter		
Fundamental Frequency 315MHz			

Duration of pulse train t1 = 48.5 ms

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	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Field Strength	
DNB Job Number:	08089	Date:	3-12-2015
			15.231(b)
Customer:	Kap Medical	Specification:	
Description:	Position Sense Transmitter		
Fundamental Frequency 315MHz			

Formula for duty cycle correction factor:

$$\text{Correction factor} = (t_1 \times n_1)/T = (48.5 \times 1)/100 = .485$$

$$20\log(.508) = -6.29\text{dB}$$

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Field Strength	
DNB Job Number:	08089	Date:	3-12-2015
			15.231(b)
Customer:	Kap Medical	Specification:	
Description:	Position Sense Transmitter		
Fundamental Frequency 315MHz			

Emissions were measured with EUT in all axes. The maximum emissions are recorded in the table below.

Freq. (MHz)	Meter (dBμV)	Ant. dB	Cable (dB)	Amp (dB)	Peak (dBμV/m)	DC factor (dB)	Ave (dBμV/m)	Limit (dBμV/m)	Delta (dB)	Pol.
315	75.4	14.4	3.2	-21.5	71.5	-6.3	65.2	67.7	-2.5	H
315	76.1	14.4	3.2	-21.5	72.2	-6.3	65.9	67.7	-1.8	V
630	33.4	19.3	3.5	-20.9	35.3	-6.3	29	46	-17	H
630	39.8	19.3	3.5	-20.9	41.7	-6.3	35.4	46	-10.6	V
945	34.2	22.1	4.4	-21.2	39.5	-6.3	33.2	46	-12.8	H
945	35.9	22.1	4.4	-21.2	41.2	-6.3	34.9	46	-11.1	V
1260	44.4	25.3	1	-32.1	38.6	-6.3	32.3	54	-21.7	H
1260	47.3	25.3	1	-32.1	41.5	-6.3	35.2	54	-18.8	V
1575	51.4	25.8	1	-33.8	44.4	-6.3	38.1	54	-15.9	H
1575	53.2	25.8	1	-33.8	46.2	-6.3	39.9	54	-14.1	V
1890	54.6	27.9	1	-31.8	51.7	-6.3	45.4	54	-8.6	H
1890	53.1	27.9	1	-31.8	50.2	-6.3	43.9	54	-10.1	V
2205	52.7	28	1	-31.5	50.2	-6.3	43.9	54	-10.1	H
2205	51.2	28	1	-31.5	48.7	-6.3	42.4	54	-11.6	V
2520	49.9	29.3	1	-31.5	48.7	-6.3	42.4	54	-11.6	H
2520	53.1	29.3	1	-31.5	51.9	-6.3	45.6	54	-8.4	V
2835	45.8	29.5	1	-31.1	45.2	-6.3	38.9	54	-15.1	H
2835	46.2	29.5	1	-31.1	45.6	-6.3	39.3	54	-14.7	V
3150	44.3	31.1	1	-31.2	45.2	-6.3	38.9	54	-15.1	H
3150	45.4	31.1	1	-31.2	46.3	-6.3	40	54	-14	V

15.231(c) Occupied Bandwidth

Test Procedure:
ANSI C63.10 6.9

Use the following spectrum analyzer settings:

RBW	=	100kHz
VBW	=	100kHz
Span	=	Greater than RBW
Sweep	=	auto
Detector	=	peak
Trace	=	max hold

The EUT should be transmitting at its maximum output power. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the marker-delta functions, and move the marker to the other side of the emission, until it is even with the reference marker level. The marker-delta reading at this point is the 20dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.


Requirement: The minimum 20dB bandwidth shall be less than 787.5kHz.

EUT Operating Conditions:

Transmitting in five second intervals when triggered.

Test Equipment Log

Asset No	Item	Manufacturer	Model No	Serial No	Calibration Date	Calibration Interval	Calibration Due
31	Antenna (Log Periodic)	Emco	3146	1284	29-Jul-13	730	29 Jul 15
1760	Pre-Amp (called ZFL)	Mini-Circuits	ZFL-2000	8350	17-Feb-15	365	17 Feb 16
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2264	Spectrum Analyzer	Agilent	E4407B	MY4510346 2	07-Aug-14	365	7 Aug 15

	5969 Robinson Ave. Riverside, CA 92503 (951)637-2630	Occupied BW	
DNB Job Number:	08089	Date:	3-12-2015
Customer:	KAP Medical		15.231(c)
Model Number:	K-150	Specification:	
Description:	Position Sense Transmitter		
Fundamental Frequency 315MHz			

Frequency	20dB OBW	Limit	Verdict
315MHz	490 kHz	787.5 kHz	Pass

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