Test Report for Unlicensed Low Power Transmitter

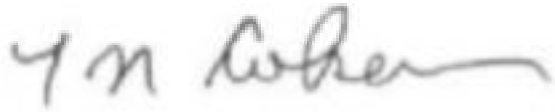
Description of device: Biometric sensor operating at 2.4 GHz ISM band
Applicable Rule Parts: 15.205, 15.207, 15.249

Applicant: Aliph
410 Jessie Street - Unit 601
San Francisco, CA 94103
tel 415 512 9191
fax 415 512 9190

FCC ID: QSA ALIPH-RAV-REVB

Emissions limits and test data are found below.

The Aliph GEMS biometric sensor meets all emissions requirements for certification under Parts 2 and 15 of FCC Rules.



THOMAS N. COKENIAS
EMC and Radio Regulatory Consultant

26 February 2003

TEST RESULTS

15.205, 15.209, 15.249 Radiated Emissions

Test Equipment Used

HP8593EM Analyzer
Miteq NSP2600-44 Preamp
EMCO 3115 Antenna

Test Set-up, 1-40 GHz

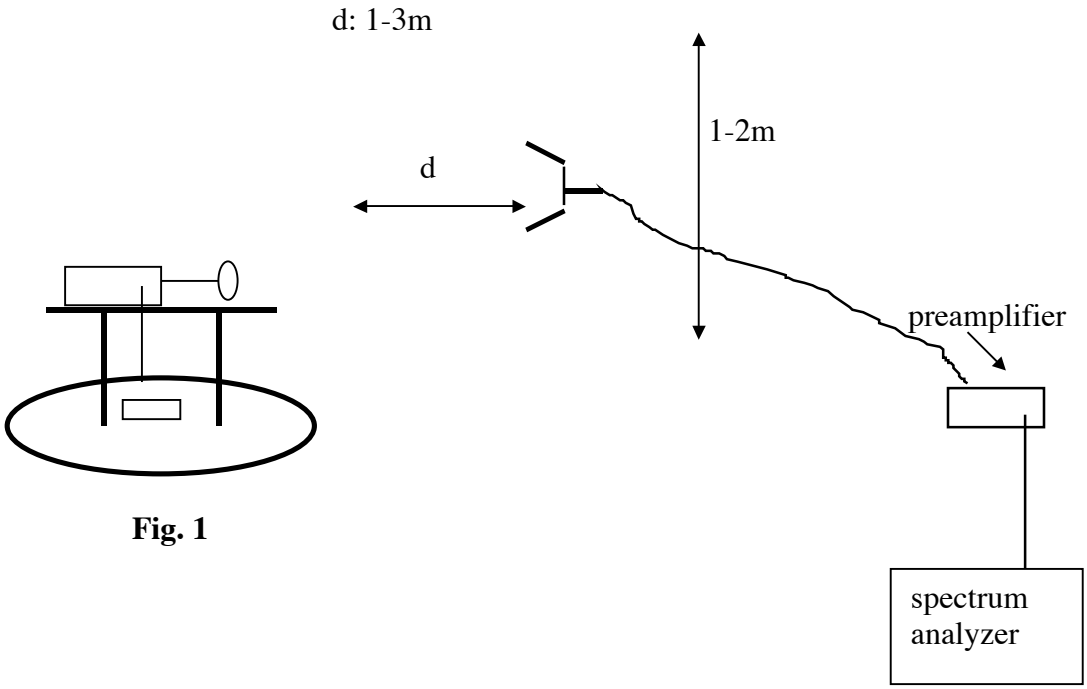


Fig. 1

Test Procedure

The EUT was placed on a wooden turntable located 3m from the search antenna. The EUT was activated to transmit continuously. Radiated emissions from fundamental operating frequency to the 10th harmonic, for search antenna in both vertical and horizontal polarities.

The test was repeated for each of the patch antennas sold with the product. For all tests the battery eliminator was plugged into the EUT, and a set of earphones was connected to the audio output jack.

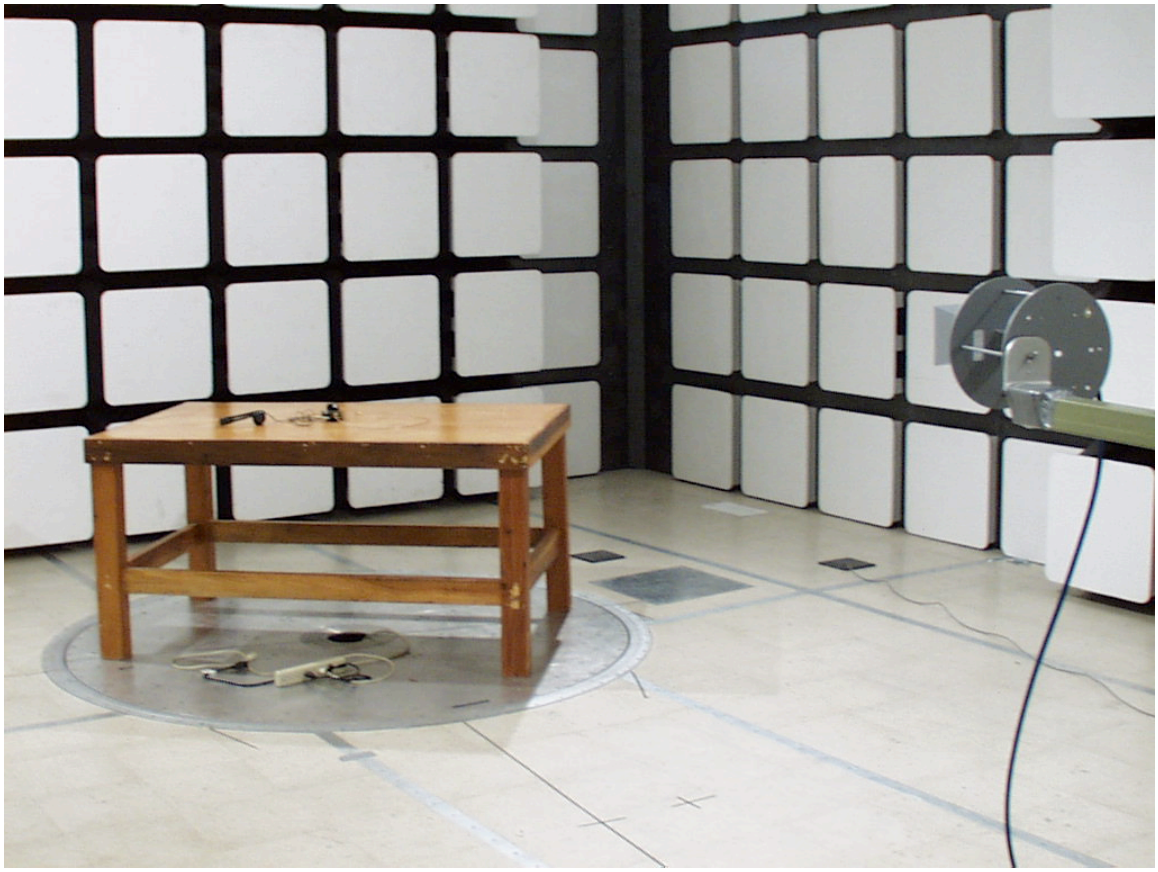
Test Results

Data shows the EUT meets all radiated requirements specified in 15.205 and 15.249. Measurements were made for each antenna from 1-25 GHz for each of four antenna types supplied with the EUT:

Antenna Model/Type	Gain, dBi
9p6+8_80	-14.4

Harmonic and spurious measurements indicated that radiated levels were independent of antenna used, emissions were the same for each antenna, and regardless of whether an antenna was connected. Radiated spurs and harmonics seemed to be leaking from the rear of the unit. Measured levels were well within limits, most were at instrument noise floor.

Test Set-up Photograph



02/19/03 **High Frequency Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: VIEN TRAN
Project #: 03U1844-1
Company: ALIPH
EUT Descrip. BIOMETRIC SENSOR:
FCC ID: QSAALIPH-RAV-REVB
Test Target: EN55022 CLASS B
Mode Oper: Stand Alone

Test Equipment:

Cable (feet)	EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz
14	T60; S/N: 2238 @3m	HP 8449B	E4440A	T87; ARA 18-26GHz; S/N:1049

Peak Measurements:
1 MHz Resolution Bandwidth
1MHz Video Bandwidth

Average Measurements:
1 MHz Resolution Bandwidth
10Hz Video Bandwidth

f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes
2.448	9.8	50.0	50.0	29.7	3.1	0.0	0.0	0.0	82.7	82.7	114.0	94.0	-31.3	-11.3	H
2.448	9.8	47.0	46.1	29.7	3.1	0.0	0.0	0.0	79.7	78.8	114.0	94.0	-34.3	-15.2	V
4.896	9.8	44.3	37.9	33.2	5.4	-34.6	0.0	0.0	48.3	41.9	74.0	54.0	-25.7	-12.1	V
7.344	9.8	41.5	30.1	36.3	6.8	-34.6	0.0	0.0	50.0	38.6	74.0	54.0	-24.0	-15.4	V
9.792	9.8	40.1	29.9	38.5	8.0	-34.6	0.0	0.0	52.0	41.7	74.0	54.0	-22.0	-12.3	V
12.240	9.8	43.8	35.9	39.4	8.9	-33.3	0.0	0.0	58.7	50.9	74.0	54.0	-15.3	-3.1	V
14.688	9.8	42.3	32.1	40.5	10.2	-33.0	0.0	0.0	60.0	49.8	74.0	54.0	-14.0	-4.2	V
17.136	9.8	41.4	29.4	41.8	11.6	-32.9	0.0	0.0	61.9	49.9	74.0	54.0	-12.1	-4.1	V
19.584	9.8	42.6	30.0	33.5	12.8	-32.7	0.0	0.0	56.1	43.5	74.0	54.0	-17.9	-10.5	V
22.031	9.8	41.6	29.9	35.1	13.9	-33.6	0.0	0.0	57.0	45.3	74.0	54.0	-17.0	-8.7	V
24.480	9.8	44.2	32.6	36.2	15.6	-34.0	0.0	0.0	61.9	50.2	74.0	54.0	-12.1	-3.8	V
4.896	9.8	44.6	36.1	33.2	5.4	-34.6	0.0	0.0	48.5	40.0	74.0	54.0	-25.5	-14.0	H
7.344	9.8	45.1	35.1	36.3	6.8	-34.6	0.0	0.0	53.6	43.6	74.0	54.0	-20.4	-10.4	H
9.792	9.8	42.0	30.4	38.5	8.0	-34.6	0.0	0.0	53.8	42.2	74.0	54.0	-20.2	-11.8	H
12.240	9.8	42.9	29.6	39.4	8.9	-33.3	0.0	0.0	57.9	44.6	74.0	54.0	-16.1	-9.4	H
14.688	9.8	41.7	29.4	40.5	10.2	-33.0	0.0	0.0	59.4	47.1	74.0	54.0	-14.6	-6.9	H
17.136	9.8	41.5	29.3	41.8	11.6	-32.9	0.0	0.0	62.0	49.8	74.0	54.0	-12.0	-4.2	H
19.584	9.8	41.6	30.1	33.5	12.8	-32.7	0.0	0.0	55.1	43.6	74.0	54.0	-18.9	-10.4	H
22.031	9.8	42.5	31.5	35.1	13.9	-33.6	0.0	0.0	57.9	46.9	74.0	54.0	-16.1	-7.1	H
24.480	9.8	43.2	32.4	36.2	15.6	-34.0	0.0	0.0	60.9	50.1	74.0	54.0	-13.1	-3.9	H

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