



DATE: 24 May 2007

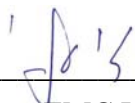
I.T.L. (PRODUCT TESTING) LTD.
FCC EMC/Radio Test Report
for
Visonic Inc.

Equipment under test:
Panic Watch

WPK 215

Written by: 
D. Shidlow, Documentation

Approved by: 
E. Pitt, Test Engineer

Approved by: 
I. Raz, EMC Laboratory Manager

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permission of I.T.L. (Product Testing) Ltd.

This report relates only to items tested.

Measurement/Technical Report for
Visonic Inc.
Panic Watch

WPK 215

FCC ID: GSAWPK250

24 May 2007

This report concerns: Original Grant x Class II change

Class B verification Class A verification Class I change

Equipment type: Part 15 Security/Remote Control Transmitter

Request Issue of Grant:

 x Immediately upon completion of review

Limits used:

CISPR 22

Part 15 x

Measurement procedure used is ANSI C63.4-2003.

Application for Certification

prepared by:

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Applicant for this device:

(different from "prepared by")

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1. General Information

1.1 Administrative Information

Manufacturer: Tetra Electronics Industry Ltd.

Manufacturer's Address: 5 Hatzoref St.
Holon 58117
Israel
Tel: +972-3-556-2775
Fax: +972-3-556-1944

Manufacturer's Representative: Gyora Reppen

Equipment Under Test (E.U.T): Panic Watch

Equipment Model No.: WPK 215

Equipment Serial No.: 5572406

Date of Receipt of E.U.T: 12.02.07

Start of Test: 12.02.07

End of Test: 25.03.07

Test Laboratory Location: I.T.L (Product Testing) Ltd.
1 Batsheva St.,
Lod 71100
ISRAEL

Test Specifications: FCC Part 15 Sub-parts B; C

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 *Product Description*

The WPK 215 manufactured by Tetra Electronics Industries is a short range transmitter used as a panic alarm device. The unit is powered by 2 X 1.55VDC type 386 Silver Oxide batteries and the transmitted frequency is 433.92 MHz with ASK modulation. Maximum transmitter time < 5 Sec.

1.4 *Test Methodology*

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 *Test Facility*

The radiated emissions tests were performed at I.T.L.'s testing facility at 1 Batsheva St., Lod, Israel. This site is a FCC listed test laboratory (FCC Registration No.861911, date of listing September 26, 2005). I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 *Measurement Uncertainty*

Radiated Emission

The Open Site complies with the ± 4 dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

2. Product Labeling



Figure 1. FCC Label



Figure 2. Location of Label on EUT

3. System Test Configuration

3.1 *Justification*

To determine the E.U.T. antenna orientation for the spurious radiated emissions tests, the product carrier field level was measured with the E.U.T. in 3 orthogonal positions. The E.U.T. was tested in 3 orthogonal positions.

The vertical position of the E.U.T. was selected as the worst case final orientation position.

The Test required the unit to transmit continuously. For that purpose the push button was by passed and two wires connected together were used to operate the unit in CW mode.

3.2 *EUT Exercise Software*

The embedded software (firmware) was not changed for testing.

3.3 *Special Accessories*

No special accessories were needed to achieve compliance.

3.4 *Equipment Modifications*

1. One coil (L2) was changed to 82nH.
2. One capacitor (C15) was changed to 3.0pF.

3.5 *Configuration of Tested System*

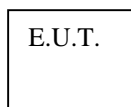


Figure 3. Configuration of Tested System

4. Block Diagram

4.1 Schematic Block/Connection Diagram

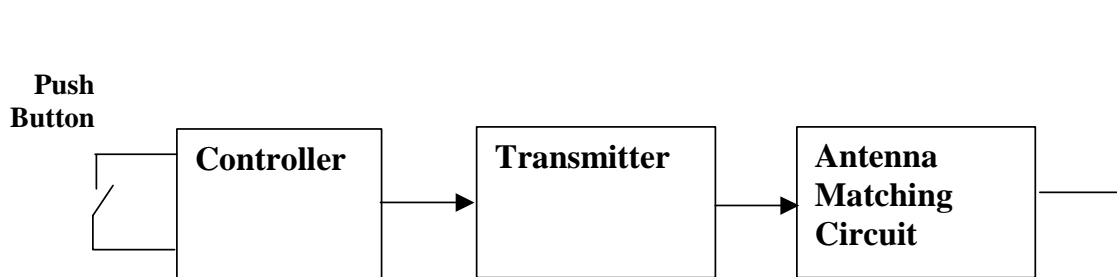


Figure 4. Block Diagram

4.2 Theory of Operation

The heart of the unit is the oscillator driven by a 433.92 MHz resonator. Upon sensing the push button, the controller sends the on-off keying to the transmitter. The information contains the transmitter id code and the battery condition bit.

See customer's declaration concerning Duty Cycle on following page.



TETRA

ELECTRONIC IND. LTD.

21 March 2007

WPK-215 Duty Cycle - Declaration

To Whom It May Concern:

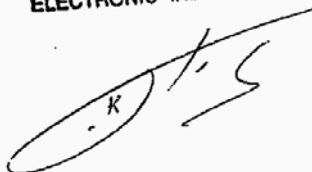
Our pendant / wrist watch transmitter model WPK 215 has a maximum duty cycle of 85% (eighty five percent) measured over any 100mSec period during transmission.

Gyora Reppen

Head, R&D

Tetra Electronic Industry

TETRA
ELECTRONIC IND. LTD.



מטרה תעשיות אלקטרוניקה (1994) בע"מ דה' חצורף 5 חולון 58856 טל: 03-5562775 פקס: 03-5561944
5 HATZOREF ST. HOLON 58856 ISRAEL, PHONE: 972-3-5562775, FAX: 972-3-5561944

5. Field Strength of Fundamental

5.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.231(b)

5.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

The E.U.T. was placed on a non-conductive table, 0.8 meters above the O.A.T.S. ground plane.

The EMI receiver was set to the E.U.T. Fundamental Frequency (433.92MHz) and Peak Detection.

The turntable and antenna mast were adjusted for maximum level reading on the EMI receiver.

The measurement was performed for vertical and horizontal polarizations of the test antenna.

The average result is:

Peak Level(dB μ V/m) + E.U.T. Duty Cycle Factor, in 100msec time window (dB)


5.3 Measured Data

JUDGEMENT: Passed by 2.13 dB

The EUT met the FCC Part 15, Subpart C, Section 15.231(b) specification requirements.

The details of the highest emissions are given in Figure 5 to Figure 6.

TEST PERSONNEL:

Tester Signature:  Date: 01.05.07

Typed/Printed Name: E. Pitt

Field Strength of Fundamental

E.U.T Description Panic Watch
 Type WPK 215
 Serial Number: 5572406

Specification: F.C.C., Part 15, Subpart C, 15.231(b)

Antenna Polarization: Horizontal

Test Distance: 3 meters

Detector: Peak

Freq.	Pol.	Peak Amp	D.C.F.	Peak Result	Peak Specification	Margin
(MHz)	V/H	(dBμ V/m)	(dB)	(dBμ V/m)	(dBμ V/m)	(dB)
433.99	H	78.0	N/A	78.0	100.83	-22.83
433.99	V	80.1	N/A	80.1	100.83	-20.73

**Figure 5. Field Strength of Fundamental. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Notes:

1. Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.
2. "Peak Amp." (dBμ V/m) included the "Correction Factors".
3. "Correction Factors" (dB) = Test Antenna Correction Factor(dB) + Cable Loss.

Field Strength of Fundamental

E.U.T Description Panic Watch
 Type WPK 215
 Serial Number: 5572406

Specification: F.C.C., Part 15, Subpart C, 15.231(b)

Antenna Polarization: Horizontal

Test Distance: 3 meters

Detector: Average

Freq. (MHz)	Pol. V/H	Peak Amp (dBμ V/m)	D.C.F. (dB)	AVG Result (dBμ V/m)	AVG Specification (dBμ V/m)	Margin (dB)
433.99	H	78.0	-1.4	76.6	80.83	-4.23
433.99	V	80.1	-1.4	78.7	80.83	-2.13

**Figure 6. Field Strength of Fundamental. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Notes:

1. Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.
2. "Peak Amp." (dBμ V/m) included the "Correction Factors".
3. "Correction Factors" (dB) = Test Antenna Correction Factor(dB) + Cable Loss.
4. "Duty Cycle Factor (D.C.F.)= $20 \log 0.85 = -1.4 \text{ dB}$ (See Section 4.2 of this report).
5. "Average Result" (dBμ V/m)=Peak Amp. (dBμ V/m)+D.C.F. (dB)

5.4 Test Instrumentation Used, Field Strength of Fundamental

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMC Analyzer	HP	HP 8593	3536A00120	November 11, 2006	1 year
Antenna Biconilog	EMCO	3142B	1250	August 23, 2006	1 year
Antenna Mast	ETS/EMCO	2070-2	9608=1497	N/A	N/A
Mast & Table Controller	ETS/EMCO	2090	9608-1456	N/A	N/A

6. Radiated Measurement Test Set-up Photo



Figure 7. Radiated Emission Test

7. Spurious Radiated Emission

7.1 Test Specification

9kHz-4400 MHz, F.C.C., Part 15, Subpart C

7.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The preliminary results showed no signals in the frequency range 9 kHz-30 MHz. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The signals from the list of the highest emissions were verified and the list was updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI spectrum analyzer..

In the frequency range 30-4400 MHz, the readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.


7.3 Test Data

JUDGEMENT: Passed by 4.5 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification. The margin between the emission level and the specification limit is 4.5 dB in the worst case at the frequency of 1301.97 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 8* to *Figure 11*.

TEST PERSONNEL:

Tester Signature: 

Date: 01.05.07

Typed/Printed Name: E. Pitt

Radiated Emission

E.U.T Description Panic Watch
 Type WPK 215
 Serial Number: 5572406

Specification: FCC Part 15, Subpart C

Antenna Polarization: Horizontal
 Antenna: 3 meters distance

Frequency range: 30 MHz to 4400 MHz
 Detectors: Peak

Freq.	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)
867.98	49.5	80.83	-31.33
1301.97	49.8	80.83	-31.03
1735.96	48.3	80.83	-32.53
2169.95	47.9	80.83	-32.93
2603.93	37.6	80.83	-43.23

**Figure 8. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detectors: Peak**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description Panic Watch
 Type WPK 215
 Serial Number: 5572406

Specification: FCC Part 15, Subpart C

Antenna Polarization: Horizontal
 Antenna: 3 meters distance

Frequency range: 30 MHz to 4400 MHz
 Detectors: Average

Freq.	Average Amp	Average Specification	Average Margin
(MHz)	(dBμV/m)	(dB μV/m)	(dB)
867.98	48.1	60.83	-12.73
1301.97	48.4	60.83	-12.43
1735.96	46.9	60.83	-13.93
2169.95	46.5	60.83	-14.33
2603.93	36.2	60.83	-24.63

**Figure 9. Radiated Emission. Antenna Polarization: HORIZONTAL
 Detectors: Average**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor + D.C.F.

“Duty Cycle Factor” = $20 \log 0.85 = -1.4 \text{ dB}$

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description Panic Watch
 Type WPK 215
 Serial Number: 5572406

Specification: FCC Part 15, Subpart C

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 30 MHz to 4400 MHz
 Detectors: Peak

Freq.	Peak Amp	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(dB μV/m)	(dB)
867.98	57.6	80.83	-23.23
1301.97	57.7	80.83	-23.13
1735.96	52.1	80.83	-28.73
2169.95	51.2	80.83	-29.63
2603.93	42.4	80.83	-38.43

**Figure 10. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Peak**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description Panic Watch
 Type WPK 215
 Serial Number: 5572406

Specification: FCC Part 15, Subpart C

Antenna Polarization: Vertical
 Antenna: 3 meters distance

Frequency range: 30 MHz to 4400 MHz
 Detectors: Average

Freq.	Average Amp	Average Specification	Average Margin
(MHz)	(dBμV/m)	(dB μV/m)	(dB)
867.98	56.2	60.83	-4.63
1301.97	56.3	60.83	-4.53
1735.96	50.7	60.83	-10.13
2169.95	49.8	60.83	-11.03
2603.93	41.0	60.83	-19.83

**Figure 11. Radiated Emission. Antenna Polarization: VERTICAL.
 Detectors: Average**

Notes:

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor + D.C.F.

“Duty Cycle Factor” = $20 \log 0.85 = -1.4 \text{ dB}$

“Correction Factor” = Antenna Factor + Cable Loss

7.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMC Analyzer	HP	HP 8593	3536A00120	November 11, 2006	1 year
Antenna Biconilog	EMCO	3142B	1250	August 23, 2006	1 year
Horn Antenna	ETS	3115	6142	May 16, 2006	2 year
Antenna Mast	ETS/EMCO	2070-2	9608=1497	N/A	N/A
Mast & Table Controller	ETS/EMCO	2090	9608-1456	N/A	N/A

8. Bandwidth

8.1 Test procedure

The transmitter unit operated with normal modulation. The spectrum analyzer was set to 120 kHz resolution BW and center frequency of the transmitter fundamental. The spectrum bandwidth of the transmitter unit was measured and recorded.

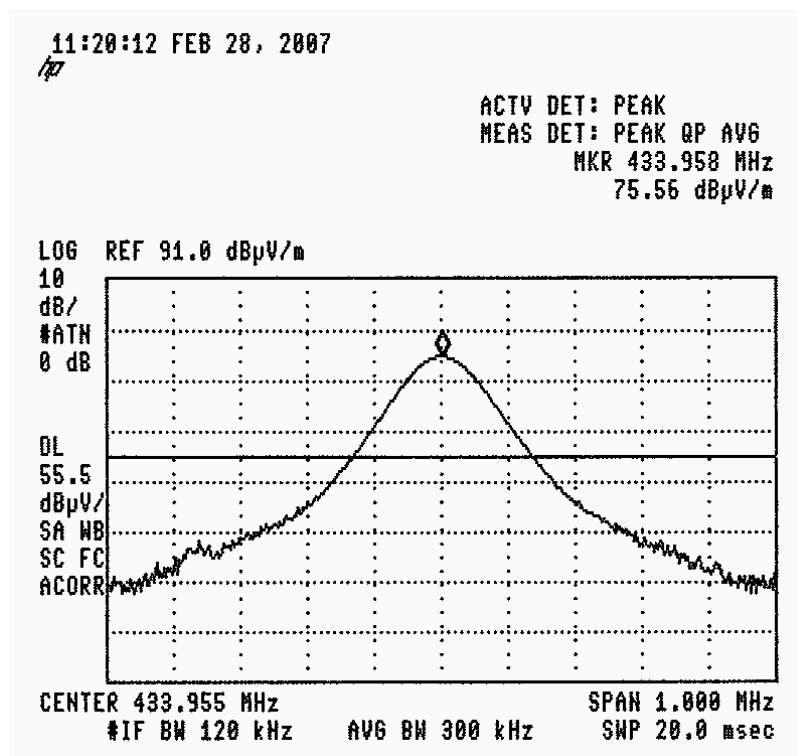


Figure 12

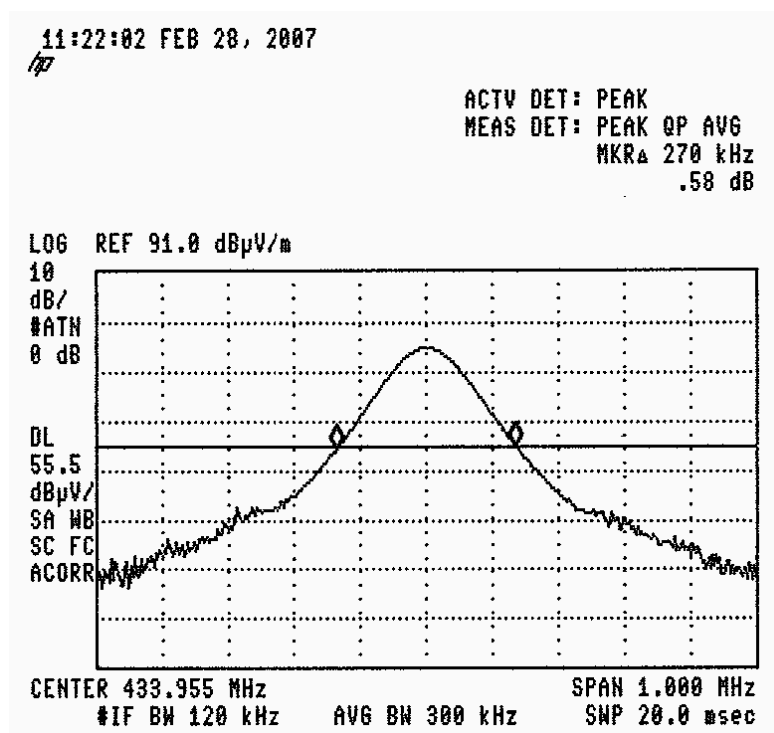


Figure 13

8.2 Results table

E.U.T Description: Panic Watch

Model: WPK 215

Serial Number: 5572406

Specification: F.C.C. Part 15, Subpart C: (15.231(c))


Bandwidth Reading (kHz)	Specification (1) (kHz)	Margin (kHz)
270	1084.8	-814.8

Figure 14 Bandwidth

JUDGEMENT:

Passed by 814.8 kHz

TEST PERSONNEL:

Tester Signature: 

Date: 01.05.07

Typed/Printed Name: E. Pitt

(1) 0.25% of the E.U.T. fundamental frequency, Section 15.231(c).

8.3 Test Equipment Used.

Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMC Analyzer	HP	HP 8593	3536A00120	November 11, 2006	1 year
Antenna Biconilog	EMCO	3142B	1250	August 23, 2006	1 year
Antenna Mast	ETS/EMCO	2070-2	9608=1497	N/A	N/A
Mast & Table Controller	ETS/EMCO	2090	9608-1456	N/A	N/A

Figure 15 Test Equipment Used

9. Radiated Emission Test Data Per FCC Part 15, Sub-part B

9.1 Test Specification

30-1000 MHz, FCC Part 15, Subpart B, CLASS B

9.2 Test Procedure

The E.U.T operation mode and test configuration are as described in section 4.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in photograph *Figure 7. Radiated Emission Test*.

The frequency range 30-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a EMI spectrum analyzer.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The emissions were measured at a distance of 3 meters.


9.3 *Test Data*

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart B, specification.

In the band 30 MHz – 1000 MHz, the emission levels were more than 20 dB below the specification limit.

TEST PERSONNEL:

Tester Signature: 

Date: 01.05.07

Typed/Printed Name: E. Pitt

9.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMC Analyzer	HP	HP 8593	3536A00120	November 11, 2006	1 year
Antenna Biconilog	EMCO	3142B	1250	August 23, 2006	1 year
Horn Antenna	ETS	3115	6142	May 16, 2006	2 year
Antenna Mast	ETS/EMCO	2070-2	9608=1497	N/A	N/A
Mast & Table Controller	ETS/EMCO	2090	9608-1456	N/A	N/A

10. Photographs of Tested E.U.T.



Figure 16 Top View



Figure 17 Bottom View



Figure 18 Bottom Cover Internal View

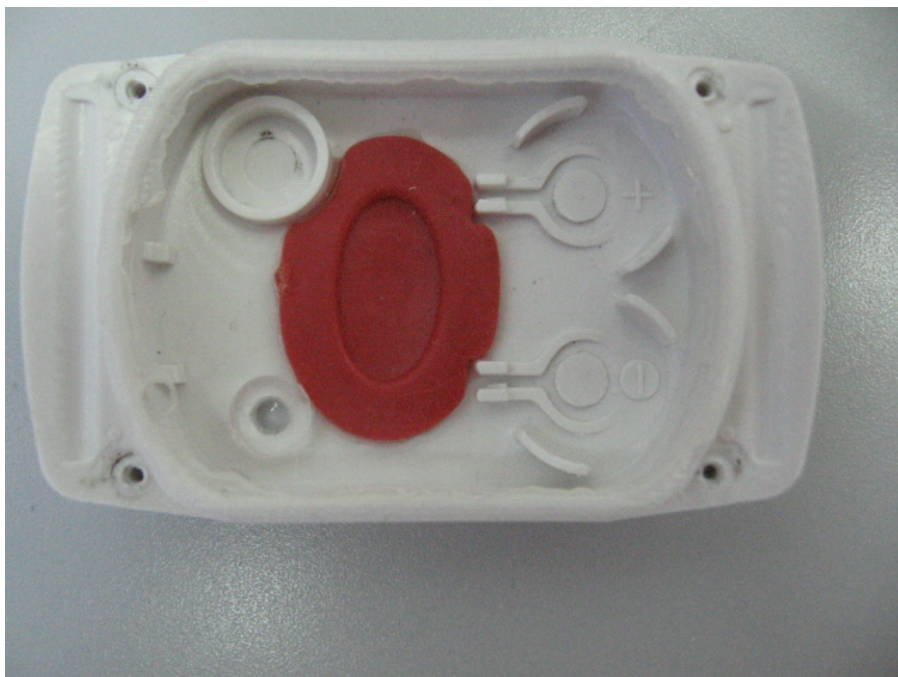


Figure 19 Top Cover Internal View

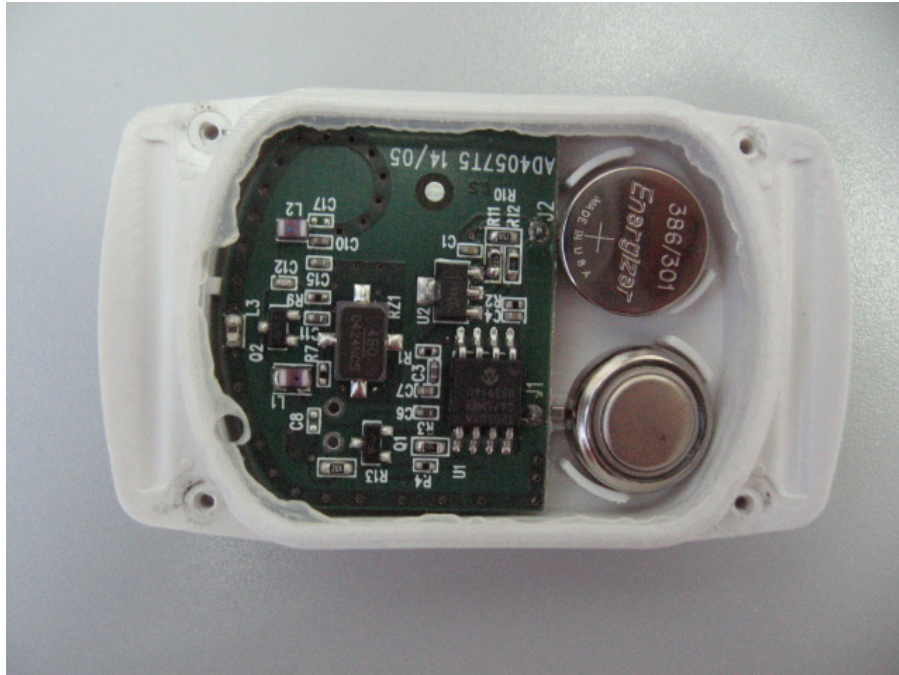


Figure 20 PCB In Case With Batteries

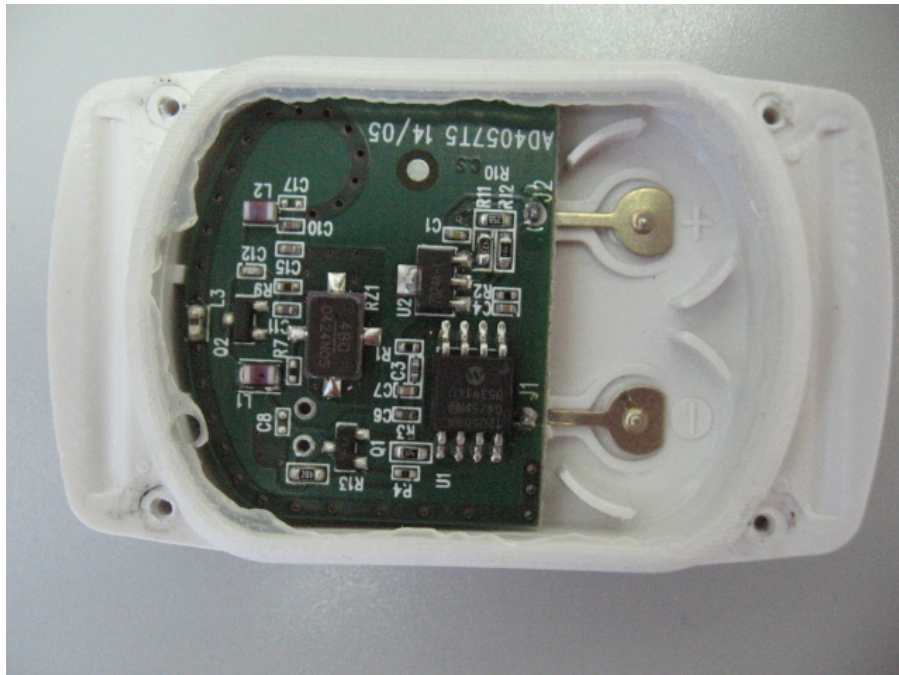


Figure 21 PCB In Case Without Batteries

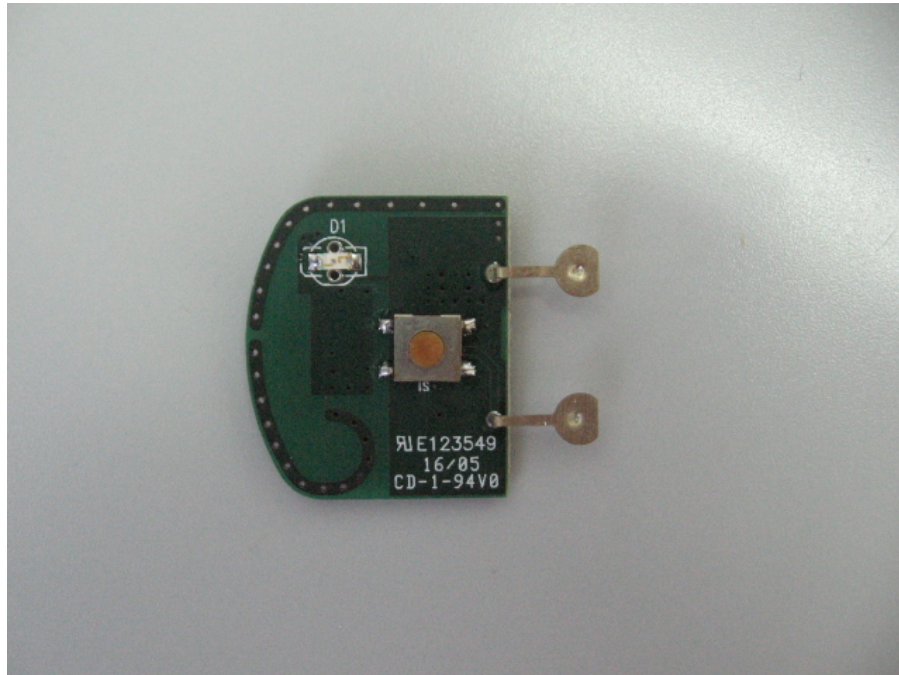


Figure 22 PCB Component Side

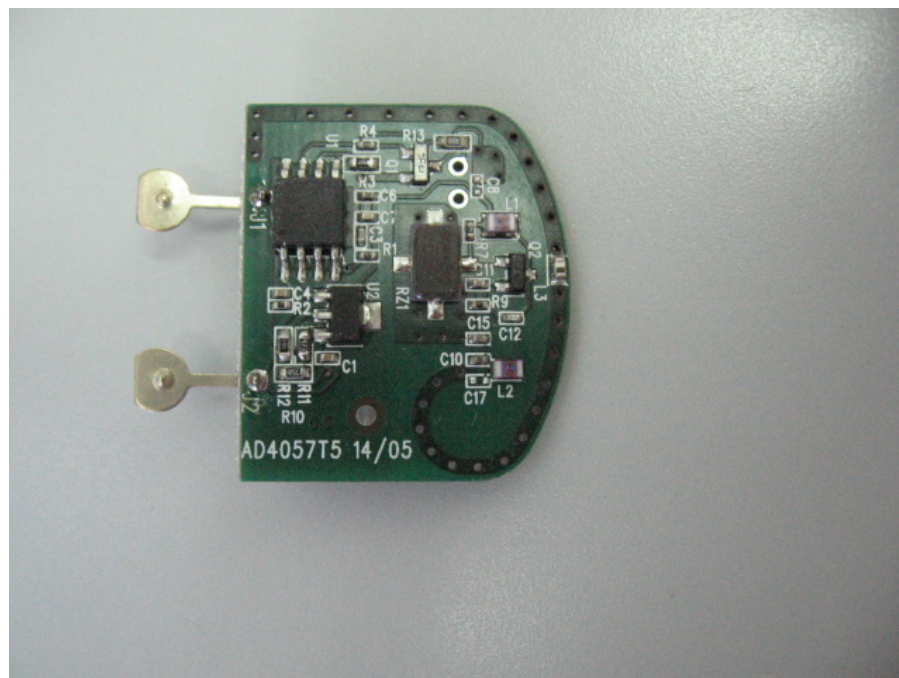


Figure 23 PCB Print Side

11. APPENDIX A - CORRECTION FACTORS

11.1 Correction factors for CABLE

from EMI receiver
to test antenna
at 3 and 10 meter range.

FREQUENCY	CORRECTION FACTOR	FREQUENCY	CORRECTION FACTOR
(MHz)	(dB)	(MHz)	(dB)
30	1.96	150	5.06
35	2.08	160	5.35
40	2.26	170	5.57
45	2.43	180	5.7
50	2.59	190	5.84
55	2.65	200	6.02
60	2.86	250	6.86
65	2.96	300	7.59
70	3.04	350	8.09
75	3.27	400	8.7
80	3.41	450	9.15
85	3.54	500	9.53
90	3.68	550	9.82
95	3.77	600	10.24
100	3.93	650	10.74
110	4.19	700	11.25
120	4.41	800	12.53
130	4.6	900	13.86
140	4.83	1000	14.86

NOTE:

The cable type is RG-214/U.

11.2 Correction factors for Biconilog Antenna

at 3 and 10 meter ranges.

Model: 3142

Antenna serial number: 1250

3 meter range

FREQUENCY	AFE	FREQUENCY	AFE
(MHz)	(dB/m)	(MHz)	(dB/m)
30	18.4	500	18.6
40	13.7	600	19.6
50	9.9	700	21.1
60	8.1	800	21.4
70	7.4	900	23.5
80	7.2	1000	24.3
90	7.5	1100	25
100	8.5	1200	24.9
120	7.8	1300	26
140	8.5	1400	26.1
160	10.8	1500	27.1
180	10.4	1600	27.2
200	10.5	1700	28.3
250	12.7	1800	28.1
300	14.3	1900	28.5
400	17	2000	28.9

11.3 Correction factors for **HORN ANTENNA**

Model: 3115

Antenna serial number: 0004-6142

1 meter range

FREQUENCY	AFE	FREQUENCY	AFE
(MHz)	(dB/m)	(MHz)	(dB/m)
1000	23.9	7500	37.5
1500	25.4	8000	37.6
2000	27.3	8500	38.3
2500	28.5	9000	38.5
3000	30.4	9500	38.1
3500	31.6	10000	38.6
4000	33	10500	38.4
4500	32.7	11000	38.5
5000	34.1	11500	39.4
5500	34.5	12000	39.2
6000	34.9	12500	39.4
6500	35.1	13000	40.7
7000	35.9		