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FCC PART 15.249

**UNLICENSED INTENTIONAL RADIATOR
TEST REPORT**

Applicant	KP ELECTRONIC SYSTEMS LTD.
Address	P.O. BOX 42 TEFEN INDUSTRIAL PARK 24959 ISRAEL
FCC ID	H78KPMT2W
Model Number	MT2W
Product Description	VHF AUTOMATIC METER READING TRANSCEIVER W/ 2.4 GHZ TX.
Date Sample Received	9/25/2015
Final Test Date	9/28/15
Tested By	Tim Royer
Approved By	Cory Leverett

Report Number	Version Number	Description	Issue Date
2010DUT15TestReport	Rev.1	Initial Issue	9/28/2015

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Summary

The device under test does:

- ☒ Fulfill the general approval requirements as identified in this test report
☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025: 2005 requirements.

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Authorized Signatory Name:



Tim Royer
Engineering Project Manager

Date: 9/28/2015

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GENERAL INFORMATION

EUT Specification

FCC Regulatory Standard	Title 47 CFR Part 2 & 15		
FCC ID	H78KPMT2W		
Model	MT2W		
EUT Description	VHF AUTOMATIC METER READING TRANSCEIVER W/ 2.4 GHZ TX		
Operating Frequency	TX: 2433MHz		
EUT Power Source	☐ 110–120Vac/50– 60Hz		
	☐ DC Power		
	☒ Battery Operated Exclusively		
Test Item	☐ Prototype	☒ Pre-Production	☐ Production
Type of Equipment	☐ Fixed	☐ Mobile	☒ Portable
Antenna Connector	None		
Antenna	External		
Test Facility	Timco Engineering Inc. located at 849 NW State Road 45 Newberry, FL 32669 USA.		
Test Conditions	Temperature: 24-26°C Relative humidity: 50-65%		
Measurement Standards	ANSI C63.10-2013 (test methods) ANSI C63.4-2009 (Site Validation)		
Test Exercise	EUT was powered with 12.5vDC. The test mode was achieved by placing magnet near reed switch		

Test Supporting Equipment

Device	Manufacturer	Model	S/N	Supplied By	Use
N/A	N/A	N/A	N/A	N/A	N/A

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TEST RESULTS SUMMARY

Requirement	FCC Rule Part	Result
Fundamental & Harmonic Emissions	15.249 (a)(c)(e)	Pass
Occupied Bandwidth	15.215 (c)	Pass
Bandedge Compliance	15.249 (c)(d)(e) 15.209	Pass
Spurious Emissions	15.249 (c)(d)(e) 15.209	Pass
AC Power Line Conducted Emissions	15.207	N/A
Restricted Band Emissions	15.205	Pass
Antenna Requirements	15.203	Pass

Notes:

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RADIATION INTERFERENCE

Rules Part No.: FCC 15.249, 15.209

Requirements:

Frequency	Limits
Part 15.209	
9 to 490 kHz	2400/F (kHz) μ V/m @ 300 meters
490 to 1705 kHz	24000/F (kHz) μ V/m @ 30 meters
1705 kHz to 30 MHz	29.54 dB μ V/m @ 30 meters
30 – 88	40.0 dB μ V/m @ 3 meters
80 – 216	43.5 dB μ V/m @ 3 meters
216 – 960	46.0 dB μ V/m @ 3 meters
Above 960	54.0 dB μ V/m @ 3 meters
Part 15.249	
Fundamental 902 – 928 MHz	94.0 dB μ V/m @ 3 meters
Fundamental 2.4 – 2.4835 GHz	94.0 dB μ V/m @ 3 meters
Harmonics	54.0 dB μ V/m @ 3 meters

Method of Measurement: ANSI C63.10 using a spectrum analyzer, a preselector, a quasi-peak adapter, and an appropriate antenna. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz with an appropriate sweep speed and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3 MHz above 1 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worst case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental. Emissions were scanned from 30MHz to the tenth harmonic of the fundamental frequency at three places in the band. All emissions greater than 20 dB from the limit are not reported.

Formula of Conversion Factors: The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	Meter Reading	+ ACF	+ CL = FS
33	20 dBuV	+ 10.36 dB	+ 0.5 = 30.86 dBuV/m @ 3m

Test Data: Peak Detector Used for all Measurement's unless otherwise noted in table.

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RADIATION INTERFERENCE

Test Data: Peak Detector Used for all Measurement's unless otherwise noted in table.

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,433.0	0.09	18.0	V	0.00	11.48	29.50	10.50
2,433.0	20.62	-8.2	V	0.14	10.01	1.93	38.07
2,433.0	25.90	-6.8	V	0.16	9.22	2.62	37.38
2,433.0	85.85	11.4	H	0.52	9.84	21.80	18.20
2,433.0	184.19	10.6	V	0.82	13.46	24.84	18.66
2,433.0	579.48	12.0	V	1.57	18.47	32.04	95.34
2,433.0	684.61	11.5	H	1.93	21.04	34.49	92.89
2,433.0	2,432.99	40.4	H	3.20	32.21	75.85	51.53
2,433.0	4,866.00	9.1	V	4.93	34.14	48.17	5.83
2,433.0	4,866.02	9.5	H	4.93	34.14	48.57	5.43
2,433.0	7,299.02	8.8	H	5.78	36.03	50.59	3.41
2,433.0	7,299.02	9.2	V	5.78	36.03	51.03	2.97
2,433.0	9,732.06	7.1	V	6.82	36.78	50.74	3.26
2,433.0	9,732.06	7.3	H	6.82	36.78	50.94	3.06

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OCCUPIED BANDWIDTH

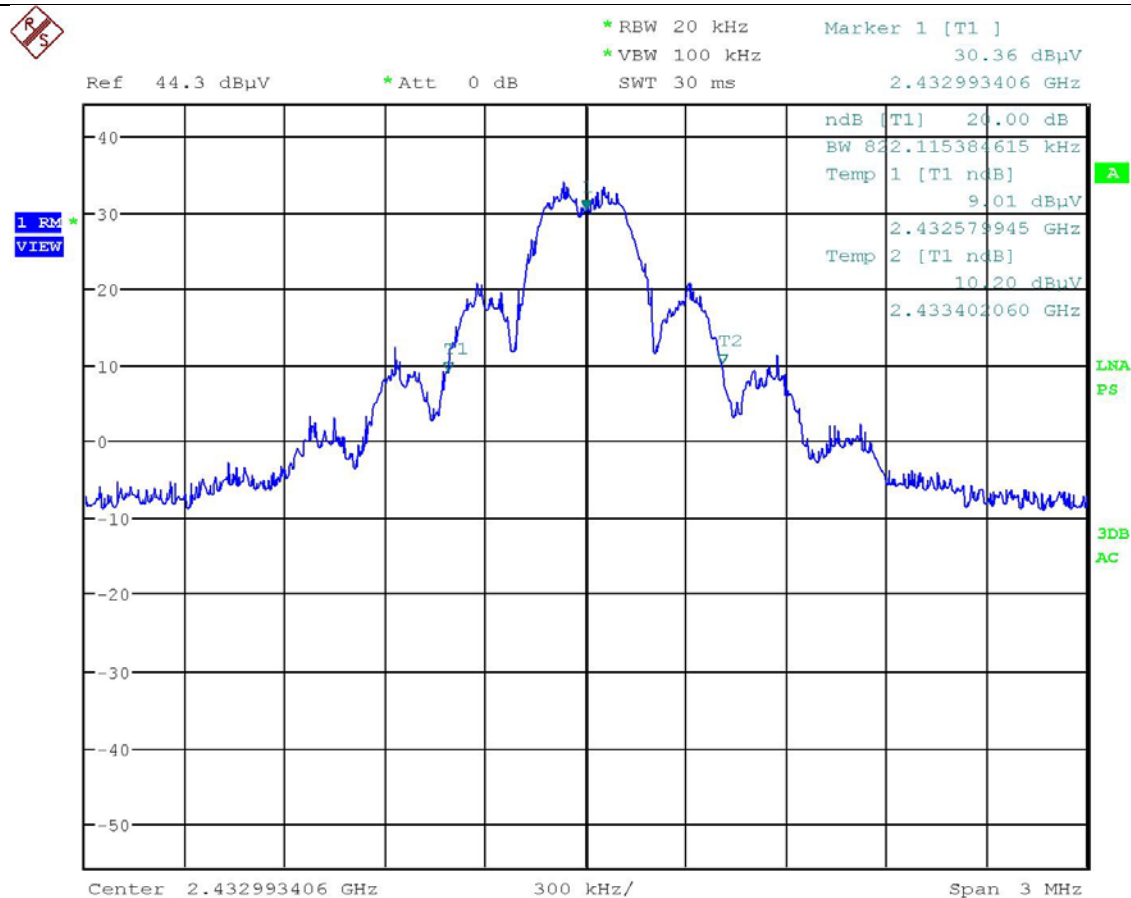
Rules Part No.: FCC 15.215(c)

Requirements: FCC requires that the 20 dB bandwidth of the emission shall be contained within the frequency band designated under which the equipment is operated.

Method of Measurement: ANSI C63.10 § 6.9 Occupied bandwidth tests

Test Data: Low End of Band

20 dB OCC BW = 822.11kHz



RESULTS MEET REQUIREMENTS

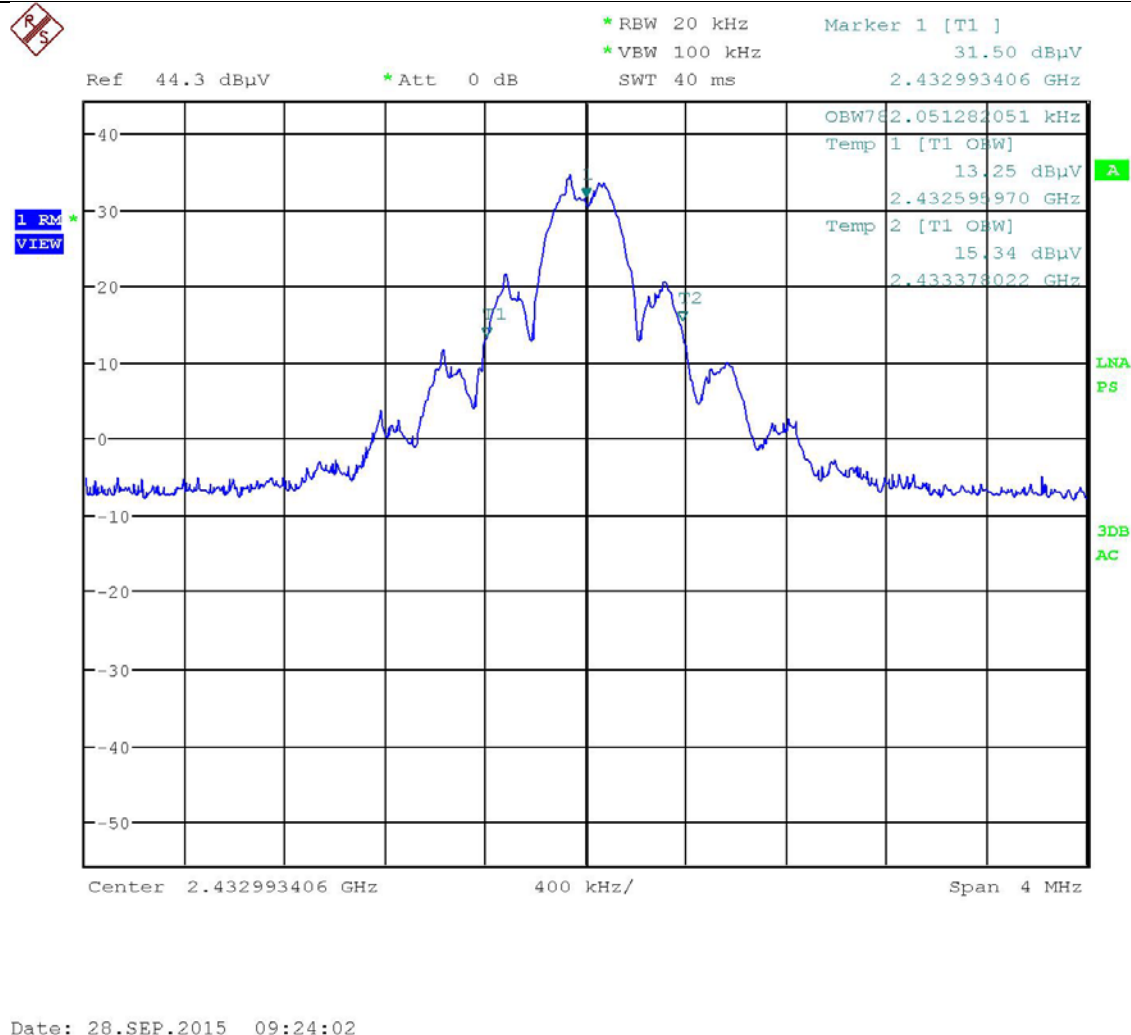
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OCCUPIED BANDWIDTH

Test Data:

99% OCC BW = 782.05kHz



RESULTS MEET REQUIREMENTS

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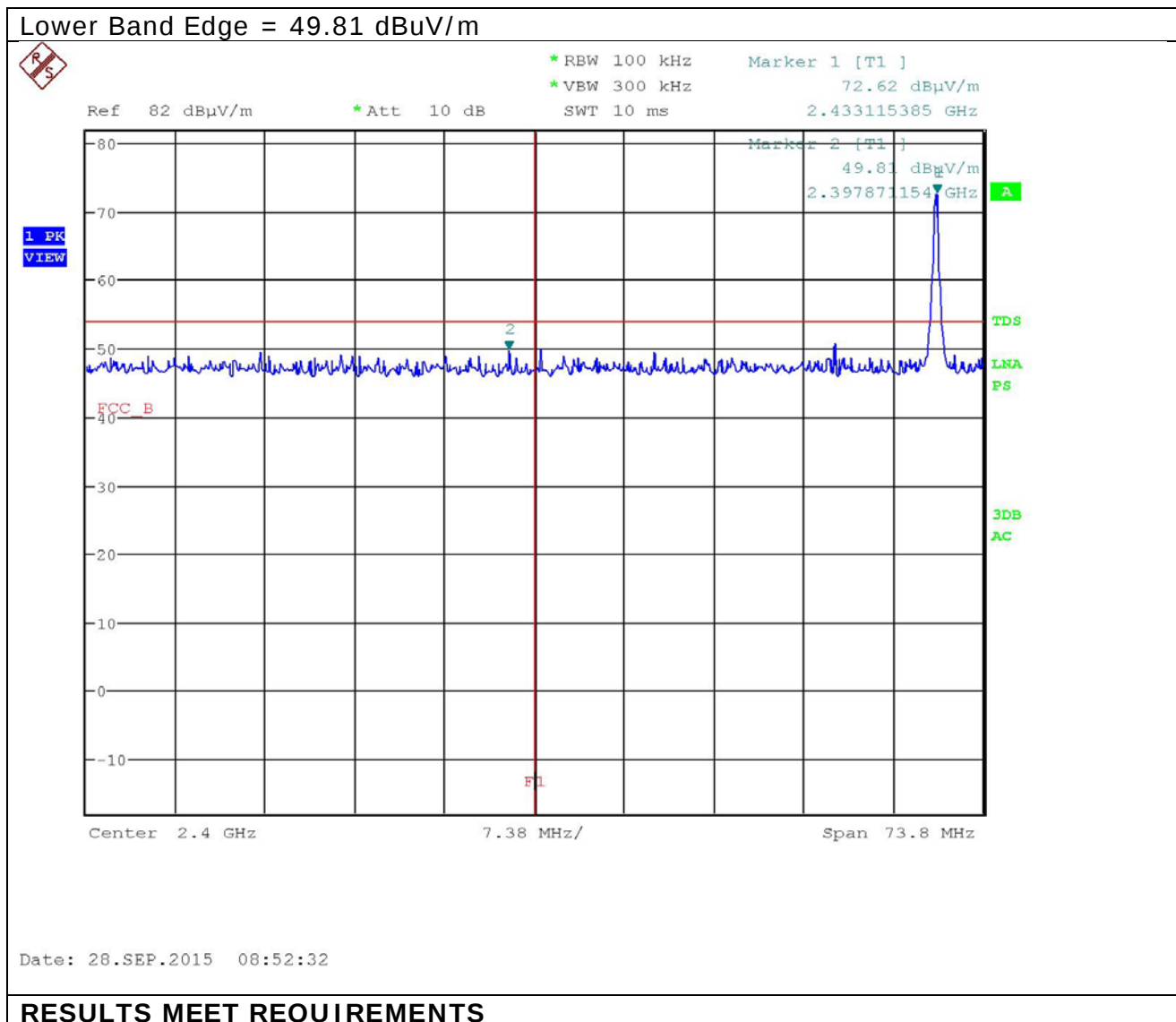
BAND-EDGE

Rules Part No.: FCC 15.249(d)

Requirements: The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

Method of Measurement: ANSI C63.10 § 6.10 Band-edge testing

Test Data:



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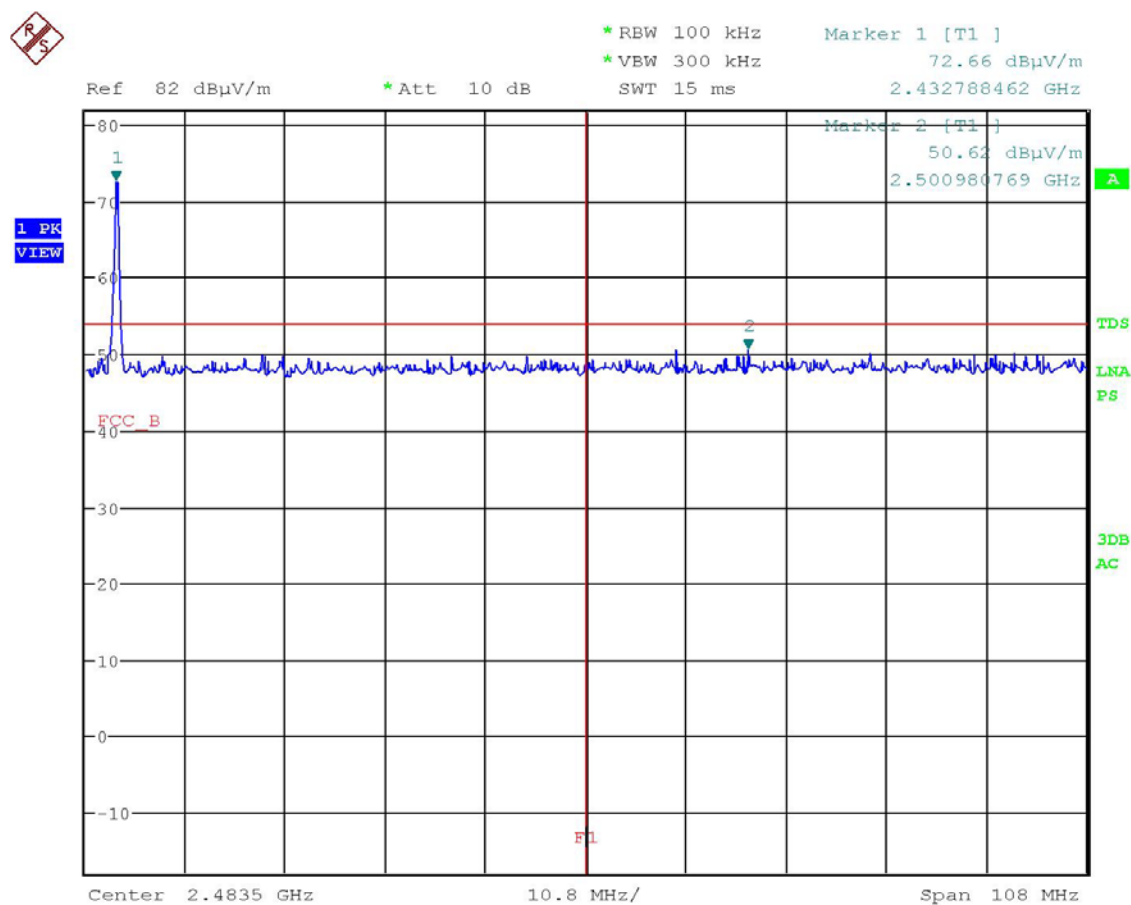
ADJACENT RESTRICTED BAND-EDGE

Rules Part No.: 15.249 (d)

Requirements: 50 dBc or in the case of restricted bands 54 dBuV/m.

Test Data: Field Strength calculation: (Fund FS) dBuV/m-(MD) dB= dBuV/m

Field Strength of Carrier (dBuV/m)	Emission Level Below Carrier (dB)	Field Strength of Emission (dBuV/m)	Emission Limit (dBuV/m)	Margin (dB)
75.85	22.66	53.19	54	0.81



Date: 28.SEP.2015 08:51:00

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EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconnical Chamber	Eaton Chamber	94455-1	1057	06/14/13	12/14/15
Antenna: Log-Periodic Chamber	Eaton	96005	1243	05/31/13	11/30/15
Antenna: Passive Loop	EMC Test Systems	EMCO 6512	9706-1211	07/09/15	07/09/17
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	12/31/13	12/31/15
Antenna: Double-Ridged Horn/ETS Horn 1	ETS-Lindgren Chamber	3117	00035923	06/13/14	06/13/16
Software: Field Strength Program	Timco	N/A	Version 4.0	12/12/99	12/12/99
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	03/11/14	03/11/16

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

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