FCC 47CFR part 15C
Test Report
For
Occupancy Sensor
WDCOCC

Reference Standard: FCC 47CFR part 15C
Manufacturer: Inotec UK Ltd
For type of equipment and serial number, refer to section 3
Report Number: 10-7040-1-13 Issue 02
This report supersedes report: 10-7040-1-13 Issue 01

Report Produced by: -

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Certificate of Test 7040-1

The unit noted below has been tested by **R.N. Electronics Limited** and, where appropriate, conforms to the relevant subpart of FCC 47CFR Part 15. This is a certificate of test only and should not be confused with an equipment authorisation. Other standards may also apply.

Equipment:	Occupancy Sensor
Model Number: Proposed FCC ID:	WDCOCC 2ABOOWDCOCC
Unique Serial Number:	11263A3200
Manufacturer:	Inotec UK Ltd 3 Read Close Hockley Essex SS5 4LS
Full measurement results are detailed in Report Number:	10-7040-1-13 Issue 02
Test Standards:	FCC 47CFR Part 15.249 effective date **October 1st 2012,** Class DXX Intentional Radiator

NOTE:
Certain other requirements are subject to manufacturer declaration only and have not been tested/verified. For details refer to section 3 of this report.

DEVIATIONS:
Deviations from the standards have been applied. For details refer to section 4.2 of this report.

This certificate relates only to the unit tested as identified by a unique serial number and in the condition at the time it was tested. It does not relate to any other similar equipment and performance of the product before or after the test cannot be guaranteed. Whilst every effort is made to assure quality of testing, type tests are not exhaustive and although no non-conformances may be found, this doesn't exclude the possibility of unit not meeting the intentions of the standard or the requirements of the Federal Regulations, particularly under different conditions to those during testing. Any compliance statements are made reliant on (a) the application of the product and use of the assigned band being acceptable to the FCC and (b) the modes of operation as instructed to us by the Customer based on their specific knowledge of the application and functionality of the EUT. Statements of compliance, where measurements were made, do not include the measurement uncertainty. The measurement uncertainty, where stated, is the expanded uncertainty based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Date of Test: 7th and 8th October 2013

Test Engineer: Digitally signed by: Daniel Sims DN: CN = Daniel Sims C = GB O = RN Electronics Date: 2014.01.06 16:57:50 Z

Approved By:
Managing Director: Roger Ray

Customer Representative:

1 Contents

2 Equipment Under Test (EUT)

2.1 Equipment Specification

Applicant	Inotec UK Ltd 3 Read Close Hockley Essex SS5 4LS
Manufacturer of EUT	Inotec UK Ltd
Brand name of EUT	Occupancy Sensor
Model Number of EUT	WDCOCC
Serial Number of EUT	11263A3200
Date when equipment was received by RN Electronics	7th October 2013
Date of test:	7th and 8th October 2013
Visual description of EUT:	Small plastic enclosure with two sensor apertures on one side and slotted air vents on the other. The unit houses an internal battery compartment and fixed integral antenna.
Main function of the EUT:	Work Place occupancy detection.
Height	18mm
Width	80mm
Depth	80mm
Weight	0.64kg
Voltage	4.5V Nominal (3AAA batteries)
Current required from above voltage source	20mA

2.2 EUT Configurations for testing

General parameters	
EUT Normal use position	Under desktop
Choice of model(s) for type tests	Single production variant
Antenna details	Integral Wire Colour coded antenna
Antenna port	Not available
Baseband Data port (yes/no)?	No
Highest Signal generated in EUT	916.5MHz (single RF channel)
Lowest Signal generated in EUT	27MHz (Crystal)
TX Parameters	
Alignment range – transmitter	916.5 MHz
EUT Declared Modulation Parameters	256KBPS GFSK
EUT Declared Power level	0dBm
EUT Declared Signal Bandwidths	500kHz
EUT Declared Channel Spacing's	Single wideband channel
EUT declared Duty Cycle	<1%
Unmodulated carrier available?	Yes
Declared frequency stability	40PPM

2.3 Functional Description

The WDCOCC occupancy sensor utilises a PIR and an IR sensor to detect heat and movement of an area/desk. This occupancy data is transmitted on event at 916.5MHz to a central access point which in turn relays the occupancy information to a central computer system for analysis.

2.4 EUT Modes

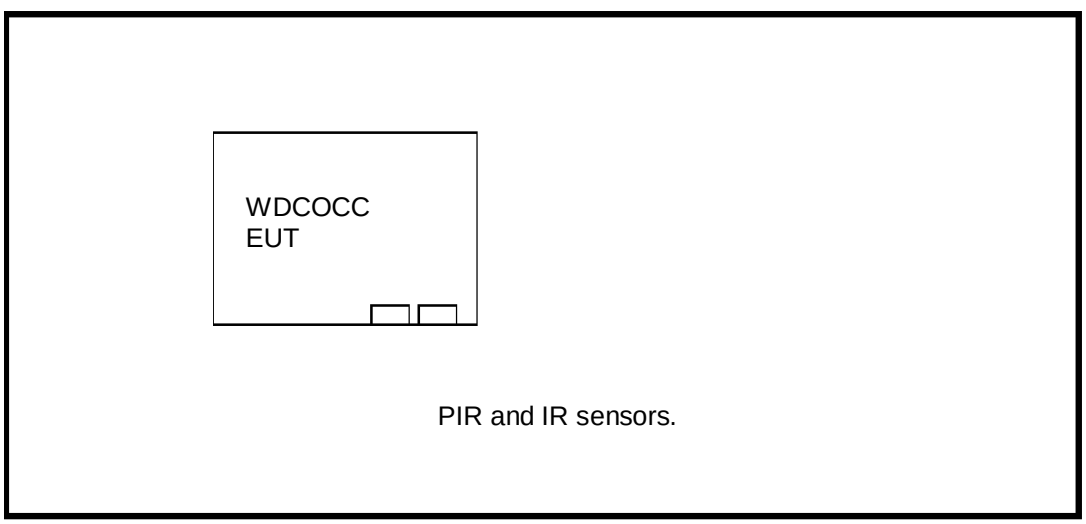
Mode Reference	Description	Used for testing
TX constant single channel	EUT transmitting constantly at 916.5MHz with system modulation	Yes
Normal operation	EUT sitting in an idle state awaiting sensor detection which would then trigger the occupancy data transmission	No

Description of ancillary equipment connected to the equipment under test, for the purpose of tests, can be found in Section 10.

Any modifications made to the EUT, whilst under test, can be found in Section 11.

This report was printed on: 06 January 2014

2.5 Emissions Configuration



The EUT was powered via 3 new AAA batteries. The unit was provided with test software which upon boot up of the EUT it started to constantly transmit with system modulation on the single channel it operates on 916.5MHz. The output power was set in coded software to -0.3dBm (please see modifications section within this report).

3 Summary of test results

The **Occupancy Sensor WDCOCC** was tested to the following standards: -

FCC 47CFR Part 15.249 (effective date October 1st, 2012); Class DXX Intentional Radiator

Any compliance statements are made reliant on the modes of operation as instructed to us by the Manufacturer based on their specific knowledge of the application and functionality of the equipment tested. Whilst every effort is made to assure quality of testing, type tests are not exhaustive and although no non-conformances may be found, this doesn't exclude the possibility of equipment not meeting the intentions of the standard, particularly under different conditions to those during testing.

Title	Reference	Results
1. AC power line conducted emissions	ANSI C63.10 §6.2.	NOT APPLICABLE[1]
2. Intentional radiator field strength	ANSI C63.10 §6.10.	PASSED
3. Radiated emissions	ANSI C63.10 §6.4 – 6.6.	PASSED
4. Frequency stability	ANSI C63.10 §6.8.	NOT APPLICABLE[2]
5. Occupied bandwidth	ANSI C63.10 §6.9.	PASSED
6. Band Edge		PASSED
7. Duty cycle	ANSI C63.10 §7.5.	NOT APPLICABLE[3]

[1] EUT does not operate from the AC power lines nor contain provisions for operation while connected to AC power lines.
[2] EUT is not for fixed, point-to-point operation, therefore no limits are specified.
[3] No limits apply, however duty cycle check made to verify 100% constant TX modes being used.

4 Specifications

The tests were performed by an RN Electronics Engineer who set up the tests, the test equipment, and operated it in accordance with the ***R.N. Electronics Ltd*** procedures manual, ANSI C63.10-2009, FCC Part 15 and those specifications incorporated by reference into 47CFR15 (e.g. ANSI C63.4-2003).

R.N. Electronics Ltd sites M and OATS are listed with the FCC. Registration Number 293246

4.1 Deviations

ANSI C63-10-2009 deviations:
The reference standard ANSI C63.4-2003 was used, not the latest ANSI C63.4-2009

FCC Part 15 deviations:
None.

4.2 Tests at Extremes of Temperature & Voltage

Not required.

4.3 Measurement Uncertainties

Parameter	Uncertainty	
Transmitter Tests		
Occupied bandwidth	± 1.9 %	
Radiated RF power	± 3.5 dB	
Radiated spurious emissions	30MHz - 1000MHz	±5.1dB
	1000MHz - 2000MHz	±4.5dB
	1 – 18 GHz	±3.5dB
	18 – 26.5 GHz	±3.9dB

5 Tests, Methods and Results

5.1 AC power line conducted emissions

NOT APPLICABLE: EUT does not operate from the AC power lines nor contain provisions for operation while connected to AC power lines.

5.2 Intentional radiator field strength

5.2.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.249 a)
Test Method: ANSI C63.10, Reference (6.3 / 6.5)

5.2.2 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres. The antenna was scanned 1-4m in height in both Horizontal and Vertical polarisations. The EUT was rotated in all three orthogonal planes. The EUT was operated in **TX constant single channel** mode.

5.2.3 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below.

Measurements were made in a semi-anechoic chamber. This site is listed with the FCC.

Both the equipment and the antenna were rotated 360° to record the maximised emission.

Tests were performed using Test Site **M.**

5.2.4 Test Equipment used

E410, E411, E412, TMS933

See Section 10 for more details

5.2.5 Test results

Ambient conditions.
Temperature: 19°C Relative humidity: 47 % Pressure: 100 kPa

Radio Parameter 1

Band	902-928 MHz
Power level	-0.3 dBm
Channel spacing	250 kHz
Mod scheme	256 KBPS
Single channel	916.5 MHz

Duty Cycle Table relating to Radio Parameters 1

	Low
Duty Cycle (%)	100.00
Duty Cycle correction	0.00

Results relating to Radio Parameters 1

	Low
QP Level (dBµV/m)	92.60
Plot reference	J7040-1 Pk field strength Horiz ant, Vert EUT (battery compartment at bottom)
Antenna Polarisation	Horiz
EUT Polarisation	Upright vertical

Any Analyser plots can be found in Section 6.3 of this report.

LIMITS:

15.249(a) 50 mV/m @ 3m, (94 dBµV/m @ 3m).

These results show that the EUT has **PASSED** this test.

5.3 Radiated emissions

5.3.1 Test Methods

Test Requirements:	FCC Part 15C, Reference (15.209)
Test Method:	ANSI C63.10, Reference (6.4 – 6.6.)

5.3.2 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres. The EUT was rotated in all three orthogonal planes. Radiated Emissions testing was performed with new batteries.

The EUT was operated in TX constant single channel mode.

5.3.3 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below.

Below 30MHz, measurements were made in a semi-anechoic chamber (pre-scan) with any final measurements required on an OATS without a ground plane. The antenna was placed 1m above the ground. The equipment and the antenna were rotated 360° to record the worst case emissions.

30MHz - 1GHz, measurements were made on a site listed with the FCC. The equipment was rotated 360° and the antenna scanned 1 – 4 metres in both horizontal and vertical polarisations to record the worst case emissions.

Above 1GHz, measurements were made in a semi-anechoic chamber with appropriate absorbing material for use in this range. The EUT was raised and antenna was placed 1.5m above the ground in line with the EUT, which was rotated through 360° to record the worst case emissions. 1 – 6 GHz a measurement distance of 3 metres was used. In the range 6 – 10GHz a measuring distance of 1.2metres was used.

At least 6 signals within 20dB and all signals within 10dB of the limit were investigated.

Tests were performed using Test Site **M.**

5.3.4 Test Equipment used

TMS81**,** TMS82, TMS933, E268, E410, E411, E412, E429, E478

See Section 10 for more details

5.3.5 Test results

Ambient conditions (Radiated emissions above 1 GHz)
Temperature: 19-21 °C Relative humidity: 43-52 %

Analyser plots for the Quasi-Peak / Average values as applicable can be found in Section 6.2 and 6.3 of this report.

Note: EUT tested in a continuous transmit mode for ease of test.

5.3.5.1 Below 30MHz.

Plot references for Low Frequency Radiated emissions measurements (150kHz to 30MHz)

Channel	Parallel Plots	Perpendicular Plots
Single channel	7040-1 150k-30MHz Parallel TX single channel	7040-1 150k-30MHz Perpendicular TX single channel

5.3.5.2 30MHz - 1GHz.

Plot references for Radiated emissions measurements (30-1000MHz)

Frequency Range	Antenna Polarisation	Plot reference
30 – 300 MHz	Horizontal	7040-1 Rad 1 VHF Horiz
30 – 300 MHz	Vertical	7040-1 Rad 1 VHF Vert
300 – 1000 MHz	Horizontal	7040-1 Rad 1 UHF Horiz
300 – 1000 MHz	Vertical	7040-1 Rad 1 UHF Vert

Table of signals measured (TX single channel)

Horizontal

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	864.619	40.3	36.6	-9.4
2	877.601	37.9	33.0	-13.0
3	955.359	40.3	35.3	-10.7
4	968.372	43.2	38.5	-7.5

Vertical

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	968.613	41.8	38.4	-15.6

5.3.5.3 Above 1GHz.

Radio Parameters 1

Band	902-928 MHz
Power level	-0.3 dBm
Channel spacing	250 kHz
Mod scheme	256 KBPS
Single channel	916.5 MHz

Results relating to Radio Parameters 1

Spurious Frequency (MHz)	Measured Peak Level (dBµV/m)	Difference to Peak Limit (dB)	Measured Average Level (dBµV/m)	Difference to Average Limit (dB)	Antenna Polarisation	EUT Polarisation
1833	49	-25	45.5	-8.5	Vertical	Vertical
2749.5	45.8	-28.2	39.1	-14.9	Vertical	Vertical
3666	53.8	-20.2	45.9	-8.1	Vertical	Horizontal
4582.5	48.6	-25.4	37.9	-16.1	Vertical	Vertical
5499	48.5	-25.5	38	-16	Vertical	Vertical
7332	47.7	-26.3	37.4	-16.6	Vertical	Vertical
9165	51.1	-22.9	39.2	-14.8	Vertical	Vertical
1833	50	-24	47	-7	Horizontal	Horizontal
2749.5	46.5	-27.5	39	-15	Horizontal	Horizontal
3666	53.5	-20.5	46.1	-7.9	Horizontal	Vertical
4582.5	50.3	-23.7	40.5	-13.5	Horizontal	Vertical
5499	51.1	-22.9	41	-13	Horizontal	Vertical
6415.5	44.2	-29.8	42.5	-11.5	Horizontal	Vertical
7332	52.6	-21.4	43.2	-10.8	Horizontal	Vertical

Plot reference table for above 1GHz emissions

Frequency Range	Antenna Polarisation	Plot reference
1-3GHz	Vertical	7040-1 Vertical 1-3GHz
1-3GHz	Horizontal	7040-1 Horizontal 1-3GHz
3-5GHz	Vertical	7040-1 Vertical 3-5GHz
3-5GHz	Horizontal	7040-1 Horizontal 3-5GHz
5-6GHz	Vertical	7040-1 Vertical 5-6GHz
5-6GHz	Horizontal	7040-1 Horizontal 5-6GHz
6-7.8GHz	Vertical	7040-1 Vertical 6-7.8GHz
6-7.8GHz	Horizontal	7040-1 Horizontal 6-7.8GHz
7.8-9.3GHz	Vertical	7040-1 Vertical 7.8-9.3GHz
7.8-9.3GHz	Horizontal	7040-1 Horizontal 7.8-9.3GHz

LIMITS:
15.209 limits are applicable in the restricted bands of 15.205 with the relevant detector
15.249(a) harmonics must not exceed 500 (54 dB) µV/m @ 3m.
15.249(d) other emissions, outside the intentional band, must be attenuated by at least 50dB from the level of the fundamental / meet the general limits of 15.209.

n.b. the general limits of 15.209 are as drawn on the respective plots.

These show that the **EUT** has **PASSED** this test.

5.4 Frequency stability

NOT APPLICABLE: EUT is not for fixed, point-to-point operation, therefore no limits are specified

5.5 Occupied bandwidth

5.5.1 Test Methods

Test Requirements**:** FCC Part 15C, Reference (15.215)
Test Method: ANSI C63.10, Reference (6.9)

5.5.2 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres. The EUT was operated in TX constant single channel mode.

5.5.3 Test Procedure

Tests were performed using Test Site **M.**
Tests were made in accordance with FCC Part 15 using the measuring equipment noted below. A 10kHz RBW (1-5% of OCBW), 2MHz span (2-5 x OCBW), 3x VBW, auto sweep time and max hold settings were used for the 20dB bandwidth.

5.5.4 Test Equipment used

E410, E411, E412, TMS933

See Section 10 for more details.

5.5.5 Test results

Ambient conditions.
Temperature: 20 °C Relative humidity: 49 % Pressure: 100 kPa

Analyser plots for the 20dB bandwidth can be found in Section 6.4 of this report.

Radio Parameter 1

Band	902-928 MHz
Power level	-0.3 dBm
Channel spacing	250 kHz
Mod scheme	256 KBPS
Single channel	916.5 MHz

Results relating to Radio Parameters 1

	Low
99% BW (kHz)	498.249
Plot reference	J7040-1 OCBW

LIMITS:
15.215(c) the 20dB bandwidth of the emission must be contained within the designated frequency band.

These results show that the EUT has **PASSED** this test.

5.6 Band Edge

5.6.1 Test Methods

Test Requirements:	FCC Part 15C, Reference (15.215 and 15.247)
Test Method:	FCC Part 15C, Reference (15.215) ANSI C63.10-2009, Reference clause 6.9.3

5.6.2 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres.

The EUT was operated in TX constant single channel mode.

5.6.3 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below. The emission from the EUT was maximised before taking the plots.

Tests were performed using Test Site **M**.

5.6.4 Test Equipment used

E410, E411, E412, TMS933

See Section 10 for more details.

5.6.5 Test results

Ambient conditions.
Temperature: 20 °C Relative humidity: 49 % Pressure: 100 kPa

The following tables list the field strengths observed in the adjacent restricted bands, which are required to meet the tighter 15.209 limits:

Radio Parameter 1

Band	902-928 MHz
Power level	-0.3 dBm
Channel spacing	250 kHz
Mod scheme	256 KBPS
Low channel	916.5 MHz

Restricted Band Edge Results relating to Radio Parameters 1

	Low	High
Peak Level (dBµV/m)	33.0	34.6
Peak Plot reference	J7040-1 Band edge plot	J7040-1 Band edge plot

Note: As Peak field strengths were below the Average limits, average measurements have not been made.

Band Edge Results relating to Radio Parameters 1

	Low	High
Plot reference	J7040-1 Band edge plot 2	J7040-1 Band edge plot 2

The band edge readings were performed with a peak detector (max held plot) and with the EUT set in a constant 100% transmit state.

Limits:
AV = 54dBuV/m at band edges
PK = 74dBuV/m at band edges

The restricted band edges closest to the EUT frequency of 902-928MHz are 614 & 960MHz.

Further wider span plots have been taken to show the fact that there are no spurious emissions above the restricted limits of 15.209.

These results show that the **EUT** has **PASSED** this test.

5.7 Duty cycle

NOT APPLICABLE: No limits apply, however duty cycle check made to verify 100% constant TX modes being used. Constant TX mode was indeed 100% duty cycle.

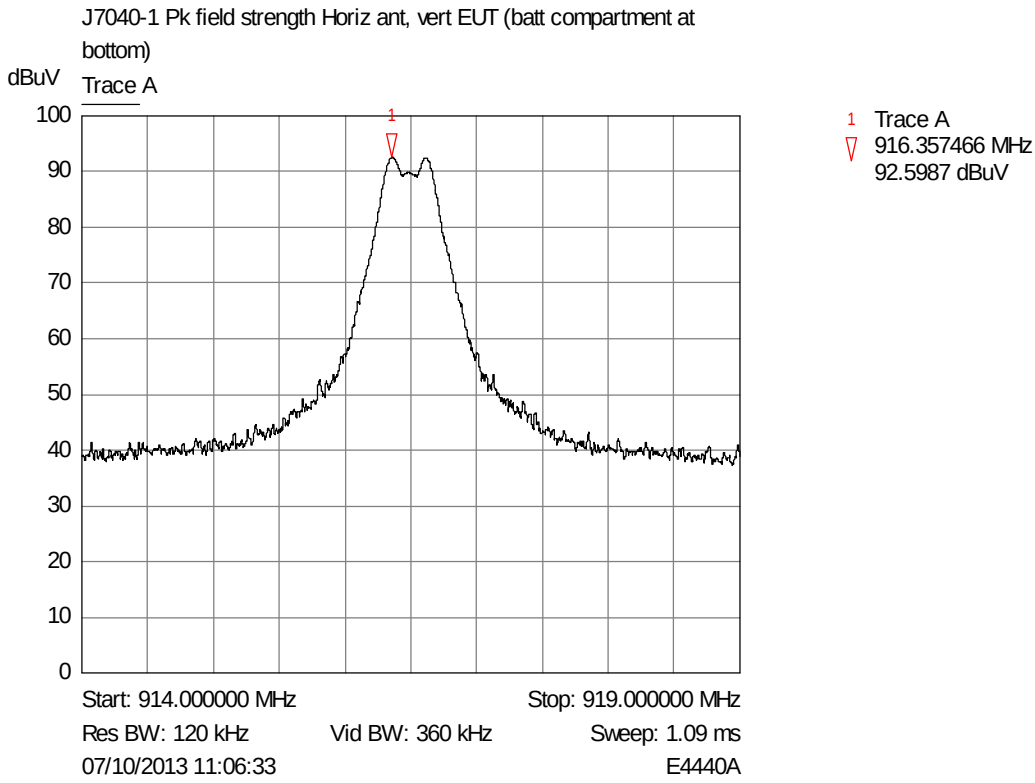
6 Plots and Results

6.1 AC power line conducted emissions plots

Not applicable, EUT does not operate from the AC power lines nor contain provisions for operation while connected to AC power lines

6.2 Intentional radiator field strength plots

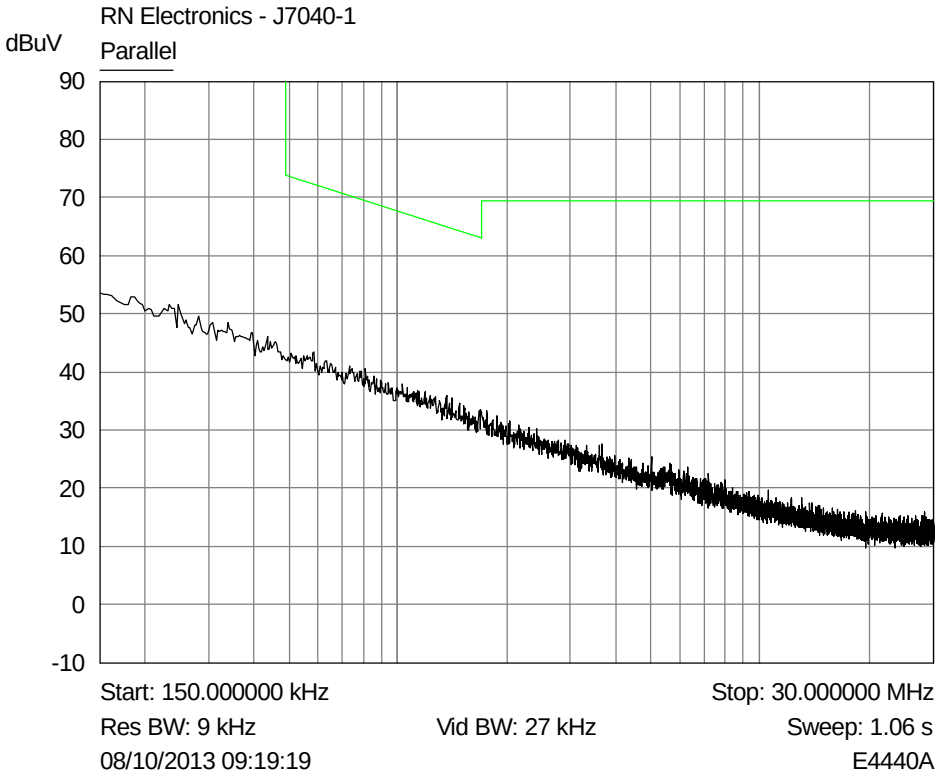
6.2.1 Plots for Band 902-928 MHz, Power -0.3 dBm, Spacing single channel, and Modulation 256 kbps



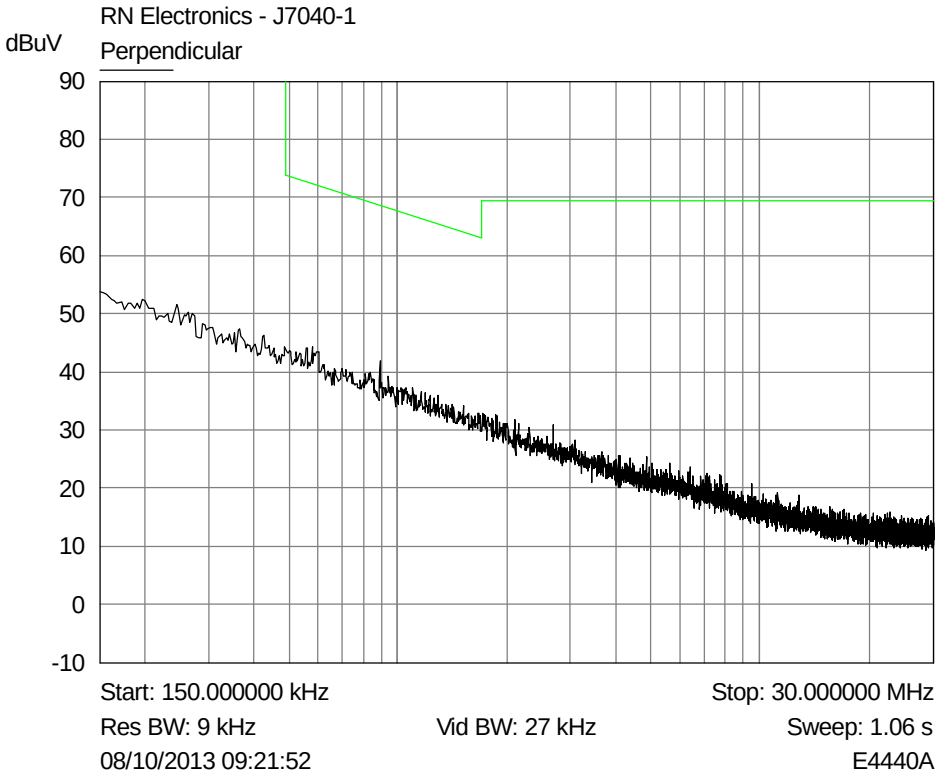
Single channel

6.3 Radiated emissions plots

6.3.1 Low frequency radiated emissions plots

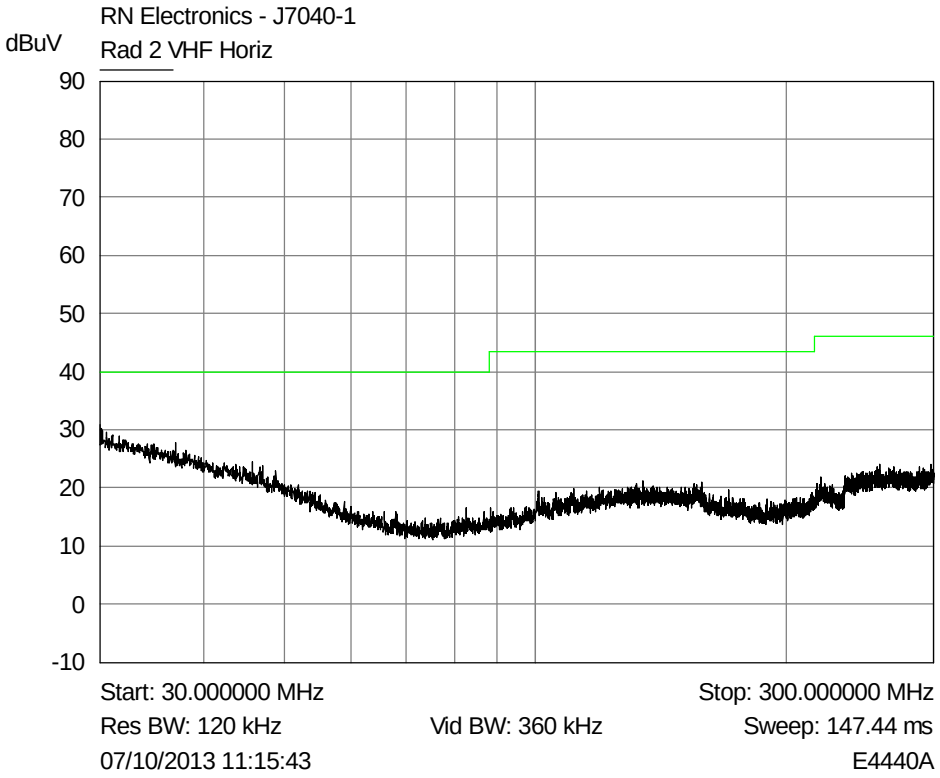


Single channel - Parallel Plot

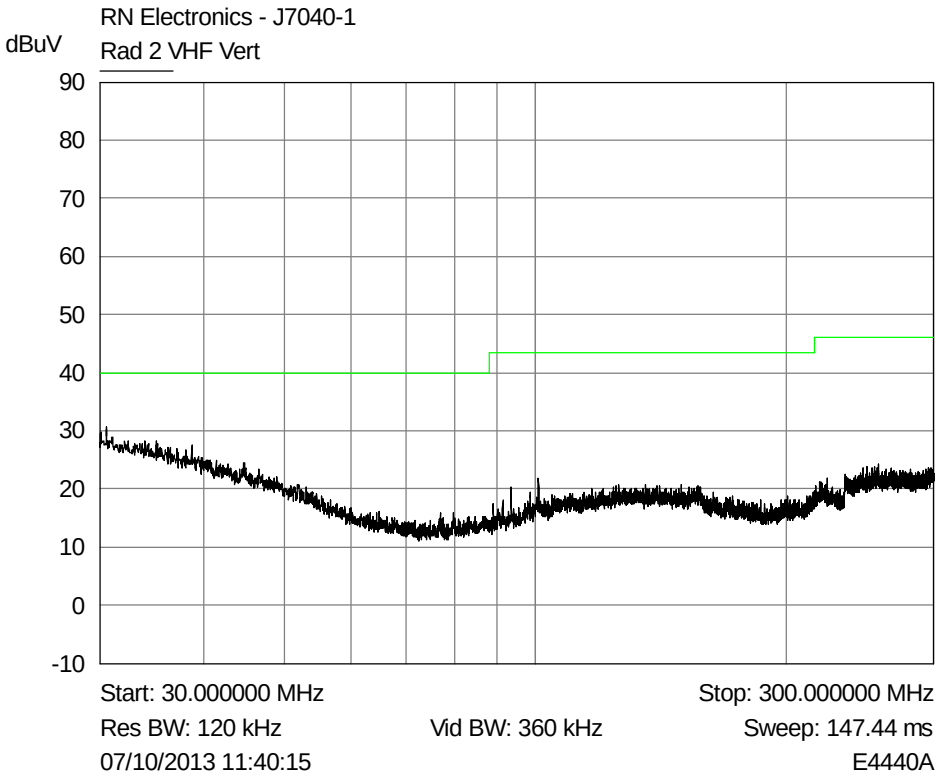


Single channel - Perpendicular Plot

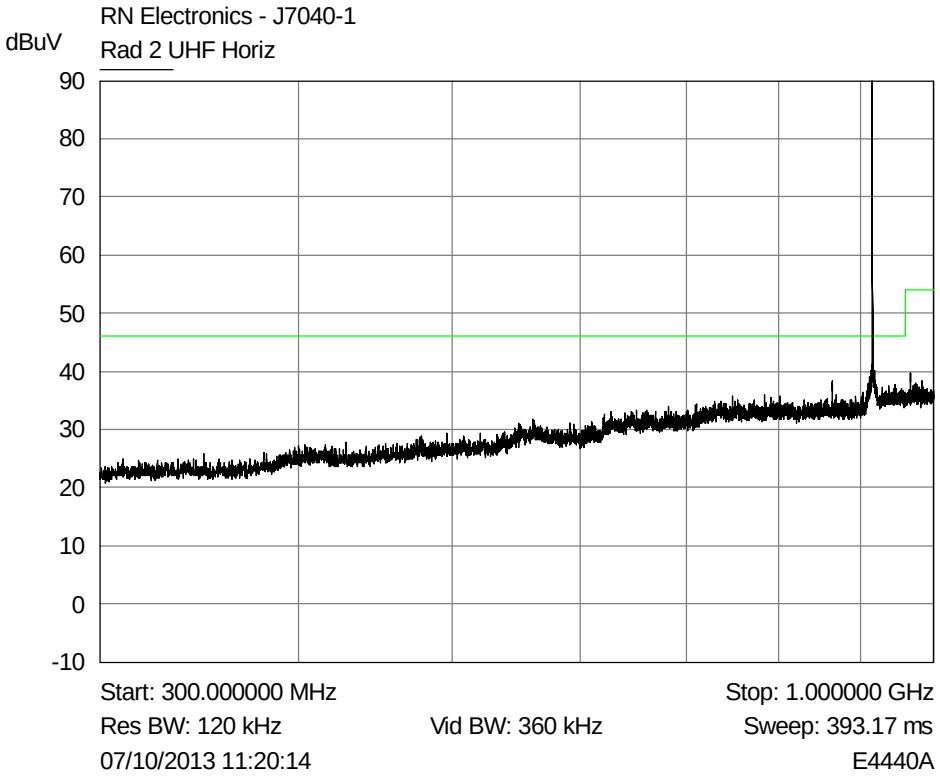
6.3.2 Radiated emissions - 30MHz - 1GHz



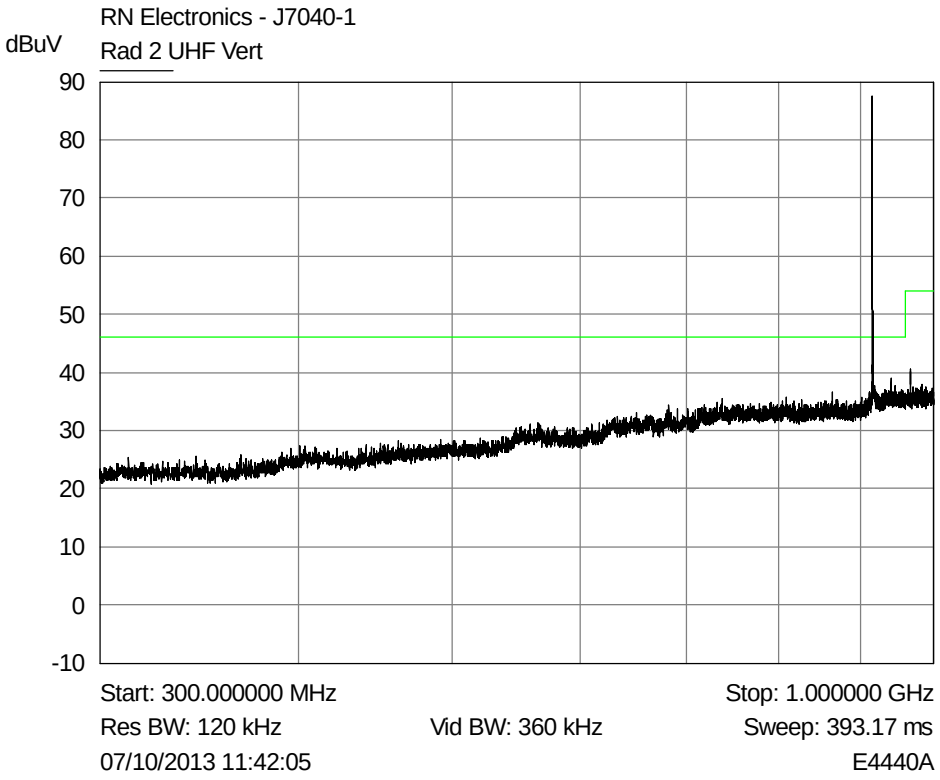
TX single channel: Plot of peak horizontal emissions 30MHz - 300MHz against the quasi-peak limit line.



TX single channel: Plot of peak vertical emissions 30MHz - 300MHz against the quasi-peak limit line.

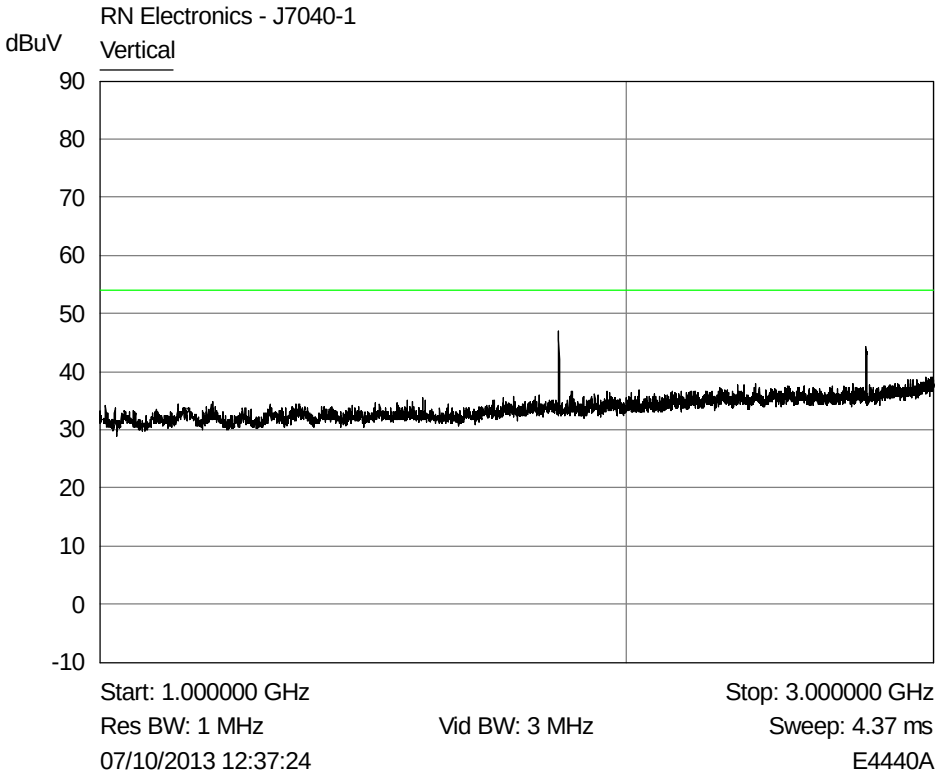


TX single channel: Plot of peak horizontal emissions 300MHz - 1GHz against the quasi-peak limit line.

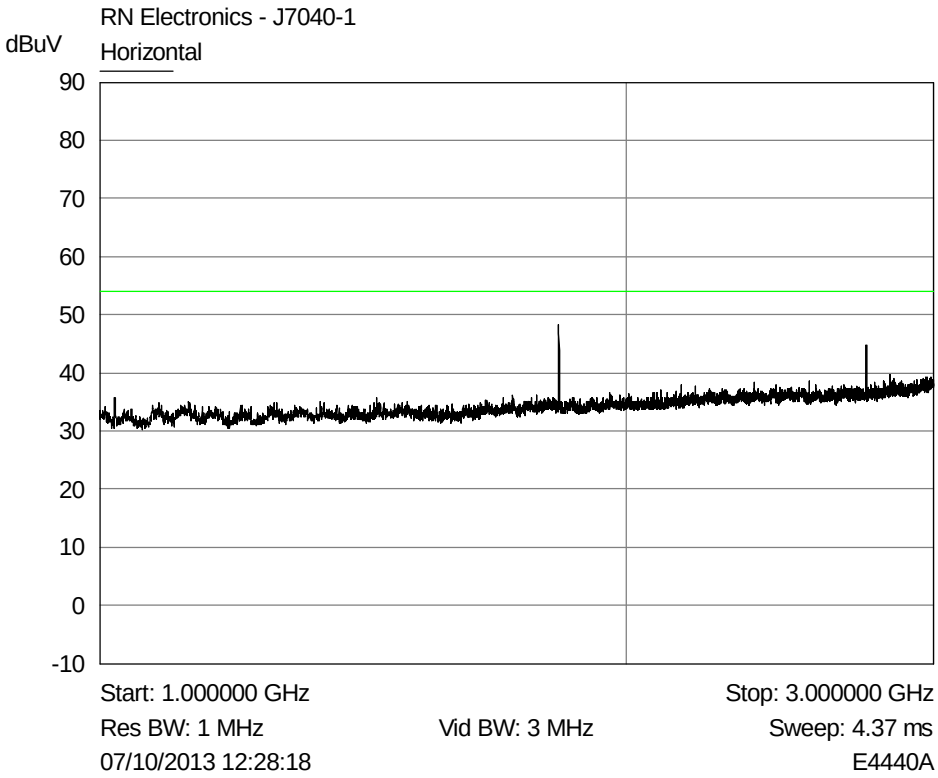


TX single channel: Plot of peak vertical emissions 300MHz - 1GHz against the quasi-peak limit line.

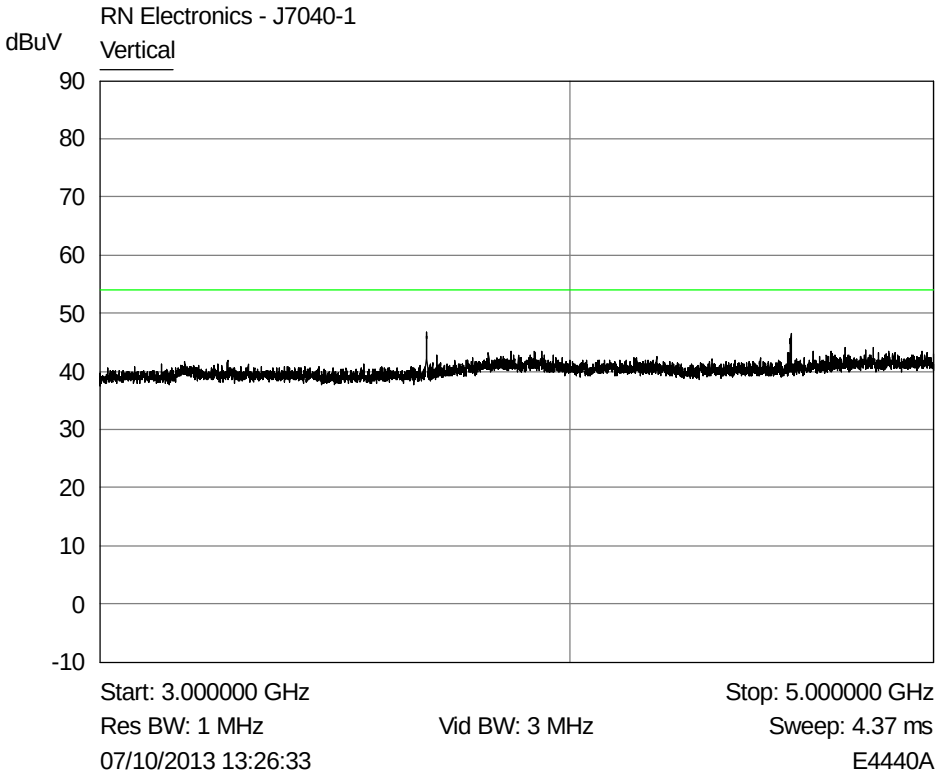
6.3.3 Radiated emissions Plots above 1GHz



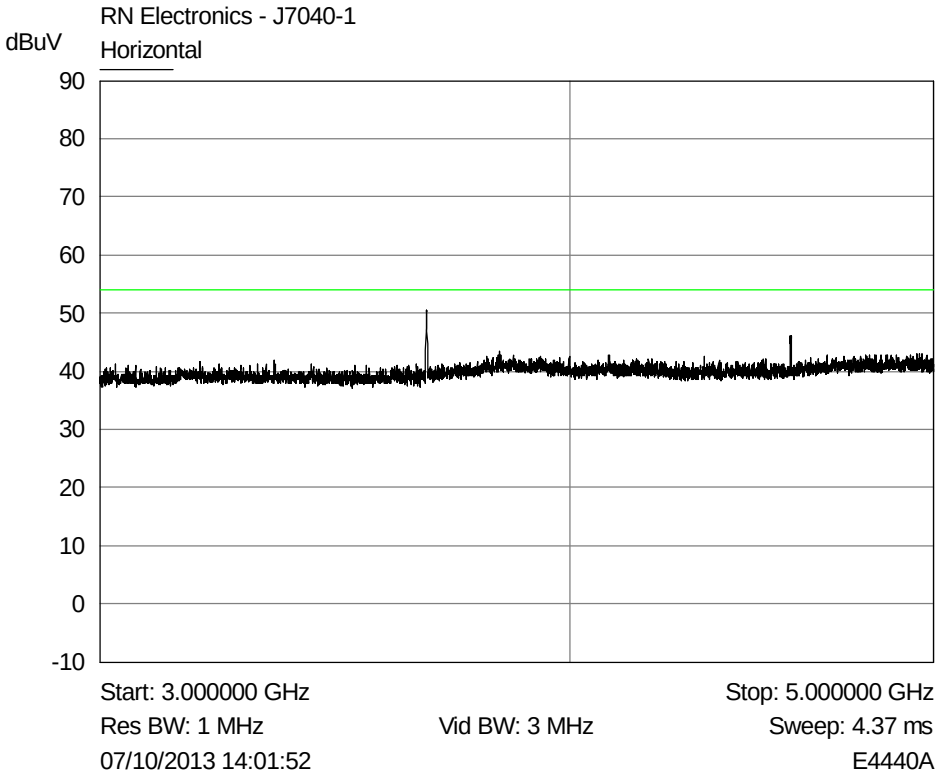
Single channel (916.5 MHz) - 1-3GHz - Vertical



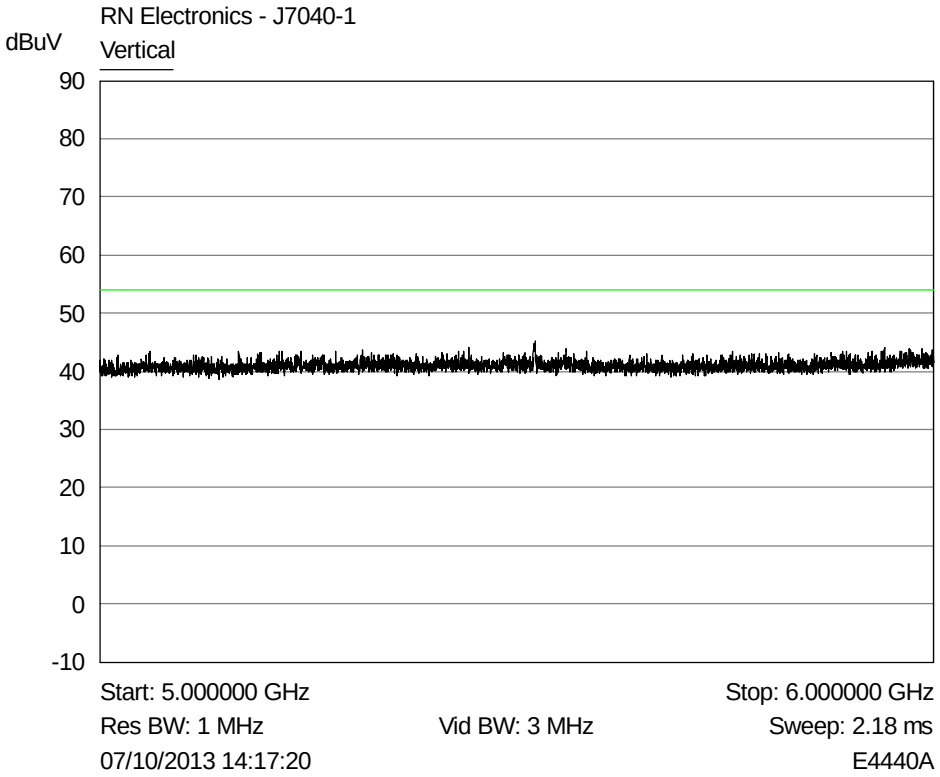
Single channel (916.5 MHz) - 1-3GHz - Horizontal



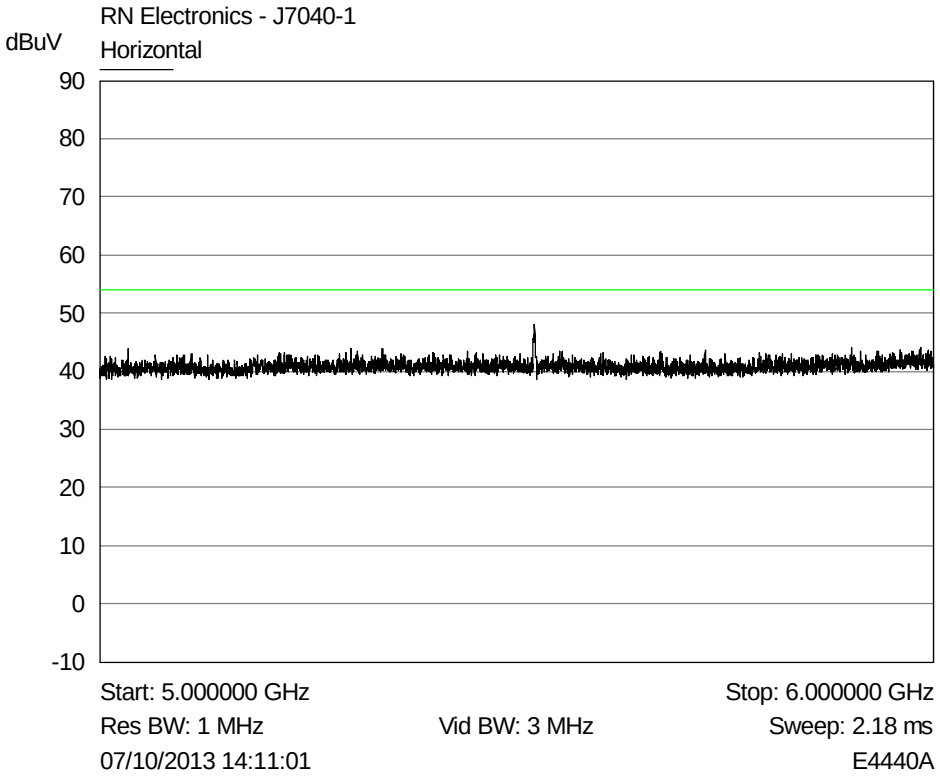
Single channel (916.5 MHz) - 3-5GHz - Vertical



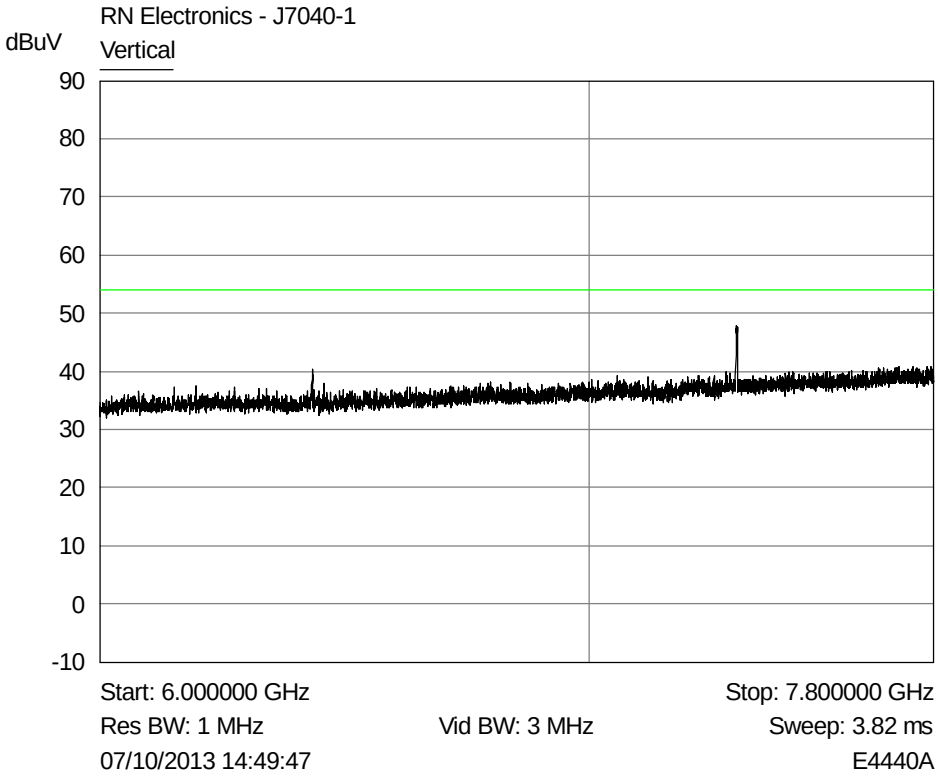
Single channel (916.5 MHz) - 3-5GHz - Horizontal



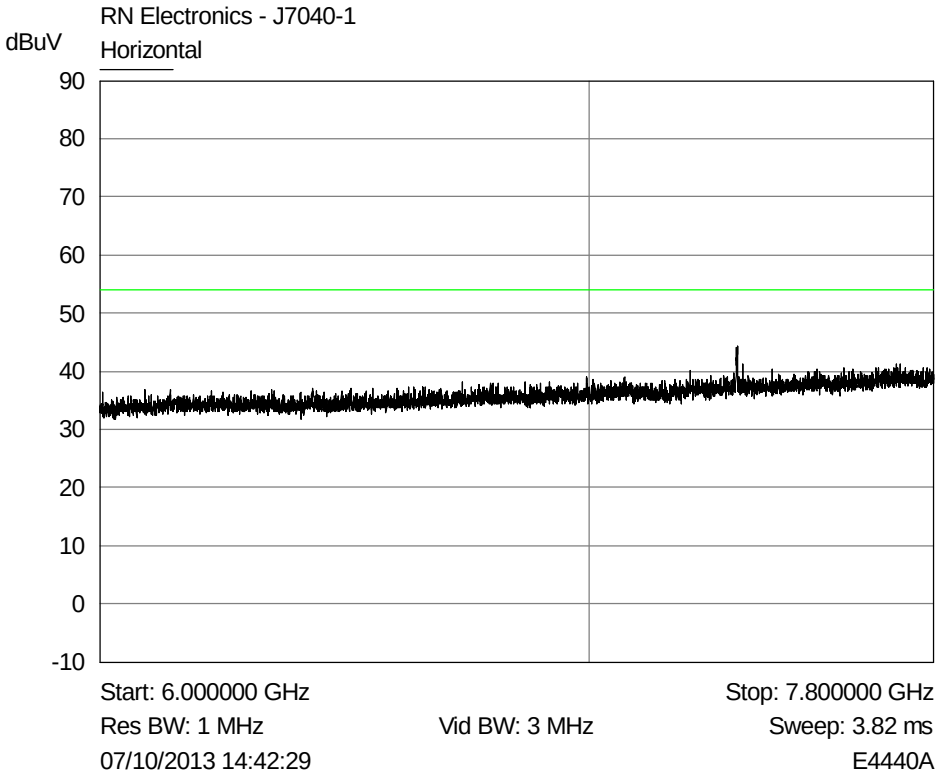
Single channel (916.5 MHz) - 5-6GHz - Vertical



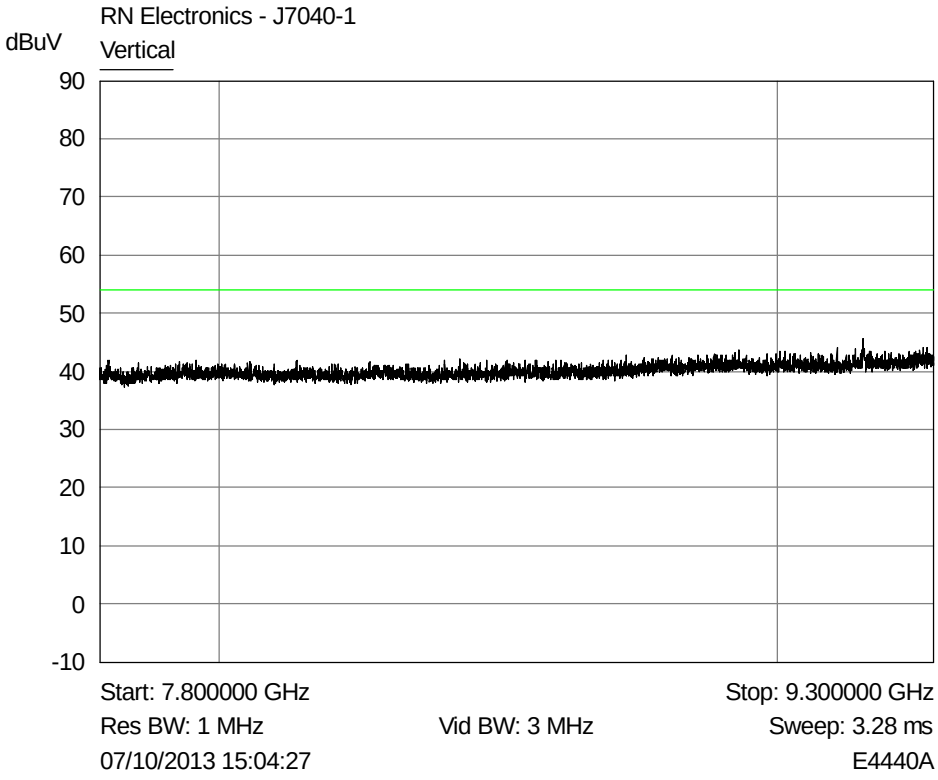
Single channel (916.5 MHz) - 5-6GHz - Horizontal



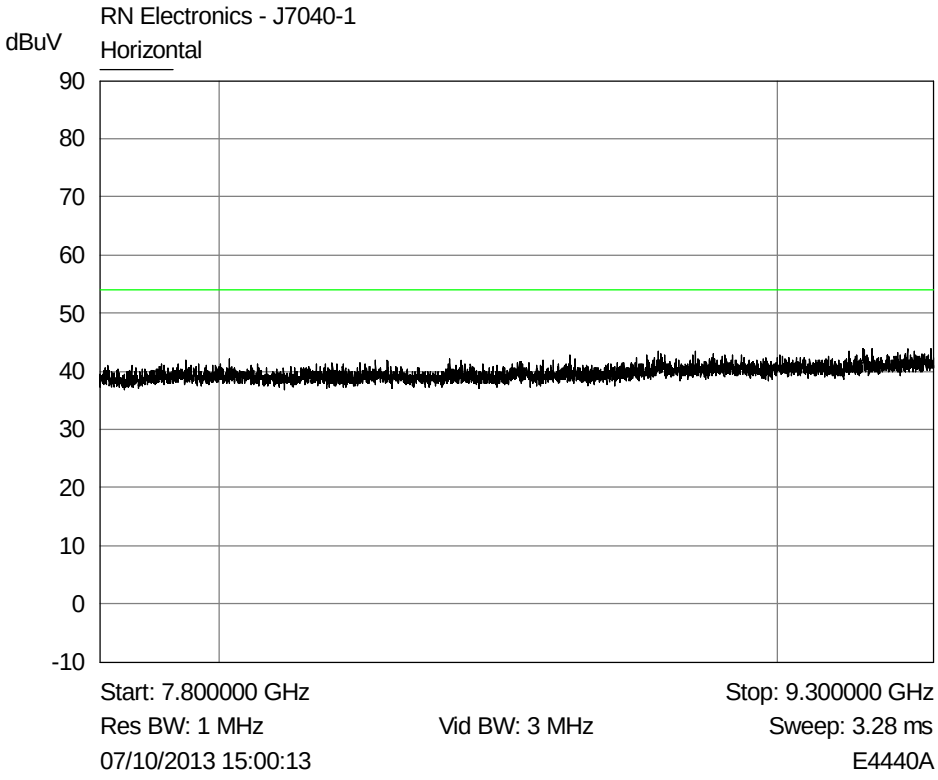
Single channel (916.5 MHz) - 6-7.8GHz - Vertical



Single channel (916.5 MHz) - 6-7.8GHz - Horizontal



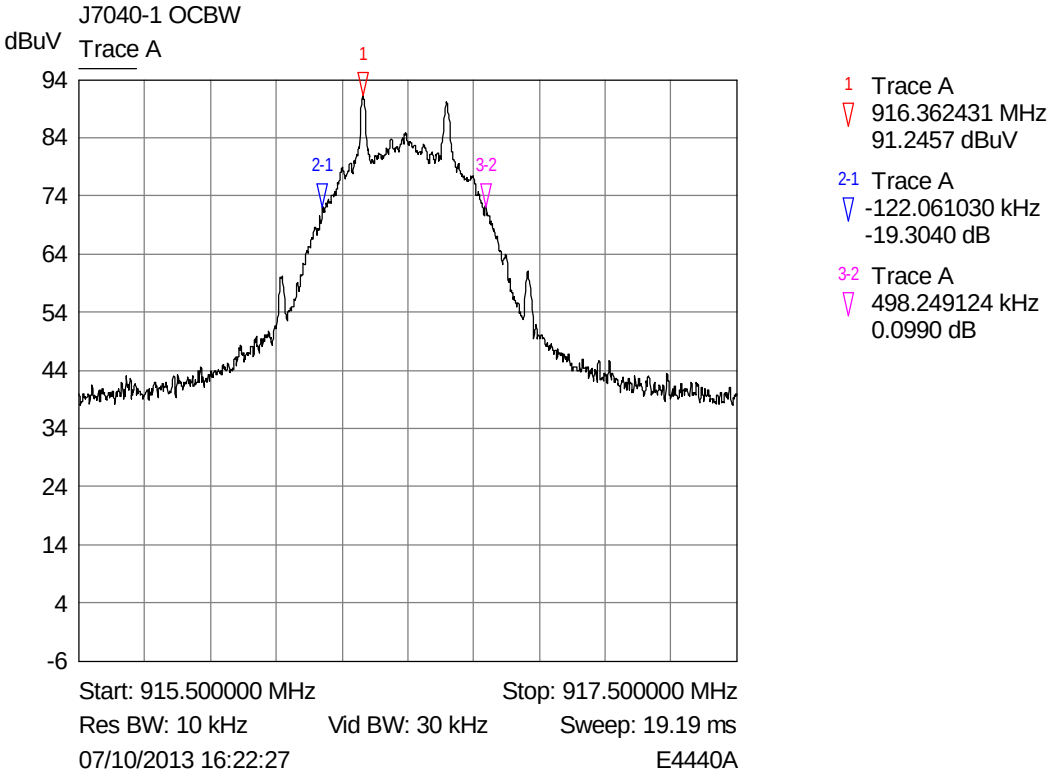
Single channel (916.5 MHz) - 7.8-9.3GHz - Vertical



Single channel (916.5 MHz) - 7.8-9.3GHz - Horizontal

6.4 20dB bandwidth / occupied bandwidth plots

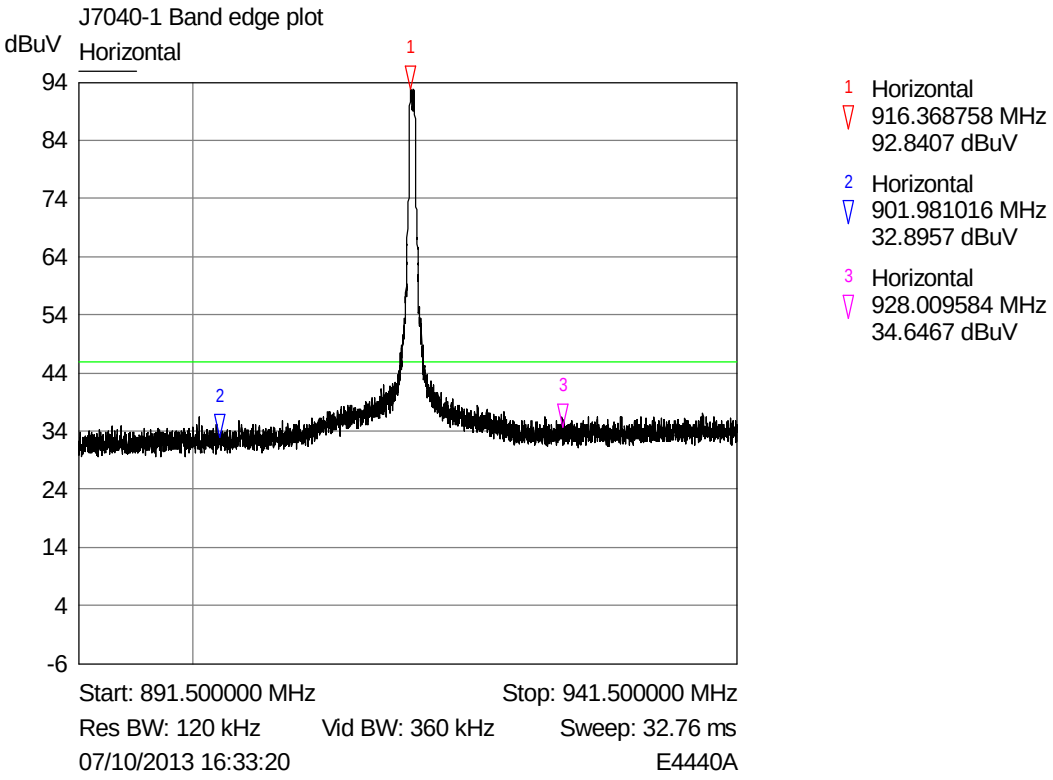
6.4.1 Plots for Band 902-928 MHz, Power -0.3 dBm, Spacing single channel, and Modulation 256 kbps



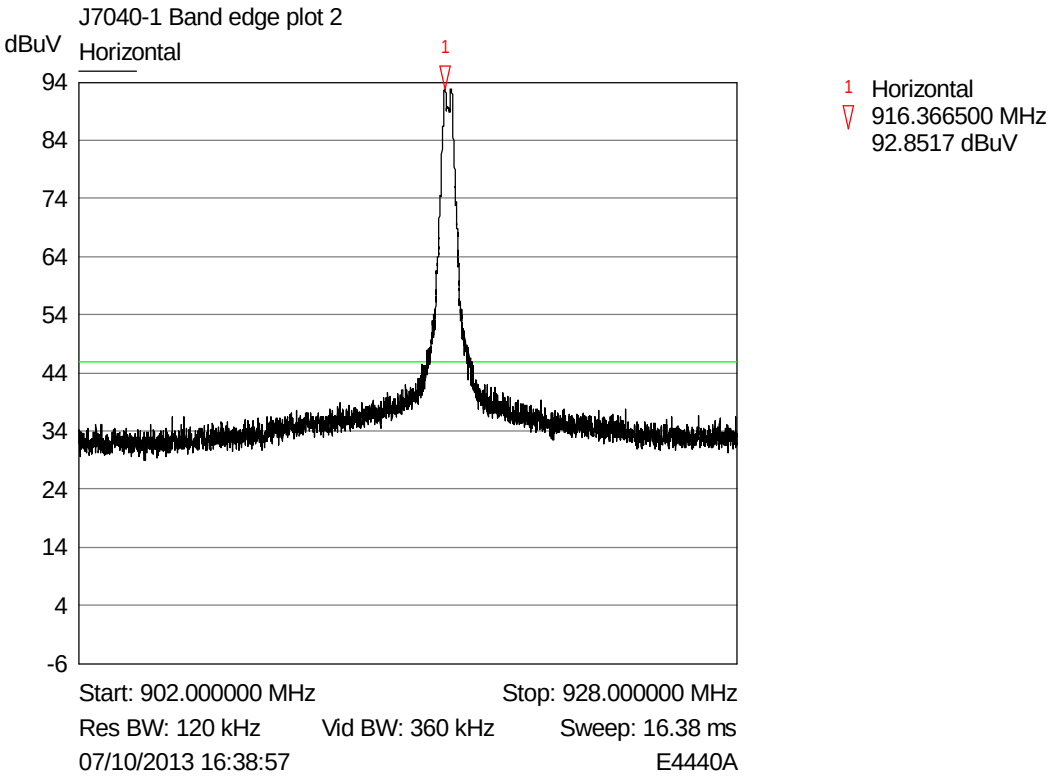
Single channel

6.5 Band edge compliance plots

6.5.1 Plots for Band 902-928 MHz, Power -0.3 dBm, Spacing single channel, and Modulation 256 kbps



Restricted Band: Single channel Peak Plot



Band Edge: Single channel Peak Plot

7 Explanatory Notes

7.1 Explanation of Table of Signals Measured

Measurements are made as required by the standard. These measurements are made and recorded using detectors, either peak, quasi peak or average dependant on the test. A table of results has been given following the relevant plots. This table looks similar to the one illustrated below dependant on the measurements required by the test: -

Signal No.	Freq (MHz)	Peak Amp (dBuV)	Pk – Lim 1 (dB)	QP Amp (dBuV)	QP - Lim1 (dB)	Av Amp (dBuV)	Av - Lim1 (dB)
1	12345	54.9	-10.5	48.0	-12.6	37.6	-14.4

Column One - Labelled Signal No. is an incremental number that the receiver has given to each signal that has been measured.

Column Two - Labelled Freq (MHz) is the approximate frequency of the signal received.

Column Three - Labelled Peak Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the peak detector.

Column Four - Labelled Pk - Lim1 (dB) is the difference in level from the peak signal given to the active limit line. If this column appears in the table the peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Five - Labelled QP Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the quasi-peak detector.

Column Six - Labelled QP - Lim1 (dB) is the difference in level from the quasi-peak signal given to the active limit line. If this column appears in the table the quasi-peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Seven - Labelled Av Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the average detector.

Column Eight - Labelled Av - Lim1 (dB) is the difference in level from the average signal given to the active limit line. If this column appears in the table the average detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Only signals highlighted in red are deemed to exceed the limit of the detector required.

7.2 Explanation of limit line calculations for radiated measurements

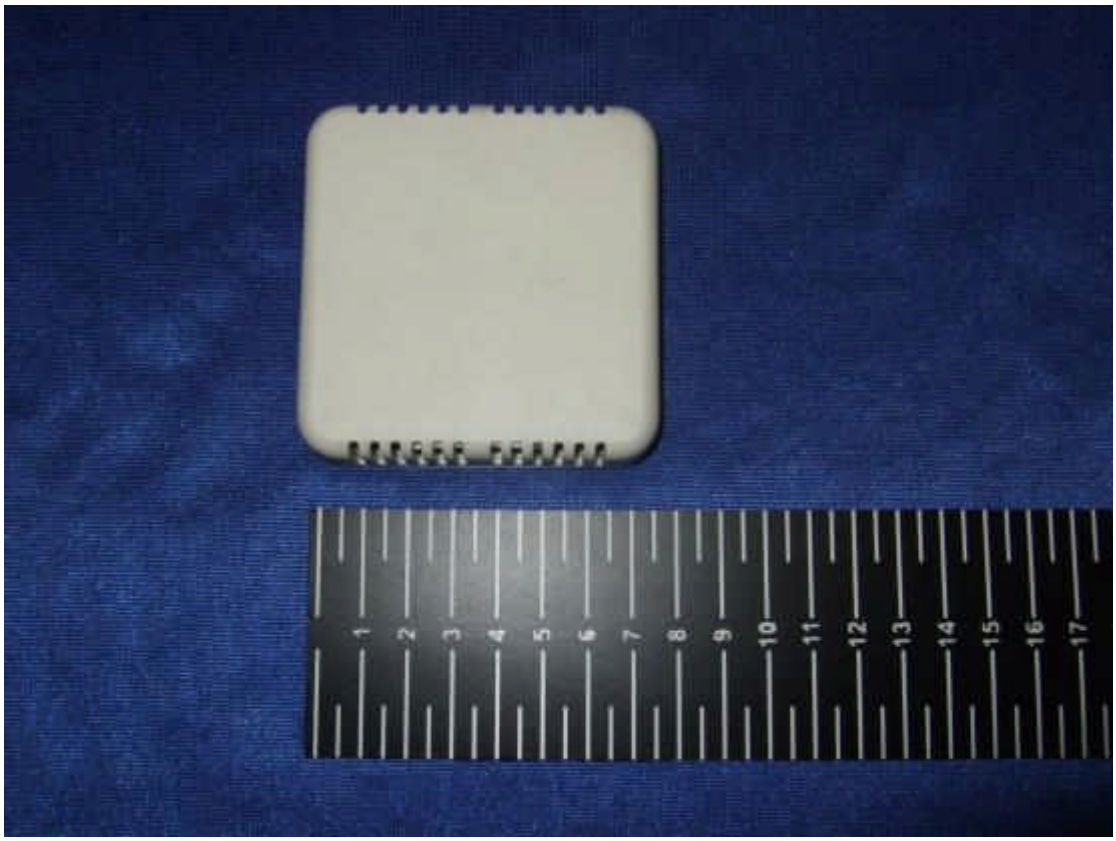
The limits given in the test standard are normally expressed as absolute values (e.g. in μV/m at a specified distance), whereas the measured values are expressed as peak, quasi peak or average values in dBμV/m referenced to the measuring instrument inputs. RN Electronics calibrate the test set-up to account for any path losses, antenna gains, etc. so that the value read at the receiver relates directly to the absolute value required, except that it is expressed in dB relative to one microVolt and may need to take account of any alternative measuring distance used. Examples:

(a) limit of 500 μV/m equates to 20.log (500) = 54 dB μV/m.

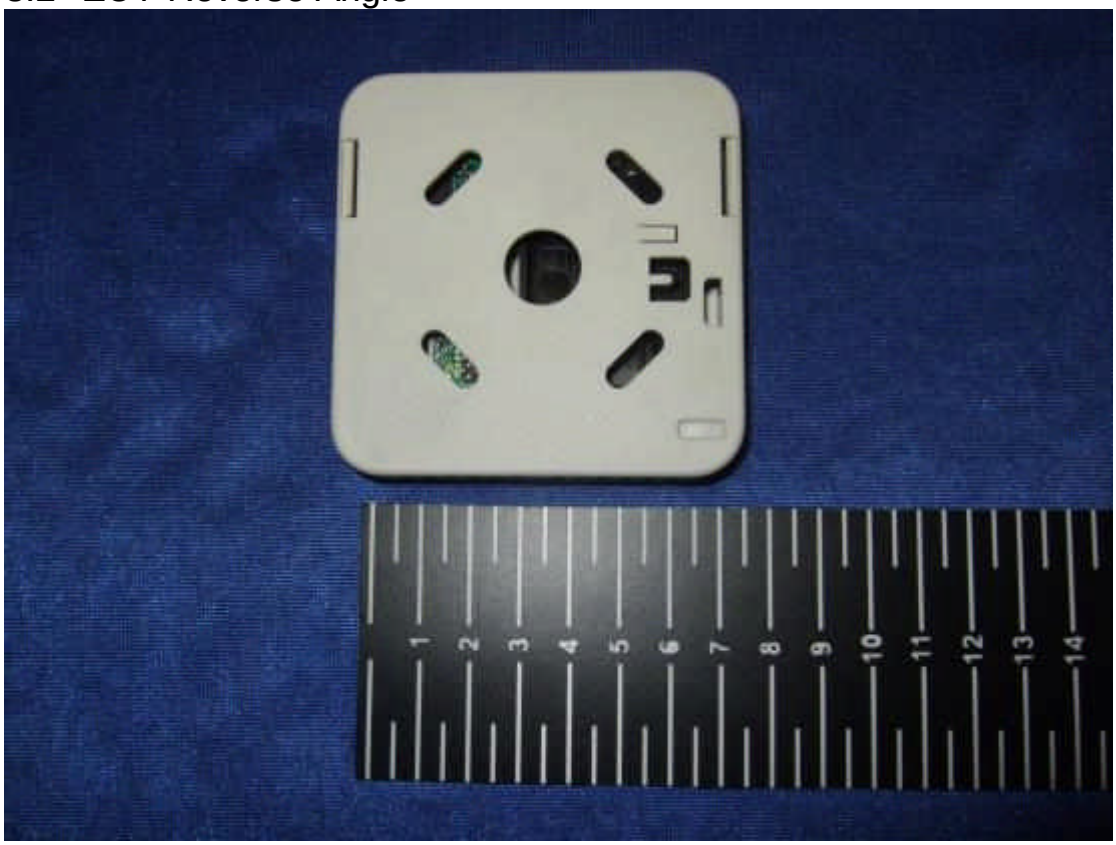
(b) limit of 300 µV/m at 10m equates to 20.log (300 . 10/3) = 60 dB µV/m at 3m
(c) limit of 30 µV/m at 30m, but below 30MHz, equates to 20.log(30) + 40.log(30/3) = 69.5 dBµV/m at 3m, as extrapolation factor below 30MHz is 40dB/decade per 15.31(f)(2).

8 Photographs

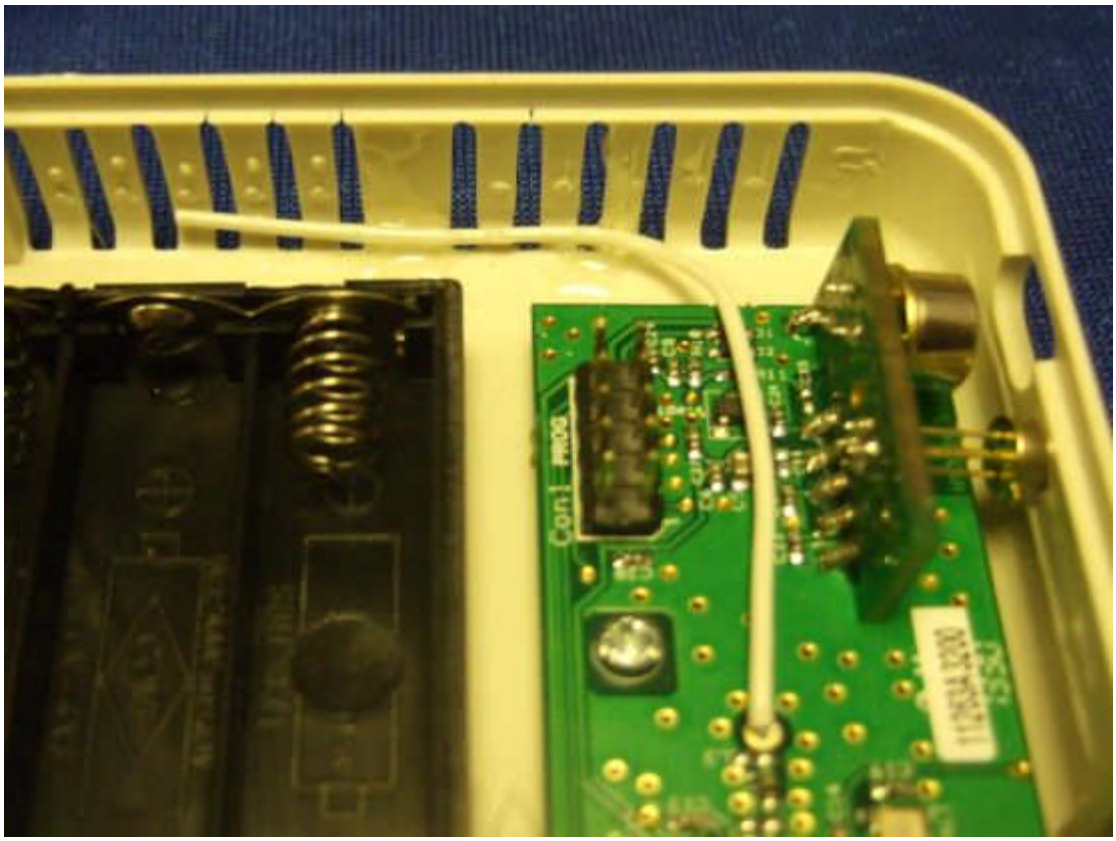
8.1 EUT Front View



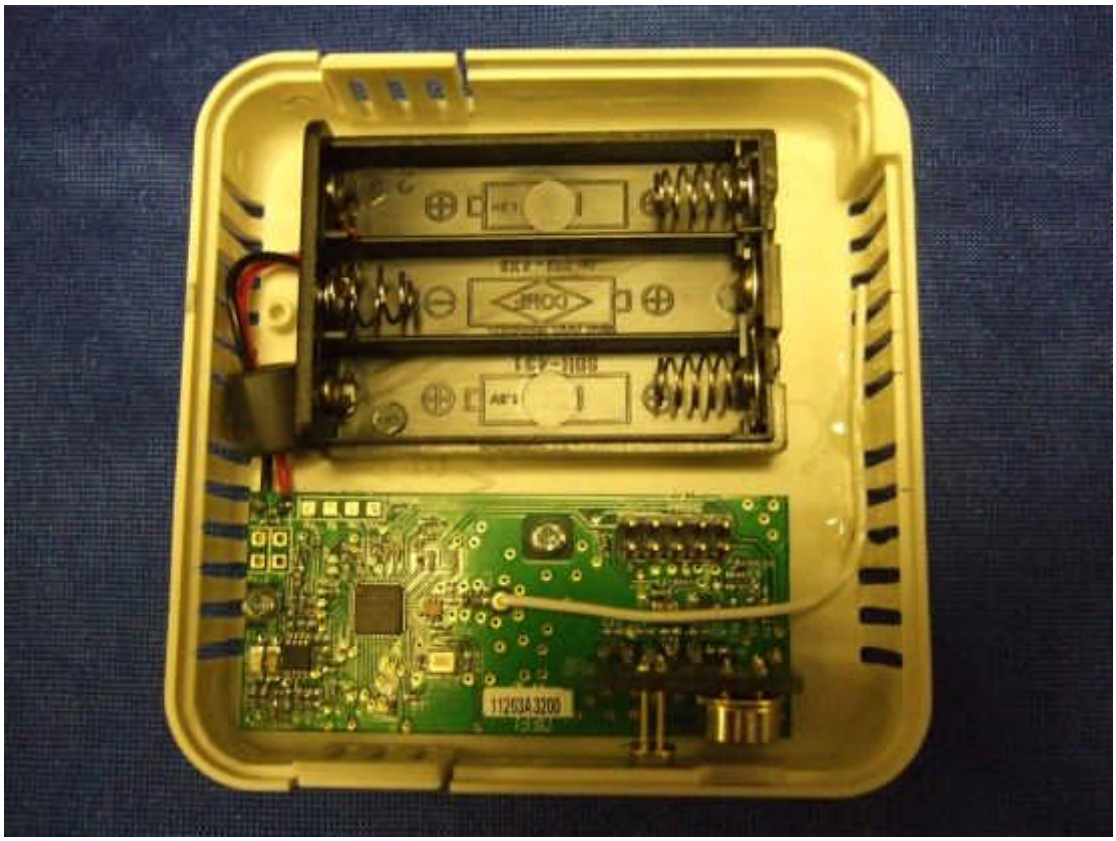
8.2 EUT Reverse Angle

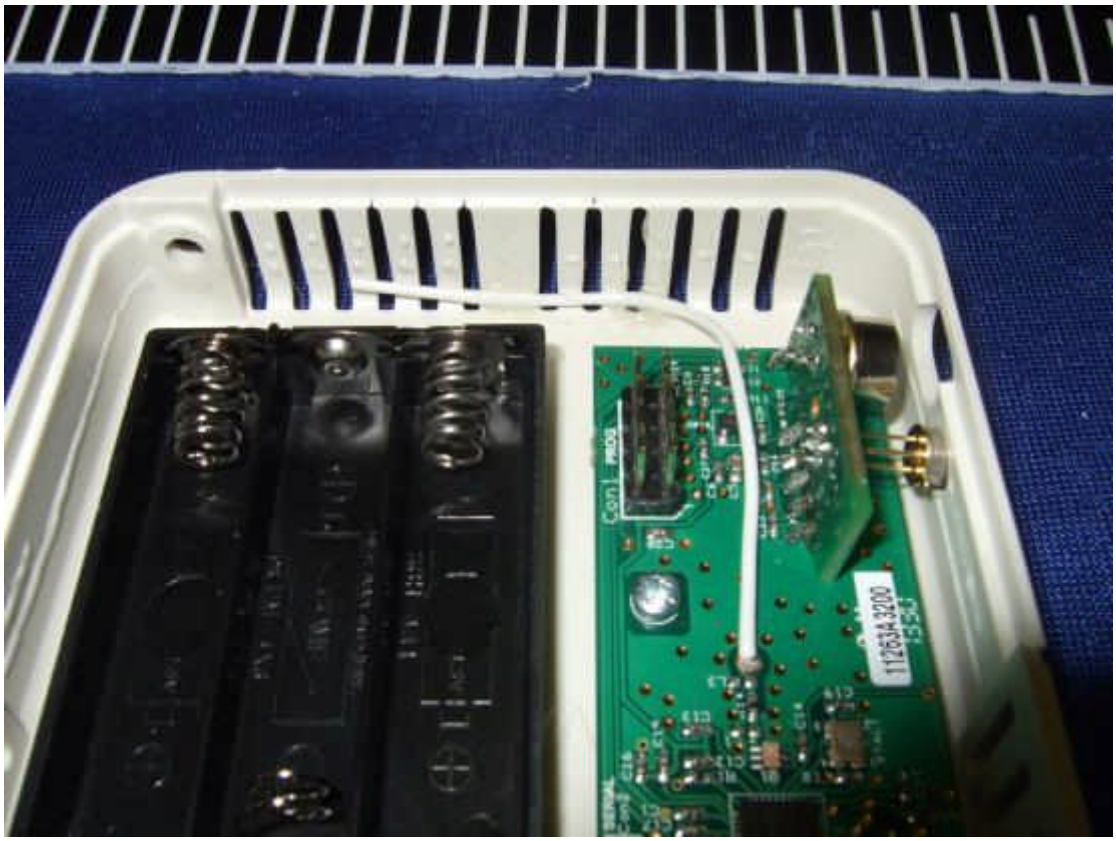


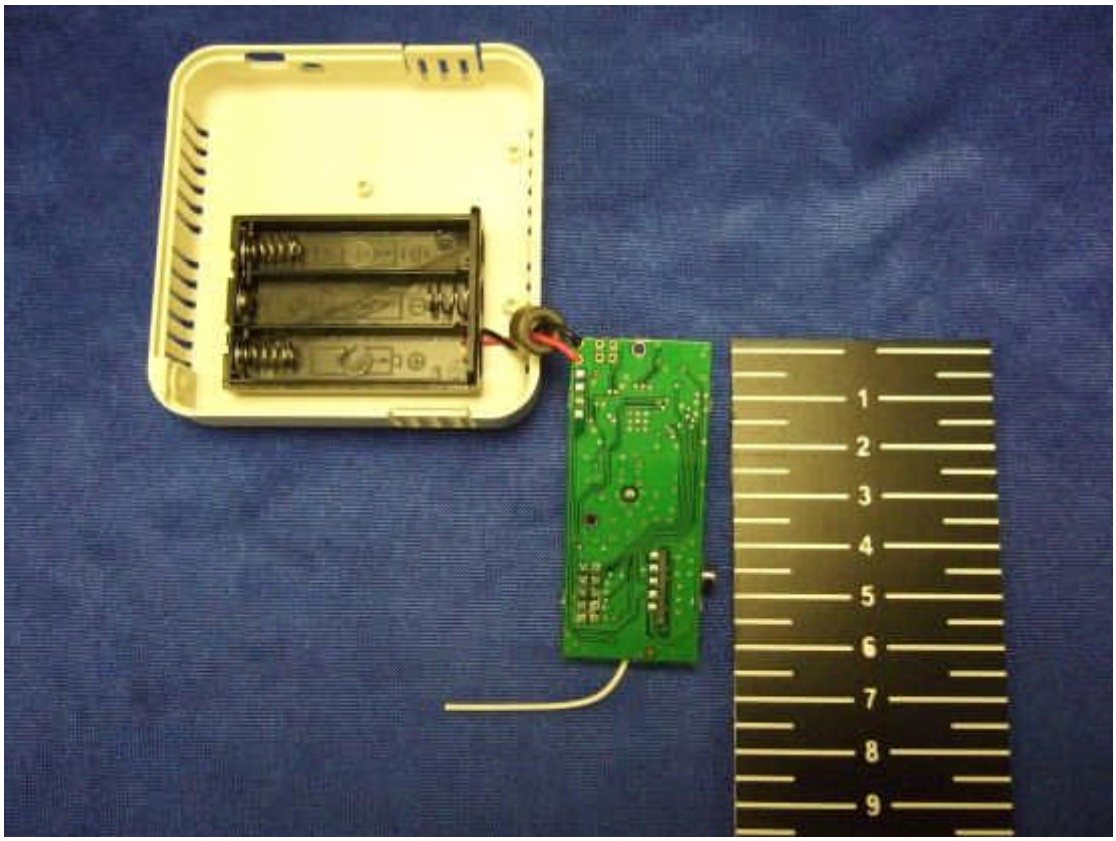
8.3 EUT Antenna



8.4 EUT Internal Construction






1
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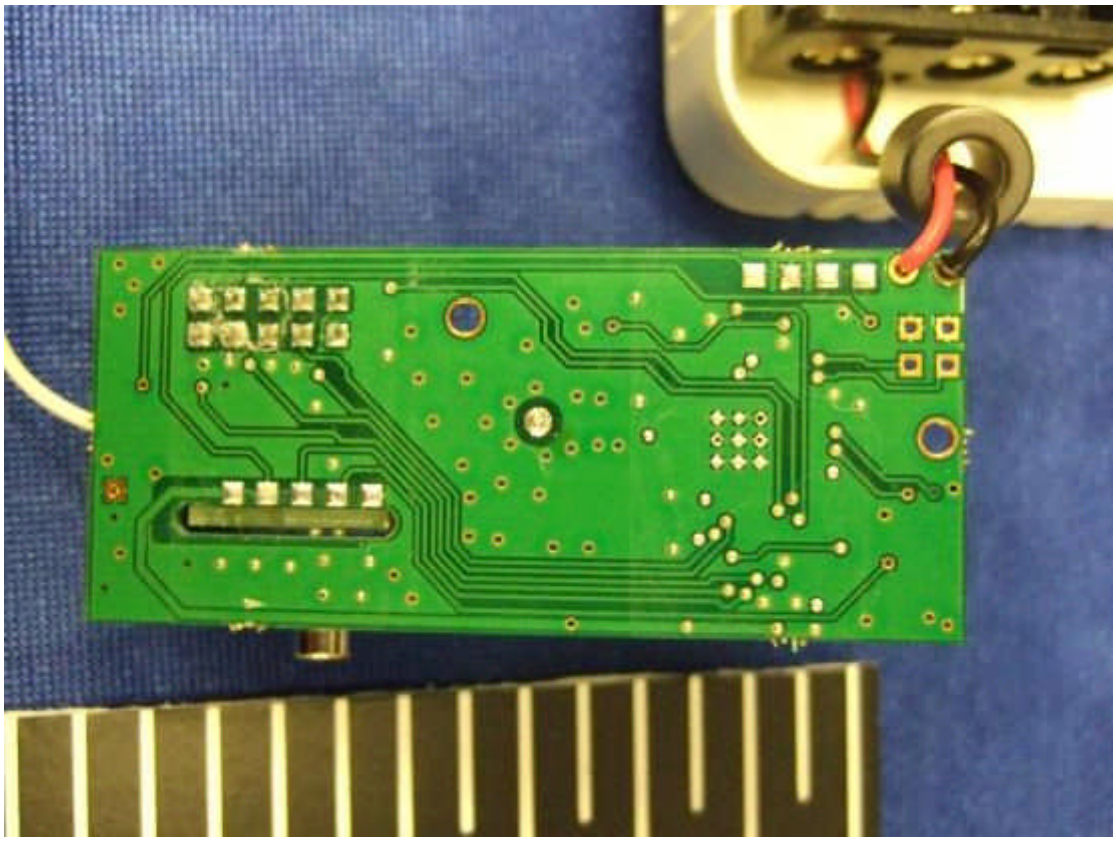
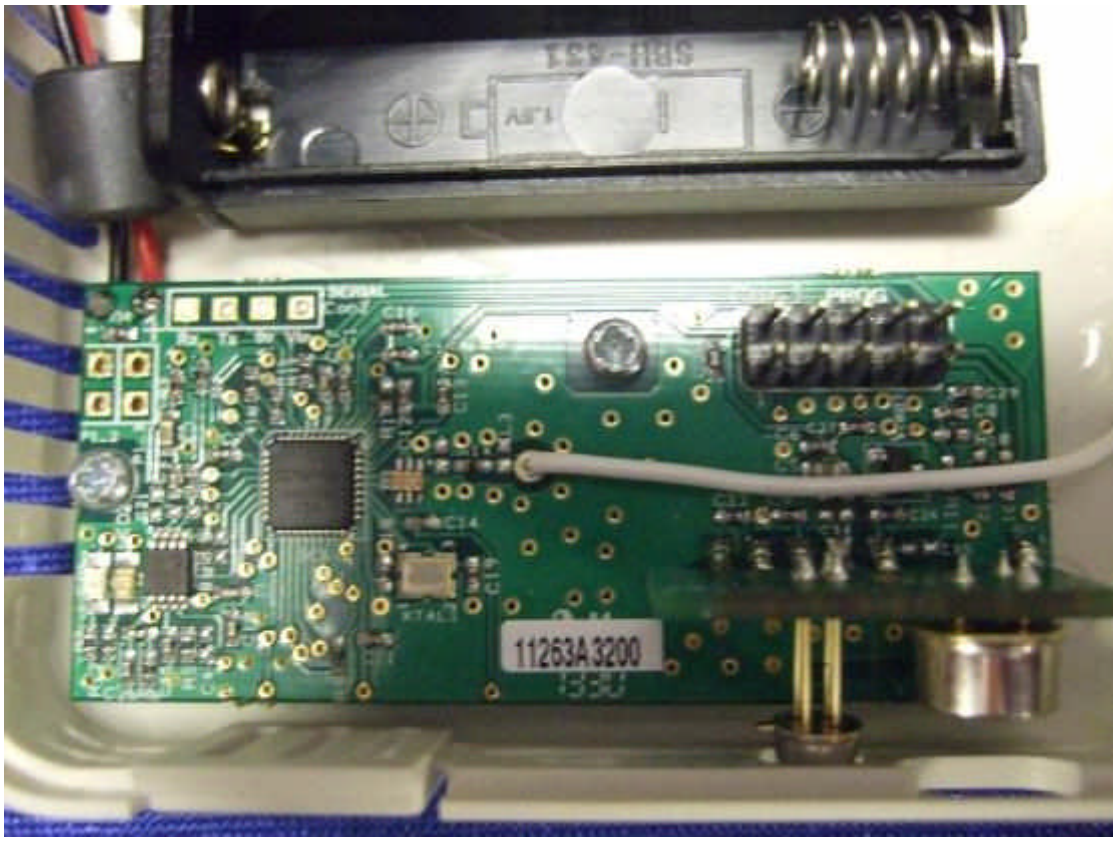
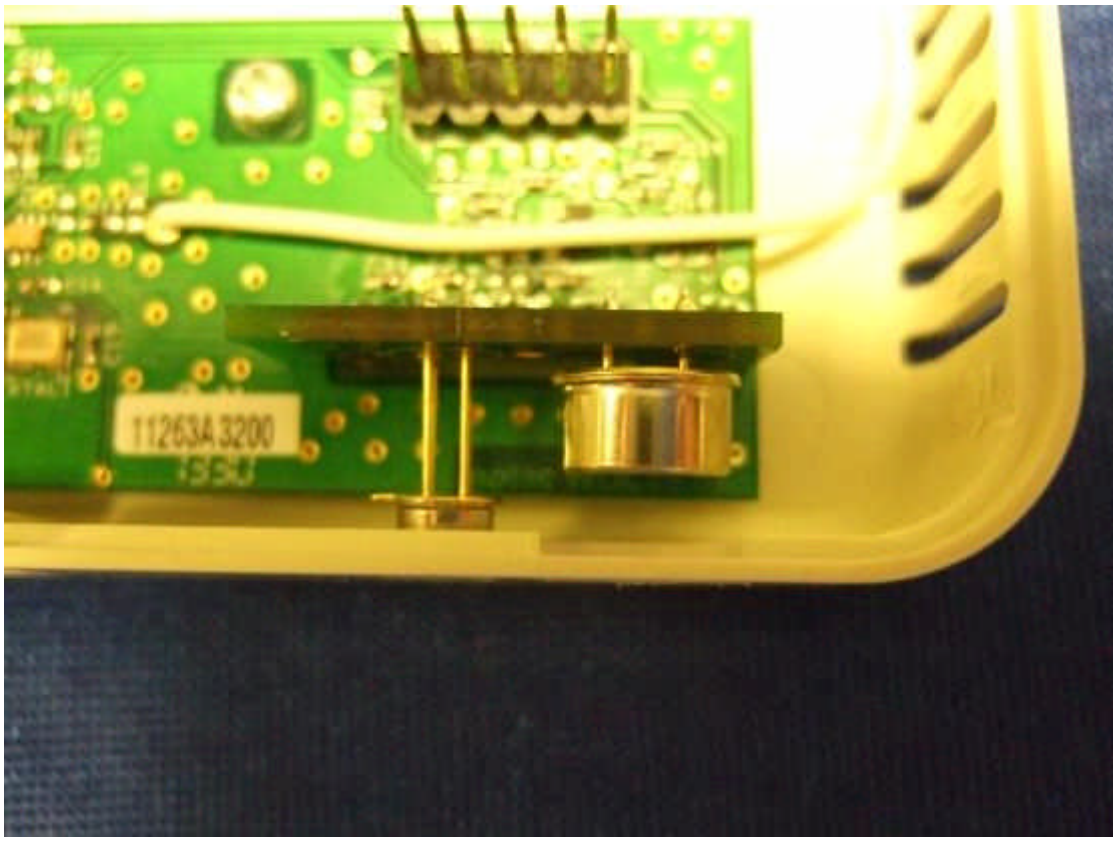
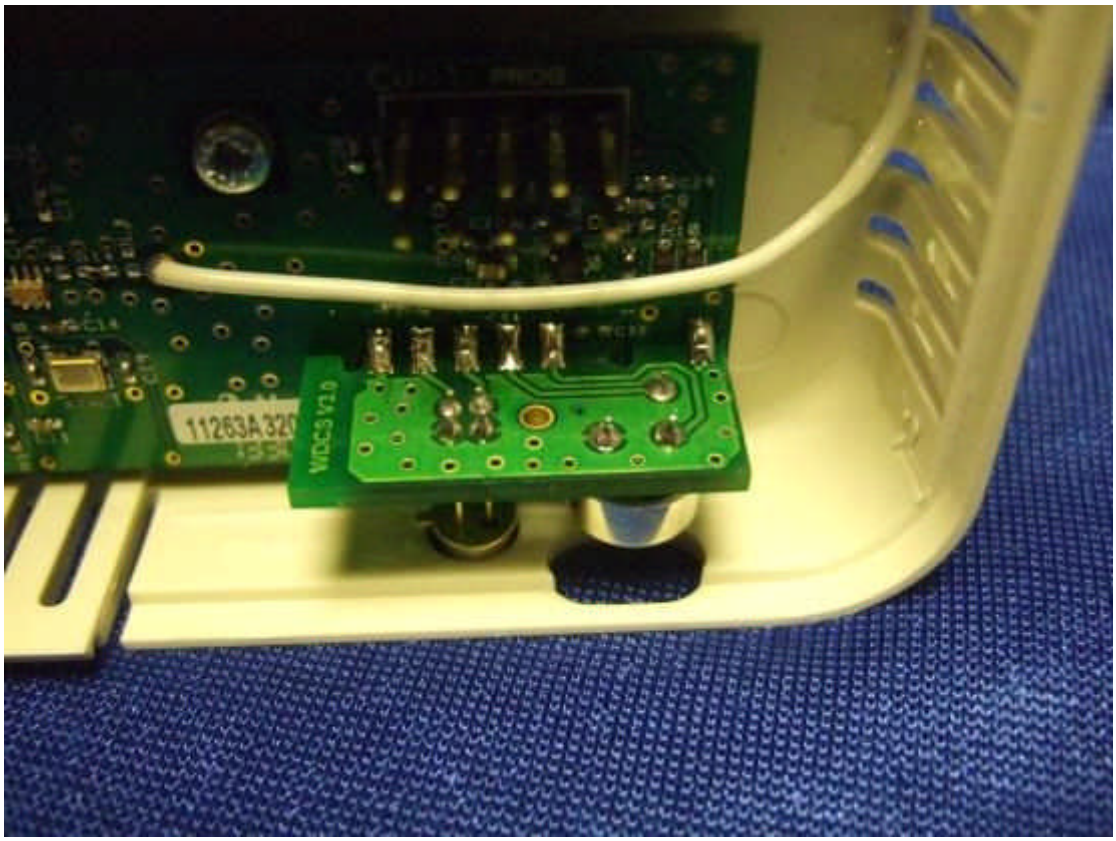
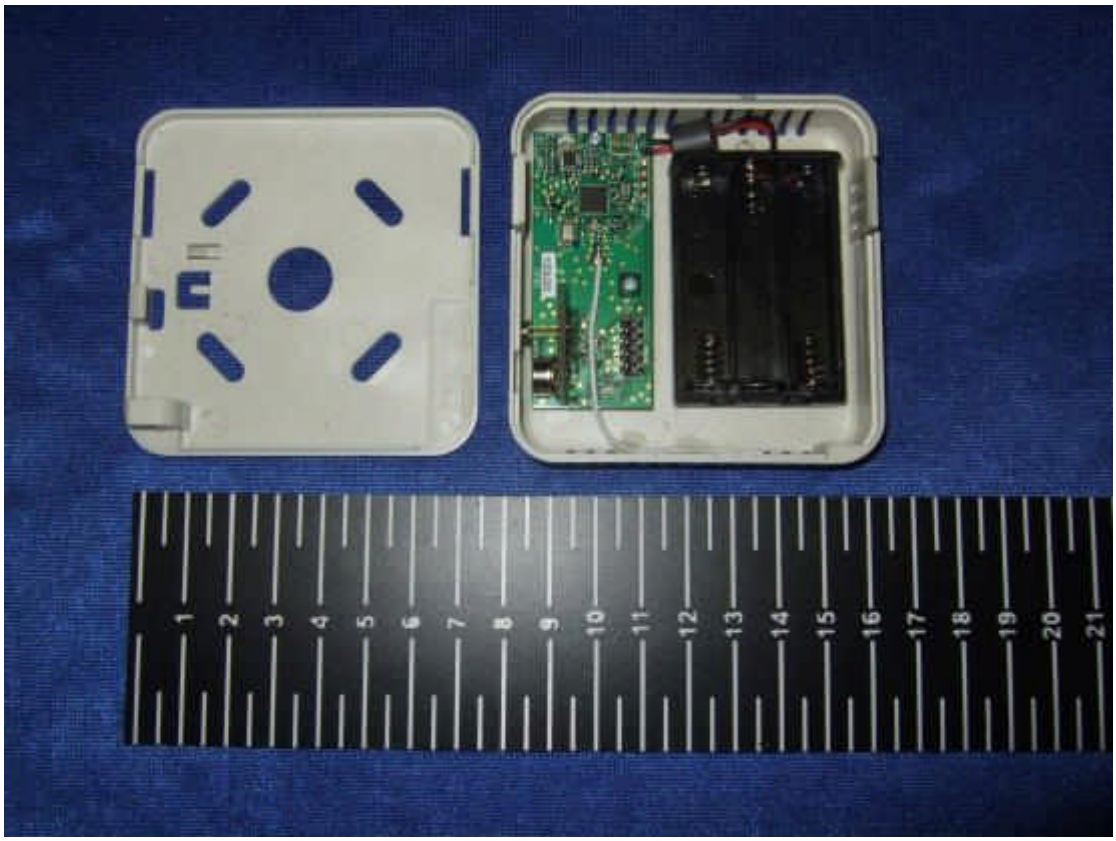



11263A 3200

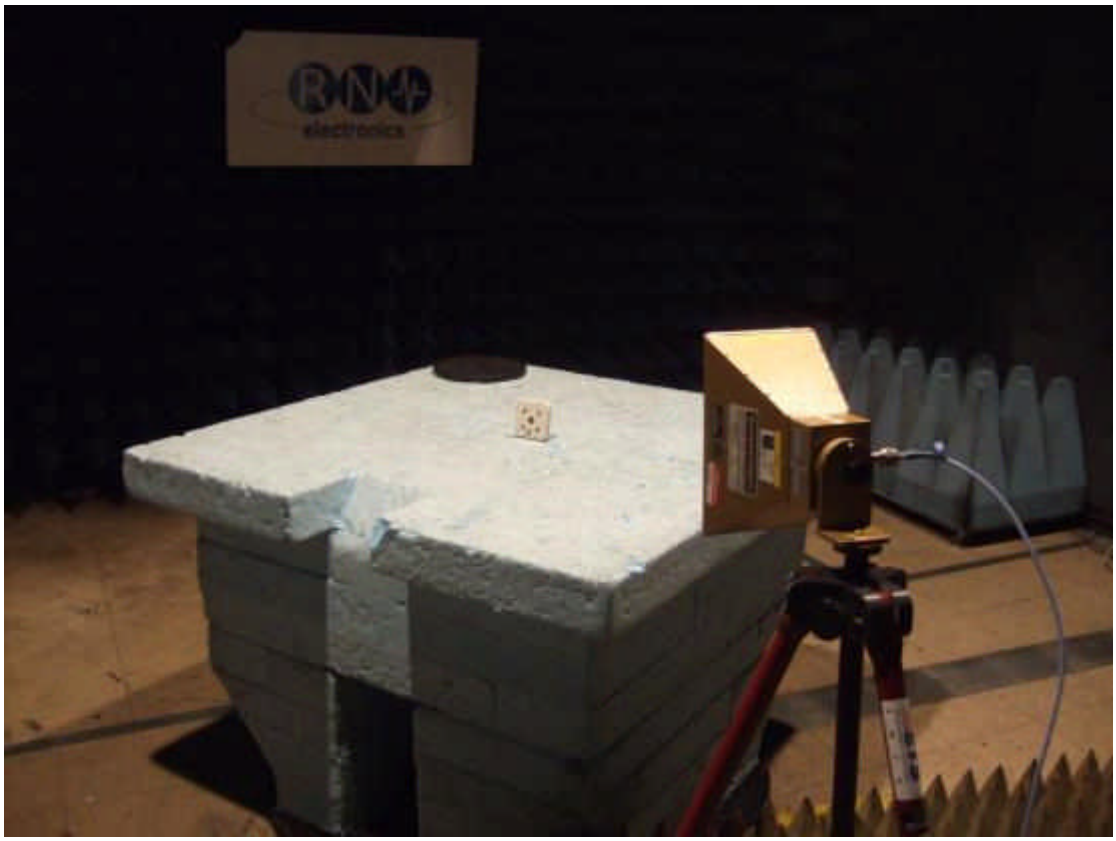

11263A 3200

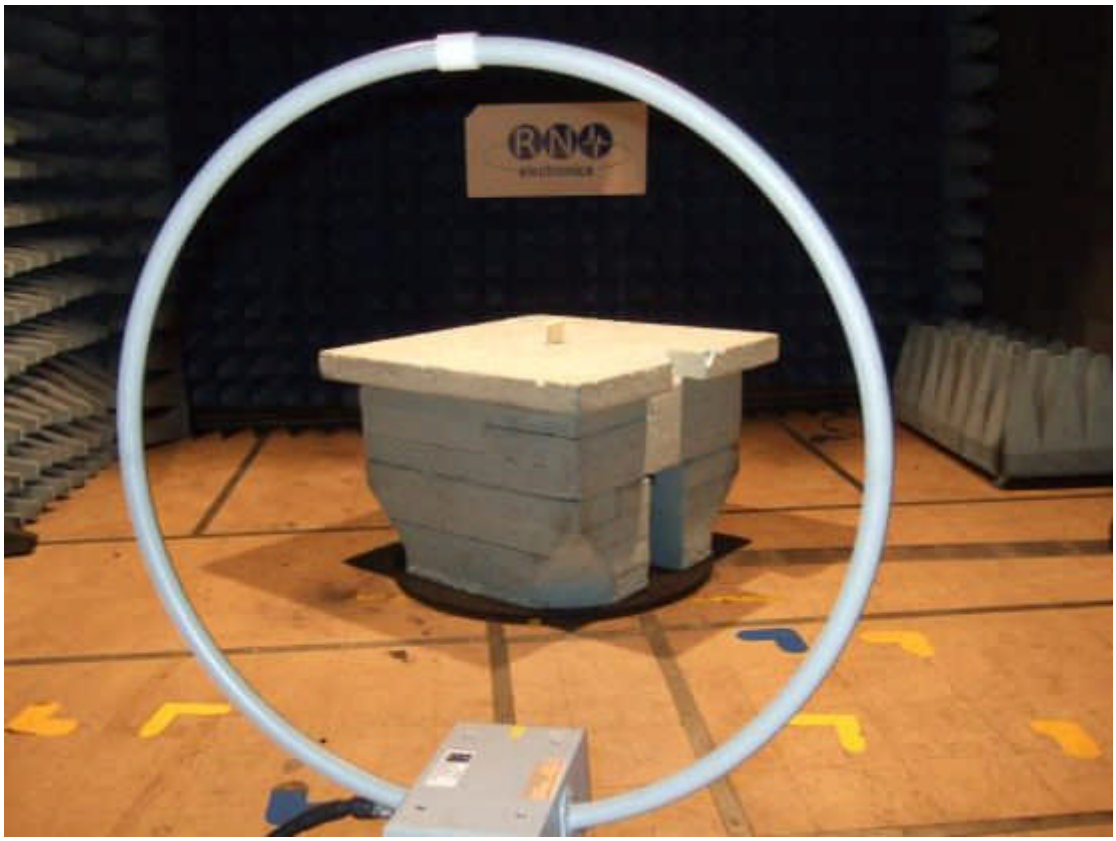

11263A320
WDC3 V1.0

8.5 EUT Chassis



8.6 Test set-up, spurious emissions





Photograph's of the EUT as viewed from in front of the antennas, site M.

8.7 Diagrams

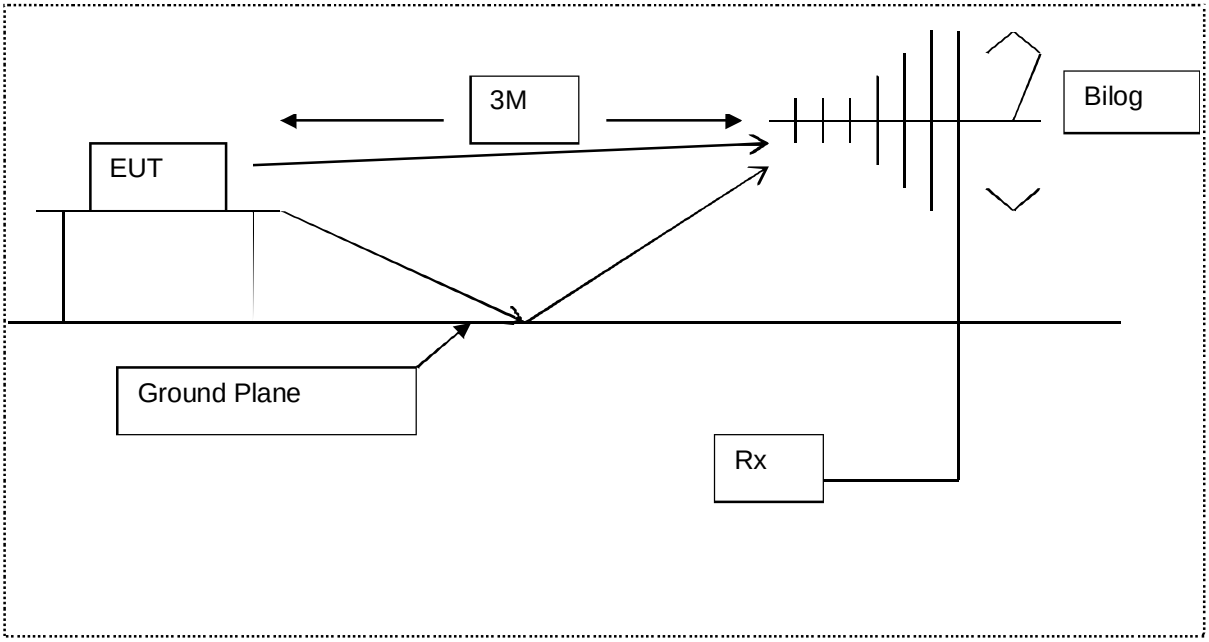


Diagram of the radiated emissions test set-up 30-1000MHz.

9 Signal Leads

No signal leads were connected to EUT during test.

10 Test Equipment Calibration list

The following table lists the test equipment used, last calibration date and calibration interval. All test equipment used has been maintained within the calibration requirements of ***R.N. Electronics Ltd.*** test facility quality system. Calibration intervals are regularly reviewed dependent on equipment manufacturer's recommendations and actual usage of the equipment.

RN No.	Model	Description	Manufacturer	Calibration date	Cal period
E268	BHA 9118	1-18 GHz Horn Antenna	Schaffner	14-Apr-13	24 months
E410	N5181A	3 GHz MXG Signal Generator	Agilent Technologies	26-Oct-11	36 months
E411	N9039A	9 kHz - 1 GHz RF Filter Section	Agilent Technologies	*18-Oct-13	12 months
E412	E4440A	3 Hz - 26.5 GHz PSA	Agilent Technologies	*18-Oct-13	12 months
E429	-	5 Switch Filter Box 0.91 GHz - 16.3 GHz	RN Electronics	20-Nov-12	12 months
E478	LQ2992/H	1-3GHz Bandpass Filter	RACAL-MESL	N/A	N/A
TMS81	6502	Active Loop Antenna	EMCO	24-Oct-12	24 months
TMS82	8449B	Pre Amplifier 1 - 26 GHz	Agilent	19-Nov-12	12 months
TMS933	CBL6141A	Bilog Antenna 30MHz - 2GHz	York EMC	09-Sep-12	36 months

* Equipment was in calibration for test and has since been re-calibrated since date of tests.

11 Auxiliary equipment

11.1 Customer supplied Equipment

Auxiliary equipment used for the purpose of test supplied by the above has been listed below

No customer supplied equipment was used

11.2 Supplied by RN Electronics Limited

Auxiliary equipment used for the purpose of test supplied by the above has been listed below

No RN Electronics supplied equipment was used.

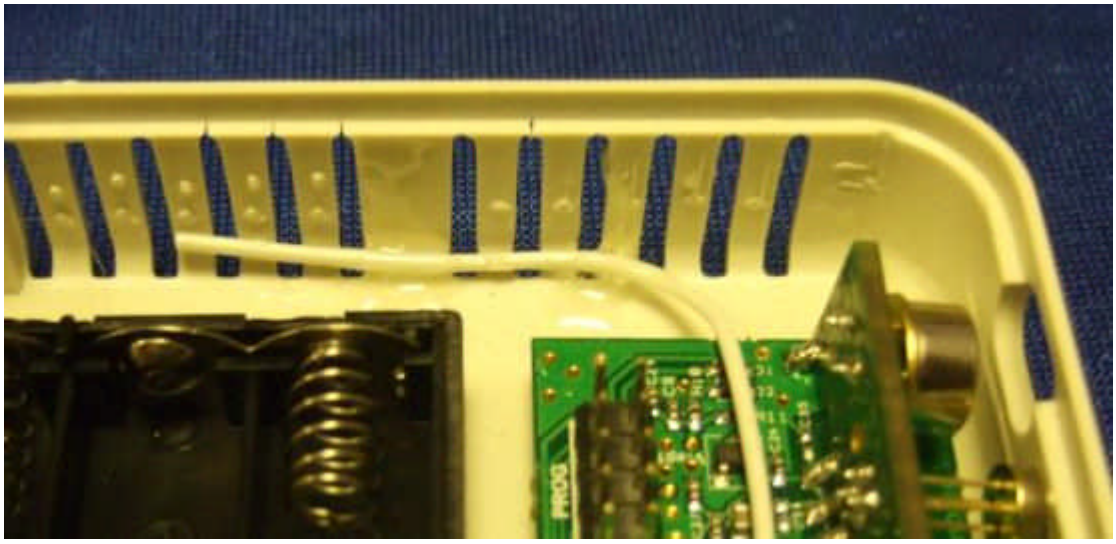
12 Modifications

In order for the EUT to produce the results shown within this report the following modifications, if any, were implemented.

12.1 Table of modifications

12.2 Modification photos

Picture MOD1.



12.3 Modifications before test

Test	Modification	Picture reference	Time of modification
TX ERP	RF IC power output setting programmed to -0.3dBm	N/A	Before testing
TX ERP	Wire antenna Spot glued to case for repeatability of field strength measurements	MOD1	Before testing

12.4 Modifications during test

No modifications were made during test by RN Electronics Ltd.

13 Compliance information

Products subject to the Declaration of Conformity procedure are required to be supplied with a compliance information statement. A copy of this statement may be included here:

CERTIFIED equipment – DoC not required.

14 Description of Test Sites

Site A	Radio / Calibration Laboratory and anechoic chamber
Site B	Semi-anechoic chamber
Site B1	Control Room for Site B
Site C	Transient Laboratory
Site D	Screened Room (Conducted Immunity)
Site E	Screened Room (Control Room for Site D)
Site F	Screened Room (Conducted Emissions) VCCI Registration No. C-2823
Site K	Screened Room (Control Room for Site M)
Site M	3m Semi-anechoic chamber (indoor OATS) FCC Registration No. 293246
Site Q	Fully-anechoic chamber
Site OATS	3m and 10m Open Area Test Site FCC Registration No. 293246 IC Registration No. 5612A-1 VCCI Registration No. R-2580
Site R	Screened Room (Conducted Immunity)
Site S	Safety Laboratory
Site T	Transient Laboratory

15 Abbreviations and Units

%	Percent
µV	microVolts
µW	microWatts
AC	Alternating Current
ALSE	Absorber Lined Screened Enclosure
AM	Amplitude Modulation
Amb	Ambient
ANSI	American National Standards Institute
ºC	Degrees Celsius
CFR	Code of Federal Regulations
CS	Channel Spacing
CW	Continuous Wave
dB	deciBels
dBµV	deciBels relative to 1µV
dBc	deciBels relative to Carrier
dBm	deciBels relative to 1mW
DC	Direct Current
EIRP	Equivalent Isotropic Radiated Power
ERP	Effective Radiated Power
EUT	Equipment Under Test
FCC	Federal Communications Commission
FM	Frequency Modulation
FSK	Frequency Shift Keying
g	Grams
GHz	GigaHertz
Hz	Hertz
IF	Intermediate Frequency
kHz	kiloHertz
LO	Local Oscillator
mA	milliAmps
max	maximum
kPa	milliBars
MHz	MegaHertz
min	minimum
mm	milliMetres
ms	milliSeconds
mW	milliWatts
NA	Not Applicable
nom	Nominal
nW	nanoWatt
OATS	Open Area Test Site
OFDM	Orthogonal Frequency Division Multiplexing
ppm	Parts per million
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
Ref	Reference
RF	Radio Frequency
RTP	Room Temperature and Pressure
s	Seconds
Tx	Transmitter
V	Volts