



TEST REPORT

Test Report No. : UL-RPT-RP87708JD06A V6.0

Manufacturer : Icnita S.L.
Model No. : T-10
FCC ID : ONXPAS01
IC Certification No. : 10451A-000002
Test Standard(s) : FCC Parts 15.209(a), 15.247(b)(3) & 15.247(d), Industry Canada RSS-Gen 4.8 & 4.9 and RSS-210 A8.4(4) & A8.5

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 6.0 supersedes all previous versions

Date of Issue:

29 April 2014

Checked by:

Sarah Williams
Engineer, Radio Laboratory

Issued by :

pp

John Newell
Group Quality Manager
Basingstoke,
UL VS LTD



This laboratory is accredited by UKAS.
The tests reported herein have been
performed in accordance with its' terms
of accreditation.

UL VS LTD

Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG, UK
Telephone: +44 (0)1256 312000
Facsimile: +44 (0)1256 312001

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Table of Contents

1. Customer Information.....	4
2. Summary of Testing.....	5
2.1. General Information	5
2.2. Summary of Test Results	5
2.3. Methods and Procedures	6
2.4. Deviations from the Test Specification	6
3. Equipment Under Test (EUT)	7
3.1. Identification of Equipment Under Test (EUT)	7
3.2. Description of EUT	7
3.3. Modifications Incorporated in the EUT	7
3.4. Additional Information Related to Testing	7
3.5. Support Equipment	7
4. Operation and Monitoring of the EUT during Testing	8
4.1. Operating Modes	8
4.2. Configuration and Peripherals	8
5. Measurements, Examinations and Derived Results.....	9
5.1. General Comments	9
5.2. Test Results	10
5.2.1. Transmitter Maximum Peak Output Power	10
5.2.2. Transmitter Radiated Emissions	12
5.2.3. Transmitter Band Edge Radiated Emissions	17
6. Measurement Uncertainty	20
7. Report Revision History	21

1. Customer Information

Company Name:	Icnita S.L.
Address:	c/Onyar 61 ES-17457 Riudellots de la Selva, SPAIN

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 15 Subpart C (Intentional Radiators) - Section 15.209
Specification Reference:	RSS-GEN Issue 3 December 2010
Specification Title:	General Requirements and Information for the Certification of Radio Apparatus
Specification Reference:	RSS-210 Issue 8 December 2010
Specification Title:	Licence-exempt Radio Apparatus(All Frequency Bands): Category I Equipment.
Site Registration:	FCC: 209735; Industry Canada: 3245B-2
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	20 September 2012 to 17 April 2014

Note: This report has been up-issued to support Industry Canada approval. The customer has confirmed that there has been no change to the EUT build since the original testing was performed.

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.247(b)(3)	RSS-Gen 4.8 RSS-210 A8.4(4)	Transmitter Maximum Peak Output Power	✓
Part 15.247(d)/ 15.209(a)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Radiated Emissions	✓
Part 15.247(d)/ 15.209(a)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Band Edge Radiated Emissions	✓
Key to Results			
 = Complied	 = Did not comply		

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Reference:	ANSI C63.10 (2009)
Title:	American National Standard for Testing Unlicensed Wireless Devices
Reference:	KDB 558074 D01 v03 April 9, 2013
Title:	Guidance for Performing Compliance Measurements on Digital Transmission System (DTS) Operating Under 15.247

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Icnita
Model Name or Number:	T-10
Serial Number:	01-17-00-01-00-00-03-70
Hardware Version Number:	PN09394
Software Version Number:	TAG_07
FCC ID:	ONXPAS01
Industry Canada Certification Number:	10451A-000002

3.2. Description of EUT

The equipment under test was a tag device, which works with the Icnita AC-50 Activator fork truck system.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:	IEEE 802.15.4 Digital Transmission System	
Type of Unit:	Transceiver	
Modulation:	O-QPSK	
Data Rate:	250 kb/s	
Power Supply Requirement(s):	Nominal	3.0 VDC
Maximum Conducted Output Power:	-12.1 dBm	
Transmit Frequency Range:	2475 MHz	

3.5. Support Equipment

No support equipment was used to exercise the EUT during testing:

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Continuously transmitting at maximum power at 2475 MHz.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- The Customer supplied a continuous transmit sample for testing. A new 3 Volt CR2450 battery was inserted into the device, the button was pressed, a tone was heard and the EUT powered on in a continuous transmit mode at maximum power. The battery voltage was monitored throughout testing.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results

5.2.1. Transmitter Maximum Peak Output Power

Test Summary:

Test Engineer:	David Doyle	Test Date:	17 April 2014
Test Sample Serial Number:	01-17-00-01-00-00-03-70		

FCC Reference:	Part 15.247(b)(3)
Industry Canada Reference:	RSS-Gen 4.8, RSS-210 A8.4(4)
Test Method Used:	As detailed in FCC KDB 558074 Section 9.1.1 referencing ANSI C63.10 (see note below)

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	33

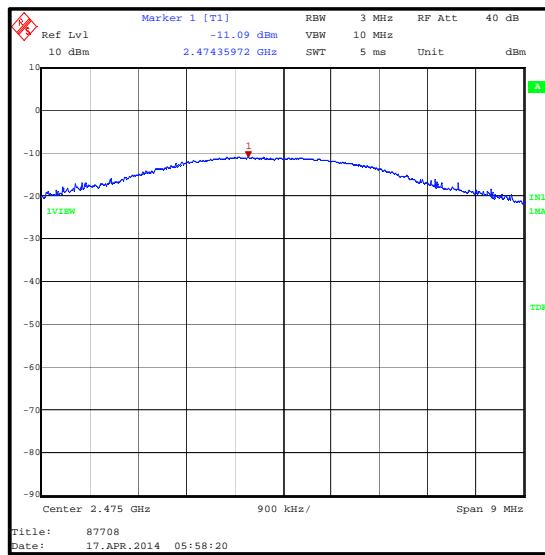
Note(s):

1. Tests were performed using a combination of the conducted test method described in FCC KDB 558074 Section 9.1.1 and the test methods for radiated emissions measurements described in Sections 6.3 and 6.6. The reason for this being that the measurements were performed radiated as the EUT has an integral antenna and does not have an external antenna port.

Results:

Channel (MHz)	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
2475.0	-12.1	30.0	42.1	Complied

Channel (MHz)	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
2475.0	-12.1	1.0	-11.1	36.0	47.1	Complied

Transmitter Maximum Peak Output Power (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB 26	100046K	01 Oct 2014	12
L1118	Pre Amplifier	Agilent	8449B	3008A02100	13 Jan 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
M1269	Digital Multimeter	Fluke	179	90250210	12 Aug 2014	12
S0523	DC Power Supply	TTI	PL320	224235	Calibrated before use	-

5.2.2. Transmitter Radiated Emissions**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	20 September 2012
Test Sample Serial Number:	01-17-00-01-00-00-03-70		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Industry Canada Reference:	RSS-Gen 4.9, RSS-210 A8.5
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	37

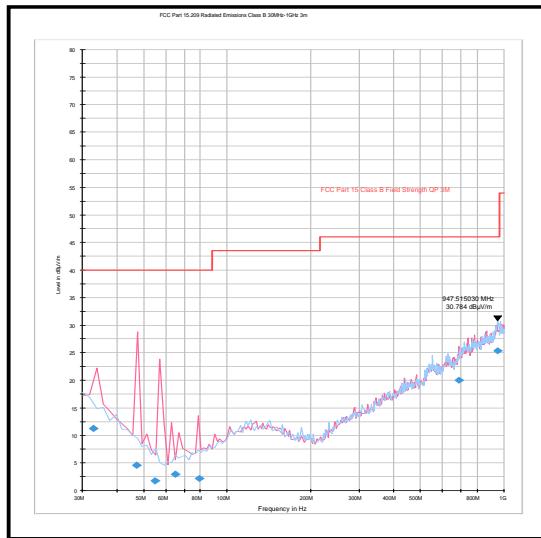
Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. All emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system. Therefore the highest level of noise floor of the measuring receiver has been recorded in the table below.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results: Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
947.515	Vertical	30.8	46.0	15.2	Complied

Transmitter Radiated Emissions (continued)



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	30 Sep 2012	12
G0543	Amplifier	Sonoma	310N	230801	15 Oct 2012	3
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	03 Feb 2013	12
A553	Antenna	Chase	CBL6111A	1593	15 Feb 2013	12
A1834	Attenuator	Hewlett Packard	8491B	10444	29 Jan 2013	12
M1251	Digital Multimeter	Fluke	175	89170179	30 Jul 2013	12
S011	DC Power Supply	Instek	PR-3010H	9401270	Calibrated before use	-

In accordance with UKAS requirements all the measuring equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

Transmitter Radiated Emissions (continued)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	20 September 2012
Test Sample Serial Number:	01-17-00-01-00-00-03-70		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Industry Canada Reference:	RSS-Gen 4.9, RSS-210 A8.5
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 25 GHz

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	37

Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. The emission shown on the 1 GHz to 4 GHz plot is the EUT fundamental.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

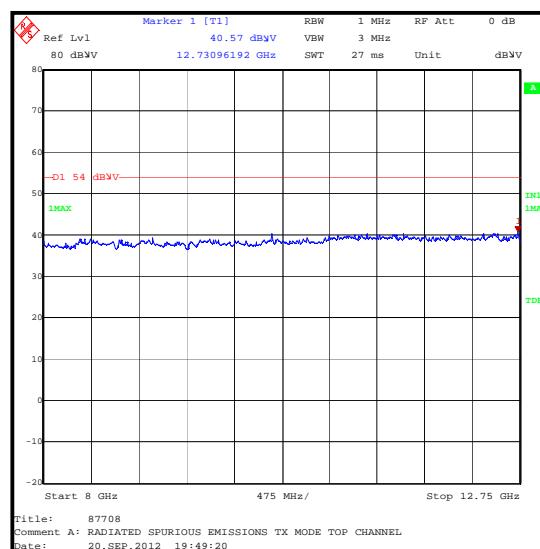
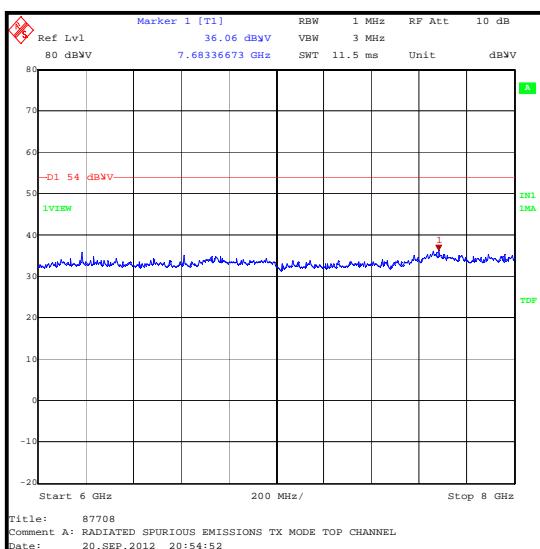
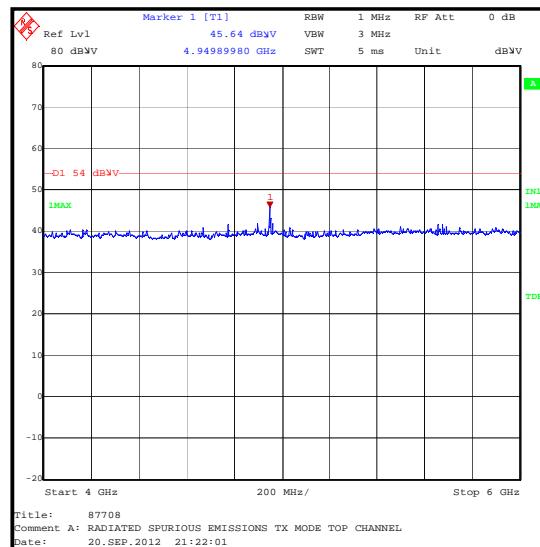
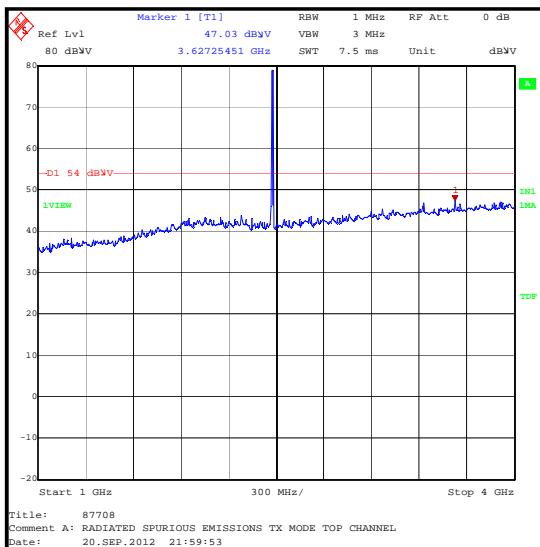
Results: Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4949.563	Horizontal	47.2	74.0	26.8	Complied

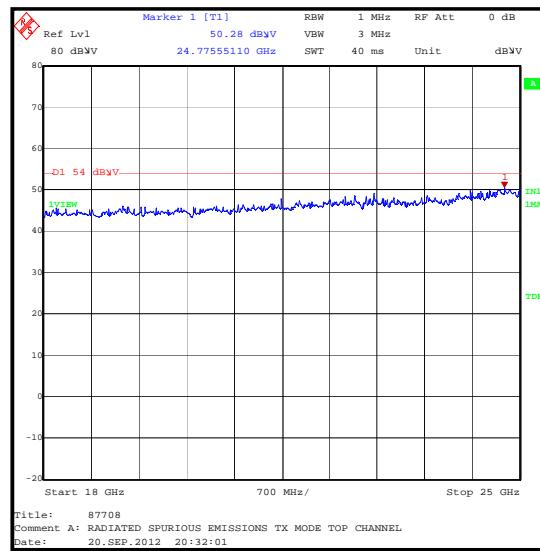
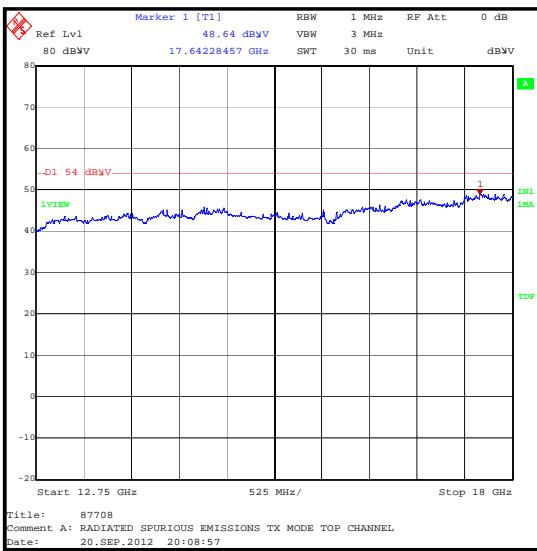
Results: Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4949.563	Horizontal	35.4	54.0	18.6	Complied

Transmitter Radiated Emissions (continued)



Transmitter Radiated Emissions (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	09 Oct 2012	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	09 Oct 2012	12
A1818	Antenna	EMCO	3115	00075692	09 Oct 2012	12
A253	Antenna	Flann	12240-20	128	09 Oct 2012	12
A254	Antenna	Flann	14240-20	139	09 Oct 2012	12
A255	Antenna	Flann	16240-20	519	09 Oct 2012	12
A256	Antenna	Flann	18240-20	400	09 Oct 2012	12
A436	Antenna	Flann	20240-20	330	09 Oct 2012	12
M1251	Digital Multimeter	Fluke	175	89170179	30 Jul 2012	12
S011	DC Power Supply	Insteek	PR-3010H	9401270	Calibrated before use	-

In accordance with UKAS requirements all the measuring equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2.3. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	David Doyle	Test Date:	17 April 2014
Test Sample Serial Number:	01-17-00-01-00-00-03-70		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Industry Canada Reference:	RSS-Gen 4.9, RSS-210 A8.5
Test Method Used:	ANSI C63.10 Section 6.9.2 & FCC KDB 558074 Section 11

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	33

Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. For the lower band edge measurements: As the lower band edge falls within the non-restricted band only peak measurements are required. In accordance with FCC KDB 558074 Section 11.1, the test method in Section 11.3 was followed: the test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker and corresponding reference level line were placed on the peak of the carrier. As the maximum conducted output power was measured using a peak detector in accordance with FCC KDB 558074 Section 9.1.1 an out-of-band limit line was placed 20 dB below the peak level (FCC KDB 558074 Section 11.1(a)). A marker was placed on the band edge spot frequency. Marker frequency and level was recorded.
3. For the upper band edge measurements: As the upper band edge falls within restricted band both peak and average measurements were recorded by placing a marker at the edge of the band (2483.5 MHz). In accordance with FCC KDB 558074 Section 12.1, the test method in ANSI C63.10 Section 6.9.2 was followed: for peak measurements the test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. For average measurements the test receiver resolution bandwidth was set to 1 MHz and video bandwidth 10 Hz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent restricted band of operation (where a higher level emission was present). Marker frequencies and levels were recorded.
4. * -20 dBc limit.

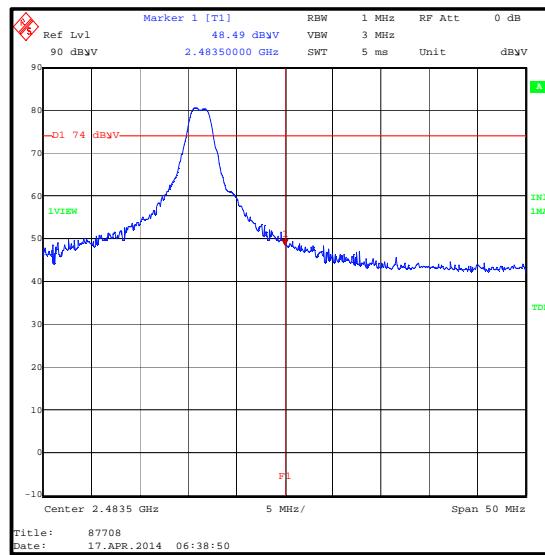
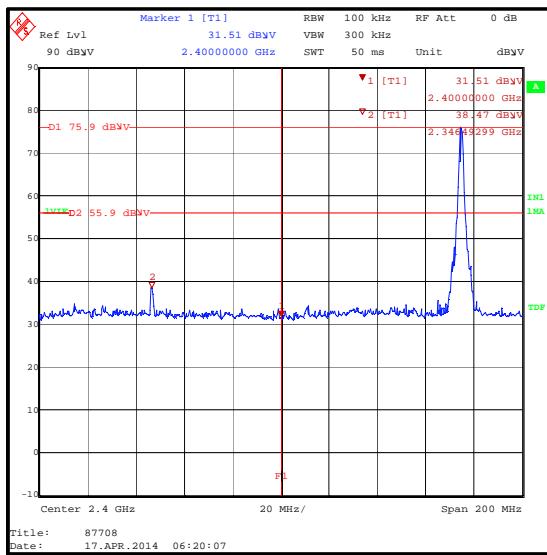
Transmitter Band Edge Radiated Emissions (continued)**Results: Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	31.5	55.9*	24.4	Complied
2483.5	48.5	74.0	25.5	Complied

Results: Average

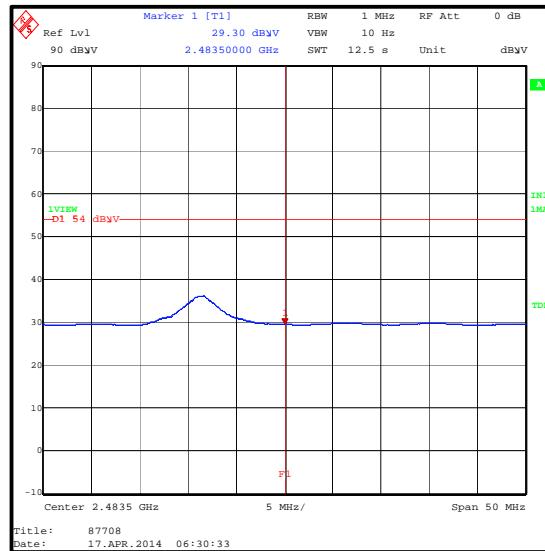
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	29.3	54.0	24.7	Complied

Transmitter Band Edge Radiated Emissions (continued)



Lower Band Edge Peak Measurement

Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	01 Oct 2014	12
L1118	Pre Amplifier	Agilent	8449B	3008A02100	13 Jan 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
M1269	Digital Multimeter	Fluke	179	90250210	12 Aug 2014	12

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Radiated Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±2.94 dB
Radiated Spurious Emissions	30 MHz to 26.5 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	-	-	FCC ID updated
3.0	-	-	Issue date changed
4.0	-	-	Updated to UL format, Location of testing updated and Note added to section 2.1, Industry Canada Certification number updated, Section 2.3 KDB 558074 reference updated, All sections except Radiated Emissions retested in accordance with KDB 558074 D01 v03, Appendix A removed and addition of test equipment tables per test
5.0	-	-	Section 3.1 FCC ID updated
6.0	-	-	Conducted power in Section 3.4 updated, Antenna gain updated in Section 5.2.1