TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: DT05-US

FCC ID: UOJ-DG04T

IC Certification Number: 6769A-DG04T

To: FCC Part 15.247: 2010 Subpart C, RSS-210 Issue 8 December 2010
& RSS-Gen Issue 3 December 2010

Test Report Serial No:
RFI-RPT-RP81704JD01A

Version 3.0 Supersedes All Previous Versions

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:	
Checked By:	Ian Watch
Signature:	
Date of Issue:	01 August 2011

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Registered in England and Wales. Company number:2117901

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1. Customer Information

Company Name:	Comfort Audio AB
Address:	Slottsmallan Halmstad 302 31 Sweden

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 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:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	31 May to 06 June 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.207	RSS-Gen 7.2.2	Transmitter AC Conducted Emissions	✓
Part 15.247(a)(2)	RSS-Gen 4.6.2 RSS-210 A8.2(a)	Transmitter 6 dB Bandwidth	✓
Part 15.247(a)(1)(i)	RSS-Gen 4.6.1/4.6.3 RSS-210 A8.1(c)	Transmitter 20 dB Bandwidth	✓
Part 15.247(e)	RSS-210 A8.2(b)	Transmitter Power Spectral Density	✓
Part 15.247(b)(2)	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)	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

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:	Comfort Audio
Model Name or Number:	Programmer DT05-US
Serial Number:	SN00017941
Hardware Version Number:	I9
Software Version Number:	1.00
FCC ID:	UOJ-DG04T
IC Certification Number:	6769A-DG04T

Description:	AC adaptor
Brand Name:	Comfort Audio
Model Name or Number:	FW7600/05
Serial Number:	1108B

3.2. Description of EUT

The equipment under test was a programmer for transmitting setup information to a receiver DT-10.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Tested Technology:	Part 15 Low Power Communication Device Transmitter	
Power Supply Requirement:	Nominal	3.7 V
Type of Unit:	Transmitter	
Modulation:	FSK	
Maximum Conducted Output Power:	-26.7 dBm	
Transmit Frequency Range:	904.05 MHz	
Transmit Channel Tested:	**Channel Frequency (MHz)**	
	904.05 MHz	

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Receiver
Brand Name:	Comfort Audio
Model Name or Number:	DT10-US
Serial Number:	S0001152

Description:	Headphones
Brand Name:	Comfort Audio
Model Name or Number:	None stated
Serial Number:	None stated

Description:	Neck Loop
Brand Name:	Comfort Audio
Model Name or Number:	None stated
Serial Number:	None stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Constant Transmit

4.2. Configuration and Peripherals

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

- Powered by its AC adaptor.
- Terminated with neck loop, headphones and DT10-US receiver.
- The client had loaded their bespoke application on to the EUT to allow the EUT to transmit in its test mode.

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.

5.2. Test Results

5.2.1. Transmitter AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	06 June 2011
Test Sample Serial No:	SN0017941		

FCC Part:	15.207
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	28

Results: Live Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.366000	Live	34.4	58.6	24.2	Complied
3.070500	Live	30.9	56.0	25.1	Complied
3.340500	Live	31.1	56.0	24.9	Complied
3.511500	Live	31.3	56.0	24.7	Complied
3.795000	Live	31.7	56.0	24.3	Complied
4.033500	Live	31.8	56.0	24.2	Complied
4.254000	Live	31.6	56.0	24.4	Complied
4.501500	Live	31.5	56.0	24.5	Complied

Results: Live Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.195000	Live	20.6	53.8	33.2	Complied
0.307500	Live	17.7	50.0	32.3	Complied
0.366000	Live	18.9	48.6	29.7	Complied
1.612500	Live	16.8	46.0	29.2	Complied
3.525000	Live	22.4	46.0	23.6	Complied
4.195500	Live	22.2	46.0	23.8	Complied

Transmitter AC Conducted Spurious Emissions (continued)

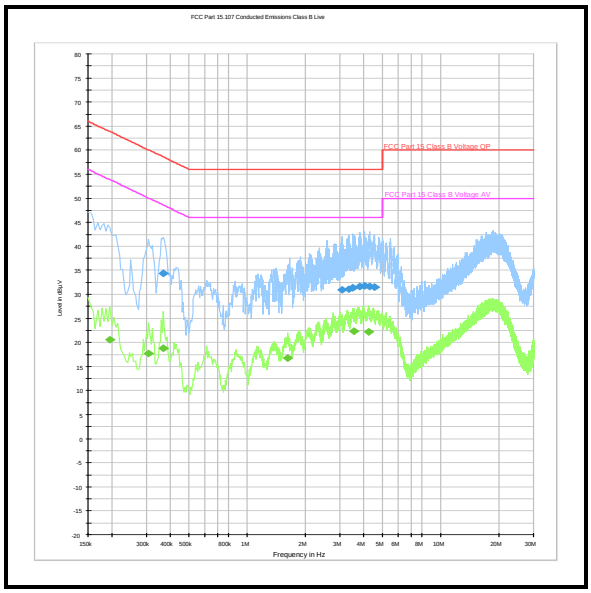
Results: Neutral Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.366000	Neutral	34.2	58.6	24.4	Complied
2.566500	Neutral	31.3	56.0	24.7	Complied
2.818500	Neutral	31.9	56.0	24.1	Complied
3.034500	Neutral	32.6	56.0	23.4	Complied
3.277500	Neutral	33.1	56.0	22.9	Complied
3.484500	Neutral	33.4	56.0	22.6	Complied
3.754500	Neutral	33.8	56.0	22.2	Complied
3.993000	Neutral	34.0	56.0	22.0	Complied
4.200000	Neutral	33.9	56.0	22.1	Complied
4.461000	Neutral	33.8	56.0	22.2	Complied

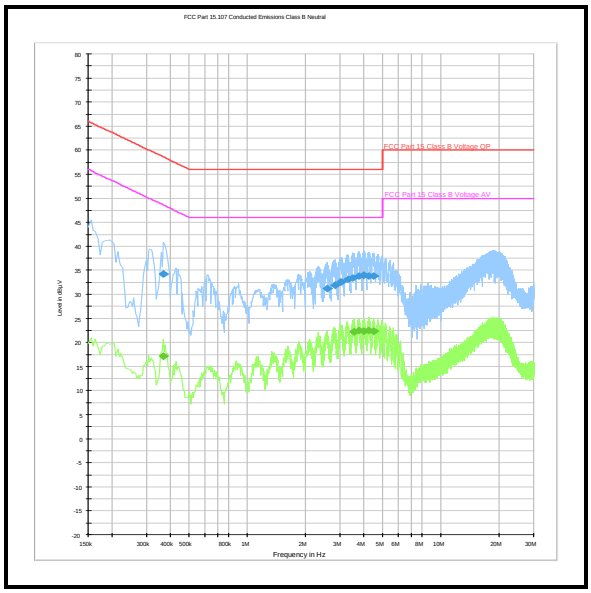
Results: Neutral Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.366000	Neutral	17.2	48.6	31.4	Complied
3.520500	Neutral	22.2	46.0	23.8	Complied
3.754500	Neutral	22.4	46.0	23.6	Complied
3.970500	Neutral	22.4	46.0	23.6	Complied
4.222500	Neutral	22.5	46.0	23.5	Complied
4.456500	Neutral	22.3	46.0	23.7	Complied

Transmitter AC Conducted Spurious Emissions (continued)



Live



Neutral

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

5.2.2. Transmitter 6 dB Bandwidth

Test Summary:

Test Engineer:	Tim Stanley	**Test Date:**	03 June 2011
Test Sample Serial No:	SN00017941		

FCC Part:	15.247(a)(2)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1 referencing KDB 558074 “Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005”.

Environmental Conditions:

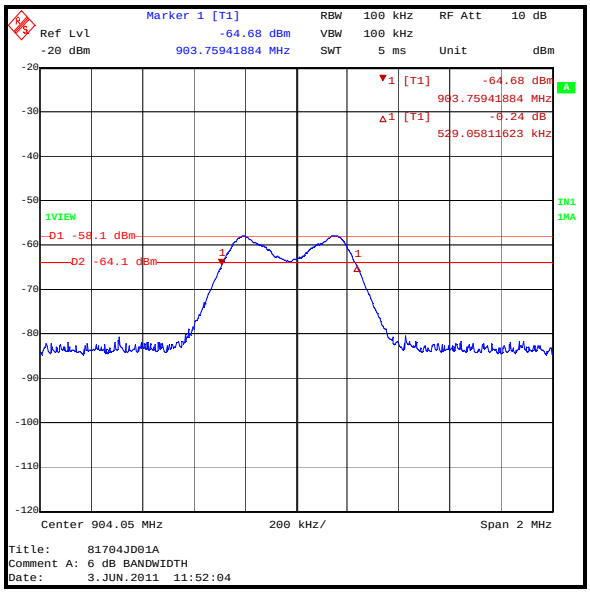
Temperature (℃):	30
Relative Humidity (%):	26

Results:

Channel	6 dB Bandwidth (kHz)	Limit (MHz)	Margin (kHz)	Result
904.05 MHz	529.058	≥0.5	29.058	Complied

Note(s):

1. These measurements were performed radiated as the EUT has an integral antenna and does not have an external antenna port.
2. The measurements were taken with a RBW of 100 kHz as stated in KDB 558074 “Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005”.



5.2.3. Transmitter 20 dB Bandwidth

Test Summary:

Test Engineer:	Tim Stanley	**Test Date:**	03 June 2011
Test Sample Serial No:	SN00017941		

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

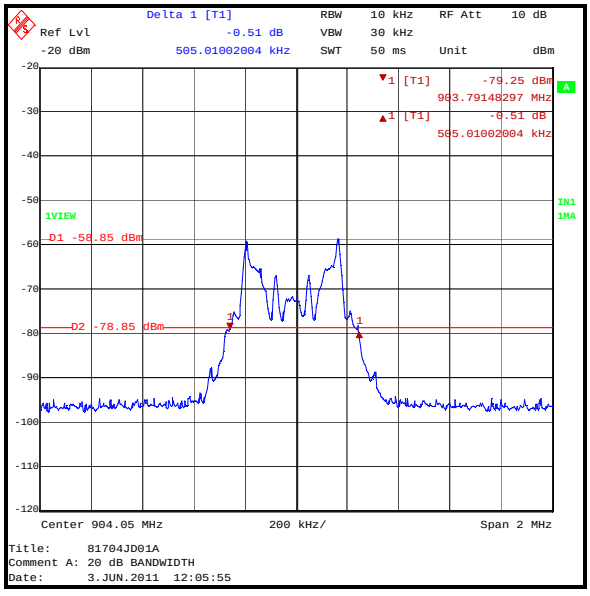
Temperature (°C):	30
Relative Humidity (%):	25

Results:

Channel	20 dB Bandwidth (kHz)
904.05 MHz	505.010

Note(s):

1. These measurements were performed radiated as the EUT has an integral antenna and does not have an external antenna port.



5.2.4. Transmitter Power Spectral Density

Test Summary:

Test Engineer:	Tim Stanley	**Test Date:**	03 June 2011
Test Sample Serial No:	SN00017941		

FCC Part:	15.247(e)
Test Method Used:	As detailed in ANSI C63.10 Section 6.11.2

Environmental Conditions:

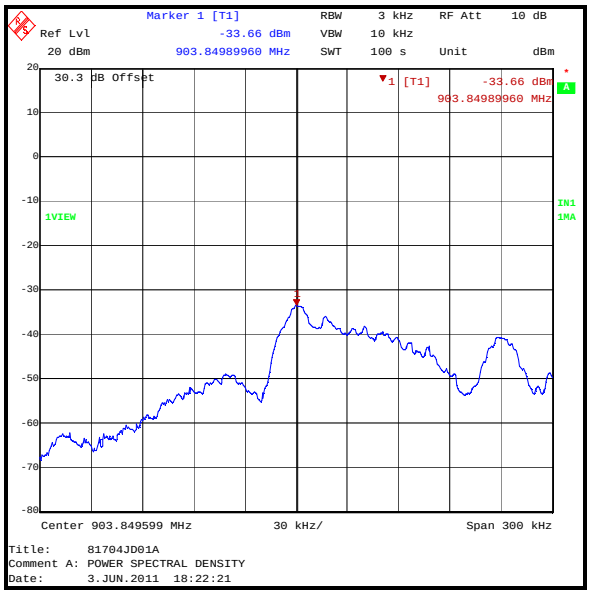
Temperature (°C):	30
Relative Humidity (%):	24

Results:

Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
904.05 MHz	-33.7	8.0	41.7	Complied

Note(s):

1. This test was performed radiated as the EUT has an integral antenna and does not have an external antenna port.



5.2.5. Transmitter Maximum Peak Output Power

Test Summary:

Test Engineer:	Tim Stanley	**Test Date:**	02 June 2011
Test Sample Serial No:	SN0017941		

FCC Part:	15.247(b)(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.2 and Sections 6.3 and 6.6 referencing ANSI C63.4 (see note below)

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

Results:

De Facto EIRP Limit Comparison

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
904.05 MHz	-26.7	0.0	-26.7	36.0	62.7	Complied

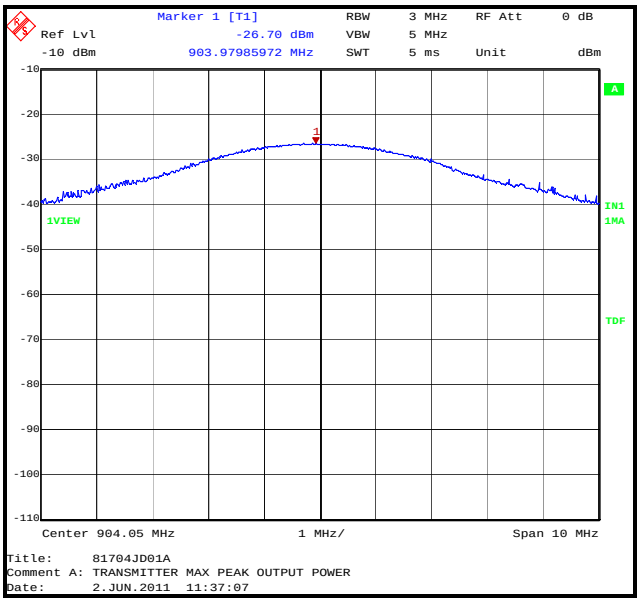
Conducted Peak Limit Comparison

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
904.05 MHz	-26.7	30.0	56.7	Complied

Note(s):

1. Tests were performed using a combination of the conducted test method described in ANSI C63.10 Section 6.10.1 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 have not an external antenna port.
2. The antenna gain, declared by the customer, is 0 dBi. The conducted peak power figure was determined by applying the antenna gain figure to the EIRP result.

Transmitter Maximum Peak Output Power (continued)



5.2.6. Transmitter Radiated Emissions

Test Summary:

Test Engineer:	Tim Stanley	**Test Date:**	31 May 2011
Test Sample Serial No:	SN0017941		

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	27

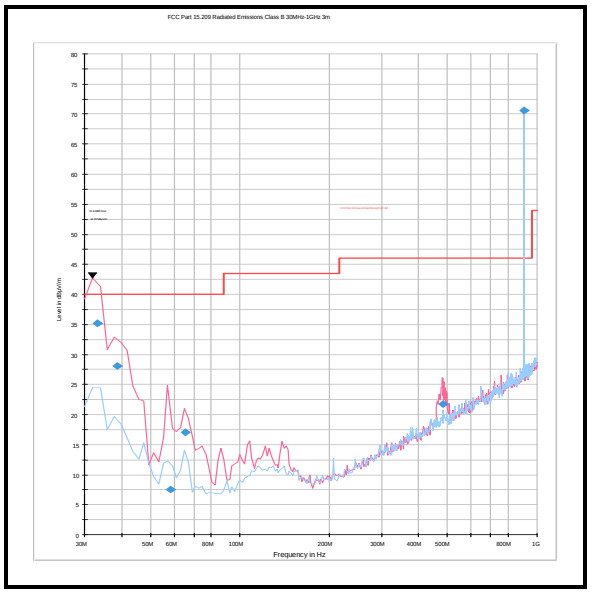
Results: Quasi-Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
33.247	Vertical	35.2	40.0	4.8	Complied
38.723	Vertical	28.1	40.0	11.9	Complied
58.383	Vertical	7.6	40.0	32.4	Complied
65.303	Vertical	17.0	40.0	23.0	Complied
482.276	Vertical	21.7	46.0	24.3	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The emission at 904.05 MHz shown on the 30 MHz to 1 GHz plot is the EUT fundamental.
3. 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.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI 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.

Transmitter Radiated Emissions (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Transmitter Radiated Emissions (continued)

Test Summary:

Test Engineer:	Tim Stanley	**Test Date:**	02 June 2011
Test Sample Serial No:	SN00017941		

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 9.3 GHz

Environmental Conditions:

Temperature (°C):	29
Relative Humidity (%):	21

Results: Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
1808.394	Horizontal	46.8	48.4	1.6	Complied
5423.122	Horizontal	45.0	74.0	29.0	Complied

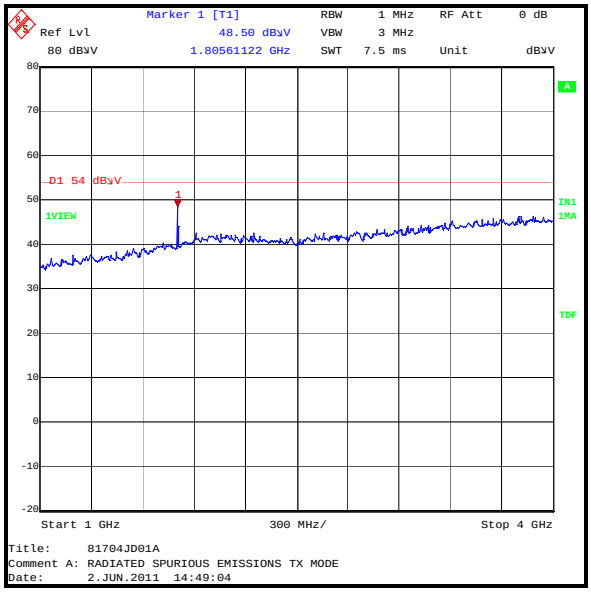
Results: Average

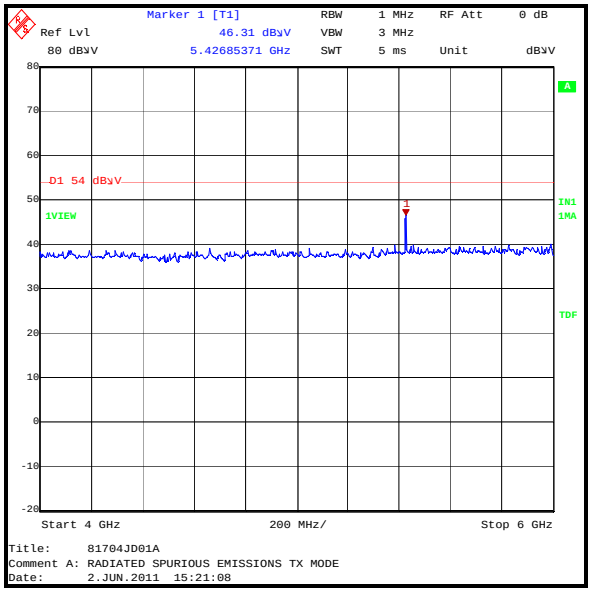
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5423.122	Horizontal	35.8	54.0	18.2	Complied

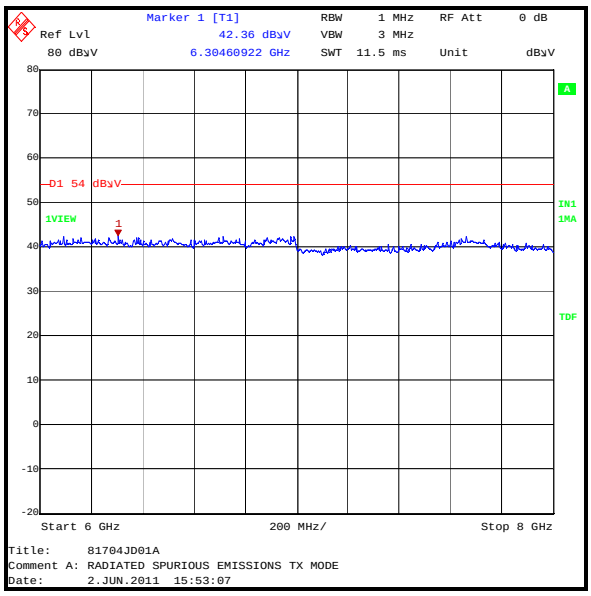
Note(s):

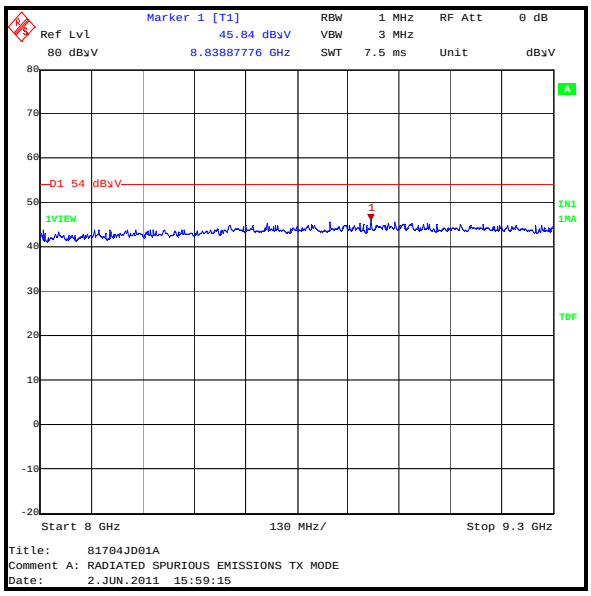
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The emission at 1808.394 appeared in a non-restricted band. Therefore, only the peak level of this emission was required to be measured.
3. All other emissions shown on 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.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI 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 (RFI 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.

Transmitter Radiated Emissions (continued)









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

5.2.7. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Tim Stanley	**Test Date:**	02 June 2011
Test Sample Serial No:	SN00017941		

FCC Part:	15.247(d)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2

Environmental Conditions:

Temperature (℃):	28
Relative Humidity (%):	21

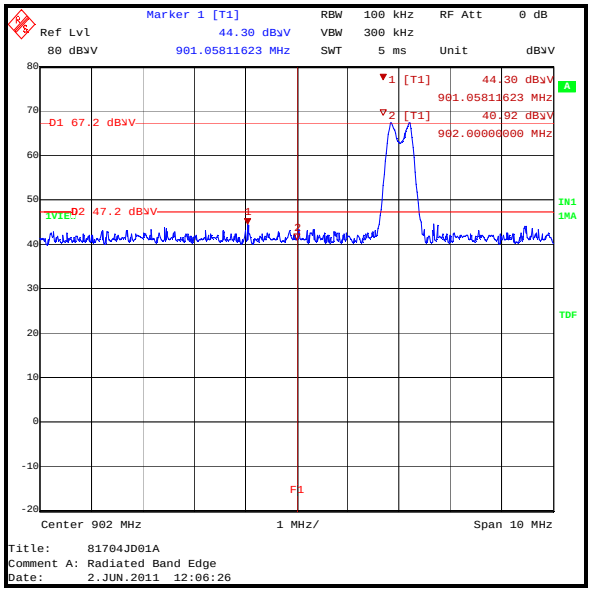
Results: Static Mode

Frequency (MHz)	Peak Level (dBµV/m)	-20 dBc Limit (dBµV/m)	Margin (dB)	Result
902	40.9	47.2	6.3	Complied
928	43.8	47.2	3.4	Complied

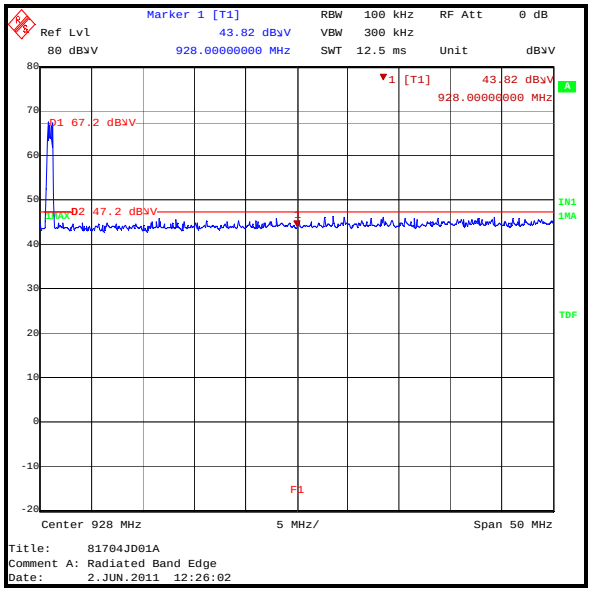
Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.

Transmitter Band Edge Radiated Emissions (continued)



Lower Band Edge



Upper Band Edge

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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Radiated Maximum Peak Output Power	902 MHz to 928 MHz	95%	±2.94 dB
6 dB / 20 dB Bandwidth	902 MHz to 928 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 10 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	20 Jun 2012	12
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1829	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100671	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A1974	High Pass Filter	AtlanTecRF	AFH-01000	090000283	29 Dec 2011	12
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
A288	Antenna	Chase	CBL6111A	1589	05 Sep 2011	12
A427	Antenna	Flann	14240-20	150	21 Nov 2013	36
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	05 Apr 2012	12
G0543	Amplifier	Sonoma	310N	230801	30 Jun 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 Jun 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12

NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.