

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Gryphon GM4100-BK-D910 incorporating Star Module Plus Small 910MHz

FCC ID: U4F0021

IC Certification Number: 3862D-005

To: FCC Part 15.249: 2010 Subpart C, RSS-210 Issue 8 December 2010
& RSS-Gen Issue 3 December 2010

Test Report Serial No:
RFI-RPT-RP77896JD01A

Version 3.0 Supersedes All Previous Versions

**This Test Report Is Issued Under The Authority
Of Chris Guy, Head of Global Approvals:**



Checked By:

A. Henriques

Signature:



Date of Issue:

17 December 2010

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1. Customer Information









Company Name:	Datalogic Scanning Group S.r.l.
Address:	13 Via San Vitalino Calderara di Reno Bologna 40012 Italy

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.249
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Section 15.249
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: 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:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	01 November 2010 to 04 November 2010

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.107(a)	RSS-Gen 7.2.4	Receiver/Idle Mode AC Conducted Emissions	
Part 15.109	RSS-Gen 4.10/6.1	Receiver/Idle Mode Radiated Spurious Emissions	
Part 15.249(a)	RSS-Gen 4.8 RSS-210 A2.9	Transmitter Fundamental Field Strength	
Part 2.1049	RSS-Gen 4.6.1/4.6.3	Transmitter 20 dB Bandwidth	
Part 15.249(a)(d)(e)/ 15.209(a)	RSS-Gen 4.9 RSS-210 A2.9	Transmitter Radiated Emissions	
Part 15.249(d)/ 15.209(a)	RSS-Gen 4.9 RSS-210 A2.9	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:	Datalogic Scanning Inc.
Model Name or Number:	Gryphon GM4100-BK-D910
Serial Number:	E10E15124 (#1)
Hardware Version Number:	664835013 (Rev E)
Software Version Number:	1.3X
FCC ID::	3862D-005
IC Certification Number::	U4F0021

3.2. Description of EUT

The equipment under test was the mobile barcode reader gun part of a barcode reading system. It incorporates a 910 MHz transceiver.

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 Transceiver	
Power Supply Requirement:	Nominal	3.7 V
Type of Unit:	Transceiver	
Channel Spacing:	Single Channel	
Data Rate:	3.6864 kb/s	
Transmit Frequency Range:	910 MHz	
Transmit Channels Tested:	Channel ID	Channel Frequency (MHz)
	Single Channel	910
Receive Frequency Range:	910 MHz	
Receive Channels Tested:	Channel ID	Channel Frequency (MHz)
	Single Channel	910

3.5. Support Equipment

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

Description:	Base Station / Charging Cradle
Brand Name:	Datalogic Scanning Inc.
Model Name or Number:	Gryphon BC4010-BK-910-CF
Serial Number:	E10E22833

Description:	AC to DC Power Supply
Brand Name:	Phihong
Model Name or Number:	PSAA18U-120
Serial Number:	102400088A1

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Continuous transmit at maximum output power
- Receive Mode

4.2. Configuration and Peripherals

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

- For the idle mode conducted AC emissions tests, the EUT was tested inserted into the base station / charging cradle being charged.
- The EUT was placed into a transmit or receive mode, by scanning a bar code provided by the client.

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. Receiver/Idle Mode AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Andrew Edwards	Test Date:	04 November 2010
Test Sample Serial No:	#1		

FCC Part:	15.107
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

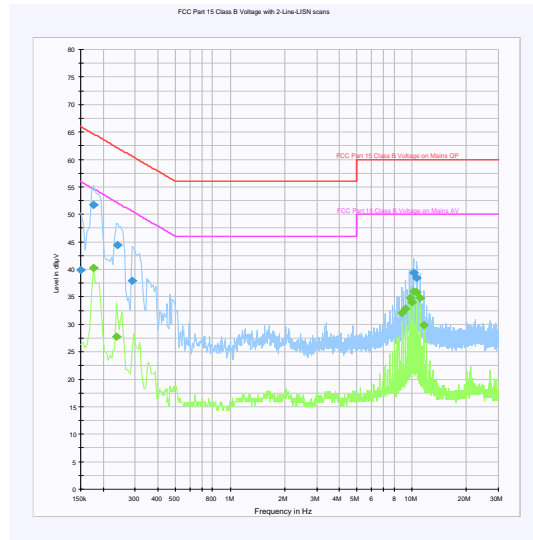
Temperature (°C):	23
Relative Humidity (%):	27

Results: Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.150000	Neutral	39.9	66.0	26.1	Complied
0.177000	Live	51.7	64.6	12.9	Complied
0.240000	Live	44.5	62.1	17.6	Complied
0.289500	Live	37.9	60.5	22.6	Complied
10.198500	Live	39.4	60.0	20.6	Complied
10.671000	Live	38.4	60.0	21.6	Complied

Results: Average

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.177000	Live	40.2	54.6	14.4	Complied
0.235500	Live	27.7	52.3	24.6	Complied
8.776500	Neutral	32.0	50.0	18.0	Complied
9.258000	Live	32.8	50.0	17.2	Complied
9.730500	Live	34.8	50.0	15.2	Complied
9.969000	Live	34.0	50.0	16.0	Complied
10.203000	Neutral	36.0	50.0	14.0	Complied
10.680000	Neutral	35.8	50.0	14.2	Complied
11.152500	Neutral	34.8	50.0	15.2	Complied
11.625000	Live	29.8	50.0	20.2	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions - Continued

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

5.2.2. Receiver/Idle Mode Radiated Spurious Emissions**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	01 November 2010
Test Sample Serial No:	#1		

FCC Part:	15.109
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:

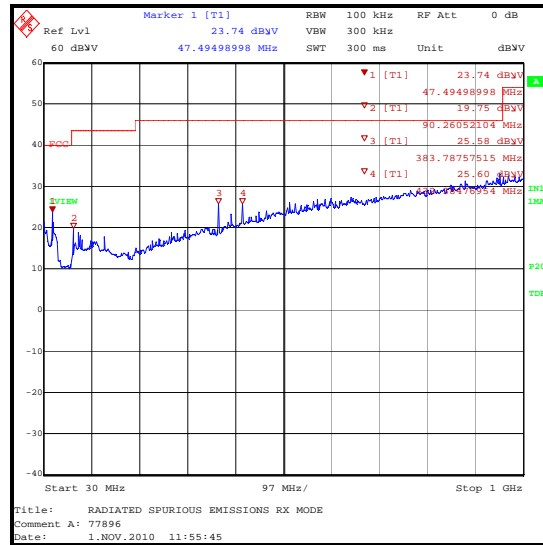
Temperature (°C):	24
Relative Humidity (%):	29

Results:

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
47.991	Vertical	23.5	40.0	16.5	Complied
383.993	Vertical	28.2	46.0	17.8	Complied
431.999	Vertical	28.6	46.0	17.4	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
1. 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.
2. 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.

Receiver/Idle Mode Radiated Spurious Emissions - Continued

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

Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	01 November 2010
Test Sample Serial No:	#1		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range:	1 GHz to 5 GHz

Environmental Conditions:

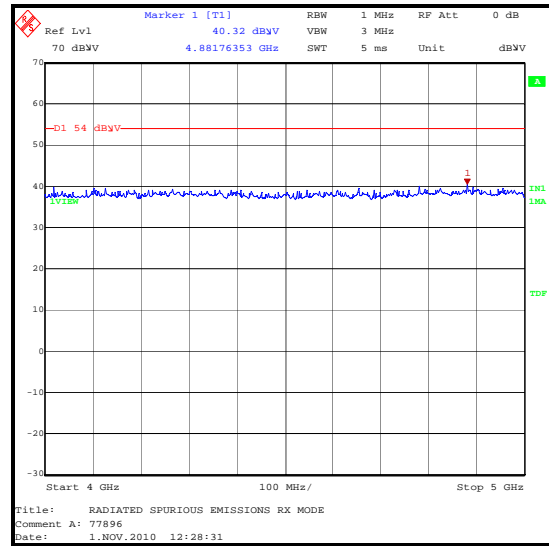
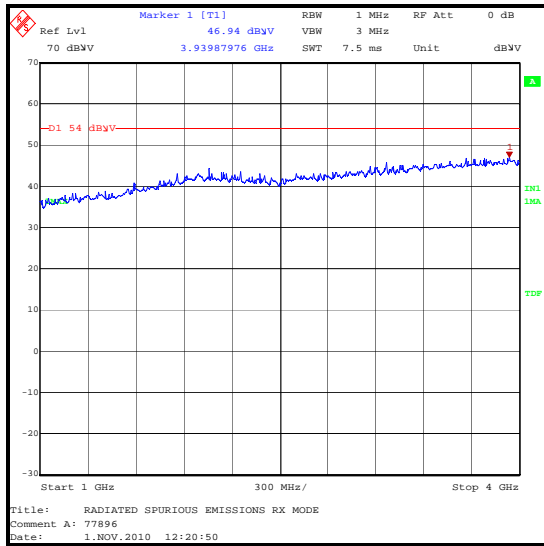
Temperature (°C):	23
Relative Humidity (%):	27

Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
3939.880	Vertical	46.9	54.0	7.1	Complied

Note(s):

1. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
2. 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.

Receiver/Idle Mode Radiated Spurious Emissions (continued)

5.2.3. Transmitter Fundamental Field Strength**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	01 November 2010
Test Sample Serial No:	#1		

FCC Part:	15.249(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.5

Environmental Conditions:

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

Results Quasi-Peak

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
910	Horizontal	73.3	94.0	20.7	Complied

Note(s):

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

5.2.4. Transmitter 20 dB Bandwidth**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	02 November 2010
Test Sample Serial No:	#1		

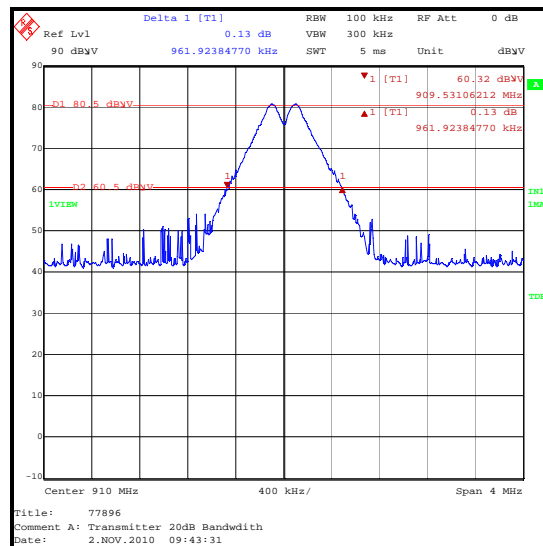
FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

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

Results:

Channel	20 dB Bandwidth (kHz)
Single	961.924



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

Test Engineer:	Nick Steele	Test Date:	01 November 2010
Test Sample Serial No:	#1		

FCC Part:	15.249(a)(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:

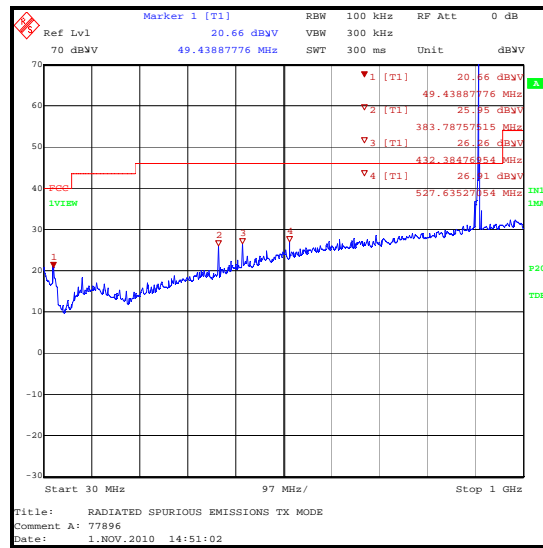
Temperature (°C):	25
Relative Humidity (%):	28

Results: Quasi-Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
383.992	Vertical	28.4	46.0	17.6	Complied
431.999	Vertical	28.8	46.0	17.2	Complied
528.005	Vertical	27.7	46.0	18.3	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 shown on the 30 MHz to 1 GHz plot is the EUT fundamental at 910 MHz.
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:	Nick Steele	Test Date:	01 November 2010
Test Sample Serial No:	#1		

FCC Part:	15.249(a)(d)(e) & 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 10 GHz

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	28

Results: Peak

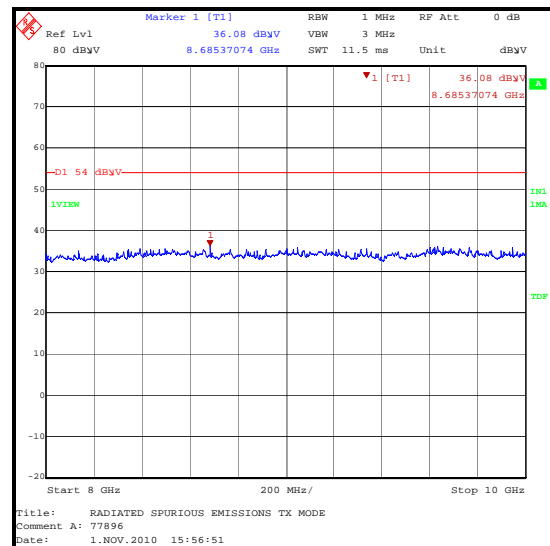
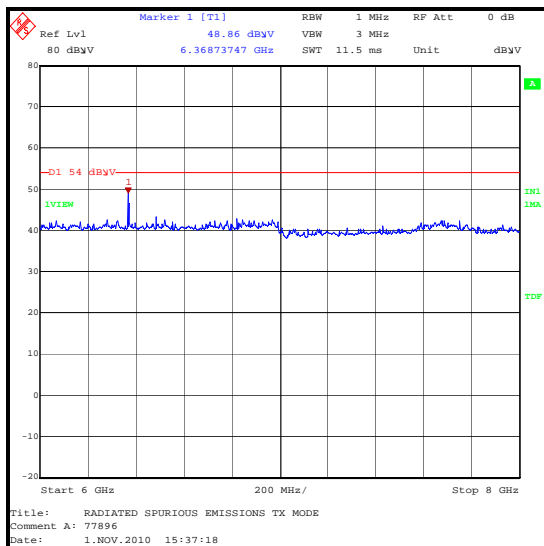
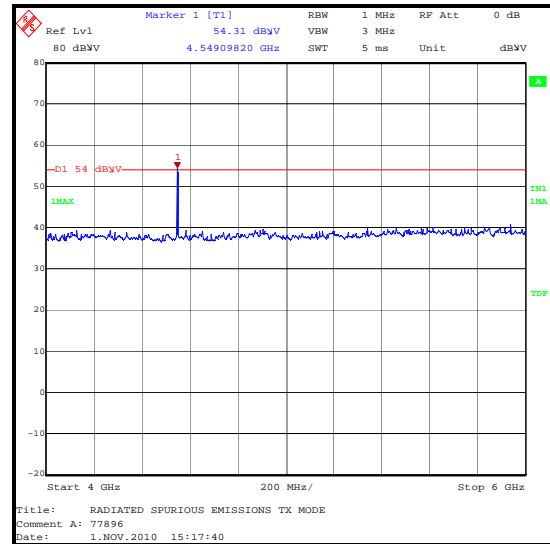
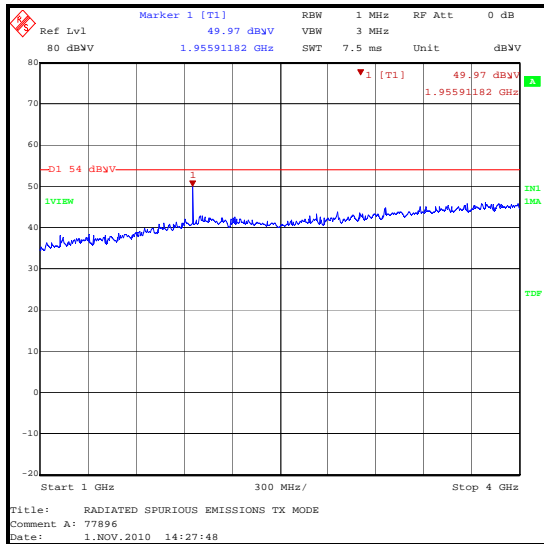
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4549.975	Horizontal	51.6	74.0	22.4	Complied

Results: Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4549.975	Horizontal	41.3	54.0	12.7	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. 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. 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.

5.2.6. Transmitter Band Edge Radiated Emissions**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	01 November 2010
Test Sample Serial No:	#1		

FCC Part:	15.249(d) & 15.209
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2

Environmental Conditions:

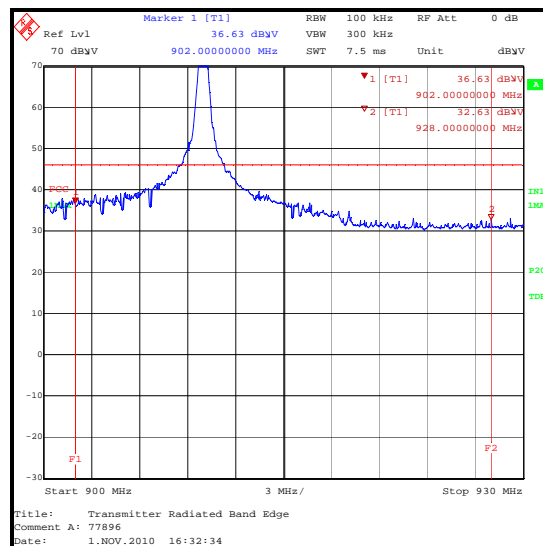
Temperature (°C):	26
Relative Humidity (%):	27

Results: Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
902	Horizontal	36.6	46.0	9.4	Complied
928	Horizontal	32.6	46.0	13.4	Complied

Note(s):

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



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
Fundamental Field Strength	902 MHz to 928 MHz	95%	±2.94 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)
A1069	LISN	Rohde & Schwarz	ESH3-Z5	837469/012	13 Apr 2011	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	06 Jun 2011	12
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	01 Mar 2011	12
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A254	Antenna	Flann Microwave	14240-20	139	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
A288	Antenna	Chase	CBL6111A	1589	05 Sep 2011	12
A553	Antenna	Chase	CBL6111A	1593	16 Mar 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 Apr 2011	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
L1001	Test Receiver	Rohde & Schwarz	ESU26	100239	28 Jan 2011	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12

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