



## TEST REPORT FROM RFI GLOBAL SERVICES LTD

Partial Test of: DataSend900-PSTN

To: FCC Part 15.247: 2009 Subpart C

**Test Report Serial No:**  
RFI/RPT1/RP75974JD03A

<b>This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:</b>	
 pp	
<b>Checked By:</b>	Nigel Davison
<b>Signature:</b>	
<b>Date of Issue:</b>	16 February 2010

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**1. Customer Information**









<b>Company Name:</b>	Kenure Developments Ltd
<b>Address:</b>	Springlakes Deadbrook Lane Aldershot Hampshire GU12 4UH United Kingdom

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR15.247
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2009: Part 15 Subpart C (Radio Frequency Devices) - Section 15.247
<b>Specification Reference:</b>	47CFR15.107 and 47CFR15.109
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2009: Part 15 Subpart B (Radio Frequency Devices) - Sections 15.107 and 15.109
<b>Site Registration:</b>	FCC: 209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire RG24 8AH, England
<b>Test Dates:</b>	25 January 2010 to 12 February 2010

### **2.2. Summary of Test Results**

<b>FCC Reference (47CFR)</b>	<b>Measurement</b>	<b>Port Type</b>	<b>Result</b>
Part 15.107(a)	Receiver/Idle Mode AC Conducted Emissions	AC Mains	
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	Enclosure	
Part 15.207	Transmitter AC Conducted Emissions	AC Mains	
Part 15.247(b)(2)	Transmitter Maximum Peak Output Power	Antenna	
Part 15.247(d) & 15.209(a)	Transmitter Radiated Emissions	Antenna	
Part 15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	Antenna	
<b>Key to Results</b>  = Complied  = Did not comply			

### **2.3. Methods and Procedures**

<b>Reference:</b>	ANSI C63.4 (2003)
<b>Title:</b>	American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
<b>Reference:</b>	DA00-705 (2000)
<b>Title:</b>	Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

### **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)**

<b>Brand Name:</b>	Datasend900-PSTN
<b>Model Name or Number:</b>	DS-C90P
<b>Serial Number:</b>	0001
<b>Hardware Version Number:</b>	7328/0 iss 1
<b>Software Version Number:</b>	1.0
<b>FCC ID Number:</b>	MS8C9P

<b>Description:</b>	2.2 dBi gain half-wave dipole antenna with SMA connector
<b>Brand Name:</b>	Antenna Factor
<b>Model Name or Number:</b>	ANT-916-CW-HWR-SMA
<b>Serial Number:</b>	Not marked or stated

#### **3.2. Description of EUT**

The Equipment Under Test (EUT) was a Wireless Data Concentrator operating over the 902 MHz to 928 MHz band. The EUT uses total 51 channels for communications where the 36th channel (919.8976MHz) is a receive-only channel and the rest are bi-directional (transmit/receive) channels.

#### **3.3. Modifications Incorporated in the EUT**

The EUT had been modified in order to select the bottom, centre or top channel during testing. A flying lead approximately 80 mm in length had been routed through the gap in the casing. A switch had been fitted to the end of the flying lead. Pressing the switch in a defined sequence allowed the desired channel to be selected.

**3.4. Additional Information Related to Testing**

<b>Tested Technology:</b>	FHSS		
<b>Power Supply Requirement:</b>	5.0 VDC via external DC supply		
<b>Type of Unit:</b>	Transceiver		
<b>Channel Spacing:</b>	500 kHz		
<b>Modulation:</b>	2-FSK		
<b>Maximum Transmit ERP:</b>	23.45 dBm		
<b>Transmit Frequency Range:</b>	902 MHz to 928 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	1	902.3976
	Middle	26	914.8976
	Top	51	927.3976
<b>Receive Frequency Range:</b>	902 MHz to 928 MHz		
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	1	902.3976
	Middle	26	914.8976
	Top	51	927.3976

### **3.5. Support Equipment**

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

<b>Description:</b>	Power supply
<b>Brand Name:</b>	Aglient
<b>Model Name or Number:</b>	E2640A
<b>Serial Number:</b>	MY4001718

<b>Description:</b>	AC/DC 5v Power supply
<b>Brand Name:</b>	Power Pax
<b>Model Name or Number:</b>	5V 8W Model 1008/PA1008-0501B
<b>Serial Number:</b>	2K9S0769

<b>Description:</b>	In circuit programmer USB BDM multilink
<b>Brand Name:</b>	P&E Pemicro
<b>Model Name or Number:</b>	E2640A
<b>Serial Number:</b>	Not stated

<b>Description:</b>	Laptop PC
<b>Brand Name:</b>	Siemens
<b>Model Name or Number:</b>	C series Life book /
<b>Serial Number:</b>	02487389E05

<b>Description:</b>	PSTN Telephone
<b>Brand Name:</b>	Binatone
<b>Model Name or Number:</b>	Caprice 600
<b>Serial Number:</b>	Q0802075265G



## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

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

- Transmitter tests were performed with the EUT transmitting at full power on the bottom, centre and top channels or frequency hopping across the band of operation.
- Receiver/idle tests were performed with the EUT in receive mode.

### **4.2. Configuration and Peripherals**

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

- AC conducted emissions tests were performed with the EUT powered from an AC/DC power supply with 120 VAC input and 5 VDC output. The power supply input was connected to a LISN and the LISN input connected to a 120 VAC 60 Hz supply.
- Radiated tests were performed with the EUT powered from an AC/DC power supply. The power supply input was connected to a 120 VAC 60 Hz supply.
- An external switch on the EUT was used to select bottom, centre or top channels. A bespoke application on a laptop PC was used to enable or disable frequency hopping mode when required. The PC was disconnected from the EUT once frequency hopping had been enabled or disabled.
- The dipole antenna was fitted for all radiated and AC conducted tests.
- An Landline phone was attached to the EUT to terminated the RJ11 port.

## **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:**

<b>FCC Part:</b>	15.107(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 7 and relevant annexes

#### **Environmental Conditions:**

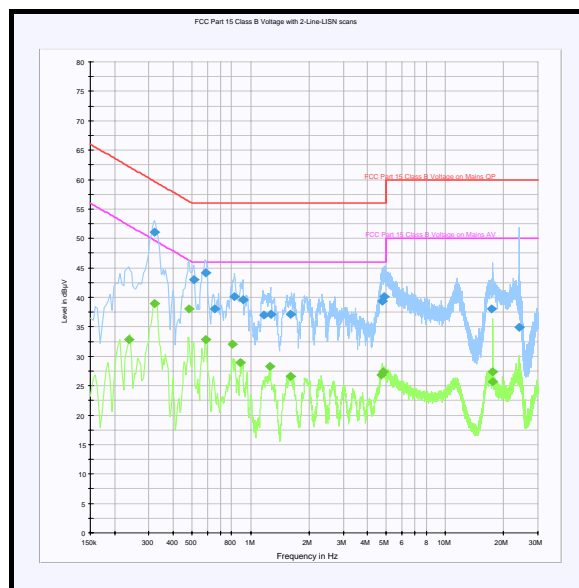
<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	23

#### **Results: Quasi Peak Detector Measurements**

<b>Frequency (MHz)</b>	<b>Line</b>	<b>Quasi Peak Level (dBμV)</b>	<b>Limit (dBμV)</b>	<b>Margin (dB)</b>	<b>Result</b>
0.321000	Live	51.1	59.7	8.6	Complied
0.510000	Live	43.0	56.0	13.0	Complied
0.591000	Live	44.2	56.0	11.8	Complied
0.649500	Live	38.0	56.0	18.0	Complied
0.825000	Live	40.2	56.0	15.8	Complied
0.910500	Live	39.6	56.0	16.4	Complied
1.167000	Live	37.0	56.0	19.0	Complied
1.270500	Live	37.1	56.0	18.9	Complied
1.612500	Live	37.2	56.0	18.8	Complied
4.726500	Live	39.4	56.0	16.6	Complied
4.884000	Live	40.1	56.0	15.9	Complied
17.430000	Live	38.1	60.0	21.9	Complied
23.995500	Live	34.9	60.0	25.1	Complied

**Receiver/Idle Mode AC Conducted Spurious Emissions (continued)****Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.235500	Live	32.8	52.3	19.5	Complied
0.321000	Live	39.0	49.7	10.7	Complied
0.483000	Live	38.1	46.3	8.2	Complied
0.586500	Live	32.8	46.0	13.2	Complied
0.807000	Live	32.1	46.0	13.9	Complied
0.888000	Live	28.9	46.0	17.1	Complied
1.261500	Live	28.3	46.0	17.7	Complied
1.603500	Live	26.6	46.0	19.4	Complied
4.717500	Live	26.9	46.0	19.1	Complied
4.780500	Live	27.4	46.0	18.6	Complied
17.448000	Live	27.4	50.0	22.6	Complied
17.632500	Live	25.7	50.0	24.3	Complied



*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:**

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	30 MHz to 1000 MHz

**Environmental Conditions:**

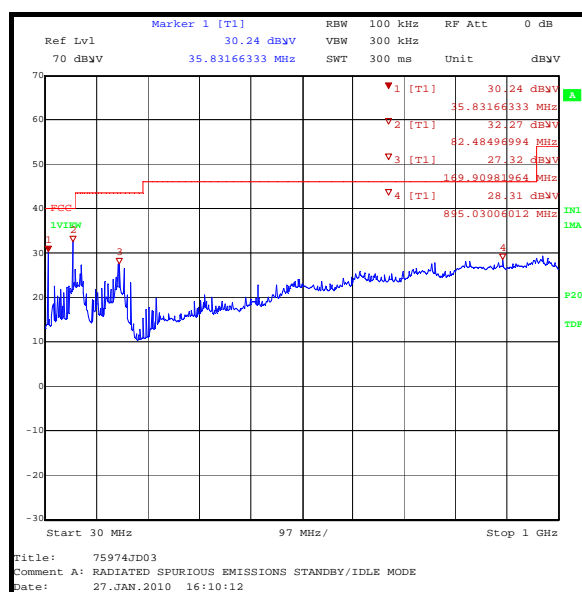
Temperature (°C):	23
Relative Humidity (%):	22

**Results:**

Frequency (MHz)	Antenna Polarity	Q-P Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
35.906	Horizontal	22.9	40.0	17.1	Complied
83.798	Vertical	34.1	40.0	5.9	Complied
167.591	Vertical	29.3	43.5	14.2	Complied

**Note(s):**

- All other emissions shown on the pre-scan plot were investigated and found to be greater than 20 dB below the applicable limit or below the level of the test system noise floor.



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

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

<b>FCC Part:</b>	15.109
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes
<b>Frequency Range:</b>	1 GHz to 4.6 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	22

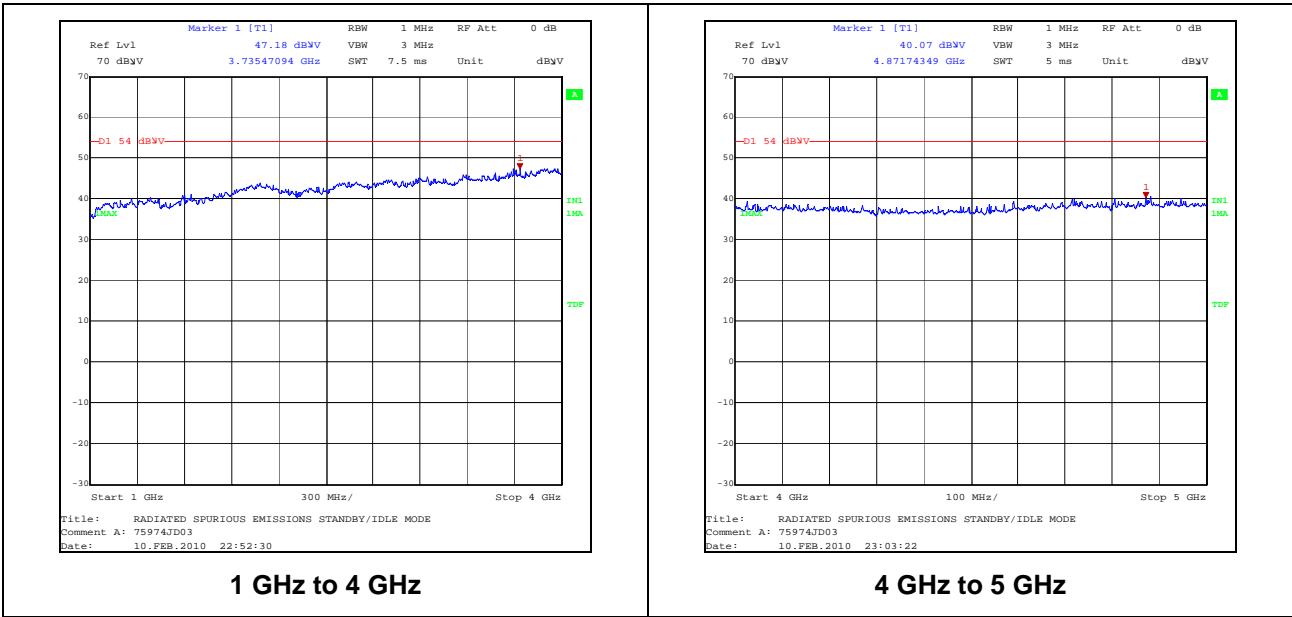
**Results:**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Peak Level (dB<math>\mu</math>V/m)</b>	<b>Average Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
3735.471	Horizontal	47.2	54.0	6.8	Complied
4871.743	Horizontal	40.1	54.0	13.9	Complied

**Note(s):**

1. Plots were taken using a maximum peak detector with the average limit applied.

Receiver/Idle Mode Radiated Spurious Emissions (continued)



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

**5.2.3. Transmitter Mode AC Conducted Spurious Emissions****Test Summary:**

<b>FCC Part:</b>	15.107(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 7 and relevant annexes

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	23

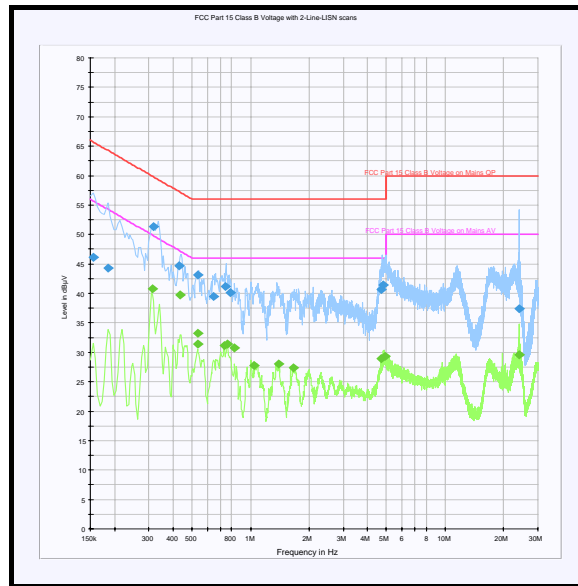
**Results: Quasi Peak Detector Measurements**

<b>Frequency (MHz)</b>	<b>Line</b>	<b>Quasi Peak Level (dBμV)</b>	<b>Limit (dBμV)</b>	<b>Margin (dB)</b>	<b>Result</b>
0.154500	Live	46.2	65.8	19.6	Complied
0.186000	Live	44.3	64.2	19.9	Complied
0.316500	Live	51.3	59.8	8.5	Complied
0.429000	Live	44.7	57.3	12.6	Complied
0.537000	Live	43.1	56.0	12.9	Complied
0.645000	Live	39.5	56.0	16.5	Complied
0.744000	Live	41.2	56.0	14.8	Complied
0.784500	Live	40.1	56.0	15.9	Complied
4.690500	Live	40.6	56.0	15.4	Complied
4.785000	Live	41.5	56.0	14.5	Complied
24.000000	Live	37.4	60.0	22.6	Complied



**Transmitter Mode AC Conducted Spurious Emissions (continued)****Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.312000	Live	40.8	49.9	9.1	Complied
0.433500	Live	39.8	47.2	7.4	Complied
0.532500	Live	33.3	46.0	12.7	Complied
0.537000	Live	31.4	46.0	14.6	Complied
0.730500	Live	31.2	46.0	14.8	Complied
0.757500	Live	31.5	46.0	14.5	Complied
0.820500	Live	30.7	46.0	15.3	Complied
1.041000	Live	27.8	46.0	18.2	Complied
1.387500	Live	28.0	46.0	18.0	Complied
1.653000	Live	27.4	46.0	18.6	Complied
4.713000	Live	28.9	46.0	17.1	Complied
4.906500	Live	29.3	46.0	16.7	Complied
24.000000	Live	29.6	50.0	20.4	Complied

**Transmitter Mode AC Conducted Spurious Emissions (continued)**

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

**5.2.4. Transmitter Maximum Peak Output Power (ERP)****Test Summary:**

<b>FCC Part:</b>	15.247(b)(2)
<b>Test Method Used:</b>	As detailed in Public Notice DA 00-705 (March 30, 2000), ANSI C63.4 Section 13.1 and FCC CFR Part 2

**Environmental Conditions:**

<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	22

**Results:**

Channel	Conducted RF O/P Power (dBm)	Conducted RF O/P Power Limit (dBm)	Margin (dB)	Result
Bottom	21.1	30.0	8.9	Complied
Middle	21.3	30.0	8.7	Complied
Top	20.8	30.0	9.2	Complied

Channel	Conducted RF O/P Power (dBm)	Stated Antenna Gain (dB)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	21.1	2.15	23.25	36.0	12.75	Complied
Middle	21.3	2.15	23.45	36.0	12.55	Complied
Top	20.8	2.15	22.95	36.0	13.05	Complied

**Note(s):**

- As per the requirements of Public Notice DA 00-705, the stated antenna gain of the EUT is 2.15 dBi which, when added to the highest (worst case) measured conducted peak output power of 21.3 dBm (from the table above), gives a de facto EIRP of 23.45 dBm. This is in compliance with the de facto EIRP limitation, i.e. 4 Watt (36 dBm).

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

<b>FCC Part:</b>	15.247(d) & 15.209(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and Public Notice DA 00-705 (March 30, 2000)
<b>Frequency Range</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	21

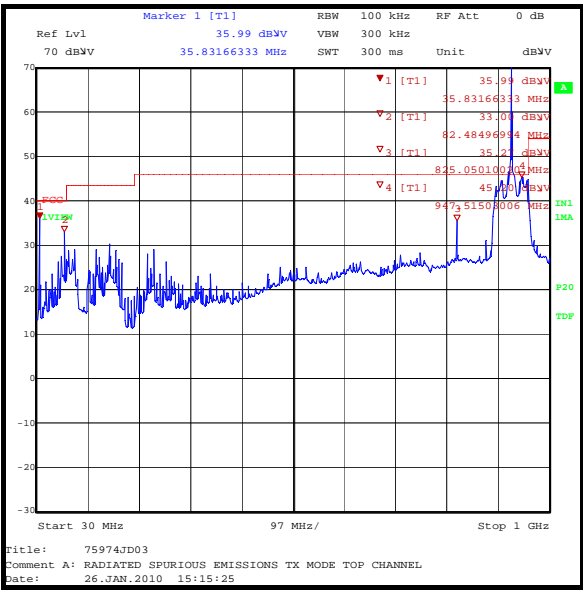
**Results: Top Channel**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Level (dB<math>\mu</math>V/m)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
35.914	Vertical	20.3	100.4	80.1	Complied
83.769	Vertical	33.6	100.4	66.8	Complied
167.567	Vertical	30.6	100.4	69.8	Complied
239.386	Vertical	29.4	100.4	71.0	Complied
251.341	Vertical	25.9	46.0	20.1	Complied
824.326	Horizontal	35.3	100.4	65.1	Complied
946.016	Vertical	47.3	100.4	53.1	Complied
956.339	Horizontal	46.8	100.4	53.6	Complied

**Note(s):**

1. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
2. The carrier is shown on the pre-scan plot at approximately 927 MHz.

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 Radiated Emissions****Test Summary:**

<b>FCC Part:</b>	15.247(d) & 15.209(a)
<b>Test Method Used:</b>	As detailed in Public Notice DA 00-705 (March 30, 2000) and ANSI C63.4 Section 8.
<b>Frequency Range</b>	1 GHz to 9.28 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	22

**Results:****Highest Peak Level. Bottom Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.805016	Vertical	81.7	-2.2	79.5	100.7	21.2	Complied
2.461767	Vertical	46.6	-0.2	46.4	100.7	54.3	Complied
2.707454	Vertical	56.8	1.1	57.9	74.0	16.1	Complied
3.609899	Vertical	57.9	3.1	61.0	74.0	13.0	Complied
5.414980	Horizontal	55.3	2.8	58.1	74.0	15.9	Complied
7.219982	Horizontal	57.3	6.6	63.9	100.5	36.8	Complied

**Highest Average Level. Bottom Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.707454	Vertical	24.1	1.1	25.2	54.0	28.8	Complied
3.609899	Vertical	25.2	3.1	28.3	54.0	25.7	Complied
5.414980	Horizontal	22.6	2.8	25.4	54.0	28.6	Complied

**Highest Peak Level. Middle Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1.830004	Horizontal	83.1	-2.0	81.1	100.9	19.8	Complied
3.659992	Vertical	62.4	4.6	67.0	74.0	7.0	Complied
5.489940	Horizontal	50.9	2.9	53.8	100.9	47.1	Complied
8.234988	Vertical	52.0	7.4	59.4	74.0	14.6	Complied
9.149859	Vertical	57.1	6.8	63.9	74.0	10.1	Complied

**Transmitter Radiated Emissions (continued)****Highest Average Level. Middle Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
3.659992	Vertical	29.7	4.6	34.3	54.0	19.7	Complied
8.234988	Vertical	19.3	7.4	26.7	54.0	27.3	Complied
9.149859	Vertical	24.4	6.8	31.2	54.0	22.8	Complied

**Highest Peak Level. Top Channel**

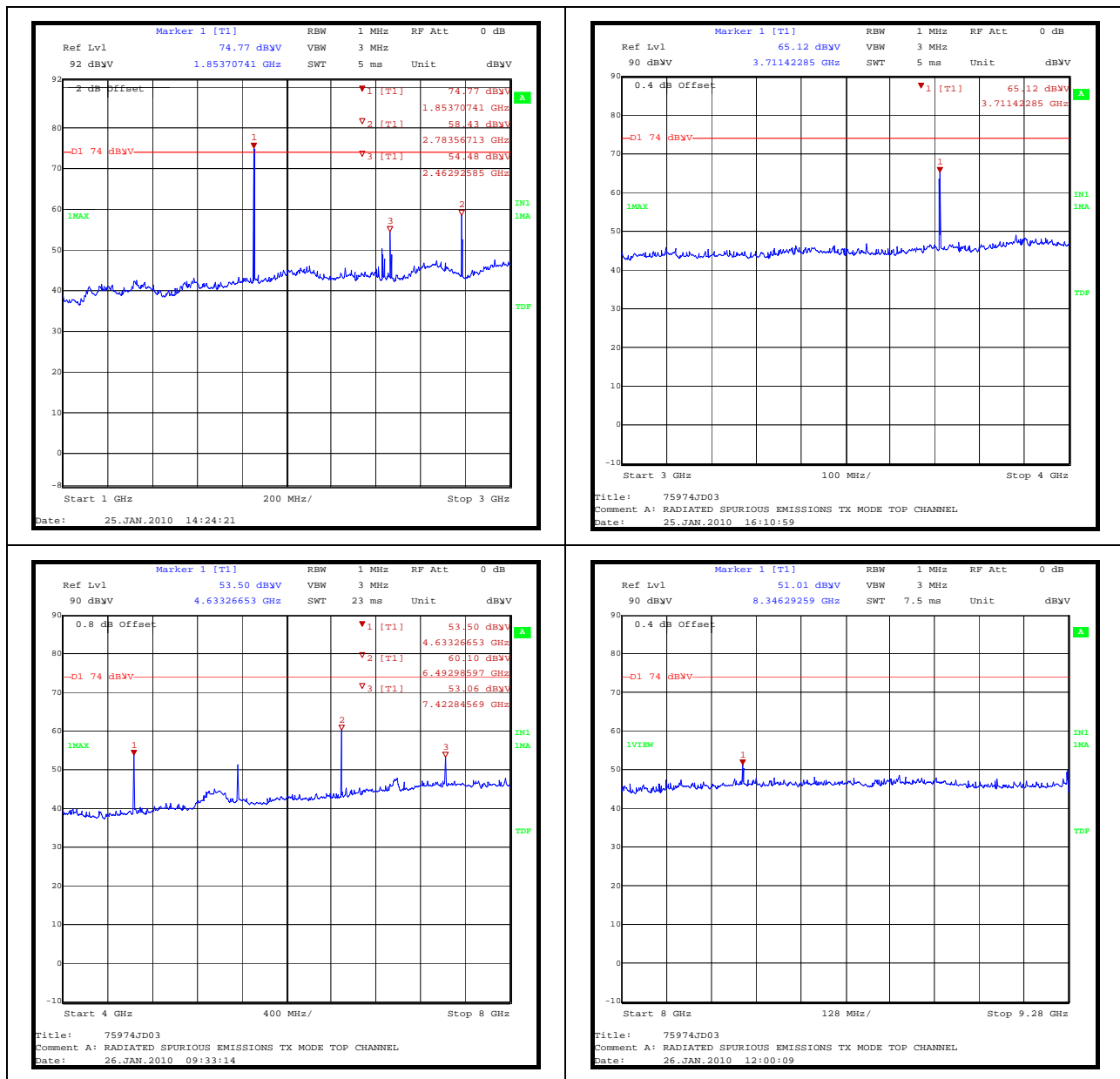
Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
1.855002	Horizontal	76.7	-1.8	74.9	100.4	25.5	Complied
2.463520	Horizontal	49.1	-0.3	46.8	100.4	53.6	Complied
2.782453	Horizontal	57.8	1.1	58.9	74.0	15.1	Complied
3.709935	Vertical	60.9	4.6	65.5	74.0	8.5	Complied
4.637565	Vertical	55.2	-2.3	52.9	74.0	21.1	Complied
6.492410	Vertical	55.3	2.0	57.3	100.4	43.1	Complied
7.419854	Horizontal	49.1	6.5	55.6	74.0	18.4	Complied
8.347344	Vertical	43.8	7.6	51.4	74.0	22.6	Complied

**Highest Average Level. Top Channel**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2.782453	Horizontal	25.1	1.1	26.2	54.0	27.8	Complied
3.709935	Vertical	28.2	4.6	32.8	54.0	21.2	Complied
4.6375652	Vertical	22.6	-2.3	20.2	54.0	33.8	Complied
7.419854	Horizontal	16.4	6.5	22.9	54.0	31.1	Complied
8.347344	Vertical	11.1	7.6	18.7	54.0	35.3	Complied

**Note(s):**

1. Average levels of emissions within the restricted bands were obtained using the test method and procedure stated in the Spurious Radiated Emissions section of FCC Public Notice DA 00-705. A duty cycle correction factor of 32.7 dB was used.
2. The calculation for the duty cycle is  $20 \log (2.325\text{ms}/100\text{ms}) = 32.7 \text{ dB}$
3. The level of peak emissions in hopping mode were equal to or less than those recorded in the results tables above.

**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 Duty Cycle****Test Summary:****Test Method Used:**

As detailed in Public Notice DA 00-705 (March 30, 2000)

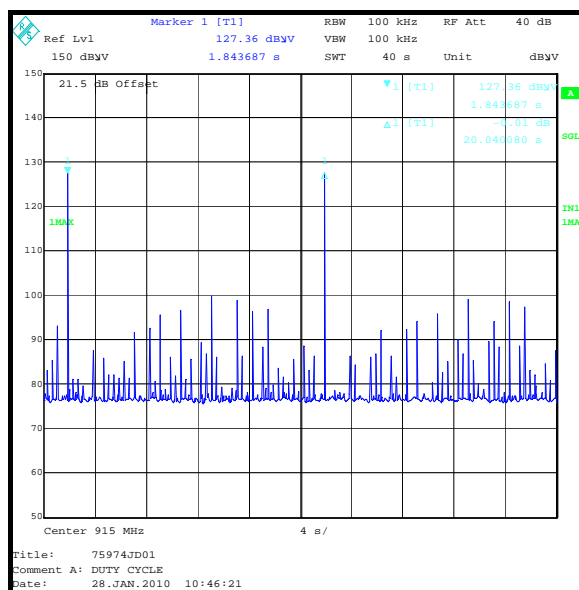
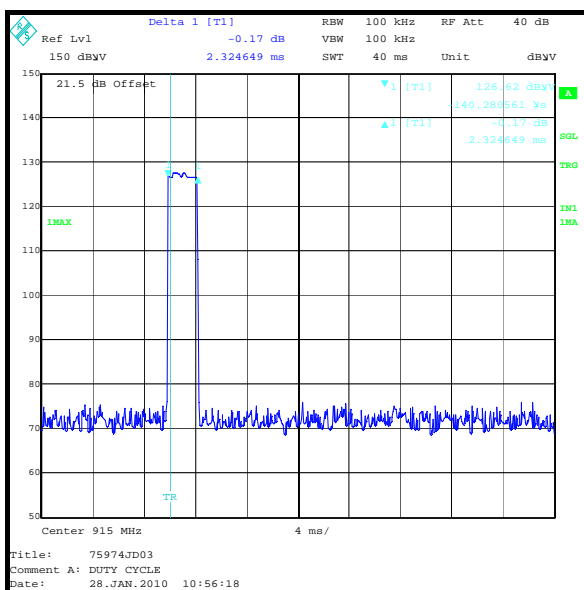
**Results:**

Pulse Duration (mS)	Duty Cycle (dB)
2.325	32.7

Silent Period (seconds)
20.040

**Note(s):**

- In order to assist with the determination of the average level of fundamental and spurious emissions field strength, measurements were made of duty cycle to determine the transmission duration and the silent period time of the transmitter.



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

<b>FCC Part:</b>	15.247(d)
<b>Test Method Used:</b>	As detailed in Public Notice DA 00-705 (March 30, 2000) and FCC CFR Part 2.

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	21

**Results: Peak Power Level Static Mode**

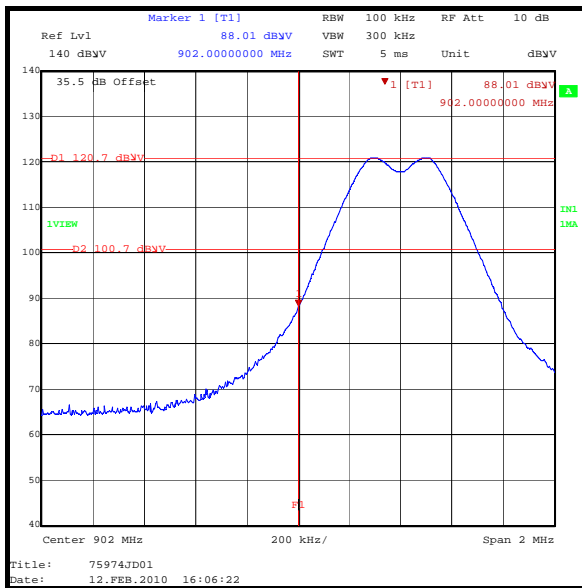
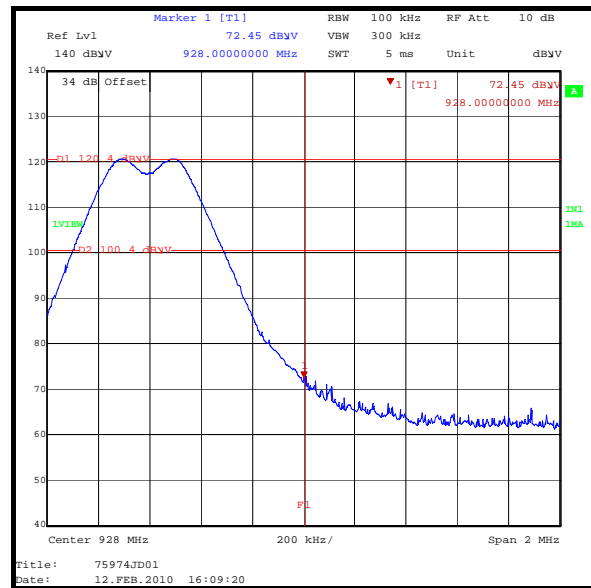
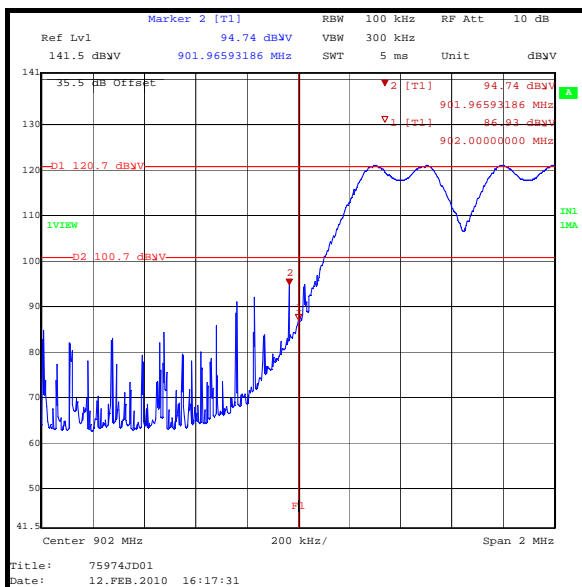
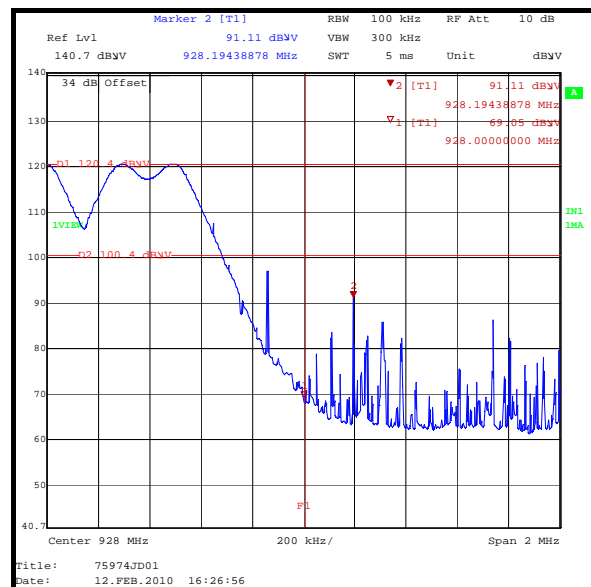
<b>Frequency (MHz)</b>	<b>Peak Emission Level (dB<math>\mu</math>V/m)</b>	<b>-20 dBc Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
902.000	88.0	100.7	12.7	Complied
928.000	72.5	100.4	27.9	Complied

**Results: Peak Power Level Hopping Mode**

<b>Frequency (MHz)</b>	<b>Peak Emission Level (dB<math>\mu</math>V/m)</b>	<b>-20 dBc Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
901.966	94.7	100.7	6.0	Complied
928.194	91.1	100.4	9.3	Complied

**Note(s):**

1. The limit lines shown on the plots are set to a level 20 dB below the fundamental peak field strength of the highest power level contained within the band when measured in a 100 kHz bandwidth.

**Transmitter Band Edge Radiated Emissions (continued)****Static- Bottom channel / lower band edge****Static - Top channel / upper band edge****Hopping - Bottom channel / lower band edge****Hopping - Top channel / 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%	±3.72 dB
Transmitter Maximum Peak Output Power	902 to 928 MHz	95%	±2.94 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±4.64 dB
Radiated Spurious Emissions	1 GHz 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 Last Calibrated	Cal. Interval (Months)
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A057	High Pass Filter	Aerial Facilities	HP-950-5N	4389B	Calibrated before use	-
A208	Attenuator	Lectronic Research	157f1	197	Calibrated before use	-
A1392	Attenuator	Huber + Suhner	757456	6820.17.B	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	27 Nov 2009	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Jan 2010	12
A288	Antenna	Chase	CBL6111A	1589	13 Mar 2009	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	19 Mar 2009	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 Sep 2009	12
M1124	Test Receiver	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	22 Apr 2009	12
M1379	Test Receiver	Rohde & Schwarz	ESIB7	100330	20 Aug 2009	12

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