



# TEST REPORT

**Test Report No. : UL-RPT-RP78574JD07A V2.0**

**Manufacturer** : Panasonic Mobile Communications Development of Europe Ltd  
**Model No.** : NTT docomo P-01C  
**FCC ID** : UCE210032A  
**Technology** : RFID – 13.56 MHz  
**Test Standard(s)** : FCC Part 15.225

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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 2.0 supersedes Test Report Serial Number RFI-RPT-RP78574JD07A. The original test report was issued under the previous company name of RFI Global Services Ltd.

**Date of Issue:** 17 June 2015

**Checked by:**

Ian Watch  
Senior Engineer, Radio Laboratory

**Issued by :**

pp

John Newell  
Quality Manager,  
UL VS LTD



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

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**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**

<b>1. Customer Information.....</b>	<b>4</b>
<b>2. Summary of Testing.....</b>	<b>5</b>
2.1. General Information	5
2.2. Summary of Test Results	5
2.3. Methods and Procedures	5
2.4. Deviations from the Test Specification	5
<b>3. Equipment Under Test (EUT) .....</b>	<b>6</b>
3.1. Identification of Equipment Under Test (EUT)	6
3.2. Description of EUT	6
3.3. Modifications Incorporated in the EUT	6
3.4. Additional Information Related to Testing	7
3.5. Support Equipment	7
<b>4. Operation and Monitoring of the EUT during Testing .....</b>	<b>8</b>
4.1. Operating Modes	8
4.2. Configuration and Peripherals	8
<b>5. Measurements, Examinations and Derived Results.....</b>	<b>9</b>
5.1. General Comments	9
5.2. Test Results	10
5.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions	10
5.2.2. Receiver/Idle Mode Radiated Spurious Emissions	12
5.2.3. Transmitter Fundamental Field Strength	14
5.2.4. Transmitter Radiated Spurious Emissions	15
5.2.5. Transmitter Radiated Emissions at Band Edges	17
5.2.6. Transmitter 20 dB Bandwidth	19
5.2.7. Transmitter Frequency Stability (Temperature & Voltage Variation)	20
<b>6. Measurement Uncertainty .....</b>	<b>21</b>
<b>7. Report Revision History .....</b>	<b>22</b>
<b>Appendix 1. Test Equipment Used .....</b>	<b>23</b>

**1. Customer Information**










<b>Company Name:</b>	Panasonic Mobile Communications Development of Europe Ltd
<b>Address:</b>	Panasonic House Willoughby Road Bracknell Berkshire RG12 8FP United Kingdom

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR15.225
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Radio Frequency Devices) - Section 15.225
<b>Specification Reference:</b>	47CFR15.107, 47CFR15.109 and 47CFR15.209
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Sections 15.107, 15.109 and 15.209
<b>Site Registration:</b>	209735
<b>Location of Testing:</b>	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
<b>Test Dates:</b>	13 August 2010 to 20 August 2010

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

<b>FCC Reference (47CFR)</b>	<b>Measurement</b>	<b>Result</b>
Part 15.107(a)	Receiver/Idle Mode AC Conducted Spurious Emissions	
Part 15.109, 15.225(d)	Receiver/Idle Mode Radiated Spurious Emissions	
Part 15.225(a)(b)(c)(d)	Transmitter Fundamental Field Strength	
Part 15.209(a)/15.225(d)	Transmitter Radiated Emissions	
Part 15.209(a)/15.225(c)(d)	Transmitter Band Edge Radiated Emissions	
Part 2.1049	Transmitter 20 dB Bandwidth	
Part 15.225(e)	Transmitter Frequency Stability (Temperature & Voltage Variation)	
<b>Key to Results</b>		
 = Complied  = Did not comply		

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

<b>Reference:</b>	ANSI C63.10 (2009)
<b>Title:</b>	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)**

<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	P-01C
<b>IMEI Number:</b>	351965040007048 ( <i>Radiated sample #1</i> ) 351965040007097 ( <i>Radiated sample #2</i> )
<b>Hardware Version Number:</b>	Rev C
<b>Software Version Number:</b>	B-D02CS1-00.01.012 D02CS1_Cv20092804
<b>FCC ID Number:</b>	UCE210032A

<b>Description:</b>	Battery
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	P17

<b>Description:</b>	AC Charger
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	FOMA AC Adapter 01 for Global use / MAS-BH0008-A 002

<b>Description:</b>	DC Charger
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	FOMA DC Adapter 02

<b>Description:</b>	Charge/USB Data cable
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	FOMA USB Cable with Charge Function 01

<b>Description:</b>	Personal Hands-Free
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	Stereo Earphone Set 01

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

The equipment under test was a dual mode UMTS/GSM cellular handset with RFID.

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

No modifications were applied to the EUT during testing.

**3.4. Additional Information Related to Testing**

<b>Tested Technology:</b>	RFID	
<b>Category of Equipment:</b>	Transceiver	
<b>Channel Spacing:</b>	Single channel device	
<b>Transmit Frequency Range:</b>	13.56 MHz	
<b>Receive Frequency Range:</b>	13.56 MHz	
<b>Power Supply Requirement:</b>	Nominal	3.7 V
	Minimum	3.4 V
	Maximum	4.2 V
<b>Tested Temperature Range:</b>	Minimum	-20°C
	Maximum	50°C

**3.5. Support Equipment**

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

<b>Description:</b>	Micro SD memory card
<b>Brand Name:</b>	Not stated
<b>Model Name or Number:</b>	Not stated

<b>Description:</b>	Dummy battery
<b>Brand Name:</b>	Not Stated
<b>Serial Number:</b>	Not Stated

<b>Description:</b>	USB Hub
<b>Brand Name:</b>	Buffalo
<b>Model Name or Number:</b>	BSH3U01

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

### **4.1. Operating Modes**

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

- Receiver/Idle mode
- Constantly transmitting at full power with a modulated carrier in RFID test mode.

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

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

- The RFID transmitter was enabled using a USIM card supplied by the customer.
- Radiated spurious emission test were performed with the Personal Hands Free connected to the EUT as this was found to be the worst case during pre-scans. All accessories were individually connected and measurements made during pre-scans to determine the worst case combination.
- As the EUT is not capable of transmitting while charging, no AC Mains conducted emissions (150 kHz to 30 MHz) test was performed in transmit 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 Uncertainties* 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. Receiver/Idle Mode AC Conducted Spurious Emissions****Test Summary:**

<b>Test Engineer:</b>	Gareth Bragg	<b>Test Date:</b>	20 August 2010
<b>Test Sample Serial No:</b>	351965040007097		

<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>	25
<b>Relative Humidity (%):</b>	38

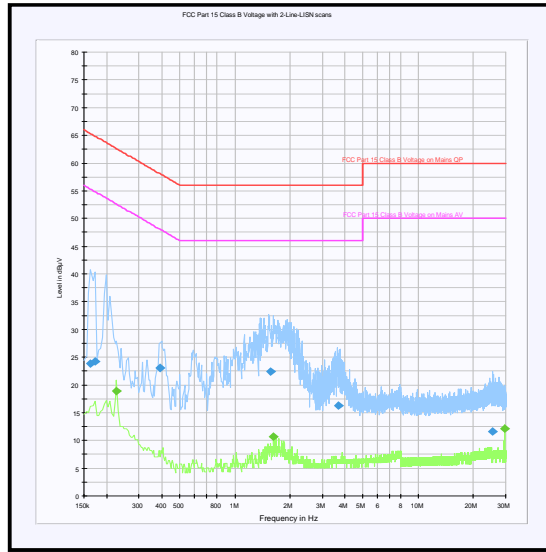
**Results: Quasi Peak Detector Measurements**

Frequency (MHz)	Line	Quasi Peak Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.163500	Live	23.9	65.3	41.4	Complied
0.172500	Live	24.2	64.8	40.6	Complied
0.388500	Neutral	23.1	58.1	35.0	Complied
1.563000	Live	22.3	56.0	33.7	Complied
3.655500	Neutral	16.3	56.0	39.7	Complied
25.584000	Neutral	11.6	60.0	48.4	Complied

**Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.226500	Live	18.9	52.6	33.7	Complied
1.630500	Live	10.7	46.0	35.3	Complied
29.616000	Live	12.1	50.0	37.9	Complied

**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:**

<b>Test Engineer:</b>	Grant Mason	<b>Test Dates:</b>	12 August 2010 to 13 August 2010
<b>Test Sample Serial No:</b>	351965040007097		

<b>FCC Part:</b>	15.109, 15.225(d)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3, 6.4 and 6.5 referencing ANSI C63.4
<b>Frequency Range:</b>	9 kHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	27

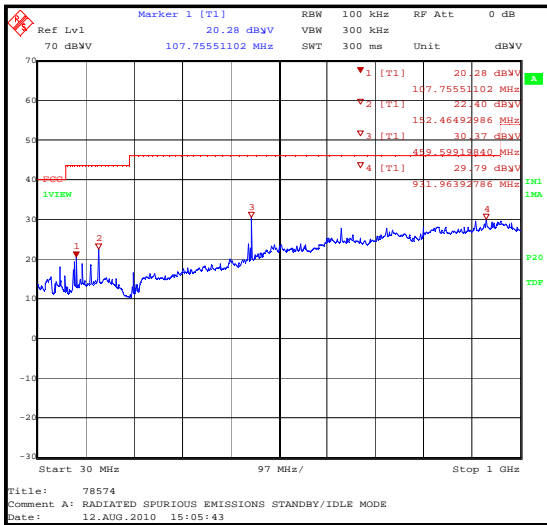
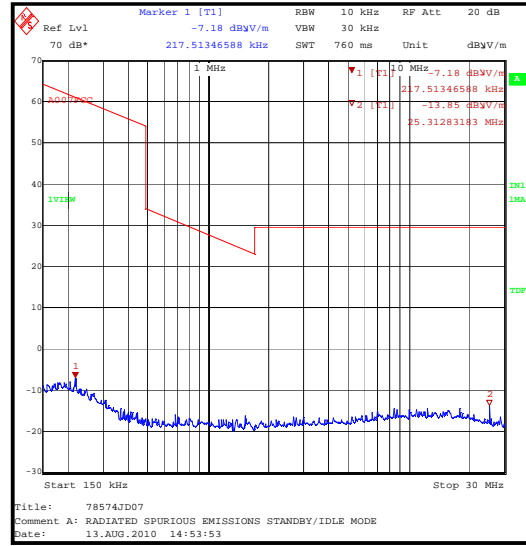
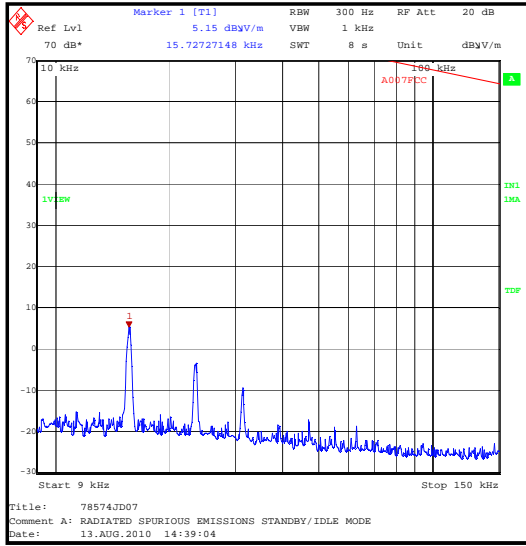
**Results:**

<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>
458.787	Vertical	31.1	46.0	14.9	Complied
639.223	Horizontal	29.6	46.0	16.4	Complied

**Note(s):**

- Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by making the measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
- A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
- Final measurement values include corrections for antenna factor and cable losses.
- All emissions on the 9 kHz to 150 kHz plot were investigated and found to be radiating from the test site turntable.
- All other emissions shown on the pre-scan plots were investigated and found to be >20 dB below the applicable limit or below the measurement system noise floor.

### 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 Fundamental Field Strength**

**Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	20 August 2010
<b>Test Sample Serial No:</b>	351965040007048		

<b>FCC Part:</b>	15.225 (a)(b)(c)(d)
<b>Test Method Used:</b>	ANSI C63.10 Section 6.4

**Environmental Conditions:**

<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	42

**Results:**

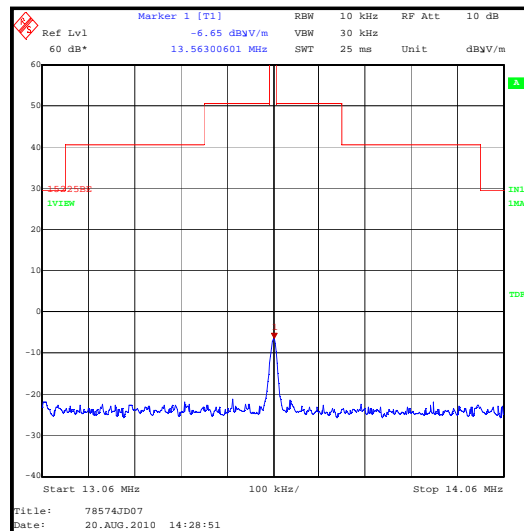
Frequency (MHz)	Antenna Polarity	Quasi-peak Level (dBµV/m)	Limit at 30 m (dBµV/m)	Margin (dB)	Result
13.56	90° to EUT	12.8	84.0	71.2	Complied

**Note(s):**

- Measurements were performed at 3 metres and results extrapolated to 30 metres. A distance extrapolation factor of 40 dB was used.
- The limit is specified at a test distance of 30 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by making the measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.

Note: An additional 20 dB has been added to attain the final value shown in the table; this is to account for a transducer factor that was not included during the original measurement.

*i.e.: -7.2 dBuV/m + 20 dB = 12.8 dBuV/m*



**5.2.4. Transmitter Radiated Spurious Emissions****Test Summary:**

<b>Test Engineers:</b>	Grant Mason & Andrew Edwards	<b>Test Dates:</b>	19 August 2010 & 20 August 2010
<b>Test Sample Serial No:</b>	351965040007048		

<b>FCC Part:</b>	15.209(a), 15.225(d)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3, 6.4 and 6.5 referencing ANSI C63.4
<b>Frequency Range:</b>	9 kHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature Variation (°C):</b>	27
<b>Relative Humidity Variation (%):</b>	41

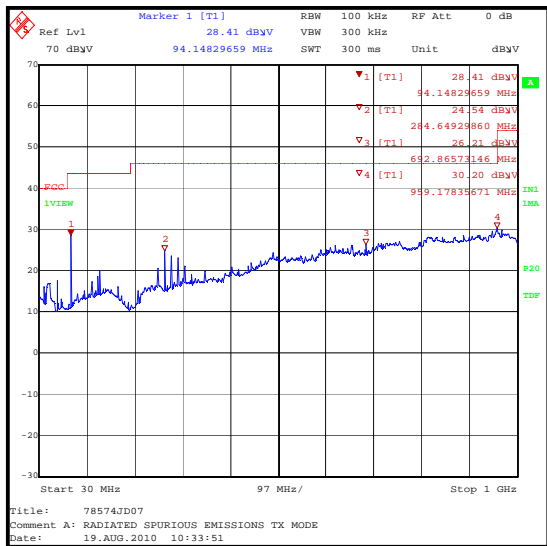
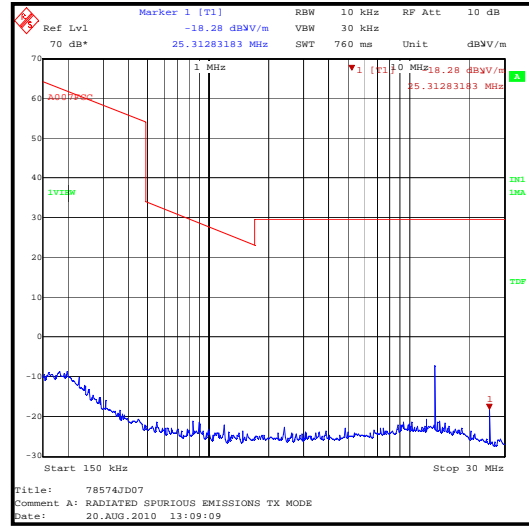
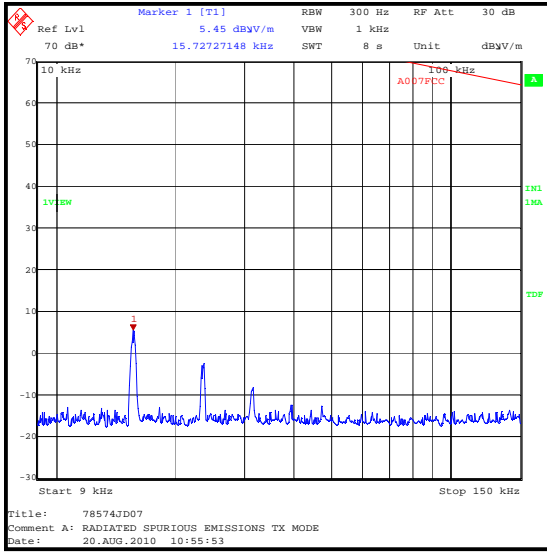
**Results: Electric Field Strength Measurements**

<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>
94.920	Horizontal	29.5	43.5	14.0	Complied
284.779	Horizontal	23.6	46.0	22.4	Complied
298.347	Horizontal	22.7	46.0	23.3	Complied

**Note(s):**

- Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by making the measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
- A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
- The emission shown at approximately 13.56 MHz is the fundamental.
- All emissions on the 9 kHz to 150 kHz plot were investigated and found to be radiating from the test site turntable.
- All other emissions shown on the pre-scan plots were investigated and found to be >20 dB below the applicable limit or below the measurement system noise floor.

### Transmitter Radiated Spurious Emissions (continued)



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



**5.2.5. Transmitter Radiated Emissions at Band Edges****Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	20 August 2010
<b>Test Sample Serial No:</b>	351965040007048		

<b>FCC Part:</b>	15.209(a) & 15.225(c)(d)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.9.2

**Environmental Conditions:**

<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	42

**Results: Lower Band Edge**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
13.11	-4.1	30.0	34.1	Complied

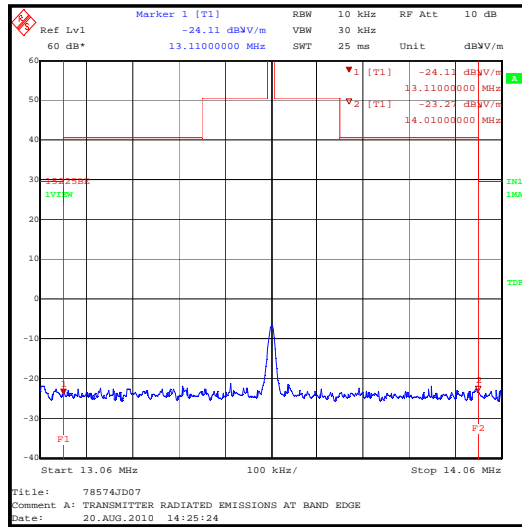
**Results: Upper Band Edge**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
14.01	-3.3	30.0	33.3	Complied

**Note(s):**

1. Measurements were performed at 3 metres and results extrapolated to 30 metres. A distance extrapolation factor of 40 dB was used.
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required.
3. The band edge emission plot shown below is low by a factor of 20 dB, due to the absence of a transducer factor at the time of measurement. An additional 20 dB has been subsequently added to any band edge measurements, for comparisons with the limit, when determining compliance.

**Transmitter Radiated Emissions at Band Edges (continued)**



**5.2.6. Transmitter 20 dB Bandwidth**

**Test Summary:**

<b>Test Engineer:</b>	Grant Mason	<b>Test Date:</b>	18 August 2010
<b>Test Sample Serial No:</b>	351965040007048		

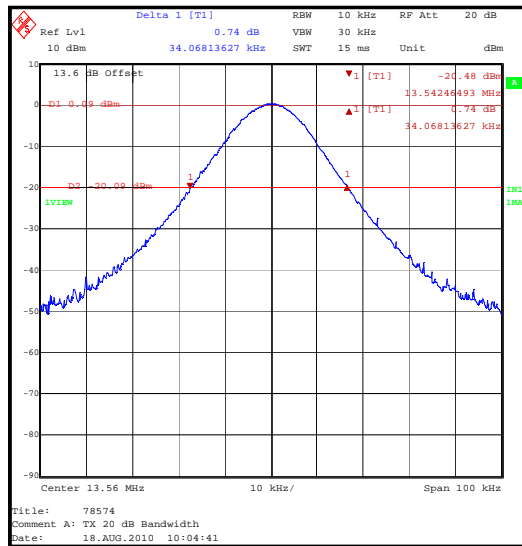
<b>FCC Part:</b>	2.1049
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.9.1

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	32

**Results:**

<b>20 dB Bandwidth (kHz)</b>
34.068



**5.2.7. Transmitter Frequency Stability (Temperature & Voltage Variation)****Test Summary:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	13 August 2010
<b>Test Sample Serial No:</b>	351965040007097		

<b>FCC Part:</b>	15.225 (e)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.8

**Environmental Conditions:**

<b>Ambient Temperature (°C):</b>	25
<b>Ambient Relative Humidity (%):</b>	31

**Results: Maximum frequency error of the EUT with variations in ambient temperature**

Temperature (°C)	Time after Start-up			
	0 minutes	2 minutes	5 minutes	10 minutes
-20	13.559825	13.559842	13.599834	13.599808
20	13.559847	13.559847	13.559844	13.559846
50	13.559811	13.559813	13.599811	13.599810

Frequency with Worst Case Deviation (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Margin (%)	Result
13.599808	192	0.001416	0.01	0.008584	Complied

**Results: Maximum frequency error of the EUT with variations in nominal operating voltage at an ambient temperature of 20°C**

Supply Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Margin (%)	Result
3.4	13.56	13.559845	155	0.001143	0.01	0.008857	Complied
3.7	13.56	13.559847	153	0.001128	0.01	0.008872	Complied
4.2	13.56	13.559845	155	0.001143	0.01	0.008857	Complied

## **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".

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
20 dB Bandwidth	13 MHz to 14 MHz	95%	±0.92 ppm
Frequency Stability	13 MHz to 14 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 1000 MHz	95%	±3.53 dB
Transmitter Fundamental Field Strength	13 MHz to 14 MHz	95%	±3.53 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	14 & 17	-	Corrected previously reported emissions levels by +20 dB

**Appendix 1. Test Equipment Used**

UL 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
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	01 Mar 2011	12
A288	Antenna	Chase	CBL6111A	1589	16 Mar 2011	12
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Calibration not required	-
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	01 Sep 2010	12
M1022	Spectrum Analyser	Rohde & Schwarz	FSM	828260/004	19 Nov 2010	12
M1068	Thermometer	Iso-Tech	RS55	93102884	01 Oct 2010	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1273	Test Receiver	Rhode & Schwarz	ESIB 26	100275	08 Apr 2011	12
M1568	Magnetic Loop	Rohde & Schwarz	HFH2-Z2	879284/2	14 Jan 2011	12

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

**--- END OF REPORT ---**