TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: NTT docomo P-04B

To: FCC Part 15.225: 2009 Subpart C

Test Report Serial No:
RFI-RPT-RP77078JD03A_V2.0

Version 3.0 supersedes all previous versions

This Test Report Is Issued Under The Authority Of Brian Watson, COO Payments and Consultancy:	pp 
Checked By:	R. Graham
Signature:	pp 
Date of Issue:	08 April 2010

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1. Customer Information

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

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.225
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2009: Part 15 Subpart C (Radio Frequency Devices) - Section 15.225
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	04 March 2010 to 10 March 2010

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.107(a)	Idle Mode AC Conducted Spurious Emissions	✓
Part 15.109(a), 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 Spurious 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)	✓

Key to Results

✓ = Complied ✗ = Did not comply

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2003)
Title:	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.

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)

Description:	UMTS/GSM Cellular Handset
Brand Name:	NTT docomo
Model Name or Number:	P-04B
Serial Number:	358862030014626
Hardware Version Number:	Rev C
Software Version Number:	B-D01WP1-01.01.001 D01WP1_Cv48032102
FCC ID Number:	UCE210027A

Description:	Battery
Brand Name:	NTT docomo
Model Name or Number:	P20
Serial Number:	N/A

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

Description:	DC Charger
Brand Name:	NTT docomo
Model Name or Number:	FOMA DC Adapter 02
Serial Number:	N/A

Description:	Charge/USB Data cable
Brand Name:	NTT docomo
Model Name or Number:	FOMA USB Cable with Charge Function 02
Serial Number:	N/A

Description:	Micro SD memory card
Brand Name:	Not stated
Model Name or Number:	Not stated
Serial Number:	Not stated

Description:	Personal Hands-Free
Brand Name:	NTT docomo
Model Name or Number:	Stereo Earphone Set 01
Serial Number:	N/A

3.2. Description of EUT

The equipment under test was a dual mode UMTS/GSM cellular handset with *Bluetooth* and RFID

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:	RFID	
Category of Equipment:	Transceiver	
Channel Spacing:	Single Channel device	
Transmit Frequency:	13.56 MHz	
Receive Frequency:	13.56 MHz	
Power Supply Requirement:	Nominal	3.7 V
	Minimum	3.4 V
	Maximum	4.2 V
Tested Temperature Range:	Minimum	-20°C
	Maximum	+ 55°C

3.5. Support Equipment

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

Description:	Dummy Battery
Brand Name:	Not Stated
Model Name or Number:	Not Stated

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 mode.

4.2. Configuration and Peripherals

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

- The RFID transmitter was enabled by fitting a specially configured test USIM into the EUT and using a test mode accessed through the user interface
- 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 only Idle AC Conducted Emissions were performed.

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:

FCC Part:	15.107
Test Method Used:	As detailed in ANSI C63.4 Section 7 and relevant annexes

Environmental Conditions:

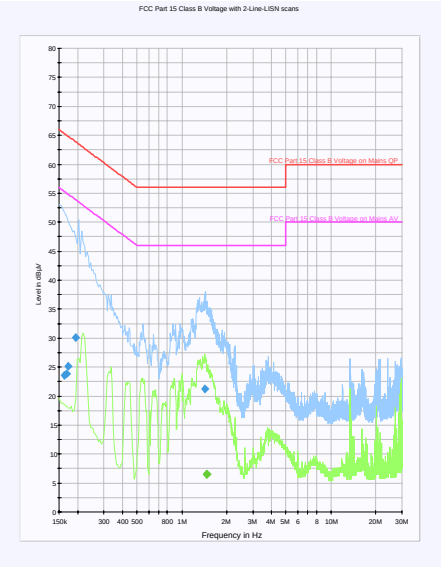
Temperature (°C):	26
Relative Humidity (%):	25

Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.163500	Live	23.5	65.3	41.8	Complied
0.168000	Live	23.9	65.1	41.2	Complied
0.172500	Live	25.1	64.8	39.7	Complied
0.195000	Live	30.0	63.8	33.8	Complied
1.419000	Live	21.2	56.0	34.8	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
1.468500	Live	6.6	46.0	39.4	Complied
1.473000	Live	6.6	46.0	39.4	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, 15.225(d)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

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

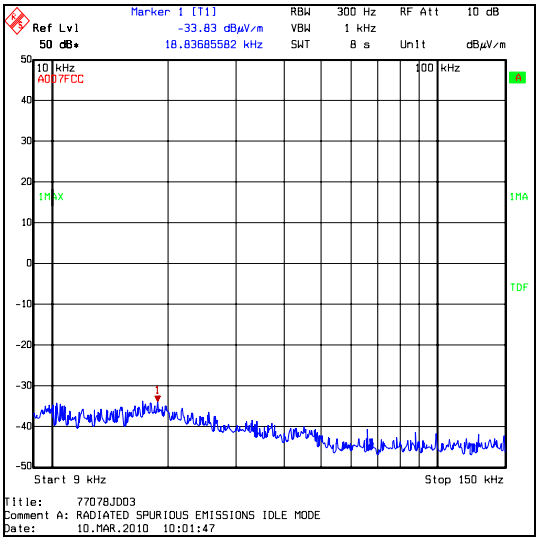
Results:

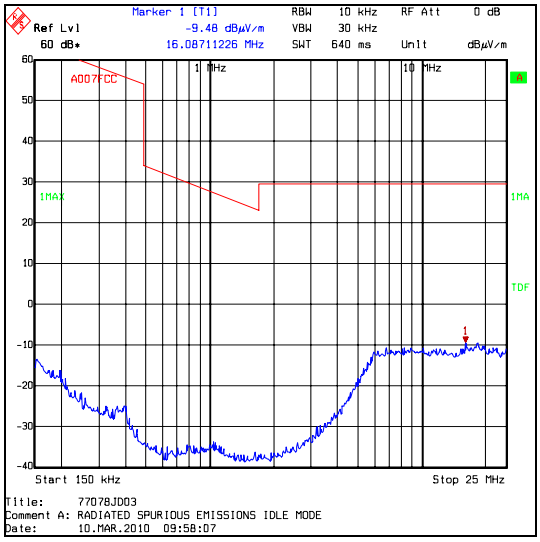
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
153.325	Horizontal	26.3	43.5	17.2	Complied
458.804	Horizontal	28.4	46.0	17.6	Complied
747.246	Vertical	27.8	46.0	18.2	Complied
931.672	Horizontal	28.8	46.0	17.2	Complied

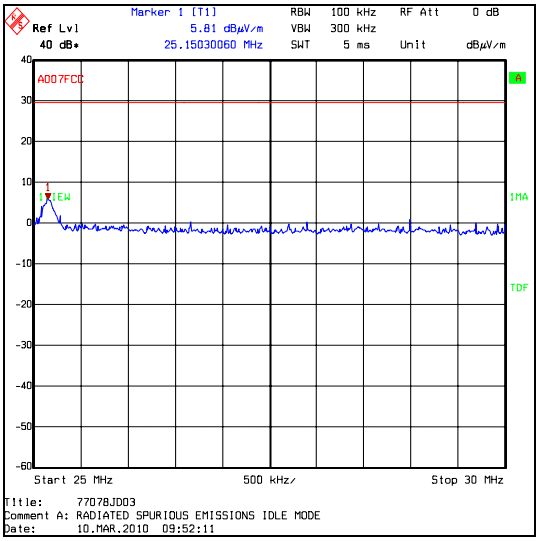
Note(s):

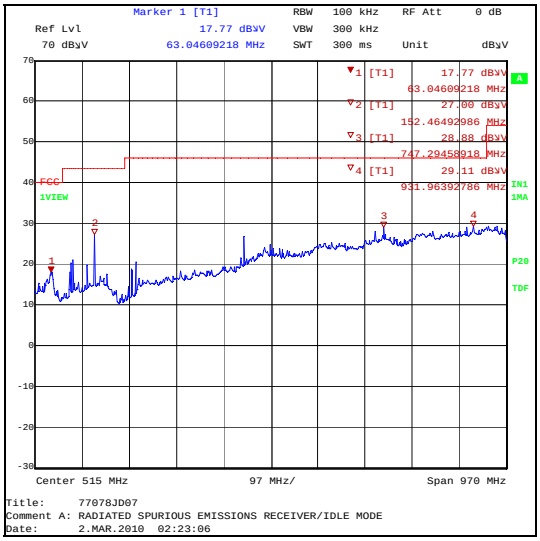
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by 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.
3. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required.

Receiver / Idle Mode Radiated Spurious Emissions (continued)









30 MHz to 1000 MHz

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:

FCC Part:	15.225 (a)(b)(c)(d)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

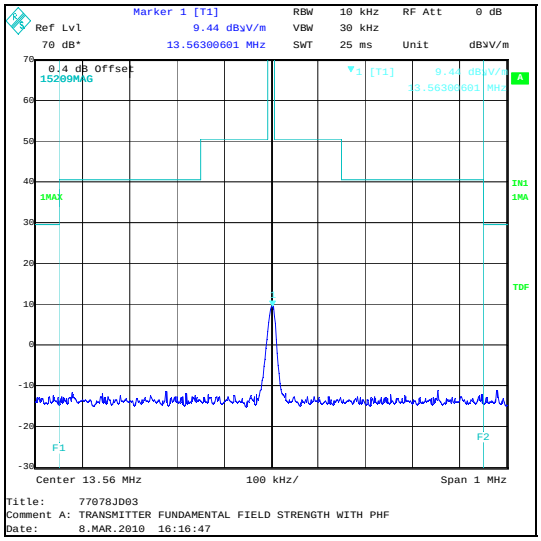
Temperature Range (°C):	24.5
Relative Humidity Range (%):	23

Results:

Frequency (MHz)	Antenna Polarity	Q-P Level (dBµV/m)	Limit at 30 m (dBµV/m)	Margin (dB)	Result
13.56	0° to EUT	9.4	84.0	74.6	Complied

Note(s):

1. Measurements were performed at 3 metres and results extrapolated to 30 metres.
2. 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: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

5.2.4. Transmitter Radiated Spurious Emissions

Test Summary:

FCC Part:	15.209 (a), 15.225(d)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	9 kHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	24.5
Relative Humidity (%):	23

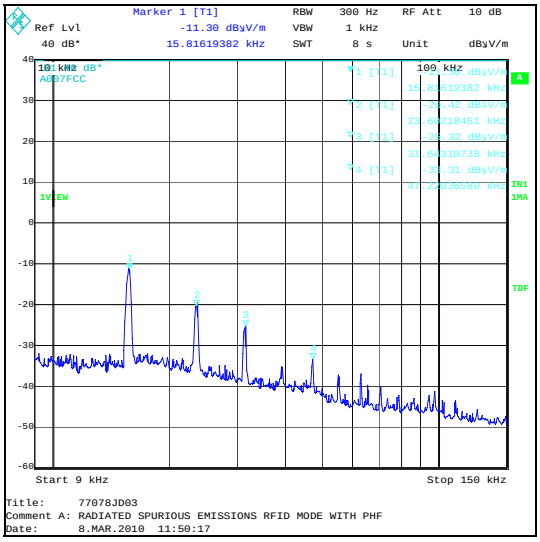
Results: Electric Field Strength Measurements

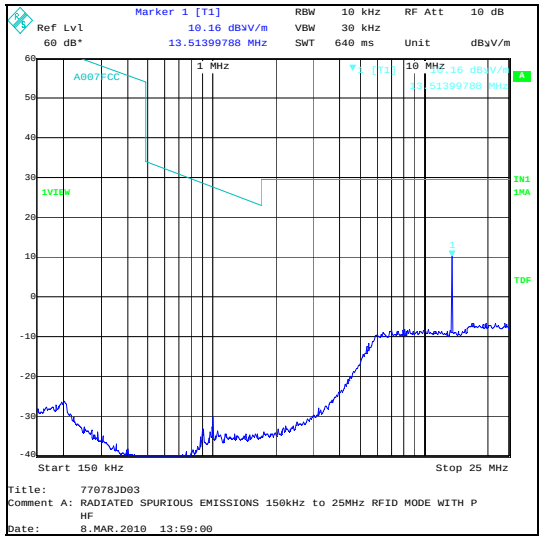
Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
447.475	Horizontal	29.2	46.0	16.8	Complied
458.775	Horizontal	35.4	46.0	10.6	Complied
474.591	Horizontal	31.3	46.0	14.7	Complied
528.804	Horizontal	30.8	46.0	15.2	Complied
555.950	Horizontal	32.8	46.0	13.2	Complied
583.060	Horizontal	31.1	46.0	14.9	Complied
745.785	Horizontal	32.9	46.0	13.1	Complied

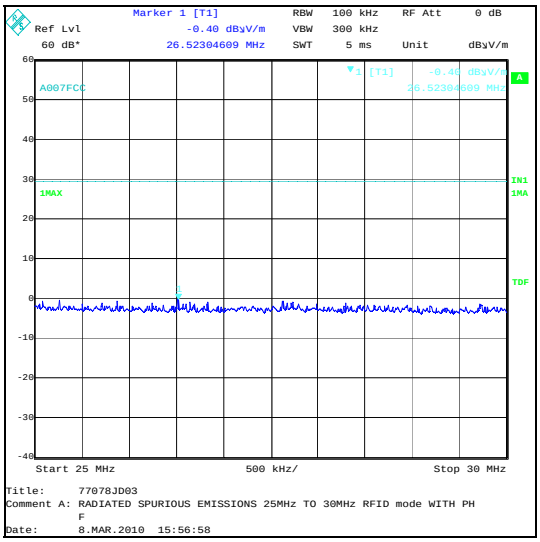
Note(s):

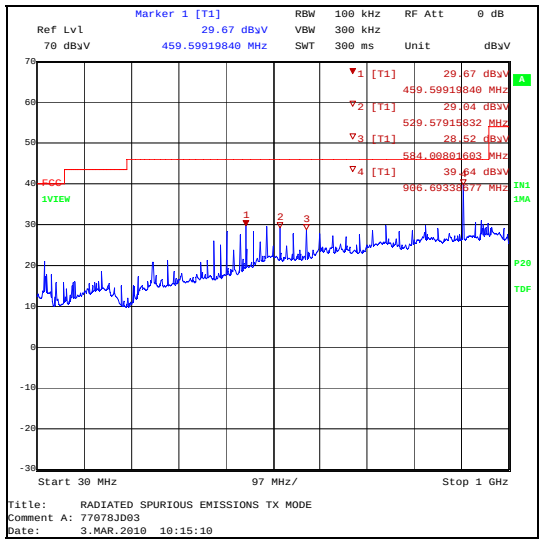
1. Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by making the measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
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 Emission show at approximately 13.5 MHz is the fundamental

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:

FCC Part:	15.209(a) 15.225(c)(d)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

Temperature (°C):	24.5
Relative Humidity (%):	23

Results: Lower Band Edge

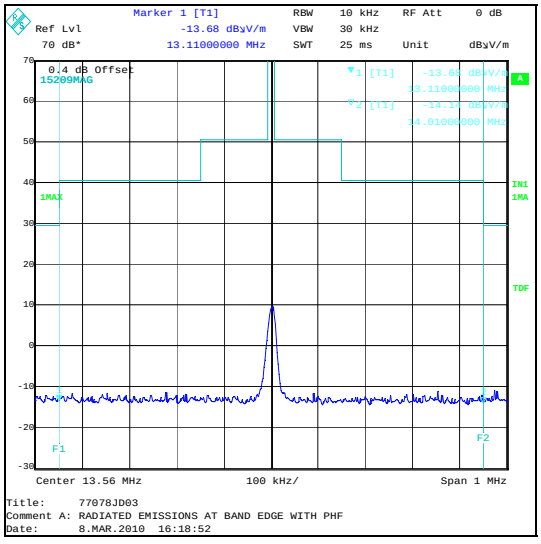
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
13.11	-12.1	40.5	52.6	Complied

Results: Upper Band Edge

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
14.01	-12.6	40.5	53.1	Complied

Note(s):

1. Measurements were performed at 3 metres and results extrapolated to 30 metres.
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.



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

5.2.6. Transmitter 20 dB Bandwidth

Test Summary:

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.1.7 and relevant annexes (see note below)

Environmental Conditions:

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

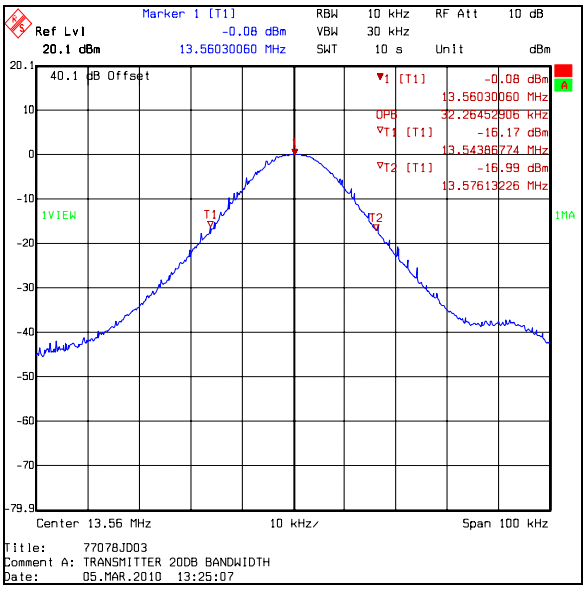
Results:

Channel	20 dB Bandwidth (MHz)
Single	0.0323

Designated Frequency Band	
Band (MHz)	**Bandwidth (MHz)**
13.110 to 14.010	0.900

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 20 dB bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



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

5.2.7. Transmitter Frequency Stability (Temperature & Voltage Variation)

Test Summary:

FCC Part:	15.225 (e)
Test Method Used:	As detailed in ANSI C63.4 Section 13.1.6 and relevant annexes

Environmental Conditions:

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

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

Temp (°C)	Nominal Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Margin (%)	Result
-20	13.56	13.560129	129	0.000951	0.01	0.009049	Complied
20	13.56	13.560043	43	0.000317	0.01	0.009683	Complied
50	13.56	13.559998	2	0.000015	0.01	0.009985	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 V	13.56	13.560070	70	0.000516	0.01	0.009484	Complied
3.7 V	13.56	13.560074	74	0.000546	0.01	0.009454	Complied
4.2 V	13.56	13.560074	74	0.000546	0.01	0.009454	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”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
20 dB Bandwidth	N/A	95%	±0.92 ppm
Frequency Stability	N/A	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±2.94 dB
Transmitter Fundamental Field Strength	9 kHz to 30 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A007	Antenna	Rohde & Schwarz	HFH2-Z2	880 458/020	29 Mar 2009	12
A067	Line Impedance Stabilization Network	Rohde & Schwarz	ESH3-Z5	890603/002	03 Jun 2009	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	01 Mar 2010	12
A288	Antenna	Chase	CBL6111A	1589	13 Mar 2009	12
C363	Cable	Rosenberger	RG142	None	23 Feb 2010	12
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Calibration not required	-
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	04 May 2009	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 Sep 2009	12
K0003	Bench Test Site	RFI Global Services Ltd	N/A	N/A	Calibration not required	-
K0008	Site Reference 4422	RFI Global Services Ltd	N/A	N/A	Calibration not required	-
M1068	Thermometer	Iso-Tech	RS55	93102884	01 Oct 2009	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	13
M122	Digital Voltmeter	Fluke	77	64910017	23 Jun 2009	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	22 Apr 2009	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	10 Jul 2009	12
M1379	Test Receiver	Rohde and Schwarz	ESIB7	100330	20 Aug 2009	12
M208	Thermometer/Hygrometer	RS Components Ltd	RS212-124	M208-RS212-124	30 Apr 2009	12
S0536	EL302D Dual Power Supply	TTI	EL302D	249944	Calibrated before use	-

Note that asset M1124 indicates it went out of calibration during testing. It shall be noted however that the asset was in calibration for the test for which it was used.

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